Organization Science
Vol. 20, No. 2, March–April 2009, pp. 281–293
ISSN 1047-7039 | EISSN 1526-5455 | 09 | 2002 | 0281
DOI 10.1287/orsc.1090.0423

Strategic Renewal of Organizations

Rajshree Agarwal
College of Business, University of Illinois, Champaign, Illinois 61822, agarwalr@illinois.edu
Constance E. Helfat
Tuck School of Business, Dartmouth College, Hanover, New Hampshire 03755, constance.helfat@dartmouth.edu

Strategic renewal, although critical for the sustained success of organizations, has received relatively little attention as distinct from the more general phenomenon of strategic change. Like all strategic issues, strategic renewal presents both opportunities and challenges for organizations. In this article, we first define the term "strategic renewal" and elaborate on important characteristics of this phenomenon. We also bring to bear evidence that suggests that strategic renewal has a critical impact not only on individual firms and industries but also on entire economies. We then provide an in-depth example of a company that has successfully renewed itself more than once, namely, IBM. Finally, we examine several different avenues for strategic renewal, involving both content and process, and identify common themes among them.

Key words: strategic renewal; dynamic capability; innovation; cognition; market entry
History: Published online in *Articles in Advance* March 6, 2009.

Introduction

"Strategic renewal" has a nice ring to it. But what does it really mean? Strategic renewal is often discussed but rarely defined. Research that refers to "strategic renewal" frequently uses the term to motivate examples of strategic change more generally, with most examples highlighting the *process* of change. Although some research has focused squarely on strategic renewal (e.g., Huff et al. 1992, Floyd and Lane 2000), this research also has tended to focus on organizational processes. Like all strategic issues, however, strategic renewal has important content aspects as well. The need to incorporate both content and process aspects of strategic renewal, along with a lack of clarity regarding the term itself, suggests that we first need a working definition of strategic renewal. Then, we need to better understand what strategic renewal consists of and how firms cope with the challenges and opportunities that strategic renewal presents.

In what follows, we first define what we mean by strategic renewal and elaborate on important characteristics of this phenomenon. We also bring to bear evidence that suggests that strategic renewal has a critical impact not only on individual firms and industries, but also on entire economies. Then we provide an example of a company that has successfully renewed itself more than once, namely, IBM, and show how IBM's experience can help us to understand strategic renewal more generally. Finally, we examine several different avenues for strategic renewal, exemplified by the articles in this special issue, and identify common themes among them.

Defining Strategic Renewal

To define the term "strategic renewal," we first define what we mean by "strategic" and then define "renewal." There are numerous definitions of "strategy," along with numerous conceptions of what it means to be "strategic," and we do not propose to arbitrate among them here. Instead, for purposes of our analysis, we define "strategic" as "that which relates to the long-term prospects of the company and has a critical influence on its success or failure."[1] In this definition, something is strategic if it relates to a firm's future prospects in a substantial way. Some factors that are critical to a company's long-term prospects may be relatively unimportant to its current well-being, and vice versa. In addition, because a firm and its managers cannot predict with certainty what factors will turn out to be critical for success in the future, factors that have the *potential* to affect an organization's long-term prospects in a substantial way also are strategic.

There is a long laundry list of factors that fall into the category of potentially critical to an organization's future. As examples, Rumelt et al. (1994) mention goals, products and services, policies that determine how a firm competes in product markets with regard to rivals, scope and diversity of businesses, organization structure, administrative systems, and policies that define and coordinate work. Recent scholarship suggests that to this list we must add critical resources (tangible and intangible assets), capabilities, routines and other processes, and people (individuals and teams) that affect an organization's ability to succeed in the future.

Winter (2007) observes that "issues relating to the development and decay of [resources and] capabilities are quintessentially strategic because they define the menu of future choice" (p. 27). Using reputation for trustworthiness as an example, Winter (2007) notes that

a good reputation is a critical determinant of a firm's relationships with stakeholders such as suppliers and customers, which in turn affect future opportunities. Like many strategic assets, reputation takes time and effort to build (Dierickkx and Cool 1991, Agarwal et al. 2009), and cannot be immediately duplicated by rivals. Thus, differences in reputation lead to differences in the opportunities available to firms. In addition, given that reputation is often product-specific or market-specific, even good reputations may have built-in constraints regarding the range of choices that they afford for the future.

The example of firm reputation applies to many resources and capabilities in that they provide opportunities for the future but also contain constraints (Helfat 2002). Poor-quality resources limit future opportunities due to their low quality; high-quality resources afford greater opportunity but still may be limited in the potential scope of their future application. Hence, strategic opportunities for the future depend in important ways on the current state of the organization (Winter 1987, Nelson 1991).

In addition to defining the word "strategic," we must also define our use of the word "renewal." Most dictionaries define the verb "renew" as "to make like new" (e.g., *Merriam-Webster Online Dictionary* 2008). Synonyms include "to refresh" by restoring strength or animation or "to replace" that which is damaged, decayed, old, or worn out (*Merriam-Webster Online Dictionary* 2008, *Webster's Seven New Collegiate Dictionary* 1972, *Webster's New World Dictionary* 1962). Dictionaries also make clear that the verb "renew" is distinct from the verb "change." In its broadest definition, the verb "change" means "to make or become different" (*Merriam-Webster Dictionary* 2008). Change can include refreshment or replacement, but need not. For example, change might refer to extensions, additions, or deletions without any associated renewal. Thus, renewal is one type of change.

Exactly what constitutes "refreshment" or "replacement" for a business organization requires further explanation. To begin, the relevant aspects subject to refreshment or replacement are the strategic attributes of organizations mentioned earlier, such as goals, products and services, resources and capabilities, and the like. The perhaps more difficult question has to do with what it means to refresh or replace such attributes. Here there are several points worth making. First, refreshment or replacement does not necessarily imply restoration of an attribute to its original state. For example, an organization can substitute one type of attribute for a qualitatively different type of attribute. Second, refreshment or replacement can be partial or full. Firms may retain a portion of an attribute in its current state if it continues to serve a useful purpose. Third, refreshment or replacement may extend beyond the original attribute in either size or scope of application. Fourth, firms can undertake strategic refreshment through reconfiguration of current attributes, with or without additions or deletions. Fifth, firms may undertake strategic renewal to refresh or replace current organizational attributes that serve a useful function in the present, but may not do so in the future. Finally, strategic renewal often connotes momentum. The verb "regrow," meaning "to continue growth after interruption or injury" (*Merriam-Webster Dictionary* 2008), is particularly germane here. Although regrowth need not be part of renewal, refreshment or replacement may be the first step that provides a basis for future growth.

Strategic renewal further encompasses process, content, and outcomes. *Merriam-Webster Dictionary* (2008) defines the noun "renewal" to include "the act or process of renewing," "the quality or state of being renewed" (content), and "something renewed" (outcome). The last definition of "something renewed" raises the concern that we must use the word renewal with care, to avoid a performance tautology. The fact that a strategic attribute has been renewed tells us only that it was refreshed or replaced, and that the outcome presumably has a minimal level of functionality. Without further investigation, we cannot tell how well the attribute performs its designated task (its "technical fitness," in the terminology of Helfat et al. (2007)). Moreover, the fact that renewal has occurred tells us nothing about its contribution to profitability. Ascertaining how well strategic renewal enables a firm to make a living, or what Helfat et al. (2007) term "evolutionary fitness," requires additional information.

The foregoing discussion suggests that strategic renewal has several important characteristics. First, strategic renewal relates to that which has the potential to substantially affect the long-term prospects of a company. Second, strategic renewal encompasses the process, content, and outcome of renewal. Third, strategic renewal involves the refreshment or replacement of attributes of an organization. Fourth, such refreshment or replacement aims to provide a foundation for future growth or development. Based on these characteristics, we define strategic renewal as follows:

> Strategic renewal includes the process, content, and outcome of refreshment or replacement of attributes of an organization that have the potential to substantially affect its long-term prospects.

This definition is intentionally broad. Key aspects of this definition relate to refreshment and replacement, rather than to all types of change, and to the long-term prospects of an organization—without specifying the exact nature of the content, process, or outcome of renewal. The types of organizational attributes and strategic issues that are relevant will depend on the situation. There are many different possible approaches to and avenues for strategic renewal, and our definition allows for this variety. In addition, attempts at strategic renewal

may vary in the degree of success, and our definition does not presuppose a particular outcome. Finally, although strategic renewal encompasses content, process, and outcomes, we would not expect an individual research study to necessarily cover all three of these aspects.

Having thus defined and elaborated on the concept of strategic renewal at a fairly abstract level, we next examine more concretely why firms may undertake strategic renewal. These reasons vary in important ways that may affect the extent of the changes that firms may put in place, as next explained.

Discontinuous Transformations and Incremental Strategic Renewal

We distinguish between two basic types of strategic renewal: (i) discontinuous strategic transformations and (ii) incremental renewal. Of these, discontinuous transformations tend to receive the most attention in analyses of strategic renewal (e.g., Floyd and Lane 2000). Major changes, such as in technology or customer demand, may cause a company to fundamentally alter one or more aspects of its strategy and organization. A firm also may attempt a strategic transformation because its primary market has matured or is declining, causing the firm to seek new avenues for growth. These types of transformations almost by definition involve replacing important parts of a company and its strategy, and affect the long-term prospects of the firm. Thus, such transformations entail strategic renewal.

We have a wealth of examples of environmental changes that have undermined entire industries. What has been termed "competence-destroying change" (Tushman and Anderson 1986) can make strategic renewal extremely difficult, because in this circumstance external change renders the core of the firm largely useless in its current product market. If the firm has little left to renew, it may end up having to disband, as in the case of Konica and Minolta, erstwhile giants in the camera industry (Reuters 2006). Even when the firm has some remaining basis for continued operations, major transformations pose severe challenges. For example, even though Kodak survived the digital camera revolution, the firm had to overcome significant hurdles before it could regain part of its earlier market share (Deutsch 2005). Major transformations involve not only large amounts of change, but also change along multiple dimensions, such as with regard to the business model, technological base, organizational structure, resources and capabilities, and organizational mindset. Part of this challenge includes responding to changes in customer demand as well (Adner 2002, Agarwal et al. 2004, Tripsas 2008). The breadth and depth of required change often proves unattainable. The mainframe computer industry, for example, is littered with firms that failed to survive.

Today, no firm can confidently predict that it will not face dramatic shifts in its external environment. The pace of globalization and technological change, for example, places significant pressure on companies to adapt. Because major transformations can pose great difficulties due to the extent of change required, companies instead may seek to continuously renew themselves in incremental ways in the hope of keeping pace with, and even leading, external environment changes. This is an important lesson of research on ambidexterity (Tushman and O'Reilly 2004, O'Reilly and Tushman 2008), which focuses on ways in which firms can build future new businesses while operating mature businesses. In this sense, ambidexterity is one solution to the problems posed by major transformations.

Incremental strategic renewal, if undertaken proactively, may enable firms to cope with changes in the external environment as they take shape, and thereby reduce the need for a much larger and more difficult transformation later on. Madsen and Leiblein (2008) provide several examples of firms across multiple industries, including Boeing, Quicken, and Calloway Golf, that undertook a fusion of related innovations and a sequence of path-dependent opportunities in pursuit of persistent advantage. Such proactive incremental renewal can include experimentation outside of the core business, such as through corporate venturing, or it can include incremental alterations to the core businesses of the company, including flagship products. For instance, Johnson and Johnson's history exemplifies the purposeful experimentation through acquisitions and subsequent reconfiguration of divisions and products (Karim and Mitchell 2004). Incremental strategic renewal may even enable the firm to shape the external environment to its advantage. For example, by proactively introducing new generations of personal computer (PC) chips on a regular basis, Intel created a barrier to new entry that enabled the firm to dominate its industry for years (Turner et al. 2008).

As the examples of Johnson and Johnson and Intel indicate, not all incremental renewal occurs in response to a previous change in the external environment. Firms conduct many activities on a regular basis that may facilitate renewal, not the least of which is research and development (R&D), with accompanying opportunities for cumulative innovation (Murray and O'Mahony 2007). Conducting renewal activities such as R&D on a regular basis requires underlying processes, rules, routines, and resources, along with the capabilities to develop and execute such activities, including dynamic capabilities (Rothaermel and Hess 2007). Helfat et al. (2007) define a dynamic capability as "the capacity of an organization to purposefully create, extend, or modify its resource base"[2] (p. 4). Thus, strategic renewal contains a role for dynamic capabilities through modification of the organization's resource base.

Given the potential benefits of continual efforts directed at strategic renewal, we might ask why we still see firms attempt major transformations. One answer

might be that some changes in the external environment are difficult to anticipate. Another answer might be that continual adaptation may be hard for organizations to manage effectively, because this may conflict with routines that enable companies to perform current tasks well (Nelson and Winter 1982). One solution to this tension between routines and change is to institutionalize continuous renewal through routines (e.g., routines for search; Helfat 1998), organizational structure (e.g., dedicated organizational units in charge of specific types of renewal activities such as alliances; Dyer et al. 2001), and incentives to conduct on-going renewal activities. Additionally, if a firm develops dynamic capabilities that it uses repeatedly to undertake specific forms of strategic renewal, such as a dynamic capability for acquisitions, this will help to institutionalize renewal within the organization and enable renewal activities to function more effectively on a continuing basis.

Through both continuous strategic renewal and discontinuous transformations, firms may end up with strategies and organizations than differ substantially from where they began. A series of small incremental changes can accumulate into a much larger change when viewed over a longer time span. Thus, not only discontinuous transformations but also continuous incremental strategic renewal efforts hold the potential for major strategic change.

Strategic renewal applies not only to mature firms, but also to young firms. For example, Intel was relatively young when it underwent a major strategic transformation, replacing the dynamic random access memory (DRAM) semiconductor chip as its primary product with the microprocessor. In this example, middle managers led the shift, which top management essentially ratified (Burgelman 1994). In other instances of strategic renewal, top management may lead the way (Tushman and O'Reilly 2004, O'Reilly and Tushman 2008). Strategic renewal also applies at several levels of analysis, including within firms, across firms through interfirm relationships (such as alliances/joint ventures, partnerships, licensing), within industries, across industries (such as those undergoing convergence), and within a network of firms (within and across industries). This potential scope for strategic renewal suggests that it may have a wide and deep impact, as we next discuss.

Impact of Strategic Renewal

Long ago, Schumpeter (1934) warned of the "gales of creative destruction." A multitude of studies has documented, across many industries and over time, the displacement of existing market leaders by new entrants to an industry when technological change occurs (Christensen and Rosenbloom 1995, Cooper and Schendel 1976, Henderson and Clark 1990, Tushman and Anderson 1986, Utterback 1994). Other evidence, however, suggests that incumbent firms can withstand the onslaught of creative destruction through strategic renewal efforts that affect not only their own performance, but also the future of entire industries (Christensen et al. 1998; Katila 2002; Madsen and Walker 2007; Mitchell 1989, 1991; Tripsas 1997). Established firms also account for a significant share of economic growth, including through factors that are frequently associated with strategic renewal. For example, in the United States, the lion's share of new patents from innovation—often an important part of strategic renewal—comes from established firms. In the semiconductor industry, for instance, incumbent firms accounted for more than 90% of all patenting activity during the period 1973–2003.[3] Likewise, new product introductions come disproportionately from incumbent firms. Evidence from both the medical devices (Karim and Mitchell 2000) and industrial robotics industries (Katila and Ahuja 2002) suggests that most of the new products developed in these industries stem from incumbent firms, as opposed to new entrants. Within the disk drive industry, Franco et al. (2008) show that incumbents in existing markets are as likely as new entrants to identify and pioneer new markets, and have a higher likelihood of survival. Similarly, Mitchell (1991) provides evidence from the medical diagnostic imaging industry that incumbents who enter emerging submarkets survive longer than new entrants, and have a higher long-term market share advantage.

The importance of incumbent firms goes beyond high technology industries and innovative activities. Madsen and Walker (2007) document that in the post deregulation regime of the U.S. trucking industry, incumbents who strategically renewed themselves had a greater impact on the evolution of the industry, as evidenced by persistently higher revenues and size, than firms who entered after deregulation. Natarajan's (2007) in-depth study of more than 100 U.S. manufacturing industries shows that new plants established by incumbents are more productive than those of startups. In addition, acquisitions, an obvious avenue for strategic renewal, are mostly undertaken by established firms (Karim and Mitchell 2000). International diversification, yet another route to strategic renewal, is largely undertaken by incumbent firms; Chittoor et al. (2009) and Dastidar (2008) quantify the internationalization premium that firms receive for such activities.

In addition to the above primary impact of incumbents within a focal industry setting, there are two enduring effects that are not fully acknowledged in studies that make the incumbent-entrant distinction. First, entrants that destroy the status quo in an industry are often established firms diversifying from other industries, rather than de novo entrants (Bayus and Agarwal 2007, Carroll et al. 1996, Helfat and Lieberman 2002, Klepper and Simons 2000, Methe et al. 1996). Although startups make up the largest share of entrants into new markets,

it is diversifying entrants that are the most successful in terms of both survival and performance in new industries (Echambadi et al. 2008, Helfat and Lieberman 2002). For instance, using 100 years of data across 22 industries, Echambadi et al. (2008) show that large diversifying entrants played a significant role in creating new industries. Diversifying entrants benefit directly from their scale and pre-entry experience (Klepper and Simons 2000). Chen et al. (2008) document their advantage, relative to entrepreneurial startups, in overcoming the challenges of growth and withstanding subsequent technological shocks, in part due to their prior experience in the reconfiguration of resources and capabilities that enabled diversified entry (Helfat and Raubitschek 2000). Diversifying entrants also play an important role in shaping the subsequent evolution and growth of new industries through investments they make in developing the necessary infrastructure and complementary assets (Agarwal and Bayus 2002) and enhancing the legitimacy of the industry (Baum and Oliver 1991, Haveman 1994).

Second, because strategy and organization studies typically focus on an organization's own performance, they may underestimate the associated social and economic welfare consequences. In a review of the growing literature on employee entrepreneurship, Agarwal et al. (2007) highlight the "process of creative construction," whereby strategic renewal investments made by established organizations can also result in the creation of spinouts—new ventures founded by employees of established firms. Although the spinout firms appropriate substantial value from their ventures (e.g., Agarwal et al. 2004, Klepper and Sleeper 2005), entire regions and economies benefit from knowledge spillovers and parallel investments by established firms (Brittain and Freeman 1986, Davis and Moore 2004, Klepper 2007, Romer 1990, Saxenian 1994). Furthermore, established organizations may deliberately encourage spinouts who produce complementary products or inputs (Agarwal et al. 2007), while at the same time discouraging rivals from competing directly in core technologies (Moore and Davis 2004, Agarwal et al. 2009). For example, both Fairchild and Intel actively encouraged spinouts in noncore technologies, so that these parent organizations could leverage the newly founded firms to obtain components for their own R&D and manufacturing efforts (Moore and Davis 2004). Thus, rather than being "destroyed," incumbents that encourage new firm formation can continue to succeed in the process of creative construction (Agarwal et al. 2007).

Through their many activities directed toward growth and change, including the creation of spinouts, established firms account for much of the new job creation in the economy. Using U.S. Census data for the 1972–1986 period, Davis and Haltiwinger (1992) show that 80% of all new job creation in the manufacturing sector resulted from the expansion efforts of established firms.[4] This evidence suggests that although entrepreneurial ventures add a great deal to the economy, we cannot overlook the activities of established firms, including activities that often are part of strategic renewal, such as innovation, market entry, and investment. Moreover, once entrepreneurial ventures become profitable enterprises, they may face the challenges and opportunities of strategic renewal (Beckman and Burton 2008).

Much of the evidence just cited involves activities that can, but do not necessarily, involve strategic renewal. Next we focus on the aspects of these and other activities that constitute "refreshment" or "replacement" via strategic renewal. To begin, we provide a case example to illustrate how firms can renew themselves multiple times and, in so doing, help to reshape the course of the economy.

Strategic Renewal at IBM

IBM arguably has had a major impact on the U.S. economy over several decades. The company has been a leading purveyor of business machines, computers, and information technology services—businesses that have permeated many sectors of the economy and consume substantial organizational resources (Aral and Weill 2007). IBM's history is characterized by multiple efforts at major strategic transformations along with continued incremental strategic renewal. We focus here on IBM's more successful efforts to provide concrete examples of the content and process of strategic renewal that can lead to positive outcomes, while acknowledging that IBM has a far from perfect record of strategic renewal. We begin by examining major transformations at IBM and then discuss incremental renewal.

Major Transformations at IBM

IBM first successfully transformed itself from an electromechanical accounting equipment company into an electronic computing company during the period 1940 to 1965 (Usselman 1993). In recent years, IBM has transformed itself from a hardware-based computing company with a substantial personal computer business into a business computing services company (Lohr 2002; 2004a, b). In between these two successful transformations, IBM built a large PC business beginning in the early 1980s, as its mainframe computing business matured. Many observers consider IBM's move into PCs to have been poorly managed. As a result, other firms came to dominate the most profitable segments of the personal computer market, namely, Microsoft in operating systems and Intel in semiconductor chips, creating a "Wintel" platform (Rivkin and Porter 1999).

IBM undertook its first strategic transformation in response to a technological advance in electronic computing that occurred in the external environment as a result of university research, aided by U.S. military

Table 1 Strategic Renewal of IBM from Electromechanical to Electronic Business Machines

	Strengths (attributes that retain value): Strong customer relationships R&D personnel Brand recognition Manufacturing and service Intrafirm coordination	**Weaknesses (attributes that constrain value creation):** Lack of electronic expertise Outdated organizational cognition regarding core business
Opportunities: Government/university research in electronic technology Untapped demand	**I. Strategies for adaptation and refreshment, given external opportunities** Combine complementary assets (strong customer relationships, brand recognition, manufacturing, service) with externally available research and emerging technology Use sales force to identify new demand opportunities in electronic computing	**II. Strategies for replacement, given external opportunities** Access university and government research to gain knowledge of electronic technology
Threats: Rival companies Risk of technological obsolescence	**III. Strategies for adaptation and refreshment, to avoid external threats** Use R&D personnel and customer feedback to avoid risk of technological obsolescence Target commercial applications for existing customers to gain competitive advantage over rivals Use links with complementary assets and investment in R&D to avoid risk of obsolescence Use intrafirm coordination to implement electronic computing, to avoid risk of obsolescence	**IV. Strategies for replacement, to neutralize external threats** Renew technological base to avoid obsolescence Top management commitment to changing organizational cognition toward electronic computing to avoid risk of obsolescence Top management provision of social and economic incentives to employees for developing electronic capabilities, to avoid risk of obsolescence

funding. In the face of this technological change, many of the leading electromechanical business machine companies failed. Of the companies that survived, IBM is generally acknowledged as having made the most effective transition to electronic computing. Table 1 adapts the TOWS matrix (Weihrich 1982) to depict IBM's transformation. As shown in Table 1, IBM's success resulted from strategies that responded to the many environmental opportunities and threats with adaptation and replacement of existing company attributes. For example, the company had early knowledge of, and access to, the technology of electronic computing through electronics research conducted for the U.S. government during World War II. Although electronic computing technology was competence-destroying (Tushman and Anderson 1986), IBM combined its early access to the new technology with proactive development of new capabilities in electronic computing (Section II of Table 1). In doing so, IBM avoided the risk the obsolescence, and obtained a significant early mover advantage (Section III of Table 1).

Although electronic computing technology was a clear substitute for the existing electromechanical technology, it was nevertheless competence-enhancing for IBM's complementary assets. The firm had strong sales relationships with customers, and a reputation for manufacturing reliable machines and servicing them effectively in the field, which helped the company to convince customers to purchase the new electronic machines from IBM rather than from competitors (Usselman 1993). Thus, IBM was able to leverage these complementary assets, along with its early access to electronic technology, to identify and take advantage of the commercial (as opposed to military) demand for electronic computing (Section I of Table 1). Moreover, through extensive communication, coordination, and use of cross-functional teams involving middle managers working in different units, IBM was able to adapt the new technology to meet the needs of its customers (Section III of Table 1) (Taylor and Helfat 2009).

Top management also had a critical impact on IBM's strategic renewal by reshaping organizational cognition, through constant communication regarding the need to move the core business to electronic computing and to integrate the requisite core and complementary assets (Taylor and Helfat 2009). Top management further created structural mechanisms to facilitate communication and coordination, and provided economic incentives and social status for managers associated with electronic computing (Section IV of Table 1).

More recently, at the turn of the 21st century, IBM initiated a transformation from computing hardware to business computing services. Initially labeled "e-business on demand," IBM combines software, hardware, and

Table 2 Strategic Renewal of IBM from Computing Hardware to Computing Business Services

	Strengths (attributes that retain value): Strong customer relationships R&D personnel Brand recognition Hardware expertise Customer service Intrafirm coordination	**Weaknesses (attributes that constrain value creation):** Lack of software and consulting expertise Outdated organizational cognition regarding core business
Opportunities: Productivity gains in combining hardware/software Existing firms with well developed expertise in complementary capabilities Untapped demand	**I. Strategies for adaptation and refreshment, given external opportunities** Combine core and complementary assets (strong customer relationships, brand recognition, service, R&D) to take advantage of opportunities in combining hardware, software, and services Use cross-functional teams to identify new demand opportunities in electronic business services	**II. Strategies for replacement, given external opportunities** Acquire Rational Software and PWC Consulting to overcome lack of software and consulting expertise Provide new strategic vision around electronic business services to leverage opportunities in combining hardware and software.
Threats: Rival companies Risk of technological obsolescence Commoditization of hardware/software alone	**III. Strategies for adaptation and refreshment, to avoid external threats** Leverage brand recognition plus customer relationships and service to seek competitive advantage over rivals in new business through early mover status	**IV. Strategies for replacement, to neutralize external threats** Renew technological base to avoid obsolescence Top management commitment to changing organizational cognition toward electronic business services, to avoid obsolescence Move out of commoditized hardware (divest hard drives, PCs), and focus on integrating consulting, software, and services with hardware

consulting expertise to provide business computing services to corporate customers (Herrald et al. 2007, Lohr 2002). As seen in Table 2, IBM has once again leveraged some of its historical strengths, including its reputation for superior customer service, relationships with customers, and R&D expertise (Section I of Table 2). This has enabled IBM to develop significant competitive strength against rivals and reduce its reliance on more commoditized businesses such as software or hardware alone (Sections III and IV of Table 2). Furthermore, as part of the transition, IBM identified key weaknesses within its existing capabilities—for example, deficiencies in software and consulting expertise—and addressed these through external development, such as the acquisitions of Rational Software and Price-Waterhouse Coopers Consulting (Section II of Table 2). Also, as depicted in Section IV of Table 2, IBM has sought to reshape organizational cognition toward the new thrust through significant efforts championed by the CEO, Samuel J. Palmisano, and divestment of its core hard disk drive and personal computer businesses (Lohr 2002; 2004a, b). Through its current championing of distributed computing, IBM hopes to further leverage its historical and current emphasis on services (Herrald et al. 2007, Garvin and Levesque 2006).

A comparison of Tables 1 and 2 reveals some striking similarities in the strategic renewal efforts undertaken by IBM in both transformations, and illustrates several aspects of strategic renewal discussed earlier. First, both transitions involved *replacement* of the company's main business. These replacements occurred because either a new technology or a changing competitive landscape threatened to make IBM's current business outdated. Second, because the replacements involved the company's primary business, by definition they had a critical affect on the *long-term prospects* of the company. Third, these transformations involved replacing *important attributes* of the company's strategy and organization. Attributes that were replaced almost in their entirety included products (in the case of the first transition), the base of technological knowledge (an intangible asset), and organizational cognition regarding the nature of the company's business. Other company attributes were only partially replaced, and were adapted from their preexisting form. These included the sales force (the existing sales force sold the new machines, or were leveraged to forge new business relationships), preexisting cognition regarding the importance of intraorganizational coordination to satisfy customer needs, the company's reputation, and its relationships with customers. Finally, these changes in company attributes related to the *content* of the strategic renewal (e.g., knowledge base), the *process* of making and implementing the associated decisions (e.g., organizational

cognition), and the *outcome* (e.g., IBM's survival as a major corporation).

IBM's transformations also provide concrete examples of the way in which the ability to take advantage of a strategic opportunity for the future depends in part on the current state of the organization. For example, to return to Winter's (2007) discussion of how reputation can affect future opportunities, IBM had a preexisting reputation for producing reliable products, which provided the company with opportunities for sales of electronic computers that de novo entrants did not have. Similarly, today IBM's reputation engenders trust among corporations that are considering outsourcing their information technology needs, an advantage not possessed by startups.

Incremental Strategic Renewal at IBM

In addition to undertaking major transformations, IBM has pursued continued renewal over time. According to former CEO Lou Gerstner, the most recent strategic transformation at IBM was in fact enabled by underlying continuous incremental renewal, which in turn was supported by dynamic capabilities (Herrald et al. 2007). IBM used business model innovations to "make small, frequent investments and to learn from them" (Herrald et al. 2007, p. 41). Through the use of its "emerging business opportunities" process, for instance, IBM made 25 "business bets" in the 1999–2004 period; three of these failed, but the remainder created more than $31 billion in additional revenue (Garvin and Levesque 2006).

In its incremental strategic renewal activities, IBM demonstrated a clear commitment and communication of strategic intent by top management, along with processes for both the formulation of strategy and its implementation. These processes have enabled incremental strategic renewal in IBM's products and the solutions and services that IBM provides to its customers. For example, IBM has historically been, and is today, a leading firm in the development and manufacturing of highly sophisticated semiconductor chips, even as new generations of chips and types of technologies continue to supplant one another. Maintaining a leading position in this environment requires institutionalizing renewal activities through routines for search for new technologies, for repeated adaptation of manufacturing operations, and for integration between the two. Similarly, IBM was one of earliest adopters of the principles of operations research and mathematical modeling in the 1940s (Baker 2008). Since then, it has continued to build on this expertise, which has enabled IBM to not only improve its own internal operations and worker productivity, but also provide new business services to customers (Baker 2008, Lohr 2004a). For example, Lohr (2004a) discusses how IBM's services and research labs worked with customers such as FinnAir to develop mathematical models and optimization algorithms designed to increase customer loyalty, reduce marketing costs, and improve response rates among members of FinnAir's frequent-flier program.

Overall, IBM's history of strategic renewal has been characterized by many important features of strategic renewal. It has included major transformations as well as incremental renewal. It has encompassed both strategic content and process, with both top and middle management playing important roles. The outcomes of the renewals have also varied in their success. Whereas the examples highlighted above are viewed as having led to high company performance, the transition to the PC business is viewed as much less successful.

In the next section, we examine a larger set of examples of strategic renewal contained in this special issue, covering a variety of external influences on strategic renewal, modes of renewal, and internal company factors that affect the content, process, and outcome of strategic renewal.

Avenues for Strategic Renewal

Technological change often dominates discussions of strategic renewal, and the analyses in this special issue reflect this common focus. All of the empirical studies involve either technology-based businesses (e.g., information technology, flash memory, telecommunications, fiber optics) or new product development/R&D in low-technology industries (e.g., tennis rackets, home furnishings). But in addition, these companies often face nontechnological market pressures, such as mature or slowing customer demand (e.g., Kim and Pennings 2009, Gulati and Puranam 2009, Tripsas 2009), deregulation (e.g., Capron and Mitchell 2009), and changes in competition (e.g., Capron and Mitchell 2009, Knott and Posen 2009). This set of analyses also includes strategic renewals by relatively young firms (e.g., Tripsas 2009), as well as by more established firms (e.g., Kim and Pennings 2009, Capron and Mitchell 2009, Salvato 2009). Although most of the studies focus at the firm level of analysis, two studies provide evidence of within-industry heterogeneity in strategic renewal efforts and outcomes (Eggers and Kaplan 2009, Knott and Posen 2009), and one study focuses on industry-level strategic renewal (Kim and Pennings 2009).

All of the empirical examples in this special issue include some form of refreshment or replacement of critical organizational attributes. For example, Tripsas (2009) documents how a company producing flash memories completely replaced its initial product-market focus and organizational identity. Kim and Pennings (2009) analyze repeated shifts by firms in the tennis racket industry from one dominant product design to another. Eggers and Kaplan (2009) investigate the timing of entry into the new fiber-optic market by telecommunications equipment providers at a time when fiber-optic technology was beginning to supplant the existing technology.

Capron and Mitchell (2009) investigate how international telecommunications companies used acquisitions to fill gaps in capabilities needed to adapt to technological, regulatory, and competitive changes in the industry. Puranam et al. (2009) examine integration of acquisitions in the fast-paced information technology industry, where acquisitions can help companies obtain new technologies. In a similar industry context, Benson and Ziedonis (2009) examine the impact of corporate venture capital investments on acquisition performance in the information technology sector. Looking deep within a company, Salvato (2009) investigates the evolution of new product development capabilities in a home furnishings company. Gulati and Puranam (2009) show how a networking equipment company underwent a complete reorganization of its internal structure to adapt to changes in market demand. Finally, Knott and Posen (2009) provide evidence suggesting that R&D enables firms to regain eroded advantage.

These studies shed light on both major transformations and incremental strategic renewal efforts. Eggers and Kaplan (2009) examine strategic renewal of incumbent organizations in the context of an external technological disruption, clearly representing a need for a major transformation. Both Tripsas (2009) and Gulati and Puranam (2009) document major transformations even in the absence of external disruptive shocks. Tripsas (2009) provides a rich analysis of how a minor change from a technological standpoint was nonetheless identity challenging and drove a complete transformation of an organization's identity from a digital photography market to a flash memory company. Similarly, Gulati and Puranam (2009) highlight the organizational transformation of Cisco Systems to make possible a dual focus on cost reduction and customer responsiveness.

The other six empirical studies underscore the need for continuous or incremental strategic renewal. This need may arise due to incremental changes in technology that affect mature industries (Knott and Posen 2009) or the firm's own new product development efforts (Kim and Pennings 2009, Salvato 2009). Other stimuli include environmental factors such as changes in government regulation and international competition (Capron and Mitchell 2009), or the continually changing technological frontier in information-technology-related industries (Puranam et al. 2009, Benson and Ziedonis 2009).

We see several modes of renewal in these studies, including internal change via reorganization, market entry, and R&D and new product development (e.g., Gulati and Puranam 2009, Tripsas 2009, Salvato 2009, Kim and Pennings 2009), as well as external sources of renewal via acquisitions and corporate venture capital investments (Capron and Mitchell 2009, Benson and Ziedonis 2009, Puranam et al. 2009). Moreover, in these studies, individuals have a substantial impact on the effectiveness of the various modes of renewal, particularly top management (e.g., Tripsas 2009, Eggers and Kaplan 2009, Salvato 2009). Augier and Teece (2009) provide a conceptual lens that focuses on the importance of the "entrepreneurial" dynamic capabilities of top management in strategic renewal (see also Adner and Helfat 2003). Salvato (2009) analyzes the strategic renewal of a home furnishings firm and provides direct evidence of how top management influenced the evolution of product development capabilities over time. Eggers and Kaplan (2009) examine strategic renewal via entry into the fiber-optics market by established telecommunications equipment firms and show how the cognition of senior managers affected the timing of entry. In addition, Tripsas (2009) underscores how a new CEO was critical to the product-market and identity shift of a flash memory company.

These studies further demonstrate that not only individuals but also organization-level attributes play an important role in strategic renewal. These attributes include the internal social and political context (e.g., Capron and Mitchell 2009), organizational identity and cognition (Tripsas 2009, Eggers and Kaplan 2009), organizational structure (Gulati and Puranam 2009, Puranam et al. 2009), and dynamic capabilities for selection and integration of acquisitions and venture capital investments (Capron and Mitchell 2009, Benson and Ziedonis 2009).

These studies also identify a number of factors that are important to consider in future research on strategic renewal. Two of the studies show how organizations undergoing strategic renewal may need to proactively manage their external environment, such as by changing perceptions of consumers (Kim and Pennings 2009) or the external identity of the company in the eyes of other stakeholders, such as investors and analysts (Tripsas 2009). These studies also suggest the importance of organizational cognition and shared assumptions that manifest themselves in the form of internal identity (Tripsas 2009) and common ground (Gulati and Puranam 2009), in addition to top management cognition (Eggers and Kaplan 2009). Yet other studies point to the importance of knowledge acquisition through corporate venture capital investing (Benson and Zidonis) and dynamic capabilities for the selection and integration of acquisitions (Puranam et al. 2009, Capron and Mitchell 2009), R&D and new product development (Kim and Pennings 2009, Salvato 2009), and top management opportunity recognition (Augier and Teece 2009, Eggers and Kaplan 2009, Tripsas 2009).

Notably, we see the role of content as well as process in these analyses, for major transformations and incremental renewal alike (see Table 3). Many of the individual studies contain both content and process elements. For example, the analysis of market entry into fiber optics focuses on the role of managerial cognition (Eggers and Kaplan 2009), the analysis of telecommunications acquisitions focuses on the role of internal

Table 3 Process and Content Aspects of Strategic Renewal in the Special Issue Articles

	Discontinuous transformations	Incremental renewal
Process	Organizational identity (Tripsas 2009) Effect of cognition on entry into new industry (Eggers and Kaplan 2009) Dual focus on cost reduction and customer responsiveness (Gulati and Puranam 2009) Formal and informal organizational structure (Gulati and Puranam 2009) Entrepreneurial dynamic capabilities of top management (Augier and Teece 2009)	Internal social context in acquisitions to fill capability gaps (Capron and Mitchell 2009) Organizational imitation and contagion in adoption of dominant designs (Kim and Pennings 2009) Microprocesses for adaptation of new product development capabilities (Salvato 2009) Effect of shared cognition on postacquisition integration (Puranam et al. 2009) Entrepreneurial dynamic capabilities of top management (Augier and Teece 2009)
Content	Product market shift (Tripsas 2009) Discontinuous technological change and entry into new industry (Eggers and Kaplan 2009)	Acquisitions to obtain new technologies (Puranam et al. 2009) Acquisitions to obtain new capabilities (Capron and Mitchell 2009) Impact on acquisitions of corporate venture capital investing (Benson and Ziedonis 2009) Changing dominant designs (Kim and Pennings 2009) Development of new products (Salvato 2009) R&D investment (Knott and Posen 2009)

social context (Capron and Mitchell 2009), and the study of information technology acquisitions focuses on the importance of organizational cognition in the form of common ground (Puranam et al. 2009). Additionally, the analysis of changing dominant designs in tennis rackets has an important role for organization imitation and contagion within the industry (Kim and Pennings 2009). The study of the reorganization of the internal structure of a networking equipment company also develops a game-theoretic model characteristic of more content-oriented analyses (Gulati and Puranam 2009). In short, as these examples suggest, both content and process matter for understanding strategic renewal.

The papers in this special issue are organized as follows. The majority of the papers focus on incremental renewal, and we begin with these. The first three papers examine external modes of acquiring and adapting capabilities (Capron and Mitchell 2009, Puranam et al. 2009, Benson and Ziedonis 2009). The next three papers focus on internal R&D and new product development (Knott and Posen 2009, Kim and Pennings 2009, Salvato 2009). Augier and Teece (2009) then provide a conceptual lens for top management dynamic capabilities that relates to both incremental renewal and major transformations. Thus, it serves as a transition to the final set of papers, which focus on organizational, managerial, and cognitive attributes in the context of major strategic transformations (Gulati and Puranam 2009, Tripsas 2009, Eggers and Kaplan 2009).

Conclusion

Strategic renewal has important consequences for the organizations involved, for the industries in which they compete, and for entire economies. Nevertheless, strategic renewal often fails to receive attention as a distinct phenomenon. This phenomenon goes beyond its most common conception as discontinuous transformation, beyond its most common exemplar of technological change, and beyond its most common application to processes of change.

As a starting point for future research, we have provided a working definition of the term "strategic renewal" that is broad enough to encompass the full range of strategic renewal possibilities, but still distinguishes strategic renewal from strategic change more generally. Strategic renewal can involve continuing incremental changes as well as discontinuous transformations, and can involve a range of precipitating circumstances, including but not limited to technological change. The many examples of strategic renewal in this special issue show that it is a phenomenon where the content and process of strategy are heavily intertwined, involving multiple dimensions of change including those with regard to competition, firm resources and capabilities, organizational structure, and cognition, as well as routines and processes for decision making and implementation. Therefore, research on strategic renewal is likely to benefit from using multiple lenses and literatures. In addition, investigation of strategic renewal can inform a number of literatures, such as the study of young "entrepreneurial" firms and the study of industry population dynamics, with the potential to yield new insights.

Acknowledgments

The authors received very helpful comments on this article from Linda Argote and Samina Karim. They are also grateful to the University of Illinois School of Business for sponsoring a conference connected with this special issue in March 2007, and to Lihong Qian for her able assistance.

Endnotes

[1]This definition combines portions of definitions used by Winter (2007) and Rumelt et al. (1994, p. 9).

[2]In Helfat et al. (2007), the resource base of an organization includes tangible, intangible, and human assets, as well as capabilities that the organization owns, controls, or has access to on a preferential basis.

[3]This statistic is based on the data used by Agarwal et al. (2008), using their definition of established firms (firms that are either public, or have more than 100 employees, or are more than five years old).

[4]This is also consistent with Spletzer's (2000) findings based on microdata for West Virginia in the 1990–1996 period.

References

Adner, R. 2002. When are technologies disruptive: A demand-based view of the emergence of competition. *Strategic Management J.* **23** 667–688.

Adner, R., C. E. Helfat. 2003. Corporate effects and dynamic managerial capabilities. *Strategic Management J.* **24** 1011–1025.

Agarwal, R., B. L. Bayus. 2002. The market evolution and sales takeoff of product innovations. *Management Sci.* **48** 1024–1041.

Agarwal, R., D. Audretsch, M. B. Sarkar. 2007. The process of creative construction: Knowledge spillovers, entrepreneurship and economic growth. *Strategic Entrepreneurship J.* **1**(2) 263–286.

Agarwal, R., M. Ganco, R. H. Ziedonis. 2009. Reputations for toughness in IP enforcement: Effects on knowledge spillovers through employee mobility. *Strategic Management J.* Forthcoming.

Agarwal, R., R. Echambadi, A. Franco, M. B. Sarkar. 2004. Knowledge transfer through inheritance: Spinout generation, development and survival. *Acad. Management J.* **47** 501–522.

Aral, S., P. Weill. 2007. IT assets, organizational capabilities, and firm performance: How resource allocations and organizational differences explain performance variation. *Organ. Sci.* **18**(5) 763–780.

Augier, M., D. J. Teece. 2009. Dynamic capabilities and the role of managers in business strategy and economic performance. *Organ. Sci.* **20**(2) 410–421.

Baker, S. 2008 *The Numerati*. Houghton Mifflin Harcourt Publishing, New York.

Baum, J. A. C., C. Oliver. 1991. Institutional linkages and organizational mortality. *Admin. Sci. Quart.* **36** 187–218.

Bayus, B. L., R. Agarwal. 2007. The role of pre-entry experience, entry timing, and product technology strategies in explaining firm survival. *Management Sci.* **53** 1887–1902.

Beckman, C. M., M. D. Burton. 2008. Founding the future: Path dependence in the evolution of top management teams from founding to IPO. *Organ. Sci.* **19**(1) 3–24.

Benson, D., R. H. Ziedonis. 2009. Corporate venture capital as a window on new technologies: Implications for the performance of corporate investors when acquiring startups. *Organ. Sci.* **20**(2) 329–351.

Brittain, J. W., J. Freeman. 1986. Entrepreneurship in the semiconductor industry. Unpublished manuscript, University of California, Berkeley.

Burgelman, R. A. 1994. Fading memories: A process theory of strategic business exit in dynamic environments. *Admin. Sci. Quart.* **39** 24–36.

Capron, L., W. Mitchell. 2009. Selection capability: How capability gaps and internal social frictions affect internal and external strategic renewal. *Organ. Sci.* **20**(2) 294–312.

Carroll, G. R., L. S. Bigelow, M.-D. L. Seidel, L. B. Tsai. 1996. The fates of de novo and de alio producers in the American automobile industry 1885–1981. *Strategic Management J.* **17** 117–137.

Chen, P., W. C. Williams, R. Agarwal. 2009. Growing pains: The effects of size, age, and technology regime on the pre entry experience—growth relationship. Working paper, University of Illinois, Champaign.

Chittoor, R., M. B. Sarkar, S. Ray, P. S. Aulakh. 2009. Third-world copycats to emerging multinationals: Institutional changes and organizational transformation in the Indian pharmaceutical industry. *Organ. Sci.* **20**(1) 187–205.

Christensen, C. M., R. S. Rosenbloom. 1995. Explaining the attacker's advantage: Technological paradigms, organizational dynamics, and the value network. *Res. Policy* **24**(2) 233–257.

Christensen, C. M., F. F. Suarez, J. M. Utterback. 1998. Strategies for survival in fast-changing industries. *Management Sci.* **44** S207–S220.

Cooper, A. C., D. Schendel. 1976. Strategic responses to technological threats. *Bus. Horizons* **19**(1) 61–69.

Dastidar, P. 2009. International corporate diversification and performance: Does firm self-selection matter? *J. Internat. Bus. Stud.* **40** 71–85.

Davis, S. J., J. Haltiwanger. 1992. Gross job creation, gross job destruction, and employment reallocation. *Quart. J. Econom.* **107**(3) 819–863.

Deutsch, C. H. 2005. Kodak bets old strategy can go digital. *New York Times* (January 26).

Dierickx, I., K. Cool. 1991. Asset stock accumulation and the sustainability of competitive advantage. *Management Sci.* **35** 1504–1513.

Dyer, J. H., P. Kale, H. Singh. 2001. How to make strategic alliances work: The role of the alliance function. *MIT Sloan Management Rev.* **42** 37–43.

Echambadi, R., B. L. Bayus, R. Agarwal. 2008. Entry timing and the survival of startup and incumbent firms in new industries. Working paper, University of Illinois, Champaign.

Eggers, J. P., S. Kaplan. 2009. Cognition and renewal: Comparing CEO and organizational effects on incumbent adaptation to technical change. *Organ. Sci.* **20**(2) 461–477.

Floyd, S. W., P. J. Lane. 2000. Strategizing throughout the organization: Managing role conflict in strategic renewal. *Acad. Management Rev.* **25** 154–177.

Franco, A., M. B. Sarkar, R. Agarwal, R. Echambadi. 2008. Swift and Smart: The moderating effects of technological capabilities on the market pioneering–firm survival relationship. Working paper, University of Illinois, Champaign.

Garvin, D. A., L. C. Levesque. 2006. Meeting the challenge of corporate entrepreneurship. *Harvard Bus. Rev.* **84**(10) 102–112.

Gulati, R., P. Puranam. 2009. Renewal through reorganization: The value of inconsistencies between formal and informal organization. *Organ. Sci.* **20**(2) 422–440.

Haveman, H. A. 1994. Follow the leader: Mimetic isomorphism and entry into new markets. *Admin. Sci. Quart.* **38**(4) 593–627.

Helfat, C. E. 1998. Simple indicators of adaptation versus rigidity in history-dependent firm activities and decision rules. *Indust. Corporate Change* **7** 49–75.

Helfat, C. E. 2002. Stylized facts regarding the evolution of organizational resources and capabilities. C. E. Helfat. ed. *The SMS Blackwell Handbook of Organizational Capabilities*. Blackwell Publishing, Malden, MA, 1–11.

Helfat, C. E., M. B. Lieberman. 2002. The birth of capabilities: Market entry and the importance of pre-history. *Indust. Corporate Change* **11**(4) 725–760.

Helfat, C. E., R. S. Raubitschek. 2000. Product sequencing: Coevolution of knowledge, capabilities and products. *Strategic Management J.* **21**(10–11) 961–979.

Helfat, C. E., S. Finkelstein, W. Mitchell, M. A. Peteraf, H. Singh, D. J. Teece, S. G. Winter. 2007. *Dynamic Capabilities: Understanding Strategic Change in Organizations*. Blackwell Publishing, Malden, MA.

Henderson, R. M., K. B. Clark. 1990. Architectural innovation: The reconfiguration of existing. *Admin. Sci. Quart.* **35**(1) 9–30.

Herrald, J. B., C. A. O'Reilly III, M. L. Tushman. 2007. Dynamic capabilities at IBM: Driving strategy into action. *California Management Rev.* **49**(4) 21–43.

Huff, J. O., A. S. Huff, H. Thomas. 1992. Strategic renewal and the interaction of cumulative stress and inertia. *Strategic Management J.* **13** 55–75.

Karim, S., W. Mitchell. 2000. Path-dependent and path-breaking change: Reconfiguring business resources following acquisitions in the U.S. medical sector, 1978–1995. *Strategic Management J.* **21**(10–11) 1061–1082.

Karim, S., W. Mitchell. 2004. Innovating through acquisition and internal development a quarter-century of boundary evolution at Johnson & Johnson. *Long Range Planning* **37** 525–547.

Katila, R. 2002. New product search over time: Past ideas in their prime? *Acad. Management J.* **45** 995–1010.

Katila, R., G. Ahuja. 2002. Something old, something new: A longitudinal study of search behavior and new product interaction. *Acad. Management J.* **45** 1183–1194

Kim, H. E., J. M. Pennings. 2009. Innovation and strategic renewal in mature markets: A study of the tennis racket industry. *Organ. Sci.* **20**(2) 368–383.

Klepper, S. 2002. The capabilities of new firms and the evolution of the us automobile industry. *Indust. Corporate Change* **11** 645–666.

Klepper, S. 2007. Disagreements, spinoffs, and the evolution of Detroit as the capital of the U.S. automobile industry. *Management Sci.* **53** 616–631.

Klepper, S., K. L. Simons. 2000. Dominance by birthright: Entry of prior radio producers and competitive ramifications in the U.S. television receiver industry. *Strategic Management J.* **21**(10–11) 997–1016.

Klepper, S., S. Sleeper. 2005. Entry by spinoffs. *Management Sci.* **51**(8) 1291–1306.

Knott, A. M., H. E. Posen. 2009. Firm R&D behavior and evolving technology in established industries. *Organ. Sci.* **20**(2) 352–367.

Lohr, S. 2002. The new leader of IBM explains his strategic course. *New York Times* (October 31).

Lohr, S. 2004a. Big blue's big bet: less tech, more touch. *New York Times* (January 25).

Lohr, S. 2004b. Sale of I.B.M. PC unit is a bridge between companies and cultures. *New York Times* (December 8).

Madsen, T. L., M. J. Leiblein. 2008. Resource stocks, innovation, and persistent heterogeneity. Presentation, West Coast Research Symposium, Stanford University, Stanford, CA (September 5–6).

Madsen, T. L., G. Walker. 2007. Incumbent and entrant rivalry in a deregulated industry. *Organ. Sci.* **18** 667–687.

Merriam-Webster Online Dictionary. 2008. Merriam-Webster, Springfield, MA. http://www.merriam-webster.com/dictionary.

Methe, D., A. Swamanithan, W. Mitchell. 1996. The underemphasized role of established firms as major sources of innovation. *Indust. Corporate Change* **5** 1181–1203.

Mitchell, W. 1989. Whether and when? Probability and timing of incumbents' entry into emerging industrial subfields. *Admin. Sci. Quart.* **34** 208–230.

Mitchell, W. 1991. Dual clocks: Entry order influence on incumbent and newcomer market share and survival when specialized assets retain their value. *Strategic Management J.* **12** 85–100.

Moore, G., K. Davis. 2004. Learning the silicon valley way. T. Bresnahan, A. Gambardella, eds. *Building High-Tech Clusters: Silicon Valley and Beyond*. Cambridge University Press, Cambridge, UK, 7–39.

Murray, F., S. O'Mahoney. 2007. Exploring the foundations of cumulative innovation: Implications for organization science. *Organ. Sci.* **18**(6) 1006–1021.

Natarajan, B. 2007. Incumbent-entrant asymmetries and learning by doing. Working paper, Florida International University, Miami.

Nelson, R. R. 1991. Why do firms differ and how does it matter? *Strategic Management J.* **12**(Winter) 61–74.

Nelson, R. R., S. G. Winter. 1982. *An Evolutionary Theory of Economic Change*. Belknap Press of Harvard University Press, Cambridge, MA.

O'Reilly, C. A., M. L. Tushman. 2008. Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. B. Staw, A. Brief, eds. *Research in organizational Behavior*, Vol. 28. JAI Press, Greenwich, CT, 185–206.

Puranam, P., H. Singh, S. Chaudhuri. 2009. Integrating aquired capabilities: When structural integration is (un)necessary. *Organ. Sci.* **20**(2) 313–328.

Reuters. 2006. Konica Minolta, a photo giant, quitting cameras and color film. *New York Times* (January 20).

Rivkin, J. W., M. E. Porter. 1999. Matching Dell. Case 9-799-158, Harvard Business School, Boston.

Romer, P. M. 1990. Endogenous Technological Change. *J. Political Econom.* **98**(October, Part 2) 71–102.

Rothaermel, F. T., A. M. Hess. 2007. Building dynamic capabilities: Innovation driven by individual-, firm-, and network-level effects. *Organ. Sci.* **18**(6) 898–921.

Rumelt, R. P., D. E. Schendel, D. J. Teece. 1994. Fundamental issues in strategy. R. P. Rumelt, D. E. Schendel, D. J. Teece, eds. *Fundamental Issues in Strategy: A Research Agenda*. Harvard Business School Press, Boston, 9–47.

Salvato, C. 2009. Capabilities unveiled: The role of ordinary activities in the evolution of product development processes. *Organ. Sci.* **20**(2) 384–409.

Saxenian, A. 1994. *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Harvard University Press, Cambridge, MA.

Schumpeter, J. A. 1934. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Harvard University Press, Cambridge, MA.

Spletzer, J. R. 2000. The contribution of establishment births and deaths to employment growth. *J. Bus. Statist.* **18**(1) 113–126.

Taylor, A., C. E. Helfat. 2009. Organizational linkages for surviving technological change: Complementary assets, middle management, and ambidexterity. *Organ. Sci.* Forthcoming.

Tripsas, M. 1997. Unraveling the process of creative destruction: Complementary assets and incumbent survival in the typesetter industry. *Strategic Management J.* **18** 119–142.

Tripsas, M. 2008. Customer preference discontinuities: A trigger for radical technological change. *Managerial Decision Econom.* **29** 79–97.

Tripsas, M. 2009. Technology, identity, and inertia: Through the lens of "The Digital Photography Company." *Organ. Sci.* **20**(2) 441–460.

Turner, S., W. Mitchell, R. Bettis. 2008. Responding to rivals and compliments: How market concentration shapes generational product innovation strategy. Working paper, University of South Carolina, Columbia.

Tushman, M. L., P. Anderson. 1986. Technological discontinuities and organizational environments. *Admin. Sci. Quart.* **31** 439–465.

Tushman M. L., C. A. O'Reilly. 2004. The ambidextrous organization. *Harvard Bus. Rev.* **82**(4) 74–81.

Usselman, S. W. 1993. IBM and its imitators: Organizational capabilities and the emergence of the international computer industry. *Bus. Econom. History* **22**(2) 1–35.

Utterback, J. M. 1994. Radical innovation and corporate regeneration. *Res. Tech. Management* **37**(4) 10.

Webster's New World Dictionary. 1962. College Ed. World Publishing Company, Cleveland.

Webster's Seven New Collegiate Dictionary. 1972. G&C Merriam Co., Springfield, MA.

Winter, S. G. 1987. Knowledge and competence as strategic assets. D. J. Teece, ed. *The Competitive Challenge: Strategies for Industrial Innovation and Renewal*. Ballinger Publishing, Cambridge, MA, 159–184.

Winter, S. G. 2007. Class notes: Management 223. Wharton School, University of Pennsylvania, Philadelphia.

Weihrich, H. 1982. The TOWS matrix—A tool for situational analysis. *Long Range Planning* **15**(2) 54–66.