

# Oxford Research Encyclopedia of Business and Management

Business Education

Business Policy and Strategy

Consulting

Entrepreneurship

Ethics

History

Human Resource Management

Information Systems

Marketing

Negotiations and Bargaining

Operations Management

Organization Theory

Organizational Behavior

Problem Solving and Creativity

Research Methods

Social Issues

Technology and Innovation Management

Browse All

Close

Organizational Innovation

**Robert Damanpour**

Subject:

Organization Theory, Organizational Behavior, Technology and Innovation Management

Online Publication Date:

Aug 2017

DOI:

10.1093/acrefore/9780190224851.013.19

Read More

- [View PDF](#)

Page of

PRINTED FROM the OXFORD RESEARCH ENCYCLOPEDIA, BUSINESS AND MANAGEMENT (business.oxfordre.com). (c) Oxford University Press USA, 2016. All Rights Reserved. Personal use only; commercial use is strictly prohibited. Please see applicable Privacy Policy and Legal Notice (for details see Privacy Policy).

date: 13 October 2017

# Organizational Innovation

## Summary and Keywords

Innovation is a complex construct and overlaps with a few other prevalent concepts such as technology, creativity, and change. Research on innovation spans many fields of inquiry including business, economics, engineering, and public administration. Scholars have studied innovation at different levels of analysis such as individual, group, organization, industry, and economy. The term *organizational innovation* refers to the studies of innovation in business and public organizations.

Studies of innovations in organizations are multidimensional, multilevel, and context-dependent. They investigate what external and internal conditions induce innovation, how organizations manage innovation process, and in what ways innovation changes organizational conduct and outcome. Indiscreet application of findings from one discipline or context to another, lack of distinction between generating (creating) and adopting (using) innovations, and likening organizational innovation with technological innovation have clouded the understanding of this important concept, hampering its advancement. This article organizes studies of organizational innovation to make them more accessible to interested scholars and combines insights from various strands of innovation research to help them design and conduct new studies to advance the field.

The perspectives of organizational competition and performance and organizational adaptation and progression are introduced to serve as platforms to position organizational innovation in the midst of innovation concepts, elaborate differences between innovating and innovativeness, and decipher key typologies, primary sets of antecedents, and performance consequences of generating and adopting innovations. The antecedents of organizational innovation are organized into three dimensions of environmental (external, contextual), organizational (structure, culture), and managerial (leadership, human capital). A five-step heuristic based on innovation type and process is proposed to ease understanding of the existing studies and select suitable dimensions and factors for conducting new studies. The rationale for the innovation-performance relationship in strands of organizational innovation research, and the employment of types of innovation and performance indicators, is articulated by first-mover advantage and performance gap theory, in conjunction with the perspectives of competition and performance and of adaptation and progression. Differences between effects of technological and nontechnological innovation and stand-alone and synchronous innovations are discussed to articulate how and to what extent patterns of the introduction of different types of innovation could contribute to organizational performance or effectiveness. In conclusion, ideas are proposed to demystify organizational innovation to allure new researches, facilitate their learning, and provide opportunities for the development of new studies to advance the state of knowledge on organizational innovation.

Keywords: innovation and organization, technology, creativity, change, and innovation, process of innovation, typologies of innovation, antecedents of innovation, innovation and firm performance, technological innovation, managerial innovation

## Introduction

Research on innovation spans many fields of inquiry including science and engineering, humanities and art, and social sciences. In academia, innovation has been probed at different levels of analysis: individual, group, organization, industry, economy. The term *organizational innovation* refers to the studies of innovation in organizations, including both business and public organizations. Organizational innovation research examines what external and internal conditions induce innovation, how organizations manage innovation process, and in what ways innovation changes organizational conduct and outcome.

Innovation in organizations is conceived both as process and outcome. Research on innovation as outcome aims to identify the contextual, organizational, and managerial conditions under which organizations innovate. Research on innovation as process aims to identify how organizations create, develop, adopt, implement, and use innovation. Outcome and process research are denoted as studies of *innovativeness* and *innovating*, respectively. The studies of innovativeness are primarily large-sample studies of multiple innovations in organizations. The studies of innovating are mainly case studies of one or few innovations in organizations.

The term organizational innovation is simple and easily understandable, but research on organizational innovation is complex—multilevel, multidimensional, and context-dependent. First, innovation overlaps with several other concepts—creativity, invention, imitation, organizational and technological change—and is often used as an umbrella concept covering all. Conceptual diversity and indiscriminate use confounds the antecedents and outcomes of organizational innovation. Second, organizations can both generate (create) and adopt (use) innovations. Generation and adoption are distinct processes that occur typically at different parts or units of organizations. They are not necessarily induced in similar environmental contexts or organizational conditions, and are not necessarily affected by the same sets of antecedents. Third, organizations generate and adopt different types of innovation—product, process, technological, and managerial, major or minor. Many authors do not distinguish between innovation types, and use the term innovation while studying only one type (especially technological and product). The role and importance of innovation types differ along the value chain (Porter, 1985), suggesting that the contextual and organizational conditions that could motivate their adoption are not similar. Fourth, myriad theoretical perspectives and approaches (rational, institutional, political, cultural, learning, interpretive, interactional), each constrained by its disciplinary discourse and methodological disposition, are applied to ground studies of

organizational innovations (Crossan & Apaydin, 2010; Damanpour & Gopalakrishnan, 1998; Sturdy, 2004; Van de Ven & Rogers, 1988). They offer competing explanations of motivation for and consequences of the generation and adoption of innovation in organizations.

However, despite the complexity of the construct and diversity of research on it, the term innovation is applied broadly and the research findings are interpreted generally. Lack of due attention to the differences emanating from disciplinary approaches, levels of analysis, generation or adoption, innovation types, and external and internal contexts challenge a common understanding of organizational innovation. Accordingly, basic questions of importance to practice such as “what are the characteristics of innovative organizations” and “how do innovations affect organizational conduct or outcome” remain unanswered. The goal of this article is to carve out the key facets and dimensions of organizational innovation, coalesce its elements, and combine insights from existing research to inform and help guide future research on its dimensions, antecedents, and outcomes. While the article draws insights from innovation research in economics, psychology, and sociology, its primary disciplinary focus is organization studies, and in particular management of innovation in organizations.<sup>1</sup>

The rest of this article is organized as follows. First, two general perspectives for studying innovations in organizations are offered. The definition of innovation and its distinction from the related concepts are presented next. This is followed with an overview of generation, adoption, and typologies of innovation in organizations, and of their salient antecedents. Finally, consequences of innovation for organizational conduct and outcome, and ideas for future research on organizational innovation are discussed.

## **Perspectives of Organizational Innovation**

Academic research on innovation in social sciences has markedly increased since the 1950s (Crossan & Apaydin, 2010; Fagerberg, 2005). Innovation, however, is a much older term and its meaning, understanding, and terminology have changed over time. Godin (2015A) chronicles emergence, evolvment, conceptualization, and application of innovation leading to its contemporary understanding. Innovation has a positive connotation and is viewed as a practical construct with beneficial outcome for its generators and adopters. Organizations generate and adopt different types of innovations that are deemed to be of value to meeting their short-term and long-term goals and making their operation efficient and effective. Accordingly, the domain of research on organizational innovation encompasses organizational activities and mechanisms for the creation (generation) and application (adoption) of new technological or nontechnological ideas and practices across their value chain.

Two primary perspectives of innovations in organizations were introduced in the 20th century. The first perspective focused mainly on the generation of new commercialized, technology-based products and processes (Damanpour & Wischnevsky, 2006; Fagerberg, Mowery, & Nelson, 2005; Godin, 2008). Organizations innovate to improve efficiency and productivity, increase market share and profitability and to generate economic wealth for their owners. The second perspective was introduced in sociology and flourished in organization management in the second half of the 20th century alongside the advent of organizations as open systems. Organizations introduce innovations to adapt to environmental change and achieve strategic intents for maintaining and improving performance (Hage & Aiken, 1970; Becker & Whisler, 1967; Mohr, 1969; Zaltman, Duncan, & Holbek, 1973). Whereas both perspectives consider organization as a vehicle for innovation, from the first perspective innovation is mainly to increase productivity and serve product, service, and performance outcomes, and from the second perspective innovation is mainly a means of organizational change and improvement to stay in business and thrive. The two perspectives are viewed here as conjoining, not competing, and are termed as “competition and performance” and “adaptation and progression” perspectives of organizational innovation.

## **Organization Competition and Performance**

This perspective is rooted in Schumpeter’s work and focuses mainly on the development and launch of new products and technological processes by organizations, where the newness is gauged at the level of product class or market. Schumpeter (1934, 1983) defined innovation (new combination) as a novel output and distinguished among five types of innovation: new products (new goods and new quality of goods), new methods of production, new markets, new sources of supply, and new ways to organize business (Fagerberg, 2005; Schumpeter, 1983).<sup>2</sup> These typologies were introduced in the context of economic development and technological change, where innovation concerns radical, discontinuous change due to the occurrence of productive revolutions driven by new firms through technology push (Damanpour & Wischnevsky, 2006; Schumpeter, 1983). This work is known as Schumpeter’s *entrepreneurial model* of innovation (or Mark I), which champions entrepreneurial start-ups and their contributions to economic growth (Barras, 1986; Fagerberg, 2005). Innovation is the essence of new, independent companies creating new industries or acting as major agents of change in established industries (Barras, 1990; Sanidas, 2005).

In his later work, Schumpeter also noted the role of incumbents—established firms—as a source of innovation for economic development (Barras, 1986; Fagerberg, 2005; Schumpeter, 1950). This work is referred to as Schumpeter’s *corporate model* of innovation (or Mark II), where established firms are the vehicles for innovation because they possess scientific knowledge and management expertise, production means and other complementary assets, better access to capital, and often some degree of monopoly power, which increase

the likelihood of investing in innovation (Barras, 1990; Damanpour & Wischnevsky, 2006; Sanidas, 2005). According to this view, established organizations (like start-ups) drive efficiency and effectiveness through innovation and create economic wealth for owners/ investors, and eventually the society at large.

Schumpeter's innovation models have mostly been applied to the generation of new technology-based products and processes. When entrepreneurial opportunities—situations in which new businesses, products, processes, and services can be introduced (Shane & Venkataraman, 2000)—exist, individuals and organizations alike engage in innovation (Damanpour & Wischnevsky, 2006). *Entrepreneurs* (members of a large and dynamic population of innovators) pursue these opportunities by starting new organizations; *incumbents* (members of a small and stable population of innovators) pursue them by forming new businesses, alliances, and joint ventures. The primary motivation for seizing new opportunities for both individuals and organizations is to increase productivity and profitability and to create economic wealth and growth (Drucker, 1985).

In organization management, the competition and performance perspective of innovation is prominent in business policy and strategy, global (international) business, and technological and strategic entrepreneurship (Grant, 1996; Teece, Pisano, & Shuen, 1997; Hitt, Ireland, Camp, & Sexton, 2001; Lengnick-Hall, 1992).<sup>3</sup> However, the focus of this perspective on innovation as technological advancement in the industrial (commercial) entities restricts its application to other types of innovation and broader types of organizations. Hence, it alone is not sufficient to fully comprehend organizational innovation.

## Organization Adaptation and Progression

Organizations in all sectors, whether commercial or noncommercial, private or public, innovate to operate efficiently and perform effectively. Organizations introduce all types of innovations, whether technological or nontechnological, product or process, radical or incremental. Innovation is not only to gain competitive advantage over rivals, it is also a means of organizational adaptation and progression. Sustained performance or effectiveness can be gained not only by generating innovation (new to market or industry) but also by adopting innovation (new to the adopting organization). While organizations can develop competencies to generate one or few types of innovation, they can adopt all kinds of innovations along their value chain (Baldrige & Burnham, 1975; Hage & Aiken, 1970; Ross, 1974).

The adaptation and progression perspective assumes that organizations innovate to respond to environmental change, renew business portfolios, and serve their customers or clients effectively in order to achieve strategic positions and boost long-term performance (Damanpour & Gopalakrishnan, 1998; Roberts & Amit, 2003). It gained currency in the second half of the 20th century after the importation of system theory to organization studies (Ackoff & Emery, 1972; Churchman, 1968; von Bertalanfy, 1951, 1968), advancement of behavioral theory of the firm and contingency theory (Burns & Stalker, 1961; Cyert & March, 1963; Lawrence & Lorsch, 1967), and the advent of the long-term planning and business strategy (Ackoff, 1970; Ansoff, 1968; Schendel, Ansoff, & Channon, 1980). Organization is defined as an open system that is composed of interdependent parts (subsystems) and is embedded in an environment with which it exchanges and interacts (Ackoff, 1981; Emery & Trist, 1960; Scott, 1992). The environment is also a system, albeit larger and more complex than the organization, with its own subsystems and environment. It is usually divided into two levels: general (macro) environment, and transactional (micro, operating, competitive) environment (Daft, 2001; Mintzberg, 1979). Changes in either environment prompt organizational actions to maintain *external fit* (balance with environmental components) and *internal fit* (harmony among internal subsystems). Effectiveness of the organization requires carrying out the systemic processes of maintaining, adapting, and progressing (Evan, 1976). Organizations can adapt to environmental changes, shifts, or jolts via developmental, transitional, or transformational change (Burke, 2002; Jick, 1993). They may even choose to preempt changes in their competitive environment by investing in the state-of-the-art technologies, processes, and services to gain competitive advantage. Independent of the type and extent of change, innovation is viewed as a means of coping with and influencing the environment.

The adaptation and progression perspective offers that organizations are motivated to innovate because of (1) pressures from the external environment due to competition, deregulation, isomorphism, resource scarcity, and customer demands, and (2) internal organizational choices for gaining distinctive competencies, reaching a higher level of aspiration, and increasing the extent and quality of their products and services.

Innovations are instruments of organizational change for effective performance. The adaptation and progression perspective partially overlaps with a few other theoretical perspectives of innovation in organizations.<sup>4</sup> However, it provides a unique platform to coalesce insights from several strands of organization and innovation management literatures to explain innovation as a process and an outcome in organizations.

## **Conceptions of Innovation in Organizations**

Godin (2008) reviewed the history of innovation as a category and identified over ten concepts (discovery, invention, imitation, technology, creativity, change, etc.) that have been used to portray innovation over time. Among them, I have selected three that are closely associated with or taken for organizational innovation: technological innovation, organizational creativity, and organizational change.

I discuss the peripheries of innovation with technology, creativity, and change and offer a pathway to help determine how innovation can be distinguished from the overlapping concepts. I rely on the notion of low- and high-order concepts, which is derived from the classification of systems into levels (Boulding, 1956), where the complexity of the system increases from a lower-level system to a higher-level system. A high-order concept embodies a low-order concept similar to a system (organization) including its subsystems (units or parts). The low-high order portrays the hierarchy of goals of systems, the *means-end* relationship where the actions of a lower-order system affect the behavior of a higher-order system (like the *effect* of a part on the whole).

### **Innovation and Technology**

Public perception of innovation equates innovation with new technology or technical invention, and understands innovation in organizations as technological innovation. Innovation researchers have exacerbated this misunderstanding by using the term innovation to portray technology-based product and process innovations.<sup>5</sup> While the importance of technology and technological innovation for organization adaptation, competition, and performance is undeniable, taking technological innovation for innovation in general is simply wrong. The concept of innovation is broader than technical invention, and technological innovation is only one type of innovation that organizations generate or adopt.<sup>6</sup>

Tushman and Anderson (1986, p. 440) define *technology* as tools, devices, and knowledge that create new products or services (product technology) and mediate between inputs and outputs (process technology). Technology affects organizational efficiency, facilitates the conversion of inputs into outputs, and reduces inefficiencies in the development, production, and delivery of products and services. The product and process technologies



represent physical technologies. New physical technologies may drive the introduction of technology-based product or process innovations. In this vein, technology (technical invention) is a lower-order concept than technological innovation. Similarly, technological innovation can be viewed as a lower-order concept than technological change.

The definition of *technological change* in business and management is diverse. For instance, technological change reflects significant advances in technological performance within a technological regime (Lawless & Anderson, 1996); changes within uniform and differentiated technological systems leading to technological development of industries (Barnett, 1990); and technological breakthroughs or discontinuities leading to a dominant design (Wade, 1996). Godin's (2015B) study of the conceptual history of technological change offered two general meanings for it: (1) a narrower meaning—change in the methods and techniques of production; and (2) a broader meaning—change in the society due to technology. I adopt the broader meaning and posit that technological change occurs due to cumulative effects of multiple technologies and technological innovations over time. In this vein, technological change is a concept suitable to the level of product class, industry, and economy, not the organization. At the macro level, technological change can impact development of new industries, economic growth, level of employment, and societal prosperity (Ahlstrom, 2010; Edquist, Hommen, & McKelvey, 2001; Nelson & Winter, 1982).

In summary, I view technology as a lower-order concept than technological innovation, itself one among several types of innovations organizations generate or adopt.

Technological change is a higher concept than organizational innovation, is the outcome of a series of innovations in contexts such as industry, product class, region, and economy, and is not discussed in this article.

## Innovation and Creativity

Creativity is a concept that is imported to organization management from psychology, where it has been studied primarily at the individual level. Ford (1996) compared creativity with conformity and proposed a theory of creative individual actions as opposed to habitual individual actions. He defined *creativity* as the outcome of a particular individual action that is judged novel and valuable (Ford, 1996). Amabile (1988) states that innovation is “creativity plus implementation.” She distinguishes creativity from innovation by relating creativity to the production of novel and useful ideas by individuals and small groups and innovation to the successful implementation of those ideas (Amabile, 1988). This view suggests that creativity is a subprocess of innovation process, associates creativity more closely to the generation than the adoption of innovation, and has prevailed among the studies of creativity in organizations (Anderson, Potočnik, & Zhou, 2014; Baer, 2012; Woodman, Sawyer, & Griffin, 1993).

Research on technological innovation has related creativity to technical invention. For instance, in the 25th anniversary publication of *R&D Management*, Roberts (1988) characterizes innovation as “invention plus exploitation,” where invention is linked with the creative work of scientists and technologists. OECD’s definition of R&D also links it with technical invention, associating the connotation of creativity to innovation through invention (Godin, 2014). The oversized role of R&D on innovation prompted organizational psychologists to study scientists and engineers in R&D functions of organizations (Andrews & Farris, 1967; Pelz & Andrews, 1966; Pelz, 1956). Studies of creativity at work and in organizations gained currency (West & Farr, 1990; King, 1990; Scott & Bruce, 1994), eventually adding the term organizational creativity to innovation vocabulary in business and management. For instance, Woodman et al. (1993) define *organizational creativity* as the creation of useful and valuable new ideas, products, services, and processes by individuals working together in an organization, and conceive organizational creativity as a subset of the broader concept of organizational innovation. According to these authors, the difference between organizational creativity and organizational innovation is that the former includes creating new ideas and practices, but the latter can also include the adaptation of preexisting ideas and practices (Woodman et al., 1993). This distinction associates newness to creativity, but not to innovation.<sup>7</sup>

However, novelty or newness is a commonly accepted component of the definition of innovation across disciplinary fields. Moreover, organizational creativity cannot be distinguished from organizational innovation by stressing the importance of cooperative actions of individuals, because organizational members’ interactions are intrinsic to nearly all organizational activities. By definition organizations are social systems, and their activities depend on human actions. The creative behavior of individuals and small groups is necessary for every organizational action, including innovation.

Overall, in the context of organizations, I posit that creativity is a subset or a subprocess of innovation. Creative ideas, behaviors, and outcomes of individuals and small groups can help solve problems that arise throughout the innovation process. That is, they influence both the generation and adoption of innovations in organizations.

## **Innovation and Change**

*Change* is a shift or transfer from one state (prior to change) to another state (after the change) (Nadler & Tushman, 1997). It is an observation of differences in time in any dimension of organization (Van de Ven & Rogers, 1988). *Organizational change* is the introduction of activities that are different from those currently in use (Burke, 2002; Daft & Becker, 1978; Wischnevsky, Damanpour, & Mendez, 2011). It occurs when organizations evolve from old behaviors and methods of operation to new ones. Thus, by definition change and innovation are distinguished primarily by the newness or novelty of the idea or actions to the focal organization.

*Newness* is a term relative to the unit of adoption (Rogers, 1995), and its notion varies in different streams of innovation research (Gopalakrishnan & Damanpour, 1997; Crossan & Apaydin, 2010). Traditionally, in innovation diffusion research, newness is perceived in relation to the individual adopter (Rogers, 1995); in technology and strategic management, it is newness to a product class or an industry (Roberts, 1988; Tornatzky & Fleischer, 1990); and in innovation management, it is newness to an organizational unit (plant, business, division, department) or the entire organization (Kimberly & Evanisko, 1981; Ettlie, 1988). In most empirical studies, what constitutes newness is left as an empirical question, an issue for managers (respondents to surveys) or a panel of experts (academics and experts) to resolve. Thus, newness is determined subjectively through judgment of adopters or professional elites, exacerbating the distinction between innovation and change.

The processes of innovation and change are considerably similar. Organizations adopt both innovation and change, and each can be grouped as major or minor. The difference between the two concepts would need to be established conceptually. I thus view innovation as a subset or a subprocess of organizational change, mirroring the distinction that was made between creativity and innovation.

## **Innovation in Organizations**

Technology, creativity, and change intersect with innovation but are different concepts. In the context of organizations, creativity is a lower-order concept to innovation and innovation is a lower-order concept to organizational change. Innovation is a means to organizational change, although change can occur without innovation. Whereas the intersection of innovation and creativity associates more closely with the generation of innovation, the intersection of innovation and organizational change associates more closely with the adoption of innovation (details below).<sup>8</sup> Technology is an element or

component of innovation: Some innovations are technology-based; others are not. Technological innovation is only a type of organizational innovation and should not be mistaken for it.

The locus of innovation and its related concepts in organizations differs. Creativity is a concept associated with individuals and small teams, innovation and change with units and organizations, and technological change with product class and industry. Loose application of these concepts and indiscriminate interpretation of research findings of one to the others causes confusion and could impede an understanding of innovating and innovativeness in organizations.

Innovation in organizations is a systematic (focused, purposeful, and organized) activity (Drucker, 1985). The creative ideas and actions of individuals and small groups, as well as the organizational capabilities to manage the innovation process, influence organizational innovations. Moreover, both physical (hard, tangible) and social (soft, intangible) technologies can advance organizational capacity for innovations (Tether & Tajar, 2008). In terms of the means-end relationship, therefore:

Technology (physical) → technological innovation → technological change<sup>9</sup>

Creativity (individual and group) → organizational innovation → organizational change

# The Process of Generation and Adoption of Innovation

The innovation process is usually conceptualized as a sequential process, including recognition of problem/opportunity, development, production, commercialization, adoption, and implementation (Rogers, 1995; Angle & Van de Ven, 1989).<sup>10</sup> The wide-scope view of the process of innovation in organizations assumes that innovation is developed and implemented in the same organization. But innovations can be developed and commercialized by one organization, and adopted and used by others (Damanpour & Wischnevsky, 2006). In this vein, Tornatzky and Fleischer (1990) grouped the innovation process into two processes of “developing” and “using.” Klein and Sorra (1996) also distinguished between “source-based” and “user-based” process, where innovation in the former is a new product or practice an organization (or a unit of it) produces, and in the latter it is the first-time adoption of a product or practice by an organization (or a unit of it).<sup>11</sup>

Most studies of innovation in organizations do not discern between generation and adoption, and refer to both as innovation process. However, generation and adoption are distinct processes, with different phases and characteristics (Damanpour & Gopalakrishnan, 1998).<sup>12</sup> *Generation* is a process that results in the introduction of a new product, service, process, or practice to the market. It covers all organizational activities related to creating new ideas, getting them to work, and supplying them to the market for use by individuals and/or organizations (Roberts, 1988). The generation process includes recognition of opportunity, research, design, piloting and testing, commercial development, production, marketing, and distribution (Tornatzky & Fleischer, 1990; Roberts, 1988). *Adoption* is the process of choosing and using a product, service, process, or practice that is new to the adopting organization. Adoption basically means that the innovation is developed elsewhere, not in the adopting organization (Angle & Van de Ven, 1989). The adoption process includes problem perception, searching for solutions, evaluating and selecting one solution, initial implementation, sustained implementation, and eventually termination (Angle & Van de Ven, 1989; Hage & Aiken, 1970; Tornatzky & Fleischer, 1990). While in generation new and existing ideas are combined in a novel way to produce a configuration that was previously unknown, in adoption ideas new to the adopting organization are identified, acquired, and adapted to fulfill recognized needs or solve existing problems (Damanpour & Wischnevsky, 2006). The adoption is complete when organizational members or clients use the innovation regularly.

Research on the generation process has typically focused on the generation of technological innovations. For instance, in Roberts' (1988) characterization of innovation (invention plus exploitation), invention is marked by a new discovery (usually at the laboratory) and exploitation consists of the commercial development and conversion of that discovery into a useful application. Prominent in business policy, technology management, and economics, this view assumes that innovations are driven by technical invention (Godin, 2008). However, as Brozen (1951) points out, even the generation of technological innovation (change in the productive methods of technological possibilities)

need not be the result of technical invention (change in technological possibilities). Moreover, organizational innovation includes nontechnological innovation, whose generation has not been scrutinized in organization studies. A notable exception is Birkinshaw, Hamel, and Mol's (2008) four-stage process framework (motivation, invention, implementation, theorization, and labeling) for the generation of management innovations.

The generation of innovation requires more in-depth specialized knowledge than adoption. Thus, organizations can obtain expertise in generating a certain type of innovation. However, they can adopt a greater variety of innovation types, making innovation adoption a more commonly researched subject in innovation management. The adoption process has been grouped into two general stages of initiation and implementation, which are separated by the adoption decision (Rogers, 1995; Zaltman et al., 1973).<sup>13</sup> *Initiation* consists of activities that pertain to recognizing a need, searching for solutions, becoming aware of existing innovations, identifying suitable innovations, and proposing a few for adoption (Duncan, 1976; Rogers, 1995). In this phase organizations learn of the innovation's existence, evaluate its suitability, solicit advice from internal and external constituents, and make the adoption decision (Birkinshaw et al., 2008; Meyer & Goes, 1988). *Implementation* consists of activities that pertain to modifying the innovation, preparing the organization for its use, trial use, acceptance of the innovation by the users, and continued use until the innovation's use is routinized (Duncan, 1976; Rogers, 1995).

In summary, organizations can both generate and adopt innovations. In generation, the newness of innovation relates to an organizational population; in adoption, it relates to an organization. The process of generation and adoption are not alike. The generation process can be characterized more like a creative process, the adoption process more like a problem-solving process. The generation process is relatively disorderly, more like a random process of chance or chaotic events; the adoption process is relatively orderly, more like a periodic and sequential progression of phases (Cheng & Van de Ven, 1996; Damanpour & Wischnevsky, 2006). The generation process is usually slower and takes longer to complete than the adoption process. Since the stages and the characteristics of generation and adoption differ, the distinction between them is necessary to understand how organizations can innovate and what factors motivate innovating.

# Typologies of Organizational Innovation

The primary approach for reducing the complexity of innovation to study its antecedents and consequences has been to develop typologies. For instance, Schumpeter (1934) grouped innovation into five types, and Zaltman et al. (1973) listed approximately 20 types. Since then, more innovation types have been introduced, including architectural, business model, exploratory, exploitative, open, green, and so on. Among the typologies of innovation, three have been most widely studied: product-process, technical (technological)-managerial (administrative), and radical-incremental (Damanpour & Aravind, 2012B). Meeus and Edquist (2006) offered a taxonomy by juxtaposing the first two typologies. These authors distinguished between two types of product innovations—product (innovation in goods) and service (innovation in services)—and two types of process innovations—technological process (technical) and organizational (managerial).<sup>14</sup> Meeus and Edquist's taxonomy does not account for the openness of innovation. Tether and Tajar's (2008) model of firm-based innovation does. Tether and Tajar's model is based on three dimensions of change—changes to what the firm produces (product) versus changes to how the firm operates (process), changes to physical technologies (technical) versus changes to social technologies (administrative), and the locus of change, intrafirm (organic) versus interfirm (open).

I organize the discussion of innovation types into four pairs: product-process, technical-managerial, radical-incremental, and organic-open. The resulting eight types of innovation provide a general framework for studying the majority of innovations organizations generate and adopt.

## Product and Process Innovation

Product and process innovations are the most commonly studied innovation types. Academic research on this typology has generally focused on industrial innovations, specifically on R&D-based innovations (Damanpour, 2010; Tether & Tajar, 2008). This orientation has resulted in the understanding of product and process innovations as two types of technological innovations.

*Product innovation* is defined as the introduction of a new product or service to meet an external user need, and *process innovation* as the introduction of new elements in a firm's production or service operation in order to produce a product or render a service (Damanpour, 2010; Schilling, 2013; Utterback, 1994). Product innovations have an external focus and are primarily market-driven; process innovations have an internal focus and are mainly techniques of producing and marketing goods or services. The drivers of product innovations are customer need and demand, and firms' aspiration to compete and grow. The drivers of process innovations are reduction in delivery time, increase in operational flexibility, and lowering of production costs. Hence, while product innovations are embodied in the outputs of an organization and may result in product differentiation and

market expansion, process innovations are oriented toward the efficiency or effectiveness of production and may decrease production costs or increase product quality (Damanpour, 2010; Schilling, 2013; Utterback, 1994).

Henderson and Clark (1990) expanded the product–process typology based on two dimensions of “core concept” and “linkage between core concepts and components,” and introduced architectural innovation in contrast to component innovation. *Component innovation* entails changes to one or more components of a product system without significantly changing the overall design. *Architectural innovation* entails changing the overall design of the system or the way components interact (Henderson & Clark, 1990; Schilling, 2013). Architectural innovations may require changes in the underlying components. In introducing architectural innovations, Henderson and Clark (1990, p. 12) portray their conceptual model as “a framework for defining innovation.” However, architectural innovation is merely a subset or a subtype of technological product innovation and has rarely been applied to other types of innovation organizations generate or adopt.

Most studies of innovation in organizations do not distinguish service innovations from product innovations. Generally, services offered by organizations in the service sector are conceptualized to be similar to products introduced by organizations in the manufacturing sector (Damanpour & Aravind, 2012B; Miles, 2005; Meeus & Edquist, 2006). In this vein, like product innovations, the drivers of service innovations are clients’ demand for new services and executives’ desire to create new services for existing markets or to find new market niches for existing services (Miles, 2005). However, service innovations are not necessarily technology-based (Tether & Tajar, 2008), and firms in both goods and service industries can introduce them. Accordingly, *service innovation* is defined as the introduction of a new service to increase the effectiveness and quality of the organization’s output, whether a product or a service, to the customers or clients (Damanpour & Aravind, 2012B).



## Technical and Managerial Innovation

The technical-managerial typology was introduced in organization management in contrast to the product-process typology that dominated the studies of innovation in economics and technology management. The distinction between technical (technological) and managerial (administrative) innovations relates to a more general distinction between technology and social structure (Evan, 1966). Technical and managerial innovations are respectively associated with the organizations' technical and social systems (Damanpour & Evan, 1984) and technical and administrative cores (Daft, 1978). Evan (1966, p. 51) defined technical and administrative innovations as ideas for new product, process, and service, and ideas for new personnel policy, reward system, resource allocation, and structuring, respectively. *Technical innovations* are directly related to the primary work activity of the organization and produce changes mainly in its operating systems. *Administrative innovations* are indirectly related to the organization's primary work activity and affect mainly its management systems (Daft, 1978; Damanpour & Evan, 1984; Kimberly, 1981). Recently, the term management innovation has replaced the term administrative innovation. *Management innovations* are departures from management principles, processes, and practices that alter the way the work of management is performed, change how managers do what they do, and constitute the rules and routines by which work gets done inside organizations (Birkinshaw et al., 2008; Hamel, 2006). They reflect approaches to devising strategy, structure, and processes that are new to the organization (Kimberly, 1981; Vaccaro, Jansen, Van Den Bosch, & Volberda, 2012; Walker et al., 2011).<sup>15</sup>

While this new term has renewed interest in research on managerial innovation, the state of knowledge on this innovation type is in its infancy. The domain of managerial innovation is wide; the concept is complex, ambiguous, and difficult to measure; and rival theoretical arguments on motivation for its generation, adoption, and performance consequences exist (Birkinshaw et al., 2008; Damanpour & Aravind, 2012A; Sturdy, 2004). A variety of terms have been used to describe managerial innovations. In a literature review, Černe, Kaše, & Škerlavaj (2016) identified ten nontechnological innovations, the majority of which represent managerial innovation. The definitions and characteristics of the terms for managerial innovations show that they overlap markedly (Černe et al., 2016, pp. 71, 79). Černe et al. (2016) also conducted a cocitation analysis of nontechnological innovations and found considerable similarity in their intellectual structure. Multiplicity of terminology, combined with lack of established typologies and measurements of managerial innovations, has constrained the advancement of this important type of innovation (Armbruster, Bikfalvi, Kinkel, & Lay, 2008; Damanpour, 2014). For technological innovations, for instance, product and process innovations have been commonly accepted as subtypes, indicators for their measurement are established (patents, R&D expenditure, scientific publications, etc.), and historical data sets for their measurement exist. For the development of data sets of managerial innovations at par with those for technological product and process

innovations, commonly accepted terminology, typology, and measurement indicators should be selected and followed.

## **Radical and Incremental Innovation**

The radical-incremental typology is primarily applied to technological product and process innovations at both industry/product class and organizational level. At the level of industry, technology can be *disruptive* or *sustaining* depending on whether it is based on entirely new knowledge and obsoletes the existing products and processes or it improves the performance of products and processes along the existing dimensions of performance (Christensen, 1997). Innovation can be *competence-destroying*, when it departs from the organization's existing competencies, or *competence-enhancing*, when it builds on and improves existing competencies (Tushman & Anderson, 1986). At the organizational level, radical and incremental innovations are distinguished by the extent to which they change internal activities or outputs of the organization. As such, *radical innovations* are those that cause fundamental changes in organizational activities and result in a clear departure from existing products, processes, and practices, and *incremental innovations* are those that result in minor changes in the existing activities, products, processes, and practices (Damanpour, 1991; Dewar & Dutton, 1986; Ettlie, Bridges, & O'Keefe, 1984).

More recently, the radical-incremental typology has been augmented by the exploratory-exploitative typology. The new typology is based on the exploration-exploitation in organizational learning (March, 1991). *Exploration* refers to the application of learning to produce new products and technologies, and *exploitation* refers to the application of learning to refine the organization's existing products and improve its processes (March, 1991). The essence of exploration is experimentation with new ideas; it is associated with divergent thinking and flexibility. The essence of exploitation is the refinement of existing ideas; it is associated with convergent thinking and focus (March, 1991). *Exploratory* and *exploitative innovations* reflect the results of exploration and exploitation for an organization's innovative actions (Bierly, Damanpour, & Santoro, 2009; Jansen, Van Den Bosch, & Volberda, 2006).

Whereas the radical-incremental and the exploration-exploitation typologies have been applied mainly to technological innovations, they are also applicable to other innovation types. Both typologies are based on *innovation radicalness*, an attribute of innovation defined as (1) the extent to which the innovation departs from existing knowledge, or (2) the degree of change the innovation creates in organizational conduct or outcome (Damanpour & Wischnevsky, 2006). At the organization level, *change* can be a result of the introduction of technological or nontechnological innovations and the nature of *knowledge* can be technological or nontechnological. The dimension of radicalness can also assist in separating generation (more radical) from adoption (more incremental), and innovation (more radical) from change (more incremental). In particular, the application of radicalness to nontechnological innovation will be helpful in screening its subtypes and identifying a

few at par with product and process innovations (subtypes of technological innovation) to further theory and measurement of nontechnological innovations.

## **Organic and Open Innovation**

*Organic innovation* refers to in-house development of a new product, process, or service, when the focal organization invents, develops, and commercializes the innovation. Chesbrough (2003) called a company's full control of the innovation process "closed innovation," and introduced *open innovation*, an approach where the tight control is relaxed and the company brings in partners through various means of interorganizational cooperation (strategic alliances, joint ventures, consortia) in one or more aspect of the generation of innovation (Chesbrough, 2003). The flexibility in developing and commercializing internal and external ideas in cooperation with other firms expedites the generation of new products and processes for the current market and facilitates entering new markets (Chesbrough, 2003). Open innovation is an important concept that has captured a timely management practice that has been induced by the demise of large in-house R&D organizations (Economist, 2007), globalization of business operations and services, and the advance in information technology.

The concept of open innovation has been embraced in strategy and technology management. While early writings focused mainly on the ideation aspect of innovation generation (e.g., emphasis on crowdsourcing as a key means of open innovation), research on open innovation has been expanded to include the development, utilization, and retention of knowledge inside and outside of an organization's boundary throughout the innovation generation process (Chesbrough & Appleyard, 2007; Lichtenthaler, 2011). Theoretically, open innovation has followed the concept of absorptive capacity, which highlighted the importance of external sources of knowledge for the generation of technological innovations (Cohen & Levinthal, 1990). Strategy scholars have probed the impact of the breadth and depth of external sources for innovation and its performance outcomes (Laursen & Salter, 2006; Leiponen & Helfat, 2010). This research has focused mainly on the generation of technological innovations along the perspective of organization competition and performance.

To enrich open innovation's theoretical domain and integrate it with the extant literature on organizational innovation, the concept should be augmented to enable its application along the perspective of organization adaptation and progression. That is, the application of the concept should include the generation of nontechnological innovation, as well as the adoption of innovations. For instance, Birkinshaw et al. (2008) developed a conceptual model for the generation of management innovations and discussed the dual role of internal and external sources of information. Mol and Birkinshaw (2014) examined the forms of external involvement on the generation of management innovation. Damanpour, Sanchez, and Chiu (2017) discussed the dual role of internal and external knowledge sources on the adoption of management innovations. These studies suggest that there is

room to extend and expand open innovation to generation and adoption of all types of innovations, in goods and services, and in business and public organizations.

Whereas comparative studies of antecedents and consequences of product and process, technical and managerial, and radical and incremental innovations have been conducted, research on motivators and outcomes of organic versus open innovations are scarce. Large-sample comparative studies of this pair of innovation type are needed to develop a stronger theoretical foundation for the role of innovation openness on organizational conduct and outcome. From an adaptation and progression perspective, organizations as social systems are inherently open systems. The openness property of an organization is crucial to innovation activities because innovation in essence cannot occur in isolation inside a firm's boundary. Some form of interdependencies with suppliers, customers, research institutions, and even competitors are needed because individual companies are unable to keep up with the pace of the development of technical and managerial knowledge, even in modestly complex and dynamic environments. In general, the more complex the physical or social technologies that constitute the innovation and the more dynamic the external environment of the organization, the more porous the organization-environment boundary and the greater the need for sourcing knowledge through different means of organization-environment relations.<sup>16</sup> Future research should ground innovation openness in the behavioral theories of organization in order to clarify the dynamic of internal and external sources, and develop mechanisms for facilitating cooperation, preventing conflicts, and managing the diversity of knowledge sources (Damanpour et al., 2017).

## **Antecedents of Organizational Innovation**

Business and public managers are keen to understand conditions under which their organization can successfully innovate. Consequently, studies of the antecedents of organizational innovation constitute the largest body of this research. These studies have focused more on innovativeness than innovating, and on innovation adoption than generation. The majority have also examined organizational innovation as a single construct, although a considerable minority have distinguished between factors that predict pairs of innovation types. While innovation is recognized as a multilevel and multidimensional construct (Baldrige & Burnham, 1975; Damanpour & Schneider, 2006; Kimberly & Evanisko, 1981; Sears & Baba, 2011), most studies have examined a set of factors associated with one level (individual, group, organization) and one dimension (industry, internal structure, personal attributes).

I focus on three dimensions that embody the majority of organizational innovation antecedents: environmental (external, contextual), organizational (structure, culture), and managerial (leadership, human capital).<sup>17</sup> Myriad number of variables have been

associated with each dimension, and qualitative and quantitative reviews to identify salient antecedents have been conducted. For parsimony, I rely mainly on the review studies to discuss factors within each dimension.

## **Environmental Antecedents**

The review studies of environmental antecedents of innovation have identified different sets of factors. For instance, in a systematic review of publications on organizational innovation during 1981–2008, Crossan and Apaydin (2010, p. 1182) identified organization, technology, market, and innovation types as environmental antecedents. In another systematic review of publications during 1983–2003, Damanpour and Aravind (2006, p. 58) identified competition, concertation, technological opportunity, appropriability conditions, and growth of demand as contextual antecedents of innovation. The difference between the two reviews is threefold. First, Crossan and Apaydin's review is based on articles published mainly in management journals, whereas Damanpour and Aravind's review is based on publications mainly in economic journals. Second, Damanpour and Aravind's review includes only technological innovations; Crossan and Apaydin's review includes both technological and nontechnological innovations. Third, the focus of studies in Damanpour and Aravind's review is mainly the generation of innovations; in Crossan and Apaydin's review it is the adoption of innovations. As such, the original publications in the two reviews come from different disciplinary fields, resulting in dissimilar sets of variables as salient environmental antecedents of innovation.

Context dependency has also been shown in two recent systematic reviews that focused on innovation adoption. Černe et al. (2016) reviewed nontechnological innovations within 1975–2011 in the business context, and identified market orientation, dynamism, and competitiveness as typical antecedents. De Vries, Bekkers, and Tummers (2016) reviewed innovation in the public context during 1990–2014 and reported environmental pressures (institutional, political, public, media), participation in networks, and extent of regulation as usual environmental antecedents. In general, while typical environmental variables in public organizations are urbanization, deprivation, ethnicity, political orientation, and community affluence (Boyne, 2002; Damanpour & Schneider, 2009; Walker, 2008), in business organizations they are market competition, industry structure, governmental regulation, technological intensity, supplier power, and customer demand (Cohen & Levin, 1989; Roberts & Amit, 2003; Schilling, 2013).

The differences between environmental antecedents in these four reviews illustrate the crucial role of academic discipline, generation versus adoption, and innovation type in predicting organizational innovation. One way to partially bridge such differences toward coalescing environmental factors that affect organizational innovation is to rely on more general constructs (e.g., environmental uncertainty) and examine the influence of its components (e.g., complexity, dynamism, and diversity) on organizational innovation

(Daft, 2001; Damanpour & Gopalakrishnan, 1998; Mintzberg, 1979; Tidd, 2001). Reliance on general constructs, however, could cloud the specificity of the findings.

## Organizational Antecedents

Although environmental conditions and events motivate and influence organizations to engage in innovation, internal organizational conditions reflect their intent and capacity to do so. Organizations are managed entities, setting goals and priorities, and designing structure and processes to conduct their activities. Innovation is also a managed activity. It is a choice that requires financial and human resources, supportive climate and culture, and enabling structure, processes, and systems. Hence, organizational determinants of innovation have been examined more than environmental and managerial antecedents, especially in organization management.

Damanpour and Aravind (2012B) conducted a systematic review of the antecedents of organizational innovation in 1990–2009, compared their results with those reported in an earlier meta-analysis of publications in 1971–1988, and found the findings from the two reviews are generally consistent. They identified seven salient antecedents supported in the empirical studies in both periods: professionalism, specialization, technical knowledge resources, functional differentiation, management attitude toward change, and internal and external communication (p. 502). Crossan and Apaydin's (2010) review added organizational culture, learning, and strategy (mission, goals, resource allocation) to these structural variables (p. 1182). However, a systematic review of publications in strategic management of innovation (1992–2010) offered a different set of antecedents. Keupp, Palmie, & Gassmann (2012) grouped organizational antecedents into intended/emergent initiatives (R&D investment, technology sourcing, competitive strategy), internal organization (size, culture, structural integration), managerial/ownership issues (human resources, ownership, process management), and resources (prior performance, knowledge and capabilities, slack) (p. 374). With the exception of internal organization, the set of variables from Keupp et al.'s review corresponds closely with organizational antecedents of the generation of technological product and process innovations in Damanpour and Aravind's (2006, p. 58) review (firm size, profit, capital intensity, diversification, ownership, and technical knowledge resources). Thus, similar to environmental antecedents, organizational predictors of innovation are disciplinary-based, and are contingent on generation and adoption and innovation types. Organizational size is an exception, however.

Firm size is the most widely researched antecedent of innovation across disciplinary fields. The size-innovation association is governed by two sets of compelling arguments. On the one hand, small organizations are more innovative because they can make quicker decisions to go ahead with new and ambitious projects, and have less bureaucratic and more flexible structure, greater ability to adapt and improve, and less difficulty in accepting and implementing change (Damanpour, 2010; Nord & Tucker, 1987; Stevenson & Jarillo, 1990). On the other hand, large organizations are more innovative because they can risk failure and absorb the costs, have diverse professional skills allowing cross-fertilization of ideas, higher technical potential and knowledge, and better scale economies for raising capital and marketing new products and processes (Damanpour, 2010; Hitt, Hoskisson, & Ireland, 1990; Nord & Tucker, 1987). While empirical results from single studies remain inconsistent (Cohen & Levin, 1989), the findings from systematic reviews report a positive

relationship between size and innovation. For instance, Damanpour (2010) found that size positively affects both product and process innovations. Similarly, in a meta-analytic review that included all types of innovation, Camisón, Lapiedra, Segarra, and Boronat (2004, p. 331) found a positive association between organizational size and innovation ( $r=.15$ ,  $p<.05$ ).<sup>18</sup>

Chandy and Tellis's (2000) study on the influence of firm size on the introduction of 64 radical product innovations in consumer durables and office products from 1851 to 1998 provides historical evidence regarding the two competing arguments on the size-innovation relationship. These authors found that while 73% of radical product innovations were generated by nonincumbents before World War II, the incumbents significantly outnumbered nonincumbents (74% to 26%) for the innovations generated after the war (Chandy & Tellis, 2000, p. 8). The results from this longitudinal analysis suggest that by the middle of the 20th century the share of innovations introduced by larger firms surpassed those introduced by smaller firms. More recent cumulative evidence on the size-innovation relationship that suggest otherwise has not been reported.

## **Managerial Characteristics**

Top managers or strategic leaders influence innovation because they modulate the process of scanning the environment for threats and opportunities, formulate policy to respond to environmental change, control resources, and shape capabilities to enable innovation activity (Bantel & Jackson, 1989; Damanpour & Schneider, 2006; Elenkov, Judge, & Wright, 2005). They are also responsible for instituting values supportive of innovation, empowering middle and line managers, motivating members and improving their morale, and encouraging innovation actions and establishing rewards for them (Damanpour & Schneider, 2006; Hoffman & Hegarty, 1993; West & Anderson, 1996).

Prior research has explored three sets of managerial characteristics on innovations in organizations: demographic (age, gender, education, experience), personality (agreeableness, authoritarianism, openness to experience), and behavioral (inspirational motivation, championing innovation, contingent rewards). Studies in business and public management have generally identified transformational leadership, change-oriented behavior, favorable attitude and disposition toward change, and skills and ability to create a climate supportive of innovation as key managerial characteristics (Crossan & Apaydin, 2010; de Vries et al., 2016; Ekvall & Arvonen, 1991). Managers with these attributes build feelings of confidence among organization members, promote the generation of new ideas, and facilitate replacing existing practices with new ones (Damanpour & Schneider, 2006; Madjar, Oldham, & Pratt, 2002; Mumford, 2000). They also promote the implementation of innovation by allocating resources, laying the social and technical groundwork, building coalitions among different constituencies, and assisting coordination and conflict resolution among units and members (Damanpour & Schneider, 2006; Dewar & Dutton, 1986; Mumford, 2000).



Quantitative reviews of the influence of managerial characteristics on organizational innovation have not been conducted. However, the articles in a two-part special issue of *Leadership Quarterly* on Leading for Innovation point out that leadership makes a major difference in the generation of ideas for new products and practices, and highlights how leaders could manage creative people to conduct creative work in creative ventures (Mumford, Scott, Gaddis, & Strange, 2002; Mumford & Licuanan, 2004). However, effective leadership of creative efforts of individuals and small teams is necessary but not sufficient for organizational innovation. In organizational settings, the selection of good ideas could be more crucial than the mere generation of new ideas (Grant, 2016). Hence, in addition to the generation of ideas, research on leadership for innovation should probe the process of selecting an idea from the portfolio of ideas, account for the effect of environmental and organizational factors on idea creation and selection, and explore whether the role of organizational leader differs in the process of generation of innovations of different types.

## **Summary**

To make sense of multiple dimensions and numerous factors that could affect innovation in organizations, I suggest a sequence of decisions in selecting the dimensions and deciphering the antecedents. The first and perhaps most important decision is to identify organizational type, whether goods or services, business or public, low-tech or high-tech, and so on. Meta-analytical studies have reported significant differences between the antecedent-innovation relationships in different types of organizations (Camisón et al., 2004; Damanpour, 1991). Second, factors that influence the generation of innovation may not be compatible with those that influence the adoption of innovation. As such, a distinction between innovation-generating and innovation-adopting organizations is necessary. Third, while a set of antecedents may predict the process of innovation (innovating), a different set may predict organizational ability to innovate continually (innovativeness). Fourth is the distinction between innovation types, especially the technological-nontechnological and the radical-incremental, for the identification of salient antecedents of each type. Fifth, the relative importance of the environmental, organizational, and managerial characteristics in different types of organizations may differ. Current studies have not tested such differences, future studies should. Finally, the complexity of innovation constrains offering a common theory of organizational innovation. A possible approach researchers may pursue could be to focus on the antecedents of pairs of innovation types along firms' value chains (Porter, 1985; Schilling, 2013). For example, antecedents of: (1) product-process pair for inbound versus outbound logistics; (2) technical-managerial pair in firm infrastructure versus human resource management; and (3) radical-incremental pair in technology development versus operations.

# Organizational Innovation and Firm Performance

The widespread popularity of innovation stems from the assumption that its introduction results in positive (intended, expected, desired) outcomes. Rogers (1995) referred to this view as “pro-innovation bias.” While innovation is risky and its success is not certain, scholars and practitioners alike postulate that innovation strategies and activities boost firm performance. Empirical studies of the generation and adoption of innovations in organizations have usually supported this expectation (Bowen, Rostami, & Steel, 2010; Calantone, Harmancioglu, & Droge, 2010; Rosenbusch, Brinckmann, & Bausch, 2011; Walker, Chen, & Aravind, 2015). Studies of innovation failure are scarce.

The rationale for the favorable influence of innovation on firm conduct and outcome is offered by the first-mover advantage and performance gap theory (Damanpour, Walker, & Avellaneda, 2009; Keupp et al., 2012; Lam, 2005). The first-mover advantage imbedded in strategic management stresses the importance of generating new products and services for firm competitiveness and growth (Lieberman & Montgomery, 1988). Firms adopt first-mover strategy to become dominant in a product class or market and gain superior performance over time (Cohen & Levinthal, 1990; Roberts & Amit, 2003). First-mover strategy prompts organizations to engage in innovation activity, enables them to be aware of the latest developments, absorbs new and related knowledge, and increases the likelihood of benefiting from innovation activities in the long term (Bierly et al., 2009; Lieberman & Montgomery, 1988; Roberts & Amit, 2003).

Performance gap is defined as the perceived difference between an organization’s potential and actual accomplishments (Damanpour et al., 2009; Zaltman et al., 1973). Performance gap creates a need for organizational change, which in turn provides motivation to introduce innovation to produce change and reduce the perceived gap. The domain of performance gap theory is broader than that of first-mover advantage. While first-mover advantage applies to business organizations, performance gap applies to all types of organizations, whether business or public, service or manufacturing, low- or high-performance (Damanpour et al., 2009). The first-mover theory suits the generation of new products and services; performance gap theory is applicable to the adoption of any type of innovation, although it can also induce the generation of innovation.

## **Technological and Nontechnological Innovations and Performance**

The conceptual confusion surrounding innovation and technology and misrepresentation of innovation as solely technology-based new products and processes has resulted in the perception that firm performance is affected by technological, but not necessarily by nontechnological, innovations. Studies of technological innovations in organizations are often espoused by the theories of economies of organization, which in management is referred to as rational (technical-efficiency) approach. The studies of nontechnological innovations, however, are governed by multiple theoretical approaches. Sturdy (2004) identified five such approaches (political, cultural, institutional, dynamic, and dramaturgical or rhetorical) for managerial innovations and compared them with the rational approach. He argued that the alternative approaches marginalize managerial rationality, might lead to empirical neglect, and portray rational management as bounded and emotional (Sturdy, 2004). In organization studies, the main alternative to the rational approach has been the institutional approach, often under the label of management fad and fashion (Damanpour, 2014).

To induce innovation, the rational perspective emphasizes on the influence of market dynamism and competition; the institutional perspective emphasizes pressures from regulators, parent organizations, and network members (Ashworth, Boyne, & Delbridge, 2009; Sturdy, 2004). Institutional pressures impel organizations toward conformity with rules and norms of their fields and heighten the importance of pursuit of legitimacy in organizational actions (Ansari, Fiss, & Zajac, 2010; Ang & Cummings, 1997). These pressures would more strongly affect nontechnological than technological innovations. For instance, organizational leaders are uncertain about technical efficiency of managerial innovations and rely on their currency in the population (Abrahamson, 1991; Burns & Wholey, 1993). Hence, the adoption of managerial innovations would result in social approval and reputation (social gain) rather than performance outcome (economic gain) (Abrahamson, 1991; Greve, 1995). Staw and Epstein (2000) provided empirical evidence for this view. They studied three administrative practices (quality, empowerment, and teams) and the implementation of TQM, and found that organizations that adopted them did not show higher economic performance (returns on asset, equity, and sales) but were more admired, perceived to be more innovative, and rated higher in management quality in their population (Staw & Epstein, 2000, p. 523).

However, a recent quantitative review of the relationship between managerial innovation and firm performance provided evidence for a positive effect. Walker et al. (2015) integrated the empirical findings from 44 articles published in peer-reviewed journals via two different quantitative procedures, examined moderating effects of several factors, and found that the adoption of managerial innovations positively affects organizational performance. Further, using data from a subsample of 22 articles, Walker et al. (2015) integrated the empirical findings for the technological innovation–performance association and found a positive relationship also.<sup>19</sup> A comparison of a matched sample of associations of

technological and managerial innovations with organizational performance showed that the two types of innovations affect performance similarly (Walker et al., 2015).

Overall, while managerial (nontechnological process) innovations are considered to be economically and socially important (Arrow, 1962; Edquist et al., 2001; Sanidas, 2005), and their introduction is deemed necessary to rejuvenate organizational strategy, structure, and systems (Birkinshaw et al., 2008; Stata, 1989; Volberda, Van Den Bosch, & Heij, 2013), research on this type of innovation lags behind technological innovation, and its influence on performance is deemed to be less predictable. Managerial innovations are operationally complex (difficult to implement and use), pervasive (changing administrative structure, authority, and power), and adaptable (modified during the adoption process) (Ansari et al., 2010; Damanpour, 2014).<sup>20</sup> Tidd (2001) argued that establishing a strong empirical relationship between innovation and performance is difficult because of technological and market contingencies, and methodological shortcomings (measurement of both constructs). For technological innovations surrogate measures such as patents and R&D expenditure are available and accepted; for nontechnological innovations easily quantifiable surrogate measures have not yet been developed (Arnbruster et al., 2008; Damanpour & Aravind, 2012A; Evangelista & Vezzani, 2010). Convincing empirical evidence on the stronger effect of one type above the other type has not yet emerged. Theoretical arguments, however, point to their combinative rather than stand-alone effects on performance outcomes.

### **Combinative Effects of Innovation Types**

On the one hand, according to the first-mover advantage theory and based on the logic of organization competition and performance, superior performance occurs when a (technological) product or process new to a product class is introduced in the market and is received well by customers. Positive performance outcomes induce organizations to invest in excelling at the type of innovation for which they have been successful. Prior experience with a certain body of knowledge encourages further absorption of the same type of knowledge because organizations can more easily integrate, explore, and exploit the absorbed knowledge to create new opportunities that would further result in performance advantages (Bierly et al., 2009; Cohen & Levinthal, 1990; Roberts & Amit, 2003). Most studies of performance consequences of innovation follow this logic and focus on one type of innovation, often product or technological.

On the other hand, according to the performance gap theory and based on the logic of organizational adaptation and progression, sustained performance requires the introduction of different types of innovations over time to help adapt organizations to the external and internal changes (Damanpour et al., 2009; Roberts & Amit, 2003). Innovation types are interdependent, the introduction of one type could prompt the introduction of another type, and an understanding of contributions of each type requires an understanding of its relations with the other types. Performance consequences of innovation could best be captured by longitudinal studies that include the introduction of

compatible sets of innovation types (product and process, technological and nontechnological, radical and incremental) across organizational parts or subsystems (Damanpour, 2014).

Georgantzas and Shapiro (1993) defined *synchronous innovation* as the adoption of compatible technological and managerial innovations, examined the influence of four descriptive models of synchronous innovation (independent, moderating, mediating, and interactive) on organizational performance, and found that the independent effect of each innovation type on performance is negligible without synchronous innovation (p. 161). Roberts and Amit (2003) extended the notion of synchronous innovation to compositions of innovation types. These authors investigated the influence of three compositions (focus, commitment, and divergence) of three types of innovations (product, process, and distribution) on performance in retail banking organizations longitudinally and found that long-term performance depends on the history of innovation activity in organizations rather than occasional success of stand-alone innovations (Roberts & Amit, 2003). Damanpour et al. (2009) also investigated three compositions (focus, consistency, and divergence) of three different types of innovation (technological, administrative, and service) in public service organizations and confirmed Roberts and Amit's conclusion. Longitudinal, empirical evidence from these studies challenges the notion that firm performance is enhanced by focus on excelling at a specific type of innovation, whether product, service, process, technical, or managerial. Instead, in line with adaptation and progression view they suggest that sustained performance requires harmonious modifications of various organizational subsystems via the introduction of complementary innovation types (Ballot, Fakhfakh, Galia, & Slater, 2015; Battisti & Iona, 2009; Hervas-Oliver & Sempere-Ripoll, 2014; Naranjo-Gil, 2009).

Theoretical support for complementarity of innovation types and their combinative performance effects can be found in organization and strategic management. The perspective of organizations as socio-technical systems is an early example. This perspective theorized that the relationship between organizational subsystems is not strictly a one-to-one relationship; rather, it is a correlative relationship representing a coupling of dissimilarities, where changes in one subsystem necessitate corresponding changes in the other subsystems (Emery & Trist, 1960). The social and technical systems interact continuously and are inclined toward a dynamic equilibrium in relation to the external environment (Boonstra & Vink, 1996; Trist & Murray, 1993). Any change in one system sets certain constraints and requirements, and necessitates a corresponding change in the other system. Considering technical and administrative innovations as means of changing the technical and social systems, organizational performance requires a balanced introduction of both types (Damanpour & Evan, 1984).

Theories and perspective in strategic management also allude to the complementary role of innovation types. For example, the resource-based and knowledge-based views underscore the roles of external and internal sources of knowledge and the firm's capability to integrate them to gain distinctive competencies (Barney, 2001; Grant, 1996). Theories of operational and combinative capabilities also imply that innovating across organizational functions and systems could ensure renewal of competencies to build,

reconfigure, and integrate internal and external experiences to cope with the dynamics of environmental change (Eisenhardt & Martin, 2000; Helfat & Winter, 2011; Van den Bosch, Volberda, & de Boer, 1999). The application of these views to innovation activity at the firm level underlines the synergistic use of organizations' technological, operational, and managerial knowledge resources, motivating the synchronous introduction of innovation types across organizational parts to gain sustained performance outcomes (Damanpour, 2014).

## Summary

The complexity of both innovation and performance constructs combined with myriad indicators for their measurement has prevented rigorous evidence on conditions and the extent to which the generation or adoption of innovation contributes to organizational performance. However, two important trends have emerged. First, since organizations generate and adopt innovation continually over time, an assessment of the true impact of innovation on performance requires longitudinal research. Second, research on performance consequences of innovation has shifted from the stand-alone to synchronous innovations. The synchronous view departs from the prevailing logic that espouses autonomous strategies of innovation types for competitive advantage and submits that innovation types, along with organizational subsystems, are interdependent and their complementary introduction could best influence organizational conduct and outcome (Damanpour, 2014). In this vein, the notion of *internal fit*, which espouses congruency in the behavior of organizational parts, also applies to the introduction of types of innovations in organizations to facilitate *external fit*, which espouses congruency in the behavior of organizations with their competitive and institutional environments.

## Conclusions and Future Research

A student in a doctoral seminar on the management of innovation observed that each article he reads adds one more star to the innovation galaxy, but the new star, as bright as it might be, does not improve his understanding of innovation. This student's predicament is not unique to him or to innovation studies. Researchers may face similar predicaments in organizational sciences, where theories are incompatible, findings inconsistent, and the body of knowledge indigestible (Zammuto & Connolly, 1984, p. 32). Research in management commonly pursues a scattered pattern where empirical studies are rarely replicated and can differ greatly in terms of definitions of key constructs, the nature of the phenomenon studied, and measurement instruments (Tsang & Kwan, 1999). Organizational studies are diverse and fragmented and theoretical and methodological consensus are not in sight (Hambrick, 1994; Pfeffer, 1993).

Assuming that diversity in innovation management research is unavoidable and consensus rather impossible, this article has mapped this research, identified major dimensions and their key components, discussed differences among components, and offered ideas to avoid unsuitable inferences. This section concludes by proposing steps to scan organizational innovation research, identify issues in the existing studies, and develop new studies. The study of innovation in organizations is theoretically and practically important, and ample opportunities exist for additional research to help explain how organizations innovate and in which contexts innovation could contribute to their conduct and outcomes. To advance the state of knowledge, innovation scholars should set out to demystify the innovation galaxy to allure new scholars and facilitate their learning rather than confusing them in the name of generating new theories (Hambrick, 2007).

## **Disciplinary Differences in Conceptualization of Innovation**

Research on innovation from the economic perspective treats organization as a black box often recognized by its small or large size, sector or industry. Organizational innovation research, however, requires opening the black box, observing operational and administrative activities occurring in it, and explaining what set of activities could lead to innovation and how. Whereas insights from multiple disciplinary fields enrich research on innovation in organizations, the differences in conceptualizations, levels of analysis, and methodological predispositions should be accounted for. The absorption and integration of theories and findings from another discipline require a deliberate effort to articulate relevance and applicability. Otherwise, disciplinary differences will result in fragmentation and confusion rather than contribution and understanding.

Intradisciplinary differences also exist among subfields of innovation management, but the absorption and application of knowledge from one subfield to another is more feasible. For instance, to bridge the differences between innovation research from micro and macro organizational behavior, Crossan and Apaydin (2010) propose a unifying approach at a meso level to link managerial actions with innovation conduct and outcome. In another example, Keupp et al. (2012) identify theoretical inconsistencies and knowledge gaps in the strategic management of innovation, encourage strategy scholars to take notice and use insights from other subfields of innovation management, and advise them to scrutinize commonalities and differences in the definition and operationalization of innovation. Innovation strategy research would need to move beyond its mere focus on technological innovations and their singular impact on firm performance. Research on other types of innovation and how different types can be introduced and managed strategically can provide valuable insights for understanding management of innovation in strategy and other subfields of organization management.

Using innovation as a sweeping word that crosses disciplines will enlarge and further complicate the innovation galaxy. Authors should be cognizant of innovation as understood and defined in various disciplines and refrain from irrelevant importation and loose generalization. Reviewers and editors of academic journals should be more cognizant of authors' limitations, and their own, refrain from discouraging repetitions, seeking new theory in every single submission, and protecting their personal investments in certain theoretical perspectives and methodologies (Starbuck, 2016). For a start, the type of innovation a paper studies and the context of the study should be included in the paper's title. This simple act mitigates the major conceptual confusion in innovation research: mistaking technology for innovation. The context of innovation studies in the subfields of organization studies differs. The primary purpose, innovation issue, and key actors in small and large, and in business and public, organizations differ. For example, the central actor in a small start-up firm is the entrepreneur, but in medium-size and large organizations individual actors' influence is mitigated by organizational culture, structure, power, and politics. In a business organization the ultimate outcome is often market share or financial



outcome, in a government organization it is the reach and quality of services to citizens. These differences make the distinction between organizational types and innovating and innovativeness necessary for understanding, interpreting, and learning from the vast body of knowledge on innovation in organizations.

## **Generation, Adoption, and Organizational Type**

In addition to the assumption that innovation is merely technology-based, many innovation studies also assume that innovation is a unitary process, and thus bypass the differences between generating and adopting innovations. Organizations can be generator of innovation, adopter of innovation, or both. They may also generate innovation for their own use, for external markets, or both. A distinction of the type of relationship between innovation and organization is necessary for deciphering the existing research and associating the conditions that prompt innovation in a certain type of organization (Kimberly, 1986).

Research on structuring for innovation has proposed several dual or ambidextrous structures based on initiation and implementation stages of adoption (Duncan, 1976), technical and administrative types of innovation (Daft, 1978), and radical and incremental types of innovation (Tushman & O'Reilly, 2002). Damanpour and Wischnevsky (2006) distinguished between organizations for generating innovations and organizations for adopting innovations. The innovation-generating organization, whether a new firm created by an entrepreneur or a self-contained unit of a large organization, requires the ability to accumulate knowledge and diffuse it inside the organization, motivate individuals' and teams' creative actions, and overcome technological and organizational obstacles to generate innovations expeditiously. The innovation-adopting organization mainly exploits current knowledge to seize new strategic opportunities or to solve existing organizational problems. It adopts new technologies, products, and practices available in the market, and applies them to improve its products, services, practices, and systems (Damanpour & Wischnevsky, 2006). These authors concluded that the typical questions of how to innovate, what conditions induce or drive innovativeness, and how innovation impacts performance should be broken into two sets of questions: one for generating innovations, another for adopting innovations.

The distinction between organizational types in general, and ambidextrous structures in particular, can help organize the existing research. Recognition of the differences between innovation generating and adopting organizations, for instance, is useful for separating the conditions that drive generation versus adoption, for aligning the studies of innovation in strategy with those in organization management, and helping to distinguish innovation activities for gaining competitive advantage from those for sustaining competitiveness.

## Emerging Field of Nontechnological Innovations

Research on managerial innovation dates back to the 1960s–1980s. Birkinshaw et al.'s (2008) article rejuvenated interest in this innovation type, resulting in a considerable number of new studies. For instance, European Academy of Management has thus far sponsored three thematic conferences on management innovation, and two special issues edited by Volberda and colleagues (Volberda et al., 2013; Volberda, Van Den Bosch, & Mihalache, 2014) have been published. Recent articles have focused on theoretical perspectives, creation, adoption, and antecedents of managerial innovation, and have articulated future research avenues (Birkinshaw et al., 2008, pp. 839–842; Damanpour, 2014, pp. 1276–1279; Volberda et al., 2013, p. 8; Volberda et al., 2014, pp. 1258–1260). However, lack of consensus on the definition and measurement of managerial innovations remains an obstacle to the advancement of this untapped area of innovation research.

The OECD (2005) Oslo Manual added two types of nontechnological (organizational and marketing) innovations to technological (product and process) innovations, which were surveyed since 1993. OECD's organizational innovation (synonymous with managerial innovation as defined in this paper) is grouped into three types: *business practices* for organizing procedures, methods of *organizing work responsibilities and decision-making*, and methods of *organizing external relations*. It groups marketing innovation into four types: *aesthetic design or packaging* of good or service, techniques for *product promotion*; methods for *product placement*, and *methods for pricing* goods or services. Data on organizational and marketing innovations are collected by seven dichotomous questions via Community Innovation Survey (CIS) since 2004. Empirical studies have selectively included OECD's organizational and marketing innovations in their operationalization of nontechnological innovations (Černe et al., 2016; Damanpour, 2014).

Černe et al. (2016) recommends coalescing various types of nontechnological innovations under one umbrella category. The category includes ancillary, business model, marketing, and open innovations, in addition to managerial innovation. Marketing innovation is an established innovation type, and has its own relatively large literature. It overlaps with the studies of product innovations, and relates mainly to the generation of innovations. Marketing and management are also two separate functional areas within business schools and are viewed as different specialties in business and management. However, in-depth comparative review analyses of managerial and marketing innovations may show that they do have a similar theoretical foundation and intellectual structure. Future research can explore such ideas and issues on the composition of nontechnological innovations.

Open innovation has been applied in strategic management and can be more easily integrated with the studies of innovation in other subfields of management. However, since closed innovation is an anomaly and cannot exist by definition, open innovation, similar to radicalness of innovation, can be regarded as a continuum rather than a type. *Innovation openness*, the extent to which organizations involve external players in various stages of generation or adoption of innovation, is applicable to all types of innovation, as is innovation radicalness. Future research on innovation openness should go beyond technological innovations in the goods sector and examine forms of external involvement for nontechnological innovations in services and public organizations. External partners,

whether individuals or organizations, can participate and influence the creation and utilization of all types of innovation. For example, Birkinshaw et al. (2008) discussed roles of internal and external players in the development of management innovations and argued that external players (academic and nonacademic experts) have a more prominent role than internal players. Future research can also investigate the consequences of innovation openness. Innovation openness via strategic alliances and joint ventures is not a panacea for success. Cooperative innovation mode should be compatible with organizational culture and strategy, and interfirm differences should be managed effectively (Lichtenthaler, 2011). The success of innovation openness is not just a function of strategy formulation; instead, it depends heavily on organizational competencies for strategy implementation. Boeing's experience in the design and production of the 787 Dreamliner is a revealing example (HBS Case #9-305-101).

### **Innovation from Garage, Innovation from Office**

In the late 19th century Gabriel Trade, a sociologist, portrayed innovation as imitation concerning social transformation; in the early 20th century Joseph Schumpeter, an economist, set the ground for portraying innovation (new combination) as technical invention concerning economic development (Godin, 2008). Schumpeter's entrepreneurial model of innovation underlined the role of entrepreneurs for bringing technical and social change, and personal and economic prosperity. In North America, innovation as a function of entrepreneurs continues to fascinate researchers, practitioners, and the general public. Young people, often without formal education or college dropouts, come up with an innovative product or service, launch and manage a new business, and gain enormous success. A contemporary example of this idealized model of innovation is the story of Steve Jobs and Apple, Inc. The corporate model of innovation, along with continued growth and global dominance of large corporations in the second half of the 20th century, brought attention to "innovation from office," but did not replace "innovation from garage" in the public imagination.

Research on innovation in organizations has been influenced by both views. However, in medium-size or large organizations where the entrepreneurial stage has passed, formal structure and processes have been devised, and the leaders are professional managers, not owner-managers, innovation from office is essential. Managing innovation in a new enterprise in the early stages of its life cycle is different from that of a medium-size or large organization in the later stages. In the postentrepreneurial stages, for instance, the central actor for innovation is not the owner-manager or the CEO only. Influences of individual actors in innovation activities are mitigated by the organization's culture and structure. Hence, reliance on the competition and performance perspective to explain innovation in medium-size and large organizations is inadequate. This perspective would need to be augmented or replaced with the adaptation and progression perspective in accordance with types and contexts of organizations. In this vein, research on organizational innovation would need to move beyond the 20th-century paradigm—that

sustained long-term performance of organizations is based on the introduction of commercialized technology-based new products and processes—to a 21st-century paradigm in which continuous high performance pivots on the complementary effects of sets of innovation types guided by environmental demands and managerial aspirations.

Early steps toward the new paradigm have been taken. For instance, research on the relationship between innovation types has moved from a sequential pattern (product leads process, technical leads managerial) to a synchronous pattern (product and process intersect, technical and managerial complement), and from a focus on the importance of technological innovations for organizational effectiveness to one that also includes nontechnological innovations. Better theory and more empirical evidence are needed, however. Future studies of organizational innovation can contribute by continuing and advancing these new research trends by developing theory and investigating the dynamics of innovation types and their combinative effects on organizational conduct and outcome in a variety of contexts. The studies should also inform practitioners how to design and manage organizations for innovation, create and maintain a proinnovation culture and climate across organizational parts, drive continuous improvement of operations, systems, and human knowledge, and ensure that innovation not only benefits the organization but also does not harm the people and the environment.

## Acknowledgement

The author thanks Rachel Bocquet, Benoît Godin, and the reviewers and editors of the *Oxford Research Encyclopedia for Business and Management* for their helpful comments.

## References

Abernathy, W. J., & Utterback, J. M. (1978). Patterns of industrial innovation. *Technology Review*, 80, 40–47.

- **Google Preview**
- **WorldCat**

Abrahamson, E. (1991). Managerial fads and fashion: The diffusion and rejection of innovation. *Academy of Management Review*, 16, 586–612.

- **Google Preview**
- **WorldCat**

Ackoff, R. L. (1970). *A concept of corporate planning*. New York: Wiley-Interscience.

- **Google Preview**
- **WorldCat**

Ackoff, R. L. (1981). *Creating the corporate future*. New York: John Wiley.

- **Google Preview**
- **WorldCat**

Ackoff, R. L., & Emery, F. E. (1972). *On purposeful systems: An interdisciplinary analysis of individual and social behavior as a system of purposeful events*. Chicago: Aldine-Atherton.

- **Google Preview**
- **WorldCat**

Ahlstrom, D. (2010). Innovation and growth: How business contributes to society. *Academy of Management Perspective, August*, 10-23.

- **Google Preview**
- **WorldCat**

Aiken, M., & Hage, J. (1971). The organic organization and innovation. *Sociology, 5*, 63-82.

- **Google Preview**
- **WorldCat**

Allan, T. A., & Sosa, M. L. (2004). 50 years of engineering management through the lens of the IEEE Transactions. *IEEE Transactions on Engineering Management, 51*(4), 391-395.

- **Google Preview**
- **WorldCat**

Amabile, T. M. (1988). A model of creativity and innovation in organizations. In L. L. Cummings & B. M. Staw (Eds.), *Research in organizational behavior* (Vol. 10, pp. 123-167). Greenwich, CT: JAI Press.

- **Google Preview**
- **WorldCat**

Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management, 40*(5), 1297-1333.

- **Google Preview**
- **WorldCat**

Andrews, F. M., & Farris, G. F. (1967). Supervisory practices and innovation in scientific teams, *Personnel Psychology, 20*(4), 497-515.

- **Google Preview**
- **WorldCat**

Ang, S., & Cummings, L. L. (1997). Strategic response to institutional influences on information systems outsourcing. *Organization Science*, 8(3), 235-256.

- **Google Preview**
- **WorldCat**

Angle, H. L., & Van de Ven, A. H. (1989). Suggestions for managing the innovation journey. In A. H. Van de Ven, H. L. Angle, & M. S. Poole (Eds.), *Research on the management of innovation: The Minnesota studies* (pp. 663-697). New York: Oxford University Press.

- **Google Preview**
- **WorldCat**

Ansari, S. M., Fiss, P. C., & Zajac, E. (2010). Made to fit: How practices vary as they diffuse. *Academy of Management Review*, 35, 67-92.

- **Google Preview**
- **WorldCat**

Ansoff, H. I. (1968). *Corporate strategy: An analytic approach for business policy and growth*. New York: McGraw-Hill.

- **Google Preview**
- **WorldCat**

Armbruster, H., Bikfalvi, A., Kinkel, S., & Lay, G. (2008). Organizational innovation: The challenge of measuring non-technical innovation in large-scale surveys. *Technovation*, 28, 644-657.

- **Google Preview**
- **WorldCat**

Arrow, K. J. (1962). The economic implications of learning by doing. *The Review of Economic Studies*, 29(3), 155-173.

- **Google Preview**
- **WorldCat**

Ashworth, R., Boyne, G., & Delbridge, R. (2009). Escape from the iron cage? Organizational change and isomorphic pressures in the public sector. *Journal of Public Administration Research and Theory*, 19, 165-187.

- **Google Preview**
- **WorldCat**

Baer, M. (2012). Putting creativity to work: The implementation of creative ideas in organizations. *Academy of Management Journal*, 55, 1102-1119.

- **Google Preview**

- **WorldCat**

Baldrige, J. V., & Burnham, R. A. (1975). Organizational innovation, individual, organizational, and environmental impacts. *Administrative Science Quarterly*, 20, 165-176.

- **Google Preview**
- **WorldCat**

Ballot, G., Fakhfakh, F., Galia, F., & Slater, A. (2015). The fateful triangle: Complementarities in performance between products, process and organizational innovation in France and the UK. *Research Policy*, 44, 217-232.

- **Google Preview**
- **WorldCat**

Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: Does the composition of the top management team make a difference. *Strategic Management Journal*, 10(S), 107-124.

- **Google Preview**
- **WorldCat**

Barnett, W. P. (1990). The organizational ecology of a technological system. *Administrative Science Quarterly*, 35, 31-60.

- **Google Preview**
- **WorldCat**

Barney, J. B. (2001). Is the resource-based view a useful perspective for strategic management research? Yes. *Academy of Management Review*, 26, 41-56.

- **Google Preview**
- **WorldCat**

Barras, R. (1986). Towards a theory of innovation in services. *Research Policy*, 15, 161-173.

- **Google Preview**
- **WorldCat**

Barras, R. (1990). Interactive innovation in financial and business services: The vanguard of the service revolution. *Research Policy*, 19(3), 215-237.

- **Google Preview**
- **WorldCat**

Battisti, G., & Iona, A. (2009). The intra-firm diffusion of complementary innovations: Evidence from the adoption of management practices by British establishments. *Research Policy*, 38, 1326–1339.

- **Google Preview**
- **WorldCat**

Becker, S. W., & Whisler, T. M. (1967). The innovative organization: A selective view of current theory and research. *Journal of Business*, 40(4), 462–469.

- **Google Preview**
- **WorldCat**

Bierly, P., Damanpour, F., & Santoro, M. (2009). The application of external knowledge: Organizational conditions for exploration and exploitation. *Journal of Management Studies*, 46(3), 481–509.

- **Google Preview**
- **WorldCat**

Birkinshaw, J., Hamel, G., & Mol, M. (2008). Management innovation. *Academy of Management Review*, 33(4), 825–845.

- **Google Preview**
- **WorldCat**

Boonstra, J. J., & Vink, M. J. (1996). Technological and organizational innovation: A dilemma of fundamental change and participation. *European Journal of Work and Organizational Psychology*, 5(3), 351–376.

- **Google Preview**
- **WorldCat**

Boulding, K. (1956). General system theory: The skeleton of science. *General Systems (Yearbook of the Society for the Advancement of General Systems Theory)*, 1, 11–17.

- **Google Preview**
- **WorldCat**

Bowen, F. E., Rostami, M., & Steel, P. (2010). Timing is everything: A meta-analysis of the relationship between organizational performance and innovation. *Journal of Business Research*, 63, 1179–1185.

- **Google Preview**
- **WorldCat**



Boyne, G. A. (2002). Public and private management: What's the difference? *Journal of Management Studies*, 39, 97-129.

- **Google Preview**
- **WorldCat**

Brozen, Y. (1951). Research, technology, and productivity. In L. R. Tripp (Ed.), *Industrial productivity* (pp. 25-49). Champaign, IL: Industrial Relations Research Association.

- **Google Preview**
- **WorldCat**

Burke, W. W. (2002). *Organization change: Theory and practice*. Thousand Oaks, CA: SAGE.

- **Google Preview**
- **WorldCat**

Burns, L. R., & Wholey, D. R. (1993). Adoption and abandonment of matrix management programs: Effects of organizational characteristics and interorganizational networks. *Academy of Management Journal*, 36(1), 106-138.

- **Google Preview**
- **WorldCat**

Burns, T., & Stalker, G. M. (1961). *The management of innovation*. London: Tavistock.

- **Google Preview**
- **WorldCat**

Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management*, 31(6), 515-524.

- **Google Preview**
- **WorldCat**

Calantone, R. J., Harmancioglu, N., & Droge, C. (2010). Inconclusive innovation returns: A meta-analysis of research on innovation in new product development. *Journal of Product Innovation Management*, 27, 1065-1081.

- **Google Preview**
- **WorldCat**

Camisón, C., Lapiedra, R., Segarra, M., & Boronat, M. (2004). A meta-analysis of innovation and organizational size. *Organization Studies*, 25, 331-361.

- **Google Preview**
- **WorldCat**

Černe, M., Kaše, R., & Škerlavaj, M. (2016). Non-technological innovation research: Evaluating the intellectual structure and prospects of an emerging field. *Scandinavian Journal of Management*, 32, 69–85.

- **Google Preview**
- **WorldCat**

Chandy, R. K., & Tellis, G. L. (2000). The incumbent's curse? Incumbency, size, and radical product innovation, *Journal of Marketing*, 64, 1–17.

- **Google Preview**
- **WorldCat**

Cheng, Y., & Van de Ven, A. H. (1996). Learning the innovation journey: Order out of chaos. *Organization Science*, 7, 593–614.

- **Google Preview**
- **WorldCat**

Chesbrough, H. W. (2003). The era of open innovation. *Sloan Management Review*, 44(3), 35–41.

- **Google Preview**
- **WorldCat**

Chesbrough, H. W., & Appleyard, M. M. (2007). Open innovation and strategy. *California Management Review*, 50(1).

- **Google Preview**
- **WorldCat**

Christensen, C. M. (1997). *The innovation's dilemma*. Boston: Harvard Business School Press.

- **Google Preview**
- **WorldCat**

Churchman, C. W. (1968). *The systems approach*. New York: Delacorte Press.

- **Google Preview**
- **WorldCat**

CIS. (2010). *The Community Innovation Survey*. Luxembourg: Eurostat.

- **Google Preview**
- **WorldCat**

Cohen, W. M., & Levin, R. C. (1989). Empirical studies of innovation and market structure. In R. Schmalensee & R. D. Willing (Eds.), *Handbook of industrial organization* (Vol. 2, pp. 1059-1107). Oxford: Elsevier.

- **Google Preview**
- **WorldCat**

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35, 128-152.

- **Google Preview**
- **WorldCat**

Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature, *Journal of Management Studies*, 47(6), 1154-1191.

- **Google Preview**
- **WorldCat**

Cyert, R., & March, J. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall.

- **Google Preview**
- **WorldCat**

Daft, R. L. (1978). A dual-core model of organizational innovation. *Academy of Management Journal*, 21, 193-210.

- **Google Preview**
- **WorldCat**

Daft, R. L. (2001). *Organization theory and design*. Cincinnati, OH: South-Western.

- **Google Preview**
- **WorldCat**

Daft, R. L., & Becker, S. W. (1978). *The innovative organization*. New York: Elsevier.

- **Google Preview**
- **WorldCat**

Damanpour, F. (1987). The adoption of technological, administrative, and ancillary innovations: Impact of organizational factors, *Journal of Management*, 13, 675-688.

- **Google Preview**
- **WorldCat**

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34, 555-590.

- **Google Preview**
- **WorldCat**

Damanpour, F. (1992). Organizational size and innovation. *Organization Studies*, 13, 375-402.

- **Google Preview**
- **WorldCat**

Damanpour, F. (2010). An integration of research findings of effects of firm size and market competition on product and process innovations. *British Journal of Management*, 21, 996-1010.

- **Google Preview**
- **WorldCat**

Damanpour, F. (2014). Footnotes to research on management innovation. *Organization Studies*, 39(5), 1265-1285.

- **Google Preview**
- **WorldCat**

Damanpour, F., & Aravind, D. (2006). Product and process innovations: A review of organizational and environmental determinants. In J. Hage & M. Meeus (Eds.), *Innovation, science, and institutional change: A research handbook* (pp. 38-66). Oxford: Oxford University Press.

- **Google Preview**
- **WorldCat**

Damanpour, F., & Aravind, D. (2012a). Managerial innovation: Conceptions, processes, and antecedents. *Management and Organization Review*, 8(2), 423-454.

- **Google Preview**
- **WorldCat**

Damanpour, F., & Aravind, D. (2012b). A review of research on organizational structure and innovation: From organic to ambidextrous structure. In M. D. Mumford (Ed.), *Handbook of organizational creativity* (pp. 483-513). Boston: Academic Press.

- **Google Preview**
- **WorldCat**

Damanpour, F., & Evan, W. M. (1984). Organizational innovation and performance: The problem of organizational lag. *Administrative Science Quarterly*, 29, 392-409.

- **Google Preview**
- **WorldCat**

Damanpour, F., & Gopalakrishnan, S. (1998). Theories of organizational structure and innovation adoption: The role of environmental change. *Journal of Engineering and Technology Management*, 15, 1-24.

- **Google Preview**
- **WorldCat**

Damanpour, F., Sanchez, F., & Chiu, H. H. (2017). Management Innovativeness: Effects of internal and external involvement and implementation actions. Paper presented at the European Academy of Management, Glasgow.

- **Google Preview**
- **WorldCat**

Damanpour F., & Schneider, M. (2006). Phases of the adoption of innovation in organizations: Effects of environment, organization, and top managers. *British Journal of Management*, 17, 215-236.

- **Google Preview**
- **WorldCat**

Damanpour, F., & Schneider, M. (2009). Characteristics of innovation and innovation adoption in public organizations: Assessing the role of management. *Journal of Public Administration Research and Theory*, 19, 495-522.

- **Google Preview**
- **WorldCat**

Damanpour, F., Walker, R. M., & Avellaneda, C. N. (2009). Combinative effects of innovation types and organizational performance: A longitudinal study of services organizations. *Journal of Management Studies*, 46(4), 650-675.

- **Google Preview**
- **WorldCat**

Damanpour, F., & Wischnevsky, J. D. (2006). Research on innovation in organizations: Distinguishing innovation-generating from innovation-adopting organizations. *Journal of Engineering and Technology Management*, 23, 269-291.

- **Google Preview**
- **WorldCat**

De Vries, H., Bekkers, V., & Tummers, L. (2016). Innovation in the public sector: A systematic review and future research agenda. *Public Administration*, 94(1), 146–166.

- **Google Preview**
- **WorldCat**

Dewar, R. D., & Dutton, J. E. (1986). The adoption of radical and incremental innovations: An empirical analysis. *Management Science*, 32, 1422–1433.

- **Google Preview**
- **WorldCat**

Drucker, P. F. (1985). The discipline of innovation. *Harvard Business Review*, 63(3), 67–72.

- **Google Preview**
- **WorldCat**

Duncan, R. B. (1976). The ambidextrous organization: Designing dual structures for innovation. In R. H. Kilmann, L. R. Pondy, & D. P. Slevin (Eds.), *The management of organizational design: Strategy implementation*, 1, 167–188. New York: North-Holland.

- **Google Preview**
- **WorldCat**

Economist. (2007, March 1). The rise and fall of corporate R&D.

- **Google Preview**
- **WorldCat**

Edquist, C., Hommen, C. L., & McKelvey, M. (2001). *Innovation and employment: Process versus product innovation*. Cheltenham, U.K.: Edward Elgar.

- **Google Preview**
- **WorldCat**

Eisenhardt K., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21, 1105–1121.

- **Google Preview**
- **WorldCat**

Ekvall, G. (1996). Organizational climate for creativity and innovation. *European Journal of Work and Organizational Psychology*, 5, 105–123.

- **Google Preview**
- **WorldCat**

Ekvall, G., & Arvonen, J. (1991). Change-centered leadership: An extension of the two-dimensional model. *Scandinavian Journal of Management*, 7, 17-26.

- **Google Preview**
- **WorldCat**

Elenkov, D. S., Judge, W., & Wright, P. (2005). Strategic leadership and executive innovation influence: An international multi-cluster comparative study, *Strategic Management Journal*, 26, 665-682.

- **Google Preview**
- **WorldCat**

Emery, F. E., & Trist, E. L. (1960). Socio-technical system. In C. W. Churchman & M. Verhulst (Eds.), *Management science: Models and techniques* (pp. 83-97). Oxford: Pergamon.

- **Google Preview**
- **WorldCat**

Ettlie, J. E. (1988). *Taking charge of manufacturing: How companies are combining technological and organizational innovations to compete successfully*. San Francisco: Jossey-Bass.

- **Google Preview**
- **WorldCat**

Ettlie, J. E., Bridges, W. P., & O'Keefe, R. D. (1984). Organization strategy and structural differences for radical versus incremental innovation. *Management Science*, 30, 682-695.

- **Google Preview**
- **WorldCat**

Evan, W. M. (1966). Organizational lag. *Human Organization*, 25, 51-53.

- **Google Preview**
- **WorldCat**

Evan, W. M. (1976). Organization theory and organizational effectiveness: An exploratory analysis. *Organization and Administrative Science*, 7, 15-28.

- **Google Preview**
- **WorldCat**

Evangelista, R., & Vezzani, A. (2010). The economic impact of technological and organizational innovations: A firm level analysis. *Research Policy*, 39(10), 1253-1263.

- **Google Preview**
- **WorldCat**

Fagerberg, J. (2005). Innovation: A guide to the literature. In J. Fagerberg, D. C. Mowery, & R. R. Nelson (Eds.), *The Oxford handbook of innovations* (pp. 1–26). Oxford: Oxford University Press.

- **Google Preview**
- **WorldCat**

Fagerberg, J., Mowery, D. C., & Nelson, R. R. (2005). *The Oxford handbook of innovations*. Oxford: Oxford University Press.

- **Google Preview**
- **WorldCat**

Ford, C. M. (1995). Creativity is a mystery: Clues from the investigators' notebooks. In C. M. Ford & D. A. Gioia (Eds.), *Creative action in organizations* (pp. 12–49). Thousand Oaks, CA: SAGE.

- **Google Preview**
- **WorldCat**

Ford, C. M. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review*, *21*, 1112–1142.

- **Google Preview**
- **WorldCat**

Georgantzias, N. C., & Shapiro, J. H. (1993). Viable theoretical forms of synchronous product innovation. *Journal of Operations Management*, *11*, 161–183.

- **Google Preview**
- **WorldCat**

Godin, B. (2008). Innovation: The history of a category. Project on the Intellectual History of Innovation, Working Paper No. 1. Montreal: INRS (Institut national de la recherche scientifique).

- **Google Preview**
- **WorldCat**

Godin, B. (2014). Innovation and creativity: A slogan, nothing but a slogan. In C. Antonelli & A. N. Link (Eds.), *Routledge handbook of the economics of knowledge* (pp. 7–19). London: Routledge.

- **Google Preview**
- **WorldCat**



Godin, B. (2015a). *Innovation contested: The idea of innovation over the centuries*. London: Routledge.

- **Google Preview**
- **WorldCat**

Godin, B. (2015b). *Technological change: What do technology and change stand for? Project on the Intellectual History of Innovation, Working Paper No. 24*. Montreal: INRS.

- **Google Preview**
- **WorldCat**

Gopalakrishnan, S., & Damanpour, F. (1994). Patterns of generation and adoption of innovations in organizations: Contingency models of innovation attributes. *Journal of Engineering and Technology Management, 11*, 95-116.

- **Google Preview**
- **WorldCat**

Gopalakrishnan, S., & Damanpour, F. (1997). A review of innovation research in economics, sociology, and technology management. *Omega, 25*, 15-28.

- **Google Preview**
- **WorldCat**

Gordon, R. (2016). *The rise and fall of American growth*. Princeton, NJ: Princeton University Press.

- **Google Preview**
- **WorldCat**

Grant, A. (2016). *Originals*. New York: Viking.

- **Google Preview**
- **WorldCat**

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal, 17*, 109-122.

- **Google Preview**
- **WorldCat**

Greve, H. R. (1995). Jumping ship: The diffusion of strategy abandonment. *Administrative Science Quarterly, 40*, 444-473.

- **Google Preview**
- **WorldCat**

Hage, J., & Aiken, M. (1970). *Social change in complex organizations*. New York: Random House.

- **Google Preview**
- **WorldCat**

Hambrick, D. (1994). What if the academy actually mattered? *Academy of Management Review*, 19, 11-16.

- **Google Preview**
- **WorldCat**

Hambrick, D. C. (2007). The field of management's devotion to theory: Too much of a good thing? *Academy of Management Journal*, 50(6), 1346-1352.

- **Google Preview**
- **WorldCat**

Hamel, G. (2006). The why, what and how of management innovation. *Harvard Business Review*, 84(2), 72-84.

- **Google Preview**
- **WorldCat**

Helfat, C. E., & Winter, S. G. (2011). Untangling dynamic and operational capabilities: Strategy for the (n)ever-changing world. *Strategic Management Journal*, 29, 79-81.

- **Google Preview**
- **WorldCat**

Henderson, R. M., & Clark, K. B. (1990). Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 35, 9-30.

- **Google Preview**
- **WorldCat**

Hervas-Oliver, J.-L., & Sempere-Ripoll, F. (2014). Disentangling the influence of technological process and product innovations. *Journal of Business Research*, 68, 109-118.

- **Google Preview**
- **WorldCat**

Hitt, M. A., Hoskisson, R. E., & Ireland, R. D. (1990). Mergers and acquisitions and managerial commitment to innovation in m-form firms. *Strategic Management Journal*, 11(S), pp. 29-47.

- **Google Preview**
- **WorldCat**

Hitt, M. A., Ireland, R. D., Camp, S. M., & Sexton, D. L. (2001). Strategic entrepreneurship: Entrepreneurial strategies for wealth creation. *Strategic Management Journal*, 22, 479-491.

- **Google Preview**
- **WorldCat**

Hoffman, R. C., & Hegarty, W. H. (1993). Top management influence on innovations: Effects of executive characteristics and social culture. *Journal of Management*, 19, 549-574.

- **Google Preview**
- **WorldCat**

Jansen, J. J. P., Van Den Bosch, F. A. J., & Volberda, H. W. (2006). Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. *Management Science*, 52(11), 1661-1674.

- **Google Preview**
- **WorldCat**

Jick, T. (1993). *Managing change*. New York: McGraw-Hill.

- **Google Preview**
- **WorldCat**

Keupp, M. M., Palmie, M., & Gassmann, O. (2012). The strategic management of innovation: A systematic review and paths for future research. *International Journal of Management Review*, 14, 367-390.

- **Google Preview**
- **WorldCat**

Kimberly, J. R. (1981). Managerial innovation. In P. C. Nystrom and W. H. Starbuck (Eds.), *Handbook of organizational design* (pp. 84-104). New York: Oxford University Press.

- **Google Preview**
- **WorldCat**

Kimberly, J. R. (1986). The organization context of technological innovation. In D. D. Davis (Ed.), *Managing technological innovation* (pp. 23-43). San Francisco: Jossey-Bass.

- **Google Preview**
- **WorldCat**

Kimberly, J. R., & Evanisko, M. (1981). Organizational innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal*, 24, 679-713.

- **Google Preview**
- **WorldCat**

King, N. (1990). Innovation at work: The research literature. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work* (pp. 15-59). New York: Wiley.

- **Google Preview**
- **WorldCat**

Klein, K. J., & Sorra, J. S. (1996). The challenge of innovation implementation. *Academy of Management Journal*, 21, 1055-1080.

- **Google Preview**
- **WorldCat**

Lam, A. (2005). Organizational innovation. In J. Fagerberg, D. C. Mowery, & R. R. Nelson (Eds.), *The Oxford handbook of innovations* (pp. 115-147). Oxford: Oxford University Press.

- **Google Preview**
- **WorldCat**

Lawless, M. W., & Anderson, P. C. (1996). Generational technological change: Effects of innovation and local rivalry on performance. *Academy of Management Journal*, 39, 1185-1217.

- **Google Preview**
- **WorldCat**

Lawrence, P. R., & Lorsch, J. W. (1967). *Organization and environment*. Homewood, IL: Irwin.

- **Google Preview**
- **WorldCat**

Laursen, K., & Salter, A. (2006). Open for innovation: The role of openness in explaining innovation performance among U.K. manufacturing firms. *Strategic Management Journal*, 27, 131-150.

- **Google Preview**
- **WorldCat**

Leiponen, A., & Helfat, C. E. (2010). Innovation objectives, knowledge sources, and the benefit of breadth. *Strategic Management Journal*, 31, 224-236.

- **Google Preview**
- **WorldCat**

Lengnick-Hall, C. A. (1992). Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management*, 18(2), 399-429.

- **Google Preview**
- **WorldCat**

Lichtenthaler, U. (2011). Open innovation: Past research, current debates, and future direction. *Academy of Management Perspectives*, 25(1), 75-93.

- **Google Preview**
- **WorldCat**

Lieberman, M. B., & Montgomery, D. B. (1988). First mover advantages. *Strategic Management Journal*, 9(S1), 41-58.

- **Google Preview**
- **WorldCat**

Madjar, N., Oldham, G. R., & Pratt, M. G. (2002). There's no place like home? The contributions of work and non-work creativity support to employees' creative performance. *Academy of Management Journal*, 45, 757-767.

- **Google Preview**
- **WorldCat**

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2, 71-87.

- **Google Preview**
- **WorldCat**

Meeus, M. T. H., & Edquist, C. (2006). Introduction to Part I: Product and process innovation. In J. Hage & M. Meeus (Eds.), *Innovation, science, and institutional change* (pp. 23-37). Oxford: Oxford University Press.

- **Google Preview**
- **WorldCat**

Meyer, A. D., & Goes, J. B. (1988). Organizational assimilation of innovations: A multilevel contextual analysis. *Academy of Management Journal*, 31, 897-923.

- **Google Preview**
- **WorldCat**

Miles, Ian. (2005). Innovation in services. In J. Fagerberg, D. C. Mowery, & R. R. Nelson (Eds.), *The Oxford handbook of innovations* (pp. 433-458). Oxford: Oxford University Press.

- **Google Preview**
- **WorldCat**

Mintzberg, H. (1979). *The structuring of organizations*. Englewood Cliffs, NJ: Prentice-Hall.

- **Google Preview**
- **WorldCat**

Mohr, L. B. (1969). Determinants of innovation in organizations, *American Political Science Review*, 63, 111-126.

- **Google Preview**
- **WorldCat**

Mol, M. J., & Birkinshaw, J. (2014). The role of external involvement in the creation of management innovations. *Organization Studies*, 35, 1287-1312.

- **Google Preview**
- **WorldCat**

Mumford, M. D. (2000). Managing creative people: Strategies and tactics for innovation. *Human Resources Management Review*, 10, 313-355.

- **Google Preview**
- **WorldCat**

Mumford, M. D., & Licuanan, B. (2004). Leading for innovations: Conclusions, issues, and directions. *Leadership Quarterly*, 15, 163-171.

- **Google Preview**
- **WorldCat**

Mumford, M. D., Scott, G. M., Gaddis, B., & Strange, J. M. (2002). Leading creative people: Orchestrating expertise and relationships. *Leadership Quarterly*, 13, 705-750.

- **Google Preview**
- **WorldCat**

Nadler, D. A., & Tushman, M. L. (1997). Implementing new designs: Managing organizational change. In M. L. Tushman & P. Anderson (Eds.), *Managing strategic innovation and change* (pp. 595-606). New York: Oxford.

- **Google Preview**
- **WorldCat**

Naranjo-Gil, D. (2009). The influence of environmental and organizational factors on innovation adoption: Consequences for performance in public sector organizations. *Technovation*, 29(12), 810-818.

- **Google Preview**
- **WorldCat**

Nelson, R., & Winter, S. (1982). *An evolutionary theory of economic change*. Cambridge, MA: Harvard University Press.

- **Google Preview**
- **WorldCat**

Nord, W. R., & Tucker, S. (1987). *Implementing routine and radical innovations*. Lexington, MA: Lexington Books.

- **Google Preview**
- **WorldCat**

OECD (2005). Oslo manual: The measurement of scientific and technological activities. Paris: OECD.

- **Google Preview**
- **WorldCat**

Pelz, D. C. (1956). Some social factors related to performance in a research organization. *Administrative Science Quarterly*, 1(3), 310-325.

- **Google Preview**
- **WorldCat**

Pelz, D. C., & Andrews, F. M. (1966). *Scientists in organizations: Productive climate for research and development*. New York: Wiley.

- **Google Preview**
- **WorldCat**

Pfeffer, J. (1993). Barriers to the advance of organizational science: Paradigm development as a dependent variable. *Academy of Management Review*, 18, 599-620.

- **Google Preview**
- **WorldCat**

Piketty, T. (2014). *Capital in the twenty-first century*. Cambridge, MA: Harvard University Press.

- **Google Preview**
- **WorldCat**

Poole, M. S. (1981). Decision development in small groups I: A comparison of two models. *Communication Monographs*, 48, 1-24.

- **Google Preview**
- **WorldCat**

Poole, M. S. (1983). Decision development in small groups II: A study of multiple sequences in decision-making. *Communication Monographs*, 50, 206-232.

- **Google Preview**
- **WorldCat**

Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York: Free Press.

- **Google Preview**
- **WorldCat**

Roberts, E. B. (1988). Managing invention and innovation. *Research Management*, 31, 11-29.

- **Google Preview**
- **WorldCat**

Roberts, P. W., & Amit, R. (2003). The dynamics of innovative activity and competitive advantage: The case of Australian retail banking, 1981 to 1995. *Organization Science*, 14, 107-122.

- **Google Preview**
- **WorldCat**

Rogers, E. M. (1995). *Diffusion of innovations*. New York: Free Press.

- **Google Preview**
- **WorldCat**

Rosenberg, N. (1982). *Inside the black box: Technology and economics*. London: Cambridge University Press.

- **Google Preview**
- **WorldCat**

Rosenbusch, N., Brinckmann, J., & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing*, 26, 441-457.

- **Google Preview**
- **WorldCat**

Ross, P. F. (1974). Innovation adoption by organizations. *Personnel Psychology*, 27(1), 21-47.

- **Google Preview**
- **WorldCat**

Sanidas, E. (2005). *Organizational innovations and economic growth: Organosis and growth of firms, sectors, and countries*. Cheltenham, U.K.: Edward Elgar.

- **Google Preview**
- **WorldCat**



Sapprasert, K., & Clausen, T. H. (2012). Organizational innovation and its effects. *Industrial and Corporate Change*, 21(5), 1283-1305.

- **Google Preview**
- **WorldCat**

Schendel, D., Ansoff, I., & Channon, D. (1980). Statement of editorial policy. *Strategic Management Journal*, 1(1), 1-5.

- **Google Preview**
- **WorldCat**

Schilling, M. A. (2013). *Strategic management of technological innovation*. New York: McGraw-Hill Irwin.

- **Google Preview**
- **WorldCat**

Schroeder, R. G., Linderman, K., Liedtke, C., & Choo, A. S. (2008). Six sigma: Definition and underlying theory. *Journal of Operations Management*, 26, 536-554.

- **Google Preview**
- **WorldCat**

Schumpeter, J. A. (1934). *The theory of economic development*. Cambridge, MA: Harvard University Press.

- **Google Preview**
- **WorldCat**

Schumpeter, J. A. (1983). *The theory of economic development*. New Brunswick, NJ: Transaction Publishers.

- **Google Preview**
- **WorldCat**

Schumpeter, J. A. (1950). *Capitalism, socialism and democracy*. New York: Harper & Row.

- **Google Preview**
- **WorldCat**

Scott, W. R. (1992). *Organizations: Rational, natural and open systems*. Englewood Cliffs, NJ: Prentice-Hall.

- **Google Preview**
- **WorldCat**

Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37, 580-607.

- **Google Preview**
- **WorldCat**

Sears, G. J., & Baba, V. V. (2011). Toward a multistage, multilevel theory of innovation. *Canadian Journal of Administrative Sciences*, 28, 357-372.

- **Google Preview**
- **WorldCat**

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25, 217-226.

- **Google Preview**
- **WorldCat**

Starbuck, W. H. (2016). 60th anniversary essay: How journals could improve research practices in social sciences. *Administrative Science Quarterly*, 61(2), 165-183.

- **Google Preview**
- **WorldCat**

Stata, R. (1989). Organizational learning: The key to management innovation. *Sloan Management Review*, 30, 63-74.

- **Google Preview**
- **WorldCat**

Staw, B., & Epstein, L. (2000). What bandwagons bring? Effects of popular management techniques on corporate performance, reputation, and CEO pay. *Administrative Science Quarterly*, 45(3), 523-556.

- **Google Preview**
- **WorldCat**

Stevenson, H. H., & Jarillo, J. C. (1990). A paradigm of entrepreneurship: Entrepreneurial management. *Strategic Management Journal*, 11(S): 17-27.

- **Google Preview**
- **WorldCat**

Sturdy, A. (2004). The adoption of management ideas and practices. *Management Learning*, 35(2), 155-179.

- **Google Preview**
- **WorldCat**

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18, 509-533.

- **Google Preview**
- **WorldCat**

Tether, B. S., & Tajar, A. (2008). The organizational-cooperation mode of innovation and its prominence amongst European service firms. *Research Policy*, 37, 720-739.

- **Google Preview**
- **WorldCat**

Tidd, J. (2001). Innovation management in context: Environment, organization and performance. *International Journal of Management Review*, 3(3), 169-183.

- **Google Preview**
- **WorldCat**

Tornatzky, L. G., & Fleischer, M. (1990). *The process of technological innovation*. Lexington, MA: Lexington Books.

- **Google Preview**
- **WorldCat**

Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *Transactions on Engineering Management*, 29(1), 28-45.

- **Google Preview**
- **WorldCat**

Trist, E., & Murray, H. (1993). *The social engagement of social science: A Tavistock anthology, Vol. 1: The social-psychological perspective*. Philadelphia: University of Pennsylvania Press.

- **Google Preview**
- **WorldCat**

Tsang, E. W. K., & Kwan, K. (1999). Replication and theory development in organizational science: A critical realistic perspective. *Academy of Management Review*, 24, 759-780.

- **Google Preview**
- **WorldCat**

Tushman, M. L., & Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative Science Quarterly*, 31, 439-465.

- **Google Preview**
- **WorldCat**

Tushman, M. L., & O'Reilly, C. A. (2002). *Winning through innovation*. Boston: HBS Press.

- **Google Preview**
- **WorldCat**

Utterback, J. M. (1994). *Mastering the dynamics of innovation*. Cambridge, MA: Harvard Business Press.

- **Google Preview**
- **WorldCat**

Vaccaro, I. G., Jansen, J. J. P., Van Den Bosch, F. A. J., & Volberda, H. (2012). Management innovation and leadership: The moderating role of organizational size. *Journal of Management Studies*, 49(1), 28-51.

- **Google Preview**
- **WorldCat**

Van de Ven, A. H., Angle, H. L., & Poole, M. S. (1989). *Research on the management of innovation: The Minnesota studies*. New York: Oxford University Press.

- **Google Preview**
- **WorldCat**

Van de Ven, A. H., & Rogers, E. M. (1988). Innovations and organizations. *Communication Research*, 15, 632-651.

- **Google Preview**
- **WorldCat**

Van Den Bosch, F. A. J., Volberda, H. W., & de Boer, M. (1999). Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. *Organization Science*, 10, 551-568.

- **Google Preview**
- **WorldCat**

Volberda, H. W., Van Den Bosch, F. A., & Heij, C. V. (2013). Management innovation: Management as fertile ground for innovation. *European Management Review*, 10(1), 1-15.

- **Google Preview**
- **WorldCat**

Volberda, H. W., Van Den Bosch, F. A., & Mihalache, O. R. (2014). Advancing management innovation: Synthesizing processes, levels of analysis, and change agents. *Organization Studies*, 35(9), 1245-1264.

- **Google Preview**
- **WorldCat**

Von Bertalanfy, L. (1951). General system theory: A new approach to unity of science, *Human Biology*, 23, 303–361.

- **Google Preview**
- **WorldCat**

Von Bertalanfy, L. (1968). *General system theory: Foundations, development, applications*. New York: G. Braziller.

- **Google Preview**
- **WorldCat**

Wade, J. (1996). A community-level analysis of sources and rates of technological variation in the microprocessor market. *Academy of Management Journal*, 39(5), 1218–1244.

- **Google Preview**
- **WorldCat**

Walker, R. M. (2008). Empirical evaluation of innovation types and organizational and environmental characteristics: Towards a configuration approach. *Journal of Public Administration Research and Theory*, 18, 591–615.

- **Google Preview**
- **WorldCat**

Walker, R., Chen, J., & Aravind, D. (2015). Management innovation and firm performance: An integration of research findings, *European Management Journal*, 33(5), 407–422.

- **Google Preview**
- **WorldCat**

Walker, R. M., Damanpour, F., & Devece, C. A. (2011). Management innovation and organizational performance: Mediating role of planning and control. *Journal of Public Administration Research and Theory*, 21, 367–386.

- **Google Preview**
- **WorldCat**

West, M. A., & Anderson, N. R. (1996). Innovation in top management teams. *Journal of Applied Psychology*, 81, 680–693.

- **Google Preview**
- **WorldCat**

West, M. A., & Farr, J. L. (1990). *Innovation and creativity at work*. New York: Wiley.

- **Google Preview**
- **WorldCat**

Whittington, R., Pettigrew, A., Peck, S., Fenton, E., & Conyon, M. (1999). Change and complementarities in the new competitive landscape: A European panel study, 1992–1996. *Organization Science*, *10*, 583–600.

- **Google Preview**
- **WorldCat**

Wischnevsky, J. D., & Damanpour, F. (2006). Organizational transformation and performance: An examination of three perspectives. *Journal of Managerial Issues*, *18*, 104–128.

- **Google Preview**
- **WorldCat**

Wischnevsky, J. D., Damanpour, F., & Mendez, F. (2011). Influence of environmental factors and prior changes on the organizational adoption of changes in products and in technological and administrative processes. *British Journal of Management*, *22*(1), 132–149.

- **Google Preview**
- **WorldCat**

Wolfe, R. A. (1994). Organizational innovation: Review, critique, and suggested research directions. *Journal of Management Studies*, *31*, 405–431.

- **Google Preview**
- **WorldCat**

Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of Management Review*, *18*(2), 293–321.

- **Google Preview**
- **WorldCat**

Zajac, E. J., Kraatz, M. S., & Bresser, R. K. F. (2000). Modeling the dynamics of strategic fit: A normative approach to strategic change. *Strategic Management Journal*, *21*, 429–453.

- **Google Preview**
- **WorldCat**

Zaltman, G., Duncan, R., & Holbek, J. (1973). *Innovations and organizations*. New York: Wiley.

- **Google Preview**
- **WorldCat**

Zammuto, R. F., & Connolly, T. (1984). Coping with disciplinary fragmentation. *Organizational Behavior and Teaching Review*, 9, 30-37.

- **Google Preview**
- **WorldCat**

## **Notes:**

(1.) As research on innovation in organizations has developed in the second half of the 20th century, this article focuses on a more recent understanding of innovation as a concept in business and management. For a historical evolution of innovation as a term, label, action, goal, and concept across multiple disciplinary fields see Godin (2008, 2014, 2015a).

(2.) It should be noted that this is Schumpeter's most commonly cited definition of innovation. He has offered other definitions such as new combinations of the means of production or change in the inputs or outputs of production. For details see Godin (2008, pp. 35-36) and Godin (2014, pp. 13-15). Also, Schumpeter's fifth innovation type—defined as “the carrying out of the new organization of any industry, like the creation of a monopoly position . . . or the breaking up of a monopoly position” (Schumpeter, 1983, p. 66)—is not synonymous with organizational innovation as defined in this article.

(3.) Since Schumpeter's early work in the beginning of the 20th century, it is generally viewed that innovation is a positive force not only for its producers but for the society as well. Yet, productivity growth has been mainly an outcome of automation, and the extent to which economic wealth spreads beyond entrepreneurs and corporations to the society at large is uncertain. For example, two recent economic analyses question the continued validity of the ripple-down of economic wealth (Gordon, 2016; Piketty, 2014).

(4.) For example, Lam (2005) classifies three perspectives: organizational structure and design; organizational cognition and learning; and organizational change and adaptation. In the context of organizational transformation and performance, Wischnevsky and Damanpour (2006) also offer three perspectives: rational and performance gap; population ecology and the liability of newness; and institutionalism and the mimetic pressure. Crossan and Apaydin (2010) listed five sets of theoretical perspectives used in the highly cited articles in their review: institutional; economics and evolution; network; resource-based view and dynamic capabilities; and learning, knowledge management, adaptation, and change.

(5.) Many studies either do not clearly identify the type of innovation or focus on product and process innovations. For example, Crossan and Apaydin's (2010, p. 1162) review of 524 articles on innovation published in 10 business and economic journals found that 50% of the articles were unclear or did not identify the type of innovation that was studied, and 39% were related to technology, product/service, and process innovations.

(6.) Godin (2008, p. 8) offers the conjunction of two primary factors for the prominence of technological innovations: (1) the culture of thing, and industrial development through technology; and (2) the influence of the (academic) conceptual frameworks of technology on policies for economic growth. For more detailed aggregation of these factors see Godin (2008, pp. 19–22).

(7.) Indeed, Woodman et al.'s (1993) propositions regarding the effects of slack resources, internal and external communication, and organic structure on organizational creative performance (production of organizational creativity) are similar to the effects of these factors on innovation as found in the studies of innovations in organizations (see Damanpour & Aravind, 2012b).

(8.) Similarly, Godin (2008) in his historical analysis of the emergence of innovation as a concept suggests that the view of innovation as a novel or new idea, artifact, or behavior has emerged in order to resolve the tension between *invention*—the process of coming up with new ideas (generation)—and *imitation*—the process of putting those ideas into positive practice (adoption).

(9.) A parallel order can be offered for social technologies: social technology → social innovation → social change. *Social change*, change at the level of society including both economic and social/cultural domains, could be the outcome or the results of both technological and nontechnological changes. Like technological change, it is a higher concept than innovation and is not a focus of this article.

(10.) The innovation process can be conceived to follow a unitary or a multiple sequence pattern (Poole, 1981). The unitary sequence pattern generally assumes that the process is orderly and occurs in a linear sequence; the multiple sequence pattern assumes that the process is more random and the stages and the sequence of their occurrence cannot be predicted (Gopalakrishnan & Damanpour, 1994). Both patterns have been found useful in describing the innovation process in organizations. However, the multiple sequence pattern is more applicable to studies of *innovating*; the unitary sequence pattern to the studies of *innovativeness*.

(11.) When an organization develops innovations for its own use, usually one unit (R&D, product development, design) develops and another unit (manufacturing, marketing, human resources) uses the innovation.

(12.) At the level of innovation, the process includes three sequential phases: generation, diffusion, and adoption. *Diffusion* is a process in which an innovation is communicated through certain channels among the members of a social system (Rogers, 1995). Diffusion connects generation to adoption, is studied at the level of population, and is not viewed as an organizational process. Hence, it is not discussed in this article.

(13.) Damanpour and Schneider (2006) consider *adoption decision* as a separate phase that includes evaluating the proposed ideas from technical, financial and strategic



perspectives, making the decision to accept an idea as the desired solution and allocating resources for its acquisition, alteration, and assimilation. It is the phase in which organizational leaders (managers, committees, boards) decide to adopt the innovation and allocate resources to it.

(14.) As is common in economics, Meeus and Edquist (2006) use the term organizational innovation to refer to nontechnological innovations, whether product or process. In this article, the term organizational innovation refers to both technological and nontechnological innovations that organizations generate or adopt.

(15.) In management, organizational innovation is understood in two ways. In a more specific way, it means nontechnological, managerial innovation (Damanpour & Aravind, 2012a). In a broader way, as in this article, it refers to innovations in organizations, whether technological or nontechnological (Crossan & Apaydin, 2010; Damanpour, 1991; Lam, 2005).

(16.) Innovations in the organization–environment relations are referred to as ancillary innovations (Damanpour, 1987). *Ancillary innovations* pertain to working with and learning from partners (service providers, suppliers, clients, customers, public agencies, and professional and educational institutions) across organizational boundaries (Černe et al., 2016; Damanpour, 1987; Tether & Tajar, 2008). They are a type of nontechnological innovation (Černe et al., 2016), and resemble Tether and Tajar’s (2008) organization–cooperation mode of innovation.

(17.) A fourth dimension—attributes or characteristics of innovation—is also used in innovation research to predict the speed of diffusion and/or the rate of adoption of innovation in social systems. Wolfe (1994) provided definitions of 18 attributes and identified approximately 20 more with different names but similar definitions. Rogers (1995) identified five primary innovation attributes, of which four (relative advantage, compatibility, trialability, and observability) positively, and one (complexity) negatively affect the adoption of innovation. In a quantitative review of the innovation attribute–adoption relationship from 75 studies, Tornatzky and Klein (1982) found that compatibility, relative advantage, and complexity had the most consistent significant relationships with innovation adoption. The level of analysis of innovation attributes research is primarily the innovation, not the organization.

(18.) Camisón et al.’s review included 87 correlations from 53 studies. In an earlier and smaller meta-analysis (36 correlations, 20 original studies), Damanpour (1992) found a larger magnitude of mean correlation between size and innovation ( $r=.32$ ,  $p<.05$ , p. 384). The low magnitude of the mean correlation in Camisón et al.’s (2004) analysis can be attributed to the greater diversity of measurements of size and innovation in the original studies.

(19.) This finding is similar to the finding from Rosenbusch et al.'s (2011) meta-analytical review of 42 articles on the innovation–performance relationship in SMEs. The original articles in the two reviews do not overlap because the selection procedure in the two reviews differs. Rosenbausch et al.'s original studies include merely technological innovations; innovation types in Walker et al.'s (2015) original studies are more varied. While Rosenbusch et al.'s review subscribes to the first-mover advantage view of innovation and performance, Walker et al.'s review falls mainly within the performance gap view.

(20.) For example, a TQM program has many elements such as service design, employee involvement, customer focus, and so on (Schroeder et al., 2008, p. 547). An organization may choose to adopt a couple of these elements only or adopt some of them initially and others at a later time.

**Fariborz Damanpour**

Rutgers Business School, Newark and New Brunswick

- Oxford University Press

Copyright © 2017. All rights reserved.

