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Dynamic capabilities and knowledge management

1. Introduction

A number of attempts have been made in several recent years to formulate a new paradigm in strategic management theory. What these attempts show is that acceptance of the need to have such paradigm is one thing but creating its fully-fledged model is quite another. What seems to have come closest to achieving that goal is the concept of dynamic capabilities. It reflects strongly what is characteristic of the modern-day innovative economy: a transition from the traditional approach of cost minimisation to that of entrepreneurship that creates added value and helps build competitive advantage.

The framework was first introduced in the early 90s and it fit well with increasingly louder calls in subsequent years for „a dynamic theory of strategic management” (Porter 1991, pp. 95-117, Spender 1996, pp. 45-62, Markides 1999, pp. 55-63). The concept, the basic assumption of which is that long-term competitive advantage is derived from organisational ability to recognise in advance and capture new business opportunities, have been gaining in strength in recent years. The logic behind the dynamic capabilities framework has also found support in what in fact are similar concepts

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of „strategic flexibility” (Volberda 2008, pp. 447-465, Hamel et al ...) and „built-to-last organisations” (Collins, Porras 2008).

Despite its widespread acceptance and the oft-expressed belief that it represents the most promising of „strategic management schools”, a large number of scholars have been sceptical about the notion of „dynamic capabilities”, the possibility of its practical application (Winter 2003, pp. 991-995), or indeed the very scientific status of the concept. H. Mintzberg, for example, sees it as part of the learning organisations framework. Under the model of „competence-based competition”, on the other hand, dynamic capabilities of a business are relegated to secondary role (Sanchez, Heene 2007, pp. 303-317).

This varied view of the dynamic capabilities framework is often a consequence of its unmaturing theoretical underpinnings and insufficient operationalisation. The problem is complex because dynamic capabilities are a highly non-trivial phenomenon and as such require for their analysis an innovative synthesis of various theories of the firm (evolutionary, transactional, resource-based), organisational learning, entrepreneurship and leadership.

Nonetheless, even at its current stage of development, the dynamic capabilities concept advances our ability to solve a number of methodological problems in modern-day strategic management theory. Of particular use is the emphasis it puts in the analysis of knowledge management problems on combining economic and behavioural aspects of the firm’s activity which hide its core competitive advantages. Significantly, the logic of dynamic capabilities is consistent with what in recent years were the most profound research results and areas of knowledge management. The most notable of those are „knowledge-creating companies” and intellectual capital management (Nonaka, Teece 2010).

2. The nature of dynamic capabilities

Dynamic capabilities provide an essential theoretical construct which is useful in understanding the phenomenon of competition in the current global environment. Dynamic capabilities are different from operational ones in that their emphasis is on change management. Most often, they are described as „the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Tece 1994, pp. 537-556).

Subsequent publications have either used this definition or formulated very similar ones. For example, Eisenhardt and Martin see dynamic capabilities as the firm’s internal processes which „integrate, reconfigure, gain or release

resources to match and even create market change" (Eisenhard, Martin 2010, pp. 1105-1121).

On the other hand, there is significant pluralism of approaches to research into dynamic aspects of firms' capabilities. This concerns both how competitive firms are created and the ways in which they operate. It will be noted that not all scholars appreciate the role of dynamic capabilities in this context.

According to one view, it should be doubted if organisational change management processes could be as routine as the firm's operating capabilities. A conclusion is offered on that basis that dynamic capabilities are not as real. S. Winter offers a criticism of this approach arguing that a certain „hierarchy of capabilities" can be distinguished in which we can speak of „zero-level" operational capabilities and „higher-order" dynamic ones (Winter 2003, pp. 991-995). Seen in this light, it may not be argued that „first-order" dynamic capabilities, for example in areas of new product development or post-merger asset integration, involve any set of routine management actions.

The „dynamic resourced-based view", which looks at all organisational capabilities, „dynamic" or otherwise, offers another way of thinking about dynamic capabilities which departs from their traditional understanding. The view tries to revamp the traditional resource-based approach and takes as its starting point the assertion that „while some capabilities may deal specifically with adaptation, learning and change processes, all capabilities have the potential to accommodate change" (Helfat, Peteraf 2003, pp. 997-1010).

What is innovative in this view is the concept of „capability lifecycle". It involves a number of stages including: founding, development and maturity. After a capability has reached its maturity stage, its further evolution may be affected by different events. Up to six outcomes are possible after an event intervenes, namely: retirement, retrenchment, renewal, replication, redeployment, and recombination. While it facilitates better understanding of how businesses differ in terms of their organisational capabilities, the „dynamic resource-based view" has certain limitations which are based on its methodological contradictions. The view does not change the principles of a traditional resource-based approach (effective resource allocation) but offers an attempt to strengthen them with evolutionary theory concepts. Moreover, while the last four variants of the additional stage in the capability lifecycle acknowledge the managers' role in creating „new combinations", the entrepreneurial factor is only given partial attention. Nothing is said of finding new business opportunities or of the need to change through proactive analysis of new markets, new technologies or competitive threats.

As a concept, dynamic capabilities are problematic in a number of areas, perhaps the most pertinent of which are related to exactly how „dynamic“ these capabilities are, the role of anticipatory management, or the influence of the environment on development of capabilities.

The fundamental interpretation of dynamic capabilities (Teece 2008, p. 1508) is that they are composed of two interrelated elements: the capacity to identify new business opportunities and the capacity to use those opportunities effectively. Accordingly, firms should be equally effective in both of these tasks, i.e. they should be developing certain meta-capabilities.

The methodology behind the Teece's concept combines the idea of „asymmetric“ advantage and organisational adaptation to market changes; it is also a blend of the concepts of organisational learning, leadership and entrepreneurship, and the economic theories of firms. Importantly, the concept assumes consensus that success in organisational learning is the condition for competitive advantages in all areas of modern-day economy (Zollo, Winter 2002, pp. 339-351). This makes space for dynamic capabilities everywhere: firms do integrate, build and reconfigure their competences even if operating in environments that are subject to low rates of change. This does not mean that firms should be in a state of change at all times (as that would lead to internal chaos). Moreover, as is emphasised by Winter, not all organisational reactions to innovation or change must necessarily involve dynamic capabilities (Winter 2003, 991-995).

It is also stressed that competitive advantages may only derive from difficult-to-replicate internal and external competences to develop new combinations of assets (Teece 2008, p. 1508). These dynamic capabilities cannot be sourced from the market but may only be developed as new capabilities or reconfigured out of existing ones. The primary role in the development of dynamic capabilities is assigned to managers and their entrepreneurial traits. According to Teece, dynamic capabilities include the following four organisational skills:

- ability to develop effective processes to manage innovation and change,
- necessary intuition and vision to create new business models,
- ability to develop mechanisms for effective investment decisions (to identify new markets and technologies; to limit uncertainty; to take the risk of investment in new technologies; to ensure effective asset configurations),
- ability to manage transactions effectively.

How dynamic capabilities operate is illustrated below.

Initially, a firm takes available factors of production from the market and creates their combinations. These combinations of factors serve as firm-specific

competences which are utilised to produce the firm's goods and services. However, in order to ensure continuous demand for their products in the ever-changing business environment, firms must be able to dynamically recognise new business opportunities (or threats) and benefit from those.

If dynamic capabilities are to secure long-term competitive advantage, they must be used quickly and in a forward-looking and effective manner so as to outpace competitors who will also be trying to create their own combinations of resources to gain an advantage. In other words, firms generate added value through their dynamic capabilities only if they adapt (react) faster and more effectively than their competitors. Accordingly, the crux of the matter is the reaction time vis-à-vis that of competitors and that „long-term competitive advantages“ can only be secured through such routines.

There is evident relationship between dynamic capabilities and the firm's productive outcome. Dynamic capabilities create and modify (for greater efficiency) the firm's competences, operational routines and resources; these, in turn, determine the results of the firm's activities and its market position. Importantly, even though dynamic capabilities of different firms may be similar, their impact on productive outcomes can vary from firm to firm due to differing levels of necessary resources to preserve those capabilities and the timing of their use (Zott 2008, pp. 97-125).

Creating and preserving dynamic capabilities requires special learning mechanisms and forms of organisation. According to Zollo and Winter, dynamic capabilities are results of organisational learning and stable patterns of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness (Zollo, Winter 2002, pp. 339-351). Zollo and Winter argue that such mechanisms involve accumulation of experience, knowledge articulation and knowledge codification. As regards the organisational forms of companies with dynamic capabilities, these should be highly decentralised to ensure flexibility and fast response to changing environment. A similar view is offered by H. Volberda who argues that dynamic capabilities are related to H. Mintzberg's adhocracy or organic structures (Volberda, Elfring 2010).

The concept of dynamic capabilities and what sets it apart from other concepts may be better clarified by referring to its analytical advantages. These advantages are derived from the „managerial extension“ of the economic theory of the firm, a headway that has been made in breaking the dichotomy of the strategic management theory and the integration of that theory with the concept of organisational learning.

In the context of the dynamic capabilities concept, the „managerial extension” to the economic theory of the firm takes us a step closer to the strategic theory of the firm (Rumlet 1984, pp. 556-570). The logic here is that, instead of focusing on strategic behaviours, the modern-day economics places much greater emphasis on identifying of new business opportunities (chances) and using those opportunities to gain competitive advantages. Accordingly, what should occupy a central place in the theory of the firm are entrepreneurship and leadership.

In traditional microeconomics, managers’ decisions are driven by the criterion of profit maximization. The concept of dynamic capabilities, on the other hand, sees certain established routines as determinants of managerial decisions. This idea is taken from the evolutionary theory.

The concept of dynamic capabilities reflects the diversified nature of strategic management and may be productively linked to the theory of the firm. On the one hand, its development can be seen as part of a wider tendency to strengthen the economic logic in the theory of organisation and management; on the other hand, the concept opens up the economic theory of the firm to notions of leadership, organisational culture and other organisational aspects of business operation.

Among other management paradigms the concept of dynamic capabilities is perhaps the one that has most prominently combined the research into organisational learning and organisational strategies. Earlier attempts to determine the relationships between the two have not been particularly effective (Crossan, Berdrow 2003, pp. 1087-1105). Firstly, they offered too narrow a view of organisational learning: it was often depicted as the trial-and-error method or even a random decision-making process. Secondly, too little attention was paid to the fundamental conflict surrounding strategic renewals, namely that between the use of older management methods and the search for the new ones. Thirdly, even where the idea of organisational learning was linked to strategic renewal, no attempts would be made to verify it in empirical terms. It is only in the last decade of the 20th century that research into those problems found its way into the centre of some new strategic management concepts.

One of those is the concept of networks. According to many authors, the analysis of „network capabilities” as sources of competitive advantages for networked firms is about collective learning capabilities which should be rare and impossible to imitate. Because these advantages persist thanks to interaction between capabilities of the firm and capabilities of the network, arguments that support the network concept are in the nature of fundamental resource-based

logic. The knowledge-based view of strategy is another new synthetic approach in which the notion of dynamic capabilities is given the central role.

3. Analytical advantages of dynamic capabilities concept in knowledge management

Today's knowledge management is an inseparable part of strategic management.

There have been attempts to give theoretical underpinning to knowledge management. Most often, they were part of the effort to develop the intellectual potential framework or formulate the knowledge-based strategic management paradigm. So far, these attempts have failed to create a new (separate) theory of the firm. The prevalent view is that the new concept is in fact a continuation and a specific variant of the resource-based approach. Indeed, some authors even went as far as to claim that the concept of the firm's intellectual capital reflects the very nature of the resource-based paradigm (Conner, Prahalad, 2006, p. 477) or is its most advanced version (Eisenhardt, Santos 2002, p. 139).

It should be noted, however, that few publications on knowledge management are directly concerned with issues of strategic management. Many studies treat strategic management first as a problem of information technologies, then as a problem of organisational routines, and only then as related to business strategies. This has given rise to a justified concern among specialists in strategic knowledge management (Nonaka, Teece, 2010).

Writings on modern-day management trends, too, shy away from the problems of connection between knowledge and strategies, and instead focus on their organisational and management aspects.

The modern strategic management paradigm is preoccupied with the notions of „knowledge society” and „learning organisation”. Knowledge is perceived as the firm's most important strategic resource and arguments are put forward that differences in knowledge resources or in the ability to create and renew them are the major determining factor of the firm's competitive advantages and outstanding results of its activities.

That organisational knowledge occupies this role in strategic management theory is the result of the blending we have witnessed in recent years of innovation and information management paradigm, resource-based approach and organisational learning.

In their initial efforts, scholars addressed the problem of knowledge in terms of traditional epistemology. The starting point, one that ties in with

mechanistic theories of organisation, was that knowledge is explicit and may be easily configured and transferred. Those simplifications were only overcome thanks to M. Polany's concept of tacit knowledge where „we can know more than we can express“, and the results of research into the role of knowledge in economic systems and business organisations (F. Hayek, K. Arrow, J. March, H. Simon).

Equally important in this process was the evolutionary theory by R. Nelson and S. Winter which integrated organisational knowledge and routines with the firm's dynamically evolving competitive environment. However, what has influenced modern approaches to research into strategic aspects of knowledge management more than anything else were publications by D. Teece, who developed a strategy of capturing and profiting from technological innovations, and by S. Winter who has defined organisational knowledge and competences as strategic business assets.

Modern research was particularly informed by the division of knowledge into explicit and tacit.

Basically, the idea was that, as it is hard to imitate and relatively immobile, tacit knowledge can be the foundation of long-term competitive advantage.

Starting with this assumption, B. Kogut and W. Zander developed a theory of the firm which sees effective knowledge creation and transfer mechanisms and not the ability to curb the opportunism (contract theory logic) as the major advantage of firms vis-à-vis the markets. According to that theory, firms exist as social vehicles of certain voluntary activities; these activities are structured through organisational resources that do not exist at the level of an individual person. This means that knowledge, even though it is in the hands of individuals, is also expressed via certain routines through which people cooperate in organisations. Changes in those routines is what makes organisations capable of renewal. The scholars also argue that activities which are designed to bring about a firm's growth through replication of its technologies increase the potential for imitation. This potential can only be curbed through innovation. Realising the importance of organisational knowledge and learning capability of firms for their competitive position, the scholars introduce the notion of „combinative capabilities“, denoting the ability of firms to recombine and use their current and future knowledge. Using this notion, the scholars analysed dynamic aspects of knowledge-based competition between firms.

The development of this strategy paradigm (itself a step towards expanding the economic theory of the firm) was given a boost by the research efforts of I. Nonaka and H. Takeuchi. The two have strengthened the behavioural aspects

of knowledge management analysis and focused their attention on integrative mechanisms between individual and organisational knowledge.

Nonaka and Takeuchi's general conclusion was that creation of organisational knowledge should be seen as occurring through processes that strengthen individual knowledge and make it part of the organisation's entire „knowledge network“. The processes reflect a „spiral“ of knowledge creation which is dynamic and occurs primarily through informal networks of intra-organisational relationships.

This gave rise to development of ideas concerned with the fundamental role that organisational learning mechanisms have in formulation of effective business strategies. Following Nonaka and Takeuchi, most people understand organisational learning as adaptive change processes which are influenced by organisational memory and accumulated experience in development and modification of typical routines. Even though indispensable, organisational learning proved an insufficient concept for precise examination of knowledge-based strategy-building process.

This paved the way for the concept of dynamic capabilities (Eisenhardt, Santos 2002, p.139). Two basic arguments were offered as part of this paradigm. One was that firms' competitive advantages are not so much linked to their overall knowledge pool but are rather derived from their ability to create and renew it. The other argument was that dynamic capabilities are the central part of the mechanism that allows firms to obtain economic returns from their ownership of knowledge assets (Teece 2008, p. 1508).

According to Teece, a firm is a repository of knowledge included in business processes. The firm's knowledge resources consist of technologies and the knowledge of customer needs and capabilities of external suppliers. These technological and managerial competences reflect both individual knowledge and experience and firm-specific internal routines. Hence, the nature of the firm lies in the potential to create, transfer, accumulate, integrate and utilise its knowledge assets. Dynamic capabilities of firms involve identification and absorption of new opportunities (chances), reconfiguring of knowledge assets, competences and complementary assets, selection of appropriate forms of organisation, proper location of resources and establishment of appropriate pricing strategy.

The idea of knowledge as an asset marks a clear shift in business strategy research from expenditure rationalisation to maximization of added value. The centre stage is taken by the question of ways in which to organise innovative processes effectively (in terms of economic rent); in other words, the question is

about the firm's potential to configure its internal and external assets to obtain appropriate returns (Teece, 2008, p. 1508).

The current knowledge management practice utilises both well-established management models (networked and virtual organisations, consortia, and strategic alliances) and the structures in early stages of development (such as innovative teams, learning or „intellectual“ organisations). Modern-day forms of organisation allow firms to accumulate information, improve knowledge-sharing processes, and avoid duplication of effort or information sources. Diversified as they are, available organisational solutions have not changed their general goal which is to build a creative environment in which there is proper balance between centralisation and decentralisation. Importantly, those concepts which have generalised the most effective knowledge management solutions (another term used here is intellectual capital) often rely on the dynamic capabilities logic or concepts similar to this paradigm. An example is the „open innovation“ concept which deals with the ability of firms to combine internal and external competences to integrate knowledge.

A number of conclusions may be drawn if we look at potential application of the dynamic capabilities paradigm in the competitiveness research. First of all, the paradigm's emphasis on entrepreneurial skills (identifying new business opportunities and using them to capture economic returns) is consistent with what is today the main trend towards continuous knowledge renewal. In contrast to G. Hamel (2006, pp. 69-82), an effective strategy under this concept is not a revolutionary change but a directed (proactive) evolution; this means that, while effective utilization of available resources is taken into account, the emphasis is on maximizing new values. Also, competitive advantages are seen as specific tacit values of organisational processes which depend on specific assets of the firm and its available development trajectories. Secondly, the concept of dynamic capabilities reveals what in fact amounts to a new mechanism of developing competitive advantages, one that is characteristic of innovative, information-driven economy. This mechanism is founded not just on the firm's pool of tacit knowledge (its key strategic asset), but primarily on the firm's ability to capture economic returns from its knowledge assets. The concept departs from a traditional juxtaposition of market and organisation-internal factors; instead, emphasis is given to the importance of the firm's ability to develop a proper combination of internal and external competences, and the analysis is extended to include limitations and hierarchical solutions. For these reasons, the network strategy may be treated as a specific case of the dynamic capabilities concept, and network-

based forms of knowledge management as a demonstration of the firm's external organisational competences.

An argument may be put forward that the dynamic capabilities concept is at the core of a new strategy paradigm being formulated, and forms part of a new stage in strategic management theory. Needless to say, it is yet to tackle a number of important tasks, such as to define the mechanism by which dynamic capabilities are formed, determine the role which these capabilities have in allowing the firm to achieve its goals, or to explain the process of their evolution over time (Eisenhardt, Martin 2010, pp. 1105-1121). Nonetheless, even today the concept lends itself to effective analysis of a large number of current developmental issues of firms or their competitive position in a variety of sectors.

4. Conclusion

Development of effective organisational strategies is a continuous process. This is particularly pertinent today when firms have to operate in unstable environments. These prevalent operating conditions are reflected in management practice but also offer grounds for evolution of strategic management theory.

The dynamic capabilities paradigm opens up perspectives for the all-encompassing analysis of various business strategy aspects, especially those that are crucial in ensuring a firm's long-term success, such as entrepreneurship, change management or knowledge-based competitiveness.

The dynamic capabilities concept was formed and has been developed by integration of evolutionary theory, transaction cost theory, and the organisational learning and tacit knowledge concepts. As a result, it helps to weaken essential dichotomies of the strategic management theory, especially those relating to „internal and external“ factors, a task that is of particular topical interest in today's environment (Lowendahl, Revang 2008, pp.755-774).

The concept has at the centre of its attention the knowledge of the firm on how to manage its resources proactively in order to form new asset combinations and thereby capture economic rent. This knowledge is of particular importance if firms are to compete in the knowledge economy. Unsurprisingly, the most creative strategy development efforts were those that were based on the concepts of „knowledge-creating organisations“ and intellectual capital management, both formulated by proponents of the dynamic capabilities paradigm or other very similar logic.

The turbulent nature of today's business environment gives rise to a large number of new problems which must be analysed using the dynamic capabilities

concept. For example, attention must be paid to the fact that unique resources may easily lose their uniqueness in the rapidly changing environment, or that what has been an effective routine is suddenly becomes obsolete. Consequently, continuous organisational renewal offers the only effective mechanism for advantage-building based on dynamic capabilities.

Summary

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The concept of dynamic capabilities reveals what in fact amounts to a new mechanism of developing competitive advantages, one that is characteristic of innovative, information-driven economy. This mechanism is founded not just on the firm’s pool of tacit knowledge (its key strategic asset), but primarily on the firm’s ability to capture economic returns from its knowledge assets.

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Key words: *dynamic capabilities, knowledge management, strategic management, competitive advantage.*

Streszczenie

Koncepcja dynamicznych zdolności i zarządzanie wiedzą

Koncepcja dynamicznych zdolności powstała i rozwinęła się w wyniku integracji teorii ewolucyjnej, teorii kosztów transakcyjnych, koncepcji organizacyjnego uczenia się i wiedzy ukrytej. W efekcie pozwala ona na osłabienie istotnych dychotomii teorii zarządzania strategicznego, w tym szczególnie dotyczącej „wewnętrznych i zewnętrznych” czynników, której przełamanie jest w obecnych uwarunkowaniach szczególnie aktualne.

Znajdująca się w centrum uwagi koncepcji dynamicznych zdolności wiedza firmy dotycząca proaktywnego zarządzania zasobami dla kształtowania ich nowych kombinacji i uzyskiwania w ten sposób przedsiębiorczej renty jest szczególnie ważne dla konkurowania w gospodarce wiedzy.

Podejście oparte na dynamicznych zdolnościach ujawnia perspektywy całościowej analizy różnych aspektów strategii firmy, szczególnie ważne dla zapewnienia długookresowych sukcesów firmy, takich jak przedsiębiorczość, zarządzanie zmianami i konkurencyjność w oparciu o wiedzę.

Koncepcja dynamicznych zdolności ujawnia w istocie nowy mechanizm kształtowania się przewag konkurencyjnych, charakterystyczny dla innowacyjnej i informacyjnej gospodarki. Mechanizm ten opiera się nie tylko na posiadanych przez firmę zasobach wiedzy ukrytej (jej kluczowych strategicznych aktywach), lecz przede wszystkim na jej zdolnościach do uzyskiwania korzyści ekonomicznych z posiadanej wiedzy jako aktywów.

Można postawić tezę, iż koncepcja dynamicznych zdolności znajduje się w centrum procesu kształtowania nowego paradygmatu strategii firmy i nowego etapu teorii zarządzania strategicznego.

Słowa

kluczowe: *dynamiczne zdolności, zarządzanie wiedzą, zarządzanie strategiczne, przewaga konkurencyjna.*

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