

1 Introduction

Business schools around the globe teach a wide variety of disciplines, subdisciplines, methods, and models. Many of the disciplines, such as finance, human resources, and marketing, outline and explain how to manage the everyday activities that every company must perform competently. But, by themselves, the techniques and tools proffered, even if practiced at a high level of proficiency, seldom allow a company facing competition to pull ahead.¹ Moreover, they are generally taught, or implemented, by specialists in each area who may not employ an overarching framework that allows easy integration of their ideas into the bigger picture of corporate success or failure.

This Element arose because of an invitation from the Business Strategy series editor to write an Element covering a big-picture approach to management called the dynamic capabilities framework. In the end, two Elements were needed, this one, which includes an introduction to the framework and a comparison to other approaches to strategic management, and a companion Element presenting a capabilities-based “theory of the firm” and the relationship of dynamic capabilities to older, foundational concepts in the business and economics literature.

The goal of the two Elements is to help scholars and practitioners of management gain a deeper understanding of dynamic capabilities – currently the dominant paradigm in strategic management – and their relation to other concepts and models of the firm. The books’ intended audience includes teachers of strategic management and managers (“practitioners”) who may have encountered some of these concepts in classrooms, journals, or in the real world.

Strategic management is a relatively new subdiscipline that focuses on the high-level, interconnected clusters of decisions that determine the longer-run success or failure of business enterprises. But, even in this field, a plethora of concepts and models are taught by a range of practitioners, economists, and other specialists who may not have the desire or even the ability to connect the disparate elements in a coherent and practical manner.

The dynamic capabilities framework is a high-level systems theory approach to the strategic management of the enterprise that tries to address these deficiencies.² It emerged in the 1990s and has continued to evolve and to

¹ The disciplinary, recipe-based approach to management treats competition almost like a game of chess. Competition in the global economy is more reminiscent of (early) mixed martial arts, where multiple combat disciplines, like karate and kickboxing, are allowed. In its early iterations, there were few rules, and fighters could use any combination of fighting styles.

² Systems theory views organizations as social systems whose elements must be coherent if the organization is to be effective (Churchman, 1968).

drive research. In the view of some strategic management scholars, “the dynamic capabilities perspective has firmly established itself as one of the most influential theoretical lenses in contemporary management scholarship” (Schilke, Hu, and Helfat, 2018, p. 390).

The dynamic capabilities framework encompasses capabilities (what the company can do), resources (the assets the company controls), and strategy (how the company selects products and markets, delights customers, and pleases partners). In addition, the framework explicitly incorporates, complements, or augments other concepts, models, and paradigms from the field of strategic management and beyond.

Dynamic capabilities reside in the minds of managers and, to a lesser degree, in the routines and traditions of the organization. Adroit orchestration by top management of the organization’s capabilities and resources over time is essential for increasing the odds that an organization will maintain a profitable competitive advantage over time, even as it shifts its activities across product and service lines and rides out waves of economic and technological change. Dynamic capabilities can be exercised at the level of a business unit as well as for a whole company – or even for a government (Mazzucato and Kattel, 2020).

In practice, competitive advantage is often fleeting. A firm’s management sometimes develops and orchestrates a compelling combination of tangible and intangible assets that sees it on top for a few years before its products and services lose their currency with customers or rivals erode its position. But a few large, long-lived firms make astute, bold bets to open new markets and develop internal systems to help them manage shifts in consumer taste, revolutions in technology, and successions in leadership. Companies like ICI, 3M, IBM, Boeing, GE, NEC, and Nokia had long, profitable runs that made clear they were not one-hit wonders. Yet even they have each now lost much of their luster. Some of this is down to luck, which is an element in any business outcome. While luck sometimes turns very bad, it also tends to favor the prepared.

Many other, lesser-known companies have also built lengthy records of success. Paint and coatings maker Sherwin-Williams, recently added as one of the thirty companies in the Dow Jones Industrial Average, is still going strong after more than 150 years of innovation and growth, with occasional crises that it has surmounted. Records like these don’t prove that a particular company has strong dynamic capabilities. Yet, it is hard to imagine a history of any long-lived enterprise that couldn’t be usefully understood in dynamic capabilities terms. Dynamic capabilities are, at root, about maintaining a company’s fit with its environment over time, which requires the ability to change. Any company that has performed well on average over a very long period has done this by

definition. Any single success can be luck or a flash of entrepreneurial insight, but a record of decades of success under a string of leaders suggests that there's something in the organization's culture and processes that helps it select the right leadership, makes it more adaptable than its rivals to shifts in the business environment, and allows it to shape that environment, forcing rivals to adapt.

Dynamic capabilities are presented here as part of a broader framework. This framework is not a model, nor is it a theory. It is more general than either of those. In her Nobel Prize address, economist Elinor Ostrom positioned frameworks as part of a nested hierarchy. A framework constitutes the broadest level and contains "the most general set of variables that an institutional analyst may want to use to examine a diversity of institutional settings including human interactions within markets, private firms, families, community organizations, legislatures, and government agencies." Within a framework, "[a] theory is used by an analyst to specify which working parts of a framework are considered useful to explain diverse outcomes and how they relate to one another" (Ostrom, 2010, p. 414). Within the ambit of a theory, "models make precise assumptions about a limited number of variables in a theory that scholars use to examine the formal consequences of these specific assumptions about the motivation of actors and the structure of the situation they face" (ibid.).

As a framework (i.e., a broad array of variables that can be used to spawn useful theories), the dynamic capabilities framework is extremely ambitious, seeking to explain the roots of the competitive advantage (or its absence) of particular firms. This is a most fundamental business and economic question. By design, the dynamic capabilities framework is sufficiently general that many other approaches to the securing of competitive advantage can be seen as using subsets of the variables within it, potentially unifying somewhat fragmented fields of knowledge.

Adam Smith's *Wealth of Nations* (1776) was developed from studying the interplay of business operations, workers, and nation-states at the dawn of the Industrial Revolution, informed by Smith's knowledge of history back to Greek and Roman civilizations. In a similar manner, the dynamic capabilities framework was formulated by observing the development of Silicon Valley's leading enterprises as they delivered extraordinary growth and profitability. At the same time, many earlier corporate histories provided positive – and negative – examples because much that is old can become new again. The analysis of this observational data was informed by existing developments in organization theory, behavioral economics, business history, and (strategic) management.

There is no question that technological shifts, particularly digitalization, have impacted competition and strategy and will continue to do so. But the fundamental organizational, technological, and competitive forces captured in the

dynamic capabilities framework still apply. In fact, the system-level thinking of dynamic capabilities is even more important in a digital setting. Digitalization facilitates global transactions, but it creates new vulnerabilities, such as cyber-crimes. In July 2024, a small corner of the digital supply chain imploded when a CrowdStrike software update failed, negatively impacting airlines, border crossings, and health services across multiple jurisdictions. Agile and effective sensing and interpretation of signals is more urgent than ever in an interconnected and interdependent global economy.

The central thesis behind the dynamic capabilities framework is that, in a global economy facing deep uncertainty, active asset orchestration (i.e., continually assessing, modifying, and coordinating internal and external resources) by entrepreneurial managers, coupled with good strategy and a bit of good luck, can enable the business enterprise to generate and capture supernormal profits over the long term. Success is not just about achieving economies of scale and scope or generating network effects. These factors are, of course, important. But outperforming rivals over the long term comes from keeping the firm's asset base aligned with its strategy and shaping the evolution of the business environment and the firm's ecosystems.

To achieve this, entrepreneurial managers must exercise good judgment and make decisions with less than full information. While managers may have rules of thumb for strategy that are rooted in the company's culture and history, strategic decisions typically flow from creative improvisation rather than from a decision-making routine (Bingham and Eisenhardt, 2011). Many strategic decisions cannot be routinized because they occur infrequently, and most are unique. This has been the case since the rise of the modern corporation in the Second Industrial Revolution that began in the late nineteenth century.³

Entrepreneurial managers and routine-based managers are complementary. The first category supports dynamic capabilities, while the second supports ordinary and superordinary capabilities. Both are necessary if large, multi-divisional, and/or vertically integrated enterprises in competitive markets are to master routine efficiency, while its leadership addresses ever-increasing levels of productive and competitive complexity.

General Stanley McChrystal, who oversaw US forces in Iraq and Afghanistan from 2003 to 2008, recognized the need for combining team-level efficiency with overall asset orchestration in the service of a strategy: "We had a culture in

³ There is a debate in the academic literature about the rise of the corporation. The dominant view (associated with Alfred Chandler and Oliver Williamson) holds that corporations exploiting new technologies expanded vertically to minimize transaction costs. A more recent interpretation of the relevant history is that the expansion was driven by entrepreneurial experimentation with access to limited information (Casson and Godley, 2007).

our forces, of excellence . . . How good can I be at flying an airplane, dropping bombs, locating an enemy target? But that's not as important as how well those pieces mesh together" (Rose, 2013). And he saw the need for this orchestration to extend beyond the boundaries of the organization: "The real art is [in] cooperating with civilian agencies, it's cooperating with conventional forces, it's tying the pieces together. That's the art of war, and that's the hard part" (ibid.).

The popularity of the dynamic capabilities framework is undoubtedly due to how well it resonates with today's business environment, which is characterized by rapid technological change, uncertainty in the regulatory domain, and now also in the geopolitical sphere as the world economy – previously knit together by nearly frictionless globalization – unravels. The framework endeavors to embrace the observed complexity without entirely sacrificing parsimony.

The founding definition of dynamic capabilities was "The ability of an organization and its management to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece, Pisano, and Shuen, 1997, p. 516). The emphasis in 1997 was on technological innovation as the generator of change, but dynamic capabilities are equally vital for addressing deep geopolitical uncertainty and changes in governance and regulatory environments at home and abroad (Teece, Peteraf, and Leih, 2016; Teece, Gupta, and Rosenberg, 2023).

Complexity, competitive opaqueness, and ubiquitous interdependencies in the global economy are why building and practicing dynamic capabilities is hard but necessary.⁴ Even articulating it is a challenge. In this regard, it conforms to a sentiment expressed by Albert Einstein that is often paraphrased as "everything should be as simple as it can be but not simpler."⁵ The dynamic capabilities framework draws ideas from multiple literatures, not just in management but also in economics and psychology. It cannot easily be reduced to memorable slogans, but, where possible, I'll try to provide them.

A key goal of this book is to show how disparate approaches to strategic management, which are frequently taught to business students in isolation, can be seen as part of a unified whole: the dynamic capabilities framework. Although not addressed here, dynamic capabilities thinking can equally be

⁴ Companies must develop sensitivity in order to detect "unseen" opportunities and threats. The title of former Intel CEO Andy Grove's book, *Only the Paranoid Survive* (Grove, 1996), captures the level of alertness required.

⁵ See <https://quoteinvestigator.com/2011/05/13/einstein-simple/>. The original quote, from a 1933 lecture, is "It can scarcely be denied that the supreme goal of all theory is to make the irreducible basic elements as simple and as few as possible without having to surrender the adequate representation of a single datum of experience."

applied to human resources, marketing, and other business functions, each of which must be aligned with the strategy of the enterprise if it is to be effective.

Many of the principles underlying the dynamic capabilities framework have been common currency in the business world over the years. For example, a book called *Who Moved My Cheese* (Johnson, 1998) became popular in the late 1990s and provided a parable about the need to innovate and change in order to achieve a desired goal. A team named Hem and Haw go hungry compared with a team named Sniff and Scurry, who are not overly attached to past success, respond to circumstances as they evolve, and embrace change as part of life. In capabilities terms, Hem and Haw are attached to their (quite ordinary) capabilities, while Sniff and Scurry engage in the sensing, seizing, and transforming that are, as will be explained, the essence of dynamic capabilities.

There is a penchant in the academic world – and sometimes in business as well – to advance silver bullet solutions to complex problems, and to do so without analyzing their relationship to existing ideas and concepts. Management ideas are too often left unconnected by their authors or by the professoriate to broader concepts or related ideas. This is unhelpful to the reader and misleading to the decision maker. This Element aims to help scholars and practitioners alike struggle through the cacophony. Among the goals in the pages that follow are to uncover hidden assumptions, identify boundary conditions, and show the consistency of common Silicon Valley management ideas with the dynamic capabilities framework.

The remainder of this Element begins with a recap of the dynamic capabilities framework. There have been countless additions by other authors to dynamic capabilities scholarship. I have also written dozens of articles and given many talks on various aspects of the topic (uncertainty, business models, etc.) as the framework has continued to evolve, deepen, and strengthen. This Element represents the most up-to-date version of the framework in a compact form. Relevant articles are referenced throughout for those interested in delving deeper.

After that, I briefly sketch a dozen strategic management paradigms related to innovation, strategic positioning, and organizational design and compare each of them to the dynamic capabilities framework, drawing out similarities and differences. In three instances, two paradigms are discussed together to underscore key similarities.

The penchant of strategic management authors, including me, for touting their own solutions in isolation from even the more prominent among the many competing and complementary ideas has sown confusion among scholars and practitioners. This Element is an effort to help remedy the situation, for myself as well as for others.

2 Capabilities: An Introduction

A capability is the potential to bring about an outcome. Firms have assets, but money, employees, and patents do not by themselves produce goods and services. Rather, production requires assets to be orchestrated by managers into organizational capabilities that can then be harnessed toward strategic goals. Well-orchestrated capabilities allow firms to delight customers, yield revenue, and generate profits. The managers of government agencies and nonprofit organizations such as universities must exercise their (dynamic) capabilities, too, if they are to achieve their strategic goals and maintain long-run evolutionary fitness (Leih and Teece, 2016).

Capabilities are key to the performance not only of firms but also, ultimately, of nations. John Sutton of the London School of Economics states in his book *Competing in Capabilities* that “The proximate cause [of differences in the wealth of nations] lies, for the most part, in the capabilities of firms” (Sutton, 2012, p. 8). As work like this shows, an embrace of capability thinking, a seemingly simple, yet powerful and transformative, concept, is steadily spreading beyond the field of strategic management, where it already has very strong currency. Sutton’s statement, for example, has profound implications not only for economic theory but for economic development policy, which has sometimes emphasized the accumulation of capital stock over the development of business enterprises with strong organizational and technological capabilities.

One scholar defined an organizational capability as “*a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization’s management a set of decision options for producing significant outputs of a particular type*” (Winter, 2000, p. 983, italics in the original). This conveys a key point; a capability is something valuable that the organization, and/or its current top management team, has learned to do that is subject to management control. In other words, an organizational capability is a type of intangible asset (Teece, 2015). However, as will be discussed later, unique management decisions – often arrived at by reasoning from first principles – are also part of a firm’s capabilities. Management is constrained in the short term by what the organization knows how to do, but management can also decide to change, over time, what the organization can do.

Capabilities are also resources in the “resource-based view” sense described by others (e.g., Wernerfelt, 1984). A key for connecting dynamic capabilities to competitive advantage is explaining why some capabilities are value-enhancing and difficult for rivals to imitate. Before addressing that, though, it’s worth looking again at why the dynamic capabilities framework was created and how it has evolved.

2.1 Why We Needed a New Framework

The dynamic capabilities framework was created because existing approaches to explaining how firms built competitive advantage fell short of reality. This is particularly true in the case of entrepreneurial, Silicon Valley-style firms. These firms depend more than most on outsourcing, platforms, and alliance/ecosystem partners, indicating a need to understand management of external as well as internal resources. Furthermore, they often represent the cutting edge of strategic management and are able to advance rapidly in environments of deep uncertainty, animated, in the first instance, by rapid technological change.

Uncertainty is worth underscoring because it's different from risk. Risk can be calibrated, managed with standard risk management tools, and, in many cases, insured against, since actuarial values can be calculated using estimated probabilities. Uncertainty, by contrast, represents the unpredictable, meaning occurrences that are currently unforeseeable with impacts that are unquantifiable. When such events occur, strong dynamic capabilities enable organizations to respond by shaping the altered competitive environment rather than being shaped by it.

The dominant models of strategy in the 1990s, Michael Porter's Five Forces (discussed in Section 4.2.2) and the Resource-Based View (discussed in the companion Element on *Foundational Concepts*), were too static and tended to ignore uncertainty. Once a firm had achieved an advantage through clever positioning or by acquiring the right assets, it could switch to autopilot. But these theories were missing the reality that firms increasingly had to keep moving faster and smarter just to stay competitive, a phenomenon known as the Red Queen effect (Barnett, 2008). The Porter framework gave short shrift to heterogeneity within each industry and also ignored the strategic implications of complementary assets (discussed in *Foundational Concepts*), which are critical in the digital economy.

The first major dynamic capabilities articles⁶ (Teece and Pisano, 1994; Teece, Pisano, and Shuen, 1997) emphasized the evolutionary aspects of capabilities, placing knowledge and learning at the heart of capability development. In so doing, they also highlighted the difficulty of making strategic changes when needed, because new capabilities take time to nurture and build (or to access, if external).

The recognition of the importance of learning to dynamic capabilities represented a shift from the resource-based view, which emphasizes the accumulation of valuable resources. The resource-based view (discussed further in the companion Element on *Foundational Concepts*) also downplays the need for

⁶ The lineage of these articles can be traced back to a working paper (Teece, Pisano, and Shuen, 1990).

asset orchestration both inside and outside the organization, another key plank in the dynamic capabilities framework. This includes the nurturing of business ecosystem relationships to drive (mutual) learning and success.

In practice, the firm's history of investments and learning can make its path to the future either easier or harder, depending on the degree of match at a given time between the firm's capabilities and the requirements of the business environment. When the release of OpenAI's ChatGPT in October 2022 ignited massive interest in generative artificial intelligence, Nvidia not only had the best chips and associated software for powering such systems, it had a well-established outsourcing relationship with TSMC, the world's largest producer of advanced chips. Nvidia's past investments and partnerships allowed it to make the most of a historic opportunity, growing its market capitalization tenfold to more than three trillion dollars in less than two years.

For applied purposes, I later restated the dynamic capabilities framework around three major clusters of high-level capabilities: sensing, seizing, and transforming (Teece, 2007).⁷ These are the key groups of activities for organizations and management to undertake to keep the firm competitive.

Other vital operations that support strong dynamic capabilities occur in the course of exercising these three groups of activities. *Innovation*, for example, results from sensing, which includes the identification of new product possibilities; from seizing, which includes the development of new business models; and, less often, from transforming, which can give rise to innovative organizational forms. *Learning* is often triggered by sensing, which includes formal R&D, and also results from seizing, which includes the execution of production plans that can produce cumulative learning effects.

Learning doesn't occur passively. It is a collective process that can improve over time. Failing to grasp learning opportunities is dangerous. An organization that turns a deaf ear to valuable negative customer feedback will soon find itself in trouble. An organization that fails to internalize lessons from alliance partners is wasting opportunities.

The dynamic capabilities concept was devised to capture how Silicon Valley-style firms keep pace in industries undergoing rapid technological change.⁸

⁷ Although the terminology I use to explicate dynamic capabilities has changed, there is congruence between the superficially distinct descriptions of dynamic capabilities in my 1997 and 2007 articles: "Teece et al. (1997) framed the dynamic capabilities perspective broadly as one of processes-positions-paths, where a firm pursues paths (strategic opportunities) through the use of managerial and organizational processes, shaped by the firm's positions (its existing asset base). Teece (2007) focused on the goal of pursuing strategic opportunities without calling them paths, and then elaborated on the processes for doing so, namely sensing, seizing, and transforming" (Schilke, Songcui, and Helfat, 2018, p. 402).

⁸ I sometimes refer to dynamic capabilities as "Silicon Valley management in a bottle." Economics is of little use in understanding the relevant phenomena. As Brian Arthur (2023) pointed out,

Over time, an understanding emerged that sensing, seizing, and transforming capabilities can be engaged to respond to opportunities and threats with innovative new products or an innovative business model. In short, innovation is embedded in, and central to, the dynamic capabilities framework.

2.2 The Capabilities Hierarchy

There are different types of capabilities and different ways they can be classified. Many are technological, like knowing how to build a world-class operating system for mobile phones. Some may be tied to making or marketing a very specific product, such as automobile tires. Other capabilities, such as the ability to offer outstanding customer service, are very generalizable to a variety of products and services.

Over time, I've come to think of three levels of organizational capabilities. At the most visible level are the firm's day-to-day ordinary capabilities for running the business on its current trajectory, which are sometimes called standard operating procedures. These are shaped by a set of mid-level capabilities I call microfoundations. Microfoundations include activities such as evolutionary (non-radical) product innovation, acquisitions, and alliance formation that are performed less frequently than ordinary capabilities but which are vital to help the firm grow. Ordinary and microfoundational capabilities are all governed by high-level dynamic capabilities, which I classify into sensing, seizing, and transforming. The action of (strong) dynamic capabilities is most noticeable when a firm undertakes a strategic change such as shifting its trajectory, changing its resource base, or reshaping the industry. But elements of dynamic capabilities are (or at least should be) always active to some degree.

All firms have sensing, seizing, and transforming capabilities in some form. However, a particular firm might be strong in some type(s) and weak in others. A common example is the firm that is strong in sensing, perhaps through R&D, but unable to seize the opportunities that it uncovers. A well-known case is Xerox, whose PARC research unit invented the graphic display, the computer mouse, and other staples of modern personal computers but utterly failed to turn them into a competitive business.

In special cases, a capability will be rooted in a "signature process" (Gratton and Ghoshal, 2005). Signature processes emerge from a company's heritage, including its prior management choices, certain irreversible investments, and context-specific learning. Because of their deep, enterprise-specific roots,

economic descriptors of firm behavior are mostly nouns, such as price, quality, or equilibrium. Understanding technological and organizational change requires verbs, such as sensing, seizing, and transforming.