

2 State of Research

2.1 Introduction

The objective of this chapter is to review the status quo of innovation management and business model research. The discussion of the theoretical foundation of this study aims at generating an understanding of the relevance of the business model concept in engaging in new business activities. The literature review starts with a look at general innovation definitions, types of innovation and innovation processes. The subsequent section reviews the business model as a concept, followed by a look at business model innovation as a process. In the last section, the identified research gaps are summarized.

2.2 Innovation in General

2.2.1 Definitions of Innovation

The Latin verb “innovare”, built from “in-“ (=into) and “novus” (=new), is translated as “to renew” or “to change”. The term innovation goes back to Austrian economist Joseph A. Schumpeter quite exactly 100 years ago (Schumpeter 1912). He defined innovation as “the doing of new things or the doing of things that are already done, in a new way“ (Schumpeter 1947, p.151). In his seminal work “The Theory of Economic Development” (1934) he provides the following examples for innovation:

- “(1) The introduction of a new good — that is one with which consumers are not yet familiar — or of a new quality of a good.*
- (2) The introduction of an improved or better method of production, which need by no means be founded upon a discovery scientifically new, and can also exist in a better way of handling a commodity commercially.*
- (3) The opening of a new market that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before.*
- (4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created.*
- (5) The carrying out of the better organization of any industry, like the creation of a monopoly position or the breaking up of a monopoly position” (p.66).*

Innovation differs from *invention* in the sense that *innovation* is an invention which became successful either in a market or within an organization (Hauschildt 1997). Whereas the

invention is simply the first manifestation of an idea for a new product or process. The literature provides various definitions of innovation (e.g., Kieser 1969; Zaltman et al. 1973; Rickards 1985; Hauschildt 1997). Some authors focus on novelty while others see the process which changes elements in the market as a vital element of innovation (Stummer et al. 2010). However, for all definitions innovation is much more than finding a solution to a technological product. This implies that innovation is an intended introduction and application of ideas, processes, products, and methods that are new to the relevant target group and result in advancement (West & Farr 1990, p.9). A recent definition which is even broader is provided by the Oslo Manual developed by the OECD¹:

*“An **innovation** is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations”* (p.46, Paragraph 146).

*“The **minimum requirement for an innovation** is that the product, process, marketing method or organizational method must be new (or significantly improved) to the firm. This includes products, processes and methods that firms are the first to develop and those that have been adopted from other firms or organizations”* (p.46, Paragraph 148).

*“**Innovation activities** are all scientific, technological, organizational, financial and commercial steps which actually, or are intended to, lead to the implementation of innovations. Some innovation activities are themselves innovative, others are not novel activities but are necessary for the implementation of innovations. Innovation activities also include R&D that is not directly related to the development of a specific innovation”* (p.47, Paragraph 149).

The definition of innovation activities provided by the Oslo Manual and the fact that innovation is more than just the solution of a technological problem call for a differentiation between *innovation in the narrow sense* and *innovation in the broader sense* (Figure 3).

¹ Oslo Manual – Guidelines for collecting and interpreting innovation data, Third Edition (Lewin 1951; Schein 1980; Mantere et al. 2012).

Figure 3: Scope of Innovation

Innovation in the broader sense				
	Innovation in the narrow sense			
R&D	Production launch	Market launch	Market Success	Dealing with competition
Development cycle		Market cycle		

Source: adapted from Stummer et al. 2010 (p.13)

For a more detailed description and classification, innovation can be categorized based on different characteristics. These different types of innovation are explained in the subsequent chapter.

2.2.2 Types of Innovation

According to Thom (1980) all types of innovation have four dominant characteristics in common which exacerbate innovation related tasks:

- *novelty* (the higher, the more challenging it is to manage innovation),
- *uncertainty / risk (of failure)*,
- *complexity*, and
- *potential of conflicts* (intellectual, social-emotional and cultural conflicts; as a result of the other three characteristics).

Besides these communalities, various types of innovation can be differentiated (Table 3). The following criteria are most frequently suggested in the literature (e.g., Kupsch et al. 1991; Vahls & Burmester 2002; Stummer et al. 2010).

Table 3: Types of Innovation

Differentiation Criterion	Core Question	Innovation Types
Domain	What is the focus of the innovation?	Product innovation, process innovation, market innovation, social innovation
Degree of Novelty	How new is the innovation?	Objective innovation (new to the world) vs subjective innovation (new to a specific group or organization)
Degree of Change	What kind of changes are necessary within the organization?	Radical vs incremental
Trigger	What initiated the innovation?	Pull innovation (triggered by market demand) vs push innovation (triggered by newly developed technologies)

Source: based on Vahls & Burmester 2002 (p.73), Kupsch et al. 1991 (p.1077), and OECD 2005 (p.17)

The *domain* is one of the most frequently used criteria to differentiate innovation types. Typically in the academic literature these four types are known (Stummer et al. 2010):

- *Product* innovation (improvement and renewal of products and services)
- *Process* innovation (aims at a more efficient production of products and services)
- *Market* innovation (competitive development of existing markets and identification of potential new markets)
- *Social* innovation (changes on the organizational level)

Also the OECD adopts these types in the Oslo Manual. However, in managerial practice there has been a tendency towards “inventing” new types of innovation. For instance, innovation consultant Jeffery Philips² suggests nine types of innovation³, Doblin strategy firm⁴ presents 10 different types⁵ (Table 4)

² <http://www.ovoinnovation.com/about/ovo-team-leaders/>

³ Available at: <http://cirf.pbworks.com/t/Examination+of+Innovation+Types+Final.ppt>, last time accessed on July 8, 2014.

⁴ [www.doblin.com /](http://www.doblin.com/)

⁵ Available at: <http://www.doblin.com/tentypes>, last time accessed on July 10, 2014 (OECD 2005).

Table 4: Innovation Classification – Academic Literature and Practitioners

Innovation Classification Frequently Used in Academic Literature	Innovation Classification Suggested Mainly by Practitioners		
	<i>Philips</i>	<i>Doblin</i>	<i>Sniukas</i>
Product Innovation	Technology Led Innovation	Product Performance Innovation	Product & Service Innovation
	R&D Innovation	Product System Innovation	
	Design Led Innovation		
Process Innovation	Operational Innovation	Process Innovation	Operational Innovation
Market Innovation	Business Model Innovation	Profit Model Innovation	Strategic Innovation
	Needs based Innovation	Service Innovation	
	Service / Experience Innovation	Channel Innovation	
		Brand Innovation	
		Customer Engagement	
Social Innovation	Management Innovation	Network Innovation	Management Innovation
	Open Innovation	Structure Innovation	

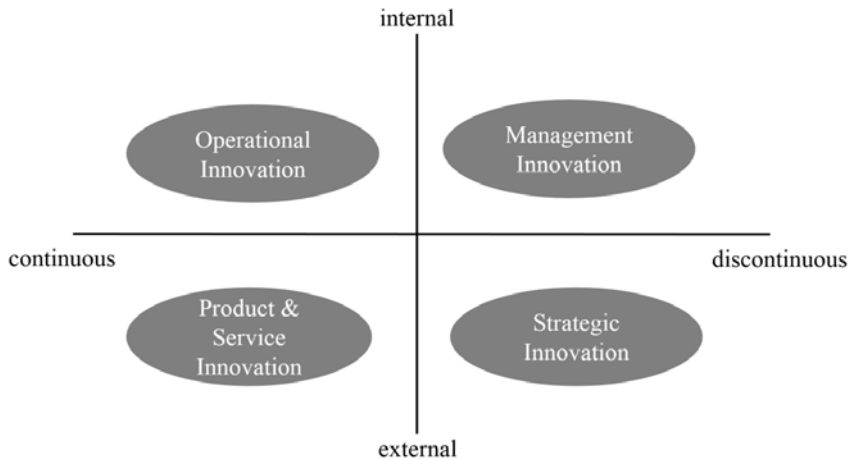
Source: own representation

The trend towards introducing new types of innovation in managerial practice might lead to confusion and partly overlapping terms. Consequently, innovation expert Marc Sniukas suggests to segment innovation based on two criteria (Figure 4):⁶

⁶ Explained during personal interview, also available at <http://de.slideshare.net/sniukas/the-innovation-map-a-framework-for-defining-innovation-outcomes>, last time accessed July 12, 2014.

- How innovative wants the company to be (i.e. continuous/evolutionary versus discontinuous/revolutionary innovation)?
- What is the direction of the innovation efforts (i.e. internal versus external innovation)?

Figure 4: Internal/External – Continuous/Discontinuous Innovation



Source: adapted from Sniukas 2014

According to Sniukas (2014) *operational innovation* is defined as technological innovation in manufacturing, making processes for established offers in established markets more effective or efficient. *Product and service innovation* refers to making surface modifications that improve customers' experience of established products and improving established offers in established markets. *Strategic innovation* includes the development of new business models, new markets and the increase of value for both the customer and the company (e.g., Markides 1997; Govindarajan & Trimble 2012). *Management innovation* “is anything that substantially alters the way in which the work of management is carried out, or significantly modifies customary organizational forms, and, by doing so, advances organizational goals“ (Hamel & Breen 2007, p.19).

Quite recently the academic literature has specified another three types of innovation which have found general acceptance in innovation management research: *Open innovation* is an approach where internal and external sources of information are used throughout all phases of the innovation process (von Hippel 1988; Cohen & Levinthal 1990). It is “the creation of something of economic value based on new jointly generated ideas that emerge from the sharing of information and knowledge” (Miles et al. 2006, p.2). To broaden and deepen the available knowledge (Gassmann 2006), companies collaborate with external partners such as customers

(e.g., Prügl & Schreier 2006; Paladino 2007), users and lead users (e.g., von Hippel 1986; Schreier & Prügl 2008; Magnusson 2009), suppliers (e.g., Petersen et al. 2003; Johnsen et al. 2006), or other organizations and companies (Griffin & Hauser 1996; Powell et al. 1996; Laursen & Salter 2006). In *disruptive innovation* a new product is initially lower performing on some metrics used to typically specify established products, but offers other benefits appealing to nonusers or low-end users in *new markets* such as being cheaper, simpler, or more convenient. Although the new product is not as good as what *existing* customers are currently using, it improves over time until it is good enough to eventually meet the needs of existing markets (e.g., Christensen 1997; Christensen & Raynor 2003; Christensen 2006; Hwang & Christensen 2008; Lindsay & Hopkins 2010). According to Christensen (Christensen 1997; Hwang & Christensen 2008) a disruptive innovation is usually based on three enablers: a simplifying technology, a new value network, and a *business model innovation*. Although the business model concept has initially been criticized for its conceptual ambiguity (Porter 2001) and as being a concept that “draws from and integrates a variety of academic and functional disciplines, gaining prominence in none” (Chesbrough & Rosenbloom 2002, p.553), in recent years the business model has been established as a new unit of analysis, providing the possibility of gaining a holistic view on how companies do business (Zott et al. 2011). Consequently, the business model can itself be a subject of innovation (Mitchell & Coles 2003). This research effort will focus on this type of innovation. The relevant literature on the business model concept and on business model innovation will be further discussed in Chapter 2.4 and 2.5.

2.3 Innovation Processes

As has been outlined above, innovation aims at commercializing ideas. The transformation of ideas into new products, processes, and business models underlies a (multi-)phased process. Various scholars have developed conceptual process models structuring the innovation process through a variety of dissimilar, but highly interconnected phases (Taran 2011). However, in the literature there are dissenting opinions regarding the extent to which innovation processes should be structured and standardized (Verworn & Herstatt 2007). On the one hand, there are studies confirming that formalization and standardization have positive influence on success in innovation and new product development (NPD) processes (e.g., Cooper & Kleinschmidt 1991; Ernst 2001). On the other hand, there is evidence that especially in early phases a structured approach might limit creativity (e.g., Stevens 2004; Verworn & Herstatt 2007).

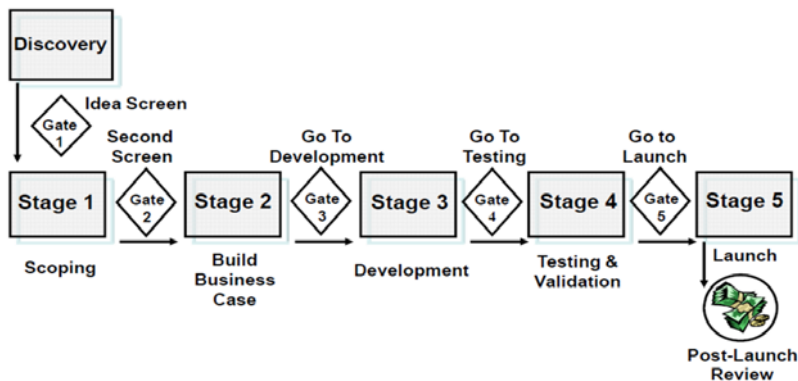
2.3.1 Linear Processes

The most classical innovation processes are strictly *linear*, typically comprise some form of *search*, *selection*, *implementation*, and *capture* phases (Tidd & Bessant 2009) and are R&D focused. Hence, these processes are geared towards (mostly incremental) product innovation

and do not take into account other types of innovation. For instance, such a process consists of *idea generation*, *idea screening*, *business analysis*, *development*, *test and validation*, and *commercialization* (Griffin 1997). One of the most frequently discussed linear innovation process models is Coopers Stage-Gate Model (Cooper 1990) (Figure 5). As a “roadmap from idea to launch consisting of discrete stages, each stage preceded by a Go/Kill decision point of gate” (Cooper 1990, p.4) this process provides measurable objectives at the end of every phase (Buggie 2002). Predefined activities (*stages*) need to be completed before the outcome is evaluated based on predefined criteria (*gates*). Once the requirements of the gate are met, the project moves on to the next stage.

Companies such as 3M, Procter & Gamble or Hewlett Packard have adopted Stage-Gate-Models (Ettlie & Elsenbach 2007; Mathews 2011) and various studies underline the benefits (Cooper & Kleinschmidt 1990; Cooper & Kleinschmidt 1991; Rundquist & Chibba 2004). However, the strict sequential procedure of the Stage-Gate-Model might lead to delays in the innovation process as missing information at a gate potentially inhibits progression. Consequently, Cooper himself suggests to include iterative elements to make the process more flexible, adaptive, and less bureaucratic (Cooper 2008).

Figure 5: Cooper’s Stage-Gate Model



Source: Cooper 2008

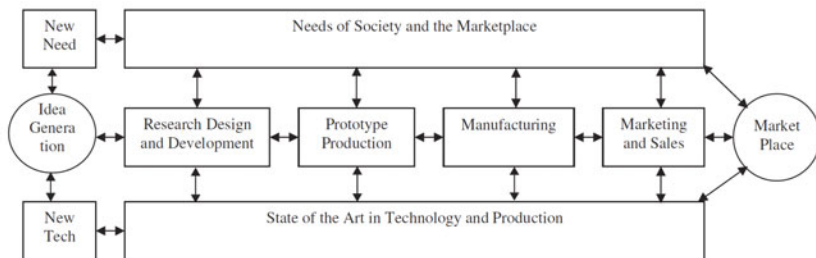
Increasing competitive pressure has led to a new paradigm in innovation processes. It became evident that innovation shall not be structured solely as linear “technology push” process, but needs to be more open and “need pull” oriented (Taran 2011). Such processes are better suited for more radical innovation and allow to integrate external sources of information (open innovation). In times of fast changing environments it’s not possible to make stable and rigid product definitions before an idea moves on to development – a fundamental principle of

Coopers Stage-Gate Model from the 1980s (Cooper 2014). As linear approaches tend to generalize causalities as driving mechanisms and to neglect iterations and feedback loops occurring between different process stages (Lassen 2007), more adaptive, agile, and flexible idea-to-launch process models emerged (Cooper 2014). Consequently, for more radical types of innovation the literature suggests to move to iterative innovation processes, which will be discussed below in more detail.

2.3.2 Iterative Processes

According to the “*Coupling Model*” Theory (Rothwell & Zegveld 1985), the innovation process “can be divided into a series of interdependent stages and feedbacks to the previous stage” (Galanakis 2006, p.1224). In this non-linear model of innovation, the process is presented as series of interactive and interdependent stages, which are not necessarily sequential.

Figure 6: Coupling Model (Rothwell, 1994)



Source: Galanakis 2006

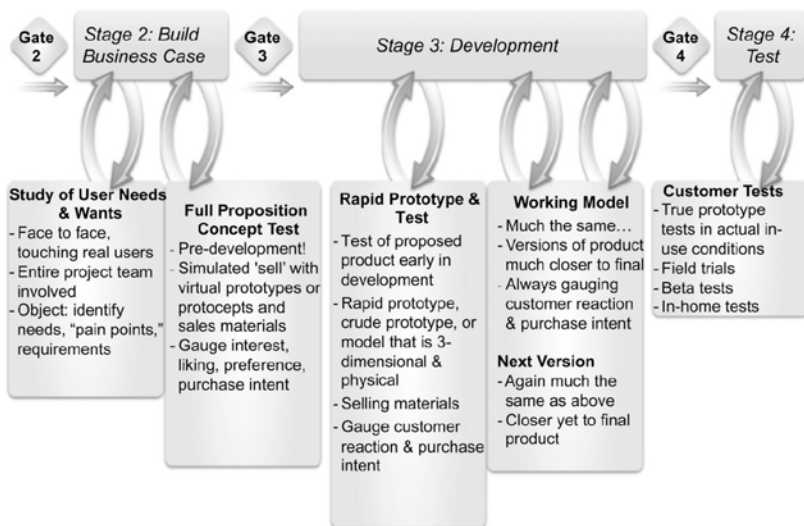
In line with the Coupling Model, *iterative* innovation processes are characterized by an independent sequence of the process phases (Koen et al. 2001). This type of process models is geared towards more radical innovation projects where in early phases uncertainty regarding markets and technologies is much higher. Consequently, in comparison to Stage-Gate Models, definitions and formalizations are found much later in the process (Veryzer 1998; Mascitelli 2000). Process phases might be repeated (Smith & Reinertsen 1991) or designed to be partly overlapping (Sandmeier & Jamali 2007). One of the earliest iterative models is proposed by Kline and Rosenberg (1986). The authors suggest a “*Chain Linked Model*” incorporating (1) “technology push” and “market pull” innovation aspects, (2) a sequential procedure, and (3) feedback loops helping to connect perceived market needs to iterations in product and service design (p.289).

Quite recently, Cooper has revised his Stage-Gate-Process from the 1980s to be more adaptive and flexible (2014). The author picks up the idea of integrating feedback loops into the various

stages to account for the impossibility of 100 percent accurate product definitions in earlier phases of the innovation process. As “people don’t know what they want until you show it to them” (famously stated by Steve Jobs, cited in Isaacson 2011, p.567) and as product requirements may change during the innovation process (e.g., new customer needs, new competitive situations, new technologies), Cooper suggests to integrate “*spirals*” or “*iterations*” thus promoting experimental elements to be integrated in the innovation process (Figure 7). Spirals or iterations consist of

- a *building* phase to develop a prototype, a working model or an early beta version which can be shown to the customer,
- a *testing* phase to have customers use these early product versions,
- a *feedback* phase to collect feedback from customers,
- a *revision* phase to rethink value propositions, benefits and product design.

Figure 7: Spiral Development in the Stage-Gate Model



Source: Cooper 2014

Even more emphasis on the iterative nature of innovation related activities is found in *innovation cycle models*. Koen et al. (2001) suggest for the front end of innovation, i.e. the early stage of the innovation process starting with opportunity identification and ending with idea selection and business case development (e.g., Moenaert et al. 1995; Eldred & McGrath 1997; Khurana & Rosenthal 1998), the *New Concept Development Model (NCDM)*. The NCDM consists of three elements: (1) the center (“engine”) representing organizational leadership and culture, (2) the environment reflecting organizational capabilities, business strategy and the



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