

2 Literature review

This chapter explores and connects the literature relevant to the research topic presented in the introduction. The relevant body of literature is based on three streams of research: (i) innovation management, (ii) corporate entrepreneurship and (iii) human resource management (HRM).

2.1 Innovation management

2.1.1 Definition of innovation

Innovation is a fashionable and frequently used term that must be defined to avoid misunderstandings (Hauschildt & Salomo 2011, p.3). A precise definition is important not only for academic purposes but also for practitioners to classify and subsequently manage innovations (Hauschildt & Salomo 2011, p.3). In accordance with Gemünden & Salomo (2004, p.505), innovation is defined in the present study as follows:

“Innovations are the results of a creative process involving different actors from one or more organizations, which leads to a qualitatively new means-end combination that is introduced to the market or the operations of a firm for the first time.”

Smith & Barfield (1996, p.21) stress the necessary introduction to the market that differentiates invention from innovation. The former does not make a direct economic contribution to an incumbent firm (Garcia & Calantone 2002, p.112; Hauschildt & Salomo 2011, p.5). Hauschildt & Salomo (2011, p.4) include in their definition of innovation the need for “measurable” newness in terms of change compared to the status quo. Innovations can be categorized and analyzed according to the following dimensions, which will be expanded upon in the following sections (Hauschildt & Salomo 2011, p.5):

1. **Object of innovation (What is new?):** Innovations can appear in various forms and comprise inter alia new products, processes, organizations, types of contracts, distribution channels, advertising messages and corporate identities (Hauschildt & Salomo 2011, pp.3–4).
2. **Degree of newness (How new?):** The literature provides various scales and techniques to assess the degree of newness (Hauschildt & Salomo 2011, p.11). Although dichotomous scales (e.g., ‘radical’ versus ‘incremental’),

‘discontinuous’ versus ‘continuous’) and simple 2x2 matrices provide only generic classifications, researchers have developed more sophisticated multidimensional and continuous constructs to capture the complexity of the concept (Hauschildt & Salomo 2011, p.12; Kock 2007).

3. **Perspective (New to whom?):** The qualitative change compared to the status quo depends on the perceptions of one or more assessors, which inevitably leads to a subjective classification of innovations (Garcia & Calantone 2002, p.112; Hauschildt & Salomo 2011, pp.18–19).
4. **Process (Where does the innovation begin and end?):** Because innovations are more than inventions and are characterized in relation to a specific moment or period, researchers and practitioners often apply a process-related view (Billing 2003, pp.36–46; Hauschildt & Salomo 2011, pp.20–21).
5. **Normative dimension (Does new equal successful?):** Some researchers argue that innovation must provide an improvement over the status quo, not just a change (Hauschildt & Salomo 2011, p.21). Because there is often a time lag between the development and the outcome of innovations, potential success can usually only be assessed ex-post, which makes the normative dimension less important for the categorization of innovation (Hauschildt & Salomo 2011, p.22).

2.1.2 Object of innovation

A number of categorizations for the object of innovation have emerged in the literature (Hauschildt & Salomo 2011, pp.5–11). Most commonly, researchers differentiate between product and process innovations (Garcia 2010, pp.89–90; Hauschildt & Salomo 2011, p.5; Totterdell et al. 2002, p.345). Process innovations represent new factor combinations through which production can be offered more efficiently (e.g., higher quality, safer, faster) (Hauschildt & Salomo 2011, p.5). The concept of product innovation is broader and includes changes in the utilization of a product or service in the market (Garcia 2010, pp.90–91; Hauschildt & Salomo 2011, p.5). Product innovations impact effectiveness by providing the user with a new functionality or existing functionality performed in a new way (Hauschildt & Salomo 2011, p.5). Researchers further distinguish between organizational and business-related innovations (Hauschildt & Salomo 2011, pp.8–9; Markides 2006, p.20). Organizational innovations affect the internal structures, culture and systems of

companies and provide a potentially positive impact on financial performance (Hauschildt & Salomo 2011, p.9; Totterdell et al. 2002, p.344). Business-related innovations are business model innovations defined by “the discovery of a fundamentally different business model in an existing business” (Markides 2006, p.20).

2.1.3 Degree of newness

Recent approaches conceptualize the newness of innovations into multiple dimensions (Garcia & Calantone 2002, p.112; Gemünden & Kock 2009, p.33; Hauschildt & Salomo 2011, pp.13–17; Kock 2007). Typically, these dimensions are (i) market-related, (ii) technology-related, (iii) organizational and (iv) environmental (Billing 2003, pp.30–35; Kock 2007; Salomo 2003, pp.399–411). The *market-related* dimension is divided into two categories: (a) the perceived difference from the status quo by the customer and (b) the newness of the market to the incumbent firm (Garcia & Calantone 2002, p.119; Kock 2007; Song & Montoya-Weiss 1998, p.126). These two components can be understood as macro (new to the market) and micro (new to the company) perspectives (Hauschildt & Salomo 2011, p.16). The *technology-related* dimension represents uncertainty regarding an innovation’s new technology (Billing 2003, pp.31–32; Dowling & Hüsigg 2004). A high degree of uncertainty is perceived by either a scientific group or the incumbent firm (Green et al. 1995, p.204). The subjective or *organizational* dimension refers to the relatedness of the innovation to the core business of an organization, or the organizational change required to manage an innovation (Billing 2003, pp.33–34; Kock et al. 2011). In addition to the market-related dimension, an innovation has the potential to redefine entire industries or its environment beyond its impact on customers (Billing 2003, p.33; Kock 2007). The degree of this company-external impact is reflected in the *environmental* dimension, taking a macro perspective (Billing 2003, p.33; Salomo 2003, p.406). The overall degree of newness of an innovation is identified by combining the degree of newness of the above dimensions (Garcia & Calantone 2002, pp.119–120; Hauschildt & Salomo 2011, pp.13–17).

2.1.4 Radical innovations

Radical innovations are characterized by a high degree of newness, which implies an elevated level of all dimensions (Garcia & Calantone 2002, p.120; Kock 2007). Garcia & Calantone (2002, pp.120–123) differentiate between radical, really new,

discontinuous and incremental innovations. They define radical innovations as innovations with a high degree of newness in technology- and market-related areas from simultaneous micro and macro perspectives. O'Connor & DeMartino (2006, pp.475–476) associate very promising opportunities and very high risks or uncertainties with the management of radical innovations. Really new innovations are characterized by a high degree of newness from a macro perspective in only one of the two above-mentioned dimensions. Discontinuous innovations are a combination of radical and really new innovations that have a high degree of newness from a macro perspective in at least one of the two dimensions. Incremental innovations are defined as innovations with a low to medium degree of newness in all dimensions (Garcia & Calantone 2002, p.123; Kock 2007). O'Connor (2008, p.315) also differentiates between radical, really new and incremental innovations but pools radical and really new innovations into the concept of major innovation. She argues that major innovations have a high level of uncertainty and therefore should be analyzed and managed separately from incremental innovations.

Based on Foster (1986), Garcia & Calantone (2002, pp.121–122) introduce the technology S-curve as a tool to identify radical innovations. The associated theory suggests that technical product performance develops along an S-curve. At some point, the investment in research results in diminishing returns, and a new S-curve is subsequently initiated. Garcia & Calantone (2002, pp.121–122) apply this theory to the market-related dimension by adding investments in marketing, and introducing the marketing S-curve. The switch from old to new S-curves represents a discontinuity or a radical innovation (Garcia & Calantone 2002, p.122).

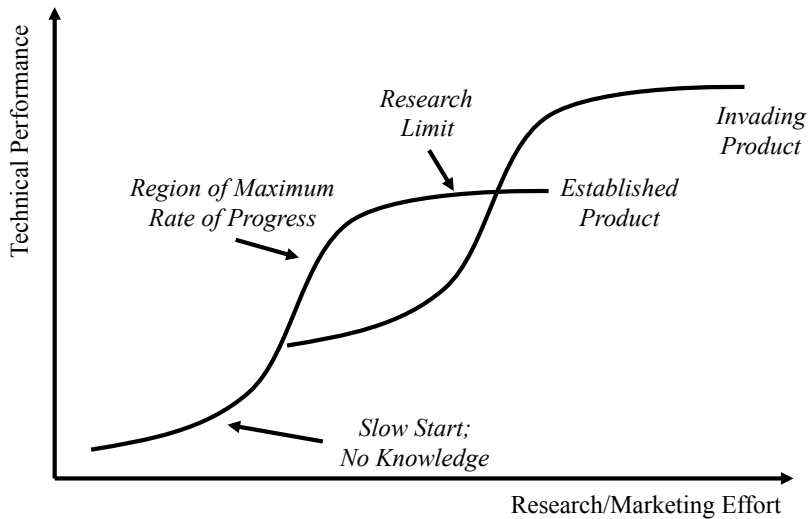


Figure 1: Technology/marketing S-curve

In a more practical manner tailored to empirical studies, O'Connor & DeMartino (2006, p.478) define radical innovation, in accordance with Leifer et al. (2000), as “products and technologies that have high impact on the market in terms of offering (1) wholly new benefits; (2) significant (i.e., five to ten times) improvement in known benefits; or (3) significant reduction in cost (i.e., 30% to 50%).”

2.1.5 Process perspective

The dynamic or process-related view of innovations begins with an idea, includes a number of stages and ends with market introduction or, in some cases, early termination (Billing 2003, p.35). Innovation processes are characterized by the creation of value through the transformation of input to output. Due to the complexity of innovations, processes span a relatively long period of time. By dividing the process into stages, the necessary tasks at any given point in time become apparent (Billing 2003, p.35). Stages include a number of activities that can be performed simultaneously (Billing 2003, p.36). Due to the importance of innovation processes, a large number of process models with different stages have been developed (Billing 2003, p.36; Cooper & Kleinschmidt 1993, pp.26–29; O'Connor & DeMartino 2006,

pp.489–492; Song & Montoya-Weiss 1998, p.126). Generally, researchers and practitioners do not agree upon the number and nature of the stages of the innovation process. Detailed process models are more suitable for incremental innovations, but they are less applicable to the development of radical innovations, which have an experimental and iterative character (Billing 2003, p.40; Lynn et al. 1996, pp.16–18). Practitioners in the field of innovation management rarely apply sophisticated and detailed process models involving numerous stages and layers of complexity (Billing 2003, p.36; Burgelman 1983, p.230).

In practice, the most widely used approach is the Stage Gate system (Billing 2003, p.38; Cooper 1998; Cooper & Kleinschmidt 1993). The underlying process is conceptualized for major new product processes and consists of five stages and five gates as well as a preceding discovery and a subsequent post-launch review (Cooper 2010, p.158). The stages include specific actions, best practices and defined accountabilities, and the gates involve go/kill criteria, defined deliverables and specific gatekeepers (Cooper 2010, p.158).

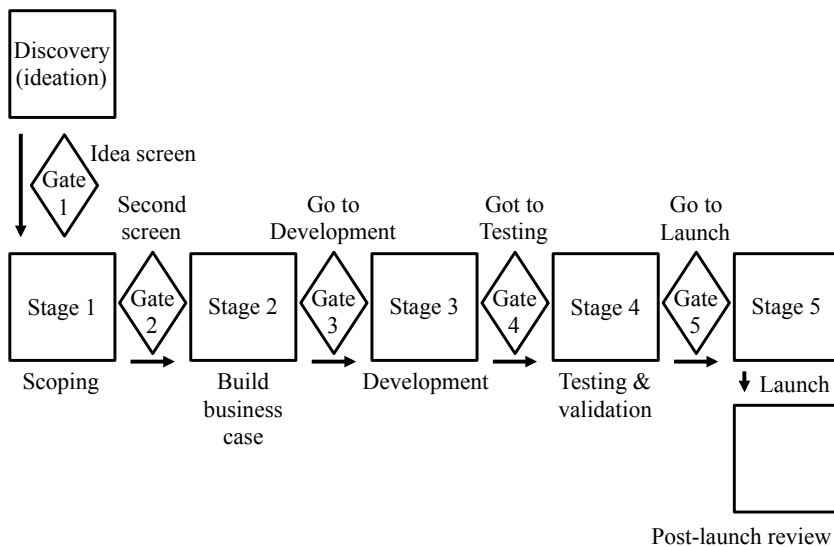


Figure 2: Overview of the Stage Gate system (Cooper 2010, p.158)

In practice, Stage Gate processes are accompanied by a high degree of customization introduced by the incumbent firm. The number of stages can be flexibly adjusted and gate decision criteria can be defined in a company-specific way (Cooper 2010, pp.164–166). In the following paragraphs, simplistic three-stage processes are introduced that can be applied to companies in different industries and regions. A three-stage process can also be applied to an incumbent firm that employs a Stage Gate system by matching the activities of the stages (Billing 2003, p.39).

Billing (2003, pp.42–46) developed Gerpott's (1999) three-stage innovation process by adding the stages of idea generation, idea concretion (technical realization and exploration of economic options), and idea commercialization (beginning of production and market entry). In this process, the first stage includes the very early impetus that begins before an idea is born. Billing (2003, p.46) re-labeled the three stages and, based on the research of Utterback & Abernathy (1975, p.645), explained them with decreasing degrees of newness over time: initiative, business building, and market development. Billing (2003, p.46) describes the first stage as creative and chaotic; it is driven by an overreaching vision to create something new. In this stage, knowledge about potential markets is limited, and the responsible persons develop preliminary rough market projections and a preliminary technical feasibility study using a limited investment budget (Billing 2003, p.43). The business-building stage is characterized by an iterative testing of new options to identify a final product-market combination. This stage is characterized by numerous throwbacks and breakthroughs (Billing 2003, p.44). The third market development stage includes the market introduction of the product and ends with its transformation into an established production line. Billing (2003, p.45) explains that only incremental changes to the product are made during this stage.

O'Connor & DeMartino (2006, p.475) integrated a three-stage sequential process model into a systems approach. Each stage of their Discovery-Incubation-Acceleration (DIA) framework represents a necessary competency for a radical innovation capability. The three competencies require certain types of expertise and processes, which will be outlined in the following paragraphs:

- 1. Discovery:** Activities during the first stage of the radical innovation process focus on creating, recognizing, elaborating, and articulating opportunities.

Therefore, the choice of structural mechanisms is broad. Incumbent firms engage in internally focused laboratories, embrace the open-innovation concept, hunt inside and outside the company for ideas and opportunities, place equity in small firms that hold promise, organize alliances with universities, and develop exploratory marketing groups to identify radical innovations at the nexus of technology and markets (O'Connor & DeMartino 2006, pp.489–490).

2. **Incubation:** During the second stage, the focus is the elaboration of a business proposal, which includes a working, testable hypothesis about markets and technologies (e.g., with a prototype in a certain market). To achieve this goal, a number of experiments are conducted with regard to the market and the technology. Typically, numerous projects enter the incubation stage and are steered by an evaluation board, which makes decisions, provides oversight, coaches the responsible employees and helps to dismantle company-internal barriers (O'Connor & DeMartino 2006, pp.490–491).
3. **Acceleration:** The last stage aims to ramp up business activities to a point where the project can survive next to the existing businesses of the incumbent firm. This capability includes predictable sales and operations as well as significant size and profitability. During this stage, the investment need required to develop the necessary infrastructure is higher than in the preceding stages (O'Connor & DeMartino 2006, pp.491–492).

2.1.6 Organizational perspective

O'Connor & DeMartino (2006, p.476) state that organizational growth is typically accompanied by a gain in efficiency of scale and scope, which may result in rigidity and incompetency with regard to radical innovation capability. In this context, radical innovations often rely on individual efforts or champions who promote these radical innovation projects. A powerful tool to realize radical innovations is the establishment of a management system with a set of roles and responsibilities. This dedicated organizational group initiates and sustains attention and resources to radical innovations (O'Connor & DeMartino 2006, pp.476–477). In addition, this unit supports the accumulation of experience in managing radical innovations and encourages reflection on applied practices and their reconfiguration over time. The

institutionalized approach facilitates cooperation between radical innovation projects and the mainstream organization by encouraging defined rules. Interfaces with projects that do not have their own organizational units are difficult to manage. Researchers and practitioners have divergent views with regard to the structural separation of radical innovation activities. Although some argue that a loosely coupled organizational unit supports the development of radical innovation, others argue that these units must be separated physically and culturally (O'Connor & DeMartino 2006, p.478). In this context, the use of company-internal resources and structural freedom are argumentative counter-poles for the design of these units. The paragraphs below provide an overview of general organizational structures, followed by an introduction to systems theory in the context of radical innovations.

2.1.6.1 Organizational structures of large established companies

O'Connor (2008, p.313) notes that the *"interface with the mainstream organization"* is one of the management system elements for major innovations. The following section provides an overview of organizational structures of large established companies. The term "mainstream organization" includes a number of organizational units, which will be detailed below.

Due to the complexity of their activities, the organizational tasks of large established companies are divided into specific jobs that are grouped in some way. The dominant forms of organization in which the grouping is performed are (i) function, (ii) product, and (iii) geography (Kolodny 1979, p.545). Characteristics of functions are diverse and include functional lines, such as marketing, production, and accounting (Ford & Randolph 1992, p.269). Under the product organization form, specific jobs are grouped with regard to a product or a group of similar products (Ford & Randolph 1992, p.269). The head of a functional line is also called a 'functional manager,' and the head of a product unit is called a 'product manager'.

Large, established companies typically organize their activities on multiple hierarchical levels based on one or more of the above-mentioned organizational forms. In some cases companies are organized in so-called matrix organizations that are characterized by a *"mixed or overlay organizational form in which traditional, vertical hierarchy is overlaid by some form of lateral authority, influence, or communication"* (Ford & Randolph 1992, p.269). Traditionally, the vertical hierarchy

is functional, and the horizontal overlay consists of products or a group of products (Ford & Randolph 1992, p.269). This organizational form exists in various forms across a wide range of industries and played an important role for large, established companies since its appearance in the 1970s (Ford & Randolph 1992, p.268).

Hauschildt & Salomo (2011, p.79) list the following units as important interfaces for innovation projects: functional divisions, research and development, other corporate projects, previous or subsequent projects and external partners. In the following, a number of selected organizational units (also called 'corporate functions') are introduced that are relevant for the present study.

1. **Controlling:** Controlling activities focus on management control systems, which are defined by Otley (1999, p.364) as follows: "*Management control systems provide information that is intended to be useful to managers in performing their jobs and to assist organizations in developing and maintaining viable patterns of behavior.*"
2. **Research & development (R&D):** R&D includes activities such as basic research, product development and market introduction of products (Kerssens-van Drongelen & Cook 1997, p.345). Researchers and practitioners emphasize the need to distinguish innovation management and R&D management. R&D processes are a subset of innovation processes, but it is not possible to draw the opposite conclusion. R&D comprises scientific and technical processes, whereas innovations include administrative processes that go beyond these processes. Furthermore, R&D processes can be executed systematically and repeatedly, which is not necessarily true of innovation processes. (Hauschildt & Salomo 2011, p.30)
3. **Intellectual property rights (IPR):** Corporate activities in the field of IPR involve the protection of inventions and knowledge from imitation through legal and non-legal mechanisms such as patents, secrecy, lead times, etc. (Cohen et al. 2000, pp.5–6; Dushnitsky & Lenox 2005, p.950).
4. **Human resources (HR):** See chapter 2.5 'Human resource management (HRM) systems'.



<http://www.springer.com/978-3-658-05981-1>

Human Resource Management Systems in New
Business Creation

An Exploratory Study

Fowinkel, T.

2014, XIII, 182 p. 8 illus., Softcover

ISBN: 978-3-658-05981-1