

## DYNAMIC INNOVATION CAPABILITIES OF ENTERPRISES

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**Purpose:** The aim of the article is to characterise and identify the role of dynamic innovative capabilities in enterprise development.

**Design/methodology/approach:** The research was conducted using a standardised structured interview questionnaire with managers of aviation companies in Poland.

**Findings:** The results of the study indicate the importance of dynamic innovation capabilities in improving competitiveness as well as coping with a dynamic environment.

**Research limitations/implications:** A limitation of the research conducted is the size of the research sample. This may provide an indication of the direction of future research concentrating on cross-sectional studies in companies from other sectors. This would provide a basis for formulating conclusions with a higher degree of generalisability.

**Practical implications:** The theoretical considerations presented and the conclusions drawn from the research can provide enterprise managers with valuable information on the use of dynamic capabilities to integrate, reconfigure and renew their resources for innovation.

**Social implications:** Enterprise managers should be aware of the importance and relevance of dynamic innovation capabilities in the context of contemporary challenges and enhancing innovation and competitiveness.

**Originality/value:** Due to its cognitive value and high practical relevance for business managers, the paper contributes on the role of dynamic innovative capacity by providing a voice in the ongoing discussion.

**Keywords:** dynamic innovation capabilities, innovation management, innovation, dynamic capability, competitive advantage.

**Category of the paper:** Research paper.

### 1. Introduction

The issue of dynamic innovative capacity is part of the current discussion focusing on finding new and better ways for companies to overcome emerging problems. It is an important issue in view of the contemporary challenges faced by enterprises struggling with the need to respond dynamically and flexibly to fast-moving changes, unexpected events that are difficult

to predict the so-called “black swans”. This is particularly relevant in a turbulent environment marked by economic crisis (Ledesma-Chaves, Arenas-Gaitán, 2022). This implies the need for a creative and innovative approach to find the best solutions and make bold decisions with the right capabilities. It also seems important for companies to adopt strategies that are geared towards exploiting the opportunities provided by these unpredictable events.

Dynamic innovative capacity fits in with the assumptions and strategic goals of EU innovation policy related to enhancing the innovativeness and competitiveness of EU countries. Indeed, innovation is an important factor in enhancing competitiveness. Thus, having the right dynamic innovative capabilities as evidenced by many authors translates into increased efficiency and competitive advantage (e.g. Calantoe et al., 2002; Tsai, Tsai, 2010; Zhang et al., 2013; Cheng, Chen, 2013; Breznik, Lahovnik, 2014; Han, Li, 2015; Saunila, 2016; El Bassiti, 2018).

The concept of dynamic innovation capability is based on the *dynamic capabilities concept* (DCC), *resource-based view* (RBV) and innovation theory. Despite the growing interest in this topic, both by practitioners and researchers, dynamic innovative capability is a construct that is poorly recognised and crystallised. It is a complex and multidimensional concept that, as an analysis of the literature shows, is associated with many concepts and models. This is indicated by many authors such as, for example, Stawasz (2014); Ledesma-Chaves, Arenas-Gaitán (2022). Besides, the very concept of dynamic capabilities on which the analysed construct is based is full of ambiguities, contradictions based on heterogeneous theory (Barreto, 2010; Matwiejczuk, 2016; Stańczyk-Hugiet, 2017). Therefore, tackling the topic related to deepening the knowledge of dynamic innovation capabilities and its role in the context of competitive advantage seems an interesting and necessary cognitive and research endeavour. In particular, the focus has been on its ability to integrate, renew and reconfigure resources for innovation management, creation and implementation of different types of innovations. In the face of contemporary challenges, the importance of the capacity for *innovation ambidextrous* was also recognised. The considerations presented and the results of the research carried out are part of a broader study that focused on the creation of a model of the innovative capacity of enterprises (Machnik-Słomka, 2020).

## **2. The role of dynamic innovative capacity in enterprise development**

Dynamic capability, as indicated in the literature, is often exposed in the context of a turbulent environment as the capacity for an organisation to behave in a way that promotes competitiveness (Stańczyk-Hugiet, 2017). Due to the perception of the environment, Ambrosini, Bowman, Collier (2009) propose to divide dynamic capabilities into three levels: incremental dynamic capabilities (level one); renewing dynamic capabilities (level two) and

regenerative dynamic capabilities (level three). When implementing innovation processes, it is therefore worth taking into account the relevant dynamic innovation capabilities depending on the dynamics of the environment (Bessant, Philips, 2013). Stańczyk-Hugiet (2017) concludes that *dynamic capabilities as a general idea fit into the dream of perfect adaptability*.

In the literature, many authors (Lawson, Samson, 2001; Wang, Ahmed, 2007; Breznik, Hisrich, 2014) emphasise the link between the concept of dynamic capabilities and the concept of innovative capabilities. Although, as Alves et al. (2017) argue, this relationship is under-recognised and requires identifying which capabilities of firms actually drive innovation. In view of this, the construct of dynamic innovation capability, against the background of the recognition of the general concept of dynamic capabilities, appears to be fragmented and ambiguous. Cheng, Chen (2013) identify dynamic innovation capabilities as capabilities created and used to manage the innovation process. Wang, Ahmed (2007) treat innovation capability as an important component of dynamic capabilities. Teece et al. (1997) indicate that innovation results from the capabilities of a given enterprise in coping with a turbulent and constantly changing environment. Cheng, Lin (2012). following Yam et al. (2011) assume that innovation is a dynamic capability understood as a stable pattern of collective action through which an organisation, aiming to improve performance, can systematically create and improve operational routines. Ledesma-Chaves and Arenas-Gaitán (2022), on the other hand, advocate viewing the concept of innovation capability as an independent capability, highlighting that there is not always a relationship between a company's possession of dynamic capabilities and the achievement of competitive advantages and the innovativeness of these firms. Identifying these relationships is therefore an interesting direction for further research that needs to be deepened.

It is generally recognised that dynamic capabilities are the capacities to *integrate, build and reconfigure internal and external resources/competencies to accommodate and shape a rapidly changing business environment* (Teece et al., 1997). This is emphasised in the work of many other authors such as Lawson, Samson (2001); Cheng, Chen (2013); Breznik, Lahovnik (2014); Han, Li (2015); Ledesma-Chaves, Arenas-Gaitán (2022). The integration of resources used for innovation activities can foster synergies through which innovation processes can be more efficient and translate into greater competitiveness of the firm. Reconfiguration of resources may involve proactive or reactive adaptation to internal and external changes (Wojcik-Karpacz, 2014).

Enterprise capabilities, according to M. Bratnicki (2008), concern the ability and skills to perform specific tasks and implement processes. Similarly, Forsman (2009) argues that innovation capability is based on activities. Relating this to innovation capability in the sphere of innovation management according to the OSLO Manual (2018), these activities can be referred primarily to:

- the creation of strategies, the setting of goals, the establishment of appropriate structures, processes, roles and ways of evaluating them for innovation,
- systematic planning, management and control of resources (internal and external) focused on innovation,
- allocating resources to innovation activities related to the organisation, internal and external collaboration supporting learning processes and performance monitoring.

Innovation capability is therefore a certain set of diverse capabilities that use resources for the implementation of innovation management tasks, which are focused on the achievement of the set outcomes, competitive advantage.

Based on a literature analysis based on the concept of dynamic capability, innovation theory, the following characteristics of dynamic innovation capability can be identified (e.g. Teece et al., 1997; Cheng, Chen, 2013; Matwiejczuk, 2014; Wijekoon, Galahityawe, 2016; Wojcik-Karpacz, 2017):

- strategic orientation,
- development orientation,
- capacity to create and implement innovations (both product and business process),
- rapid detection and exploitation of emerging opportunities,
- creating stakeholder value in response to identified needs,
- capacity to integrate, reconfigure and renew resources to manage innovation processes in response to changes in the environment,
- fostering effective systemic innovation management,
- capacity to raise and renew competitive advantages in the long term,
- increasing the role of capabilities in a turbulent environment.

Increasing attention in the literature focuses on ambidextrous innovation, often understood as the capacity to simultaneously implement radical innovation and incremental innovation (e.g. He, Wong, 2004; Zelong et al., 2011; Stelmaszczyk, 2017; Martin et al., 2017). Although it is a relatively under-recognised construct it seems to be of great importance in the context of increasing the competitiveness of companies in a dynamic environment by targeting not only incremental but also radical innovations. This creates greater opportunities for gaining competitive advantage in the long term through radical innovation.

### 3. Research methods

Based on the analysis of the literature, the research presented on dynamic innovative capacity considers:

- the capacity to integrate, reconfigure, renew and reconstitute its innovation resources in response to a changing environment,
- the capacity to identify market opportunities and adapt to trends,
- the capacity to simultaneously implement radical and incremental innovations.

The research was conducted in 2019-2020 with managers of aerospace companies in Poland taking into account the criterion of belonging to this industry according to PKD (30.3 PKD). It is worth emphasising in the context of the conducted research on dynamic innovative capacity that enterprises in this sector are classified as *high-tech* industries according to Eurostat or OECD (Nauka i Technika w 2017 r., 2019). This is associated with the high intensity of R&D activities carried out by these companies. This influenced the selection of the sector for research in this area.

The research used a standardised structured interview questionnaire. A random sampling method was used to select respondents for the study. The identified variables in terms of dynamic innovative capability (DIC) were assessed at five levels of maturity (from 1 meaning that a given practice does not exist to 5 - true everywhere) adopting a description of each level based on the PN-ISO 10014:2008 (2008) standard. A correlation analysis was also performed between the variables of dynamic innovative capability and competitive advantage (CA). A factor analysis of the variables of these constructs was conducted before assessing the correlation. Competitive advantage was assessed on a five-point Likert scale (1 - worst in the industry, 2 - worse than the industry average, 3 - same as the industry, 4 - better than the industry average, 5 - best in the industry).

The following methods were used during the data collection phase: PAPI (*Paper And Pen Interview*), CATI (*Computer Assisted Telephone Interview*) and CAWI (*Computer Assisted Web Interview*).

Calculations were carried out using the PS IMAGO PRO 5.1. software and the STATISTICA programme.

### 4. Results and discussion

The study sample comprised 53 companies in the aviation industry in Poland out of 234 active entities in this industry registered in 2019 (Główny Urząd Statystyczny, 2019). The structure of the surveyed enterprises in terms of size is presented in Table 1.

**Table 1.**  
*Structure of the surveyed enterprises in terms of size*

<b>Size of the enterprise</b>	Micro and small enterprises (up to 49)	88.68%
	Medium-sized enterprises (50 to 249)	5.66%
	Large enterprises (over 250)	5.66%

Source: Own study.

As can be seen from the data presented in Table 1, micro and small enterprises constituted the largest group among the surveyed enterprises (88.68%), followed by medium and large enterprises at 5.66% each. Compared to the statistical data, the structure of the sample is similar to that of the whole population.

Table 2 shows the maturity levels (rated on a scale of 1 to 5) for each of the five variables of the dynamic innovative capability (DIC) dimension.

**Table 2.**  
*Maturity level of the dynamic innovation capability (DIC) dimension variables*

<b>Symbol</b>	<b>Variables</b>	<b>Average level</b>
DIC_1	The firm has the capacity to integrate resources for innovation in response to a rapidly changing environment	3.91
DIC_2	The firm has the capacity to renew and recreate its resources for innovation in reaction to a changing environment	3.79
DIC_3	The firm has the capacity to reconfigure its innovation resources in reaction to a changing environment	3.72
DIC_4	The firm has the capacity to react and adapt to trends and identify market opportunities	4.13
DIC_5	The firm has the capacity to simultaneously realise (develop and implement) radical innovation and incremental innovation	3.64

Source: Own study.

From the data presented in Table 2, it can be seen that the highest value for maturity level was obtained by the variable DIC\_4 on having the capacity to react and adapt to trends and identify market opportunities (4.13). This capability is strongly emphasised in the literature by many authors in the context of the role of dynamic innovation capability. The next variable assessed in terms of the value obtained was the DIC\_1 variable related to the capacity to integrate resources for innovation in response to rapid changes in the environment (3.91). On the other hand, the lowest value obtained was the DIC\_5 variable related to the capacity to implement radical and incremental innovations simultaneously.

Descriptive statistics are presented for the individual variables of the DIC dimension in Table 3.

**Table 3.***Descriptive statistics of the dynamic innovation capability (DIC) dimension variables*

Symbol	Mean	Median	Minimum	Maximum	Lower quartile	Upper quartile	Standard deviation	Coefficient of variation
DIC_1	3.91	4.00	1.00	5.00	3.00	5.00	1.08	27.62
DIC_2	3.79	4.00	2.00	5.00	3.00	5.00	0.95	24.99
DIC_3	3.72	4.00	1.00	5.00	3.00	5.00	1.15	30.93
DIC_4	4.13	4.00	2.00	5.00	3.00	5.00	0.98	23.75
DIC_5	3.64	4.00	2.00	5.00	3.00	4.00	0.96	26.44

Source: Own study.

The results presented in Table 3 show that the minimum value of the DIC maturity level is 1.00 (for the variables DIC\_1 and DIC\_3) and the maximum value is 5.00. The median value for all the variables assessed is 4.00. The highest coefficient of variation can be observed for the variable DIC\_3 concerning the capacity to reconfigure its resources for innovation in reaction to a changing environment (30.93) which is associated with the highest variation in values. The lowest variability is for the DIC\_4 variable related to the capacity to react and adapt to trends and identify market opportunities (23.75).

The study measured competitive advantage and also examined the relationships between the variables of dynamic innovative capability and competitive advantage (CA).

Table 4 shows the basic descriptive statistics of the competitive advantage construct.

**Table 4.***Descriptive statistics of competitive advantage (CA)*

Symbol	Mean	Median	Minimum	Maximum	Lower quartile	Upper quartile	Standard deviation	Coefficient of variation
CA	3.66	3.67	2.17	4.83	3.33	4.00	0.57	15.57

Source: Own study.

As can be seen from Table 4, the value of the average competitive advantage is 3.66. In order to examine the correlations between the variables of dynamic innovation capability and competitive advantage (CA), Pearson correlation coefficient values were analysed. The results of the analysis showed a positive correlation between the variables of the capacity to integrate, renew, recreate and reconfigure its resources in the area of innovation and the capacity to react and adapt to trends and identify market opportunities. A less correlated variable with competitive advantage was found to be ambidextrous innovation capability related to the capacity to simultaneously implement radical innovation and incremental innovation.

## 5. Conclusion

Dynamic innovative capability is an increasingly popular research topic due to its high cognitive and practical value. As the literature on the subject and the research results of many authors indicate, this is due to its widely recognised role in the context of company development, increasing competitiveness in a turbulent environment. The activity of enterprises in conditions of high uncertainty and dynamics of change requires appropriate capabilities for coping with difficult conditions.

The study shows that the assessed level of dynamic innovation capability variables is at a relatively high level. This is reflected in the statistical data on aerospace enterprises characterised by higher R&D and innovation intensity. These capabilities, as highlighted in the literature, are particularly important due to the importance of dynamic innovative capability in the context of performance and competitive advantage. This has been confirmed by studies that show positive, positive correlations between dynamic innovative capability variables and competitive advantage. The results complement and confirm existing considerations and research on innovation capability and its role in the context of competitive advantage. These correlations are pointed out by, among others, Guan, Ma (2003); Zhang et al. (2013); Breznik, Lahovnik (2014).

With regard to the research carried out, limitations can be identified that are related to the sample size. At the same time, this points in the direction of future research, which could focus on comparative studies with other companies included in the high-tech industry or cross-sectional studies taking into account different industries. This would allow more general conclusions to be drawn.

The research carried out is a contribution to future in-depth research as part of the ongoing discussion on dynamic innovative capacity.

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