Optimizing sales and customer support processes using service blueprinting

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Optimizing sales and customer support processes using service blueprinting

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Abstract

This research was on the scalability of the business processes involving a customer, i.e. sales and customer support processes at Bicore, a small IT company. Service blueprinting was chosen as process analysis methodology to model and redesign the processes of interest. In order to come up with potential process improvements, a combination of a case analysis and a benchmark was used. By associating process differences with high performance on the dimensions effectiveness and efficiency, improvement directions could be identified. These improvement directions can assist Software as a Service providing SMEs operating in a B2B environment to model their customer-related business processes to become scalable. The main academic contribution of this study can be found in the application of service blueprinting for the sales process, which appeared to be suitable in this context. In addition, this study provides evidence that combining relevant performance measures with service blueprinting may support the identification of process improvements by providing a quantitative justification for the improvement directions to be selected.

Management summary

This document presents a Master thesis project in the field of service innovation, executed at the small IT company Bicore. The research was on the scalability of the business processes involving a customer, i.e. sales and customer support processes, at Bicore, aiming for a balance in effectiveness and efficiency. The relatedness of sales and customer support processes can be explained using the customer experience management concept of the 'customer journey': the cycle of the relationship between the customer and the organization (Nenonen, Rasila, Junnonen, & Kärnä, 2008). In a service setting, this customer lifecycle typically starts when a customer discovers a need for a service and starts over or ends when the contract is respectively extended or expired. Crucial are the touchpoints in this journey, also referred to as 'moments of truth', all related to sales and customer processes of the service providing company and critical in ensuring customer satisfaction and loyalty (Goffin & New, 2001).

Bicore is a small enterprise developing the strategic portfolio management software 'Flightmap'. Bicore expects (international) growth in the upcoming years and consequently a need is signaled for a professionalization of the sales and customer support processes, together referred to as the customer-related business processes. Taking this into account, the following problem statement was defined: *'The sales and customer support processes of Bicore seem to be insufficiently scalable, i.e. optimally balanced in effectiveness and efficiency, due to a lack of clearly defined processes and their relations, a discrepancy between the defined processes and the actual processes in practice, and presumed bottlenecks in the processes'.* This problem statement was translated in a research objective: to design future proof, i.e. improved in scalability by balancing in efficiency and effectiveness, sales and customer support processes for small Software as a Service providers in general and Bicore in specific.

The concept of the 'customer experience' was used as a starting point in the search for an appropriate methodology to analyze, and subsequently improve, the customer-related business processes. To deliver a consistent and satisfying customer experience the service providing company needs to be fully aware of its service delivery process (Zehrer, 2009). A number of process analysis and improvement methodologies in the field of customer experience management were identified and assessed. Even though the concept of the customer journey is perfect to illustrate the scope of this study, customer journey mapping will not be the process analysis methodology of choice. Service blueprinting, was considered fitting the research objective of balancing efficiency and effectiveness of customer-related business processes best, since it is shown to be the most process-centric analysis and improvement methodology originating from customer experience management (Samadzadeh, 2015). This characteristic makes service blueprinting more suitable for business process improvement when focusing on both effectiveness as well as efficiency, than for improving only the customer experience, which is associated with effectiveness (Samadzadeh, 2015). Moreover, service blueprinting can be considered one of the most-established techniques in this field, both in theory as well as practice (Bitner, Ostrom, & Morgan, 2008; Hewing, 2013). More specifically, a combination of service blueprinting and basic flowcharting was proposed to achieve the before mentioned objective. The research gap to be addressed was related to the presumed applicability of service blueprinting for the whole lifecycle of the customer experience, also including sales, which has not been done before, and the combination of service blueprinting with performance indicators to identify and select process improvements in a more scientific manner.

Research methodology

The processes of interest were identified using semi-structured interviews with frontline personnel of Bicore. These processes were modeled in three 'as-is' service blueprints for sales, implementation, and customer support. It was decided to develop an additional service blueprint, next to sales and customer support, because the customer support blueprint appeared to be inappropriate to model the implementation phase of Flightmap. As a next step, a within-case analysis was executed. Five cases involving the customer-firm interactions of specific customers of Bicore, were discussed using objective and subjective information from various sources. In addition, a cross-case analysis revealed potential process bottlenecks and improvement directions. Since a case analysis is not suitable to discover more radical improvements, also a benchmark was executed. The relevant processes of four

benchmark partners and Bicore were compared mutually. These partners were all small Software as a Service (SaaS) providers in a business-to-business environment, demonstrating excellent sales and/or customer support. The processes of the benchmark partners were discovered using semi-structured interviews with sales and/or customer support managers.

Results

As part of the case analyses, each case was rated on effectiveness and efficiency based on their scores on corresponding performance indicators. Consequently, process differences associated with high performance on efficiency/effectiveness could be identified and translated into improvement directions. Following the same logic as in the case analysis, in the benchmark process differences between Bicore and the partners were linked to high performance. The most promising improvement directions resulting from the case analysis and benchmark are shown in Figure 1.

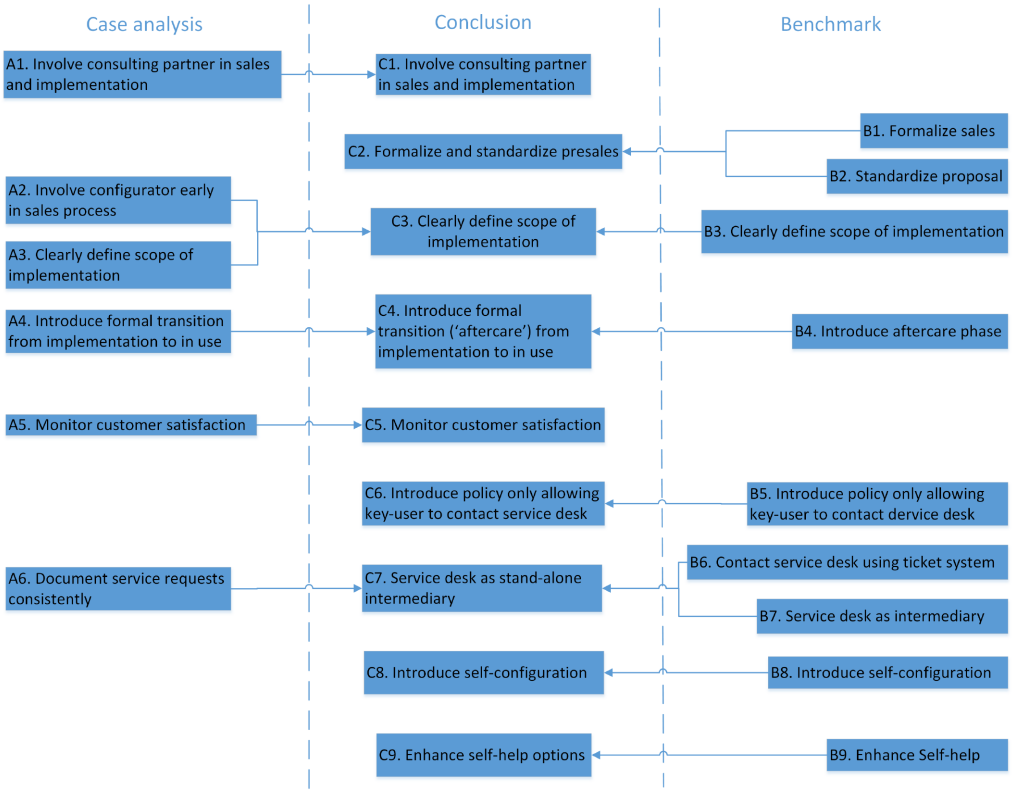

Figure 1. Integration of improvement directions of case analyses and benchmark into conclusion

In general, the sales, implementation, and customer support processes of the benchmark partners matched the processes of Bicore relatively well. At all benchmarking partners, problems occurred as a result of the upscaling of their business. They signaled a need to formalize processes and to implement tools enabling this shift. Furthermore, it turned out that the structural measurement of performance indicators was very immature at all of the interviewed companies. As a result, it appeared to be very difficult to compare the scores mutually and to identify best performers in each stage, because of the limited number of scores retrieved.

Conclusion

The case analyses and benchmark yielded a number of improvement directions for the relevant processes. For the (pre)sales phase, two main improvements were distinguished. Firstly, it was shown that involving consulting partners may provide considerable advantages. Secondly, as seen in the benchmark the process towards closing a deal could be done more efficiently. Introducing procedures could aid this processes, e.g. the period of following up leads could be standardized as well as the input for writing proposals, e.g. by defining one or more templates for a proposal. At the moment, as seen in the case analysis, implementation effort often escalates due to customers initially not having a

clear view on the scope, requirements, and goals of Flightmap for their business. The implementation can be significantly smoothened by preparing the scope, requirements, and goals thoroughly before the actual implementation takes place and consequently formalize this in a statement of work. The involvement of the intended configurator is crucial to ensure that the proposal is realistic in terms of offered features and implementation planning. The transition from implementation to in use also deserves considerable attention. By introducing an aftercare phase this transition could be enforced: after the initial implementation is delivered, Bicore should let the client formally know that the project has proceeded to the aftercare phase. After a fixed period of time, the formal transition to in use should take place, in which no longer configuration requests will be handled free of charge. In the future, as a result of introducing a configuration studio for the customer, during in use configuration requests should be handled by the key user himself. For the in use phase also a number of process improvements were distinguished. As argued in the case analysis, monitoring customer satisfaction periodically is very important to secure contract extension by intervening at the right time. Furthermore, for the service desk new procedures need to be introduced. First of all, it is recommended to allow only the key user of the customer to contact the service desk. This key user should be responsible for handling all service requests internally, and may contact the service desk if necessary. In the future, the service desk should take more the role of an intermediary, assigning service requests to the corresponding developers or configurators. In addition, Bicore should stimulate key users to contact the service desk directly instead of using personal telephone numbers or email addresses and to consistently document service requests in the ticket system. Moreover, self-help solutions can ease the pressure on the service desk, moving these activities above the line of interaction.

In summary, the most prominent managerial recommendations to achieve an optimal balance between effectiveness and efficiency for the design of customer-related business processes are listed in Table 1, also pointing out to the related performance dimensions, required effort, estimated impact, and resulting priority for implementation.

Improvement direction	Related to	Effort	Impact	Priority
C1. Involve consulting partner in sales and implementation	Efficiency	High	High	Third
C2. Formalize and standardize presales	Efficiency	Medium	Medium	Second
C3. Clearly define scope of implementation	Effectiveness	Medium	High	Second
C4. Introduce a formal transition ('aftercare') from implementation to in use	Efficiency	Low	Medium	First
C5. Monitor customer satisfaction	Effectiveness	Low	Medium	First
C6. Introduce a service desk contact policy allowing only key users to make contact	Effectiveness	Low	Medium	First
C7. Change the role of the service desk into a stand-alone intermediary	Efficiency	High	High	Third
C8. Introduce self-configuration	Efficiency	High	High	Second
C9. Enhance self-help options	Efficiency	Medium	Low	Second

Table 1. List of managerial recommendations

The main practical contribution of this study is the development of three 'as-should' service blueprints for sales, implementation, and customer support processes of small Software as a Service (SaaS) providers in general and Bicore in particular (Appendix XXI and Appendix XXII). These service blueprints present guidelines on how to structure the customer-related business processes when aiming for both effectiveness and efficiency. These recommendations are particularly relevant for companies struggling to scale their processes to keep up with fast growth rates, since processes need to be formalized and tools introduced to support this shift.

A major academic contribution of this study can be found in the application of the service blueprinting technique for the sales process. As argued in literature, it appears to be a challenge to map a sales process with its relationships, decisions, and negotiations (Barber & Tietje, 2008). To my best

knowledge this is the first attempt to map the sales process in a service blueprint. This first attempt appears to be successful, while both Bicore as well as the benchmark partners agree on its suitability to visualize the sales process. In addition, this study provides evidence that combining performance measures with service blueprinting results in a stronger justification when identifying and selecting process improvements. The last theoretical contribution comprises the proposed set of performance indicators. Few scholarly articles have discussed which performance indicators should be used when assessing sales, implementation, or customer support processes.

Limitations and directions for future research

The first limitation concerns the scope of this research, which was relatively broad. The whole cycle of the customer-firm relationship has been under research, i.e. sales, implementation, and customer support processes. If the focus of this study would have been on either sales or customer support the number of cases and the number of benchmark partners per phase could have been doubled within the same time-constraints, improving the generalizability of the results. Moreover, a major limitation concerns the limited set of scores on performance indicators which could be retrieved from the benchmark partners. Consequently, no strong conclusions could be drawn from comparing scores on the performance indicators mutually. In addition, the generalizability of the recommended process model seems limited to small, i.e. less than hundred employees, software providing companies in a business-to-business setting. Even though in the present study the customer-related business processes of the benchmark partners were comparable to a large extent, from this study no conclusions can be drawn on service providers active in other sectors, in business-to-consumer markets, and/or larger in volume. An additional direction for future research could be the involvement of customers (and their processes) to include their view and possibly to extend the service blueprint with additional swim lanes for backstage or supporting processes of the customer, as previously done by Becker et al. (2013) and Trkman et al. (2015).

Preface

All good things come to an end, which is also very true for my time as a student at the University of Technology in Eindhoven. This report marks the completion of the master program Innovation Management and preludes a new, exciting phase in my life. I would like to take this opportunity to express my gratitude to several people who contributed to the development of my Master thesis.

First of all, I would like to thank Bicore for giving me the opportunity to conduct a research which was appealing from both a theoretical as well as a practical point of view. My colleagues were open and helpful, which was greatly appreciated. In particular, I would like to thank my company supervisor Maarten Kluitman for his great support and advice. Moreover, his laid-back attitude eased my nerves in times of setbacks.

Second, I would like to thank my first university supervisor Joost Wouters for his guidance. He provided me with the freedom to manage my graduation project on my own, which made it even more challenging and consequently more valuable. In addition, I would like to thank my second supervisor, Ed Nijssen, for his valuable feedback.

Ultimately, my gratitude goes out to my parents. Even though not as a pair anymore, they both supported me unconditionally in their own way. A special word of thanks also goes out to my girlfriend Marlies, loving me for better or worse. I would also like to thank my friends and roommates for making my spare time highly enjoyable and the last year a worthy goodbye to my student life.

Daniel van den Boorn, November 2015

'Education is not the filling of a pail, but the lighting of a fire' – William Butler Yeats

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1. Introduction

This document presents a Master thesis project in the field of service innovation, executed at the IT company Bicore. The research was on the scalability of the business processes involving a customer, i.e. sales and customer support processes, of small Software as a Service providing companies in general and Bicore in specific, consequently aiming for a balance in effectiveness and efficiency between these processes.

The structure of this chapter is as follows: first of all, the context in which the assignment will be executed, is outlined. Secondly, a problem statement will be defined, resulting in a number of research questions. Thirdly, the research methodology of choice is briefly described. Finally, the structure of the remainder of this report is explained.

1.1. Research context

After World War II Western economies have gradually shifted from largely manufacturing-based towards mainly service-oriented (in relative terms). As a result service innovation became of greater interest in academic literature (Nijssen, Hillebrand, Vermeulen, & Kemp, 2006). The crucial difference between services and products is the inherent intangibility of a service. A service is generated by a process, which differs from the production of goods because the participation of the customer at the time of 'production' is mandatory. Production and consumption happen at the same point in time for a service, i.e. the customer experiences what takes place in the 'service factory' (Edvardsson, 1997). In addition, heterogeneity and perishability are mentioned in literature as characteristics of a service (Zeithaml, Parasuraman, & Berry, 1985). Along with the increased orientation on services in the world's economies, comes the increased focus of businesses on creating meaningful customer experiences. The premise is that companies can no longer compete by providing superior product quality alone, but also have to consider the customer experience to create long-term, emotional bonds with customers (Bitner et al., 2008). The increasing focus on service innovation and, more specifically, on customer experience management suggest a need for innovative analysis and improvement methods for services (Bitner et al., 2008). Customer experience management can be defined as the process of strategically managing a customer's entire experience with a product or service and the company itself (Schmitt, 2003) or alternatively as a 'set of frameworks, tools, and methodologies to manage customer experiences' (Schmitt, 2003, p. 85). Traditional product innovation tools focus on the design of tangible, static products and are, due to the previously mentioned differences between products and services, not suitable for service innovation, at least not without significant modifications to address service innovation challenges (Bitner et al., 2008). Therefore, since research is at the moment still dominated by studies on systems and products, additional research in service innovation is needed on this subject (Carlborg, Kindström, & Kowalkowski, 2014; Toivonen & Tuominen, 2009).

In line with the principles of customer experience management, service providing companies generally aim to create the prerequisites for a long-term, profitable relation with the client (Edvardsson, 1997). This is where sales and customer support processes come into the picture, while being crucial for acquiring an in-depth understanding of the client's needs, expectations and perceptions of quality in relation to cost (Edvardsson, 1997; Goffin & New, 2001; Moncrief & Marshall, 2005). To be able to understand the sales and customer support processes of a service providing company and the corresponding (re)design tools, the concept of business processes will first be explained. Business processes are defined by Davenport and Short (1990, p. 12) as a 'set of logically related tasks performed to achieve a defined business outcome'. This definition implies an emphasis on how things are done, contrary to a focus on the products or services that are the result of a process (Lindsay, Downs, & Lunn, 2003). Lindsay et al. (2003, p. 1017) translate this reasoning in: 'A process is thus a specific ordering of work activities across time and place with a beginning, an end and clearly identified inputs and outputs: a structure for action'. Two important characteristics of business processes can be identified (Davenport & Short, 1990):

- They cross organizational boundaries, i.e. processes move across or between organizational subunits.

- They have customers, either internal or external of the firm.

Sales and customer support processes are the main business processes of interest in this research. Their relatedness can be explained using the customer experience management concept of the 'customer journey': the cycle of the relationship between the customer and the organization (Nenonen, Rasila, Junnonen, & Kärnä, 2008). In a service setting, this customer life cycle typically starts when a customer discovers a need for a service and starts over or ends when the contract is respectively extended or expired. Crucial are the touchpoints between the customer and the company in this journey, also referred to as 'moments of truth', all related to sales and customer processes of the service providing company. To manage this journey in such a way that it maximizes value for both the customer and the organization, one has to look into both sales and customer support processes. These are the main processes involving customer contact and are therefore crucial in ensuring customer satisfaction and loyalty (Goffin & New, 2001). In the modern world these two are increasingly becoming intertwined, e.g. in the form of customer relationship management (Sawy & Bowles, 1997). In the remainder of this research, sales and customer support processes are referred to as the 'customer-related (business) processes', illustrating the close proximity and visibility of these business processes to the customer.

Even though the concept of the customer journey is perfect to illustrate the scope of this study, customer journey mapping will not be the process analysis methodology of choice. In this thesis I study customer-related business processes from a customer experience perspective using service blueprinting. Service blueprinting is a tool containing the customer journey as well as the interactions enabling this journey (Ruiz, Ross, & Samadzadeh, 2014). The choice for this tool will be justified in section 2.3. The addressed research gap will be on the presumed applicability of service blueprinting for the whole customer journey, also including sales processes, which has not been done before, and the combination of service blueprinting with performance indicators to identify and select process improvements in a more scientific manner, as elaborated on in section 2.6.

1.2. Business context

Bicore is a small enterprise situated at the Science Park in Son, employing thirteen employees. It develops the strategic portfolio management software 'Flightmap', which provides support in portfolio management, venturing, business creation and alliance development. To complement the Flightmap solution they offer expert consulting in the same fields. Bicore focuses on the high tech industry sectors ICT, electronic and electrical equipment, automotive, and life sciences, as well as the process industry. The business model of Bicore is based on paid subscriptions, offering all-in solutions for the time of the contract. Based on the wishes of the customers, this may include hosting, user licenses, portal setup and configuration, installation of new releases, and maintenance and support. Bicore develops their software iteratively, according to the 'agile' philosophy. Each project is divided into smaller parts, so called 'sprints' of two weeks. Ideally, after each sprint a new software version could be released.

The main product of Bicore is Flightmap. This strategic portfolio management tool can be considered 'Software as a Service' (SaaS), i.e. the online delivery of software (Dubey & Wagle, 2007). Vendors using this concept do not sell licenses but rather sell subscriptions for their remotely hosted software, providing the customer with more flexibility to switch and less effort for maintenance. Software as a Service is the core service under research in this study. The purpose of Flightmap is to facilitate the decision making process of managers on which projects to start, prioritize, delay or put on hold in their organizations. Flightmap supports decision makers such as board members, R&D managers, and project leaders, to balance their project portfolio using the insight analysis features of Flightmap, taking into account both financial and strategic aspects. Flightmap collects the business cases of actual projects and transforms these into visualizations, e.g. bubble plots, funnel charts, roadmaps, etc. These visualizations can plot all sorts of indicators (e.g. net present value, strategic score or total cost) bound to the constraints of choice (e.g. maximum R&D costs or profitability). The tool is also able to provide external business intelligence, such as forecasts or market trends, which can be used as input for an analysis. In addition, through Flightmap the client is able to monitor ongoing projects, by looking into charts on the development of costs, risk, and value of projects over time.

1.3. Problem statement

Bicore expects substantial (international) growth in the upcoming years and consequently a need is signaled for a professionalization of the processes involving customer contact, i.e. the sales and customer support processes, to be able to guarantee service quality in the future. In the coming years, a standardization of processes is needed to balance effectiveness and efficiency, to be able to offer service for a substantially larger group of clients. Bicore expects bottlenecks in the scalability of their current processes and used tools, however these bottlenecks need yet to be identified and resolved. The scalability is doubted because service is currently often delivered ad hoc, while bypassing the procedures. An example mentioned by a Bicore employee illustrates this: 'When I receive a request for service, I try to solve the problem instantaneously. I ask my colleague, who is responsible for developing and is sitting next to me, to help me if necessary. If the problem is solved, I will not mention the service request in the support system, nor will the solution be stored in a knowledge database.' This quote summarizes a major dilemma for Bicore: the above mentioned process bypasses the procedures and is not feasible when the volume of service requests would substantially increase. However, in the current situation this approach leads to a fast solution for the customer and subsequently to a relatively high customer satisfaction.

At the start of this project, the documentation of the sales and customer support processes at Bicore was very brief and probably outdated. In 2011 some basic service processes from ITIL v2 (Axelos, n.d.) were taken and adopted by Bicore, however in a simplified form to make it more suitable for a small company such as Bicore. In practice, most processes are executed in a way differing from the method described in the ITIL framework. For the sales processes no formal process model at all is present at the moment.

When taking all this into account, the following problem statement can be formulated: *'The sales and customer support processes of Bicore seem to be insufficiently scalable, i.e. optimally balanced in effectiveness and efficiency, due to a lack of clearly defined processes and their relations, a discrepancy between the defined processes and the actual processes in practice, and presumed bottlenecks in the processes.'*

In the next section this problem statement will be translated into the research direction for this Master thesis. This research direction was intended to be compelling from an academic as well as a business point of view.

1.4. Research objective

The main objective of this study was to design future proof, i.e. improved in scalability by balancing in efficiency and effectiveness, sales and customer support processes for small Software as a Service providing companies in general and Bicore in specific.

Scalability refers to 'the ability of a system to maintain, if not improve, its average performance as the number of client grows' (Paetow, Schmitt, & Malsch, 2005, p. 133). In this particular case, scalability refers to the issues related to sales and customer support Bicore expects when the number of customers would substantially increase, while the number of frontline employees, i.e. sales and support personnel, does not grow to the same extent. To deal with this, these processes need to be optimally balanced in efficiency and effectiveness, i.e. increased in efficiency while effectiveness is, at least, maintained. Efficiency and effectiveness are concepts to assess the performance of organizations. Drucker (1977) defines effectiveness as 'doing the right things' and efficiency as 'doing things right'. An organization is effective to the degree it achieves its goals. On the other hand, an organization operates efficiently when achieving outputs while minimizing the level of input (Drucker, 1977). At the moment, a major challenge for organizations concerns achieving both effectiveness and efficiency at the same time (Coenen, Felten, & Schmid, 2011).

This objective will be achieved using the research questions mentioned in the next section. From a theoretical perspective, the academic contribution focused mainly on the method towards achieving the research objective. The addressed research gap will be explained in more detail in section 2.6.

1.5. Research questions

In this chapter multiple research questions are proposed. Answering these questions will result in a solution for the previously mentioned problem statement. These research questions are:

RQ1. *'What would be a suitable framework for optimizing sales and customer support processes for a service providing company?'*

RQ2. *'Which improvement directions in terms of scalability can be identified for the current sales and customer support processes of Bicore using a case analysis?*

RQ3. *'How do the sales and customer support processes of Bicore differ from the processes of the best performing companies at the benchmark?'*

RQ4. *'How can the insights from RQ2 and best practices discovered in RQ3 be applied to Bicore's sales and customer support processes and modeled in an improved service blueprint?'*

Research question 1 aims to identify relevant theoretical input to be able to assess customer-related business processes in terms of scalability in the context of a service providing company. More specifically, a suitable process analysis methodology and relevant performance measures will be identified. Research questions 2 and 3 will guide the search for improvements for the sales and customer support processes at Bicore. Ultimately, the answer to research question 4 will include a design of the 'as-should' state of the sales and customer support processes at Bicore.

1.6. Research methodology

As a starting point for this research the regulative cycle was used, as defined by Van Strien (1997) and further elaborated on in Van Aken, Berends, and Van der Bij (2012, p. 8). This framework provided the theoretical basis for the research methodology. The regulative cycle is not organized in distinct phases, but in five basic process steps. First of all, the 'problem definition' results in an 'analysis and diagnosis'. This provides a basis for the 'plan of action', in which the solution for the problem is designed, which is followed by the 'intervention' in which the roles and work processes are changed based on the solution design. Ultimately, after a period of time after the implementation of the proposed solution an 'evaluation' takes place, possibly providing input for a new cycle. The scheduling of all these steps is depending on progress and can be both iterative (move back to previous step) or explorative (move on to subsequent step) (Van Aken et al., 2012). The intervention and evaluation steps are generally outside the scope of a Master thesis project, therefore the labels of these steps were altered in respectively 'recommendations' and 'validation' in order to match their purpose in a better way. The remainder of this section elaborates on the research methodology in the context of the regulative cycle. A visualization of this process can be found in Appendix I.

In the preparation phase for this Master thesis project, a research proposal and a literature study were written. These tasks were performed in parallel to be able to complement each other. A literature study was conducted on the relevant concepts, such as sales processes, customer support processes, and service blueprinting, to gain valuable insights for the actual Master thesis. The most important insights from the literature study can be found in chapter 2. The research proposal was also formulated during the preparation phase. In this research proposal the scope of the research was defined, the problem statement explained, elaborated on the methodology, and the deliverables set.

The actual Master thesis project started with the analysis and diagnosis phase. The current situation was analyzed using interviews and relevant documents, providing input for the 'as-is' service blueprint, as explained in detail in section 3.1. Related to this was the identification of performance metrics to compare processes on. These metrics had to be related to effectiveness and efficiency to be able to assess the performance in terms of scalability of sales and customer support processes at Bicore, but also to assess the performance of these processes at other companies. The diagnosis was carried out using a combination of a, internally oriented, case analysis and a, externally oriented, benchmark. In respectively section 4.1 and 5.1 is elaborated on the corresponding methodologies.

The already discussed steps of the regulative cycle were used as input for the plan of action. This plan of action encompasses in this case the modeling of the proposed improvements, originating from the analysis and diagnosis step, into an updated service blueprint. This blueprint specifies the desired process structure in a detailed way. Further details on the application of service blueprinting in the current research are presented in section 3.2.

Based on the previous step, a list of recommendations was suggested. This list consists of a set of recommendations which are derived from the differences between the actual, current state of the customer support and sales processes at Bicore and the preferred state, as described in the improved service blueprint.

Lastly, the proposed improvements were validated, using input from the experts of Bicore. The aim was specifically to assess the effectiveness of the blueprint to solve the problem statement. New insights arising during this step, were taken care of in an earlier step, by iteration. After this step the research objective was fulfilled, the research questions answered and the deliverables provided, and consequently the research completed.

1.7. Report structure

In the next chapter the theoretical background for this study is presented, explaining the most relevant concepts, frameworks and the selection of relevant performance measures. The empirical research will be initiated in chapter 3, which outlines the identification and modeling of the relevant processes at Bicore. As a next step, both a within-case and a cross-case analysis are presented in chapter 4. For this research also a benchmark was performed, which is discussed in chapter 5. Ultimately, in chapter 6 the research questions are answered, resulting in managerial implications, modeled in an ‘as-should’ service blueprint, as well as theoretical implications.

2. Theoretical background

In this chapter the theoretical background of this study will be presented. First of all, the current, relevant knowledge on the processes of interest, i.e. sales and customer support processes, is briefly discussed. In addition, the selection of an appropriate process analysis methodology is explained and subsequently elaborated on the selected methodology. Furthermore, a section is dedicated to performance indicators, providing input for the selection of relevant performance measures. Ultimately, all insights are integrated in a theoretical framework.

2.1. Introduction to sales processes

'Sales' and 'selling' are generally used interchangeably (Viio, 2011). Traditionally, sales/selling was defined as: 'an interactive, personal, paid promotional approach between a buyer and seller' (Tanner & Raymond, 2010). However, to incorporate the current transition towards multi-person, technology-enabled sales, Dixon and Tanner proposed the following updated definition: 'the phenomenon of human-driven interaction between and within individuals/organizations in order to bring about economic exchange within a value-creation context' (Dixon & Tanner, 2012, p. 3).

The traditional paradigm in the field of sales divided the sales process in seven sequential steps: prospecting, pre-approach, approach, presentation, overcoming objections, close, and follow-up (Dubinsky, 1981). These seven steps of selling focus on a relationship between one salesperson and one buyer. However, over the last decades the view on sales in academic literature has shifted from sales as a sequential, one-on-one process towards an iterative, cross-functional process and consequently this traditional paradigm became outdated (Moncrief & Marshall, 2005).

For a number of reasons, including customers becoming increasingly sophisticated and informed, the servitization of society, and the introduction of the internet, it became of greater importance to create a long-term relationship rather than selling a product or service (Jolson, 1997). This philosophy calls for abandoning short-term, transactional thinking and to aim for long-term relationships with selected customers. The underlying rationale is that keeping existing customers is significantly cheaper than attracting new customers. Essentially in this so called 'relationship selling' is delivering value to the customer. Consequently, the needs and expectations of a customer are increasingly taken into account to be able to provide value for the customer (Sheth & Sharma, 2008). For the sales function this means that their knowledge on the customer's processes, and their ability to adapt to these processes, becomes increasingly important in the search for value creation for the customer (Viio, 2011). All these changes request a shift from sales personnel being product experts to customer experts or customer relationship managers (Plouffe, Nelson, & Beuk, 2013; Sheth & Sharma, 2008). To keep up with this shift, companies make increasingly use of CRM systems and internet-based communication.

When pursuing improvement of the sales processes from an engineering perspective, one has to acknowledge a number of differences between a manufacturing and a sales context. In manufacturing, processes are generally standardized and repetitive to a high degree. In contrast, sales processes vary across companies, sales personnel, and circumstances. In addition, while manufacturing processes tend to be sequential, sales processes are iterative and simultaneous. When taking these differences into account, it appears to be a challenge to map a sales process with its relationships, decisions, and negotiations (Barber & Tietje, 2008). Mapping the sales processes of an organization may however reveal opportunities for improvement. Academic literature has so far focused on two other approaches to improve sales processes: implementing technology (e.g. Hunter & Perreault Jr., 2007) and increasing the efficiency of the sales force (e.g. Pilling, Donthu, & Henson, 1999). Storbacka et al. (2009) identified three main themes in sales process improvement:

- From function to process: sales is increasingly regarded as a process instead of an umbrella term for the activities carried out by the sales function.
- From isolated to cross-functional: sales should transform from an isolated function in a department with links to other units, such as marketing, operations, etc.
- From operational to strategic: sales should be a strategically focused part of the business strategy of a company.

It has been shown that the improvement of sales processes is different for service and product companies. As a result sales process management should be different for products versus services. In service sales, emphasize should be put on pre-purchase preparation, personal contact, and customer support. In the case of selling products, channel optimization, focusing on the core business, and terminating bad customer accounts are considered to be most important (Parvinen, Aspara, Kajalo, & Hietanen, 2013)

In conclusion, the view on sales taken in this study regards sales as an iterative, cross-functional process focusing on creating a long-term relationship with the customer. Mapping sales processes with its inter-functional relationships appears to be a challenging task, but may result in valuable insights for improvement.

2.2. Introduction to customer support processes

When looking at service processes one has to distinguish between the core service and the supporting service processes. Customer support, also referred to as after-sales service (for complex machinery), technical support (for technology goods), or simply service, is intended to enable and support the use of the core service for the customer (Roos & Edvardsson, 2008). The more complex a core service, the more necessary becomes the supporting service. Customer support can be defined as 'all activities undertaken by service support providers to ensure that a product is available for trouble-free use to consumers over its useful life span' (Loomba, 1998, p. 143). The goal of customer support is to help clients to derive maximum value from their purchase (Goffin & New, 2001). Moreover, it appears to be essential for achieving customer satisfaction and long-term relationships between the customer and the company (Goffin & New, 2001). The modern day customer is more flexible, has more information and more choices, therefore it is becoming increasingly important to acquire the loyalty of the customer (Walter, Edvardsson, & Öström, 2010). Typical support services are different for manufacturers and service providers: customers of the former typically require installation, maintenance, spare parts provision, and repair services, while the latter mainly provide phone and online support, software updates, documentation, etc. (Goffin & New, 2001).

Customer support is part of the broader concept of customer service, which is considered as the way in which a customer is handled before, during, and after selling a product or a service (Goffin & New, 2001). Customer service has received considerable attention from both the field of operations management as well as marketing, e.g. pointing out to the differences between product and services marketing. Customer support, which can be regarded as customer service after the purchase has taken place, has however received considerably less attention. Moreover, the available research is mostly conducted in traditional manufacturing settings.

When experiencing proper customer service, the customer feels validated in choosing the right company to buy from and as a result the relationship between customer and company will last longer (Andreassen & Olsen, 2012). Related to this is the observation that customer service and sales are becoming increasingly intertwined processes, while companies focus customer relationship management more and more on partnering and solution finding instead of solely selling and order taking (Sawy & Bowles, 1997).The most prominent view on customer support refers to it as a revenue generator, instead of a cost generator, as a result of the sales opportunities generated by cross- and up-selling and the competitive advantage it could provide. It is shown that adopting such a philosophy on customer support is beneficial for a company, certainly in the long-term (Saccani, Johansson, & Perona, 2007).

An important trend in customer support is related to the channels used. In recent years, the focus of customer support systems has shifted. While reliability has increased due to technological innovations, also the complexity of products and services has increased. As a result customer support services are increasingly directed at the training of the user and providing support in an online environment (Smith, 2006). An increased emphasis is put on the role of information technology (IT) in customer service, resulting in a more prominent role of online methods and self-service technology in customer support (Froehle, 2006). These changes can have a huge positive impact on service quality, costs, and

customer satisfaction, if deployed adequately (Bitner, Ostrom, & Meuter, 2002; Weijters, Rangarajan, Falk, & Schillewaert, 2007).

In conclusion, customer support should be taken into account when opting for systematic process improvement, due to the fact that a satisfying customer service experience can radically change the perception of a customer towards the company (Selden, 2000).

2.3. Process analysis methodologies

The concept 'customer experience' can be used as a starting point in the search for an appropriate methodology to analyze, and subsequently improve, the customer-related business processes. The customer experience is defined as 'the internal and subjective response customers have to any direct or indirect contact with a company' (Meyer & Schwager, 2007, p. 2). It has been argued that in the modern 'experience economy' it is crucial to differentiate service offerings from those of competitors by creating memorable events (Pine & Gilmore, 1999). Companies have to systematically manage the experiences of their customers, since it evokes perceptions of service quality, which in turn may result in brand preference and loyalty (Haeckel, Carbone, & Berry, 2003).

The first step in managing the customer experience is identifying the 'clues' a company is sending to its clients (Haeckel et al., 2003). In other words: in order to deliver a consistent and satisfying customer experience the service providing company needs to become fully aware of its service delivery process (Zehrer, 2009). To do this, specialized tools need to be applied to identify and model the customer-related business processes (Haeckel et al., 2003). Customer experience mapping methods examine the touch points that a customer encounters across channels. At each touch point, the difference between customer expectations and actual experience is of influence on customer satisfaction (Meyer & Schwager, 2007). Unfortunately, academic research on customer experiences appears scarce, resulting in a lack of holistic process analysis and improvement approaches (Teixeira et al., 2012).

From the available literature can be deduced that the available methods of customer experience management can be positioned on a continuum (Samadzadeh, 2015). This continuum features customer journey mapping on the one extreme, purely focusing on the customer experience, and service blueprinting on the other, also taking the business processes (both backstage and frontstage) that deliver the service into account. Between these extremes a number of other methods can be positioned (Frow & Payne, 2007): e.g. customer activity cycles (Vandermerwe, 1993), customer-firm touchpoint analysis (Sawhney, Balasubramanian, & Krishnan, 2004), and service transaction analysis (Johnston, 1999). Next to a difference in focus, also the grounding of the theory varies between these methods: only service blueprinting has received considerable academic recognition (Hewing, 2013), as indicated by the amount of search results for the corresponding keywords in Scopus, an bibliographic database for academic journals.

Service blueprinting contains more business process details, but less information about the actual customer experience compared with the other methods. This difference makes service blueprinting more suitable for business process improvement when focusing on both effectiveness as well as efficiency, than for improving only the customer experience, which is associated with effectiveness (Samadzadeh, 2015). Since the research objective of this research is to balance the customer-related business processes in effectiveness and efficiency, service blueprinting can be considered the best option in this situation. Apart from theoretical grounding, also the practical validation of a method is important: using case studies, Bitner et al. (2008) showed that service blueprinting can be considered highly effective for service innovation, quality improvement and customer experience design, thus strengthening my choice. In the next section service blueprinting will be discussed in more detail.

2.4. Service blueprinting

Service blueprinting is the most prominent example of a customer-oriented process analysis methodology and can be considered as an adequate way to map a service (system) in an objective and explicit manner (Shostack, 1982). The most important feature of service blueprinting is to illuminate

the customer's role in the service process, i.e. it takes a customer perspective (Bitner et al., 2008). It also helps employees to see the bigger picture, in order to identify their contribution to the entire service system and helps to establish a customer orientation among employees. Next to being a tool for service planning and design, service blueprinting can also be used to identify fail points in the process.

2.4.1. Components of a service blueprint

The horizontal axis of the blueprint represents the chronology of the actions by the service customer and provider. The vertical axis distinguishes between the different components (Bitner et al., 2008; Fliess & Kleinaltenkamp, 2004):

- Customer actions: all of the actions of the customer during the service delivery process.
- Onstage/visible contact employee actions: all interactions between frontline employees and the customer.
- Backstage/invisible contact employee actions: non-visible interaction with the customer
- Support processes: actions carried out by non-contact employees in order to deliver the service.
- Physical evidence: at the top of the blueprint all physical evidence ('tangibles') of customer-company interaction is shown.

An example diagram of these components can be seen in Figure 2.

The activities in the blueprint are presented in a flow-chart mode, pointing out to both the process in a chronological order (horizontal axis) as well as structure (vertical axis). First of all, onstage and backstage actions are separated by the line of visibility. Everything above this line is visible by the customer, i.e. 'front-office', everything beneath invisible, i.e. 'back-office'. Similarly, customer actions and onstage actions are separated by the line of interaction. All onstage actions are so called 'moments of truth' or 'service encounters'. These points of interaction between the service provider and the customer have the highest influence on the quality of the service as perceived by the customer: each service encounter is an opportunity for the service provider to either satisfy or disappoint the customer (Bitner, Brown, & Meuter, 2000). In addition, backstage actions and support processes are separated by the line of internal interaction (Kingman-Brundage, 1989).

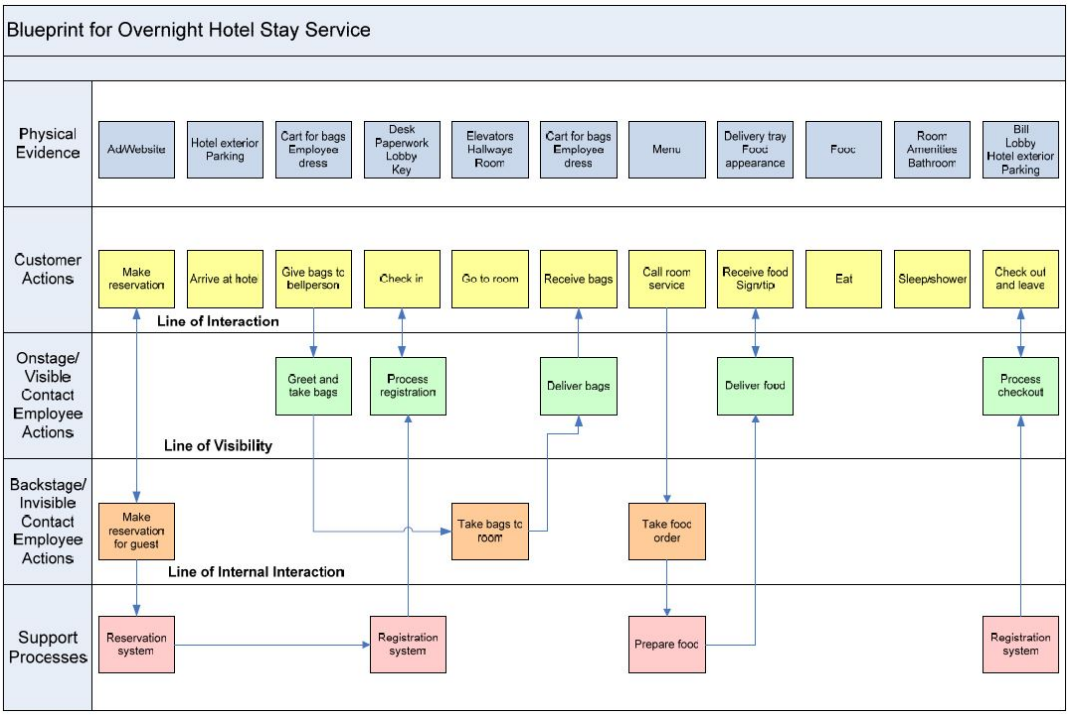


Figure 2. Example of a service blueprint (Bitner et al., 2008)

2.4.2. Service blueprinting as a tool for analysis and redesign

Service blueprinting is generally considered a highly suitable tool for analyzing and (re)designing service processes (Frauendorf, 2006). Service blueprinting is able to integrate an aim for both effectiveness and efficiency. In general, the service provider benefits from a higher efficiency, whereas an increase in effectiveness would be in the first place advantageous for the customer (Frauendorf, 2006). The efficiency of processes can be increased through identifying gaps and disruptions within the service processes. In addition, service blueprinting aids the process of gaining insight on the customer perspective and consequently provides a tool for increasing effectiveness (Coenen et al., 2011). In order to increase effectiveness, e.g. additional services can be offered to the customer or activities shifted across the line of interaction and/or line of visibility. However, it appears to be a major challenge for modern businesses to achieve effective and efficient processes simultaneously, since the provision of additional services may increase effectiveness but hamper efficiency at the same time (Coenen et al., 2011).

Depending on the purpose of the analysis, the blueprint can best be interpreted either horizontally or vertically (Frauendorf, 2006). By focusing on the activities around the line of visibility, one can for example analyze the role of customer-contact personnel. By looking at it from a horizontal perspective, the integration of various process elements becomes clear. Service blueprinting can also be used as a tool for (re)design by helping to structure the process systematically, often pointing to redundant steps which can be eliminated or parallelized. In redesigning one can move activities across the different zones. Shifting activities over the line of interaction results in more responsibilities for the customer, i.e. externalizing activities. Externalizing could lead to cost reductions, but could also hamper customer satisfaction. In addition, shifting activities over the line of visibility makes them more visible, and thus understandable, for the customer.

2.4.3. Fit of service blueprinting with Bicore

A conceptual framework (Figure 3) to assess the effectiveness of service blueprinting in a specific context was proposed by Kostopoulos et al. (2012). Effectiveness of service blueprinting was shown to consist of two sub-dimensions, i.e. standardization-related and flexibility-related effectiveness. More specifically, service blueprinting effectiveness was conceptualized as helping the service provider to offer standardized solutions to customers and meanwhile ensuring the required flexibility for frontline employees to offer an adequate response to individual needs. They identified three, statistically significant, organizational characteristics as drivers of blueprinting success: market orientation, service climate, and service design formality. Thus, the effectiveness of service blueprinting is positively related to the degree in which a market orientation is present at the service providing company. In addition, all employees involved in service delivery should understand their specific role in the total system, i.e. a service-oriented climate should be present. Finally, the presence of formal procedures is positively correlated with service blueprinting effectiveness. These three antecedents of effectiveness are moderated by the complexity and divergence of the service processes in place (Kostopoulos et al., 2012).

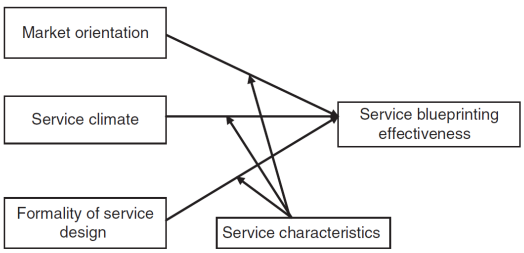


Figure 3. Conceptual framework on service blueprinting effectiveness (Kostopoulos et al., 2012)

When applying this framework to Bicore, a market orientation and service climate appear to be present, e.g. indicated by respectively their use of consultative selling and customer support always receiving highest priority. However, formality of the service design seems to be currently underdeveloped. In conclusion, service blueprinting appears to be a suitable process analysis and

improvement technique to fulfill the objective of the research at hand, but the effectiveness of service blueprinting may be hampered by the low degree of formality at Bicore, which is something to keep in mind during the remainder of the research.

2.5. Performance measures

To be able to assess the performance of the processes of a company, one has to make use of adequate performance measures. In the section 2.5.5 relevant performance indicators will be proposed for Bicore based on insights acquired in this section. The focus will be on measures related to efficiency and effectiveness of the relevant processes. The performance measures have to serve two goals: on the one hand to compare the performance of sales and customer support processes between different customers in the case analysis, on the other hand to compare the performance of these processes with other companies in the benchmark. Before coming up with the actual performance measures , in the following section an theoretical introduction on performance measures and on the issues associated with selecting the appropriate ones will be presented.

2.5.1. Purpose of performance measures

Performance measurement is considered an essential part of management. Performance measures provide insights on strengths and weaknesses of a company, on the progress in achieving targets, and facilitate improvements in organizational performance (Purbey, Mukherjee, & Bhar, 2007). The total of performance measures used at a company is called the Performance Measurement System (PMS). The data in a PMS should be accurate, relevant, timely, and accessible (Yasin & Gomes, 2010). The purpose of a PMS is to quantify the efficiency and effectiveness of actions from the past to enable informed decisions for the future (Neely, Adams, & Kennerley, 2002).

2.5.2. Challenges in selecting relevant performance measures

Bicore is a small Software as a Service (SaaS) provider and consequently the performance indicators to be selected should be suitable for such a company. However, the main attention in academic literature on performance measuring has been directed to large companies, not so much on small and medium-sized enterprises (SMEs), i.e. enterprises employing less than 250 people. Small and large companies are crucially different in terms of uncertainty, innovation and evolution. As a result, performance measures should support SMEs in managing the external uncertainty, to innovate their products or services, and to sustain evolution (Garengo, Biazzo, & Bititci, 2005). It has been argued that performance measurement systems are also imperative for SMEs, even though these companies have to deal with limited resources and more dynamic, emerging strategy styles which may conflict with performance measures necessarily being long-term and strategically focused (Hudson, Smart, & Bourne, 2001). Consequently, developing a PMS for an SME is required to be resource effective, to produce both short-term as well as long-term benefits, and to retain the support of the development team. Furthermore, such a PMS has to be developed in an iterative way to be flexible enough to accommodate for strategic changes.

Apart from the overemphasis on performance measures for large companies in academic literature, also a distinction between manufacturing companies and service providers has to be made. For service operational settings substantially less research has been done, since much of a service is intangible, making it difficult to measure (Yasin & Gomes, 2010). In general, ‘hard’ measures, e.g. profitability, tend to overrule ‘soft’ measures, e.g. customer satisfaction, even though these soft measures are often important drivers of competitive advantage (Fitzgerald, Johnston, & Brignall, 1991). Fitzgerald et al. (1991) argue that, apart from measuring cost and productivity, measuring the effectiveness and efficiency of the activities related to the intangible aspects of a service appears to be crucial for competitive success.

2.5.3. Performance indicators for sales

When measuring sales performance the most obvious metric is units sold. However, since customer satisfaction and loyalty are increasingly recognized as being crucial for long-term success, more sophisticated measures are needed which also incorporate these performance dimensions (Zallocco, Pullins, & Mallin, 2009). According to Zallocco et al. (2009) performance measures for sales

processes can be categorized as internally oriented (i.e. on an intra-organizational dimension) or externally oriented (i.e. market-based measures). An additional categorization can be made in terms of whether such a measure is related to effectiveness or efficiency. A selection of the most meaningful performance measures related to sales, as identified by Zallocco et al. (2009), is shown in Figure 4.

	Effectiveness (selling outcomes)	**Efficiency (selling activities)**
Internally oriented (selling skill, capabilities)	• Sales volume • Quota attainment	• Productivity • Time management • Gross margin
Externally oriented (marketplace metrics)	• Customer feedback/satisfaction • Performance relative to opportunities	• Closing ratio • Sales penetration per account

Figure 4. Performance measures for sales (Zallocco et al., 2009)

2.5.4. Performance measures for customer support

There is limited academic literature available on performance measurement in the context of customer service (Gaiardelli, Saccani, & Songini, 2006). Based on an analysis of existing literature Gaiardelli et al. (2006) proposed an integrated framework for after-sales service (Figure 5). After-sales service involves in the case of Bicore the implementation activities and customer support. This framework is articulated in four levels: the business area, the process level, the activity level, and the development and innovation level. The level of interest is in this case the process level, linking strategic objectives of a business with specific operational activities. Process performance can be measured in terms of customer satisfaction, flexibility and productivity (Lynch & Cross, 1995). Customer satisfaction measures are intended to measure differences between expectations of the customer and actual performance. In addition, flexibility measures are used to measure the ability to satisfy customer expectations, both from an internal and an external perspective. The focus, when taking an internal view, is on process efficiency, i.e. to minimize process lead time. From an external perspective, the delivery time of the (customized) product or service is of most interest. Lastly, productivity measures are related to the efficiency in resource consumption.

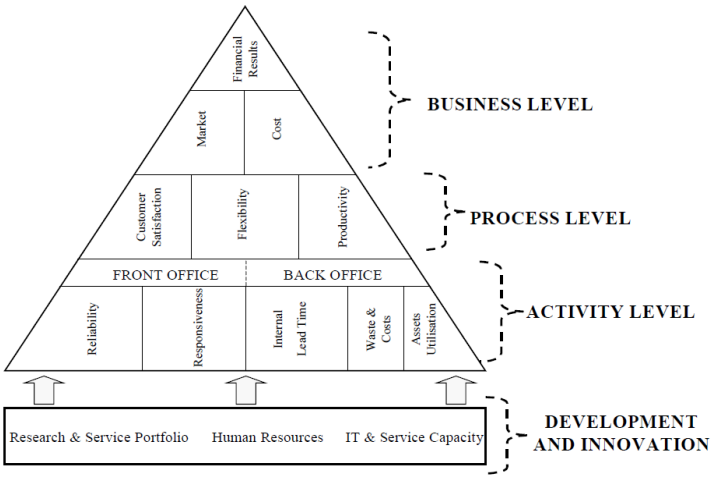


Figure 5. After-sales performance measurement framework (Gaiardelli et al., 2006)

Gaiardelli et al. (2006) propose individual metrics related to each level. A selection of these metrics also relevant for service providing companies is shown below:

- Customer satisfaction: customer satisfaction index, repurchase intent
- Flexibility: time to market, average time to respond to a service request
- Productivity: global productivity on cost basis, break even time

The theoretical findings on performance indicators are integrated in the next section, explaining the selection of metrics to be used in the case analysis and benchmark.

2.5.5. Selection of relevant performance measures for current research

At the start of this research, Bicore had documented a set of key performance indicators (KPIs) for the support processes based on the standards described in the ITIL framework (Cannon, 2007) and none for the sales processes. In all cases however no systematic measuring is done nor subsequent action undertaken.

To be able to select performance measures which reflect the whole spectrum of criteria related to effectiveness and efficiency of the sales and customer support processes, categorization types from literature have been consulted in the previous chapter. The next step involves the selection of relevant performance measures for each dimension, to ensure that ultimately a balanced set is chosen. In addition, a distinction has to be made between performance measures for the case analysis and for the benchmark. The performance measures for the benchmark have to assess the performance of the processes on a higher, company-wide, level, compared to the indicators for the case analysis, which have to enable comparison between cases within Bicore. In addition, some theoretically important performance measures, e.g. customer satisfaction score, are not available at Bicore and will therefore only be used in the benchmark.

An initial selection of performance measures for sales processes was made based on recommendations in academic literature. It was ensured that these covered the four dimensions as identified by Zallocco (2009) and shown in Figure 4. However, not all dimensions are equally represented in the set. In B2B markets the type of performance measures should be dependent on the relative importance of a customer, i.e. for companies dealing with major customers most frequently, metrics that combine an external orientation and effectiveness should be used mostly (Zallocco et al., 2009). Following this advice, relatively many externally oriented measures related to effectiveness are selected for this study because this matches the current business model of Bicore best, i.e. serving relatively few customers and achieving a high turnover per customer. The total set of selected performance measures for sales is shown in Table 2.

Measure	Orientation	Focus	Used in	Source
Average sales volume per salesperson	internal	effectiveness	benchmark	Zallocco (2009)
Gross margin	internal	efficiency	benchmark/ case analysis	Fitzgerald et al. (1991), Lynch & Cross (1995)
Mean customer satisfaction score	external	effectiveness	benchmark	Fitzgerald et al. (1991), Lynch & Cross (1995), Zallocco (2009)
Repurchase (retention) rate	external	effectiveness	benchmark	Fitzgerald et al. (1991), Lynch & Cross (1995)
Trial conversion rate	external	effectiveness	benchmark	Zallocco (2009)
Sales cycle time	external	efficiency	benchmark/ case analysis	Neely et al. (2002)

Table 2. Performance measures for sales

An important measure, which needs further clarification, is the gross margin. The gross margin is calculated by dividing the difference between net revenue and the cost of goods sold by the net revenue. Net revenue is defined as the total contract value of a specific portal, including the license, (initial) configuration, maintenance, and support fees, but excluding any additional revenue from consulting services. The reference date for determining net revenue and cost of goods sold is the 1st of July 2015. For contracts stretching over a longer period, the net revenue is interpolated. In the case of a service provider the cost of goods sold can be substituted by direct labor costs. These are estimated for Bicore at €40 per hour for a configurator and €55 per hour for a project leader.

In terms of customer support, a distinction is made between support during the implementation and in use phase. Furthermore, a different classification compared with the performance measures for sales is

used, based on the process level of the already discussed after-sales performance measurement framework (Gaiardelli et al., 2006). The proposed measures (Table 3 and Table 4) cover all three dimensions, i.e. customer satisfaction, flexibility, and productivity.

Measure	Area	Used in	Source
Mean customer satisfaction score	customer satisfaction	benchmark	Fitzgerald et al. (1991), Lynch & Cross (1995), Zallocco (2009)
Implementation throughput time	flexibility	benchmark/case analysis	Parmenter (2010)
Number of service requests (per type)	flexibility	benchmark/case analysis	Cannon (2007)
Service request resolution time	flexibility	benchmark/case analysis	Cannon (2007), Fitzgerald et al. (1991)
Implementation workload (compared with estimated)	productivity	benchmark/case analysis	Zallocco (2009)

Table 3. Performance measures during the implementation

Measure	Area	Used in	Source
Repurchase (retention) rate	customer satisfaction	benchmark	Fitzgerald et al. (1991), Lynch & Cross (1995)
Mean customer satisfaction score	customer satisfaction	benchmark	Fitzgerald et al. (1991), Lynch & Cross (1995), Zallocco (2009)
Response time to service request	flexibility	benchmark	Cannon (2007), Fitzgerald et al. (1991), Parmenter (2010)
First time resolution rate	flexibility	benchmark	Cannon (2007), Lynch & Cross (1995), Parmenter (2010)
Percentage of resolutions within SLA	flexibility	benchmark	Cannon (2007)
Service request resolution time	flexibility	benchmark/case analysis	Cannon (2007), Fitzgerald et al. (1991)
Service request resolution effort in working hours	productivity	benchmark/case analysis	Cannon (2007)

Table 4. Performance measures for customer support

2.6. Theoretical framework

The literature study showed that sales and customer support processes play an important role for the customer in deriving maximum value from his or her purchase. It also appears crucial for the company in achieving customer loyalty and satisfaction (Goffin & New, 2001). As a result of major changes in recent years, i.e. customers becoming increasingly sophisticated and informed, the servitization of society, and the introduction of the internet, companies have to reshape their sales and customer support processes to remain competitive and to deliver value to the customer (Plouffe et al., 2013). Companies are increasingly becoming aware of the importance of creating a relationship rather than solely selling a product or service, resulting in sales and customer service becoming more intertwined (Sawy & Bowles, 1997). To further increase effectiveness and efficiency of the sales and customer support processes, modeling and redesigning these business processes using an appropriate technique, may result in valuable insights for improvements.

The concept of the 'customer experience' was used as a starting point in the search for an appropriate methodology to analyze, and subsequently improve, the customer-related business processes. To deliver a consistent and satisfying customer experience the service providing company needs to be fully aware of its service delivery process (Zehrer, 2009). To do this, specialized tools need to be applied to identify and model the customer-related business processes (Haeckel et al., 2003). A number of process analysis and improvement methodologies in the field of customer experience management were identified and assessed. Service blueprinting was considered fitting the research objective of balancing efficiency and effectiveness of customer-related business processes best, since

it is shown to be the most process-centric analysis and improvement methodology originating from customer experience management (Samadzadeh, 2015). Moreover, service blueprinting can be considered one of the most-established techniques in this field, both in theory as well as practice (Bitner et al., 2008; Hewing, 2013). Consequently, service blueprinting can be considered appropriate to model the relevant processes and to identify bottlenecks related to effectiveness or efficiency.

More specifically, I propose a combination of service blueprinting and basic flowcharting to aid the before mentioned goal. This combination is necessary because the processes to be modeled involve a relatively large number of possible paths, which would require a separate service blueprint for each possible path when using the traditional approaches of Shostack (1982), Kingman-Brundage (1989) or Fliess and Kleinaltenkamp (2004); an approach unfeasible in the current setup. This service blueprint '2.0' features advanced flowchart principles in the swim lane format of service blueprinting. At a minimum, flow objects and connecting objects should be included in this blueprint: i.e. activities, gateways (to enable choices), and connecting arrows. Consequently, the advantages of both approaches are combined: the proposed approach offers more options to include details in the process model, making it more suitable to model complex business processes with different possible paths, while remaining customer-focused. However, this approach comes also with the disadvantage of compromising the chronological order of activities, which remains globally but not in all cases true.

Lastly, theoretical categorizations were identified to select a complete set of appropriate performance measures later on. It was shown that developing a performance measurement system for an SME is required to be resource effective, to produce both short-term as well as long-term benefits, to retain the support of the development team, and has to be developed in an iterative way. According to Zallocco et al. (2009) performance measures for sales processes can be categorized on two dimensions: orientation (internal or external) and performance focus (effectiveness or efficiency). For customer support, performance measures on customer satisfaction, flexibility, and productivity should be included (Gaiardelli et al., 2006). It appears crucial to include measures on all dimensions, to prevent an overemphasis or underemphasis on a dimension.

With regard to possible theoretical contributions of this research, a number of directions can be identified. First of all, no research has been found on using service blueprinting for sales processes. However, since service blueprinting is frequently mentioned as a customer experience management method in academic literature (Bitner et al., 2008; Teixeira et al., 2012; Zehrer, 2009), it seems logical that service blueprinting is also applicable for the whole lifecycle of the customer experience, implying that sales processes can also be incorporated (Frow & Payne, 2007). Modeling sales processes using service blueprinting is considered a major theoretical contribution of this research. Furthermore, the selection of relevant performance measures and the combination of these metrics with service blueprinting will be two additional theoretical contributions. These measures can be used to assess performance differences internally, i.e. between cases, and externally, i.e. between benchmark partners, as modeled in the corresponding service blueprints. In academic literature no more than one article was found taking an approach linking performance measures with service blueprinting (Höber, Pergler, Weitlaner, & Grahsl, 2015). This article showed that this combination may provide valuable insights, but since this article had the ultimate goal of developing a performance measurement system instead of improving business processes, room is left for additional academic research. Combining performance measures with service blueprinting is presumed to yield stronger, i.e. quantitative, evidence for improvement directions compared with the traditional method of identifying bottlenecks on a qualitative basis. This is illustrated by the statement of Bitner et al. (2008, p. 12) that 'it is often just the act of trying to create a blueprint that leads to big insights that can improve a service', an approach considered scientifically questionable and insufficient for this research. Furthermore, there is still debate over what elements to include in a service blueprint. The components described in the articles of e.g. Shostack (1982), Kingman-Brundage (1989), and Fliess and Kleinaltenkamp (2004) differ substantially, which could lead to misunderstandings and misinterpretations when applied in practice. Additional research is needed to reach agreement on a generally applicable service blueprint.

3. Identification of 'as-is' processes

In this chapter will be elaborated on the identification of the customer-related business processes in the current 'as-is' state at Bicore. First, the approach used to identify the current processes is detailed. Next, the resulting service blueprints of respectively the sales, implementation, and customer support processes are explained.

3.1. Process identification method

As a first step in the analysis phase, the relevant processes needed to be identified. Since the processes of interest were expected to be dynamic and not cast in stone, I aimed to model the most frequently occurring processes as recommended in literature (Bitner et al., 2008). The identification of the 'as-is' sales and customer support processes was done using semi-structured interviews, for which the template can be found in Appendix II. Initially, it was intended to interview all frontline employees, i.e. three for sales and two for customer support, involved with sales or customer support at Bicore. However, due to practical problems one sales person was not interviewed. Two individual interviews were held with the sales persons and two with employees responsible for customer support. The interview questions were aligned accordingly. The semi-structured interviews lasted for 1,5 hours and were structured all the same: firstly, formalities about the purpose of the interview and confidentiality were addressed, and secondly, the interviewee was asked some general information about his function and tasks related to the function applicable, i.e. sales or customer support. Next, a general model depicting the high-level overview of the phases in which customer-firm interactions occur, as developed for the research proposal, was used as a starting point to discuss the scope of the sales and customer support processes at Bicore (Appendix III). Moreover, depending on the expertise of the interviewee, a more detailed process model for either sales or customer support processes was used to guide the process identification of the sales or support processes. For the sales phase, Bicore had no processes formally defined and consequently a general business to business process model from literature (Selden, 1998) was used as a starting point (Appendix IV). For the customer support processes, Bicore had adapted some parts of the Information Technology Infrastructure Library (ITIL) reference framework, a set of best practices for aligning IT services with the needs of a company (Axelos, n.d.). The 'service support' set of ITIL, covering the customer support processes to a large extent, was used as a starting point for the customer support processes (Appendix V). During the interview every aspect of the reference model was discussed for a hypothetical scenario, i.e. as it happens most of the time. At each step in the reference model, the interviewee was asked about possible differences with the actual processes at Bicore. The required information to be able to model a service blueprint later on, was (Bitner et al., 2008):

- Activities/events initiating or ending the process
- Sequence of activities and mutual relations between activities
- Missing or redundant activities, compared with the reference models
- Actors involved in each specific activity
- Activity being visible for the customer (onstage) or invisible (backstage)

After reaching consensus on the process flow at Bicore with the interviewee, questions were asked about potential bottlenecks in the current processes. Ultimately, the interview was evaluated with the interviewee to assess whether the interview covered the whole spectrum of interest.

The interviews were recorded and afterwards all remarkable insights were written down. Subsequently, the reference models were extended and adjusted to match Bicore's processes. Ultimately, these updated reference models were used as input for the initial service blueprints for customer support and sales. The reference models were translated to match the service blueprint notation and the processes were grouped in the corresponding swim lanes. The resulting blueprints were validated in cooperation with the company supervisor which yielded some minor adjustments. It was decided to develop an additional service blueprint, because the customer support blueprint appeared to be inappropriate to model the implementation phase of Flightmap. Further validation was done during a validation session in a group setting with all interviewees. Prior this meeting the service blueprints were sent to all invited persons, along with a manual for reading service blueprints, and all

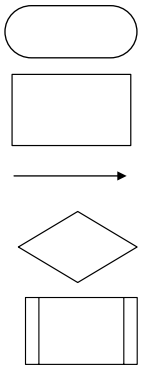
participants were asked to check whether the service blueprints depict the actual, most frequently occurring processes at Bicore at that time. During this validation session the service blueprints were confirmed to be accurately resembling the current processes at Bicore. However, some minor adjustments to the service blueprints were proposed, which were included later on.

3.2. Details of service blueprint

In this section will be elaborated on the process flow as modeled in the service blueprints. As said, three service blueprints were developed:

- Sales: divided into two phases, i.e. presales and aftersales.
- Implementation: divided into three phases, i.e. scoping, implementation, and in use.
- Customer support: no division into phases.

In the service blueprints flow diagram symbols were used:



- Start/end point
- Activity
- Process transition
- Decision node
- Sub process

The activities in each process are grouped horizontally into so called swim lanes. The contents of these lanes differ in this study from the traditional definitions in literature (e.g. Bitner, Ostrom, & Morgan, 2008) and are presented below:

- Business customer action/User action/Key user action/Consulting partner action: all actions performed by the corresponding, third-party actor. A swim lane is only included if the corresponding actor is directly involved in that particular blueprint, i.e. the business customer swim lane is included in all service blueprints, the user swim lane in the customer support blueprint, key users in implementation and customer support, and consulting partners in sales.
- Onstage: all 'visible' interactions between frontline employees and the customer (i.e. business customer, key user and user).
- Backstage: all 'invisible' actions performed by frontline employees.
- Supporting processes: actions carried out by non-contact employees in order to deliver the service.

3.3. Service blueprint for sales

In this section the flow of the 'as-is' sales processes at Bicore is explained. The corresponding service blueprint can be found in Appendix VI.

Two phases can be distinguished: presales and aftersales, referring to respectively all sales activities before and after a contract is signed. The sales process can be initiated by five different start points from four different perspectives: by a demo request or a request for information (RFI) from a business customer, by a consulting partner discovering a lead for Bicore, by a sales employee discovering a lead onstage or backstage, i.e. a 'target'. These leads are taken backstage, classified as either a target, suspect, or prospect, and assigned to a specific sales employee or consulting partner in a management team meeting. Another source of leads is the Flightmap website where a trial account can be requested by a potential customer. When the time is right, these leads will be contacted to assess initial interest, which takes the process onstage. Next, when initial interest exists the contact person at the potential customer has to check interest and budget internally. During this process the perceived needs of the customer are influenced by the sales person, who promotes the advantages of Flightmap and portfolio

management in general. If Bicore detects that no substantial progress is made after a particular period of time, a lead is discussed in the sales intervention meeting with the purpose of coming up with a new strategy to convert the lead into a client. Eventually this process leads to a decision by the potential business customer whether a proposal is requested or not. In case of the former, the backstage activity of writing a proposal is triggered. This process can also be triggered by a request for information from a company with which no earlier contact has taken place. As input for writing a proposal, two supporting activities can be distinguished: a discussion on the feasibility of offered features and the provision of requested information (e.g. service level agreements, case studies, etc.). When the proposal is finished, the decision making unit of the potential customer has to decide on the proposal: final decline, provisional decline, or acceptance. In case of a final decline, the lead is closed. Another possibility would be a provisional decline on the proposal, which results in rework on the proposal, e.g. to include additional documents. The last option would be to accept the proposal, after which the contract needs to be signed. Another sales channel is the sales through a consulting partner, which may also discover leads or gets leads assigned. In both cases, assessing initial interest, influencing needs, negotiating and monitoring customer satisfaction has become the responsibility of the partner, while all other activities (e.g. proposal preparation and implementation) remain at Bicore. The dashed arrows are only applicable in case of a consulting partner involved.

A signed contract triggers in any case the aftersales phase which starts with the implementation of the Flightmap portal, which will be discussed in a separate service blueprint. After finishing the implementation, the customer is 'in use', in which the sub process customer support can be triggered. Customer support is modeled in a separate service blueprint and will be discussed further on. Eventually, sales negotiation is again triggered by either the backstage monitoring of indicators for customer (dis)satisfaction (e.g. by monitoring portal usage), by an onstage, informal evaluation with the customer, or an internal evaluation at the customer company. The sales negotiation can either be on contract expansion, i.e. to include additional features, or contract extension, i.e. extend the contract period. The corresponding decision nodes lead to either again the in use phase or the end point: take portal offline.

3.4. Service blueprint for the implementation phase

In this section is elaborated on the 'as-is' implementation process for Bicore. The corresponding service blueprint can be found in Appendix VII.

After a portal has been sold to a customer and before it can be used, Flightmap has to be implemented. The implementation phase comprises three stages: scoping, implementation, and in use. Scoping starts when the contract is signed. Next, Bicore assigns backstage a project leader and a configurator to the implementation team. The implementation team prepares backstage the onstage kickoff meeting in which the scope and goals of the implementation project are refined in cooperation with the business customer and/or key user(s) based on the outline formulated in the contract. After this kickoff meeting the project moves to the actual implementation phase. The implementation team of Bicore investigates backstage cases of the customer related to portfolio management in order to determine possible requirements for the portal. At the same time the customer also identifies requirements for the portal. Using this input the first to-do list is formulated. The next step involves a very basic configuration of Flightmap to check the technical readiness of the portal. After an onstage evaluation of this portal and an update on the to-do list, the next iteration involves a first analysis for a small set of projects. This loop repeats itself until the agreed functionality is achieved, after which is checked whether user training would be appropriate and subsequently the in use phase is triggered, the end point of this blueprint. However, an implementation activity can also be initiated when a service request is encountered by a business customer or key user. The business customer or key user typically contacts the project leader or configurator directly, depending on the nature of the request. Four service requests can be distinguished: a question, a request for training, a configuration request, and a request for change. A question can be answered onstage instantaneously. In case a customer signals a need for training, he or she can request a Flightmap workshop. In case of a configuration request, this will be included in the to-do list and will eventually be configured. A request for change involves a request for an additional feature, which can be in accordance with the contract or not. If in accordance, the change

will be provided and the sub process release management is triggered, which is outside the scope of this research. Otherwise, the change could also be provided depending on the outcomes of the change management process.

3.5. Service blueprint for customer support

The service blueprint depicting the 'as-is' customer support processes of Bicore can be found in Appendix VIII. The corresponding process flow is explained in words below.

The customer support process can be triggered by various events: by a problem or incident encountered either by a regular or a key user, i.e. the user, appointed by the customer to take the lead in using the software. Three common scenarios exist: the user discusses the problem or incident with the key user and the latter contacts the service desk of Bicore, the user contacts the service desk directly, e.g. in case of a question on how to perform a specific analysis, or the key user encounters a problem or incident and contacts the service desk directly. Another starting point could be the report automatically generated when an error occurs in a Flightmap portal. All these activities lead to the decision of a service desk employee whether the request concerns a service request or an incident. In the former case four types of services requests can be distinguished: a question, a request for user training, a request for change or a configuration request. A question is immediately answered onstage, a Flightmap user training will be provided upon request, a request for change is passed on to the 'propose change' decision and a configuration request results in a backstage configuration change. In the case of an incident being reported, the incident is documented and classified by creating a support ticket in the support system and assigning a priority to this incident. The next step involves providing a workaround for the customer, of which the customer is informed. If he or she is satisfied by the provided workaround, the ticket is closed and it is determined whether additional research is needed for the problem underlying the incident, otherwise the problem is archived for optional future analysis. If additional research is needed, a process which can also be triggered by the proactive identification of a problem by a Bicore employee (e.g. by testing), the problem is documented, classified and further analyzed backstage, eventually leading to either an internal proposal for change of the Flightmap software or the archival of the problem. The next step, which can also be triggered by a request for change from a business customer or key user, involves an estimation of risk and impact of implementing the proposed change, resulting in an approval or disapproval of the proposed change. When an approved change has to be custom made or becomes optional for all customers the business customer has to decide on the offer, which involves a contract expansion and is subsequently transferred to software development. In the case of an approved change becoming a standard feature, it is transferred to supporting activities directly in order to develop the feature and eventually the change moves on to the sub process release management. Ultimately a release will be made, regularly involving an onstage demonstration of the new features.

4. Results: case analyses

In the following chapter five cases, i.e. the total of interactions between Bicore and specific customers, are discussed using objective and subjective information from various sources. For confidentiality reasons the names of these companies will not be disclosed. First of all, the approach to select and analyze cases at Bicore is discussed. Next, all cases are discussed individually. At the end of this chapter will be assessed whether each specific case can be considered a success or a failure on the dimensions effectiveness and efficiency. Lastly, the cases will be compared in order to identify potential process improvements.

4.1. Case analysis method

The case analysis focused on the customer-oriented processes within Bicore. The main advantage of a case analysis is the ability to study a phenomenon embedded in its real-life context, which distinguishes it from other research approaches (Blumberg, Cooper, & Schindler, 2008). The subject of inquiry was quantitative and qualitative information on the total of experiences a customer goes through when interacting with Bicore. The unit of analysis, i.e. a particular case, was the total set of customer-firm interactions of a specific customer of Bicore. The focus was on objective, quantitative data gathered from various sources, complemented with subjective information from interviews to also capture the sentiments of the Bicore employees involved in a particular case. The quantitative data represents specific performance indicators for each of the phases in the total lifecycle of the customer-firm relationship. The relevant performance measures were described in section 2.5.

Relevant cases were selected in cooperation with representatives of Bicore. It was decided that researching five cases would be the optimal tradeoff between feasibility and resulting robustness of the research. The selection criteria for including cases in the case analysis were:

- Location of client in customer-firm relationship: the customer has to be currently situated in the in use or end of contract phase, otherwise no complete overview of a case can be presented.
- Availability of data: only cases which have all relevant data available are included. At least statistics on sales cycle, portal usage, implementation effort, and handling of service requests have to be available at Bicore.
- Portal activity: a minimum of six months of portal activity should be detected to satisfy this criterion. Including unused portals could result in biased conclusions, due to the absence of customer feedback in the form of service requests.
- Focus on software: the focus, i.e. majority of revenue, should be on the selling of a Flightmap license instead of consultancy services.

A total of fourteen cases was available at Bicore and each case was scored on all four selection criteria (Appendix IX). First of all, three potential cases were excluded because they were still in the implementation phase at the moment of selection, consequently resulting in an incomplete overview of the customer-firm relationship. Secondly, three cases did not satisfy the criterion of data availability because no documentation on either the sales cycle or service requests was available. Furthermore, six cases underperformed in terms of portal activity, i.e. they had less than six months with at least one user session per month. Lastly, company F was excluded because this project involved mainly activities out of the scope of this research. Bicore's activities for company F focused on consultancy services on portfolio management instead of solely selling a tool for portfolio management. From the total set of fourteen cases, five (i.e. company A-E) satisfied all four criteria. As a next step, it was validated that these cases covered a wide range of presumed bottlenecks in different phases of the customer-firm relationship.

In the following sections, next to a textual summary of the selected cases, graphical overviews will be modeled visualizing the performance indicators, resulting in both a within-case analysis and a cross-case analysis. In Table 5 the used performance indicators are listed, also referring to the phase it is relevant for and the source.

Performance indicator	Additional analysis	Relevant for	Source
Gross margin	Compared with estimated gross margin	Sales	TimeLog registration system
Sales cycle time (in months)		Sales	CRM system
Throughput time (in months)	Compared with estimated duration	Implementation	TimeLog registration system, quotation, and to-do lists
Implementation workload (in hours)	Compared with estimated number of hours	Implementation	TimeLog registration system
Number of service requests (in numbers per month)	Per type of service request	Implementation/ In use	Support ticket system and to-do lists
Service request resolution time (in working days)		Implementation/ In use	To-do lists
Service request resolution effort (in hours per month)	Compared with estimated number of hours	In use	TimeLog registration system
Portal activity (in sessions per month)		In use	Portal activity monitor
Subjective performance		All	Interviews

Table 5. List of performance indicators used in the case analysis

As also shown in Table 5, interviews were held to complement the quantitative information gathered. A total of four persons were interviewed, i.e. two project leaders and two configurators. The project leaders were also involved in the sales process of all selected cases and the configurators were involved in customer support during the in use phase. In addition, in pairs of both roles they formed the implementation team responsible for implementing the portals of the five selected cases. As a result, the whole trajectory of customer-firm interactions was covered for each case. In all cases, input came from at least one project leader and one configurator. In rare cases when conflicting opinions were retrieved, the company supervisor was consulted to provide an decisive answer.

4.2. Case 1 – Company A

Company A is a material handling and logistics automation company. Bicore was already in 2005 consulted by company A for advisory on innovation management. At that time Bicore could not provide a user-friendly portfolio management solution to complement their advice, but company A remained a target for future business. From 2012 onwards Bicore made regularly contact, approximately every six months, with company A to discuss portfolio management in general and to promote the Flightmap software. Even though company A was interested, they did not actually request a proposal from Bicore until 2014, due to constraints in terms of budget and priorities. In 2014 company A was looking for ways to professionalize their portfolio management using a tool. The tool was supposed to assist in the decision making process with respect to the priorities of projects and to provide insights regarding choices made and the progress of projects in general. Bicore proposed the use of Flightmap to meet these goals and sold a trial period of six months to company A, which was eventually extended with two months. The portal made use of a standard configuration and in total one update was performed, after which company A ran some analyses on the estimated performance of future projects. Ultimately, Flightmap was rejected as being not appropriate to fit company A's needs. The total sales cycle is shown in Figure 6. The sales cycle time, i.e. time from first contact to a signed contract, was relatively high with 30 months.

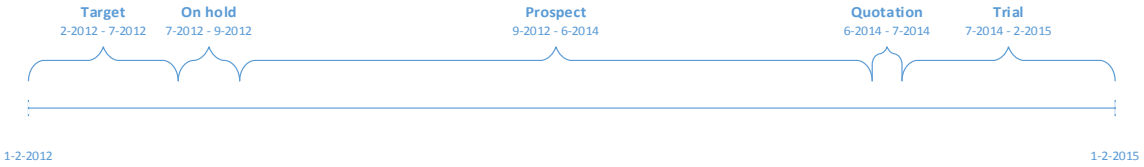


Figure 6. Sales cycle for company A (source: CRM system)

The implementation of the trial required not much time, however more time than estimated, as can be seen in Figure 7 and Table 6. In absolute terms this exceedance, i.e. a total of 7 hours, of the estimate can be considered negligible. The portal was regularly used by the two key users of company A. Since no major issues were mentioned in terms of service requests during the trial period and the portal was used regularly, the decision to not extend the contract was a surprise for Bicore. In May 2015 an evaluation session was scheduled in which the encountered bottlenecks were discussed, pointing to problems with user-friendliness of the software. A major problem as encountered by company A involved the usability of Flightmap. The key users of company A experienced the offered functionalities of Flightmap as overwhelming and complex. The initial goal of company A was to let all business developers use Flightmap without assistance from an expert. As a result, adoption within company A was judged to be a too huge risk due to the perceived complexity of the tool. In other words, company A was looking for a light version of Flightmap with less functionality and easy-to-use analyses with a more intuitive interface.

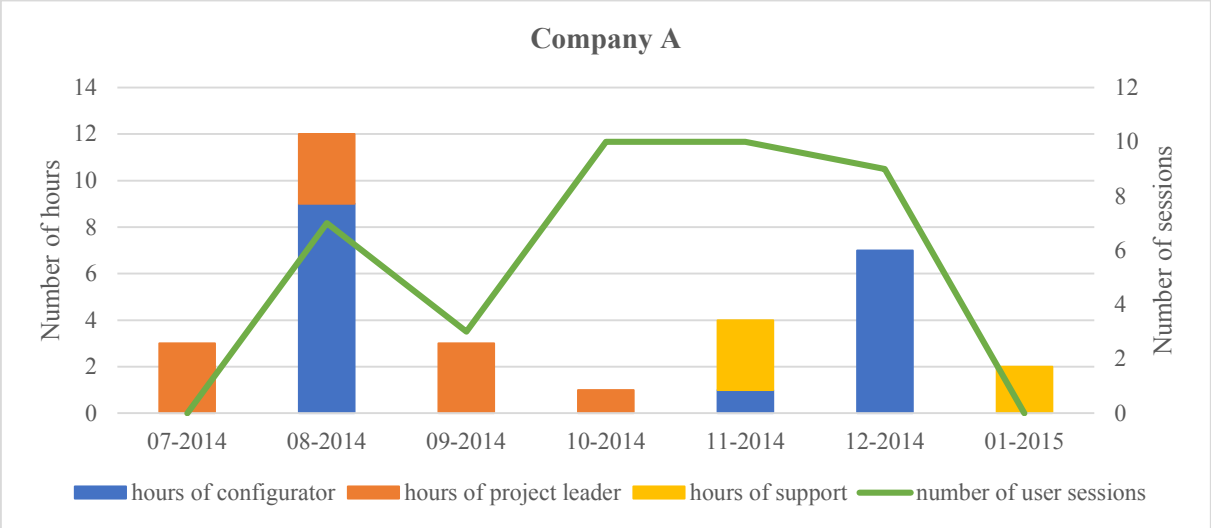


Figure 7. Overview of implementation time and portal usage (source: TimeLog registration system and activity monitor)

	Average per month	Actual total	Estimated total	Difference actual vs. estimated
Gross margin	n.a.	88,8%	88,6%	+0,2 %.
Number of user sessions	5,6	39	n.a.	n.a.
Number of hours for implementation	3,9	27	20	+35,0%
Number of hours of configurator	2,4	17	10	+70,0%
Number of hours of project leader	1,4	10	10	0,0%
Number of hours support	0,7	5	20	-75,0%

Table 6. Overview of statistics for portal company A (source: TimeLog registration system and activity monitor)

4.2.1. Conclusion

To be able to determine whether case 1 can be considered either successful or unsuccessful from the perspective of Bicore the scores on the performance measures, as elaborated on in section 2.5, are evaluated. From a sales perspective, after a long period of preparation, there was only minor effort needed for closing the deal after a proposal was requested. The gross margin appears high and matches the forecast very well, but the absolute value of the sale was relatively low because it concerned a trial.

Furthermore, the portal was used relatively well, the implementation did not take much effort and no substantial involvement from the service desk was needed. The implementation effort could even be regarded as worrying low. However, company A ultimately rejected Flightmap, mainly for reasons related to customer friendliness. These concerns were not signaled on time by Bicore and as a result case 1 can be considered a failure in terms of effectiveness.

When comparing the actual processes with the reference 'as-is' service blueprints, the monitoring satisfaction activity in the aftersales phase stands out. From analyzing the case it became clear that this activity must have been executed improperly, i.e. customer satisfaction not being measured directly, because the negative evaluation came as a huge surprise for Bicore.

4.3. Case 2 - Company B

Company B is a regional development and investment company. The program for which Flightmap is implemented focuses on the development of manufacturing SME's in this region. Before becoming an actual customer of Bicore, company B and Bicore partnered in a European project on innovation projects, providing a test case of such a tool for company B. At the end of 2013 the need for a workflow management system was formalized and a public tender was launched. A quotation was submitted by Bicore in December 2013 and the project was granted by an independent jury in the same month, mainly because of the price being substantially lower than the price of other offerings. This competitive price was offered because Bicore hoped to be able to implement an additional portal at a later stage. Consequently, a discount was offered based on the purchase of multiple portals, however these additional portals have never been actually sold. The implementation phase started in January 2014. The initial implementation phase lasted for approximately two months until mid-March, after which a list of remaining implementation items was formulated. The total sales cycle is visualized in Figure 8. The sales cycle time was substantial with 19 months from first contact to the signing of the contract.

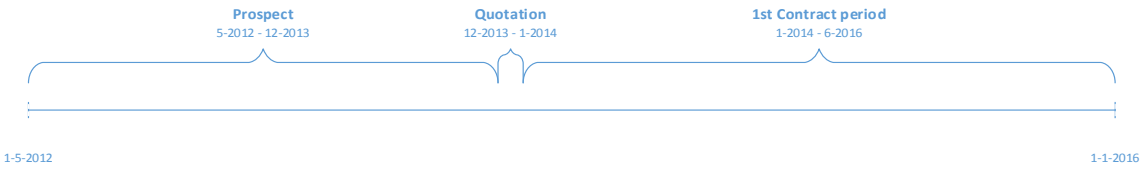


Figure 8. Sales cycle for company B (source: CRM system)

Flightmap is used by company B as a workflow and data management system for registering and analyzing all requests for subsidy. Initially, company B stated that they were searching for a portfolio management tool, however the focus shifted towards a workflow management system last-minute, i.e. just before requesting a proposal. At that time workflow management was already a feature in Flightmap, however this feature did not match the requirements of company B. The importance of making the sale was at that moment decided to outweigh the additional development effort. As a result, during the implementation it became clear that the portal needed to be almost completely custom-made. As can be seen in Figure 9 an enormous effort has been dedicated to the implementation of the portal for company B, especially by the configurator. Two reasons can be identified for this high workload: the main reason involved the challenge to translate the requirements of company B in Flightmap functionality which became even harder because company B had an incomplete overview of their workflows. From January to June 2014 the configuration was done by a junior configurator of Bicore with little experience. The first half of this period was used to establish the basic portal after which fine-tuning was needed based on feedback from the users. From July 2014 onwards the responsibility for the configuration was handed over to a senior configurator. Another reason for the relatively high workload during the implementation can be attributed to the unclear vision of company B on their requirements which were evolving over time. The hours for the project leader were mainly on relation management, i.e. monitoring customer satisfaction, and to discuss high-level issues with a steering committee. The total hours of implementation were a 180% increase, i.e. 366 hours on top of the initial estimate, compared with the forecast (Table 7). Apart from the implementation effort Figure 9 also shows a trend of increasing adoption in the first six months of 2014. Usage has remained

relatively stable afterwards, except for the summer holiday period. This stable and relatively high usage, i.e. on average 73 sessions per month, can be attributed to the use of Flightmap as a workflow management system, which results in a more stable usage than the typical usage pattern of periodically analyzing the project portfolio.

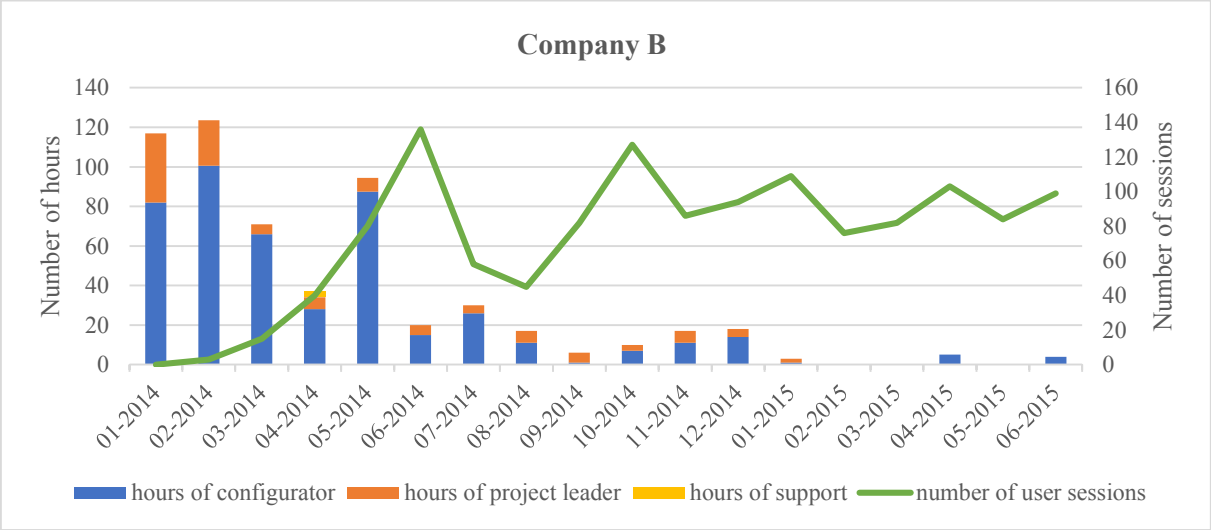


Figure 9. Overview of implementation time and portal usage (source: TimeLog registration system and activity monitor)

	Average per month	Actual total	Estimated total	Difference actual vs. estimated
Gross margin	n.a.	29,8%	70,7%	-40,9 %.
Number of user sessions	73	1319	n.a.	n.a.
Number of hours for implementation	31,7	570	204	+179%
Number of hours of configurator	25,5	459	144	+219%
Number of hours of project leader	6,2	111	60	+85%
Number of hours support	0,2	3	40 (20/yr.)	-90%

Table 7. Overview of statistics for portal company B (source: TimeLog registration system and activity monitor)

When looking at the types of items on the remaining items list (Appendix IX), which was defined by company B after the first iteration of implementation from January to March 2014, most requests can be categorized as requests for (software) change. From December 2014 onwards no support was requested, while the user activity remained constant. When looking at the total period, it took on average approximately 19 working days to finish a service request, with a clear outlier in the first month (i.e. 35 working days on average).

4.3.1. Conclusion

From a sales perspective, some issues related to company B could be identified: a relatively long sales cycle and a very poor gross margin, being substantially lower than estimated. The portal was sold with a discount, based on an implicit deal on the purchase of additional portals, which did not actually take place. A relevant quote summarizing the case of company B was presented in an interview with a Bicore employee: ‘We sold something we couldn’t offer and we made someone with no experience responsible for it’. When looking at the performance measures, there is ample support for this claim: the gross margin is substantially lower than estimated, due to an escalation in the hours needed for the implementation of the portal. Furthermore, a high number of service requests, mainly requests for software change, were received, indicating a misfit between the requirements of company B and the standard functionality of Flightmap. Along with this finding comes the fact that service request resolution time is relatively high with an average of almost four weeks to handle a request during the implementation. However, no additional problems occur during the in use phase, i.e. no service requests are submitted since November 2014 and portal usage is relatively high and stable.

When comparing the process flow for company B with the reference service blueprints, a number of process-related issues can be identified. In the sales phase, all the relevant activities seem to have occurred, however not all processes received the priority they deserved in hindsight. For example, the feasibility of the offered features in the proposal have been discussed with the developers during presales and major concerns were mentioned. However, it was decided to offer these features anyway, ultimately leading to an escalation of implementation effort. Furthermore, the role of configurator has been assigned to an unexperienced employee of Bicore, which also contributed to the high workload for the implementation. In addition, the requirements of the customer were evolving over time, stretching the implementation by including 'refine requirements' into the configuration loop.

4.4. Case 3 – Company C

Company C is a development agency aiming to improve the industrial and economic activities in a specific region in the Netherlands. While being a partner of Bicore in various European projects, e.g. on establishing partnerships and innovation projects, company C has been a prospect for a number of years before becoming an actual Bicore customer in 2014. In addition, various employees of Bicore and company C already had a long-lasting, personal relationship before the actual purchase took place. However, despite these close contacts it still took a relatively long period of time before company C actually requested a portfolio management tool publicly. Bicore eventually tried to speed up this process by assigning a different account manager to company C. From 2013 onwards company C and Bicore participated in a European innovation project, which was seen as a test case for Flightmap in a public-private partnership environment. In addition, during the project the decision making unit of company C became acquainted with the functionalities of Flightmap. Eventually a public tender procedure was initiated by company C Mid-2014. Because of the expected possibility to sell an additional portal to company C, the initial portal was offered in Bicore's proposal for a relatively low price, similar to the situation in case 2. Consequently, it was determined by an independent jury that Bicore offered the best proposal in terms of functionality and price and the tender was granted to Bicore. A three year contract was signed in July 2014 and the kick-off meeting was scheduled mid-July 2014. Company C became a customer after a 12-month sales cycle (Figure 10).

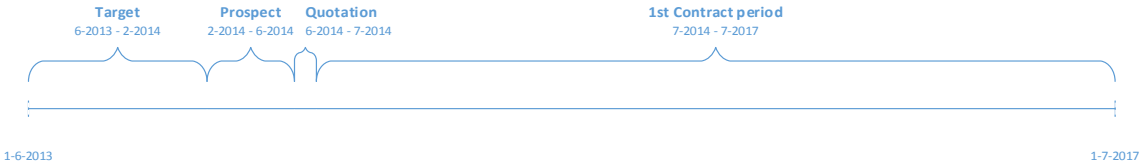


Figure 10. Sales cycle for company C (source: CRM system)

Company C intended to improve the quality of management information for program and general managers in their Business Development department through the use of Flightmap. The purpose of Flightmap in this case is to monitor the innovation funnel of Business Development, which consists of approximately eighty companies in different phases of development. More specifically, to assist in the decision making process, e.g. regarding the allocation of budgets for innovation projects, to increase the efficiency of program managers, and to quantify the added value of the Business Development department. These requirements are matched relatively well by the standard functionality of Flightmap, as argued in the proposal of Bicore. The kick-off meeting was used to discuss and refine the scope and requirements as formulated in the request for proposal. The scope was considered in need of refinement, because the exact purpose of Flightmap turned out to be unclear for company C at that point of time. An additional challenge was found in the unfamiliarity with portfolio management in general and the usage of a portfolio management tool in particular, which may have resulted in extra work for the project leader of Bicore.

When looking at the data (Figure 11), the first few months can be described as a ramp up period for usage. The initial implementation was divided in two phases: from mid-July until September 2014 a configurator of Bicore put significant effort in the configuration of the input side of the portal. Simultaneously a pilot was executed at company C in which the project portfolio of two employees was used as a source for the first data to test the basic functionality of Flightmap. The next phase,

starting in November 2014, involved the configuration of the data analysis and reporting options by another configurator, based on the findings from the first pilot phase. In the same period data had to be gathered in the Business Development department as a prerequisite for running analyses. The process of data gathering was a time-consuming task for the stakeholders at company C and resulted in critical questions from program managers on the balance between effort and return for them personally. The project leader of Bicore tried to increase the support base for Flightmap at company C by educating them with the advantages resulting from their data entry effort in the subsequent months. In mid-December 2014 a list of remaining items was made, i.e. the to-do list. In March 2015 all items on the remaining items list were handled, concluding the second phase of the implementation. From April onwards the project leader put substantial effort in educating company C on the functionalities of Flightmap in terms of advanced analyses.

Based on internal forecasts of the estimated time needed for implementation, i.e. combined hours of the project leader and configurator, exceeded the expected time with 178%, while the time allocated to support turned out to be too high compared with reality (Table 8). The hours for support are estimated for a three year period of which two years remain, therefore the yearly average is used to compare the actual and the estimated hours for support. A remark has to be made on the fact that in this case service requests were often communicated in an informal way by company C, i.e. directly between the project leaders of both parties, bypassing the service desk. As a result, it may be the case that not all actual hours of providing support are booked as such. Noteworthy is also the relatively high effort from the project leader, which spent almost as much hours on the implementation as the configurator. As indicated before, this may be due to the newness of portfolio management for company C and the unclear scope at the start of the implementation. Initially, the number of user sessions increased every month. However, after February 2015 a steep decline was seen, which indicates that Flightmap adoption could be a problem at the client. According to company C this should be a temporary pattern though, due to activities scheduled in these months receiving higher priority. In June 2015 usage recovered, however it is unclear whether this trend will be persistent.

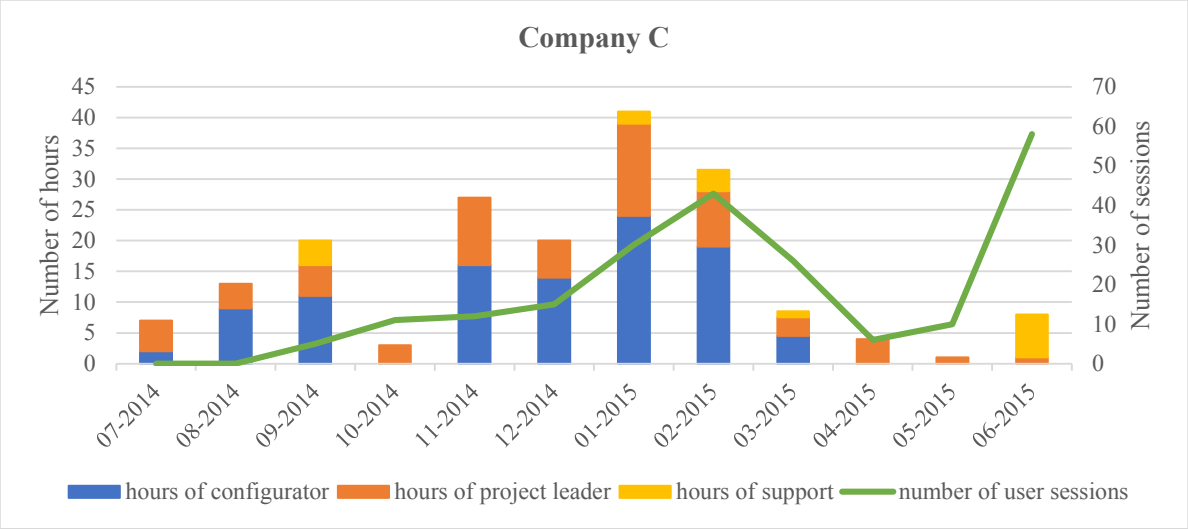


Figure 11. Overview of implementation effort and portal usage (source: TimeLog registration system and activity monitor)

	Average per month	Actual total	Estimated total	Difference actual vs. estimated
Gross margin	n.a.	77,3%	87,6%	-10,3%.
Number of user sessions	37	440	n.a.	n.a.
Number of hours for implementation	13,9	166,5	60	+178%
Number of hours of configurator	8,3	99,5	40	+149%
Number of hours of project leader	5,6	67	20	+235%
Number of hours support	1,5	17,5	140 (47/yr.)	-63%

Table 8. Overview of statistics for portal company C (source: TimeLog registration system and activity monitor)

After the initial implementation period still a relatively large amount of service requests was submitted to the implementation team of Bicore (Appendix X). The majority of these requests comprised configuration requests and few requests for software change. This indicates that the portal needed a high level of customization, however not in terms of additional software features. The implementation team of Bicore took on average 13,5 working days to handle a service request after submission by company C.

4.4.1. Conclusion

The sales process of company B and C show similarities: both were already close contacts for a long time before becoming actual customers and in both cases the initial portal was sold for a bottom price, influencing the lower than expected gross margin. In addition, it can be stated for company C that the sales and implementation process both took relatively long. In combination with the relatively high number of configuration requests starting after six months of configuration, this indicates an unclear scope of the implementation. At the moment, the implementation phase has just finished from the perspective of Bicore, however Bicore and company C still have to work in collaboration on the adoption of Flightmap, with the main focus on enabling company C to make use of the full potential of Flightmap by running advanced analyses.

When comparing the case of company C with the reference service blueprints, a crucial difference can be found in the definition of the requirements for the portal which was in practice an iterative process, which resulted in additional configuration effort for the project team. In addition, the way of requesting service was different from the way modeled in the service blueprint. In practice, service requests were often delivered in an informal way, bypassing the service desk and the support ticket system. As a result, it is assumed that an unknown proportion of service delivery has been done without written documentation. This issue may also be related to the phase of the project which after almost a year of implementation still has not been transferred to in use. Consequently, contact remains on a relatively high and personal level within the project team, related to the different processes for handling service requests during the implementation and in use phase as modeled in the corresponding service blueprints.

4.5. Case 4 – Company D

Company D is a truck manufacturing company and a Flightmap user since 2011. In the five years before, Bicore and company D already partnered in order to improve the project budgeting and monitoring of company D. As a next step, during an advisory project, the need for a portfolio management solution was identified. The purpose of the portfolio management solution has been defined as to support the decision making process regarding the portfolio of company D and to track progress of projects. Portfolio management was at that moment already a topic with high priority within company D and as a result, few sales effort was required to convince the company of the potential advantages of a corresponding tool. Company D had already advanced portfolio management methodologies and project scoring models available, resulting in a clear scope and goals. In 2010 Flightmap was piloted and confirmed to match company D's requirement, resulting in a purchase in 2011 and a yearly contract extension ever since. The implementation has been started in June 2011 and the portal has been considered operational according to D's requirements after five months of implementation in November 2011. In the following years, the contract was expanded once: in 2014 additional users were contractually allowed and an add-on connecting Flightmap and Excel was purchased to automate the data entry process. Company D received a substantial discount for being a reference customer by giving permission to share its case study with potential future clients of Bicore. As shown in Figure 12, the sales cycle time was 8 months.

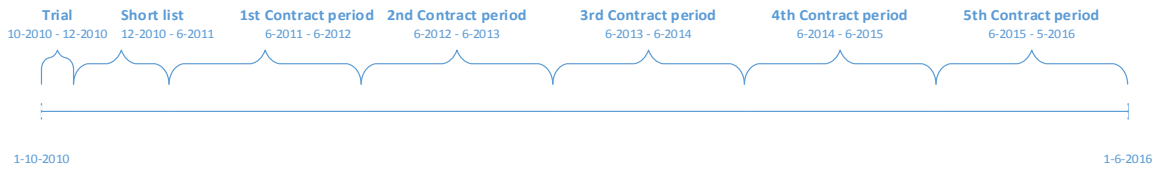


Figure 12. Sales cycle for company D (source: CRM system)

A member of the project team of Bicore characterized the portal usage before December 2012 as relatively high (Figure 13). From December 2012 onwards statistics on portal usage have been available which show a fluctuating usage pattern at Company D, resulting from Flightmap being used to run portfolio analyses periodically. Since July 2014 usage is relatively low which was confirmed by company D as being an issue. Company D pointed to two reasons for the low usage: at the end of 2014 there was too little time available for Flightmap analyses and in the first half of 2015 no new projects were initiated at company D so there was no need for Flightmap. No clear pattern can be found for the booked hours of the implementation team (Table 9). In this case no distinction was made between configuration and customer support for booking the hours, however it can be assumed that most time can be attributed to configuration activities. In mid-2012 and from early 2013 to early 2014 a significant amount of time is spent by the configurator. This work effort was due to a major release of Flightmap which involved the migration of the portal, presentation of the new features to the customer and resolving resultant issues. Configuring this specific portal was relatively time-consuming because it offered custom, complex calculation rules. Even within company D confusion existed on the definition of their own calculation rules, which made the configuration more difficult for Bicore. In general can be said that the actual hours do not match the forecasts: the contribution of the configuration was overestimated, while the contribution of the project leader was underestimated.

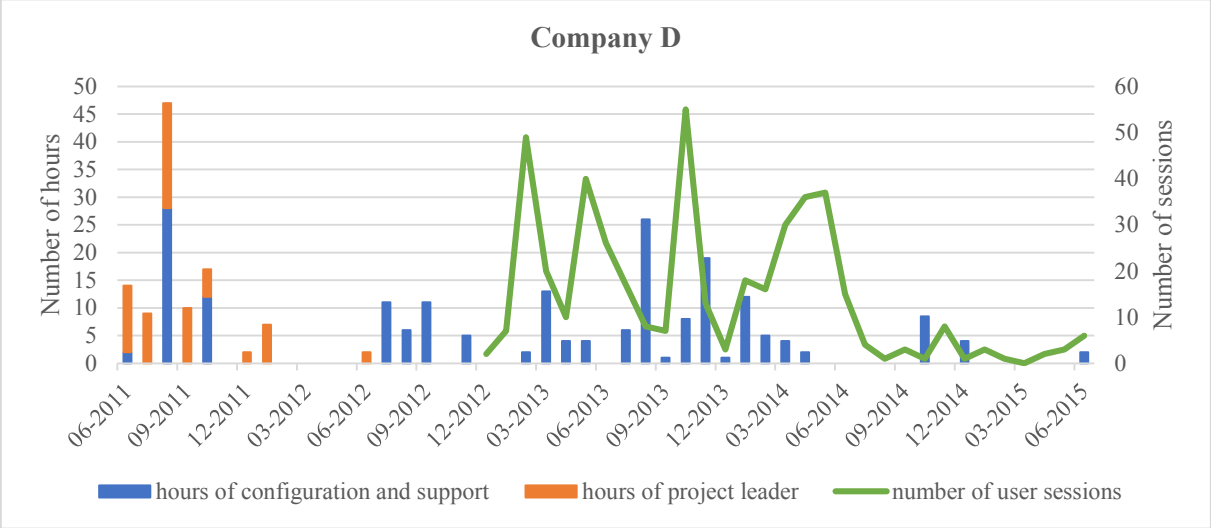


Figure 13. Overview of implementation time and portal usage (source: TimeLog registration system and activity monitor)

	Average per month	Actual total	Estimated total	Difference actual vs. estimated
Gross margin	n.a.	91,5%	85,0%	+6,5%.
Number of user sessions	14	442	n.a.	n.a.
Number of hours for implementation	5,4	262,5	448	-41%
Number of hours of configurator	4,0	196,5	400	-51%
Number of hours of project leader	1,4	66	48	38%

Table 9. Overview of statistics for portal company D (source: TimeLog registration system and activity monitor)

The number of service requests per month as listed in the remaining items list is shown in Appendix IX. Most items were classified as requests for change, indicating a potential mismatch in Flightmap and the customer's requirements. In November 2011 also a number of incidents were reported, i.e. when the normal state of Flightmap is distorted. However, no incidents have been reported in the following months.

4.5.1. Conclusion

Company D has been a client for a long-time, initially even supporting Bicore with defining their standards. The portal can be considered highly profitable for Bicore, which is indicated by the very high gross margin. The yearly extensions and one-time contract expansion compensate for the substantial implementation effort, which is however substantially less than expected. A large number

of requests for service, mostly for software change, were submitted in the first months of implementation, which may be related to the portal working on an early, basic version of Flightmap. The implementation has followed an atypical pattern in which most configuration work has been done after the implementation was officially finished, related with the release of a new version of Flightmap. In conclusion, this case can be regarded as successful from an financial as well as an operational perspective. However, the substantial decrease in portal usage for over a year is worrying. From a process perspective can be concluded that monitoring customer satisfaction has been done effectively, because a worrying decrease in portal usage was spotted in an early stage.

4.6. Case 5 – Company E

Company E became a lead through a consulting partner of Bicore. The consulting partner was hired by company E to professionalize its innovation management and proposed to aid this process by a portfolio management software tool such as Flightmap. Consequently, the consulting partner and Bicore jointly prepared a proposal for a trial of Flightmap. The intended purpose was to use Flightmap for the technology development center of company E in the area of dredging and mining. The functionalities of interest were portfolio planning, project scoring, budget and resource constraints, and the approval workflow. The project was ultimately granted in July 2014. The sales cycle time of only one month indicates a favorable sales cycle (Figure 14).

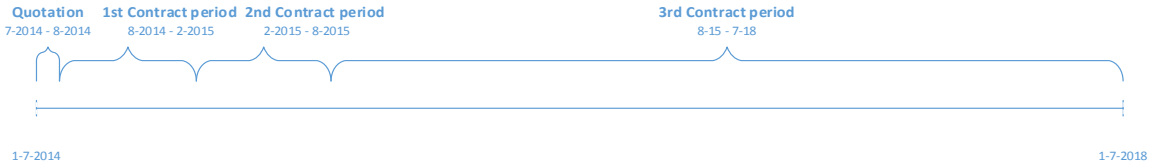


Figure 14. Sales cycle for company E (source: CRM system)

The portal was implemented by Bicore in cooperation with the consulting partner, which took the role of project leader at company E. The consulting partner formulated the specifications which were configured by Bicore. The first phase of the implementation involved data collection and entry in Flightmap, in iterations from few to all projects. Most implementation effort has been on providing support, not so much on configuration (Figure 15). Portal usage has been erratic, which matches the purpose of Flightmap for company E, i.e. to run analyses periodically. After the six month contract period the contract was extended with another six months because portfolio management was not yet as mature as expected. From the second pilot onwards, the role of project leader was transferred from the consulting partner towards an employee of company E. In this second pilot the focus shifted towards configuration updates and more sophisticated analyses to underpin decisions on budget allocations. In Mid-2015 the contract was again extended, in this case for a three year period.

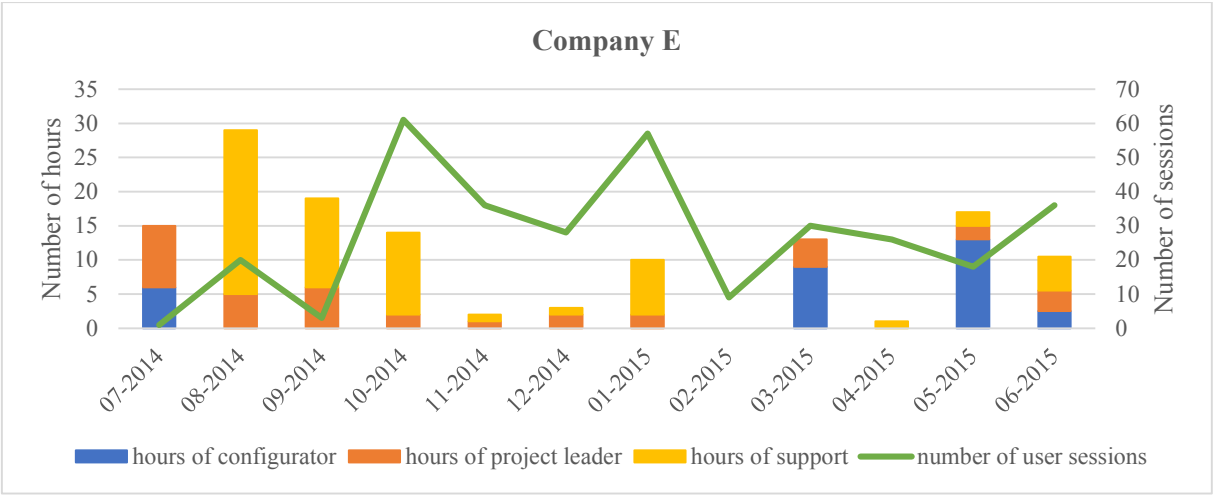


Figure 15. Overview of implementation time and portal usage (source: TimeLog registration system and activity monitor)

Even though the portal was used by eleven users, only one key user was appointed by company E. This key user was responsible for all data collection, changes, and analysis. This situation was identified by Bicore as a potential bottleneck for the continuity of portfolio management in general and the use of Flightmap specifically, e.g. in case of the key user leaving company E. The potential danger of lost knowledge was confirmed by company E and policy changes proposed. As a first step, project leaders were allowed to make changes in Flightmap themselves for their own projects.

	Average per month	Actual total	Estimated total	Difference actual vs. estimated
Gross margin	n.a.	86,9%	89,2%	-2,2 %.
Number of user sessions	27	325	n.a.	n.a.
Number of hours for implementation	5,5	66,5	80	-17%
Number of hours of configurator	2,5	30,5	24	27%
Number of hours of project leader	3,0	36	48	-25%
Number of hours support	5,6	67	32	109%

Table 10. Overview of statistics for portal company E (source: TimeLog registration system and activity monitor)

Due to the involvement of experts from a consulting partner, the implementation was done very effectively. Consequently, in the subsequent months almost no service requests were submitted (Appendix IX). After a year the portal was evaluated and updated to match developments within company E, which resulted in additional configuration requests.

4.6.1. Conclusion

Case 5 involves a highly profitable portal, which required relatively few effort in terms of working hours for pre-sales and configuration (Table 10). Due to the involvement of a consulting partner all time-consuming sales processes normally required before preparing the proposal, e.g. lead generation and influence interest, could be skipped and the sales cycle could be compressed to one month. The portal is relatively well used and few service requests were submitted. However, a substantial amount of support has been provided by the service desk, which may due to the relative newness of portfolio management to the company.

4.7. Summary of cases

After elaborating on each case individually in the first part of this chapter, in this section the cases will be summarized. Unfortunately, no targets for the selected performance indicators were available at Bicore, so only relative performance compared with an average could be assessed. For each case, the scores on the performance indicators were graded by comparing them with the Bicore average (of the total available pool of 14 cases), as shown in Table 11. For each performance indicator an acceptable range was determined, i.e. plus and minus 25% of the average was considered a standard score (coded grey), apart from the gross margin which required a more strict range of plus and minus 10%. All scores above this range are considered outstanding and are coded green. Following the same logic, all scores below were considered insufficient and coded red. The performance indicators were, in line with the research objective, related to effectiveness and efficiency. Unfortunately, for effectiveness only one performance indicator could be retrieved, while for efficiency five measures were scored. For both effectiveness and efficiency a final score was determined on a three-points scale (from low to high: -, +/-, and +), taking the average of the scores on the corresponding performance indicators (from low to high: red, grey, green). A majority of scores coded red resulted in a classification as a failure on effectiveness and/or efficiency and a majority of green scores in a classification as a success on the corresponding dimension. When looking at efficiency, cases 2 and 3 were considered a failure and 5 a success. On the other hand, when focusing on effectiveness case 1 was considered a failure and case 2, 3, and 5 were considered a success. In the next section, process differences between cases will be matched with success or failure in terms of effectiveness and efficiency. Eventually, these relations will be used as input for the proposed recommendations on how to structure sales and support processes.

	Bicore average [range]	Case 1	Case 2	Case 3	Case 4	Case 5
Efficiency						
1. Gross margin	81,0% [72,9-89,1]	88,8%	29,8%	77,3%	91,5%	86,9%
2. Sales cycle time (in months)	9,0 [6,8-11,3]	30	19	12	8	1
3. Throughput time implementation (in months)	5,1 [3,8-6,4]	6	12	9	5	1
4. Implementation workload (in hours)	116 [87-145]	27[1]	570	166,5	262,5[2]	66,5
5. Service request resolution effort (in hours/portal/month)	3,3 [2,5-4,1]	0,7	0,2	1,5	unknown	5,6
Score on efficiency	n.a.	+/-	-- (failure)	-- (failure)	+/-	++ (success)
Effectiveness						
6. Portal activity (avg. sessions per month)	17,5[3] [13,1 – 21,9]	5,6	73	37	14	27
Score on effectiveness	n.a.	- (failure)	+ (success)	+ (success)	+/-	+ (success)

Table 11. Scores on relevant performance indicators for each case.

4.8. Cross-case comparison

A method similar to the one described for the identification of as-is processes (section 3.1) was used to identify process differences between cases. During the interviews with Bicore personnel involved in a case, the interviewee was asked to point out to process differences of a case compared with the reference 'as-is' situation. As a next step, by checking whether these process differences were in place for cases considered either a success or a failure on the dimensions effectiveness and efficiency, possible explanations for the differences in performance could be found. In this section, these presumed antecedents of success or failure in terms of efficiency and effectiveness will be listed, followed by a table visualizing this reasoning. In the final part of this chapter, the process differences identified as having an influence on effectiveness and/or efficiency will be explained in more detail.

First of all, the outstanding scores of case 5 (effectiveness and efficiency success) on sales cycle time and implementation throughput time could be explained by the involvement of a consulting partner addressing the scalability issues surrounding direct sales (elaborated on in section 4.8.1). The scores of efficiency failures case 2 and 3 on implementation throughput time and workload can be considered a negative outlier and could be attributed to problems associated with the transition from sales to implementation (4.8.2), from implementation to in use (4.8.4), and to an unclear scope of the implementation (4.8.3), subsequently negatively impacting their corresponding gross margins. After looking into the details of case 1 (effectiveness failure), problems associated with monitoring customer satisfaction were discovered (4.8.5): i.e. even though case 1 scored not particularly bad on the performance indicators, Flightmap was unexpectedly rejected after the trial phase. Furthermore, a problem with documenting service requests could be identified (4.8.6), originating from the inexplicable difference between hours booked on support and support tickets documented for case 5.

[1] The implementation workload of case 1 cannot be compared with other cases because the trial has not been extended and consequently no full implementation project has been executed.
[2] For case 4 no distinction was made between hours booked on the implementation or on customer support and consequently no separate score on performance indicators 4 and 5 could be determined.
[3] One clear outlier was removed from the data set.

To show a relation between the before mentioned process differences and performance on effectiveness and efficiency Table 12 was constructed. This table shows whether the identified process differences are in place at the cases considered a success or failure on the dimensions effectiveness and efficiency. Meaningful relations are shown in black, others in grey.

	Efficiency success	Efficiency failure	Effectiveness success	Effectiveness failure
Involve consulting partner in sales and implementation (5.8.1)	Yes	No	Mixed	No
Involve configurator early in sales process (5.8.2)	Yes	No	Mixed	No
Clearly define scope of implementation (5.8.3)	Yes	No	Mixed	No
Introduce formal transition from implementation to in use (5.8.4)	Yes	No	Mixed	n.a.
Monitor customer satisfaction (5.8.5)	Yes	Yes	Yes	No
Document service requests consistently (5.8.6)	No	No	No	No

Table 12. Relation between process differences and performance on effectiveness/efficiency in case analysis

Most directions for improvement can be underpinned by contrasting the process differences with the categorization as success or failure. Consequently, it is shown that efficient cases at Bicore involve a consulting partner, ensure that the intended configurator is involved early in the presales process, have a clearly defined scope, and feature a formal transition from implementation to in use. In addition, effective cases involve a timely customer evaluation. On the other hand, the contrary is also true: inefficient cases do not involve a consulting partner, do not involve the configurator early in the process, do not feature a clear scope, and do not offer a formal transition from implementation to in use. In addition, ineffective cases do not offer a timely customer satisfaction evaluation. The last process difference, i.e. documenting service requests, could not be underpinned by contrasting cases, however it was anecdotally proven to be a bottleneck for all cases. Consequently, I decided to include this improvement direction also for further research.

In the following sections the six identified improvement directions are further explained. These improvement directions are also visualized in updated service blueprints (Appendix XI, Appendix XII, and Appendix XIII). The number given in parentheses corresponds with the number of the modification to the 'as-is' service blueprint. The processes of interest are colored in black, contrasting with the green and blue originals.

4.8.1. Involve consulting partner in sales and implementation (1)

Involving a consulting partner in the sales and implementation process may substantially decrease the required presales and implementation effort for Bicore, as was the case with company E. When a consulting partner provides a qualified lead, this eliminates the time-consuming aspects of presales, e.g. lead generation, follow-up, etc., almost completely for Bicore, consequently increasing the efficiency of the implementation. The consulting partner earns a fee in case of an actual sale and may get additional consultancy work, so this scenario is also beneficial for him or her. When this consulting partner also acts as the project leader of the customer during the implementation of Flightmap, an effective and efficient implementation is very likely. This is due to the fact that this partner is familiar with portfolio management in general, the needs of the client company, and with the functionality of Flightmap. Even though this conclusion is drawn based on only one case, this provides a very interesting direction for resolving the scalability issue of the sales processes at Bicore.

4.8.2. Involve configurator early in sales process (2)

The cooperation between salespeople and configurators is limited at the moment. Most of the time configurators are only involved at the end of the presales process to discuss the features offered in a proposal. In the case of company B, the enormous implementation effort was foreseen, but winning the bid was considered to be of higher, strategic importance. Involving configurators and/or

developers more and earlier in the sales process may result in a better match of the product offered in the proposal with the standard functionality of Flightmap. In addition, the cases showed that estimations of implementation workload are most of the time inaccurate. A closer cooperation between sales and the intended implementation team during the presales phase will presumably result in a more realistic planning.

4.8.3. Clearly define scope of implementation (3)

An unclear scope of the implementation project often results in an escalation of implementation duration and work effort, negatively impacting the gross margin. This is especially relevant for cases with the business customer and the (key) user(s) being different people, which may result in conflicting views on the scope and goals of a portal. For cases B and C refining the requirements became an iterative process due to the needs of the customer evolving over time. Consequently, the requirement refinement activity became part of the configuration loop, unnecessarily stretching the implementation duration and required effort. Preceding this issue may be a (request for) proposal with an intentionally vague scope to increase the chance of winning a tender. However, in the case requirements are formulated clearly before the actual configuration starts, i.e. either as input for the proposal or in the kickoff meeting, most likely less implementation effort will be required.

4.8.4. Introduce formal transition from implementation to in use (4)

The transition from implementation to in use is almost never formalized. Moreover, even when a portal is considered in use, configuration requests are most of the time still granted at no additional costs. The implementation duration and effort often, e.g. for cases B and C, substantially exceed the estimation, which may be partly due to Bicore's method of implementing until the customer is satisfied. During the in use phase service requests should be submitted to the service desk instead of personally to a member of the implementation team, which is usual during the implementation phase. A quicker and more formal transition to in use would in theory lead to a more efficient implementation.

4.8.5. Monitor customer satisfaction (5)

Monitoring customer satisfaction occurs unstructured at the moment. Currently, customer satisfaction is measured by the project leader, in the role of account manager, of Bicore through monitoring portal usage. In addition, the types and amount of service requests are seen as indicators of customer satisfaction. However, customer satisfaction is never measured directly, e.g. by means of a survey. The case of company A strongly indicates that additional, direct measures would be useful to secure contract extension, because in that case all indirect measures failed: even though portal usage was high and no complaints were received through the service desk, in the end the evaluation was negative.

4.8.6. Document service requests consistently (6)

Registration of service requests happens inconsistently. Especially for cases D and E hours are booked on support which cannot be explained from service requests originating from either the to-do list or the support ticket system. This may be related to the previous remark about the transition from implementation to in use: because customers often contact Bicore employees directly or informally, the central system of support tickets is used inconsistently. Currently, there are no indications that this leads to major issues, but this informal way of providing customer support seems not scalable very well.

5. Results: benchmark

In addition to the case analysis, a benchmark was executed to identify more radical improvements for the sales, implementation and customer support processes.

5.1. Benchmark method

Benchmarking can be defined as the search for and implementation of best practices (Camp, 1995). As stated by Camp (1995, p. 14): 'the most efficient way to promulgate effective change is by learning from the positive experience of others', which can be regarded as the essence of benchmarking. To structure the benchmarking activities Camp's 10-step benchmarking process was adapted for this research. Because of the implementation of continuous benchmarking at Bicore is outside the scope of this research, only the first four steps were incorporated: identify benchmark subject, identify benchmark partners, plan and conduct the investigation, and determine the competitive gap. Ultimately, this resulted in recommendations for designing sales and customer support processes at software SMEs in general and for Bicore in specific.

First of all, the benchmark subject included the sales, implementation, and customer support processes of Bicore. The intended goal of the benchmark matches the research objective, i.e. to improve the sales and customer support processes in terms of scalability by balancing efficiency and effectiveness. While already being visualized using the service blueprinting technique, these processes can be compared between the benchmark partners. In section 2.5 is elaborated on the process of selecting performance measures which were used to compare processes in terms of performance in order to identify a 'best practice'.

Secondly, to select appropriate benchmark partners, a set of requirements was formulated. These requirements had to ensure the ability of mutually comparing the relevant processes. In addition, an indication of superior work processes related to sales and customer support should be present. The requirements were:

- The benchmark partner should be a supplier of software.
- The benchmark partner should provide an on-site implementation of its software.
- The benchmark partner should operate in a business-to-business market.
- The benchmark partner should employ more than 25 and less than 100 employees.
- There should be some indication of the benchmark partner demonstrating excellent work processes.

As a first step to develop a candidate list, the 2014 edition of Main Software Top 50 was consulted (Main Capital Partners, 2014). The Main Software Top 50 ranks the most successful, independent Dutch software companies on criteria such as growth and financial results. Since these criteria are mostly related to sales processes, additional indicators for high performance on customer support were identified, e.g. customer service awards. Of the initial 50 candidates, 18 satisfied all of the above criteria. These companies were contacted in order of rank (from high to low) on the Main Software Top 50 and asked to participate in the benchmark. It was ensured that no more than one software provider per sector was included, to eliminate issues related to companies not being prepared to exchange information with competitors. Camp (1995) proposed to limit the number of benchmark partners to an accomplishable set of companies, usually being three to six. In that light, the intended number of benchmark partners was set at four for this project.

The scope of the research, i.e. sales, implementation, and customer support processes, turned out to be an obstacle for the benchmark. In practice, contacts at the benchmark partner were either experts in sales and implementation processes or in customer support processes. Consequently, it was decided to focus on one of both in each benchmark interview, depending on indicators of superior performance in one of both fields.

The actual investigation at the benchmark partner was conducted using a face-to-face semi-structured interview at the benchmarking partner. This interview consisted of four parts, starting with general questions about the company and the specific processes of interest. Secondly, and most importantly,

the processes of interest of the benchmarking partner and a reference model (i.e. the 'as-is' service blueprint as modeled at Bicore) were compared. This reference model was used to structure the process discovery. In addition, because the time available for an interview was limited, a reference model appeared to be essential to sped up this process. The guidelines for process discovery were the same as in the process identification part and were aimed at gathering the required information for modeling a service blueprint. The interviewee was asked about activities or events initiating or ending the process of interest, the sequence of activities, the relations between activities, missing or redundant activities, and actors involved. In the third part of the interview the scores on the relevant performance measures were discussed. Lastly, a set of problematic scenarios for software SMEs as identified in the case analysis was presented to the interviewee(s) and possible solution directions were discussed. When relating the scores on the performance measures with differences in process structure, potential 'best practices' could be identified. The purpose of this step is to understand the difference between the current and desired process structure. Ultimately, the benchmark was used to come up with potential process improvements as seen at other companies.

In the following sections the results of the benchmark are presented per benchmark partner. For confidentiality reasons the names of these companies will not be disclosed. For each benchmark partner a short introduction of the company is presented and the differences between their processes and the reference 'as-is' model of Bicore are outlined and visualized in service blueprints. Red arrows or boxes in the blueprint refer to a flow not existing at the benchmark partner and relations or activities not existing in the process of Bicore are shown in yellow. Ultimately, the scores on the relevant performance indicators are compared and conclusions drawn on 'best practices'. This chapter is based on interviews held with the employees responsible for the sales, implementation and/or customer support processes at these companies. The main focus in the interviews with company B1 and B2 was on customer support, while the sessions with B3 and B4 focused on sales and implementation.

5.2. Company B1 (customer support)

The customer support processes of company B1 were discussed with the manager of support.

Company B1 is a provider of enterprise resource planning (ERP) software in the form of Software as a Service. The ERP software consists of a number of standard and optional modules, e.g. accounting, business intelligence, customer relationship management, data management, human resource management, inventory management, etc. B1's software is developed according to the agile philosophy and each month a new version is released with new and improved features. Company B1 focuses on four target groups: associations, service providers, professional services firms, and the public sector. New customers are mainly acquired through references from current, satisfied customers and within the network of B1's salesforce. Since the software is customized to suit the customer's needs, implementation is always required. The implementation involves configuring parameters and settings in order to match the work processes of the client company and is assigned to an implementation consultant of B1. After the implementation, the aftercare phase is started, ultimately leading to 'in use'. The aftercare phase is a bridging period in which the implementation consultant remains available to the customer to fix initial problems while the portal is already operational. Customer support needs to be tailored to each specific configuration as a result of the high level of customization required for each portal. For the same reason, the implementation consultant remains the contact person during the in use phase. The appointed key user at the customer is closely involved in the implementation and becomes responsible for the configuration after the initial implementation.

The service desk of B1 exists since 2012 as a separate unit and provides support during the in use phase. In the period 2013-2014 the service desk was expected to handle all service requests, however this approach turned out to be less efficient, because the service desk was lacking knowledge on the specific configuration of a portal. Currently, the service desk answers questions, but the majority of service requests is transferred to the responsible developer or implementation consultant, depending on the nature of the service request. The service desk also signals opportunities for up- and cross-selling, e.g. additional user licenses or features. B1 employs 34 employees of which two FTE are dedicated to customer support and ten consultants to the implementation. Company B1 offers two options for customer support, i.e. support through an account manager and second-tier customer

support. First-tier support is always provided by the key user at the customer and covers basic support, e.g. questions and requests. The two options offered by B1 are:

- Customer support through the account manager, i.e. the consultant also responsible for the implementation. The consultant is the contact person for the key user during the implementation and possibly also during the in use phase in the role of account manager.
- Second-tier customer support: support in the case of incidents/errors related to the software. Second tier support is available for all customers. In most of the cases the service desk assigns the service request of the customer to either a consultant or a developer. In addition, direct support from the B1 service desk for straightforward questions is available through a premium subscription, offering the advantage of receiving quicker responses compared with the support provided by the account manager.

5.2.1. Differences in processes

The differences between customer support processes of B1 and Bicore are modeled in a service blueprint (Appendix XIV) and elaborated on below (the number of the difference corresponds with the number of the change as modeled in the service blueprint):

1. A number of additional support channels are provided on top of the service desk: user meetings, workshops and a support website. The support website offers self-help in the form of manuals and answers to frequently asked questions. These are intended for the customer to achieve maximum value of the purchase and to ease the pressure on the service desk. The use of self-help results in a change of processes and is shown in the service blueprint.
2. No direct contact between users, apart from the key user, and the service desk is allowed. Regular users have to contact the key user for all service requests. Depending on the type of contract the key user can contact the service desk and/or consultant in case additional help is needed. The reason for this strict policy is security-related and originates from B1 complying with ISO and ISAE3402 standards.
3. B1 adds an aftercare phase between implementation and in use. During the aftercare phase the implementation consultant is still available to the customer to fix initial problems while the portal is already ‘live’. Consequently, the first point of contact is not the service desk but the consultant. The implementation and aftercare phase are highly variable in terms of duration depending on the requirements of the customer.
4. During in use, configuration requests are handled by the key user, which is trained by B1 during the implementation. Also, in the case of major changes in the software affecting the specific configuration of a portal, the key user is responsible for fixing the configuration.
5. The majority of service requests is related to a specific configuration of the software and is directly submitted to the consultant by the key user or assigned by the service desk to the corresponding consultant. The service desk itself handles problems and incidents, and only in case of the customer having a premium subscription also questions not related to the specific configuration.
6. Support tickets and requests for change are linked in the system, i.e. developers make use of the same system when prioritizing software changes. As a result, no additional step to document and classify a problem based on a support ticket is needed, because this information is already enclosed in the support ticket.

5.2.2. Conclusion

The customer support processes of B1 are closely related to the processes of Bicore, except for a few differences. First of all, a major difference concerns the responsibility for configuration changes after the initial implementation, which is assigned to the key user of the customer. The key user is trained during the implementation and is the only person qualified to receive support from B1. Secondly, B1 adds the aftercare phase in between implementation and in use. This phase is intended to smoothen the transition from intensive contact during the implementation to infrequent contact during in use. During the aftercare phase the implementation consultant is still available for the key user to fix hiccups. Eventually, the procedure for support during in use is explained and started. The service desk at B1 is mainly an intermediary, assigning service requests to experts on either the specific configuration or

software code. This approach is, compared with a previously tested approach of handling all service requests itself, proven to be considerably more efficient and effective in serving the customer.

5.3. Company B2 (customer support)

At company B2 the manager of operations and a business support analyst were interviewed about their customer support processes.

Company B2 provides software for managing electronic invoices (e-invoices) and documents. B2 was founded in 2000 and has grown rapidly ever since. Currently, B2 operates globally with offices in four countries, employing in total 35 employees, three of them on customer support. Many customers of company B2 operate in highly regulated industries, e.g. aviation, automotive, and pharmacy, and use the software to meet all compliance regulations while improving their cash flow. The software is mainly sold using a combination of direct and referral sales.

The software of B2 is available as a standard solution or custom made, which comes with a client-specific look and feel, customized input document types, etc. The subsequent implementation and customer support processes are highly dependent on this choice. Implementation is only needed for a custom portal. Both types also have different implications for the provided customer support from B2's perspective: a high, continuous effort has to be attributed to the custom portals, contrasting with a lower, peak effort for customers of the standard portal. The latter also comes with self-service support such as a manual and frequently asked questions.

The implementation of the software is roughly described in the statement of work, part of the contract. As a next step, the project is assigned to a project leader of B2, who provides a functional workshop, explaining and discussing the functionalities, resulting in a functional specification. Next, the technical specifications, e.g. related to security, connections, delivery channels, etc., are discussed and defined in the second workshop. Based on these agreements, the implementation is started, distinguishing between the batch processing of documents and the actual configuration of the portal. This implementation is done by a project team normally consisting of a project leader and a developer. When the portal is complete and tested according to the DTAP cycle (development, testing, acceptance, and production), it goes live. The first few weeks after going live, aftercare is provided by the implementation team. Ultimately, the responsibility of taking care of the customer is transferred to the service desk. After this phase, the service desk is the first point of contact and assigns tickets internally. An estimation is made about the required effort; all projects requiring an effort exceeding 20 working hours are assigned to a consultant, otherwise the project will be handled by the service desk itself.

5.3.1. Differences in processes

The differences between customer support processes of B2 and Bicore are detailed below and modeled in a service blueprint (Appendix XV). The processes are modeled for the customer support on a custom-made portal of B2, which is more contact-intensive than support for a standard portal. The main reasons to model this situation is that it is the most similar to Flightmap and while currently customized portals are the main business of B2.

1. No direct contact between users, apart from the key user, and the service desk is allowed. Regular users have to contact the key user for all service requests. Depending on the type of contract the key user can contact the service desk and/or consultant in case additional help is needed.
2. At B2 an error report is not always caused by a bug, but can also be initiated by an input error of the customer, e.g. input fields left empty. Consequently, the customer is asked how this problem should be solved, after which the processing of the documents is continued.
3. The key user is also able to submit a service request through creating a support ticket in the support system instead of calling or mailing the service desk. This approach results in faster responses from the service desk, because the support ticket ensures that all relevant information on the service request is provided at once.

4. Estimations on the required effort for handling service requests are used as input for deciding whether the request is assigned to the corresponding consultant or handled by the service desk itself: projects expected to exceed 20 working hours are assigned to a consultant, all smaller projects are handled by the service desk itself.
5. B2 adds the activity of providing the customer monthly with an overview of the service requests submitted along with the corresponding statistics.

5.3.2. Conclusion

The process model of B2 matches the customer support reference blueprint of Bicore relatively well. However, they have already made some steps concerning issues associated with customer support Bicore is still suffering from. First of all, key users are encouraged to make use of the ticket system when submitting service requests. This makes it easier for B2 to consistently document service requests in its ticket system. As an extra service, B2 provides a monthly overview of the submitted support tickets to the customer. B2 acknowledges the importance of documenting service requests in order to make support tickets transferable, to provide input for developers, and to enable enhanced performance monitoring. Furthermore, customer satisfaction is discussed quarterly in face-to-face meetings with the key user and/or contract owner, so reasons for dissatisfaction are signaled early. Overall, the service desk at B2 is mainly an intermediary, assigning service requests to the implementation consultant which has the knowledge on the specific configuration.

5.4. Company B3 (sales & implementation)

Thirdly, the sales coordinator of Company B3 was interviewed about their sales and implementation processes.

B3 is a B2B-provider of email security software, founded in 2005 and has grown rapidly ever since. Currently, B3 employs approximately fifty employees and operates worldwide, backed by offices in the Netherlands and Romania. Their target group consists of webhosts, internet service and telecom providers, and IT resellers. The email security solution of B3 features services for incoming and outgoing filtering, and email archiving.

The sales force of B3 consists of ten people, divided in seven actual sales people, i.e. account managers, two employees operationally supporting sales, and one sales coordinator. For sales a distinction is made between in- and outbound channels, referring to respectively (potential) customers contacting B3 and B3 identifying and contacting (potential) customers. Inbound sales occurs mainly through visitors of the website requesting a trial version of the software or additional information. The system automatically creates a ticket which is assigned to a sales employee based on region and level of expertise. The main problem of inbound sales is the low quality of leads. In contrast, outbound sales requires more effort to generate a substantial number of leads. Types of outbound sales channels used at B3 are mainly cold calling and mailing, but also referral sales and sales at events.

5.4.1. Differences in processes

The differences between the implementation and sales processes of B3 and these processes of Bicore are outlined below and modeled in a service blueprint (Appendix XVI).

1. In the case of a tender, it is often decided to not participate because of a combination of preparing a proposal being time-consuming and the low chance of winning the tender. In other words: after a request for proposal or information the opportunity is assessed based on fixed requirements.
2. In general, B3 uses a more formalized sales process, i.e. procedures with fixed due dates are prescribed. For example, there is a fixed period of following-up associated with a potential customer requesting a trial account. Another showcase of this formalization involves the situation when cases are becoming ‘cold’, i.e. when after a certain period of time no contract is signed, the case is transferred to sales operations which keeps in contact by sending periodical mailings to the lead.
3. Writing the proposal is a highly standardized process which requires just a couple of minutes to prepare, depending on a number of variables such as number of domains, types of services

requested, etc. Consequently, at B3 no supporting activities have to be performed when writing a proposal.

4. For the implementation two types of hosting can be distinguished: remote or onsite.
   4.1. Remotely hosted solutions are self-configurable by the customer and the software can be live in a number of hours. The self-configuration is supported by an extensive, online knowledgebase.
   4.2. An onsite implementation requires up to three days for installing the software.

5.4.2. Conclusion

Even though the sales techniques and volumes of B3 and Bicore differ substantially, the actual sales process matches relatively well. In general, the sales process of B3 can be considered even more formalized and detailed, e.g. with detailed prescriptions on sub steps, but it is unknown to what extent reality matches theory. During the actual sales process a clear difference can be found between B3 and Bicore in the activity of writing a proposal, which is highly standardized at B3 and requires no additional input from sales support. Furthermore, the implementation process of company B3 can be regarded as totally different, due to the software being highly standardized. Consequently, the remotely hosted solution requires no implementation effort from B3 and the onsite solution only a maximum of three days related to the installation of the software. The last difference can be found in the intensity of account management which segmented differently at B3 based on the importance of the customer. The scalability of direct sales is addressed by B3 by the increased importance of resellers.

5.5. Company B4 (sales & implementation)

Lastly, the two managers respectively responsible for sales and software implementation of company B4 were interviewed about the sales- and implementation processes of B4.

The software of company B4 is aimed at supporting sales, mainly for companies in the manufacturing, IT and telecom, financial services, or service industry sector. They offer a range of applications, all related to the customer-specific sales processes, through either a license or a subscription. The purpose of B4's software is to support a selling company in the process towards a signed contract, e.g. by (partly) automating the writing of quotations which would otherwise be a lengthy and complex process. The software is provided standardized, however the match between client requirements and the offered solution is ensured through enabling the right modules in the software. The implementation team consists normally of one or two consultants of B4 and needs, depending on the scope of the implementation, three to nine months for implementing the software at the client. A frequently occurring problem during the implementation phase is inferior data quality at the customer. As a next step, the users themselves can configure most of the software to match their needs, after receiving training during the implementation. B4 employs approximately fifty employees, of which six are responsible for sales and fourteen consultants for the implementation of the software at the client. B4 cannot be regarded as pure SaaS provider, because the software can also be purchased as a license and the hosting of the software is the responsibility of the client.

Sales is mainly performed by using consultative selling; i.e. selling a solution instead of solely software. The focus in the sales process is on creating awareness at the potential customer of the problem they are dealing with and subsequently convincing them that this problem can be solved by using B4's solutions. In line with their solution selling philosophy, B4 prefers to not demonstrate their software in the first phase of the sales process but rather analyze the problem at the client thoroughly before. Consequently, the main difference between both sales process models involves the sequence of the 'demonstrate software' and 'influence needs' activities.

5.5.1. Differences in processes

The differences between the sales and implementation related processes of B4 and Bicore are listed below and visualized in a service blueprint in Appendix XVII.

1. B4 prefers not to provide a trial version or demonstration of the software, because this conflicts with their philosophy of solution instead of software selling. As a result,

demonstrating software happens only after the needs of the client are analyzed and when requested by the (potential) customer. B4 prefers the involvement of reference customers through a reference meeting or call, which provides an objective evaluation of the software in a situation comparable with the potential customer.
2. The role of a (consulting) partner at B4 varies: some are only signaling leads, while others are also responsible for the actual sale and/or implementation.
3. Qualifying leads is a highly structured process at B4, supported by a tool which determines a score based on a number of predetermined inputs. In addition, the progress can be tracked and if needed sales tactics are discussed within the sales team.
4. The preferred sales situation involves an additional activity of 'problem analysis and solution description' between 'influence needs' and before the proposal is written. This activity is used as input for the actual proposal, which adds financial information and the implementation plan.
5. The sales process in most cases also involves developing a business case, presenting a cost-benefit analysis for the potential customer.
6. An ideal implementation is preceded by an orientation phase in the sales process. In this orientation phase the scope and goals of the implementation should be covered. Consequently, B4 aims to sell this orientation phase in the form of a proof of concept to the customer. However, often the customer is not willing to dedicate such an effort before the full contract.
7. During the in use phase the service desk can refer all service requests which involve deep knowledge about the customer specifics, e.g. optimization or analyses, to customer care in the person of a senior consultant. The goal is to deliver additional value to the customer, but also cross- and/or upselling opportunities can result from customer care.
8. A training is provided to the model builder at the client at the start of the implementation. Eventually, this model builder will provide a user training to the other users at the client company.

5.5.2. Conclusion

A number of differences between the sales process of B4 and Bicore can be distinguished based on the interview. As a result of the philosophy of selling a solution, the sales processes of B4 are clearly intended to prepare for the implementation, by defining the goals and requirements ideally before the signing of the contract or otherwise sold separately as a proof of concept. Related to this difference is the preference for a reference meeting to convince a potential customer instead of demonstrating the software. The implementation is different from Bicore because the configuring itself is done by a model builder at the customer, which is also responsible for training colleagues in using the software.

5.6. Cross-case comparison of benchmark partners

In this chapter the scores on the performance indicators are compared between the cases (Table 13). It turned out that the structural measurement of performance indicators was very immature at all of the interviewed companies. The set of measured indicators differed radically for each company. As a result, it appeared to be very difficult to compare the scores mutually, because of the limited number of scores retrieved. When looking at the scores in Table 13 one may distinguish between performance indicators for sales (1-5), implementation (6-7), and customer support (8-12).

5.6.1. Process performance indicators

Due to the limited set of performance indicators measured at the benchmark partners, no strong conclusions can be drawn from Table 13. However, it may still provide valuable directions for process improvement at Bicore when linking the differences with high performance in terms of effectiveness and efficiency. When looking at the sales indicators, Bicore consistently performs the worst, providing an indication that the sales processes of the sales-related benchmark partners B3 and B4 are better structured when aiming for efficiency and effectiveness. For the implementation phase, it appears even harder to draw conclusions, because the implementation of the software is difficult to compare mutually. As discussed in the interviews, the implementation duration and workload are mainly dependent on the level of customization required for a specific customer and to a lesser extent on actual implementation performance. However, there is anecdotal evidence from the interviews that

the level of escalation compared with the estimated workload is substantially lower at the benchmark partners due to stricter processes. Lastly, most scores on the performance indicators related to support are missing and consequently it is hard to assess Bicore's performance on customer support. However, it is remarkable that e.g. B2 spends substantially less effort per service request, so there seems to be room for improvement at Bicore.

Performance indicator	Score Bicore	Score B1	Score B2	Score B3	Score B4
Sales					
1. Gross margin	84,4%	-	-	-	-
2. Average customer satisfaction score	-	7,8	-	-	-
3. Retention rate (for 2014)	80,0%	-	-	95,0%	98,7%
4. Trial conversion rate	0%	-	-	23%	-
5. Average sales cycle time (in months)	9,0	-	-	1,25	6,0
Implementation					
6. Average throughput time of implementation (in months)	5,1	-	3,5	0	6,0
7. Average implementation workload (in hours)	116,0	-	-	0	400
Customer support					
8. Number of service requests (average per month)	17,8	179,7	-	-	-
9. Average service request response time in minutes (1st response)	131	21,4	15	-	-
10. Average service request response time in minutes (resolution)	231	39,9	-	-	-
11. Service request resolution effort (hours/month)	43	58,1	-	-	-
12. First time resolution rate	53,5%	-	60%	-	-

Table 13. Scores on performance indicators for each benchmark partner

5.6.2. Classification of benchmark partners as success or failure

As a next step, following the same logic as in the case analysis, performance measures were grouped into ones related to efficiency and others related to effectiveness (Table 14). Metrics mainly dependent on other dimensions than efficiency or effectiveness, e.g. on the number of customers or level of complexity, i.e. performance indicators 6, 7, 8, and 11, were left out. Each score was coded: red for below average scores, green for above average scores and grey if no comparison was possible, e.g. in the case of no more than one data point available. It is remarkable that all benchmark partners perform better than average and can be considered a success on both dimensions. At the same time, all benchmark partners perform substantially better than Bicore in terms of efficiency and effectiveness of their processes, classifying Bicore as a failure on the same dimensions. This finding confirms the starting point of the benchmark partners being best in class and Bicore being in need of improvement.

Performance indicator	Score Bicore	Score B1	Score B2	Score B3	Score B4
Related to efficiency					
1. Gross margin	84,4%	-	-	-	-
5. Average sales cycle time (in months)	9,0	-	-	1,25	6,0
9. Average service request response time in minutes (1st response)	131	21,4	15	-	-
10. Average service request response time in minutes (resolution)	231	39,9	-	-	-
Score on efficiency	Failure	Success	Success	Success	Success
Related to effectiveness					
2. Average customer satisfaction score	-	7,8	-	-	-
3. Retention rate (for 2014)	80,0%	-	-	95,0%	98,7%
4. Trial conversion rate	0%	-	-	23%	-
12. First time resolution rate	53,5%	-	60%	-	-
Score on effectiveness	Failure	-	Success	Success	Success

Table 14. Classification as a success or a failure in terms of efficiency and effectiveness for each benchmark partner

When contrasting the process differences, resulting from the interview method as described in section 5.1, for the high-performing benchmark partners with the low-performing processes from Bicore, valuable evidence for improvement directions could be identified. In Table 15 the process differences as identified in the benchmark, of which the method is explained in the first part of this chapter, are listed. All process differences which are mentioned by at least two benchmark partners are regarded as a promising research direction and are elaborated on in the following sections. The number in brackets in the first column of the table refers to the number of the process difference given in the following sections. Process differences with no number assigned are mentioned by less than two benchmark partners and are therefore discarded due to insufficient evidence for the influence of these processes on performance. The codes in the other columns refer to the process difference as discussed in the previous sections, e.g. B1-1 refers to process difference 1 of benchmark partner 1.

	Bicore (failure)	**B1 (success)**	**B2 (success)**	**B3 (success)**	**B4 (success)**
Formal sales procedures (1)	No	Unknown	Unknown	Yes (B3-2)	Yes (B4-3)
Standardize proposal (2)	No	Unknown	Unknown	Yes (B3-3)	Yes (B4-4)
Clear scope before implementation (3)	No	Unknown	Yes (B2)	Unknown	Yes (B4-5/6)
Aftercare phase (4)	No	Yes (B1-3)	Unknown	Unknown	Yes (B4-7)
Service desk contact policy (5)	No	Yes (B1-6)	Yes (B2-1)	Unknown	Unknown
Contact service desk using ticket system (6)	Yes, partially	Yes (B1-2)	Yes (B2-3)	Yes	Unknown
Service desk as intermediaries (7)	No	Yes (B1-5)	Yes (B2-4)	Unknown	Unknown
Self-configuration (8)	No	Yes (B1-4)	Unknown	Yes (B3-4)	Yes (B4-8)
Self-help (9)	Yes, partially	Yes (B1-1)	Unknown	Yes (B3-4)	Unknown
Involve reference customers	No	Unknown	Unknown	Unknown	Yes (B4-1)
Overview of service requests	No	Unknown	Yes (B2-5)	Unknown	Unknown
Tender opportunity assessment	Yes, partially	Unknown	Unknown	Yes (B3-1)	Unknown
Remote/onsite implementation	No	No	No	Yes (B3-4)	No
Varying level of involvement for consultant	No	Unknown	Unknown	Unknown	Yes (B4-2)

Table 15. Relation between process differences and performance on effectiveness/efficiency for benchmark

5.6.3. Process improvement directions

The process improvement directions as selected in the previous section, are modeled in service blueprints for sales and customer support, which can be found in respectively Appendix XVIII and Appendix XIX. Since the process differences related to the implementation occur at the boundary of sales and implementation, they are for the sake of clarity modeled in the service blueprint for sales.

1. An option could be to formalize the sales process to a higher extent, e.g. by following a more structured and fixed presales process as done by benchmark partner 3, e.g. set fixed periods for a follow-up, or by using an opportunity progress analysis as done by benchmark partner 4, quantifying the progress of a lead in the sales funnel and providing input for a possible sales intervention.
2. One possible way to reduce the average sales cycle time is to standardize the contents and inputs of a proposal, as done by benchmark partner 3 and 4.

3. To ensure an efficient implementation the scope, requirements, and goals should be defined thoroughly before the actual implementation phase, according to company B4. Consequently the implementation phase can be scheduled more realistically and no escalation of implementation effort can occur due to changing requirements of the customer. Company B2 uses the same philosophy by detailing the scope, requirements, and goals in a statement of work before the actual implementation.
4. Introducing an aftercare phase, as used by benchmark partners 1 and 4, after the implementation phase could provide several advantages for both the supplier as well as the customer. During the aftercare phase the implementation consultant remains the first point of contact instead of the service desk and consequently issues related to the configuration are solved relatively quick, while the implementation consultant still has hours available to work at this project. For the software provider an aftercare phase could smoothen the transition from implementation to in use, preventing an escalation of the implementation workload. In addition, the aftercare phase could be used to explain the procedure of submitting service requests during the in use phase.
5. B1 and B2 are very strict in their policy on employees of the customer qualified to contact the service desk: only the key user may contact the service desk if necessary. The key user is also responsible for providing first-tier support to his colleagues. This may ease the pressure on the service desk of the software provider and prevents the submission of conflicting service requests.
6. Providing advantages for the customer when contacting the service desk by using the ticket system, e.g. in response time and additional information, appears crucial during the transition from implementation to in use, to prevent the customer from contacting the implementation consultant directly. In addition, the employees responsible for customer support should also be convinced of the importance to use the support ticket system consistently themselves.
7. The service desks at the benchmark partners are intermediaries, i.e. they assign service requests requiring specific knowledge to the appropriate implementation consultant or developer instead of handling service requests themselves. For B1, both approaches have been tested and the ‘service desk as intermediary’ approach was shown to be more effective and efficient.
8. Most benchmark partners are very keen on letting the client configure their portal themselves during the in use phase. This could be done by setting up a configuration studio, enabling the key user to make some (basic) changes to the initial configuration instead of making this the responsibility of the service desk.
9. The pressure on the service desk could also be decreased by providing self-help solutions to the users, e.g. manuals, answers on frequently asked questions, etc. However, self-help is mainly helpful for portals with a low customization.

6. Conclusion

In this chapter final conclusions are drawn. In the first section, the research questions are answered, resulting in the main deliverable of this research: three improved service blueprints for respectively the sales, implementation and customer support processes of Bicore. Secondly, the managerial and theoretical implications of these conclusions are discussed. Lastly, in the final section will be reflected on this study by presenting research limitations and possible directions for future research.

6.1. Answers to research questions

6.1.1. Research question 1

The first research question was defined as: *'What would be a suitable framework for optimizing sales and customer support processes for a service providing company?'*

To be able to propose process improvements one has to first assess the performance of the current processes of a company in order to identify potential directions for improvement. To evaluate processes, selecting and measuring adequate performance indicators is essential. These performance measures had to serve two goals: on the one hand to compare the performance of sales and customer support processes between different cases in the case analysis, and on the other hand to compare the performance of these processes with other companies in the benchmark. The performance measures for the benchmark have to assess the performance of the processes on a higher, company-wide, level, compared to the indicators for the case analysis, which have to enable comparison between cases within Bicore. Therefore not all performance indicators are used for both the case analysis as well as the benchmark. Based on recommendations from literature (e.g. Fitzgerald et al., 1991; Lynch & Cross, 1995; Parmenter, 2010; Zallocco et al., 2009) the following set of performance indicators was selected:

- For sales: average sales volume per salesperson, gross margin, mean customer satisfaction score, retention rate, trial conversion rate, and sales cycle time.
- For implementation: mean customer satisfaction score, implementation throughput time, implementation workload, number of service requests (per type), and service request resolution time.
- For customer support: retention rate, mean customer satisfaction score, response time to service request, first time resolution rate, percentage of resolutions within SLA, service request resolution time, service request resolution effort in working hours.

The concept of the 'customer experience' was used as a starting point in the search for an appropriate methodology to analyze, and subsequently improve, the customer-related business processes. To deliver a consistent and satisfying customer experience the service providing company needs to be fully aware of its service delivery process (Zehrer, 2009). To do this, specialized tools need to be applied to identify and model the customer-related business processes (Haeckel et al., 2003). A number of process analysis and improvement methodologies in the field of customer experience management were identified and assessed. Service blueprinting was considered fitting the research objective of balancing efficiency and effectiveness of customer-related business processes best, since it is shown to be the most process-centric analysis and improvement methodology originating from customer experience management (Samadzadeh, 2015). Moreover, service blueprinting can be considered one of the most-established techniques in this field, both in theory as well as practice (Bitner et al., 2008; Hewing, 2013). Consequently, service blueprinting can be considered appropriate to model the relevant processes and to identify bottlenecks related to both effectiveness as well as efficiency.

More specifically, I propose a combination of service blueprinting and basic flowcharting to aid the before mentioned goal. This combination is necessary because the processes to be modeled involve a relatively large number of possible paths, which would require a separate service blueprint for each possible path when using the traditional approaches of Shostack (1982), Kingman-Brundage (1989) or Fliess and Kleinaltenkamp (2004); an approach unfeasible in the current setup. This service blueprint '2.0' features advanced flowchart principles in the swim lane format of service blueprinting. At a

minimum, flow objects and connecting objects should be included in this blueprint: i.e. activities, gateways (to enable choices), and connecting arrows. If needed, additional informational details can be included. Consequently, the advantages of both approaches are combined: this new approach offers more options to include details in the process model, making it more suitable to model complex business processes, while remaining customer-focused. However, this approach comes also with the disadvantage of compromising the chronological order of activities, which remains globally but not in all cases true.

6.1.2. Research question 2

The second research question was: *'Which improvement directions in terms of scalability can be identified for the current sales and customer support processes of Bicore using a case analysis?*

Five cases of specific customers of Bicore, were discussed using objective and subjective information from various sources, i.e. a within-case analysis was conducted. As a next step, a cross-case analysis revealed potential process bottlenecks. Each case was rated on effectiveness and efficiency based on their scores on corresponding performance indicators and consequently the mutual performance differences were linked with process differences. The six major process improvement directions were:

- Involve consulting partner in sales and implementation: involving a consulting partner in the sales and implementation process may substantially decrease the required presales and implementation effort for Bicore. Consequently, this may provide a valuable direction for dealing with the current method of direct sales which is insufficiently scalable due to the long cycle time associated with consultative selling.
- Involve configurator early in sales process: involving configurators more and earlier in the sales process may result in a better match of the offered product in the proposal with the standard functionality of Flightmap. In addition, a closer cooperation between sales and the intended implementation team during the presales phase could presumably result in a more realistic planning.
- Clearly define scope of implementation: an unclear scope of the implementation project often results in an escalation of implementation duration and work effort, negatively impacting the gross margin. This situation can be prevented by defining the scope, goals, and requirements thoroughly before the actual start of the implementation.
- Introduce formal transition from implementation to in use: the transition from implementation to in use is almost never formalized by Bicore and the customer. As a result, the implementation effort often escalates while configuration requests are almost always granted at no additional costs, even during the in use phase. A quicker and more formal transition to in use would in theory lead to a more efficient implementation.
- Monitor customer satisfaction: monitoring customer satisfaction occurs unstructured and indirectly at the moment. The cases present strong evidence that also direct measurements, e.g. in the form of a customer evaluation meeting, are needed to identify possible issues at the customer. Consequently, when taking the appropriate actions to resolve these issues the chance of contract extension can be substantially increased.
- Document service requests consistently: the central support ticket system is used inconsistently at the moment and many service requests remain undocumented. This informal way of providing customer support seems not scalable very well due to issues arising when the transferal of tickets between support personnel is required in case of holidays or illness.

6.1.3. Research question 3

The third research question was defined as follows: *'How do the sales and customer support processes of Bicore differ from the processes of the best performing companies at the benchmark?'*

In general, the sales, implementation, and customer support processes of the benchmark partners match the processes of Bicore relatively well. At all benchmarking partners, problems occur as a result of the upscaling of their business. They signal a need to formalize processes and to implement tools enabling this shift.

Furthermore, it turned out that the structural measurement of performance indicators was very immature at all of the interviewed companies. As a result, it appeared to be very difficult to compare the scores mutually and identify best performers in each stage, because of the limited number of scores retrieved. However, there seemed to be enough evidence to state that the following process differences can be related to high performance:

- The presales process being formalized to a high extent, e.g. using a fixed follow-up period
- A high level of standardization of the inputs for a proposal
- Detailing the scope, requirements, and goals of an implementation before the actual signing of the contract
- An additional 'aftercare' phase to bridge the implementation and in use phase
- The policy in which only the key user is allowed to contact the service desk and to submit service requests
- The use of the support ticket system externally and internally in a consistent way
- The service desk as an intermediary, assigning tickets to a developer or consultant with the required knowledge
- The key user at the customer being responsible for the configuration of the portal during the in use phase
- Self-help being available to the customer

6.1.4. Research question 4

Research question four was formulated as *'How can the insights from RQ2 and best practices discovered in RQ3 be applied to Bicore's sales and customer support processes and modeled in an improved service blueprint?'*

To answer this question, the answers on research questions 2 and 3 were integrated as shown in Appendix XX. The result is visualized in 'as-should' service blueprints for sales and customer support (Appendix XXI and Appendix XXII). Since no process improvements for the actual implementation process were identified, no service blueprint was modeled for the implementation phase. The design criteria for the 'as-should' situation are a combination of the individual criteria for the case analysis and benchmark: improvement directions are included in the 'as-should' situation when process differences in the case analysis could be related to effectiveness or efficiency success or when process differences were in place at a minimum of two high-performing benchmark partners.

For the (pre)sales phase, two main improvements can be distinguished. Firstly, the case analysis and benchmark showed that involving consulting partners may provide considerable advantages: the sales cycle can be significantly shortened while the lead provided by the consultant can already be considered a prospect, the required implementation effort can be decreased because the preparation is already done by the partner, and consequently the decrease in work effort seems to outweigh the fee to be paid for the consulting partner. However, something to keep in mind is the resulting larger distance between the software supplier and the customer, making it difficult to signal issues. The consultant was already modeled as an additional swim lane in the 'as-is' service blueprint, but more activities and relations are recommended to be included as seen at the benchmark partners: e.g. the possibility to assign leads to a consultant and enabling partners to (partly) implement Flightmap at the customer. Secondly, as seen in the benchmark the process towards closing a deal could be done more efficiently. Introducing procedures could aid this processes, e.g. the period of following up leads could be standardized as well as the input for writing proposals, e.g. by defining one or more templates for a proposal. To make this process even more mature, a standard assessment of leads could be used to assess the progression of a lead in the sales funnel.

At the moment, as seen in the case analysis, implementation effort often escalates due to customers initially not having a clear view on the scope, requirements, and goals of Flightmap for their business. As a result, the transition from sales to implementation provides an interesting direction for improvement: the implementation can be significantly smoothened by preparing the implementation contents, i.e. scope, requirements, and goals, thoroughly before the actual implementation takes place

and consequently formalize this in a statement of work. It is important to emphasize the importance of this step by making it a moment of truth, i.e. an onstage activity. The involvement of the intended configurator is crucial to ensure the proposal is realistic in terms of offered features and implementation planning. Unfortunately, it may not always be possible to detail the implementation objectives before the actual contract is signed, e.g. when the customer is not willing to dedicate such a high effort in the preparation of the project. Apart from the transition from sales to implementation, also the transition from implementation to in use deserves considerable attention. At the moment this transition is almost never formalized and consequently configuration requests remain to be submitted even long after the initial configuration. By introducing an aftercare phase this transition could be enforced: after the initial implementation is delivered, Bicore should let the client formally know that the project has proceeded to the aftercare phase. In the aftercare phase the portal can be considered 'live', but the implementation team remains available to handle service requests. After a fixed period of time, the formal transition to in use should take place, in which no longer configuration requests will be handled free of charge. The customer will still be served well, however they are forced to think more thoroughly about their configuration requests. In the future, as a result of introducing a configuration studio for the customer, during in use configuration requests should be handled by the key user himself.

For the in use phase also a number of process improvements were distinguished. As argued in the case analysis, monitoring customer satisfaction periodically is very important to secure contract extension by intervening at the right time. Based on the service blueprinting principles this should be done onstage, making it a moment of truth. To reach this goal, I have contributed in developing a customer survey to assess customer satisfaction. This survey contains a set of questions, which will be discussed with the business customer and/or key user during fixed moments (i.e. right after the implementation and every six months) in a face-to-face meeting or by phone. Furthermore, for the service desk new procedures need to be introduced. First of all, it is recommended to allow only the key user of the customer to contact the service desk, thus changing the line of interaction in the service blueprint. This key user should be responsible for handling all service requests internally, and may contact the service desk if necessary. In the future, the service desk should take more the role of an intermediary, assigning service requests to the corresponding developers or configurators. However, the current amount of service requests does not require a dedicated service desk yet. It could be worthwhile to hire a part-time support employee though, combining this with activities which can be planned flexibly, e.g. testing the software. This could substantially decrease the pressure on the configurators, currently responsible for customer support at Bicore.

In addition, Bicore should stimulate key users to contact the service desk directly instead of using personal telephone numbers or email addresses and to consistently document service requests in the ticket system. Moreover, self-help solutions can ease the pressure on the service desk, moving these activities above the line of interaction. Following this logic, I contributed in the development of an updated manual for Flightmap. Unfortunately, due to most portals being customized additional self-help solutions are hard to develop.

6.2. Managerial implications

The managerial implications of this study are aimed at optimizing effectiveness and efficiency of customer-related business processes for software SME's in general and Bicore in specific. This balance is considered optimal when all improvement directions are included which result in an increase in efficiency and/or effectiveness.

The most prominent ones were previously described in detail in section 6.1.4. Moreover, these recommendations are also listed in Table 16. In total, nine recommendations are presented of which six are mainly related to efficiency and three to effectiveness, in line with the goal of balancing effectiveness and efficiency. In addition, dependencies have to be taken into account: it makes sense to start involving consulting partners (C1) only in the case they can configure a portal themselves (C8). In addition, self-help solutions (C9) should be available before introducing a dedicated service desk (C7). These improvement directions were also rated based on expected effort required for implementing the change and on expected impact on efficiency/effectiveness of the processes. Low

effort was scaled as not exceeding 50 working hours, medium effort as exceeding 50, but not exceeding 250 working hours, and a high effort as exceeding 250 working hours. Unfortunately, the estimated impact could not be quantified. The prioritization was done using a categorization in quick wins which receive the highest priority, i.e. C4, C5, and C6. The quick wins are characterized by having a substantial impact on the short-term and requiring relatively little effort. As a next step, the directions requiring a medium or high effort, but also have a higher impact on the effectiveness or efficiency, should be implemented. Based on the previously mentioned dependencies C2, C3, C8, and C9 have to be prioritized before C1 and C7.

Improvement direction	Related to	Effort	Impact	Priority
C1. Involve consulting partner in sales and implementation	Efficiency	High	High	Third
C2. Formalize and standardize presales	Efficiency	Medium	Medium	Second
C3. Clearly define scope of implementation	Effectiveness	Medium	High	Second
C4. Introduce a formal transition ('aftercare') from implementation to in use	Efficiency	Low	Medium	First
C5. Monitor customer satisfaction	Effectiveness	Low	Medium	First
C6. Introduce a service desk contact policy allowing only key users to make contact	Effectiveness	Low	Medium	First
C7. Change the role of the service desk into a stand-alone intermediary	Efficiency	High	High	Third
C8. Introduce self-configuration	Efficiency	High	High	Second
C9. Enhance self-help options	Efficiency	Medium	Low	Second

Table 16. List of managerial recommendations

The major contribution of this study is the development of three 'as-should' service blueprints for sales, implementation, and customer support processes of small SaaS providers in general and Bicore in particular (Appendix XXI and Appendix XXII). These service blueprints present guidelines on how to structure the customer-related business processes when aiming for both effectiveness and efficiency. These recommendations are particularly relevant for companies struggling to scale their processes to keep up with fast growth rates. Consequently, processes need to be formalized and tools introduced to support this shift.

6.3. Theoretical implications

A major academic contribution of this study can be found in the application of the service blueprinting technique for the sales process. As argued in literature, it appears to be a challenge to model a sales process with its relationships, decisions, and negotiations (Barber & Tietje, 2008). To my best knowledge this is the first attempt to model the sales process in a service blueprint. This first attempt appears to be successful, since both Bicore as well as the benchmark partners agree on its suitability to visualize the sales process. This is remarkable, while literature agreed on the challenge of modeling sales, describing sales as a set of iterative, simultaneous activities and interactions between sellers and buyers (Moncrief & Marshall, 2005). In the context of software SMEs this is found to be true, but the process flow can nevertheless be modeled fairly well in a service blueprint, using the flowchart method described in the next paragraph. For similar, yet larger companies sales processes are expected to be even more structured and formalized, presumably increasing the applicability of service blueprinting even more.

Along with the previously discussed contribution, comes the recommendation on which elements to include in a service blueprint, over which there is still debate. The components described in the articles of e.g. Shostack (1982), Kingman-Brundage (1989), and Fliess and Kleinaltenkamp (2004) differ substantially, which could lead to misunderstandings and misinterpretations when applied in practice. In this case, the service blueprint is extended with flowchart functionality, distinguishing between start/end nodes, activities, and decision nodes, making it also suitable for more complex processes involving multiple decisions. In the traditional service blueprint, each single, possible path needs to be modeled in a separate service blueprint. This workflow approach makes it possible to model more

complex processes while remaining easy to read and understand, as proven during the benchmark interviews. However, this approach comes also with the disadvantage of compromising the chronological order of activities, which remains globally but not in all cases true.

A third theoretical contribution comprises the proposed set of performance indicators as listed in sections 2.5.3 and 2.5.4. Few scholarly articles have discussed which performance indicators should be used when assessing sales, implementation, or customer support processes. The proposed set is based on a wide range of academic literature and it is ensured that these cover the most important aspects of sales, implementation, and customer support processes. Even though all benchmark partners agreed on the potential of measuring this set (and to be able to act accordingly), the availability of scores on these performance indicators was limited at the moment.

Also very importantly, this study provides evidence that combining performance measures with service blueprinting results in a stronger justification of the proposed process improvements. This approach of contrasting process differences with scores on performance indicators appears more suitable for complex processes compared with the traditional service blueprinting method of identifying improvement directions, as described in e.g. Bitner et al. (2008), in which gaps and disruptions are identified using logical reasoning.

6.4. Limitations and directions for future research

I will list the shortcomings of this research below and will discuss them briefly. In addition, directions for future research related to these limitations will be presented.

The first limitation concerns the scope of this research, which was relatively broad. The whole trajectory of customer-firm interaction, and the corresponding backstage processes, have been under research, i.e. sales, implementation, and customer support processes. The initial scope, which could already be considered as broad, only included sales and customer support. However, in a later stage it turned out that the implementation processes, even though theoretically part of customer support, differed radically from the customer support processes during in use. In practice, more effort is dedicated to customer support during implementation than during in use and therefore it was decided to also model a service blueprint for the implementation phase. Consequently, in the case analysis and benchmark attention had to be divided between the different phases. Moreover, all interviewees were experts in only one or two of the domains, but never in all three, automatically limiting the scope of the interview. If the focus of this study would have been on either sales or customer support the number of cases and the number of benchmark partners per phase could have been doubled within the same time-constraints, improving the generalizability of the results.

Moreover, a major limitation concerns the limited set of scores on performance indicators retrieved from the benchmark partners. All benchmark partners could be regarded as immature in measuring their sales and customer support performance and only a small number of performance measures was available or could be made available, i.e. was gathered on my request. In addition, this small set differed radically between each partner and consequently no strong conclusions could be drawn from comparing scores on the performance indicators mutually. The performance indicators used in this study where based on recommendations from academic literature, which could also explain the limited availability of data at the benchmark partners. For future, similar research it could be worthwhile to aim for the performance indicators mostly used by practitioners instead of using theory-based performance indicators.

Another limitation concerns the potential impact of the proposed process improvements, which turned out to be difficult to quantify in terms of efficiency and/or effectiveness gains. A related problem concerns the fact that the impact of effectiveness-focused improvement directions on efficiency, and vice versa, is unclear based on the current findings. A valuable direction for future research would be to investigate the effects of the identified process improvements by comparing a large set of customers in terms of performance and relating their performance to process differences using statistical analysis. Another option would be to compare the performance before and after the implementation of the proposed process improvements at Bicore.

In addition, the generalizability of the recommended process model seems limited to small, i.e. less than hundred employees, software providing companies in a business-to-business setting. Even though in the present study the customer-related business processes of the benchmark partners were comparable to a large extent, from this study no conclusions can be drawn on service providers active in other sectors, in business-to-consumer markets, and/or larger in volume. Literature presents indications that sales processes differ radically between industries, companies, salespeople, and circumstances (Barber & Tietje, 2008). The same is probably also true for customer support processes, illustrated by the goods-services continuum (Oliva & Kallenberg, 2003). Companies on the one end of the continuum one can find the product manufacturers with a minimum of service as add-on, and on the other end products are merely an add-on to the services. In this light, substantial differences can be expected for customer support processes between companies.

An additional direction for future research could be the involvement of customers (and their processes) to include their view and possibly to extend the service blueprint with additional swim lanes for backstage or supporting processes of the customer, as previously done by Becker et al. (2013) and Trkman et al. (2015). In the present study one of the main goals was to serve customers more effectively, however due to the limited availability of time no actual customers were consulted on how they perceive the current processes.

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Appendix I. Research outline based on regulative cycle

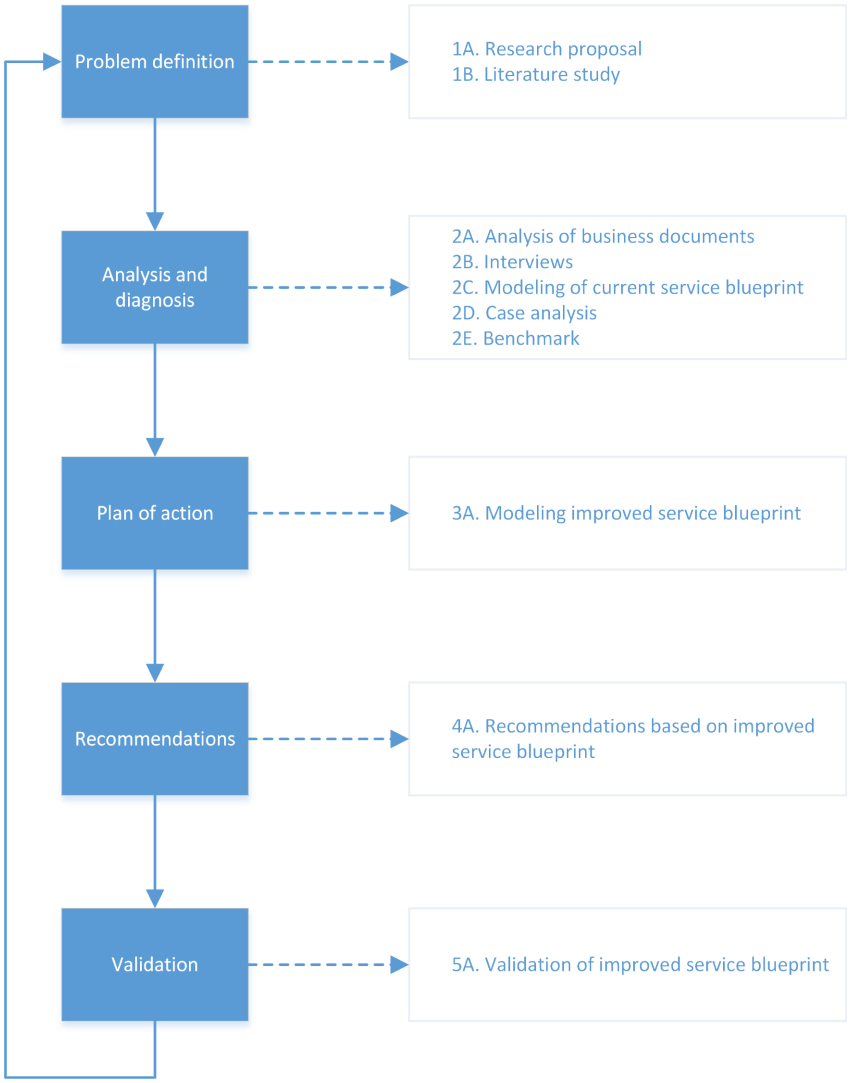


Figure 16. Research outline based on regulative cycle

Appendix II. Template for process identification template

1. Introductie
    a. Achtergrond scriptie
        i. Effectiviteit/efficiëntie van sales/support processen bij Bicore met het oog op schaalbaarheid in de toekomst
        ii. Service blueprinten van huidige processen o.b.v. deze interviews
        iii. Aanbevelingen o.b.v. combinatie case analyse/benchmark
    b. Doel interview
        i. Identificeren huidige processen
        ii. Relaties tussen processen
    c. Opbouw interview
    d. Tijdsduur interview
    e. Toestemming vragen voor geluidsopname
2. Achtergrond te interviewen persoon
    a. Functie
    b. Taken (m.b.t. relevante proces)
3. Valideren uitgangsmodel → eerst toelichten
    a. In hoeverre komt 'customer journey' (Appendix III) overeen met daadwerkelijke proces in de praktijk?
        i. Correcte volgorde?
        ii. Missen er stappen?
4. Inzoomen onderdelen model (afhankelijk van expertise geïnterviewde) → eerst toelichten
    a. Voor sales: presales/sales/contractverlenging
        i. In hoeverre komt 'sales' (Appendix IV) overeen met daadwerkelijke proces in de praktijk?
            1. Correcte volgorde?
            2. Missen er stappen?
        ii. Wat zijn typische doorlooptijden bij ieder onderdeel?
    b. Voor support: implementation/in use
        i. In hoeverre komt 'customer support' (Appendix V) overeen met daadwerkelijke proces in de praktijk?
            1. Geschikt voor zowel implementatie als in use?
            2. Correcte volgorde?
            3. Missen er stappen?
        ii. Wat zijn typische doorlooptijden bij ieder onderdeel?
5. Identificatie van processen
    - Welke collega's van Bicore zijn ook betrokken bij dit proces?
        - En in welke rol?
    - Wat triggert de start van het sales/support proces?
        - Zijn er meerdere manieren om proces te triggeren?
    - Hoe geraakt het proces van ene in andere fase?
        - E.g. hoe geraakt het proces van presales in sales/sales in contractverlenging?
        - Van implementatie naar in use?
    - Bestaan er formele regels/procedures om het proces te sturen?
        - Zo ja, hoe verschilt de praktijk van deze procedures?
    - Welke indicatoren worden er gebruikt om de prestaties in het proces te observeren?

6. Identificatie knelpunten
    - Welk onderdeel van het proces kost de meeste tijd?
    - Welke knelpunten bestaan er in het proces volgens u (efficiëntie/effectiviteit)?
        - Wanneer/waarom komt het voor?
        - Hoe erg is het als het optreedt?
    - Welke onderdelen van het proces worden (soms) overgeslagen?

- Waar in het proces worden er stappen herhaald?
- Als je de mogelijkheid zou hebben, wat zou je dan aan het proces veranderen?

7. Identificatie van relevante documenten/tools
8. Evaluatie interview
    a. Heb ik iets gemist?
    b. Uitleggen verdere procedure
        i. Service blueprint van huidige processen
        ii. Validatie in groepssessie
    c. Bedanken

Appendix III. Trajectory of customer-firm interaction

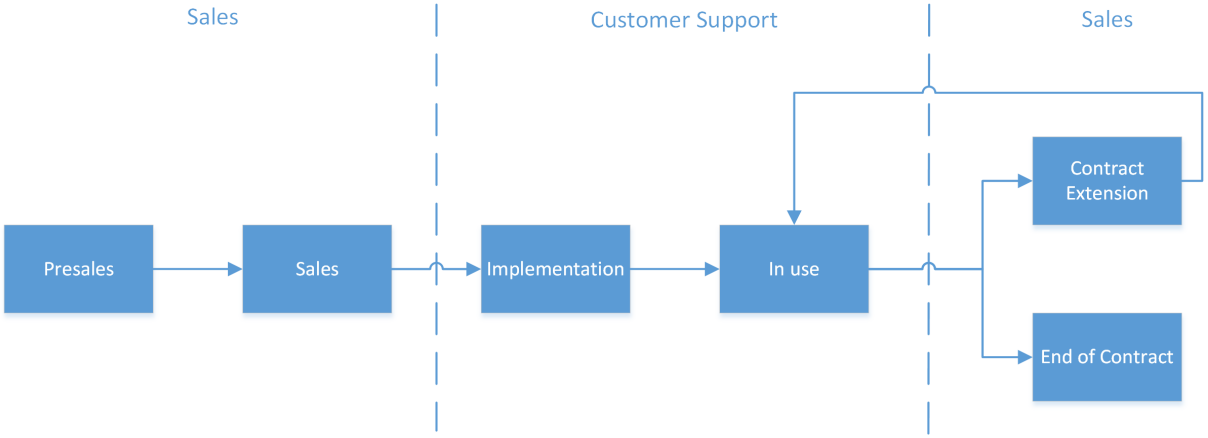


Figure 17. Trajectory of customer-firm interaction

Appendix IV. Generic model of business-to-business sales process

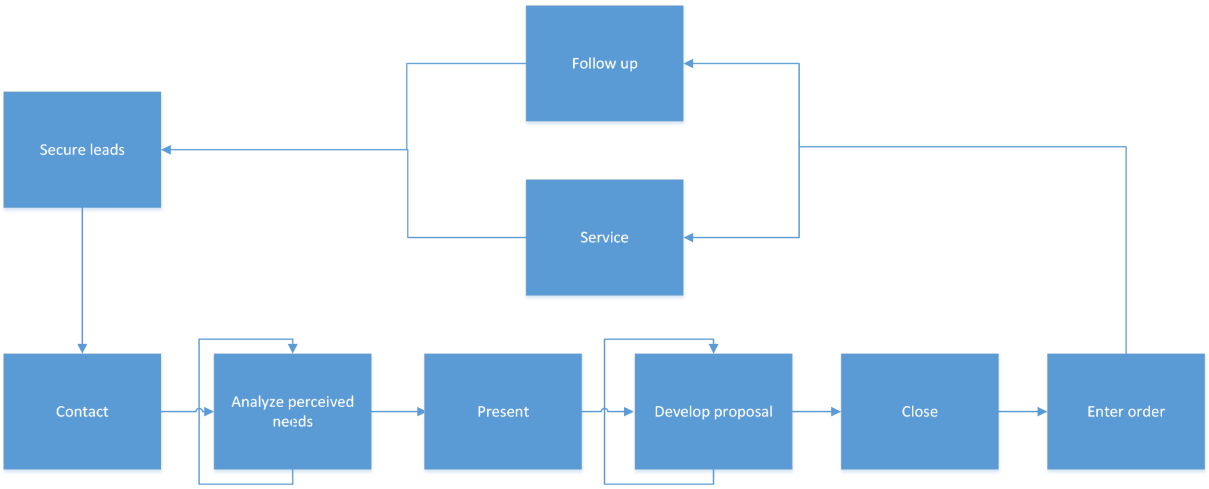


Figure 18. Generic model of B2B sales process (Selden, 1998)

Appendix V. Generic customer support process model

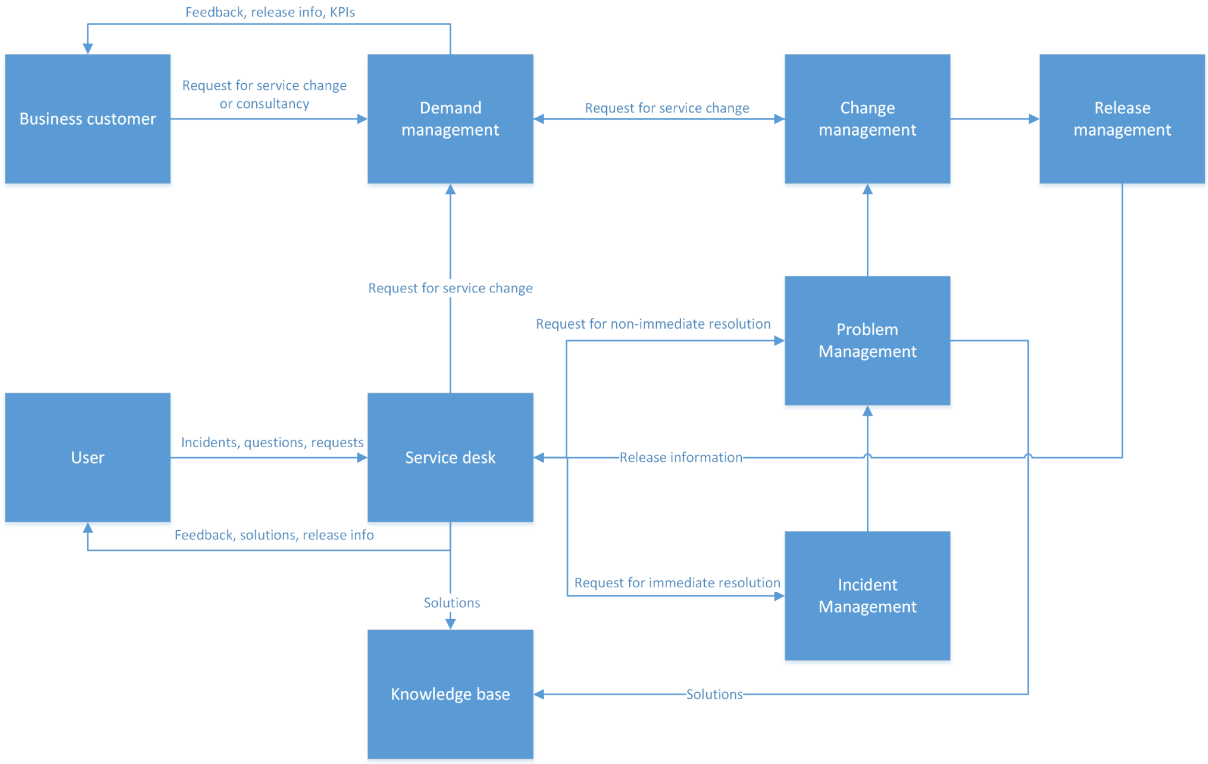
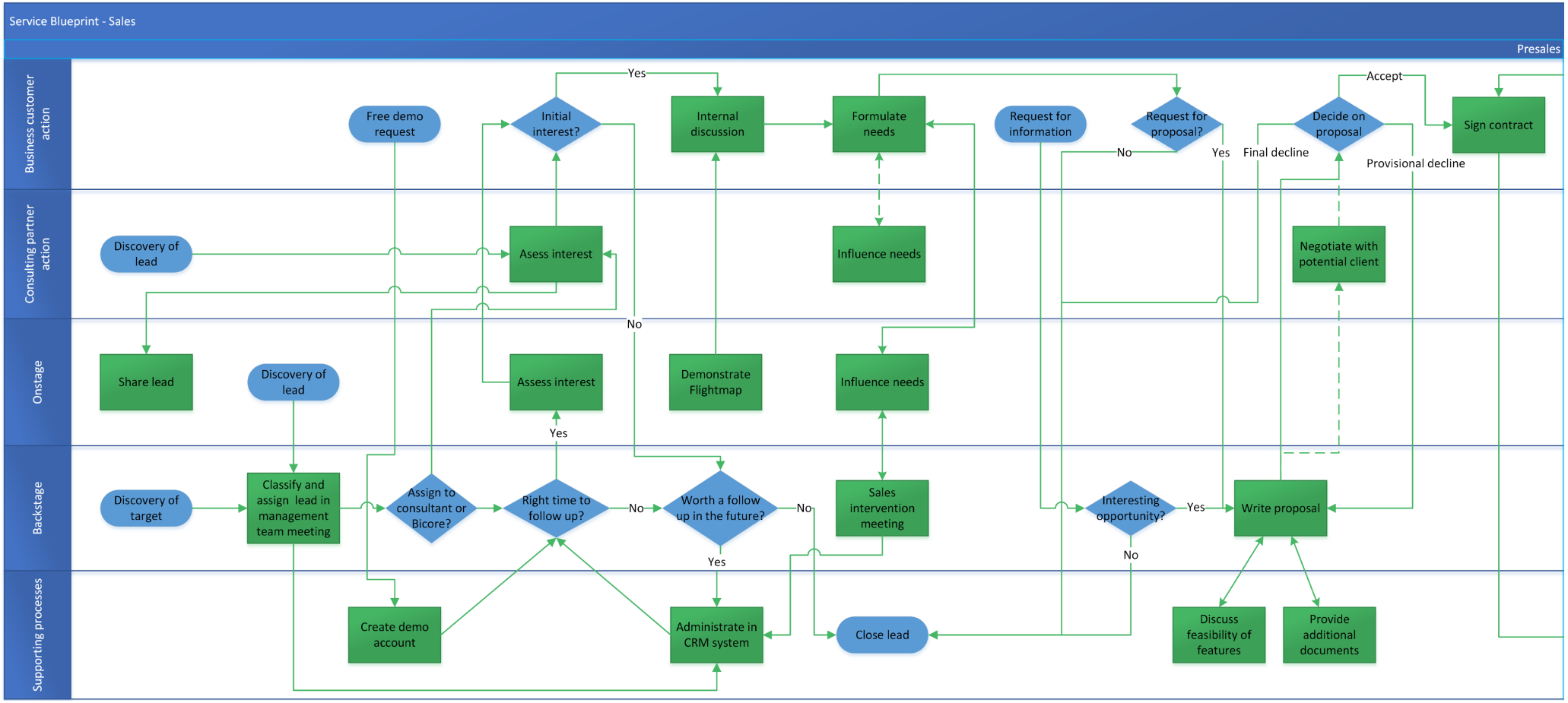
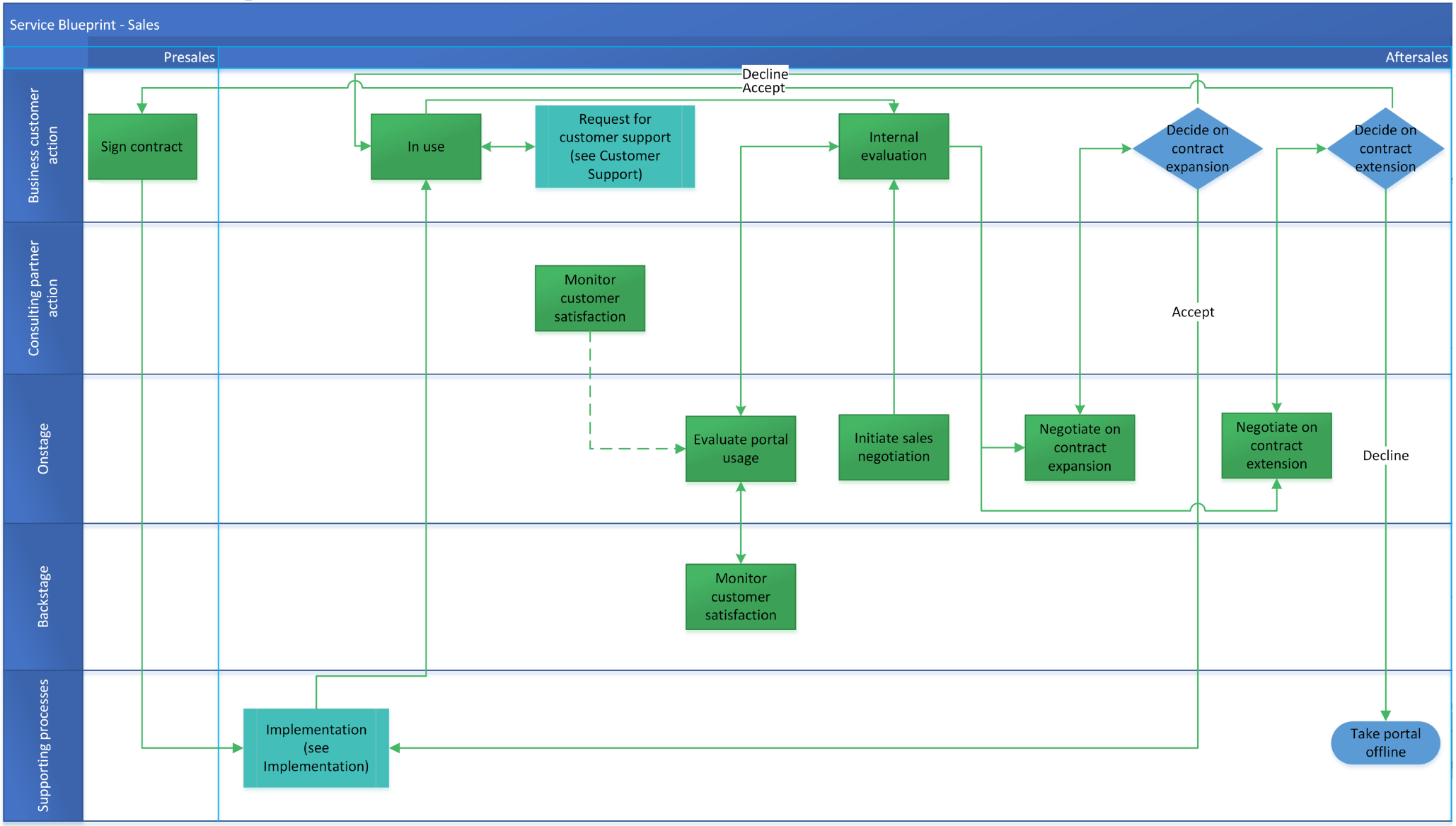


Figure 19. Customer support process model of ITIL v2 (Cannon, 2007)

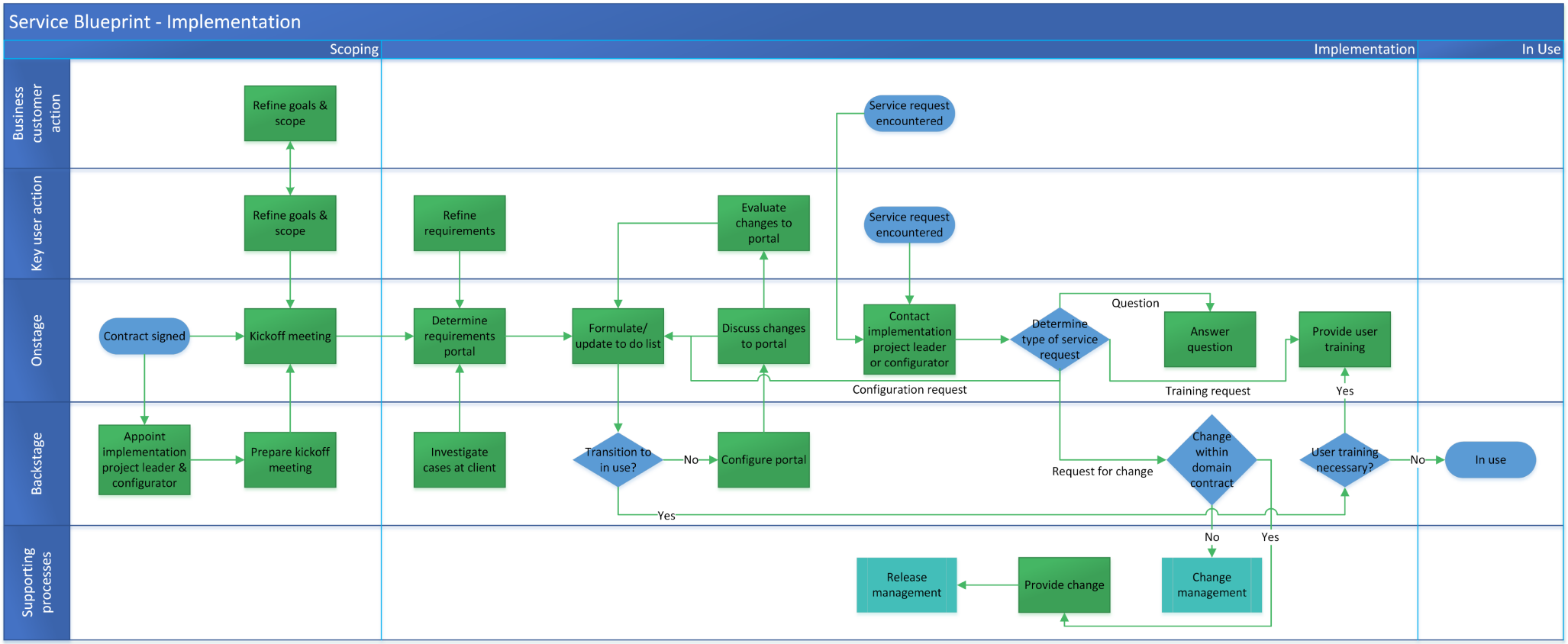
Appendix VI. ‘As-is’ Service blueprint for Sales (1 of 2)



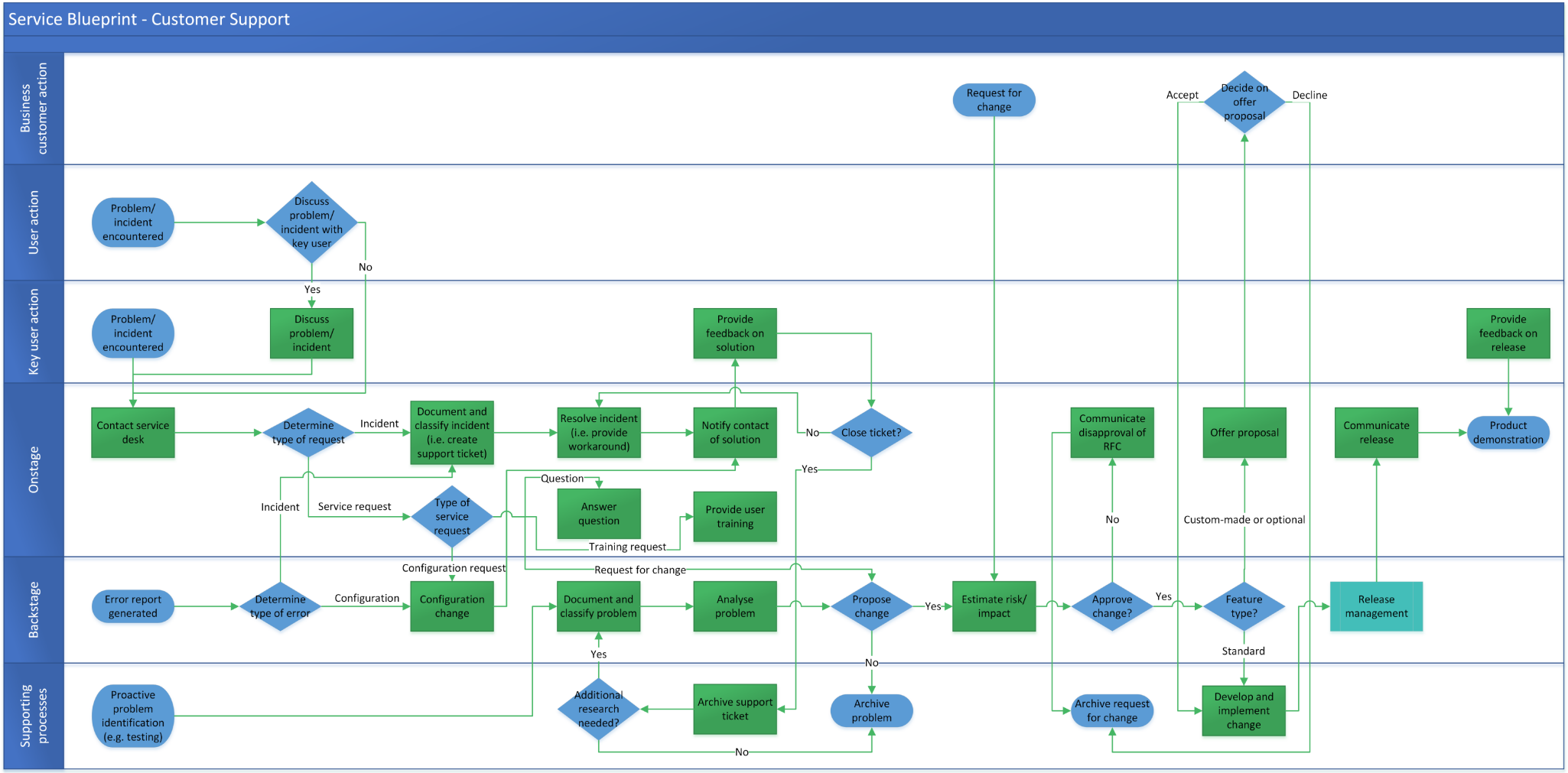
‘As-is’ Service Blueprint for Sales (2 of 2)



Appendix VII. ‘As-is’ Service Blueprint for Implementation



Appendix VIII. 'As-is' Service Blueprint for Customer Support



Appendix IX. Selection criteria for case analysis

	Complete customer journey?	Required data available?	Substantial portal activity?	Focus on selling of software?	Included?
Company A	x	x	x	x	**x**
Company B	x	x	x	x	**x**
Company C	x	x	x	x	**x**
Company D	x	x	x	x	**x**
Company E	x	x	x	x	**x**
Company F	x	x		x	
Company G	x	x	x		
Company H	x	x		x	
Company I				x	
Company J		x	x	x	
Company K	x	x		x	
Company L	x			x	
Company M	x	x		x	
Company N		x		x	

Table 17. Scoring on selection criteria for case analysis

Appendix X. Types of service requests received per month per case

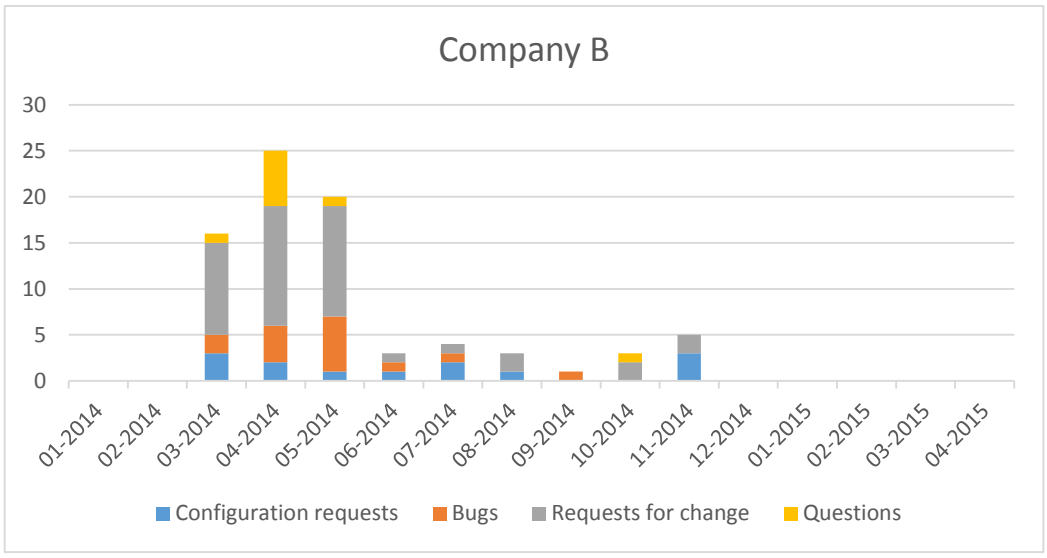


Figure 20. Types of service requests received per month from company B (source: to-do list and osTicket support system)

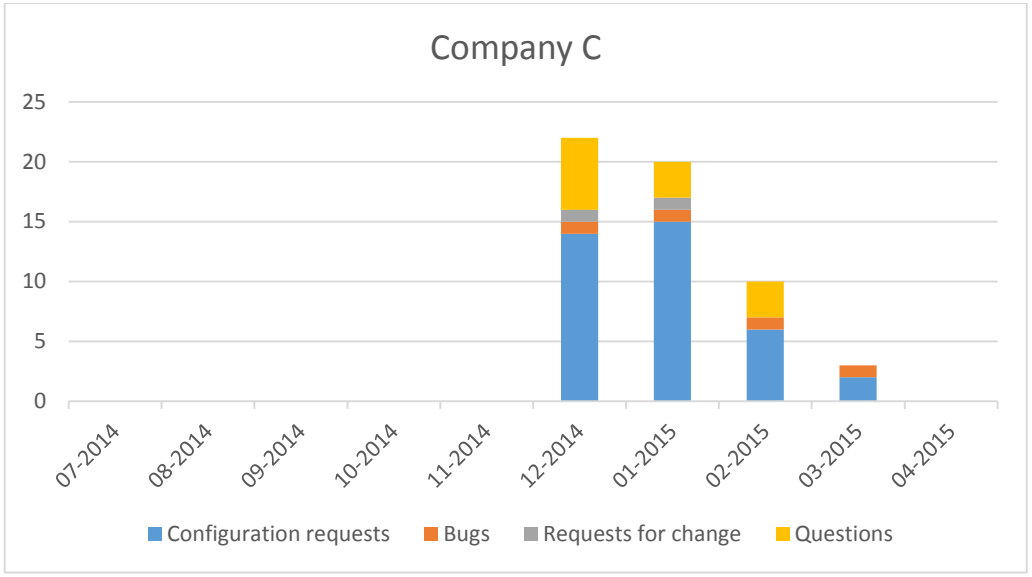


Figure 21. Types of service requests received per month from company C (source: to-do list and osTicket support system)

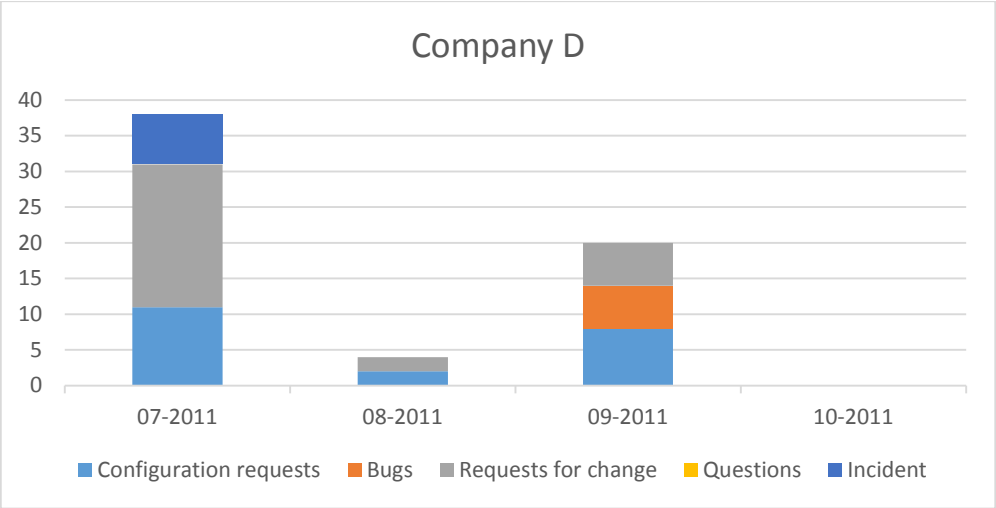


Figure 22. Types of service requests received per month from company D (source: to-do list and osTicket support system)

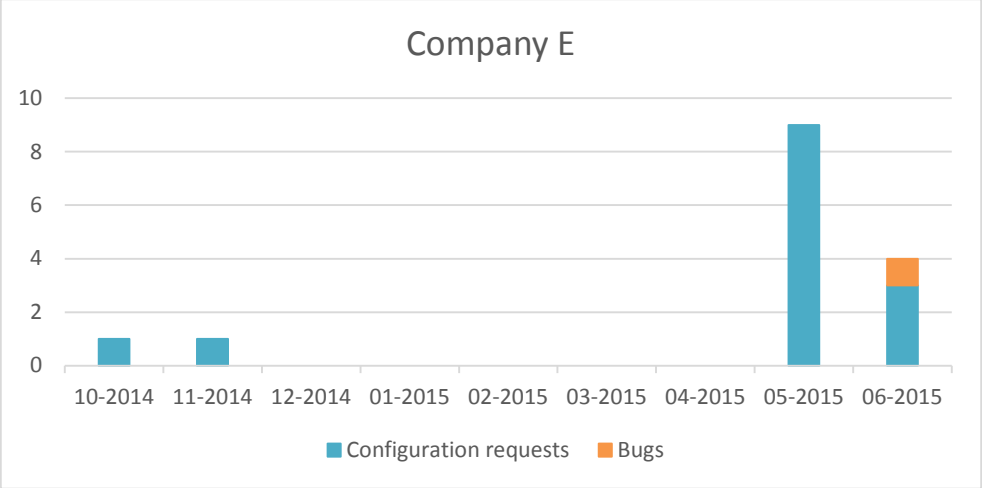
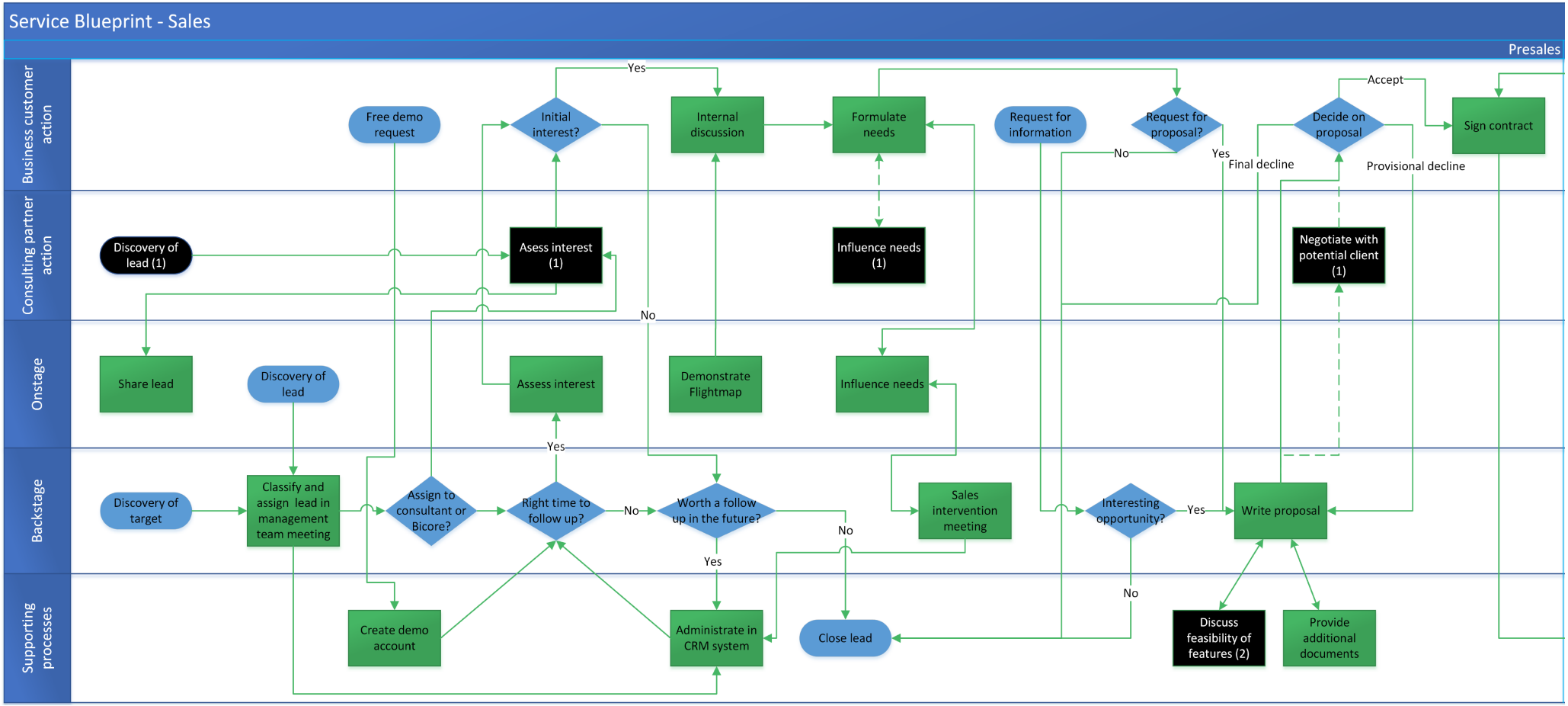
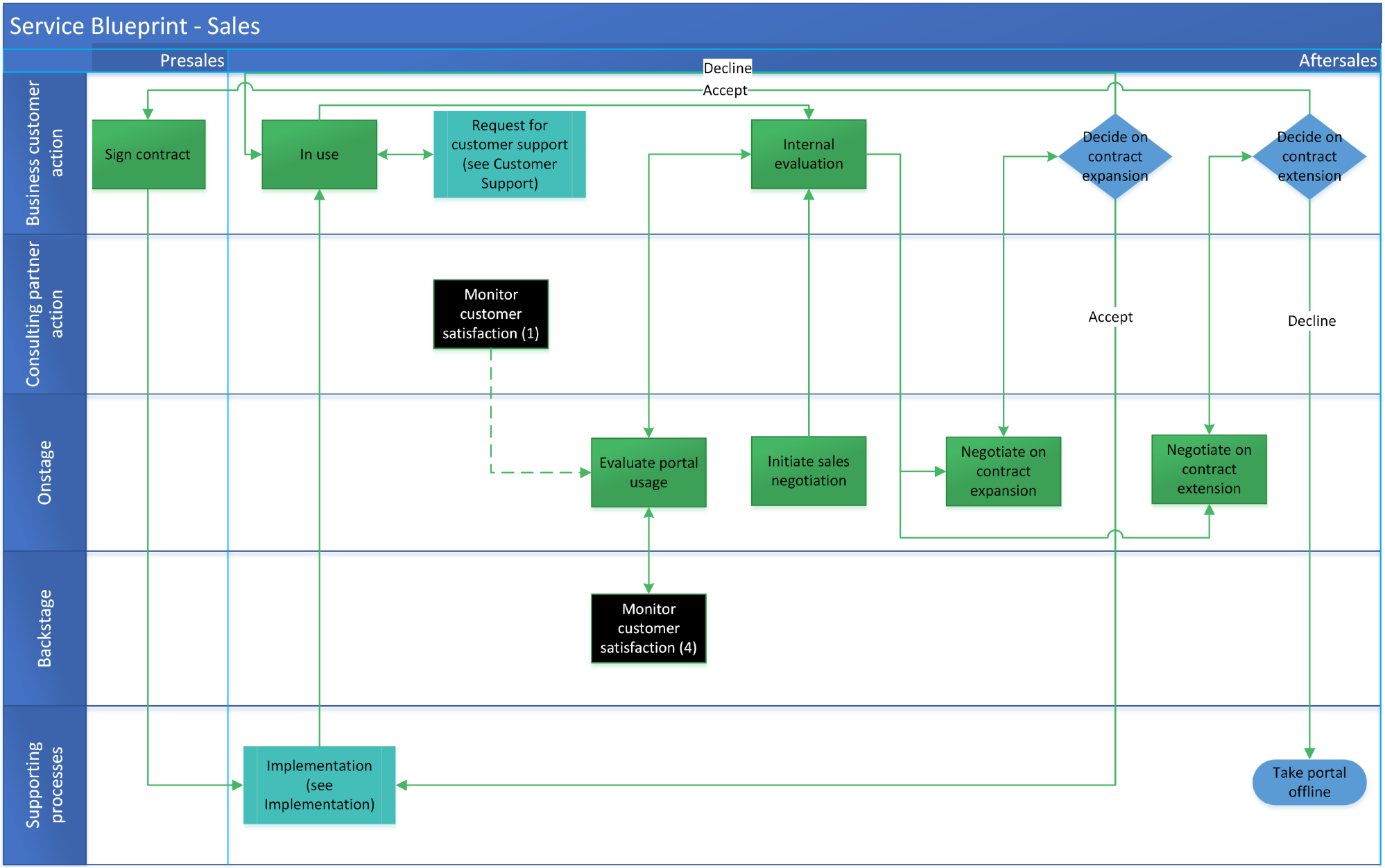


Figure 23. Types of service requests received per month from company E (source: to-do list and osTicket support system)

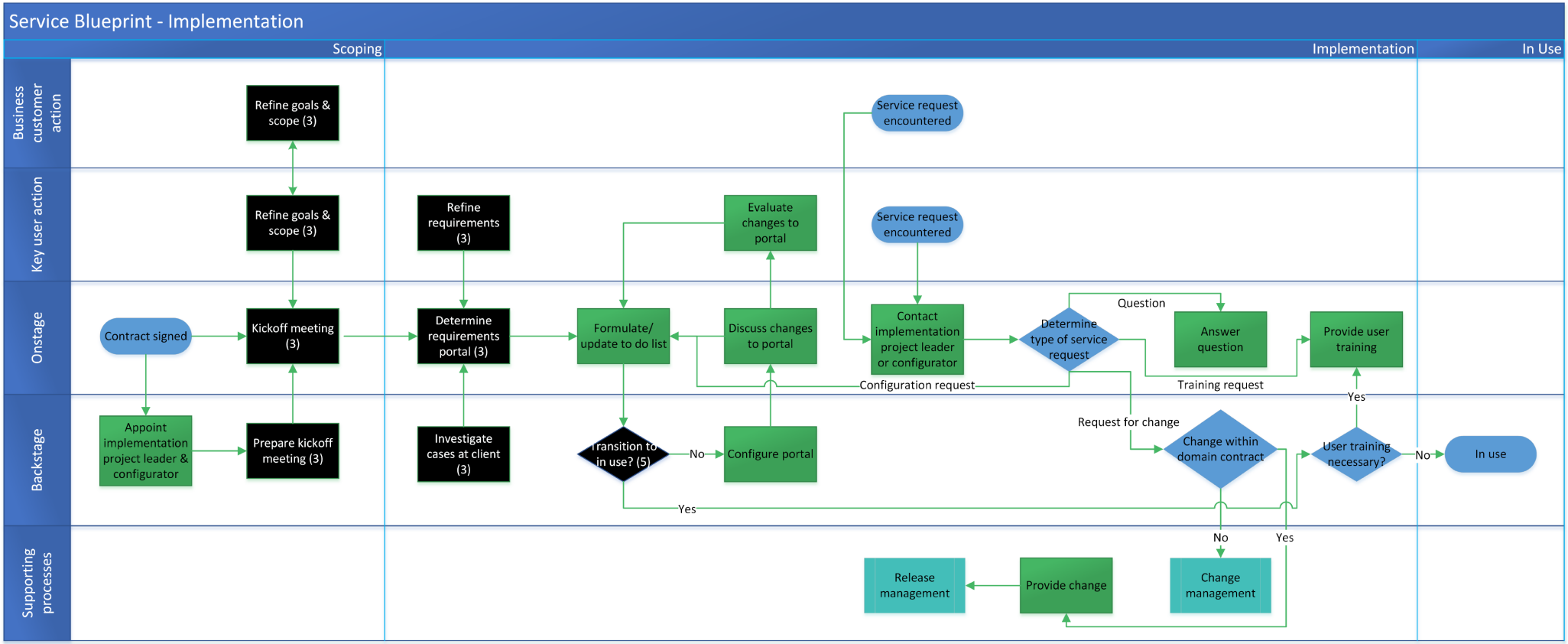
Appendix XI. Service Blueprint for Sales based on case analysis (1/2)



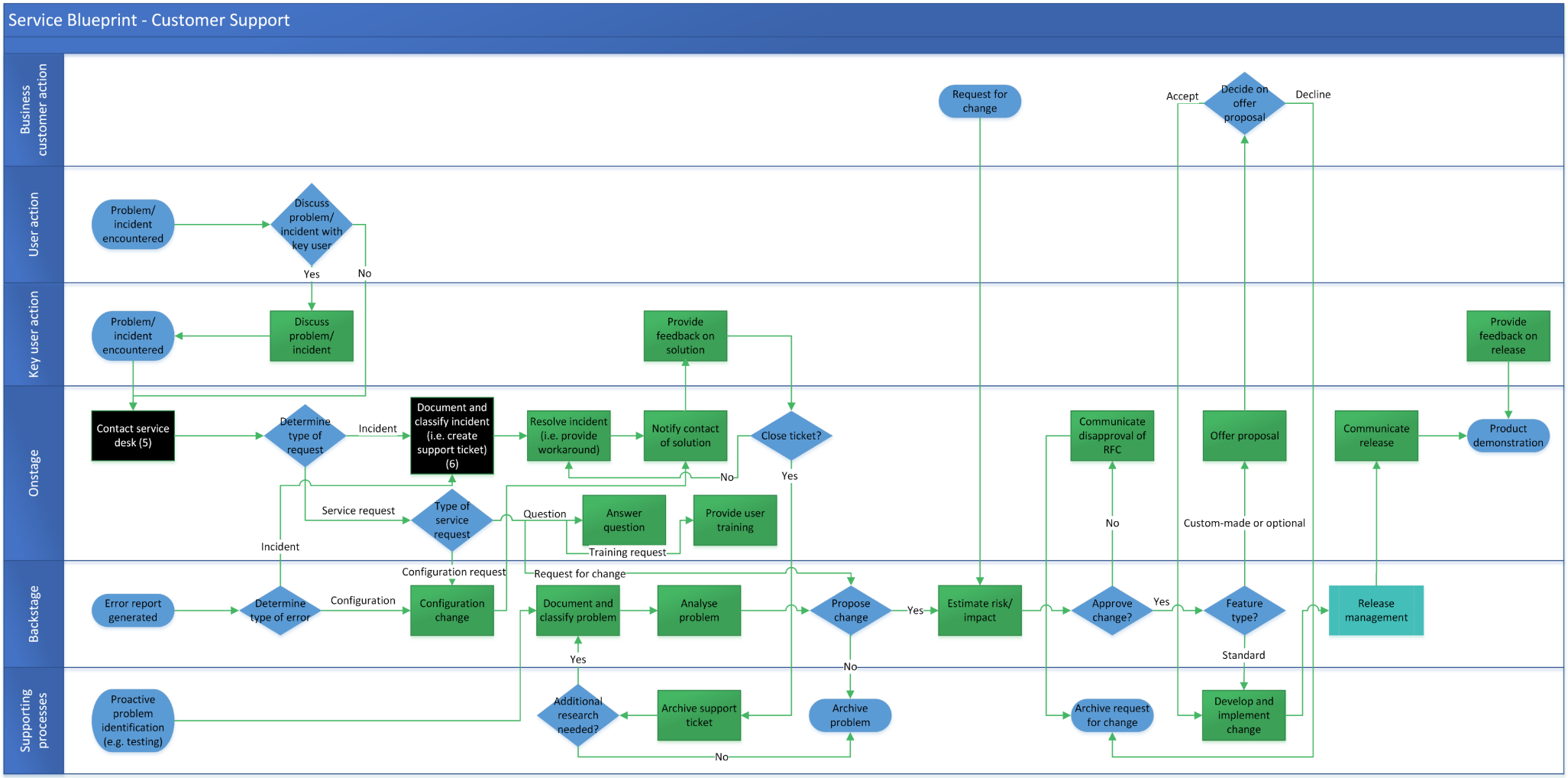
Service Blueprint for Sales based on case analysis (2/2)



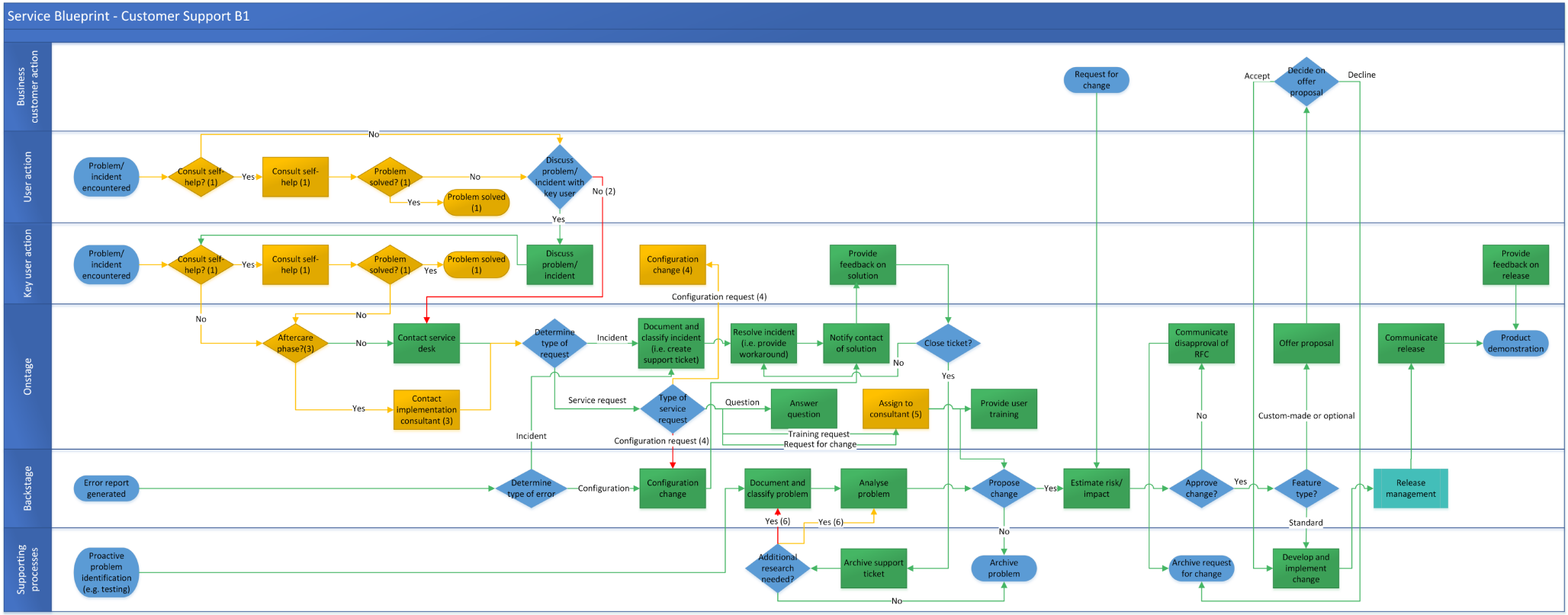
Appendix XII. Service Blueprint for Implementation based on case analysis



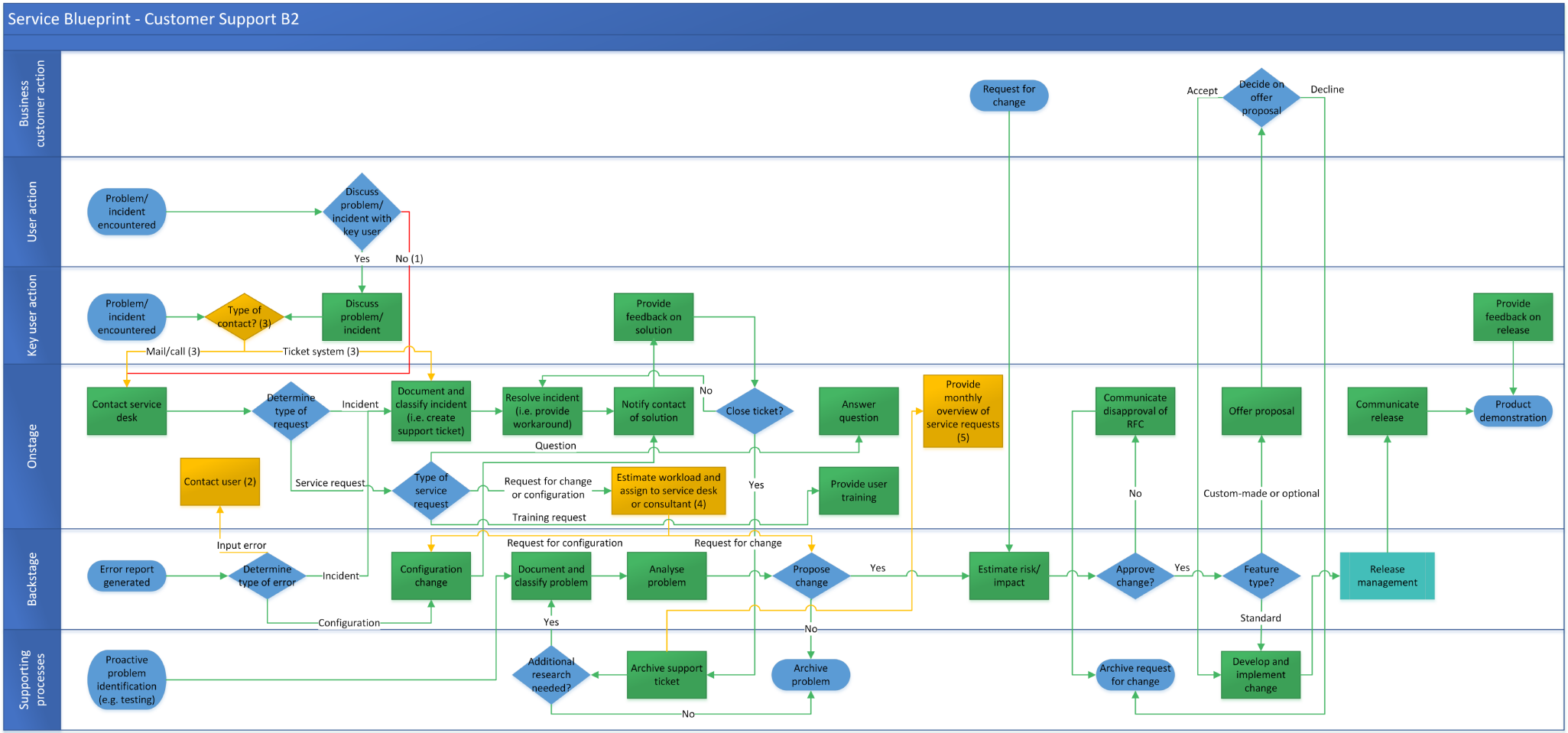
Appendix XIII. Service Blueprint for Customer Support based on case analysis



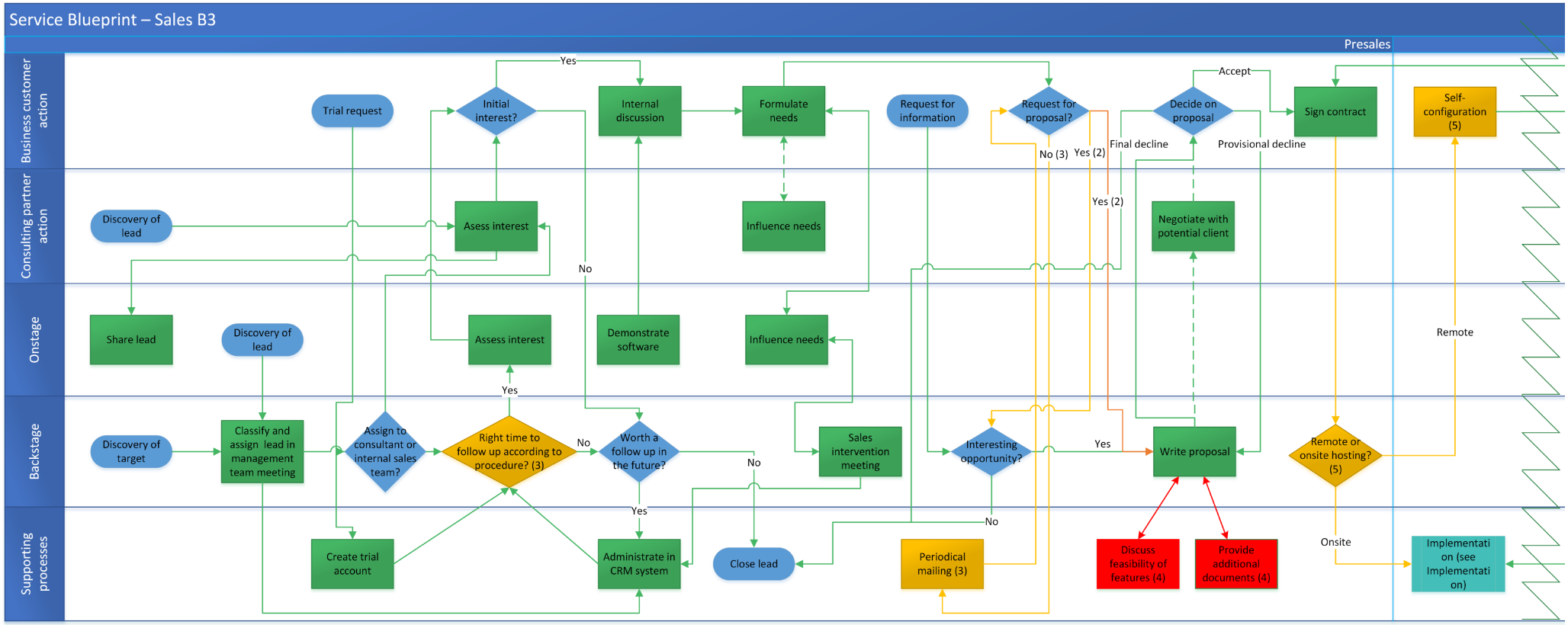
Appendix XIV. Service Blueprint for Customer Support (Benchmark partner 1)



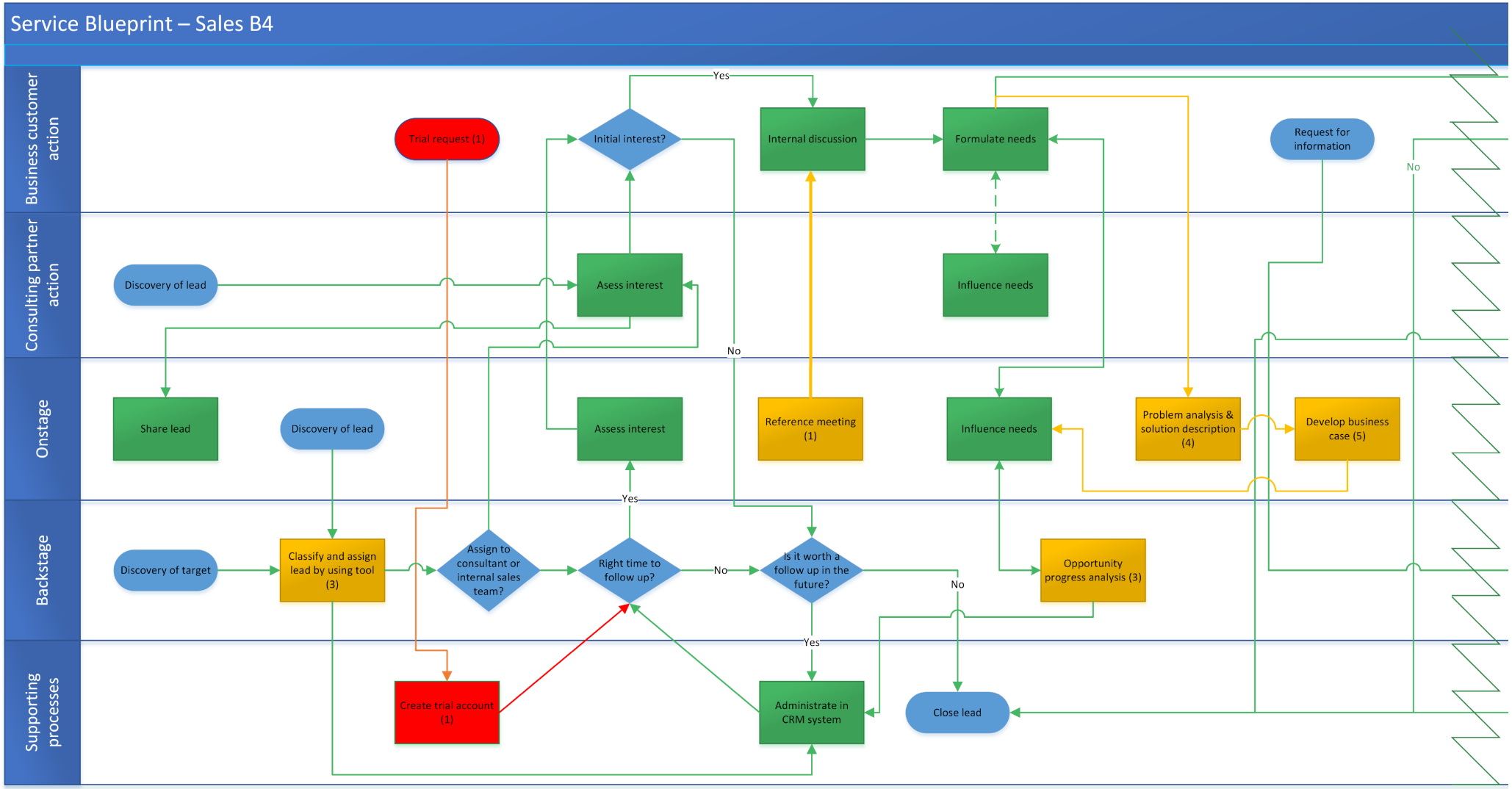
Appendix XV. Service Blueprint for Customer Support (Benchmark partner 2)



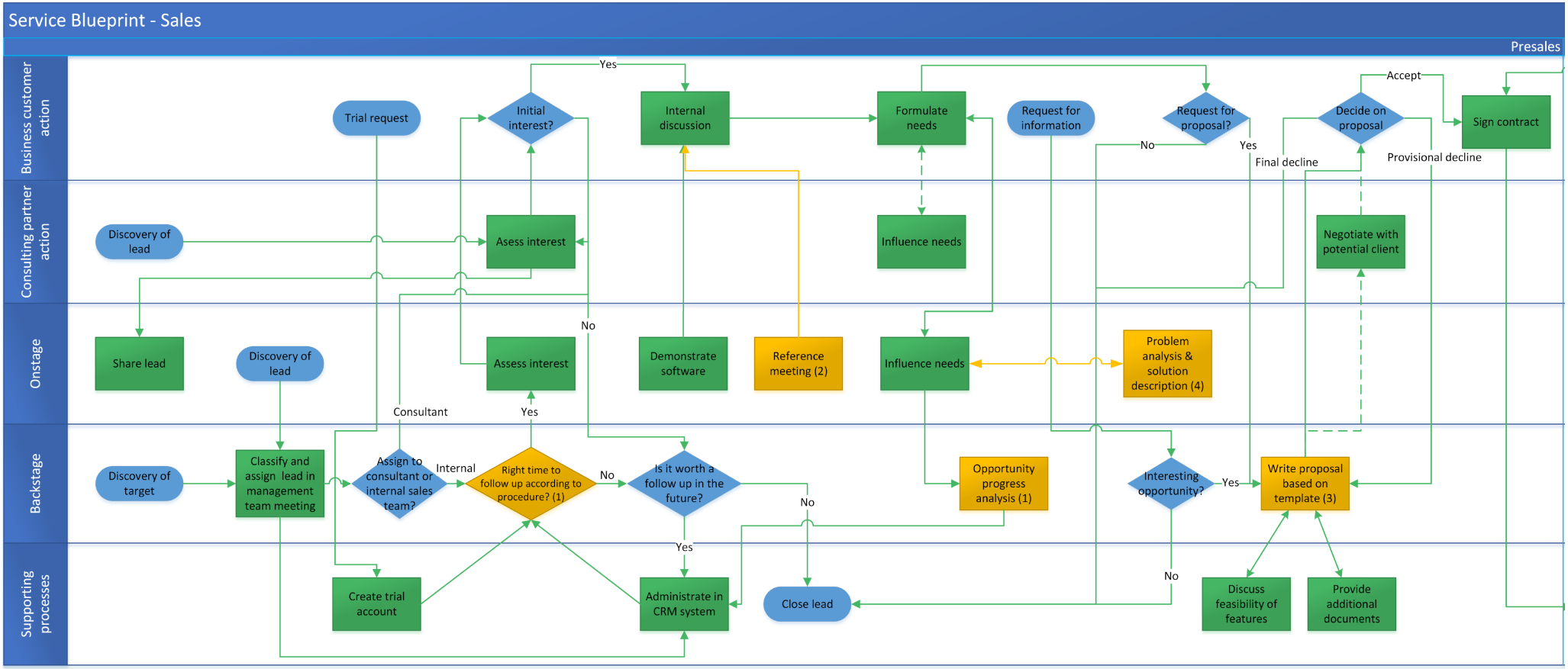
Appendix XVI. Service Blueprint for Sales (Benchmark partner 3)



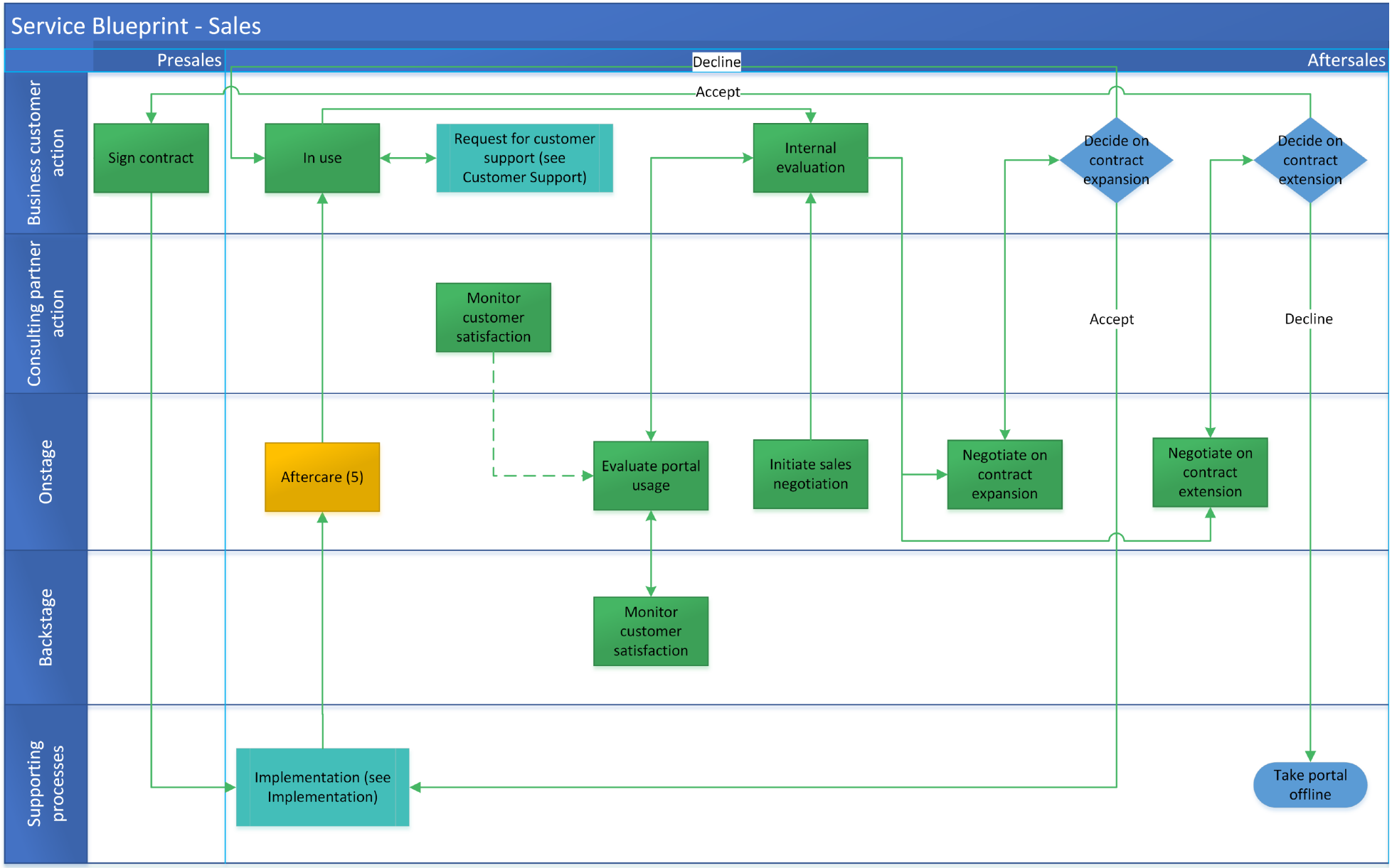
Appendix XVII. Service Blueprint for Sales (Benchmark partner 4)



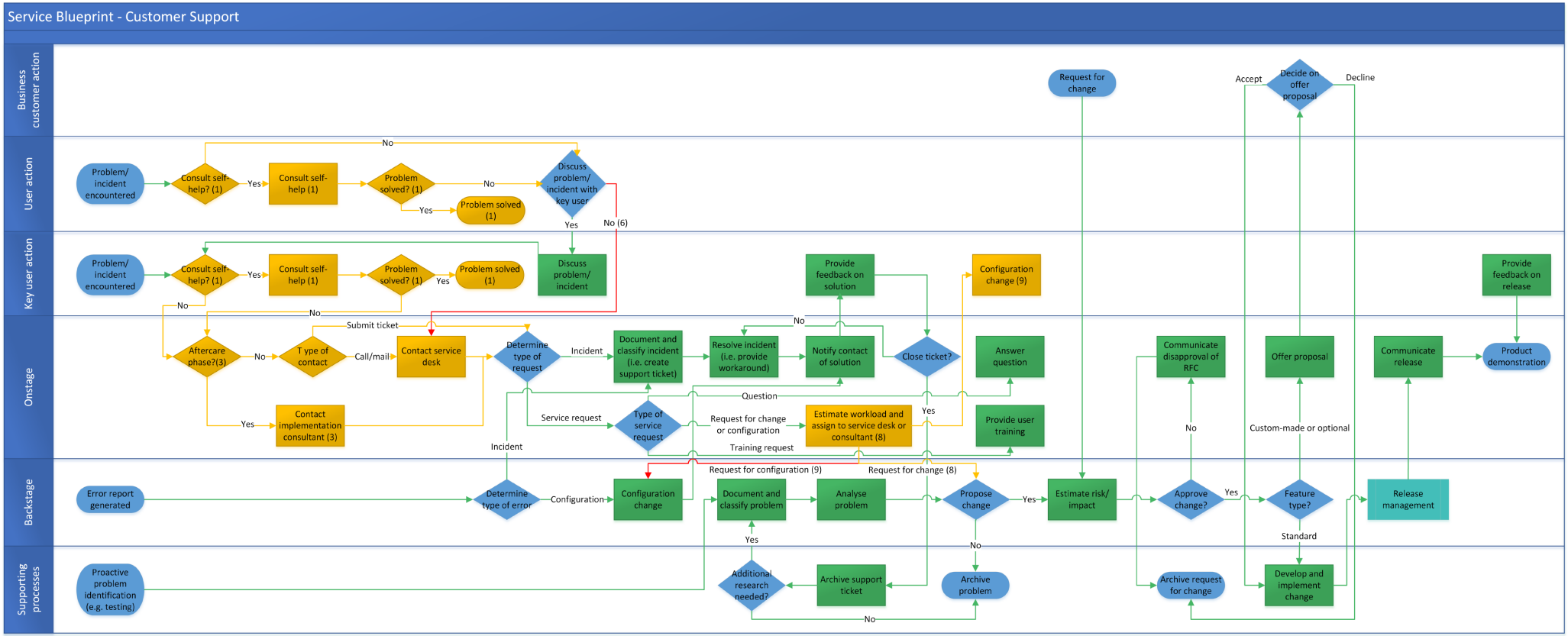
Appendix XVIII. Service Blueprint for Sales/Implementation based on benchmark (1/2)



Service Blueprint for Sales/Implementation based on benchmark (2/2)



Appendix XIX. Service Blueprint for Customer Support based on benchmark



Appendix XX. Integration of findings case analyses and benchmark into conclusion

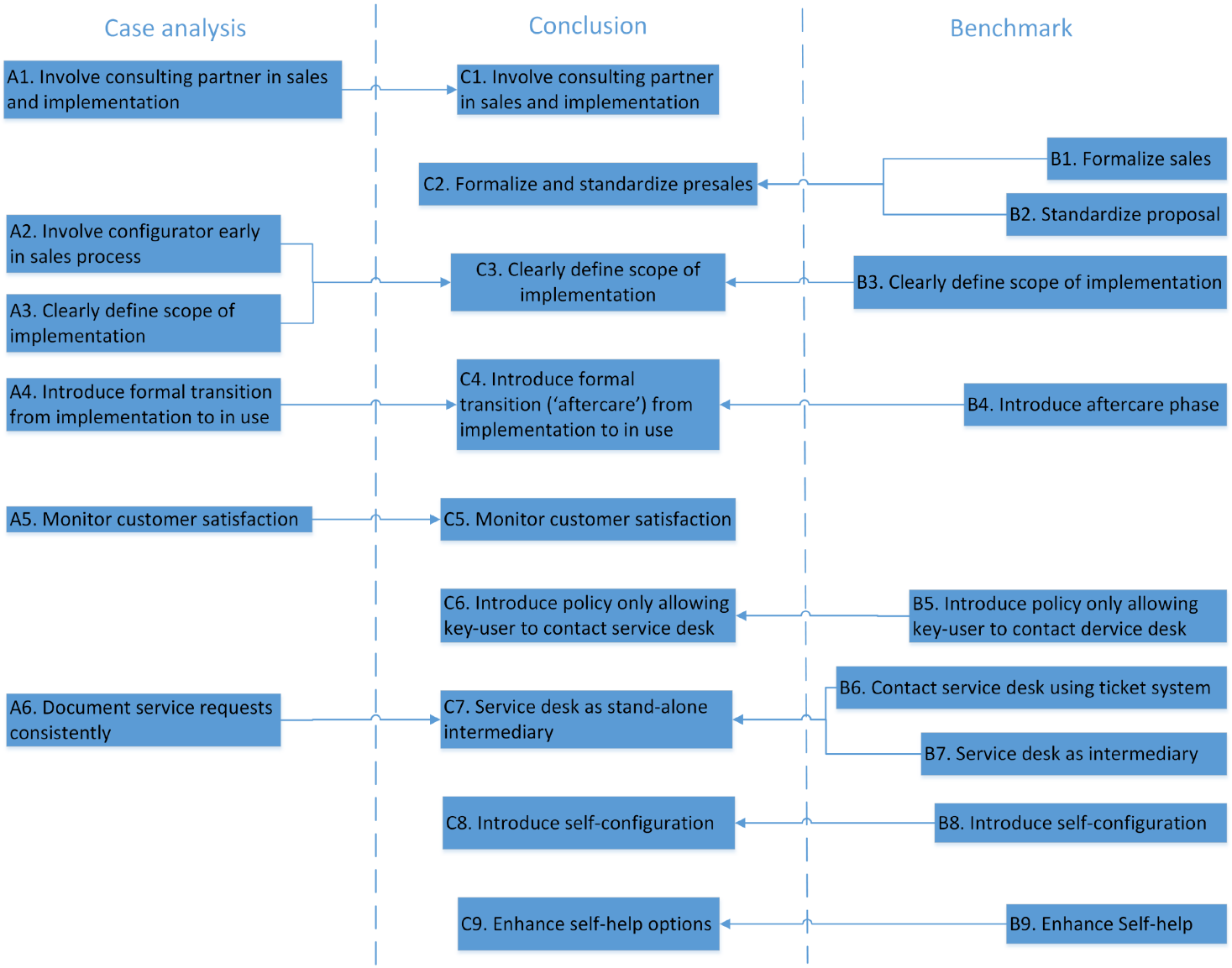
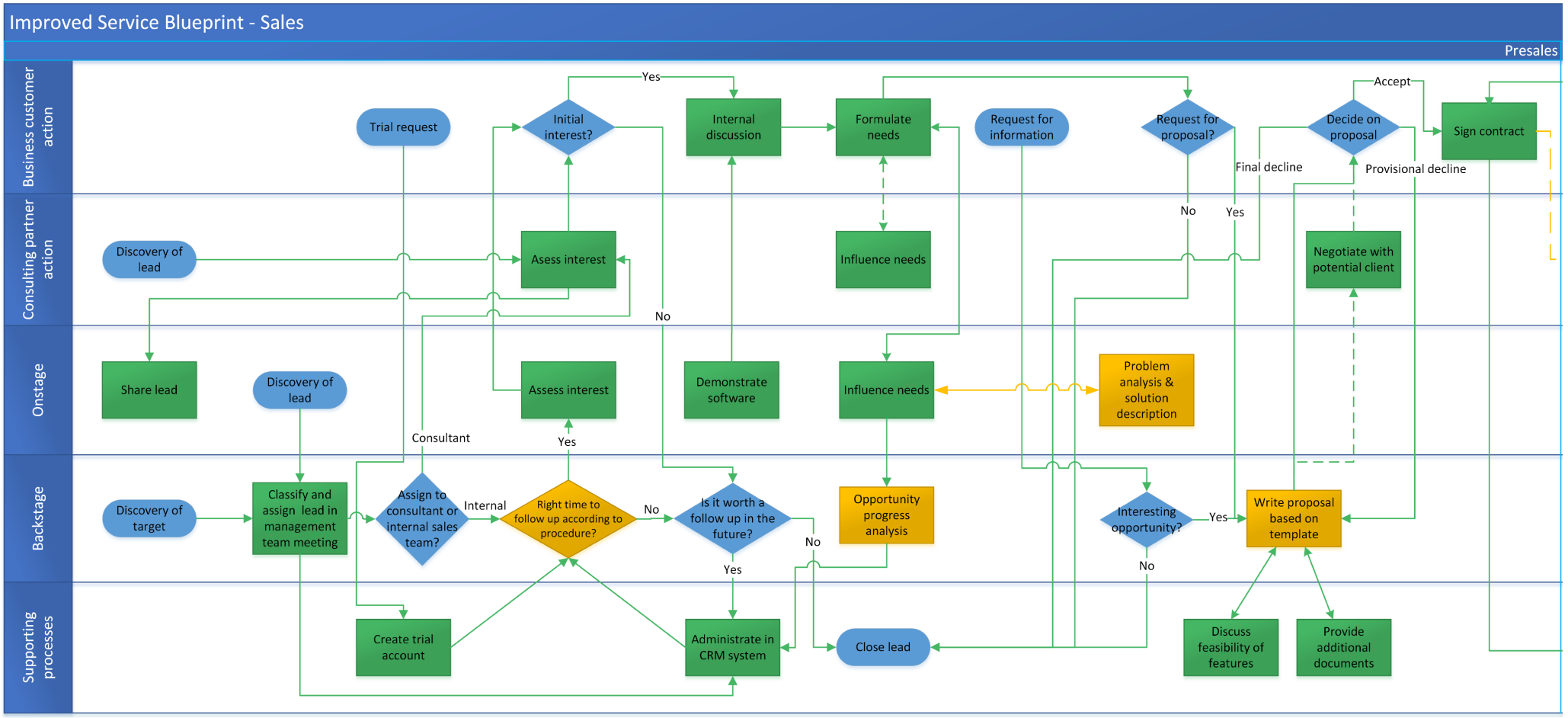
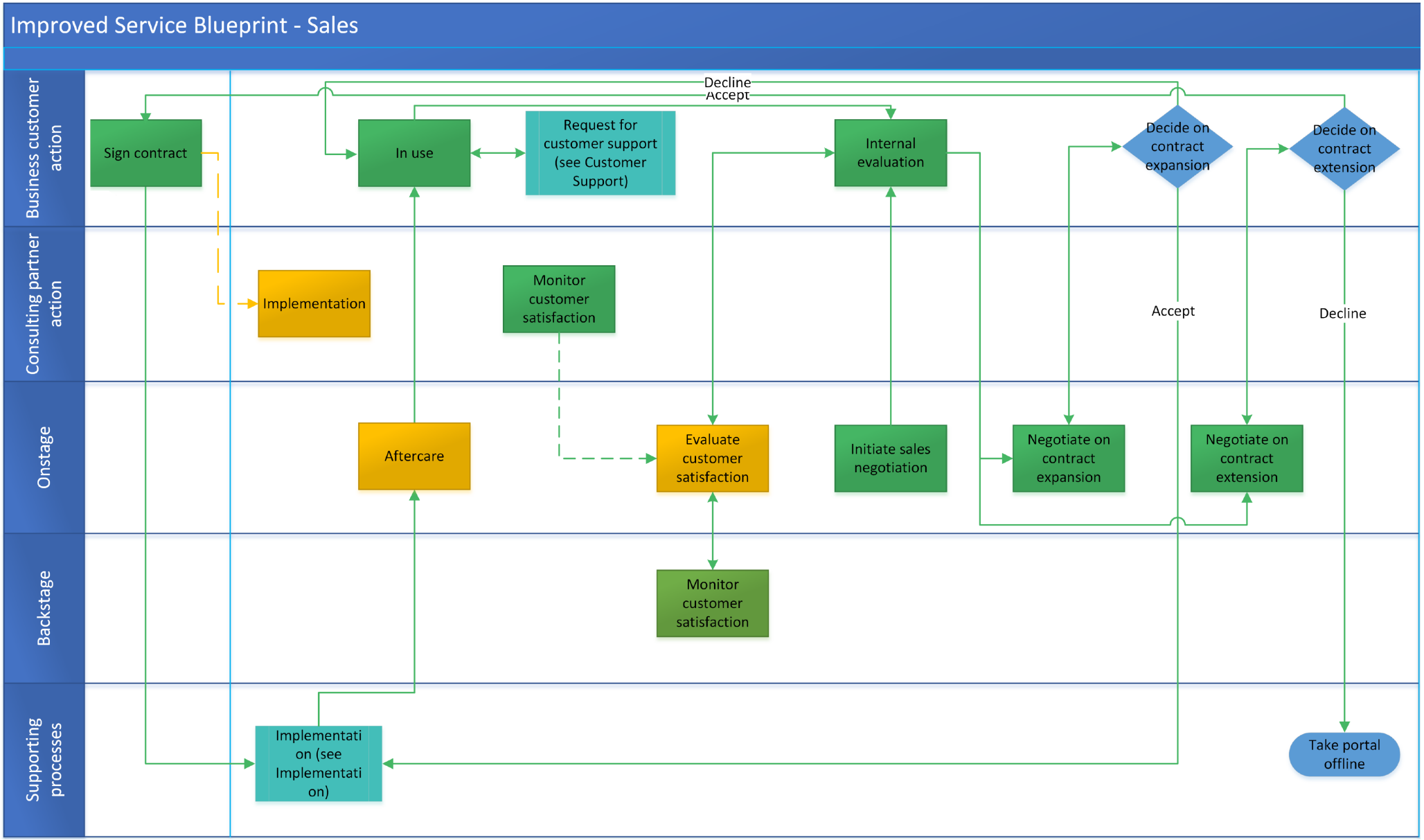


Figure 24. Integration of improvement directions of case analyses and benchmark into conclusion

Appendix XXI. ‘As-should’ Service Blueprint for Sales/Implementation (1/2)



‘As-should’ Service Blueprint for Sales/Implementation (2/2)



Appendix XXII. ‘As-should’ Service Blueprint for Customer Support