

2 Theoretical foundations and research questions

“... an open mind is good; an empty mind is not. It is true that one wants to retain the capacity to be surprised, but it seems useful (and inevitable) that our observations be guided and influenced by some initial hunches and frames of reference.”

(Siggelkow 2007, p.21)

The first objective of this chapter is to derive a definition of the term “new business creation”. For that purpose, the concept of innovation (see Chapter 2.1) is explored, followed by a review of literature on entrepreneurship (see Chapter 2.2) in order to lay the theoretic foundations to detail that term (see Chapters 2.3 and 2.4). Chapter 2.5 reviews the literature on the other main theoretic concept this thesis builds on, namely performance measurement systems. Chapter 2.6 illustrates the identified research gap and translates it into research questions (Chapter 2.7). A synthesis of the concepts used to guide the empirical part of this study is presented in Chapter 2.8.

2.1 The concept of innovation

Innovation is a broadly used term with a variety of meanings that draw upon theories from various disciplines (Crossan & Apaydin 2010, p.1165). The initial discussion of innovation in an economic context can be traced to Schumpeter (1934), who described innovation as the behavior of an enterprise that transforms not only the company itself but also the competitive environment into something significantly different from the status quo (Schumpeter 1934; Stopford & C. W. F. Baden-Fuller 1994, pp.521–522).² Since then, Schumpeter’s conceptualization has been modified and expanded.³

Given the central role of innovation in the present study, the following **definition** of the term is provided (Gemünden & Salomo 2004, p.505; Kock 2010, p.1):

Innovation is the result of a creative process involving different actors from one or more organizations, which lead to a qualitatively different means-end-

² Note that Schumpeter (1934) did not explicitly use the term “innovation” for the phenomenon he observed.

³ A summary of the various definitions of an innovation can be found in Hauschildt (2004, pp.4–6).

combination that is perceived as new and that is introduced to the market or the operations of a firm for the first time.

This definition highlights the difference between innovation and **invention** (Garcia & R. Calantone 2002, p.112; Garcia 2010, p.89). The latter refers to the first conceptualization of an innovation, which does not incur an economic benefit for the sponsor. By moving from research to development and, finally, through the marketing phase, an invention diffuses to other parties beyond the inventor and thus becomes an innovation.

Crossan and Apaydin (2010) note that despite the complexity and fragmentation of innovation research, **categorizations of innovations typically fall into two groups**: innovation as a process (the “how” category) and innovation as an outcome (the “what” category). Because innovation as an outcome is the result of innovation as a process, the latter is investigated first.

2.1.1 Innovation as a process

According to the above definition, an **innovation has a temporal, dynamic element**. Because of this characteristic, an innovation can be conceptualized as a process, a sequence of steps that transform a set of inputs into a set of outputs (Limberg 2008, p.14).

Academics tend to design the innovation process as a trajectory that begins with an idea and ends with the market diffusion of the outcome of the process (Cooper & E. J. Kleinschmidt 1986, pp.74–78; Garud & van de Ven 1992; Cooper 1998, p.96; Song & Montoya-Weiss 1998, p.126; Hauschildt 2004, pp.24–25; Hansen & Birkinshaw 2007, p.124).⁴ Because innovation processes are often company-specific, variety can be observed in operational practice. Furthermore, the iterative nature of the innovation process, in which activities are overlapping rather than sequential (Thom 1980, pp.46–53; Burgelman 1983; Albers & Eggers 1991, p.48; Garud & van de Ven 1992, pp.107–108; Leifer et al. 2000, pp.18–19; Garvin 2004, pp.19–20), **complicates the derivation of abstract models**.

⁴ Scholars have developed a wide array of process models for innovation activities. For an overview see, for instance, Billing (2003, pp.35–46).

For the purposes of this study, **a process model should meet two criteria**: it must be sufficiently detailed to reflect the key phases and decision-making points between idea generation and market introduction, and it must be sufficiently abstract to find a common denominator between different approaches in practice. In addition, because the focus of the study is on new business created within the boundaries of an existing firm, the process must hold in a highly innovative context. Two widely adopted models will be explored in the following chapters.

2.1.1.1 Stage-Gate® process

To better manage the innovation process, **sequential phase models** have been developed, one of which is the Stage-Gate® process by Cooper (2001).⁵ This approach is a blueprint for moving a new product from idea to market introduction and divides this process into a pre-determined number of stages, which are separated by gates. Depending on the specific application, there are typically three to six stages, each of which includes activities to move the project toward the next gate (Cooper 2010, p.157). Information on this progress is gathered, and at the end of each stage, the project must pass a gate with a go/kill decision. Overall, the Stage-Gate® process is a practically oriented and widely used approach to manage the innovation process (Cooper 2010, p.157). However, Stage-Gate® models are usually company-specific, which **impedes comparability across firms**. Therefore, a more generalizable model is developed in the next chapter.

2.1.1.2 Discovery, incubation, acceleration

A synthesized model, based on work by InnovationsKompass (2001, p.10), O'Connor and DeMartino (2006), Zahra et al. (2006, pp.543–544), Morris et al. (2008, pp.30–32), and Limberg (2008, pp.14–18), is depicted in Figure 1. The process is built on three phases: discovery, incubation, and acceleration. It **begins with idea generation and ends with the diffusion of the innovation** (Hansen & Birkinshaw 2007, p.123ff). The entire transformational process takes place within a system that is referred to as innovation management (Hauschildt 2004, p.30).

⁵ Gerybadze (2004, p.21ff) critically examines the suitability of sequential models for innovation processes. Alternative models have been suggested, such as Burgelman's (1983) "Process model of internal corporate venturing in the diversified major firm" or Pinchot's (1985) person-oriented approach. However, due to their complexity, these models are rarely used in practice (Limberg 2008, p.16).

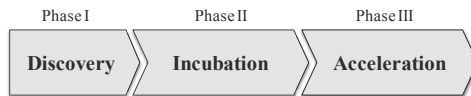


Figure 1: The stylized innovation process

Discovery

This phase comprises the **creation, identification, and evaluation of opportunities**, followed by their articulation in a new business proposal that is ultimately affirmed or rejected. A multitude of methods exist to identify and generate ideas, such as, for instance, expert interviews, customer observations, and systematic screening (Limberg 2008, p.20ff). During the discovery phase, a broad spectrum of informants from within or outside the company may contribute, such as company-wide R&D, a dedicated R&D team, a dedicated idea screening team, and creative people within the firm or outside the organization.

Incubation

The ultimate objective of this phase is to **mature the innovation into a marketable outcome**, which is a prerequisite for entering the acceleration stage. Typical tasks include the development of detailed technical specifications, of a comprehensive business plan, and the definition and acquisition of the required resources. Research, both basic and applied,⁶ plays a crucial role in the incubation phase, and knowledge obtained through this process flows into the subsequent development activities.⁷ The incubation is terminated with the first (or failed) introduction of the outcome to the market, typically after testing prototypes with lead customers.

⁶ Basic (or fundamental) research can be defined as “experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view” (OECD 2002, p.30). Applied research can be described as an “original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective” (OECD 2002, p.30). Although basic research is not directly related to a specific innovation, both basic and applied research are part of the innovation process (OECD 2005, p.91).

⁷ Basic and applied research emphasize the exploration of knowledge and technologies, whereas the development process emphasizes their exploitation (Limberg 2008, p.22). However, as Limberg (2008, pp.22–23) points out, it is often difficult to define where basic and applied research activities stop and development activities begin. See, for instance, Hauser and Zettelmeyer (1997, p.3) and Kerssens-van Drongelen and Bilderbeek (1999, p.37). Both research and development activities play a pivotal role in the innovation process (Frattini et al. 2006, p.428).

Acceleration

Whereas the focus in earlier phases is on exploratory, conceptual and experimental skills, acceleration primarily aims to prepare an innovation to **enter the mass production stage** by ramping it up to viable business. This process includes building the infrastructure necessary to raise sales to a critical level. The phase ends when the innovation is available to the broader market and the activities within the newly created business have become routine (InnovationsKompass 2001, p.10; O'Connor & DeMartino 2006, pp.490–491; Zahra, Yavuz, et al. 2006, pp.543–544; Morris et al. 2008, pp.30–32; Limberg 2008, pp.14–18).

The above model of the innovation process will be drawn on in both the remainder of the literature review and the empirical part of this thesis. To summarize, innovation management encompasses the entire process, including idea generation, research and development (R&D) activities, the diffusion of the innovation (Limberg 2008, p.36), and related support functions (Hauschildt 2004, pp.29–30). Consequently, the **management of R&D activities is a sub-process of innovation management** that focuses on the effective and efficient execution of R&D processes (Hauschildt 2004, p.31).

2.1.2 Innovation as an outcome

As noted previously, the term “innovation” also describes the result of a process (Garcia & R. Calantone 2002, pp.112–117), thus referring to a static aspect of the phenomenon. The concept of newness is central to this facet of innovation. This **newness**, which captures the change from a given status quo (Garcia & R. Calantone 2002, pp.112–117), can relate to the following areas.

- The **object** that is renewed (Hauschildt 2004, p.8),
- The **perspective** from which the newness is assessed (Garcia & R. Calantone 2002, p.112; Salomo 2003, p.403; Hauschildt 2004, p.22), and
- The **dimensions** in which the newness may occur as well as the **extent** of newness in each of these dimensions (Schlaak 1999; Hauschildt & Schlaak 2001; Danneels & E. J. Kleinschmidt 2001; Garcia & R. Calantone 2002).

The above aspects are explored in the following chapters.

2.1.2.1 Object of innovation

A wide variety of approaches has developed in the literature to categorize innovations according to the object that is being renewed. A widely used typology is the differentiation into (i) product, (ii) process, (iii) business model, and (iv) organizational innovations (Thom 1980, pp.32–36; Hauschildt 2004, p.8; Krieger 2005, p.10; Crossan & Apaydin 2010, p.1168), which are explored in the following sections.

- **Product innovations** are tangible objects that aim to either deliver an entirely new performance to end-users or to enhance existing performance (Thom 1980, p.32; Garcia 2010, pp.89–90). Similarly, service innovations, which are intangible methods, focus on performance enhancements that benefit a party external to the innovating company. Therefore, they have traditionally been included in the category of product innovations (Garcia 2010, pp.90–91), an approach adopted by the present study.
- **Process innovations** are a company-internal phenomenon. Process innovations deliver a new level of performance to the *modus operandi* of a firm, typically through efficiency improvements (Garcia & R. Calantone 2002, p.112; Garcia 2010, pp.89–92). It is worth mentioning that process innovations are frequently confused with the innovation process, which focuses on the required steps for diffusing innovations (including, for example, process innovations) and harvesting the economic benefits (Garcia & R. Calantone 2002, p.112).
- A business model refers to “how a company creates, sells, and delivers value to its customers” (Davila et al., 2006, p.32) and converts payments received into profits (Teece 2010, p.173).⁸ Accordingly, a **business model innovation** is a redefinition of an existing product and the way this product is delivered to the customer, for example, by emphasizing different product attributes (Teece 2010, p.173; Markides 2006, p.20).

⁸ Despite the widespread use of the term “business model” among practitioners, the related literature is fragmented and incoherent. For recent literature reviews in this context, see George and Bock (2011) and Zott et al. (2010).

- **Organizational innovations** can be described as new forms and methods that modify existing social relationships in an enterprise (Thom 1980, pp.32–33).

The above categorization may suggest that the four types are distinct. However, one type of innovation may induce other types of innovation; for example, product innovations are typically followed by process innovations (Van de Ven 1986, p.592; Schlaak 1999, pp.28–32; Garcia & R. Calantone 2002, p.112) and vice versa (Garcia 2010, p.91). This relation is particularly relevant in the case of service innovations. As a result, the initial innovation is often indistinguishable from accompanying types (Schlaak 1999, p.29) and should not be considered isolated. The present study **focuses on product (including service) and business model innovations** because these types of innovations are customer-centric, whereas organizational and process innovations are company-internal phenomena.

2.1.2.2 Perspective on innovation

The analytical perspective plays a central role when assessing the newness of an innovation (Hauschildt & Salomo 2007, pp.22–24) because it specifies the point of reference against which newness is assessed. Garcia and Calantone (2002, pp.118–120) distinguish two perspectives, **a micro perspective and a macro perspective**. From a macro view, newness is measured as the departure from a global, industry-wide⁹ or market-wide status quo, ex ante. This perspective is also referred to as an “objective” view (Hauschildt 2004, pp.22–24). When considering the micro perspective, newness is the departure from a company-wide status quo, ex ante. This perspective is also referred to as a “subjective” view (Hauschildt 2004, pp.22–24). Accordingly, newness at a macro level typically entails newness at a micro level, whereas newness at a micro level does not necessarily entail newness at a macro level (Salomo 2003, p.403).

Van de Ven (1986, pp.591–592) notes that an innovation is typically perceived by a group of individuals who assess the degree of newness based on their state of

⁹ An industry is (i) the milieu within which important decisions are made about a firm's served market and “competitive weapons” (Zahra 1993b, p.50) and (ii) comprises a group of companies that compete with similar or identical products (Morris et al. 2008, pp.82–83).

knowledge, that is, from **a subjective perspective** (Schlaak 1999, pp.29–30). This is the view adopted by this dissertation.

2.1.2.3 Dimensions of an innovation

Some of the liveliest discussions in academia and practice have focused on the dimensions along which innovations can be defined. Although early approaches focused on mono-dimensional, nominally scaled conceptualizations,¹⁰ **multidimensional classifications have recently gained importance** (S. G. Green et al. 1995; Song & Montoya-Weiss 1998; Schlaak 1999; Danneels & E. J. Kleinschmidt 2001; Ahuja & Lampert 2001; Hauschildt & Schlaak 2001; Garcia & R. Calantone 2002; Salomo 2003; R. J. Calantone et al. 2006; Gemünden et al. 2007; Garcia 2010; Crossan & Apaydin 2010). As Salomo (2003, p.403) notes, there were several attempts during the 1990s to establish general agreement on the dimensions of the newness of innovations and to measure their respective degrees. Salomo (2003, p.399) synthesized these attempts and developed a framework consisting of four dimensions, capturing changes that are market-related and technology-related as well as organizational and environmental alterations. The following sections explore these dimensions to answer the question, “What is new?”

- **Market-related dimension:** Market-related changes (Danneels & E. J. Kleinschmidt 2001, p.361; Garcia & R. Calantone 2002, p.119) can be decomposed into two aspects (Kock 2007, pp.3–4). The first refers to an alteration of the benefits of an innovation as perceived by customers, or a macro perspective (Montoya-Weiss & R. Calantone 1994, p.415). For instance, if an innovation satisfies former unsatisfied needs for the first time, there is a quantum leap in customer benefits, or if there is a significant reduction in price, then the market-related newness is high (Gemünden et al. 2007, p.410). In addition, the more customers are affected, the higher is the market-related newness. The second aspect refers to the newness of the market to the company and the firm's familiarity with this new market, i.e. an assessment from a micro perspective (Danneels & E. J. Kleinschmidt 2001, pp.360–361; Salomo 2003, p.405; Gemünden et al. 2007, p.410).

¹⁰ See, e.g., Song and Montoya-Weiss (1998).

- **Technology-related dimension:** This dimension refers to changes in technological principles embedded in an innovation (Danneels & E. J. Kleinschmidt 2001, p.361; Garcia & R. Calantone 2002, p.119; Gemünden et al. 2007, p.410). These principles are either known or not well understood by a scientific group (i.e., a macro-level view) or a company (i.e., a micro-level view) (S. G. Green et al. 1995, p.204; Salomo 2003, p.404).
- **Organizational dimension:** The organizational dimension¹¹ assesses the changes that are required within a company to accommodate an innovation (Hauschildt & Schlaak 2001, p.170; Avlonitis et al. 2001, p.330-332). As a result, this dimension measures how well the organization's resources and capabilities fit the innovation and captures changes related to strategy, structure, processes, competencies, culture, etc. (Danneels & E. J. Kleinschmidt 2001, p.361; Gemünden et al. 2007, p.410; Kock et al. 2011, p.121). This dimension is limited to the micro-sphere because it refers exclusively to a company-wide level.
- **Environmental/social dimension:** The last dimension takes a macro perspective and refers to changes that innovations may produce in a company's environment (Salomo 2003, p.406), such as for instance suppliers and competitors. In this dimension, behavioral and attitudinal changes of individuals (i.e., value systems and culture) outside the firm are considered as well as regulatory and infrastructure changes.

Within each of these dimensions, the **degree of newness can be assessed separately**¹² and can be systematically combined to address the overall degree of newness of an innovation (Garcia & R. Calantone 2002, p.120; Salomo 2003, pp.406–419). For instance, Gemünden et al. (2007, pp.412–417) and Kock (2007) develop a model to operationalize and accurately assess the market- and technology-related dimensions of innovativeness.

¹¹ Sharma and Chrisman (1999, p.22) refer to this as the “degree of relatedness to existing business”.

¹² For a narrative example of how the degree of newness is assessed in each dimension, see, e.g., Garcia (2010, p.91). For an operationalization of the separate dimensions, see, for instance, Salomo (2003).

2.1.2.4 Magnitude of an innovation

The magnitude of an innovation indicates its **overall degree of newness based on the degrees of newness in each of the aforementioned dimensions** and with respect to a reference (i.e., the perspective on innovation). The rationale for determining the overall degree of newness of an innovation is that different degrees of overall newness require different techniques to efficiently and effectively manage innovations (Hauschildt & Schlaak 2001, p.163; Kock et al. 2011).¹³ As shown by a recent review of the literature on innovation management by Crossan and Apaydin (2010, p.1168), scholars tend to distinguish between incremental innovations and radical innovations.

- **Incremental innovation** are modifications, enhancements, or refinements of existing innovations and build on the extant knowledge and capabilities of the incumbent firm (Song & Montoya-Weiss 1998, p.126; Garcia 2010, p.91). As a result, they are characterized by relatively high predictability and reliability and lower risk (Garcia 2010, p.91), which results in low to medium degrees of newness in most of the four innovation dimensions. Incremental innovations are often referred to as “sustaining innovations”, “continuous innovations”, ‘evolutionary innovations’, or “minor innovations” (Garcia & R. Calantone 2002, pp.117–118). Incremental innovations play an important role in sustaining and increasing shares in extant markets through product refinements and increases in production efficiency.
- **Radical innovations:** In contrast to incremental innovations, radical innovations break away from the customary and are characterized by high degrees of newness (Gemünden et al. 2007, p.410). Radical innovations offer significant enhancements of known benefits, entirely new benefits, or substantial cost reductions, leading to the transformation of existing markets or the creation of entirely new possibilities for growth (Song & Montoya-Weiss 1998, p.126; Leifer et al. 2000, p.5; R. N. Foster & S. Kaplan 2001, pp.107–109; Garcia 2010, p.91). These innovations are also referred to as “breakthrough”, “disruptive”, “discontinuous”, or “paradigm-shifting”

¹³ Leifer et al. (2000, pp.18–24) note that depending on the degree of newness of an innovation, the risk and return profile of the project varies. Consequently, to determine an optimal risk-return profile of a portfolio of innovations, the overall degree of newness of each innovation project must be assessed (Salomo 2003, p.402).

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