
Business Model Innovation: the Role of Different Types of Visualizations

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Abstract: Although the ongoing discussions about the definition and design of business models is increasingly prominent, little attention has been paid to understanding the different concepts of visualization, i.e., how they can help to understand the nature of business models, and their role in analyzing and designing a business model. The paper focuses on analyzing the different forms of visualization and highlights the relationships and differences between various approaches.

The analysis of more than 40 visualizations reveals seven different categories. Each category has its own characteristics and understanding of what a business model is and can help people to understand and to design business models in a specific way. The paper introduces to the features and characteristics of the individual groups, the understandings that underlie them, and may help to get an overview of advantages, and disadvantages of different forms of visualization.

Keywords: Business Model, Visualization, Graphic Representation

1 Introduction

The ongoing changes caused by the development of the Internet and communications technology is changing the way companies do business. New companies and ecosystems are emerging and former market leaders are at risk of losing their positions. Increasingly, innovation not only applies to a product or process but to the whole business model. New value propositions based on new forms of value creation are being offered. Thus, it is important to cast an eye on what makes a business idea successful and how successful businesses are created.

The business model, its implications, and its potential for innovation are getting increasing attention both in theory and in practice: a fast-growing number of scientific publications have emerged, and new approaches and tools are being publicized. In addition to the research on definitions and taxonomies for categorizing business models, several academics and practitioners have developed visualizations in order to explain the underlying understanding or to provide a tool suitable for building and analyzing a business model.

Although the ongoing discussions about the definition and design of business models and the research about knowledge and information is increasingly prominent, little attention has been paid to understanding the different concepts of visualization, i.e., how they can help to understand the nature of business models, and their role in analyzing and designing a business model. The only paper that has analyzed existing visualizations using predefined criteria in order to develop a new tool was published by Deelmann and Loos (2003).

Therefore the objective of this research is to provide an overview of existing forms of visualization and their purpose in understanding, designing, and innovating a business model.

The questions driving this research are:

- How can existing visualizations be evaluated?
- What are the differences between existing visualizations and are there categories they can be divided into?
- What are the main characteristics and fields of application of different kinds of visualization?

Based on the question of how visualization can help to understand and design a business model, the first part of the paper focuses on defining criteria to analyze the different forms of visualization. Therefore, in order to specify criteria, the literature review focuses on understanding the purposes and characteristics of visualizations and also on the different understandings of what a business model is.

The second part of this paper investigates the existing forms and tools for visualizing a business model. The search for visualizations includes theoretical approaches as well as tools developed by practitioners. More than 40 different visualizations have been analyzed in order to create categories and to highlight differences in the underlying understandings, applied uses, and advantages and disadvantages.

2 Theoretical Background

Business Model

With the advent of the Internet, the term business model has increased in popularity as it is widely used to describe the new forms of business that have emerged (Zott et al., 2010). The roots of describing a business model go back to the 1950s, when Peter Drucker addressed the question: What value can stakeholders get from the business and how can this value be created by the company (Casadesus-Masanell and Ricart, 2007; Magretta, 2002).

In spite of the growing attention devoted to business models in theory and practice and an increasing number of publications on this topic, there is neither a common understanding nor a common definition among scholars of what exactly a business model is. Zott et al. (2010) even argue that the “literature is developing largely in silos according to the phenomena of interest on the respective researchers”, which leads to different understandings. The authors identify three research streams: innovation and technology management, strategy and e-business. Furthermore, different authors compared selected definitions (e.g. Shafer et al., 2005; Zott et al., 2010; Osterwalder, 2004).

Moreover, there are different perspectives from which to look at a business model (Osterwalder and Pigneur, 2005; Linder and Cantrell, 2000). It can be viewed:

1. As the construct that describes a company and its core logic of how to do business as a whole system
2. As a description of a specific type or a component with a common characteristic (e.g. freemium business model)
3. As a real company and its function as a role model (e.g. the Dell business model)

Visualization

A model is always a replication of reality. The term “model” implies a reduction of the complexity of this reality. Visualization is one subgroup of how a model can be expressed.

Visualization is constituted by different variables such as color, position, texture and form. Furthermore, semiotics - the theory of symbols and signs, which is also seen as a “grammar of visual design” (Kress and van Leeuwen, 2006) - is the basis for developing rules for visualization. It embraces semantics, pragmatics, and syntax. Semantics defines the objects that are visualized, syntax describes the rules and structural relations between objects, and pragmatics refers to the relation between the visualization and interpreters and the meaning of visualization to interpreters. Deelman and Loos (2004) use this classification to explain but also to develop their own visualization of a business model.

In general it can be said that visualizations improve understanding and help to process complex information. The fields of data visualization and knowledge visualization are based on this fact. Data visualization aims to make large amounts of data or data with a

complex structure understandable in order to provide insights and make decisions. There are different types of data visualization: visualizations of places and routes, times, categories, and hierarchies. Moreover, data visualizations play an important role in controlling and monitoring a company.

In contrast, visualization of knowledge aims to facilitate knowledge-intensive communication and transmit experiences, opinions, values, expectations, and perspectives (Eppler and Burkhard, 2004).

Eppler and Lengler (2007) define a method for visualization as follows:

“A visualization method is a systematic, rule-based, external, permanent, and graphic representation that depicts information in a way that is conducive to acquiring insights, developing an elaborate understanding, or communicating experiences.” (Lengler and Eppler, 2007)

The goal is to support knowledge-intensive work and to create and share knowledge based on visual artifacts. Examples of knowledge visualizations are heuristic drawings, metaphors, diagrams, and knowledge maps.

3 Criteria for Analyzing Different Visualization Approaches of Business Models

In order to analyze the different visualizations, the first step is to define the criteria. The systematic of semantics, already used by Deelman and Loos (2004) in the context of visualizing a business model, points to the following three main categories:

- The object that is visualized (semantics)
- The rules or structural relations between objects (syntax)
- The meaning for the user and interpreter (pragmatics)

The corresponding detailed criteria are deduced from the elements and rules of visualization and the theoretical backgrounds of a business model (e.g., understanding, elements, roots).

Object of Visualization (Semantics)

The first group of criteria aims to investigate the object, the context, and the underlying understanding that is visualized.

- *Origin:* What are the roots or the underlying research field of the visualization - IT, eBusiness, or strategy and innovation?
- *Object of visualization/definition of business model:* What is the understanding and definition of business model that is the basis for the visualization? This may

be the visualization of interrelations, value streams, components, quantitative data, or other topics.

- *Level*: Which part of reality is being analyzed - the industry, the company, or a part of a company?
- *Validity*: Can the visualization only be applied to a specific industry sector or form of business model (e.g., service-based business models) or is it generally valid?
- *Components*: Which components are visualized - e.g., value proposition, customers, channels, strategic components, team culture, resources, costs, revenue, or other components?

Rules or Structural Relations (Syntax)

The second group of criteria describes the modalities for visualizing the object.

- *Visual elements*: What are the visual elements of the visualization - e.g., icons, forms, grid, connections, or arrows?
- *Variables*: Which aspects can be changed when applying the visualization - e.g., position, size, form?
- *Granularity*: What level of detail is visualized? This ranges from focusing on the core logic to all the details and aspects that are visualized.
- *Scalability*: How much can the model be varied? No scalability corresponds to a static, predefined visualization or grid; high scalability corresponds to visualizations where elements, perspectives or levels can be added.

Application and meaning for the user (Pragmatics)

The third group of criteria helps to assess how the visualization is applied and which knowledge is necessary. These criteria are evaluated superficially in order to get a general understanding.

- *Complexity of usage*: What knowledge is necessary for the application of the visualization?
- *Comprehensibility*: Can the visualization be understood without prior knowledge?
- *Objective and usage of visualization*: For what purpose has the visualization been developed? This criterion can be evaluated in the context where the visualization was found. Some visualizations are only intended to facilitate the understanding of a theory or concept, while other models can be used as tools during innovation processes or may help people to compare or visualize the developments over time.

4 Results of the Analysis

Based on the literature review as well as on Internet research, more than 40 different visualizations of business models have been identified (cf. Appendix 1). This includes theoretical approaches as well as tools developed by practitioners. The list does not claim to be complete, but it does include well-known and frequently discussed approaches. Moreover, the analysis explicitly focuses on visualizations that represent business models. Further models from the fields of strategy, management, innovation, or design have not been taken into account.

The main result is that the visualizations can be divided into seven categories. Each visualization can be assigned to one or more categories. The analysis shows that each category has its own characteristics, underlying understandings, and fields of application both in theory and practice and can help people to understand and design business models in a different way. Moreover, the outcome of the analysis shows that there are interesting differences between models within one category.

Value Networks

Models that visualize the value network focus on the different actors within a business model and the interrelations between these actors. This category includes models from Tapscott et al. (2000), Gordijn and Akkermans (2001), Weill and Vitale (2001), Deelmann and Loos (2004), Alves and Roque (2005), De Mey and De Ridder (2010) and Becker et al. (2011). When visualizing a value network there are two perspectives that can be investigated: On the one hand, the company and the relation to its stakeholders, and on the other hand, the logic of an industry and how value is produced by different actors.

The analysis shows that most of the representations are rooted in the field of e-business. Comparing the different models there is no common understanding of the actors that are represented. Some models classically differentiate between the company and its customers and suppliers. Others use the description “actors” and distinguish them using different colors, icons, or labels.

In order to visualize transactions, all visualizations use arrows that make visible the connection between two actors and the direction of the transaction. The transaction object is either visualized by using different colors and textures for the arrows or by using different icons and text descriptions. Most models differentiate between the transfer of goods or services, money, and information. De May and De Ridder even distinguish between ten kinds of transactions using different icons. These include goods, services, reputation, money, less money, and data. Each model identifies the transaction using a text label. Additionally, Weill and Vitale distinguish between real and electronic relations. Alves and Roque distinguish in their visualization approach, which focuses on online game business models, between real and in-game monetary transaction.

In addition to transactions, Deelmann and Loos visualize the value creation of the analyzed company. Alves and Roque additionally show the value creation of each actor. However, none of these models illustrates the value proposition and the costs for creating the product or service.

Comparing the complexity of the different models, it can be stated that apart from the e³value model by Gordijn and Akkermans, all the models are easy to apply and to understand.

As a result, it can be said that value networks are suitable for illustrating and identifying what actors are relevant for the business models and how they interrelate. Moreover, the logic of how the company generates money and what kinds of transactions are necessary becomes visible. However, this kind of visualization is not useful for visualizing how to create value within a company. Furthermore, it fails to visualize the value proposition.

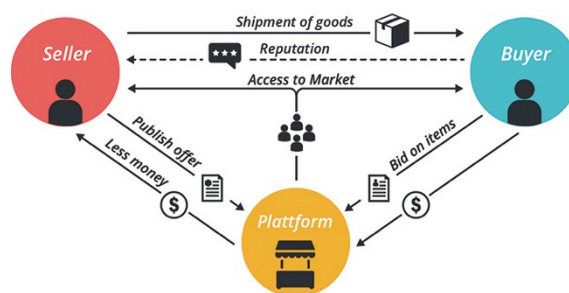


Figure 1: Visualization of a value network

Causal-Loop/Cause-Effect Models

Some authors like Linder and Cantrell (2000), Bouwman et al. (2005), Casadesus-Masanell and Ricart (2007), Kett et al. (2009) and Becker et al. (2011) use cause-effect models that visualize the relationship between a decision and the consequences or the core logic of a company.

These models can be divided into two subcategories: models that visualize the core logic of a company and models that use cause-effect relation in order to visualize the relation between the product or service and its realization.

The first group, which visualizes the core logic, illustrates the story of a company, why it exists, how it provides value to its customers, what consequences arise, or how a company plans to grow. This relates to Magretta's definition: Business models are "stories that explain how enterprises work" (Magretta, 2002). Moreover, it can be said that cause-effect models are suitable especially for visualizing and checking success factors (Casadesus-Masanell and Ricart, 2007). These include:

- Positive correlations between several cause-effect relations
- Growth strategy and customer loyalty as self-enforcing loops
- Uniqueness and robustness

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- Alignment with the objectives of the company
- Identifying the most important assumptions in the core logic

The visualization consists of arguments and arrows that link the arguments. The direction of the arrows represents the logic of cause and effect, and therefore, it represents the underlying theory or assumption. Closed cycles illustrate loops that intensify with each iteration.

Casadesus-Manasell and Ricart describe the elements as choices and resulting consequences and the arrows as the corresponding theory. The cause-effect loops only illustrate an aggregation or a part of the business. Otherwise, the visualization would become very complex.

The second group, which includes the models proposed by Kett et al. and Bouwman, visualizes the relation between the value that is offered to the customer and the realization from a technological, organizational or financial viewpoint, or the effect on other components of a decision to design a component in a certain way. This aspect of cause-effect will also be part of the category “value creation models”.

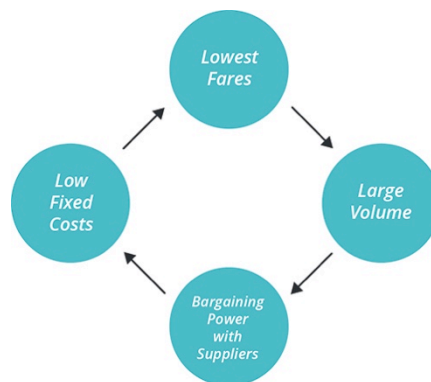


Figure 2: Visualization of a cause-effect model
(based on Casadesus-Masanell and Ricart, 2007)

Value creation models:

Models that fit in this category focus on the visualization of value creation within the company. Based on the value proposition that is delivered to the customer, the model shows the different steps and aspects that need to be considered. Examples of authors who propose such models include Eriksson and Penker (2000), Wirtz (2000), Osterwalder (2004), Bouwman et al. (2005), Kett et al. (2009) or Weiner (2011).

Comparing these models it can be stated that they use very different forms of visualization. One aspect they have in common is that all the models are rooted in e-business or IT.

The models by Eriksson and Penker and by Kett et al. are designed to close the gap between strategy experts and developers. Erikson and Penker build on the established language for visualization UML in order to visualize business models and make them understandable for both developers and for strategy experts. Kett et al. integrate four different perspectives on how to make service comprehensible - from the market-oriented view of the strategy expert, to the conceptual view of the business analyst, to the logic-oriented view of the IT architect, to the technical-realization focus of the developer. Moreover, they identify six dimensions for every perspective: finance, service, workflow, people, assets, and rules. Therefore, the model is granular and difficult to understand. Both this model and Bouwman's model were developed to visualize internet-based services. Both models visualize aspects of internal value creation and how these aspects interrelate with other aspects. This concept has already been described in the category "cause-effect models". Moreover, Bouwman et al. differentiate between the perspective of service, technology, organization, and finance and elaborate on their interrelations. One interesting aspect is that the authors differentiate between expected, perceived, delivered, and intended value.

In his model, Wirtz visualizes the different components that lead to a service offer model. Based on the intention to use this model in the field of e-business, the service offer model is divided into the following categories: commerce, content, connection and context.

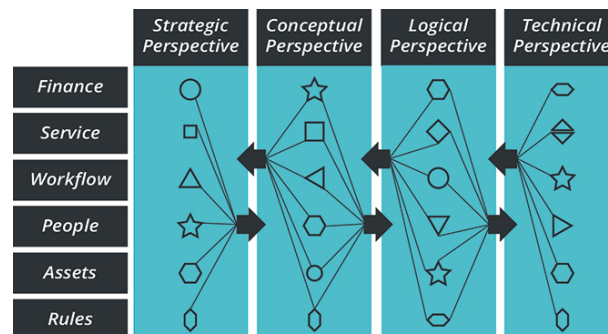


Figure 3: Visualization of a value creation model
(based on Kett et al., 2009)

In conclusion it can be said that models in this category try to visualize all the activities and interrelations that are necessary within a company in order to realize the value proposal for the actors in different ways. The granularity ranges from low to high. Moreover, they close the gap between strategy and realization by focusing on processes, activities, resources, and financial aspects as well as on their interrelation.

Component Based Models

Similar to a checklist, component based models visualize the different building blocks of a business model. The building blocks are visualized as a canvas. Every component can be filled in. The most popular model in this category is the Business Model Canvas by Osterwalder and Pigneur (2010), which inspired other authors to develop modifications such as HackFwd and Hulme (2010), the Lean Canvas by Maurya (2011) or the Social Business Model Canvas by Social Innovation Lab (2013). Other examples for component based models include the visualizations by Stähler (2009) and Bieger and Reinhold (2011). All the models are rooted in the field of strategy and innovation.

The comparison of the different models shows that they are similar in their structure and form of visualization. However, they differ in how they understand, define and visualize the components that are the building blocks of a business model. All the models contain the value proposition and, apart from Bieger and Reinhold's model, they show the customer as a component. But only some of them integrate components that refer to strategy (e.g. HackFwd and Hulme, 2010), value creation (e.g. Bieger et al., 2009) or company culture (e.g. Stähler, 2009). The Lean Canvas additionally contains the problem and solution as components. The Social Business Model Canvas, which was designed to depict social businesses, contains components such as “beneficiary” in addition to the customer or investment of “surplus”.

Due to the fact that these models have a fixed structure, there are almost no additional variables like different forms, colors, or positions. Color is only used as a secondary aspect to differentiate between customer groups. The relation between the components is visualized using the position in the canvas. Only Hulme and Bieger link components with arrows to illustrate the connection between components. Furthermore, most canvases follow the logic of the value creation process and visualize the internal perspective on the left and the market perspective on the right. Scalability and granularity can only be achieved by providing an extended description.

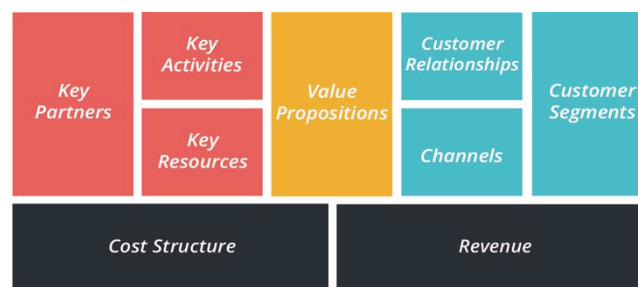


Figure 4: Visualization of a component based model
(based on Osterwalder and Pigneur, 2010)

The summary is that these models allow their users to focus on the aspects that are visualized and to fill them in in a similar manner to a checklist. Moreover, they can help to facilitate group discussion.

As the models do not add details and cause-effect relations, they are easy to apply and to use as a first draft for a business model.

Timeline:

This category visualizes the development of one or many business models over time. This form of visualization can only be found with Gassmann et al. (2013). The authors visualize how different business model patterns develop and how they are mixed or adapted to another industry. This form of visualization is interesting when analyzing the origin and development of specific types of business models.

However, there are no visualizations that are explicitly designed to map the evolution of a company's business model.

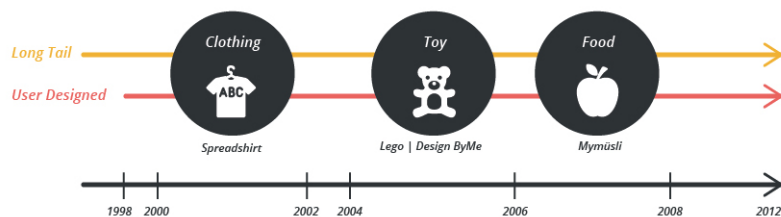


Figure 5: Visualization of a timeline
(based on Gassmann, 2013)

Quantitative data models:

This form of visualization is the most common one in business management and economics, but it is almost never used for visualizing a business model. Only one approach of the research visualizes quantitative data: the “Value Imaging“ by Boulton et al. (2001). This model illustrates five different material and financial values that are composed according to their size. It is remarkable that none of the other identified models visualizes quantitative aspects such as the size or potential of a customer segment.

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Figure 6: Visualization of a quantitative model
(based on Boulton, 2001)

Meta models:

Besides tools and approaches that can be used to create an own visualization there are many models that only present a theoretical approach in order to help the reader to better understand the text and the context. Examples for this categories are the visualizations by Hamel (2000), Linder and Cantrell (2000), Alt and Zimmermann (2001) Hoegg et al., (2006), Müller-Stewens and Lechner (2005), Greiner and Wolf (2010), Johnson (2010), Teece (2010), Kates (2011) or Gassmann et al. (2013).

These models often visualize components and their relationships. This can be done in a compact way like the models by Johnson or Gassmann et al. that remind of the definition that was already introduced at the beginning of this paper: What value can stakeholders get from the business and how can these values be created by the company.

In summary, these models often contain an interesting composition of building blocks. As an example, the Business Model Framework by Hamel combines strategic components and value creation components together with the four wealth potential factors efficiency, uniqueness, fit and profit booster. Alt and Zimmermann visualize the components mission, structure, processes, and revenue as well as the legal issues and technology as cross-functional building blocks.

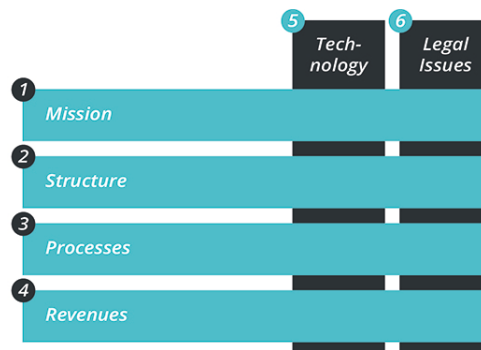


Figure 7: Visualization of a meta model
(based on Alt and Zimmermann, 2001)

5 Conclusion, Practical Implications and Outlook

The results of the analysis reveal that the visualizations vary in the object that is represented as well as in their form and application. The assumption that different categories exist and that the models can be assigned to one or more of these has been proved. The paper may help to get an overview of differences, advantages, and disadvantages of different visualizations, and it shows how they are linked to their underlying understandings of what a business model is.

Every category has its own characteristics and is especially suited for a specific purpose.

- Visualizing a *value network* gives important insights on the interrelation of a company and its customers, partners, and stakeholders.
- The *cause-effect models* illustrate and facilitate an understanding of the core logic of the business model and highlight the underlying assumptions.
- The *value creation models* connect the outer perspective of providing a value with the inner perspective to generate this value.
- To get an overview and to understand as well as to elaborate the different building blocks of a business model it is recommended to use a *component model*.
- The *timeline* helps to understand the evolution of specific forms of business models
- The only *quantitative model* that was identified is helpful for understanding the characteristics of the value of a company
- *Meta models* can provide inspiration and a broader understanding of what a business model is.

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This paper aims to add the dimension of visualization to the current discussion about the understanding of business models.

„[...] it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail.“ (Maslow, 1969)

The outcomes of this submission may help practitioners to get an overview of the different approaches for visualizing a business model. It helps to gain new perspectives on how to understand, design and innovate a business model. Moreover the categories and the differentiation of the visualizations may help academics when designing and visualizing their own research approaches and results.

This paper serves as an introduction to further research topics, like the suitability of different visualization for designing, comparing, analyzing, or communicating a business model.

The result of the analysis can be seen as providing the basis for a toolbox: it can help to choose a form of visualization for different problems and it expands the possible perspectives academics and practitioners may adopt when researching, analyzing, designing, or innovating a business model.

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Appendix 1

<i>Author</i>	<i>Name of the visualization</i>
(Eriksson and Penker, 2000)	Eriksson-Penker Business Extensions
(Hamel, 2000)	Business Model Framework
(Linder and Cantrell, 2000)	Operating Business Model
(Linder and Cantrell, 2000)	Operating Model Framework
(Tapscott et al., 2000)	Value Map
(Wirtz, 2000)	Integriertes Geschäftsmodell
(Alt and Zimmermann, 2001)	Generic Elements of a Business Model
(Boulton et al., 2001)	Value Imaging
(Gordijn and Akkermans, 2001)	e ³ value
(Weill and Vitale, 2001)	Business Model Schematic
(Leimeister et al., 2002)	Generischer Architekturrahmen für das Geschäftsmodell virtueller Communities
(Hedman and Kalling, 2003)	The components of a business model
(Deelmann and Loos, 2004)	Geschäftsmodellierungssprache
(Osterwalder 2004)	Business Model Ontology
(Alves and Roque, 2005)	Value Net
(Bouwman et al. 2005)	STOF-Business Model
(Müller-Stewens and Lechner, 2005)	Geschäftsmodell
(Hoegg et al., 2006)	mcm - Business Model Framework
(Casadesus-Masanell and Ricart, 2007)	Casual loop diagramm
(Kett et al., 2009)	Integrated Service Engineering
(Stähler, 2009; Stähler, 2011)	Business Model
(Capgemini, 2010)	Das Geschäftsmodell

(De Mey and De Ridder, 2010)	Business Model Blocks
(Greiner and Wolf, 2010)	7-K-Prinzip von Horváth and Partner
(HackFwd and Hulme, 2010)	Business Model Framework
(Johnson, 2010)	The four boxes business model
(Osterwalder and Pigneur, 2010)	Business Model Canvas
(Teece, 2010)	Elements of business model design
(Becker et al., 2011)	Structural Model
(Becker et al., 2011)	Toulmin's scheme
(Bieger and Reinhold, 2011)	Wert-basieres Geschäftsmodell
(Maurya, 2011)	Lean Canvas
(Kates, 2011)	Business Genome
(Weiner, 2011)	[moby] Business Model Designer
(Gassmann et al., 2012)	Ein Fahrplan für Innovationen
(Rusnjak, 2012)	Business Model Framework
(Doll, 2013)	Business Model Canvas
(Gassmann et al., 2013)	Das magische Dreieck
(Grasl, 2013)	Geschäftsmodell-Prototyping
(Social Impact Lab, 2013)	Social Business Model Canvas
