Managing service innovation: firm-level dynamic capabilities and policy options

den Hertog, P.

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Annex 3

Introduction to the Resource Based View and Dynamic Capabilities View of the firm for non-specialist readers
Why do some firms perform systematically better than others? How do firms build competitive advantage and, more importantly, how do they sustain it over time? Why are some firms capable of extending their scope of products and services and enter or even develop completely new markets, whereas others cannot? These are some of the key questions featuring prominently in the vast strategic management literature as well as part of the innovation literature. As we observed in chapter 1, these types of questions are as relevant to service firms as to manufacturing firms. Especially in the Eighties, industry structure and strategic positioning in such a structure and hence a superior market product/combination vis-à-vis competitors have been held responsible for differences in firm performance. Not least through the work of Porter and fellow collaborators in the positioning school (Minzberg et al., 2009), firm strategy was largely interpreted as driven by the external environment or industry (set of industries) in which a firm had to compete by positioning itself through a fine product-market combination.

However, the rise of the Resource-Based View (RBV, key references here are Barney, 1986 and 1991; Wernerfelt, 1984181) since the early Eighties of the previous century and mostly in parallel with the rise of the Dynamic Capabilities View (DCV, key references are for example Teece & Pisano, 1994 and Teece et al., 1997; Eisenhardt & Martin, 2000) since the Nineties caused the pendulum to swing back in important parts of the strategic management literature (see also Prahalad & Hamel, 1990). The dominant focus on the position in an external environment was partly substituted by analysis of the role played by the internal organization of the firm in creating and sustaining competitive advantage. We introduce both the RBV and DCV views briefly below.

In the RBV a resource is defined as “an asset or input to production (tangible or intangible) that an organization owns, controls, or has access to on a semi-permanent basis” (Helfat & Peteraf, 2003, p. 999). Essentially the RBV conceptualises firms as “bundles of resources” that are “heterogeneously distributed across firms” and assumes that these “resource differences persist over time” (Eisenhardt & Martin, 2000, p. 1105). The basis for competitive advantage is essentially resources that meet the VRIN criterion (i.e. they are Valuable, Rare, Inimitable and Non-substitutable) that give rise to “fresh value creating strategies that cannot be easily duplicated by competing firms” (Eisenhardt & Martin, 2000, p. 1105). Teece et al. (1997), in their seminal contribution to the dynamic capabilities approach, characterised the RBV as follows: “The resource-based approach sees firms with superior systems and structures being profitable not because they engage in strategic investments that may deter entry and raise prices above long run costs, but because they have markedly lower costs, or offer higher quality or product performance. This approach focuses on the rents accruing to the owners of scarce firm-specific resources rather

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181 Prahalad and Hamel (1990) added considerably to the approach by presenting it to a wider audience under the label of the core competence of the corporation.
than the economic profits from product market positioning. Competitive advantage lies ‘upstream’ of product markets and rests on the firm’s idiosyncratic and difficult–to-imitate resources” (1997, p. 513). Apart from the heterogeneity in terms of resources Teece et al. (1997) also highlight what they phrase as the stickiness of resource endowments in the short run which they then explain:

“firms are to some degree stuck with what they have and may have to live with what they lack. This stickiness arises for three reasons. First business development is viewed as an extremely complex process. Quite simply, firms lack the organizational capacity to develop new competences quickly (Dierickx & Cool, 1989). Secondly, some assets are simply not readily tradeable, for example, tacit know how (Teece, 1976, 1980) and reputation (Dierickx and Cool, 1989). Thus resource endowments cannot equilibrate through factor input markets. Finally, even when an asset can be purchased, firms may stand to gain little by doing so. As Barney (1986) points out, unless a firm is lucky, possesses superior information, or both, the price it pays in a competitive factor market will fully capitalize the rents from the asset” (p. 514).

So, simplified, the sheer possession of these rare and hard to imitate resources and leveraging them drives value creation through development of competitive advantage.

Over the years and responding to some of the criticism of the approach, the RBV was developed and enriched. It started to deal (once again) more explicitly with how a firm’s external environment is influencing the process of managing resources and how firm resources are transformed into value. Sirmon et al. for example recently proposed a dynamic resource management model of value creation. Here they not only dealt with environmental contingencies, but systematically dealt with the structuring, bundling and leveraging of firms’ resources and increasingly capability. In doing so, they effectively mix DCV elements into the RBV. Bingham and Eisenhardt (2008) contributed to the RBV by arguing that “competitive advantage stems from both the characteristics of individual resources and the linkages among the resources” (p. 242). They apply the VRIN criteria basically to the combinations of resources and especially see inimitability as the key criterion for gaining competitive advantage. They further differentiate between three alternative strategic logics of RBV (namely leverage, position and opportunity) and argue convincingly that “different types of resources and linkages among resources constitute distinct strategies” (p. 244). This is clearly an attempt to bring firm strategy back under the RBV equation. They further address market dynamism suggesting that different levels of market dynamism affect the strategic logic to be chosen and hence the ways in which resources are linked.

What is confusing though is that Bingham and Eisenhardt (2008, p. 243) in their definition of resources refer to dynamic capabilities as a specific or nested subcategory. In their
w deserve defining resources as the tangible assets (e.g. location, plant, equipment), intangible assets (e.g. patents, brands, technical knowledge) and organizational processes (e.g. product development, country entry, partnering) from which firms can develop value creating strategies"... they also include organizational processes by which firms create, reconfigure or exit resources (often termed ‘dynamic capabilities’) such as Cisco’s acquisition process, Yahoo’s alliance process, and Google’s product development process. In our view a differentiation between operational and dynamic capabilities is lacking here. Further, complex organizational processes are reduced to single dynamic capabilities whereas these are in our view complex firm activities or business processes requiring – depending on the firm strategy, market dynamism, and dynamic capabilities a firm has developed over time – different mixes of dynamic capabilities. For that reason we use the plural form when discussing service innovation and the dynamic capabilities needed for managing a complex organizational process like service innovation.

Earlier, Helfat and Peteraf (2003, p. 1000 and 1009) have deliberately added a dynamic component to the RBV by introducing the notion of capability lifecycles. This is clearly another attempt to explain the sources of heterogeneity that are so central in the RBV. They differentiate between three initial stages of a capability which they label as founding, development and maturity to be followed by a possible branching into six additional stages labelled as six Rs (retirement, retrenchment, renewal, replication, redeployment and recombination).

The DCV as compared to the initial, basic version of the RBV, offers the more dynamic variety of the RBV by emphasizing that possessing a set of resources with VRIN characteristics is not enough to stay competitive in a changing business context. Instead dynamic capabilities or “the firm’s ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al., 1997, p. 516) are seen as key and perceived as the cornerstone of competitive advantage. Dynamic capabilities (still following Teece et al., 1997, p. 518-524) are based upon highly firm-specific managerial and organizational processes (or routines) and shaped to a considerable degree by its specific asset position (current specific endowments of technology, intellectual property, complimentary assets, customer base and its external relations with suppliers and complementors) and paths dependencies (the path ahead a firm can travel is dependent on the current position and importantly on previous investments, routines developed or simply the specific lessons learned by a firm or it’s history). So, it is not merely the unique set of resources with VRIN characteristics at a certain point in time that matter (as is the case the basic version of the RBV), but essentially the firms ability to constantly adapt, reconfigure and innovate that is key.

As pointed out by Easterby-Smith and Prieto (2008, p. 237) a further complicating factor is how dynamic capabilities relate to learning and includes learning capabilities next to
operational capabilities (zero order) and dynamic capabilities (first order). Some scholars in our view rightly link dynamic capabilities to organizational learning and differentiate it from ad hoc problem solving. Zollo and Winter for example make this link to learning explicitly and define dynamic capabilities accordingly as “a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness” … ”dynamic capabilities arise from learning: they constitute the firms systematic methods for modifying operating routines” (2002, p. 340). In our view dynamic capabilities essentially refer to these unique and difficult to replicate tacit firm meta-capabilities.

How should we discriminate then between the various levels (next to various categories) of dynamic capabilities? At first the basic difference between an operational capability and a dynamic capability need to be made clear. Helfat and Peteraf (2003, p. 999) have defined an (organizational) capability as “the capability of an organization to perform a coordinated set of tasks utilizing organizational resources, for the purpose of achieving a particular end result”. Like most other DCV scholars they stress that “dynamic capabilities do not directly affect output for the firm in which they reside, but indirectly contribute to the output of the firm through an impact on operational capabilities” (p. 999). Winter has formulated the basic difference very nicely when he stated that “the capabilities exercised in that stationary process are the zero-level capabilities, the ‘how we earn a living now’ capabilities. Without them the firm could not collect the revenue from its customers that allow it to buy more inputs and do the whole thing over again. By contract, capabilities that would change the product, the production process, the scale, or the customers (markets) served are not at the zero level” (2003, p. 992).

On top of this basic differentiation between an operational capability and a dynamic capability various hierarchies of capabilities have been suggested in the literature. Wang and Ahmed (2007, p. 36) in their review of the dynamic capabilities literature not only discriminate between resources (zero-order elements), capabilities (first order i.e. “ability to deploy resources to attain a desired goal”), core capabilities (second order i.e. “a bundle of a firms resources and capabilities that are strategically important to its competitive advantage at a certain point”) and dynamic capabilities (third order i.e. “a firms constant pursuit of the renewal, reconfiguration and re-creation of resources, capabilities and core capabilities to address the environmental change”). Ambrosini et al. (2009, p. 9) in their review of various hierarchies propose a similar ordering. They split what generally are referred to as dynamic capabilities in incremental dynamic capabilities (i.e. “those

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182 They interestingly also categorise (2007, p. 36-39) commonalities of dynamic capabilities under three headings i.e. adaptive capability (“stresses a firm’s ability to adapt itself in a timely fashion through flexibility of resources and aligning resources and capabilities in line with external changes”), absorptive capability (“highlights the importance of taking in external knowledge and absorbing it for internal use”) and innovative capability (“effectively links a firm’s inherent innovativeness to marketplace-based advantage in terms of new products and/or markets”).
capabilities concerned with the continuous improvement of the firm’s resource base”) and renewing dynamic capabilities (i.e. those that refresh, adapt and augment the resource base). A third category that they discern are regenerative dynamic capabilities (i.e. “which impact, not on the firm’s resource base, but on its current set of dynamic capabilities, i.e. these change the way the firm changes its resource base”). Zahra et al. (2006, p. 924) following Winter (2003) discriminate between substantive capability (i.e. “the organization’s ability to produce a desired output (tangible or intangible)”) and dynamic capability (i.e. “the higher-order ability to manipulate their substantive capabilities”). They also (p. 921), in our view quite rightly, suggest that much of the confusion surrounding dynamic capabilities can probably be linked to the confusion whether dynamic capabilities refer to substantive capabilities in a certain setting or the firm’s ability to change these substantive capabilities. What is clear at least for our purposes is that we need to be precise when defining dynamic capabilities for managing service innovation. We take up this issue at the beginning of section 6.4.

Apart from serious comments that both RBV and DCV are facing (see section 6.5) it should be noted here, however, that scholars using the notion of dynamic capabilities differ among themselves considerably in how dynamic capabilities should be positioned. Eisenhardt and Martin (2000) for example do define dynamic capabilities – as compared to Teece – still closer to the RBV tradition as “The firm’s processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die” (p. 1107) They are compared to especially Teece et al. (1997) more specific about discrete and recognisable strategic and organizational processes than can be labelled as dynamic capabilities and mention for example product development, alliance and acquisition routines, reconfiguration of resources, resource allocation routines, knowledge creation routines and exit routines (p. 1107-1108). They further argue that dynamic capabilities are less unique and idiosyncratic – as for example argued by Teece et al. (1997) – and do show commonalities across firms implying that best practice can be identified. The latter is a precondition in our view for being able to develop more prescriptive management tools and advice. Eisenhardt and Martin argue that “dynamic capabilities have greater equifinality, homogeneity, and substitutability across firms than traditional RBV thinking implies” (p. 1106). This implies that there are more ways to derive at the same core dynamic capabilities and the results created with these, that these capabilities can be substituted between different contexts (i.e. can be used by firms operating in different contexts) and eventually that dynamic capabilities can only provide a temporary and not a sustainable competitive advantage. The latter means that the true differentiator still resides in the resource configuration itself. In their words: “We argue that, hence the functionality of dynamic capability can be duplicated
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... long term competitive advantage lies in the resource configurations that managers build using dynamic capabilities, not in the capabilities themselves. Effective dynamic capabilities are necessary, but not sufficient, conditions for competitive advantage” (Eisenhardt & Martin, 2000, p. 1106 and 1117). This means that Eisenhardt and Martin in fact stay closer to the core thinking of the RBV as compared to Teece et al. (1997) and show greater confidence in using dynamic capabilities for both building new resource configurations and for enhancing existing resource configuration.

Teece has recently developed the dynamic capability framework\(^\text{183}\) considerably in another landmark study (Teece, 2007 and included in Teece, 2009). Here he more deliberately attempts to weave an “umbrella framework that highlights the most critical capabilities needed to sustain the evolutionary and entrepreneurial fitness of the business enterprise” (2007, p. 1322). He proposes three categories of dynamic capabilities that he sees as most critical for sustaining evolutionary and entrepreneurial fitness\(^\text{184}\) i.e. the capacity to sense and shape opportunities and threats, to seize opportunities and dynamic capabilities to maintain competitiveness through enhancing, combining, protecting, and, when necessary reconfiguring the business enterprise’s intangible and tangible assets (Teece, 2007, p. 1319). In his attempt to explain the differences among resources/competences on the one hand and dynamic capabilities on the other hand, he argues that it is dynamic capabilities that result in sustainable competitive advantage downplaying the key role of resources by associating them with operational capabilities and technical fitness. In his words: "perhaps there is now an emerging consensus that resources/competences map well into what historically we have thought of as the enterprise’s operational capabilities, which help sustain technical fitness. Dynamic capabilities, by contrast, relate to high-level activities that link to management’s ability to sense and then seize opportunities, navigate threats, and combine and reconfigure specialized and co-specialized assets to meet changing customer needs, and to sustain and amplify evolutionary fitness, thereby building long-run value for investors” (p. 1344). There is some unclarity whether the three main categories are the dynamic capabilities or the organizational processes which Teece labels as “micro-foundations of dynamic capabilities”. In our view the many processes

\(^{183}\) Teece has neatly and concisely summarized his ambition with his version of the dynamic capabilities approach by stating that “dynamic capabilities aspire to be a relatively parsimonious framework for explaining an extremely seminal and complicated issue: how a business enterprise and its management can first spot the opportunity to earn economic profits, make the decisions and institute the disciplines to execute on that opportunity, and then stay agile so as to continuously refresh the foundations of its early success, thereby generating economic surpluses over time.” (p. 1347).

\(^{184}\) Evolutionary or external fitness – a phrase introduced by Helfat et al. (2007) – indicated how well a capability enables a firm to make a living (as compared to technical capability which refers to how effectively a capability performs its function, regardless of how well the capability enables a firm to make a living).
and elements that Teece labels as micro-foundations are the real dynamic capabilities and spelled out at a level of analysis that is (more) suited for business managers.

Teece’s 2007 paper is an intellectual tour de force in which he comprehensively spells out the microfoundations of his three classes of dynamic capabilities. Some of the elements relevant for our discussion of dynamic capabilities for managing service innovation in section 6.5 are mentioned below.

In the first place Teece adopts a clear business perspective. He states that the framework offered is managerial. He differentiates between the three categories of dynamic capabilities and their micro-foundations (i.e. “the organizational and managerial processes, procedures, systems and structures that undergird each class of capability”, p. 1321) meaning that the business perspective is now much more evident than in Teece’s earlier work on dynamic capabilities. He further indicates that he wants to “provide guidance to managers for avoiding the zero-profit condition” (p. 1320).

Secondly, he explicitly includes under the notion of dynamic capabilities the development of new products and processes and signals that “technological innovation is necessary but not sufficient for success” (p. 1320). He also points at the need to “also generate and implement the complementary organizational and managerial innovations needed to achieve and sustain competitiveness” (p. 1321). This means that Teece is opening up the floor for types of (non-technological) dynamic capabilities which are critical in managing service innovation (see section 6.3). In this context he also specifically refers to value of designing and implementing new business models. In his words “The enterprise must also select or create a particular business model that defines its commercialization strategy and investment priorities. Indeed, there is considerable evidence that business success depends as much on organizational innovation, e.g., design of business models, as it does on the selection of physical technology…. the invention and implementation of business models and associated enterprise boundary choices involve issues as fundamental to business success as the development and adoption of the physical technologies themselves” (p. 1327). As discussed in section 6.4 new revenue models and more widely new business models feature prominently in our new 6D-model and the associated dynamic capabilities for managing the service innovation process.

185 At the same time Teece is compared with for example Eisenhardt and Martin (2000) more hesitant about the transferability of dynamic capabilities which he sees as firm specific and unique. In his view sustainable competitive advantage would erode if dynamic capabilities would be easy to describe and communicate (Teece, 2007, p. 1321).

186 He thereby addresses the issue why and how intangibles contribute to sustained enterprise competitiveness (p. 1321). In this context he still makes the link to overall firm performance when remarking that “the framework indicates that the extent to which an enterprise develops and employs superior (non imitable) dynamic capabilities will determine the nature and amount of intangible assets it will create and/or assemble and the level of economic profits it can earn” (p. 1341).
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Thirdly, Teece introduces a systems perspective\(^{187}\) and explicitly acknowledges the interaction between a firm and the ecosystem it occupies and shapes (p. 1320)\(^{188}\) for superior firm performance. So compared to most RBV contributions Teece takes on board a clear external orientation. More specifically in relation to innovation he points at the need for open innovation processes and the associated “broad-based external search and subsequent integration involving customers, suppliers, and complementors” (p. 1324).

Finally, Teece strongly advocates for entrepreneurial management (and even more widely ‘entrepreneurial managerial capitalism’, p. 1346). This implies that top-management has a responsibility for “figuring out the next big opportunity and how to address it” (p. 1346). In this context he uses the notion of asset orchestration which he sees as a key responsibility of management. In Teece’s words (2007, p. 1341):

“A key strategic function of management is to find new value-enhancing combinations inside the enterprise, and between and amongst enterprises, and with supporting institutions external to the enterprise. Because many of the most valuable assets inside the firm are knowledge related and hence non-tradable, the coordination and integration of such assets create value that cannot be replicated in a market. … The need to sense and seize opportunities, as well as reconfigure when change occurs, requires the allocation, reallocation, combination, and recombination of resources and assets. These are the key strategic function of executives.”

This in our view means that in Teece’s view the responsibility for at least managing the innovation process resides primarily with top management.

By way of conclusion we observe that the RBV is in the process of becoming more dynamic and RBV scholars have started pondering about how resource management leads to competitive advantage. We also notice that the DCV has started off and dived into the micro-foundations of classes of dynamic capabilities such as sensing, seizing and reconfiguration capabilities. Both approaches are gradually becoming more prescriptive i.e. offering practical advice at the business level as how to built adaptive firms.

\(^{187}\) Which we feel comfortable with as is evident from chapters 7-8 where we clearly adopt an innovation systems perspective when discussing the role of knowledge intensive business services and service innovation policies.

\(^{188}\) Later he defined the business ecosystem as “the community of organizations, institutions, and individuals that impact the enterprise and the enterprise’s customers and suppliers” (p. 1325).