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Establishing a Business Model for Software Development Services

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The objective of the thesis was to establish a new service business model for the case company that offers software development services for the construction industry. The business model offers a solution how building product manufacturers can provide BIM content for BIM software used by the AEC industry. The case company has been acquired recently by a company established in Europe and the acquisition provides an opportunity to expand the service to international markets.

Applied action research utilising case study and qualitative data gathering methods were applied for the study. The research of the study consisted mostly of open questions, theme interviews and the purpose of the data collection was to gather information for the service business model. The action research cycles represented the different stages of the study and the method supports the logic that business models must be continuously reviewed throughout and after implementation.

The outcome of this thesis is a new service business model. The study describes the generalised version of the business model and the possibility to be fine-tuned to other partners and market areas at a later stage. The detailed service business model, the company, the software, and customer names are labelled confidential by the request of the case company.

In today's competitive market, companies need to be as innovative as possible to prosper in the business environment and the development and procurement of useful information is crucial to create and provide new and improved services. The new service business model supports the organisation's mission to guide AEC and manufacturing companies in their digital transformation.

Keywords	business model, customer value proposition

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1   Introduction

Architecture, engineering, and construction (AEC) businesses use Building Information Modeling (BIM) to plan, design, construct, and manage building projects. To be able to use the models and documents produced out of them throughout the building project lifecycle it is important the information contained within the models is accurate and standardised. Building project models contain a large amount of manufacturer specific BIM content that is placed in the model by the designers.

According to the 2018 NBS National BIM Report (2018), 75% of designers agreed that manufacturers need to provide the BIM content. However, the manufacturers that design the products and equipment that go into the BIM models do not often have the know-how of the BIM softwares used or skills required for the software development.

The objective of this thesis is to establish a service business model for a software development type of service for the construction industry and resolve how building product manufacturers can provide the BIM content. The idea of the service business model is to answer questions such as how to find the true value of the solution that the service offers to the market; how to create customer value; how to make the business competitive; and evaluate the revenue and anticipated costs.

1.1   Business Context

The case company offers software, training, support, and professional services for the construction sector. The case company is a part of a group, which also includes two other companies that provide software and professional services for the infrastructure sector and asset management solutions. The group has been acquired recently by a company that is focusing on delivering a complete software and application expertise for all phases of the construction project lifecycle through a network established in Europe.

The case company is currently going through a transition period. To start with, the parent company that acquired the case company is very similar, they operate within the same sectors and share similar mission and values. The organisations mission is to guide AEC and manufacturing companies in their digital transformation. The case organisation partners with different software vendors operating in the construction sector. The experts

within the company are at the forefront of all topics concerning BIM, digital twins, and digitalisation of the built environment.

1.2 Business Challenge, Objective and Outcome

The case company has a basic idea of a new software development type of service for the construction industry. The current service is established on the partner software and platform. A need exists for having building supplies, products and embedded items provided by manufacturing companies operating in the construction field available in the partner 3D modeling software. The content developed is often 3D objects or BIM content tools and applications containing manufacturer specific product information.

The case company has four customers from the manufacturing industry in Finland so far. The acquisition provides an opportunity to expand the service to international markets and in order to increase competitiveness the basic idea needs to be operationalised in more detail.

Therefore, the objective of the thesis is to establish a new service business model for software development services for construction industry. The new service business model is intended to support the organisation's mission to guide AEC and manufacturing companies in their digital transformation. The service business model can be used to present the business concept to the parent company.

The outcome of this thesis is a new service business model. The study is restricted to one key partner to start with and the possibility to be fine-tuned to other partners and market areas at a later stage. In today's competitive market, companies need to be as innovative as possible to prosper in the business environment and the development and procurement of useful information is crucial to create and provide new and improved services. Therefore, the company, the software, and customer names, and the actual, detailed service business model is labelled confidential by the request of the case company.

1.3 Thesis Outline

This thesis contains 7 sections to address the set business challenge introduced in the Section 1 Introduction. Section 2 describes the project plan, explaining in detail the research design and methods as well as the data collection plan created to carry out the study and ensure the best possible result.

Section 3 is to review service business model practices from literature, conceptual frameworks and identify tools to discover customer needs. Section 4 describes the current business model idea of the case company, analysis of key customer needs and analysis of key competitor business models. Development needs are identified by comparing the existing model, customer needs and competitor models.

Section 5 presents an initial service business model proposal for the new service business model. The proposal is based on ideas of business modelling presented in the conceptual framework and on the findings obtained in the current state analysis. Section 6 provides feedback for the initial proposal from the case company stakeholders and presents the final service business model proposal. Section 7 contains the summary, practical next step recommendations and provides an evaluation of the reliability and validity of this thesis.

2   Project Plan

The business challenge, objective and outcome were introduced in the previous section. This section describes the selected research approach and design, followed by the data collection plan and analysis methods.

2.1   Research Approach

Various research methods were considered to select the best possible research approach from many available in order to accomplish the overall goals of the study. It is important that the data collection techniques employed are suitable to provide the information required and to ensure the best possible outcome for the study.

According to Saunders et al. (2016) business and management research projects can be placed on a continuum of Basic and Applied research based on their purpose and context. Basic research is a type of research approach that is centred on progression of knowledge rather than solving a specific problem. Basic research is also known as fundamental or pure research and used in universities with the aim of improving scientific theories. Applied research is located at the other end of the continuum with a purpose of finding a solution for a relevant business problem. In Applied research objectives are set by the organisation, theoretical knowledge is restricted to the problem, outcomes of the research have practical relevance and they bring value to the originator (Saunders et al., 2016: 9-10).

Saunders et al. (2016) recommend that a choice between quantitative, qualitative, or mixed method research design should be made for the study. Quantitative method applies numerical data or data that can be transformed into usable statistics to formulate facts and uncover patterns in research. Qualitative research uses non-numerical data such as interviews and group discussions to gather information of underlying reasons and opinions. In mixed methods research the quantitative and qualitative techniques can be combined in several ways (Saunders et al., 2016: 163-172).

According to Yin (2014) case study research is best applied when the research addresses descriptive or explanatory questions: i.e., what happened, how, and why? Case study strategy is preferred for describing a situation or phenomenon occurring in the present, where in-depth description is useful and where the researcher does not get to influence on the study. Case study is a linear but iterative proses and can contain single

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or multiple cases it can be limited to quantitative data and a useful method in doing evaluation (Yin, 2014: 1-11). Data for case study can be collected from documents, archival records, interviews, observation, and questionnaires (Yin, 2014: 132).

Kananen (2013) states that action research aims for change and the researcher takes part in the change and the realisation of the change cycle. More expertise and understanding of the phenomenon are required from the researcher as the aim is a change and its testing and implementation in practice. Action research has the same qualities as qualitative and case study research, all are designed to develop solutions to real organisational problems through a participative and collaborative approach. Action research must have several cycles as shown in Figure 1. (Kananen, 2013: 26-45).
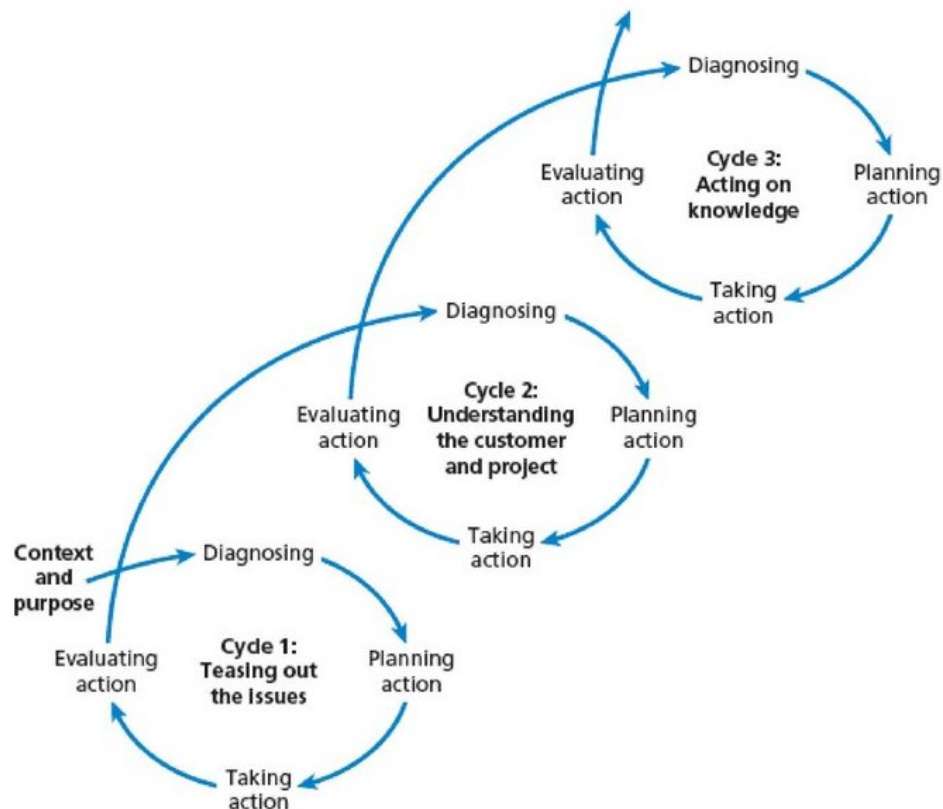
Figure 1. The three cycles of the action research spiral (Saunders et al., 2016).

Figure 1 shows an example of an action research process with three cycles. The purpose of the cycles is to encourage organisational learning to produce practical outcomes trough identifying problems, planning action, and evaluating action. In action research the research question may change as the process develops as it works through several cycles or iterations (Saunders et al., 2016: 189-193).

Applied research can consist of different research strategies such as case study or action research. To carry out this study a case study strategy was identified as one of the methods since it fits the business challenge and the objective of the study. Qualitative research approach and data collection methods were chosen because the research of the study consists mostly of open questions, theme interviews and the purpose of the data collection is to gain understanding for the service business model.

In addition, characteristics from applied action research method was recognised. The researcher is an active participant rather than external participant of the study. The cycles represent the different stages of the thesis and the method supports the logic that business models must be continuously reviewed throughout and adapted after implementation. However, the implementation of the business model is not part of the study.

2.2   Research Design

This study is designed to have five stages: objective, Conceptual Framework (CF), Current State Analysis (CSA), solution development and validation. Figure 2 shows the research design of this study.
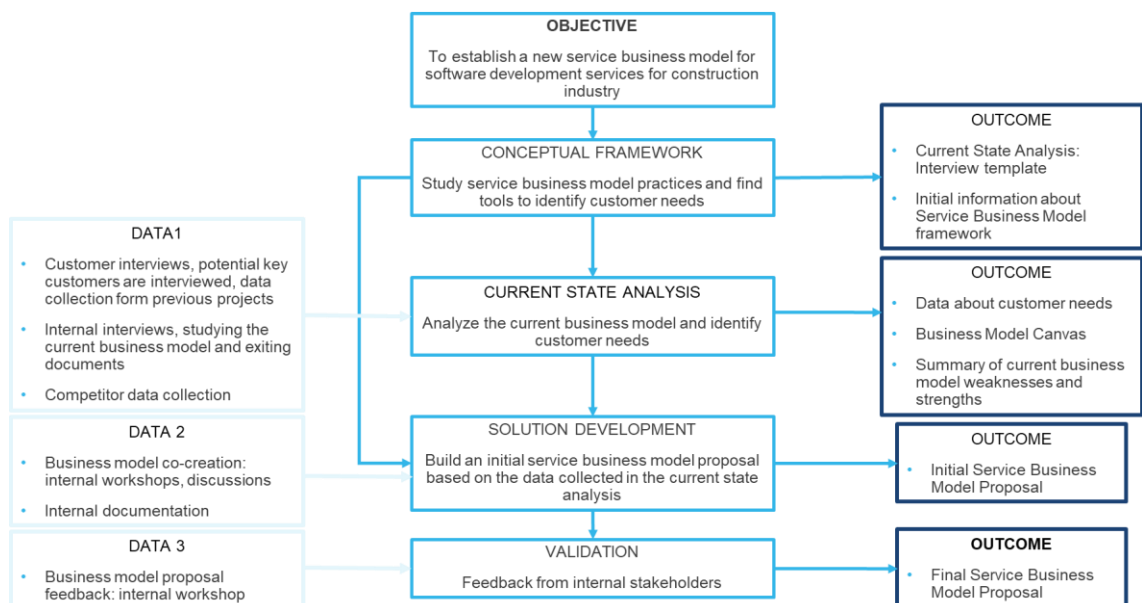
Figure 2. Research design.

As shown in Figure 2, the research began from defining the business problem and stating the research objective of the thesis. The Conceptual Framework (CF) section emphasises the existing knowledge on different business model practices and finding tools to

identify the customer needs. The purpose of this stage was to identify a relevant framework to support the study and find significant questions for the interview templates to be used in the Current State Analysis (CSA) stage. The order of the CF and CSA was carefully considered, and the CF was selected to come first as it contributes to the CSA.

The CSA evaluates the case company's current business model, competitor business models and how to identify the customer needs. The CSA includes internal interviews in the case company, interviews with potential key customers, data collection from previous projects and competitor research. The goal of this stage was to perform strengths and weaknesses analysis of the current business model and complete relevant framework to the business model.

An initial service business model was built in the solution development stage based on the data collected in the CF and in the CSA stage. The outcome was to propose an initial service business model for the case company. In the final stage the initial service business model was presented to the case company key stakeholders and based on their feedback, the final proposal of the service business model was presented.

2.3   Data Plan

This study applies data from a variety of data sources and data was collected in several data collection rounds. The data collection methods included interviews with the case company key stakeholders and potential key customers as well as internal workshops and discussions. Table 1 shows an overview of the Data collections 1-3.

Table 1.   Data Plan.

	CONTENT	SOURCE	INFORMANT	TIMING	OUTCOME
DATA 1 **ANALYSIS OF CURRENT MODEL**	• Customer interviews, potential key customers are interviewed, data collection form previous projects • Internal interviews, studying the current business model/basic idea • Competitor data collection	• Customer interviews and survey results • Stakeholder theme interviews • Competitor websites	• Key Customer 1 • Key Customer 2 • Company expert • Company decision maker	DECEMBER - JANUARY	• Data about the customer needs • Data for Business Model framework • Data about the competitor models • SW- analysis of the current business model/basic idea
DATA 2 **CREATION OF MODEL**	• Business model creation: internal workshops, discussions • Internal documentation	• Stakeholder workshops • Quality system documents	• General Manager • Company decision maker	FEBRUARY	• Initial Service Business Model proposal
DATA 3 **FEEDBACK VALIDATION OF PROPOSED MODEL**	• Business model proposal feedback: internal workshop	• Stakeholder theme interviews	• Company decision maker • Data 2 participants	MARCH-APRIL	• Final Service Business Model proposal

As seen in Table 1, data for this project was collected in three rounds. The first round, Data 1 was conducted to gain the knowledge to perform a current state analysis. Data 1 collection included internal interviews and studying the current business model with the company stakeholders and experts. To collect data about the customer needs two key customers were interviewed and data was collected from the previous projects. Data about the competitor models was collected from the competitor websites.

In the next round, Data 2 was collected to gather recommendations from the case company for the creation of the initial service business model proposal. This data included discussions and internal workshops. Internal documentation from previous business models was viewed. The final data was collected when receiving feedback for the proposal from the case company.

Interviews and workshops were conducted in Finnish and translated to English to prevent language barrier and provide as reliable data as possible. Due to the Covid-19 pandemic interviews and workshops were organised online or in group gatherings with two to three people. The questions for the internal and customer interviews were created in advance based on the business model framework used in the study. The questions for the Value Proposition canvas interviews can be found in Appendix 1 and the questions for the Business Model Canvas internal interviews can be found in Appendix 2. Interviews were recorded and field notes were taken but considered confidential as a request by the case

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company. The key results were generalised and collected to the Business Model Canvas and the Value Proposition Canvas templates.

Data from previous projects was collected from previously recorded data and customer surveys. The key results were collected and combined to the Value Proposition Canvas. Competitor data was collected from websites and analysed. Business model processes, strategy and vision statements were studied using existing internal documentation and combined to the Business Model Canvas.

The next section presents ideas on building service business models from literature and identifying customer needs to create the Conceptual Framework for the business model.

3   Ideas from Literature on Building Business Models

In this section, different perspectives to business model methods from literature are reviewed. Based on the collected knowledge, this section develops a Conceptual Framework on business model elements for Section 5, which concentrates on building the initial service business model. In addition, this section recognises ways to identify customer needs and tools for the Current State Analysis in Section 4.

This section first presents business model definitions and discusses how business models have developed over time and then describes different elements and frameworks for business models. Next, it introduces ways to identify customer needs and how external environment effects on business models. Ending with an overview of the Conceptual Framework.

3.1   Business Model Definitions

The business model concept came into common use in the managerial world in the 1990s and early uses of the business model concept were typically simplified comparisons for how a company creates value. By the end of the decade business models were identified in various categories such as *price models*, *innovation models*, *change models* and *e-business model*, which is a framework for internet-based businesses (Bock and Gerald, 2017).

One of the first scholarly research on business models was conducted by Professors Amit and Zott in 2001, when they published the research article about business models in a management journal. They stated that the business model was a new way to think about how companies create value and provided the first logically consistent definition for a business model (Amit and Zott, 2001). Some of the business model definitions collected from literature are illustrated in Table 2.

Table 2.   Business model definitions.

Authors	Definition
Amit and Zott (2001)	"A business model depicts the design of transaction content, structure, and governance so as to create value through the exploitation of business opportunities"
Morris et al. (2005)	"A business model is a concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets."
Johnson et al. (2008)	"A business model consists of a number of interlocking elements that, taken together, create and deliver value."
Osterwalder and Pigneur (2010)	"A business model describes the rationale of how an organisation creates, delivers and captures value."
Afuah (2014)	"A business model is a framework or recipe for making money – for creating and capturing value."
Gassmann et al. (2014)	"Business models describe how the magic of a business works based on its individual bits and pieces."
Bock and Gerald (2017)	"A business model is the organisational design used to exploit an opportunity and create value."

Since the Amit and Zott article in 2001, hundreds of research papers have been written about business models. To date, no clear definition has been established on exactly what a business model is precisely, but as the collection of business model definitions shows in Table 2, business models have almost always been discussed and described in the

context of two key organisational concepts. The first is value creation, since business models have something to do with how organisations create value. The second concept is design. Business models often describe how organisations operate, specifically in terms of the elements and functions that manage performances and activities.

3.2 Business Model Elements and Frameworks

There are vast amounts of different views and perspectives to business model elements and frameworks as there is for the business model definitions. The academic literature provides multiple and diverse interpretations for a business model. Some definitions go profoundly in the details while other views are more focused on defining the key concepts. This study presents some of the popular and current perspectives to business modelling.

Amit and Zott (2001) claimed that a business model is the design of the transactions a company uses to create value. This includes internal and external transactions – everything, in effect, the company does where information or assets are exchanged.

Johnson et al. (2008) introduced a business model concept that includes four elements: (1) a customer value proposition that accomplishes an important job for the customer in a better than the competitors' offerings; (2) a profit formula that informs how the company makes money delivering the value proposition; and (3) the key resources and (4) key processes required to deliver that proposition (Johnson et al. 2008).

3.2.1 Five Components of a Business Model

Afuah (2014) presents a business model framework that consist of five components. The five components of a business model are shown in Figure 3. In Afuah's model, first a company must discover how their products and services can solve customers' needs or help customers discover their underlying needs better than competitors to offer the right *customer value proposition*. The second step is to discover a *market segment* to the value proposition that has many customers willing to pay and how profitable it will be serving these customers. The market segment component is about customers and coopetitors involved in capturing the value.
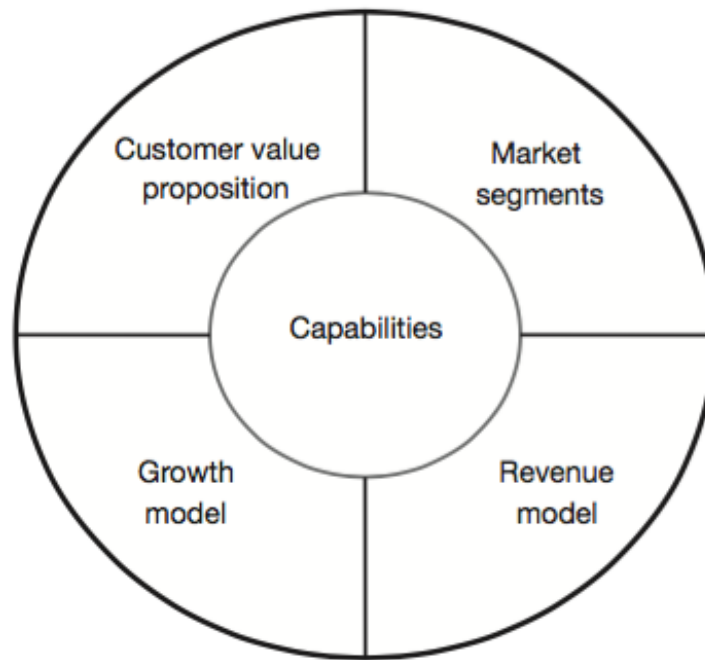
Figure 3. Components of a business model (Afuah, 2014: 5).

The third component in the business model is a *revenue model* which reveals how much customers are willing to pay for the products and services offered, when and how. It is about finding the highest price that the customer is willing to pay without driving them away. *Growth model*, the fourth component, is all about how to increase profitability while beating the competitors and how to gain more customers and maximise revenues while keeping costs low. The final and central component of the business model are *capabilities* that consist of resources and activities. Resources include e.g., people, equipment, products, financing, and distribution channels and activities transform resources into value created and captured (Afuah, 2014: 4-11).

3.2.2 Business Model Canvas

The Business Model Canvas is one of the most well-known framework tools developed by Osterwalder and Pigneur to describe how organisation creates, delivers, and captures value. Business Model Canvas divides the business model to nine business building blocks that cover the four main areas of a business: customers, offer, infrastructure, and financial viability. The framework provides a visual plan to implement strategy through organisational structures, processes, and systems (Osterwalder and Pigneur, 2010: 15-19). The Business Model Canvas is presented in Figure 4.
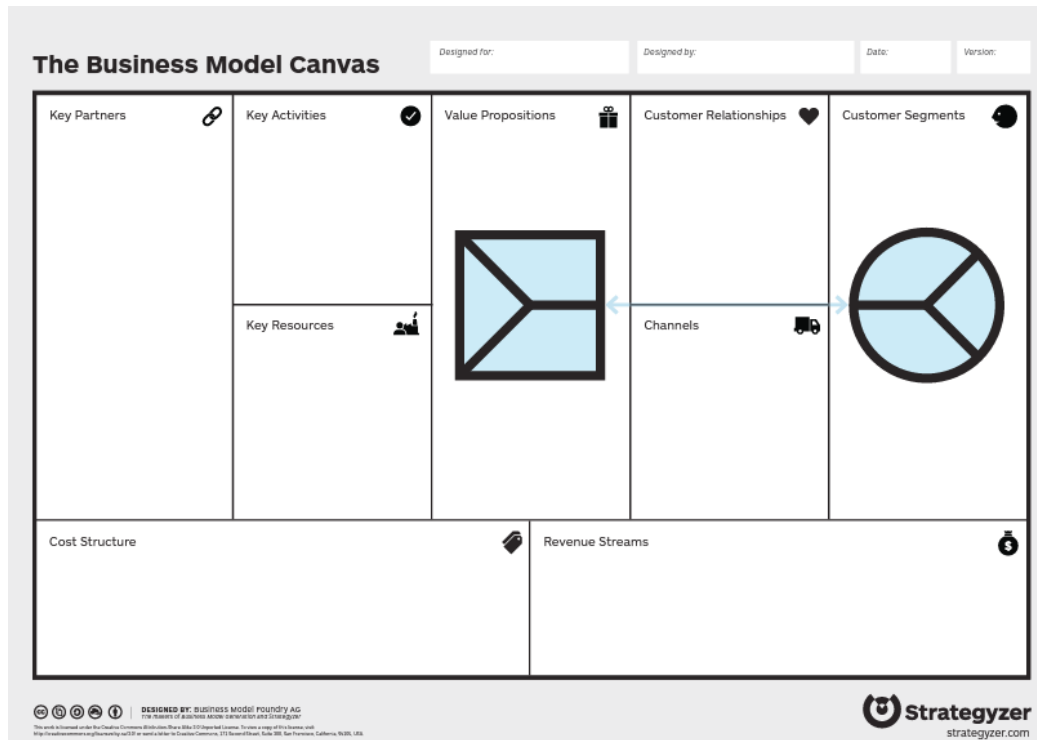
Figure 4. The Business Model Canvas (Osterwalder and Pigneur 2014).

The blocks presented in Figure 4 and explained below are Customer Segments, Value Propositions, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partnerships and Cost Structure.

1. *Customer Segments* are the groups of people and/or organisations a company or organisation plans to reach and create value for with a dedicated value proposition. A business model may define one or several large or small Customer Segments.

2. *Value Propositions* are based on a bundle of products and services that create value for a customer segment. It solves a customer problem or satisfies a customer need.

3. *Channels* describe how a value proposition is communicated and delivered to a customer segment through communication, distribution, and sales channels.

4. *Customer Relationships* outline what type of relationship is formed and maintained with each customer segment, and they explain how customer relationships are established and kept.

5. *Revenue Streams* result from a value proposition successfully offered to a customer segment. It is how an organisation captures value with a price that customers are willing to pay. Revenue streams can entail transaction revenues resulting from one-time customer payments or recurring revenues resulting from ongoing payments to either deliver a Value Proposition to customers or provide post-purchase customer support.

6. *Key Resources* are the most important assets required to offer and deliver the previously described elements. Key resources can be physical, financial, intellectual, or human and they can be owned or rented by the company or acquired from key partners.

7. *Key Activities* are the most important activities an organisation needs to perform to operate successfully. They can be activities related to production, problem solving and platforms.

8. *Key Partnerships* shows the network of suppliers and partners that bring in external resources and activities. Partnerships are created to optimise business models, reduce risk, or acquire resources.

9. *Cost Structure* describes all costs incurred to operate a business model. Defining Key Resources, Key Activities, and Key Partnerships first, help determine the costs. Profit is calculated by subtracting the total of all costs in the cost structure from the total of all revenue streams. (Osterwalder and Pigneur, 2010: 20-41).

The Business Model Canvas is integrated with The Value Proposition Canvas that zooms into the details of Value Proposition and Customer Segment building blocks (Osterwalder et al., 2014). In addition to the Business Model Canvas tool Osterwalder and Pigneur present ideas to examine the organisation's strategy and environment through the Business Model Canvas to create stronger and more competitive business models (Osterwalder and Pigneur, 2010: 199-200).

3.2.3 St. Gallen Business Model Navigator: Magic Triangle

The St. Gallen Business Model Navigator Magic Triangle model by Gassmann et al. (2014) provide a business model concept that consists of four elements: the Who, the What, the How, and the Value as seen in Figure 5.
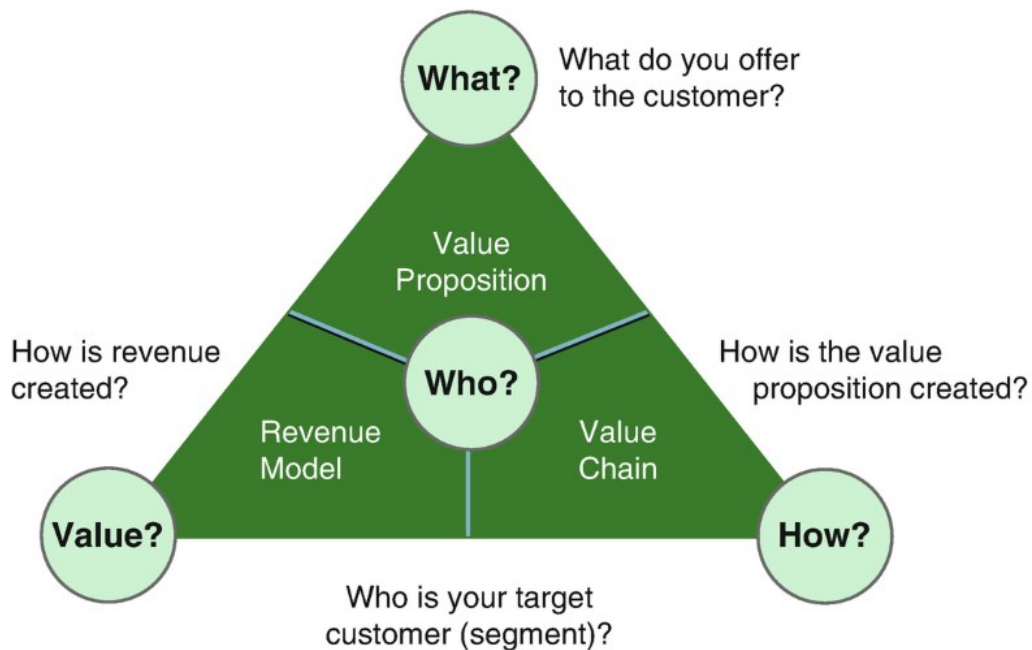
Figure 5. St. Gallen Magic Triangle (Gassmann et al. 2014).

As depicted in Figure 5, *Who* is the customer, *What* is the value proposition, *How* is the value proposition created, and the fourth element explains how the business model creates revenue, i.e. *Value*. The customer is located in the middle of this triangle to represent their central role in the business model. The concept is simple to use, but, at the same time, extensive enough to provide a clear picture of the business model design (Gassmann et al. 2014).

The idea of the tool is to help companies that are stuck in conventional thinking to think outside the box and create new revenue streams. However, for its simplicity it can be used to create new business models by building on the four core elements (Gassmann et al. 2014).

3.3   Identifying Customer Needs

This sub-section takes a closer look on the value creation element when building business models. A business needs customers to thrive and understanding customer needs will help deliver the most value to buyers. A customer need is a problem that a company or a person is trying to solve, which encourages them to seek a product or service to do so. There are several types of customer needs, including functional, social, and emotional needs.

Anderson et. al., (2006) argue that a properly constructed and delivered customer value proposition constitutes considerably to business strategy and performance. A customer value proposition must provide distinctive, measurable, and sustainable value. A distinctive value proposition is superior to the competitor's offering, a measurable value proposition allows customers to quantify value in financial terms, and a sustainable value proposition ensures that customers can execute the value proposition for a significant time period (Anderson et al., 2006).

According to Teece (2010) the essence of a business model is that it crystallizes customer needs and ability to pay. A new business model describes the organisation's idea about what customers want, how they want it and what they will pay, and how a business can meet customer needs, and get paid well for doing so and convert those payments to profit (Teece 2010).

3.3.1 Payne et al., Customer Value Proposition Framework

Payne et. al., (2020) offer a re-assessed value proposition (VP) framework for B2B markets in the context of both strategy and implementation ensuring a fit between a business model and customers' needs. The framework presented in Figure 6, contains five key interrelated process phases of implementation that are comprehensively addressed: (1) value design and assessment, (2) value quantification, (3) value communication, (4) value documentation, and (5), value verification and VP review.
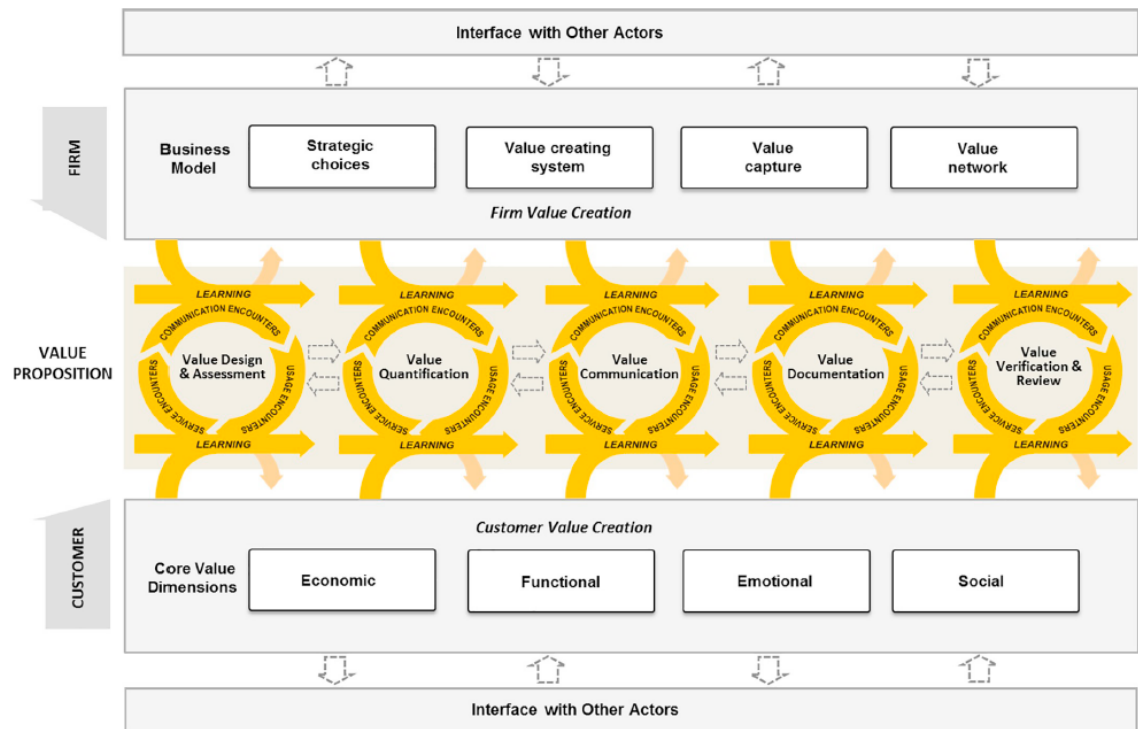
Figure 6. The customer value proposition: a conceptual framework (Payne et. al., 2020).

The framework identifies four business model elements on top of the Figure 6, strategic choices (competitive strategy, value chain structure, value focus, and customer segment emphasis), value creating system (resources, capabilities, processes), value capture (revenue model and cost model), and value network (strategically important actor relationships). These business model elements collectively form the strategic basis from which target customer segments are identified and the value requirements of the segments are identified (Payne et. al., 2020).

The lower section of the Figure 6 illustrates the customers' core value dimensions: functional value, economic value, emotional value, and social value. The selected value dimensions are based on views of several researchers as their views somewhat overlap due to the contexts in which they are studied (Payne et. al., 2020).

The framework provides a robust approach for addressing the dynamic competitive environment, as well as considering changing customer needs. The value verification phase feeds back into the value (re)design and assessment phase highlighting the iterative nature of VP implementation (Payne et. al., 2020).

3.3.2 Value Proposition Canvas

The Value Proposition Canvas is a tool which can help ensure that a product or service is positioned around what the customer values and needs. The Value Proposition Canvas is a detailed look at the relationship between two parts of the Osterwalder's broader Business Model Canvas: Customer Segments and Value Propositions.

As seen in Figure 7, the Value Proposition Canvas has two sides. Customer Profile side clarifies customer understanding and Value Map describes how value is intended to be created for the customer. Fit is achieved between the two when one connects the other.
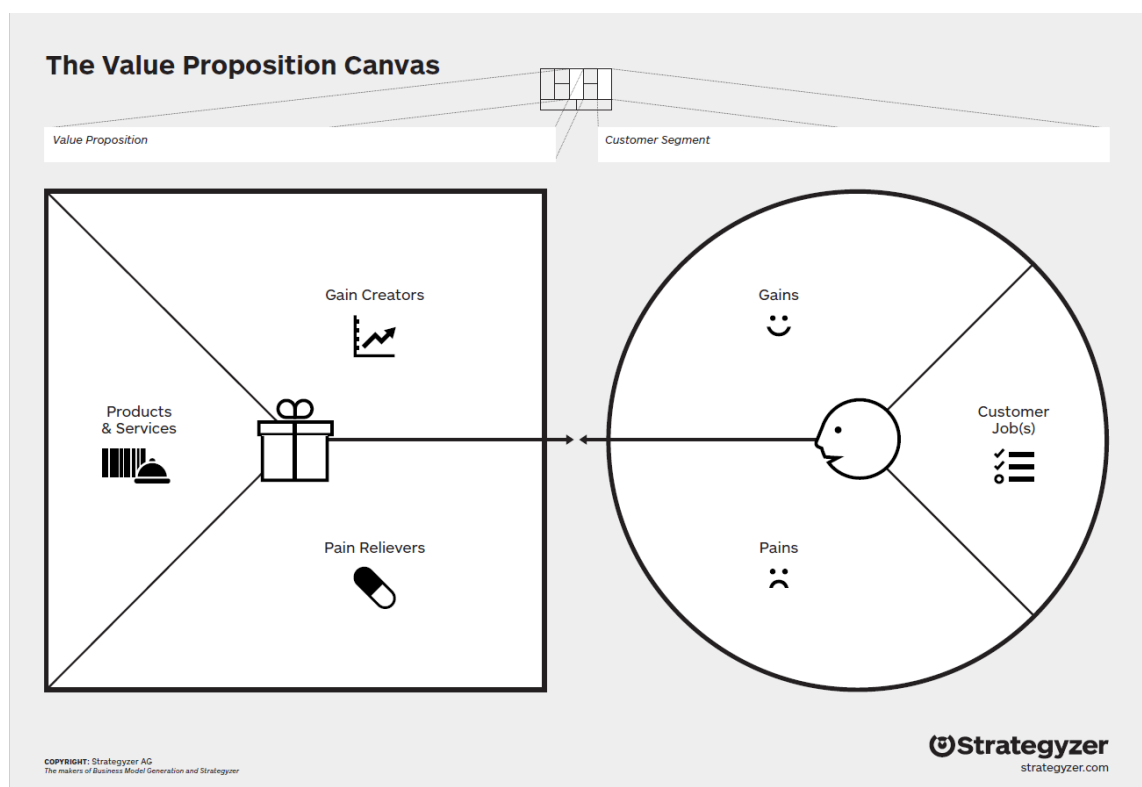
Figure 7. The Value Proposition Canvas (Osterwalder et al., 2014).

The Value Map on the left-hand side of Figure 7 describes the features of a specific value proposition in a business model in a more structured way by dividing the value proposition into three segments. A list of all the Products and Services a value proposition is built around, Pain Relievers describe how products and services alleviate the customer pains and Gain Creators describe how your products and services create customer gains (Osterwalder et al., 2014: 8).

The Customer Profile on the right-hand side of The Value Proposition Canvas describes a specific customer segment in your business model in a more comprehensive way. It collects information from the customer point of view in three segments. Customer Jobs describe what customers are trying to get done in their work and in their lives, as expressed in their own words. Pains describe bad outcomes, risks, and obstacles related to customer jobs. Gains describe the outcomes customers want to achieve or the concrete benefits they are seeking (Osterwalder et al., 2014: 9).

To collect the information to be used in the framework Osterwalder et al. (2014) present a set of trigger questions to be used in workshops and customer interviews. Ranking the individual items and answers on the Customer Profile based on their importance gives a better understanding on customers priorities (Osterwalder et al., 2014: 12-24).

The fit between the Value Map and the Customer Profile occurs in three phases. The first is when relevant customer jobs, pains, and gains that address the value proposition are identified. The second occurs when customers respond positively to the value proposition and it gets recognition in the market. The third happens when the business model becomes scalable and profitable. A business model can consist of a combination of several value propositions and customer segments and fit is required between each value proposition and its respective customer segment for the business model to work (Osterwalder et al., 2014: 48-52).

Companies can benefit from the Customer Profiles by sharing and utilising them across organisation. They have long term value if they are constantly updated based on communication with real customers and used in different Value Proposition designs. The Value Proposition design should be validated as soon as possible in order to understand, improve and create better designs (Osterwalder et al., 2014: 60- 62).

3.4   Business Model Innovation and Environment

Amit and Zott (2001) discussed business model innovation in their study on value creation in e-business in terms of emergence of new online markets and how internet opens new sources of innovation that require a parallel shift in strategic thinking. Amit and Zott identify efficiency, complementarities (cross selling and additional services), lock-in (affiliate and loyalty programs) and novelty as key characteristics of business model innovation.

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Chesbrough (2010) has studied barriers to business mode innovation and in his view, companies need to adopt an attitude for business model experimentation to discover potential new business models before the time comes when external innovations render their traditional one idle. Design tools and frameworks are valuable when creating a business models and the elements will also provide the basis for business model change and innovation, but alone they are not adequate without proper business model experimentation and innovation (Bock and Gerald, 2017 and Chesbrough 2010).

Osterwalder and Pigneur (2010) suggest studying four main areas of the organisation's environment to design more competitive business models that are adaptive to the changing external forces. These are (1) market forces, (2) industry forces, (3) key trends, and (4) macroeconomic forces (Osterwalder and Pigneur, 2010: 200-201).

Business model innovation captures and creates value differently, delivers new value propositions and changes the rules of the game (Johnson 2008 and Afuah 2014). According to Afuah (2014) business model innovation can come through a change in any of the five business model components presented in sub-chapter 3.2.1, that are in the inner circle of Figure 8 or from the surrounding industrial environments as well as the overarching macro environments.
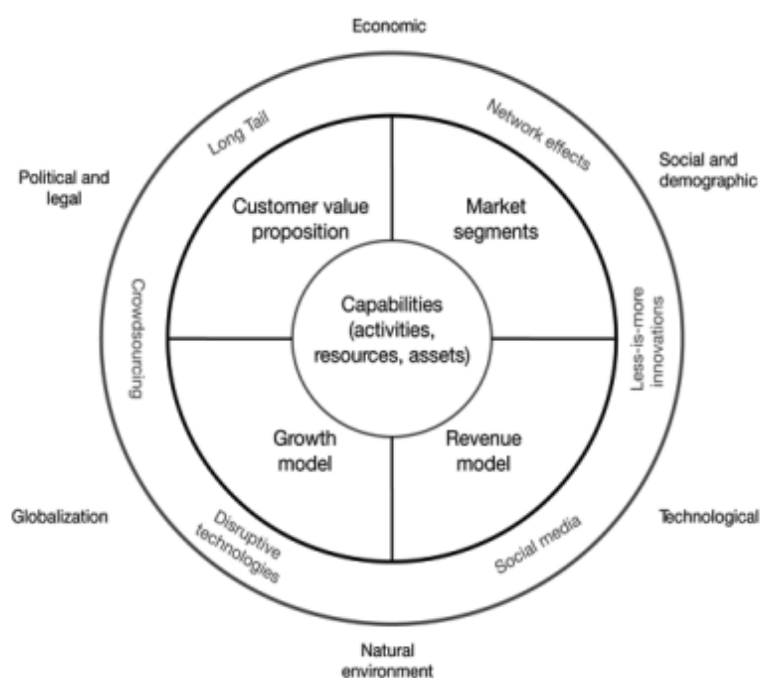
Figure 8. A Business model innovation's environment (Afuah 2014).

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Afuah (2014) presents four types of business model innovation that can be directed on one or more of the components of a business model. In *regular* business model innovation existing capabilities are used to build the new business model so that the existing market remains competitive and there is little or no change in the rules of the game. In *capabilities-building* business model innovation comes from new or acquired capabilities that were not present in the old model. In the *position-building* business model innovation old products and services are made non-competitive using primarily same capabilities as that in the old model. The position-building and capabilities-building types have some changes in the rules of the game. *Revolutionary* business model innovation redefines what creating and capturing value in a market is all about while overturning the products rooted in the old business model obsolete. The rules of the game are changing both capabilities-wise and marketwise (Afuah 2014: 11-15).

Business models operate in an industry environment that present opportunities and threats where companies can seek differentiation and advantages against competitors. The external business model innovation can come from known phenomenon and past business models or from factors such as new inventions or government regulations (Afuah 2014:15).

3.4.1   Strengths and Weaknesses analysis using Business Model Canvas

Osterwalder and Pigneur (2010) provide checklists for assessing the business model's strengths, weaknesses, opportunities, and threats (SWOT) to help evaluate each building block. A business model can be assessed from a big picture perspective or from a building block perspective and they are complementary activities. A weakness in one building block may have consequences for one or several other building blocks or for the entire model. Business model assessment, therefore, varies between individual elements and overall integrity (Osterwalder and Pigneur, 2010: 212-225). SWOT analysis provides four perspectives presented in Figure 9, from which to assess the elements of a business model.

What are your business model's . . .
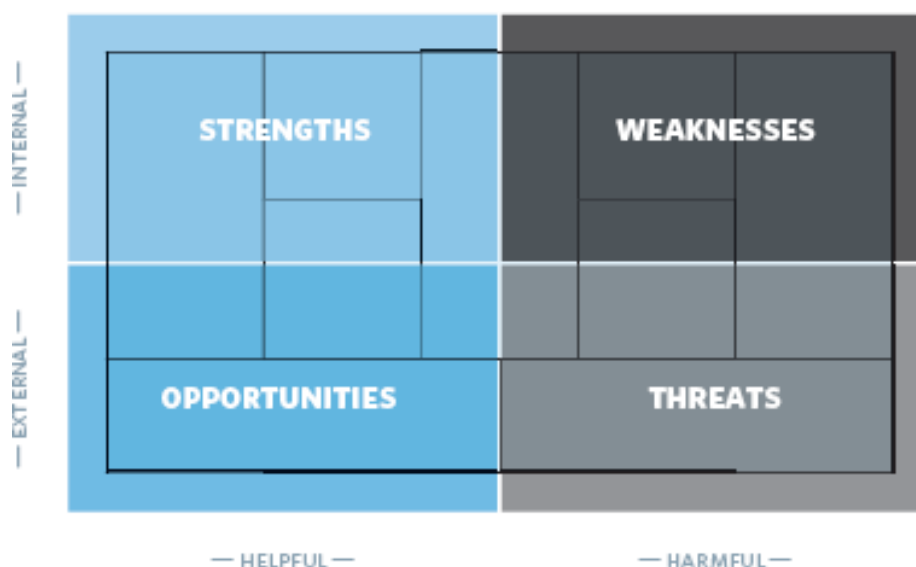
Figure 9. SWOT analysis with the Business Model Canvas (Osterwalder and Pigneur 2010).

All SWOT analysis conclusions may not always be useful for companies but combined with the Business Model Canvas SWOT enables a focused assessment and evaluation of an organisation's business model and its building blocks. A well-defined SWOT assessment of a business model generates a description of current state, *strengths, and weaknesses*, and it indicates direction for the future, *opportunities, and threats*. Results of the exercise can help design new business model options and innovation in the organisation. SWOT analysis is therefore a substantial part of the process of designing both business model prototypes and new models (Osterwalder and Pigneur, 2010: 212-225).

3.4.2   Blue Ocean Strategy

Blue ocean strategy concept created by Kim and Mauborgne (2015) is about creating new businesses in uncontested market space rather than outdoing competitors in the red oceans that represent the existing market. In the red oceans companies try to overtake their rivals to gain a greater share of existing demand. As the market space gets crowded, possibilities for profits and growth are reduced. Blue oceans are defined by untapped market space, creation of new demand and profitable business growth opportunities. New blue oceans can be created outside existing industry boundaries, but most are created within red oceans by expanding known boundaries. (Kim and Mauborgne, 2015: 4-5).

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Blue ocean strategy is about recognising new trends and market areas where competition is made irrelevant by creating more value for customers with lower operating costs. The authors call this cornerstone of the blue ocean strategy *value innovation*. Customer value is increased by growing and creating elements the industry has never offered. Cost savings are made by eliminating and cutting the factors the industry competes on. Value innovation approach rejects the traditionally accepted trade-off between differentiation and lower cost. (Kim and Mauborgne, 2015: 12-18).

Kim and Mauborgne present analytical tools and frameworks to create and capture blue oceans. The strategy canvas is both a diagnostic and an action framework for developing a compelling blue ocean strategy. The Four Actions Framework is used to achieve value innovation with four key questions (Kim and Mauborgne, 2015: 27-32).

The strategy canvas serves two purposes. First, it captures the current state of the known market space, it displays the factors that the industry currently competes on, where the competition invests and what customers are receiving from the existing market offering. The key competing factors are captured in the horizontal axis of the strategy canvas in Figure 10. (Kim and Mauborgne, 2015: 27-31).
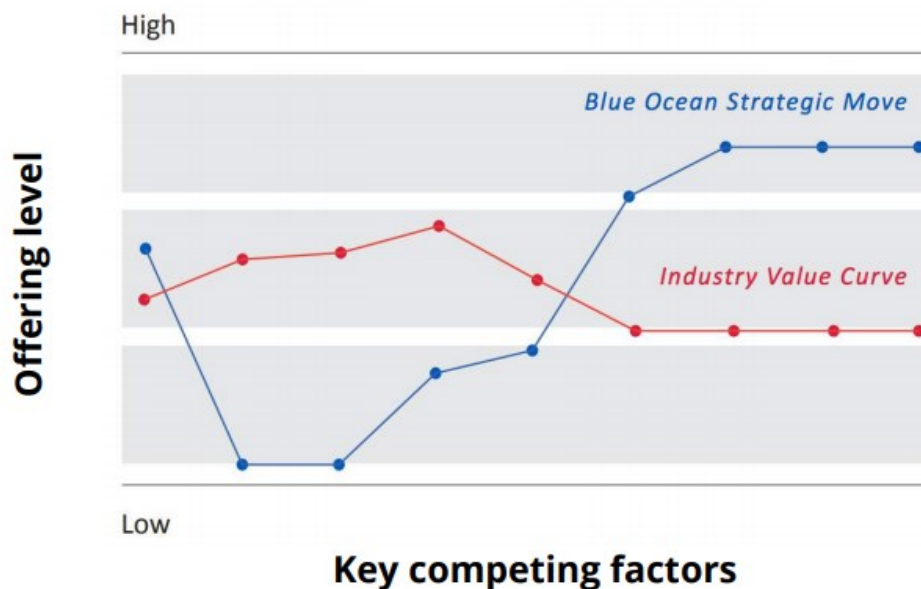
Figure 10.   Strategy canvas (Kim and Mauborgne, 2021).

The vertical axis, in Figure 10, captures the offering level that buyers receive across all these key competing factors. A high score means that a company offers customers more

and therefore the customer is willing to invest more in that factor. A value curve is created by plotting the key competing factors with the offering level. It is a graphic depiction of a company's performance across its industry's factors of competition (Kim and Mauborgne, 2015: 27-31).

The second purpose of the strategy canvas is to shift the strategic focus from competitors to alternatives and from customers to noncustomers of the industry to discover the blue ocean strategic factors. To reconstruct customer value elements in drafting a new value curve the authors developed a tool called the *four actions framework*. To break the trade-off between differentiation and low cost in creating a new value curve, the framework asks four key questions, shown in Figure 11 (Kim and Mauborgne, 2015: 27-31).

Raise
Which factors should be raised *well above* the industry's standard?

Eliminate
Which factors that the industry has long competed on should be eliminated?

New Value Curve

Create
Which factors should be created that the industry has never offered?

Reduce
Which factors should be reduced *well below* the industry's standard?
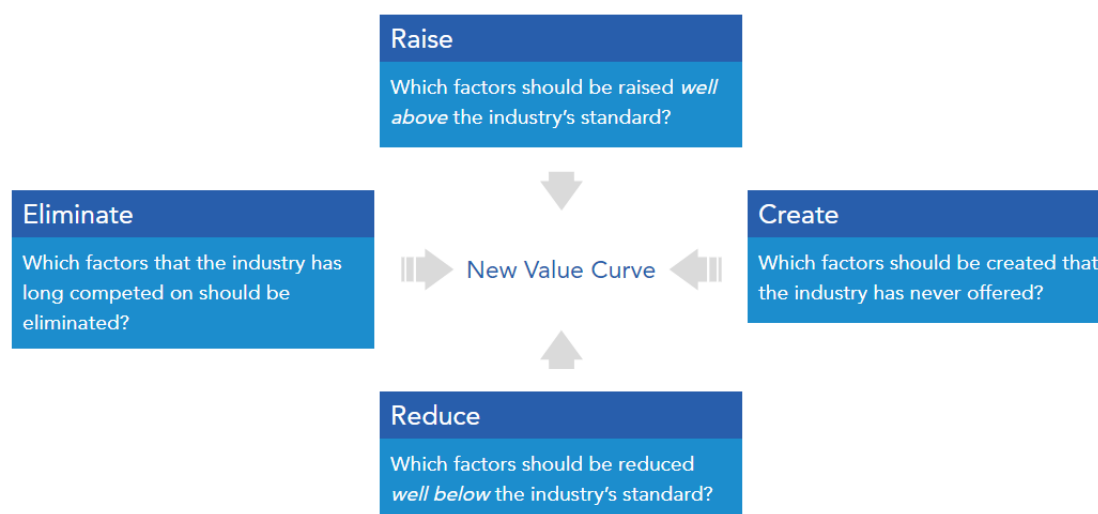
Figure 11.   The four actions framework (Kim and Mauborgne, 2021).

Eliminate and reduce questions in the four actions framework are designed to discover how to lower the company's cost structure against the competitors. Create and raise questions provide insight how to raise customer value and create new demand. The four key questions challenge industry's strategic logic and established business model:

Which of the factors that the industry has long competed on should be eliminated?

Which factors should be reduced well below the industry's standard?

Which factors should be raised well above the industry's standard?

Which factors should be created that the industry has never offered?

The first question forces to find factors that should be considered eliminated. Often these factors are taken for granted or no longer deliver value. The second question helps to understand whether the competitive situation has led to products or services that are too good, where companies overserve customers and their cost structure is increased without profit. The third question drives to reveal and eliminate the compromises the industry forces the customers to make. The fourth question helps to discover new value sources for customers and to create new demand and shift the strategic pricing of the industry. (Kim and Mauborgne, 2015: 31-37).

Eliminate-Reduce-Raise-Create (ERRC) grid presented in Figure 12, is a third tool of blue ocean strategy developed by Kim and Mauborgne (2015). It is a tool that drives companies to ask all four questions in the four actions framework and act on them to create a new value curve that is essential to unlocking a new blue ocean (Kim and Mauborgne, 2015: 37- 39).
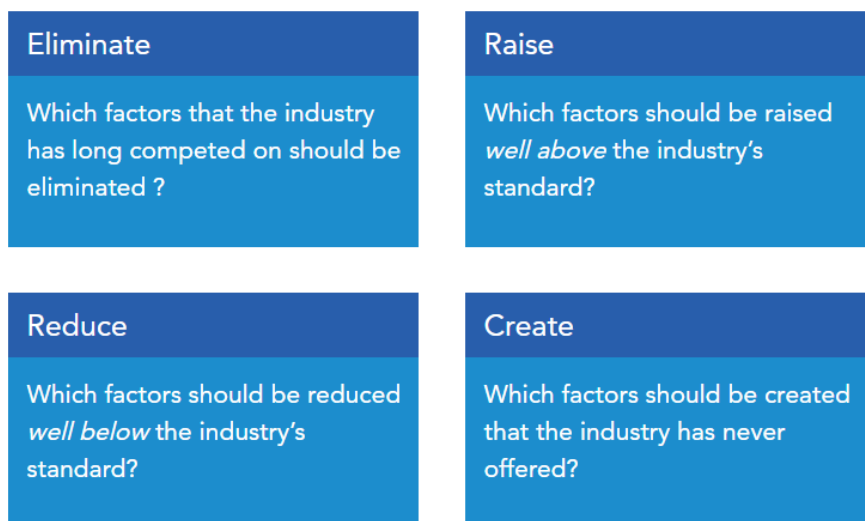
Figure 12.　　The Eliminate-Reduce-Raise-Create (ERRC) Grid (Kim and Mauborgne, 2021).

ERRC is an analytical tool that focuses simultaneously on eliminating and reducing, as well as raising and creating while unlocking a new blue ocean. The grid gives companies four immediate benefits:

- It pushes companies to simultaneously pursue differentiation and low cost to break the value-cost trade off.

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- It immediately flags companies that are focused only on raising and creating, thereby raising the cost structure and often over-designing products and services – a common dilemma for many companies.

- It is easily understood by managers at any level, creating a high degree of engagement in its application.

- Because completing the grid is a challenging task, it drives companies to thoroughly scrutinise every factor the industry competes on, helping them discover the range of implicit assumptions they unconsciously make in competing. (Kim and Mauborgne, 2015: 37- 39).

Value curves presented in a strategy canvas reveals great quantity of strategic knowledge on the status and future of the industry. A strong value curve has focus, divergence as well as a compelling tagline. If the value curve lacks focus, business model cost structure tends to be high and complex to implement and execute. When the value curve lacks divergence, company's strategy is not unique enough in the market. Compelling tagline speaks to customers and prevents the strategy to be internally driven. When a company's value curve converges with its competitors, it indicates that the company is caught within the red ocean of tough competition (Kim and Mauborgne, 2015: 43-45).

3.4.2.1   Business Model Perspective on Blue Ocean Strategy

Combining Blue ocean strategy and the Business Model Canvas provides a framework to analyse the business model innovation and to create new, more competitive models. In the Business Model Canvas the right-hand side represents value creation and the left-hand side represents costs (Osterwalder and Pigneur, 2010: 226-231). This fits well with Kim and Mauborgne's value innovation logic of increasing value and reducing costs. The fit is demonstrated in Figure 13.

Changing elements on the right-hand side has implications for the left-hand side. For example, if parts of the Value Proposition, Channels, or Customer Relationship building blocks are added or removed, it will have direct implications for Resources, Activities, Partnerships, and Costs (Osterwalder and Pigneur, 2010: 226-231).
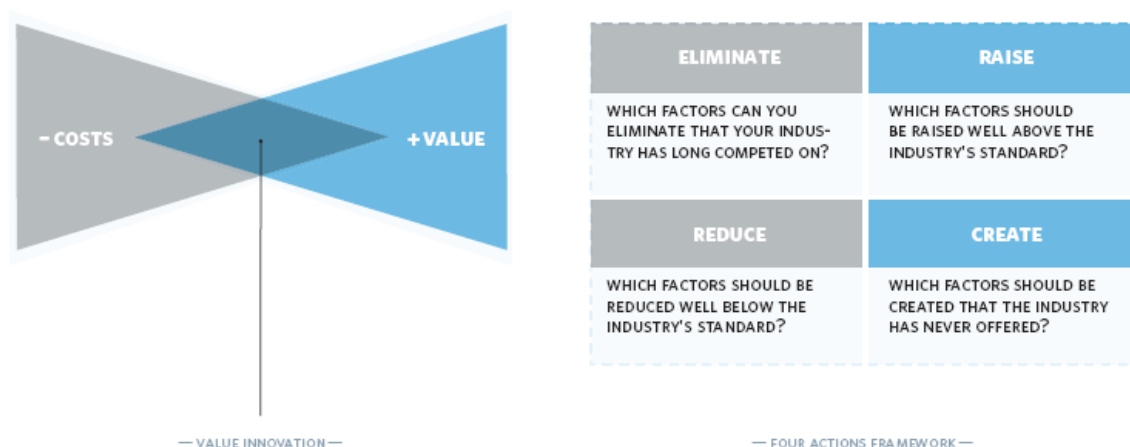
Figure 13.   Value innovation and Four Actions Framework fit on the Business Model Canvas (Osterwalder and Pigneur 2010).

The Four Actions Framework questions (eliminate, create, reduce, raise), as seen in Figure 13, can be asked about each business model building block, and used to identify which elements of the value proposition can be eliminated, reduced, raised, or newly created. The first goal is to cut costs by reducing or eliminating fewer valuable features or services. The second goal is to enhance or create high-value features or services that do not significantly increase the cost structure (Osterwalder and Pigneur, 2010: 226-231).

3.4.3   St. Gallen Business Model Navigator

Gassmann et al. (2014) did not only create the Magic Triangle but a whole methodology for business model development and innovation. The St. Gallen Business Model Navigator expands the main concept with the Business Model Innovation Map. The authors identified 55 known business models which served as the base for new business models in the past, such as e-commerce, freemium, long tail, razor and blade, and subscription. The 55 patterns of business models identified can provide inspiration when designing innovative business models. The Business model innovation software allows users to explore patterns and the map interactively (Gassmann et al. 2014).

In order to achieve successful business model innovations Gassmann et al. (2014) emphasise the importance of effective implementation process within the company. Promising ideas need to be gradually developed into full-blown business models that describe

all four dimensions - Who-What-How-Value? The implementation process should be iterative and stakeholders, new partners, and consequences for the market should be considered (Gassmann et al. 2014).

3.5   Overview of Conceptual Framework

From the various tools researched in order to create the Conceptual Framework for this study, the Business Model Canvas and Value Proposition Canvas tools developed by Alexander Osterwalder was selected. The overview of the Conceptual Framework built for this thesis contains 3 key themes as shown in Figure 14 below.
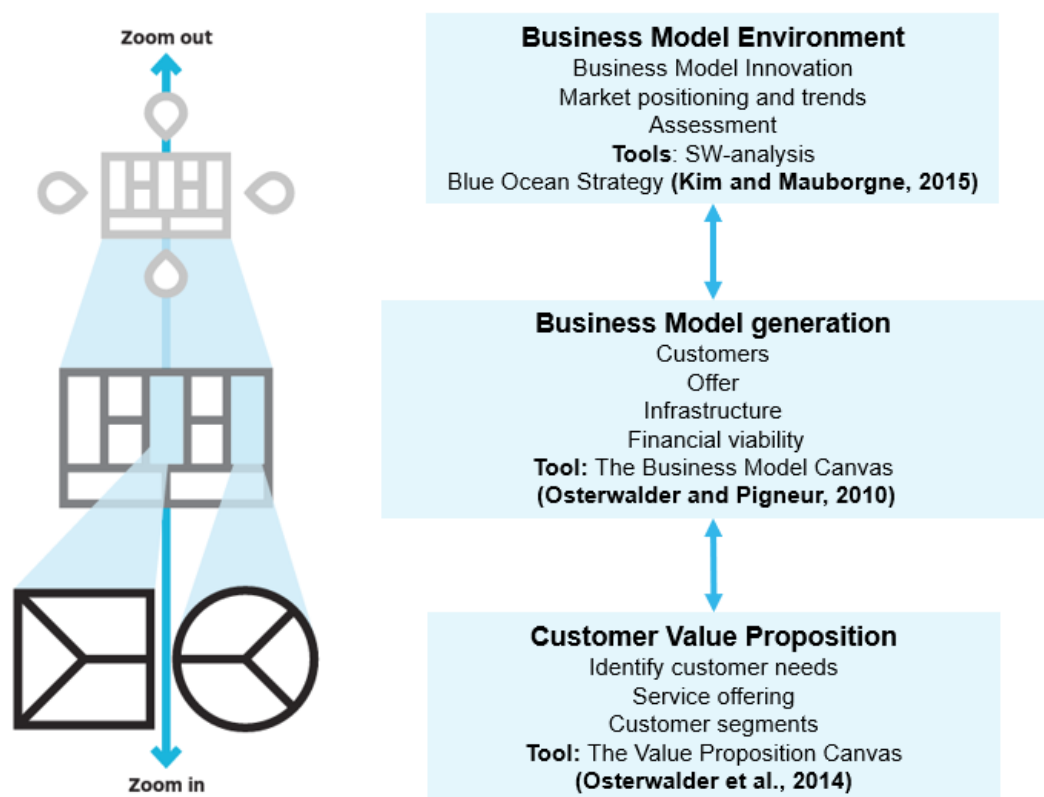
Figure 14.   Overview of Conceptual Framework.

The Business Model Canvas offers an easy-to-use visual design tool, and the Value Proposition Canvas tool offers a possibility to zoom in to identify customer needs and value creation, fulfilling the two elements of business model definition.

Osterwalder and Pigneur provide ideas on how to zoom out of the business model and how to consider the organisation's environment to design more innovative business models that are adaptive to the changing external forces. The Business Model Canvas framework can be combined with the Blue Ocean Strategy to create new, more competitive models. A SWOT assessment of a business model can be used to evaluate the business model and its building blocks to identify its current state strengths, and weaknesses, and indicate its direction for the future with opportunities and threats.

The framework tools are a good fit for the study as they can be used when there is a need to refine an existing service offering or where a new offering is being developed from scratch. The tools offer a visual design of the service business model that can be used to present the business concept to the parent company. The Customer Profiles created for the Value Proposition Canvas provide valuable data of the customers that can be exploited for other and future business models.

With the Conceptual Framework now established the next section focuses on finding out the strengths and weaknesses in the current service business model through performing a Current State Analysis of the case company's service business model.

4 Analysis of Current Service Business Model and Operating Environment

This section describes the current state of the case company's business model for software development services and the findings are categorised into Strengths and Weaknesses. Furthermore, this section includes analysis of key customer needs and analysis of key competitor business models. Collection of the data to establish a conception of the Current State Analysis (CSA) was introduced in Section 2.

4.1 Overview of This Data Stage

The Business Model Canvas and Value Proposition Canvas tools developed by Alexander Osterwalder was selected for the study based on the conceptual framework presented in Section 3. The framework tools are used by the parent company and the selection supports the intention that the service business model can be used to present the business concept to the parent company.

The first step of the CSA was to collect data about the customer needs. This was conducted by interviewing the key customers and collecting data from previous projects. The analysed data was collected to the Value Proposition Canvas, a tool which can help ensure that the service is positioned around what the customer values and needs. The Value Proposition Canvas is a detailed look at the relationship between two parts of the Osterwalders broader Business Model Canvas: Customer Segments and Value Propositions.

The second step was to collect data of the case company current business model to fill the nine building blocks of the Business Model Canvas. Data was gathered from existing documents related to the current offering and from internal interviews with the case company experts and stakeholders. The interview questions were based on the Business Model Canvas and Value Proposition Canvas framework presented in Section 3.

In the third step of the CSA information on competitors and competitor business models was collected from websites and analysed. The fourth step compared the existing model, customer needs and competitor model. At the end, an overview of the main strengths and weaknesses identified in the current state analysis in Section 4 was collected in a table and development needs moving forward were presented.

4.2   Analysis of Key Customer Needs using Value Proposition Canvas

To collect data about the customer needs two key customers were interviewed and data was collected from the prior projects. Information from prior projects was collected from previously recorded data and customer surveys. Customer 1 and Customer 2 were interviewed, and Customer 1 and Customer 3 participated in the customer survey. The key results were collected and combined to the Value Proposition Canvas presented in Figure 15.
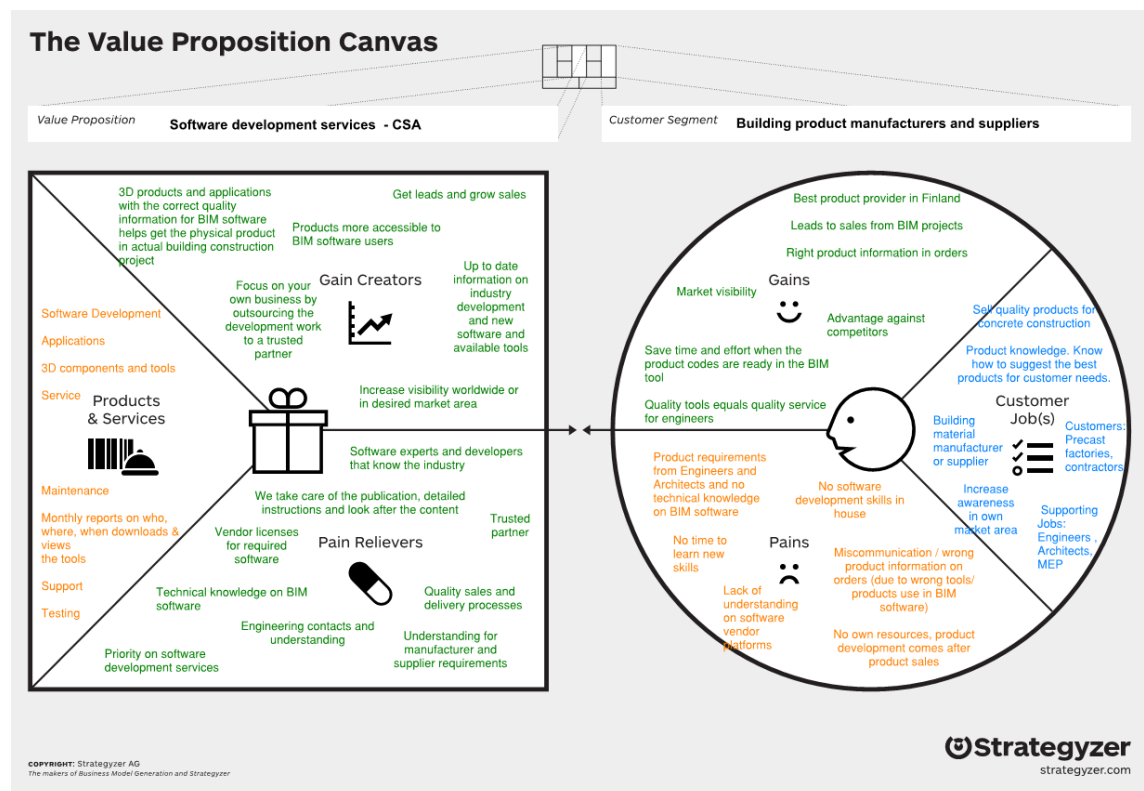
Figure 15.   The Value Proposition Canvas for CSA.

As seen in Figure 15 the Value Proposition Canvas has two sides, the *Customer Profile* clarifies the customer positioning, and the *Value Map* describes how the company intends to create value for that customer. Questions for the interviews were created in advance based on the Value Proposition Canvas framework by Osterwalder and Pigneur (2014) and they can be found in Appendix 1. Questions for customer interviews were divided to fit the three segments in the Customer Profile. The segments are *Customer Jobs*, *Customer Pains* and *Customer Gains*. Customer 1 and Customer 2 Profiles can be found in Appendix 3.

All the prior and ongoing projects for the case company have been to customers in the building product manufacturing segment, where the customer's most important job is to sell their products to precast factories or contractors. Their indirect customers are structural engineers and sometimes architects who use BIM software to design the structures. From the case company perspective, the customers are in the same segment, however the customers might not always compete against each other. Certain customers in the segment might sell steel products used for lifting and connections, while others may sell penetration seals or insulation, so the product range in the segment is wide.

Customers have common pains that were recognised from the interviews, both customers stated that they do not have in depth knowledge on the BIM software nor inhouse software developers. Both customers said that the mistakes on orders and deliveries often come from wrong product names or codes used in BIM software and this can be prevented by the case company service offering and seen as a gain.

Other gains that the customers recognised were leads and eventually an increase in product sales, market visibility and advantage against competitors. Their product is more likely to be chosen for the building construction project if the competitor product is not available for the BIM software used.

Questions for the Value Proposition Map were divided in three segments: *Gain Creators*, *Pain Relievers* and *Products and Services*, and they were answered by the case company experts and stakeholders. Questions for Gain Creators and Pain Relievers can be found in Appendix 1, Products and Services were collected based on prior projects, and the answers were collected in their corresponding segments and presented in Figure 15. Pain Relievers were compared against the Customer Pains and several pairs were recognised and they are presented in Table 3.

Table 3.　　　Pain Relievers and Customer Pain comparison.

Pain Relievers	Customer Pains
Software experts and developers that know the industry	No software development skills in house
We take care of the publication, detailed instructions and look after the content	Lack of understanding on software vendor platforms

Technical knowledge on BIM software	No time to learn new skills
Engineering contacts and understanding	Product requirements from Engineers and Architects and no technical knowledge on BIM software
Priority on software development services	No own resources, product development comes after product sales
Understanding for manufacturer and supplier requirements	Miscommunication / wrong product information on orders (due to wrong tools/ products use in BIM software)

As seen in Table 3 comparison of the current value propositions addresses customer's pains well. The case company current value propositioning does not address customer pains on order, delivery, or logistics delays nor financial risks, where sales depend on economic trends in construction industry.

The customer needs were validated by the feedback survey on software development services provided by the case company. The survey was sent to customers after the software development project and has been answered by two customers. The survey was originally conducted in Finnish and translated for the study. The most important question that validates the case company value proposition is the question on the survey where customers could select what their company's top priorities for the project were. Both companies that answered the survey selected the following priorities: *grow sales*, *increase product awareness*, *reach designers better* and *gain visibility in Finland*. One of the customers also selected the option *gain international visibility* since their market area is not restricted only to Finland. Both customers fully agreed that *the project was a profitable investment* and that *the case company had experts that know the industry*.

4.3 Description of the Case Company Current Business Model using Business Model Canvas

After evaluating customer needs and the value proposition, the data collection continued with exploring the existing documents related to the current business model offering with the company stakeholders. The existing documents were sales presentations, company website, offer and project documentation made to first customers.

The data collection was complemented by interviewing the company stakeholders and experts to fill the missing pieces and validate the findings from the existing documents. Questions for the internal interviews were created in advance based on the Business Model Canvas framework by Osterwalder and Pigneur (2010). Questions for internal interviews were divided to fit the 9 building blocks in the Business Model Canvas and they can be found in Appendix 2. The blocks are Customer Segments, Value Propositions, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partnerships and Cost Structure (Osterwalder and Pigneur 2010). Field notes were taken of the interviews and the key results were collected to the Business Model Canvas template presented in Figure 16.
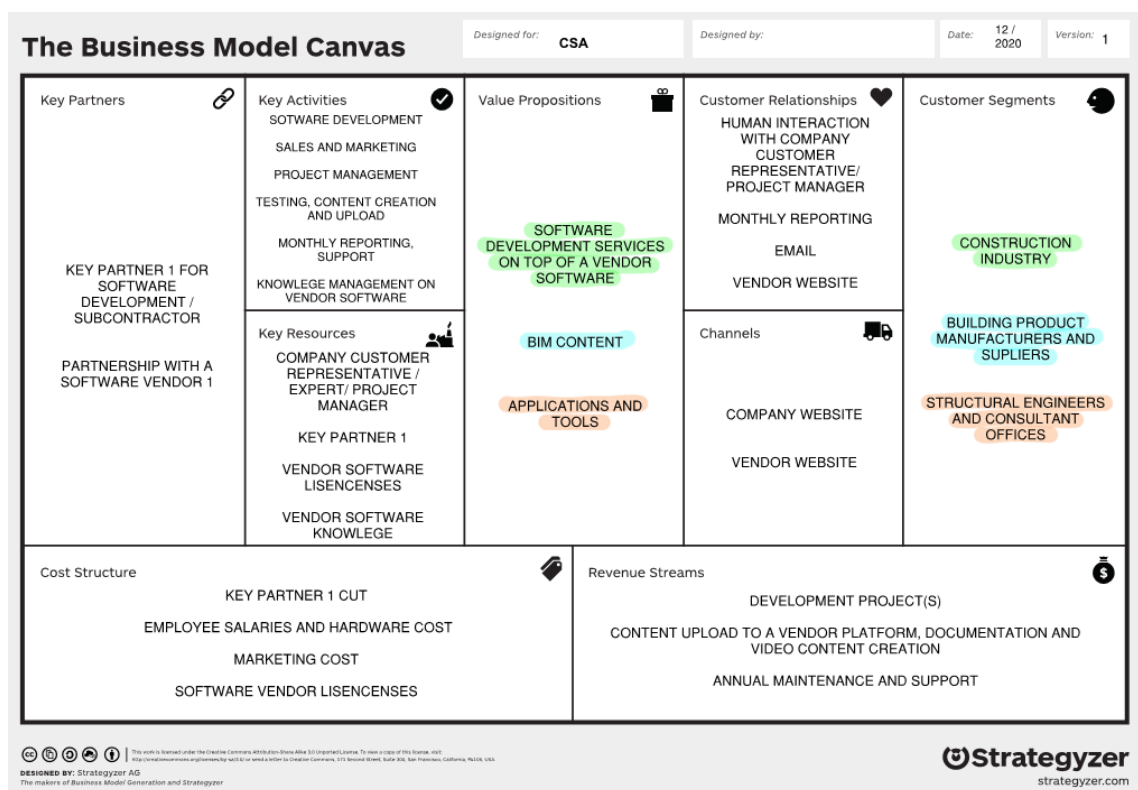
Figure 16.   The Business Model Canvas designed for CSA.

1. The *Value Proposition* and *Customer Segments* blocks for the Business Model Canvas designed for CSA were based on the fit presented in the Value Proposition Canvas (Figure 15). So far, the case company has four customers from the building product manufacturing industry in Finland and that was recognised as the most important *customer segment*. Two other customer segments were identified from the existing documents and proposals: construction industry, and structural engineers and consultant offices.

2. Three *value propositions* were identified to match the customer segments. In a wide perspective the case company offers software development services on top of a vendor software for the construction industry. Additional applications and tools can be developed on top of the vendor software for structural engineers and consultant offices. BIM content creation for the building product manufacturing industry has proven to deliver the most value. The case company is solving the BIM content creation problem for them by offering software experts and developers that know the industry and the vendor software.

3. In most cases the customer finds the case company through the software vendor website or from landing to the case company website that has a description of the software development services. The software vendor *channel* is recognised important as it also lists the other companies offering similar services globally. The software vendor channel cost is included in the yearly license subscription fee. The BIM content and developed tools are published in the software vendor website, it is known by the structural engineers and the platform is free for the software vendor customers and now there is no method to collect a fee or sell tools in the platform.

4. The building product manufacturers and suppliers segment expects the case company to be a trusted partner that takes care of the BIM content creation for them. *Customer relationships* must be handled as effectively as possible so that the customer can focus on their main job that often is selling the building products. After the initial contact, that would preferably be a live meeting, email and online meetings are often used to communicate and follow the progress of the development project. Customers appreciate human interaction with the case company expert that they can reach out for support when needed. After the development project a feedback survey is sent to the customer. Value proposition is delivered to the customer by a monthly report of the views and downloads of the published BIM content on the vendor website.

5. In the current sales proposal that is sent to the customer, the development project, content upload to the vendor platform, and annual maintenance and support are separated to recognise different *revenue streams*. The building product manufacturing customers are willing to pay for the whole package as they prefer to outsource the BIM content creation and they recognise the value of annual

maintenance and support services. Whereas structural engineers and consultant offices can sometimes manage themselves if they have good enough experience on the vendor software and the platform.

6. The current value proposition requires the case company to have the vendor software license and an adequate amount of knowledge on the vendor software to deliver the software development services. The case company expert or project manager is a *key resource* to handle sales, customer relationships and development projects with the key partner. Key partner is needed to deliver the value proposition while keeping the cost structure secured. Currently all the experts working for the case company are from a structural background as is the key partner and this is a good fit when offering services for the vendor 1 software. The case company does not have any experts working for them with knowledge of architectural or Mechanical, Electrical and Plumbing (MEP) fields in Finland, however the parent company has a wider range of software developers and experts in Europe. Currently the organisation does not have any own software developers that would be familiar with the vendor software.

7. *Key activities* are aligned with customer relationships, distribution channels and revenue streams. The current recognised key activities were software development, sales and marketing, project management, testing, content creation and upload, monthly reporting, support, and knowledge management on vendor software.

8. The case company has one *key partner* and in most projects the software development is outsourced to the key partner. In addition, the key partner performs testing and crates content for the vendor platform where the tools are published. Case company expert or project manager oversees the sales process, customer contacts, testing and content upload to the vendor platform. The case company manages the monthly reporting and customer support after the development project. The case company has a training partnership with the software vendor, but they are not a reseller for the vendor software.

9. *Cost structure* consists of the case company employee salaries and hardware, marketing expenses and yearly license fee of the software vendor license. Currently one license has been enough for the case company as the key partner

purchases their own licenses. When it comes to a single development project the key partner cut is the main cost. Using a key partner reduces the risks in case there are no development projects.

4.4 Analysis of Competitor Business Models

Competitor data was collected from websites and analysed. The software vendor website lists other companies offering similar services. Most competitors are in other countries than Finland and offer services in their native language. European and Asian based companies often have their websites only in their native language and not in English, some contacts do not even have a website. The competitor companies are often small, employing 1-2 people, and the software development services are directed more towards the structural engineers and consultant offices rather than the building product manufacturers and suppliers. Some competitors are restricting their development services to a material, e.g., only steel, or speciality areas such as exporting information from the vendor software to a production machinery or Enterprise resource planning (ERP) systems.

The case company key partner could be categorised as a competitor. The key partner employs two people currently and the partnership has been working well, the case company has better capabilities and structure to support the sales and marketing process and that is valued by the customers. The partnership allows the key partner to focus on the software development and the case company manages the projects and customer contact.

Some consultant offices are providing software development services to the building product manufacturers and suppliers. The need to have building product BIM content in the vendor software comes from the structural engineers and consultant offices. They are indirect customers for the building product supplier companies, and they often make the decision what product should be used in the building project. In the beginning the software vendor created generic BIM content but not company specific content. There have not been companies offering software development services for the building product manufacturers and suppliers, they started buying the service from the consultant offices that had the need for them and they knew the vendor software better. A Few building product manufacturers hired own developers and created content in house.

4.5   Comparison of the Existing Model, Customer Needs and Competitor Models

The case company offers software, training, support, and professional services for the construction sector for several software vendor products. The software development services complement this offering and has proven profitable with the first customers from the building manufacturing industry in Finland. The case company structure and existing sales, marketing and support processes provide a solid foundation for the new service business model and against competitors.

The current value proposition for BIM content creation for the building product manufacturing industry meets customer needs well. The other two value propositions expand the offering and case company can deliver them. The development process is more unique for applications and tools for the structural engineers and consultant offices and there are more competitors offering the same service. The customer needs are not as clear for the structural engineers and consultant offices. The competitors listed in the vendor software website are not seen as a big threat for the case company as the Finnish customers often want to communicate in Finnish language, especially the ones whose market area focus is domestic market and communicating is easier when you are in the same time zone. The same is in post-delivery support and for the monthly report, customers can choose whether they want it in Finnish or in English language.

Consultant offices often develop the BIM content based on their own needs that might come from a particular project and then building product supplier and manufacturer needs are overlooked. Software development is not their core business, but they can offer competitive pricing if they are offering software development with the same pricing as engineering and consultant services for building projects.

4.6   Development Needs and Summary of the Current State

This sub-section provides an overview of the key strengths and weaknesses identified in the current state analysis of the current service business model. The existing business model was assessed from the big picture perspective and from a building block perspective. Some strengths and weaknesses were discovered when the existing model, customer needs and competitor models were compered in the previous sub-section. In addition, each building block of the business model presented in Figure 16, was evaluated and the strengths and weaknesses are illustrated in Figure 17.
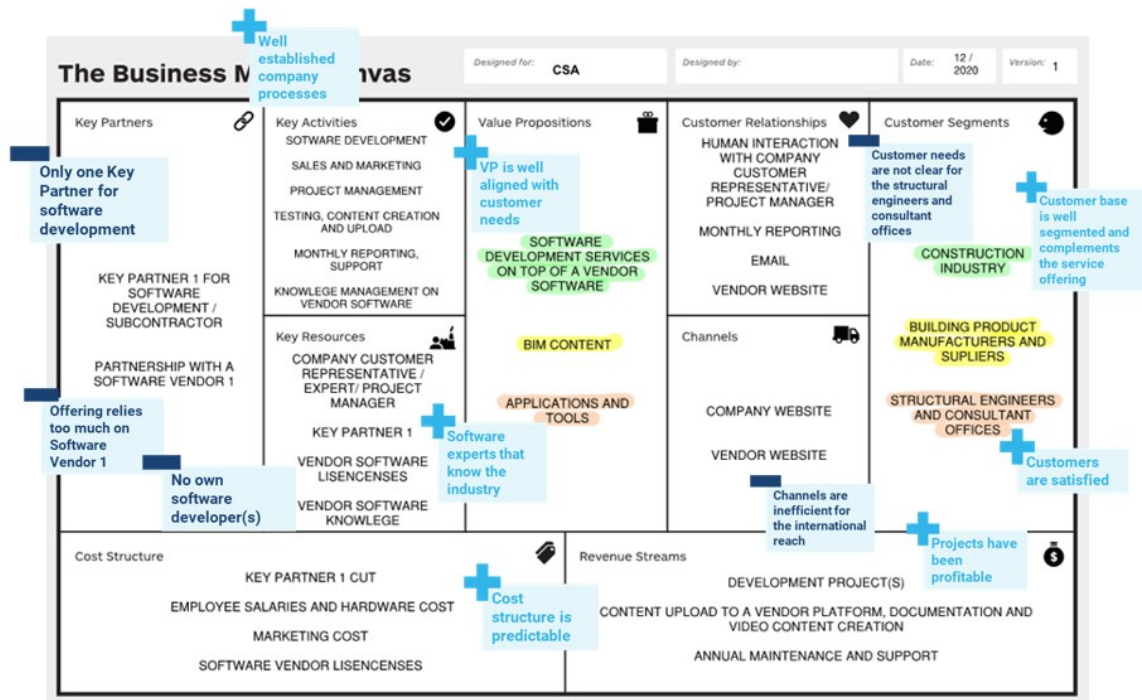
Figure 17.   Strengths and Weaknesses of the Current Business Model.

The value proposition and customer segments were identified as strengths of the current business model illustrated in Figure 17. The case company has well established sales and marketing processes that differentiate them from the competitors. The case company project manager and software experts are responsible of the customers relationships are well taken care of and the customers have been satisfied. The financial viability of the current business model is strong as the cost structure is predictable, the key partner reduces the risks in case there are no development projects, and as of now the projects have been profitable.

To increase the competitiveness and grow the business, the current model relies too much on one software vendor and a key partner. The case company is not able to offer the monthly reporting service included in the annual maintenance service without the BIM content been published in the software vendor 1 website. The case company can currently work on one project at the time as the key partner is a small company and does not have any own software developers that know the vendor 1 software.

To improve the current service offering the case company should see how they can benefit and utilise the parent company resources and expertise and how the organisations

service offering is positioned in the international market. Summary of the strengths and weaknesses of the current business model are presented in Table 4.

Table 4.   Summary of Strengths and Weaknesses of the Current Business Model.

Strengths	Weaknesses
Strong value proposition for building product manufacturers and suppliers	**Business model relies too much on Software Vendor 1**
First customers are satisfied, and profitable revenue stream established	**Only one Key Partner for software development**
Software experts that know the industry	**No own software developer(s) for Software Vendor 1**
Complements the case company service offering and mission	Customer needs are not clear for the structural engineers and consultant offices
Case company structure and processes (sales, marketing support)	**Service offering is not known in the international market**

All the highlighted weaknesses in the Table 4 were selected for further development. The data collection to clarify the customer needs for the structural engineers and consultant offices will be done in the implementation phase of the business model which is not a part of this study.

The parent company operating in Europe offers valuable resources and an opportunity to expand the service offering to international markets. The current service business model can work as it is for the international market because the vendor software is used globally, but the case company needs to increase awareness of the service offering as it has now operated only in the domestic market. The organisation's mission statement is to guide AEC and manufacturing companies in their digital transformation and the service offering supports it well.

With the results of the Current State Analysis and the Conceptual Framework presented in Section 3, the next section focuses on building an initial business model proposal for the case company.

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5 Creation of Initial Service Business Model for the Case Company

In this section, the outcomes of the Conceptual Framework (CF) and the Current State Analysis (CSA) are combined to make an initial service business model proposal for the case company.

5.1 Overview of This Data Stage

In order to build the initial proposal for the new service business model for the case company and to present the business concept to the parent company a second round of data collection was arranged. The Data 2 collection started with an internal workshop with the same company stakeholders that participated in the Data 1 collection for the CSA. The face-to-face workshop started with a presentation of CF and CSA findings, after which the participants shared their suggestions for the initial proposal that are discussed in more detail below in Sections 5.2, 5.3 and 5.4. During the workshop field notes were collected for the framework tools used in the study and analysed later.

After the workshop, the data collection continued with discussions with the case company General Manager to add on and finalise the topics covered in the workshop. Internal documentation from previous business models was viewed to get ideas for building the initial service business model. The plan for the Data 2 collection was presented in Section 2.

The Business Model Canvas and the Value Proposition Canvas tools developed by Alexander Osterwalder was selected for the study based on the CF presented in Section 3 and the tools were used to present the collected data in the CSA. The CSA in Section 4 identified the development needs for the service business model to grow and expand the service to international markets. In this section, the same tools are used for the second time as the business model is reviewed by the company stakeholders to discuss the development needs and create the initial service business model proposal.

The first step was to revaluate the Business Model Canvas designed for CSA based on the identified strengths and weaknesses. The second step was to modify the Value Proposition Canvas based on the changes made for the Customer Segments and Value Prop-

ositions building blocks on the Business Model Canvas. The key results were generalised and collected to the Business Model Canvas and the Value Proposition Canvas templates.

The third step was to assess the business model environment, market trends and if the information gathered on the competitors in the CSA stage presented in Section 4.4, was still valid. Blue ocean strategy tools were used to further evaluate the competition and the business model environment, to recognise new trends and market areas. The final subsection presents the initial service business model proposal for the case company.

5.2   Business Model Canvas

The case company experts have knowledge on the vendor 1 BIM software. However, one of the development needs for the business model was that it relies too much on software vendor 1 and one of the first suggestions in the workshop was to expand the offering to include a key partnership with another software vendor that the parent company has more expertise on. The parent company is a reseller and offers software development services for the software vendor 2 products.

Vendor 1 BIM software is only used by structural engineers where vendor 2 BIM software is used by architects, structural and MEP engineers. BIM content for building product manufacturers and suppliers can be offered for both vendor BIM software where applicable as there are not known companies providing that now successfully. The software developers or key partners that the development is subcontracted to are typically separate for vendor 1 and vendor 2 software.

Once the decision was made to add the software vendor 2 as a key partner the other building blocks of the Business Model Canvas were reviewed and modified accordingly. The Business Model Canvas designed for the initial Service Business Model proposal is illustrated in Figure 18 and the changes made after the Current State Analysis are highlighted in yellow.
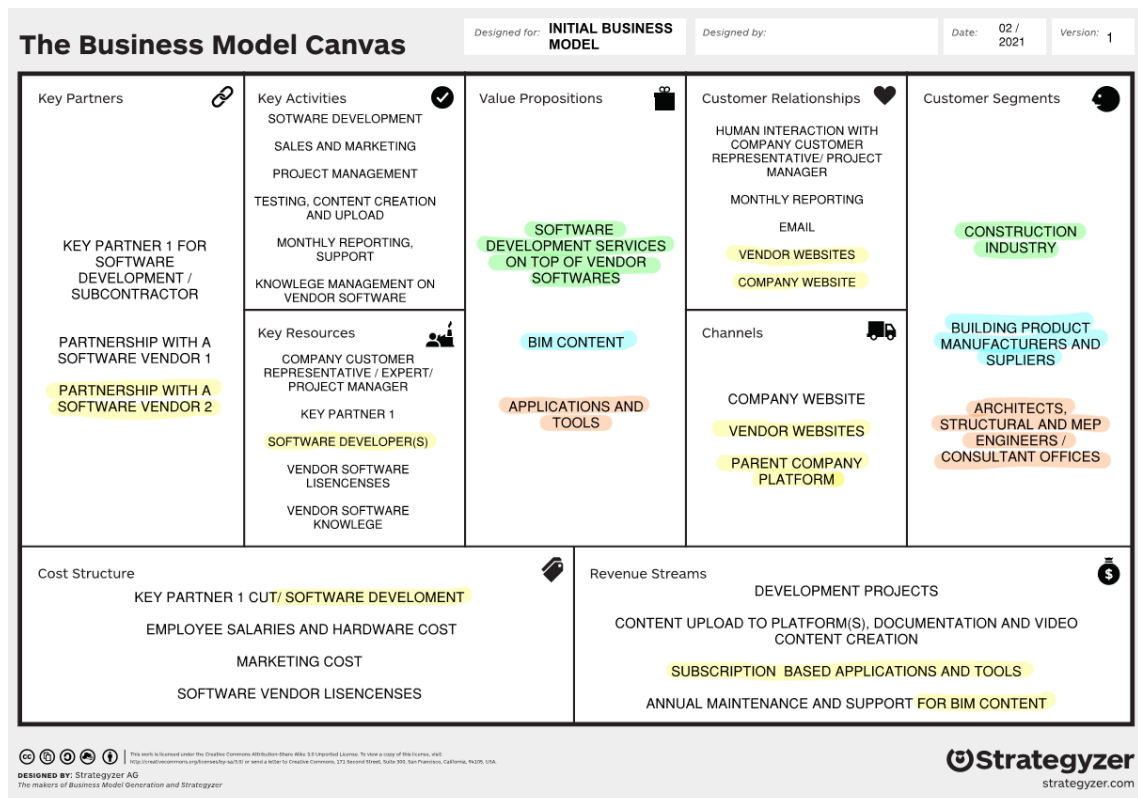
Figure 18. The Business Model Canvas designed for the initial Service Business Model proposal.

1. The construction industry and building product manufacturers and suppliers *Customer Segments* were kept the same as in the CSA Business Model Canvas presented in Section 4.3. In the Business Model Canvas designed for the initial Service Business Model proposal, illustrated in Figure 18, the third customer segment was expanded to include architects and MEP engineers as the software vendor 2 products are also used by those customer segments.

2. The *Value Proposition* block for the Business Model Canvas designed for the initial Service Business Model proposal was kept the same as in the Business Model Canvas designed for the CSA because it was identified as a strength of the business model and all three value propositions complement the case company service offering and mission.

3. Now both software vendor websites are considered as *channels* to communicate the value proposition to the customers. Merging the case company and the parent company brands brings an opportunity to implement the service offering to the

parent company website that would increase the visibility in the international market. The parent company platform is required to publish the BIM content and developed tools for both vendor software and to increase competitiveness. The own platform will allow a method to collect a fee or sell tools in the platform and that is missing from the software vendor 1 platform. However, having an own platform does not exclude content sharing in other platforms as well.

4. *Customer relationships* were expanded to include both vendor websites and the importance of the company website was recognised. The parent company platform on the website can be built so that the same method to deliver the value proposition to the customer by a monthly report of the views and downloads of the published BIM content can be kept.

5. The *Revenue streams* identified in the CSA are still valid for the BIM content value proposition. Since the parent company software development services for the software vendor 2 BIM software is focused more on the applications and tools for designers that are offered either free or with subscription-based pricing model it was added as a distinct revenue stream.

6. Own software developers were added to the *Key resources* building block as the parent company has software developers for the software vendor 2 products. Otherwise, the previously defined key resources vendor software licences and vendor software knowledge are valid for the software vendor 2 as well.

7. The *Key activities* building block did not require any changes compared to the CSA Business Model Canvas. The case company has well established processes for sales and marketing that support the key activities and it is important to retain them throughout the transition period.

8. The decision to add the software vendor 2 as a *Key partner* was the key change made to expand the business model to the international market and increase the competitiveness. With this change the business model has more potential to grow as it is no longer relying only on the software vendor 1.

   The fact that the organisation has only one *Key partner* for the software development and no own software developers for software vendor 1 were identified as a

development need in the CSA stage. As a solution, it was discussed that the case company can employ software developers or create other similar partnerships to subcontract the software development when the business starts growing. This study was restricted to one key partner to start with and the possibility to be fine-tuned to other partners and market areas at a later stage.

9. With the use of the key partner 1 for the software development the *Cost structure* is predictable and profitable. The use of own software developers was added as they would be used for the vendor 2 software development projects.

5.3 Customer Value Proposition

Based on the changes made for the Customer Segments and Value Propositions building blocks on the Business Model Canvas the Customer Value Proposition Canvas was reviewed and adapted. At this stage, the suggestions were made by the company stakeholders and no new customer interviews were performed. As stated in Section 4.6, the data collection to clarify the customer needs for the architects, structural and MEP engineers will be done in the implementation phase of the business model which is not a part of this study.

The revised Customer Value Proposition Canvas is illustrated in Figure 19 and the changes made after the CSA stage are highlighted in yellow.
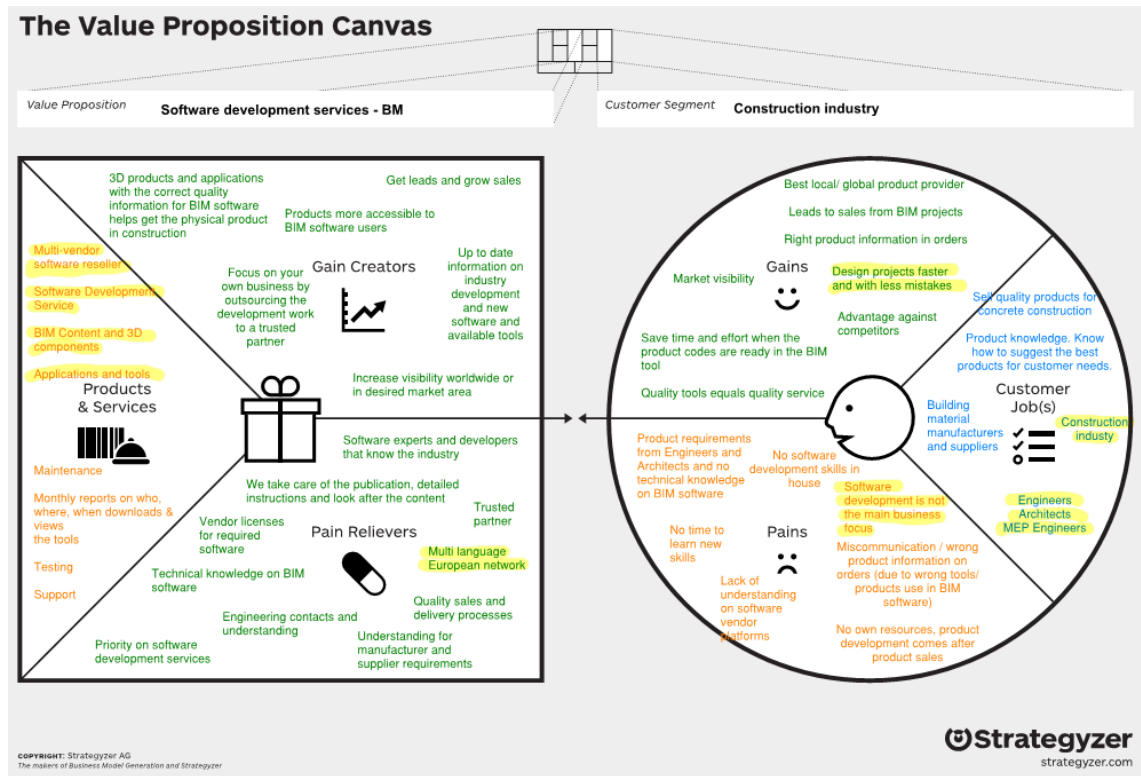
Figure 19.   The Value Proposition Canvas for the initial Service Business Model proposal.

The customer profile on the right side of the Figure 19 was adjusted to cover the whole construction industry where in the CSA stage it focused on customers in the building product manufacturing and supplier segment. Construction industry, architects and MEP engineers were added to the customer jobs section as the software vendor 2 products are used by those customer segments. "Software development is not the main business focus" statement was added to the pains segment as it valid for all the customer segments. The developed applications and tools deliver gains to the architects and engineers using them and they can "design projects faster and with less mistakes".

The Value Map on the left side of the Figure 19 was revised so that the products and services segment now include the full service offering of the case organisation. "Multi language European network" statement was added to the pain relievers segment as it was identified that in some of the countries that the parent company operates communication in the native language is appreciated.

5.4   Business Model Environment

This sub-section discusses the business model operating environment and the external forces that influence the design choices. Understanding the business model environment and other players in the field helps to create stronger and more competitive business models.

5.4.1   Engineering and Construction Industry Outlook and Market Trends

According to Deloitte (2021) engineering and construction industry outlook digital investments, creating long-term efficiencies and new approaches to partnerships and workforce will increase competitive advantages for companies. Some of the engineering and construction industry is lagging other industries in digital strategy and maturity, so there is pressure to increase the pace of digital investments that deliver value and return on investment. One approach is for companies to identify ecosystem partners they can work with to enable connected construction together (Deloitte 2021).

The industry is likely to witness strong activity in both traditional and non-traditional partnership approaches, companies are expected to target different business models such as alliances to complement their expertise and targeted consolidation (Deloitte 2021).

Building Information Modeling (BIM) technology is no longer a new concept but the use is growing as it is helping larger projects run more efficiently. Off-Site, prefabrication and modular construction projects are increasing and can address long-term costs and margin issues. Engineering and construction companies can achieve advantages by investing and moving toward advanced construction materials (Deloitte 2021).

Environment and combating climate change will continue to be one of the key market trends affecting construction and engineering industry. These industry outlook trends support the case company business model proposal where the value proposition is to offer software development services for the construction industry. The business model relies heavily on partnerships and alliances, the service offering is based on partner BIM modeling software that promotes digitalisation, and a key partner is used for the software development. It is likely that building product manufacturers and supplier companies are exploring next-generation materials, prefabricated and digitalised ways of construction, that encourage sustainability.

5.4.2 Competitors

The first round of competitor data was collected at the CSA stage and presented in Section 4.4. The competitors recognised at the first round are still valid when it comes to the BIM content service offering for the software vendor 1. Those were, the companies offering similar software development services and that are listed in the software vendor 1 website, and for Finland market, in house development and the consultant offices that are providing software development services to the building product manufacturers and suppliers.

When the software vendor 2 was added as a key partner the competitor data required another data collection round as the software vendor 2 BIM software is used by a wider customer base and the BIM content, application and tools are offered in multiple platforms. The additional data was collected from websites, analysed, and presented in the detailed service business model that is labelled confidential by the request of the case company.

The parent company has recently acquired other companies in Europe that offer applications and tools for the software vendor 2 BIM software. The acquisitions have strengthened the positioning of the organisations service offering and removed companies that were previously known as competitors. The organisation has gained already developed content for the own platform that is established after the transition period.

The BIM content for the software vendor 2 is offered and shared in multiple different platforms as for the software vendor 1 the most know platform globally is the software vendor 1 own platform. For the software vendor 2 the platforms are typically either focused on a certain customer segment content, e.g., architectural, or interior design related content or the platform provider is known in a particular country and offering content for that specific country.

5.4.3 Business Model Perspective on Blue Ocean Strategy

Blue ocean strategy tools were used to further evaluate the competition, the business model environment, and to recognise new trends and market areas where the competition does not exist. Blue ocean strategy four actions framework questions were asked about each business model building block to identify which elements of the value proposition can be eliminated, reduced, raised, or newly created. The exercise was done to

find out if there is more value to be created for customers with lower operating costs. The results are presented in Table 5.

Table 5.   Four Actions Framework on the Business Model Canvas designed for the initial Service Business Model proposal.

ELIMINATE	RAISE
Which of the factors that the industry has long competed on should be eliminated?	Which factors should be raised well above the industry's standard?
Non manufacturer specific / generic BIM content	Content documentation, quality, maintenance service, productization

REDUSE	CREATE
Which factors should be reduced well below the industry's standard?	Which factors should be created that the industry has never offered?
	Helpdesk, multi-vendor service provider, partnerships with software developers and other platforms

The right-hand side of Table 5 represents value creation, and the left-hand side represents costs. The cost structure and profitability were identified as strengths of the business model and there were not many factors found in the workshop to eliminate or reduce costs. It was discussed that the case organisation should not promote or create non manufacturer specific or generic BIM content but then this does not require any changes for the business model.

In terms of increasing value, it was recognised that the content documentation, quality, and maintenance service raise value and to make it more cost effective the processes could be more productized in the implementation phase. The case organisation can create more value by offering helpdesk service and option to create BIM content for different vendor software for manufactures. This will not increase costs as the case organisation already has an operating helpdesk service function. Forming partnerships with software developers and other platform providers enhances and allows the case organisation to offer a variety of value features or services that do not significantly increase the cost structure.

Industry Strategy Canvas captures the current state of the known market space, it displays the factors that the industry currently competes on, where the competition invests and what customers are receiving from the existing market offering. The vertical axis in Figure 20, captures the offering level that customers receive across all these key competing factors. A high score means that a company offers customers more and therefore the customer is willing to invest more in that factor.

Two competitor companies, consultant offices and manufacturers and suppliers that do in house development were compared against the case organisation in the Industry Strategy Canvas presented in Figure 20.
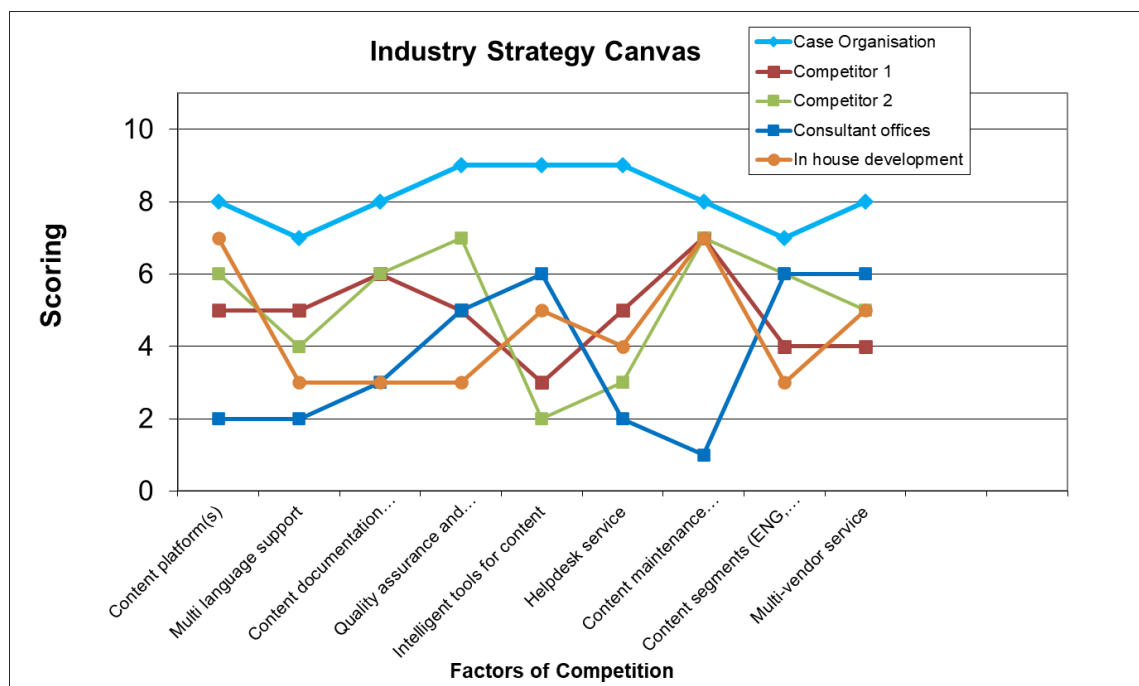
Figure 20.   Industry Strategy Canvas for software development services.

The key competing factors are captured in the horizontal axis of the Industry Strategy Canvas illustrated in Figure 20. The following factors for competition were considered and evaluated:

Content platform(s): Is there a platform or multiple platforms where BIM content is published or shared? Who does it reach? With the case organisations own platform, the offering would cover multiple software vendors and all designers (Architects, Structural and MEP Engineers). For building product manufacturers and suppliers, the BIM content can be offered to publish in multiple platforms.

Multi language support: The case organisation can offer support and services locally and communicate with the customer in their native language with the support of colleagues and experts in Europe. If competitors expand to the same markets this advantage can be lost.

Content documentation (instructions in form of text, pictures, and videos): Is content documented? Is documentation service offered? The case organisation can offer and recognise added value by distinguishing the content documentation from the development project.

Quality assurance and content testing: Is content high quality and tested? How? The case organisation has software experts and developers that know the industry who can convince the customer to order high quality content and tools that are better than the competitor offering. The case organisation experts have the know-how on partner software capabilities and new features.

Intelligent tools for content: The case organisation offers own tools for the partner software. The case organisation experts know how to combine the needs of a designer with the features of the content and tools. Most competitors are only focused on BIM content creation or tools for software users, not both.

Helpdesk service: Is helpdesk service offered? Software vendors offer helpdesk services for the software users. For BIM content platforms helpdesk service is missing, yet there is a need for that for manufactures when they get questions from the designers regarding BIM content use in the software. With the case organisation offering manufacturers can rely on the support from its experts.

Content maintenance service / Analytics for marketing and sales: Is content maintenance service part of the offering? Can analytics be extracted from the platform? The case organisation can benefit form its own platform and the features implemented there. Currently vendor 1 platform allows this type of service, but it is unknow how well e.g., consultant offices and companies doing in house development are utilising the features.

Content segments (ENG, ARK, MEP): To whom is the content created for? Who is the end user of the service offering? The case organisation can offer software development services and BIM content for all designers (Architects, Structural and MEP Engineers).

Multi-vendor service: The case organisation can offer software development services for both partner BIM software, where the competitors have expertise or are only focused on one software vendor. Building product manufacturers and suppliers can order BIM content for both software from the same provider.

The case organisations value curve was created by plotting the key competing factors with the offering level. Based on the graphic illustration in Figure 20, the case organisation is positioned above its industry's factors of competition, within the untapped market space, where creation of new demand and profitable business growth opportunities exists.

5.5   Initial Service Business Model Proposal

The initial service business model identifies two main customer segments within construction industry with distinguished value propositions and revenue models for software development services. The first one includes the software users, architects, structural and MEP engineers and consultant offices. The second one is the building product manufacturers and suppliers.

Users

Customer segment: Architects, Structural and MEP Engineers and Consultant offices

Value proposition: Applications and tools for software vendor 1 and software vendor 2 BIM software to streamline and automate the design and modeling.

Revenue model: Free and subscription-based tools.

Manufacturers

Customer segment: Building product manufacturers and suppliers

Value proposition: BIM content creation for software vendor 1 and software vendor 2 BIM software.

Revenue model: Development project, where BIM content upload to the selected platform, documentation and video content creation has been separated to recognise the added value.

Users annual recurring subscription revenue model is based on the parent company existing pricing models. Manufacturers recurring subscription-based pricing model has three tiers that includes the annual maintenance and support. The detailed service business model is labelled confidential by the request of the case company.

With the initial service business model proposal for the case company now established, the next section concentrates on feedback received and corrections to the initial proposal.

6   Feedback on Proposed Service Business Model

In this section, the feedback received and corrections to the initial proposal are presented and based on the feedback, the final service business model proposal is presented.

6.1   Overview of This Data Stage

The initial service business model proposal was presented to the key stakeholders in an internal workshop to collect feedback. The key stakeholders included the same members that participated building the initial service business model proposal presented in Section 5 and participants from the parent company. Based on the feedback the initial business model proposal was enhanced and the improved business model is the final business model proposal and the outcome of this study.

6.2   Feedback Received and Corrections to Initial Proposal

In the workshop, the initial service business model proposal, that consisted of the Business Model Canvas and the Value Proposition Canvas templates, business model environment and competitor data was presented, and it was approved by the key stakeholders without major changes in the final proposal.

The parent company own platform is needed to publish the BIM content and developed tools for both vendor software in order to increase competitiveness and not be so depended on vendor or partner platforms. Own platform is essential to execute the presented revenue model. Discussions about the features that the own platform should have was held during the workshop and the parent company has a task force group to plan and implement the organisations website and platform further.

BIM content creation needs more specifications for Vendor 2 software per customer segment and the parent company expertise is required for the detailed business model. However, the data collection to clarify the customer needs for the architects, structural and MEP engineers will be done in the implementation phase of the business model which is not a part of this study. In a later stage the value proposition for the tools and applications development can be separated as an own business model.

From past projects it was identified that the building product manufacturing and supplier customers need help to bring awareness to the BIM software users of the published BIM content. During the workshop new marketing options for BIM content were recognised. To productize the offering further it was discussed that a newsletter and social media post cost could be added on the sales proposal that is sent to the customer. In the sales proposal the development project, content upload to the vendor platform, annual mainte-nance and support and marketing options should be separated to recognise different revenue streams and for billing processes. Some building product manufacturing cus-tomers could be willing to pay and participate for a written article or a webinar with the customer to promote the products.

6.3   Final Service Business Model Proposal

The final service business model proposal consists of the Business Model Canvas and the Value Proposition Canvas templates, outlook of the business model environment and market trends, and information gathered on the competitors, presented in Section 5. Blue ocean strategy tools were used to further evaluate the competition and the business model environment, to recognise unexploited market areas.

The final service business model identifies the same two main customer segments within construction industry with distinguished value propositions and revenue models for soft-ware development services. The first one includes the software users, architects, struc-tural and MEP engineers and consultant offices. The second one is the building product manufacturers and suppliers and based on the feedback the marketing options were recognised as added in the revenue model.

Users

Customer segment: Architects, Structural and MEP Engineers and Consultant offices

Value proposition: Applications and tools for software vendor 1 and software vendor 2 BIM software to streamline and automate the design and modeling.

Revenue model: Free and subscription-based tools.

Manufacturers

Customer segment: Building product manufacturers and suppliers

Value proposition: BIM content creation for software vendor 1 and software vendor 2 BIM software.

Revenue model:

- Development project, where BIM content upload to the selected platform, documentation and video content creation has been separated to recognise the added value.

- **Marketing options: Newsletter and social media post/ Article / Webinar.**

Users annual recurring subscription revenue model is based on the parent company existing pricing models. Manufacturers recurring subscription-based pricing model has three tiers that includes the annual maintenance and support. The detailed service business model is labelled confidential by the request of the case company.

The seventh and the final section of the study summarises the project, recommends the next steps towards the implementation of the service business model and provides a self-evaluation of the study.

7 Conclusions

This final section of the study contains an executive summary, recommendations for the practical next steps towards the implementation of the plan, a self-evaluation of the thesis and its results, and finally the closing words.

7.1 Executive Summary

The objective of the thesis was to establish a new business model for the case company that offers software development services for the construction industry. The current service offering for the building product manufacturing industry in Finland is developed on a partner software and published on the partner platform. The case company has been acquired recently by a company established in Europe and the acquisition provides an opportunity to expand the service to international markets.

The selected research approach of the study was applied action research utilising case study and qualitative data gathering methods since the research of the study consisted mostly of open questions, theme interviews and the purpose of the data collection was to gather information for the service business model. The action research cycles represented the different stages of the study and the method supports the logic that business models must be continuously reviewed throughout and after implementation.

The Conceptual Framework (CF) was selected to be the first stage of the study for the purpose to identify relevant framework tools and find significant questions for the interview templates to be used in the Current State Analysis (CSA) stage. The Business Model Canvas and the Value Proposition Canvas framework tools were selected for the study as the tools are also used by the parent company. The Customer Profiles created for the Value Proposition Canvas provide valuable data of the customers that can be exploited for other and future business models.

The CSA stage collected data about the customer needs, the case company current business model, and the competitors. The data was gathered from existing documents related to the current offering, from customer and internal interviews with the case company experts and stakeholders. Information on competitors and competitor business models was collected from websites. The data was analysed and gathered to the Business Model Canvas and the Value Proposition Canvas templates.

The CSA revealed that one of the current business model strengths was the three value propositions that match with the identified customer segments: (1) the case company offers software development services for the construction industry, (2) BIM content creation for the building product manufacturers and suppliers, and (3) applications and tools developed for structural engineers and consultant offices.

The following four weaknesses were selected as development needs of the current business model: (1) the business model relies too much on software vendor 1, (2) the case company has only one key partner for software development, (3) the case company does not have any own software developers for software vendor 1, and (4) currently the service offering is not known in the international market.

The initial service business model proposal was built based on the findings of the CSA and the tools discovered in the CF stage were used for the second time. The initial business model proposal was established with the key stakeholders in an internal workshop and finalised later with discussions with the case company General Manager. The initial service business model proposal consisted of the Business Model Canvas and the Value Proposition Canvas templates, outlook of the business model environment and market trends, and information gathered on the competitors. In addition, blue ocean strategy tools were used to further evaluate the competition, the business model environment, and to recognise unexploited market areas.

Based on the development need (1), that the business model relies too much on software vendor 1, a software vendor 2 was added as a key partner since the parent company is a reseller and offers software development services for the software vendor 2 products. With this change the business model has more potential to grow and expand the offering to the international market.

To further increase the visibility in the international market and improve the development need (4), currently the service offering is not known in the international market, the initial proposal suggested merging the case company and the parent company websites and establishing an own platform for the organisation to publish the BIM content and developed tools. To solve the development needs (2) organisation has only one Key partner for the software development, and (3) no own software developers for software vendor

1, the initial service business model proposed that the case company can employ software developers or create other partnerships to subcontract the software development when the business starts growing.

The initial service business model identified two main customer segments within construction industry with distinguished value propositions and revenue models for software development services. The first one includes the software users, architects, structural and MEP engineers and consultant offices. The customer segment was expanded to include architects and MEP engineers as the software vendor 2 products are also used by those customer segments. The second one is the building product manufacturers and suppliers.

The initial service business model was presented and approved by the case company key stakeholders and participants from the parent company in an internal workshop without major changes in the final proposal. During the workshop new marketing options for the building product manufacturers and suppliers were recognised and added to the final proposal. The final service business model presented a unique service offering for users and manufactures. A recurring subscription-based pricing model with three tiers for manufacturers was presented in the detailed service business model that is labelled confidential by the request of the case company.

The new service business model supports the organisation's mission to guide architecture, engineering, and construction (AEC) and manufacturing companies in their digital transformation. The business model creates a cohesive service offering for the organisation and an opportunity to expand the offering to the international markets with competitive advantage. The business model offers a solution how building product manufacturers can provide BIM content for BIM software used by the AEC industry.

7.2   Next Steps and Recommendations towards Implementation

This section presents suggestions for next steps and recommendations towards the implementation of the business model. The study provided a business model proposal for software development services for the construction industry, with two distinguished value propositions and customer segments: (1) applications and tools developed for structural engineers and consultant offices, and (2) BIM content creation for the building product manufacturers and suppliers.

The next step towards the implementation would require to further develop the service business model into a service business plan, that would describe the basic concepts of how the organisation is aiming at putting the business idea and business strategy into operation. The business plan should include a marketing plan, detailed look of finances, and a vision, targets and how to get there. The detailed business model includes a risks, strengths, opportunities, and threats analysis that should be considered when the business plan is created. As the case company is still going through the transition period, the future direction of the organisation depends considerably on the parent company. The parent company support, interest and commitment are key for the future of the service business model.

The business model should be considered when the case company and the parent company websites are merged and when the organisations own platform to publish the BIM content and developed tools is prepared and designed. Special focus should be placed on the features required for the platform. The platform should have the required architecture for the planned pricing and revenue models, the features to deliver the value proposition for the annual maintenance and support and functionality to insert content directly to the BIM software.

In addition to the organisation website, a marketing plan is key to further increase the visibility in the international market and create awareness of the offering specially for the building product manufacturers and supplier companies. Due to the Covid-19 pandemic new ways of doing marketing should be explored while keeping a look if the traditional event and fairs are organised, and which ones fit for the identified customer segments.

While the study was restricted to one key partner for the software development to start with and the possibility to be fine-tuned to other partners and market areas at a later stage, the practical next steps towards the implementation should inspect the possible partners for the software development and content platforms when the business starts growing. While the partnership approach is supported by the industry outlook, it would be recommended to review the organisations own expertise and development skills. Moving forward with multiple partners it would be advised if the BIM content creation projects could be productized further.

As stated in the research plan, business models and plans must be continuously re-viewed throughout, and adapted after implementation to keep up with the changing business model environment and technical innovations.

7.3 Thesis Evaluation

The objective of the thesis was to establish a new business model for software development services for construction industry. The new service business model was intended to support the organisation's mission to guide AEC and manufacturing companies in their digital transformation and to present the business concept to the parent company. The outcome of this thesis was a new service business model which was presented to the parent company stakeholders and validated that the business model supports well the organisation's mission. Therefore, it can be concluded that the result of the thesis meets the objective. However, the real business impact of the new service business model can only be verified after implementing it in the real business environment. Business models are never entirely completed as they require continuous evaluation throughout, and after the implementation.

To ensure that the results of the study are credible the quality of this thesis is evaluated in relation to the following tests commonly used in academic research: validity (construct validity, internal validity, external validity) and reliability.

Construct validity is ensured by using multiples sources of evidence, i.e., data collection methods, forming a chain of evidence, and allowing key informants to review the draft (Yin, 2014: 45-47). In this study, construct validity was ensured by interviewing both customers and company decision makers, feedback was collected on the initial proposal and the interviewees confirmed the translations. The chain of evidence was ensured by collecting field notes and recordings of the interviews and workshops. The service business model identified two main customer segments, software users and building product manufacturers and suppliers. The data collection was more focused on the manufactures and could be considered narrow as the data collection to clarify the customer needs for the software users was not a part of this study. However, the constraint was explained and considered throughout the study.

Internal validity is established when correct issues are researched a causal relationship is demonstrated between two variables. In a questionnaire-based survey internal validity

can be established when set of questions can be associated with a systematic outcome (Saunders et al., 2016: 203). In this study, the interview and workshop questions were prepared in advance and high-quality frameworks were used as inspiration. All the customers were interviewed using the same initial questions which allowed comparison between the interview results and key items could be identified, generalised, and combined in the relevant framework models. In the CSA stage the customer needs were validated further by the feedback survey sent to customers after the software development project.

External validity measures how well the research results can be generalised by answering the question how the findings can be transferred to another context or group? (Yin, 2014: 45-47). In this study the data was collected to establish a new service business model for a case company in a certain market segment. This means that this data cannot be directly transferred to another context. Since the objective of the study was to create a service business model only for the certain market segment and not to be generalised, external validity is not seen as a critical aspect of the study. However, characteristics of external validity was identified with different practices and the use of the framework tools found in the Conceptual Framework stage. E.g., the Customer Profiles created for the Value Proposition Canvas framework can be exploited for other and future business models.

Reliability means the consistency of the research results or the fact that if the research is replicated another researcher should be able to come up with the same findings (Kananen, 2013: 183-184). In this study, the researcher was an active participant rather than external participant of the study and was somewhat able to influence the results of the study. Nevertheless, the reliability was ensured by following methods: the use of several, high-quality sources from literature and existing knowledge and well planned and documented research and data collection processes. The data collection for the framework tools used in the study was executed as instructed by the authors. Furthermore, the preparation of the interview and workshop questions in advance prevented the research or the researcher to influence the research results.

7.4   Closing Words

Today countless innovative business models are emerging due to the competitive markets and companies need to be as creative as possible to discover the best opportunities

and prosper in the business environment. In this study, a need for a new software development type of service was identified and a new business model proposal was developed to support the future implementation of the service offering for the case organisation. Perhaps, not too far from now the BIM models are built with data rich BIM content that can transform the digitalisation of the AEC industry.

References

Amit, R. and Zott, C. (2001) Value creation in e-business. *Strategic Management Journal*. Jun/Jul 2001, Vol.22(6/7), pp.493-520.

Anderson, J. C., Naurus. J. A. and Van Rossum, W. (2006) Customer Value Propositions in Business Markets. *Harvard Business Review.* Vol 84 (3), 91-99.

Bock, A. J. and George, G. (2017) *The Business Model Book*. Harlow: Pearson Business.

Chesbrough, H. W. (2010). Business Model Innovation: Opportunities and Barriers. *Long Range Planning*. Vol. 43 (2–3), 354-363.

Detoitte Development LLC. (2021) *Engineering and construction industry outlook 2021.* Available from: https://www2.deloitte.com/us/en/pages/energy-and-resources/articles/engineering-and-construction-industry-trends.html [Accessed 20 February 2021].

Gassmann, H., Frankenberger, K. and Csik. M. (2014) The St. Gallen Business Model Navigator. Working Paper: University of St. Gallen: ITEM-HSG.

Johnson, M. W., Christensen, C. M. and Kagermann, H. (2008). Reinventing Your Business Model. *Harvard Business Review*. Vol. 86 (12), 50-59.

Kananen, J. (2013) *Design Research (Applied Action Research) as Thesis Research: A practical guide for thesis research*. Jyväskylä: Publications of JAMK University of Applied Sciences.

Kim, W. C. and Mauborgne, R. (2015) *Blue Ocean Strategy: How to create uncontested market space and make the competition irrelevant*. Expanded edition. Boston, Massachusetts: Harvard Business School Publishing.

Kim, W. C. and Mauborgne, R. (2021) *Blue Ocean Strategy & Shift Tools*. Available from: https://www.blueoceanstrategy.com/tools/ [Accessed 2 February 2021].

Morris, M., Schindehutteb, M. and Allen, J. (2005) The entrepreneur's business model: toward a unified perspective. *Journal of Business Research*. Vol. 58, 726 – 735.

NBS Enterprises Ltd. (2018) *The National BIM Report 2018. Page 31: BIM Objects*. Available from: https://www.thenbs.com/knowledge/the-national-bim-report-2018 [Accessed 12 December 2020].

Osterwalder, A. and Pigneur, Y. (2010) *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. Self-Published.

Osterwalder, A., Pigneur, Y., Smith, A., Bernarda, G. and Papadakos, P. (2014) *Value Proposition Design*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Payne, A. Frow, P., Steinhoff, L. and Eggert, A. (2020) Toward a comprehensive framework of value proposition development: From strategy to implementation. *Industrial Marketing Management.* Volume 87, May 2020, Pages 244-255.

Saunders, M., Lewis, P. and Thornhill, A. (2016) *Research methods for business students*. 7th edition. Harlow: Pearson Education.

Strategyzer AG. (2020) *Recourses for the Business Model and Value Proposition Canvas, tools and guides.* Available from https://www.strategyzer.com/resources/canvas-tools-guides [Accessed 18 December 2020].

Teece, D. J. (2010) Business Models, Business Strategy and Innovation. *Long Range Planning*. Vol. 43, 172-194.

Yin, R.K. (2014) *Case Study Research: Design and Methods*. 5th edition. Thousand Oaks, California: SAGE Publications.

The Value Proposition questions

Questions for Customer Profile (answered by customer)

Customer Jobs

i. What is the most important job/ task for your company? What does your customer expect from you? What problems are you trying to solve?

ii. What are your goals? Are they / How are they measured?

iii. Who is your customer? What is their profession or customer segment?

iv. How do you interact with your customers? In what situations?

v. How would you like other people/ your customers perceive you/ your company?

vi. How would you want to feel in your job or working for your company? What do you need to do to feel this way?

vii. What jobs or professions exist in your company? What type of jobs are supporting your job/ company?

Customer Pains

i. How do you define too costly? Takes a lot of time, costs too much money, or requires substantial efforts?

ii. What makes you feel bad? What are your frustrations, annoyances, or things that give you a headache in your job?

iii. How did we perform? Could we improve something (in the development project)?

iv. What challenges you encounter in your job? Are you concerned about something?

v. What negative social consequences do you encounter or fear? Are you afraid of a loss of face, power, trust, or status?

vi. What risks do you have in your job or in your company? Are they financial, social, or technical risks?

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vii.   What mistakes do you or your customers make?

viii.   What would you like to improve in your job or company? A process, implement something?

ix.   Is something stopping you from improving or implementing something new? Investment costs, a steep learning curve, or other obstacles preventing adoption?

Customer Gains

i.   Which savings would make you happy? Which savings in terms of time, money, and effort would you or your company value?

ii.   What does quality mean to you / your company? Is it measured someway, and what would you wish for more or less of?

iii.   How did we help you? Could we help you more with something? What performance and quality do you expect?

iv.   What would make your jobs or lives easier? Could there be a flatter learning curve, more services, or lower costs of ownership?

v.   How would you like to grow your business?

vi.   What were your expectations? Did we perform under or over your expectations?

vii.   What positive consequences do you desire? What makes you look good? What increases your power or status against your competitors?

viii.   What do you dream about? What do you wish to achieve, or what would be a big relief to you?

ix.   How do you/ your company measure success and failure? How do you measure performance or cost?

x.   What would increase your likelihood of adopting digitalisation? Lower cost, less investment, lower risk, or better quality?

Questions for Value Proposition Map (answered by case company stakeholders)

Gain Creators

Could our services…

 ... create savings that please our customers? In terms of time, money, and effort.

... produce outcomes our customers expect or that exceed their expectations? By offering quality levels, more of something, or less of something.

... outperform current value propositions and delight your customers? Regarding specific features, performance, or quality.

... make your customers' work or life easier? Via better usability, accessibility, more services, or lower cost of ownership.

... create positive social consequences? By making them look good or producing an increase in power or status.

... do something specific that customers are looking for? In terms of good design, guarantees, or specific or more features.

... fulfill a desire our customer dreams about? By helping them achieve their aspirations or getting relief from a hardship?

... produce positive outcomes matching our customers' success and failure criteria? In terms of better performance or lower cost.

... help make adoption easier? Through lower cost, fewer investments, lower risk, better quality, improved performance, or better design.

Pain Relievers

Could our services…

 ... produce savings? In terms of time, money, or efforts.

... make our customers feel better? By killing frustrations, annoyances, and other things that give customers a headache.

... fix under-performing solutions? By introducing new features, better performance, or enhanced quality.

... put an end to difficulties and challenges our customers encounter? By making things easier or eliminating obstacles.

... wipe out negative social consequences your customers encounter or fear? In terms of loss of face or lost power, trust, or status.

... eliminate risks our customers fear? In terms of financial, social, technical risks, or things that could potentially go wrong.

... help our customers better sleep at night? By addressing significant issues, diminishing concerns, or eliminating worries.

... limit or eradicate common mistakes customers make? By helping them use a solution the right way.

... eliminate barriers that are keeping our customer from adopting digitalisation? Introducing lower or no upfront investment costs, a flatter learning curve, or eliminating other obstacles preventing adoption.

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The Business Model Canvas questions for internal interviews

1. Customer Segments

    i. Which segments are we creating value for?

    ii. For whom are we creating value?

    iii. Who are our most important customers?

2. Value Propositions

    i. What value do we deliver to the customer?

    ii. Witch problems are we helping to solve for them?

    iii. Which customer needs are we satisfying?

3. Channels

    i. What channels are our customers using? How do we raise awareness about our company's offering and services?

    ii. How do our customers find us? How can customers purchase our services?

    iii. Which channels work best? How much do they cost? How are they integrated into our and our customers' routines?

4. Customer Relationships

    i. What kind of relationship our customer expects us to establish and maintain with them?

    ii. How do we communicate with customers?

    iii. How customer relationships integrated with the rest of our business model in terms of cost and format?

    iv. How do we deliver a Value Proposition to customers? How do we provide post-purchase support?

5. Revenue streams

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  i. For what value are customers willing to pay?

  ii. What and how do they currently pay? How would they prefer to pay?

  iii. What are our revenue streams? How much does each revenue stream contribute to overall revenues?

6. Key Resources

  i. What key resources our value proposition requires?

  ii. What resources our distribution channels require? Customer relationships? Revenue streams?

7. Key Activities

  i. What key activities do our value propositions require?

  ii. What activities our distribution channels require? Customer relationships? Revenue streams?

8. Key Partnerships

  i. Who are our key partners?

  ii. Which key resources are we acquiring from partners? What key activities partners perform?

  iii. What are the motivations for the partnerships?

9. Cost Structure

  i. What are the most important costs in our business?

  ii. Which key resources/ activities are most expensive?

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Customer 1 and Customer 2 Profiles

The Value Proposition Canvas

Customer (Segment) Profile: Customer 1

Gains

Best product provider in Finland

Leads to sales from BIM projects

Right product information in orders

Advantage against competitors

Save time and effort when the product codes are ready in the BIM tool

Quality tools equals quality service for engineers

Customer Job(s)

Sell quality products for concrete construction

Product knowledge. Know how to suggest the best products for customer needs.

Increase awareness in Finland and Nordic countries

Customers: Precast factories, contractors

Sales, CEO, Development Manger (engineers, BIM), logistic personnel. 8 employees in Finland, 80 in Nordic countries.

Supporting jobs: Engineers, Architects

Pains

Logistics delays on product deliveries

Financial risks, sales depend on economic trends in construction industry

Product requirements from Engineers and Architects and technical knowledge on BIM software

No software development skills in house

Miss communication/ wrong product information on orders (due to wrong tools/ products use in BIM software)

No own resources, product development comes after product sales

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The Value Proposition Canvas

Customer (Segment) Profile: Customer 2

Gains

Best in Finland

Leads to sales from BIM projects

Right product information in orders

Support and communication with native language

Help MEP and Structural Engineers

Market visibility and advantage

Now we have a partner we can turn for help when it comes to BIM software

Save time and effort for engineers when the product codes are ready in the BIM tool

Sell quality products for concrete construction and precast element production

Product knowledge. Expert in their specialty products.

Customer Job(s)

Increase awareness in Finland

Customers: Precast factories

Pains

Order and delivery delays due to missed or wrong product codes

No software development skills in house

Limited technical knowledge on BIM software

Miss communication/ wrong product information on orders (due to wrong products use in BIM software or Engineer manual writing)

Searching product codes from precast drawings

Limited own resources, product development comes after product sales

Sales, CEO, Technical Specialist, logistic and factory personnel.

Supporting jobs: Engineers, MEP designers

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