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Understanding the Concept of Dynamic Capabilities by Dismantling Teece, Pisano, and Shuen (1997)'s Definition

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Abstract

The concept of dynamic capabilities (DCs) is gaining popularity in management field particularly in strategic management. The concept that is still new and contemporary has attracted many arguments that may lead to confusion. To understand the basic concept of DCs, looking back to the definition in Teece, Pisano and Shuen 1997's working paper will be crucial not just because the authors are among the first to seriously promote DCs but also among the most referred article in the management field of 1990s and even still today. Hence, the objective of this review paper is to understand the basic concept of DCs by scrutinizing the definition in Teece, Pisano and Shuen (1997) that will give benefit to those who are new to the concept and wanting a quick insight on it. The definition is dismantled into six questions where the contested arguments (when applicable) relating to each of the questions are drawn from mainly various DCs literature that is not means to be conclusive and exhaustive.

Keywords: Dynamic capabilities; Teece, Pisano and Shuen (1997)

Introduction

The concept of dynamic capabilities (DCs) that is the extension of resource-base view (RBV) for its ability to respond to rapidly technological change (Teece, 2007) is gaining greater attention in strategic management and has becoming an attractive topic since early 1990s where the origin of the concept can be tracked back as early as 1959 by Penrose (Cavusgil, Seggie, & Talay, 2007). Since the work of Teece, Pisano and Shuen (1997), the concept of DCs has been the fundamental discussion in the related management fields following the works of such as Eisenhardt and Martin (2000), among others. For the record, the term DCs was first coined by Teece in 1990. However, DCs only begun to attract greater attention after the publication of Teece's seminal paper with Pisano and Shuen in 1997 (which is based on the early working paper of Teece and Pisano (1994)) that is one of among the most influential article in management studies in 1990s, and still even today according to the numbers of citation. However, since the Teece, Pisano and Shuen 1997's seminal paper, there have been growing numbers of argument surrounding the concept (e.g., Barreto, 2010) that may lead to confusion among new readers. For the reason, this review paper is designed to highlight the arguments in the simplest and quickest possible way to give some insight to those who are new and interested in the concept – through the definition itself.

With its reputation as one of the most cited article in 1990s, even though there are so many definitions have been proposed ever since, this review paper will focus on the Teece, Pisano and Shuen's definition of DCs as the basis to discuss the arguments. According to Teece, Pisano and Shuen (1997, p.516) DCs is defined as *'the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments'*. By dismantling the definition, the concept of DCs can be understood by answering four fundamental questions, namely: (1) What is DCs? (the ability/capacity), (2) What is the function of DCs? (to integrate, build, and reconfigure), (3) What to be changed by DCs? (the competences/resources), and (4) When to use DCs? (under environmental change). In addition, when referring to Leonard-Barton (1992), Teece, Pisano and Shuen (1997, p.516) have further explained that DCs *'reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions'*. These further raise the questions of (5) What is to be achieved with DCs? (sustainable competitive advantage), and (6) What makes DCs unique? (path dependencies and market positions).

By focusing on the six questions, the related discussion/argument can be properly addressed accordingly. In sum, this review paper will be focusing on the questions as listed below:
1. What is dynamic capabilities?
2. What is changed by dynamic capabilities?
3. What is the function of dynamic capabilities?
4. When to use dynamic capabilities?
5. What is to be achieved with dynamic capabilities?, and
6. What makes dynamic capabilities unique?

What is Dynamic Capabilities?

Firm's resources consist of tangible and intangible assets where the intangible assets are more difficult to be managed (Teece, 2007). As the internal processes and efforts are crucial in building DCs than the external efforts (Grobler, 2007) in which the *'intangible assets are the ultimate source of sustainable value creation'* (Kaplan & Norton, 2004, p.7), only the processes/skills/routines/capacities that are not just valuable but also difficult-to-duplicate by competitors can be the source of competitive advantage (Barney, 1991).

Wang and Ahmed (2007) have argued firm's resources and capabilities can be treated in hierarchical order, which Ambrosini and Bowman (2009) termed as DCs typologies that is also confirming to Collis's (1994) categorization of organizational capabilities. Wang and Ahmed (2007) identified resources as the zero-order, while capabilities as first-order, core capabilities as second-order, and DCs as third-order competences in the hierarchy. Because the core capabilities are better than capabilities, and capabilities are better than resources as the source of competitive advantage (Wang & Ahmed, 2007), DCs is the ultimate organizational capabilities that are different from the rest of organizational capabilities as it enables the firm to innovate outside routines (Lee & Kelley, 2008) instead of simply a subgroup (Lopez, 2005) or subset of capabilities (Teece, Pisano, & Shuen, 1997).

Even though the firm's capabilities are transferable (Helfat & Peteraf, 2003), there is limit for the transferability of capabilities as they are not easily transferable and some not even transferable at all (Makadok, 2001) which is suggesting special skills are needed for the successful transfer of capabilities that is not widely available between firms (Helfat, et al, 2007). Thus, as the resource reconfiguration is not an easy process and the timing for reconfiguring resources is different between firms (Helfat & Peteraf, 2003), success in sustaining competitive advantage cannot be guaranteed by only actively reconfiguring the right processes and structures; it has to be done in an effective and skillful manner (Jantunen, Puumalainen, Saarenketo, & Kylaheiko, 2005).

Even though DCs is related to the firm's capacities, processes and/or routines, not all can be considered as DCs (Helfat, et al, 2007) and not all can be the source of sustained competitive advantage (Barney, 1991). In such, capabilities that are common among firms will not become the source of competitive advantage (Eisenhardt & Martin, 2000). As some resources can be imitable while others are not, so how to differentiate between processes/routines that are DCs and that are not? For the reason, the capacities that are used in the resource base renewal are the higher-order capabilities (Ambrosini, Bowman, & Collier, 2009) as DCs is treated as meta-capability (Collis, 1994) which is the highest form of organizational capabilities (Wang & Ahmed, 2007).

What is changed by Dynamic Capabilities?

As suggested by scholars, DCs is not defined in term of firm's performance (McKelvie & Davidsson, 2009) but the ability to purposefully reconfigure resource (Zahra, Sapienza, & Davidsson, 2006). For instance, Zahra, Sapienza and Davidsson (2006), and Zollo and Winter (2002) have defining DCs in such a way that not directing DCs to the firm performance or competitive advantage. The recent definition by Helfat, et al. (2007, p.4) is also taking the same stand in which they defined DCs as *'the capacity of an organization to purposefully create, extend, or modify its resource base'*. In the recent literature, Barreto (2010) has also defined DCs as to create change to the resource base. For instance, *'the emphasis in dynamic capabilities is on change processes, inventing and reinventing the architecture of the business, asset selection, and asset orchestration'* (Helfat, et al., 2007, p.28).

As the definition of DCs influence the kind of relationships to be analyzed (Barreto, 2010), it is clear from the above definitions that DCs is to reconfigure, renew, and modify resource base including the firm's processes, routines, and competences (intangible assets). Thus, as demonstrated by Macpherson, Jones and Zhang (2004), it is concluded DCs is designed mainly to alter the resource base from zero-levels capabilities to high-levels capabilities including renewing the DCs themselves according to the levels of environmental change (Ambrosini, Bowman, & Collier, 2009; Helfat, et al, 2007).

What is the Function of Dynamic Capabilities?

There are six functions (resource reconfigurations) that can be performed by DCs in any levels of capability lifecycle (e.g., founding, development, and maturity) that allows firm to strengthen it appearance in the existing market, to enter new market, and/or to leave existing market as long as the products (even for different markets) are sharing the same capabilities. The six DCs functions is to renew, recombine, redeploy, replicate, retrench, and retiring the resources/capabilities (Helfat & Peteraf, 2003). In other words, DCs is not just to create resources, it also can be used to eliminate resources when situation arise.

When to use Dynamic Capabilities?

Even though firm can effectively use DCs with bundle of resources (Majumdar, 2000) by creating new or different set of resources to respond to market change, it is difficult to assure the resources possessed by firm have potential to create future value when the environment is hard to be predicted (Sirmon, Hitt, & Ireland, 2007). Even if the strategic capabilities are built from resources but simply possessing resources does not guarantee capabilities building as the resources and capabilities systems of the firm are dynamic in nature and their relationships are always changing (Grobler, 2007). Because DCs is *'to explain the adoption of a firms' resource and capability base in rapidly changing environments'* (Guttel & Konlechner, 2010, p.2), firms must focus on the uncertainties in the resources and markets and try to match them (Boccardelli & Magnusson, 2006). Thus, the new or improved resources are needed to respond to the new demands as the changing of resources positions at various times will cause differences in firm's performance (Zott, 2003).

There are many arguments regarding the environment for DCs. For instance, Teece (2007) claims the environments for DCs is characterized by rapidly changing environments which is consistent with Zollo and Winter (2002) as they claim DCs is necessary for rapid changing environments but not for static environments. This is further evidenced by empirical researches that suggest the use of DCs is better under rapidly changing environment (Wu, 2010, 2007, 2006), which is also consistent to Lichtenthaler (2009) where the effects of absorptive capacity (a form of DCs) is stronger to performance under technological and market turbulence. However, some scholars such as Winter (2003) claims DCs is not useful for highly non-patterned and non-repetitious activities.

Meanwhile, the need to apply DCs in other than rapidly changing environment has been addressed recently in literature (Katkalo, Pitelis, & Teece, 2010). For instance, Eisenhardt and Martin (2000) have argued DCs work well under moderate-to-high velocity markets which is supported by Ambrosini, Bowman and Collier (2009) that have proposed the hierarchy of DCs (from incremental to renewing to regenerative), which is also in line with DCs for exploitation and DCs for exploration (Fischer, Gebauer, Gregory, Ren, & Feisch, 2010) and routinized DCs and ad-hoc DCs (Guttel & Konlechner, 2010) that are to respond to different levels of environmental change. In different vein, Zahra, Sapienza and Davidsson (2006) have argued changing environment is not necessarily a component of DCs as the capabilities themselves is the source of change.

In addition, even though firm and market are co-evolve where changing in customers preferences will shape how firm will respond to the market and at the same time the firm's technological innovation will create opportunities that will shapes the market (Helfat, et al, 2007), some scholars such as Dunning and Lundan (2010) claim market is shaped by firms, not the other way around. No matter what the arguments are, the extant literature has agreed DCs is associated with the environmental change. Indeed, the birth of DCs is to response to RBV static nature that is not sufficient to explain the source of competitive advantage under environmental change where the advantage of the resource will be disappears as it cannot explains how resource can be renewed or modified under such conditions (Ambrosini, Bowman, & Collier, 2009). Thus, either it is a stable, moderate or rapidly changing environments, DCs is designed to respond to environmental change both internal and external to the firms.

What is to be achieved with Dynamic Capabilities?

The concept of DCs exists because of dynamics interactions between firms' capability building and environment, and the needs to sustain competitive advantage through capability building. This is because DCs assess the environments and realign the resources base to gain future performance (Arthurs & Busenitz, 2006). When the environment is not stable, the possession of bundle of resources is not strongly favoring the competitive advantage of the firms (Wu, 2007). To sustain competitive advantage in highly volatile market, firms need to continuously reconfigure resources to create a series of short term competitive advantage (Eisenhardt & Martin, 2000) in which the strategic focus of firms has changed from the effective ways of managing resources to the effective ways of modifying resources (Kylaheiko & Sandstrom, 2007). Hence, without the present of DCs, resources alone will not be able to be translated into performance under environmental change (Wu, 2006).

It is posited the firm who possessing DCs is capable of meeting the change that is necessary to build competitive advantage. This is because, in the field of business strategy, distinctive capabilities are the basic source of competitive advantage where DCs is the key for sustained success under rapid change (Nelson & Winter, 2002). Hence, even though the concept is still new (Czakon, 2009) and the theory itself is still in great debate (Zahra, Sapienza, & Davidsson, 2006), what bring consensus to the scholars is that DCs is to achieve sustainable competitive advantage (Teece, Pisano, & Shuen, 1997; Lopez, 2005; Bhutto, 2005; Kylaheiko & Sandstrom, 2007; Teece, 2007). Others have also related DCs to rent-creation (Makadok, 2001; Blyler & Coff, 2003), and performance (Majumdar, 2000; Zott, 2003; Pablo, Reay, Dewald, & Casebeer, 2007).

What makes Dynamic Capabilities Unique?

Even though any firms can actively reconfigure their structures and strategies but the ways of doing thing will not be the same (Jantunen, Puumalainen, Saarenketo, & Kylaheiko, 2005). Different DCs exists between firms because each firms is facing different environments and strategic importance of change (Zollo & Winter, 2002) that influence the diversification between firms (Doving & Gooderham, 2008). For example, in technology-based industry, firms will see the worthiness of certain technologies in a different way than the others because of different technology base and strategy they have (Teece, 2007). Moreover, different managers perceived, interpreted and responded differently to the same environment that affect the way they reconfigure resource base and causing variation in DCs performance (Ambrosini, Bowman, & Collier, 2009).

There are many reasons behind the differences; one of the reasons is the heterogeneity of the firms (Czakon, 2009) where different firms possessing different set of internal resources (Oliver & Holzinger, 2008) which explain why two or more firms may well be begun at the same place but where will they go next, how will they go there, and how fast will they reach there will be different (Zahra, Sapienza, & Davidsson, 2006), which means the capability development is different among firms (Wang & Ahmed, 2007). Moreover, the people who plan the strategy will keep on changing over time and only the activities that parallel with the overall strategic direction of the firm (Green, Larsen, & Kao, 2008) will be chosen as there are many possible ways of altering resource base to choose from. In addition, the ways firm imagine the future scenarios (Canibano, Encinar, & Munoz, 2006), learn and build capability are different and they possessing difference sets of intentions, knowledge, and goals that create heterogeneity between firms (Canibano, Encinar, & Munoz, 2006). To add further, the potential values of the capabilities are depending to the owners' future imagination as the possible combinations and applications of the capabilities are unknown because of uncertainty (Loasby, 2010).

At the same time, DCs is also strongly path dependent (Ellonen, Wikstrom, & Jantunen, 2009) where differences in firms' performance may be explained by their path dependency that influence how they modify resources over time (Zott, 2003) as the capability accumulation occurs through experiences (Bayer & Gann, 2007). The experience is interpreted in term of the relationships between the firm's aspirations and performance, and the conflicting goals where the firm's routines will change whenever the experience is changing (Augier & March, 2008). Firm making decision base on the capabilities they possess that will shape and influence the future capabilities of the firm. Hence, the effects of change to the firm are determined by the firm's configuration of the capabilities prior to the change and the levels of change (Benner, 2009). Thus, firm is following specific paths in capability building which is not identical to the other firms and therefore causing differences in the outcomes (Wang & Ahmed, 2007).

The firms' possession of different resources and different ways of deploying resources (Oliver & Holzinger, 2008) make managers follow different process of learning and therefore affect their decisions that leads to different levels of performance (Adner & Helfat, 2003). With the economy keep growing the differences in performance will continue and even small differences in firms can cause significant differences in performance (Zott, 2003). Even if firms possessing similar capabilities, DCs is different between firms because the same capabilities that are distinctive (imperative) to one firm can be nothing more than just a normal operating capabilities to the others (Winter, 2003). Therefore, different firms possessing different DCs (Adner & Helfat, 2003) because of different environments and strategic importance of change, this is what makes DCs unique!

Conclusion

The concept of DCs is gaining popularity among scholars in the management field. As it is still a new concept, various arguments and issues have been dominating the literature. As a starting point for discussion, the article is taking among the most acclaimed DCs definition by Teece, Pisano and Shuen (1997) as the foundation. By dismantling the definition into six questions, all the arguments can be properly addressed under each of the questions. As the article is more interested on various arguments relating to each of the questions, the discussion is not necessarily in support of Teece, Pisano and Shuen's conceptualization of DCs. To summarize the discussion, first, DCs is a high order-capability usually in the form of intangible (processes/skills/routines/capacities) assets. Second, DCs is designed to change resource base that can be internal and/or external to the firm as long as they have control over them. Third, as DCs is to change resource base, it can be used not just to renew resources but also to redeploy, replicate, retrenching, and even to destroy them. Fourth, even though DCs can be effectively used to response to rapidly changing environment, it can also be used in other types of environment. Fifth, the main objective of DCs is not just to achieve competitive advantage but most importantly is to sustain the competitive advantage under challenging environment. Lastly, the intangible processes/skills/routines/capacities can only be the source of DCs when they are valuable, rarely available in the market, difficult-to-duplicate by competitors, and non-substitutable that grows from path dependency and heterogeneity between firms. There are many other aspects of DCs that is outside the discussion parameter such as on how DCs can be deployed but since the article is confined by the six questions, it is not means to be conclusive and exhaustive but fair enough to provide the easiest way to understand the basic concept of DCs – that is through the definition itself. Hopefully, through this review article, students and those who are not familiar with DCs are able to grasp some of the 'must know' about DCs in minutes.

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