Journal of Cleaner Production 198 (2018) 401–416

Contents lists available at ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

Review

Sustainable business model innovation: A review

Martin Geissdoerfer [a, b, *], Doroteya Vladimirova [a], Steve Evans [a]

[a] University of Cambridge, The Old Schools, Trinity Lane, Cambridge, CB2 1TN, UK
[b] University of California, Berkeley, Haas School of Business, Berkeley, CA, 94720-1930, USA

ARTICLE INFO

Article history:
Received 27 February 2018
Received in revised form
19 June 2018
Accepted 22 June 2018
Available online 30 June 2018

Keywords:
Business model innovation
Sustainable business model
Challenges
Review
Barriers
Circular business model

ABSTRACT

The capability to rapidly and successfully move into new business models is an important source of sustainable competitive advantage and a key leverage to improve the sustainability performance of organisations. However, research suggests that many business model innovations fail. Despite the importance of the topic, the reasons for failure are relatively unexplored, and there is no comprehensive review of the sustainable business model innovation literature. This research provides a review of the literature, using a systematic database search and cross-reference snowballing. Its key contributions are: (1) a review of the key underlying concepts, discussing their similarities and differences and offer new definitions where there is an identified need; (2) we identify a research gap; and (3) we deduct research questions to address the gap.

Contents

1. Introduction

Sustainability issues, like growing inequality (Piketty and Saez, 2014) and the deterioration of our natural livelihood (Rockström, Steffen, and Noone, 2009) make the transformation to a more sustainable economic system increasingly desirable. To realise this

* Corresponding author. University of Cambridge, The Old Schools, Trinity Lane, Cambridge, CB2 1TN, UK.
E-mail address: ml733@cam.ac.uk (M. Geissdoerfer).

https://doi.org/10.1016/j.jclepro.2018.06.240
0959-6526/

transition, private business is a pivotal stakeholder commanding the most resources and capabilities (Porter and Kramer, 2011). However, technological advances towards sustainability are increasingly incremental, and many companies find it difficult to meet their sustainability targets. Therefore, innovation on the business model level is required to align incentives and revenue mechanisms to leverage sustainable solutions (Rashid et al., 2013).

Business model innovations are suspected to yield higher returns than product or process innovations (Chesbrough, 2007; Lindgardt et al., 2009), and sustainable business models might have the additional benefit of higher risk mitigation and resilience (Choi and Wang, 2009) and yield additional diversification and value co-creation opportunities (Nidumolu et al., 2009; Porter and Kramer, 2011; Tukker and Tischner, 2006). To realise these advantages organisations become increasingly interested in implementing sustainable solutions (Evans et al., 2009).

However, many business model innovations fail (Patel, 2015). This has serious economic implications for companies (Chesbrough, 2007) and leads to considerable delays in the adoption of sustainable solutions (Geissdoerfer et al., 2017a, b). Despite the importance of these issues, the reasons for failure remain relatively unexplored.

To explore this issue, we conducted a comprehensive review of the sustainable business model innovation literature. We identified various definitions of the key underlying concepts, which we interpreted and synthesised into working definitions. We identified essential research gaps and formulated research questions based on our analysis and thinking. We propose that these and similar questions are addressed by the development of research agendas based on the gap and the proposed working definitions.

The paper is structured as follows. First, the employed method for the literature review is described in section 2, before the key underlying concepts for this research are introduced in section 3. This is followed by a description of the research gap in section 4, based on which, research questions are formulated in section 5. The paper concludes with a short discussion of the findings and some final remarks in section 6.

2. Method

The research was based on a structured literature review, following the recommendations of Creswell (2014), Easterby-Smith et al. (2015), and Tranfield et al. (2003). A systematic database search was conducted, followed by cross-reference snowballing, as illustrated in Fig. 1.

In a first step, a systematic literature search was conducted. As shown in Table 1, the search strings, "*business model*" in 'Title' respectively 'Article title' and *"sustainable business model", "business model* for sustainability", "business model innovation" AND sustainab*, "business modelling" AND sustainab**, and *"business model design" AND sustainab** in 'Topic' respectively 'Article title, Abstract, Keywords' were used to search for reviews or articles in English on the Thomson Reuters Web-of-Science and Elsevier Scopus databases. Subsequently, the abstracts of the identified publications where scanned to define an initial sample of relevant literature.

In a second step, relevant cross-references were identified in this initial sample by first scanning the publications' title in the reference section and their context and cited content in the text. The abstracts of the identified additional publications were scanned to determine whether the paper was relevant. Relevant references were subsequently added to the sample and analogously scanned for relevant cross-references. This process was repeated until no further relevant cross-references could be identified.

In a third step, the final sample was integrated, synthesised, and compiled into the literature review presented in the following. The process was updated on the day of submission.

3. Underlying concepts

This section presents definitions of the concepts of business models, sustainable business models, business model innovation, and sustainable business model innovation, discusses their similarities and differences and synthesises new definitions where there is an identified need. We also introduce the notion of the design-implementation gap of sustainable business model innovation identified during the review. The first four parts of this section are accompanied with a selection of different definitions, while an overview of all considered definitions can be found in Appendix A to D respectively.

3.1. Business models

The business model concept gained popularity during the dotcom boom of the 1990's with a vibrant and diverse research activity more recently (Zott et al., 2011). This activity led to an extensive special issue in the Long Range Planning journal in 2010 and a considerable range of literature reviews, like Bieger and Reinhold (2011), George and Bock (2011), Massa et al. (2017), Schallmo (2013), and Zott et al. (2011), which were integrated, updated, and synthesised into this literature review, whose result is illustrated in Table 2.

During the e-commerce boom of the 1990's, new innovative revenue mechanisms were introduced. In this context, the business model concept was originally used to communicate complex business ideas to potential investors within a short time frame (Zott et al., 2011). From there, the purpose of the concept developed to be now seen as both a tool for the systemic analysis, planning, and communication of the configuration and implementation of one or more organisational units and relevant parts of their environment in face of organisational complexity (Doleski, 2015; Knyphausen-Aufsess and Meinhardt, 2002), as well as a strategic asset for competitive advantage and firm performance (Afuah, 2004; Casadesus-Masanell and Ricart, 2010; Chesbrough, 2007; Hamel, 2000; Magretta, 2002).

For organisational decision-making and academic research in the context of emerging industrial phenomena, like Industry 4.0 (Bundesregierung, 2014) or Re-Distributed Manufacturing (Srai et al., 2016), the business model concept allows to extrapolate from potential customer and value chain benefits to the required configuration and implementation of the other business model elements (Osterwalder et al., 2014; Yang et al., 2016). The resulting potential business models provide the necessary information about the implementation of phenomena's conceptual and technological implications that is required as a basis for further research in these.

As these definitions show, there are three main groups of understanding of the term business model, as illustrated in Fig. 2. The concept is either described as a model of an organisational system (e.g. Baden-Fuller and Morgan, 2010; Knyphausen-Aufsess and Meinhardt, 2002), as an abstract characteristic of an organisational unit, (e.g. Osterwalder and Pigneur, 2010; Teece, 2010), or with a reduced scope that equates the term with individual elements of other authors' definitions or reduce it to achieve certain means (e.g. Doganova and Eyquem-Renault, 2009). There is a central role of value in most definitions, roughly following the categorisation of Richardson (2008), value proposition, value creation and delivery, and value capture, with some authors also adding the value network (e.g. Zott and Amit, 2010).

Business model working definition

Based on this analysis, we define business models as *simplified representations of the value proposition, value creation and delivery, and value capture elements and the interactions between these elements within an organisational unit.*

However, since there can be several representations of the same organisational unit, perceptions of the term must be considered

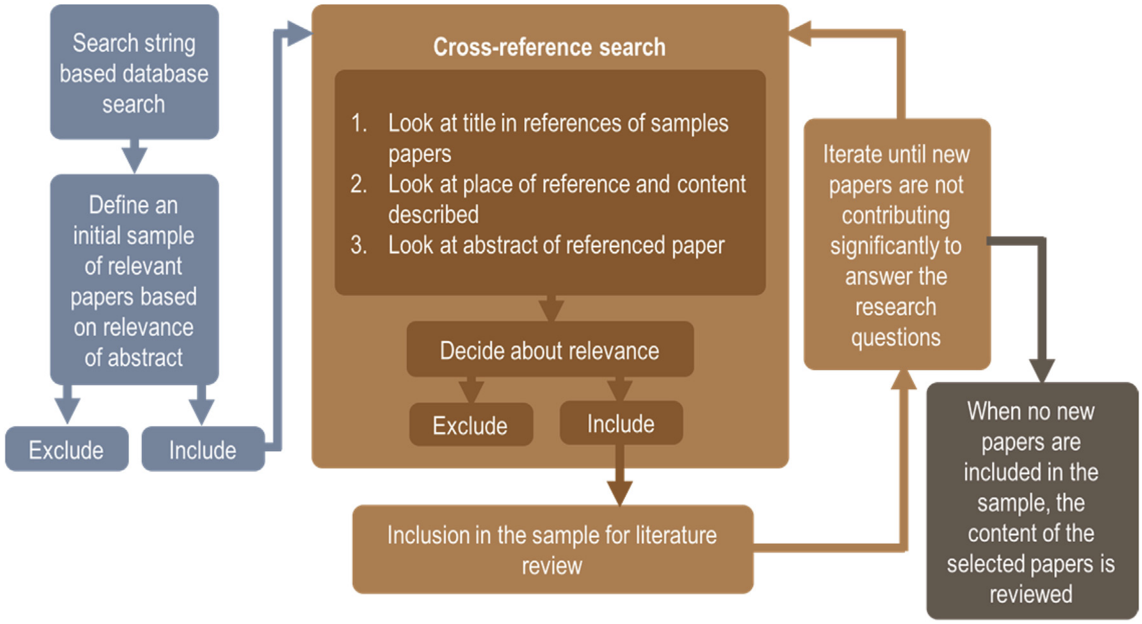

Fig. 1. Literature review approach, illustration adapted from Geissdoerfer et al., (2017b.

Table 1
Literature search strings.

Search string	Search field	Number of non-exclusive results		
		Web of Science	Scopus	Last updated
"business model*"	Title/Article title	1690	2314	27/02/2018
"sustainable business model*"	Topic/Article title, Abstract, Keywords	190	279	27/02/2018
"business model* for sustainability"	Topic/Article title, Abstract, Keywords	22	25	27/02/2018
"business model innovation" AND sustainab*	Topic/Article title, Abstract, Keywords	90	109	27/02/2018
"business modelling" AND sustainab*	Topic/Article title, Abstract, Keywords	9	105	27/02/2018
"business model design" AND sustainab*	Topic/Article title, Abstract, Keywords	8	17	27/02/2018

that assume an underlying abstract concept that is characteristic of the entity — analogue to capabilities, resources, or strategies, which can be documented in different ways without the document becoming the underlying concept. Not fully considered can be definitions with reduced scope that assume identity of the business model with one of its elements, for example, the revenue model.

3.2. Sustainable business models

The academic and practitioner interest in sustainable business models has grown rapidly, culminating in special issues in Journal of Cleaner Production (Vol. 45, April 2013), and Organisation and the Environment (Vol. 29, Is. 1, March 2016), which provide an excellent overview over the topic. There is also a growing range of review articles by Bocken et al. (2014), Boons and Lüdeke-Freund (2013), Evans et al. (2017), and Schaltegger et al. (2016). Following on from this work, an updated and complemented literature review was conducted. An overview of the considered definitions is provided in Table 3.

When the concept was first conceived, its main purpose was to put companies into the service of the transformation to a more sustainable economic system and to provide leverage for integrating sustainability considerations into organisations and helping companies to achieve their sustainability ambitions (Rashid et al., 2013; Stubbs and Cocklin, 2008; Wells, 2013). Today, the notion of sustainable business models is increasingly seen as a source of competitive advantage (Nidumolu et al., 2009; Porter and Kramer, 2011). Thus, it could be argued that the sustainable business model concept model might eventually supersede the business model concept much like sustainable competitive advantage has superseded competitive advantage (Grant, 2010).

The definitions in the literature have in common that they see sustainable business models as a modification of the conventional business model concept, with certain characteristics and goals added to it; and, they either 1) incorporate concepts, principles, or goals that aim at sustainability; or 2) integrate sustainability into their value proposition, value creation and delivery activities, and/or value capture mechanisms.

The literature describes different subcategories, archetypes, or generic strategies for sustainable business models, like product-service systems, base of the pyramid, or circular business models (Bocken et al., 2014). These types have additional characteristics. For example, circular business models are not only creating sustainable value, employing pro-active multi-stakeholder management, and have a long-term perspective, but also close, slow, intensify, dematerialise, and narrow resource loops (Bocken et al., 2016; Geissdoerfer et al., 2018a), as illustrated in Fig. 3.

However, because of potential trade-offs between these additional characteristics and the characteristics that qualify a sustainable business model, there may be cases that represent only the subcategory without being a sustainable business model as illustrated in Fig. 4. This could, for example, be caused by efficiency gains of a new technology that exceed the environmental benefits of closing the loop for an old technology, or negative consequences of going circular for the working conditions of employees (Geissdoerfer et al., 2017b).

Sustainable business model working definition

Based on this analysis, we define sustainable business models as *business models that incorporate pro-active multi-stakeholder*

Table 2
Selected business model definitions.

Source	Definition
Timmers, 1998	The business model is "an architecture of the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; a description of the sources of revenues" (p. 4)
Chesbrough and Rosenbloom, 2002	The business model is "the heuristic logic that connects technical potential with the realization of economic value" (p. 529). "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" (p. 532).
Knyphausen-Aufsess and Meinhardt, 2002	A business model is a simplified representation of a profit aimed venture, consisting of its essential elements and their interconnections.
Magretta, 2002	"[Business models] are, at heart, stories—stories that explain how enterprises work [and answer the following questions,] Who is the customer? And what does the customer value? It also answers the fundamental question 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 the customers at an appropriate cost?" (p. 87)
Richardson, 2008	A business model is "a conceptual framework that helps to link the firm's strategy, or theory of how to compete, to its activities, or execution of the strategy. The business model framework can help to think strategically about the details of the way the firm does business." (p. 135) "The three major components of the framework — the value proposition, the value creation and delivery system, and value capture — reflect the logic of strategic thinking about value. The essence of strategy is to create superior value for customers and capture a greater amount of that value than competitors." (p. 138)
Doganova and Eyquem-Renault, 2009	"The business model is a narrative and calculative device that allows entrepreneurs to explore a market and plays a performative role by contributing to the construction of the techno-economic network of an innovation." (p. 1559)
Baden-Fuller and Morgan, 2010	"business models have a multivalent character as models. They can be found as exemplar role models that might be copied or presented as nutshell descriptions of a business organisation: simplified, short-hand descriptions equivalent to scale models. We can think of them not only as capturing the characteristics of observed kinds in the world (within a taxonomy), but also as abstract ideal types (in a typology)" (p. 167)
Casadesus-Masanell and Ricart, 2010)	"A business model is […] a reflection of the firm's realized strategy" (p. 195).
Osterwalder and Pigneur, 2010	"A business model describes the rationale of how an organisation creates, delivers, and captures value."(p. 14)
Teece, 2010	"A business model articulates the logic, the data and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value" (p. 179).
Zott and Amit, 2010	"we conceptualize a firm's business model as a system of interdependent activities that transcends the focal firm and spans its boundaries. The activity system enables the firm, in concert with its partners, to create value and also to appropriate a share of that value [and is defined by] design elements - content, structure and governance - that describe the architecture of an activity system; and design themes - novelty, lock-in, complementarities and efficiency – that describe the sources of the activity system's value creation." (p. 216).
Geissdoerfer et al., 2016	"we describe business models as simplified representations of the elements e and interactions between these elements e that an organisational unit chooses in order to create, deliver, capture, and exchange value." (p. 1218)
Wirtz et al., 2016	"A business model is a simplified and aggregated representation of the relevant activities of a company. It describes how marketable information, products and/or services are generated by means of a company's value-added component. In addition to the architecture of value creation, strategic as well as customer and market components are taken into consideration, in order to achieve the superordinate goal of generating, or rather, securing the competitive advantage. To fulfil this latter purpose, a current business model should always be critically regarded from a dynamic perspective, thus within the consciousness that there may be the need for business model evolution or business model innovation, due to internal or external changes over time." (p.41)
Massa et al., 2017	"a business model is a description of an organisation and how that organisation functions in achieving its goals (e.g., profitability, growth, social impact, …)." (p. 73)

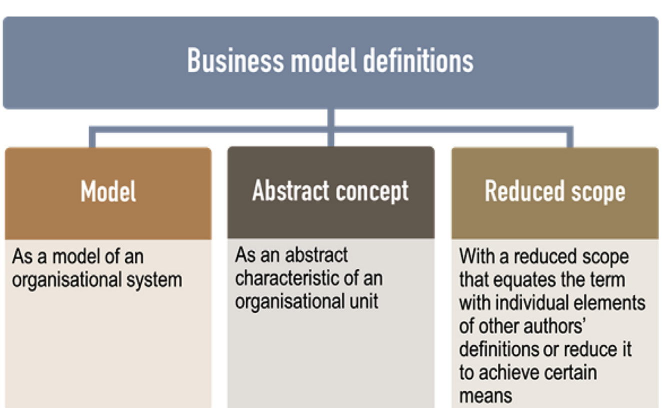

Fig. 2. Three types of business model definitions.

management, the creation of monetary and non-monetary value for a broad range of stakeholders, and hold a long-term perspective.

The most prevalent framework underlying the different conceptualisation is the value proposition, value creation and delivery, and value capture structure of Richardson (2008), which we included in our working definition. In different modifications, it is used by most authors in our sample. While some of these modifications have accounted for the multi-stakeholder nature of sustainable business models in two of the elements, the focus on customer and monetary value of the value capture element endured. Since sustainable business model innovation focuses on stakeholder benefit and stakeholder value rather than solely on customer benefit or shareholder value the existing definition seems inadequate. We therefore propose the following definition: *value capture describes how part of the value generated for a stakeholder can be transformed into value useful for the company*. The value is useful for the company if it helps the company to achieve its purpose. Examples of useful value thus could be profit, strategic fit, and employee motivation.

3.3. Business model innovation

Business model innovation is a stream in the work on business models, and some authors of the latter assume it to be an implicit part of their conceptualisation. Schallmo (2013) and Foss and Saebi (2017) provided an extensive literature review on the topic, which was updated and complemented for this research. A resulting overview of different business model innovation definitions is provided in Table 4.

The concept is investigated to understand and facilitate the analysis and planning of transformations from one business model to another (Schallmo, 2013). The capability for frequent and successful business model innovation can increase an organisation's resilience to changes in its environment and constitute a sustainable competitive advantage (Mitchell and Coles, 2003).

Table 3
Selected sustainable business model definitions.

Source	Definition
Stubbs and Cocklin, 2008	A sustainable business model is "a model where sustainability concepts shape the driving force of the firm and its decision making [so that] the dominant neoclassical model of the firm is transformed, rather than supplemented, by social and environmental priorities." (p. 103)
Garetti and Taisch, 2012	Sustainable business models "have a global market perspective, taking into account the development of new industrialised countries as well as the need for more sustainable products and services." (p. 88)
Schaltegger et al., 2012	Sustainable business models "create customer and social value by integrating social, environmental, and business activities" (p. 112)
Bocken et al., 2013	"Sustainable business models seek to go beyond delivering economic value and include a consideration of other forms of value for a broader range of stakeholders." (p. 484)
Boons and Lüdeke-Freund, 2013	A sustainable business model is different from a conventional one through four propositions, "1. The value proposition provides measurable ecological and/or social value in concert with economic value […] 2. The supply chain involves suppliers who take responsibility towards their own as well as the focal company's stakeholders […] 3. The customer interface motivates customers to take responsibility for their consumption as well as for the focal company's stakeholders. […] 4. The financial model reflects an appropriate distribution of economic costs and benefits among actors involved in the business model and accounts for the company's ecological and social impacts" (p. 13)
Wells, 2013	A business model for sustainability "would assists in the achievement of sustainability [by] following major principles […] for sustainability", which Wells defines as 1) resource efficiency, 2) social relevance, 3) localisation and engagement, 4) longevity, 5) ethical sourcing, and 6) work enrichment. (p. 65)
Upward and Jones, 2015	A (strongly) sustainable business model "is the definition by which an enterprise determines the appropriate inputs, resource flows, and value decisions and its role in ecosystems, [in a way that] sustainability measures [which] are those indicators that assess the outputs and effects of business model decisions […] might be claimed as successfully sustainable." (p. 98)
Abdelkafi and Tauscher, 2016)	Sustainable business models, "incorporate sustainability as an integral part of the company's value proposition and value creation logic. As such, [Business models for Sustainability] provide value to the customer and to the natural environment and/or society." (p. 75)
Geissdoerfer et al., 2016)	"we define a sustainable business model as a simplified representation of the elements, the interrelation between these elements, and the interactions with its stakeholders that an organisational unit uses to create, deliver, capture, and exchange sustainable value for, and in collaboration with, a broad range of stakeholders." (p. 1219)
Evans et al., 2017	Sustainable business models are described with five propositions, "1. Sustainable value incorporates economic, social and environmental benefits conceptualised as value forms. 2. Sustainable business models require a system of sustainable value flows among multiple stakeholders including the natural environment and society as primary stakeholders. 3. Sustainable business models require a value network with a new purpose, design and governance. 4. Sustainable business models require a systemic consideration of stakeholder interests and responsibilities for mutual value creation. 5.Internalizing externalities through product-service systems enables innovation towards sustainable business models." (p. 5ff)

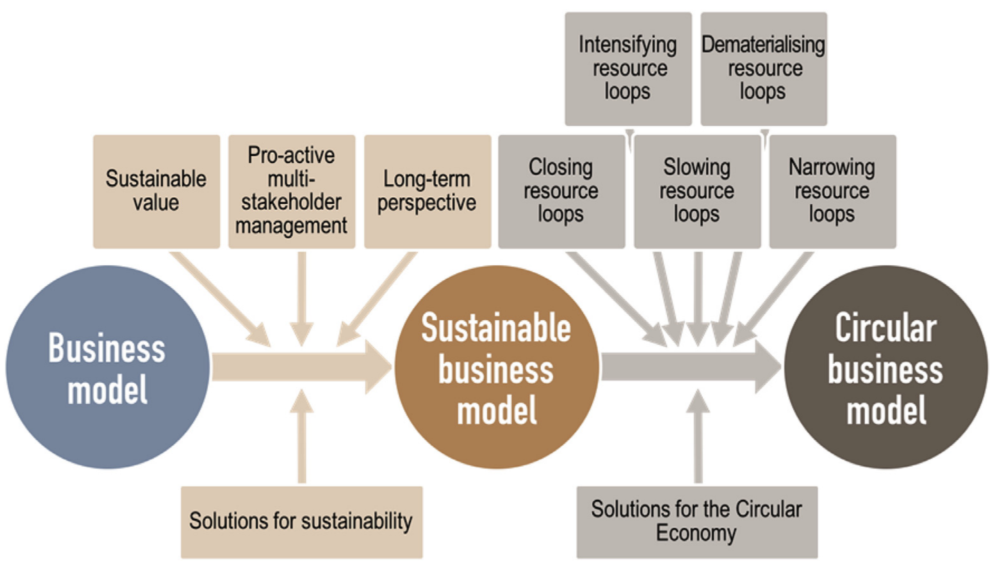

Fig. 3. Sustainable and circular business models (Geissdoerfer et al., 2018a).

These definitions refer to business model innovation as a change in the configuration of either the entire business model or individual elements of it, either as a reaction to opportunities or challenges in the organisation's environment or as a vehicle for diversification and innovation. Consequently, the concept's main fields of application have been in corporate diversification (Ansoff, 1957) and business venturing and start-up contexts. Based on the described business model innovation examples, four generic configurations of business model innovation can be distinguished. These comprise start-ups, business model transformation, business model diversification, and business model acquisition (Fig. 5).

The differentiation between other forms of innovation and diversification is not clearly defined by the reviewed publications. For example, Lindgardt et al., 2009 define that at least two business model elements have to change for an innovation to qualify as a business model innovation. However, the thresholds for changes in a company's activities to qualify as a change in a business model element remain unclear, for instance, when a product innovation constitutes a new value proposition. Thus, it remains conceptually underexplored under what circumstances, for example, product innovation, service innovation, or changes in the supply chain qualify as a business mode innovation.[1]

Business model innovation working definition

Based on this analysis, we define business model innovation as *the conceptualisation and implementation of new business models.*

[1] We have discussed this in more detail in Geissdoerfer et al., (2018b).

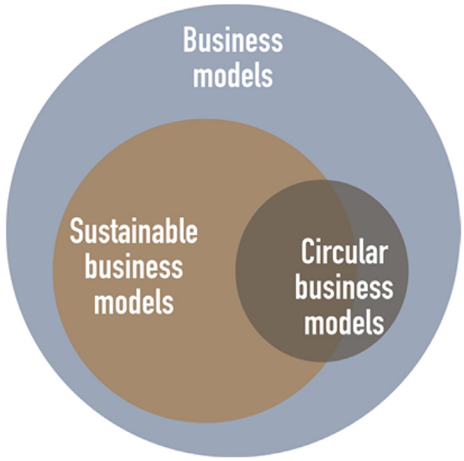

Fig. 4. Imperfect overlap of sustainable business model concept and its subcategories like circular business models.

This can comprise the development of entirely new business models, the diversification into additional business models, the acquisition of new business models, or the transformation from one business model to another. The transformation can affect the entire business model or individual or a combination of its value proposition, value creation and deliver, and value capture elements, the interrelations between the elements, and the value network.

3.4. Sustainable business model innovation

As a subset in the sustainable business model field, research in sustainable business model innovation has started relatively recently, and there seems to be no comprehensive review of the literature yet. Therefore, this review was conducted, and an overview of different definitions is presented in Table 5.

These definitions combine a business model innovation element with sustainability considerations. Similar to the understanding of conventional business model innovation scholars, business model innovation is seen as a process of business model exploration, adjustment, improvement, redesign, revision, creation, development, adoption, and transformation. The process qualifies as a sustainable business model innovation or a business model innovation for sustainability, when it aims at: 1) sustainable development or positive, respectively reduced, negative impacts for the environment, society, and the long-term prosperity of the organisation and its stakeholders or 2) adopting solutions or characteristics that foster sustainability in its value proposition, creation, and capture elements or its value-network.

Analogous to the discussion of conventional business model innovation in section 3.3, there are four types of sustainable business model innovation: (1) sustainable start-ups: a new organisation with a sustainable business model is created; (2) sustainable business model transformation: the current business model is changed, resulting in a sustainable business model; (3) sustainable business model diversification: without major changes in the existing business models of the organisation, and additional, sustainable business model is established; 4) Sustainable business model acquisition: an additional, sustainable business model is identified, acquired, and integrated into the organisation.

Based on the discussion in section 3.2, these four innovations are expected to aim at implementing certain sustainable business model types and strategies. The types include circular business model innovation (Bocken et al., 2016), social enterprises (Defourny and Nyssens, 2010), bottom-of the pyramid businesses (Prahalad, 2009), and product-service systems (Tukker, 2004). The strategies were reviewed by Bocken et al. (2014) and recently updated by Ritala et al. (2018). They have synthesised nine generic sustainable business model strategies, they call “archetypes”. The strategies comprise: (1) maximise material and energy efficiency; (2) closing resource loops; (3) substitute with renewables and natural processes; (4) deliver functionality rather than ownership; (5) adopt a stewardship role; (6) encourage sufficiency; (7) repurpose for society or the environment; (8) inclusive value creation; and (9) develop sustainable scale up solutions.

Sustainable business model innovation therefore aims at (1)

Table 4
Selected business model innovation definitions.

Source	Definition
Mitchell and Coles, 2004	“By business model innovation, we mean business model replacements that provide product or service offerings to customers and end users that were not previously available. We also refer to the process of developing these novel replacements as business model innovation.“ (p. 17)
Labbé and Mazet, 2005	A business model innovation changes one or more dimensions of a business model (which are perceived by the authors as product-market combination, the architecture of the value creation, and the revenue model) so that a novel configuration of the elements is created and implemented. (pp. 897 f.)
Osterwalder and Pigneur, 2005	“Specifying a set of business model elements and building blocks, as well as their relationships to one another […] a business model designer […] can experiment with these blocks and create completely new business models, limited only by imagination and the pieces supplied.” (p. 24)
Chesbrough, 2007	Business model innovation is to “advance [the] business model […] from very basic (and not very valuable) models to far more advanced (and more valuable) models.” (p.15)
Lindgardt et al., 2009	“Innovation becomes BMI [business model innovation] when two or more elements of a business model are reinvented to deliver value in a new way. […] BMI can provide companies a way to break out of intense competition, under which product or process innovations are easily imitated“. (p. 2)
Romero and Molina, 2009	“business models as definers of the value creation priorities in an organisation should be continuously reviewed in response to actual and possible changes in the perceived market conditions and evolve the enterprise strategy as the business environment and customers' needs change.” (p. 3)
Chesbrough, 2010	Business model innovation “[1] Articulates the value proposition (i.e., the value created for users by an offering based on technology); [2] Identifies a market segment and specify the revenue generation mechanism (i.e., users to whom technology is useful and for what purpose); [3] Defines the structure of the value chain required to create and distribute the offering and complementary assets needed to support position in the chain; [4] Details the revenue mechanism(s) by which the firm will be paid for the offering; [5] Estimates the cost structure and profit potential (given value proposition and value chain structure); [7] Describes the position of the firm within the value network linking suppliers and customers (incl. identifying potential complementors and competitors); and [8] Formulates the competitive strategy by which the innovating firm will gain and hold advantage over rivals.” (p. 355, citing Chesbrough and Rosenbloom, 2002)
Johnson, 2010	“[Seizing the white space] calls for the ability to innovate something more core than the core, to innovate the very theory of the business itself. I call that process business model innovation.” (p. 13) “business model innovation is an iterative journey“ (p. 114)
Geissdoerfer et al., 2016	“Business model innovation describes either a process of transformation from one business model to another within incumbent companies or after mergers and acquisitions, or the creation of entirely new business models in start-ups.” (p. 1220)

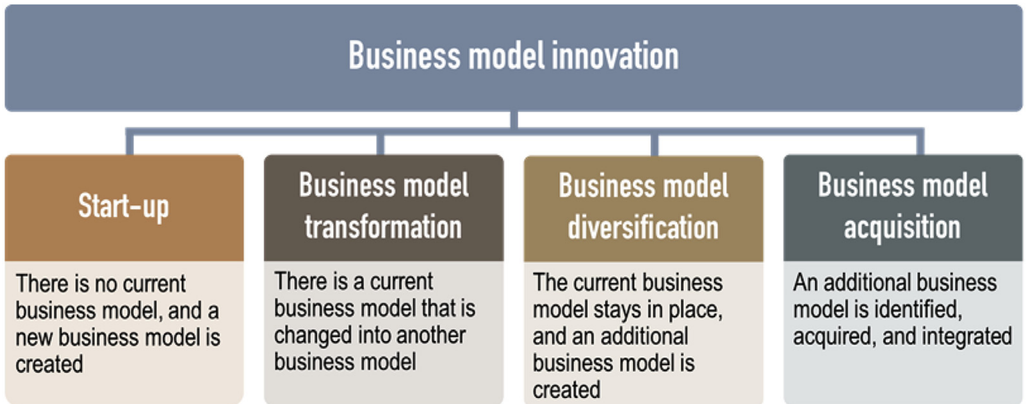

Fig. 5. Types of business model innovation.

Table 5
Selected sustainable business model innovation definitions.

Source	Definition
Boons and Lüdeke-Freund, 2013	Sustainable business model innovation is underststood as the adaption of the business model to overcome barriers within the company and its environment to market sustainable process, product, or service innovations. (p. 13)
Loorbach and Wijsman, 2013	Sustainable business model innovation describes businesses' "searching for ways to deal with unpredictable […] wider societal changes and sustainability issues." (p. 20)
Bocken et al., 2014	"Business model innovations for sustainability are defined as: Innovations that create significant positive and/or significantly reduced negative impacts for the environment and/or society, through changes in the way the organisation and its value-network create, deliver value and capture value (i.e. create economic value) or change their value propositions." (p. 44)
Geissdoerfer et al., 2016	"Sustainable business innovation processes specifically aim at incorporating sustainable value and a pro-active management of a broad range of stakeholders into the business model." (p.1220)
Roome and Louche, 2016	Sustainable business model innovation describes the "processes through which […] new business models are developed by businesses and their managers […] how companies revise and transform their business model in order to contribute to sustainable development." (p. 12)
Schaltegger et al., 2016	Sustainable business model innovation describes the creation of "modified and completely new business models [that] can help develop integrative and competitive solutions by either radically reducing negative and/or creating positive external effects for the natural environment and society" (p. 3)
Yang et al., 2016	"Sustainable business model innovation can be more easily achieved by identifying the value uncaptured in current business models, and then turning this new understanding of the current business into value opportunities that can lead to new business models with higher sustainable value." (p. 2)

characteristics of a sustainable business model – sustainable value creation, proactive multi-stakeholder management, and a long-term perspective. (2) four types of innovation – sustainable start-ups, sustainable business model transformation, sustainable business model diversification, sustainable business model acquisition. (3) creating a sustainable business model type – circular business models, social enterprises, bottom of the pyramid solutions, or product-service systems. (4) the implementation of one or more sustainable business model strategies. An overview of sustainable business model innovation types, business model types and strategies is provided in Table 6.

Sustainable business model innovation working definition

Based on this, we define sustainable business model innovation as *the conceptualisation and implementation of sustainable business models. This can comprise the development of entirely new business models, the diversification into additional business models, the acquisition of new business models, or the transformation from one business model to another.*

3.5. The design-implementation gap in sustainable business model innovation

There seems to be a three-fold problem in sustainable business model innovation: 1) many business model innovation meetings and workshops are conducted, but the ideas are not followed up, 2) even promising sustainable business model concepts are not implemented, and 3) most implemented business models, especially in the start-up context, fail in the market. This is caused by different challenges, some of which were identified in a literature review by Evans et al. (2017). These challenges are presented in Table 7.

These challenges are confirmed by a range of authors in the business model innovation, strategic management, and change management literature.

Chesbrough (2010) remarks that business model innovation often does not take place because the organisation cannot identify the appropriate business model for new technologies or solution. Other authors, like Christensen (1997) and Christensen and Raynor (2003), see the problem further down the line in conflicts with the current business model and organisational logic that prevent implementation. These scholars see the difficulties that disruptive technology pose for firms not in the identification of the appropriate business model to exploit it, but in the inertia to change the current business model. This inertia is caused by often higher gross margins of the incumbent technology in the crucial early phases, and the consequent misallocation of resources. Similarly, according to Amit and Zott (2001), novelty, lock-in complementarities and efficiency are inherent aspects of business model innovation that require changes in the current configuration of assets. This causes conflicts with the managers of these assets who will consequently resist the innovation process.

This is reinforced by Prahalad and Bettis (1986) and Bettis and Prahalad (1995)'s concept of dominant logic that describes how organisations assess, select, and interpret information in often

Table 6
Overview of sustainable business model innovation types, business model types and strategies.

	Examples	Description
Sustainable business model innovation types	1) Sustainable start-ups:	A new organisation with a sustainable business model is created
	2) Sustainable business model transformation	The current business model is changed, resulting in a sustainable business model
	3) Sustainable business model diversification	Without major changes in the existing business models of the organisation, and additional, sustainable business model is established
	4) Sustainable business model acquisition	An additional, sustainable business model is identified, acquired, and integrated into the organisation
Sustainable business model types	1) Circular business models	Business models that are closing, slowing, intensifying, dematerialising, or narrowing resource loops
	2) Social enterprises	Business models that aim at social impact by generating profits from economic activity or reinvesting them entirely
	3) Bottom of the pyramid solutions	Business models that aim at customers at the bottom of the income pyramid
	4) Product-service systems	Business models that integrate products and services into customer offerings that provide a product, a functionality, or a result
Sustainable business model strategies	1) Maximise material and energy efficiency	Aims at less material and energy input through more efficient processes
	2) Closing resource loops	Aims at closing resource loops through reuse, remanufacturing, and recycling
	3) Substitute with renewables and natural processes	Aims at replacing non-renewable resources with renewable ones and artificial processes with ones that mimic or use processes in nature
	4) Deliver functionality rather than ownership	Aims at providing the user with the functionality she requires without her owning the product that delivers the service
	5) Adopt a stewardship role	Aims at protecting natural systems by introducing a gatekeeper that controls access or incentivises certain behaviours
	6) Encourage sufficiency	Aims at providing information and incentives that encourage less consumption
	7) Repurpose for society or the environment	Aims at utilising organisational resources and capabilities to create societal or environmental benefits
	8) Inclusive value creation	Aims at delivering value to formerly unattended stakeholders or including them into the value creation process
	9) Develop sustainable scale up solutions	Aims at scaling sustainable solutions and technologies

Table 7
Challenges for innovation towards sustainable business models (Evans et al., 2017).

Challenges	Description	Authors
Triple Bottom Line	The co-creation of profits, social and environmental benefits and the balance among them are challenging for moving towards sustainable business models.	(Hart et al., 2003; Schaltegger et al., 2012; Stubbs and Cocklin, 2008)
Mind-set	The business rules, guidelines, behavioural norms and performance metrics prevail the mind-set of firms and inhibit the introduction of new business models.	(Boons and Lüdeke-Freund, 2013; Johnson et al., 2008; Yu and Hang, 2010)
Resources	Reluctance to allocate resources to business model innovation and reconfigure resources and processes for new business models.	(Björkdahl and Holmén, 2013; Chesbrough, 2010; C Zott et al., 2011)
Technology innovation	Integrating technology innovation, e.g. clean technology, with business model innovation is multidimensional and complex.	(Hart et al., 2003; Yu and Hang, 2010; Zott et al., 2011)
External relations	Engaging in extensive interaction with external stakeholders and business environment requires extra efforts.	(Boons and Lüdeke-Freund, 2013; Stubbs and Cocklin, 2008; Vladimirova, 2012)
Methods and tools	Existing business modelling methods and tools, e.g. Osterwalder and Pigneur (2010) and Johnson et al. (2008), are few and rarely sustainability driven.	(Björkdahl and Holmén, 2013; Girotra and Netessine, 2013; Yang et al., 2014)

chaotic and uncertain environments. This can prevent companies to utilise value creation opportunities that are different from their current business model and its logic.

Similarly, the change management field refers to organisational inertia as a reason why change efforts fail (Hughes, 2011). This inertia is caused by different barriers to organisational change, like insufficient top management involvement, job security concerns, power struggles, and agency problems (Burnes, 1996; Kegan and Lahey, 2001; Kotter, 2007) that also apply to business model innovation as a particularly comprehensive and complex change effort (Table 8).

Working definition

Based on this review, we define the design-implementation gap of sustainable business model innovation as *the set of challenges that prevent organisations from successfully innovating their business model, due to insufficient follow-up on ideas, lack of implementation of concepts, and failure of businesses in the market.*

To conclude the literature review part, an overview of all working definitions that we develop in this section is illustrated in Table 9.

4. Research gap

In our review, we identified a research gap in the following three areas of sustainable business model innovation that undermine bridging its design-implementation gap: 1) the implementation of the business model innovation process; 2) its tools; and 3) its challenges.

Even though business model research is a relatively young field in management studies (Baden-Fuller and Morgan, 2010; Zott et al., 2011), a broad discourse on business model innovation has evolved in the last decade (e.g. Chesbrough and Rosenbloom, 2002; Chesbrough, 2007, 2010; Mitchell and Coles, 2003, 2004; 2004; Demil and Lecocq, 2010; Johnson, 2010; Johnson et al., 2008; Teece, 2010; Zott et al., 2011). However, the way organisations actually implement new business models is still unexplored (Chesbrough,

Table 8
Change management stages, actions, and pitfalls (Kotter, 2006).

Stage	Actions needed	Challenges
Establish a sense of urgency	Examine market and competitive realities for potential crises and untapped opportunities. Convince at least 75% of your managers that the status quo is more dangerous than the unknown.	Underestimating the difficulty of driving people from their comfort zones. Becoming paralyzed by risks
Form a powerful guiding coalition	Assemble a group with shared commitment and enough power to lead the change effort. Encourage them to work as a team outside the normal hierarchy.	No prior experience in teamwork at the top. Relegating team leadership to an HR, quality, or strategic-planning executive rather than a senior line manager
Create a vision	Create a vision to direct the change effort. Develop strategies for realizing that vision.	Presenting a vision that's too complicated or vague to be communicated in 5 min.
Communicate the vision	Use every vehicle possible to communicate the new vision and strategies for achieving it. Teach new behaviours by the example of the guiding coalition.	Undercommunicating the vision. Behaving in ways antithetical to the vision.
Empower others to act on the vision	Remove or alter systems or structures undermining the vision. Encourage risk taking and non-traditional ideas, activities, and actions.	Failing to remove powerful individuals who resist the change effort.
Plan for and create short-term wins	Define and engineer visible performance improvements. Recognize and reward employees contributing to those improvements.	Leaving short-term successes up to chance. Failing to score successes early enough (12–24 months into the change effort)
Consolidate improvements and Produce more change	Use increased credibility from early wins to change systems, structures, and policies undermining the vision. Hire, promote, and develop employees who can implement the vision. Reinvigorate the change process with new projects and change agents.	Declaring victory too soon—with the first performance improvement. Allowing resistors to convince "troops" that the war has been won.
Institutionalise new approaches	Articulate connections between new behaviours and corporate success. Create leadership development and succession plans consistent with the new approach.	Not creating new social norms and shared values consistent with changes. Promoting people into leadership positions who don't personify the new approach.

2007; Foss and Saebi, 2017; Teece, 2006), despite some definitions of innovation requiring successful market introduction (Boons and Lüdeke-Freund, 2013). Even less research has been conducted on sustainable business model innovation, and the concept still remains underexplored (Boons and Lüdeke-Freund, 2013; Schaltegger et al., 2016; Wells, 2008).

In academic research, several tools and processes have been developed to support organisations in the design of business models. More recently the area of tool development that is aiming to enhance sustainability performance is emerging. This development primarily aims at products or takes a broad view on eco-innovation (Baumann et al., 2002; Bocken and Allwood, 2011; Byggeth and Hochschorner, 2006). Even more recent is the development of tools that combine both notions and focus on using business model innovation as a leverage point to support organisations in meeting their sustainability ambitions (Bocken et al., 2013; Evans et al., 2014; Geissdoerfer et al., 2016; Joyce et al., 2016; Upward and Jones, 2015; Yang et al., 2017). These approaches are addressing single phases of the sustainable business model innovation process, with the notable exception of the work of Evans et al. (2014), which combines different individual tools into a more comprehensive process. While these tools can provide some support with the conceptual design of business models, they offer only limited guidance through most of the remaining business model innovation process.

Finally, in the reviewed literature, there seems to be little research on the challenges that business model innovation faces and on the reasons for low success rates in implementation. While the academic change management literature quotes failure rates of up to 70% (Hughes, 2011), there seem to be no comparable numbers for business model innovation. Popular and practitioner publications suggest that it might be as high as 90 percent (Patel, 2015). While there are theoretical discussions on the causes of the design-implementation gap, e.g. by Amit and Zott (2001), Chesbrough (2010), Christensen (1997), and Christensen and Raynor (2003), there is little evidence-based research on the underlying failure modes and root causes.

Table 9
Summary of working definitions.

Concept	Definition
Business model	A simplified representation of the elements and the interactions between these elements that the unit employs for value proposition, creation, delivery, and capture. However, since there can be several representations of the same organisational unit, perceptions of the term must be considered that assume an underlying abstract concept that is characteristic of the entity – analogue to capabilities, resources, or strategies, which can be documented in different ways without the document becoming the underlying concept. Not fully considered can be definitions with reduced scope that assume identity of the business model with one of its elements, for example, the revenue model.
Sustainable business model	A business model that incorporates pro-active multi-stakeholder management, the creation of monetary and non-monetary value for a broad range of stakeholders, and which holds a long-term perspective.
Business model innovation	The transformation from one business model to another. It can affect the entire business model or individual or a combination of its elements.
Sustainable business model innovation	The analysis and planning of transformations to a more sustainable business model or from one sustainable business model to another. This comprises both the development of an entirely new business model and the transformation of an existing business model.
The design-implementation gap	The set of challenges that prevent organisations from successfully innovating their business model, due to insufficient follow-up on ideas, lack of implementation of concepts, and failure of businesses in the market.

5. Research questions

The objective of this research project is to improve the understanding of how organisations move to new, sustainable business models. The research addresses the theoretical research gap and the organisational management problem described in chapter 3.5. It investigates both the business model innovation process and the failure of organisations to successfully develop and launch sustainable business models. Consequently, the research's purpose is to help organisations bridge the design-implementation gap of sustainable business model innovation.

From this objective, the following central research question is derived (Creswell, 2014):

RQ: How do organisations move from one business models to a more sustainable business model in practice?

To operationalise this research question, we break it down into three sub-questions:

1. *What phases does an organisation undergo when creating new, sustainable business models?*
2. *What are the key activties in each of these phases?*
3. *What are the challenges that an organisation faces when creating new, sustainable business models?*

To address the underlying practitioner problem of how to help organisations bridge the design-implementation gap of sustainable business model innovation, two additional sub-questions are proposed:

4. *What are strategies to develop additional tools to support this process?*
5. *How do organisations use these tools to solve the challenges that arise during the business model innovation process?*

6. Discussion and conclusions

This paper presents a comprehensive review of the sustainable business model innovation literature. We provide the raw data from the literature together with interpretations of this data and working definitions of the key underlying concepts and a clearly defined research gap. We also propose a range of research questions to address this gap.

Sustainable business model innovation is a relatively nascent field of research. This research has reviewed the field and has synergised definitions for the key underlying concepts and identified a research gap in the implementation of the business model innovation process, in the challenges of this process, and in the tools to address these challenges. Based on the research gap we have formulated a research question and broke it down into five sub-questions. These research questions aim to generate descriptive knowledge about the process organisations undergo to move into new, sustainable business models, both in the start-up and corporate context. While this comprises the development of an entirely new business model from scratch in the context of start-ups, it describes the transformation from one business model to another, the acquisition and integration of new business models, or the process of business model diversification in a corporate setting.

This also contributes to the more established field of business model innovation. The literature reveals comprehensive advantages that sustainable business models have for organisations (Nidumolu et al., 2009; Porter and Kramer, 2011). The authors argue that these advantages will make the concept of non-sustainable business models obsolete and sustainable business models will eventually supersede the notion of business models, analogue to competitive advantage and sustainable competitive advantage. Therefore, the conceptual advances of this review will become increasingly relevant for the field at large.

Deliberate, planned business model innovation process is also potentially required in many bigger innovation projects, like new product or service introductions, to align all elements of the business model optimally for exploitation and gain competitive advantages compared to conventional diversification activities (Mitchell and Coles, 2004). This indicates that sustainable business model innovation research might complement established strategic management fields like corporate and product diversification.

Furthermore, we believe that business model innovation can replace some strategic mergers and acquisitions (M&A). Both the high failure rate of business model innovation and sinking transaction costs (Coase, 1937) lead to both disruptive (Bower and Christensen, 1995) but also incremental innovation increasingly being developed in start-ups rather than within incumbent corporations. This has interestingly lead to a return of conglomerates (Manral and Harrigan, 2017) like Alphabet or Alibaba that have acquired the capability to identify, buy, and integrate start-ups strategically. As more and more corporates wake up to this approach, identifying and buying adequate start-ups becomes more difficult. This increases the costs and risks of these activities. Therefore, we propose business model diversification through the development of in-house start-ups as a complement to this M&A approach to business model innovation.

The research questions aim at developing a sustainable business model innovation framework. This framework could guide companies through their business model innovation process by mapping the necessary key activities, potential challenges, and available tools. This will be the basis for developing a tool development framework to develop individual management tools and combine them into comprehensive and potentially synergistic toolboxes.

Helping managers by proving guidance and the anticipation of challenges related to sustainable business model innovation would yield societal implications. It is intended to lead to a higher adoption rate of more sustainable business models and higher success rate of sustainable venturing and start-ups. This would allow more efficient and effective deployment of more sustainable solutions and technologies in industry (Rashid et al., 2013), generating more customer benefit, shareholder value, and economic growth. In turn, the creation of more social, economic, and environmental value for a broader set of stakeholders might work towards the goal of all economic activity - increased happiness (Evans et al., 2014; Frey and Stutzer, 2001).

Acknowledgements

This work was supported by the EPSRC Centre for Innovative Manufacturing in Industrial Sustainability, grant number EP/I033351/1 and the EPSRC project Business Models for Sustainable Industrial Systems, grant number EP/L019914/1, as well as studentships from the EPSRC and the Foundation of German Business.

Appendix A. Considered business model definitions

Source	Definition
(Timmers, 1998)	The business model is "an architecture of the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; a description of the sources of revenues" (p. 4)
(Amit and Zott, 2001)	"A business model depicts the design of transaction content, structure, and governance so as to create value through the exploitation of business opportunities" (p. 493)
(Finnie, 2000)	"the major components of a business model [are] customer interface, core strategy, strategic resources, and value network. These basic components are linked by three, bridging components: customer benefits, configuration of activities, and company boundaries" (p. 10)
(Chesbrough and Rosenbloom, 2002)	The business model is "the heuristic logic that connects technical potential with the realization of economic value" (p. 529)."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" (p. 532).
(Hawkins, 2002)	„In other words, a business model describes how an enterprise gears up its resources, planning capabilities and processes to the revenue producing potential of a specific product or service. By focusing in on this relationship to revenue producing potential, a new context is provided for assessing the planning and operational aspects of an enterprise, and for assessing the relationship between on-line and off-line trading environments" (p. 308)
(Knyphausen-Aufsess and Meinhardt, 2002)	A business model is a simplified representation of a profit aimed venture, consisting of its essential elements and their interconnections.
(Magretta, 2002)	"[Business models] are, at heart, stories—stories that explain how enterprises work [and answer the following questions,] Who is the customer? And what does the customer value? It also answers the fundamental question 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 the customers at an appropriate cost?" (p. 87)
(Mangematin et al., 2003)	"A business model is a description of the commercial relationship between a business enterprise and the products and/or services it provides in the market." (p. 299)
(Mitchell and Coles, 2003)	"A business model is the combination of, 'who', 'what', 'when', 'where', 'why', 'how', and 'how much' an organisation uses to provide its goods and services and develop resources to continue its efforts" (p. 17)
(Pateli and Giaglis, 2004)	"business models are not conceived as a purely management-related concept, but embrace a broad spectrum of organisational activities, from the operational (processes) to the strategic level. Moreover, given the evolution of networked organisations and the growing adoption of eBusiness, the definition of business models has been extended to include inter-organisational activities, roles, and elements as well." (p. 308)
(Rappa, 2004)	"A business model is a method of doing business. All business models specify what a company does to create value, how it is situated among upstream and downstream partners in the value chain, and the type of arrangement it has with its customers to generate revenue" (p. 34)
(Downing, 2005)	The business model "is a set of expectations about how the business will be successful in its environment" (p. 186).
(Morris et al., 2005)	"At the most rudimentary level, the business model is defined solely in terms of the firm's economic model. The concern is with the logic of profit generation. Relevant decision variables include revenue sources, pricing methodologies, cost structures, margins, and expected volumes." (p. 727)
(Johnson et al., 2008)	„A business model, from our point of view, consists of four interlocking elements that, taken together, create and deliver value […] Customer value proposition […] Profit formula […] Key resources […] Key processes […]" (p. 60f)
(Richardson, 2008)	A business model is "a conceptual framework that helps to link the firm's strategy, or theory of how to compete, to its activities, or execution of the strategy. The business model framework can help to think strategically about the details of the way the firm does business." (p. 135) "The three major components of the framework — the value proposition, the value creation and delivery system, and value capture — reflect the logic of strategic thinking about value. The essence of strategy is to create superior value for customers and capture a greater amount of that value than competitors." (p. 138)
(Zott and Amit, 2008)	"In this paper, we […] introduce[e] the firm's business model as a new contingency factor that captures the structure of a firm's boundary spanning exchanges and asking: How do the firm's business model and its product market strategy interact to impact firm performance?" (p. 1)
(Doganova and Eyquem-Renault, 2009)	"The business model is a narrative and calculative device that allows entrepreneurs to explore a market and plays a performative role by contributing to the construction of the techno-economic network of an innovation." (p. 1559)
(Baden-Fuller and Morgan, 2010)	"business models have a multivalent character as models. They can be found as exemplar role models that might be copied, or presented as nutshell descriptions of a business organisation: simplified, short-hand descriptions equivalent to scale models. We can think of them not only as capturing the characteristics of observed kinds in the world (within a taxonomy), but also as abstract ideal types (in a typology)" (p. 167)
(Casadesus-Masanell and Ricart, 2010)	"A business model is […] a reflection of the firm's realized strategy" (p. 195).
(Dahan et al., 2010)	"firms [and] NGOs use business models to structure and map the mechanisms whereby they intend to deliver value […] to their target public, and how the necessary costs and revenues will be structured." (p. 329)
(Demil and Lecocq, 2010)	"The business model concept generally refers to the articulation between different areas of a firm's activity designed to produce a proposition of value to customers. Two different uses of the term can be noted. The first is the static approach - as a blueprint for the coherence between core business model components. The second refers to a more transformational approach, using the concept as a tool to address change and innovation in the organisation, or in the model itself." (p. 227)
(Osterwalder and Pigneur, 2010)	"A business model describes the rationale of how an organisation creates, delivers, and captures value" (p. 14)
(Svejenova et al., 2010)	Individual business models describe activities, the organisation, and the implication of strategic resources that organisational agents use to pursue their interests and motivations and create value and revenues in the process.
(Teece, 2010)	"A business model articulates the logic, the data and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value" (p. 179).
(Weiner et al., 2010)	"A business model is a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm. Therefore, we must consider which concepts and relationships allow a simplified description and representation of what value is provided to whom, how this is done and with which financial consequences" (p. 23)
(Wirtz et al., 2010)	A business model represents a strongly simplified and aggregated illustration of the relevant activities of a venture. It explains how the value creation component of a venture creates marketable information, products, and/or services. Besides the architecture of value creation, the strategic, as well as the customer and market component are considered to realise the superordinate goal objective of

(continued on next page)

(*continued*)

Source	Definition
	generating respectively securing the competitive advantage. The business model reflects the systemic output of an organisation, the way the organisation works and creates value.
(Yunus et al., 2010)	"among the plethora of definitions [of business models], three elements are usually distinguished: the product/service proposed to customers, the way the company is organized so as to deliver this product and service to its customers, and the revenue model." (p. 311)
(Zott and Amit, 2010)	"we conceptualize a firm's business model as a system of interdependent activities that transcends the focal firm and spans its boundaries. The activity system enables the firm, in concert with its partners, to create value and also to appropriate a share of that value [and is defined by] design elements - content, structure and governance - that describe the architecture of an activity system; and design themes - novelty, lock-in, complementarities and efficiency – that describe the sources of the activity system's value creation." (p. 216).
(Bieger and Krys, 2011)	A business model describes the basic logic of how an organisation creates value by defining 1) the organisation's value offering, 2) how the value is created within the organisational system, 3) how the created value is communicated and delivered to the customer, 4) how it is captured in the form of revenues by the company, 5) how the value is distributed within the organisation and to stakeholders, and 6) how the basic logic of value creation is refined to ensure the sustainability of the business model in the future.
(Evans et al., 2012)	"Business model is the way in which a business chooses to create, deliver, capture and exchange value" (p. 10)
(Beattie and Smith, 2013)	The business model "makes visible how the company acquires and uses different forms of capital (physical, financial and intellectual) to create value." (p. 243) "The concept is holistic, multi-level, boundary-spanning and dynamic." (p. 244)
(Schallmo, 2013)	A business model is the underlying logic of a company that describes the value that is created for its customers and partners, how it is created, and how the created value flows back to the company as revenues. The created value allows for a differentiation from competitors, a consolidation of customer relations, and the realization of a competitive advantage
(Skarzynski and Gibson, 2013)	"We define a business model as a conceptual framework for identifying how a company creates, delivers and extracts value. It typically includes a whole set of integrated components, all of which can be looked on as opportunities for innovation and competitive advantage." (p. 112)
(Geissdoerfer et al., 2016)	"we describe business models as simplified representations of the elements e and interactions between these elements e that an organisational unit chooses in order to create, deliver, capture, and exchange value." (p. 1218)
(Wells, 2016)	"In broad terms, a business model can be defined as having three constituent elements: the value network and product/service offering that defines how the business is articulated with other businesses and internally (i.e., how value is created); the value proposition that defines how products and/or services are presented to consumers in exchange for money (i.e., how value is captured); and the context of regulations, incentives, prices, government policy and so on (i.e., how value is situated within the wider socioeconomic framework)." (p. 37)
(Wirtz et al., 2016)	"A business model is a simplified and aggregated representation of the relevant activities of a company. It describes how marketable information, products and/or services are generated by means of a company's value-added component. In addition to the architecture of value creation, strategic as well as customer and market components are taken into consideration, in order to achieve the superordinate goal of generating, or rather, securing the competitive advantage. To fulfil this latter purpose, a current business model should always be critically regarded from a dynamic perspective, thus within the consciousness that there may be the need for business model evolution or business model innovation, due to internal or external changes over time." (p.41)
(Massa et al., 2017)	"a business model is a description of an organisation and how that organisation functions in achieving its goals (e.g., profitability, growth, social impact, …)." (p. 73)

Appendix B. Considered sustainable business model definitions

Source	Definition
Stubbs and Cocklin (2008)	A sustainable business model is "a model where sustainability concepts shape the driving force of the firm and its decision making [so that] the dominant neoclassical model of the firm is transformed, rather than supplemented, by social and environmental priorities." (p. 103)
(Birkin et al., 2009a, 2009b)	Sustainable business modesl are "new business models for sustainable development [that] are operating and appraising their performances within the four classes of information identified in the cloverleaf account of sustainable development (namely mass balance, life-cycle impacts, stakeholders and ecological resilience), [and] these operations are […] integrated by a comprehensive new understanding that […] could have more to do with societal and value issues than technical and managerial ones. In this way, some companies specifically did report that their decisions are based upon issues wider than traditional economics, accounting or market theory." (2009b, p. 288)
(Garetti and Taisch, 2012)	Sustainable business models "have a global market perspective, taking into account the development of new industrialised countries as well as the need for more sustainable products and services." (p. 88)
(Schaltegger et al., 2012)	Sustainable business models "create customer and social value by integrating social, environmental, and business activities" (p. 112)
(Bocken et al., 2013)	"Sustainable business models seek to go beyond delivering economic value and include a consideration of other forms of value for a broader range of stakeholders." (p. 484)
(Boons and Lüdeke-Freund, 2013)	A sustainable business model is different from a conventional one thorugh four propositions, "1. The value proposition provides measurable ecological and/or social value in concert with economic value […] 2. The supply chain involves suppliers who take responsibility towards their own as well as the focal company's stakeholders […] 3. The customer interface motivates customers to take responsibility for their consumption as well as for the focal company's stakeholders. […] 4. The financial model reflects an appropriate distribution of economic costs and benefits among actors involved in the business model and accounts for the company's ecological and social impacts" (p. 13)
(Wells, 2013)	A business model for sustainability "would assists in the achievement of sustainability [by] following major principles […] for sustainability", which Wells defines as 1) resource efficiency, 2) social relevance, 3) localisation and engagement, 4) longevity, 5) ethical sourcing, and 6) work enrichement. (p. 65)
(Bocken et al., 2014)	"a sustainable business model aligns interests of all stakeholder groups, and explicitly considers the environment and society as key stakeholders." (p. 44)
(Evans et al., 2014)	A sustainable busines model "is the holistic value logic that encompasses economic, environmental and social goals while aligning the interests of all stakeholder groups" (p. 9)
(Abdelkafi and Tauscher, 2016)	Sustainable business models, "incorporate sustainability as an integral part of the company's value proposition and value creation logic. As such, BMfS [Business models for Sustainability] provide value to the customer and to the natural environment and/or society." (p. 75)

(*continued*)

Source	Definition
(Dentchev et al., 2015)	“Sustainable business models are in the first place oriented to resolving social and environmental issues. In this vein, profit generation is not their predominant concern.” (p. 1)
(Upward and Jones, 2015)	A (strongly) sustainable business model “is the definition by which an enterprise determines the appropriate inputs, resource flows, and value decisions and its role in ecosystems, [in a way that] sustainability measures [which] are those indicators that assess the outputs and effects of business model decisions […] might be claimed as successfully sustainable.” (p. 98)
(Evans et al., 2017)	Sustainable business models are described with five propisitions, “1. Sustainable value incorporates economic, social and environmental benefits conceptualised as value forms. 2. Sustainable business models require a system of sustainable value flows among multiple stakeholders including the natural environment and society as primary stakeholders. 3. Sustainable business models require a value network with a new purpose, design and governance. 4. Sustainable business models require a systemic consideration of stakeholder interests and responsibilities for mutual value creation. 5.Internalizing externalities through product-service systems enables innovation towards sustainable business models.” (p. 5ff)
(Geissdoerfer et al., 2016)	“we define a sustainable business model as a simplified representation of the elements, the interrelation between these elements, and the interactions with its stakeholders that an organisational unit uses to create, deliver, capture, and exchange sustainable value for, and in collaboration with, a broad range of stakeholders.” (p. 1219)

Appendix C. Considered business model innovation definitions

Source	Definition
(Mitchell and Coles, 2003)	“When a company makes business model replacements that provide product or service offerings to customers and end users that were not previously available, we refer to those replacements as business model innovations. […] We also refer to the process of developing and making these novel replacements as the process of business model innovation“ (p. 17)
(Mitchell and Coles, 2004)	“By business model innovation, we mean business model replacements that provide product or service offerings to customers and end users that were not previously available. We also refer to the process of developing these novel replacements as business model innovation.“ (p. 17)
(Labbé and Mazet, 2005)	A business model innovation changes one or more dimensions of a business model (which are perceived by the authors as product-market combination, the architecture of the value creation, and the revenue model) so that a novel configuration of the elements is created and implemented. (pp. 897 f.)
(Osterwalder and Pigneur, 2005)	“Specifying a set of business model elements and building blocks, as well as their relationships to one another […] a business model designer […] can experiment with these blocks and create completely new business models, limited only by imagination and the pieces supplied.” (p. 24)
(Chesbrough, 2007)	Business model innovation is to “advance [the] business model […] from very basic (and not very valuable) models to far more advanced (and more valuable) models.” (p.15)
(Giesen et al., 2007)	Business model innovation comprises one or a combination of: „innovations in industry models, in revenue models and in enterprise models.” (p. 27)
(Lindgardt et al., 2009)	“Innovation becomes BMI [business model innovation] when two or more elements of a business model are reinvented to deliver value in a new way. […] BMI can provide companies a way to break out of intense competition, under which product or process innovations are easily imitated“. (p. 2)
(Romero and Molina, 2009)	“business models as definers of the value creation priorities in an organisation should be continuously reviewed in response to actual and possible changes in the perceived market conditions and evolve the enterprise strategy as the business environment and customers' needs change.” (p. 3)
(Chesbrough, 2010)	Business model innovation “[1] Articulates the value proposition (i.e., the value created for users by an offering based on technology); [2] Identifies a market segment and specify the revenue generation mechanism (i.e., users to whom technology is useful and for what purpose); [3] Defines the structure of the value chain required to create and distribute the offering and complementary assets needed to support position in the chain; [4] Details the revenue mechanism(s) by which the firm will be paid for the offering; [5] Estimates the cost structure and profit potential (given value proposition and value chain structure); [7] Describes the position of the firm within the value network linking suppliers and customers (incl. identifying potential complementors and competitors); and [8] Formulates the competitive strategy by which the innovating firm will gain and hold advantage over rivals.” (p. 355, citing Chesbrough and Rosenbloom, 2002)
(Johnson, 2010)	“[Seizing the white space] calls for the ability to innovate something more core than the core, to innovate the very theory of the business itself. I call that process business model innovation.” (p. 13) “business model innovation is an iterative journey“ (p. 114)
(Osterwalder and Pigneur, 2010)	“Business model innovation is not about looking back, because the past indicates little about what is possible in terms of future business models. Business model innovation is not about looking to competitors, since business model innovation is not about copying or benchmarking, but about creating new mechanisms to create value and derive revenues. Rather, business model innovation is about challenging orthodoxies to design original models that meet unsatisfied, new, or hidden customer needs“ (p. 136)
(Schallmo, 2013)	Business model innovation comprises the development of either individual business model elements, like customer segments, value proposition, etc., or the entire business model and covers both incremental as well as radical changes. It can affect the customer, competitors, the industry, and the company itself. The business model innovation follows a process with a sequence of activities and decisions that interrelate logically and chronologically. the activities comprise the development, the implementation, and the marketing of the business model with the goal to combine business model elements in a way that creates value for customers and partners in a novel way. Thus, a differentiation from the competitors is possible that allows to consolidate customer relations, to build a competitive advantage, to foster inimitability, and to realise synergies between the business model elements to generate growth.
(Skarzynski and Gibson, 2013)	„At its essence, business model innovation is about creating fundamentally new kinds of businesses, or about bringing more strategic variety into the business you are already in — the kind of variety that is highly valued by customers“ (p. 111)
(Geissdoerfer et al., 2016)	“Business model innovation describes either a process of transformation from one business model to another within incumbent companies or after mergers and acquisitions, or the creation of entirely new business models in start-ups.” (p. 1220)

Appendix D. Considered sustainable business model innovation definitions

Source	Definition
(Schaltegger et al., 2012)	"business model innovations may be required to support a systematic, ongoing creation of business cases for sustainability" (p. 95) and connects defensive, accomodative, and pro-active sustainability strategies with business model adjustment, adoption, improvement, and redesign.
(Boons and Lüdeke-Freund, 2013)	Sustainable business model innovation is underststood as the adaption of the business model to overcome barriers within the company and its environment to market sustainable process, product, or service innovations. (p. 13)
(Iles and Martin, 2013)	Sustainable business model innovation (in the chemical industry) describes "how firms are devising business models to address the challenges of making the business case for [its offering] and addressing sustainability." (p. 39)
(Loorbach and Wijsman, 2013)	Sustainable business model innovation describes businesses' "searching for ways to deal with unpredictable […] wider societal changes and sustainability issues." (p. 20)
(Bocken et al., 2014)	"Business model innovations for sustainability are defined as: Innovations that create significant positive and/or significantly reduced negative impacts for the environment and/or society, through changes in the way the organisation and its value-network create, deliver value and capture value (i.e. create economic value) or change their value propositions." (p. 44)
(Geissdoerfer et al., 2016)	"Sustainable business innovation processes specifically aim at incorporating sustainable value and a pro-active management of a broad range of stakeholders into the business model." (p.1220)
(Roome and Louche, 2016)	Sustainable business model innovation describes the "processes through which […] new business models are developed by businesses and their managers […] how companies revise and transform their business model in order to contribute to sustainable development." (p. 12)
(Schaltegger et al., 2016)	Sustainable business model innovation describes the creation of "modified and completely new business models [that] can help develop integrative and competitive solutions by either radically reducing negative and/or creating positive external effects for the natural environment and society" (p. 3)
(Yang et al., 2016)	"Sustainable business model innovation can be more easily achieved by identifying the value uncaptured in current business models, and then turning this new understanding of the current business into value opportunities that can lead to new business models with higher sustainable value." (p. 2)

References

Abdelkafi, N., Tauscher, K., 2016. Business models for sustainability from a system dynamics perspective. Organ. Environ. 29, 74–96. https://doi.org/10.1177/1086026615592930.

Afuah, A., 2004. Business Models: a Strategic Management Approach. McGraw-Hill/Irwin, Boston.

Amit, R., Zott, C., 2001. Value creation in ebusiness. Strat. Manag. J. 22, 493–520. https://doi.org/10.1002/smj.187.

Ansoff, I., 1957. Strategies for diversification. Harv. Bus. Rev. 35, 113–124. https://doi.org/10.1016/0024-6301(72)90048-9.

Baden-Fuller, C., Morgan, M., 2010. Business models as models. Long. Range Plan. 43, 151–171.

Baumann, H., Boons, F., Bragd, A., 2002. Mapping the green product development field: engineering, policy and business perspectives. J. Clean. Prod. 10, 409–425.

Beattie, V., Smith, S.J., 2013. Value creation and business models: refocusing the intellectual capital debate. Br. Account. Rev. 45, 243–254. https://doi.org/10.1016/j.bar.2013.06.001.

Bettis, R.A., Prahalad, C.K., 1995. The dominant logic: retrospective and extension. Strat. Manag. J. 16, 5–14.

Bieger, T., Krys, C., 2011. Das wertbasierte geschäftsmodell - ein aktualisierter strukturierungsansatz. In: Bieger, T., Knyphausen-Aufseß, D., Krys, C. (Eds.), Innovative Geschäftsmodell. Springer, Berlin.

Bieger, T., Reinhold, S., 2011. Das wertbasierte geschäftsmodell—ein aktualisierter strukturierungsansatz. In: Bieger, T., zu Knyphausen-Aufseß, D., Krys, C. (Eds.), Innovative Geschäftsmodelle. Springer, Berlin, Heidelberg.

Birkin, F., Cashman, A., Koh, S.C.L., Liu, Z., 2009a. New sustainable business models in China. Bus. Strat. Environ. 18, 64–77. https://doi.org/10.1002/bse.568.

Birkin, F., Polesie, T., Lewis, L., 2009b. A new business model for sustainable development: an exploratory study using the theory of constraints in Nordic organizations. Bus. Strat. Environ. 18, 277–290. https://doi.org/10.1002/bse.581.

Björkdahl, J., Holmén, M., 2013. Editorial: business model innovation - the challenges ahead. Int. J. Prod. Dev. 18, 213–225.

Bocken, N., Allwood, J., 2011. Development of an eco-ideation tool to identify stepwise greenhouse gas emissions reduction options for consumer goods. J. Clean. … 19, 1279–1287 doi:Development of an eco-ideation tool to identify stepwise greenhouse gas emissions reduction options for consumer goods.

Bocken, N.M.P., Short, S., Rana, P., Evans, S., 2013. A value mapping tool for sustainable business modelling. Corp. Gov. Int. J. Bus. Soc. 13, 482–497. https://doi.org/10.1108/CG-06-2013-0078.

Bocken, N.M.P., Short, S.W., Rana, P., Evans, S., 2014. A literature and practice review to develop sustainable business model archetypes. J. Clean. Prod. 65, 42–56. https://doi.org/10.1016/j.jclepro.2013.11.039 U6.

Bocken, N.M.P., de Pauw, I., Bakker, C., van der Grinten, B., 2016. "Product design and business model strategies for a circular economy. Journal of Industrial and Production Engineering, Taylor & Francis 33 (5), 308–320.

Boons, F., Lüdeke-Freund, F., 2013. Business models for sustainable innovation: state-of-the-art and steps towards a research agenda. J. Clean. Prod. 45, 9–19. https://doi.org/10.1016/j.jclepro.2012.07.007 M4.

Bower, J.L., Christensen, C.M., 1995. Disruptive technologies: catching the wave. Harv. Bus. Rev. 73, 43–53.

The Federal Government of Germany (Bundesregierung), 2014. The New High-tech Strategy Innovations for Germany (Berlin).

Burnes, B., 1996. No such thing as … a "one best way" to manage organizational change. Manag. Decis. 34, 11–18. https://doi.org/10.1108/00251749610150649.

Byggeth, S., Hochschorner, E., 2006. Handling trade-offs in ecodesign tools for sustainable product development and procurement. J. Clean. Prod. 14, 1420–1430. https://doi.org/10.1016/j.jclepro.2005.03.024.

Casadesus-Masanell, R., Ricart, J.E., 2010. From strategy to business models and onto tactics. Long. Range Plan. 43, 195–215. https://doi.org/10.1016/j.lrp.2010.01.004.

Chesbrough, H., 2007. Business model innovation: it's not just about technology anymore. Strat. Leader. 35, 12–17. https://doi.org/10.1108/10878570710833714.

Chesbrough, H., 2010. Business model innovation: opportunities and barriers. Long. Range Plan. 43, 354–363. https://doi.org/10.1016/j.lrp.2009.07.010.

Chesbrough, H., Rosenbloom, R., 2002. The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. For. Ind. 11, 529–555.

Choi, J., Wang, H., 2009. Stakeholder relations and the persistence of corporate financial performance. Strat. Manag. J. 30 (8), 895–907.

Christensen, C., 1997. The Innovator's Dilemma: when New Technologies Cause Great Firms to Fail. Harvard Business School Press, Cambridge, MA.

Christensen, C., Raynor, M., 2003. The Innovator's Solution: Creating and Sustaining Successful Growth. Harvard Business School Press, Cambridge, MA.

Coase, R.H., 1937. The nature of the firm. Economica 4, 386–405.

Creswell, J.W., 2014. In: Research Design, Internatio. Sage, Los Angeles, London, New Delhi, Singapore, Washington, DC.

Dahan, N., Doh, J., Oetzel, J., Yaziji, M., 2010. Corporate-NGO collaboration: Co-creating new business models for developing markets. Long. Range Plan. 43, 326–342. https://doi.org/10.1016/j.lrp.2009.11.003.

Defourny, J., Nyssens, M., 2010. Conceptions of social enterprise and social entrepreneurship in europe and the United States: convergences and divergences. J. Soc. Entrep 1, 32–53. https://doi.org/10.1080/19420670903442053.

Demil, B., Lecocq, X., 2010. Business model evolution: in search of dynamic consistency. Long. Range Plan. 43, 227–246. https://doi.org/10.1016/j.lrp.2010.02.004.

Dentchev, N., Baumgartner, R., Dieleman, H., Jóhannsdóttir, L., Jonker, J., Nyberg, T., Rauter, R., Rosano, M., Snihur, Y., Tang, X., van Hoof, B., 2015. Embracing the variety of sustainable business models: social entrepreneurship, corporate intrapreneurship, creativity, innovation, and other approaches to sustainability challenges. J. Clean. Prod. https://doi.org/10.1016/j.jclepro.2015.10.130.

Doganova, L., Eyquem-Renault, M., 2009. What do business models do? Innovation devices in technology entrepreneurship. Res. Pol. 38, 1559–1570 doi:1559-1570.

Doleski, O.D., 2015. Integrated Business Model: Applying the St. Gallen Management Concept to Business Models.

Downing, S., 2005. The social construction of entrepreneurship: narrative and dramatic processes in the coproduction of organizations and identities. Enterpren. Theor. Pract. 29, 185–204. https://doi.org/10.1111/j.1540-6520.2009.00354.x.

Easterby-Smith, M., Thorpe, R., Jackson, P., 2015. Management and Business Research, fifth ed. Sage, London.

Evans, S., Gregory, M., Ryan, C., Bergendahl, M., Tan, A., 2009. Towards a Sustainable

Industrial System: With Recommendations for Education, Research, Industry and Policy. University of Cambridge, Cambridge.
Evans, S., Rana, P., Short, S.W., 2012. State-of-practice in Business Modelling and Value-networks, Emphasising Potential Future Models that Could Deliver Sustainability. SustainValue Project Deliverable 2.1.
Evans, S., Rana, P., Short, S.W., 2014. Final Set of Tools and Methods that Enable Analysis of Future Oriented, Novel, Sustainable, Value Adding Buisness Models and Value-networks. EU SustainValue Project Deliverable 2.6.
Evans, S., Vladimirova, D., Holgado, M., Van Fossen, K., Yang, M., Silva, E., Barlow, C., 2017. Business model innovation for sustainability: towards a unified perspective for creation of sustainable business models. Bus. Strat. Environ. https://doi.org/10.1002/bse.1939.
Finnie, W.C., 2000. Leading the revolution: an interview with gary Hamel. Strat. Leader. 29, 4–10. https://doi.org/10.1108/10878570110367141.
Foss, N.J., Saebi, T., 2017. Fifteen years of research on business model innovation. J. Manag. 43, 200–227. https://doi.org/10.1177/0149206316675927.
Frey, B.S., Stutzer, A., 2001. Happiness and Economics: How the Economy and Institutions Affect Human Well-being. Princeton University Press, Princeton.
Garetti, M., Taisch, M., 2012. Sustainable manufacturing: trends and research challenges. Prod. Plann. Contr. 23, 83–104. https://doi.org/10.1080/09537287.2011.591619.
Geissdoerfer, M., Bocken, N.M.P., Hultink, E.J., 2016. Design thinking to enhance the sustainable business modelling process. J. Clean. Prod. 135, 1218–1232. https://doi.org/10.1016/j.jclepro.2016.07.020.
Geissdoerfer, M., Savaget, P., Evans, S., 2017a. The cambridge business model innovation process. Procedia Manufacturing 8, 262–269.
Geissdoerfer, M., Savaget, P., Bocken, N.M.P., Hultink, E.J., 2017b. The Circular Economy – a new sustainability paradigm? J. Clean. Prod. 143, 757–768. https://doi.org/10.1016/j.jclepro.2016.12.048.
Geissdoerfer, M., Morioka, S.N., de Carvalho, M.M., Evans, S., 2018a. Business models and supply chains for the Circular Economy. J. Clean. Prod. 190, 712–721.
Geissdoerfer, M., Vladimirova, D., Van Fossen, K., Evans, S., 2018b. Product, service and business model innovation: a discussion. Procedia Manufacturing 21, 165–172. https://doi.org/10.1016/j.promfg.2018.02.107.
George, G., Bock, A.J., 2011. The business model in practice and its implications for entrepreneurship research. Enterpren. Theor. Pract. 35, 83–111.
Giesen, E., Berman, S.J., Bell, R., Blitz, A., 2007. Three ways to successfully innovate your business model. Strat. Leader. 35, 27–33. https://doi.org/10.1108/10878570710833732.
Girotra, K., Netessine, S., 2013. OM forum – business model innovation for sustainability. Manuf. Serv. Oper. Manag. 15, 537–544.
Grant, R.M., 2010. Contemporary Strategy Analysis, seventh ed. John Wiley & Sons, Chichester.
Hamel, G., 2000. Leading the Revolution, Strategy & Leadership. Harvard Universityl Press, Cambridge.
Hart, S.S.L., Milstein, M.B.M., Overview, E., 2003. Creating sustainable value. Acad. Manag. Exec. 17, 56–69.
Hawkins, R., 2002. The phantom of the marketplace: searching for new e-commerce business models. Commun. Strat. 46, 297–329.
Hughes, M., 2011. Do 70 per cent of all organizational change initiatives really fail? J. Change Manag. 11, 451–464. https://doi.org/10.1080/14697017.2011.630506.
Iles, A., Martin, A.N., 2013. Expanding bioplastics production: sustainable business innovation in the chemical industry. J. Clean. Prod. 45, 38–49. https://doi.org/10.1016/j.jclepro.2012.05.008.
Johnson, M., 2010. Seizing the White Space: Business Model Innovation for Growth and Renewal. Harvard Business Press, Boston.
Johnson, M.W., Christensen, C.M., Kagermann, H., 2008. Reinventing your business model. (cover story). Harv. Bus. Rev. 86, 50–59.
Joyce, A., Paquin, R., Pigneur, Y., 2016. The triple layered business model canvas: a tool to design more sustainable business models. J. Clean. Prod. 135, 1474–1486. https://doi.org/10.1016/j.jclepro.2016.06.067.
Kegan, R., Lahey, L.L., 2001. The real reason people won ' t change. Harv. Bus. Rev. 85–92. https://doi.org/10.2307/25006822.
Knyphausen-Aufsess, D.Z., Meinhardt, Y., 2002. Revisiting Strategy: ein Ansatz zur Systematisierung von Geschäftsmodellen. In: Bieger, T., Bickhoff, N., Caspers, R., Knyphausen-Aufseß, D.Zu, Reding, K. (Eds.), Zukünftige Geschäftsmodelle. Springer, Berlin, Heidelberg.
Kotter, J.P., 2006. Leading change: why transformation efforts fail. In: HBR's 10 Must Reads on Change. Harvard Business School Publishing Corporation, Boston, pp. 2–12.
Kotter, J.P., 2007. Leading change: why transformation efforts fail. Harv. Bus. Rev. 85, 96–103. https://doi.org/10.1109/EMR.2009.5235501.
Labbé, M., Mazet, T., 2005. Die Geschäftsmodellinnovations-Matrix: geschäftsmodellinnovationen analysieren und bewerten. Der Betr 17, 897–902.
Lindgardt, Z., Reeves, M., Stalk, G., Deimler, M.S., 2009. Business Model Innovation. When the Game Gets Tough, Change the Game. The Boston Consulting Group, Boston.
Loorbach, D., Wijsman, K., 2013. Business transition management: exploring a new role for business in sustainability transitions. J. Clean. Prod. 45.
Magretta, J., 2002. Why business models matter. Harv. Bus. Rev. 80, 86–92.
Mangematin, V., Lemarié, S., Boissin, J., 2003. Development of SMEs and heterogeneity of trajectories: the case of biotechnology in France. Res. Pol. 32, 621–638. https://doi.org/10.1016/S0048-7333(02)00045-8.
Manral, L., Harrigan, K.R., 2017. Corporate advantage in customer-centric diversification. J. Strat. Market. https://doi.org/10.1080/0965254X.2017.1299789.
Massa, L., Tucci, C., Afuah, A., 2017. A critical assessment of business model research. Acad. Manag. Ann. 11, 73–104. https://doi.org/10.5465/annals.2014.0072.
Mitchell, D., Coles, C., 2003. The ultimate competitive advantage of continuing business model innovation. J. Bus. Strat. 24, 15–21. https://doi.org/10.1108/02756660310504924.
Mitchell, D.W., Coles, C.B., 2004. Business model innovation breakthrough moves. J. Bus. Strat. 25, 16–26. https://doi.org/10.1108/02756660410515976.
Morris, M., Schindehutte, M., Allen, J., 2005. The entrepreneur's business model: toward a unified perspective. J. Bus. Res. 58, 726–735.
Nidumolu, R., Prahalad, C.K., Rangaswami, M.R., 2009. Why sustainability is now the key driver of innovation. Harv. Bus. Rev. 87, 56–64.
Osterwalder, A., Pigneur, Y., 2005. Clarifying business models. Commun. Assoc. Inf. Syst. 16, 1–40.
Osterwalder, A., Pigneur, Y., 2010. Business Model Generation. Wiley & Sons, Hoboken.
Osterwalder, A., Pigneur, Y., Bernarda, G., Smith, A., 2014. Value Proposition Design: How to Create Products and Services Customers Want. Wiley, Hoboken.
Patel, N., 2015. 90% of Startups Fail: Here's what You Need to Know about the 10%, vol. 16. Forbes.
Pateli, A.G., Giaglis, G.M., 2004. A research framework for analysing eBusiness models. Eur. J. Inf. Syst. 13, 302–314. https://doi.org/10.1057/palgrave.ejis.3000513.
Piketty, T., Saez, E., 2014. Inequality in the long run. Science 344, 838–843. https://doi.org/10.1126/science.1251936.
Porter, M.E., Kramer, M.R., 2011. Creating shared value. Harv. Bus. Rev. 89, 62–77.
Prahalad, C.K., 2009. The Fortune at the Bottom of the Pyramid, fifth ed. Prentice Hall, Upper Saddle River.
Prahalad, C.K., Bettis, R.A., 1986. The dominant logic - a new linkage between diversity and performance. Strat. Manag. J. 7, 485–501. https://doi.org/10.1002/smj.4250070602.
Rappa, M.A., 2004. The utility business model and the future of computing services. IBM Syst. J. 43, 32–42. https://doi.org/10.1147/sj.431.0032.
Rashid, A., Asif, F.M.A., Krajnik, P., Nicolescu, C.M., 2013. Resource Conservative Manufacturing: an essential change in business and technology paradigm for sustainable manufacturing. J. Clean. Prod. 57, 166–177. https://doi.org/10.1016/j.jclepro.2013.06.012.
Richardson, J., 2008. The business model: an integrative framework for strategy execution. Strat. Change 17, 133–144. https://doi.org/10.1002/jsc.821.
Ritala, P., Huotari, P., Bocken, N., Albareda, L., Puumalainen, K., 2018. Sustainable business model adoption among S&P 500 firms: a longitudinal content analysis study. J. Clean. Prod. 170, 216–226. https://doi.org/10.1016/j.jclepro.2017.09.159.
Rockström, J., Steffen, W., Noone, K., 2009. Planetary Boundaries: Exploring the Safe Operating Space for Humanity.
Romero, D., Molina, A., 2009. Value co-creation and co-innovation: linking networked organisations and customer communities. IFIP Adv. Inf. Commun. Technol. 307, 401–412. https://doi.org/10.1007/978-3-642-04568-4_42.
Roome, N., Louche, C., 2016. Journeying toward business models for sustainability: a conceptual model found inside the black box of organisational transformation. Organ. Environ. 29, 11–35. https://doi.org/10.1177/1086026615595084.
Schallmo, D., 2013. Geschäftsmodell-Innovation: Grundlagen, bestehende Ansätze, methodisches Vorgehen und B2B-Geschäftsmodelle. Springer Fachmedien Wiesbaden, Wiesbaden. https://doi.org/10.1007/978-3-658-00245-9.
Schaltegger, S., Hansen, E., Lüdeke-Freund, F., 2012. Business cases for sustainability and the role of business model innovation. Int. J. Innovat. Sustain. Dev. 6, 95–119.
Schaltegger, S., Hansen, E.G., Lüdeke-Freund, F., 2016. Business models for sustainability: origins, present research, and future avenues. Organ. Environ. 29, 3–10. https://doi.org/10.1177/1086026615599806.
Skarzynski, P., Gibson, R., 2013. Innovation to the Core: a Blueprint for Transforming the Way Your Company Innovates. Harvard Business Press, Boston.
Srai, J.S., Kumar, M., Graham, G., Phillips, W., Tooze, J., Ford, S., Beecher, P., Raj, B., Gregory, M., Tiwari, M.K., Ravi, B., Neely, A., Shankar, R., Charnley, F., Tiwari, A., 2016. Distributed manufacturing: scope, challenges and opportunities. Int. J. Prod. Res. 54, 6917–6935. https://doi.org/10.1080/00207543.2016.1192302.
Stubbs, W., Cocklin, C., 2008. Conceptualizing a sustainability business model. Organ. Environ. 21, 103–127. https://doi.org/10.1177/1086026608318042.
Svejenova, S., Planellas, M., Vives, L., 2010. An individual business model in the making: a chef's quest for creative freedom. Long. Range Plan. 43, 408–430. https://doi.org/10.1016/j.lrp.2010.02.002.
Teece, D.J., 2006. Reflections on “profiting from innovation. Res. Pol. 35, 1131–1146. https://doi.org/10.1016/j.respol.2006.09.009.
Teece, D.J., 2010. Business models, business strategy and innovation. Bus. Model 43, 172–194. https://doi.org/10.1016/j.lrp.2009.07.003.
Timmers, P., 1998. Business models for electronic markets. Electron. Market. 8, 3–8.
Tranfield, D., Denyer, D., Smart, P., 2003. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. Br. J. Manag. 14, 207–222. https://doi.org/10.1111/1467-8551.00375.
Tukker, A., 2004. Eight types of product–service system: eight ways to sustainability? Experiences from SusProNet. Bus. Strat. Environ. 13, 246–260. https://doi.org/10.1002/bse.414.
Tukker, A., Tischner, U., 2006. New Business for Old Europe. Greenleaf, Sheffield.
Upward, A., Jones, P., 2015. An ontology for strongly sustainable business models defining an enterprise framework compatible with natural and social science. Organ. Environ. 29, 97–123.
Vladimirova, D., 2012. Transformation of Traditional Manufacturers towards Servitized Organisations. Cranfield University.
Weiner, N., Renner, T., Kett, H., 2010. Geschäftsmodelle im Internet der Dienste:

Aktueller Stand in Forschung und Praxis. Fraunhofer IAO, Stuttgart.

Wells, P.E., 2008. Alternative business models for a sustainable automotive industry. In: Tukker, A., Charter, M., Vezzoli, C., Stø, E., Andersen, M.M. (Eds.), Perspectives on Radical Changes to Sustainable Consumption and Production 1. System Innovation for Sustainability. Greenleaf, Sheffield, pp. 80–98.

Wells, P.E., 2013. Business Models for Sustainability. Edward Elgar, Cheltenham.

Wells, P., 2016. Economies of scale versus small is beautiful: a business model approach based on architecture, principles and components in the beer industry. Organ. Environ. 29, 36–52. https://doi.org/10.1177/1086026615590882.

Wirtz, B., Schilke, O., Ullrich, S., 2010. Strategic development of business models: implications of the Web 2.0 for creating value on the internet. Long. Range Plan. 43, 272–290. https://doi.org/10.1016/j.lrp.2010.01.005.

Wirtz, B.W., Pistoia, A., Ullrich, S., Göttel, V., 2016. Business models: origin, development and future research perspectives. Long. Range Plan. 49, 36–54. https://doi.org/10.1016/j.lrp.2015.04.001.

Yang, M., Evans, S., Vladimirova, D., Rana, P., 2016. Value uncaptured perspective for sustainable business model innovation. J. Clean. Prod. https://doi.org/10.1016/j.jclepro.2016.07.102.

Yang, M., Vladimirova, D., Evans, S., 2017. Creating and capturing value through sustainability: the sustainable value analysis tool. Res. Technol. Manag. 60, 312–332.

Yang, M., Vladimirova, D., Rana, P., 2014. Sustainable value analysis tool for value creation. Asian J. Manag. Sci. Appl. 1 (4), 312–332.

Yu, D., Hang, C., 2010. A reflective review of disruptive innovation theory. J. Manag. Rev. 12, 435–452.

Yunus, M., Moingeon, B., Lehmann-Ortega, L., 2010. Building social business models: lessons from the Grameen experience. Long. Range Plan. 43, 308–325. https://doi.org/10.1016/j.lrp.2009.12.005.

Zott, C., Amit, R., 2008. The fit between product market strategy and business model: implications for firm performance. Strat. Manag. J. 29, 1–26. https://doi.org/10.1002/smj.642.

Zott, C., Amit, R., 2010. Business model design: an activity system perspective. Long. Range Plan. 43, 216–226. https://doi.org/10.1016/j.lrp.2009.07.004.

Zott, C., Amit, R., Massa, L., 2011. The business model: recent developments and future research. J. Manag. 37, 1019–1042. https://doi.org/10.1177/0149206311406265.