

How to choose the one?



A business case method for business models

Master of Science graduation thesis
Industrial Engineering & Management

Eelco Starreveld

August 16, 2012



UNIVERSITEIT
TWENTE.

HOW TO CHOOSE THE ONE?

A BUSINESS CASE METHOD FOR BUSINESS MODELS

Author Eelco Starreveld

Study program Master of Science in Industrial Engineering and Management
School of Management and Governance
University of Twente, Enschede, The Netherlands

Student number s0150320

E-mail eelcostarreveld@gmail.com

GRADUATION COMMITTEE

First Supervisor Prof. Dr. Ir. L.J.M. Nieuwenhuis
School of management and Governance
Industrial Engineering and Business Information Systems
University of Twente, Enschede, The Netherlands

Second Supervisor Ir. L.O. Meertens
School of management and Governance
Industrial Engineering and Business Information Systems
University of Twente, Enschede, The Netherlands

Logica Supervisor Ing. R. Kleizen
Project Leader Working Tomorrow Logica Arnhem
Logica, Arnhem, The Netherlands

Acknowledgements

Writing this thesis, has been an interesting experience. Spending seven months on researching a very specific topic, really enabled me to understand the value and beauty of scientific research. During my internship at Logica, I met many remarkable people who helped me to increase the quality of my research. I would like to express my sincere gratitude to those who helped me during this research.

First of all, I would like to thank my supervisors. I was lucky to have three of them. I would like to thank my two supervisors from the University for their effort guiding me in the right direction, their knowledge on my research topic, and their feedback on my work. I also want to thank René, my supervisor from Logica, for the daily support. It was great to experience the Tuesday morning SCRUM-meetings, progress meetings, and teasing MJ every now and then.

Furthermore, I would like to say thanks to my colleagues at Logica. I had a great time working with you. Especially Iliana and Maarten-Jan I want to thank for their help during my research. Next to the work, I will definitely remember the endless discussions about life, work, politics, religion, and multiple other topics. The days spend at Logica were enjoyable, memorable and often very intellectually stimulating.

Finally I want to express my love and gratitude to the people dearest to me. I want to thank my parents, bother, and sisters for the great support and wisdom over the last six years. Also, I want to thank my in-laws for their support and effort in educating me about farming. And last, be not least, my fiancée. Thank you for your love, support, and endless encouragement.

Eelco

Arnhem

August 16, 2012

Abstract

With the emergence of the dot.com era in the late 1990's, the first e-business models were introduced. After a rapid growth in research towards this phenomenon in the fifteen years after its introduction, the concept is nowadays better established and defined. Business models, as the concept is named since the last decade, represents and describes the rationale of how an organization makes, delivers, and captures value (Osterwalder & Pigneur, 2004).

Due to shortening product lives, intense global competition, a disruptive and agile environment, business models need to be renewed more rapidly and more frequently. In addition, the chosen course of action is of great importance for the future performance of organizations.

Based on the two stage framework of Casadesus-Masanell & Ricart (2010), in this research the relation between strategy, business models, and tactics is defined. Together with research towards the concept of innovation, three main causes of business model innovation are identified. The first one is strategically innovation. If an organization changes its strategy, this will influence and change the business model. The next one is business model innovation. In this case, the business model itself is innovated, and thus will lead to a renewed business model. Finally, in some cases where process and product innovation exceed the limits of the tactical set enabled by the business model, it influences and changes the organizations business model.

When a business model is renewed, in most cases, multiple alternative business models can be generated. Because of the importance of a business model to an organization, the choice of which of the alternative business models is chosen to be implemented, is of great importance to the organizations performance. Therefore, in this research a business case method is developed, to compare the business model alternatives, in terms of effects, risks, and costs, as objectively as possible. In order to be able to choose the best course of action.

The developed business case method for business models, consists of the following eight steps:

1. *Business driver – the cause, problem or opportunity that need to be addressed*
2. *Business objectives – the objectives that are aimed for and their stakeholders*
3. *Alternatives – representing the options there are to reach the objectives*
4. *Effects – positive and negative effects caused by the pursued alternative attached to an effect owner*
5. *Risks – risks that come with the pursued alternative*
6. *Costs – costs that come with the pursued alternative*
7. *Alternative selection – based on the gathered data the best alternative is chosen*
8. *Implementation plan – plan which explains when and how the alternative is implemented*

The method is demonstrated in a case study. This showed that the method worked, but that it is also very hard to keep the business case objective, for many choices depend on the subjective judgment of the business case maker and other stakeholders. A solution to decrease this subjectivity, is to outsource the task to make the business case, to an independent party.

Keywords: *Business model, business case, strategy, tactics, innovation, case study, business case method*

Table of contents

Table of contents.....	V
Table of figures.....	X
Table of tables.....	XI
1 Introduction.....	1
1.1 Thesis and problem definition.....	1
1.2 Goal and research question.....	1
1.3 Research design and methodology.....	2
2 Business models: a literature research.....	3
2.1 Approach, structure, sources, criteria, and a short literature overview.....	3
2.2 Early evolution of business models.....	7
2.3 Business models: what it is, what it is used for and what it is not.....	9
2.4 Business model components.....	16
2.5 Business model evaluation.....	20
3 Business cases: a literature review.....	24
3.1 Literature criteria, search and selection process.....	24
3.2 Business case: what it is, what it is used for, and what it is not.....	26
3.3 Business case components: two perspectives.....	28
3.4 Business case evaluation.....	35
4 Relation between BM and BC.....	36
4.1 Business models and organizations.....	36
4.2 Innovation as common factor.....	37
4.3 Business model innovation causes.....	38
4.4 The business case method.....	39
4.5 Business case component clarification.....	40
4.6 Business model mapping on the business case method.....	42
5 Method demonstration and validation.....	44
5.1 Company overview.....	44
5.2 Case description: The IP-Infrastructure.....	45
5.3 The business case.....	46
5.4 Method evaluation.....	57
6 Conclusion and discussion.....	59
6.1 Conclusion.....	59
6.2 Discussion.....	60
7 References.....	63

Table of figures

Figure 1: DSRM process (Peffer et al., 2007)	2
Figure 2: Search query	4
Figure 3: Literature selection process	5
Figure 4: Published business model articles from 1974 until 2012 retrieved from Scopus.com.....	7
Figure 5: Business Model Concept Hierarchy (Osterwalder et al., 2005a, fig. 2).....	9
Figure 6: Strategy, business model and tactics two stage framework (Casadesus-Masanell & Ricart, 2010).....	15
Figure 7: Components of business model affinity diagram (Shafer et al., 2005).....	16
Figure 8: Business model Canvas (Osterwalder & Pigneur, 2010)	17
Figure 9: Components of a business model (Hedman & Kalling, 2003)	18
Figure 10: Strengths and weakness assessment of the value proposition (Osterwalder & Pigneur, 2010).....	22
Figure 11: Threats assessment of value proposition (Osterwalder & Pigneur, 2010)	22
Figure 12: Opportunities assessment of value proposition (Osterwalder & Pigneur, 2010)	23
Figure 14: Business case literature selection process	25
Figure 13: Search query.....	25
Figure 15: Framework for developing a business case	29
Figure 16: Strategy, business model, tactics (Casadesus-Masanell & Ricart, 2010)	36
Figure 17: McDonald's case in the innovation opportunity grid (Tucker, 2002)	37
Figure 18: Degrees of Innovation (Tucker, 2002)	38
Figure 19: Risk assessment matrix	42
Figure 20: Visualization of business case method for business models.....	43
Figure 21: IP-Infrastructure schematic representation	46
Figure 22: Current business model of a Dutch housing corporation	48
Figure 23: Business model with IP-Infrastructure and C-Lock solutions.....	49
Figure 24: Risk assessment matrix classic infrastructure	53
Figure 25: Risk assessment matrix IP-Infrastructure.....	53
Figure 26: Surface plot of cumulative extrapolated costs over time and functions	55

Table of tables

Table 1: Business model literature overview	6
Table 2: Thematic Summary of Business Model Literature (George & Bock, 2011)	10
Table 3: building blocks description (Osterwalder et al., 2005a, p. 18).....	11
Table 4: Six questions that underlie a business model (Morris et al., 2005)	17
Table 5: Shared business model ontology components.....	19
Table 6: The leadership Action Agenda (Doz & Kosonen, 2010).....	21
Table 7: Business case literature overview	26
Table 8: BCD method comparison.....	34
Table 9: Effect overview	49
Table 10: Terms for quantifying likelihood (Tah & Carr, 2000).....	51
Table 11: Terms for severity quantification (Tah & Carr, 2000).....	51
Table 12: Classic infrastructure risk likelihood and severity overview.....	51
Table 13: IP-Infrastructure risk likelihood and severity overview.....	52
Table 14: Estimated construction costs, maintenance costs, and profit	54
Table 15: Difference between cumulative extrapolated costs over time and functions of the two alternatives.....	55
Table 16: Assessment of method's objectivity.....	57

1 Introduction

With the emergence of the dot.com era in the late 1990's, the first e-business models were introduced. After a rapid growth in research towards this phenomenon in the fifteen years after its introduction, the concept is nowadays better established and defined. Not only the name slightly changed, but also the fields of use and the model's possibilities increased. Business models, as the concept is named since the last decade, represents and describes the rationale of how an organization makes, delivers, and captures value (Osterwalder & Pigneur, 2004).

Due to shortening product lives, intense global competition, a disruptive and agile environment, business models need to be renewed more rapidly and more frequently (Chesbrough, 2007a). In addition, the chosen course of action is of great importance for the future performance of organizations. With the renewal of business models, multiple possible directions can be defined. A recent example is seen in the automotive industry. Car manufactures need to choose if they want to produce cars running on alternative energy, and next, which type of energy. Hybrid, bio-fuel, electric, or hydrogen are all options. Making the choice is hard, for each of the alternatives require a business model change and the success of the produced car is unsure. This is an example of the need for a method to objectively compare alternative business models, and choose the best course of action. A business case can be of help to form the answer to this question. A business case is a tool for identifying and comparing multiple alternatives for pursuing an opportunity and then proposing the one course of action that will create the most value (Harvard Business Review Press, 2010). Making a business case for the defined possible business model alternatives, gives the decision makers a solid and objective as possible basis, to make the best choice.

1.1 Thesis and problem definition

The thesis behind this research is as follows. Choosing one of the business model alternatives, should be well considered. Instead of a gut feeling, each of the alternative's consequences, impact, risks, and benefits for the organization, should be assessed as objectively as possible. This will result in a better choice, resulting in better organizational performance.

However, the main problem is that it is unclear how alternative business models can be compared in order to choose the best course of action. A business case could be one of the solutions, for it compares alternatives in terms of costs, benefits and risks. In order to scope the research and due to time limitations, the possibility of a business case as solution for the problem, is investigated in this research, without excluding other solutions to the problem. Therefore, it will be investigated what exactly is meant with the terms 'business model' and 'business case'. The next problem is that it is unclear how a business case can be a solution and if it works. To summarize, sub problems underlying the main problem are that it is unclear how a business model, and how a business case should be made. Also, it is unclear what good business model and business case components are, and which of those business model components are of relevance for the development of the business case.

1.2 Goal and research question

In this research, the topic is how business cases can be made to compare business models. The intended outcome of this research is a method to create an objective business case of business models. The goal of the research is to increase the quality of the decision making process of the possible business models attempted by developing a method to make a business case of potential business models, to objectively compare the alternatives. Some problems stand between the goal and the current situation. These can be overcome by answering the research question:

How to choose the best business model objectively by making a business case?

To make it easier and more structured to answer the research question, the following sub questions are defined:

1. *What is a business model?*
2. *What are the components of a business model?*
3. *What is a business case?*
4. *What are components of a business case?*
5. *What additional information is needed?*

1.3 Research design and methodology

The function of a research design is to ensure that the evidence obtained, enables answering the research question as unambiguously as possible (Vaus, 2001). The research design is based on the design science research methodology (DSRM) by Peffers et al. (2007). This method is chosen because it creates an artifact as solution to a problem. In this research, the problem is the unstructured decision making of potential business models. The artifact designed is a business case method which enables the objectively comparison of business models. Further, the DSRM enables process iterations so that it is possible to adjust previous phases to increase the quality of the artifact. However, because the review of academic literature is less emphasized, the method is slightly adjusted to include the value of academic literature in the process. For the literature study the five-stage grounded theory method for rigorously reviewing literature by Wolfswinkel et al. (2011) is used. This method assures solidly legitimized, in-depth analyses of empirical facts and related insights, including the emergence of new themes, issues and opportunities (Wolfswinkel et al., 2011). The five sequential steps are shown integrated with the DSRM method in Figure 1.

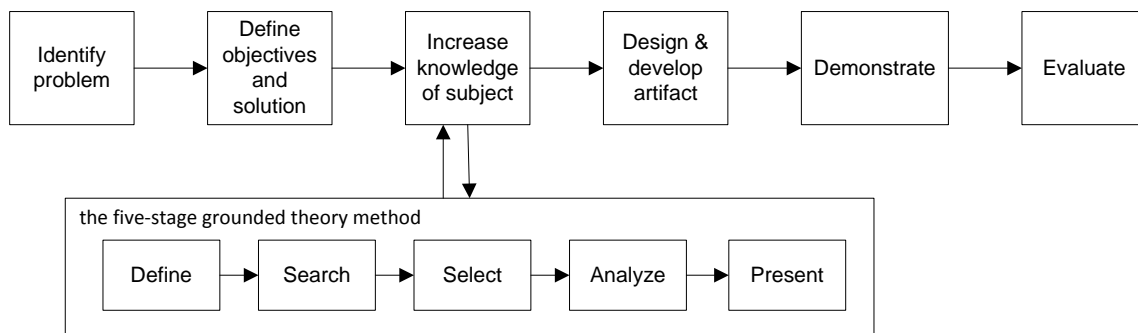


Figure 1: DSRM process (Peffers et al., 2007)

2 Business models: a literature research

As the research method shows, after the identification of the problem and defining the objectives and solution, knowledge about the topic is increased through a scientific literature review. In this chapter the business model concept is investigated. First the search approach, structure, and criteria are discussed, followed by a short literature overview. In the second part, the early revolution of business models is discussed, followed by the use of business models in the third section. Next, business model components are identified, and finally evaluation methods for business models are discussed in the fourth section.

2.1 Approach, structure, sources, criteria, and a short literature overview

The scientific knowledge about business models that is needed to make a qualitative BM-BC transformation method is retrieved from scientific papers and books. A quick search on Scopus¹ on the keywords: “*business models*” OR “*e-business models*”, returns over 8000 relative recent results, with only 200 papers published before the year 2000. To conduct a thorough and structured literature review, the paper: “*Analyzing the past to prepare for the future: writing a literature review*” written by J. Webster and R. Watson (Webster & Watson, 2002), is used as a guide, together with the five-stage grounded theory method for rigorously reviewing literature by Wolfswinkel et al. (2011). In the first part the sub research questions are formulated, which need to be answered by the found literature. Next, a forward search is performed (Webster & Watson, 2002, p. 16). Starting with discussing the search engine, further also the search and selection criteria are clarified. Next, the selection process of the results from the forward search is visualized and a short literature overview is presented. Finally, a backward search is performed on the selected articles.

2.1.1 Sub research questions on business models

Based on the problem definition, the research goals and the research question, the following sub research questions are formulated. By answering these questions with insights from the academic literature, the information and background on business models needed as input for a good basis is retrieved, from where the BM/BC transformation method can be formed.

1. *How have business models evolved over time, and what is it now?*
2. *What is the use of business models?*
3. *Which components can be distinguished?*
4. *How are business models evaluated?*

2.1.2 Source, selection criteria, and keywords

For the search process, SciVerse Scopus is used. This search engine provides a lot of search specification options and searches quickly through the world’s biggest database of title, abstract and author information of leading scientific journals. Google Scholar is used to retrieve the full text of the selected articles.

¹ SciVerse Scopus is the world’s largest abstract and citation database of peer-reviewed literature. (www.info.sciverse.com/scopus/about)

To narrow down the number of search results, the following criteria are used:

1. *Papers published before 2008 should have 15 or more citations*
2. *Papers published between 2008 and 2010 should have 8 or more citations*
3. *Papers published between 2010 and 2012 should have 1 or more citations*
4. *Papers must be published between 1998 and 2012*
5. *Papers must have at least 20 references*
6. *Search is limited to subject areas 'business management and accounting' and 'computer science'.*

The number of citations of a paper gives a good indication for the quality, utility and the impact value on the research area (Seglen, 1997). The number of citations is also used as an indicator to assess the quality of a journal in journal ranking studies. There are two arguments for the second search restriction. The first argument is that publications older than (in this case) 14 years have an increased probability of being out dated. The significant papers that are excluded by this restriction have a high probability of being cited in newer included articles. The second argument is based on a research of Osterwalder in 2005. Here the number of hits on the term "*Business Model*" in scholarly reviewed journals is counted for the separate years from 1990 until 2003. The results show an exponential growth of hits starting in 1998 (Osterwalder, Pigneur, & Tucci, 2005a, p. 6) (see Figure 4). The third point states that papers should have at least 20 references. This is to make sure that the research presented is well founded and based on previous research of others. The final criterion limits the number of results to the articles published in journals of two specific fields where probably the biggest part of fundamental research towards business models is done. A search without this restriction results in five times more hits. Large parts of these results are about making a specific business model for a medicine or other investment or entrepreneurial ideas.

The search is performed using the keyword '**usiness mode**'. The asterisk sign ('*') is used to include all results for which the rest of the word could be anything. So with the search term "*mode**", both '*model*' and '*models*' are included. In Figure 2 the search query is shown as it was entered in Scopus.com on March 20, 2012. The search resulted in 4926 results. After application of the citation restriction, 406 results were found.

```
TITLE-ABS-KEY(  
    ("*usiness mode*")  
AND PUBYEAR > 1997  
AND ( LIMIT-TO(SUBJAREA, "COMP" ) OR  
      LIMIT-TO(SUBJAREA, "BUSI" ) OR  
      LIMIT-TO(SUBJAREA, "MULT" ) ) )
```

Figure 2: Search query

In Figure 3, the selection process of the relevant articles is shown. In three iterations, the most useful articles are retrieved in full text. In the first phase, based on potential relevance of the title, the articles are selected. In the second phase, the articles are selected based on the abstract and finally the articles to which access is granted to retrieve the full text are selected. The total search process yields 28 papers.

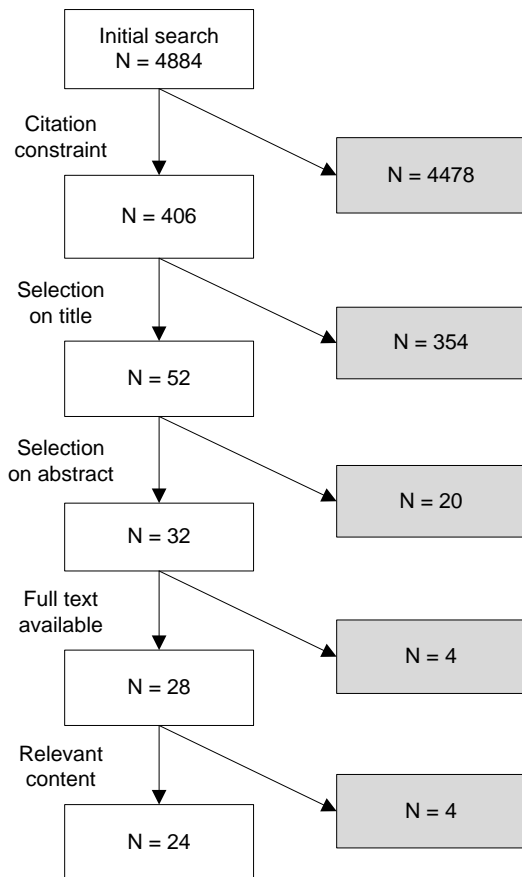


Figure 3: Literature selection process

2.1.3 Short literature overview

In the next chapter, a more in-depth theoretical framework is discussed. This section will show the content covered by the retrieved articles and discusses if the performed literature search is sufficient to answer the sub research questions.

In Table 1, an overview is given which gives insight in which articles give (partial) answer to the sub research questions. Not all retrieved articles are represented for some articles do not directly address or give answer to one of the research questions, but can be of use for indirect relevant knowledge.

Table 1: Business model literature overview

		BM evolution	Goal of BM and usage	BM components and/or building blocks	BM evaluation
1	(Baden-Fuller & Morgan, 2010)	p. 158			
2	(Casadesus-Masanell & Ricart, 2010)	p. 201	p. 1b		
3	(Chesbrough, 2010)		p. 355a		
4	(Demil & Lecocq, 2010)			p. 231	
5	(Doz & Kosonen, 2010)	p. 1&2			p. 1-9
6	(Gambardella & McGahan, 2010)	p.2			
7	(Chesbrough, 2007a)	p. 1&2			p.4
8	(George & Bock, 2011)	p.5	p. 7		
9	(Vidal Tost & others, 2011)			p. 58 & 62	p.58
10	(Magretta, 2002)		p. 3		
11	(Shafer, Smith, & Linder, 2005)	p. 2-5	p. 3	p. 6	
12	(Morris, Schindehutte, & Allen, 2005)	p. 1-4		p.2	
13	(Pateli & Giaglis, 2004)	p. 6	p. 8		p. 11
14	(Hedman & Kalling, 2003)		p. 2-6	p.8	
15	(Sosna, Trevinyo-Rodríguez, & Velamuri, 2010)		p. 1		p. 3
16	(Teece, 2010)		p. 1-2	p. 3	p. 10
17	(Markides, 2006)				p. 1
18	(Gordijn, Akkermans, & Van Vliet, 2001)		p. 1-2	p. 2	
19	(Morris et al., 2005)	p.1-3	p.1-2	p.5	
20	(Pateli & Giaglis, 2004)	p.1-4	p. 1-4	p. 5	p. 9
21	(Amit & Zott, 2001)			p. 2	
22	(Bremser & Chung, 2006)				p.1
23	(Christoph Zott & Amit, 2010)			p.7	p.8
24	(C. Zott, Amit, & Massa, 2011)	p. 1-5	p. 2	p. 11	

To check if most of the relevant literature about a subject is found, (Levy & Ellis, 2006) give a common rule of thumb, which is: “the search is near completion when one discovers that new articles only introduce familiar arguments, methodologies, findings, authors, and studies”. (Webster & Watson, 2002) give a comparable argument: “You can gauge that your review is nearing completion when you are not finding new concepts in your article set”. The outcome of performed literature review towards business models with the goal to answer the sub research questions, satisfies the two guidelines and will therefore be enough to provide answers with sufficient background and knowledge based on the studied literature. Especially when taking into account that the important ‘backwards search’ is not included in this section but is done without further notification in the more in-depth theoretical framework.

2.2 Early evolution of business models

The term 'business model' (BM) is often used, especially in the entrepreneurial and management field, but also in other areas. A quick search on the search engine Scopus.com teaches us that over 8000 articles are published until 2012². Just over 2000 articles are published in the business area. In Figure 4, a graph is shown which represents the number of articles found in all research fields and in the business area. The numbers strongly increase after 1996. This even makes it clearer that business models and research towards this term is relatively new and started only a decade ago. Looking closer at the search results, it becomes clear that the combination of these two words is used for multiple purposes with significant different meanings. One of the first published articles in the search results uses the term to discuss how a business can be modeled for simulation purposes (Duersch, 1975). Some of the articles selected in the literature search process as described before, mention the same -in their eyes even problematic- phenomena of using the same term for different purposes (George & Bock, 2011; Morris et al., 2005; Shafer et al., 2005) and the other way around (Morris et al., 2005). This is mostly due to the fact that the expression is emanated from many different perspectives like e-business, strategy, technology and information systems (Christoph Zott & Amit, 2010). From every viewpoint, peering through different lenses, each author was seeing different things and came up with a new definition. Around 1997, the ideas about business models were already split into roughly two groups. The biggest group was from the Business/IT perspective which focused on how value is created and transferred between IT activities and business (Morris et al., 2005). The other from the strategic perspective which focused on *"the totality of how a company selects its customers, defines and differentiates its offerings, defines the tasks it will perform itself and those it will outsource, configures its resources, goes to market, creates utility for customers and captures profits."* (Slywotzky, 1996). The internet boom caused that business models were almost routinely invoked which caused a stream criticism on the concept due to its immaturity and the diversity of the business models. "A company didn't need a strategy, or a special competence, or even any customers – all it needed was a Web-based business model that promised wild profits in some distant, ill-defined future. Many people –investors, entrepreneurs, and executives alike- bought the fantasy and got burned. The concept of the business model fell out of fashion nearly as quickly as the .com appendage itself" (Magretta, 2002). A better understanding of the concept was necessary.

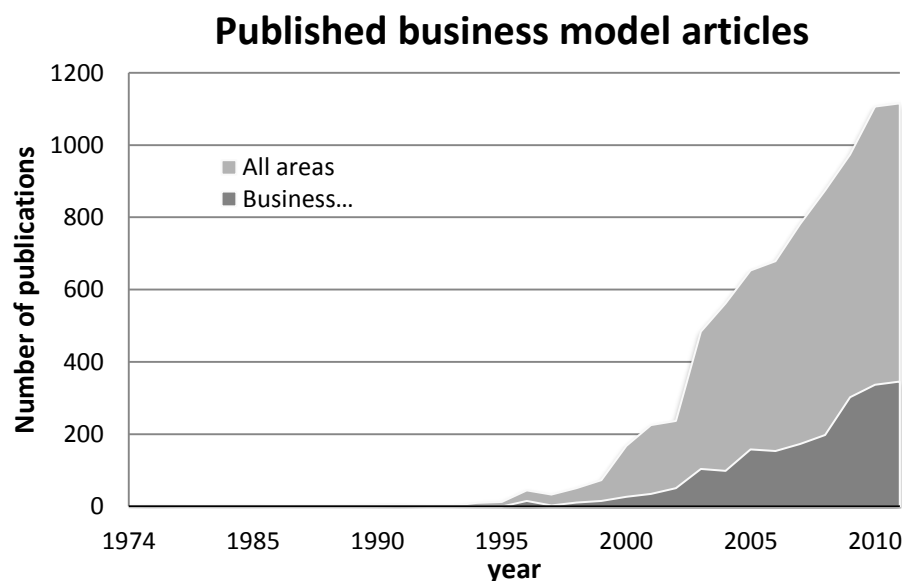


Figure 4: Published business model articles from 1974 until 2012 retrieved from Scopus.com

² Search query entered at Scopus.com: *TITLE-ABS-KEY("business model") AND PUBYEAR < 2012*

The research towards a better understanding of the concept grew and in 2005 Shafer et al. (Shafer et al., 2005) published an article with the goal to clarify much of the confusion about what business models are and how they can be used properly. In their literature search, they found 12 definitions and 42 different business model components. Some of the components appeared in only one definition, others were used by more. The components that were cited twice or more were categorized using an affinity diagram, which helps to identify patterns and establish related groups in qualitative datasets. This process resulted in four main categories: strategic choices, create value, value network and capture value. Each category consisted of multiple entities like costs, financial aspects, and profit for the value-capturing category. Based on this they presented a new definition which defined a business model as “a representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network”. The definition suggests that business models helps articulate and make explicit key assumptions about cause-and-effect relationships and the internal consistency of strategic choices. Because for-profit companies must make money to survive, their viability is tied both to the value they create and to the way they capture value and resultantly generate profit. The creation and capturing of value does not occur in a vacuum. (Hamel, 2002) argues that both occur in a ‘value network’. This can include suppliers, partners, distribution channels, and other roles that extend the companies resources. (Shafer et al., 2005)

At the same time Osterwalder et al. (2005) published an article with a comparable goal. Instead of a literature review to obtain the different definitions, he asked participants of the IS community for their definitions of what they understand to be a business model. From 62 respondents, 54 definitions were received. Osterwalder distinguished the definitions into a value/customer-oriented business model category (55%) and an activity/role-oriented business model (45). The main difference between the two categories as he defines them is that from a company perspective, the former approach is more outward looking, while the latter is more inward focused. One of the most interesting parts in Osterwalder’s work is the part where he distinguishes research towards and articles about business models between three different hierarchical levels (Figure 5). The levels are not mutually exclusive, but must be distinguished conceptually to achieve a common understanding. The overarching first level consists of definitions of what a business model is and what belongs in it and meta-models that conceptualize them. Here a business model describes what a business does for a living, so to say. In the second level, several types or meta-model types of business models that are not generic but contain common characteristics are represented. The final level consists either of concrete real world business models or of conceptualization, representations, and descriptions of real world business models. This is also used to analyze companies. (Osterwalder et al., 2005a)

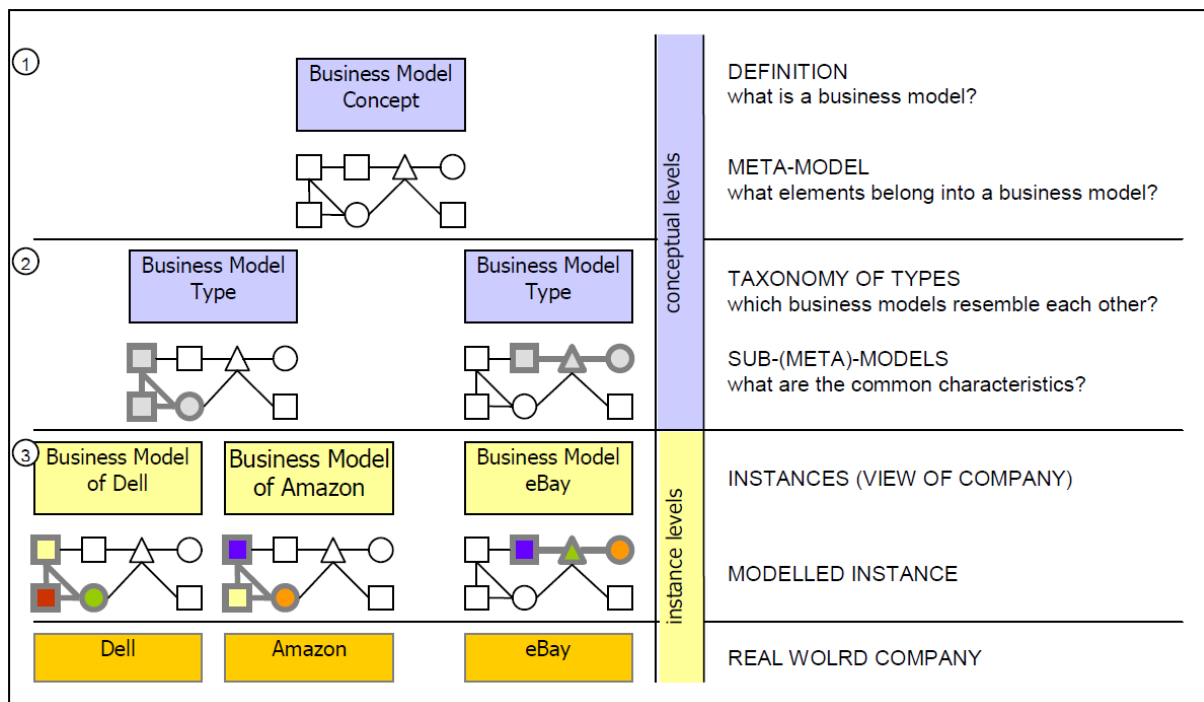


Figure 5: Business Model Concept Hierarchy (Osterwalder et al., 2005a, fig. 2)

With this model the literature about business models can be separated much better for the model makes it officially clear that authors can be talking about the same concept ‘business model’ and addressing a specific level which has a significantly different meaning than one of the other two levels.

In the years between 2005 and 2011 research has focused less on the definition and components of business models and more on the position of business models in relation to strategy (Casadesus-Masanell & Ricart, 2010; Teece, 2010), business model innovation (Chesbrough, 2010; Doz & Kosonen, 2010; Vidal Tost & others, 2011) and different sub-meta-models (level 2) (McGrath, 2010). These topics will be discussed separately in the next sections.

2.3 Business models: what it is, what it is used for and what it is not

Now it is clearer where business models come from, it is time to define what a business model is and what it is not. This is discussed in three parts. First the most used and acknowledged definitions are discussed followed by explaining what business models are currently used for. Finally, this section is concluded by discussing the scope of business models to define the line where business models stop, and strategy and business plans starts.

2.3.1 Business models: what it is

As shown in the previous section, over the years a lot of definitions have been formed and used to explain the concept of business models (George & Bock, 2011; Morris et al., 2005; Shafer et al., 2005). In 2005, Osterwalder asked 62 respondents to give a definition of business models (Osterwalder et al., 2005a). Forty-four definitions were given. Therefore, there has been some confusion about the concept in literature as well as in practice. Even in a recent publication of George and Bock in (George & Bock, 2011) this problem is acknowledged and addressed as a lack of coherence. Lots of effort has been put into literature review to develop consensus that tends to yield all-encompassing definitions that subsume established organizational constructs such as value creation and strategy. In other words, the research done, leads to divergent definitions instead of a

convergent definition (George & Bock, 2011). This is -at least partly- caused by the wide variety of roles that business models can or ought to fulfill. George and Bock give an overview of these perspectives based on their literature review. Perhaps the biggest problem with this is that in most publications it is unclear from which perspective the research is performed and all authors write about it as for it is *the only right* perspective and definition. In Table 2 George and Bock give an overview of the different business model themes with their own representative definition.

Table 2: Thematic Summary of Business Model Literature (George & Bock, 2011)

Theme	Sample publications	Summary	Representative definition
Design	Slywotzky, 1999; Timmers, 1998	Agent-driven or emergent configuration of firm characteristics	“A business model is an architecture for product, service, and information flows, including a description of the various business actors and their roles” (Timmers, 1998, p. 4).
RBV	Mangematin et al., 2003; Winter & Szulanski, 2001	Organizational structure codeterminant and coevolving with firm’s asset stock or core activity set.	“Each business model has its own development logic which is coherent with the needed resources—customer and supplier relations, a set of competencies within the firm, a mode of financing its business, and a certain structure of shareholding” (Mangematin et al., 2003, p. 624).
Narrative	Magretta, 2002	Subjective, descriptive, emergent story or logic of key drivers of organizational outcomes.	“[Business models] are, at heart, stories—stories that explain how enterprises work” (Magretta, 2002, p. 87).
Innovation	Chesbrough & Rosenbloom, 2002	Processual configuration linked to evolution or application of firm technology	“The business model provides a coherent framework that takes technological characteristics and potentials as inputs and converts them through customers and markets into economic outputs” (Chesbrough & Rosenbloom, 2002, p. 532).
Transactive	Amit & Zott, 2001; Zott & Amit, 2007, 2008	Configuration of boundary-spanning transactions	“A business model depicts the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities” (Amit & Zott, 2001, p. 493).
Opportunity	Afuah, 2003; Downing, 2005; Markides, 2008	Enactment and implementation tied to an opportunity landscape	“[The business model] is a set of expectations about how the business will be successful in its environment” (Downing, 2005, p. 186).

Because the focus of this research is to develop a structural approach to make a business case of an organizations (potential) business model, the used definition of a business model is derived from scientific publications discussing often used and approved business modeling approaches.

Osterwalder and Pigneur propose a good descriptive definition. To identify the most common used building blocks among business models in literature, they compared the models mentioned most often, and studied the used components. Nine building blocks emerged from that synthesis which were mentioned by at least two authors (Osterwalder, Pigneur, & others, 2002). Based on this, they proposed the following definition:

Business model definition:

A business model is a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams. (Osterwalder et al., 2005a, p. 18)

In this definition, the nine building blocks are represented. Osterwalder et al. grouped the nine blocks into four categories, product, customer interface, infrastructure management, and financial aspects. A description of the separate blocks is given in Table 3.

Table 3: building blocks description (Osterwalder et al., 2005a, p. 18)

Pillar	Business Model Building Block	Description
Product	Value proposition	Gives an overall view of a company's bundle of products and services.
Customer interface	Target customer	Describes the segments of customers a company wants to offer value to.
	Distribution channel	Describes the various means of the company to get in touch with its customers
	Relationship	Explains the kind of links a company establishes between itself and its different customer segments.
Infrastructure management	Value Configuration	Describes the arrangement of activities and resources.
	Core competency	Outlines the competencies necessary to execute the company's business model.
	Partner network	Portrays the network of cooperative agreements with other companies necessary to efficiently offer and commercialize value.
Financial aspects	Cost structure	Sums up the monetary consequences of the means employed in the business model.
	Revenue model	Describes the way a company makes money through a variety of revenue flows.

In section 2.4, the emergence and selection of business model components will be discussed in more detail.

2.3.2 Business models: what they are used for

According to Magretta (Magretta, 2002), a good business model answers Peter Drucker's age-old questions: Who is the customer? And what does the customer value? Next to that, she also argues that a business model must answer the fundamental questions that every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?

So, business models are used to structure, organize, synchronize, and formalize all the thoughts and ideas within a company that explain what they do, how they make money with it, and to whom this value is delivered. In 2000, Accenture did a study in which 70 executives from 40 companies were interviewed regarding their company's core logic for creating and capturing value. Which is the basis of a business model according to Shafer et al. (Shafer et al., 2005). One of the results of the study was that 62% of the interviewees had a difficult time describing succinctly how their own company made money (Linder, 2000). This study was performed during the emergence of the business model concept.

(Chesbrough, 2010) suggested in one of his publications about business models, that it fulfills the following functions:

- Articulates the value proposition (i.e., the value created for users by an offering based on technology);
- Identifies a market segment and specifies the revenue generation mechanism (i.e., users to whom technology is useful and for what purpose);
- Defines the structure of the value chain required to create and distribute the offering and complementary assets needed to support position in the chain;
- Details the revenue mechanism(s) by which the firm will be paid for the offering;
- Estimates the cost structure and profit potential (given value proposition and value chain structure);
- Describes the position of the firm within the value network linking suppliers and customers (incl. identifying potential complementors and competitors);
- Formulates the competitive strategy by which the innovating firm will gain and hold advantage over rivals.

In addition, Osterwalder and Pigneur searched for the use of usages of business models. After a literature search, they came up with five categories, which are:

- Understanding and sharing
- Analyzing
- Managing
- Prospects
- Patenting of business models

(Osterwalder et al., 2005a)

The five points will be explained a bit more in detail now.

Understanding and sharing

Business models help to understand and share the business logic. They argue that because people use different mental models, they do not automatically understand a business model in the same way. Therefore, a generic and shared concept for describing business models is necessary. Further, formalizing business models and expressing them in a more tangible way, clearly helps managers to communicate and share their understanding of a business among other stakeholders.

Analyzing

Based on the reasoning that things are only comparable if they are understood in the same way, a structured business model approach is needed to enable companies to compare their business

model to those of their competitors. By comparing, business model become a new unit of analysis for they can improve measuring, observing and comparing the business logic of a company.

Manage

In addition, management of the business logic of the firm is improved because businesses models help ameliorate the design, planning, changing, and implementation of business models.

Organizations are able to adjust quicker to market changes and business models improve the alignment of strategy, business, organization, and technology. In an agile environment, it is much easier to go from one point to another when one can exactly understand, say and show what and how elements will change.

Prospect

Business models describe possible futures for a company. Osterwalder et al. argue that the business model concept can help foster innovation and increase readiness for the future through business model portfolios and simulation.

Patenting of business models

The final point they make is that business model may even play an important role in the legal domain of patents. They explain this argument by an example where an online retailer has a competitive advantage by making use of a special patented ordering system and attacked a competitor that started using the same ordering system technology for patent infringement. However, they also say that it remains to be seen in what direction patenting business models and business processes moves.

(Osterwalder et al., 2005a)

Both the definition by Osterwalder and the use of business models as described by Magretta, Shafer et al. and Chesbrough, can be summarized by stating that business models should be used as a tool to analyze define and describe the rationale of how an organization creates, delivers and captures value. (Magretta, 2002; Osterwalder & Pigneur, 2010; Osterwalder et al., 2002; Shafer et al., 2005)

2.3.3 What a business model is not

After discussing what a business model is and what it is (or could be) used for, it is also important to distinguish what it is not. The two most discussed things in literature about what it is not are discussed in this section. The first one is strategy, and the second one business plans. Two concepts that seem to have a lot to do with business models, but should not be mistaken for business models.

Business plans

Business plans have been widely studied in the literature on entrepreneurship. They have been considered an internal management tool or an instrument for finding partners. (Doganova & Eyquem-Renault, 2009) Business planning helps firm founders to anticipate on problems and information needs, turn broad goals into concrete milestones and correct quickly deviation from objectives (Delmar & Shane, 2003). On the other hand it can be argued that once written, business plans are never used by entrepreneurs for internal management purposes (Honig, 2004). Furthermore, (Carter, Gartner, & Reynolds, 1996) argues that business planning spoils resources and time that could be more profitable to the venture if employed for more necessary marketing activities.

Therefore, a business plan is about a set of business goals, the reason why they should be attained, and the plan how those goals can be reached. Osterwalder argues that the purpose of a business plan is to describe and communicate a for-profit or non-profit project and how it can be implemented, either inside or outside and organization. The motivation behind the plan may be to “sell” a project, either to potential investors or to internal organizational stakeholders. It may also serve as an implementation guide. (Osterwalder & Pigneur, 2010)

So what then is the difference? As stated in the previous section, a business model can be summarized and described as the rationale of how an organization creates, delivers, and captures value. A business plan describes the reason and the plan to obtain certain business goals. A business model could be (not necessarily) a part of a business plan.

Osterwalder states the difference as follows: *“Once you’ve arrived at a final business model design, you will start translating this into an implementation design. This includes defining all related projects, specifying milestones, organizing any legal structures, preparing a detailed budget and project roadmap, and so forth. The implementation phase is often outlined in a business plan and itemized in a project management document.”* (Osterwalder & Pigneur, 2010)

Strategy

In literature, everybody seems to agree that business models and strategy are two different things. Related, but different. The difference however is sometimes hard to make clear. Using publications from Casadesus-Masanell, Magretta and Shafer, the difference between the two concepts will be emphasized in the next paragraphs.

Business models, strategy and tactics

The purpose of the publication by Casadesus-Masanell et al. is to contribute to the literature by presenting an integrative framework to distinguish and relate the three concepts. The following definitions were given:

- Business model refers to the logic of the firm, the way it operates, and how it creates value for its stakeholders.
- Strategy refers to the choice of business model through which the firm will compete in the marketplace.
- Tactics refers to the residual choices open to a firm by virtue of the business model it chooses to employ.

A representation of their two-stage framework is given in Figure 6. In their formulation, strategy and business models are related, but not the same. A business model is a direct result of strategy but is not, itself, strategy. Further, they argue that a strategy is a contingent plan of action as to what business model to use. The firm's available actions for strategy are choices (of policies, assets, or governance structures) that constitute the raw material of business models. Thus, strategy entails designing business models to allow the organization to reach its goals. (Casadesus-Masanell & Ricart, 2010)

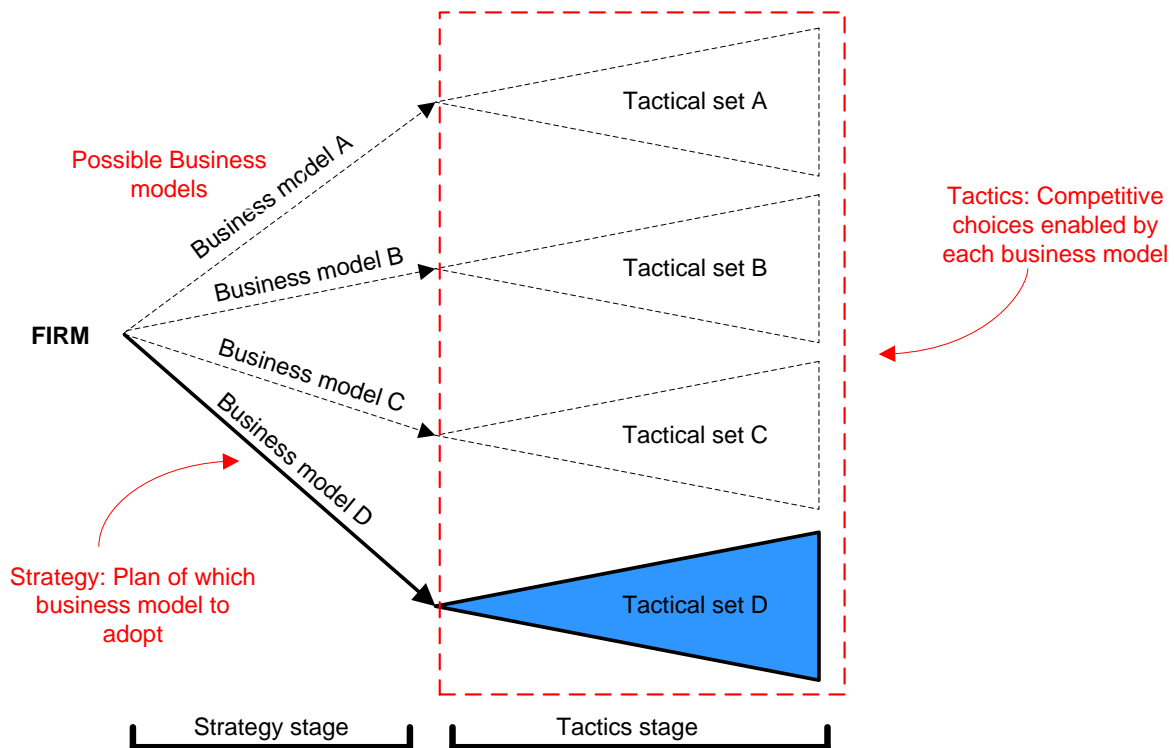


Figure 6: Strategy, business model and tactics two stage framework (Casadesus-Masanell & Ricart, 2010)

Magretta (Magretta, 2002) gives an additional important difference between strategy and business models. She explains that though many people use the terms interchangeably today, the difference is that strategy explains the competitive advantage of the company. Thus, why and how a company will do better than their rivals.

(Shafer et al., 2005) argues that business models reflect the choices and their operational implications, made in the strategy process.

Nonetheless, the different explanations and argumentations, the difference between the two concepts might seem to remain a bit fuzzy. It is clear that there is a difference and that the terms are connected and interrelated. The difference becomes most clear when the two definitions are compared. A strategy is the plan of action of how a company obtains specific goals in a period. It has to be kept in mind however, that the strategy field is fragmented. There is no such thing as one theory of strategy (Hedman & Kalling, 2003). A business model is a representation and description which explains the rationale of how an organization creates, delivers and captures value (Osterwalder et al., 2005a). Tactics are the actions that lead to the execution of the strategy.

2.4 Business model components

Like the definition of business models, the literature about the components is ambiguous as well. However, multiple authors have tried to bring some structure, which will be discussed in this section. After a period of a strongly increasing amount of research towards business models in 2002 – 2004 (see Figure 4) three different authors (Morris-, Shafer-, and Osterwalder et al.) published articles trying to define a complete unambiguous set of constructs that form a business model. Despite their approach and point of view differences, the basis of their results showed many similarities. In the literature review by (Shafer et al., 2005) a total of 12 definitions were found, containing 42 different components. With the use of an affinity diagram³, the components that were cited twice or more were categorized. This resulted in a diagram with 20 business model components divided in four main categories: strategic choices, create value, value network and capture value (see Figure 7). Motivated by the lack of consensus over the key components of business models that hindered, Morris amongst other, (Morris et al., 2005) also came up with a perspective on business model components based on a literature review. They found 24 different items that were mentioned as possible components, with 15 receiving multiple mentions. Based on those conceptual and theoretical roots, they developed a standard framework for characterizing a business model. They argued that to be useful, such framework must be reasonably simple, logical, measureable, comprehensive, and operationally meaningful. Their model addresses six key questions (Table 4) derived from their literature review and based on commonalities among the various perspectives. The first four key questions concern the most consistently emphasized components: the value proposition, the customer, the internal processes and competencies, and how the firm makes money. The fifth key question reflects the need to translate core competencies and the value proposition into a sustainable marketplace position. Finally, they argue, a useable framework should apply to all types of ventures, reflecting the design considerations necessary to accommodate differing levels of growth, time horizons, resource strategies, and exit vehicles. Therefore, the sixth decision area captures the growth and time objectives of the company.

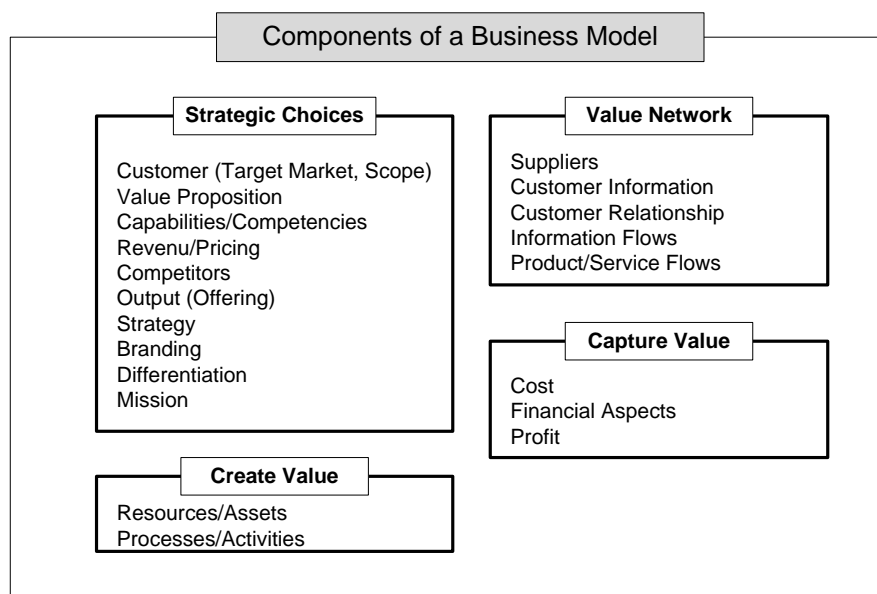


Figure 7: Components of business model affinity diagram (Shafer et al., 2005)

³ Affinity diagrams are a popular “Six Sigma” tool for organizing ideas into categories based on their underlying similarity; affinity diagrams help to identify patterns and establish related groups that exist in qualitative datasets (Shafer, Smith, & Linder, 2005, p. 2)

Table 4: Six questions that underlie a business model (Morris et al., 2005)

Component	Question	Description
1	How do we create value?	Factors related to the offering
2	Whom do we create value for?	Market factors
3	What is our source of competence?	Internal capability factors
4	How do we competitively position ourselves?	Competitive strategy factors
5	How do we make money?	Economic factors
6	What are our time, scope, and size ambitions?	Personal/investor factors

In 2004, Osterwalder and Pigneur also published their ideas concerning the business model ontology. Their ontology has been inspired by different enterprise ontology projects described in academic literature (Osterwalder & Pigneur, 2004). They argued that the studied ontology's mainly concentrate on processes and organizational representation, where the focus of their work is on the logic and concepts of value creation, at a higher level of abstraction, which is the business model. Their ontology is broken down into four pillars, the what, who, how, and how much. These corresponds the building blocks: product innovation, customer relationship, infrastructure management, and financial aspects. These building blocks were then subdivided into 11 blocks. However, within a short period of time the number of blocks were reduced to the 9 blocks which are still used in Osterwalder's Canvas method (Osterwalder et al., 2005a). In Table 3 the nine blocks and their description are shown.

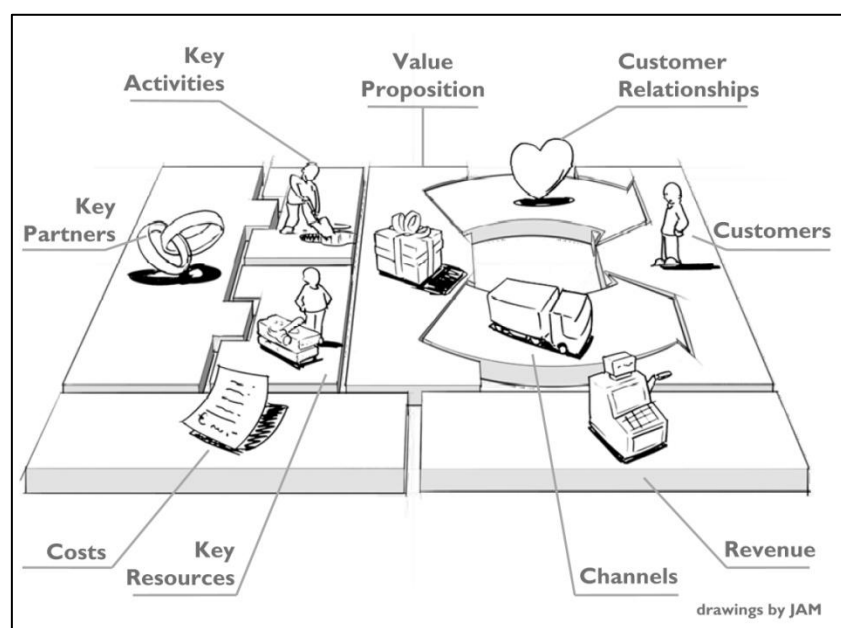


Figure 8: Business model Canvas (Osterwalder & Pigneur, 2010)

In a publication from 2003 by Hedman et al., a slightly comparable ontology model is presented. Their results are the outcome of a widely ramified literature study towards (e-)business model components from a strategic perspective. The model includes seven causally related components: (1) customers, (2) competitors, (3) offering, (4) activities and organization, (5) resources, (6) supply of factor and production inputs, and (7) a longitudinal dimension (Hedman & Kalling, 2003). The representation of the model (Figure 9) is not as shiny as Osterwalder's Canvas figure, but the composition of components is interesting. Within the model, the separation is made between outside influences on the company and causal components inside the company. Also the causality between for example the suppliers and the resources, or the available resources and the possible organizational activities, are effects of the strategic perspective on the business model ontology.

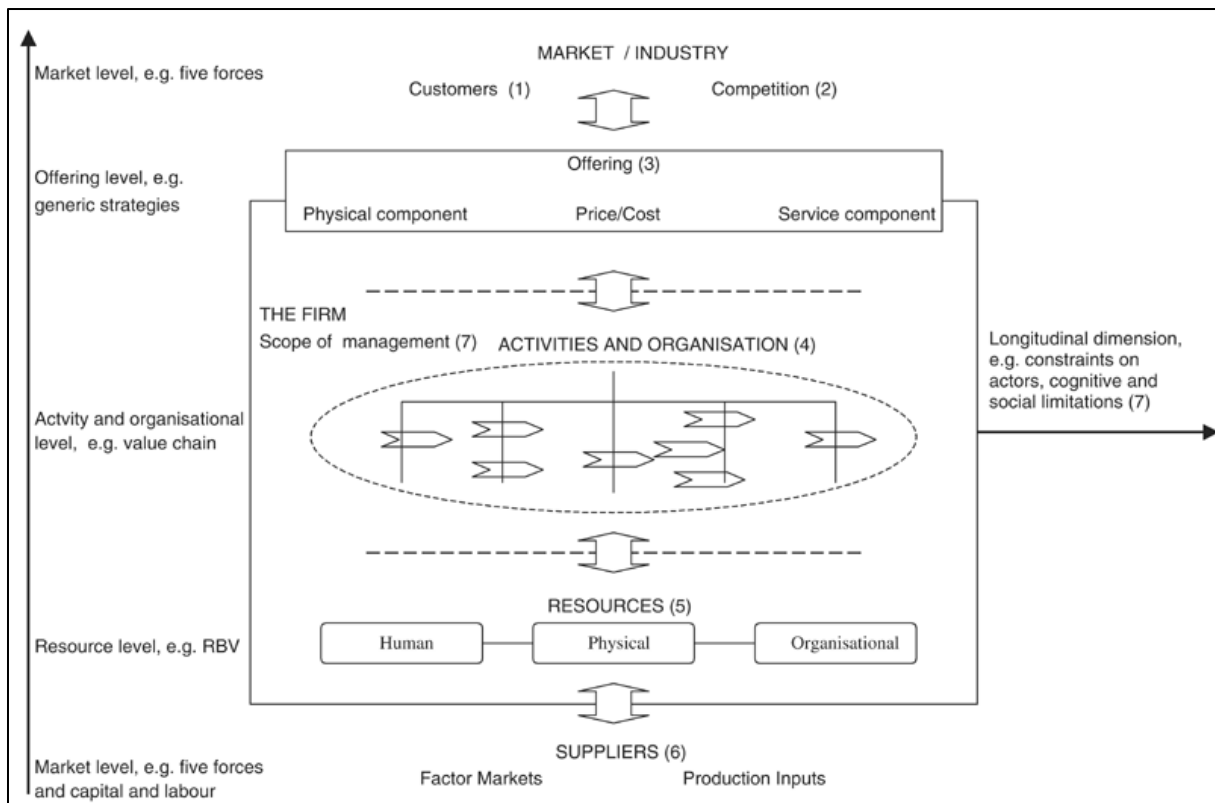


Figure 9: Components of a business model (Hedman & Kalling, 2003)

All of the above ontology's, created by different authors, with differing approaches, around the same time, from different perspectives and backgrounds, and building on the work of different authors, produce independently a business model ontology that contains very similar components. In Table 5 an overview is given.

Therefore, based on the discussed literature, a business model is not a value proposition, a revenue model, or a network of relationships by itself; it is a combination of all these elements.

When the models are ranked against each other, Morris' model gets the last place. The key questions can surely help companies to analyze and design their business models, but the questions are multi interpretable causing a wide variety of incomparable business models without the possible security of covering the important components.

Shafer's models comes on the third place after Morris' model. The model covers almost all possible components, because all components that were referred to twice or more times were admitted in the model. This causes over completeness on the one hand, and structure less on the other.

With Osterwalder's model and Hedman's model left, the ranking becomes harder. Both models have their own objective and subjective advantages and disadvantages. The more subjective positive aspect about Osterwalder's ontology, is that the model turned out to be used with success around the world in practice (Osterwalder & Pigneur, 2010). However, the model lacks the longitudinal dimension and strategic perspective that are represented in Hedman's model. This raises the important question if the longitudinal time attribute and the strategic perspective belong in a business model.

Table 5: Shared business model ontology components

	(Shafer et al., 2005)	(Morris et al., 2005)	(Osterwalder, Pigneur, & Tucci, 2005b)	(Hedman & Kalling, 2003)
All shared components	Customers	Customers	Customers	Customers
	Value proposition	Value proposition	Value proposition	Offering
	Capabilities/competences	Capabilities/competences	Key activities	Activities
	Resources	Resources	Resources	Resources
	Cost	Cost	Costs	Cost
	Revenue	Revenue	Revenue	Price
	Suppliers	Suppliers	Key partners	Suppliers
Partly shared components	Customer relationship		Customer relationship	Service (?)
	Competitors			Competition
		Time		Longitudinal dimension
	Strategy	Strategy		
Unique components	Mission	Scope	Channels	
	Information flows	Size		

2.5 Business model evaluation

Based on the literature, first the need for evaluation and innovation will be discussed, followed by some methods to do this.

The need for business model evaluation and innovation

Business models matter for a better business model often will beat a better idea or technology (Chesbrough, 2007a). It is shown that many companies fail. Not because they do something wrong or mediocre, but because they keep doing what used to be the right thing for too long, and fall victim to the rigidity of their business model (Doz & Kosonen, 2010). In the face of discontinuities and disruptions, convergence and intense global competition, companies now need to transform their business models more rapidly, more frequently and more far-reaching than in the past. Shortening product lives mean that even great technologies no longer can be relied upon to earn a satisfactory profit before they become commoditized. Today, innovation must include business models, rather than just technology and R&D. (Chesbrough, 2007a)

The domain of evaluation models is concerned with identifying criteria for either assessing the feasibility, viability, and profitability of new business models or evaluating them against alternative or best practice cases (Pateli & Giaglis, 2004). In an extensive literature research by (Pateli & Giaglis, 2004), four primary evaluation purposes have been identified: *benchmarking* with competitors in business model terms; *assessment* of alternative business models for possible implementation; *risk identification* for a firm pursuing business model innovation; and *evaluation* of an innovative business model in terms of feasibility and profitability.

According to Osterwalder & Pigneur (2010), an organization should assess its business model regularly so that the health of the companies market position is maintained. Furthermore, this check-up may become the basis for incremental business model improvements, or it might trigger a serious intervention in the form of a business model innovation initiative.

According to the remarks on the need for business model evaluation of these different authors, it can be stated that due to rapidly changing markets and shortening product life cycles, it is important for organizations to regularly assess their business model to maintain their marked position.

Business model evaluation and innovation methods

Transforming the business model of a successful company is never easy. Practical, actionable steps and well defined methods can make successful business model transformation more likely (Doz & Kosonen, 2010). Next to the lack of good evaluation methods in practice and literature, the responsibility for initiating business model evaluation and innovation is in many organizations poorly defined (Chesbrough, 2007a).

Based on the studied literature, only a small group of articles addresses the issue of evaluation and a few evaluation methods discussed in those articles are found useful. The evaluation model sub-domain is among the less mature areas of business model research. The majority of the criteria proposed draws from general theory and is mostly driven by financial indicators that are very difficult, if possible at all, to measure in all cases. Examples of this are: *measures of profitability*, *profitability prediction*, and *firm access to key information and conflicts* (Pateli & Giaglis, 2004). In the next part, two methods will be discussed. However, it is questionable if the first by (Doz & Kosonen, 2010) can be called a model for they describe it their selves as a set of practical, actionable steps that a CEO and a corporate leadership team can take to foster a more purposive – and more strategic – evolution and adaptation of business models which makes successful business model transformation more likely. The second comes from the non-academic book by Osterwalder (2010).

To develop a prescription for business model renewal, (Doz & Kosonen, 2010) build on the strategic agility framework that they developed from an earlier empirical research on a dozen companies in the information technology industry which were reconceiving their business models. That work conceptualized strategic agility as the *'thoughtful and purposive interplay'* on the part of top management between three meta-capabilities:

- Strategic sensitivity: the sharpness of perception of, and the intensity of awareness and attention to, strategic developments;
- Leadership unity: the ability of the top team to make bold, fast decisions, without being bogged down in top-level 'win-lose' politics;
- Resource fluidity: the internal capability to reconfigure capabilities and redeploy resources rapidly.

Based on these three dimensions they developed five recommended leadership actions for each dimension as illustrated in Table 6. Each of these sets can contribute to a firm's ability to renew its business models successfully.

Table 6: The leadership Action Agenda (Doz & Kosonen, 2010)

Dimensions	Leadership actions
Strategic Sensitivity	Anticipating: <i>sharpening foresight</i> Experimenting: <i>gaining insights</i> Distancing: <i>gaining perspective</i> Abstracting: <i>gaining generality</i> Reframing: <i>imagining new business models</i>
Leadership Unity	Dialoguing: <i>surfacing and sharing assumptions, understanding contexts</i> Revealing: <i>making personal motives explicit</i> Integrating: <i>building interdependencies</i> Aligning: <i>rallying around a common interest</i> Caring: <i>providing empathy and compassion for empowerment</i>
Resource Fluidity	Decoupling: <i>gaining flexibility</i> Modularizing: <i>disassembling and reassembling business systems</i> Dissociating: <i>separating resource use from ownership</i> Switching: <i>using multiple models</i> Grafting: <i>acquiring to transform oneself</i>

Strategic agility is most obviously a keystone to having the ability to transform and renew business models. The strategic sensitivity actions can make the company both more precise and accurate in the perceptions its executives have both of its (external) ecosystem and of its (internal) activity system. They also contribute to make executives more aware and alert about their environment. The leadership unity actions contribute to the team's ability to reach collective commitments and elicit true engagement toward them, among its members and from other members of the organization. The resource fluidity actions contribute to the success rate of implementing the agreed changes in the organization's business model (Doz & Kosonen, 2010).

In contrast with the more abstract prescription of the leadership action method, Osterwalder assesses each building block⁴ with the SWOT analysis. One of the advantages of SWOT as a tool to analyze and evaluate a business model is that it is familiar to many businesspeople. In Osterwalder's opinion too, the regularly assessment of a company's business model is an important management activity that allows an organization to evaluate the health of its market position and adapt

⁴ *Building blocks* see Figure 8: Business model Canvas (Osterwalder & Pigneur, 2010)

accordingly (Osterwalder & Pigneur, 2010). In the following section the SWOT analysis as Osterwalder applies it, will be further discussed.

SWOT assessment

The SWOT analysis is an attractive tool because of its simplicity. On the other hand, sometimes a certain SWOT-fatigue is recognized among managers due to the little direction provided by the method, concerning which aspects of an organization to analyze. This may result in a lack of useful outcomes. Osterwalder argues that the SWOT analysis in combination with the structure of the Canvas business model, enables a focused assessment and evaluation of an organizations business model and its building blocks (Osterwalder & Pigneur, 2010).

The tool in itself is rather simple and exists of three questionnaire-like forms. The first form covers the strengths and weaknesses of the current business model. The result gives a good perspective on the current situation of the organization. In the form, questions like: ‘Our value propositions are well aligned with customer needs’, can be ranked in ten steps from +5 (strength) via 1 (no strength, no weakness) till -5 (weakness). An example of this assessment form is given in Figure 10.

The second and third form are very similar to the first, but in these forms either the opportunities are evaluated or the threats. Again, this is done with several questions per building blocks that can be ranked in five steps from 1 till 5. An example of the opportunities and threats form is given in Figure 11 and Figure 12.

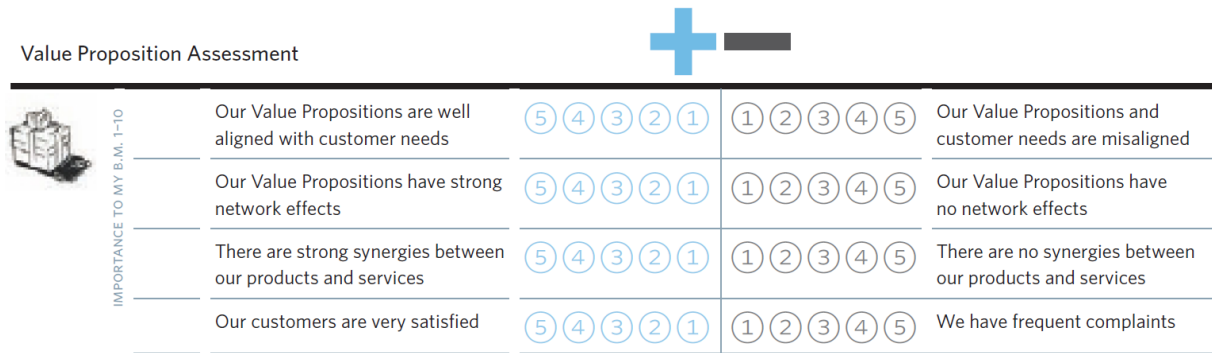


Figure 10: Strengths and weakness assessment of the value proposition (Osterwalder & Pigneur, 2010)

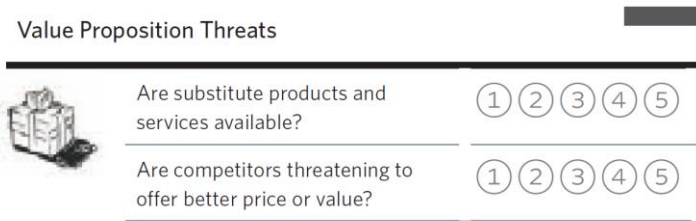


Figure 11: Threats assessment of value proposition (Osterwalder & Pigneur, 2010)

As said before, the evaluation model sub-domain is among the less mature areas of business model research. There are no empirical research results that evaluate and test the quality of the evaluation methods. Therefore, it is hard to say whether the methods are any good in practice. What can be said though is that business model evaluation is found to be important by several authors.

Value Proposition Opportunities



Could we generate recurring revenues by converting products into services?

① ② ③ ④ ⑤

Could we better integrate our products or services?

① ② ③ ④ ⑤

Which additional customer needs could we satisfy?

① ② ③ ④ ⑤

What complements to or extensions of our Value Proposition are possible?

① ② ③ ④ ⑤

What other jobs could we do on behalf of customers?

① ② ③ ④ ⑤

Figure 12: Opportunities assessment of value proposition (Osterwalder & Pigneur, 2010)

3 Business cases: a literature review

Research has shown that developing business case for organizational investments, especially in IT, is common practice currently. A conducted survey of over 100 European organizations showed that 96% of the respondents reported that they are required to produce some form of business case when seeking approval for their investments. (Ward, Daniel, E., & Peppard, J., 2007)

According to a publication of the (Harvard Business Review Press, 2010), a business case is a tool for identifying and comparing multiple alternatives for pursuing an opportunity and then proposing the one course of action that will create the most value.

In this chapter, the business case concept will be further investigated. After an overview of the literature search process towards business cases, in the first section the origin, different types, and the use and goal of business cases will be discussed. Next, the different components of a business case will be discussed. Finally, some effort will be spend on investigating how the literature says a business case should be made.

3.1 Literature criteria, search and selection process

To increase knowledge about business cases or as Google says: '*building on the shoulders of giants*', a literature study is conducted starting with clarifying the search process. For the course of this research, it is interesting to find out what has already been written about business cases to answer the following knowledge problems:

- What is meant with *business cases*?
- What is the goal of business cases and where is it used?
- What are components of business cases?
- How should business cases be developed?
- How can business cases be evaluated?

A forward literature search will be performed using Scopus, the largest abstract and citation database of peer-reviewed literature. Search results should meet the following criteria:

1. Papers published before 2009 should have 3 or more citations
2. Papers must be published between 1998 and 2012
3. Papers must have at least 20 references
4. Subject area is limited to:
 - I. Engineering
 - II. Computer Science
 - III. Business, Management and Accounting
 - IV. Decision Sciences
 - V. Economics, econometrics and finance
 - VI. Mathematics

Based on the selected articles, a backward search will be performed to gather the relevant articles for business cases that did not meet the criteria of the literature search or did not show in the results for other reasons. '*usiness cas*' is the used keyword for this search, for all publications which have the exact phrase of a variation of the term 'business case' in title, abstract, or keywords, can be interesting for this literature review. Figure 2 shows the exact search query as it was entered in Scopus.com on April 22, 2012. The search resulted in 2149 results in the title, abstract, and keywords of publications. After applying the citation restriction, 557 results remained.

```
TITLE-ABS-KEY(
  ("*business cas*"))
AND PUBYEAR > 1997
```

Figure 13: Search query

The number of search results is large. This can be adjusted by sharpening the criteria, but then the risk increases of excluding good articles. The main reason for the large number of results by this search is that many articles use the word 'business case' in their abstract without spending any text on the fundamentals of business cases.

The selection process continues as follows. First, the results are selected or excluded based on their title. Next, the remaining articles will be selected or excluded based on their abstracts. Then the articles without an available full text (directly via Scopus or indirectly via Google Scholar) will be excluded. After reading the full texts of remainder, only the articles with relevant content concerning the knowledge problems above will be kept and used further. Figure 14 shows this process.

From the 557 hits that meet the selection criteria, only three articles are selected at the end of the process. The reason for the large number of un-useful hits is a combination of a few factors. In the first place, all articles which talk about case studies done in an organization (i.e.; business case studies), are not about business cases but about case studies. Another part of the results just used the word 'business case' as a common word to express that their invention is profitable in at least one of the possible value proposition. The last group of un-useful hits is formed by articles making a business case for a wide variety of projects as if it is the most normal thing to do, causing no use of any reference towards what a case study is or how it should be developed. Next to the found literature the book 'Developing a business case' (Harvard Business Review Press, 2010) will be used.

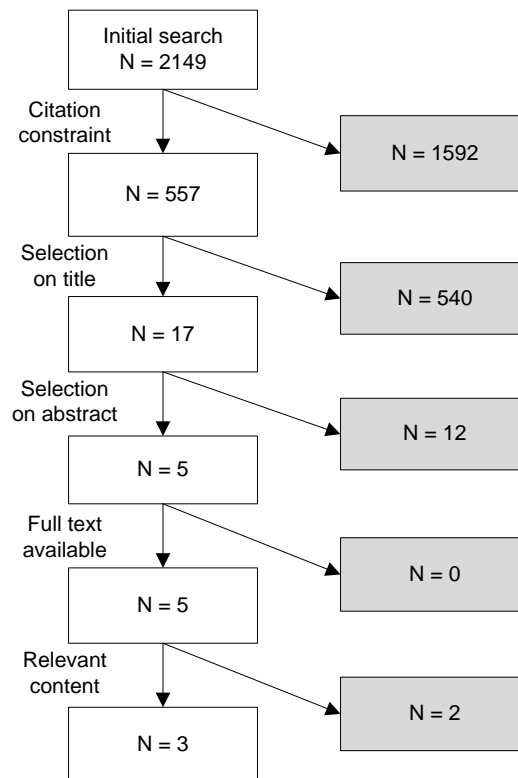


Figure 14: Business case literature selection process

3.1.1 Short literature overview

The selected literature is used to solve the knowledge problems. Table 7 shows which literature (partly) addresses the knowledge problems.

Table 7: Business case literature overview

	(Al-Twairsh & Al-Mudimigh, 2011)	(Nielsen & Persson, 2012)	(Ward et al., 2007)	(Harvard Business Review Press, 2010)
What is meant with the term 'business cases'?	p.44	p. 2	p.1	p.3
What is the goal of business cases and where is it used?	P.44	P.1, p.2	p.2	p.5
What are components of business cases?	p.45		p.4	p.6
How should a business case be developed?	p.45		p.5	p.73
How can business cases be evaluated?			p.8	

3.2 Business case: what it is, what it is used for, and what it is not

In this section, the business case concept will be further defined. Not only is effort put into defining what a business case is, but also in what it is not and what it often gets confused with. This section is based on academic literature found as described in the previous section, and the literature found by a backward search on the citations used in those articles. Next to that the book 'developing a business case' (Harvard Business Review Press, 2010) will be used. Before exploring and defining the concept based on the academic literature, it must be said that plenty of information and discussion about business cases exists in the non-academic field. A quick search on Google on the search term 'business case', results in a multitude of hits that are good to use as information source in practice. Stating this in contrast with the limited amount of useful in-depth academic articles on this subject on the one hand and research results showing that business case development is a common practice nowadays on the other hand, it might be the case that a richer source of information on this subject exists in the non-academic field.

3.2.1 Business case: what it is

In literature, business cases are usually related to IT projects and investments. (Nielsen & Persson, 2012) define business cases as artifacts in the form of a document specifying the main rationale behind the expected value and cost of an IT investment for the adopting organization. Also (Ward et al., 2007), relates business cases with IT projects in terms of a method, amongst others, to get funding for the investment. (Al-Twairsh & Al-Mudimigh, 2011) give a more general applicable definition of business cases, but then also relate it to the role of business cases in ERP implementation. They define a business case as (Ross & Beath, 2002) defined it: '*a structured proposal for business change that is justified in terms of expected costs and benefits*'. The Harvard business review press (Harvard Business Review Press, 2010) defines and applies business cases in

general; they state that a business case is a tool for identifying and comparing alternatives for pursuing an opportunity and then proposing the one course of action that will create the most value.

In this research, the term business cases will refer to the definition by (Ross & Beath, 2002) for it does not purely focus on IT investments alone as other definitions do. The Harvard business review press gives a general applicable definition as well, but they include the components 'identification' and 'comparison'. In the literature too little is referred to a business case as a tool for opportunity/alternative identification. This does not mean that opportunity/alternative identification cannot be a component of business cases, but there is too little reason to state that is per se a part of a business case.

3.2.2 Business case: what it is used for

According to (Ward et al., 2007), traditionally the main purpose in building the business case for an IS/IT project has been to obtain funding approval for the financial spend. In their publication, they expand the role of business cases with the following points stating that business cases should be used also to:

- Enable priorities to be set among different investments for funds and resources
- Identify how the combination of IT and business changes will deliver each of the benefits identified – a benefit realization plan
- Ensure commitment from the business managers to achieving the intended investment benefits
- Create a basis for review of the realization of the proposed business benefits when the investment is complete

While (Ward et al., 2007) focuses specially on IT projects, his ideas about business cases are applicable in general for the goal and definition of business cases as discussed in 3.2.1 are equal. In addition, his business case components seem to be applicable to non-IT related projects as well. (Harvard Business Review Press, 2010) presents a list of situations where a business case is useful. They state that the process of building a business case is similar to solving a problem. Developing a business case would not only help to identify potential solutions to problems, but also help to sell the ideas to key decision makers. According to them, a business case is useful in situations where the goal is to:

- Demonstrate the value a proposed product or service would generate for your organization
- Prioritize projects within your group and identify which ones to eliminate
- Demonstrate the value of a product or service to a customer to make a sale
- Obtain additional resources for a new project, initiative, or organization
- Modify an existing offering
- Invest in a new capability, such as a software program or training
- Decide whether to outsource a particular function

3.2.3 Business case: what it is not

Business cases are in practice not always used as a structured proposal for organizational change. For example, (Nielsen & Persson, 2012) describe that, in some of the municipalities they investigated, business cases were developed after an investment decision was made already, to justify and promote the IT investment decision internally. In contrast with the Harvard business review press (Harvard Business Review Press, 2010) ideas about business cases (i.e.; business cases as a tool for identifying and comparing multiple alternatives for pursuing an opportunity and then proposing the one course of action that will create the most value), this post hoc use is wrong.

Further, the Harvard business review press (Harvard Business Review Press, 2010) stresses the difference between business cases and business plans. They argue that a business case answers the question “What happens if we take this course of action?”, while a business plan describes how an organization or business unit intends to navigate successfully through its own unique competitive environment. Business plans feature long-range projections of revenues, expenses, business strategy, and other information. Typically, business plans are used to secure financing from investors or to plan strategy execution for an organization or business.

3.3 Business case components: two perspectives

It is clear what business cases are and what they are used for. In this section, two different ways of developing a business case with their components are discussed. According to the literature overview (Table 7), three publications discuss components of business cases. After a closer look however, it shows that (Al-Twairesh & Al-Mudimigh, 2011) only give a short summary of the model proposed by (Ward et al., 2007), split into more steps and adjusted towards ERP implementation projects. Therefore, in this section the model from Ward et al. will be discussed, followed by the method of the (Harvard Business Review Press, 2010).

3.3.1 Building the business case by (Ward et al., 2007)

From their research and work with management teams in a wide range of organizations in both private and public sectors, (Ward et al., 2007) developed a six-step approach to building business cases more rigorous and robust:

1. Define business drivers and investment objectives
2. Identify benefits, measures and owners
3. Structure the benefits
4. Identify organizational changes enabling benefits
5. Determine the explicit value of each benefit
6. Identify costs and risks

The six steps are discussed further now.

1. Define business drivers and investment objectives

In their opinion, a business case should start with a statement of the current issues facing the organization that need to be addressed, which are the business drivers. The business drivers can be both internal as external. Then the business case should state clearly what the proposed investment seeks to achieve for the organization, i.e. the *investment objectives*. These should clearly show that it addresses some or all of the business drivers.

2. Identify benefits, measures, and owners

In the second step, the expected benefits need to be identified that will arise if the objectives are met. The investment objectives and benefits differ in the following way: investment objectives are the overall goals or aims of the investment, which should be agreed by all relevant stakeholders. In contrast, benefits are advantages provided to specific groups or individuals because of meeting the overall objectives.

Next, two essential pieces of information need to be added to each benefit. Firstly, it is important how the benefit could be measured because the precision about what was meant by a particular benefit will increase often. Secondly, an individual who will be the owner of the benefit should be identified and assigned to the benefit. This is because the benefit owner is willing to work with the

team undertaking the project to ensure the benefit is realized. This may either be personally or through the resources and influence that the owner has. Making individuals, particularly senior managers benefit owners not only builds commitment to the project but also demonstrates the importance of the investment, adding to the weight of the business case.

3. Structure the benefits

To structure the benefits expected from meeting the investment objectives, (Ward et al., 2007) developed a framework as shown in Figure 15. This framework seeks to differentiate or structure these benefits according to two factors: the type of business change that gives rise to benefit and how much is known already or can be determined about the benefit before the investment is made, i.e. the *degree of explicitness*. Each benefit should be placed within one column and one row, resulting in a spread of benefits across the framework. Instead of a list of benefits as found in most business cases, this framework clearly shows the mix of financial and more subjective benefits and the types of business change necessary to deliver these benefits. Furthermore, the framework encourages greater discussion and evidence gathering about the expected benefits. Moreover, the use of the framework across all business cases enables comparison across investments and assists prioritization.

Degree of explicitness	Do new things	Do things better	Stop doing things
Financial			
Quantifiable			
Measurable			
Observable			

Figure 15: Framework for developing a business case

4. Identify organizational changes enabling benefits

Both step four and five are about using and filling the framework. In step four, expected benefits are classified as either doing new things, doing things better, or stop doing things. Identifying the changes necessary to deliver some benefits may be straightforward. However, in other cases the necessary business changes may be less obvious. In such cases, it is important to identify the change owners. In a similar way to the identification of benefit owners, a named individual should be made responsible for each of the changes that have been identified. This helps to build commitment to the investment and shows, not only what the investment is likely to yield, but how it can be achieved as well.

5. Determine the explicit value of each benefit

In this step, each benefit is assigned to a row in the framework. The degree of explicitness of each row is based upon the ability to assign a value to the benefit from information that is known already or can be determined before the investment is made. Each benefit should be allocated to the observable row initially. The benefit owner should then provide evidence to move it to the rows above. These represent increasing levels of explicitness and knowledge about the value of the benefit.

Observable benefits: are benefits that can only be measured by opinion or judgment. These are often described as subjective, intangible, or qualitative benefits. Important is that a clear statement of the criteria used to assess achievement, and also the person who is qualified or appropriate to make the judgment, should be agreed at the outset of the project. Observable benefits can be identified if the following rule applies: By use of agreed criteria, specific individuals/groups will decide, based upon their experience or judgment, to what extent the benefit has been realized.

Measureable benefits: are benefits where an identified measure for the benefit exists already or where one can be put in place easily. This allows current performance to be determined as the baseline prior to the investment. However, importantly, it is not possible to estimate how much performance will improve when the investment is completed. Measurable benefits can be identified if the following rule applies: This aspect of performance is being measured currently or an appropriate measure could be implemented. However, it is not possible to estimate by how much performance will improve when changes are completed.

Quantifiable benefits: are the benefits where an existing measure is in place or can be put in place relatively easily. However, in addition to being able to measure performance before the investment is made, the size or magnitude of the benefit can be reliably estimated too. Without legitimate quantification, it will be difficult to agree a realistic financial value. Quantifiable benefits can be identified if the following rule applies: Sufficient evidence exists to forecast how much improvement/benefit should result from the changes.

Financial benefits: are benefits that can be expressed in financial terms. A benefit should be placed in this row only when sufficient evidence is available to show that the stated value is likely to be achieved. Hence, all financial benefits should be the result of applying a financial value or formula to a proven quantifiable benefit. The financial benefits can then be combined to calculate an overall financial value of the investment, rate of return or payback.

6. Identify costs and risks

In addition to the benefits, a full business case must include all the costs and an assessment of the associated risks. Once a total financial value of the relevant benefits has been determined and the expected costs have been identified, a financial assessment can be made. In terms of assessing the investment risks, (Ward et al., 2007) refers to some well established ways of estimating financial and technical risks for IT investments. The risks of the project should be assessed, but how this is done depends on the type of investment and the assessment can be done by applicable risk assessment methods. On this part, (Al-Twairesh & Al-Mudimigh, 2011) have a good addition. They argue that the risk of no investment is often overlooked, but just as critical in developing a business case is the 'risk of no investment' outcome. If the investment is not made, then it is important to know what could happen to the company's bottom line. For example, the chances of losing customers, or market share, or maybe some future costs can be avoided if the investment is made.

3.3.2 Seven steps to a business case (Harvard Business Review Press, 2010)

In the following part, the method by the Harvard Business Review Press will be discussed. They start with differentiating between the product and the process. Here they mean that the product is a document or presentation, for which many companies have their own templates and specific guidelines. However, they focus on the process of defining the business case. Regardless of the format of the business case, the following steps can be used to prepare it:

1. Define the opportunity
2. Identify the alternatives

3. Gather data and estimate time frame
4. Analyze the alternatives
5. Make a choice and assess the risk
6. Create a plan for implementing the idea
7. Communicate the case

All the steps need to be completed to build a strong business case. The depth of analysis and extent of documentation necessary to support the case, likely varies depending on the proposed initiative's scope, costs, organizational impact, and risk.

1. Define the opportunity

To define the pursued opportunity, the following elements are needed:

- Problem or opportunity identification
- Crafting an opportunity statement
- Identify the business objectives in pursuing the opportunity
- Prioritize the objectives
- Assign metrics to the objectives

The first step in building a business case is the identification of the problem or opportunity. Then a statement that describes the benefits that will come with solving the problem or seizing the opportunity needs to be developed. After this, the most relevant business objectives that are hoped to be achieved by pursuing this opportunity need to be identified. Next, the objectives need to be prioritized. To end the first step, metrics for each of the defined objectives need to be identified.

2. Identification of alternatives

This step consists of three tasks. First, they argue, it is vital to brainstorm a full set of alternatives rather than latching on to the first one or two good ideas that occur. Second, the stakeholders are identified and contacted. Because a big part of building a business case is about selling the idea, it makes sense to involve stakeholders early in the process. Next to that, they may also provide ideas and additional information, and it becomes clearer what they value most. The final task is to narrow the list of alternatives down to two or three options that best address the business objectives and stakeholders needs.

3. Gather data and estimate time frame

Based on the chosen metrics for each business objective, all information needs to be gathered to compare the options making use of the metrics. Next, a time frame for implementing the initiative and achieving the benefits of the defined opportunity needs to be made. The following guiding questions can be used to accomplish this:

- When would the initiative get under way?
- Would it be phased in over the course of one year, three years, or more?
- Would it be synchronized with calendar years, fiscal years, or other initiatives?
- Would it have a clear end at which all its benefits would be generated?

Setting the time frame requires a lot of estimating. While doing this, the used information and assumptions should be documented so that in a later stage the reasoning can be explained.

4. Analyze the alternatives

In the end, the decision-makers want to know the financial implications of each of the alternative courses of action presented in the business case. Financial implications can be described by possible impact on revenues, return on investment, payback period, and so forth.

When the financial ramifications and the impact on non-financial metrics of the alternatives are defined, using an alternative comparing table, the alternatives can be compared. Suggested is a table with the alternatives in the rows and the pros and cons in the columns. The following eight steps are presented to structure this process:

- List the costs
- List the benefits of expected additional revenues
- Point out any cost savings to be gained
- Identify when the anticipated costs and revenues can be expected
- List the impacts on other corporate metrics, such as customer satisfaction, customer retention, and operational efficiency
- List any unquantifiable benefits and costs
- Conduct the business impact analysis
- Organize the information into a table for comparison

5. Make a choice and assess the risk

Based on the information in the comparison table, the best alternative can be chosen. This is not exact science for also non-quantifiable benefits could play a part in the decision. Again, the rationale needs to be documented so the reasoning can be explained in later stages.

After the choice is made, the potential risks need to be identified. Next to risks for the organization, also the risk of implementation of the choice needs to be assessed, as well as the risk for peers and stakeholders. A good way to explain the risks is by conducting a worst-case and best-case scenario. After the risk assessment, ways to migrate the risks need to be identified.

6. Crafting an implementation plan

An implementation plan lays out how the progress can be tracked and the success can be measured if the proposed solution is put into action. Next to lists of action items, due dates, and responsible people, the following things should also be in the implementation plan:

- The primary milestones
- Individuals responsible for each milestone
- Resources required to reach each milestone
- Dates when the benefits can be shown
- Impacts on the company's expense and headcount budgets
- Increases in revenue
- A plan for demonstrating that the solution's intended results have been realized

7. Communicate the case

The final step is about communicating the business case to the decision makers. It is important to know what the decision makers value and that it becomes clear to them what they need to do. For example, do they need to approve resources or do they need to 'talk up' the proposal to others? Furthermore, it is important that both the document and the presentation (if there is one) are short and to the point.

3.3.3 Business case method comparison

After explaining how (Ward et al., 2007) and the Harvard Business Review Press (2010) suggest a business case should be developed, Table 8 lists and compares the different components used in the two methods to see how they differ.

Next to some minor differences between the two methods, a couple of bigger differences can be identified. The first is the inclusion of alternatives in the Harvard Business Review Press method. They state that the biggest mistake, which can be made when developing business cases, is going for the first and only option without seriously thinking about alternatives. The only alternative, which (Ward et al., 2007) consider, is the (non-)financial consequences of not implementing the proposed idea. This 'alternative' is not mentioned by the Harvard Business Review Press (2010).

The second difference is how stakeholders are involved in the business case. Ward et al. (2007) involve benefit owners in the beginning of the business case development to get knowledge of what

stakeholders want and what ideas they have concerning the issue that needs to be addressed. In addition, by assigning a benefit to an owner, this individual should therefore be willing to work with the team undertaking the project to ensure the benefit is realized.

Next, Ward et al.'s method categorizes the benefits. First, they are categorized based on the type of need for organizational change, and then based on the degree of explicitness. This way, not a long list of benefits is not shown which need to be valued by the reader to see what the benefits are really worth, but the value and consequences of the benefits are easy to estimate.

In the final step of Ward et al.'s method, the costs and risks are assessed. Both methods agree that costs and risks are important decision criteria. However, in the Harvard Business method, only the best alternative is chosen based on the (non-)financial benefits, excluding the risks. After the choice has been made, the risks for this choice are assessed. It would be more logical, to assess the risks of all the alternative as the costs are assessed, and based on that information the choice is made.

Another good aspect of the Harvard Business method is the creation of an implementation plan. If the business case is good, but the plan or approach to implement the project lacks, the risk that the project fails increases.

To summarize, both methods have a lot of common, and some unique components. Combining the two methods will produce an even stronger and better business case.

Table 8: BCD method comparison

(Ward et al., 2007)			Harvard Business Review Press (2010)	
Step	Component	Explanation	Component	Explanation
1	Business drivers	Organizations current issues that need to be addressed	Problem or opportunity	A problem that the organization currently faces or an opportunity for the organization
	Investment objectives	Which business drivers are addressed with the proposed investment	Business objectives	Most relevant business objectives that are hoped to be achieved by pursuing this opportunity
			Objective metrics	Metrics for each defined objective are identified
2	Benefit identification	Identification of the benefits that are hoped to be achieved	Alternative identification	Identification of two or three alternatives that best address the business objectives
	Benefit metrics	Defining the metrics which can be used to measure each of the benefits		
	Benefit owners	Identification of an individual who will be the owner of the benefit		
3	Benefit structuring	Structure the benefits according to type of organization change, and degree of explicitness	Data gathering	Data gathering to compare the alternatives based on the used metrics
			Time frame estimation	A time frame shows when the initiative is implemented and when benefits are achieved
4	Organizational change identification	Identify the (organizational) changes necessary to deliver the benefits	Alternative analysis	Compare the alternatives based on quantitative and qualitative measurements
5	Determine explicit value of the benefits	Assign financial, quantifiable, measureable or observable value to each benefit	Chose best alternative	Chose the best alternative based on the analysis
			Risk assessment	Assess the risk of the chosen alternative
6	Identify costs	The costs of the project as well as estimated financial returns	Implementation plan	A plan that lays out how the progress can be tracked and the success can be measured
	Identify risks	Organizational risk that is caused by the project		
7			Communication of the case	A plan how the case can be best communicated aligned to the needs of the decision makers

3.4 Business case evaluation

As stated before, a big gap in academic research towards business cases exists. An even bigger gap exists concerning business case evaluation. In the reviewed literature (including backward search (Webster & Watson, 2002)), only (Ward et al., 2007) give a short remark on evaluation.

The first empirically assessed point they make, is that business cases which overstate the benefits to obtain funding, are least likely to put effort into reviewing the outcome. Moreover, if they do, less than 50% of their business case projects deliver the expected benefits. A good business case should enable the outcome of the investment to be assessed in terms of the benefits delivered, or if they were not achieved, to explain why. Based on their field research, they found that of all the aspects of business case development that differentiate the successful from the unsuccessful, evaluation and review of the benefits was where the differences were most pronounced. Evaluation of business cases can be done by reviewing which benefits were delivered and which not. This followed by explaining what caused the lack benefit delivery and what can be learned from that.

4 Relation between BM and BC

In the previous parts, the theoretical frameworks of business models and business cases are discussed. In this section, the relation between the two concepts is unraveled. The first section discusses the place of the business model in an organization. Later this supports better understanding of which organizational parts are influenced by a renewed business model, and what parts cause a change in the business model. In the second part the concept of innovation is discussed more in-depth and its relation to business models. In the third section, the various causes that lead to a changed business model are discussed. Next, a new business case method is created and clarified. The last section is about mapping the business model on the business case method.

4.1 Business models and organizations

As discussed in the theoretical framework of business models, Casadesus-Masanell & Ricart (2010) present a framework to separate and relate the concepts of strategy and business models. They argue that a business model is a reflection of the firm's realized strategy. Therefore, business models are on a lower abstraction level than strategy. Strategy is according to them, often defined as a contingent plan of action designed to achieve a particular goal. Porter states that strategy is the creation of a unique and valuable position, involving a different set of activities. Further Casadesus-Masanell & Ricart (2010) argue that the word 'creation' in Porters definition, implies a choice as to the particular way in which the firm competes. Thus, while the resulting through strategy created 'creation', this 'creation' is a reflection of the strategy, and not the strategy in itself. Consistent with this notion, strategy refers to the contingent plan as to what business model to use. Strategy is a high-order choice that has profound implications on competitive outcomes. Choosing a particular business model means choosing a particular way to compete, a particular logic of the firm, a way to operate and to create value for the firms stakeholders. Next to strategy and the business model, the meaning and position of tactics need to be defined. Casadesus-Masanell & Ricart (2010) refer to tactics as the residual choices open to a firm by virtue of the business model that it employs. To illustrate this, they used the example of the free newspaper 'Metro'. This newspaper is free for the reader and is completely ad-sponsored. Per region, Metro can make choices about its advertising rates, as well as the number of ads and pages in each edition, the balance between news and opinion pieces, and so on. All of these choices are part of metro's tactics. However, its business model dictates that it must be sold at zero price. This way is precludes Metro from using 'selling price' as a variable that can be changed depending on the intensity of competition and other factors. Therefore, 'price' does not belong to the set of Metro's tactics. The framework, which interrelates the concepts of strategy, business model, and tactics, is represented in Figure 16.

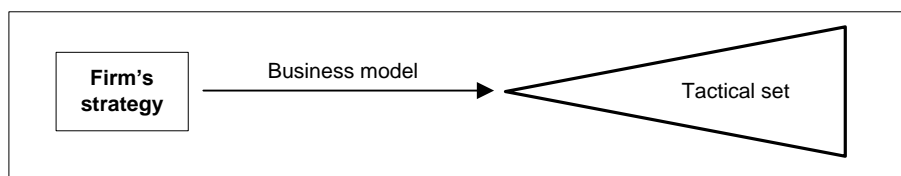


Figure 16: Strategy, business model, tactics (Casadesus-Masanell & Ricart, 2010)

4.2 Innovation as common factor

As discussed in section 2.5; in the face of discontinuities and disruptions, convergence and intense global competition, companies now need to transform their business models more rapidly, more frequently and more far-reaching than in the past. Shortening product lives mean that even great technologies no longer can be relied upon to earn a satisfactory profit before they become commoditized. Today, innovation must include business models, rather than just technology and R&D. (Chesbrough, 2007a)

Business model innovation (or agility) is important for an organization to adapt to the continuously changing market it operates in. But, what is meant with innovation? According to Garcia & Calantone (2002), over fifteen constructs and at least 51 distinct scale items have been used in just 21 empirical studies in the new product development literature that model product innovativeness. A common used typology of innovation that is used in the remaining of this research, is described in the book: "Driving growth through innovation" by Tucker (2002). He defines innovation as: *'Bringing new ideas to life'*. In its simplest definition, innovation is coming up with ideas and bringing them to life. Creativity and innovation are often used interchangeably. But this shouldn't be, because while creativity implies coming up with ideas, it is the "bringing ideas to life" part of this simple definition that makes innovation the distinct undertaking it is (Tucker, 2002).

The purpose of innovation strongly correlates with the value proposition of a business model, for the purpose of innovation is to create new customer-perceived value. Tucker (2002) differentiates both types and degrees of innovation in three parts as shown in Figure 17 where it is applied on the McDonald's case.

<i>Degree / Type</i>	Product	Process	Strategy
Breakthrough	Big Mac	Consistency	Global expansion
Substantial	Value meals	Hamburger University	Opening for breakfast
Incremental	Green Milkshake for St. Pat's day	New French Fry cookers	Boston markets acquisition

Figure 17: McDonald's case in the innovation opportunity grid (Tucker, 2002)

Innovation types

The three types are product, process, and strategy innovation. Product/service innovation is the result of bringing to life a new way to solve the customer's problem that benefits both the customer and the company. In the McDonald's case, this is the Big Mac. A tasteful fast-food product for a low price.

Process innovations increase bottom-line profitability, reduce costs, raise productivity, and increase employee job satisfaction. The unique trait about process innovations is that they are most often out of view of the customer; they are back office. Only when a firm's processes fail to enable the firm to deliver the product or service expected does the customer become aware of the lack of effective process. An example is the consistency of products and tastes around the world at all McDonald's locations. Everywhere the products are made according to the same process and with the same raw-materials, resulting in the same product experience all over the world.

Strategy innovation is about challenging existing industry methods of creating customer value in order to meet newly emerging customer needs, add additional value, and create new markets and

new customer groups for the company. (Tucker, 2002) An example of this is also given in the McDonald's case. In earlier times, McDonald restaurants only provided meals that could be used as lunch or dinner. Introducing breakfasts required a completely new product line, opening times, and customers.

Innovation degrees

The degree of innovation is represented in Figure 18. Breakthrough innovations are defined as the commercialization of products and technologies that have strong impact on two dimensions. The market in terms of offering completely new customer benefits, and the company in terms of its ability to create new business.

Substantial innovations are mid-level in significance to both customers and the company. The innovation falls short of being a breakthrough but enables and ensures that the organization meets or exceeds its goals to grow the business and increase market share.

Incremental innovation has the smallest impact and requires the least amount of change. It uses existing forms or technologies as a starting point. Either it makes incremental improvements to something or some process or it reconfigures it so that it may serve some other purpose.

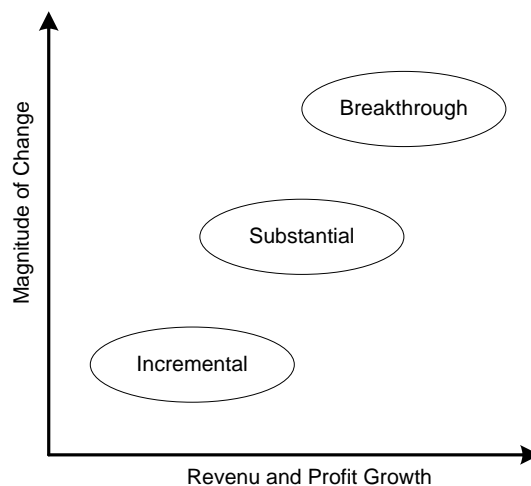


Figure 18: Degrees of Innovation (Tucker, 2002)

4.3 Business model innovation causes

In the previous sections, the relation between the strategy, business model, and tactics is discussed, as well as the concept, types and degrees of innovation. In this section, the relation between these two parts is established resulting in an overview of causes resulting in a business model change. The point of origin for this research is to establish a method to develop a business case of potential business models, in order to objectively compare business models and choose one for the best course of action. Understanding the causes of business model change, helps developing and using the business case method for business models.

As discussed in the previous section, Tucker (2002) defines three types of innovation. Combining these types of innovation with the framework of Casadesus-Masanell & Ricart (2010), shows that strategy innovation will always lead to a changed business model, for strategy can be described as a creation process where the 'creation' is the business model. Thus changing the creation process, leads to a different creation.

Process and product innovation belong to the tactical and operational levels, below the business model. Each business model enables a tactical set of choices as illustrated by the Metro case.

Therefore, not all process and product innovations have a direct influence on the business model. In other words, not all process and product innovations will change the business model, but some of

those innovations will change the business model. To better specify which of those innovations influence the business model, the framework of Casadesus-Masanell & Ricart (2010) can be used again. As discussed, each business model enables a so-called tactical set. If a process or product innovation exceeds the limits of the tactical set, it will lead to a change in the business model. A business model can be affected by strategy, process, and product innovation, but also from within itself. With business model innovation the business model is assessed and approved. In the canvas method of Osterwalder, the business model is modeled in nine building blocks. Each of the building blocks individually or all together can be innovated. For example, the revenue model of a value offering can be substantially innovated as seen in the past in the music industry. Where customers first owned music by buying CD's, now there are possibilities to pay a monthly fee to listen to music without owning it. This innovation of the business model resulted in changes on the tactical level of the music providing organization to make the new form of music delivery possible. In this case, the organizational change was initiated by a business model innovation.

To summarize, three situations can lead to business model innovation:

- Business model innovation (direct impact on business model)
- Strategic innovation (direct impact on business model)
- Product or process innovation ((direct impact on business model if innovation is outside the tactical set enabled by the business model)

In any of these situations, it is valuable to know whether the new business model is really the best model possible in the given situation. Here the business case comes in.

4.4 The business case method

The research objective is to design a structural method to create a business case of business models, to be able to objectively compare the assessed business models, and choose the best alternative. Based on the previous shown business case approaches comparing table (Table 8), eight main steps can be identified.

1. Business driver – the cause, problem or opportunity that need to be addressed
2. Business objectives – the objectives that are aimed for and their stakeholders
3. Alternatives – representing the options there are to reach the objectives
4. Effects – positive and negative effects caused by the pursued alternative attached to an effect owner
5. Risks – risks that come with the pursued alternative
6. Costs – costs that come with the pursued alternative
7. Alternative selection – based on the gathered data the best alternative is chosen
8. Implementation plan – plan which explains when and how the alternative is implemented

In contrast with the business case method proposed by (Ward et al., 2007), this method does take alternatives into account like the model of (Harvard Business Review Press, 2010). This is because in most cases more than one solution can be thought off and applied to reach the goal. Therefore, it would be bad to go with the first possible solution without putting some effort in the quest for other compelling solutions.

Further, the fourth point is different from the business case methods proposed in the reviewed literature. There the authors only look to the benefits that the proposal brings. However, this is almost like a facade for arguing towards Pareto efficiency⁵. The benefits are important for the business case. The possible negative effects however, cannot be dismissed. Therefore, a good

⁵ 'An economic situation is Pareto efficient if the benefit derived by any of the parties can be increased only by reducing the benefit enjoyed by one of the other parties.' (Kirschen & Strbac, 2004)

overview of not only the benefits but also the disadvantages should be presented in the business case as an overview of the caused effects of the proposed business model change. According to (Ward et al., 2007), organizations who overstate the benefits to obtain funding are the least likely to review the outcome and less than 50% of their business case projects deliver the expected benefits resulting in unsatisfied senior management.

4.5 Business case step clarification

Due to the introduction of a new business case development method based on literature the method will be clarified in more detail in this section. The business case method is designed with the focus on business models.

4.5.1 Business drivers

The meaning of the business drivers has not changed and originate from the business case method by (Ward et al., 2007). The business drivers stand for a statement of the current issues facing the organization that need to be addressed. These can either be issues (i.e. problems) or opportunities and ideas with enough potential to make it worth persuading. Applied to business models, the business driver originates most likely from the need for business model innovation. (Chesbrough, 2007a) argues that due to shortening product lives, even great technologies no longer can be relied upon to earn a satisfactory profit before they become commoditized. Practice has learned that even great business models will not last forever. Therefore, he argues, a company is going to need to think hard about how to sustain and innovate its business model. For future markets will be smaller, more highly targeted (and effective), and the new environment will require different processes to develop and launch products successfully.

4.5.2 Business objectives

Both methods discussed in the theoretical framework advice to set business objectives which state how and which business drivers are addressed and hoped to be achieved with the business model change. Also the stakeholders are identified. The stakeholders can provide knowledge and ideas. Also, involving stakeholders in an early stage will increase their support in the future.

4.5.3 Alternatives

The reasoning to admit the identification and assessment of alternative solutions in the business case development method is explained above. Summarized the argument is that it would be unwise to go with the first idea that comes along which addresses the business drivers, without investigating if there are other and perhaps better alternatives. Amongst others, the identification of alternatives can be done by assigning a senior manager with the task to define and launch business-model experiments (Chesbrough, 2007a). (Harvard Business Review Press, 2010) proposes brainstorm sessions as a tool to identify alternatives. Applying the identification of alternatives to business models, both tools can be used. Next to those, also can be thought of market assessment tools or a SWOT analysis.

4.5.4 Effects

The effect component is the largest of all. This is because a variety of actions need to be performed with the effects to create a consistent and structured overview of the effects on the organization per alternative. Effects are the positive (benefits) and negative (disadvantages) effects caused by an alternative. First, the effects need to be identified. Second, it is important to attach information to each effect how it can be measured. Third, each effect should be connected to an owner for it increases the involvement to the project within the organization, and stimulates owners of benefits to help establishing the alternative if it is approved. Then each effect needs to be place in the framework as proposed by (Ward et al., 2007) (see Figure 15). In this framework, for each effect the type of organizational change and the degree of value explicitness is determined. Furthermore, each

positive effect should be connected to its owner. This is the stakeholder who is positive affected by the effect. Finally, a time frame is estimated per alternative. This time frame gives information of when the project will start, when the results are expected to be delivered and when the project is supposed to be finished.

4.5.5 Risks

The fifth step is concerned with the risk assessment of each alternative. Risk can be defined as the probability that the actual input variables and the outcome results may vary from those originally estimated (Remenyi, 1999). How risks can be assessed depends on the situation and needs further research per case. Amongst many others, the Best case/worst case scenario method can be used to assess the risk of the alternatives. With this method, two scenarios are developed and the effects of each scenario on the organization are estimated. In the first scenario, the alternative will perfectly result in the expected benefits. In the second scenario, the worst reasonable possible situation will evolve caused by the alternative.

4.5.6 Costs

Costs are one of the most important aspects of a business case. The costs give an indication of the total expected investment costs, and expected profit over a specific time period. The investment costs, represent the money needed to implement the business model change in the organization. Also, in the costs section, the expected payback time is calculated to indicate how long it will take for the break-even point is reached.

4.5.7 Alternative selection

After the data gathering for all of the alternatives, the best option can be chosen. This is done by weighting the expected effects of the alternative against the expected calculated costs. (Harvard Business Review Press, 2010) suggests that the best alternative is partly chosen based on feelings. However, if the risks are translated into expected costs, this can be added to the costs-effect equation. Then the alternatives have to be compared based on the non-financial effects and the total expected costs/profit of the alternative. There are many methods to do this, varying from complex to rather simple. For example the direct-rating method, point-allocation method, analytical hierarchy process, and many others (Van Ittersum, Pennings, Wansink, & Van Trijp, 2004). A rather simple three-step method could be derived from the direct-ranking method. First all effects and cost/profit numbers are listed together. Second the positive effects and (in case of a profitable project) the profit, are ranked according to importance relative to each other from "0-100". The negative effects and costs (in case of a non-profitable project) are ranked also relative to each other on a scale from "-100 – 0". In the third step, the values of the effects and cost/profit per alternative are added up. The alternative with the highest total score wins.

4.5.8 Implementation plan

The final component of the business case method concerns the development of an implementation plan. This lays out how the progress can be tracked and the success can be measured if the proposed solution is put into action.

4.6 Business case method application on a business model

In this section the developed business case method is applied to the business model concept. A visualization is given in Figure 20. In this figure, the business case steps are shown on the left. The source or type of information or input for each of those steps, is shown on the right.

The first step contains the business driver. Business drivers for business model innovation can come from different sources. In general however, shortening product lives, intense global competition, and the disruptive and agile environment (Chesbrough, 2007b), are sources for the business driver. This can cause one of the three causes for business model renewal as discussed in 4.3. The business objective represents the goals that are aimed to be obtained with the business model change. The next step, is the identification of alternatives. In this step, multiple business models can be developed, which are developed with the focus on meeting the business objectives.

Next, the effects, risks, and costs of each of the business model alternatives are assessed. The effects represent the positive and negative non-financial effects cause by the presented alternative. The effects can be represented with the framework for business case development as shown in Figure 15 by Ward et al. (2007).

To assess the risks of the project, one of the risk assessment methods described in literature for project management can be used. The risk assessment part should at least cover the following points (Remenyi, 1999):

- Description of the risk
- Likelihood of risk occurring
- Potential impact of the risk
- Possible actions to handle or overcome the risk
- Identification of possible early warning sign indicators
- The risk owner

The risk can be represented in a risk probability vs. risk impact matrix as shown in Figure 19.

In business cases, the costs representing the expected financial benefits in a specific period along with the costs of the project, is often the most important part for decision makers. In the costs section, changes in the business models costs and revenue component need to be assessed. Costs created in other components like the key activities, should be covered in the costs component. Next to the expected costs and profits, the payback period and return on investment rate should be presented.

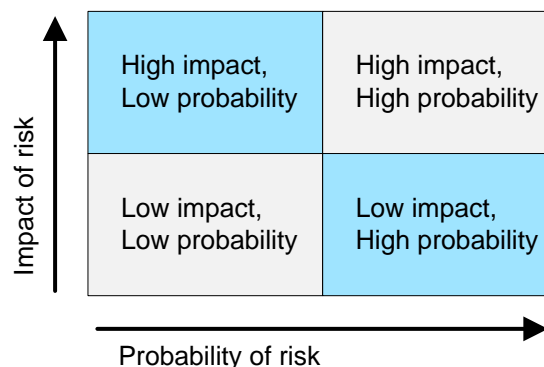


Figure 19: Risk assessment matrix

Using a multi criteria method, as discussed in 4.5, the most suitable business model can be selected in the seventh step. At last, an implementation plan can be developed.

From step three till eight, the alternative business model should be compared to the current business model to assess the change and effects it causes. For example, in the fourth step, only the effects of the first alternative business model that differ from the current business model are assessed. The reason for this is, that the other effects remain the same for both alternatives, and thus only increases the size and complexity of the business case.

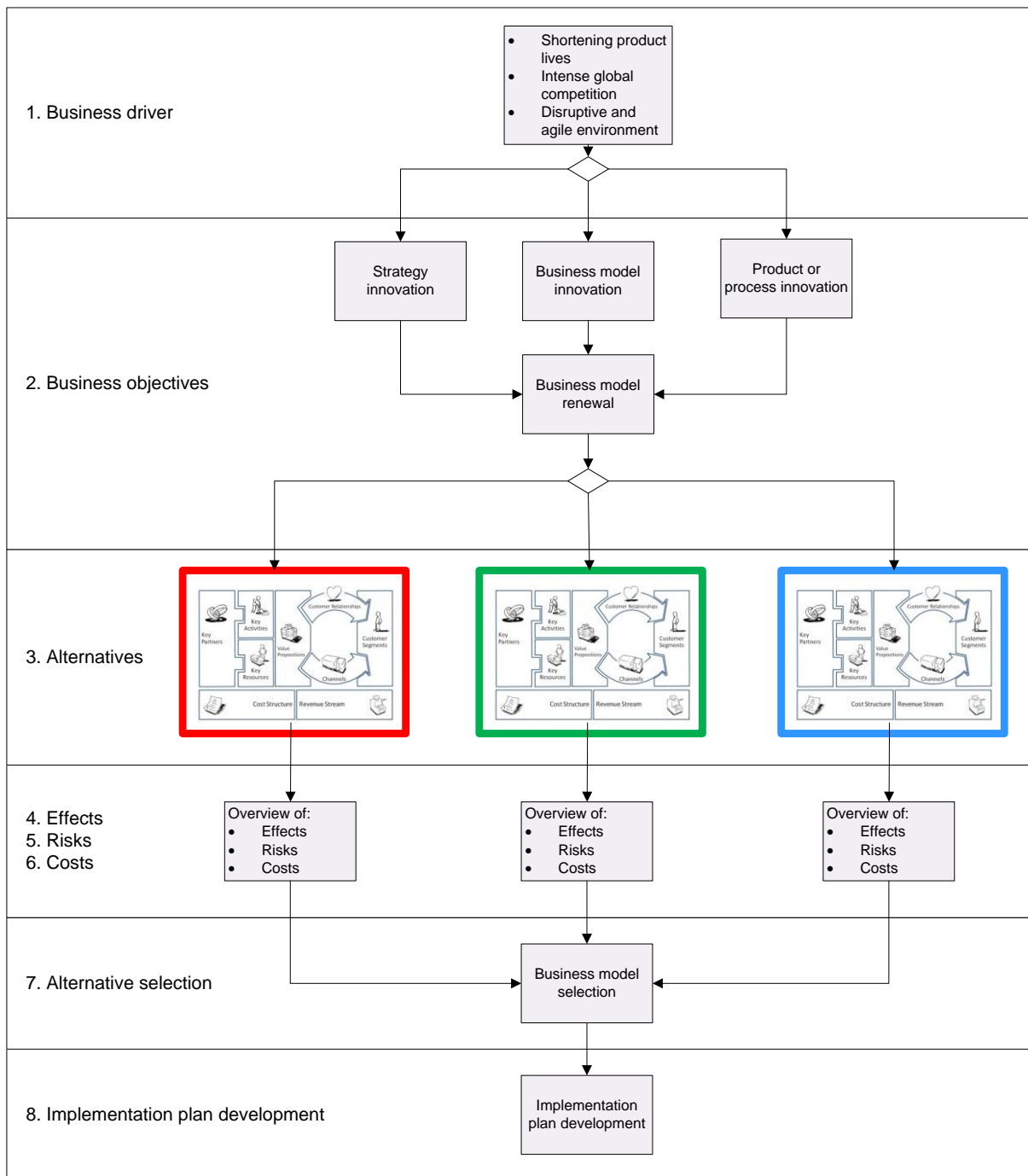


Figure 20: Visualization of the business case method for business models

5 Method demonstration and validation

Based on literature, a method to create a business case of potential business models is designed in the previous part. As discussed in the methodology section, after the development of the artifact, the next step is to demonstrate and evaluate the artifact, to retrieve new insights and increase the quality. To demonstrate the designed method, a case study is done. The case is provided by the Dutch company DEA Logic (Dugour Electronics Almere⁶) and is performed on the Dutch housing corporations in general.

In the first part of this chapter, a short company overview of DEA Logic and information about Dutch housing corporations is given. In the second part the innovation and case is discussed. In the third part, the business case is made, using the designed method. In the fourth part, the method is evaluated.

5.1 Company overview

In the following two sections, information is given about the stakeholders. First, the case providing company, DEA Logic, and is discussed. In the second section, Dutch housing corporations will be discussed. The innovation is developed by DEA Logic, and the target customer for this innovation are Dutch housing corporations. The innovation will have an impact on the business model of the Dutch housing corporations.

5.1.1 DEA Logic

'Development and innovation starts with DEA Logic' is the company's slogan. DEA Logic is an engineering company specialized in advanced electronics, security software, consulting in the ICT, information management, and building management area. Over the last years, DEA Logic developed an access control system called 'C-Lock'⁷, which currently has a major position in their product portfolio. The C-Lock system can be extended with multiple solutions. This way, apartments can be better adjusted to the needs of the tenants. DEA Logic provided this case, because they would like to know whether their product is favorable for housing corporations.

5.1.2 Dutch housing corporations

In the Netherlands, a housing corporation is a non-profit organization which mission is to build, manage, maintain, and rent houses and apartments. The responsibilities are defined and assigned by the Ministry of Housing, Spatial Planning, and the Environment. Each housing corporation is private, but can only operate between the boundaries set by the Dutch government. Therefore, the Housing corporations are very similar. In addition, every Housing corporation has more demand than supply, which causes waiting lists. The Houses they rent are favorable for citizens with a low income (an annual maximum income of € 43.000 is allowed). The corporations are tasked to supply good housing possibilities for the relatively more vulnerable and poorer people in society. For the public character of the housing corporations, all needed information for this case is public and presented on websites of housing corporations, the government⁸, and the central fund for people housing⁹. For the scope and purpose of this research, applying the DEA Logic case on Dutch housing corporations in general is sufficient to demonstrate the designed method.

⁶ Website of DEA Logic (Dugour Electronics Almere): <http://www.dealogic.nl>

⁷ Website of C-Lock by DEA Logic: <http://www.c-lock.nl>

⁸ Website of Dutch government: <http://www.government.nl>

⁹ Website of central fund people housing: <http://www.cfv.nl>

5.2 Case description: The IP-Infrastructure

In the next section, the innovation will be explained in more detail. The second section will discuss the case for this innovation from the perspective of Dutch housing corporations.

5.2.1 The innovation

DEA Logic develops technological and electronic innovations for real estate amongst others. The C-Lock access control system is one of those products. The IP-Infrastructure is an innovation for newly built or renovated apartment buildings. In the current situation, each apartment in the complex is supplied with public utilities and digital infrastructural connections. In the Netherlands, each apartment is at least provided with a telephonic, cable, intercom system, and often fiberglass connections. Each of these connections makes use of their own wires. The main idea of the IP-Infrastructure is to supply each apartment with only one TCP-IP connection, combining the telephonic, cable, intercom system, fiberglass connections, and other possible data connections. A schematic overview of the IP-Infrastructure is given in Figure 21. The normal cables enter the building and are connected to a central server. Through CAT5 or fiberglass cables, each apartment is supplied with the necessary connection possibilities. This infrastructure does not only reduce the infrastructural costs and materials of newly built or renovated apartments, but also increases the possible functionalities. The currently developed functionalities are derived from the C-Lock access system and can be easily connected to the receiver. Tenants can choose individually which 'solutions' they need. Some examples of the solutions:

- Access solutions
 - Electronic keys are used to grant access to the building and the apartment.
 - If favorable, the system can be extended with an automatic door opener, which opens the door if the tenant with the right key is standing in front of the door.
- ICom solutions
 - This is a door phone system with video support as seen nowadays in most newly build apartment buildings.
- Security solutions
 - This module contains a burglar alarm, smoke detector, and camera monitoring.
 - In case where other tenants also have this module, the alarm message can also be send to them, for example in case of a fire.
- Care solutions
 - The ICom phone with touch screen system can be extended with additional modules for extra functionalities. This could include personal alarm, telemedicine, tele-monitoring and even detection to prevent people from wandering off.
- Communication solutions
 - Communication between tenants and housing corporations, is done by sending letters or by phone. With the communication solution, housing corporations can send information for example about maintenance, to the ICom system. Tenants are also able to send requests for maintenance using the ICom system.

The core of the innovation is to increase the apartment's flexibility, functionality, and luxury, and to minimize the maintenance costs.

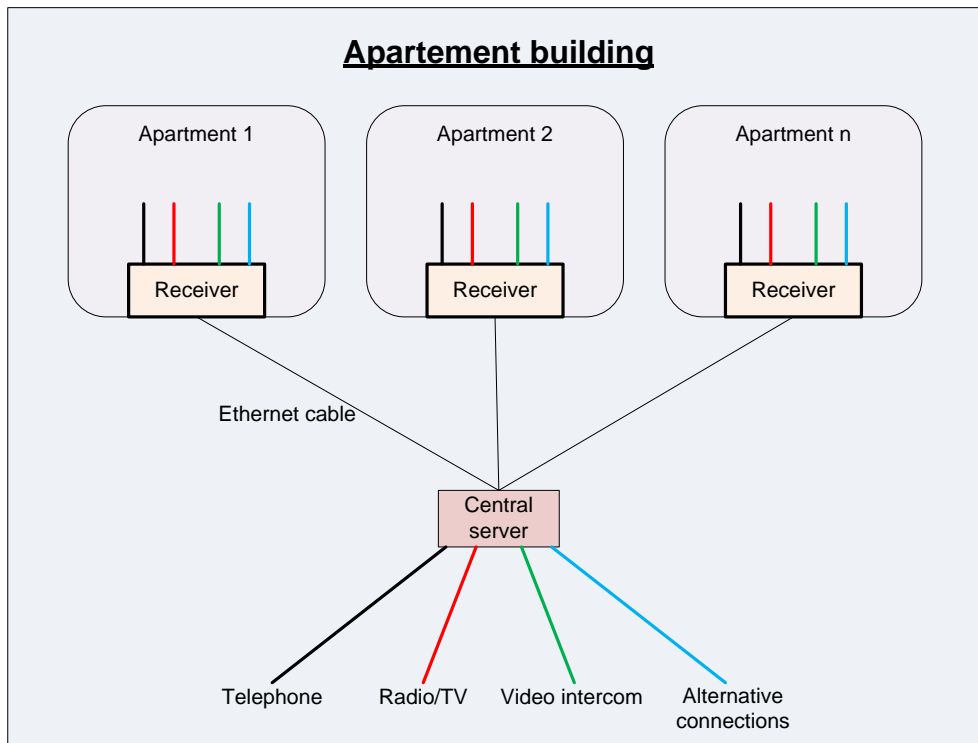


Figure 21: IP-Infrastructure schematic representation

5.2.2 The case for housing corporations

The C-Lock and IP-Infrastructure innovation by DEA Logic is suitable for Dutch housing corporations, for they build, rent, manage, and maintain relatively low-priced apartments for a diverse target group. The target group is diverse for their customers are young as well as old people. In addition, families with children and people who need daily nursing support, belong to the target customers. Introducing DEA Logic's product innovation will increase the target group for each apartment, for they can be easily adjusted to the needs of the tenant. Further, the maintenance costs will decrease. The innovation affect the housing corporation's business model. Renting C-Lock solutions and the IP-Infrastructure, will become a new key activity. DEA Logic will become a new key partner, together with several service providers. Also the value proposition will be extended, for apartments will be more secure and luxury. The customer segment will be increased for each apartment can be adjusted to the needs of tenants. Finally, a new revenue stream is added, for the IP-Infrastructure is rented in combinations with some C-Lock solutions in addition to the rent of apartments. Therefore, DEA Logic's product innovation and Dutch housing corporations form a good combination to test the business case development method.

5.3 The business case

The business case will be made using the method described in paragraph 4.4. The goal of the business case is demonstrating the designed method. The data and numbers used in the business case are based on calculations by DEA Logic, and internet sources. For the hypothetical character of the business case, it was not possible to use precise values. The business case can be used as an indication of the order of magnitude of the costs difference between the two discussed alternatives. In case the project is realized in the future, a new business case will have to be made, to assess the effects of the innovation on the specific situation. For the purpose of demonstrating the business case method, the used numbers and accounted variables are sufficient.

The following eight paragraphs represent the eight steps of the business case development method. Two scenarios are compared. In both scenarios, the same apartment complex is build with hundred

apartments. The first scenario represents the current situation. In the second scenario the IP-Infrastructure is implemented together with C-Lock solutions.

5.3.1 Business driver

Based on the vision and strategy of the three largest housing corporations (CFV, 2012), their mission is to build, manage, and maintain quality tenement housing for people with a low income and the vulnerable groups in society. Therefore, it is preferable that the building, managing, and maintenance costs of the tenement houses are low. Housing corporations are continuously seeking possibilities to reduce the costs and deliver high quality, affordable and luxury homes for a large and diverse target group.

The IP-infrastructure in combination with the variety of possible C-Lock solutions provided by DEA Logic, is an innovation that contributes to the corporations' mission.

5.3.2 Business objectives

The pursued objectives of the IP-infrastructure presented in this business case are the following:

- Reduce maintenance costs
- Increase compatibility with tenant target group
- Increase quality of living environment
- Increase security of tenants
- Increase luxury

5.3.3 Alternatives

The current business model of a housing corporation is shown in Figure 22. The value proposition is the offering of low-priced rental houses in a good living environment for people with low income belonging to the more vulnerable groups in the society. Revenue is generated via the monthly rent on the houses and subsidy from the government. The alternative business model of the housing corporation with a apartment complex with the IP-Infrastructure, is shown in Figure 23. The changes are indicated with a blue 'post-it' color. In addition to the current key activities, renting solutions and the infrastructure, forms a new key activity. DEA Logic becomes a new key partner of the housing corporation, for they provide the solutions and maintain the system. Further, the customer segments is extended with an increased target group including tenants who requires special care. The fourth change is in the revenue stream building block. Next to the rent of houses, and state subsidy, the housing corporations receive rent for the use of the IP-Infrastructure by tenants.

Next to the visible changes in the business model, a lot of the benefits of the IP-Infrastructure are within the tactical set of the current business model. Therefore they do not influence or change the business model. However, the effects will be included in the business case.

IP-Infrastructure

Many technologies are nowadays used in apartment buildings. Examples are a video-intercom system, triple play network connections, access control systems, ventilation installations, etc. When a new apartment building is build, all of these technologies are placed, for adding wiring for techniques after the building is completed is expensive and causes a lot of inconvenience for the tenants. With the IP-Infrastructure, only one cable type is placed in the building to each apartment. Via a central server, all other external connections can be transferred using the IP-Infrastructure to the apartments. The IP-Infrastructure has three main advantages in addition to the old situation. The first advantage is that future technology extensions that require wiring through the building, can be implemented without rigorous rebuilding. The second advantage is that the reduction of wiring through the building results in decreased building costs. However, the installation costs for triple play connection is done by the providers, causing no extra building costs. The third advantage is that apartments can be easily adjusted towards the tenant specific requirements provided by the multiple C-Lock solutions.

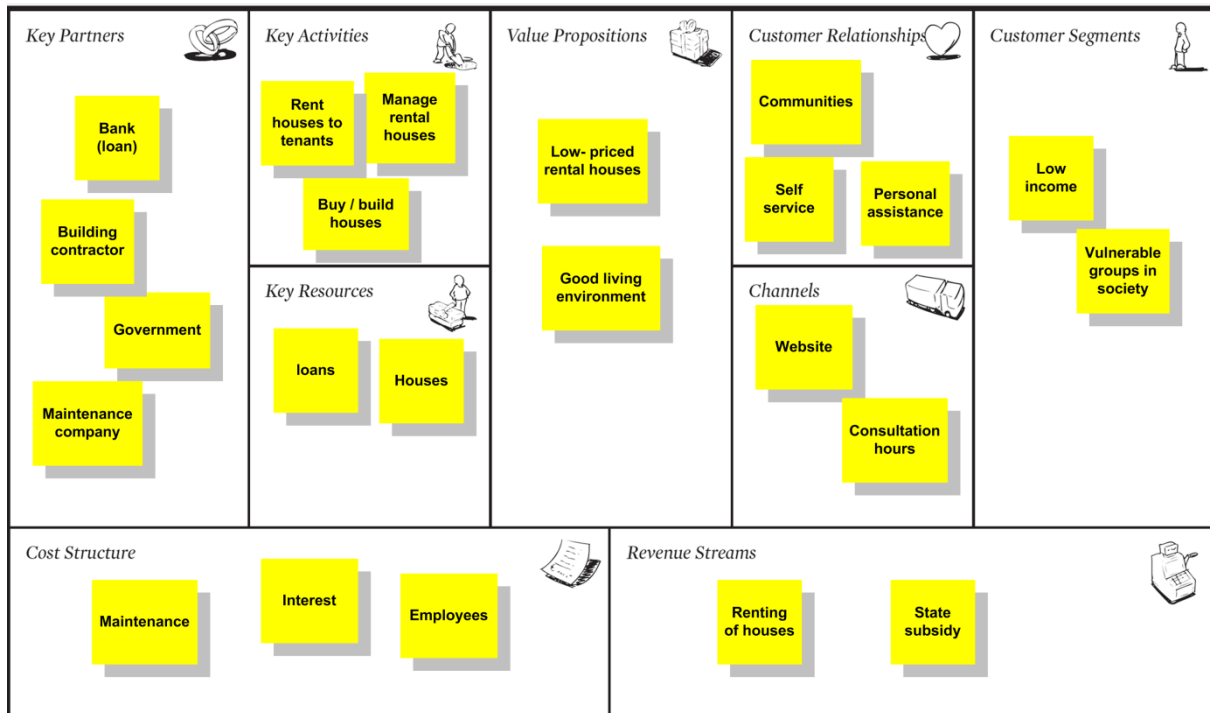


Figure 22: Current business model of a Dutch housing corporation

C-Lock solutions

The various C-Lock solutions are a flexible extension to the IP-Infrastructure. Current developed solutions can be divided into four categories: access, security, care, and luxury.

The access solutions contain various options with regard to access to the building. Instead of the multiple doorbells and nameplates at the central entrance, a single vandalism proof touch screen monitor is fitted together with an RFID reader. Via the touch screen, visitors can ring the right apartment. Via a video intercom system, the tenants can see who is at the main entrance and can choose the grand access or not. Instead of the traditional key, tenants get a wireless electronic key, which makes use of the secure RFID technology. The video intercom system in each apartment can be extended with various other options, which will be described below.

The security solutions contain functions like a burglar and fire alarm. In case of a fire, not only the tenants of the apartment are warned, but also the neighbors. Via an additional video camera system, the tenants can receive a live feed of their apartment on a remote location if the burglar alarm is triggered. The security extensions are a modular extension on the video intercom system.

The care solutions can also be fitted modular to the video intercom system. Functions like a personal alarm, tele-medicine, tele-monitoring, and a detection system for tenants who might wander off. These are just the solutions that are currently developed, but the possibilities are practically unlimited, according to DEA Logic. The solutions make apartments suitable for a large and diverse target group of tenants. Older people or those who need extra support can chose to fit the apartment with a selection of the care solutions.

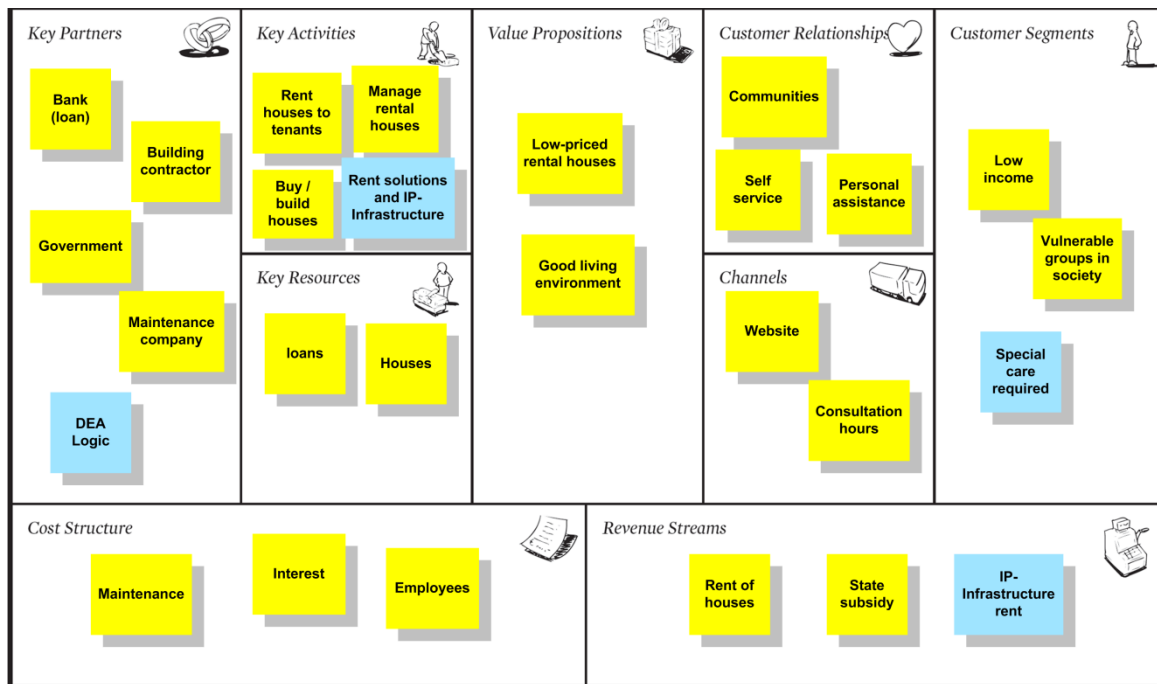


Figure 23: Business model with IP-Infrastructure and C-Lock solutions

5.3.4 Effects

The implementation of the IP-Infrastructure in renovated or newly build apartment buildings affects the organization. The effects of the new IP-Infrastructure compared to the current classic infrastructure are discussed below. They are also represented in Table 9. In the table, the effects are structured according to two factors. Horizontally they are categorized according to the type of required organizational change. Vertically they are categorized according to the degree of explicitness.

Table 9: Effect overview

Degree of explicitness	Do new things	Do things better	Stop doing things
Financial	Rent C-Lock solutions and IP-Infrastructure		Reduce maintenance costs by not replacing door locks & nameplates
Quantifiable			
Measurable		<ul style="list-style-type: none"> Increased target group Increased security 	
Observable	<ul style="list-style-type: none"> Dependable on non-standardized technology In line with mission and vision 	Increase quality living environment	

Because the only difference between the two alternatives in business model terms is the revenue model, the other effects of both alternatives are equal and therefore represented in only one effect overview table.

Financial effects

Starting with the financial effects, the revenue model behind the IP-Infrastructure is new in the business model. For some solutions, an additional rent is incurred for the use of the IP-Infrastructure. Further, some non-standard C-Lock solutions can be rented from the housing corporation.

The second financial effect is a reduction on maintenance costs. Normally if an apartment is rented to a new tenant, the door lock and keys are renewed together with the nameplates. With the IP-Infrastructure, this can be easily done remotely, saving time and money. The nameplates are digitally shown on the touch screen at the main entrance. The names can be edited from behind the desk by logging into the buildings central server. The access rules for the keys can be changed the same way. The new tenants receive new keys with a different RFID chip. Access to the apartment is then only granted by using the new key.

In the cost section, the benefits and reductions are calculated and presented.

Measurable effects

There are two measurable benefits that make the organization better. The first benefit is the increased target groups for apartments. With the C-Lock solutions, apartments can be easily adjusted to the requirements and demands of the tenants. If for example older people who require extra care functions rent the apartment, a selection of the care solutions can be connected to the system providing the required services. No longer a specific group apartments is suitable for a special target groups, but all apartments with the system can be adjusted to become suitable for each target group.

The second benefit is the increase security with the IP-Infrastructure in combination with C-Lock solutions. The electronic keys are much harder to forge compared to the classic key, keeping unwanted visitors out. Furthermore, with the fire alarm, neighbors are alarmed as well to be careful and investigate the emergency.

Observable effects

There are also two observable effects which influence are hard to estimate. First of all, the IP-Infrastructure and C-Lock solutions are developed by DEA Logic. At this moment, there are no direct interchangeable alternatives to the DEA Logic's product. This makes the apartment building technologically dependable on DEA Logic.

The second effect is the increase quality of the direct living environment for tenants. Each apartment can be fitted with various C-Lock solutions to make living more comfortable. For example the automatically opening doors, curtains and lights.

5.3.5 Risks

As with each innovation, some risks are involved. To assess the risks a construction project risk assessment method is used (Tah & Carr, 2000). First, the risk sources, and risks per source are identified for both alternatives.

- Product:
 1. malfunctioning of software
 2. malfunctioning of hardware
 3. compatibility issues with external parties
- Service:
 4. unavailability of maintenance
 5. unavailability of training
 6. unavailability of upgrades and improvements
- Political:
 7. changes in laws and regulations
- Market:
 8. lack of customer demand
 9. too complicated user interface
- Nature:
 10. vulnerability for fire
 11. vulnerability for water
 12. vulnerability for lightning

Next, for both alternatives, the likelihood and severity in terms of costs, quality, and safety of the risks is estimated. In order to compare the risk of both alternatives, the value of likelihood of occurring is multiplied by the value of severity. The severity value is the sum of the values for costs, quality, and safety. An overview of the risks of the classic infrastructure is given in Table 12. Table 13 represents the likelihood and severity of risks of the IP-Infrastructure alternative. In Table 10 and Table 11, the terms for quantifying the likelihood and the severity are defined based on Tah & Carr (2000).

Table 10: Terms for quantifying likelihood (Tah & Carr, 2000)

Likelihood	Value	Description
Very very high	7	Expected to occur with absolute certainty
Very high	6	Expected to occur
High	5	Very likely to occur
Medium	4	Likely to occur
Low	3	Unlikely to occur
Very low	2	Very unlikely to occur
Very very low	1	Almost no possibility of occurring

Table 11: Terms for severity quantification (Tah & Carr, 2000)

Severity	Value	Costs	Negative effect on product quality	Negative effect on safety
Very high	5	>20% above target	Very poor	Injury
High	4	10% < target < 20%	Poor	Safety hazard
Medium	3	5% < target < 10%	Average	Average
Low	2	1% < target < 5%	Above average	below average
Very low	1	1% < target	OK	OK

Table 12: Classic infrastructure risk likelihood and severity overview

Risk	Likelihood of occurring	Costs	Negative effect on product quality	Negative effect on safety	Multiplied risk effect	Risk prevention option
1	2	3	3	1	14	Warranty contract
2	2	2	3	1	12	Warranty contract
3	-	-	-	-	-	-
4	2	2	2	1	10	Service contracts
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	2	3	1	1	10	-
8	-	-	-	-	-	-
9	2	2	4	3	22	Preventative surveys
10	2	4	3	4	22	Fuses to prevent short-circuiting
11	2	4	3	4	22	Waterproof components
12	4	4	3	2	36	Uninterruptible Power Supply
Total					148	

Table 13: IP-Infrastructure risk likelihood and severity overview

Risk	Likelihood of occurring	Costs	Negative effect on product quality	Negative effect on safety	Multiplied risk effect	Risk prevention option
1	3	3	3	2	24	Warranty contract
2	3	4	3	2	27	Warranty contract
3	4	4	4	1	36	Warranty contract
4	3	4	2	2	24	Service contracts
5	3	2	1	1	12	Service contracts
6	3	-	2	1	9	Service contracts
7	2	3	1	1	10	-
8	2	1	-	-	2	Preventative surveys
9	3	2	4	3	27	Preventative surveys
10	1	4	3	4	11	Fuses to prevent short-circuiting
11	2	4	3	2	18	Waterproof components
12	4	4	3	2	36	Uninterruptible Power Supply
Total					236	

Summary

As shown in Table 12 and 13, most risks can be prevented, resulting in a very low overall project risk. However, some risks of the IP-Infrastructure alternative remain due to the following two points:

1. The technology is new. So far, it has been deployed in one apartment building.
2. The technology is developed and build by one company. The current market does not provide any substitutes that work with the same infrastructure.

These two points are somehow interconnected. There is a very small change that the technology does not work as good as was hoped for, or the subcontractor stops supporting the technology. In that scenario, the costs to transform the infrastructure back to the current standard are high. Other risks for both alternatives can either be prevented, or do not have a negative influence on the organization. In Figure 24 and Figure 25, the risks are shown in the risk matrix. The total risk before prevention of the IP-Infrastructure, is one and a half times bigger than the classic approach. This is mostly because the classic infrastructure is used almost everywhere and has been improved over time.

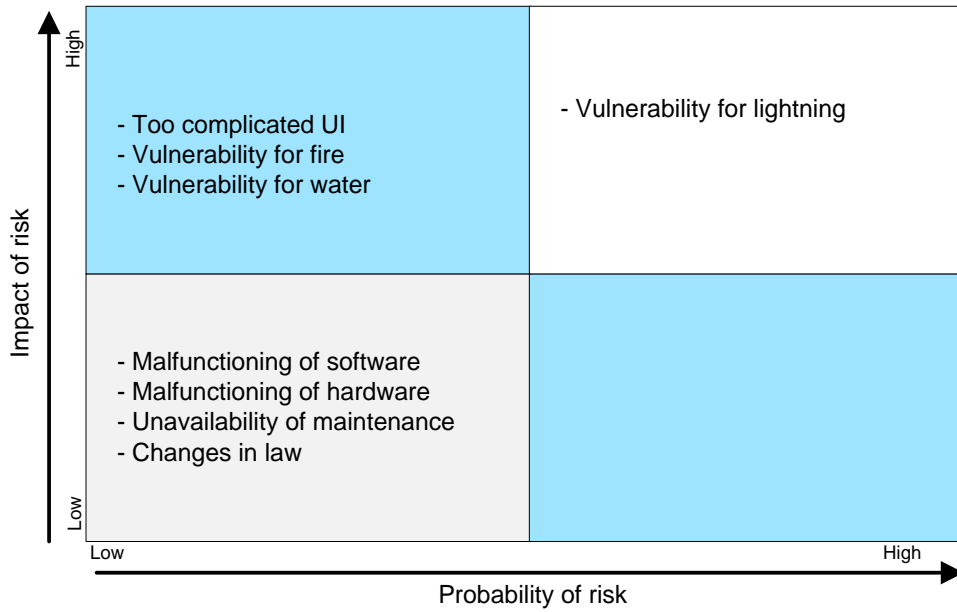


Figure 24: Risk assessment matrix classic infrastructure

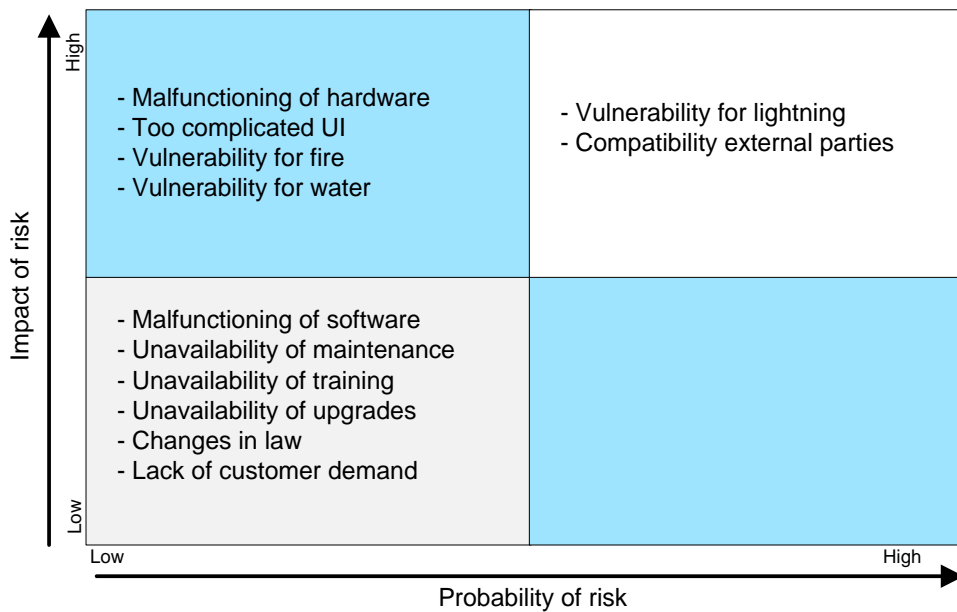


Figure 25: Risk assessment matrix IP-Infrastructure

5.3.6 Costs

The costs difference between the current situation and the IP-Infrastructure alternative, depends on two variables. First, the number and type of C-Lock solutions affect the costs. The second variable is time. Time is important, for not only building apartment complexes is the organizations objective, but also maintaining the buildings. Therefore, maintenance is also included in the costs overview. To compare the costs of both approaches, an indication of the costs for a apartment building with 100 apartments is calculated. Only the costs for the infrastructure and the C-Lock solutions is covered. The other building costs are equal for both alternatives. Because the costs for the construction and the maintenance of the infrastructure and the C-Lock solutions strongly vary from situation to situation, the following assumptions and raw cost estimates are used:

- A new apartment building is made with 100 apartments.
- In the current situation, multiple apartments or even all, use the same wire instead of having their own individual wire. Therefore, the infrastructural costs are estimated to be only half of the IP-Infrastructure costs.
- Costs for the IP-Infrastructure is estimated on 26.000 euro, based on calculations of DEA Logic.
- Cost estimates for access, video intercom system, and the care solution, are also based on calculations of DEA Logic.
- 10% of the tenants will make use of the care solution.
- The costs for communications are based on 5 letters per year per apartment, at a cost of 1,50 per letter.

Table 14 shows the constructional costs, yearly maintenance costs, and yearly profit, per function. Next, the maintenance costs and profits are extrapolated over five years to get more insight in the breakeven point of the alternatives. Because of the raw input data, the assumptions, and the extrapolation of five years, the outcome of this analysis is relatively unreliable and can only be used as an indication for the expected costs of both alternatives over a time span of ten years. If the project is deployed in a real situation, more research is needed to calculate the specific values and come to better estimates.

Table 14: Estimated construction costs, maintenance costs, and profit

Function Costs (€)	Infrastructure		Access		Intercom		Care		Communication	
	Old	New	Old	New	Old	New	Old	New	Old	New
Construction (Initial)	13.000	26.000	30.000	30.000	52.000	50.000	800	400	-	-
Maintenance (Yearly)	500	1.000	11.250	6.950	16.500	7.000	3600	1800	750	0
Profit (Yearly)	-	-	-	-	-	-	-	300	-	-

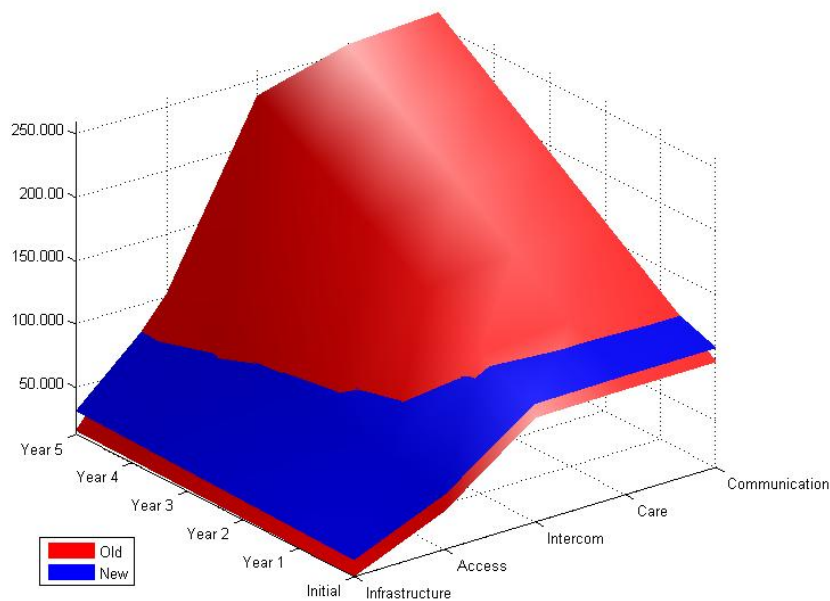


Figure 26: Surface plot of cumulative extrapolated costs over time and functions

Figure 26 represents a surface plot of the cumulative extrapolated costs over time and functions. Based on the numbers shown in Table 14, the expected cumulative costs over five years are calculated for both situations. The costs are influenced by both time and functions. More functions leads to more costs, and due to the maintenance costs, over time the total costs increases. The blue surface represents the costs of the IP-Infrastructure. As shown, the initial costs for the IP-Infrastructure are higher compared to the current situation. However, the difference is not very big, and within three years, the IP-Infrastructure in combination with the access C-Lock solution is cheaper than the alternative. To show the difference between the two alternatives, Table 15 shows the difference in cumulative extrapolated costs. In case all functions are chosen, in five years, close to € 70.000 can be saved with the IP-Infrastructure.

Table 15: Difference between cumulative extrapolated costs over time and functions of the two alternatives

Time (years)	Infrastructure	Access	Intercom	Care	Communication
0	€ 13.000	€ 13.000	€ 11.000	€ 11.000	€ 11.000
1	€ 13.500	€ 9.200	-€ 2.300	-€ 4.400	-€ 5.150
2	€ 14.000	€ 5.400	-€ 15.600	-€ 19.800	-€ 21.300
3	€ 14.500	€ 1.600	-€ 28.900	-€ 35.200	-€ 37.450
4	€ 15.000	-€ 2.200	-€ 42.200	-€ 50.600	-€ 53.600
5	€ 15.500	-€ 6.000	-€ 55.500	-€ 66.000	-€ 69.750

Cost summary

In the cost overview, the financial differences between the IP-Infrastructure and the classical approach are assessed. The initial costs for the IP-Infrastructure are higher, but due to the lower maintenance costs, this difference is equalized within one to three years, depending on the functions. Especially with real estate, long term is important for buildings last for decades. In the cost overview, cost estimates are used. Therefore, they are only extrapolated over five years. However, in

case a project is realized with the IP-Infrastructure and building plans are better established and concrete, the costs will have to be reassessed to improve reliability before they can be used to make the definitive decision.

5.3.7 Alternative selection

The effects, risks, and costs of the IP-Infrastructure compared to the classic infrastructure, are discussed in the previous sections. Based on this information, one of the alternatives needs to be selected. Looking at the effects, the IP-Infrastructure is the best choice for it increases the target group, the quality of living, and security of the tenants. Further, with the new technology, apartments can become more luxury. The risks however, are one and half times higher than the classic infrastructure. But, this can be strongly reduced using the available risk prevention options. The initial costs of the IP-Infrastructure are higher, but within four years it becomes cheaper than the classic alternative. Depending on the functions, in five years, the estimated IP-Infrastructure savings are around 70.000 euro. The initial costs are higher, but the maintenance is much lower. The IP-Infrastructure offers new functionalities and increases the security of tenants, quality of living, and target group. The risks are higher, but can be prevented. The initial costs are higher, but over time money is saved due to the low maintenance costs. Therefore, the IP-infrastructure is the best alternative to choose.

5.3.8 Implementation plan

After improvement of this project by the board of directors, the project can be implemented. In this phase however, it is too far stretched to determine an explicit implementation plan. However, the following can be used as an indication of the steps that need to be made to achieve a successful implementation. The steps are based on the Deming cycle, which is an iterative management method for the control and continuous improvement of processes and products (Kanji, 1996).

The first project implementation step concerns the *planning* of the project. After the decision to build a new apartment building, the exact installation costs and system specifications can be determined and the contracts can be drawn up.

In the second step, the apartment building needs to be realized and the IP-Infrastructure in combination with the C-Lock solutions need to be installed.

In the third phase, the system check need to be performed to determine the system is secure and works as it is planned.

In the fourth phase, the apartments can be rented to tenants and the solutions can be rented. In addition, problems, flaws, and obscurities need to be analyzed.

After this fourth step, the cycle starts again with planning how the determined flaws and problems of the previous phase can be assessed and solved, followed by taking action, checking solutions and implementing them and assessing if the problems are solved and if others have occurred. If needed, the cycle can start again, until the system is optimized.

5.4 Method evaluation

After demonstrating the designed artifact, it needs to be evaluated. The objective of the evaluation is to observe how well the artifact supports a solution to the problem. This is done by comparing the objectives of a solution to actual observed results from the demonstration. First, the overall objective will be assessed, followed with some general remarks to the complete method.

5.4.1 Overall objective assessment

The objective for designing the business case development method to compare business models was to design a method to create a business case of business models, in order to objectively compare the assessed business models, and choose the best alternative.

First, the objectivity of the method is assessed. Because of the abstract descriptive nature of business models, it is often required to involve more tactical and operational details, implicated by the change in the business model. Deciding which 'details' are useful and which aren't must be judged by the maker of the business case. This enables a certain amount of subjectivity. Table 16 represents which method steps are objective and which are open for subjectivity.

The business drivers and objectives are fixed input variables. The identification of alternatives is in most cases variable. This gives freedom for interpretation and creativity, and is therefore subjective. The same argumentation is valid for the assessment of effects and risks. These steps as well are subjective and depend on the business case maker. The cost step of the method is objective, but depends on the scope of the project. The alternative selection step can be objective as well as subjective and depending on the non-financial effects of alternatives and their importance weight. In case where the alternative only financially differ from each other, the decision is made objectively, for the most profitable alternative is selected. In case where other subjective variables play a role as well, it depends on the person making the decision how much weight is giving to these variables. The development of the implementation plan is also subjective and depends on the developer. However, this step does not influence the selected alternative.

To reduce the effects of human bias, it is preferable that the business case is made by an independent actor to increase the objectivity of the business case.

Table 16: Assessment of method's objectivity

Method step	Objective / Subjective
Business driver	Objective
Business objectives	Objective
Identification of alternatives	Subjective
Stakeholder analysis	Objective / Subjective
Effects	Subjective
Risks	Subjective
Costs	Objective
Alternative selection	Objective / Subjective
Implementation plan	Subjective

5.4.2 General remarks to the method

One of the experienced difficulties during the creation of the business case, was switching between abstraction levels. The business model is an abstract representation of the organization. Processes and products are on a more tactical or even operational organizational level. The outcome of comparing business models in the business case, depends on choices made in lower organizational

abstraction levels, like the tactical and operational level. The distinction between a process or product business case, and a business model business case needs to be made. The focus in the first case is on the cost and benefit comparison of the innovated process or product. In the second case, it is about the choosing the best alternative way of how an innovated product or process affects the business model.

Further, some empirical evidence supporting the '*strategy – business model – tactical set*' framework by Casadesus-Masanell & Ricart (2010) is found. Afterwards, the used case study was mostly a product innovation within the tactical set of the building corporation's business model. Some minor changes were made in the business model. This made it hard to devote the business case to the business model, and forced to include more operational aspects in the business case. This is not per se negative for the demonstration, the method, or the outcome of the business case, but the goal and focus of the designed method, is to objectively compare two business models, in opposite of assessing the costs and benefits of a product innovation.

Overall, the method does what it is designed for. It is a method to develop a business case which allows different business models to be compared and the best chosen as objective as possible.

6 Conclusion and discussion

In this chapter, the research results are discussed. First, the conclusions are presented followed in the second section by the discussion. In the third section, the research limitations will be discussed, which gives an opening for further research suggestions that are presented in the fourth section of this chapter.

6.1 Conclusion

The designed business case method to objectively compare business models, can be used to compare and choose the best business model successfully, as demonstrated by the case study. The goal of this research was to increase the quality of the decision making process between possible business models, by developing a method to objectively compare the alternatives. The research question was: *'How to choose the best business model objectively by making a business case?'*. Based on literature research, the concepts of business models and business cases was clarified. Next, the business case method was designed. This method contains the following eight steps:

1. *Business driver – the cause, problem or opportunity that need to be addressed*
2. *Business objectives – the objectives that are aimed for and their stakeholders*
3. *Alternatives – representing the options there are to reach the objectives*
4. *Effects – positive and negative effects caused by the pursued alternative attached to an effect owner*
5. *Risks – risks that come with the pursued alternative*
6. *Costs – costs that come with the pursued alternative*
7. *Alternative selection – based on the gathered data the best alternative is chosen*
8. *Implementation plan – plan which explains when and how the alternative is implemented*

The need for a method like this comes from the increasing popularity of business models over the last decennia in practice as well as in academic literature. As discussed in the literature overview, companies who are aware of their business model performed significantly better than companies who are not aware (Chesbrough, 2007b; Doz & Kosonen, 2010; Shafer et al., 2005). Not only the concept is used more, but it also seems to increase organizational performance. A business model is in this research defined as: *"a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams"* (Osterwalder et al., 2005a). Because a business model is an abstract description of a company, it is affected if the company changes. Innovation on strategic level, the business model, or process and product level, changes the company and on some level the business model. Most organizational changes can be variously modeled in the business model, each with a specific effect on the organization. Instead of just choosing one business model, a method is needed to compare the business models, and choose the best in terms of costs, benefits, and risks. The objective of this research was therefore to investigate the possibilities of the use of a business case as a method to compare business models, with the goal to define a method that increases the quality of business model decision making.

The case study showed that the method can be used to compare business models and choose the best one. However, the output of the business case depends partially on the person(s) making the business case, for steps 3, 4, 5 and 7 are relative subjective steps, which gives decision freedom. Further research is needed to establish the effects of this decision freedom on the quality of the outcome of the business case.

Still, the method fulfils the defined goal of the research and forms an adequate answer to the research question.

6.2 Discussion

The discussion is split into three sections. First, the designed method, which is the result of the research, is discussed. In the second part, the research limitations are addressed, and in the final section, some suggestions for further research are given.

6.2.1 Business case method limitations

The designed business case method is deducted from two published business case methods. One method focused on business cases for IT projects (Ward et al., 2007), the other focused on general projects (Harvard Business Review Press, 2010). This raises the question if the designed business case method is specifically suitable for business models, or if it can be used in other situations as well. Given the eight steps, it can be assumed that this business case method also is usable for other organizational change comparisons next to business models. However, this is not tested in this research. Furthermore, this would be a side effect of the method, for it was not one of the initial goals. During the design of the method, no special attention is given to this side effect. This raises the question: why is this a special business model focused business case method? The answer to this question is that the development focus has been around business models. In the literature review the definition, goal, and components of a business model were defined. In the second part of the literature review the definition, goal, and components of a business case was defined. Based on that knowledge, a new business case method is deducted with the focus on comparing the effects of organizational change due to changes in the business model. Therefore, the business case method is designed for business model, but has the side effect that it probably also suitable for other projects.

In the demonstration phase, the method is tested in a single case study. To further improve the method and increase experience, it is preferable to test the method on more cases (Vaus, 2001). Due to time limitations, this was not possible. The case study showed how the method can be used and proved that it can be used to compare business models in terms of effects, risks, and costs. For further testing, it is advised to test it on a real business model innovation case instead of a product or process innovation, because most of those innovation are in, or interfere with, the tactical set (Casadesus-Masanell & Ricart, 2010).

The goal of the research was to design a business case method, which objectively compares business models. A business model is as discussed, an abstract representation of the organization. Comparing business models requires the use of information other than the business models. It requires the use of more practical, tactical, and operational effects caused by the business model change. Deciding the level of detail that is appropriate for the business case, depends from case to case and should be decided by the business case maker. This factor decreases the objectivity of the business case for it is possible to make a biased business case in favor of the maker.

6.2.2 Research limitations

The initial goal of the research was to design an artifact to objectively compare multiple variations of a business model to choose the most profitable. Therefore, the Design Science Research Methodology was used. During the literature review problems occurred. The first problem that occurred was due to the divergent view of the business model concept. Over time, more and more unique definitions were used in academic literature. There seemed not to be a general accepted definition, which lead to the problem of which definition to use in this research. Using one definition means rejecting the others. This causes problems for the generalizability of the designed method, for the method is designed based on the business model definition of Osterwalder & Pigneur (2010). In a more ideal situation, academic literature would have agreed on one definition, which would lead to less ambiguity.

The second limitation of the research is due to an almost complete lack of academic literature about business cases. The concept is used often, but without a well-designed and widely accepted methodology. As well as for the business model concept, it would have been better if a general accepted business case development method would have existed in academic literature for the reliability thoroughness of the research.

The third limitation concerns the absence of a causal relation between business model innovation and the business case. Business model innovation does not cause a business case. It might however cause the need for a tool to compare business models. This need is described in academic literature, but no further empirical evidence is gathered in this research.

Another limitation is that a business case is a subjective representation of facts and expectations. An independent group of people will all create a unique business case if they were individually given the task to design a business case of the same topic. Eliminating this subjectivity will probably decrease the quality of the outcome of the business case.

Finally, the designed business case method in the research has been tested on one case. As established in section 4.3, multiple organizational innovations can lead to a changed business model in which case it is preferable to compare the business models and choose the most profitable. Due to time limitations, it was not possible to test the method on multiple cases to improve its quality.

6.2.3 Further research suggestions

Due to the limited amount of time available for this research, some aspects could not be investigated. Therefore, some further research suggestions are named in this section. The first topic of interest is about the definition of business models. In academic literature, over 50 definitions are currently used (George & Bock, 2011; Osterwalder et al., 2005a; Shafer et al., 2005). Some authors tried to merge these definitions to increase the clarity of the meaning of the concept. More research is needed on this topic to come up with one widely accepted definition.

The second suggestion is about business cases. The term is used often in academic literature as well as in other publications. However, academic literature about the precise definition, goal, and components is missing. More research is welcome on this topic.

With regard to this research, two things should be done. First further research should be done to investigate the effects of the human bias enabled by the designed method. Second point is related to this point and is about research towards the possibilities to reduce this human bias opening.

7 References

- Al-Twairesh, N., & Al-Mudimigh, A. S. (2011). Business Cases For ERP Implementations, *25*(1), 43–49.
- Amit, R., & Zott, C. (2001). Value creation in E-business. *Strategic Management Journal*, *22*(6-7), 493–520. doi:10.1002/smj.187
- Baden-Fuller, C., & Morgan, M. S. (2010). Business models as models. *Long Range Planning*, *43*(2), 156–171.
- Bremser, W. G., & Chung, Q. B. (2006). A framework for performance measurement in the e-business environment. *Electronic Commerce Research and Applications*, *4*(4), 395–412.
- Carter, N. M., Gartner, W. B., & Reynolds, P. D. (1996). Exploring start-up event sequences. *Journal of business venturing*, *11*(3), 151–166.
- Casadesus-Masanell, R., & Ricart, J. E. (2010). From Strategy to Business Models and onto Tactics. *Long Range Planning*, *43*(2–3), 195–215. doi:10.1016/j.lrp.2010.01.004
- CFV. (2012). CFV. Retrieved June 27, 2012, from <http://www.cfv.nl/>
- Chesbrough, H. (2007a). Business model innovation: it's not just about technology anymore. *Strategy & Leadership*, *35*(6), 12–17.
- Chesbrough, H. (2007b). Business model innovation: it's not just about technology anymore. *Strategy & Leadership*, *35*(6), 12–17.
- Chesbrough, H. (2010). Business model innovation: opportunities and barriers. *Long Range Planning*, *43*(2), 354–363.
- Delmar, F., & Shane, S. (2003). Does business planning facilitate the development of new ventures? *Strategic Management Journal*, *24*(12), 1165–1185. doi:10.1002/smj.349
- Demil, B., & Lecocq, X. (2010). Business model evolution: in search of dynamic consistency. *Long Range Planning*, *43*(2), 227–246.
- Doganova, L., & Eyquem-Renault, M. (2009). What do business models do?: Innovation devices in technology entrepreneurship. *Research Policy*, *38*(10), 1559–1570.

- Doz, Y. L., & Kosonen, M. (2010). Embedding strategic agility: A leadership agenda for accelerating business model renewal. *Long Range Planning*, 43(2), 370–382.
- Duersch, R. R. (1975). SIMPLE MODEL FOR BUSINESS SIMULATIONS. *IEEE Transactions on Engineering Management*, EM-22(2), 55–76.
- Gambardella, A., & McGahan, A. M. (2010). Business-model innovation: General purpose technologies and their implications for industry structure. *Long Range Planning*, 43(2), 262–271.
- Garcia, R., & Calantone, R. (2002). A critical look at technological innovation typology and innovativeness terminology: a literature review. *Journal of Product Innovation Management*, 19(2), 110–132. doi:10.1111/1540-5885.1920110
- George, G., & Bock, A. J. (2011). The Business Model in Practice and its Implications for Entrepreneurship Research. *Entrepreneurship Theory and Practice*, 35(1), 83–111. doi:10.1111/j.1540-6520.2010.00424.x
- Gordijn, J., Akkermans, H., & Van Vliet, J. (2001). Designing and evaluating e-business models. *IEEE Intelligent Systems*, 16(4), 11–17.
- Hamel, G. (2002). *Leading the revolution: how to thrive in turbulent times by making innovation a way of life*. Harvard Business Press.
- Harvard Business Review Press. (2010). *Developing a Business Case: Expert Solutions to Everyday Challenges*. Harvard Business School Press.
- Hedman, J., & Kalling, T. (2003). The business model concept: theoretical underpinnings and empirical illustrations. *European Journal of Information Systems*, 12(1), 49–59.
- Honig, B. (2004). Institutional forces and the written business plan. *Journal of Management*, 30(1), 29–48. doi:10.1016/j.jm.2002.11.002
- Kanji, G. K. (1996). Implementation and pitfalls of total quality management. *Total Quality Management*, 7(3), 331–343. doi:10.1080/09544129650034882
- Kirschen, D. S., & Strbac, G. (2004). *Fundamentals of Power System Economics*. John Wiley & Sons.

- Levy, Y., & Ellis, T. J. (2006). A systems approach to conduct an effective literature review in support of information systems research. *Informing Science: International Journal of an Emerging Transdiscipline*, 9, 181–212.
- Linder, J. (2000). Institute for Strategic Change.
- Magretta, J. (2002). Why Business Models Matter. *Harvard Business Review*, (may).
- Markides, C. (2006). Disruptive Innovation: In Need of Better Theory*. *Journal of Product Innovation Management*, 23(1), 19–25.
- McGrath, R. G. (2010). Business models: A discovery driven approach. *Long Range Planning*, 43(2-3), 247–261.
- Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: toward a unified perspective. *Journal of business research*, 58(6), 726–735.
- Nielsen, P. A., & Persson, J. S. (2012). IT Business Cases in Local Government: An Action Research Study. *2012 45th Hawaii International Conference on System Sciences* (pp. 2208–2217).
- Osterwalder, A., & Pigneur, Y. (2004). An ontology for e-business models. *Value creation from e-business models*, 416.
- Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. John Wiley and Sons. Retrieved from file:///C:/Dropbox/afstuderen/Osterwalder_A._-_Business_Model_Generation_-_2010.pdf
- Osterwalder, A., Pigneur, Y., & others. (2002). An e-business model ontology for modeling e-business. *15th Bled Electronic Commerce Conference* (pp. 17–19).
- Osterwalder, A., Pigneur, Y., & Tucci, C. L. (2005a). Clarifying business models: Origins, present, and future of the concept. *Communications of the association for Information Systems*, 16(1), 1–25.
- Osterwalder, A., Pigneur, Y., & Tucci, C. L. (2005b). Clarifying business models: Origins, present, and future of the concept. *Communications of the association for Information Systems*, 16(1), 1–25.

- Pateli, A. G., & Giaglis, G. M. (2004). A research framework for analysing eBusiness models. *European Journal of Information Systems*, 13(4), 302–314.
- Peffer, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A Design Science Research Methodology for Information Systems Research. *Journal of Management Information Systems*, 24(3), 45–77. doi:10.2753/MIS0742-1222240302
- Remenyi, D. (1999). *Stop IT Project Failure Through Risk Management*. Butterworth Heinemann.
- Ross, J. W., & Beath, C. M. (2002). Beyond the business case: New approaches to IT investment. *MIT Sloan Management Review*, 51.
- Seglen, P. O. (1997). Citations and journal impact factors: questionable indicators of research quality. *Allergy*, 52(11), 1050–1056. doi:10.1111/j.1398-9995.1997.tb00175.x
- Shafer, S. M., Smith, H. J., & Linder, J. C. (2005). The power of business models. *Business horizons*, 48(3), 199–207.
- Slywotzky, A. J. (1996). *Value migration: how to think several moves ahead of the competition*. Harvard Business Press.
- Sosna, M., Treviño-Rodríguez, R. N., & Velamuri, S. R. (2010). Business model innovation through trial-and-error learning: The Naturhouse case. *Long Range Planning*, 43(2), 383–407.
- Tah, J. H. M., & Carr, V. (2000). A proposal for construction project risk assessment using fuzzy logic. *Construction Management and Economics*, 18(4), 491–500. doi:10.1080/01446190050024905
- Teece, D. J. (2010). Business Models, Business Strategy and Innovation. *Long Range Planning*, 43(2–3), 172–194. doi:10.1016/j.lrp.2009.07.003
- Tucker, R. B. (2002). *Driving Growth Through Innovation: How Leading Firms Are Transforming Their Futures*. Berrett-Koehler Publishers.
- Van Ittersum, K., Pennings, J. M. E., Wansink, B., & Van Trijp, H. C. M. (2004). A multidimensional approach to measuring attribute importance. *Advances in consumer research*, 31, 86–87.
- Vaus, D. A. D. (2001). *Research design in social research*. SAGE.

- Vidal Tost, A., & others. (2011). Innovation Management in ABB-IT Innovation designed for Customer Experience.
- Ward, J., Daniel, E., & Peppard, J. (2007). *Building Better Business Cases for IT Investments*. the Open University.
- Webster, J., & Watson, R. T. (2002). ANALYZING THE PAST TO PREPARE.
- Wolfswinkel, J. F., Furtmueller, E., & Wilderom, C. P. M. (2011). Using grounded theory as a method for rigorously reviewing literature. *European Journal of Information Systems*.
- Zott, C., Amit, R., & Massa, L. (2011). The Business Model: Recent Developments and Future Research. *Journal of Management*, 37(4), 1019–1042. doi:10.1177/0149206311406265
- Zott, Christoph, & Amit, R. (2010). Business Model Design: An Activity System Perspective. *Long Range Planning*, 43(2-3), 216–226. doi:10.1016/j.lrp.2009.07.004