

Dynamic capabilities developed by the interaction of individuals

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THE AIMS OF THE PAPER

The existence of dynamic capabilities is key for newly created organizations. However, the development of these capabilities is less researched, especially in the case of start-ups. The primary aim of the study is to explore the characteristics of the development of dynamic capabilities through the case study of a domestic start-up, to illustrate the relationship between organizational and individual capabilities, while providing insights into the interaction between individual capabilities that can lead to the development of dynamic organizational capabilities.

METHODOLOGY

The primary data collection took place at a domestic start-up. The chosen methodology is the case study, in which three data sources were used. The in-depth interview served as the primary data source, personal or online interviews for at least 45 minutes were conducted with all members of the organization. The in-depth interviews were supplemented by document analysis to gather information from other sources. At the end of the study, the results were validated in a management workshop.

MOST IMPORTANT RESULTS

During the development of dynamic capabilities four types of interactions between individual capabilities could be identified: complementation, merging and extending similarities, searching and selecting alternatives and acceptance. Each type of interaction provides a solution in different situations, but all of them ultimately contribute to the development of dynamic capabilities.

RECOMMENDATIONS

Development of dynamic organizational capabilities (hence flexibility) is at least partly rooted in individuals and the interactions between them. It is therefore worthwhile for organizations to emphasize the acquisition of employees with good dynamic managerial capabilities and their involvement in interactions.

Keywords: dynamic capabilities, dynamic leadership capabilities, development of dynamic capabilities, start-up

INTRODUCTION

Organizational capabilities can be divided into two groups: dynamic and static (also known as operational) capabilities. Static capabilities are those through which the organization ensures its day-to-day income, using which the organization satisfies the same existing customers, with the same existing product, in the same form (Zollo & Winter 2002). Dynamic capability, on the other hand, is the ability of an organization to modify internal capabilities and competencies in response to a rapidly changing environment (Teece *et al.* 1997), i.e. to transform existing static capabilities. Dynamic capabilities can thus contribute to increasing organizational performance (Teece *et al.* 2016, Mikalef & Pateli 2017, Teece 2018), managing the dynamics of inter-organizational collaboration (Vilmányi & Hetesi 2017), but can also serve as a source of competitive advantage for organizational leaders in some cases (Teece 2012).

Developing dynamic capabilities is an important part of creating a business (Corner & Wu 2011), and in a rapidly changing environments, it is absolutely essential for start-ups (Wu 2007, Teece *et al.* 2016). For start-ups, dynamic capabilities are also a means of survival and growth (Pigola & Rezende 2022). Non-responsive organizations will fall behind, while organizations with dynamic capabilities will advance over time (Schoemaker *et al.* 2018). Globally, the number of start-ups reaches record highs, but we can see significant differences in their number in different regions and industries. Although many new start-ups are founded, they rarely survive more than five years (Seo & Lee 2019). It is beneficial for start-ups to work with an incubator or accelerator, which can help in developing dynamic capabilities (García-Ochoa *et al.* 2022) and entering into markets (Posza 2019).

From the above, it is necessary to understand how dynamic capabilities are developed in the case of start-ups and this study aims to provide new insight on this topic. After the review of the relevant literature, the methodology is presented, followed by the results of the empirical research. The study was conducted at a Hungarian start-up.

DYNAMIC CAPABILITIES

Dynamic capabilities are considered as a unified theoretical concept, but can also be interpreted as a multidimensional aggregate, a complex capability that can be defined by the set of components or subparts that make it up (Barreto 2010). Perhaps the

most widely accepted grouping (of the subparts that make up dynamic capabilities) is linked to Teece (2007). In the author's interpretation, dynamic capabilities can be divided into three subparts: Sensing, seizing, and transforming (Teece 2007).

Sensing

In order for the organization to build new capabilities, it needs new stimuli, which it acquires through sensing processes (Donada *et al.* 2016). The individuals involved in the process of sensing are not only limited to the top management of the organization. The workers in the "front line" also have an important role, the stimuli they perceive and transmit influence the perception of the managers as well (Donada *et al.* 2016).

Seizing

Seizing primarily means strategic decision-making related to a business model or an investment opportunity. The purpose of which is for the organization to develop a response to the opportunity or threat detected (Teece 2007). The output of the seizing is usually a new business model or business logic, but in some cases, the organization can create actions that can modify not only the internal characteristics, but also the market (Teece 2017).

Transforming

During transforming, the organization makes resource, process, or structural transformations for actions identified as a result of seizing (Teece 2007). In addition to implementing strategy and plans, another important aspect is to release organizational rigidity. The longer the organization continues to perform its tasks in the same form, the more rigid it becomes, so a later change would be met with greater resistance (Teece 2016).

DEVELOPMENT OF DYNAMIC CAPABILITIES

The development of dynamic capabilities is a process where interacting individuals combine their capabilities (Zahra *et al.* 2006, Donada *et al.* 2016) in a leadership-influenced development process (Williamson 2016). At the same time, the development of dynamic capabilities is influenced not only by individuals and the interactions between them, but also by current organizational processes and routines (Slaouti 2021) and organizational culture (Vicente *et al.* 2018, Williamson 2016). The development of dynamic capabilities depends on local cultural

characteristics; thus a dynamic capability can only be interpreted in the given environment (Williamson 2016). An organizational culture open to knowledge supports the development of dynamic capabilities (Vicente *et al.* 2018) and its subparts (sensing, seizing, transforming) (Warner & Wager 2018).

CHARACTERISTICS OF START-UPS FROM THE PERSPECTIVE OF DYNAMIC CAPABILITIES

The transformation of dynamic capabilities has been discussed in several studies, but their formation (the initial part of the development) is less studied (McKelvie & Davidsson 2009, Cyfert *et al.* 2021, Farkas 2022), while examining the development of these abilities has become even more important since the COVID-19 pandemic (Hitt *et al.* 2021). The majority of the studies of dynamic capabilities are conducted among larger companies (Rindova & Kotha 2001, Zahra *et al.* 2006), because mature companies have more and better identifiable dynamic capabilities than start-ups. (Ma *et al.* 2021), thus their examination is also simpler. But dynamic capabilities are present not only in large companies, but also in startups (Teece 2007), or smaller companies (Helfat & Winter 2011, Teece 2012). Although the interactions between individuals are receiving more and more attention, there is still a need for research that examines these interactions (Wilkens & Sprafke 2019, Vogus & Rerup 2018).

In the case of dynamic capabilities, the performance of younger organizations increases at a higher rate than that of large companies (Arend 2014). However, for start-ups, dynamic capabilities are more likely to be entrepreneurial capabilities than organizational routines (Teece 2012, Ma *et al.* 2015). Although start-ups have less dynamic capabilities at the beginning, they develop their dynamic capabilities at high rate in order to react to the environment (Ma *et al.* 2021).

METHODOLOGY

The purpose of this study is to better understand the development of dynamic capabilities. The examination of dynamic capabilities in previous research was mostly carried out in larger organizations (Teece 2015), but it would be necessary to examine newly founded organizations as well, because their dynamic capabilities differ significantly from the capabilities of older and bigger organizations (Zahra *et al.* 2006). Generating dynamic capabilities is an important part of creating new enterprises (Corner &

Wu 2011). Research on newly established start-ups is of paramount importance, as dynamic capabilities exert a substantial influence on their growth potential (Teixeira *et al.* 2021). Consequently, scrutinizing the evolution of dynamic capabilities within such start-ups can yield invaluable insights.

Accordingly, this research incorporates a case study to investigate a recently established start-up (the members commenced their collaboration in 2021, and the company was legally formed in 2022). The understanding of dynamic capabilities through individual case studies is a widely accepted methodology (Valantiejiéné *et al.* 2022), which is used internationally (e.g.: Danneels 2011, Sandberg 2021) and also domestically (e.g.: Bohl 2015, Kosztyán *et al.* 2018, Sebrek - Váradi 2019). The case study is an effective methodology for obtaining detailed information about a phenomenon by showcasing different points of view (Eisenhardt & Graebner 2007, Yin 2009).

The examined organization is a software company aiming to develop a multi-purpose voice-control technology. Upon implementing this solution into other applications or websites, those apps or websites become controllable through voice commands only (e.g., navigation applications can be fully operated by voice). The product is currently focused on the domestic market and aims to expand to the international market following successful growth in the local market. One of its competitive advantages in the domestic market is its ability to understand and execute commands in Hungarian. The top management of the organization has extensive experience and worked in leadership positions in high tech industries.

Three data sources were used for the data collection: (1) in-depth interviews with all members of the organization, (2) organizational documents, and (3) a management workshop at the end of the research (the main focus of the management workshop was the validation of the data collected).

The organization currently has 7 employees, the duration of the interviews with them was between 80 and 200 minutes, the interviews were conducted from June 13, 2022 to June 21, 2022. The positions of the interviewees and the date of the interview are given in Table 1. The interviews conducted online were video-recorded, and the face-to-face interviews were audio-recorded. During the research, the protocol for semi-structured in-depth interviews was followed: the main questions and topics were defined in advance, but modifications were possible based on the answers. The guideline of the interview was divided into three main parts and, in line with the literature of dynamic capability, the central element is change. The three main parts are: (1) Overview

Table 1. The positions of the interviewees and the dates of the interviews

Interviewee code	Interviewee’s organizational position	Date of the interview
A	COO	13 June 2022
B	software engineer	14 June 2022
C	CTO, software engineer	15 June 2022
D	software engineer	16 June 2022
E	professional assistant	20 June 2022
F	AI consultant, software developer	20 June 2022
G	CEO	21 June 2022

Source: Own construction

of the development of the enterprise, (2) Overview of the changes and reasons for changes in the main operational processes/routines of the enterprise, (3) Overview of the company’s change processes and change routines.

During the interviews, in addition to changes, special attention was given to routines. If the interviewees mentioned an individual, group, or organizational level routine, further questions were posed in relation to it. These additional questions focused on three factors: (1) Origin – to understand where the routine originated from and what preceded it; (2) Embeddedness – to understand who in the organization uses this routine; and (3) Process of dissemination – if more than one person uses this routine. The gathered information was organized into the following four categories (Table 2): The (1) basic data of the routine were recorded, where fundamental information about the routine, along with its textual context, was documented, and the routine was given a name. Next, the (2) type of routine was selected from the following: static, dynamic - sensing, dynamic - seizing, or dynamic - trans-

forming. Then, the (3) embeddedness of the routine was recorded, distinguishing between individual, group (used by more than one person but not the entire organization), and organizational. Finally, (4) any changes in the routine were recorded. If the routine underwent changes, the cause and manner of the change were documented. The first three categories (1-3) were necessary to determine whether the subject of the study was part of any dynamic capability, while the fourth (4) category revealed the interaction patterns that would be presented in the later part of the analysis. Regarding changes in routines (the fourth category), there were no pre-defined groups into which the phenomena were classified; each change was examined individually.

Although interviews can be used to gather in-depth empirical data, the data obtained can be subjective and other methods should be used at the same time (Mikalef *et al.* 2021). During document analysis, the organization’s reports prepared for external partners (e.g. venture capital investors), internal notes (development protocols) and documents presenting the product and the organization were

Table 2. Data categorization

Dimensions	Sub-dimensions
(1) Routine basic data	Name of the routine Context of the routine
(2) Routine type	Static Dynamic: Sensing Dynamic: Seizing Dynamic: Transforming
(3) Embeddedness	Individual Group Organization
(4) Routine change	No change Has changed (If yes, context of the change)

Source: Own construction

examined. During the analysis of the documents, any indication of change was collected. In order to capture any changes, no pre-established categories were used. Any observed changes (e.g., change in reporting, processes, types of documents being produced, declared goals or activities of the organization) were recorded, and the interviewees were asked about the reasons and characteristics of those changes. At the end of the research, the results were presented in a management workshop, where the managers of the organization were able to validate the results.

RESULTS

The presentation of the results follows the logic of the identified patterns of interaction.

Complementarity as an interaction pattern

The organization primarily engages in IT development, and as such, it requires transforming capabilities to adapt and modify its IT development processes. Currently, the organization possesses the capability of experimentation. This dynamic capability refers to the organization's ability to capture ideas from its vision, identify the necessary tasks for implementation, break down these tasks, test them, and manage the iterative process of refining ideas.

Initially, the organization lacked the ability to break down tasks associated with these dynamic capabilities, as well as manage the testing and iteration of ideas. However, with the addition of a new colleague (who now serves as the Chief Technology Officer), the organization's operations and associated routines were supplemented by the new colleague's individual transforming routines. The CTO had prior experience dealing with similar challenges, providing valuable assistance to the organization. *"[The CTO] had prior experience with these kind of problems, so he was a great help for us"*.

The new colleague brought accumulated knowledge from previous workplaces, which enhanced the organization's functioning. By integrating his individual transforming routines with the organization's existing sensing and seizing routines, a new dynamic capability was formed.

Merging and extending similarities as an interaction pattern

An example that demonstrates the integration of dynamic managerial and organizational capabilities is the practice of "literature reading" as part of the sensing capability. In this case, the entrepreneur and

the majority of colleagues had prior experience working in a university setting or had obtained scientific degrees, making regular engagement with scientific literature a natural habit for them. *"When we start thinking about something, we read about the topic, share those readings with each other, everyone reads them, and then we discuss them."*

These individual routines evolved into organizational-level practices as the widespread acceptance of "literature reading" encouraged others to adopt this routine. Subsequently, the organization's leaders made efforts to promote and incorporate this routine into various other processes. Currently, it is expected that nearly all job roles within the organization involve processing professional literature as part of problem-solving.

Alternative search and choice as an interaction pattern

Within the organization, we identified a seizing routine element that was not derived from an individual's previous job experience but was collectively developed by the members during ongoing operations. This routine element pertains to the ability to assess and generate development ideas. It can be defined as the organization's competence in interpreting, organizing, handling, and managing development ideas through management workshops, chat flows, and feedback from developers. The creation of this organizational routine element involved several steps. Firstly, the necessary conditions were established, followed by the exploration of alternative approaches that fulfilled these conditions. Finally, through compromise, the organization selected an alternative that suited its members. What makes this situation interesting is that the organization did not adopt an entirely new solution. Instead, they transferred their management workshops and discussions to a chat platform they were already familiar with and used in their personal lives: Viber. *"We all used Viber in our personal lives and saw that it met all our expectations, so it was natural for us to start using it for messaging each other."*

Acceptance as an interaction pattern

At the beginning of the organization's operation, the organization adapted many routine elements from the founder, which he had developed during his previous work. In connection with this, he says that *"[...] I already have complex processes in my head."* During the organization's founding phase, a significant change in direction was initiated at the request of a venture capital investor. Due to the founder's previous collaboration with this venture

capital investor, the founder intended to incorporate his own sensing and seizing routines into the organization. The other members of the organization did not intervene but instead accepted and aligned their actions with these routine elements. This type of interaction differs from complementation, as it was not a deliberate introduction of a new pattern specifically designed to achieve a particular task. Rather, it occurred naturally due to the influential position of the founder, whose patterns superseded those of other organizational actors. A similar interaction pattern, characterized by acceptance, emerged when the Chief Technology Officer (CTO) joined the organization. The CTO made it mandatory for developers to utilize the reporting system he had previously employed in his previous work. Despite subsequent modifications made by the CTO to the format, the developers consistently accepted these changes without resistance or without complementing the routine.

Arguably, the most significant finding of the research is the identification of individual-driven introduction of specific subparts of routines associated with dynamic capabilities (sensing, seizing, transforming) into the organization. However, through interactions among individuals, these subparts undergo transformation, interconnection, and, as a consequence, may even develop into a full-fledged dynamic capability. In essence, the study underscores the substantial interdependence between dynamic organizational capabilities and dynamic managerial capabilities.

DISCUSSION

The significance of developing dynamic capabilities and the influence of interactions in this process have been highlighted in the literature (Hitt *et al.* 2021, Wilkens & Sprafke 2019, Vogus & Rerup 2018). However, there has been a dearth of research focusing on the specific patterns of these interactions. Thus, the primary objective of the current study is to address this research gap and shed light on the intricate dynamics of these interactions.

The first contribution of this study is to validate the findings of Prieto & Easterby-Smith (2006) and Salvato & Vassolo (2018), which emphasize that dynamic capabilities indeed emerge from interactions, primarily between individuals. However, these interactions do not necessarily lead to changes in an individual's pre-existing routines. Interaction serves as a prerequisite for dynamic capabilities to manifest at the organizational level, but individuals can simply accept the routines of others without making

any modifications to them. Therefore, the patterns of interaction can encompass non-change/acceptance as well.

The second contribution of this research pertains to the factors influencing interactions. It has been acknowledged that interactions are influenced by various factors, including structure, routines, processes, norms (Bojesson & Fundin 2021), and even the relationships themselves (Salvato & Vassolo 2018). This study reaffirms previous research findings regarding the influence of various factors on interactions. Among these factors, the most prominent within this organizational context is the formal power of the individual. Acceptance by others was most likely to occur when the routine to be adapted was suggested by a direct superior. In contrast, in cases where individuals at a similar hierarchical level interacted to create a new routine, it was much more common for ideas to be collectively formed and complemented.

LIMITATIONS OF THE RESEARCH

The validity of the study can be extended if data is collected from several other organizations. The insights presented in the study are based on observations from a relatively new, small-sized start-up. It is important to note that start-ups differ from non-start-up organizations due to the involvement of specialized actors such as venture capitalists, mentors, and incubators, which influence capability development and market entry (Polo *et al.* 2020, Posza 2019). Therefore, it is crucial to conduct further research to validate and generalize the findings beyond this specific organization. The interaction patterns and transformations identified in this study may not be universally prevalent in all organizations, as dynamic capabilities are shaped by local characteristics (Williamson 2016).

CONCLUSION

Dynamic capabilities are essential for start-ups (Wu 2007, Teece *et al.* 2016), and these capabilities can mean survival for them (Pigola & Rezende 2022). The development of dynamic capabilities is a less researched area (McKelvie & Davidsson 2009, Cyfert *et al.* 2021, Farkas 2022), mainly considered under-researched among start-ups (Teece 2007, Ma *et al.* 2021).

This study focused on examining the development of dynamic capabilities in a start-up. The findings support the existing research that highlights a strong connection between dynamic organizational capabili-

ties and dynamic managerial capabilities, particularly during the early stages of operations (Schomaker *et al.* 2018, Pigola & Rezende 2022).

During the development of dynamic capabilities four types of interaction between individual capabilities could be identified: complementation, merging and extending similarities, searching and selecting alternatives, and acceptance.

During the process of complementation, new routine elements are introduced by the organization to address specific problems. These new elements complement the existing patterns without transforming them. In contrast, acceptance occurs when organizational members, who possess adaptable patterns themselves, choose to adopt the individual abilities of others instead of enforcing their own routines. Merging and extension involve the expansion of dynamic managerial capabilities throughout the entire organization or a significant portion of it. Pattern searching and selecting come into play when organizational members do not have readily adaptable solutions. In this case, they define the conditions, explore alternative approaches that meet those conditions, and then select the most suitable alternative to be implemented as an organizational capability. In future research, it would be valuable to investigate interactions across different types of organizations and examine the factors that moderate the formation process in diverse contexts. This would provide a more comprehensive understanding of how interactions contribute to capability development and its variations across different organizational settings.

MANAGERIAL IMPLICATIONS

To enhance an organization's capability for change, two factors should be considered. Firstly, recruiting individuals with capabilities related to market sensing, idea generation and seizing, or organizational transformation can be advantageous. These individuals bring valuable expertise and skills to the organization, enabling it to adapt to market dynamics effectively. Secondly, creating platforms or spaces for interactions among these individuals, as well as with top management, is crucial. Such interactions foster knowledge sharing, collaboration, and the exchange of innovative ideas. Through these interactions, new organizational capabilities can emerge, further strengthening the organization's competitive edge and its ability to navigate change successfully.

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