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Reconsidering dynamic capabilities: implications for innovation research

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Abstract

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Introduction

The dynamic capabilities framework offers attractive research opportunities, and interest in advancing and applying it has been growing rapidly. One of the founding articles (Teece et al., 1997) has already reached an impressive number of more than 20 000 citations. This framework “was created with an ambitious agenda in mind, namely to provide a general framework to help scholars and practitioners understand the foundations of firm-level competitive advantage and associated enterprise value creation and maintenance” (Teece, 2014, p. 328). However, currently there is more confusion than understanding around the framework as well as the construct of dynamic capabilities itself (Di Stefano et al., 2014).

This paper recognizes the immense potential of the dynamic capabilities framework in integrating various perspectives and providing a general understanding of organizational processes. At the same time, it argues that there is a missing link, which impedes the framework in its current state from accomplishing this ambitious goal. This link is namely individuals who actually create organizations and organizational processes, manage them (“orchestrate”) and modify. Similarly to string theory that attempts to unite quantum mechanics with general relativity, this paper aims to show how including individuals into the framework may unite perspectives not only within strategic management, but many other disciplines, including economics, knowledge management, leadership and psychology. Moreover, it solves the problem of an infinite regress (Collis, 1994) that results from the conceptualization of dynamic capabilities as higher-order routines. Essentially, by claiming that dynamic capabilities reside exclusively in individuals, this paper makes the last step in the gradual movement towards individuals. This movement becomes evident via comparing the views on dynamic capabilities as “being resident in the firm’s organizational processes” (Teece et al., 1997, p. 524) and residing “in part, with individual managers and the top management team” (Teece, 2014, p. 332). In this sense, this paper can be seen as a contribution to the search of micro-foundations of routines and capabilities (Felin and Foss, 2005; Abell et al., 2008; Felin et al., 2012).

Finally, the dynamic capabilities framework, being predominantly pre-occupied with sensing opportunities, creating new and reconfiguring the existing states of things, is tightly related to innovation research. This paper demonstrates how advances of innovation research may

be valuable for the dynamic capabilities framework, and how the latter can contribute to understanding innovation in organizations.

This paper starts by describing the dynamic capabilities view and recent developments in it, showing the variety of meanings and understandings. Next, the paper discusses why individuals are important for the conceptualization of dynamic capabilities and shows how the development of the framework has been actually moving towards acknowledging the role of individuals. The paper then provides the reason of why and how dynamic capabilities reside exclusively in humans and how their interaction with organizational processes happens. Building on Coleman (1990) and Abell et al. (2008), it re-visualizes the Coleman's framework to include interaction between individuals. The paper then briefly reviews research related to the role of individuals in innovation, focusing on corporate entrepreneurship (intrapreneurship) and creativity, and, finally, links it with the dynamic capabilities framework.

The dynamic capabilities framework

The dynamic capabilities perspective has existed since the beginning of 1990s, being derived from the resource-based view as an attempt to explain the source of competitive advantage of firms operating in changing environments (Teece and Pisano, 1994; Teece et al., 1997). In these earliest conceptualizations, dynamic capabilities represent a firm's unique ability to create and modify competences, which in turn are described as firm-specific assets (i.e. resources) assembled into routines. The modification is performed via integration, building and reconfiguration of internal and external competences, and it is essential for the firm's survival and renewal in dynamic markets (Teece et al., 1997). Later, trying to avoid defining "capability" tautologically as ability, Zollo and Winter (2002) have distinguished between operating routines that are patterns of functioning per se, and dynamic capabilities – the patterns of generating and modifying operating routines. The former can be presented as "zero-order capabilities", while the latter become the "first-level capabilities" (Winter, 2003). In a similar vein, Helfat and Peteraf (2003) acknowledge the differentiation between operational and dynamic capabilities, although they prefer to use the term "organizational capabilities" as a more encompassing concept in a wider "dynamic resource-based view". They also suggest that an organizational capability, regardless of its type, may be replicated, recombined or redeployed. The authors, however, conclude that a dynamic capability generally cannot transform itself.

In such conceptualizations, dynamic capabilities crown a certain hierarchy, where in the bottom there are the most general – and the least firm-specific – factors of production, followed by tangible and intangible firm assets (resources), organizational processes (routines) needed for the productive use of resources, and capabilities (competences) in the form of the most effective bundles of routines (Teece et al., 1997; Wang and Ahmed, 2007; Easterby-Smith and Prieto, 2008; Peng et al., 2008; Schilke, 2014). Thus, this approach leads to understanding dynamic capabilities as routines to operate routines: in other words, operating routines of higher order¹.

Seemingly clear at first sight, this understanding of dynamic capabilities nevertheless creates an opportunity for an infinite regress (Collis, 1994), because it sets no upper limit for the capabilities of even higher orders. In an attempt to solve this problem, the alternative views have been proposed. For example, Eisenhardt and Martin (2000) do not distinguish between orders and regard dynamic capabilities as the processes to both use resources and achieve new resource configurations. In addition, they argue that the more dynamic markets are, the less routinized these processes get, becoming simpler, more experiential and situational. The authors claim that the dynamic capabilities may be neither the one and only source of sustained competitive advantage nor they are unique and idiosyncratic. Moreover, there may be various ways to develop and execute the same dynamic capabilities, and studying them can identify the “best practices”.

Some of these ideas have been opposed by Teece (2014), who stresses the differentiation between ordinary (essentially, operational) and dynamic capabilities, and positions the ability to build new dynamic capabilities in the firm’s bundle of dynamic capabilities, seeing no use in continuing the hierarchy up. For him, ordinary capabilities are about “doing things right”, while dynamic capabilities are about “doing the right things”. Moreover, he classifies “dynamic capabilities” of Eisenhardt and Martin (2000) as strong ordinary capabilities and restates the uniqueness of dynamic capabilities to each firm (“signature processes”), which entails the difficulty of transferring them between companies.

A number of dynamic capabilities types have been suggested and examined in the literature. Teece (2007) has developed a framework, where he categorized dynamic capabilities into three groups: sensing and shaping opportunities and threats, seizing opportunities, and

¹ For Wang and Ahmed (2007), dynamic capabilities top the hierarchy, but they define them as a firm’s behavioral orientation embedded in processes, rather than processes *per se*.

managing threats and reconfiguration. Sensing capability has in its core exploration, understanding and interpretation of technologies and markets. It manifests itself in, for example, internal R&D and the whole range of the market research types (customer analysis, competitor analysis, market trends, etc.). Seizing capability implies addressing opportunities to capture value most efficiently and to build loyalty and commitment. It is realized through the activities related to the design of business and solutions, the calibration of assets and the overcoming of biases. These activities may take form of, for instance, innovation investments, the design of business model elements, or the shaping of corporate culture. Finally, reconfiguration/transformation capability is crucial for conducting changes in ordinary capabilities to keep pace with the internal and external dynamism and continuously achieve strategic fit. It involves, for example, asset alignment and realignment, the redesign of business model and routines, knowledge management and governance structures associated with them.

Teece (2007) recognizes sensing and seizing capabilities as fundamental for any company: they are naturally indispensable for planning and launching an efficient business. Meanwhile, not every enterprise needs continuous renewal, – if its ecosystem is stable, – and thus, reconfiguration capability might be of less importance. There are different opinions on this issue, though. For example, Helfat and Peteraf (2003) claim that dynamic capabilities are not present in new organizations, and moreover, all organizational capabilities have the potential for change, evolving through the capability lifecycle without dynamic capabilities.

Nevertheless, the sensing/seizing/reconfiguration framework is the most general and the most influential in the current literature. In addition, many studies pay attention to more specific types of dynamic capabilities, for example, alliance capability (Kale et al., 2002), manufacturing flexibility (Zhang et al., 2003), acquisition-based dynamic capabilities (Helfat et al., 2007), adaptive capability, absorptive capability and innovative capability (Wang and Ahmed, 2007), learning continuous improvement capability (Anand et al., 2009), and even operational absorptive capacity capability (Setia and Patel, 2013).

A missing link in the dynamic capabilities framework

For Teece (2014, p. 348), dynamic capabilities lay the foundation for the most ambitious framework aimed at “a truly fundamental understanding of the origins of firm-level heterogeneity and the sources of enterprise-level value creation, capture, and growth”. As this paper will

demonstrate later, he is much likely right. However, in its current form, the framework misses an important link that is necessary for a more complete picture.

The studies based on dynamic capabilities view focus almost exclusively on the firm or organizational unit level. Both resource-based view and dynamic capabilities view basically regard a firm as a formation, capable of living and acting by itself through the use of its assets, capabilities, organizational processes and firm attributes. This problem applies to much of the past and contemporary economic and business research, which examines firms as depersonalized actors with people as one of the resources.

People might be viewed as a resource (as most managers and researchers see them) and in this case they represent the perfectly valuable, rare, inimitable and non-substitutable resource (as fewer managers and researchers actually see them). Nevertheless, people are also primarily managers of resources, irrespective of resource or routine types. Understanding opportunities and establishing a business does not happen by itself, it requires someone who is able to do so. Both launching and running business requires at least one person; otherwise it would not be started or would be just a registered name. In other words, any organization consists of people and exists because of people (Felin and Foss, 2005). Thus, organizations (including firms) are essentially bundles of people, who bundle resources and organizational routines.

Some attempts have been done to “humanize” the dynamic capabilities perspective, but they remain few and mainly theoretical. One of the earliest efforts was made by Adner and Helfat (2003), who introduced the concept of dynamic managerial capabilities. These capabilities allow managers to create and manipulate organizational resources and competences, and they are based upon three factors: managerial human capital, managerial social capital and managerial cognition. The empirical evidence for the necessity of including managerial cognition of resources into the dynamic capability view has come only eight years later (Danneels, 2011). Later, Helfat and Peteraf (2014), classifying dynamic managerial capabilities into sensing, seizing and reconfiguring, suggested that each of them was based on corresponding managerial cognitive capabilities (perception and attention; problem-solving and reasoning; and language, communication and social cognition).

Although Helfat et al. (2007) describe dynamic capability as the organizational capacity to purposefully create and manipulate its resource base, they acknowledge the relevance of dynamic capabilities to both an organizational unit and an individual decision maker. They

exclude from the definition of capability “innate talent”, arguing that a capacity implies patterned and practiced activity. Augier and Teece (2009) also note that dynamic capabilities view has the possibility to explain enterprise performance and position by examining role of management, and especially, entrepreneurial managers. The authors argue that the capabilities of asset selection and asset orchestration play a crucial role in the organizational activities, including innovation process.

Thus, the development of the dynamic capabilities framework through the articles of Teece and colleagues shows a considerable increase in attention towards managers, leaders and entrepreneurs. Before, dynamic capabilities were regarded as being “rooted in high performance routines operating inside the firm, embedded in the firm's processes, and conditioned by its history” (Teece and Pisano, 1994, p. 553). Now it is recognized that “certain dynamic capabilities may be based on the skills and knowledge of one or a few executives rather than on organizational routines” (Teece, 2012, p. 1395), and that “dynamic capabilities are partly resident in leadership team itself” (Teece, 2014, p. 347). Di Stefano et al. (2014) develop a metaphor of the organizational drivetrain, where simple rules (individual-level actions) gear complex routines (organizational-level actions), thus bringing “attention back to internal processes and, more specifically, to the role of individuals in creating, implementing, and renewing dynamic capabilities” (p. 322). The authors view both types of rules as parts of a dynamic system. Still, for them, simple rules are largely “unstable and ephemeral”, fragile, short-lived, transparent and imitable. It is important to note, however, that the rules, described by Di Stefano and colleagues, are actually “rules of thumb”, for example, simple rules of Cisco for making acquisitions, such as “target must have geographic proximity” or target “must share Cisco’s vision of where their industry is headed”.

The stumbling block of dynamic capabilities is its current definitions that have a logical inconsistency: so far as a capability is formalized on the organizational level, it is an ordinary, or operational, capability; and if it is good enough, it can turn into “a signature process”. Signature processes are similar to best practices: the difference is in whether they originate within the organization or come from outside it (Gratton and Ghoshal, 2005). In other words, signature processes of one company can be or become a best practice for others. Thus, signature processes are strong ordinary capabilities. Simple rules, when formalized, become ordinary capabilities too, and the discussion of the complexity of rules may be compared with the notion of the potency of

ordinary capabilities (Teece, 2014). Simple strong rules may bring a short-term success, while strong complex routines (“signature processes”) can provide longer lasting benefits.

Finding the missing link

What are dynamic capabilities then? In the final analysis, both simple and complex firm routines and assets require human competences to be aligned, managed and used, and such human competences are dynamic capabilities by the definition of dynamic capability. Market research by itself has no value: individuals need to interpret and translate its results into opportunities, and two different individuals may sense different opportunities. Investments are done by individuals who make decisions about them. Transformation does not start by itself: it is launched and conducted by people. In other words, the decisions about doing the right things come from specific individuals in a company (might be managers, leaders, board members), while doing things right (ordinary capabilities) are embedded in the formalized and codified routines that do not depend on specific employees.

Thus, dynamic capabilities indeed reside in the leadership team itself (Teece, 2014), but fully, not partially. They are in top managers, in team leaders, in intrapreneurs, - in individuals, who are able to sense opportunities and influence other people (and thus decision-making process) in an organization. The foundations of dynamic capabilities are personal routines: patterned and practiced activities of individuals aimed at aligning, managing and modifying ordinary capabilities. In sole proprietorships, the share of ordinary capabilities, compared to dynamic capabilities, may be very small (or one may say that they largely coincide), but in big companies with long history and formal structures, ordinary capabilities may dramatically outweigh and suppress dynamic capabilities of individuals, thus hardening into core rigidities (Leonard-Barton, 1992).

As soon as ideas about new rules and processes become codified and formalized as organizational routines, they become ordinary capabilities. As Teece (2014) notice, this is similar to the Nonaka’s (1994) spiral of knowledge. For Nonaka, “an organization cannot create knowledge without individuals”, and “at a fundamental level, knowledge is created by individuals” (p. 17). Then, individual tacit knowledge through socialization is shared, externalized as explicit knowledge, combined with knowledge from other individuals and then

internalized again. While tacit knowledge is possessed only by individuals, explicit knowledge is articulated, codified and stored, *inter alia*, in organizations.

However, the translation of dynamic capabilities into ordinary capabilities has important differences from Nonaka's theory. Knowledge is what a person cognitively possesses, but dynamic capability is what a person regularly does to modify the present state of things. Knowing how to do it does not automatically implies being good in doing it. Glaub et al. (2014) describe this using action regulation theory: while individuals (e.g., entrepreneurs) may know action principles (rough rules of thumb)² that regulate actions, they may not be able to translate these principles into effective actions. Cognitions are translated from abstract to operational through learning-by-doing, namely through repeated actions and regular practicing of action principles. Using a randomized field intervention on 109 business owners in Uganda, Glaub et al. (2014) demonstrated that learning and regular practicing the sequence of action principles for "good planning" – rules of thumb – have indeed increased personal initiative behaviour and, in turn, entrepreneurial success. Another field experiment, with similar meaning, was conducted by Bloom et al. (2013) in 28 Indian plants operated by 17 firms, where participants learned 38 management practices (in fact, rules of thumb too), which resulted in productivity increase and opening of more plants.

The essential difference between these two studies is that the rules of thumb by Bloom et al. (2013) are clearly operational routines, simple rules such as "the shop floor should be clear of waste and obstacles" or "there should be a regular meeting between sales and operational management". Although less gentle and sophisticated than simple rules of Di Stefano et al. (2014), they are nevertheless simple rules: they are about "doing things right" and do not depend on a specific individual. On the other hand, many of the action principles of Glaub et al. (2014), - such as "introduce something new", "change your environment", or "anticipate potential barriers", - are considerably closer to the notion of dynamic capabilities: they require individuals who knows how to do the right things.

Thus, dynamic capabilities reside in individuals, but what is the place of dynamic capabilities in a firm and how this conceptualization can form a framework, integrating various perspectives and fields? As it was mentioned earlier, much of traditional economic and business research focuses on firms as living organisms. Ironically, managers and researchers endowed

² Compare to the notion of «simple rules» (Di Stefano et al., 2014)

depersonalized firms with humanlike qualities (similarly to the students in Ward's (1994) experiment, who one and all imagined animal life on other planets with the use of properties that are typical of animals on Earth). Personal goals and motivation have turned into a firm's strategy, personal values, beliefs and norms have been translated into corporate vision and culture, personal skills have been transformed into organizational routines (e.g., Nelson and Winter, 2002). This thinking allows drawing even a grotesque analogy between the human body and organizational structure with, for example, the head being top management and hands being production workers. The apotheosis of such thinking is Living Systems Theory (e.g., Miller, 1978), where living systems are classified according to increasing complexity: cells, organs, organisms, groups, organizations, communities, societies and supranational systems. Each level is composed of the same set of critical subsystems (such as "reproducer", "distributor", "producer", "memory"), which have similar functions across the levels, but differ in form and composition. For instance, "ingestor", or the subsystem that imports matter-energy from the environment, takes form of input arteries in organs, mouth and nose in organisms, receiving departments in organizations, immigration offices in societies.

The analogy between humans and firms is entirely applicable to dynamic capabilities, particularly to the hierarchy of resources and capabilities by Teece et al. (1997). Factors of production, being undifferentiated inputs, correspond to anatomical features, common to all people. Resources, or firm-specific assets that are difficult or impossible to imitate, correspond to personality traits and abilities. Organizational routines, needed for performing distinctive activities with the use of firm resources, correspond to human skills, needed for realizing biological and psychological potential to perform certain tasks. Organizational capabilities (core competences) that define a firm's business and are essential for the competition correspond to human competences, i.e. the most significant skills and talents (Figure 1).

Insert Figure 1 about here

However, dynamic capabilities reside exclusively in individuals, who use them to manage and change personal and organizational competences/resources to achieve efficient results. Thus, the dynamic capabilities become a nexus between individual and organizational

resources (not least, human resources). Figure 1 demonstrates the interconnection between individual and organizational capabilities, with dynamic capabilities, inherent in individuals, in the middle.

It is important to note that, although individuals are the primary source of influence, firms (i.e. social groups) influence individuals to no less extent. The processes, started by certain individuals/leaders, often become routinized and thus embedded in an organization in the form of ordinary capabilities. This embedding, being inevitable in most cases, especially for a growing organization, influences the behaviour of individuals. The influence is especially noticeable in situations where a new leader has to deal with existing routines. The arrows in Figure 1 reflect this two-directional relationship. Although Figure 1 shows one individual and one firm, one should bear in mind that it illustrates the interaction, happening between an individual and the organization of people. Finally, in the case of several leaders, the left part of the picture multiplies.

Beyond doubt, analogical reasoning is often helpful, but it should be applied with caution, since it may lead to forming beliefs that do not describe reality adequately. Examples are identifying seven colours in a rainbow by analogy with the musical notes, the days of the week and known objects of the Solar system by Newton, or Bohr's planetary model of the atom. In the systems on the group level and higher, the Living Systems framework finds subsystems, similar in functions to those in living organisms, and concludes that the systems are also living. One must not forget, though, that people in groups, irrespective of the level of complexity, are normally free to enter, move within and leave the systems, be members of several systems on the same level or change their affiliations, and even play their own games, which is apparently neither the case of organs in organisms nor cells in organs. Such a loose coupling does not necessarily make a system "bad" or "less systemic" (Weick, 1976), but it hardly makes it living *per se*, and thus necessitates studying the underlying elements and processes that lead to the observed outcomes.

Figure 1 is more than an analogy. It is a depiction of the dynamic process, happening between members of social groups as individuals and the other group members. It is inherently human-centred, and it does not depart from the "individuals in groups"-level and does not regard firm as a living organism. It is, however, recognizes the dual role of humans in organizations, i.e. both as resources and managers of resources. Organizational routines are in practice personal

routines, too (if a routine is not used by anyone, it has no effect and might be omitted): they come from individuals with dynamic capabilities and are shared by employees. Even business models have their designers.

Expanding Coleman’s framework

The idea of explaining social phenomena by focusing on behaviour of individuals is certainly far from being new in social sciences (John Stuart Mill’s and Max Weber’s works may serve as early examples). The premise of such methodological individualism may be described by quoting Elster (1989, p.13): “The elementary unit of social life is the individual human action. To explain social institutions and social change is to show how they arise as the result of the action and interaction of individuals”. Among theories that have found the fruitful soil in this perspective, rational choice theory is probably one of the most prominent examples. In this connection, the framework by Coleman (1990) is particularly relevant.

In essence, the Coleman’s framework (alias “bathtub” and “boat”) provides an explanation of the observed relations between macro-level phenomena by describing how they both ignite and result from individual behaviour (Figure 2). The figure may be explained by using the case of revolution provided by Coleman (because revolution is about change and thus indirectly related to innovation). In a holistic perspective, certain social conditions (macro-proposition 1) lead to revolution (macro-proposition 2). However, Coleman argues that this explanation is not full without taking into consideration the individual level. According to him, what actually happens is that social conditions influence individuals’ expectations (micro-proposition 1), which in turn lead to purposive action (micro-proposition 2) with respect to revolution.

Insert Figure 2 about here

Peter Abell, Teppo Felin, Nicolai Foss and Koen Heimeriks (among others) have augmented the Coleman’s framework and applied it to the context of routines and capabilities (Felin and Foss, 2005; Abell et al., 2008; Felin et al., 2012). Thus, Abell et al. (2008) extend Coleman’s model by placing routines as an another macro-proposition between macro-

antecedents and macro(firm-level)-outcomes. For them, firm is an averaging mechanism, where routines and standard operating procedures are used to control inter-individual productivity.

However, the Coleman's framework, even after the adjustment, can not be considered as exhausting. First, it assumes that individual behaviour is based on utility maximization (hence "purposive action"), which leaves little room for individual differences. However, both Felin et al. (2012) and Helfat and Peteraf (2014) have addressed this issue by reassuring the importance of individual characteristics and abilities in shaping routines and capabilities. Figure 1 incorporates individual skills, traits and abilities as well, but, in contrast to, for example, Helfat and Peteraf (2014), who views cognitive capabilities as pillars, proposing different sets of cognitive capabilities for each dynamic managerial capability, Figure 1 illustrates them as a foundation, recognizing their joint contribution to any type of dynamic capability.

Second, the Coleman's model does not sufficiently incorporate interaction between individuals (Hodgson, 2012). This problem, however, can be easily solved by picturing the original "two-dimensional" model as three-dimensional (Figure 3).

Insert Figure 3 about here

For the sake of simplicity and clarity, Figure 3 shows the situation of just two individuals and uses terms of Abell et al. (2008) to describe the individual level. In compliance with Elster (1989), it depicts both individual actions and interactions between individuals. Macro-level proposition 1 is an aggregation of external stimuli for both individuals. One of them (individual 1) has dynamic capabilities, and thus senses opportunities in macro-level proposition 1 and wants to seize them. Individual 2 may or may not understand the opportunities, but he/she is exposed to the stimuli either directly or through individual 1's actions. In turn, subsequent actions of individual 2 may influence the individual 1's conditions and the individual 1 may adjust his/her behaviour. This continuous interaction results in macro-level proposition 2. The double arrow between individual conditions represents the beliefs of individuals about each other's interests. On the other hand, the direct link between individual actions has no meaning, so it is absent. Finally, the figure may be expanded in both directions to encompass a more long-term process, when macro-level proposition 2 starts playing the role of (or together with) macro-level proposition 1.

Innovation research and individuals

The framework presented on Figure 1 and Figure 3 can both contribute to and learn from innovation research. Innovation studies typically focus on the firm or organizational unit level. They offer a large number of various resources, practices and other specific internal and external contexts that may act as success factors, given proper management or fortunate coincidence (e.g., Ernst, 2002; Papastathopoulou and Hultink, 2012; Sivasubramaniam et al., 2012; Slater et al., 2013). However, some attempts to advance research on the role of individuals in innovation have been made, and can currently be presented by two main directions: corporate entrepreneurship/intrapreneurship (Pinchot 1985; Sharma and Chrisman, 1999) and creativity (Mumford et al., 2011).

Corporate entrepreneurship. In its broadest meaning corporate entrepreneurship includes acts of organizational creation, renewal and innovation performed by an individual or a team within an organization (Sharma and Chrisman, 1999). Thus, corporate entrepreneurship by definition is an incarnation of a dynamic capability, although technically the former term was introduced earlier than the latter. In addition, the terms “intrapreneurship” and “corporate venturing” are often used with the same meaning (e.g., Antoncic and Hisrich, 2001; Parker, 2011).

The corporate entrepreneurship literature presents many findings such as the attributes of corporate entrepreneurship (Stopford and Baden-Fuller, 1994), models of corporate entrepreneurship (Wolcott and Lippitz, 2007), supportive strategic management practices (Barringer and Bluedorn, 1999), human resource management practices (Schmelter et al., 2010), and favorable top management team human and social capital (Heavey and Simsek, 2013; van Doorn et al., 2013). However, the literature mainly examines how corporate entrepreneurship is enabled by the specifics of either the whole organizational context or the top management. It is clearly reflected in the tools developed to measure corporate entrepreneurship, such as the ENTRESALE (Khandwalla, 1977); the scales by Zahra (1991) and Zahra (1993); or the Corporate Entrepreneurship Assessment Instrument (Hornsby et al., 2002), which are exclusively focused on an organization.

The studies that examine a corporate entrepreneur/intrapreneur per se are very scarce. One of the few exceptions is studies of innovation champions, i.e. individuals within

organizations, who promote and support innovations (Chakrabarti, 1974). They provide autonomy, gather organizational support, use loose monitoring mechanisms and informal means for persuasion, support flat decision making, and protect from interference by the hierarchy (Shane, 1994). Howell et al. (2005) suggest an instrument to measure the behavior of product innovation champions, consisting of three dimensions: expressing enthusiasm and confidence about the success, persisting under adversity, and getting the right people involved. Top management involvement (Felekoglu and Moultrie, 2013) can be viewed as a particular type of the champion behavior, where support is given – or not – by people who formally have the most power in an organization.

For Hayton and Kelley (2006), corporate entrepreneurs are more than just promoters. Taking the competency-based approach to the phenomenon, the authors suggest four competences specific to corporate entrepreneurs: innovating, brokering, championing, and sponsoring. They propose that each of these competences is a function of certain abilities. Thus, innovating competence may be a result of combination of domain-specific knowledge, cognitive ability, and creativity, while brokering may be based on analogical reasoning skills, personal confidence, credibility, networking skills, curiosity, creativity and intrinsic movement. Emotional intelligence, transformational leadership skills, broad organizational experience, credibility, and trustworthiness may contribute to championing competence. Finally, sponsoring competence may be a function of deep technological and business knowledge, risk tolerance, persistence and passion, and transformational leadership skills. These competences may reside in a one individual, or may be dispersed throughout an organization. Clearly, this thinking is similar to what Figure 1 presents. Although this framework still remains purely conceptual, the evidence for the importance of an individual's networking skills (labeled "individual network capacity") is found by Kelley et al. (2009). They stress that, although network position is important, credibility and persuasiveness are critical for an individual's network.

Being entrepreneurial within organization and outside the organization is not the same, and they require different capabilities. Comparing nascent intrapreneurs (engaged in start-up activities for their employer) with nascent entrepreneurs, Parker (2011) finds several systematic differences between them. Thus, the former tend to be middle aged and explore more business-to-business opportunities, while the latter are generally younger and older people that focus on ventures related to selling directly to customers. The author also asserts that unobserved personal

attributes are more important than a corporate work environment in making a decision between intrapreneurship and entrepreneurship.

Nevertheless, in corporate entrepreneurship too, there is still a lack of research on the “human element” (individual, teams and managers), although this human element is “what ultimately sustains or recaptures competitive advantage for the firm” (Corbett et al., 2013, p. 817). Their roles and perceptions of the context are different from those of the top management, so the factors that enable entrepreneurial activity are not the same for all managerial levels (Hornsby et al., 2009). Ironically, the concept of “intrapreneurship” was originally created to describe a particular individual – a “dreamer” who transforms an idea into a profitable solution – nearly three decades ago (Pinchot, 1985). In his book “Intrapreneuring”, Pinchot (1985, p. 6) claimed: “For a brief time we believed that carefully planned new-product process could replace the disorder of entrepreneurial passion. Study after study has proved this false. Innovation almost never happens in large organizations without an individual or small group passionately dedicated to making it happen.”

Unfortunately, after three decades since the publication of this book, we still possess more knowledge on what can make than who actually makes the innovation process successful. Currently, the attempt to concentrate research on an individual/team has in fact landed on the higher levels of analysis. Another gap is related to the lack of knowledge about corporate entrepreneurship in the service industries: the existing research has mainly locked-in on the manufacturing sector (Phan et al., 2009).

Creativity. As opposed to the previously discussed perspectives, the creativity research focuses largely on humans and provides rich, but contradictive findings on creative people. Even the very definition of creativity is fuzzy and differs from author to author (Plucker et al., 2004). In the most general sense, the term creativity refers to the ability to achieve novel and appropriate outcomes of high quality (Sternberg, 2003), and it underlies the notions of innovation and entrepreneurship (Wehner et al., 1991). It has a multifaceted nature and manifests itself in the interaction of the four P’s: person, process, press (environment) and product (Rhodes, 1961).

The research on the creative person (the first P) provides certain insights into intelligence, personality, motivation, skills and expertise of creative individuals. The conclusions are neither definitive nor clear, though.

There have been numerous attempts to capture the relationship between creativity and *intelligence*. They started with Guilford's (1950) divergent production tests, which later became the foundation for the Torrance Tests of Creative Thinking (Torrance, 1974), and continues up to date with a number of more recent intelligence tests, which are mainly based on the Cattell-Horn-Carroll theory (Kaufman et al., 2011). In general, findings suggest that higher levels of intelligence, and especially fluid intelligence (the ability to solve novel problems), are often related to creativity, but these and any further elaborations continuously fall under debate (Sternberg, 2003; Kaufman et al., 2011).

In studying the relationships between creativity and *personality*, it is common to refer to the Big Five personality traits: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Goldberg, 1992). Openness to experience reflects the degree of intellectual and experiential curiosity as well as a preference for variety, and shows the positive relation to creativity in most studies (Kaufman, 2009). Other personality traits show less consistent association with creativity and vary depending on domains (e.g., art or science) and measurement tools (Kaufman, 2009).

The studies on *motivation* traditionally distinguish extrinsic motivation (doing activities for achieving separable outcomes) and intrinsic motivation (doing activities for their inherent satisfactions) (Ryan and Deci, 2000). The main and common finding from the studies on the relationship between motivation and creativity provides support for the motivation crowding theory (Frey and Jegen, 2001): extrinsic motivation may decrease intrinsic motivation and, moreover, undermine creativity (e.g., Amabile, 1985; Prabhu et al., 2008).

Besides intrinsic motivation, creativity requires certain *skills*: for example, domain-relevant skills that include talent, knowledge, experiences and technical abilities, and creativity skills, such as cognitive styles, risk-taking, skills in generating ideas, tolerance for ambiguity, and self-discipline (Amabile, 1996). Many authors recognize the importance of *expertise* to achieve excellence in producing creative products (e.g., Kaufman, 2009; Mumford et al., 2011), although they also consider a situation when too much knowledge and expertise may hinder creativity due to certain inflexibility.

The creative process (the second P) with respect to individuals basically means the personal routines and methods the creative person uses to produce creative outcomes. Although creative people might not be aware of the process themselves, some researchers aim to open this

“black box” and even make attempts to formalize the process. Examples are the “Geneplore” model by Finke et al. (1992), consisting of generative and explorative phases, and the eight-stage model by Mumford et al. (1991) that includes problem construction, information encoding, category selection, category combination and reorganization, idea generation, idea evaluation, implementation planning, and solution monitoring.

The notion of creative press (the third P) is broad and is used to describe home, school, work and other types of environment, which influence the creative person, process or product “from the outside”. For example, many studies suggest factors that influenced people in their childhoods, contributing to their creativity, such as being later-born children (Suloway, 1996) or losing a parent before age 10 (Simonton, 1994). A considerable amount of work deals with the investigation of the organizational environment for creativity, especially the role of leaders, who need to orchestrate expertise and relationships (Mumford et al., 2002; Basadur, 2004) and support creative workers (Amabile et al., 2004) skilfully. After all, leading creative people is a delicate job that requires bearing in mind many nuances, such as a detrimental effect of external evaluation on creativity (Amabile, 1979).

Meanwhile, it is not necessarily only environment that affects a person; the influence may be exerted in the opposite direction, too. According to the system perspective by Csikszentmihalyi (1990), creativity takes place in an interaction of an individual with the domain (the system of symbolic rules and procedures) and the field (set of individuals working within and responsible for the domain).

Finally, the creative product (the fourth P) is the outcome of a person’s creative process, affected by the press. It may take form of a tangible or an intangible product, an idea, a solution or a response, but the evaluation of its novelty, quality and relevance in most cases is subjective (Kaufman, 2009). Correspondingly, differentiating between types of creative products can be difficult and always involves a judgmental element. Nevertheless, it does not reduce the need for systematization, and one of the most detailed taxonomies of creative outcomes is offered by the propulsion theory of creative contributions (Sternberg, 2003). It suggests eight types of contributions, grouped in three categories: contributions that accept current paradigms and attempt to extend them (replication, redefinition, forward incrementation, and advance forward incrementation); contributions that reject current paradigms and attempt to replace them

(redirection, reconstruction, reinitiation); and a contribution that merges disparate current paradigms (integration).

Despite the numerous findings and theories, the translation of creativity research into the language of innovation requires a great caution. The problems lie not only in the contradictions in findings and disagreements in the use of measurement tools, but in the predominant use of subjects outside firms, such as children, students, artists and scientists. Those studies of creativity that address firms mostly focus on organizational environment (i.e., “press” in terms of four P’s). Although creativity research provides an invaluable source of information on human creativity, it basically focuses on idea generation, - or invention, while the rest of innovation process remains largely uncovered. It might be that the notions of creativity and innovation are used interchangeably for certain interdisciplinary reasons (Wehner et al., 1991), but they are inherently two distinct concepts. The illustration of the distinction can be found even in the arts, so much favoured by creativity research. Thus, J.S. Bach and W.A. Mozart were certainly highly creative and professional, but they were not innovative with respect to the music styles they worked in (Baroque and Classicism), as opposed to C. Monteverdi and J. Haydn, respectively. As much as invention does not mean innovation (until commercialized), being creative does not imply being innovative. In other words, creativity lays the foundations for both invention and innovation, being necessary for creating (a deliberate tautology) novel outcomes, but it is not sufficient for neither of them.

Towards an anthropocentric theory of an (innovative) organization

All three above-mentioned perspectives – dynamic capabilities view, corporate entrepreneurship (intrapreneurship), and creativity – deal with change and innovation, and, either explicitly or implicitly, with capabilities/abilities. The combination of these perspectives gives an opportunity to create a framework for the identification of the set of capabilities inherent to innovators inside firms.

Dynamic capabilities view is the most general of these three perspectives and focuses on the change and management of assets and routines. The sensing/seizing/reconfiguration framework (Teece, 2007) is useful in understanding what kind of capabilities are relevant for working in an organization, because it provides an analytical disaggregation for virtually any capability. However, it requires adjustment to the individual level and translation into personal routines.

The corporate entrepreneurship (intrapreneurship) literature examines the processes of innovation and venturing within companies. Although its mainstream is concerned with the organizational context, it also provides important theoretical developments related to the behaviour of innovation champions and intrapreneurs.

Finally, creativity research examines the ability to produce novel and useful outcomes. Creativity rests upon many human abilities as well as personality, motivation, skills and expertise: the large part of the left pyramid on Figure 1. The research of creativity focuses mostly on idea generation rather than innovation and uses subjects outside organizational context, but it provides a solid framework for studying innovative managers, because it addresses individuals and is conceptually close to innovation.

Based on the combination of advances from dynamic capabilities view, intrapreneurship and creativity research, Table 1 contrasts dynamic capabilities of individuals and operational capabilities of organization.

Insert Table 1 about here

It is natural to assume that a particular individual might not have the whole set of capabilities needed for inventing and commercializing solutions. In this case, an organization may ensure the success by composing a team, where members collectively possess the necessary set of capabilities. Theoretically, one might argue that this situation is a *raison d'être* of organizations themselves: more often than not individuals do not solely possess all capabilities (especially, if one thinks about the whole range of processes, not only innovation), and thus bundle their capabilities together in a firm. This idea is strikingly similar to the explanations of firm existence by the transactional cost theory (Williamson, 1985), which assumes that in case of large recurring transactions it is more economical to use hierarchy, while for low levels of transaction frequency it is better to choose markets. Here, in turn, the existence of firm might be explained by the necessity of uniting dynamic capabilities of different individuals.

How can placing dynamic capabilities in individuals bring us closer to “understanding of the origins of firm-level heterogeneity” and the source of competitive advantage (Teece, 2014)? The operational capabilities in Table 1 (which would be regarded as “dynamic” according to the previous conceptualizations) can be more or less easily imitated and diffused, and in fact, it is

exactly what happens. However, the dynamic capabilities, as presented in Table 1, cannot be copied: they reside in individuals, and, as the left part of Figure 1 shows, dynamic capabilities in each individual have a complex supporting structure of personal competences, skills, psychological traits and abilities, which are often combined in a unique way. It does not mean that a successful organization is fatally dependent on one or few persons, and after their leave, it will necessarily fail. The solutions may include finding people with similar dynamic capabilities or trying a different constellation of capabilities.

How can placing dynamic capabilities in individuals contribute to innovation research? First, it may bring us closer to understanding the nature of innovation in firms. The consideration of individuals as a primary (success) factor of innovation shifts the focus from the organizational factors, making them moderators in the general model of innovation in firms. If the organizational factors favour innovativeness and create the appropriate organizational context, or at least do not considerably obstruct innovation attempts, the interaction between the individual capabilities and organizational factors may ensure the innovation process success. In the case of obstructive organizational context, innovators may abandon either their innovation attempts or leave the organization. The process success manifests itself in the project implementation and the launch of a new solution. In a general perspective, these situations may be illustrated by juxtaposing an individual's capabilities and the conditions of its social group, which might range from friends, family and team to firm, society and international community (Figure 4).

Insert Figure 4 about here

In the case of the firm, innovation (or any change in routines) will happen when there is an individual (or individuals) with dynamic capabilities, able to recognize opportunity and eager to realize it, and there is a receptive audience, who does not hinder or even assists in realizing the opportunities. Neither of the remaining combinations result in a change other than the eventual recession. However, Figure 4 provides a much simplified illustration. For example, it reflects neither heterogeneity of the social group nor a balance of power in it, and does not explicitly describe a situation when in the group there are several individuals with dynamic capabilities and competing interests. Such situations provide food for future investigations.

Finally, one might notice exiting overlaps between, for example, sensing/seizing and explorative innovation, sensing/reconfiguration and exploitative innovation (e.g., Jansen et al., 2006), reconfiguration and architectural innovation (Handerson and Clark, 1990). Bringing in the individual level, as depicted on Figure 1, has indeed a potential of integrating various perspectives and disciplines and can significantly contribute to the existing research. It offers exciting opportunities for integrating a wide range of disciplines, including economics (factors of production), strategy and management (resources, organizational routines), leadership (competences), pedagogy (skills), and psychology (personality traits and abilities). The trick is to seize them.

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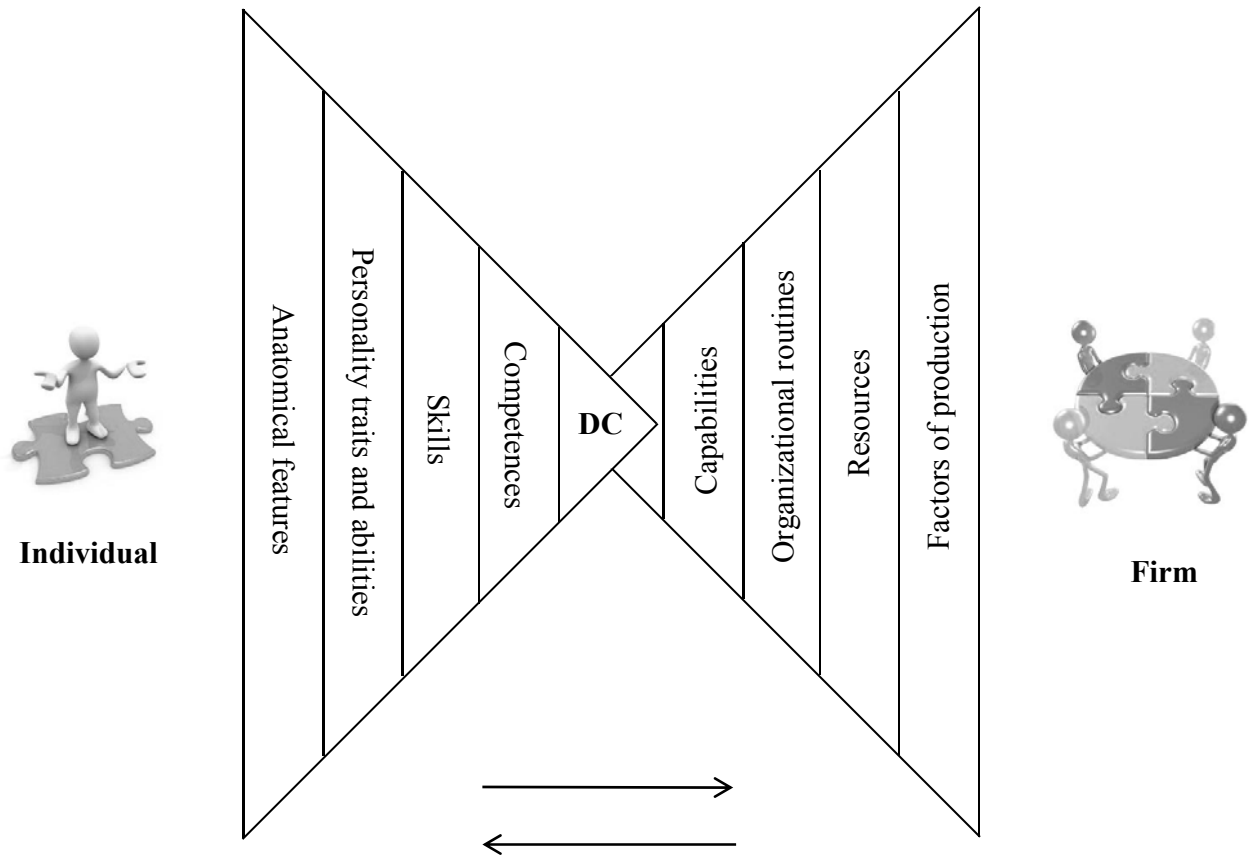
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FIGURE 1

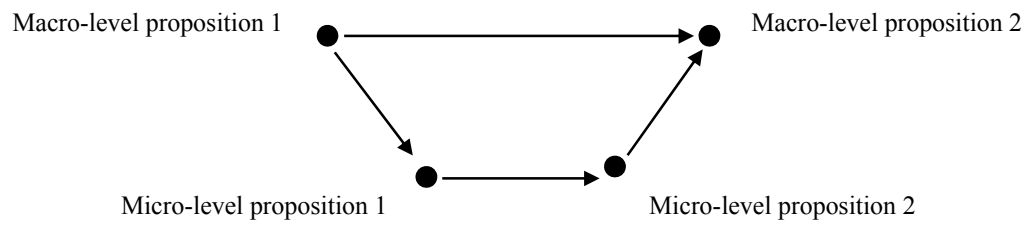
Interconnection between individual and organizational capabilities



*DC – dynamic capabilities

FIGURE 2

Coleman's macro- and micro-level propositions



Adapted from Coleman (1990)

FIGURE 3

Re-visualization of the Coleman's framework

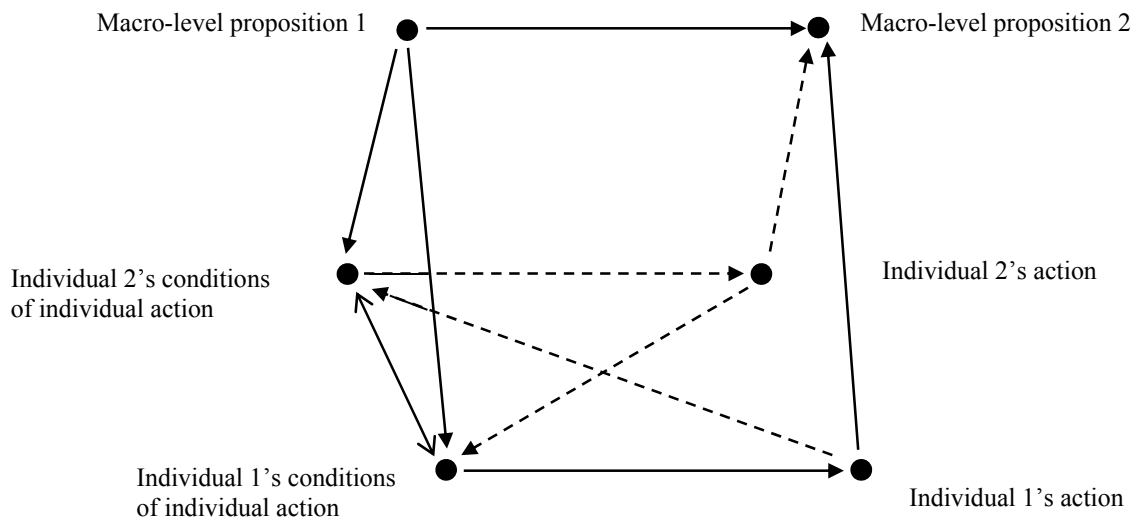


TABLE 1

Examples of dynamic capabilities and corresponding operational capabilities for innovation

	Dynamic capabilities	Operational/ordinary capabilities
Sensing	Individuals regularly discover problems and opportunities; get inspired for finding new solutions; come up with new ideas	Company has procedures to regularly collect information about customers, competitors, technical opportunities, competitors, partners Company has an established R&D department Company has a cooperation with research institutions
Seizing	Individuals regularly support and promote new ideas; express enthusiasm and confidence about the ideas' success; get right people involved	Company has a stage-gate innovation process Company uses prototyping, testing, service blueprinting
Transformation / Reconfiguration	Individuals regularly introduce changes in existing goods/services and organizational structures; use transformational leadership	Company has a policy of launching new goods/services periodically Company has job rotation and term limits Company has a rule of changing organizational structure periodically

FIGURE 4

Individuals, groups and change

Individual in the social group	<i>With DC</i>	Suppression (“martyr” or “unrecognized genius”)	Change
	<i>Without DC</i>	Unrecognized opportunity	Anticipation (“waiting for a messiah”)
		<i>Not receptive</i>	<i>Receptive</i>
		Social group	

*DC – dynamic capabilities