Journal of ENTREPRENEURSHIP, MANAGEMENT and INNOVATION
JEMI
Volume 17, Issue 2, 2021

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PUBLISHER

'Cognitione' Foundation for the Dissemination of Knowledge and Science; os. Bohaterów Tobruku 5, 34-400 Nowy Targ, Poland; www.fundacjacognione.org; e-mail: fundacja@cognitione.org; KRS: 0000587704. Journal website: www.jemi.edu.pl

JEMI IS INDEXED AND ABSTRACTED IN

Web of Science Core Collection; ANVUR; ERIH PLUS; CEON; GALE Science in Context: Academic OneFile, Business&Company Profiles, Business and Economics Theory, General Business File ASAP, GREENR, Infotrac Custom Journals, Internati onal Business; Cabell's Directories; Directory of Open Access Journals (DOAJ); EBSCO; Google Scholar; Index Copernicus; CEJSH; NLU-Library; Urlichsweb; WorldCat; SSRN; ARIANTA; Electronic Journals Library; E-journals.org, BazEkon; WSB-NLU Institutional Repository.

The original version: Online first
ISSN 2299-7075 (PRINT) | ISSN 2299-7326 (ONLINE)
ISBN 978-83-959006-0-0 (ONLINE)

Cover: Joanna Długosz
Typesetting and printed by:
Wydawnictwo i Drukarnia NOVA SANDEC
ul. Lwowska 143, 33-300 Nowy Sącz, www.novasandec.pl

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Dynamics of the evolution of the strategic management concept: From the planning school to the neostrategic approach

Tomasz Kafel[1], *Bernard Ziębicki*[2]

Abstract

Purpose: *Strategic management has been developing in business theory and practice for over 50 years. Presently, it constitutes the main area of research interest in management science. The contemporary conditions of business operations create new challenges for strategic management, such as the use of dynamic capabilities in strategy building, relational strategies, networking of organizations, technology development and automation of processes, and global strategies. These challenges are often referred to as neostrategic management. The purpose of this publication is to present the findings of research concerning new strategic management concepts and challenges.* ***Methodology:*** *The main research method of this article was a narrative literature review. On the basis of the research, the development of the concepts as well as contemporary trends and challenges of strategic management were characterized. There is also a synthesis of the problems and research results presented in the articles in this special issue of JEMI.* ***Findings:*** *Various schools and approaches to strategy formulation have been created. They indicate different factors that allow for success in strategic management such as: setting long-term goals, selection of programs and their execution plans (planning school); connection of the enterprise with the environment (evolutionary school); focusing attention on competitive advantage and achieved performance (position-based school); focus on one's own resources and competences (resource school); use of opportunities and creating innovation (simple rules school); selection of the best option and orientation in business management (real options school); or eclectic perspectives, integrating the listed approaches. The strategic management concept has two dimensions. The first dimension is related to the emergence of subsequent, new strategic management*

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Received 14 December 2020; Revised 3 March 2021; Accepted 7 March 2021.

concepts, which often hark back to the previous schools and approaches. The second dimension of development applies to operationalization and adjustment of the previous concepts to the changing conditions. ***Implications for theory and practice:*** *The paper characterizes the research results presented in the articles included in this JEMI issue. They deal with various problems and challenges in the field of strategic management, such as the relationship between market dynamics, market orientation and performance of enterprises; the innovativeness of companies as a contemporary strategic orientation of companies; the strategy implementation and the management of the organization change; problems of strategic management of the development of the city.* **Originality and value***: The problems presented in the study relate to challenges and new concepts in strategic management. They enrich the existing knowledge on the development of strategic management, and also create inspiration for further research in this area.*
Keywords: *evolution of the strategic management concept, neostrategic management, strategy implementation success, market dynamism, strategic management of cities, innovation strategy.*

INTRODUCTION

The beginning of the 21st century brought about fundamental changes in the conditions of business operations. They are above all a consequence of the political processes (particularly military conflicts), social processes (in particular migration), economic (particularly the growing disparity of income), technological ones (particularly the effects of the so-called *Fourth Industrial Revolution*) and the phenomena forming health threats (in particular the COVID-19 pandemic). The unpredictability of the organization's environment is not a phenomenon we have only been dealing with in recent years. For this reason, among others, traditional strategic planning methods became outdated as early as the 1990s (Vrdoljak-Raguž, Jelenc, & Podrug, 2016; Kaleta & Wittek-Crabb, 2016). As a consequence, other research areas in strategic management have been developed, among others: strategic alliances, mergers and acquisitions, internationalization strategies, or strategic learning (Vrdoljak-Raguž, Jelenc, & Podrug, 2016). Certainly, the increased uncertainty of the conditions of business operations can be noticed at present. For this reason, new concepts, models, and methods presently arise, aspiring to be modern tools for studying the strategic management "blackbox." They go away from the classical understanding of strategic management, towards designing the practice, process and approaches to strategy on the basis of the achievements of other scientific fields. This combination of various perspectives and approaches to strategic management, along with the application of knowledge from other disciplines, is what distinguishes new strategic management, for which the international literature uses the

term: *neostrategic management*. The purpose of this article is to present a relatively little-known approach to strategic management and especially to indicate new research directions undertaken in the field of strategic management. In the first part of the article, the authors characterize the most important, in their opinion, challenges faced at present by enterprises and their consequences for the strategic management process. Some directions of research in strategic management will also be proposed here, resulting from the challenges being described. Further, the evolution of strategic management schools and the essence of the new strategic management concept (*neostrategic management*) and the disciplines that create it will be presented. Finally, the articles presented in this issue, with the contents matching the new strategic management concept, will be summarized. The further directions of strategic management concept exploration, hopefully creating inspiration for other researchers and management practitioners, will be indicated at the end of the paper.

LITERATURE BACKGROUND

Key changes in the environment of enterprises and their consequences for the strategic management process

New challenges faced by entrepreneurs at the beginning of the 21st century have significant consequences for the approach to the strategic management process. Among those challenges, the most important ones are mainly the effects of the recent industrial revolutions (both the third, but particularly the fourth and the fifth one) that are difficult to anticipate as well as the pandemic phenomena. As a consequence, the uncertainty of business operations is growing. Other essential processes that managers must tackle include pressure on corporate social responsibility, the increasing potential of emerging markets, and shrinking natural resources. It seems that the main problem for the "strategic management" discipline will be the fast pace of change and the scale of novelties concerning enterprises and their environment. The period of intensive economic and technological change started at the end of the 20th century, known as the *Third Industrial Revolution*, shows its new face, which has already been named the *Fourth Industrial Revolution*. This idea, for which the term *Industry 4.0* is used, assumes that manufacturing competitiveness can be ensured based on new technologies combined with the Internet (the so-called business networking). Here, we are talking about the realization of the idea of a *smart factory* through the application of technologies and principles of organization of the value chain

together using and utilizing cyber-physical systems, the Internet of Things (intelligent mobility) and cloud processing (Hermann, Pentek, & Otto, 2015; Kagermann, Wahlster, & Helbig, 2013). Other equally important elements of the *Fourth Industrial Revolution* are the internet of persons (social and business networks), internet of services (smart networks and logistics), and internet of data (smart buildings and apartments). Some researchers include *smart factories* arising on the basis of the mentioned technologies as phenomena of the *Fifth Industrial Revolution* (Furmanek, 2018). The reality of the *Fifth Industrial Revolution* implies that in the near future, chat-bots and cobots (collaborative robots) will substitute live people in performing many work processes, while blockchain and cryptocurrencies will completely change the functioning of the world of finance. In the opinion of Furmanek (2018), the introduction of artificial intelligence and self-learning machines changes the way decisions are made and communication is conducted, and this process is irreversible and will proceed. It is therefore difficult to imagine that these phenomena be neglected in the business strategic management process. Given the key challenges of the contemporary times described above, and in particular the future, the authors have made an attempt to determine the directions of future research in strategic management, which is synthetically presented in Table 1.

The development of research in the field of strategic management within the last two decades has been dramatic. The survey areas described in the table are already the subject of scientists work around the world. For example, Sanchez, and Heene (2004) described the new strategic management in the context of competition and competence. Zakrzewska-Bielawska (2021) revealed the essence and meaning of the ambidextrous strategy concept, in turn, Kosch and Szarucki (2020a, 2020b) indicated a trend of growing international scientific collaboration in the field of strategic management. When analyzing the literature on the subject, it can be noticed that the current field of strategic management is strongly theory based, with substantial empirical research. This trend is also followed by the approach described below, for which the term neostrategic management was adopted.

Table 1. Directions of research in strategic management in view of the crucial challenges of the contemporary times

CHALLENGES OF THE CONTEMPORARY TIMES	CONSEQUENCES FOR THE STRATEGIC MANAGEMENT PROCESS	FUTURE RESEARCH AREAS
Subsequent industrial revolutions (including so-called „blue swans," characterizing unexpected events generated by digital technologies and artificial intelligence)	• Change in sources of competitive advantage towards knowledge management. • Blurred boundaries between sectors (e.g., photography and mobile phones). • Hypercompetition – quick and turbulent competitive actions (faster erosion of competitive advantage) forcing companies to ensure continuous innovation. • Shortened life cycle of sector/product/service. • Development of virtual businesses. • Intensifying the diversification strategy (radical increase in the quality level of the offered products). • Value migration from old to new sectors.	• Identification of future conditions of business operations. • Indication of the sources of market agility and their determinants in the future. • Application of inventive methods to determine the directions of change/modification of the operational domain (disappearing sectors). • Broader application of cooperation strategies with regard to scientific and development works. • Preparation of new ways of information support for strategic management. • Identification of areas of work outside the office/company. • Development/modification of the „learning organization". • Designing future business models (for instance, taking account of business value as the strategic goal).
Strategic uncertainty (resulting, among others, from the phenomena described by Nassim Taleb as „black swans" or new pandemics)	• Need to make sustainable choices under the conditions of extreme uncertainty leads to the "strategy paradox."[3] • Business strategy starts resembling a set of options[4], which can be either realized or discarded. • Change in approach to risk: "failure management" instead of risk minimization. • Utilization of the so-called "smart defeats."[5] • Prediction according to the VUCA model (volatility, uncertainty, complexity; ambiguity).	• Development of methodologies, improvement of forecasting techniques and algorithms. • Deepening and disseminating knowledge about the real options school. • Improvement of methods of successful strategy implementation in the conditions of continuous uncertainty. • Development of mental/cognitive models used to anticipate changes in the environment (the so-called "dominating logic"). • Popularization of the concept of loose resources (using the metaphor of organism). • Antifragility (Hydra) as the antidotum to the so-called „black swans" (Taleb 2007, 2012)

3 It consists, in the opinion of Raynor, in the fact that „actions and characteristics necessary to achieve spectacular success at the same time increase the risk of total failure" if we hold tight to the perfectly prepared strategy, not accepting any changes during its implementation (Raynor, 2008).

4 This option is the right to take a specific action in the future on the principle *if-then* giving the company freedom to postpone the decision until relevant information is obtained in the future (Wąsowska, 2012).

5 This refers to making mistakes in an 'as-least-costly way as possible' by detecting errors, correcting them, learning from them, and building resistance for the future [ibidem].

CHALLENGES OF THE CONTEMPORARY TIMES	CONSEQUENCES FOR THE STRATEGIC MANAGEMENT PROCESS	FUTURE RESEARCH AREAS
Pressure on business responsibility (including change in the approach to the employee).	• Redefinition of mission of the organization (dilemma: responsibility versus profitability). • Strategic model of corporate social responsibility as a source of competitive advantage (e.g. Toyota Prius). • Responsive model of corporate social responsibility as a tool for improving the image. • Standardization of CSR activities and formation of stock exchange indexes (CSR's effect on business value). • Dilemma – image or competitive advantage (or perhaps image and competitive advantage?).	• Improvement of business cooperation models with non-governmental organizations and public institutions. • Development of methods for building long-term bonds of the company (owners, management) with the employees. • Development of a model of shared (management and employees) accountability for effective operations of the company (e.g., using the employee share ownership concept). • Implementation of the assumptions for full participation in management. • Solutions in the sphere of employee privacy protection. • Dissemination of the business ecosystem concept.
Potential of emerging markets (including demographic explosions)	• Scale effect – emerging markets account for 70% of the future growth of Western international corporations (including China and India being 40%). • Acute competition for customers from the highest (by income) market segments – here approx. 20000 international companies are present on the emerging markets. • Unused potential of segments from the so-called "bottom of the income pyramid" on the emerging markets.	• Development of market segmentation methods with focus on examination of the so-called "bottom of the income pyramid." • Professionalization of researching social and cultural differences. • Identification of communication channels and distribution channels integrated with the segment from the bottom of the pyramid. • Preparation of models of cooperation with NGOs in order to reach out to the segments from the bottom of the pyramid.
Shrinking natural resources (including so-called „green swans" symbolizing catastrophic ecological events)	• Competitive fight enriched with high tech dimension. • New energy sources as foundations of competitive advantage.	• Development of a developed cooperation system in economic macrosystems (e.g. common policy of purchasing raw materials on the level of the whole European Union). • Working on organizational transformation strategies (alliances, mergers of large business unions, virtual systems).

Source: Authors' own study on the basis of Banaszyk and Urbanowska-Sojkin (2007); Romanowska (2004); Roland Berger Strategy Consultants (2011); Stabryła (2000); Szczerski (2012); Taleb (2007, 2012); Walas (2007); Wąsowska (2012).

Development of strategic management concepts towards the neostrategic approach

The challenges of the contemporary times presented in Table 1 contribute to the fact that strategic management is subject to constant changes, like the whole discipline of management sciences. New theories, concepts, methods,

and techniques aimed at improving the management of both commercial and non-commercial organizations are being created almost each year. This is a consequence of departing from the simplified and naive claim of the precursors of scientific management (in particular the engineering school) that there is one best management method. At the end of the 20th century, a number of new approaches leading to the so-called Organizational Excellence appeared. Among them, there are, for example, the concept of a New Wave in Management, Process Management, Business Process Reengineering, TQM, Project Management, and Postmodernism in Management. Among the newest achievements in management sciences – known in the United States and Europe – certainly include, for instance, The Actor-Network Theory, The Organization Learning Theory, The Positive Organizational Management Concept, The Organization's Social Responsibility Concept (considering the environmental context of management), The Creative Class Concept, the birth of the so-called Social Entrepreneurship (in particular among non-governmental organizations), and, in the case of public institutions, New Public Management and Governance Concept or the so-called Neoweberism. Their formation and dissemination is a result of a continuous search for instruments to improve the effectiveness of companies (in particular their profits) in the new operating conditions. On the other hand, in the public and non-governmental sector, new management concepts or methods are largely a result of isomorphic pressures arising directly from the goals expected from these organizations (what often means transformation of the solutions applied in business to non-commercial organizations). These changes also relate to strategic management, which is a separate part of management sciences. According to Romanowska and Krupski (2010), its development takes place both at the level of developing theoretical models and the methods supporting strategic management (in particular strategic analysis methods) and verification of theoretical models in management practice. Research objects are mainly businesses, but the majority of theories and tools are also applied in public institutions and non-governmental organizations.

Multiple theoretical views and practical experiences of advisory companies and enterprises on the development of strategic management have created the need to order them. The consequence of this is various classifications of strategic management schools. The roots of strategic management have been in a more applied area, often referred to as business policy (Hoskisson et al., 1999). An effect of changes in the business environment was the management practitioners' search for theories and methods of solving the problems they were facing. In response to the needs of the management practice in the second half of the 20th century, subsequent strategic management theories, models, and methods were born. The convergence

of the views presented by both management practitioners and theoreticians on the methods of solving organizational problems allowed, in subsequent periods, the separation of the so-called strategic management schools or streams, which most frequently stress one of the basic strategic management categories, for example: plan, competitive environment, resources, building around it a philosophy of the contemporary problem-solving for the future of the organization (Krupski, 2010). According to Krupski (2010), regardless of the priority dilemma: markets or resources?, subsequent schools also reach for large theories describing the reality such as, for example, the general systems theory, the complexity theory, the chaos theory, the game theory, and the options theory, in search of any patterns therein to describe problems, or even patterns for solving them. The growing turbulence of the environment and the ineffectiveness of the proposed action patterns ensure continuous evolution of the schools, streams, and approaches to strategic management. They have been characterized and compared in numerous publications (e.g., Jelenc, 2009; Jelenc, 2007; Furrer, Thomas, & Goussevskaia, 2008). In the 1950s and 1960s the main challenge faced by managers was the problem of coordinating and controlling their increasingly complex companies. The emphasis on long-term planning required the integration of strategic and financial management.

The answer to these problems from the **planning school of strategic management** created in this period was the document containing the plan, usually a several-year one, presenting the company's goals and tasks, priorities for particular products and businesses where the company operates, and allocating the resources for investment (Obłój, 2007). This approach assumed that the environment is relatively stable, controllable or at least predictable (Mintzberg & Waters, 1985; Wąsowska, 2012). Excessive formalization and stiffening of the planning process, a focus on procedures, failure to notice conflicts of interests of various groups in the company, slow response to changes in the environment, all contributed to the broad criticism of the planning school and the establishment of the so-called **evolutionary school of strategic management**. The representatives of this stream adopted the opinion that each enterprise has the capacity of learning and improving, and strategy is an expression of an accord among the process participants, rather than a document developed by external specialists and imposed on the management board (Romanowska, 2004). In the subsequent years (the turn of the 1960s and 1970s), planning in large companies involved the diversification process. Ansoff (1965) believed that strategic decisions are rather concerned with external than internal problems of the company, particularly related to the choice of the products that the company will produce and the markets will sell them on. Unfortunately, in the 1970s, the oil

crisis, excessive diversification as well as aggravating competition from Asian (mostly Japanese and Korean) companies changed the method of making decisions in enterprises, leading to autonomization of thinking about strategy (Grant, 2005). It was decided that the company's performance depends, first of all, on its (competitive) position in the environment, and strategy is to contribute to building competitive advantage. Porter (2001), the co-creator of the **position-based strategic management school** emerging in the 1980s, relied on the industrial organization stream in search of industry-based profitability determinants.

The 1990s are the birth of an important stream in research on strategy, the so-called **resources and competences school**, which treats strategy as a method of resource allocation, letting the company maintain or improve performance (Barney, 1991). Here, strategy is to respond to a completely different (as compared to the position-based school) question, which is "What should we be?" (Romanowska, 2004). The **concept of organizational capabilities** (organizational capability) developed the "static" version of this approach, paying attention to the ability to identify and use opportunities and threats as well as the ability to maintain competitive advantage by building, combining, protecting and reconfiguring resources (Teece, 2007). The beginning of the 21st century gave birth to subsequent schools and a completely different approach to strategy. Special attention should be paid to the **simple rules school** (*how-to-rules, boundary rules, priority rules, timing rules*), the representatives of which (e.g., Christensen) believed that the goal of strategy should be to find the answer to the question: "How should we act?" in the conditions of fast transformations in the environment and extreme uncertainties concerning market expectations, typical of the early 21st century. This school refers to the achievements of chaos theory, psychology, and biology. According to the supporters of this school, the essence of building competitive advantage is the ability to take advantage of occasional opportunities, building innovative strategies (Eisenhardt & Sull, 2001). And, finally, one of the contemporary strategic management schools, **real options school,** is the result of borrowings from the theory of options and finance. Its representatives make the assumption that the huge uncertainty of the environment eliminates any sense in pursuing any long-term projects and ventures. Strategies should be treated as gradually climbing up the stairs having at all times the possible option to resign from further climbing (Domański, 2010).

It is worth noting that the newest strategic management solutions seem to go towards examining the so-called **strategic dynamic**. The primary representatives of this stream are D'Aveni, Ghemawat, Brandenburger and Nalebuff, Stacey, Brown and Eisenhard, von Krogh, Schwartz and Trgigeorgis

(Segal-Horn, 2004). To some extent, De Witt and Meyer (2007) reference this stream and claim that, to succeed, businesses must manage contradictions, often reconciling and pursuing contradictory goals. Through a dialectical process, they should aim at balancing both exploratory and operating actions. In the opinion of Zakrzewska-Bielawska (2021), the term "ambidexterity" has been adopted for such abilities in the professional literature. This implies the need for contemporary companies to explore simultaneously new opportunities, to ensure profits in the future, and to use any present competences for current profitability. Both activities are necessary to achieve competitive advantage in the long term (Zakrzewska-Bielawska, 2021). In the opinion of the authors, this approach is consistent with the main idea behind the portfolio analysis, the aim of which is such allocation of measures that ensures the company's sustainable development. This often implies the concurrent use of both the diversification strategy (namely exploratory actions) and the penetration strategy (namely operating actions).

Some similarities can be noticed in presented schools or concepts of strategic management, being an obvious consequence of (the authors) noticing similar reactions or actions taken by entrepreneurs in reply to the problems they are forced to face at a specific time. However, the emphasis on different processes and problems can be noticed within each of the approaches, resulting in all of them having their enthusiasts today. Therefore, we can assume, after Stabryła (2000), that from the practical point of view, all (schools) together form a mutually complementing whole, and consequently, the complex nature of the research approach will be one of the main characteristics of the developed strategic management concept. The development of strategic management concepts is still progressing. It has two dimensions. The first of the dimensions is related to the emergence of subsequent, new strategic management concepts, which often hark back to the previous schools and approaches. The second dimension of development applies to the operationalization and adjustment of the previous concepts to the changing conditions. These changes have specific consequences, both for the strategic management process and the future research areas related to the strategic management concept. The above-described contemporary conditions of business operations create new challenges for strategic management. These include, for instance, the use of dynamic capabilities in strategy building (Segal-Horn, 2004; Teece, 2007; Krzakiewicz & Cyfert, 2014), relational strategies (Zakrzewska-Bielawska, 2017), networking of organizations (Krzakiewicz & Cyfert, 2013; Czakon, 2016), technology development and automation of processes (Schwab, 2016), global strategies (Porter, 1986; Gupta, Govindarajan, & Wang, 2008). In view of these challenges, some researchers postulate the assumption of a new

term: **neostrategic management** (Vrdoljak-Raguž, Jelenc, & Podrug, 2016). According to their assumptions, the key disciplines shaping neostrategic management are strategic entrepreneurship, spiritual management, behavior strategy and cognition, and strategy as practice. Among the disciplines shaping neostrategic management, the authors of the term have also identified supplementary disciplines, such as entrepreneurship, cognitive and social psychology, spiritual and religion movements, sociology, and anthropology (Vrdoljak-Raguž, Jelenc, & Podrug, 2016). In the proposed neostrategic management concept, its creators have addressed an important and valid problem of adjusting the strategic management concept to the new economic conditions of the 21st century. In this concept, particularly valuable is its link to the problems faced at present by the strategic management concept and indication of the proposals to solve these problems. These solutions oscillate around such areas as networking the organizations, a multidisciplinary approach to strategic management, continuous improvement of strategy (in accordance with the idea of a learning organization), the enterprising nature of strategic thinking, and strategic group leadership (Vrdoljak-Raguž, Jelenc, & Podrug, 2016; McGrath 2013).

CONTRIBUTIONS

The authors of the articles presented in this special issue of JEMI address problems and challenges that refer to the contemporary approaches of the strategic management concept, including the neostrategic management. The collection of articles in this issue shows how diverse the research areas in which the concept of strategic management is applied may be. Readers are concerned with such areas as: the company's market orientation in strategic management and its effect on the financial performance in the context of market dynamics; innovation as the contemporary strategic orientation of companies; or strategy implementation and change management, from the point of view of the differences in the perception of these processes by employees at various levels in the organizational hierarchy. The problem area of strategic management in the public sector has also been addressed. In this regard, the subject matter of the analysis was economic development strategy implementation processes at the level of municipalities and regions. All the articles present findings of empirical research, conducted with the use of both qualitative and quantitative research methods.

The article by **Anna Wójcik-Karpacz, Jarosław Karpacz, and Joanna Rudawska** addresses the relationship between market dynamics, market orientation, and performance of MSMEs. The research was conducted in

Polish companies operating in technology parks. Two quantitative empirical research methods: CAWI and PAPI were used in the study. The research hypothesis was: *Market dynamism moderates the market orientation – firm performance relationship; the positive effect of market orientation on firm performance is likely to be stronger under high market dynamism than under low market dynamism.* The conducted research confirmed the assumed hypothesis. The surveyed companies were characterized by quite a considerable market orientation. Simultaneously, high values of standard deviations of different market orientation dimensions proved a significant differentiation in this regard. In addition, the identified levels of different market dynamics dimensions indicated that these companies were generally operating on a stable or moderately dynamic market. Under these conditions, a more often adopted strategic orientation was exploratory development rather than operating market exploration. Simultaneously, enterprises that exhibited a high market orientation achieved better financial performance than the competitors. Based on completed studies, a conclusion can be formulated about the significant role of market orientation in strategic management of MSME enterprises, regardless of the dynamics of the market they operate on.

The article by **Edyta Bielińska-Dusza and Monika Hamerska** addresses the problem of innovativeness of companies as a contemporary strategic orientation of companies (Block, Fisch, & van Praag, 2017). The authors prove that strategic innovation, being a long-term process subjected to penetration of various types of innovation with strategic thinking, can be an effective management tool to achieve high operational effectiveness and maintain competitive advantage in the market. However, the level of innovativeness of companies is significantly diverse. Considerable differences in this regard are observed even within the same industry. The problem area of innovativeness of companies has been addressed in many scientific works. However, they have been concerned with particular companies, sectors, industries, and regions. On the other hand, there is no study showing the similarity of industries and their division into homogeneous groups in terms of the share of innovative companies. This gap became an inspiration for the research, the results of which are presented in the paper. This research aimed to classify the industries classified by PKD (NACE) divisions into homogeneous groups according to innovative projects of companies in the given industry. The completed research led to a number of interesting conclusions and observations. Companies from a particular industry can be divided into several innovation clusters, characterized by a high level of similarity of the innovation processes. This type of classification may increase the effectiveness of forecasting changes within the companies classified into

the same cluster. The research also confirmed a high correlation between product and process innovations.

The article by **Valentina Ivančić, Lara Jelenc, and Ivan Mencer** addresses the problem of strategy implementation. Previous research concerning the problem area of strategy implementation focused mostly on the perspective of the top management, ignoring the assessment of this process by lower hierarchical levels (Simons, 2013). The hypothesis of the study was: *There is a statistically significant difference in the evaluation of key implementation factors between employees from different hierarchical levels.* The strategy implementation process was subjected to assessment with regard to four factors: people, allocation of resources, communication, operational planning, and control (Okumus, 2003). The study covered all large enterprises in Croatia. The applied research method was a survey of opinions on the basis of a questionnaire. A total of 208 questionnaires were sent back from 78 companies. The assumed hypothesis was confirmed. The study proved that the assessment of key strategy implementation factors significantly differs between the hierarchical levels in two out of four factors: communication and planning, and operational control. First line managers and operators most frequently expressed the opinion that strategy implementation instructions are unclear and that their suggestions are not taken into consideration. They also believe that communication-related to the strategy implementation process is usually too slow, resulting in a mess and reducing the effectiveness in coordinating operating tasks and introducing potential changes. On the other hand, when it comes to the perception regarding these factors – people and resource allocation – the study has not confirmed any significant differences between the different levels in the organizational hierarchy. The studies described have allowed the identification of different problems related to strategy implementation and, as a result, a number of recommendations have been formulated. First of all, top managers should take account of feedback from lower-level managers and operators, to identify any threats associated with strategy implementation. Operational problems that may occur, such as unclear or slow communication, budgeting discrepancies, incorrectly determined schedule of actions and its dynamic as well as improper ways of measuring performance when implementing strategy, can be significantly restricted thanks to these activities.

The issue of strategic change management was also discussed in the article by **Ekaterina Brandtner and Jörg Freiling**. It concerns the role of the dominant logic of the organization in change implementation. The authors raised two research questions: *(RQ1) How to re-conceptualize the construct of the dominant logic to address both the driving and the hampering role in case of explorative turns? (RQ2) Which factors restrain and which factors allow*

explorative turns? The area of research was traditional German companies from the energy industry, characterized by a stable, well-established position. The authors of the article perceive the dominant logic of the organization, on the one hand, as a limiting factor for change implementation, and on the other hand, as a favorable factor that facilitates its interpretation. The research was qualitative. The results of the research confirm the positive influence of the dominant logic under the conditions of change. The data indicate that an exploratory turn, driven by dominant logic, works better with combined learning and unlearning abilities, an ambidextrous balance of exploration and exploitation, coexisting logic, the continuous adaptation of dominant logic, and lower levels of leadership strength and formal structures. However, the management of the organization plays a key role in interpreting the dominant logic. The response to the raised research question (RQ1) pointed to six factors: A) business success in the past; (B) core competence dependence; (C) structural rigidity and cost trap; (D) knowledge potential and learning capability; (E) risk aversion and complexity reduction; (F) communication and information behavior. Regarding the research question (RQ2), the four process mechanisms of unlearning, exploring, changing, and managing were identified. The research also confirmed the key role of the management of the organization in interpreting the dominant logic.

The special issue also includes an article devoted to the problem area of strategic management in the public sector by **Jan Fazlagić, Aleksandra Szulczewska-Remi, and Windham Loopesko**, relates to the problem area of the role of the entrepreneurship promotion policy in the strategic management of a city. The article presents the findings of a comparative analysis of regional development policies in Poland and Germany. The main research question of the article was: (*RQ) How do urban policies in Poland supporting knowledge spillovers and entrepreneurship – the key drivers of regions' innovative capacity development to sustain global competitiveness – differ from German cities' policies?* Strategic documents of the largest Polish and German cities and partially structured interviews were used in the study to answer the so formulated question. The completed research proved that Polish and German cities apply many of the same approaches to knowledge-transfer support policies. Both groups regard entrepreneurship as an important element of the development strategy. However, German lands support such activities to a greater extent as compared to Polish voivodeships. This mostly results from a stronger position and a higher autonomy of the lands in the federal structure of Germany as compared to voivodeships in Poland, which operate within a more uniform system. Polish cities are much more dependent on implementing their economic growth strategies on EU funds compared to German cities. Industrial cluster promotion policy is important in both city

groups. However, in Germany, such policies were already implemented much earlier and are presently well established. The majority of the respondents from Poland believe that their cities should put a greater emphasis on creating industrial clusters. Polish and German cities offer many initiatives attracting private capital, but in both cases, the main challenge is strengthening the social perception of entrepreneurship, especially among young inhabitants. Factors contributing to the development of entrepreneurship are tax reliefs and financial incentives. As it results from the studies performed, such incentives play a greater role in Poland than in Germany. However, neither German nor Polish cities guarantee significant incentives or preferences for companies operated by young people. The research also indicated the significant role of universities in supporting entrepreneurial operations. In this regard, the activity of universities and cooperation with local governments is more considerable in German than in Polish cities. Also, social entrepreneurship is a more developed concept in German cities as compared to Poland, but is becoming more important in both groups.

Further research

The presented problems and research findings involve different problems related to development and implementation of strategic management in contemporary enterprises and non-profit organizations. They enrich the present knowledge in this area and indicate further exploration directions, creating inspiration for other researchers and management practitioners. Strategic management is a branch of management science that is constantly being developed. Changes in the environment of enterprises create new challenges in this area and contribute to the creation of new concepts of strategic management. Classic methods are also perfected to increase their effectiveness. This special issue of JEMI presents selected current problems in the development of strategic management concerning both: the development of known concepts and methods of strategic management, as well as new ones. Much attention was paid to the implementation of strategic management. The conducted research provided new knowledge in the areas of the discussed problems but also allowed to set the directions for further research.

In the article by **Anna Wójcik-Karpacz, Jarosław Karpacz,** and **Joanna Rudawska**, comparative research on the interrelationships between different strategic orientations and company results in many contexts was indicated as the direction of further research. In particular, these studies should cover companies that introduce current products into new markets, new products into existing markets, and new products into new markets. The importance of these issues for strategic management grows along with the progress of the

managerial staff in increasing the effectiveness of business organizations. The research conducted by the authors of the article concerned MSME enterprises operating in technology parks. However, the issue of the impact of strategic orientations on financial results is general and concerns enterprises of all categories. Therefore, this research should be extended to other types of enterprises and carried out internationally.

The result of **Edyta Bielińska-Dusza** and **Monika Hamerska's** research is to divide industries, classified according to NACE divisions, into groups that will be homogeneous in terms of the share of innovative enterprises in a given industry. Although the research procedure showed which enterprises belong to the groups of PKD divisions, it does not provide sufficient ground for inferring causation. It can be assumed that the similarity of the group may result from the amount of financial outlays, knowledge of products and services, use and level of support with IT tools, or extensive inter-organizational cooperation. These studies can be a starting point for further in-depth analysis. An attempt to create a ranking of industries in terms of the share of innovative enterprises introducing new or improved products or business processes and checking whether it will reflect clusters of homogeneous industries seems to be an interesting research direction.

Extending the research to companies of different sizes and belonging to different industries is also indicated by **Valentina Ivančić, Lara Jelenc, and Ivan Mencer** as the direction of future research. The research presented in their article concerns the issues of strategy implementation and the role of operational employees in this process. The problem of implementing the strategy is still valid. According to McKinsey, one of the world leaders in implementation consulting, up to 70% of program changes fail to achieve their goals, mainly due to employee resistance and lack of management support (Ewenstein, Smith, & Sologar, 2015). The authors of the article point out the difficulties in researching this problem. In their opinion, some respondents were not entirely sure of their position in the hierarchical pyramid. Hierarchical items are not always well defined and explained at lower levels of the hierarchy. Also, they noticed that lower-level employees were frustrated when answering certain questions, which may have been due to a misunderstanding of the topic or a reluctance to express their views. Moreover, it shows that there is insufficient communication between the different levels of the hierarchy and that lower levels are usually not sufficiently familiar with the relevant facts in the implementation process, which, consequently, contributes to their sense of caution and fear of expressing their attitude.

The authors of the article: *Is the Dominant Logic a Value or a Liability? On the Explorative Turn in the German Power Utility Industry*, **Ekaterina Brandtner**

and Jörg Freiling, see the need to continue research into the attributes of emotions of managers and management teams (Sundermeier, 2020). These factors play an important role in the case of exploratory turns related to the dominant logic. Research on the above-mentioned factors requires the use of specially selected research methods and appropriately prepared researchers. Contextual factors may also play a key role in the dominant logic in the process of strategic change. This study was about a large, traditional company. The situation is different for small businesses or start-ups. A contextual factor that also has a significant impact is the social and business situation related to the COVID-19 crisis.

Directions for further research were also indicated in the article by **Jan Fazlagić, Aleksandra Szulczewska-Remi, and Windham Loopesko**. According to the authors, further research must focus on the more specific aspects of youth policy, for example, how these policies are adapted to the needs of local economies and how they support the development of social capital in cities. Youth entrepreneurship should be seen as a broader social attitude, not just an economic activity. Youth involvement in entrepreneurial activities should not be strictly measured in terms of economic indicators. The experience and social capital gained during entrepreneurial activities constitute an added value for the city, regardless of its economic results. It seems that such aspects of youth entrepreneurship do not receive sufficient attention among researchers in this field. One limitation of the research process worth mentioning was the lack of visual, non-verbal cues that could facilitate contextualization during the interview. Although the survey for German participants was conducted in English, this may have had an impact on the quality of the research (the questions may have been misunderstood or misinterpreted by the German respondents). As mentioned earlier, Polish cities depend to a large extent on non-private financing, mainly from the EU. Innovation requires the involvement of resources, which in turn require funding. Therefore, the decision to invest in innovation depends on two critical factors, namely the initial incentive to allocate funds to innovation and the ability to obtain the necessary financial resources (Peneder, 2008).

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Acknowledgment

The publication was co-financed by a subsidy awarded to the Cracow University of Economics.

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Abstrakt

Cel: *Zarządzanie strategiczne rozwijane jest w teorii oraz praktyce biznesowej od ponad 50 lat. Współczesne uwarunkowania funkcjonowania przedsiębiorstw tworzą nowe wyzwania dla zarządzania strategicznego. Należą do nich m.in. wykorzystanie zdolności dynamicznych w budowaniu strategii, strategie relacyjne, sieciowość organizacji, rozwój technologii i automatyzacja procesów, strategie globalne. Wyzwania te często określane są mianem zarządzania neostrategicznego. Celem niniejszej publikacji jest przedstawienie wyników badań dotyczących nowych koncepcji i wyzwań zarządzania strategicznego.* ***Metodyka:*** *Główną metodą badawczą tego artykułu był narracyjny przegląd literatury. Na podstawie przeprowadzonego badania scharakteryzowano rozwój koncepcji oraz współczesne trendy i wyzwania w zakresie zarządzania strategicznego. Dokonano także syntezy problemów i wyników badań przedstawianych w artykułach zamieszczonych w tym wydaniu specjalnym JEMI.* ***Wyniki:*** *Powstało wiele różnorodnych szkół oraz podejść do formułowania strategii. Wskazują one różne czynniki, umożliwiające osiągnięcie sukcesu w zarządzaniu strategicz-*

nym, takie jak: wyznaczanie długofalowych celów, dobór programów oraz planów ich realizacji (szkoła planistyczna); połączenie przedsiębiorstwa z otoczeniem (szkoła ewolucyjna); koncentrowanie uwagi na przewadze konkurencyjnej i osiąganych wynikach (szkoła pozycyjna), bazowanie na własnych zasobach i kompetencjach (szkoła zasobowa), wykorzystanie szans i kreowanie innowacji (szkoła prostych reguł); wybór najlepszej opcji i orientacji w zarządzaniu przedsiębiorstwem (szkoła realnych opcji); czy też eklektyczne ujęcia, integrujące wymienione podejścia. Rozwój koncepcji zarządzania strategicznego postępuje nadal. Realizowany jest on dwuwymiarowo. Pierwszy ze wspominanych wymiarów związany jest z pojawianiem się kolejnych, nowych koncepcji zarządzania strategicznego, które często nawiązują do wcześniejszych szkół i podejść. Drugi wymiar rozwoju dotyczy operacjonalizacji i dostosowania dotychczasowych koncepcji do zmieniających się warunków. ***Implikacje dla teorii i praktyki:*** *W opracowaniu scharakteryzowano wyniki badań przedstawione w artykułach zamieszonych w tym numerze JEMI. Dotyczą one różnych problemów i wyzwań w zakresie zarządzania strategicznego, jak: związek między dynamiką rynku, orientacją rynkową i wynikami przedsiębiorstw; innowacyjność firm jako współczesna orientacja strategiczna firm; wdrażanie strategii i zarządzanie zmianą organizacyjną; problemy strategicznego zarządzania rozwojem miasta. Oryginalność i wartość: Przedstawione w opracowaniu problemy dotyczą wyzwań oraz nowych koncepcji w zarządzaniu strategicznym. Wzbogacają dotychczasową wiedzę na temat rozwoju zarządzania strategicznego, a także tworzą inspiracje dla kolejnych badaczy i praktyków zarządzania.*
Słowa kluczowe: ewolucja koncepcji zarządzania strategicznego, zarządzanie neostrategiczne, sukces wdrażania strategii, dynamika rynku, zarządzanie strategiczne miastami, strategia innowacji

Conflicts of interest

The authors declare no conflict of interest.

Citation

Kafel, T., & Ziębicki, B. (2021). Dynamics of the evolution of the strategic management concept: From the planning school to the neostrategic approach. *Journal of Entrepreneurship, Management and Innovation*, *17*(2), 7-28. https://doi.org/10.7341/20211721

The impact of market orientation on the performance of MSMEs operating in technology parks: The role of market dynamism

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Abstract

Purpose: *The purpose of this article is to identify the role of market dynamism in the relationship between market orientation and the performance of micro, small, and medium enterprises (MSMEs) operating in technology parks (TPs) in Poland.* ***Methodology:*** *The two methods used for performing the quantitative empirical research are CAWI and PAPI. The research sample included MSMEs operating in technology parks in Poland. The article is the answer to the needs for systematic research of models between market orientation and firm performance.* ***Findings:*** *The research findings provide an insight into the level of market orientation and performance of the analyzed MSMEs operating in technology parks in Poland. It was found that MSMEs in the research sample were not a homogeneous group in this respect. It has been proven that market orientation is a significant stimulant of firm performance, while market dynamism has not been classified as a moderator of the market orientation–firm performance relationship.* ***Implications for theory and practice:*** *This study contributes to strategic management by identifying the key role of market orientation for enterprises wishing to benefit from this type of strategic orientation. The important role of the predictor – market orientation in shaping the results of micro, small and medium-sized enterprises operating at TPs in Poland has been proven. In practice, this means that increasing the level of market orientation is conducive to increasing positively assessed financial performance.* ***Originality and***

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Received 31 May 2020; Revised 1 June 2020; Accepted 20 June 2020.

value: *Our research carried out at MSMEs operating in technology parks in Poland enriches and supplements knowledge about market orientation as a phenomenon of universal character because it also applies to smaller sized business organizations.*
Keywords: *market orientation, market dynamism, firm performance, technology park, micro, small, medium enterprises, MSMEs*

INTRODUCTION

Small enterprises are important for most economies (Zakrzewski & Skowrońska, 2019). In general, small- and medium-sized enterprises (SMEs) and micro-enterprises are indicated as important sources of job creation and income generation in market economies, and this honorable role is played especially by those micro, small, and medium enterprises (MSMEs) which are growth-oriented (Rigtering, Kraus, Eggers, & Jensen, 2014; Harbat et al., 2018). Considering the constantly changing nature of the economic environment, these enterprises are continuously striving to take new opportunities in the market, so that they can identify growth paths and develop well. Growth is also a condition of survival for young and small businesses, as growing firms are found to be less vulnerable to failure than non-growers (Gancarczyk & Zabala-Iturriagagoitia, 2015). Strategic orientations of enterprises describe the trends and decision-making principles of enterprises that direct their actions and generate behaviors with the intention of achieving better organizational performance in the markets in which they conduct economic activities (Hakala, 2011). Development of strategic orientations in enterprises may therefore have a significant impact on organizational performance (Wales, Beliaeva, Shirokova, Stettler, & Gupta, 2020). That is why enterprises' strategic orientations are the object of scientific research with regard to their relationships with organizational performance (Mu, Thomas, Peng, & Di Benedetto, 2017). Previous research has distinguished several types of strategic orientations, including market orientation (Hakala, 2011; Kirca, Jayachandran, & Bearden, 2005). Market orientation (MO) reflects the degree to which enterprises rely on maximizing customer satisfaction and loyalty as their organizing principle (Gnizy, Baker, & Grinstein, 2014). Market orientation is a phenomenon of universal character and concerns every size of organisation. However, the literature indicates that previous research was focusing on the role of strategic orientations in large multinational corporations (Baker & Sinkula, 2005; McKenny, Short, Ketchen Jr., Payne, & Moss, 2018), rather than in micro- or small- and medium-sized enterprises (Kara, Spillan, & DeShields, 2005; Michna & Kmieciak, 2012).

Thus, there is still a deficit of empirical research on some groups of enterprises, and MSMEs operating in technology parks in Poland are

undoubtedly among them (Wójcik-Karpacz, 2019). Therefore, the aim of this article is to identify the role of market dynamism in the relationship between market orientation and performance of MSMEs operating in technology parks in Poland. Explaining these issues is essential in order to be able to treat market orientation as a strategic organizational factor shaping firm performance, including different environmental conditions.

The article is the answer to the needs for systematic research of models between market orientation and firm performance. The subject matter of the article forms part of the broader trend of research on discovering the role of market dynamism while analyzing the effects of market orientation. The two methods used for performing the quantitative empirical research are CAWI and PAPI. The research sample included micro-, small- and medium-sized enterprises (MSMEs) operating in technology parks in Poland. Enterprise size is defined as the number of employees.

LITERATURE REVIEW

Theoretical framework and hypothesis development

Conceptualization of market orientation in literature

Previous research has recognized two main conceptualizations of market orientation (Gupta, Gizem, & Dutta, 2019). One of the main definitions of MO is the one proposed by Kohli and Jaworski (1990), who define it as the organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization-wide responsiveness to it. In the extant literature, market orientation has been pinpointed as a part of organizational behavior, a facet of organizational culture, a firm resource, or a firm capability (İpek & Bıçakcıoğlu-Peynirci, 2020). Market orientation is closely intertwined with market learning; such that market-oriented firms regularly gather data about their external stakeholders and they convert this information into market offerings with superior customer value. Additionally, firms with high market orientation possess exceptional market sensing, customer linking, and channel bonding competencies, which are supported by effective management practices (İpek & Bıçakcıoğlu-Peynirci, 2020). To be implemented successfully, market orientation requires enterprises to proactively acquire, disseminate and rely on market information when developing marketing strategies and tactics. Kohli and Jaworski (1990) believe that MO relates to organization-wide generation and dissemination of market information, and accompanies

organizational responses (Kohli & Jaworski, 1990). This conceptualization of MO was adopted in this research. Knowledge is one of the key assets that needs to be properly managed (Soniewicki & Paliszkiewicz, 2019). By empowering, disseminating, and using customer and market information, MO enables enterprises to tailor their activities to target markets, anticipate and respond to customer needs, as well as build competitive advantage (Atuahene-Gima, Slater, & Olson, 2005). Based on the scientific literature review, it is obvious that knowledge is one of the key factors affecting especially market choices, entry modes (Wach, 2017). Customers are more satisfied with products and services provided by a market-oriented enterprise and their loyalty to such an enterprise increases (Wales et al., 2020). The second important conceptualization presented in the literature is the one proposed by Narver and Slater (1990). These scientists combine dimensions of customer orientation, competitor orientation, and inter-functional coordination. MO refers to strategic inclination and enterprise-level activities directed at the generation of superior value for customers. A market-oriented enterprise is one that most effectively and efficiently creates the necessary behaviors for the creation of superior value for buyers and, thus, continuous superior performance for the enterprise (Narver & Slater, 1990).

Market orientation is perceived as organizational resources (Hult, Snow, & Kandemir, 2003), and more recently – as dynamic capabilities. Market orientation provides the firm with market-sensing, customer-linking, and channel-bonding capabilities (Abbua & Gopalakrishna, 2021). This orientation has been labeled as DCs (Barreto, 2010) because the focus on customers, competitors and the external market environment imbues enterprises with the ability to make informed, proactive adjustments to capabilities (Gnizy, Baker, & Grinstein, 2014). Therefore, the undertaken subject matter is part of the enterprise's resource-based view (RBV) and dynamic capabilities view (DCV). The basic assumption of the enterprise's resource-based view (RBV) is to strive to achieve competitive advantage of large enterprises and MSMEs (Hessels & Parker, 2013). However, RBV does not explain how enterprises maintain competitive advantage in changing and uncertain environments. The DCs framework is an extension of the enterprise's resource-based view (RBV) (Barney, 1991) to fill out these gaps. Through dynamic capabilities, companies are able to sense and seize new business opportunities and to reconfigure the company. The bare existence of dynamic capabilities allows changing business models more proficiently and, thus, tapping the potential of new business opportunities (Freiling, 2015).

Relationships of market orientation with firm performance in the context of market dynamism – research model

Market dynamism, forcing enterprises to adapt themselves to the imposed rules of the game, means that these enterprises, being subject to the influence of internal and external forces, are in a state of permanent change and transformation. The process of shaping capacities and ways of behavior may not be treated as a one-time action, being an ex-post reaction of a given enterprise to changes in the environment, but should be a process allowing for continuous anticipation of change (Cyfert & Krzakiewicz, 2017). A company's capacity to achieve its aims calls for successful adaptation to the changes occurring in its environment as well as for the creation of its own solutions (Bitkowska, 2020).

According to DCV, market orientation facilitates (re)configuration of other performance-related capabilities and behaviors, which are fundamental to evaluation of economic operations. Enterprises with strong MO are likely to be adept at effectively developing and launching innovations in established products and market. If this orientation is weak, it may be seen as a threat that can make it difficult for enterprises to maintain expected business results in new and changing conditions, which generates chances and threats. Nowadays, the general trend in the business environment is to shorten the product's life and business model cycle (Dyduch, 2017). Thus, future profit streams from existing operations are unsure, and the companies have to seek new opportunities all the time.

For this reason, companies should modify, reject or achieve the resources and redesign their business models (Li & Liu, 2014). Like large enterprises, MSMEs need to focus on the market. However, MO is different in SMEs in comparison to large enterprises. The differences result from SMEs' characteristics such as small size, informal organization structure, and being close to the market (Kmieciak & Michna, 2012).

Weak market orientation may be more painful for MSMEs, which, unlike large enterprises, have no resources to cover potential business failures, and especially continuous ones, which may reduce their performance. There were controversial research findings on environmental dynamism and its determining of the effects of operational and dynamic capabilities. The results indicate that operational and dynamic capabilities (i.e., MO) have different performance effects in high-dynamic and low-dynamic environments. The discussion on operational effects and dynamic capabilities (i.e., MO) in different market conditions still requires better theorizing and empirical research on the implications of market dynamism (Petrus, 2019). Literature studies show that insufficient research has been carried out on the MSMEs'

group in the field of moderating the market orientation–firm performance relationship in the context of market dynamism, while these issues are universal in terms of the size of enterprises (Michna & Kmieciak, 2012). The discussion on operational effects and dynamic capabilities in different market conditions still requires better theorizing and empirical research on the implications of market dynamism (Karna, Richter, & Riesenkampff, 2016). Therefore, it was decided to analyze the influence of market dynamism, describing the functioning of enterprises on their performance in the context of dynamism of the market in which these enterprises operate. It was assumed that market orientation could show different patterns at different levels of market dynamism (Kamasak, Yavuz, & Altuntas, 2016; Petrus, 2019). To recognize the implications of market dynamism on the market orientation–firm performance relationship. In this research, market dynamism was understood as the rate of change of various elements in the market in which a given enterprise operates (Wang, Senaratne, & Rafiq, 2015). It was expected that market dynamism covering three dimensions, i.e. speed of change in technology and competition, unpredictability of change in technology and competition, and uncertainty of customer behavior, was the moderator of the market orientation–firm performance relationship. That is why the following hypothesis has been put forward:

H1: *Market dynamism moderates the market orientation–firm performance relationship; the positive effect of market orientation on firm performance is likely to be stronger under high market dynamism than under low market dynamism.*

The above discussion is summarized by the research model presented in Figure 1. It shows the analyzed constructs and expected relationships.

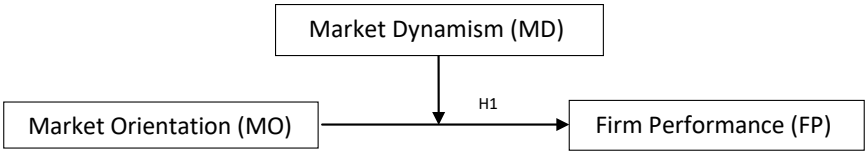

Figure 1. The research model and hypothesis

The object of research is market dynamism, which may be a moderator and better explain the analyzed market orientation–firm performance relationship. Therefore, it was decided to continue research efforts related to the analysis of the market orientation–firm performance relationship in the

conditions of existing intermediary variables affecting this relationship. That is why the hypothesis was verified by a linear regression model in the next step.

METHODOLOGY AND RESEARCH METHODS

This research is based on a survey of MSMEs, including micro-, small- and medium-sized enterprises (ACT of 6 March 2018 – Entrepreneurs' Law, Journal of Laws of 2019, item 1292, art. 7). Using the contact details provided on technology parks' websites or on the websites belonging to their tenant enterprises, a list of 1568 MSMEs (including self-employment) operating in the technology parks (TPs) was developed. At this stage of the research, it was impossible to determine the structure of these enterprises (general population) according to the size of enterprises measured by the number of employees. As a result, the survey covered all identified enterprises operating in technology parks in Poland. The overall research was carried out from March 2017 to December 2018. The empirical research was conducted using the PAPI (Paper over Pencil Interview) and CAWI (Computer Assisted Web Interviews) techniques. Sending e-mails (using the CAWI method) to respondents was preceded by informing the managing directors of technology parks in Poland about conducted studies and asking them to disseminate this information to tenant enterprises to authenticate this empirical research. Technology parks' managing directors were also asked to support the distribution of questionnaires among tenant enterprises through internal communication systems, i.e. tenant enterprises' e-mail databases, newsletters, Intranet, social media groups such as Facebook, or appointing employees to distribute paper questionnaires (using the PAPI method). Enterprises' owners/managers served as respondents due to their knowledge of market orientation and firm performance being achieved as a result of conducting economic activities. Initially, 225 enterprises took part in the survey. The overall return of questionnaires was 14%. At this stage of the research, data obtained from the respondents on the size of the analyzed enterprises were also enabling the exclusion of both self-employed entrepreneurs and large enterprises from the research group because they were not the objects of the research. Therefore, the effective research sample was much smaller (182 enterprises), being reduced by large enterprises (5 enterprises) and self-employed entrepreneurs (38 enterprises) that were initially included in the overall research sample. Thus, the effective return of questionnaires subject to further statistical analysis was 12%.

The applied market orientation measures were dedicated to enterprises employing at least one employee (Gnizy, Baker, & Grinstein, 2014). Hence,

the research sample did not include self-employment that is a form of self-employed work as an independent, non-agricultural economic activity as part of a one-person enterprise which does not employ employees (Lasocki & Skrzek-Lubasińska, 2016; Zakrzewski & Skowrońska; 2019). This means that those micro enterprises that had not been employing any employees were excluded from the research. This article presents only a part of the research project results among these enterprises at that time. Data showing the structure of the research sample by size of the enterprises are shown in Table 1.

Table 1. Structure of the research sample according to the size of enterprises

Size of enterprises (according to the number of employees)	Number of enterprises	%
Micro-enterprises (from 1 to 9 employees)*	93	51.1
Small enterprises (from 10 to 49 employees)	68	37.4
Medium enterprises (from 50 to 249 employees)	21	11.5
In total	182	100.0

Note: * except for self-employment.

More than half (51.1%) of the analyzed enterprises were micro-enterprises in the research sample in which employment did not exceed nine persons (except for self-employment). Small enterprises constituted 37.4% of all enterprises belonging to the research sample. Every tenth enterprise (11.5%) belonged to the group of medium-sized enterprises. The methods of statistical description and inference were used to analyze the empirical data. First, Cronbach's Alpha test was used because it measures the internal consistency of the questionnaire. There were three theoretical constructs subjected to the analysis of reliability (market orientation, firm performance, and market dynamism). All variables in the model were latent.

Despite the fact that the reliability of scales used in the questionnaires had previously been analyzed by their authors, the questionnaires used in this empirical research were verified once again. The purpose of testing the reliability of scales, in this case, was to verify whether the reliability of the questionnaire, in the analyzed sample, was similar to that provided by its authors, and whether the selection of the sample did not affect the level of reliability of the questionnaire itself.

In the next step, the analysis of correlations among variables was carried out using Spearman's rank-order correlation coefficient. This coefficient measures the monotonic relationship among variables, which is more preferred to measure relationships for ordinal scales. The linear regression model was then used to test the hypotheses, which allowed for an assessment

of relationships among all analyzed variables. This technique was used to explain the relationships among the examined variables.

Independent variables

The tools used to measure variables in the quantitative empirical research were those widely used in the literature. These measures were translated by the forward-back translation method.

In order to analyze market orientation (MO), a questionnaire (α=0.94) developed by Gnizy, Baker, and Grinstein (2014) focusing on measuring market information acquisition (MIA) and market information dissemination (MID) of enterprises was applied. All items were measured using a 7-point Likert scale. MO reflects the degree to which firms rely on maximizing customer satisfaction and loyalty as an organizing principle of the firm. MO requires firms to proactively acquire, disseminate, and rely on market information when developing marketing strategies and tactics to be employed successfully. In the empirical studies, the values obtained through Cronbach's alpha values (=0.898) showed very good reliability of this variable.

Market dynamism was understood as the rate of change of various elements in the market in which the enterprises operate, measured by changes in technology, competition, and customers. This questionnaire (α = 0.73) was used earlier by Wang, Senaratne, and Rafiq (2015). In our empirical studies, the values obtained by means of Cronbach's alpha values (α = 0.856) showed very good reliability of this questionnaire. The selection of the sample did not reduce the level of its reliability.

Dependent variable

Firm performance is a dependent variable measured by three items of profitability, sales growth, and market share. This questionnaire (α =0.892) was used earlier by Keh, Nguyen, and Ng (2007). Respondents were asked to compare their firm's performance to their major competitors. All performance measures of the enterprises were subjective, i.e. according to the perception of the respondent. All items were measured using a 7-point Likert scale (1 – Much Weaker to 7 – Much Better). Research studies by Khan, Xuehe, Atlas, and Khan (2019) mentioned that using subjective measures is a valid alternative when objective measures are not obtainable. What is important to note is that the values obtained by means of Cronbach's alpha values (α = 0.901) showed very good reliability of this variable. The reliability of the questionnaire used was similar to that given by its authors, and the selection of the sample did not reduce the level of its reliability.

Control variable

Businesses of a different size may exhibit different organizational and environmental characteristics, which in turn may influence performance. Therefore, this variable (firm size) was included as control.

RESULTS

Descriptive statistics of the analyzed constructs according to the size of enterprises

Another analysis of variables was made according to the size of enterprises using the criterion of the number of employees according to the ACT of 6 March 2018 – Entrepreneurs' Law, Journal of Laws of 2019, item 1292, art. 7. A pivot table was used in which the average levels of variables and the corresponding standard deviations, min., max., median, Q_{25}, Q_{75}, and p-value for individual sizes of enterprises are presented. A comparison of average levels of variables along with standard deviations and values of other categories presented separately for individual sizes of enterprises is shown in Table 2.

Table 2. Size of enterprises according to the number of employees and analyzed constructs: market orientation, market dynamism, and firm performance

		Mean value	Standard deviation	Min.	Q25	Median	Q75	Max.	p-value
Market orientation	from 1 to 9	4.32	1.24	1.50	3.60	4.50	5.20	6.70	
	from 10 to 49	4.49	1.12	2.20	3.75	4.50	5.10	7.00	0.253
	from 50 to 249	4.78	1.42	1.50	4.00	4.90	5.80	7.00	
Market information acquisition	from 1 to 9	4.36	1.39	1.60	3.40	4.40	5.40	7.00	
	from 10 to 49	4.71	1.16	2.00	4.00	4.70	5.50	7.00	0.066**
	from 50 to 249	5.04	1.64	1.40	3.80	5.20	6.20	7.00	
Market information dissemination	from 1 to 9	4.28	1.35	1.00	3.40	4.40	5.20	7.00	
	from 10 to 49	4.27	1.25	2.00	3.20	4.20	5.20	7.00	0.676
	from 50 to 249	4.52	1.41	1.60	3.80	4.60	5.20	7.00	
Market dynamism	from 1 to 9	3.83	1.03	1.00	3.33	3.83	4.33	6.50	
	from 10 to 49	3.97	1.29	1.33	3.08	4.17	5.00	6.67	0.295
	from 50 to 249	3.61	1.01	1.67	3.00	3.67	4.33	5.33	

		Mean value	Standard deviation	Min.	Q25	Median	Q75	Max.	p-value
Speed of change in technology and competition	from 1 to 9	4.23	1.31	1.00	3.50	4.00	5.00	7.00	
	from 10 to 49	4.43	1.37	1.50	3.50	4.75	5.50	7.00	0.516
	from 50 to 249	4.31	1.40	1.00	4.00	4.50	5.00	7.00	
Unpredictability of change in technology and competition	from 1 to 9	3.54	1.33	1.00	2.50	3.50	4.50	6.50	
	from 10 to 49	3.65	1.45	1.00	2.50	4.00	4.75	7.00	0.214
	from 50 to 249	3.12	1.23	1.00	2.00	3.50	4.00	5.50	
Uncertainty of customer behavior	from 1 to 9	3.74	1.13	1.00	3.00	4.00	4.50	6.50	
	from 10 to 49	3.83	1.56	1.00	2.75	4.00	5.00	7.00	0.343
	from 50 to 249	3.40	1.30	2.00	2.50	3.00	4.00	6.50	
Firm performance	from 1 to 9	4.34	1.23	1.00	3.33	4.33	5.00	7.00	
	from 10 to 49	4.63	1.03	1.00	4.00	4.50	5.33	7.00	0.039*
	from 50 to 249	4.90	1.23	1.00	4.33	5.33	5.67	6.33	

Note: * significant at the level of $p < 0.05$; ** significant at the level of $0.05 < p < 0.1$.

The analysis of the results contained in Table 2 indicated that medium-sized enterprises are characterized by the highest market orientation (4.78 on average), while slightly lower market orientation is characteristic of micro and small enterprises (4.32 and 4.49, on average, respectively). However, small enterprises are the least diversified group, and medium-sized enterprises are the most diversified one in this respect. This is evidenced by the recorded values of standard deviation (SD) (1.12 and 1.42, respectively), indicating that the evaluation of the level of market orientation differed from the arithmetic mean by 1.12 points in the group of small enterprises and by 1.42 points in the group of medium-sized enterprises. In addition, 50% of micro and small enterprises rated their market orientation as not higher than 4.5 points. However, it should be taken into account that 25% of micro enterprises rated MO as not higher than 3.60 points and the other 75% of micro enterprises rated MO as not higher than 5.20 points. A similar level of MO was rated in the group of small enterprises, because 25% of small enterprises rated MO as not higher than 3.75 points, and 75% of small enterprises rated MO as not higher than 5.10 points. It is worth adding that 50% of medium-sized enterprises rated MO as not higher than 4.90 points, 25% of medium-sized enterprises rated it not higher than 4.00 points, while 75% of medium-sized enterprises believed that its MO level was not higher than 5.80 points. It is also noteworthy to add that micro and small enterprises showed a similar and slightly lower level of MO than medium-sized enterprises. This means that medium-sized enterprises with strong MO attach great importance to updating their knowledge about customers, competitors, and market

conditions. In practice, this is manifested by the fact that they pay special attention and are sensitive to the main participants of the local environment, such as customers and competitors. However, these differences were statistically non-significant, as indicated by the values of means (see Table 2) and their level of significance.

Market dynamism measured by changes in technology, competition and customers was not extremely low or high from the enterprises' point of view. Nevertheless, changes in market dynamism were not identically evaluated. Micro and small enterprises were indicating a moderately dynamic environment (3.97 and 3.83, on average; SD: 1.29 and 1.03 points), while medium-sized enterprises perceived the environment as still a bit more stable (3.61, on average). At the same time, it is a group of least diversified enterprises in terms of evaluating the degree of market dynamism (SD: 1.01 points).

Moreover, 50% of small enterprises rated their MD as not higher than 4.17 points. Also noteworthy is that 25% of small enterprises rated MD as not higher than 3.08 points, and 75% of them rated MD as not higher than 5.00 points. In contrast, 50% of micro-enterprises rated their MD as not higher than 3.83 points. In addition, 25% of these enterprises rated MD as not higher than 3.33 points, and 75% of them rated MD as not higher than 4.33 points. Over 50% of medium-sized enterprises, in turn, rated their MD as not higher than 3.67 points. What is more, 25% of medium-sized enterprises rated MD as not higher than 3.00 points, and 75% of them rated MD as not higher than 4.33 points. But these differences were statistically non-significant.

The compilation of statistical data (in each group of analyzed enterprises) describing market dynamism and market orientation showed that these surveyed enterprises have higher than average MO levels in more stable and predictable markets. At that time, the degree of market dynamism was probably not high enough for these enterprises to have the need to develop dynamic capabilities more than the operational ones. The states of the analyzed phenomena indicated a moderately stable and predictable environment in which these enterprises had to develop market orientation more.

By continuing the analysis of statistical data, one may notice that the medium-sized enterprises rated their performance better than other organizations. For this group of enterprises, the performance was at the level of 4.90 points, on average; while, the standard deviation value equaled 1.23 points. In other words, medium-sized enterprises were characterized by slightly higher performance than micro and small enterprises (4.63; 434, on average). Standard deviations of micro- and medium-sized enterprises were identical and, therefore, indicated the same diversity of enterprises in these groups in terms of business results (1.23 points). The least diversified group while evaluating the results were small enterprises (1.03 points). Although

these differences were relatively small, they were statistically significant, as indicated by the values of means (see Table 2) and their level of significance.

Therefore, it may be concluded that the financial performance of the analyzed enterprises was higher than that of their competitors. The better performance of the enterprise, when compared to its competitors, usually serves as an empirical indicator of competitive advantage (Schilke, 2014). This means that the analyzed enterprises, by achieving a better performance than the others, were also more successful than the others. In general, higher levels of financial performance were recorded in groups of larger enterprises than in those of smaller sizes. Therefore, in the next step, it was decided to recognize the relationship between the number of employees in a given enterprise and its performance.

The non-parametric Kruskal-Wallis H test was used to compare continuous variables among the analyzed groups. Statistically significant results obtained on that basis showed a difference in the distribution of a given variable among the groups being compared. It was confirmed by the Kruskal-Wallis H test ($p<0.05$) that financial performance was better evaluated in larger enterprises. The conducted post-hoc tests indicated differences between micro- and medium-sized enterprises while evaluating firm performance (Dunn, $p<0.05$). Table 3 shows the significance of pairwise comparisons.

Table 3. Size of enterprises and firm performance (post-hoc: by Dunn's test)

Number of employees and firm performance (pairwise comparisons: Dunn; p <0.05)		
	from 1 to 9*	**from 10 to 49**
from 10 to 49	0.153	
from 50 to 249	**0.016**	0.153

Note: *except for self-employment.

In the next step, correlations among the variables appearing in the research model were being analyzed. A table for correlation of variables was prepared using Spearman's rank-order correlation coefficient. The following values of Spearman's rank-order correlation coefficient were used to determine the strength of correlations:

$0.00 \leq |r_s| \leq 0.29$ – no correlation – weak correlation
$0.30 \leq |r_s| \leq 0.49$ – moderate correlation
$0.50 \leq |r_s| \leq 0.69$ – strong correlation
$0.70 \leq |r_s| \leq 1.00$ – very strong correlation

It was assumed that only statistically significant relationships would be analyzed. The results of correlations among the analyzed variables are presented in Table 4.

Table 4. Correlations between the analyzed variables

	Market orientation	Market information acquisition	Market information dissemination	**Market dynamism**	Speed of change in technology and competition	Unpredictability of change in technology and competition	Uncertainty of customer behavior	**Firm performance**
Market orientation	1.000	0.906**	0.895**	0.176*	0.251**	0.072	0.135	0.328**
Market information acquisition	0.906**	1.000	0.640**	0.256**	0.330**	0.130	0.191**	0.349**
Market information dissemination	0.895**	0.640**	1.000	0.072	0.131	0.005	0.064	0.239**
Market dynamism	0.176*	0.256**	0.072	1.000	0.769**	0.873**	0.811**	0.016
Speed of change in technology and competition	0.251**	0.330**	0.131	0.769**	1.000	0.525**	0.430**	0.181*
Unpredictability of change in technology and competition	0.072	0.130	0.005	0.873**	0.525**	1.000	0.623**	-0.046
Uncertainty of customer behavior	0.135	0.191**	0.064	0.811**	0.430**	0.623**	1.000	-0.073
Firm performance	0.328**	0.349**	0.239**	0.016	0.181*	-0.046	-0.073	1.000

Note: * $p < 0.05$; ** $p < 0.01$; r_s – Spearman's rank-order correlation coefficient.

The analysis of data included in Table 4 indicated weak or moderate correlations among the variables in individual configurations. It may be noted that both market orientation dimensions were positively correlating with firm performance. However, the value of Spearman's rank-order correlation coefficient (r_s = 0.349) showed that the relationship between the market orientation dimension, i.e. market information acquisition and firm performance, was positive, had average strength, and was statistically significant ($p<0.01$). Simultaneously, the correlation of the following market orientation dimension, i.e. market information dissemination and firm performance, was positive, though it was slightly weaker (r_s = 0.239, $p<0.01$). Positive, although weak (r_s = 0.176), correlation between market dynamism and market orientation could be observed, which was statistically significant ($p<0.05$). Furthermore, positive and greatest (r_s = 0.330), correlation between speed of change in technology and competition (MD dimension) and market information acquisition (MO dimension) could be observed, which was statistically significant ($p<0.01$). The correlation analysis results indicated a weak, but positive, correlation between the first dimension of market dynamism, i.e. speed of change in technology and competition and firm performance (r_s = 0.181; $p<0.05$). Correlations between the two remaining dimensions of MD were not statistically significant.

The analysis of the correlations among individual dimensions of market dynamism encourages a deeper recognition and understanding of the existing market orientation–firm performance relationship in the context of market dynamism.

Results of verification of research hypothesis

In order to verify the H1 hypothesis, the linear regression model was used. The values of coefficients obtained for permanent effects in this model inform how much the expected value of explanatory variable changes and the unitary growth of a given predictor. The explanatory variable (predictor) is a variable in a statistical model on the basis of which the response variable is calculated. There are two explanatory variables in the model. The phenomenon which is being analyzed is, in turn, called a response variable (firm performance). Factors affecting its behavior are the above-mentioned explanatory variables (market orientation, market dynamism). The statistical significance of these coefficients was verified by a test based on the t statistics. For all of the above-mentioned tests, $p<0.05$ indicated the statistical significance for the analyzed relationships.

The evaluation of the impact of dynamism of the market in which enterprises operate in explaining the impact of market orientation on firm performance is dictated by the verification of the H1 hypothesis.

H1: *Market dynamism moderates the market orientation–firm performance relationship; the positive effect of market orientation on firm performance is likely to be stronger under high market dynamism than under low market dynamism.*

Due to the lack of significance of predictors, the results of the H1 hypothesis verification are presented only in the table. Importantly, a colon sign between MO and MD in Table 5 means the interaction between the factors included in the H1 hypothesis.

Table 5. Regression models

	Model 1			**Model 2**		
Adjustment measurements						
Akaike Information Criteria (AIC)	AIC=560.33			AIC=562.78		
Degree of dependent variable explanation (Firm Performance) (R^2)	R^2 = 0.172			R^2 = 0.179		
Model's parameters (dependent variable – Firm Performance)						
Predictor	**Coefficient**	**Confidence interval**	**p-value**	**Coefficient**	**Confidence interval**	**p-value**
Absolute term	3.51	2.75 – 4.27	0.00	3.95	2.09 – 5.81	<0.001
Small enterprises (from 10 to 49 employees)	0.22	-0.14 – 0.57	0.23	0.21	-0,14 – 0,57	0,24
Medium enterprises (from 50 to 249 employees)	0.37	-0.18 – 0.93	0.19	0,39	-0,17 – 0,95	0,17
Market Orientation (MO)	0.30	0.16 – 0.43	0.00	0.07	-0.35 – 0.48	0.76
Market Dynamism (MD)	-	-	-	-0.23	-0.73 – 0.26	0.35
Moderation effects (moderator – Market Dynamism)						
MO: MD	-	-	-	0.06	-0.05 – 0.17	0.26

Models 1 and 2 in Table 5 were estimated based on the Akaike Information Criteria (AIC). The AIC for both models was similar, i.e. 560.33 for the first model and 562.78 for the second one. AIC levels for both models indicated acceptable matching levels. The lower the value of AIC, the better the predictive values of the model (Burnham & Anderson, 2002, pp. 261–304). Model 1 explained 17.2% of data variability (R^2 = 0.172), while Model 2 explained 17.9% of data variability (R^2 = 0.179), which is just a little more than in the case of Model 1. The analysis of the models presented in Table 5

has led to several conclusions. In the first model, only the market orientation was positively related to firm performance, and it only slightly explains the variability of the dependent variable. It has a small, although statistically significant, impact on firm performance (coefficient: 0.30; p=0.00).

Secondly, the linear regression model (Model 2) did not support the thesis about the moderating role of market dynamism on the market orientation–firm performance relationship. None of the predictors showed statistical significance in Model 2. What is more, taking the market dynamism variable into account affects the quality of the model, and market dynamism itself adopts negative prediction indicators, which means that better firm performance in responding to changes in the level of market dynamism deteriorates the overall firm performance. The research, however, did not confirm whether market dynamism – a higher-order construct built from three first-order constructs, i.e. speed of change in technology and competition, unpredictability of change in technology and competition, uncertainty of customer behavior – raises the importance of market orientation in increasing firm performance and thus in achieving competitive advantage.

Thirdly, control variables were non-significant in both models. This shows that the introduction of two control variables and a moderator variable reduced the impact of market orientation on firm performance to a statistically insignificant level.

DISCUSSION

This research fits into the mainstream of scientific inquiry into the conditions in which market information acquisition (MIA) and market information dissemination (MID) of enterprises can improve or worsen their performance. Verification of the research hypothesis allowed for answering the question of how market orientation is explained by firm performance provided that a moderator in the form of market dynamism is applied. Already, at the stage of analyzing the data reflecting correlations among the variables, one may observe a negative effect of this variable, but it was not statistically significant (Table 4). The linear regression Model 2 (Table 5) indicated that introducing market dynamism as a moderator negatively impacts this model, making the previously significant predictor (market orientation) (Model 1; coefficient: 0.30; p=0.00) lose statistical significance in explaining companies performance (Model 1; coefficient: 0.07; p=0.76). Therefore, no significant role of the moderating variable, i.e. market dynamism on the market orientation – firm performance relationship was proved.

CONCLUSION

The descriptive statistics of the analyzed variables allowed for determining market orientation, firm performance, market dynamism and their components, according to the size of MSMEs operating in technology parks in Poland, being under analysis. In the research sample, the enterprises were characterized by relatively high market orientation. At the same time, fairly high values of standard deviations of the individual dimensions of market orientation proved that not all enterprises in the sample had a high level of market orientation, as there were also those that had it at a much lower level than the others.

Moreover, the identified levels of individual dimensions of market dynamism indicated that these enterprises were generally functioning in a more stable or moderately dynamic market than in the conditions of high market dynamism. However, fairly high values of standard deviation of particular dimensions of market dynamism (speed of change in technology and competition, unpredictability of change in technology and competition, uncertainty of customer behavior) indicated that not all enterprises are equally able to perceive the pace of change in technology, competition, and customers. This means that among them, there are those that assess the conditions of their functioning in the market as more and definitely less stable. Tenant enterprises are not a homogeneous group in this respect.

Data analysis showed (Table 3) that larger enterprises consider their business operations much better than smaller ones. This means that the level of firm performance is related to the number of employees. These findings are an argument to treat an increase in the number of employees as a non-financial measure of organizational growth.

At the same time (Table 2), the financial performance achieved by the analyzed enterprises was slightly higher than the performance of their direct competitors. However, the high value of standard deviation showed that in this group of enterprises, there were those that achieved a small, but still at least some, advantage over competitors and those that had no competitive advantage or had performance similar to those achieved by their competitors.

Current research indicates that, in the conditions of a moderately changing environment (on average, such a level of market dynamism was occurring in the markets operated by enterprises operating in technology parks in Poland at the time of the quantitative empirical research), the analyzed enterprises, on average, put more emphasis on exploratory development than on operational learning about the market. These findings indicate that in such conditions, having an above-average level of market orientation allowed those enterprises to achieve a higher financial performance than their competitors. However,

a fairly high level of standard deviations referring to the performance of enterprises in individual sizes of enterprises cannot be overlooked.

Further comparative research on inter-relationships among different strategic orientations and firm performance in many contexts is, thus, important. In the international arena, this research can be repeated in the context of enterprises that introduce current products to new markets, new products to existing markets, as well as new products to new markets. The importance of these issues for strategic management increases along with the progress of managerial staff on increasing the efficiency of business organizations. What is more, the results of the research are the basis for statements on the effectiveness of the surveyed MSMEs functioning in TPs in Poland. However, as the research sample is not representative, it is not possible to generalize these research findings on the entire MSMEs' population operating in technology parks in Poland.

Acknowledgment

Funding is gratefully acknowledged. The study has been performed as part of a research project financed by the Jan Kochanowski University in Kielce, no. 20064. We would like to thank the two anonymous reviewers for providing constructive feedback that greatly improved this article.

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Abstrakt

Cel: *Celem artykułu jest określenie roli dynamizmu rynkowego w relacji między orientacją rynkową a wynikami mikro-, małych i średnich przedsiębiorstw (MMŚP) działających w parkach technologicznych (PT) w Polsce.* ***Metodyka:*** *Do przeprowadzenia ilościowych badań empirycznych wykorzystano dwie metody CAWI i PAPI. Próba badawcza obejmowała MMŚP działające w parkach technologicznych w Polsce. Artykuł jest odpowiedzią na potrzebę systematycznego badania modeli między orientacją rynkową a wynikami firm.* ***Wyniki:*** *Wyniki badań dają wgląd w poziom orientacji rynkowej i wyników analizowanych MMŚP działających w parkach technologicznych w Polsce. Stwierdzono, że MMŚP w próbie badawczej nie stanowiły pod tym względem jednorodnej grupy. Udowodniono, że orientacja rynkowa jest istotnym stymulatorem wyników firm, podczas gdy dynamizm rynkowy nie został sklasyfikowany jako moderator relacji orientacja rynkowa - wyniki firmy.* ***Implikacje dla teorii i praktyki:*** *Badanie to wnosi wkład w zarządzanie strategiczne poprzez identyfikację kluczowej roli orientacji rynkowej dla przedsiębiorstw, które chcą odnieść korzyści z tego typu orientacji strategicznej. Udowodniono istotną rolę predyktora - orientacji rynkowej w kształtowanie wyników mikro-, małych i średnich przedsiębiorstw działających w PT w Polsce. W praktyce oznacza to, że zwiększenie poziomu orientacji rynkowej sprzyja poprawie pozytywnie ocenianych wyników finansowych.* ***Oryginalność i wartość:*** *Nasze badanie przeprowadzone w MMŚP działających w parkach technologicznych w Polsce wzbogaca i uzupełnia wiedzę na temat orientacji rynkowej jako zjawiska o charakterze uniwersalnym, ponieważ dotyczy także mniejszych organizacji biznesowych.*

Słowa kluczowe: *orientacja rynkowa, dynamizm rynku, wyniki firm, park technologiczny, mikro, małe i średnie przedsiębiorstwa, MMŚP*

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Conflicts of interest

The authors declare no conflict of interest.

Citation

Wójcik-Karpacz, A., Karpacz, J., & Rudawska, J. (2021). The impact of market orientation on the performance of MSMEs operating in technology parks: The role of market dynamism. *Journal of Entrepreneurship, Management and Innovation*, *17*(2), 29-52. https://doi.org/10.7341/20211722

Innovative activity of Polish enterprises – a strategic aspect. The similarity of NACE divisions

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Abstract

Purpose: *The innovativeness of enterprises is dependent on many variables, including decisions regarding innovation, possessed resources and competences, and the sector of their activity. Therefore, it should be considered in a strategic dimension, both at the level of the enterprise's strategic innovativeness and overall strategy. Strategic innovativeness, which is a long-term process that takes into account the interpenetration of various types of innovation together with strategic thinking, can be an effective tool for achieving high operating efficiency and maintaining a competitive advantage in the market. The analysis of literature on the subject, as well as observations, indicates that even within one industry, there are differences in this respect. A plethora of publications focusing on the problem of innovativeness in individual enterprises, sectors, industries, and regions were found. The authors aimed to divide industries classified by NACE (the Statistical Classification of Economic Activities in the European Community) divisions into homogeneous groups in terms of the innovative undertakings of said enterprises in a given industry.* ***Methodology:*** *The empirical part presents the results of own research using the cluster analysis method, while all calculations were performed with the use of R software.* ***Findings:*** *It can be concluded that industries can be grouped into homogeneous clusters in terms of the share of innovative enterprises. The authors can also conclude that clusters listed on the basis of the share of innovative companies that introduced new or improved products and clusters listed on the basis of the share of innovative companies that introduced new or improved business processes are very similar.* ***Implications for theory and practice:*** *The combined value of the considerations presented in the paper is the possibility of obtaining supplementary information about the homogeneity of*

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Received 10 June 2020; Revised 1 December 2020; Accepted 10 February 2021.

innovative activities of said enterprises in an individual NACE division. These results can be used for further in-depth analysis of individual groups. ***Originality and value:*** *However, there is no study presenting the similarity between industries and their division into homogeneous groups in terms of the share of innovative enterprises. Such a gap became an inspiration for the research, which allowed for the verification of this scientific problem.*
Keywords*: strategy, innovation strategy, sector, NACE divisions, cluster analysis, similarity*

INTRODUCTION

The issues related to the innovativeness of modern enterprises, regions and countries remain relevant, and are considered an important area of research by both theoreticians and practitioners around the world (Szopik-Depczyńska, 2018; Dyduch, 2018; Zartha et al., 2016; Dyduch, 2015; Casadeus-Masanell & Zhu, 2013; Pichlak, 2012; Christensen, 2010; Conway & Steward, 2009; Baldwin & Gelletly, 2003; Pomykalski, 2001; Kay, 1996). On the one hand, the reasons for the continued interest in innovativeness can be seen in the heterogeneity and diversity of its understanding, and on the other hand, as an accelerator of change and improvement, success and wealth. However, the complexity of processes taking place in the modern world, including the dynamics of ICT technology development and the related digital revolution, shortening the life cycle of products, networking, force enterprises to make decisions in the field of innovation and implementation of innovation strategies. They allow for raising the level of their competitiveness and obtaining wider social, cultural and economic benefits for the regions in which they operate and in which they constitute an important pillar of economic, technological, and civilization development (Block, Fisch, & van Praag, 2017; Rahimi, Rostami, Shad, &Vafaei, 2017). Moreover, as researchers rightly point out (Nogalski & Karpacz, 2012; Branzei & Vertinsky, 2006), the creation of innovation strategies that are effective in shaping competitiveness requires building the innovative capacity of enterprises. This is done through the implementation of various activities in generating or absorbing new ideas and their implementation and supporting processes of innovativeness and a properly oriented action strategy. The scope of these activities is not unified and it differs not only between sectors but also between enterprises operating in the same industries.

In the subject literature concerning research in the field of innovative enterprise activity patterns, two main research trends can be distinguished (Wziątek-Kubiak, 2010). The first focuses on studying the homogeneity of enterprise innovation behaviors in various fields of industrial production

from the perspective of how diversified the enterprise innovation strategies are (Urbankova & Krizek, 2020; Jakimowicz & Rzeczkowski, 2019; Srholec & Verspagen, 2008; Llerena & Oltra, 2002; Elliott, Greenaway, & Hine, 2000). The second trend, which emerged in the 1990s, assumes cross-industry differentiation of enterprise innovation behaviors, and focuses on the study of the specificity of patterns in terms of the innovation of companies with high, medium, and low technological intensity. These studies contributed to the capture of the inter-sectoral differentiation of factors and patterns in the field of innovation between these two groups of enterprises (Wziątek-Kubiak, 2010; Hirsch-Kreisen, Hahn, & Jacobson, 2008).

The above-mentioned approaches raised the question of whether industries are similar in terms of the share of innovative enterprises. The lack of such studies was the main factor that inspired the authors to take up this topic and fill the research gap.

Therefore, the aim of the paper is to divide industries, classified according to NACE (the Statistical Classification of Economic Activities in the European Community) divisions, into groups that will be homogeneous in terms of the share of innovative enterprises in a given industry based on the original concept. Based on the goal defined in this way, the following research hypotheses were formulated:

H1: Within NACE divisions, there are industries that can be grouped into clusters in terms of the share of innovative enterprises.

H2: The specified clusters include industries in which enterprises run a similar type of business.

H3: Clusters listed on the basis of the share of innovative companies that introduced new or improved products, and clusters listed on the basis of the share of innovative companies that introduced new or improved business processes, are very similar.

The aim of the study was achieved and the research hypotheses were verified on the basis of the results of an empirical study using the methods of multivariate statistical analysis. The structure of the study includes three main parts. In the first, the authors describe the concept of innovation as an unwavering subject of interest for researchers. Moreover, they pay attention to the typology of innovations and the dimensions of organizational innovativeness and describe innovativeness as the fundamental dimension of enterprise strategic innovativeness. The second part deals with the methodological aspects of the discussed issues. The third and last part presents the results of the quantitative methods used for the statistical evaluation and verification of

the adopted goal. The research procedure includes a cluster analysis method and calculations that were performed using R software.

As part of the research, the classification of industries adopted by the Polish Central Statistical Office (GUS) was used, divided into service and industrial enterprises, and the classification of innovations divided into the introduction of new or improved products and new or improved business processes, including the type of innovation.

Moreover, the data used in the analysis came from a report published in January 2020 by the Polish Central Statistical Office – Innovative activity of enterprises in the years 2016–2018 (GUS, 2020). The following tables were adopted as the source of input data for the grouping procedure, which are an integral part of the indicated report: 1) Product innovations in the years 2016–2018; 2) Enterprises that introduced new or improved business processes in the years 2016–2018. This tool was also supported by a classic review of foreign and domestic literature and a narrative review. Undoubtedly, the advantage of the study is that it fills a research gap by presenting the similarity between industries and attempting to divide NACE divisions into homogeneous groups in terms of the share of innovative enterprises.

LITERATURE REVIEW

In an era of digital revolution and globalization, it is known that there is no escape from change, continuous improvement, and the implementation of innovative solutions at the level of an individual, enterprise, region, or country. However, the essence of these changes should focus on replacing those solutions that are no longer sufficient with strategies that are based on the implementation of innovative solutions, allowing in the long-term perspective the achievement of lasting competitive advantage and favoring the achievement of sustainable development (Mallinguh & Zoltan, 2020; Szopik-Depczyńska, 2018; Okwiet, Grabara, 2016; Stawarz, 2013; Bowonder, Dambal, Kumar, & Shirodkar, 2010; Low & Kalafut, 2004; Gadomski, 2004). The authors do not doubt that the implementation of innovations is perceived as a key determinant of enterprise development.

Although the topic of innovation is not new, one can still observe the heterogeneity and difficulties in interpreting the very concept of innovation and a number of analyses and scientific research in this field. There are many definitions and classifications, ways of understanding it, and levels of its perception (Jansza & Kozioł-Nadolna, 2011; Białoń, 2010). Due to its nature, there has not been one unified definition so far, there is none presently, and there will not be one in the future. It seems that, like the concept of

technology, innovation often carries a large interpretative burden and, therefore, it is pointless to spend too much effort on attempting to solve this challenge (Bielińska-Dusza, 2020). However, for the accuracy and correctness of the research, the main assumptions in this matter should be accepted.

Innovations resulting from creative and planned activities are related to technological and non-technological areas, such as operational, organizational, process, financial, marketing, and economic. They are a key intangible asset and the main tool for improving and shaping competitiveness and are a fundamental process of organizational renewal. They arouse the interest of both practitioners and theoreticians, not only in the field of management and applied sciences, but also economists, lawyers, and politicians. Innovations are becoming the engine of change and the driving force behind changes in enterprises as well as economies, regions, and countries. With their growing importance, innovations are treated more and more widely, and today they constitute a condition for development and an inherent attribute of the enterprise (Dyduch, 2018; Szopik-Depczyńska, 2018; Łunarski, 2016; Low & Kalafut, 2004).

Also, the issue of the typology of innovations is challenging to characterize unambiguously due to the large diversity and varied criteria of division. As a result, this division is not standardized, precise, or transparent (Penc, 1999) and numerous research and literature reviews have attempted to systematize this issue (Szopik-Depczyńska, 2018; Szatkowski, 2016; Łunarski, 2016; Dyduch, 2015, Karlik, 2013).

Due to the limitations on content, the authors present the typology contained in the Oslo Manual. This is due to the fact that this paper uses the data contained in the GUS report, which is based on the methodology developed by Eurostat and the OECD, presented in the same manual (GUS, 2020).

The Oslo Manual distinguishes four main types of innovation: 1) Product innovations – new or significantly improved compared to the previous version of a good or service, taking into account technical specification, components and materials, software, user-friendliness or other functional features; 2) Process innovations – new, significantly improved methods of producing or delivering a product, taking into account techniques, tools and/or software; 3) Marketing innovations – new marketing methods consisting of a significant change in the appearance of the product, packaging, distribution, promotion or price; 4) Organizational innovations – new organizational methods in business practice, consisting of modifications to the workplace or external relations (OECD, 2005).

When discussing the issues of comprehending and the typology of innovations, one cannot ignore the critical and unresolved issue, which is the distinction between two closely related concepts: innovation and

innovativeness. As rightly noted by Klimas (2013), many authors (Binti et al., 2011; Jalonen, 2012; Semerciöz, Hassan, & Aldemi, 2011) use these concepts interchangeably, while others consider them inappropriate, incorrect, or even erroneous (Lynch, Walsh, & Harrington, 2010). Klimas (2013) refers to an interesting approach proposed by Wang and Ahmed (2004), according to which organizational innovativeness is the entire ability of an organization to introduce new products to the market, and open new markets through the appropriate configuration of strategic orientation with the innovative behavior of employees and implemented processes.

Researchers believe that the four types of innovation defined in the Oslo Manual, i.e. product, organizational, technological, and marketing innovation, are components of organizational innovativeness. They propose five dimensions of organizational innovativeness: 1) Product innovativeness; 2) Process innovativeness; 3) Behavioral innovativeness; 4) Strategic innovativeness; 5) Market innovativeness.

This proposal inspired the research conducted by Crossan and Apaydin (2010), which resulted in the identification of four dimensions of innovativeness: 1) Product innovativeness understood as the novel and pioneering nature of new products implemented on the market at the right time; 2) Process innovativeness understood as the implementation of new production methods, technological and management solutions for the improvement of production and management processes; 3) Behavioral innovativeness understood as individual, team or managerial activities aimed at building an internal culture of innovation and the overall openness of the organization to new ideas and innovations; 4) Strategic innovativeness understood as the ability of an organization to manage a bundle of ambitious goals, identify resource gaps that prevent the achievement of ambitious goals set for itself, take creative actions to minimize resource gaps, as well as innovative approaches and methods of operation necessary for entering new markets and deeper exploitation of the existing target markets.

These proposals provide an interesting perspective of the problem under study, but the conclusion is that no matter how one classifies the set, the distinguished types will interpenetrate, complement, overlap and merge into each other, while the enterprise may implement them jointly. And it may do so, often treating them as one, because the distinguished types do not constitute separate, isolated entities, but constitute an interdependent whole (Dyduch, 2015).

This is because innovativeness is the fundamental dimension of enterprise strategic innovativeness and a growth factor. Many studies have been written on the subject of innovativeness, highlighting that it is a source of organizational effectiveness but that it also initiates changes. It is a factor

in building a competitive advantage and is not so much a feature of the country as a feature of individual enterprises (Gomułka, 2006). Numerous researchers have also attempted to answer the question of how innovative activity within a company impacts its competitiveness (e.g., Bogdanienko, 2004; Zastempowski, 2013; Lemanowicz, 2014; Prajogo & Ahmed, 2006; Poznańska, 2002a). Most often, subject literature focuses on analyzing the innovativeness of a selected enterprise or group of enterprises, industry, economy, state or regions. Moreover, as mentioned earlier, the problem is dealt with by distinguishing within two groups: the diversity of innovativeness behaviors and homogeneity (Wziątek-Kubiak, 2010). It should also be underlined that the adopted research methodology, based on different criteria and reflecting different research perspectives, may show discrepancies in the obtained results and present them in different cross-sections. Furthermore, due to technological changes, the time period adopted for the analysis may be an interesting variable showing the nature of changes in the level of innovativeness in the long term.

Cyclical surveys conducted since 2011 by the Polish Central Statistical Office show slight changes in the innovativeness of industries over the years. In Table 1 and Table 2, five industries are presented that are the most and the least innovative in terms of the share of innovatively active enterprises.

Table 1. Innovatively active industrial enterprises in the years 2011–2018 by NACE divisions

	2016-2018	**2014-2016**	**2011-2013**
The most innovation	1. Manufacture of pharmaceutical products 2. Manufacture of computer, electronic and optical products 3. Mining of coal and lignite 4. Manufacture of electrical equipment 5. Manufacture of coke and refined petroleum products	1. Mining of coal and lignite 2. Manufacture of pharmaceutical products 3. Manufacture of computer, electronic and optical products 4. Manufacture of chemicals and chemical products 5. Manufacture of coke and refined petroleum products	1. Manufacture of coke and refined petroleum products 2. Manufacture of pharmaceutical products 3. Manufacture of computer, electronic and optical products 4. Manufacture of chemicals and chemical products 5. Mining of coal and lignite

	2016-2018	2014-2016	2011-2013
Least innovation	1. Remediation activities 2. Manufacture of wearing apparel 3. Manufacture of products of wood, cork, straw, and wicker 4. Manufacture of leather and related products 5. Waste collection, treatment, and disposal activities; materials recovery	1. Manufacture of wearing apparel 2. Manufacture of leather and related products 3. Repair and installation of machinery and equipment 4. Manufacture of products of wood, cork, straw, and wicker 5. Remediation activities	1. Manufacture of wearing apparel 2. Repair and installation of machinery and equipment 3. Manufacture of products of wood, cork, straw and wicker 4. Manufacture of leather and related products 5. Manufacture of food products

Source: Authors' own work, based on: GUS (2014); GUS (2018); GUS (2020).

Table 2. Innovatively active service enterprises in the years 2011–2018 by NACE divisions

	2016-2018	2014-2016	2011-2013
The most innovation	1. Scientific research and development 2. Insurance, reinsurance, and pension funding 3. Computer programming and consultancy activities 4. Information service activities 5. Publishing activities	1. Insurance, reinsurance, and pension funding 2. Scientific research and development 3. Computer programming and consultancy activities 4. Financial service activities 5. Publishing activities	1. Insurance, reinsurance, and pension funding 2. Scientific research and development 3. Computer programming and consultancy activities 4. Financial service activities 5. Information service activities
Least innovation	1. Architectural and engineering activities; technical testing and analysis 2. Air transport 3. Wholesale trade 4. Postal and courier activities 5. Water transport	1. Air transport 2. Land and pipeline transport 3. Advertising and market research 4. Postal and courier activities 5. Wholesale trade	1. Land and pipeline transport 2. Air transport 3. Architectural and engineering activities; technical testing and analysis 4. Wholesale trade 5. Warehousing and support activities for transportation

Source: Authors' own work, based on: GUS (2014); GUS (2018); GUS (2020).

The analysis of the tables above provides for a general observation that the highest share of innovatively active enterprises concerns those industries in which enterprise activity is based on knowledge and those that offer knowledge-intensive services and products. These industries are saturated with knowledge in the form of technology, techniques supported by IT tools or organizational and managerial methods and techniques, which are based on up-to-date information, thanks to, for example, electronic IT tools and extensive cooperation.

The lowest innovative activity, especially industrial enterprises, results from their traditional production and low or close-to-exhaustion innovative potential (Gomułka, 2006) and insufficient financial resources and a focus on the current activities of the enterprise, rather than a well-thought-out, long-term strategy. It should be noted that in both industrial and service enterprises, the decrease and the increase in innovativeness might be a consequence of the amount of financial outlays. Moreover, enterprises more often introduce business process innovations than product innovations. This is mainly related to the implementation of new or improved methods of goods production or service development and new methods of task division, decision-making improvements, or human resource management. Additionally, the higher the level of technology advancement there is in a given industry, the greater the percentage of enterprises implementing innovations (GUS, 2020).

Moreover, it seems that such activities in individual industries are characterized by diversity, which is consistent but not homogeneous. The issue of innovativeness in Polish enterprises is the center of many academic studies (Lemanowicz, 2014; Grzybowska, 2012; Mizgajska, 2002; Poznańska, 2002b; Włodarczyk, 2012; Zastempowski, 2016). However, the research focuses on the ordering of enterprises and industries in terms of their innovativeness. Still, there are no studies that show the similarity of sectors regarding the share of innovatively active enterprises. Such an approach to the problem could also be the basis for further research, which would allow for better recognition of this area. Therefore, in the further part of this study, the authors focus on the first issue: the grouping of industries similar to each other in terms of the share of enterprises introducing new or improved products and business processes.

METHODOLOGY

The scope and the goals of the analysis

According to the definition given by the Polish Central Statistical Office, an innovative enterprise in the field of product innovations and business processes is an enterprise that introduced at least one innovation to the market during the period considered, in the form of a new or improved product, or new or improved business process (GUS, 2020). A new product is a product or service that differs significantly in terms of its features or purpose from the products previously manufactured by the enterprise. Improvements to existing products include changes to materials, components and more features that make these products work better. Product innovation in the field of services is about introducing significant improvements in the way the services are provided, by adding new functions or features to existing services or by introducing completely new services. Concurrently, innovation of business processes is the introduction of new solutions or the improvement of existing business processes in the enterprise within one or more business functions, which significantly change business processes used so far (GUS, 2020).

The data used in the analysis come from a report published in January 2020 by the Polish Central Statistical Office – Innovative activity of enterprises in the years 2016–2018 (GUS, 2020). The following tables were adopted as the source of input data for the grouping procedure, which are an integral part of the indicated report: 1) Product innovations in years 2016-2018; 2) Enterprises that introduced new or improved business processes in the years 2016–2018.

Stages of conducted analysis

Research on the homogeneity of industries was carried out separately for two groups of enterprises: industrial and service. The conducted research focused on 24 NACE divisions for industrial enterprises and 33 NACE divisions for service enterprises. Because industrial enterprises belonging to the NACE division of *Extraction of crude petroleum and natural gas* did not introduce a new or improved product or business process in the period under study, they were not included in the analysis.

The analysis was carried out according to the steps presented in Table 3.

Table 3. Stages of conducted analysis

Stages	Goals	Variables
Stage 1.	Designating groups of industries similar to each other	1. Share of enterprises that introduced new or improved products; 2. Share of enterprises that introduced new or improved business processes.
Stage 2.	Designating groups of industries similar to each other in terms of the share of enterprises that introduced new or improved products	1. Share of enterprises that introduced new or improved goods; 2. Share of enterprises that introduced new or improved services; 3. Share of enterprises that introduced new or improved goods or services new to the market; 4. Share of enterprises that introduced new or improved goods or services new only to the enterprise.
Stage 3.	Designating groups of industries similar to each other in terms of the share of enterprises that have introduced new or improved business processes	1. Share of enterprises that introduced new or improved methods for producing goods or providing services (including methods for developing goods or services); 2. Share of enterprises that introduced new or improved logistics, delivery or distribution methods; 3. Share of enterprises that introduced new or improved methods for information processing or communication; 4. Share of enterprises that introduced new or improved methods for accounting or other administrative operations; 5. Share of enterprises that introduced new or improved business practices for organizing procedures or external relations; 6. Share of enterprises that introduced new or improved organizing work responsibility, decision making or human resource management; 7. Share of enterprises that introduced new or improved marketing methods for promotion, packaging, pricing, product placement or after sales services.

Source: Authors' own work, based on: GUS (2020).

Research procedure – cluster analysis

In order to identify NACE divisions similar to each other in terms of the features listed in individual stages of the research process, cluster analysis was used. All calculations were performed using R software.

Cluster analysis is a term used to describe a family of statistical procedures specifically designed to discover homogenous groups within complex data sets. The objective of cluster analysis is to group objects into clusters, so that objects within one cluster share more in common with one another than they do with the objects of other clusters. Thus, the purpose of the analysis is to arrange objects into relatively homogeneous groups based on multivariate observations (Paul & Gore, 2000). A hierarchical method was used in the presented research. This method, in general, tries to decompose the dataset of n objects into a hierarchy of groups (Bora & Gupta, 2014). This hierarchical decomposition can be represented by a tree structure diagram called a "dendrogram", whose root node represents the whole dataset. Each leaf node is a single object of the dataset. The clustering results can be obtained by cutting the dendrogram at different levels (Soni & Ganatra, 2012).

The clustering of similar NACE divisions in terms of the share of innovative enterprises was carried out in the following steps:

1) Cosine distance was determined (due to data concerning the share of enterprises in the analyzed NACE divisions). Cosine similarity measures the similarity between two vectors of an inner product space. It is measured by the cosine of the angle between two vectors and it determines whether two vectors are pointing in roughly the same direction (Han, Kamber, & Pei, 2012). Similarity increases when the distance between two vectors decreases. The *cosine* method implemented in the *philentropy* package (R software) was used to determine the cosine similarities. The formula to find the cosine similarity is as follows (Drost, 2018):

$$s = \frac{\sum_{i-1}^{N}(P_i * Q_i)}{\sqrt{\sum_{i=1}^{N} P_i^2} * \sqrt{\sum_{i=1}^{N} Q_i^2}}$$

and the formula of Cosine distance is expressed as: *1- cosine similarity.*

2) For cluster analysis, the agglomeration method of hierarchical clustering (Ward algorithms) was used. The Ward algorithm was implemented in *agnes* from the *cluster* library (R software). Ward's method minimizes the increase in total within-cluster sum of squared errors (Szekely & Rizzo, 2005). Clustering results were presented using a dendrogram.
3) The number of classes was specified. The silhouette index was adopted to assess the quality of the division. This silhouette shows which objects lie well within their cluster, and which ones are merely somewhere in between clusters. The silhouette index allows an assessment of the relative quality of the clusters and an overview of the data configuration. The average silhouette width provides an evaluation of clustering validity

and it might be used to select an "appropriate" number of clusters (Rousseeuw, 1987). The silhouette index was implemented in *silhouette* in *cluster* library (R software).

4) The similarity between the two data classifications was measured using the Rand index. The Rand index has a value between 0 and 1, with 0 indicating that the two data clusterings do not agree on any pair of points and 1 indicating that the data clusterings are exactly the same. The Rand index was implemented in *fossil* package (R software).

RESULTS AND DISCUSSION

Analysis of the similarity of industries in terms of the share of innovative service enterprises

Innovation activity of service enterprises

The cluster analysis of NACE divisions similar to each other in terms of the share of service enterprises that introduced new or improved products or business processes was the main goal of this stage of the analysis. The following variables were included in the analysis: total share of service enterprises that introduced new or improved products, and total share of service enterprises that introduced new or improved business processes. For the cluster analysis, Ward's algorithm was used with the Cosine distance. The dendrogram obtained as a result is presented in Figure 1.

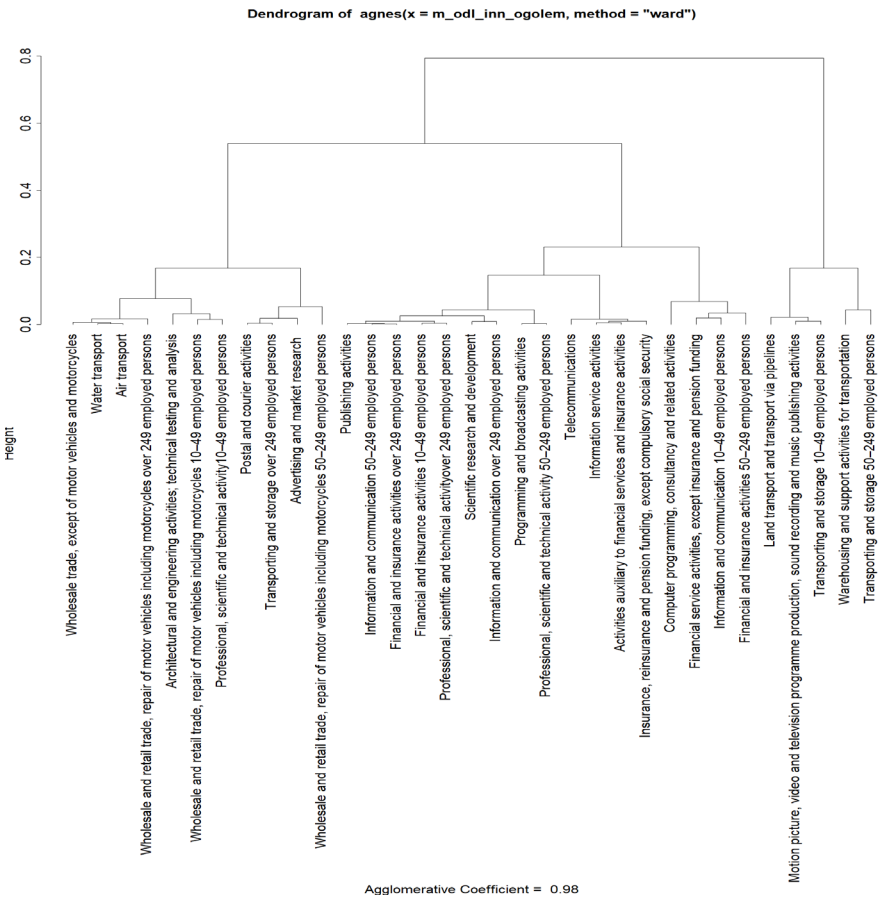

Figure 1. The similarity of NACE divisions with respect to the total share of service enterprises that introduced new or improved products or business processes

The next step in the analysis was to determine the appropriate number of clusters. The silhouette index was used to assess the quality of the division. As the results in Table 4 show, the best quality was found in the division of the surveyed population into three clusters. The silhouette index was 0.79, which means that strong structure has been found.

Table 4. The silhouette index for the similarity of NACE divisions with respect to the total share of service enterprises that introduced new or improved products or business processes

	2 groups	3 groups	4 groups	5 groups	6 groups
The silhouette index	0.6532158	0.7992131	0.6910298	0.6754593	0.6865722

Figure 2 shows the calculated coefficients for all objects and values aggregated for every cluster. As the results show, all three clusters are of high quality.

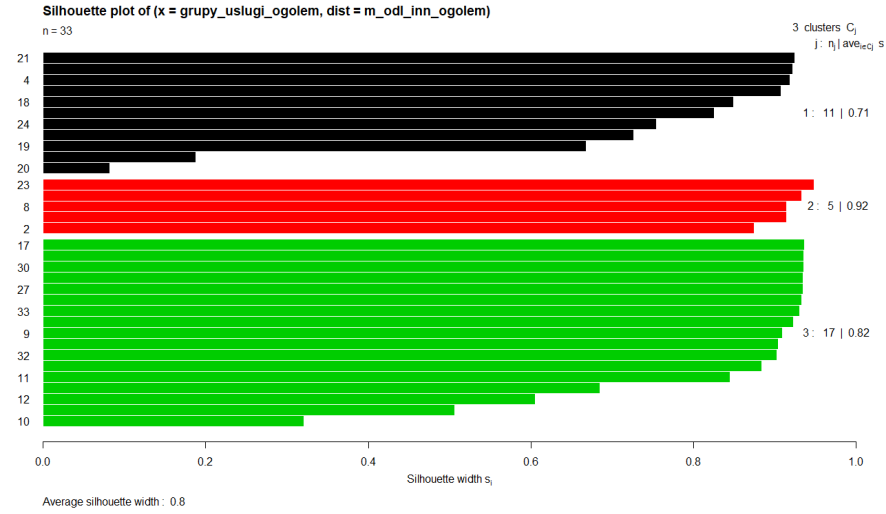

Figure 2. The silhouette index for three clusters of similar NACE divisions with respect to the total share of service enterprises that introduced new or improved products or business processes

Table 5 presents the NACE divisions divided into three clusters. Based on the tables published by the Polish Central Statistical Office (GUS, 2020), it can be indicated that the third cluster is characterized by a high share of enterprises that introduce both new and improved products and business processes and contains 17 NACE divisions. The highest share in introducing product and business innovations concerns enterprises belongs to the NACE division:

Insurance, reinsurance and pension funding except compulsory social security and amounts to 50.7% for products innovations and 77.6% for business

innovations. The second NACE division with the highest share is: Financial *and insurance activities over 249 employed persons* with a share of 42% for products innovations and 56.5% for business innovations.

Table 5. Similarity of NACE divisions with respect to the total share of service enterprises that introduced new or improved products or business processes

Cluster	NACE divisions
1	Wholesale trade, except of motor vehicles and motorcycles, Water transport, Air transport, Postal and courier activities, Architectural and engineering activities; technical testing and analysis, Advertising and market research, Wholesale and retail trade, repair of motor vehicles including motorcycles 10–49 employed persons, Wholesale and retail trade, repair of motor vehicles including motorcycles 50–249 employed persons, Wholesale and retail trade, repair of motor vehicles including motorcycles over 249 employed persons, Transporting and storage over 249 employed persons, Professional, scientific and technical activity10–49 employed persons
2	Land transport and transport via pipelines, Warehousing and support activities for transportation, Motion picture, video and television programme production, sound recording and music publishing activities, Transporting and storage 10–49 employed persons, Transporting and storage 50–249 employed persons
3	Publishing activities, Programming and broadcasting activities, Telecommunications, Computer programming, consultancy and related activities, Information service activities, Financial service activities, except insurance and pension funding, Insurance, reinsurance and pension funding, except compulsory social security, Activities auxiliary to financial services and insurance activities, Scientific research and development Information and communication 10–49 employed persons, Information and communication 50– 249 employed persons Information and communication over 249 employed persons, Financial and insurance activities 10– 49 employed persons Financial and insurance activities 50–249 employed persons, Financial and insurance activities over 249 employed persons, Professional, scientific and technical activity 50– 249 employed persons, Professional, scientific and technical activityover 249 employed persons

The second cluster is the smallest and contains only 5 NACE divisions, mainly related to transport activities, warehousing, activities supporting transport, presented by enterprises whose share in introducing new or improved products is rather low. When it comes to introducing new or improved business processes, 3 out of 5 NACE divisions are characterized by an average share. Attention should be paid to the two NACE divisions: *Land transport and transport via pipelines* (share of 3.7% for product innovations and 11.7% for business innovations) and *Transporting and storage 10–49 employed persons* (share of 3.2% for products innovations and 10.7% for business innovations), which have the lowest share in both the introduction of new or improved products and business processes.

The first cluster contains 11 NACE divisions, where the share of enterprises introducing product innovations is rather at an average level, with the three clusters of the lowest share being: *Whole trade, except of motor vehicles and motorcycles* (7.5%), *Postal and courier activities* (7.3%), *Whole trade and retail trade, repair of motor vehicles including motorcycles 10–49 employed persons* (6.7%). These industries are also characterized by a low share of enterprises in the introduction of new or improved business processes. This share is accordingly: 14.8%, 17.1%, and 12%.

Innovation activity of service enterprises that introduced new or improved products

The cluster analysis of NACE divisions similar to each other in terms of the share of service enterprises that introduced new or improved products was the main goal of this stage of the analysis. The following variables were included in the analysis:

1) Share of enterprises that introduced new or improved goods.
2) Share of enterprises that introduced new or improved services.
3) Share of enterprises that introduced new or improved goods or services new to the market.
4) Share of enterprises that introduced new or improved goods or services new only to the enterprise.

For the cluster analysis, Ward's algorithm was used with the Cosine distance. The dendrogram obtained as a result is presented in Figure 3.

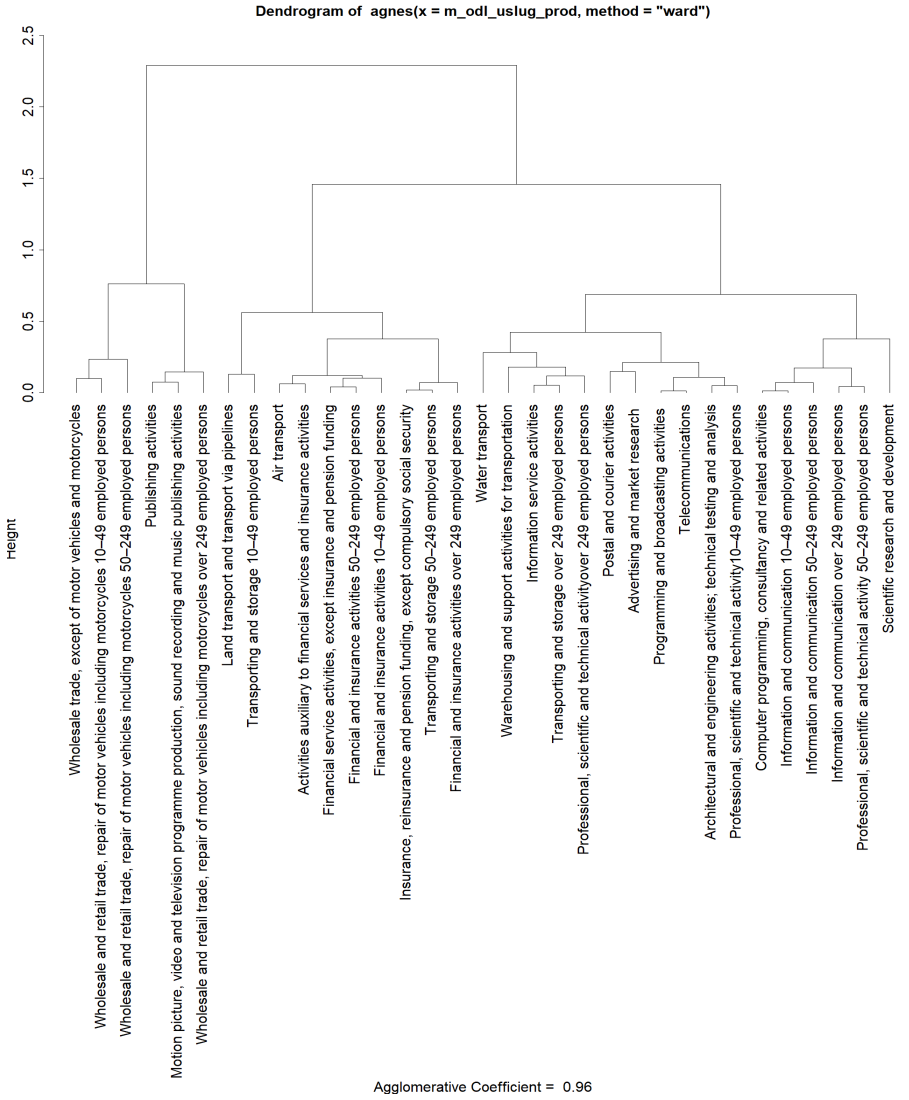

Figure 3. The similarity of NACE divisions with respect to the total share of service enterprises that introduced new improved products

The next step in the analysis was to determine the appropriate number of clusters. The silhouette index was used to assess the quality of the division. As the results in Table 6 show, the best quality was found in the division of the surveyed population into two and three clusters. The silhouette index was accordingly 0.6805 and 0.6738.

Table 6. The silhouette index for the similarity of NACE divisions with respect to the total share of service enterprises that introduced new or improved products

	2 groups	3 groups	4 groups	5 groups	6 groups
The silhouette index	0.6805194	0.6738426	0.5775993	0.5036341	0.4265721

Figure 4 shows the calculated coefficients for all objects and values aggregated for every cluster. As the results show, one of the clusters is of high quality and the second one presents a reasonable structure. In the case of division into three clusters, as presented in Figure 5, one group is characterized by a reasonable structure. The other two groups present a high quality of cluster structure.

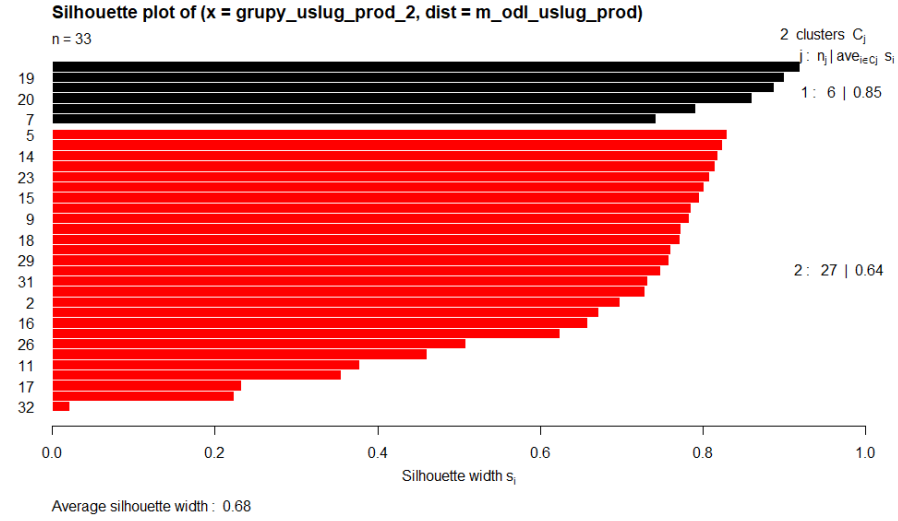

Figure 4. The silhouette index for two clusters of similar NACE divisions with respect to the total share of service enterprises that introduced new or improved products

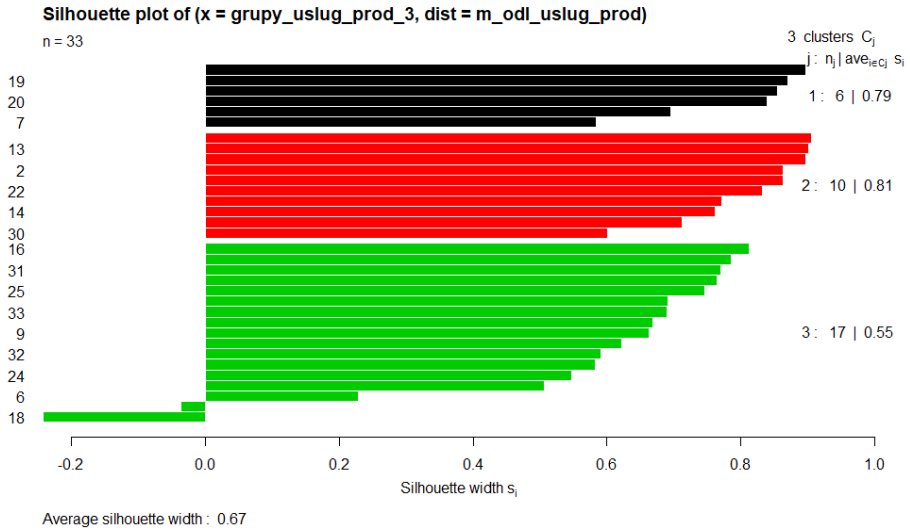

Figure 5. The silhouette index for three clusters of similar NACE divisions with respect to the total share of service enterprises that introduced new or improved products

According to the results, Table 7 shows the grouping of NACE divisions divided into two clusters. The first cluster contains 6 NACE divisions. Based on the tables published by the Polish Central Statistical Office (GUS, 2020), it can be indicated that the first cluster is characterized by a similar value of the share of enterprises that introduce new or improved goods and share of enterprises introducing new or improved services with a slight advantage in favor of the share of enterprises that introduce new or improved goods. NACE divisions belonging to the first cluster are also characterized by the fact that the share of enterprises, which introduced new or improved goods or services new only to the enterprise, is higher than the share of enterprises that introduced new or improved goods or services new to the market. The second cluster contains 27 NACE divisions, always characterized by a higher share of enterprises introducing new or improved services rather than products.

Table 7. Similarity of NACE divisions with respect to the total share of service enterprises that introduced new or improved products

Cluster	NACE divisions
1	Wholesale trade, except of motor vehicles and motorcycles, Publishing activities, Motion picture, video and television programme production, sound recording and music publishing activities, Wholesale and retail trade, repair of motor vehicles including motorcycles 10–49 employed persons, Wholesale and retail trade, repair of motor vehicles including motorcycles 50–249 employed persons, Wholesale and retail trade, repair of motor vehicles including motorcycles over 249 employed persons,
2	Land transport and transport via pipelines, Water transport, Air transport, Warehousing and support activities for transportation, Postal and courier activities, Programming and broadcasting activities, Telecommunications, Computer programming, consultancy and related activities, Information service activities, Financial service activities, except insurance and pension funding, Insurance, reinsurance and pension funding, except compulsory social security, Activities auxiliary to financial services and insurance activities, Architectural and engineering activities; technical testing and analysis, Scientific research and development Advertising and market research, Transporting and storage 10–49 employed persons, Transporting and storage 50–249 employed persons, Transporting and storage over 249 employed persons Information and communication 10–49 employed persons, Information and communication 50–249 employed persons, Information and communication over 249 employed persons, Financial and insurance activities 10–49 employed persons, Financial and insurance activities 50–249 employed persons, Financial and insurance activities over 249 employed persons, Professional, scientific and technical activity10–49 employed persons, Professional, scientific and technical activity 50–249 employed persons, Professional, scientific and technical activityover 249 employed persons,

Innovation activity of service enterprises that introduced new or improved business processes

The cluster analysis of NACE divisions similar to each other in terms of the share of service enterprises that introduced new or improved business processes was the main goal of this stage of the analysis. The analysis included variables related to the share of service enterprises that introduced new or improved methods for:

1) Producing goods or providing services (including methods for developing goods or services).
2) Logistics, delivery or distribution.
3) Information processing or communication.
4) Accounting or other administrative operations.
5) Business practices for organizing procedures or external relations.
6) Organizing work responsibility, decision making or human resource management.
7) Marketing methods for promotion, packaging, pricing, product placement or after sales services.

For the cluster analysis, Ward's algorithm was used with the Cosine distance. The dendrogram obtained as a result is presented in Figure 6.

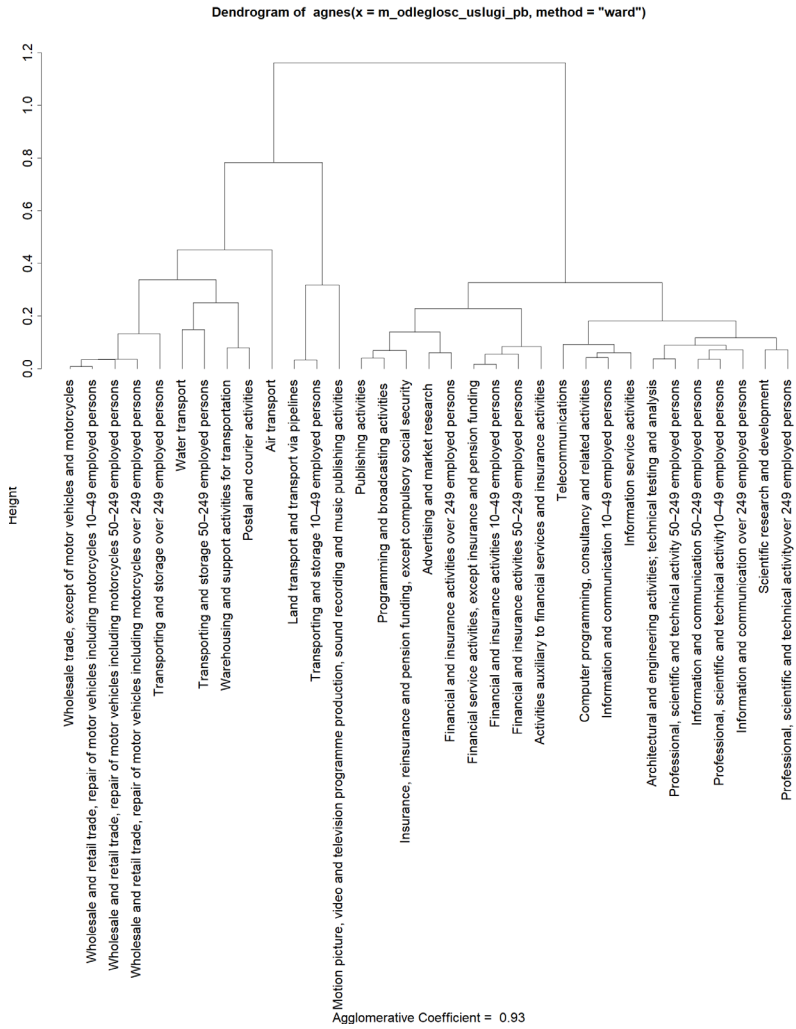

Figure 6. The similarity of NACE divisions with respect to the total share of service enterprises that introduced new or improved business processes

The next step in the analysis was to determine the appropriate number of clusters. The silhouette index was used to assess the quality of the division. As the results show, the best quality was found in the division of the surveyed population into two clusters. Results of the analysis are presented in Table 8.

Table 8. The silhouette index for the similarity of NACE divisions with respect to the total share of service enterprises that introduced new or improved business processes

	2 groups	3 groups	4 groups	5 groups	6 groups
The silhouette index	0.5185402	0.4637078	0.4671621	0.3755261	0.2079042

Figure 7 shows the calculated coefficients for all objects and values aggregated for every cluster. As the results show, one of the clusters is of high quality but the structure of the second one has very low quality.

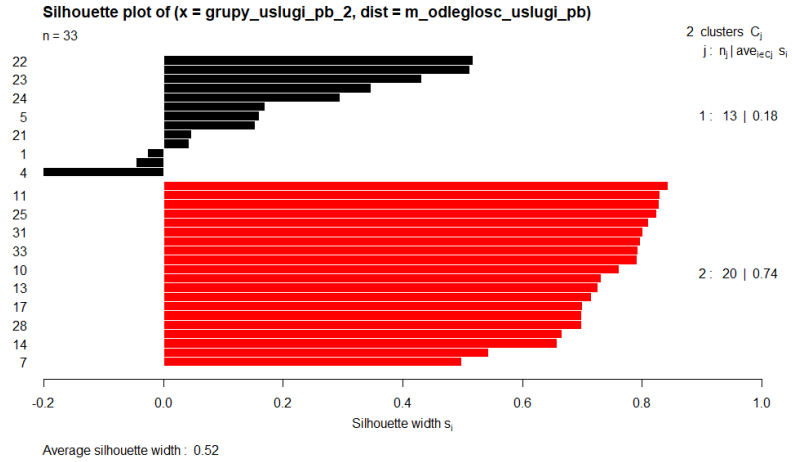

Figure 7. The silhouette index for two clusters of similar NACE divisions with respect to the total share of service enterprises that introduced new or improved business processes

According to the results, Table 9 shows the grouping of NACE divisions divided into two clusters. The first cluster contains 13 NACE divisions and the second one contains 20 NACE divisions. The first cluster is characterized by a rather lower share of enterprises that introduced new or business processes and the second one contains NACE divisions such as: Insurance, reinsurance and pension funding, except compulsory social security and Financial and insurance activities over 249 employed persons where total share of service enterprises is the highest in introducing any kind of business process innovation.

Table 9. Similarity of NACE divisions with respect to the total share of service enterprises that introduced new or improved business processes

Clusters	NACE divisions
1	Wholesale trade, except of motor vehicles and motorcycles, Land transport and transport via pipelines, Water transport, Air transport, Warehousing and support activities for transportation, Postal and courier activities, Motion picture, video and television programme production, sound recording and music publishing activities, Wholesale and retail trade, repair of motor vehicles including motorcycles 10–49 employed persons, Wholesale and retail trade, repair of motor vehicles including motorcycles 50–249 employed persons, Wholesale and retail trade, repair of motor vehicles including motorcycles over 249 employed persons, Transporting and storage 10–49 employed persons, Transporting and storage 50–249 employed persons, Transporting and storage over 249 employed persons
2	Publishing activities, Programming and broadcasting activities, Telecommunications, Computer programming, consultancy and related activities, Information service activities, Financial service activities, except insurance and pension funding, Insurance, reinsurance and pension funding, except compulsory social security, Activities auxiliary to financial services and insurance activities, Architectural and engineering activities; technical testing and analysis, Scientific research and development, Advertising and market research, Information and communication 10–49 employed persons, Information and communication 50–249 employed persons, Information and communication over 249 employed persons, Financial and insurance activities 10–49 employed persons, Financial and insurance activities 50–249 employed persons, Financial and insurance activities over 249 employed persons, Professional, scientific and technical activity10–49 employed persons, Professional, scientific and technical activity 50–249 employed persons, Professional, scientific and technical activityover 249 employed persons

Analysis of the similarity of NACE divisions in terms of the share of innovative industrial enterprises

Innovation activity of industrial enterprises

The cluster analysis of NACE divisions similar to each other in terms of the share of industrial enterprises that introduced new or improved products or business processes was the main goal of this stage of the analysis. The following variables were included in the analysis: total share of industrial enterprises that introduced new or improved products and total share of industrial enterprises that introduced new or improved business processes.

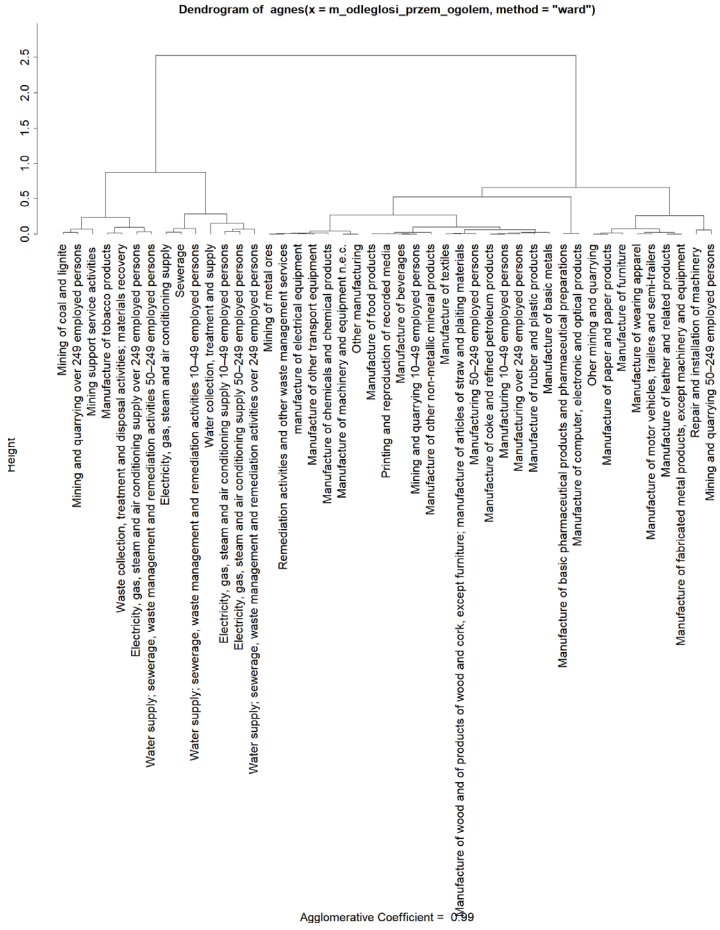

Figure 8. The similarity of NACE divisions with respect to the total share of industrial enterprises that introduced new or improved products or business processes

For the cluster analysis, Ward's algorithm was used with the Cosine distance. The dendrogram obtained as a result is presented in Figure 8.

The next step in the analysis was to determine the appropriate number of clusters. The silhouette index was used to assess the quality of the division. As the results in Table 10 show, the best quality was found in the division of the surveyed population into two clusters. The silhouette index was 0.90, which means that a strong structure has been found.

Table 10. The silhouette index for the similarity of NACE divisions with respect to the total share of industrial enterprises that introduced new or improved products or business processes

	2 groups	3 groups	4 groups	5 groups	6 groups
The silhouette index	0.9011347	0.8372588	0.7213203	0.7645575	0.7034355

Figure 9 shows the calculated coefficient for all objects and values aggregated for every cluster. As the results show, all three clusters are of high quality.

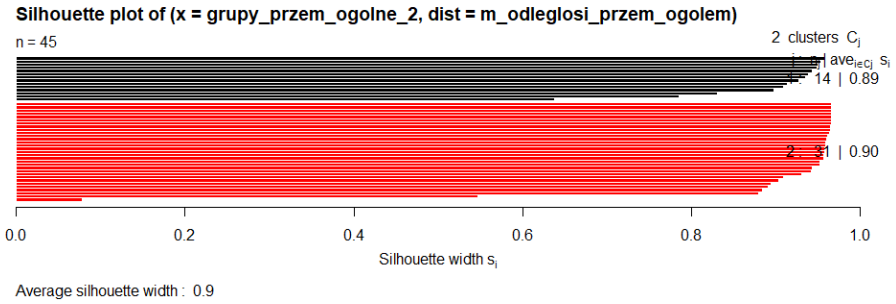

Figure 9. The silhouette index for three clusters of similar NACE divisions with respect to the total share of industrial enterprises that introduced new or improved products or business processes

Table 11 presents NACE divisions divided into two clusters. The first cluster contains 14 NACE divisions, where it can be observed that the share of industrial enterprises introducing new or improved business processes is much higher in each NACE divisions than the share of industrial enterprises introducing new or improved products. The second cluster contains 32 NACE divisions, where it can be observed that the share of enterprises introducing new or improved business processes and products is at a similar level within each NACE division.

Table 11. Similarity of NACE divisions with respect to the total share of industrial enterprises that introduced new or improved products or business processes

Cluster	NACE divisions
1	Mining of coal and lignite, Mining support service activities, Manufacture of tobacco products, Electricity, gas, steam and air conditioning supply, Water collection, treatment and supply, Sewerage, Waste collection, treatment and disposal activities; materials recovery, Mining and quarrying over 249 employed persons, Electricity, gas, steam and air conditioning supply 10–49 employed persons, Electricity, gas, steam and air conditioning supply 50–249 employed persons, Electricity, gas, steam and air conditioning supply over 249 employed persons, Water supply; sewerage, waste management and remediation activities 10–49 employed persons, Water supply; sewerage, waste management and remediation activities 50–249 employed persons, Water supply; sewerage, waste management and remediation
2	Mining of metal ores, Oher mining and quarrying, Manufacture of food products, Manufacture of beverages, Manufacture of textiles, Manufacture of wearing apparel, Manufacture of leather and related products, Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials, Manufacture of paper and paper products, Printing and reproduction of recorded media, Manufacture of coke and refined petroleum products, Manufacture of chemicals and chemical products, Manufacture of basic pharmaceutical products and pharmaceutical preparations, Manufacture of rubber and plastic products Manufacture of other non-metallic mineral products, Manufacture of basic metals, Manufacture of fabricated metal products, except machinery and equipment, Manufacture of computer, electronic and optical products, Manufacture of electrical equipment, Manufacture of machinery and equipment n.e.c., Manufacture of motor vehicles, trailers and semi-trailers, Manufacture of other transport equipment, Manufacture of furniture, Other manufacturing, Repair and installation of machinery, Remediation activities and other waste management services, Mining and quarrying 10–49 employed persons, Mining and quarrying 50–249 employed persons, Manufacturing 10–49 employed persons, Manufacturing 50–249 employed persons, Manufacturing over 249 employed persons

Innovation activity of industrial enterprises that introduced new or improved products

The cluster analysis of NACE divisions similar to each other in terms of the share of industrial enterprises that introduced new or improved products was the main goal of this stage of the analysis. The following variables were included in the analysis:

1) Share of enterprises that introduced new or improved goods.
2) Share of enterprises that introduced new or improved services.
3) Share of enterprises that introduced new or improved goods or services new to the market.
4) Share of enterprises that introduced new or improved goods or services new only to the enterprise.

For the cluster analysis, Ward's algorithm was used with the Cosine distance. The dendrogram obtained as a result is presented in Figure 10.

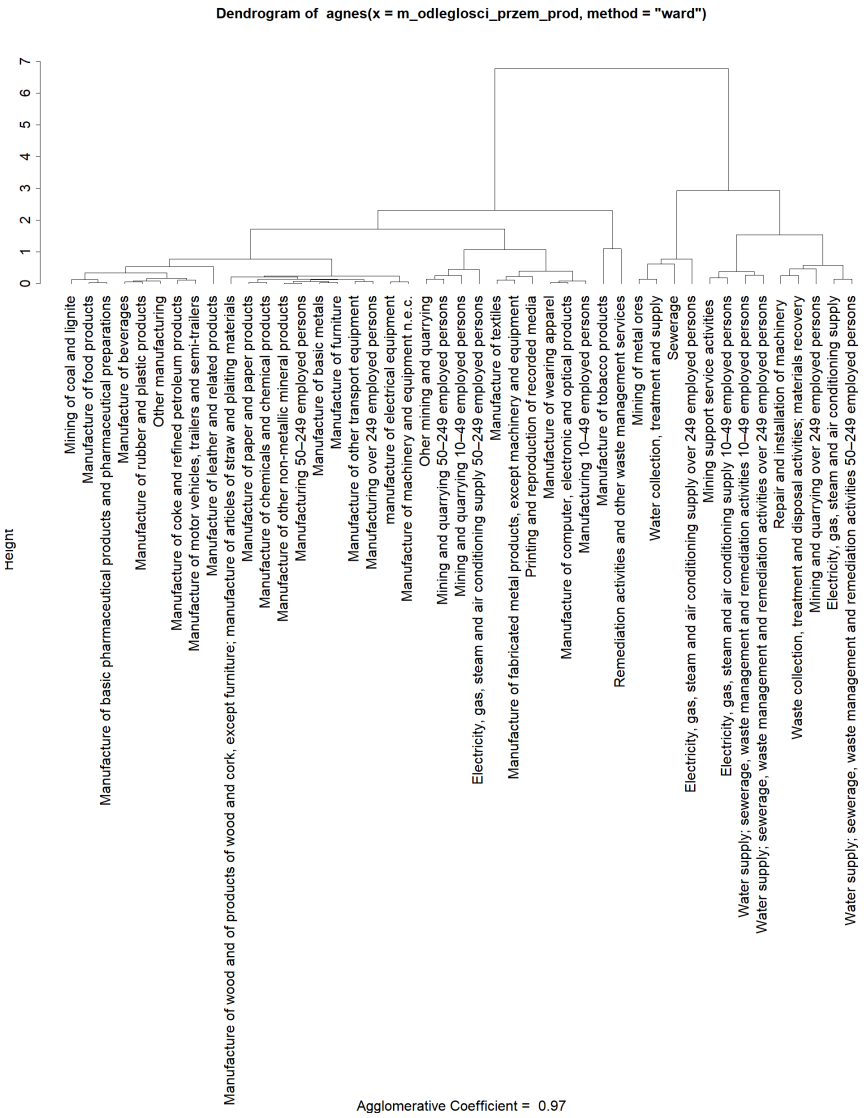

Figure 10. The similarity of NACE divisions with respect to the total share of industrial enterprises that introduced new or improved products

The next step in the analysis was to determine the appropriate number of clusters. The silhouette index was used to assess the quality of the division. As the results in Table 12 show, the best quality was found in the division of the surveyed population into two clusters. The silhouette index was 0.76.

Table 12. The silhouette index for the similarity of NACE divisions with respect to the total share of industrial enterprises that introduced new or improved products

	2 groups	3 groups	4 groups	5 groups	6 groups
The silhouette index	0.7628942	0.6287666	0.6333996	0.4387073	0.3772319

Figure 11 shows the calculated coefficients for all objects and values aggregated for every cluster. As the results show, one of the clusters is of high quality and the second one presents a reasonable structure.

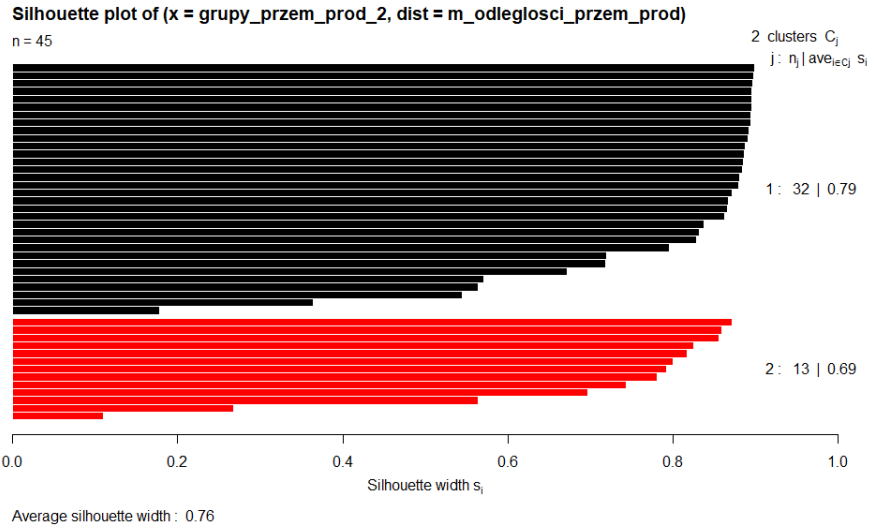

Figure 11. The silhouette index for two clusters of similar NACE divisions with respect to the total share of industrial enterprises that introduced new or improved products

According to the results, Table 13 shows the grouping of NACE divisions divided into two clusters. Based on the tables published by the Polish Central Statistical Office (GUS, 2020), it can be indicated that the first cluster is characterized by a high share of enterprises that introduce new and improved goods. In the case of the second cluster, the share of industrial enterprises that introduced new or improved goods is higher than the share of industrial enterprises that introduced new or improved services.

Table 13. Similarity of NACE divisions with respect to the total share of industrial enterprises that introduced new or improved products

Cluster	NACE divisions
1	Mining of coal and lignite, Oher mining and quarrying, Manufacture of food products, Manufacture of beverages, Manufacture of tobacco products, Manufacture of textiles, Manufacture of wearing apparel, Manufacture of leather and related products, Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials, Manufacture of paper and paper products, Printing and reproduction of recorded media, Manufacture of coke and refined petroleum products, Manufacture of chemicals and chemical products, Manufacture of basic pharmaceutical products and pharmaceutical preparations, Manufacture of rubber and plastic products Manufacture of other non-metallic mineral products, Manufacture of basic metals, Manufacture of fabricated metal products, except machinery and equipment, Manufacture of computer, electronic and optical products, Manufacture of electrical equipment, Manufacture of machinery and equipment n.e.c., Manufacture of motor vehicles, trailers and semi-trailers, Manufacture of other transport equipment, Manufacture of furniture, Other manufacturing, Remediation activities and other waste management services, Mining and quarrying 10–49 employed persons, Mining and quarrying 50–249 employed persons, Manufacturing 10–49 employed persons, Manufacturing 50–249 employed persons, Manufacturing over 249 employed persons, Electricity, gas, steam and air conditioning supply 50–249 employed persons
2	Mining of metal ores, Mining support service activities, Repair and installation of machinery, Electricity, gas, steam and air conditioning supply, Water collection, treatment and supply, Sewerage, Waste collection, treatment and disposal activities; materials recovery, Mining and quarrying over 249 employed persons, Electricity, gas, steam and air conditioning supply 10–49 employed persons, Electricity, gas, steam and air conditioning supply over 249 employed persons, Water supply; sewerage, waste management and remediation activities 10–49 employed persons, Water supply; sewerage, waste management and remediation activities 50–249 employed persons, Water supply; sewerage, waste management and remediation activities over 249 employed persons

Innovation activity of industrial enterprises that introduced new or improved business processes

The cluster analysis of NACE divisions similar to each other in terms of the share of industrial enterprises that introduced new or improved business processes was the main goal of this stage of the analysis. The analysis included variables related to the share of industrial enterprises that introduced new or improved methods for:

1) Producing goods or providing services (including methods for developing goods or services).
2) Logistics, delivery or distribution.
3) Information processing or communication.
4) Accounting or other administrative operations.
5) Business practices for organizing procedures or external relations.
6) Organizing work responsibility, decision making or human resource management.
7) Marketing methods for promotion, packaging, pricing, product placement or after sales services.

For the cluster analysis, Ward's algorithm was used with the Cosine distance. The dendrogram obtained as a result is presented in Figure 12.

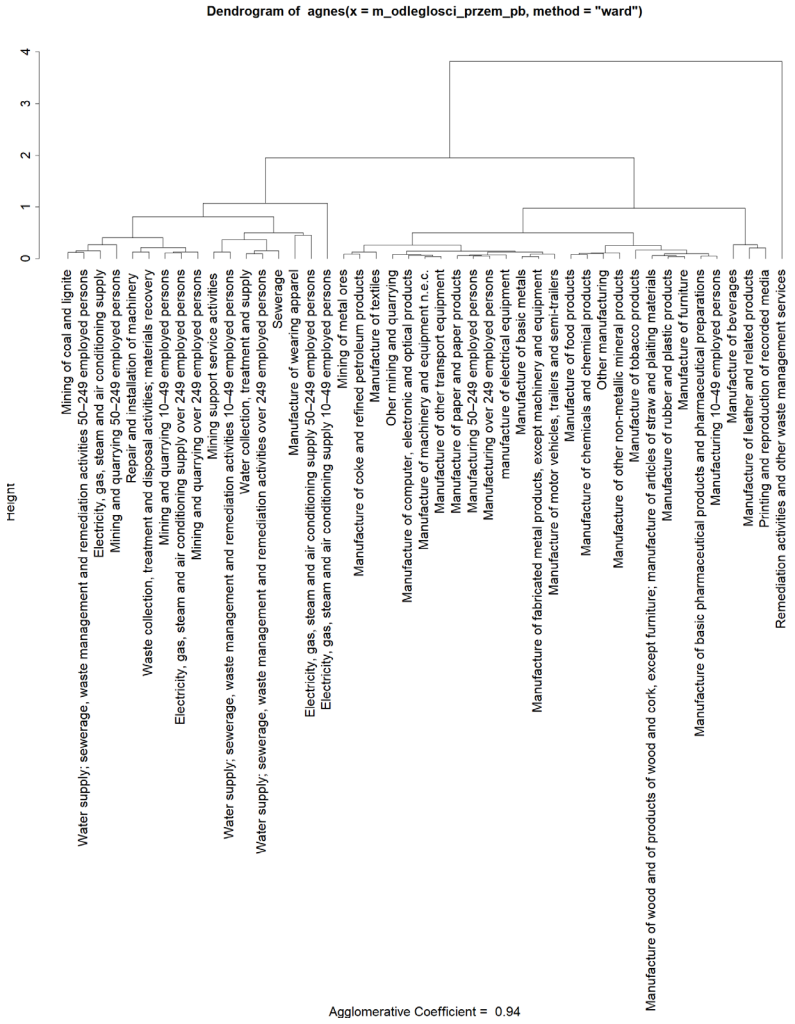

Figure 12. The similarity of NACE divisions with respect to the total share of industrial enterprises that introduced new improved business processes

The next step in the analysis was to determine the appropriate number of clusters. The silhouette index was used to assess the quality of the division. As the results in Table 14 show, the best quality was found in the division of the surveyed population into two clusters.

Table 14. The silhouette index for the similarity of NACE divisions with respect to the total share of industrial enterprises that introduced new or improved business processes

	2 groups	3 groups	4 groups	5 groups	6 groups
The silhouette index	0.847214	0.5345078	0.4789247	0.360337	0.3084363

Figure 13 shows the calculated coefficients for all objects and values aggregated for every cluster. The surveyed group was divided into two clusters. One of them is a one-element group and it concerns the NACE division:

Remediation activities and other waste management services. This is the only one of the analyzed NACE divisions that is characterized by the lack of introduced innovative methods for producing goods or providing services, logistics, delivery or distribution of logistics methods, accounting or other administrative operations, business practices for organizing procedures or external relations, marketing methods for promotion, packaging, pricing, product placement or after sales services. It is also characterized by a very low share of industrial enterprises that introduced new or improved innovation methods for information processing or communication (1.9%) and organizing work responsibility, decision making or human resource management (3.7%).

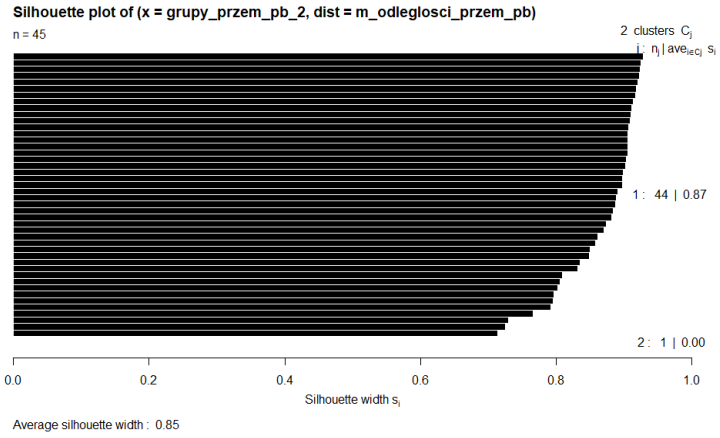

Figure 13. The silhouette index for two clusters of similar NACE divisions with respect to the total share of industrial enterprises that introduced new or improved business processes

Similarity of classifications

The last stage of analysis was to measure the similarity between two data classifications using the Rand index. The results of this stage of analysis, for clustering NACE divisions with respect to the total share of enterprises that introduced new or improved products or business processes and separately for new or improved products and new or improved business processes, are shown for service enterprises in Table 15 and industrial enterprises in Table 16. The analysis of similarity took into account the division into two and three clusters in each case.

Table 15. Similarity of clustering NACE divisions with respect to the share of service enterprises: in innovation activity (product innovations or business processes innovations) that introduced new or improved products (product innovations) or business processes (business processes innovations)

	Product innovations or business processes innovations 2 clusters	**Product innovations or business processes innovations 3 clusters**	**Product innovations 2 clusters**	**Product innovations 3 clusters**	**Business processes innovations 2 clusters**	**Business processes innovations 3 clusters**
Product innovations or business processes innovations **2 clusters**	1	0.6458333	0.5909091	0.4772727	0.6212121	0.655303
Product innovations or business processes innovations **3 clusters**	0.6458333	1	0.5056818	0.5662879	0.782197	0.8162879
Product innovations **2 clusters**	0.5909091	0.5056818	1	0.6780303	0.5909091	0.5871212
Product innovations **3 clusters**	0.4772727	0.5662879	0.6780303	1	0.5568182	0.5833333
Business processes innovations **2 clusters**	0.6212121	0.782197	0.5909091	0.5568182	1	0.9431818
Business processes innovations **3 clusters**	0.655303	0.8162879	0.5871212	0.5833333	0.9431818	1

Table 16. Similarity of clustering NACE divisions with respect to the share of industrial enterprises: in innovation activity (product innovations or business processes innovations) that introduced new or improved products (product innovations) or business processes (business processes innovations)

	Product innovations or business processes innovations 2 clusters	**Product innovations or business processes innovations 3 clusters**	**Product innovations 2 clusters**	**Product innovations 3 clusters**	**Business processes innovations 2 clusters**	**Business processes innovations 3 clusters**
Product innovations or business processes innovations **2 clusters**	1	0.9505051	0.7979798	0.7838384	0.5454545	0.7727273
Product innovations or business processes innovations **3 clusters**	0.9505051	1	0.7828283	0.7929293	0.4959596	0.7373737
Product innovations **2 clusters**	0.7979798	0.7828283	1	0.9636364	0.5616162	0.7383838
Product innovations **3 clusters**	0.7838384	0.7929293	0.9636364	1	0.5252525	0.720202
Business processes innovations **2 clusters**	0.5454545	0.4959596	0.5616162	0.5252525	1	0.5363636
Business processes innovations **3 clusters**	0.7727273	0.7373737	0.7383838	0.720202	0.5363636	1

In the case of service enterprises, the highest values of the coefficients occurred for the division into two and three clusters according to the share of enterprises that introduced new or improved business process. The Rand index in this case was 0.9431818. As for industrial enterprises, the highest value of the index concerned the division of the NACE divisions into two and three clusters, taking into account enterprises that introduced new or improved products. In this case, the Rand index was 0.9636364.

CONCLUSIONS

The aim of this paper was to divide industries, classified according to NACE (the Statistical Classification of Economic Activities in the European Community) divisions, into groups that will be homogeneous in terms of the share of innovative enterprises. Based on the analyses carried out, the following conclusions can be drawn:

1) In the case of service enterprises, the best quality of the division was achieved when NACE divisions were separated into three clusters with

respect to the total share of service enterprises that introduced new or improved products or business processes.

2) In the case of service enterprises, the best quality of the division was achieved when NACE divisions were separated into two clusters with respect to service enterprises that introduced new or improved products and with respect to the total share of service enterprises that introduced new or improved business processes.
3) The similarity of separating NACE divisions into two clusters, with respect to the share of service enterprises that introduced new or improved products (product innovations) or business processes (business processes innovations) is on average level. The Rand index in this case was 0.5909091.
4) In the case of industrial enterprises, the best quality of the division was achieved when NACE divisions were separated into two clusters.
5) The best quality of division was obtained in the case of separating NACE divisions with respect to the total share of industrial enterprises that introduced new or improved products or business processes. The silhouette index was 0.9011347.
6) The NACE divisions of Remediation activities and other waste management services are significantly different from the rest in terms of introducing new or improved business processes and are characterized by a very low share of enterprises introducing this kind of innovation.

Within the total share of service enterprises that introduced new, improved products or business processes, three clusters have been observed. The highest share in introducing product and business innovations concerns NACE divisions such as: *Insurance, reinsurance and pension funding, except compulsory social security*; *Financial and insurance activities*; *Publishing activities*; *Programming and broadcasting activities*; *Telecommunications*; *Computer programming, consultancy, and related activities*; *Information service activities*; *Financial service activities, except insurance and pension funding*; *Activities auxiliary to financial services and insurance activities*; *Scientific research and development*; *Information and communication*; and *Professional, scientific and technical activity*.

The second cluster is the smallest and contains only 5 NACE divisions: *Land transport and transport via pipelines*; *Warehousing and support activities for transportation*; *Motion picture, video and television program production*; *Sound recording and music publishing activities*; and *Transporting and storage*. This cluster has been presented by enterprises whose share in introducing new or improved products is rather low.

The third cluster contains 11 NACE divisions, where the share of enterprises introducing product innovations is rather on average level, with

the three clusters of the lowest share being: *Whole trade, except of motor vehicles and motorcycles*; *Postal and courier activities* and *Whole trade and retail trade, repair of motor vehicles including motorcycles*. These industries have been presented by *Water transport*; *Air transport*; *Architectural and engineering activities, technical testing and analysis*; *Advertising and market research*; *Transporting and storage over 249 employed persons*; and *Professional, scientific and technical activity*.

Consequently, the analysis of the similarities in NACE divisions in terms of the share of innovative industrial enterprises has shown only two similar clusters.

The first cluster contains: *Mining of coal and lignite*; *Mining support service activities*, *Manufacture of tobacco products*; *Electricity, gas, steam and air conditioning supply, Water collection, treatment and supply*; *Sewerage*; *Waste collection, treatment and disposal activities*; *Materials recovery*; *Mining and quarrying over 249 employed persons*; and *Water supply, sewerage, waste management, and remediation activities*.

Whereas the second cluster contains: *Manufacture of: computer, electronic, optical products and electrical equipment*; *Manufacture of motor vehicles and other transport equipment*; *Repair and installation of machinery*; *Manufacture of: food products, textiles, leather, wood and of products of wood, articles of straw and plaiting materials, paper and paper products, rubber and plastic products*; *Printing and reproduction of recorded media*; *Manufacture of chemicals and pharmaceutical*; *Manufacture of basic metals and other non-metallic mineral products*; *Manufacture of fabricated metal products*; *Remediation activities and other waste management services*; *Mining of metal ores*; and *Manufacture of coke and refined petroleum products*.

Although the research procedure showed which enterprises belong to the groups of NACE divisions, it does not give us sufficient grounds to infer causality. It can be assumed that the similarity of a group may be a consequence of the amount of financial outlays, knowledge of products and services, use and level of support with IT tools, or extensive inter-organizational cooperation.

Besides, divisions grouped into similar clusters may constitute a starting point for further in-depth analysis. However, some limitations of the conducted research should be pointed out. Firstly, the analysis carried out was based on data from a report published in January 2020 by the Polish Central Statistical Office and it concerns the innovative activity of enterprises in the years 2016–2018. Secondly, in the next stages of the research, it is crucial to verify whether, in previous years, NACE divisions were grouped into similar clusters. Lastly, an interesting direction of future research would be to try to create a ranking of industries in terms of the share of innovative

enterprises introducing new or improved products or business processes and to check whether it reflects clusters of homogeneous industries.

Acknowledgment

The data used in the analysis come from a report published in January 2020 by the Polish Central Statistical Office – Innovative activity of enterprises in the years 2016–2018 (GUS, 2020). The research has been carried out as part of a research initiative financed by the Ministry of Science and Higher Education within "Regional Initiative of Excellence" Programme for 2019–2022. Project no.: 021/RID/2018/19. Total financing: 11,897,131.40 PLN.

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Abstrakt

Cel: *Innowacyjność przedsiębiorstw uzależniona jest od wielu zmiennych, w tym od decyzji w zakresie innowacji, posiadanych zasobów i kompetencji, jak i sektora działalności. Powinna być rozpatrywana w wymiarze strategicznym, zarówno na poziomie innowacyjności strategicznej przedsiębiorstwa oraz ogólnej strategii. Innowacyjność strategiczna będąca długookresowym procesem uwzględniającym wzajemne przenikanie się różnych rodzajów innowacji wraz z myśleniem strategicznym może być skutecznym narzędziem uzyskiwania wysokiej efektywności działania oraz utrzymania przewagi konkurencyjnej na rynku. Analiza literatury przedmiotu, jak również obserwacje, wskazują, że nawet w obrębie jednej branży występują zróżnicowania pod tym względem. Celem autorów było dokonanie podziału branż klasyfikowanych według podziałów PKD na jednorodne grupy pod względem innowacyjności przedsiębiorstw w danej branży.* ***Metodyka****: W części empirycznej przedstawiono wyniki badań własnych metodą analizy skupień, natomiast wszystkie obliczenia wykonano w programie R.* ***Wyniki:*** *Na podstawie tych wyników można stwierdzić, że branże można pogrupować w jednorodne klastry pod względem udziału innowacyjnych przedsiębiorstw. Wyniki przeprowadzonych badań wykazały, że klastry wyliczane na podstawie udziału firm innowacyjnych, które wprowadziły nowe lub ulepszone produkty oraz klastry notowane na podstawie udziału firm innowacyjnych, które wprowadziły nowe lub ulepszone procesy biznesowe, są bardzo zbliżone.* ***Implikacje dla teorii i praktyki****: Wartością dodaną rozważań przedstawionych w artykule jest możliwość uzyskania dodatkowych informacji o jednorodności działalności innowacyjnej tych przedsiębiorstw w poszczególnych działach PKD. Wyniki te można wykorzystać do dalszej pogłębionej analizy poszczególnych grup.* ***Oryginalność i wartość****: Możemy odnaleźć wiele pozycji skupiających się na problemie innowacyjności poszczególnych przedsiębiorstw, sektorów, branż, regionów. Brak jest natomiast opracowania prezentującego podobieństwo branż i podział na jednorodne grupy pod względem udziału innowacyjnych przedsiębiorstw. Luka ta, stała się inspiracją do badań, co pozwoliło zweryfikować problem naukowy.*

Słowa kluczowe: *strategia, strategia innowacji, sektor, klasyfikacja PKD, analiza skupień, podobieństwo*

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Conflicts of interest

The authors declare no conflict of interest.

Citation

Bielińska-Dusza, E., & Hamerska, M. (2021). Innovative activity of Polish enterprises – a strategic aspect. The similarity of NACE divisions. *Journal of Entrepreneurship, Management and Innovation*, *17*(2), 53-98. https://doi.org/10.7341/20211723

The strategy implementation process as perceived by different hierarchical levels: The experience of large Croatian enterprises

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Abstract

Purpose: *Although the implementation process involves employees from different hierarchical levels, previous research on the implementation topic focused mostly on a top management perspective, omitting the perspective of lower hierarchical levels. We believe that employees from different hierarchical levels perceive differently the way the implementation process is carried out because of many intrinsic and extrinsic factors. Considering the primary role of lower hierarchical levels during the implementation process, we decided to include lower levels of management and operatives in our research.* ***Methodology:*** *We investigate the way employees from different hierarchical levels perceive the implementation process. The implementation process in our research was evaluated using four implementation factors: 1) People, 2) Resources allocation, 3) Communication, 4) Operational planning & control. We sent the questionnaire to all large Croatian enterprises (396) and gathered 208 questionnaires from 78 enterprises.* ***Findings:*** *The research findings confirm that the evaluation of key implementation factors differs significantly between hierarchical levels in two of the four identified factors: 1) Communication and 2) Operational planning & control. Frontline managers and operatives mostly consider the instructions for implementing the strategy too vague and unclear, their suggestions not taken into account, the communication generally too slow, what creates confusion and reduces the efficiency in coordinating operational tasks and introducing potential changes.* ***Implications for theory and practice:*** *Although we proved the statistically different perception about two out of four implementation factors, we contributed in a way to point out that this stream of research, with multiple factors and multiple respondents*

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Received 1 April 2020; Revised 2 June 2020; Accepted 20 June 2020.

from different hierarchical levels, should be taken into consideration in future research about strategy implementation. Top managers should include feedback from lower hierarchical levels in order to grasp the pitfalls of strategy implementation. This study highlights the operational problems that might occur such as vague or slow communication, budget discrepancy, inadequate definition of timeline for activities and its dynamics, and ways to measure performance during strategy implementation. We believe that the research results are beneficial for academics and consultants when creating teaching and training programs for future managers about strategy implementation. ***Originality and value:*** *Based on the analysis of the literature review and the research findings, we develop a new implementation model with questionnaire to analyze the way employee from different hierarchical levels perceive the implementation process.*

Keywords: *strategy implementation process, key implementation factors, hierarchical levels, employees' perspectives on the strategy implementation process, large Croatian enterprises.*

INTRODUCTION

Managers spend billions of dollars on consulting and training in the hope of creating successful strategies. But all too often, successful strategies do not translate into successful performance. Strategy implementation ranks high on top managers' agendas, but it is a topic that has not received sufficient attention in academia. It seems like academics have assumed that if an enterprise has a strategy, it gets implemented automatically. But when talking with managers, it is obvious that the process of implementation does not go smoothly. Most managers admit that their organization is experiencing significant problems with translating their strategies into concrete activities and results (Verweire, 2018).

Research on *The Times 1000* conducted in 2001 points out that 80% of the interviewed managers confirm they have an appropriate strategy, but only 14% think that the strategy is implemented appropriately (Cobbold & Lawrie, 2001). Only four years later, the journal *The Economist* published results, according to which 57% of the enterprises were not successful in implementing strategy (Allio, 2005). Furthermore, the research of *Marakon Associates and The Economist Intelligence Unit consultancies* on a sample of 197 members of top management shows that, due to problems in implementation, only 63% of enterprises accomplished their planned goals (Mankins, 2005). McKinsey, one of the world's leaders in implementation consultancy, notes that even 70% of change programs fail to achieve their goals, largely due to employee resistance and lack of management support (Ewenstein, Smith, & Sologar, 2015).

As part of the strategic management field, the research on strategy implementation has moved away from practice and does not have a need to serve managers (Whittington, 1996). Strategy implementation is happening in practice and that is where we need to seek new efficient solutions (Tovstiga, 2010). The analysis of strategy implementation should start with people, their perspective, their character, and their drive (Zafar, Butt, & Afzal, 2014). They are critical for successful strategy implementation and they are the starting point when things go wrong. The research focus should be on their thoughts, experience, and capabilities (Asmuss, 2018).

Strategy implementation assumes implementing a strategic plan according to the predefined elements and scheduled timeframe. Those elements are the essence of implementation and, during the process, should be carefully monitored. The research (Beer & Eisenstat, 2000; Radoš, 2006; Pučko & Čater, 2008; Brinkschröder, 2014; Harrison, 2017) showed that the lack of systemic control over these elements is the most common mistake in strategy implementation.

The additional thing that makes strategy implementation more complex is the necessity of coordinating a large number of people on different hierarchical levels and with varying functions of business (Candido & Santos, 2019). Strategy is no longer positioned within a limited group consisting of the top management team, instead it can potentially involve any internal and external organizational actor whose actions can be identified to be of relevance for strategic outcomes (Asmuss, 2018). An enterprise can be seen as interconnected sets of processes – and processes are a collection of tasks and activities that together transform inputs into outputs (Verweire, 2018).

Traditional studies on strategy implementation and strategic management processes, in general, focus mainly on the top managers' perspective (Simons, 2013), omitting the key role of middle managers and operatives (Floyd & Lane, 2000; Grönroos, 1995; Schaap, 2006; Kalali et al., 2011; Anchor et al., 2012; Kownatzki et al., 2013). Although the top management perspective is critical because it emphasizes strategic thinking and endeavor, it is mostly the lower-level employees who participate in the implementation process. In order to ensure efficient use of resources and maintain the planned dynamics of strategy implementation, it is vital that employees, at all hierarchical levels, understand what is expected of them, what is the objective of the implementation, what is the expected dynamics of tasks and what are the key factors that need special attention (Noble, 1999a). A failure to understand or approve of some of the key implementation factors may prolong and/or increase the cost of strategy execution (Noble, 1999). Without the integration of knowledge, information and experience brought

in by all hierarchical levels, the process of strategy implementation cannot be successful (Hrebiniak, 2006; Mantere, 2008; Shimizu, 2017).

Exploring the opinions of lower hierarchical levels, i.e. those participating in the implementation process on a daily basis, would enable practitioners and strategists to get a complete picture of the implementation obstacles and needs arising within the implementation process when it comes to resolving disagreements, reaching an operatives' consensus, identifying required skills and creating training programs (Floyd & Wooldridge, 1992; Rapert, 1996; Noble, 1999a; Dooley et al., 2000; Heracleous, 2003).

So, the first identified research gap is the lack of a systematic consideration of key implementation factors. We addressed this by gathering feedback on the level of satisfaction with implementing each of the implementation factors. The list of key implementation factors is based on Okumus (2003) theoretical research, who stressed the systematic approach of looking at all crucial implementation factors. Key implementation factors defined in his model are: 1) People, 2) Resources allocation, 3) Communication, 4) Operational planning, 5) Control.

According to the second identified gap, i.e. the lack of strategy practitioners' perspective research, we decided to develop our research with a special focus on all employees involved in the implementation process. When implementing strategy, top, middle, frontline management and operatives are involved, and we decided to ask all of them about the implementation factors. In each enterprise, we had four respondents, one from each hierarchical level.

The aim of the paper is to examine how employees from different hierarchical levels evaluate the adequacy of key implementation factors, respectively evaluating how each of the respondents from different hierarchical levels is satisfied with the specific implementation factors. We believe that viewing the implementation process through different hierarchical levels and the interrelation among the different influencing factors is the starting point for a comprehensive analysis of the implementation process. This approach enables one to integrate and compare the perspectives of different actors within the implementation process, link the strategic and operational perspective, look for potential sources of problems and determine the assumptions on which new strategy implementation model has to be developed.

The research was conducted in large enterprises in the Republic of Croatia. Large enterprises in Croatia represent 0.3% of the total number of enterprises, employ 30.5% of the work force, create 41.5% of value added, and 97.5% of net profit (Ministry of Economy of the Republic of Croatia, 2016).

By including all industries in the sample, it provided 396 large enterprises in the Republic of Croatia.

The paper is organized into five sections. After the introductory section, the second section provides a literature overview and develops the research model, research questions, and hypothesis. Section 3 describes the research methodology and presents the sample, the research instrument, and the research results. In the fourth section, we discuss the empirical findings and their implications. The paper concludes with a conclusion, which analyzes research gaps and proposes guidelines for future research.

LITERATURE REVIEW

Strategy implementation is the process that involves the execution of the necessary tasks or activities to obtain a result over what has been planned (Ramadan, 2015). David Garvin says, successfully implementing and executing strategy involves delivering what is planned or promised on time, on budget, at quality, and with minimum variability – even in the face of unexpected events and contingencies (Miller, 2020).

While it is agreed that strategy formulation is relevant for business success, to date, little attention has been paid to its actual implementation, i.e. to the concrete steps needed to translate sustainability strategy into practice (Klettner et al., 2014; Engert & Baumgartner, 2016). A high percentage of failure in implementing strategy in practice urges research to move the focus from strategy formulation to strategy implementation (Blahová & Knápková, 2011; Hassan, 2016). Tawse et al. (2019) posit that one reason for the ineffective transition from strategy formulation to strategy implementation is that planning is associated with a different set of thought processes and emotional experiences than is required for strategy implementation.

As employees implement strategy from different hierarchical levels, we think there is a gap in the literature that includes not only the attitudes of the top management team (Heracleous, 2003; Kalali, 2011) but also the attitudes of frontline managers and operatives. In the last couple of years, there has been a slight tendency to include middle-level managers in the research on strategy implementation (Salih & Doll, 2013; Darkow, 2015; Chowdhury, 2016; Johansson & Svensson, 2017), yet lacking ones including front line management and operatives.

Gibson et al. (2019), who introduced the notion of the hierarchical erosion effect, emphasize that employees within the same enterprise usually have heterogeneous interests and perceptions. Their study argues that individual perceptions about specific practices can differ according to his/her

position in the hierarchical structure. That means an enterprise might have a low dispersal of views across employees of similar levels, but a significant difference between the views of senior executives, middle-level managers, frontline supervisors, and non-managerial employees.

In our view, there is a twofold contribution of including different hierarchical levels of management in the research. The first one is that the comparison of perspectives from different hierarchical levels could contribute to revealing obstacles and problems for successful strategy implementation. For example, it could be problems like not understanding the strategy at lower hierarchical levels, slow flow of information from top to bottom and from the bottom up, weak dedication of employees for achieving business results. The second one is linked to the way strategic plans are developed. In the last two decades, there has been growing attention paid to bottom-up approaches and alternative ways on how to develop strategy. In more complex and turbulent times of doing business, strict strategic plans lose their relevancy (Schaap, 2012). Additionally, the role of middle-level and frontline managers is becoming more relevant due to the experiences and skills that could be helpful in improving the strategy itself during the implementation process (Noble, 1999; Hrebiniak, 2006). Pereverzieva (2020) emphasized that it is important to understand how personal interactions occur in the enterprise. The issue of co-existence and interactions between people within a particular system becomes of particular importance. From the managerial perspective, an efficient and united team envisages not only the automatic distribution of roles and labor functions but also the availability of interaction, collaboration, support and assistance on the way to the common goal. Unfortunately, there is often a lack of cooperation between hierarchical levels (Alexander, 1985; Al Ghamdi, 1998; Beer & Eisenstat, 2000; DeLisi, 2001; Shah, 2005; O'Regan & Ghobadian, 2007; Wheelen & Hunger, 2010; Kalali et al., 2011) and a lack of systematic analysis of crucial implementation factors.

Tiemersma (2015) and Wolczek (2014) emphasize that top managers do not sufficiently collaborate with mid-level managers, although the latter play a key role in the strategy implementation process by translating top management's expectations into the daily workload of their subordinates. Top managers usually do not coordinate and integrate activities between different levels and business functions in a proper manner (Al Ghamdi, 1998; Hrebiniak, 2006; Pučko & Čater, 2008; Koseoglu et al., 2009, Kalali et al., 2011) and the responsibilities during the implementation process are not clearly defined (Hrebiniak, 2005; Shah, 2005; Radoš, 2011; Behery et al., 2016). In addition to this, top managers fail to collect employees' suggestions and develop appropriate programs to improve employees' skills and competencies needed for the implementation of new strategies or quick adaption to changing

conditions (Shah, 2005; Pučko & Čater, 2008; Heathfield, 2019), which is why employees performing operational tasks are not ready to accept and execute what is expected of them. Different perceptions about implementation needs and barriers can lead to employees feeling misunderstood, exhausted, disengaged, and stressed. In these situations, individuals commonly start to resist the intended changes; promote self-serving agendas; obstruct intra- and inter-departmental communication; deplete personal and enterprise resources, and generally undermine the success of the planned strategic decision (Bouckenooghe, 2012).

The understanding of the differences in the perception and interpretation of key implementation factors is the first step in defining the framework for developing a model that could help monitor the strategy implementation process, maintain the focus on planned tasks and implementation dynamics, align employees from different levels performing different business tasks, and adhere to the planned budget.

The proposed hypothesis stems from the starting point that people at different hierarchical levels evaluate key implementation factors differently because, given the set of intrinsic and extrinsic factors, they perceive differently what shortcomings within the implementation process impede it to be carried out qualitatively and in line with the predicted dynamics.

This paper builds on the theoretical model of key implementation factors proposed by Okumus (2003). Key implementation factors include:

1) **Operational planning:** the process of initiating the project, and the operational planning of the implementation activities and tasks. Operational planning has a great deal of impact on allocating resources, communicating, and providing training and incentives. The key issues to be considered are preparing and planning implementation activities, defining work procedures and scheduling tasks, participation and feedback from different management levels and functional areas, initial pilot projects and the knowledge gained through them, and the timescales of making resources available and budgeting.
2) **Resource allocation:** the process of ensuring that all necessary time, financial resources, skills and knowledge are made available. It is closely linked with operational planning and has a great deal of impact on communicating and on providing training and incentives. The key issues to be considered are the procedures of securing and allocating financial resources, the relationship between price, quality and timeliness of resources, information and knowledge requirements needed to implement a new strategy, and the time available to complete the implementation process.

3) **People:** recruiting new staff, providing training and incentives for relevant employees. The key issues to be considered are recruitment of relevant staff to accommodate the implementation needs, the acquisition and development of new skills and knowledge, the adoption of the necessary training activities to prepare key employees for the change, and the provision of incentives.
4) **Communication:** the mechanisms that send formal and informal messages about the new strategy. The main issues are the use of clear messages when informing relevant people within and outside the enterprise, the implications of (not)using multiple modes of communication (top-down, bottom-up, lateral, formal/informal, one time or continuously), and the impact of organizational culture and structure on the communication process.
5) **Control:** the formal and informal mechanisms that allow the efforts and results of implementation to be monitored and compared against predetermined objectives. The main issues are monitoring activities carried out during and after the implementation process, alignment with operational plans, providing feedback on implementation progress from implementation actors, and establishing corrective actions if necessary.

It is necessary to take into account that the number of hierarchical levels depends on enterprise size and the applied organizational structure. Large enterprises usually have at least one level between the top and the bottom of the hierarchical pyramid. In our research, we identified four hierarchical levels. **Top management** creates and directs the strategy path according to the "big picture," i.e. the wide range of information it collects, selects, and analyzes from inside and outside the enterprise. **Middle management** usually represents the change facilitator, removing obstacles like contradictory goals, and ensuring required resources (Aaltonen, 2001). It manages the information flow in both directions: top-down and bottom-up (Huey, 1994; Hrebiniak, 2006). Middle managers are usually the head of dislocated strategic business units, functional departments, or the head of key enterprise project initiatives. They deploy strategic initiatives to concrete job positions. **Frontline management** covers different tasks such as team leader or shift leader depending on enterprise needs and cooperation with middle management level. For sure, together with operatives, it composes the core of the strategy implementation team. **Operatives** are the direct performers, the strategy executors. They follow the instructions and suggestions from superior levels and transform plans into actions through day-to-day operations.

To summarize, we would like to set out three research questions:

RQ1) Does the perception of key implementation factors differ with respect to the position of respondents within the enterprise?

RQ2) Is the hierarchical level a crucial variable for that differentiation?
RQ3) Could this approach be helpful for managers to improve strategy implementation?

Based on the research questions, we define the research model in Figure 1.

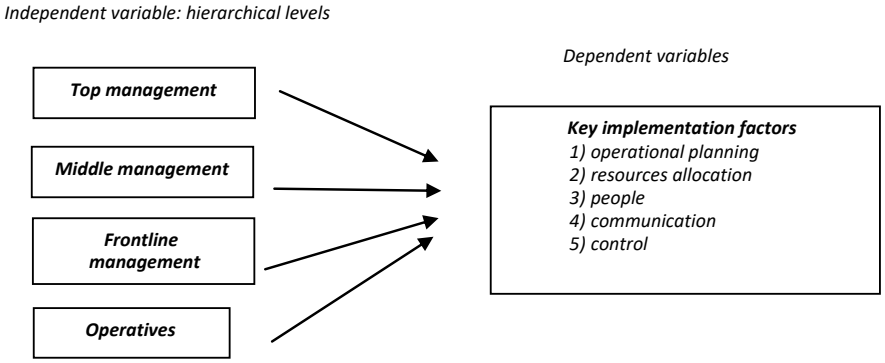

Figure 1. The research model

Source: Authors' work adapted from Okumus (2003, p. 876).

In line with the mentioned literature review, defined research goal, and research questions, we define the following hypothesis:

H: There is a statistically significant difference in the evaluation of key implementation factors between employees from different hierarchical levels.

RESEARCH METHODS

The research instrument

The questionnaire is created based on the research on the key implementation factors defined by Okumus (2003), whose research gave the guidelines on what to include within each of the specific implementation factors. Based on that research, we created the dependent variables and defined specific items.

In the strategic management literature, the most common methods are questionnaires, interviews, and case study methods. We selected the questionnaire as the most appropriate method for our research. This was due to the fact that we wanted to include lower levels of management (as recommended in previous research, e.g. Alexander, 1985; Nutt, 1986; Rapert et al., 1996; Noble, 1999a; Hassan, 2016), a number of the factors

influencing the implementation process (Noble, 1999; Okumus, 2001; Li et al. 2008; Schaap 2012), and as many of the 396 large enterprises in the Republic of Croatia as we could in the sample. We asked respondents to evaluate their level of satisfaction on a variety of different critical factors of implementation. With a Likert type of scale, we gave respondents the possibility to evaluate the intensity of satisfaction with the specific implementation factor from 1 – very unsatisfied to 5 – very satisfied.

Table 1. Key implementation factors – the questionnaire

Key implementation factors	**Rate the level of your satisfaction with the following statements, which describe the current state of strategy implementation in your enterprise. 1 – very unsatisfied, 2 – unsatisfied, 3 – neutral, 4 – satisfied, 5 – very satisfied**
Operational planning	1. Operational planning is mostly carried out by middle and lower-level management. 2. Work procedures are clear to all. 3. The investment priorities on an annual basis are clearly defined. 4. The strategy implementation process in general does not lag behind the scheduled plans. 5. The planned budget is not exceeded in the development and execution of planned activities.
Resources allocation	1. The resources available are sufficient. 2. The quality of resources is adequate. 3. The resources are available on time and do not hinder the scheduled execution of planned activities. 4. The price of *input* is appropriate given the price of *output*.
People	1. All employees understand the goals of the strategy. 2. The number and structure of employees are in line with the strategy implementation needs. 3. The employees are adequately trained to execute scheduled activities. 4. The employees are in general ready to cooperate in implementing the strategy. 5. I believe that the employees are satisfied with their work post and are dedicated to their business tasks. 6. The employee motivation and reward system is properly set.
Communication	1. Communication is timely. 2. Formal and informal channels of communication are applied within the enterprise. 3. The top management messages are clear and transparent. 4. The top management acknowledges the opinion and suggestions of employees from lower hierarchical levels. 5. The middle management level plays a key role in communicating the strategy to operational levels. 6. The employees understand and know how to use the information provided by the management. 7. The organizational culture and structure of the enterprise facilitate the communication process.
Control	1. The implementation process is continuously monitored. 2. Feedback is adequately collected and communicated to top management members. 3. Obtained feedback is compared against predetermined objectives. 4. The management takes timely corrective actions if it spots a problem.

Respondents who did not understand the question or did not know, or did not want to express their opinion were asked not to circle any answer.

The respondents were asked to rate the questions on five-point Likert scales. Higher scores indicate that respondents consider that the implementation process is carried out in a proper manner. In Table 1, we present the questionnaire.

In order to determine face validity, we gave the questionnaire to five academics in the field of management. Their role was to give us feedback on how appropriate and clear the terminology used in the items was. After that, we conducted pilot research on five enterprises. Based on the feedback, we did small corrections to the questionnaire and then conducted the research on the whole sample.

The list of enterprises and contacts were taken from the database of the Croatian Chamber of Economy. The first contact with the enterprises was established by phone call or e-mail with the human resource department or with corporate governance. They directed us to employees on different hierarchical levels to whom we delivered the questionnaire. After making the first contact, the questionnaire was sent by e-mail or post, depending on the instruction given by the contact person from each enterprise. The questionnaire was coupled with a letter explaining the goal of the research and the way the questionnaire could be sent back. The empirical research lasted for five months. We managed to get 208 responses from 78 firms. Internal reliability had a value of 0.95 of Cronbach's alfa for the whole research sample and internal reliability of specific variables and items are presented in Table 2.

Table 2. Reliability and validity of the research instrument

Variables	People	Resources	OPPC	COMM
Cronbach's alpha coefficient for each variable separately	0.89	0.90	0.87	0.87
Number of items	7	5	6	8
Explanation of the variance		62.43%		
Kaiser-Meyer-Olkin and Bartlett test		0.936		
Chi-square		3467.74		
Degrees of freedom		406		
Significance		.000		

Note: N=208. Extraction: principal component analysis. Rotational method: Oblimin with Kaiser normalization. Rotation converged into 14 iterations. Deleted values below 0.30.
OPPC = Operational planning and control
COMM= Communication

Analyzing the intercorrelation matrix, for the Confirmatory factor analysis, we remove all items with a loading factor below 0.4 and proceed with four variables: 1) resources allocation, 2) communication, 3) people, and 4) operational planning and control. The results of our research indicated that in the operationalization of key implementation factors, the variables of operational planning and control are combined into one.

Apart from key implementation factors, we asked respondents to make a note about the hierarchical level they belong to (top, middle, frontline management and operatives), years of age (number), years of experience in the existing enterprise (number), ownership form (possibility to mark > 50% in private ownership or > 50% in public ownership), market of placement (possibility of mostly domestic or mostly foreign market) and industry sector (according to Statistical classification of economic activities from 2007– NACE Rev. 2).

Sample size and data collection

The size of the enterprises in Croatia is defined by the Act of Accounting. Firms are defined by exceeding two out of the three criteria: (1) more than 250 employees, (2) the amount of assets equal or higher than 150.000.000 kunas, (3) annual income exceeds 300.000.000 kunas.

According to the Croatian Chamber of Economy there were 396 registered large enterprises and that presented a sample frame for us. We received 208 questionnaires from 78 enterprises, with a response rate of 19.75%.

There are two reasons why large enterprises were selected for the sample. The first reason is that large enterprises have a strategic impact on the whole economy. The second one is that strategy implementation is more complex in large enterprises for the following reasons: (1) larger number of employees and (2) larger number of different hierarchical levels, business functions, and dislocated business units. In those situations, strategy implementation demands, from top managers, the coordination of several influential factors, stakeholders, and different environmental contexts.

Data analysis

The demographic characteristics of the sample are presented in Table 3, such as the structure of respondents by hierarchical level, average age of the respondents by hierarchical level, years of respondents' experience in the respective enterprise, form of ownership, placement market, and industry.

Table 3. Demographic characteristics of the sample

	N=208 respondents	**N=78 enterprises** Number of large active enterprises per industry/% of enterprises that have completed the questionnaire in relation to the total number of active enterprises within the industry	
Hierarchical level		A - Agriculture, forestry and fishing	14 (7.14%)
Top management	59 (28.4%)	B - Mining and quarrying	3 (100%)
Middle management	70 (33.7%)	C - Manufacturing	144 (22.22%)
Frontline management	49 (23.6%)	E - Water supply, sewerage, waste management	13 (23.08%)
Operatives	30 (14.4%)	F - Construction	30 (13.33%)
No answer	38 (18.3%)	G - Wholesale and retail trade, repair of motor vehicles and motorcycles	81 (12.35%)
Length of employment with the respective enterprise		H - Transporting and storage	30 (30%)
		I - Accommodation and food service	18 (72.22%)
0–4 y.		J - Information and communication	12 (8.33%)
5–9 y.	48 (23.1%)	M - Professional, scientific and technical activities	5 (20%)
10–14 y.	44 (21.2%)	R- Art, entertainment and recreation	8 (12.5%)
15–19 y.	28 (13.5%)		
20+ y.	47 (22.6%)		
No answer	3 (1.4%)		
Ownership			
Private	166 (80%)		
Public	42 (20%)		
Major placement market			
Domestic	99 (47,5%)		
Foreign	109 (52,5%)		
Average age			
Top management	45		
Middle management	44		
Frontline management	41		
Operatives	36		

The largest number of responses (questionnaires) was completed by middle management, followed by top management, frontline management, and operatives. We grouped the employees' experience into five-time categories. We have respondents with a starting (up to 4 years), short (between 5 and 9 years), medium (between 5 and 14 years), long (from 15 to 19 years), and very long (over 20 years) work experience within the respective enterprises. Most of the sample enterprises are privately owned (80%). The distribution of enterprises according to the major placement market is balanced. Namely, 47.5% of the sample enterprises market their products/services primarily in the domestic market, while 52.5% are in foreign markets.

The most representative enterprises in the sample are those in the manufacturing industry, followed by enterprises in the tourism industry and enterprises in wholesale and retail trade. The survey included 19.75% of the total number of large enterprises in the Republic of Croatia. According to economic activity, the representation of individual industries in the total population indicates the representativeness of the sample of enterprises in Mining and quarrying, Manufacturing, Water supply, sewerage and waste management, Transporting and storage, Accommodation and food service, and Professional, scientific and technical activities.

As mentioned above, depending on the organizational structure selected, each enterprise has different hierarchical levels. Table 4 shows the number of enterprises from which we obtained responses from all four hierarchical levels. We obtained responses from three levels, two levels, and only one level.

Table 4. The structure of involved hierarchical levels

Involved hierarchical levels	Number of enterprises
Four hierarchical levels	5
Three hierarchical levels	59
Two hierarchical levels	10
One hierarchical level	4
Total	**78**

In Table 5, there is an overview of the average level of satisfaction for each implementation factor per specific hierarchical level.

According to the average score for each of the four key implementation factors, it can be concluded that people and resources are the ones managed less successfully. Table 6 summarizes the results of the analysis of the relationship between the evaluation of key implementation factors (dependent variable) and the hierarchical position of respondents (independent variable). A simple variance analysis test was applied.

Table 5. Descriptive statistics (mean and standard deviation)

Hierarchical levels	People	Resources allocation	Operational planning & control	Communication
Top management	3.69 (.72)	3.71 (.73)	4.03 (.54)	4.64 (.73)
Middle management	3.57 (.73)	3.54 (.84)	3.82 (.72)	4.38 (.88)
Front line management	3.47 (.66)	3.60 (.83)	3.70 (.63)	4.24 (.74)
Operatives	3.37 (.62)	3.43 (.75)	3.77 (.49)	4.17 (.72)
Total	**3.55 (.70)**	**3.59 (.79)**	**3.85 (.63)**	**4.39 (.80)**

Note: values in parentheses show standard deviation.

Table 6. Perspective on key implementation factors depending on the hierarchical level of the respondents

	People	Resources allocation	Communication	Operational planning & control
Respondent's hierarchical position	$F_{(3,200)}$=1.654 p=0.178	$F_{(3,200)}$=0.903 p=0.441	**$F_{(3,200)}$=2.772 (0.3976)$_{13}$ (0.4679)$_{14}$ p=0.043**	**$F_{(3,200)}$=3.236 (0.3345)$_{13}$ p=0.023**

Note: values in parentheses show statistically significant Mean differences between hierarchical levels. Post Hoc test: Bonferroni test provided for variables People, Resources and Operational planning and control, Dunett T3 for variable Communication; 1–Top management, 2 – Middle management, 3 – Front line management, 4 – Operatives.

Considering the hierarchical position of the respondents, there are statistically significant differences in the evaluation of the *Communication* variable and the *Operational planning & control* variable, which requires the application of corresponding post hoc tests. In the case of the *Communication* variable, due to the inhomogeneous distribution of data, the non-parametric Dunnett T3 test was applied while, due to the homogeneous distribution of data in the case of the *Operational planning & control,* we applied the Bonferroni test. We found statistically significant differences in the way respondents rated the communication process ($F_{(3, 200)}$ = 2.72; p=0.043, R^2 = 0.47, R^2 adj. = 0.33), and the operational planning & control processes ($F_{(3, 200)}$ =3.23; p=0.023, R^2=0.41, R^2 adj.=0.26).

Regarding the *Communication* variable, statistically significant differences were observed between the evaluation given by top management and that

of frontline management and operatives. There is no statistically significant difference between top management and middle management evaluation. Operatives gave the lowest score, lamenting that communication is not clear and timely, and that the communication channels are not well established. Bottom up communication is also neglected and there is no active participation of lower hierarchical levels in the formulation stage.

When considering *Operational planning & control,* the evaluation of frontline management is statistically significantly different from that of top management in evaluating the adequacy of implementation process dynamics, adherence to budget, clarity of priorities and procedures, the role of middle management, and alignment of partial plans with the strategic plan.

DISCUSSION

The implementation process engages individuals from different hierarchical levels. Each hierarchical level gives its contribution by bringing in the information and experiences it possesses. Quality interaction between hierarchical levels should ensure a better formulation and implementation process (Hrebiniak, 2006; Mantere, 2008).

The research idea was that examining the attitudes of those implementing the strategy in their day-to-day business is necessary because only by combining a strategic and operational perspective can we gain more concrete and complete insights that would be of use to practitioners. Their experiences and attitudes reflect a more realistic picture of the strategy implementation process within an enterprise. Our research hypothesizes that employees from different hierarchical levels perceive key implementation factors differently because of the different intrinsic and extrinsic influencing factors, such as the degree of information possession, involvement in the formulation/ implementation process, accumulated job experience, etc. Although this research does not go into the description and analysis of the impact of individual intrinsic and extrinsic factors on employees' perceptions of the strategy implementation process, we wanted to prove that it is necessary to include the perspectives of the various actors involved in the strategy implementation process. This is because it is rather difficult to expect that scientific research is able to develop useful guidance for practitioners if only one isolated opinion within the enterprise (usually top management) continues to be explored.

The implementation process in our research was evaluated using four implementation factors: *People, Resources, Communication, Operational planning & control*. Empirical findings show a statistically significant

difference in the way respondents from different hierarchical levels assess factors *Communication* and *Operational planning & control,* while there are no statistical differences in assessing *People* and *Resource*s. Although *People* (M = 3.55) and *Resources* (M = 3.59) are the lowest rated, the hierarchical levels are harmonious in expressing that there are not adequately allocated. Generally, our results show that top management rates the implementation of all four factors considerably higher than lower hierarchical levels.

Within the *Communication* factor, lower hierarchical levels mostly lament that their opinions and suggestions are not sufficiently respected, that the communication process is too slow, and that changes and innovations from the strategic point are not communicated to them in a timely way, which creates confusion and reduces the efficiency in coordinating operational tasks and introducing potential changes. In addition, from the analysis of the results, operatives point out that they receive too vague and unclear information, without adequate instructions on how to implement it concretely. Our conclusion is that the poor flow of information between hierarchical levels leads to reduced efficiency in coordinating the operative tasks. There is a need for a "strategy as practice" approach, which emphasizes the importance of the interaction between all hierarchical levels throughout the entire strategic management process by applying a bottom-up approach to decision-making and constantly developing the skills needed to cope quickly with ever-changing conditions. This approach contradicts the fact that top management is primarily in charge of strategy formulation while other levels are responsible for strategy implementation; within this approach, the strategy is adapted to meet the daily challenges and changing circumstances (Johnson et al., 2008). From our research, it emerges, as also noted before by others (e.g., Noble, 1999; Hrebiniak, 2006), that the non-integration of individuals potentially causes misunderstanding and is one of the key sources of problems that prolong and/or complicate the implementation process.

In the interpretation of the statistically significant difference in the evaluation of the *Operational planning & control* variable, we want to emphasize that, among all of the investigated aspects within this variable, the respondents from lower hierarchical levels rated the implementation dynamics as the worst. Strategy implementation generally lags, time-wise, behind scheduled plans. Moreover, lower hierarchical levels also emphasize that set budgets are often exceeded and that the work procedures are not clear. Operatives believe that the superiors do not take timely corrective actions when they notice that an obstacle has occurred in the course of the implementation. The explanation should clearly be sought in the interrelation with other key implementation factors.

CONCLUSION

The hypothesis has been only partially proven and the research results respond only partially to the research questions. The results of the empirical study show that hierarchical levels are not the only and the best grouping variable or perspective that could group different perspectives on the strategy implementation process. Some additional grouping variables or perspectives could be explored to realize the obstacles and suggest an improvement for strategy implementation. Further research should be directed towards the identification of those grouping variables of perspectives.

We also believe that it would be useful to approach the research topic through other research methods, bringing everything to a more qualitative research approach. Only in this way will it be possible to provide an in-depth explanation of what affects the perspective of each level and how the differences in the evaluation of the implementation process can contribute to the development of implementation models. Additionally, it should also be noted that, depending on the research subject, the respondents' answers, and the respondents' position, it can be weighted differently, thus ensuring more accurate reasoning. It is important to consider the extent of the respondents' awareness and understanding of the issue under consideration, again depending on the research topic, his/her involvement in the particular situation, and specific research conditions to interpret his/her perspective correctly.

Furthermore, future research needs to be extended to the analysis of intrinsic and extrinsic factors that influence the respondents' perspective in order to provide an in-depth explanation of what affects the perspective of each level and how the differences in the evaluation of the implementation process can contribute to the development of more concrete strategy implementation frameworks and guidelines. Research could be widened to include middle and small firms, and test the validity of the proposed model with different hierarchical levels on the different size of enterprises. Different research settings and control variables such as the same industry and strategy implementation could make a difference in the results.

Most of the current studies were performed in Anglo-Saxon countries and very rarely in the setting of Eastern European or transitional economies. Several examples of research on the issue of strategy implementation in the transitional economy were given, for instance, by Pučko and Čater (2008) and Radoš (2011). The field of strategy implementation in Eastern European economies is not sufficiently explored and the studies on this topic should certainly be intensified.

We need to highlight two difficulties we encountered during our research. Some respondents were not quite clear about their position in the hierarchical pyramid. Hierarchical positions are not always well defined and explained to lower hierarchical levels. In addition, we noticed that employees from lower hierarchical levels felt frustrated when answering some of the questions, which may be caused by a lack of understanding of the topic or their reluctance to express their views. Additionally, this proves that there is insufficient communication among different hierarchical levels and that lower levels are usually not familiar enough with the essential facts within the implementation process, which in turn, further contributes to their sense of guardedness and fear of expressing their attitude.

Acknowledgment

This article has been financed by the project of University of Rijeka under the title *Challenges of Strategic Management Practice* (ZP UNIRI 6/17).

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Abstrakt

Cel: *Mimo, że proces wdrożenia angażuje pracowników z różnych szczebli hierarchicznych, wcześniejsze badania dotyczące tematu wdrożenia koncentrowały się głównie na perspektywie najwyższego kierownictwa, pomijając perspektywę niższych szczebli hierarchicznych. Uważamy, że z powodu wielu wewnętrznych i zewnętrznych wpływów pracownicy na różnych poziomach hierarchii inaczej postrzegają sposób realizacji procesu wdrożeniowego. Biorąc pod uwagę podstawową rolę niższych szczebli hierarchicznych w procesie wdrażania, zdecydowaliśmy się włączyć do naszych badań niższe szczeble kierownictwa i pracowników.* ***Metodyka:*** *Proces wdrożenia w naszym badaniu został oceniony na podstawie czterech czynników: 1) Ludzie, 2) Alokacja zasobów, 3) Komunikacja, 4) Planowanie operacyjne i kontrola. Wysłaliśmy kwestionariusz do wszystkich dużych chorwackich przedsiębiorstw (396) i zebraliśmy 208 kwestionariuszy z 78 przedsiębiorstw.* ***Wyniki:*** *Wyniki badań potwierdzają, że ocena kluczowych czynników wdrażania różni się znacząco między poziomami hierarchii w dwóch z czterech zidentyfikowanych czynników: 1) Komunikacja oraz 2) Planowanie operacyjne i kontrola. Menedżerowie i operatorzy pierwszej linii najczęściej uważają instrukcje wdrożenia strategii za zbyt niejasne, ich sugestie nie są brane pod uwagę, komunikacja generalnie jest za wolna, co powoduje zamieszanie i zmniejsza efektywność w koordynowaniu zadań operacyjnych i wprowadzaniu potencjalnych zmian.* ***Implikacje dla teorii i praktyki:*** *Chociaż udowodniliśmy statystycznie różne postrzeganie dwóch z czterech czynników procesu wdrożenia, przyczyniliśmy się do wskazania, że ten strumień badań, z wieloma czynnikami i wieloma respondentami z różnych poziomów hierarchicznych, powinien być wzięty pod uwagę. Najwyżsi menedżerowie powinni uwzględnić informacje zwrotne od menedżerów z niższych szczebli hierarchicznych, aby uchwycić pułapki związane z wdrażaniem strategii. Badanie to zwraca uwagę na problemy operacyjne, które mogą wystąpić, takie jak niejasna lub powolna komunikacja, rozbieżności budżetowe, nieodpowiednie określenie harmonogramu działań i ich dynamiki oraz sposoby mierzenia wyników podczas wdrażania strategii. Wierzymy, że wyniki badań są korzystne dla naukowców i konsultantów przy tworzeniu programów dydaktycznych i szkoleniowych dla przyszłych menedżerów z zakresu wdrażania strategii.* ***Oryginalność i wartość:*** *Na podstawie analizy przeglądu literatury i wyników badań opracowujemy nowy model wdrożenia wraz z kwestionariuszem do analizy sposobu, w jaki pracownicy na różnych poziomach hierarchii postrzegają proces wdrożenia.*

Słowa kluczowe: *proces wdrożenia strategii, kluczowe czynniki wdrożenia, poziomy hierarchiczne, perspektywy pracowników na proces wdrażania strategii, duże chorwackie przedsiębiorstwa.*

Biographical notes

Valentina Ivančić worked first as a young researcher and later as a Professor Assistant at the Faculty of Economics and Business, University of Rijeka (Croatia) until 2018. She held seminar classes on these subjects: Strategic Management, Quality Management, Market Research, and Promotion. She finished the training program for Internal Auditor ISO 9001:2015 and several seminars on Applied Statistics. In 2015 she was awarded her Ph.D. in the field of Strategic Management (topic: strategy implementation). In the last decade, she has participated in the preparation and implementation of several scientific projects, while in the last year, as a consultant, she has been more involved in the improvement of the implementation process of certain Croatian enterprises.

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Conflicts of interest

The authors declare no conflict of interest.

Citation

Ivančić, V., Jelenc, L., & Mencer, I. (2021). The strategy implementation process as perceived by different hierarchical levels: The experience of large Croatian enterprises. *Journal of Entrepreneurship, Management and Innovation*, *17*(2), 99-124. https://doi.org/10.7341/20211724

Is dominant logic a value or a liability? On the explorative turn in the German power utility industry

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Abstract

Purpose: *This study seeks to specify the role of 'dominant logic' in an organization. So doing, the ambiguous character of the dominant logic emerges, as on the one hand, a dominant logic can make sense of a change, provide useful guidelines and keep the company focused. However, on the other hand, a dominant logic may provide reasons why preventing change could be 'logical' or work as a blinder when it comes to interpreting up-and-coming developments. Therefore, a dominant logic can be a value and a liability in times of change.* ***Methodology:*** *This study sets out to contribute to prior research by raising two questions. First, how can we re-conceptualize the construct of dominant logic to address both the driving and the hampering role in the case of explorative turns? And, second, which factors restrain and which allow explorative turns? With special regard to the German energy transition in the 2010s, this research grounds on explorative qualitative empirical research and employs a single case-study design for a traditional German power utility company, which – as an incumbent – has to deal with the high complexity in the German power industry. Data sources are in-depth and problem-centered interviews with both internal and external experts as well as field observations. An inductive procedure allows the development of research propositions from data, framed by prior research.* ***Findings:*** *As a result, this study delivers a six-factor framework to shine a light on the micro-foundations of dominant logic. Whether a dominant logic is of value or is a liability in organizational change and allows an explorative turn, depends on the identified abilities to unlearn, to explore, to change and to manage. Data suggests that an explorative turn, driven by dominant logic, works better in the case of combined learning and unlearning capacities, an ambidextrous balance of*

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Received 12 November 2020; Revised 11 January 2021; Accepted 3 February 2021.

exploration and exploitation, co-existing logics, continuous adaptations of dominant logic and lower levels of leadership power and formal structures. ***Implications for theory and practice:*** *This study specifies the roles of dominant logic that may hamper explorative turns in times of severe disruptions.* ***Originality and value:*** *It contributes to the research of managerial cognition by refining and applying the concept of dominant logic. It provides empirical evidence on how this phenomenon creates inertia, drives change, and discusses the needs for and the barriers to an explorative turn. From a managerial viewpoint, dominant logic serves as a filter to identify required changes and to tune the speed of change. This, however, depends on managerial reflection on the appropriateness of dominant logic in the run of events.*
Keywords: *dominant logic, explorative turn, exploitation trap, German energy transition.*

INTRODUCTION

Times of disruptive changes call for constructs that help companies to master the change. While in most recent times, technological developments like digitalization stand at the fore when it comes to analyzing disruptive change, sustainability and the related energy provision play an important role in terms of radical social and economic changes as well. With regard to incumbents, there is a strong need to adapt to these changes and, therefore, to 'reanimate' their explorative capabilities to avoid getting stuck in an 'exploitation trap' (Freiling, 2018). However, sometimes, the incumbents seem to be unable to move. One example is the rapid development of renewable energy sources, in connection with the current political pressure in terms of climate change. While this holds true for many countries worldwide, Germany is an extreme case due to massive changes in environmental public policy and legislation (Haake, 2015; Lee & Lee, 2019). The term 'German Energiewende' (i.e., energy transition: an exit from nuclear and fossil energy and a move to sustainable energy sources) crystallizes the disruptive character of the major political and social changes caused by the Fukushima catastrophe (Beveridge & Kern, 2013; Giones et al., 2018). As a consequence, incumbents had to develop completely new businesses and business models as the old ones broke down almost from one day to the other. In terms of ambidexterity (March, 1991), managers in the energy industry had to move from exploitation back to exploration to realize an explorative turn (Gibson & Birkinshaw, 2004).

While it is still an open question as to how to master an explorative turn in formerly stable businesses like energy provision, the simultaneous pressure of digitalization and its imprint on strategy is strong (Buchan, 2012; Teece, 2018) and reconfiguring resources and capabilities must indispensably be followed by changing business models, organizational cultures and even

company identities (Kor & Mesko, 2013). Against this background, incumbent business models, existing structures, commitments and cognitive constraints prevent companies from explorative turns (Christensen, 1997; Desai, 2013). However, examples from other industries like the German company Linde show how dominant logic may drive change – here in the direction of permanent transformations towards up-and-coming trends and technologies like the fuel cell.

While the reasons for this resistance to change may be different, Prahalad and Bettis (1986) pointed to cognitive issues around 'dominant logic' (DL) as the "way in which managers conceptualize the business and make critical resource allocation decisions" (p. 490). As DL can drive or prevent disruptive change, DL comes into play when an explorative turn is required. Particularly in the case of strongly committed and traditional power utility companies, DL may relate to traditional ways of managerial thinking based on previous experience and accomplishments that make them stick to the old business and get stuck in an exploitation trap. Two faces of the DL debate appear: DL as a value when it leads to renewal and DL as a liability when specific knowledge and old styles of thinking prevent the required changes. Accordingly, we raise two research questions:

RQ1) How to re-conceptualize the construct of the dominant logic to address both the driving and the hampering role in the case of explorative turns?
RQ2) Which factors restrain and which factors allow explorative turns?

The response to these questions is relevant, as the explorative turn in connection with an exploitative trap is a less understood phenomenon that relates to a wide number of industries. Currently, the automotive industry is undergoing a fundamental change, where incumbents still stick to previously learned ways of manufacturing combustion engines, trying to 'greenwash' business models and technologies (Fischedick & Grunwald, 2017). Many established companies in mechanical and plant engineering still believe in the power of traditional ways of designing and tailoring solutions, with limited drive to move towards advanced 'industry 4.0' options. On the other hand, and on a more general level, societies recognize the power and potential of recent AI solutions – and this conviction currently opens many doors for change. While DL seems to be in place in all these cases, we still do not know very much of the ambiguous role of DL in the context of rapid change. Facing the relevance of this issue, this paper makes a contribution to fill this relevant gap and aims at specifying this ambiguous, yet largely undiscovered role of DL, by taking into account the time dimension.

As for the contribution, the study enhances research on managerial cognition with an emphasis on the complex interplay between the individual, team and organizational level that allows an explanation of DL's ambiguity. A six-factor framework refines and structures the cornerstones of DL that are decisive to the value or liability role of the construct. Owing to the complexity of the research topic, a qualitative research design is chosen that rests on a single case study.

This article proceeds as follows: the next section provides the conceptual background and state of the art in the literature. Afterward, the methodology clarifies the epistemological frame and delivers details of the empirical fieldwork. It is followed by a section on the results that already comprises a discussion. The article ends with a section on conclusions and implications.

CONCEPTUAL BACKGROUND

This section seeks to clarify the core constructs in use. This step is connected with a literature review to locate the state of research.

Dominant logic and its immanent ambiguity

Basics of DL. Following the research line, the DL construct rests on beliefs, assumptions, experiences, and industry-specific identities with predictable models of behavior and action consequences (Bettis & Prahalad, 1995). The discourse on DL in strategic management research is, to some extent, iterative. On this note, Bettis and Prahalad (1995) extended the above understanding and regard DL as "a fundamental aspect of organizational intelligence, whereas organizational learning can be thought of as occurring at the level of the strategy, systems, values, expectations and reinforced behaviors, which then shape the dominant logic through feedback" (p. 7). The ambiguity in definition highlights the complex nature of DL. Furthermore, a state of ambiguity implies complexity as well as uncertainty (Kaplan, 2008). This research aims to contribute to the conceptual development of a special view of DL as a barrier to and enabler of innovation by explaining how DL is related to organizational transformation and to shaping managerial decision-making, especially under time pressure and causal ambiguity (March, 1991). This balanced view of DL ties in with most recent discourses on hybrid phenomena like 'enabling constraints' (Selden & Fletcher, 2015; Gancarczyk et al., 2021).

The roots of the DL phenomenon stem from cognitive psychology (Grant, 1988; Ginsberg, 1989). The DL concept rests on input from four streams of research on cognitive maps and problem-solving behaviour: "operant

conditioning, paradigms, cognitive biases, and artificial intelligence" (Prahalad & Bettis, 1986, p. 491). This traces back to Kelly's construction systems as "transparent patterns or templates, which he creates and then attempts to fit over the realities of which the world is composed" (Kelly, 1955, p. 7). In our case, this interrelation of thinking and acting, the management's interpretation of the environment, has a 'double effect' with positive (value) and negative (liability) impacts.

DL and Liabilities. An important facet of DL relates to its consistency and rigidity (Blettner, 2008). Tversky compared people's internal representations to mental maps and cognitive biases in general, supported by mental collages and spatial mental models (Tversky, 1993). On the one hand, this mental mapping is an articulation of fundamental beliefs and expectations based on previous accomplishments and failures (Kor & Mesko, 2013, p. 235). On the other hand, this can imply systematic errors or wrong judgments of the environment. Especially in times of rapid changes, these interpretations may be detrimental and end up in the least possible efforts or following old paths and learned rules (Greif & Laitin, 2004).

Later contributions from research on organizational and institutional theory revealed change-inhibiting forces based on negative developments of a managerial logic and its adoption by organizations, which may result in technological, organizational, and strategic lock-ins (Sydow et al., 2009). The organization moves along its own path. Alternative ways and choices may remain hidden, as well as market changes ignored (Levitt & March, 1988). Even signs of innovation tend to be seen as provocation or threat (Markides, 2006) rather than as an opportunity. Preservation of the well-known business and an (over-)emphasis on exploitation, based on firm routines, technological expertise, established learning styles or core competences (Leonard-Barton, 1992; Bettis & Wang, 2003) seems to be 'logical' from this angle – a disruptive change, however, not. Based on empirical evidence in mechanical engineering, Freiling and Dressel (2015) found how a goods-dominant logic, developed and practised over decades, 'made sense' internally and prevented the unfolding of service-dominant logic (Vargo & Lusch, 2004; Vargo & Lusch, 2007).

DL and Value. A firm's cognitive framework develops over time framed by resources, assets and knowledge and, on a different level, organizational boundaries. Each company has its own unique experiences with DL's emergence and its establishment within iterative learning processes. This influences a firm's resource allocation and competence configuration (Kor & Mesko, 2013). Mental maps provide a firm-level information filter, even more, a "collective learning system" (Prahalad & Hamel 1990, p. 82) and a knowledge set on how managers may trigger complexity and deal with information overload by using core capabilities (Leonard-Barton, 1992).

DL, related to the firm's competence repository, available technology and market knowledge, may influence the strategic direction, firm's positioning, and the organizational intelligence (Bettis & Prahalad, 1995) – with the latter shaped by individuals, their capability to interpret environmental dynamics and opportunities in rapid changes (Danneels, 2004). However, individual managerial mental activities are the basis for corporate value creation, strategy development, and a firm's performance in a core business through the application of specialized competences, previous experiences, and, not least, business failures (Greitemann et al., 2014). This all unveils the valuable nature of DL.

There is a growing interest in mental processes at an organizational level within management and organization literature, which triggered research on the wave of a 'cognitive revolution' (Butler et al., 2016). Only a few publications reveal empirical research findings with a focus on DL's deep dive into managerial cognition (Benner & Tripsas, 2012; Raffaelli et al., 2019). Based on the longitudinal analysis, the purpose of this paper is to continue the controversial debate on the impact of DL on explorative turns versus exploitation traps. Drucker illustrated the role of managerial logics as follows: "The greatest danger in times of turbulence is not the turbulence – it is to act with yesterday's logic" (Drucker, 1980, p. 1). With the ambiguous role of DL as a driver and a barrier to innovation, there is a need for an analytical framework to consider this role more explicitly and to also consider the time dimension, which is a core purpose of this study.

Dominant logic and the time dimension

As DL evolves over time, the time dimension plays a significant role in the DL operationalization process. Especially in decision-making under radical uncertainty, the incumbent organization draws on values incorporated in available resources, knowledge, and capabilities. Whether an explorative turn takes place or the company fails to renew depends to some extent on overcoming resistance to change. Schumpeter (1934) conceptualized the notion of 'creative destruction' as a possibility to innovate or renew. So doing, he pointed already to the entrepreneurial power on the one hand and the conservative forces on the other. When creative destruction should unfold, the entrepreneurial power has to be stronger at a single point in time and during a running process. Following this thinking, Brandtner and Freiling (2019) elaborated that corporate innovation and transformation processes need an organizational turn from exploitation to exploration. Building on the creative destruction process, the old state has to be overcome and replaced. This, however, is counter-intuitive for many deciders, insofar as the old

constellation is made of many valuable and appreciated things, reinforced by habits. Thus, there are reasons why an established constellation was dominant or still is. Over time, values emerged and abandoning them could cause a state of emptiness and disorientation (Brandtner & Freiling, 2019). This gives rise to the impression that DL can be context-dependent and favoring an old business concept. In those cases, it could be that the logic needs to change to allow making sense of an explorative turn. In other cases, when such context dependence does not occur, the new constellation simply needs to make more sense to deciders individually and in groups. DL can prevent realizing ambidexterity and favor exploitation (Gibson & Birkinshaw, 2004). In times of rapid changes and the need for more exploration, "the blinders of dominant logic" handicap the organization to recognize risks and chances (Prahalad 2004, p. 172).

When entire paradigms for thinking and acting in terms of doing business are changing, organizations involved in these businesses need to provide a response in different regards. This holds true particularly for the ongoing digital transformation that often not only changes the rules of the market but opens completely new markets. In these settings, the response implies continuous changes of organizational structures, strategies, and business models (Slater & Mohr, 2006; Pan, 2017; Ross, 2019). This is difficult to achieve, insofar as digital transformation is about how technology changes the conditions under which business is done (Kane, 2017), as well as aligning the enterprises' culture and people with the digital strategy. Wessel et al. (2020) developed a process model to distinguish between different types of transformation, based on case-study research, and found out: "Digital transformation involves a new organizational identity compared with IT-enabled organizational transformation that enhances an existing organizational identity" (Wessel et al., 2020, p. 1).

In 2015, the Global Center for Digital Business Transformation launched a series of biennial studies to understand better attitudes and behaviors towards digital disruption in selected industries. Digital Vortex 2019, the third of these studies, showed " (…) that all 14 industries have moved closer to the center of the vortex, where the velocity and magnitude of change are highest" (Digital Vortex, 2019, p. 4). The energy and utilities sector, ranking #13, is one of the industries already dragged into the digital vortex, although it is moving at the moment along the edge. This implies that energy companies have a bit more time for preparation. However, in the last few years, the progress was anything but convincing. "Energy companies have failed to achieve substantial business value from digital because their approaches do not account for the unique challenges of being an energy company, which create extraordinary inertia" (Booth et al., 2020, p. 2). Following Booth et

al. (2020), the companies are still not committed enough to overcome this inertia. Cognitive restraints work as innovation barriers and limit learning for necessary changes, while flexibility and values become decisive factors for competitiveness in the digital revolution (Prahalad, 2004; Friedrich von den Eichen et al., 2015). Booth et al. (2020) add regarding the energy industry that "the mindset of business executives has evolved over the years, but still not enough" (p. 5).

When rapid and major changes are not necessary in' normal times', DL provides stability and accompanies corporate culture with a shared philosophy, identity, and a way of doing business (Weick & Sutcliffe, 2007). These operational characteristics are important for sustainability and improvement of the exploitation activities of the current business based on existing resources (Helfat & Martin, 2015). Over time, it may constrain managers' attention to the extent that they do not see (strategic) real options (Collan et al., 2014), so that 'cognitive rigidities' and 'cognitive inertia' occur (Hodgkinson & Wright, 2002). The stabilizing effect of DL initially protects companies from complexity (value), but finally, DL becomes resistant to change (liability) and turns into an innovation barrier: "exploitation wins over exploration" (Danneels, 2004, p. 3) and an exploitation trap occurs (Freiling, 2018).

The time dimension refers to the fact that DL emergence builds on two value-creating factors: competence repositories and organizational memory. Organizational memory collects and condenses past events (Govindarajan, 2012). At the same time, organizational memory creates preventive mechanisms against (extensive) change and innovation. For instance, the time dimension refers to prior experience and established routines so that DL does not develop 'overnight.' This opens the door for the need to unlearn when modifying or breaking old paths (Wang et al., 2016; Chlebna & Simmie, 2018).

Elements of the dominant logic in the light of the ambidextrous tension

According to the research questions, this study targets DL determinants that consider both the driving and constraining role DL plays when it comes to disruptive change. The original DL concept and further research on DL and interlinked concepts reveal four fundamental model components: value and expectations, competitive strategy, measures of performance, and reinforced behavior (Bettis & Prahalad, 1995). Prior research already suggests factors that drive the interplay of the four components. Prahalad and Bettis (1986) refer to business success in the past. Several scholars pointed to the enabling and constraining role of core competences (Leonard-Barton, 1992; Freiling

et al., 2008; Greitemann et al., 2014) that form and enable dominant logic. Structural rigidity and cost traps are another reason why it may be 'logical' to stay rather than to move (Kor & Mesko, 2013; Shollo & Constantiou, 2013). As another factor set, the knowledge potential, the learning capability and the readiness to unlearn are important cornerstones of DL and may impact an explorative momentum (Teece, 2007; Gavetti, 2011). The same holds for managerial risk aversion and complexity reduction (Prahalad & Bettis, 1986) and communication and information behavior (Walsh, 1995; Bettis & Wong, 2003). With these cornerstones in mind, the empirical challenge appears to learn from case evidence. The context is a rather conservative industry under the highest pressure to change. Synthesizing the findings of this section and relating them to earlier publications allows the following condensation and systematization of factors that the next sections can build on:

1) Prahalad and Bettis (1986) highlighted the relevance of past experiences in managing business. We label this factor (A) as *business success in the past.*
2) Various authors described the role of organizational and managerial capabilities, rigidities and competences in the core business (Prahalad & Hamel, 1990; Leonard-Barton, 1992; Greitemann et al., 2014). We label this factor (B) as *core competence dependence.*
3) Recent research on structural rigidity (Leonard-Barton, 1992) and cost traps (Kor & Mesko, 2013; Shollo & Constantiou, 2013) allowed deeper access to understanding conventional business logics. We combined these characteristics in one factor (C) we named *structural rigidity and cost trap*.
4) Some authors stressed the relevance of knowledge and organizational learning processes. We followed the suggestion of Teece (2007, 2016) and Gavetti (2012) to consider a factor (D) named *knowledge potential and learning capability*.
5) As a reflection of the environmental requierements and the managerial handling of huge data flows (Teece, 2016; Bettis & Prahalad, 1995) we consider *risk aversion and complexity reduction* as factor (E).
6) According to prior research, DL influences communication styles and information handling (Walsh, 1995; Bettis & Wong, 2003), that crystalized *communication and information behavior* (factor F).

In the empirical analysis, we refer to these factors for the aggregation of the theoretical dimensions whenever data suggests this. However, as the methodological section shows, our procedure is data-driven and open for new findings beyond these crystallized factors.

METHODOLOGY

This section seeks to clarify the epistemological foundations by specifying and explaining the research design. Afterwards, the procedures of data selection and analysis are explained.

Research design

Due to the complexity of the research object, this study rests on social constructivism and employs an explorative qualitative research design to respond to the nature of the research questions raised above (Kukla, 2000; Yin, 2014). As a rather 'sticky' construct relevant to individual, group and organizational decision-making, it is deemed important to gather in-depth data from multiple perspectives. As the companies in the respective power utility industry are big and complex, the choice of a single case-study design appears to be useful (Yin, 2014). To be open to new findings, this study employs an inductive approach that starts analyzing with data from the field. However, to consider the findings in the literature, the procedure follows the Gioia et al. (2013) procedure of a systematic inductive approach that allows structuring and interpreting data by using established frames and findings from prior research.

Data deletion

A single case on a complex phenomenon requires the extensive on-site experience of the authors' observations to allow cognitive insights on the drivers and barriers of organizational innovation related to DL (Huff, 1997). The selection criteria to identify the case company are: (i) power utility focus to ensure that the business is under the strong pressure of the 'Energiewende,' (ii) business focus in Germany for the same reason, (iii) age and tradition to allow the development of a strong DL and (iv) size to identify complex settings. To avoid biases by triangulation, the data stems from different sources. The prime data source is in-depth interviews. To allow unexpected findings, the interviews are semi-structured with a narrative section right at the beginning and followed by a set of follow-up questions closely related to the research questions.

The number of interviews should follow the data saturation principle, according to Yin (2014), so that no more interviews were scheduled in the case of only marginal additional insights of the last two. The total number of interviews is 13. As a first step of data triangulation, interviewees from inside the company (ten interviews) were chosen, as well as external experts

(three in number) with intimate knowledge both about the company and the industry for triangulation purposes. First, triangulation of perspectives (internal/external) allows comparing findings from different sources of information and to reduce "false conclusions" (Hammersley, 2008, p. 23). Second, this implies a different understanding of DL based on 'confirmation bias' (Tversky & Kahneman, 1974) and 'judgemental heuristics' provided by internal informants and external experts.

Internal experts are managers with responsibilities in the area of strategy, business model development, and implementation. We focused on decision-makers (Raynaud & Arrow, 2013), senior managers, vice presidents and board members, as managers in these positions are involved in decision-making processes that shape the organizational path and leave an imprint on DL. For external experts, we deliberately chose experts from the power utility industry with independent perspectives and considerable expertise of at least the industry: consultants, competitors, and former managers. They validated findings as an accurate representation of the phenomenon and its impact on the organization.

For validation reasons, specifying the time sequence was important to set up an interview phase in the short time period from November 2016 till March 2017 – the peak of the transition debate in Germany. This is the point in time where energy companies in Germany stopped complaining and tried to go for explorative turns. This way, all interview partners have been on a similar level of awareness and information. Table 1 provides an overview of the interviews, the time when they were held, the duration, information on the interviewees, as well as the codes used for anonymized data analysis. Each interviewee got a unique study ID, which differentiates corporate affiliation (internals v. externals) and management level (first, second, third) of the interviewees. All interviews were held in German as the relevant business language and audio-recorded as well as transcribed.

In line with Wolfinger (2002), observation-based fieldnotes and secondary data from websites, social media and mass media accompanied the interview data. While the interviews are the prime data source, the observations and the secondary data sources are meaningful and useful to check and deepen the impressions of the interviews. The goal of the observation was to experience the way of thinking and action in the DL context by taking the entire atmosphere and the interactions of decision-makers into account. Observation memos helped to document the impressions and to consider them in the steps of data analysis. With intensive access to the case company, these fieldnotes are extensive and useful for identifying DL related topics and checking prior research findings in the light of the case setting.

Table 1. Data matrix and codes

Case	Single case study in German Power Utility Sector												
Data	Fieldnotes and Interviews												
Period	October 2016 - March 2017												
Category	Internal interviews										Ext. interviews		
Date y/m/d	2016/11/23	2016 12/05	2017 03/15	2016 10/26	2016 12/02	2017 01/03	2016 10/31	2016 11/15	2017 01/25	2017 02/08	2016 10/24	2017 03/15	2017 03/28
Time (min)	73	73	58	90	50	65	55	110	73	100	90	73	70
Q1	How long have you worked/did you work in the company/in Energy Sector?												
Years	>10		≤10				>20				≤10		
Q2	What is/was your Management/Partner level?												
Level	1M-First (low) Management level Head of Department (HoD) Project Lead (PL)			2M-Second (middle) Management level Vice President(VP)			3M-Third (top) Management level Senior Vice President (SVP) Director (D)				Partner Management level Partner (P) Senior Partner (SP)		
Position	HoD	PL	HoD	VP	VP	VP	SVP	SVP	SVP	D	SP	SP	P
ID Code	INT-1M-001	INT-1M-002	INT-1M-003	INT-2M-004	INT-2M-005	INT-2M-006	INT-3M-007	INT-3M-008	INT-3M-009	INT-3M-010	EXT-2M-011	EXT-2M-012	EXT-3M-013

Data analysis

We employed a systematic inductive approach to condense and convert raw data into 1st- and 2nd-order categories (Gioia et al., 2013) – and to develop research propositions based on it. To identify relevant patterns and supported by MAXQDA as software for analyzing qualitative data, we conducted an open coding in line with Corbin & Strauss (2008) based on a keyword search in the interview transcripts. First, we analyzed interview data and fieldnotes line by line to identify relevant statements on DL and paraphrases representing key findings. For example, the common statement in interviews: "*We were successful and satisfied with the way things were going in the energy sector"* was coded first as *everything was better in the past* and later this code was re-examined in fieldnotes and re-coded as *dwelling on past success.* Codes and categories were developed iteratively from the first to the last interview analysis. Afterward, the inductively generated codes were applied and aggregated to a list of concepts (1st-order analysis according to Gioia et al., 2013).

In sum, we extracted 68 codes within the 1st-order analysis. At the next level of the data aggregation, we analyzed similarities and differences among the codes (Corbin & Strauss, 2008). First-level codes, which represented similar ideas, have been grouped in higher-level categories where some of them became indicators. In sum, we identified 18 indicators that provide these category labels (Gioia et al., 2013) and evidence of managerial logic and its specific role. During the 2nd-order analysis, we analyzed links between our findings and theoretical themes in the light of the research objectives. The data aggregation allowed explaining phenomena and re-examining theoretical dimensions (c.f., 'Conceptual Background').

Figure 1 provides an exemplified overview of how to move principally from raw data via 1st-order concepts and 2nd-order themes to aggregate dimensions. The aggregate dimensions are core to responding to the research questions in terms of DL related factors with impacts on driving or hampering explorative turns. Glaser and Strauss (1967, p. 45) coined this process as "theoretical sampling" followed by "theoretical saturation" that allows the aggregation of dimensions. The identified mechanisms allow insights on DL's impact on explorative turns as well as internal factors constituting DL.

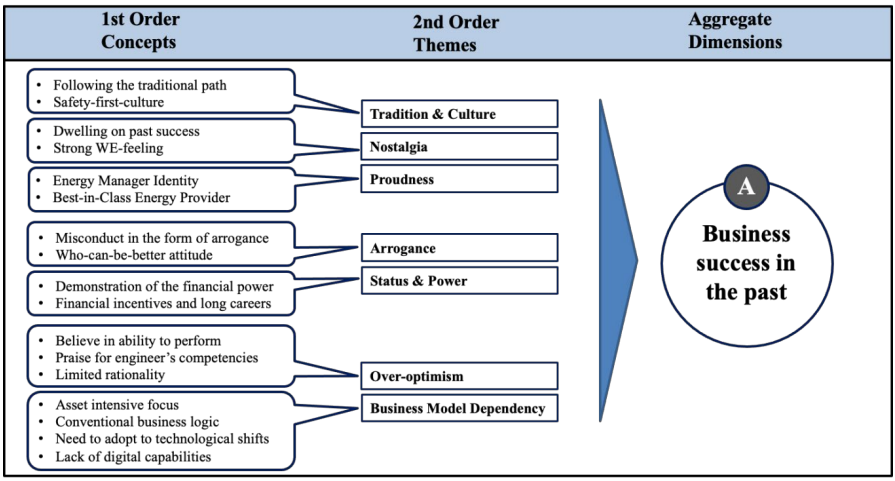

Figure 1. Example of the data structure of 'Factor A'

However, when we analyzed interrelations between different factors and indicators, micro processes such as the capacities to unlearn, explore, change, and manage in digital frames of references appeared. This step was valuable to understand the impact of DL on explorative turns from a process view. For this reason, we re-examined our aggregated data with a focus on DL development with reference to the digital context (c.f., 'Results').

The preliminary coding of collected data helped achieve consistency (Charmaz, 2014) between observation memos, secondary data, and transcripts to generate a picture representing a firm's DL and its development. To ensure the validity of this picture, the findings were presented to a small circle of external experts. In line with Corbin and Strauss (2008), the communicative validation took place on different levels of the research process: (i) coding, (ii) theoretical saturation and (iii) re-conceptualization of DL. First, we discussed our initial results from the data aggregation process with experts for both a critical and a constructive reality check. When regarding the defined categories from the meta-perspective, they provided feedback on our handling of codes, themes, and theoretical dimensions. They provided some ideas about the interpretations of the original text sequences, which allowed a reduction in data complexity. Second, the experts checked the findings for an accurate representation of the phenomenon and its impact on organization.

RESULTS

This section starts with a short overview of the case company and proceeds with data structured around the two research questions – responding to them one by one. The section concludes with a discussion.

Case description

The researched company is one of Germany's largest energy providers with a long tradition and an impressing track record. In response to political, social and economic requirements, the analysed company was split up in two separate units during this study. The first unit, with its core competences in conventional plant operations, was founded as a completely new company with a new brand, while the second one carried on the 'old' brand focussing on renewable energies, decentralized energy production, intelligent networks, and customer services. The organizational setting had been changed significantly and the focus of both parts of the company were increased by the change. However, the logics behind and the mindsets of the management did not need to change – and they did not change. This way, the 'old world' was transferred in a new setting – but not really transformed. The management team was divided into two teams, but essentially the staff did not change and stuck to the old way of doing business. They moved on, doing the same things, following the same routines and logics under a new brand: 'old wine in new bottles'. As mentioned before, this meets with the general observations in the energy industry: "Many energy executives have been at the same company for at least 30 years, rising through the ranks by running a well-worn playbook" (Booth et al., 2020, p. 4).

Findings on the ambiguous role of DL (RQ1)

Developing a data structure by way of "theoretical saturation" (Glaser & Strauss, 1967, p. 45), we investigate whether it is possible to use a Six-Factor framework (cf. 'Conceptual Background') to describe the phenomena we are observing. In our data gathering and interpretation process, we used our theoretical insights about six factors: (A) business success in the past; (B) core competence dependence; (C) structural rigidity and cost trap; (D) knowledge potential and learning capability; (E) risk aversion and complexity reduction; (F) communication and information behavior. Moving back and forth in the available data, the analysis suggests high suitability of the condensation according to the conceptual background above. The

analyzed data in balance with the theoretical insights support comprising a reconceptualization of DL by six factors.

Against this background, a first contribution at reconceptualizing and refining DL is possible. Based on the Bettis and Prahalad (1995) illustration of DL as an information funnel, we can modify the filter structure of DL. The six factors identified in the data, based on both theoretical and empirical findings, allow a more fine-grained understanding of the components that form DL. Consequently, Figure 2 considers these six factors in a cohesive framework building on Bettis and Prahalad's (1995) seminal work.

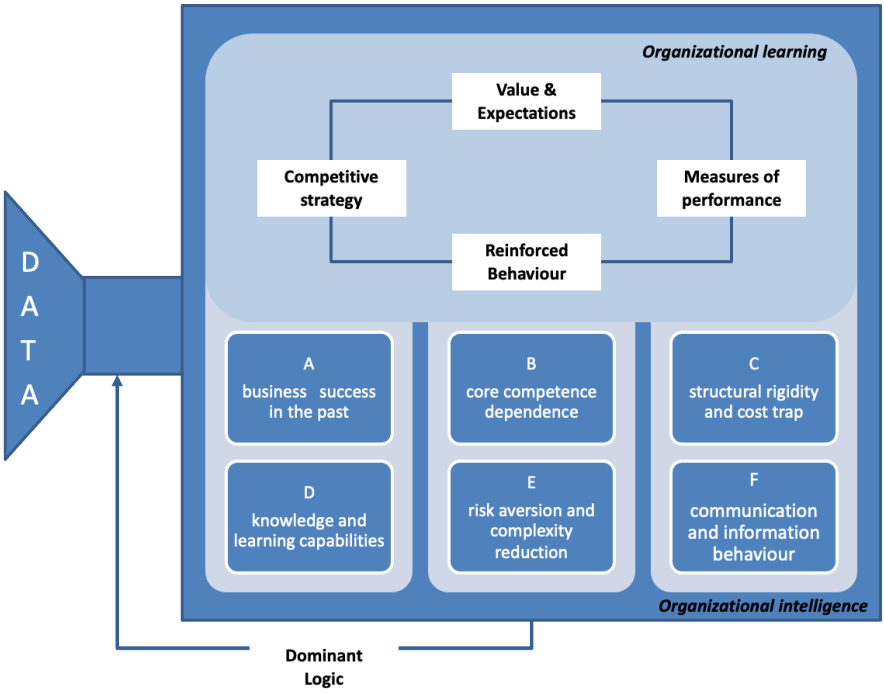

Figure 2. Reconceptualization of the Dominant Logic by a Six-Factor Framework

Source: Own illustration based on Bettis and Prahalad (1995, p. 7).

Building on Bettis and Prahalad (1995), the huge amount of data is filtered by DL and incorporated into the organization with an impact on "the analytic procedures managers use to aid strategy development" and on "organizational learning" occurring at the level of the strategy, value, expectations, measure of performance and reinforced behavior (p. 7). We modified the funnel by adding in six factors belonging to the "organizational intelligence" (Bettis & Prahalad, 1995, p. 7) as they shape managerial cognition and managerial

decision-making processes in real time (c.f., the sub-section 'Dominant logic and its immanent ambiguity'). The orchestration of these factors is useful to understand frames of reference, particularly in times of rapid changes.

The model developed here sheds light on the impact of the combination of the different factors that constitute DL and cause a specific organizational behavior that permeates managerial decision-making and activates the driving or hampering role of DL. DL corresponds to environmental changes in different ways and depending on the equilibrium of the factors, it provides either value or liability. The set of coherent factors influence the development of DL in relation to the external environment and changing times. We investigate both the positive and negative effects of these factors (cf. *Process facets*). Especially, facing rapid changes like digitalization, inevitably affects strategic moves.

Therefore, it seems reasonable to assume that this modified comprehension of DL along these six factors (dimensions) helps to handle the ambidextrous character of DL (c.f., Conceptual Background). The modified structure reflects the complexity of the DL phenomenon. Inevitably, the list of factors may encompass relevant items that are context-dependent and generalized for further empirical analysis (Brown, 2015). Notably, the conceptualization of DL originates from the dynamic interplay of the six factors with a driving or preventive impact on an explorative turn during the disruptive changes in the German power utility sector.

Remarkably, the intra-organizational data sources allowed moving from initial data to themes, concepts, and dimensions. The results were discussed with external experts. The data analysis revealed that digitalization was one of the core topics when it comes to understanding the role of DL in the context of an explorative turn. In Figure 2, the data reveals to some extent how far the single perceptions of interviewees seem to translate into convictions shared at least at the team level, if not at the organizational level. Moreover, it shows skepticism whether an explorative turn of the digital kind may create value or destroy it. Accompanying observations confirm this to a large extent and reveal the relevance of an exploitation trap in terms of the opinion that digital moves are not necessarily better and that the organization needs time to prepare before starting to go in this direction.

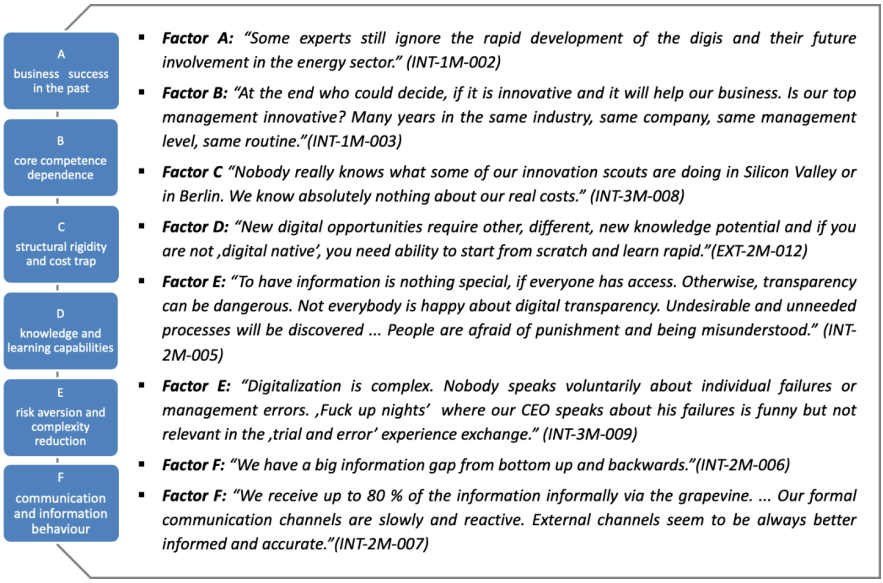

Figure 2. The evidence of DL in the digital context

Findings on DL-related factors and the explorative turn (RQ2)

To respond to RQ2, it is essential to understand the cognitive patterns that make it hard to move from an old business to a renewed one. The interconnection of factors and related indicators allows access to these patterns. We selected and analyzed argumentative indicators that are significant for an adequate reconstruction of determinants and result in an analytic overview of the mechanisms relevant to the challenge of the explorative turn. Indicators like 'arrogance,' 'nostalgia,' 'non-recognition,' 'dependency on traditional business model,' 'group thinking,' lock-in,' 'over-optimism,' 'fear of uncertainty,' 'allocation of blame' have been crystallized as 1st-order codes from data. A taxonomical order of indicators (resulting from the 1st-order analysis) provides an opportunity to align the visibility of the factor–indicator connection, to facilitate a better understanding of their interrelations and finally to explain the forces driving or constraining explorative turns.

The same indicator can address different factors, but which factor is really powerful in the end depends on a combination of indicators based on context. We recognized how relevant it is to pay attention to this interrelation. The nature of casual relationships with positive or negative connotations helps to describe and explain the impact of DL on explorative turns. In this context,

data reveals four managerial capacities that strongly depend on DL, namely the capacity to (i) unlearn, (ii) explore, (iii) change, and (iv) manage. Figure 3 portrays these processual capacities in the light of the six-factor framework developed above. The figure already comprises first paraphrases from the empirical data set. The three factors A, B and C structure DL in such a way that an exploitation trap is the result. This is only negative for the company in those cases when rapid changes are necessary (digitalization, energy transition). In the case of evolutionary change, however, the influence of factors A, B, and C is a value for the company. It helps to focus and to keep track. If the target is to achieve an explorative turn, then factors D, E, and F are crucial. They may re-animate the dormant capabilities needed for exploration and, thus, help reduce the liability impact of DL. These capacities allow a return to exploring new ways of doing business ('explorative turn'). However, their (re-) activation takes time within change processes. This often implies processes of unlearning, which are sometimes much more complicated and challenging as learning. The four managerial capacities influence DL and allow explorative turns based on available data, which is explained in more detail below.

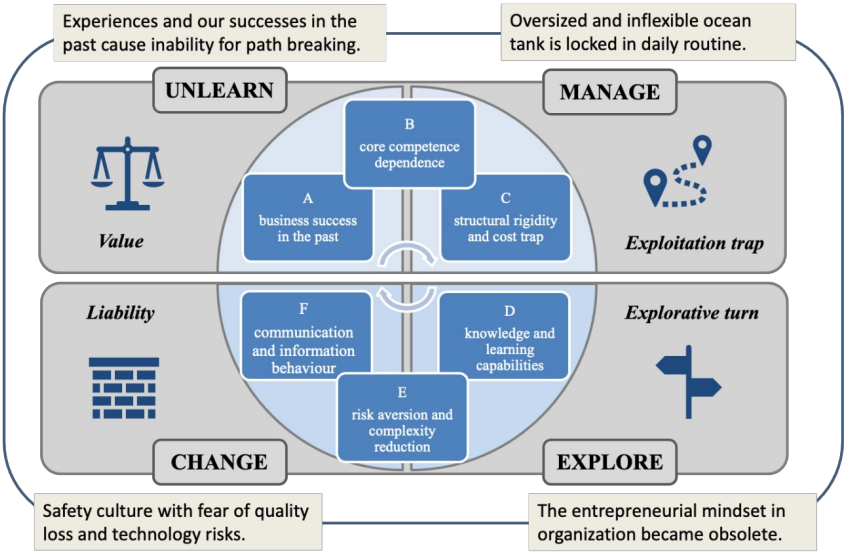

Figure 3. Managerial Process Capacities and the Six-Factor Framework

***Capacity to unlearn*.** The *capacity to unlearn* is related to the role of open-mindedness versus inflexibility. A low capacity restricts the openness for the new digital opportunities. Dynamic use of digital networks may provide new experiences and digital knowledge. Technology knowledge and project

experience occupied a prominent role in all interviews (Fieldnotes, 2016/11/20): The interviewed partners are proud of the company's experiences, knowledge potentials, and learning capablities *based on core competences and business success in the past* (factor D). Nevertheless, we identified discussions around the knowledge exchange between departments. Therefore, indicators like 'power position' or 'group thinking' describe internal interrelations. The majority of decisions is based on power or group dependency, less so on 'rational facts.' The business environment changes have been ignored for decades. This makes it easier to stick to previously learned and highly understood procedures and makes unlearning much harder.

Additionally, the frequently raised question, "Do we have the necessary qualifications, digital competencies, and right mindset in our house?," emphasizes the importance of companies' knowledge potential. Digital technology trends push out from the comfort and security zone and transcend the intimate knowledge base considerably. This requires acquiring new capabilities and different kinds of knowledge. The interviewed managers doubt about internal learning capabilities like "digital literacy" (INT-2M-002) and ways to overcome barriers based on collected experiences and past knowledge. According to the interviews, respondents believe that each learning process has to start on top of the company and to move strictly top down. One thing for them is clear (Fieldnotes, 2016/11/20): *Continuous learning outside of the box, outside of the energy sector, could help the company avoid the insufficient perception of the urgency due to the rapid business environment changes. Significant amounts of digital products are there, thus, customers expect from the energy sector new solutions and products with service levels they have experienced in other industries*. In this regard, it is important to start with the end user needs: "to learn fast or to forget what we know … our knowledge plays against us" (INT-3M-009). Unlearning as a process capacity may only unfold if new and better knowledge is available and to some extent understood, in order to move from exploitation to exploration with a certain conviction to master the change. Research proposition 1 (RP1) mirrors this:

RP1) Explorative DL-driven turns rest on combined learning and unlearning capacities.

***Capacity to explore*.** The narrative part of interviews shares the same elements (Fieldnotes, 2017/01/15): *A majority of the interviewed managers stated that their company has a proven track record of success from the core business.* This focus defined the business strategy for decades and caused a dependency, maybe to some extent an 'ideology.' This belief in their own core competence could be an explanation for a strict resource allocation

and an investment program with extreme focus on geographical expansion and asset strategy, however less so on business model innovation. An asset-intensive company, like the one under focus, clings to their assets which have always been the fundament for new projects and optimization of the current technologies. For decades, energy managers seem to have done well, but suddenly they recognized a downward spiral.

The negative connotation of core competence is linked with a sense of distrust, fear of uncertainty, non-recognition, and fear to be blamed. These key indicators from the interviews concern the dependency on the traditional way of doing business and uncertainty at the same time. Experts recognize that the core competence that predominantly worked well in 'normal' times turned to dependency and inflexibility under uncertainty – like the core rigidity notion of Leonard-Barton (1992) suggests. The competence trap creates resistance and fosters a "wait and see" (EXT-2M-012) attitude. A sense of urgency exists, but the explorative spirit has been lost decades ago.

Concerning business success in the past (factor A, Figure 2), we observed that it mainly relates to an ex-post way of thinking in the power utility sector with a distinct sense for history and tradition. This factor stands for a thinking decade backward. The former business model was successful for many years. The disruption, however, changes the situation completely. This reinforces a typical attitude of "everything was better in the past" (INT-2M-003). The narrative part of interviews reveals that some managers still hang on the past and wallow in nostalgia to cover themselves from all unknowns and unexposed realities. They are proud remembering the company's development after the liberalization of energy markets and during the internationalization phase as well as newly developed activities in Europe.

In the past, an established market position was based on strong brands, traditional technologies, access to resources, and customers – besides strong market regulations of the political kind. In the argumentative discourse, we found a linkage between successes in the past and establishing misconduct behavior. Keywords based on the analyzed context were identified as symbols for the formation of special attitudes in the company. The strong indicators materialize in keywords like arrogance, power, and over-optimism. Strategy failure and lack of success today refer to longitudinal and profound processes started in the past and significantly influence the future. The current business model was successful initially, but the new digital age forces a search for a new direction with an eventually disruptive impact.

Against this background, we can theorize on the *capacity to explore.* Cognitive limitations and a missing entrepreneurial mindset limit this capacity. The management seems to be urgently searching for new opportunities, innovations and for a vision and new ideas, but "the enterpreneurial mindset

in the organisation became obsolete" (INT-3M-009). The willingness to face challenges is buried under fear and a huge number of exploitative activities that are time-consuming and restrain their creativity. The described current state is "the corporate management is running after ages of external moves without clear direction and the management on the business level is playing not to lose covered by a flurry of daily business" (INT-2M-010). To pave the way towards explorative turns, it is obviously useful to connect old and new businesses in terms of ambidexterity rather than running strictly on explorative paths, so we propose:

RP2) Explorative DL-driven turns rest on a balance between 'exploitative' operational processes and 'explorative' activities.

***Capacity to change*.** Two topics seem decisive for an explorative turn: data transparency and open communication (factor F). The interviewed managers perceive that some action like data centralisation and democratization is required in all business sectors and departments. Nevertheless, they observe not only positive influences that are built on data transparency. Fieldnotes 2016/12/05: *Some of the managers are afraid that confidential data could be interpreted wrongly or even misused. The transparency obviously scares.* On the one hand, there is a fear of reduced or lost information power. On the other hand, there is a fear of disclosure and punishment, if "undesirable and unneeded processes will be discovered" (INT-2M-002).

The communication and information behavior depends on certain issues. The respondents are interested in new technologies, especially related to social media. All of them are sure that digital trends affect their life. Especially regarding digital transformation projects in the company, the state of information is different due to ignorance, cherry-picking, lack of interest, and lack of knowledge. Nevertheless, in the interview discussions we identified "limited" (INT-2M-003), sometimes "restricted" (INT-3M-008) communication behavior. Managerial experience with internal and external information exchange stimulates this behavior. The restricted communication style may interrupt information flows and favor 'grapevines' that could narrow the information gap, but even so exaggerate new fears. This limited internal communication confuses managers through bewildering rapid flows of external information.

The capacity to change relates to the role of organizational culture and self-reflexivity of the management. We find that a "safety culture" (EXT-2M-012) endowment in the firm's way of doing business has a considerable effect on reduced exploration activity. The feeling of uncertainty describes the current state in the company. The 'digital age' has shaped two attitudes:

over-optimism and over-estimating the probability of losses. Moreover, by impeding the level of self-reflexivity, these factors weaken the ability to sense opportunities and threats (Teece, 2007). Data reveals this dilemma. On the one hand, the interviewed managers showed an openness to digital innovation; on the other, they preferred to talk about future risks and losses in the business articulated in fear of "quality loss and technology risks" (INT-2M-003).

The interviewed managers related the high-risk aversion to the high complexity of the product 'energy' with all business levels involved. The "unsexy" product electricity is needed by "everyone, everyday and everywhere" (INT-2M-001). Fieldnotes 2017/01/25: *This 'E³ formula' gives managers a learned pattern of argumentation as to why it is so difficult, complex and hazardous. If somebody starts asking about change activities and innovation openess, he would be blocked and the most defensive responses would be linked to the complex technology and to the risk relevance.* A fear of unknown changes refers to the company's risk-averse culture with focus on different present and historic matters rather than future issues. Running an existing business does not open the door for creative and explorative activities. Managers do not get the time and the resources for experiments or a true entrepreneurial passion. Relatedly, we propose:

RP3(a). Explorative turns rest on different co-existing logics, enabled by organizational reflexivity and multiculturality.

RP3(b). Explorative turns rest on a continuous revision of DL, enabled by diversified businesses and flexibility in managerial action.

***Capacity to manage*.** Furthermore, the also addressed multicultural perspective forces the co-existence and interplay of different DLs at the organizational level. The analyzed company experiences the new digital culture through new businesses and 'young' companies integrated into the established structure. A closer inspection reveals that the willingness to change is obviously connected with firms' traditional structure and corporate size, with structural rigidities and a certain cost trap (factor C). In contrast to definitions such as "well organized" (INT-2M-005) or "process improved" (INT-2M-003), the interviewed managers regard the traditional organizational structure as an obstacle to innovation. In this context, they consider critically several positions like "oversized and unflexible" (EXT-2M-012), "restrained and conservative" (EXT-3M-013), and "kingdom with a centralized, à la command and control style" (INT-3M-009).

Indicators like fear and mistrust represent Factor D. Frequent mentions of these indicators reveal the impact of this factor on the managerial DL and the negative influence on an exploration turn. The empirical findings illustrate

a traditional way of decision-making with a strong relatedness to power and status and a visible impact on the capacity to manage. The cross-over analysis of reasonings reveals that ideas and, even more, the readiness to manage the challenges are missing: in strategy, in competences and in terms of digital innovation. To bring oneself or a complete organization positively in line with radical, disruptive change, it takes a conscious, active influence of blocking dominant logic. This might be complicated by an (apparently) paradox situation. To create a new approach, the old one must be destroyed and forgotten. Fieldnotes 2017/03/15: *This old approach was successful.* And this approach might have been constitutive before, as a *raison d´être*. If so, nobody may be surprised that such a value is not given up without resistance. On the contrary, when such a destruction of the old happens, it first results in a gap that needs to be filled to prevent an emptying of meaning. We conclude:

RP4) Explorative DL-driven turns rest on a reduced role of power in leadership and formal structures.

Following Christensen's (1997) idea, digital disruption may only offer an opportunity if the players have the willingness to change and to act. For the incumbent company, it means a complete transformation: of the business and operating model, the organizational structure and the managerial logic. In other words, all four managerial capacities are influenced by DL, especially in times of digital disruption. To achive the explorative turn, a logic turn is also needed, a turn in the way how managers think and act. On the cognitive level, this implies transformation from firm's current DL based on 'exploitative' operational processes to a logic characterized as 'dynamic,' 'ambidexterous,' 'multiple,' and 'flexible.' Moreover, facing digital innovation, managers with previously defined abilities may design and execute the logic turn in an established organization.

Our aim was to locate the interplay between different DL mechanisms that enable an established company to consider challenges of an exploration turn of the disruptive kind. Moreover, our research propositions concerning 'capacity issues' could be a first step in how companies are operationalizing ideas for cognitive path-breaking and for the explorative turn. Thus, the cognitive process is essentially devoted to developing capacities that lead to the individual logic turn as well as to organizational adaptation to the innovative challenges from its environment. Fieldnotes 2017/03/5: *The DL is still the same and did not show considerable differences. Shorthand reconstruction of conversation shows unanimous mood in all defined clusters: over-optimism mixed with allocation of blame.* As for the results, case evidence suggests that the supposed change did not take place at the most important point in the

minds of the people concerned. To follow up this development in the years to come might open an interesting field for further studies.

DISCUSSION

Prior research on DL revealed a set of factors that constitute, develop and maintain DL. Success in the past (Prahalad & Bettis, 1986), core rigidities (Leonard-Barton, 1992; Greitemann et al., 2014), structural inertia (Kor & Mesko, 2013; Shollo & Constantiou, 2013), knowledge and learning (Teece, 2007; Gavetti, 2011), risk aversion and complexity reduction (Prahalad & Bettis, 1986) and communication and information behavior (Walsh, 1995; Bettis & Wong, 2003) are the structural factors that this study could build on. The data reveals the relevance of every single factor and, thus, allows the development of a holistic set of interrelated factors constituting the six-factor framework according to Figure 2, as one contribution of this study. Notably, the interplay of these structural factors is compatible to the Bettis and Prahalad (1995) framework of modeling DL-based behavior of organizations.

Another discourse relevant to responding to RQ2 is about the mechanisms that allow or prevent explorative turns. The case company is a prominent example that demonstrates how formerly rather successful and still strong companies (at least in terms of assets) struggle with starting exploration, although their old business models are already outdated and defective. Data reveals that four mechanisms, both stand-alone and in combination, explain the run of the explorative turn. The case company struggled with gearing these mechanisms of unlearning, exploring, changing and managing, which are another contribution of this study.

CONCLUSIONS AND IMPLICATIONS

This single case study responded to the research questions raised by pointing to the six-factor framework (RQ1) and the four process mechanisms of unlearning, exploring, changing and managing (RQ2). The more theoretical implications of this study relate to the developed set of research propositions as causalities for the sake of theorizing and model development as to how they influence exploration in the context of DL. These causalities may undergo follow-up research to specify or modify the causal relationships. Moreover, the empirical findings indicate several cognitive maps via 'factor-indicator connections' which influence DL and, thereby, the indirectly, unintentionally, and mostly unnoticed, explorative turns.

As for the managerial implications of this study, the process mechanisms allow both driving and preventing explorative turns. Managers get to know decisive cornerstones for change management initiatives they can deal with – sometimes very much depending on context. A delicate question, however, is whether fostering or preventing explorative turns is beneficial or detrimental to the company. Not in every situation is there such a strong pressure to change as in the case company of this study. A preventing role of explorative turns by DL is not necessarily problematic but can be useful to avoid changes that might get out of control, so that 'self-security mechanisms' may work. However, a core challenge for managers is the management of the complexity of the factors relevant to manage explorative turns in the realm of DL. Another implication is about the way of turning a manager from an "innovation killer" (INT-3M-008) to an "innovation designer" (INT-2M-010). This implies considerable challenges, particularly on the cognitive level. Finally, one should not underestimate the threat that DL may become outdated in the light of running and future developments. This calls for the implementation of reflective mechanisms that help check how 'logical' DL is from a forward-looking viewpoint.

This research study has certain limitations we are aware of. First, we analyzed just a single case in a single country and in a single industry. Furthermore, this single case study could only consider a subset of people. Changing the context may imply different results. However, based on the intensive embeddedness of the authors' perceptions in connection with intensive observations, the researched contexts may represent a situation the entire company was or is in. Moreover, the multiple perspectives of interviewees helped to overcome potential biases. Second, the transformation process in the German power utility sector shows a very unique development and outlines the specific complexity level due to the influences of 'German Energiewende'. Therefore, the findings of this study should be approved in the energy markets of other countries and even more in other industries. Third, the set of findings relates to early explorative research and now offers the opportunity to be tested in further explorative and exploitative empirical studies. Fourth, the data collected is from 2016 and 2017. Although the organizational setting of the case company has been changed in the meantime, the situation regarding the analyzed phenomenon did not change significantly from then on. Key representatives of the management and the factors identified are still in place.

There are additional questions of interest for further research. What is still not considered sufficiently are the attributes that relate to the emotions of managers and managing teams. Sundermeier et al. (2020) pointed to the ambiguous role of hubris in leadership. For explorative turns in connection

with DL, the role of hubris could be interesting as hubristic leadership may drive or prevent the respective turns – and if it plays a role, then the impact can be rather strong. Contextual factors can play a pivotal role as well. This study dealt with a large, long-established company. However, are things different when it comes to small businesses or startups? Currently, the social and work environment has changed considerably due to the impact of the CoViD-19 pandemic. It may be important to understand how far this new and relevant context factor has impacted this study's topic.

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Abstrakt

Cel: *Niniejsze badanie ma na celu określenie roli „dominującej logiki" w organizacji. W ten sposób pojawia się niejednoznaczny charakter dominującej logiki, ponieważ z jednej strony dominująca logika może nadać sens zmianie, dostarczyć użytecznych wskazówek i utrzymać koncentrację firmy. Jednak z drugiej strony dominująca logika może dostarczyć powodów, dla których zapobieganie zmianom może być „logiczne" lub działać jako zasłona, jeśli chodzi o interpretację nadchodzących zmian. Dlatego dominująca logika może być wartością i zobowiązaniem w czasach zmian.* ***Metodyka:*** *Niniejsze studium ma na celu wniesienie wkładu do wcześniejszych badań poprzez postawienie dwóch pytań. Po pierwsze, w jaki sposób możemy ponownie konceptualizować konstrukcję dominującej logiki, aby odnieść się zarówno do roli kierującej, jak i utrudniającej w przypadku zwrotów eksploracyjnych? Po drugie, które czynniki ograniczają, a które umożliwiają zwroty eksploracyjne? Ze szczególnym uwzględnieniem niemieckiej transformacji energetycznej w roku 2010, niniejsze badanie opiera się na eksploracyjnych badaniach empirycznych jakościowych i wykorzystuje pojedynczy projekt studium przypadku dla tradycyjnego niemieckiego przedsiębiorstwa energetycznego, które - jako operator - musi radzić sobie z dużą złożonością niemieckiej energetyki. Źródła danych to pogłębione i skoncentrowane na problemie wywiady z ekspertami wewnętrznymi i zewnętrznymi, a także obserwacje terenowe. Procedura*

indukcyjna pozwala na opracowywanie propozycji badawczych na podstawie danych, ujętych w ramach wcześniejszych badań. ***Wyniki:*** *W rezultacie niniejsze badanie dostarcza sześcioczynnikowej ramy, aby rzucić światło na mikro-podstawy dominującej logiki. To, czy dominująca logika ma wartość, czy też jest odpowiedzialnością za zmianę organizacyjną i umożliwia zwrot eksploracyjny, zależy od zidentyfikowanych zdolności do oduczania się, eksploracji, zmiany i zarządzania. Dane sugerują, że zwrot eksploracyjny, napędzany dominującą logiką, działa lepiej w przypadku połączonych zdolności uczenia się i oduczania się, równowagi eksploracji i eksploatacji, współistniejącej logiki, ciągłej adaptacji dominującej logiki i niższych poziomów siły przywódczej i formalnej struktury.* ***Implikacje dla teorii i praktyki:*** *To badanie określa rolę dominującej logiki, która może utrudniać zwroty eksploracyjne w czasach poważnych zakłóceń.* ***Oryginalność i wartość:*** *Przyczynia się do badań poznania menedżerskiego poprzez udoskonalenie i zastosowanie pojęcia logiki dominującej. Ponadto dostarcza empirycznych dowodów na to, w jaki sposób zjawisko to wywołuje inercję i napędza zmiany, a także umożliwia dyskusję na temat potrzeb i barier dla zwrotu eksploracyjnego. Z menedżerskiego punktu widzenia dominująca logika służy jako filtr identyfikujący wymagane zmiany i dostosowujący szybkość zmian. Zależy to jednak od menedżerskiej refleksji nad stosownością dominującej logiki w biegu wydarzeń.*
Słowa kluczowe: *logika dominująca, zwrot eksploracyjny, pułapka eksploatacyjna, niemiecka transformacja energetyczna.*

Biographical notes

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Conflicts of interest

The authors declare no conflict of interest.

Citation

Brandtner, E., & Freiling, J. (2021). Is dominant logic a value or a liability? On the explorative turn in the German power utility industry. *Journal of Entrepreneurship, Management and Innovation*, *17*(2), 125-157. https://doi.org/10.7341/20211725

City policies to promote entrepreneurship: A cross-country comparison of Poland and Germany

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Abstract

Purpose: *The policy to promote entrepreneurship plays a central role in the strategic management of cities. Therefore, the research question asks how urban policies in Poland support knowledge spillovers and entrepreneurship in comparison to German cities' policies. Also investigated is how do Polish and German cities support entrepreneurship in different forms (including social entrepreneurship, youth entrepreneurship, and creative industries).* ***Methodology:*** *To answer this question, we have adopted a multiple-case study methodology relying on multiple sources of evidence, primarily strategic documents of the biggest Polish cities in the context of cross-country comparison with selected large cities in Germany, and semi-structured interviews with decision-makers representing municipalities from the analyzed cities in Poland. Building on the concept of the knowledge spillover theory of entrepreneurship, we refer to the approach in which spillovers of knowledge are a strategic lever through which firms distribute innovation and have profound implications for the region's entrepreneurial activities development.* ***Findings/research and practical implications****: The research enriches our understanding of urban policies in Poland that support knowledge spillovers and entrepreneurship, and discovers the possible relationship between factors determining entrepreneurship in Polish and German cities. In all Polish and German cities, entrepreneurship was an important component of economic development strategy. However, Polish cities depend on EU funding to a much greater extent than German cities in implementing their economic*

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Received 5 November 2020; Revised 26 January 2021; Accepted 15 March 2021.

development strategies. Cluster strategies in the framework of key cities' industries were embedded in most urban policies, but a majority of Polish respondents believed that their cities should place greater emphasis on this policy. The main challenge for policy-makers is that current entrepreneurial polices should be more effective and oriented towards reinforcing the social perception of entrepreneurship, especially among young inhabitants. ***Originality/value:*** *The research allowed enough data to be gathered to answer the research questions. However, future research validating the results in quantitative study is suggested. Also, some limitations in the research process were highlighted, such as a lack of personal contact with the respondents or different levels of economic development among Polish and German cities. Our research demonstrates the opportunities for knowledge spillover and sharing of good practices between the two countries.*

Keywords: *strategic management of cities, knowledge spillover theory of entrepreneurship, social and cultural entrepreneurship.*

INTRODUCTION

Interest is growing on the impact of entrepreneurship on urban economic development (e.g., Alvarez & Busenitz, 2001; Glaeser, 2007; Isenberg, 2011; OECD, 2018). Scholars have identified entrepreneurship as a process of recognizing opportunities, understanding an idea's or invention's commercial potential, and converting the resulting intellectual capital into successful businesses that create value through innovation (Schumpeter, 1912; Shane, 2007). Moreover, research demonstrates that entrepreneurship is a key factor through which knowledge spillovers stimulate knowledge-based economies. Audretsch et al. (2015) argue that a policy to promote entrepreneurship plays a central role in the strategic management of cities, because knowledge-based entrepreneurship is the key to global competitiveness.

The knowledge spillover theory of entrepreneurship indicates that the level of knowledge-based entrepreneurship is determined by new knowledge creation and whether entrepreneurial absorptive capacity exists to exploit it (Acs et al., 2013). The effectiveness of knowledge spillovers and entrepreneurship has frequently been suggested to depend on factors like a region's enterprise policy and strategy, including start-up strategy (Huggins & Williams, 2011) and public cluster policy (Porter, 1998; Audretsch et al., 2018). Despite the recognition of the importance of new firm formation in urban economic development, a widespread theme in the existing literature is defining the need to support cities' cultural entrepreneurship (Qian & Liu, 2018) and social entrepreneurship (Simón et al., 2016). An example of this theme is the typology proposed by Spencer and colleagues (2005), who

adopted a contingency theory to explain differences in national policies' impact on social entrepreneurship, innovation, and venture creation.

Stough (2003) argues that political and social changes in Central and Eastern European (CEE) countries reduced their investment risk and opened more advanced countries' access to highly skilled and significantly lower-cost workers. These changes resulted in higher-wage, developed countries being forced to invest in new firm creation and jobs in technology-intensive and knowledge industries. Consequently, contemporary regional development policies in those countries focused mainly on innovation, entrepreneurship, firm formation and industrial clustering. By contrast, in CEE countries, growth and development are not necessarily propelled by companies' research and development (R&D) activities (Marelba, 2010). Hence, Poland and Germany were chosen for comparison because of their geographic proximity, strong economic ties and Polish aspirations to catch up with the most developed economies of Western Europe within the next two decades. As Germany is the largest and one of the most advanced economies in terms of technological development in Europe, it offers many opportunities for benchmarking and learning for Poland, including city management practices. The primary purpose of this study is to evaluate current regional development policies in Poland and Germany in their efforts to develop successful innovative environments and provide some insights for the Polish cities, which could allow them to imitate the best practices and follow the path of their most successful German counterparts. As no single policy can be copied and implemented universally to improve regions' performance (Audretsch, 2015), we aim to answer the following research question:

RQ) *How do urban policies in Poland that support knowledge spillovers and entrepreneurship – the key drivers of regions' innovative capacity development to sustain global competitiveness – differ from German cities' policies?*

To answer this question, we have adopted a multiple-case study methodology relying on multiple sources of evidence, primarily the strategic documents of 11 largest Polish cities in the context of cross-country, which were compared with seven selected large cities in Germany. We conducted a series of semi-structured interviews with the decision-makers representing municipalities from the analyzed cities in Poland. Building on the concept of the knowledge spillover theory of entrepreneurship, we refer to the approach described by Agarwal et al. (2010), in which spillovers of knowledge are a strategic lever through which firms distribute innovation and have profound implications for the region's entrepreneurial activities development.

This article is organized as follows: it begins with this introduction, followed by a review of the theoretical strategic orientation of cities' background, the importance of social and cultural entrepreneurship for city development, and actions to promote creative and innovative companies. The methodology is presented in the next section, and the last section reflects on the findings of the study in the context of future policy development.

LITERATURE REVIEW

Enterprise policy and strategy as a key of urban economic development

There is voluminous literature both on entrepreneurship and city development. The special role of regions in the development of innovative capacity to sustain global competitiveness has been a source of inquiries that have recently increased considerably. Starting from the work of Smilor and Wakelin (1990) on key factors in the development of smart infrastructure (talent – technology – capital – know-how model) supported by policy implications, authors have concentrated on company formation and entrepreneurship-oriented policies (Stough, 2003). In pursuing beneficial outcomes of entrepreneurship, governments and regional development organizations enact policies to stimulate entrepreneurial activity (Roundy & Feyard 2019). Scholars consider entrepreneurship to be the most reliable driver of economic growth and community development (Audretsch et al., 2015; Baumol & Strom, 2007; Valliere, 2016). Entrepreneurial activities support job growth and social development (Malchow-Møller, 2011) and economic growth (Galindo & Méndez, 2014; Mumby-Croft & Brown, 2006).

The taxonomy of entrepreneurial theories has been condensed into three major traditions, defined by Hébert and Link (1989). However, the Schumpeterian tradition, which emphasizes the role of the entrepreneur and innovations in the process of economic development, had the greatest impact on further theory development. Similarly, Schumpeter's idea of creative destruction has dominated the framework for entrepreneurship and economic development (Agarwal et al., 2007). According to the Knowledge Spillover Strategic Entrepreneurship (KSSE) theory, introduced by Acs et al. (2008), knowledge is created endogenously. Consequently, industries and regions can grow due to KSSE and can further attract additional human capital as well as its supporting infrastructure.

Cities and regions with higher entrepreneurial activity will introduce greater knowledge spillovers and the resultant commercialization of knowledge, which will lead to economic growth and new jobs creation

(Agarwal et al., 2007). Some cities are much more entrepreneurial than others (Glaeser, 2007). Hart (2003) argues that entrepreneurship policy raises the level of entrepreneurship, concentrating not only on existing entrepreneurs but also on those who consider starting a new venture. Therefore, entrepreneurship policies within regions consist of measures taken to stimulate more entrepreneurial behavior in a region or country (Lundström & Stevenson, 2001). Entrepreneurship policy intends those measures to directly influence the level of entrepreneurial vitality in a country or a region (Lundström & Stevenson, 2005). Regions with their innovative firms and entrepreneurial individuals are henceforth the key contributors to innovation (Breshsnahan & Gambardella, 2004).

Research that explores KSSE through questions related to cities' strategies may be properly addressed by comparisons between two countries. For this purpose, our research analyzes regional policy in selected Polish and German cities to the extent to which such policy accounts for entrepreneurship issues influencing regional competitiveness; these attempts are the first that can significantly contribute to the literature.

Brooks et al. (2019), who examined the role of public policy in the formation of entrepreneurial ecosystems in three Polish cities, argue that Polish attempts to foster entrepreneurial activity had some successes; however, the entrepreneurial ecosystems have still not been created. Previous studies, including Poland in the framework of The Innovative Policy Research for Economic Growth (IPREG) project, were based on an estimation of the total net cost of public expenditure on entrepreneurship policy and the description of the comprehensiveness of these policies (Entrepreneurship and SME Policies across Europe report, 2011). According to Lundström et al. (2014), expenditure on entrepreneurship policy constitutes only 16% of total policy expenditure in Poland, and we observe the same numbers for Flanders. Also, it is broadly similar per capita for Austria, Flanders and Sweden, taking into account differences in wealth. However, entrepreneurship education, policy relevant research, promotion measures and especially innovative entrepreneurship and target policy groups mean values were lower in Poland as compared to Sweden. Hence, our research draws a comparison in the areas that require special intervention. For example, Audretsch et al. (2007) have shown that one area where public intervention can enhance entrepreneurial culture of residents, especially in European countries, is the entity's education policy. Education influences young people's mindsets, skills and attitudes for turning ideas into actions, so that they can be prepared for entrepreneurial careers; it therefore has become a priority in European Union strategy (European Commission, 2010). Similarly, government policy through comprehensive policy strategy and innovative entrepreneurship promotion

can influence the environment for entrepreneurship and increase the innovative capacities of enterprises to address the key global challenges of the 21st century (OECD, 2010). Table 1 presents an overview of the most important factors stimulating knowledge spillover entrepreneurship in different regions.

Table 1. Key factors influencing knowledge-based regional systems of entrepreneurship

No	Authors	Factor influencing regions' entrepreneurial capacity development	Region of research
1	Qian et al. (2013) Lehmann and Keilbach (2019)	Agglomeration and industry specialization	US and Western European areas
2	Qian et al. (2013)	Quality of life	US metropolitan areas
4	Audretsch et al. (2010) Qian et al. (2013)	Social, knowledge and cultural diversity	German cities US metropolitan areas
5	Carayannis and Grigoroudis (2014) Marelba (2010) Lehmann and Keilbach (2019)	Availability of highly skilled and educated people	Western European countries including Germany (Carayannis/Grigoroudis 2014; Marelba 2010) and selected CEE countries including Poland (Carayannis/Grigoroudis 2014)
6	Audretsch and Keibach (2008) Braunerhjelm et al. (2010) Acs et al. (2013) Lehmann and Keilbach (2019)	Spillover and commercialization of knowledge	US and German regions
7	Acs et al. (2013) Fritsch andAmoucke (2013) Qian et al. (2013) Guerrero et al. (2014) Caiazza et al. (2015) Lehmann and Keilbach (2019)	Research university	US metropolitan areas (Qian et al. 2013) and European countries including Germany (Fritsch/Amoucke 2013; Guerrero et al. 2014)
8	Audretsch and Lehmann (2005) Qian et al. (2013) Qian and Haynes (2014) Lehmann and Keilbach (2019)	Infrastructure that enables young firms to absorb necessary resources like business incubators hosted by universities	Germany US regions

No	Authors	Factor influencing regions' entrepreneurial capacity development	Region of research
9	Acs et al. (2013) Ghio et al. (2015) Lehmann and Keilbach (2019)	Innovative clusters	US and Western European regions
10	Braunerhjelm et al. (2010) Marelba (2010) Carayannis and Grigoroudis (2014)	Financial incentives to firms that invest in knowledge creation and diffusion	Western European countries including Germany (Carayannis/Grigoroudis 2014; Marelba 2010) and selected CEE countries including Poland (Carayannis/Grigoroudis 2014), OECD countries (Braunerhjelm et al. 2010)

The importance of social and cultural entrepreneurship

In addition to enterprise policies, we introduce the importance of cultural entrepreneurship, defined by Qian and Liu (2018) as arts and cultural activities leading to new firm formation. Cultural entrepreneurship was recognized as the most creative part of the creative economy, and the authors also show that entrepreneurship itself also requires creativity (Ward, 2004); hence, we focus on the role of government in stimulating cultural entrepreneurial dynamics of local economies (Parker, 2008). More broadly, our empirical exploration may illustrate cultural entrepreneurship as a separate realm within entrepreneurship.

While there is not yet a single agreed-upon definition or typology of social entrepreneurship, Corner and Ho (2010) refer to the concept of opportunity recognition or the identification of opportunities to solve social problems or to create social value. Friedman and Desivilya (2010) describe a range of practices for the creation of new innovative organizations or enterprises to meet social goals and systematic change with economic sustainability or profit. Consequently, social ventures exhibit both entrepreneurial, product-oriented and social-, people-oriented identities, and they share a similar process in acquiring resources for start-ups and growth (Meyskens et al., 2010; Moss et al., 2011). Starting from the research of Albert (2017), Narangajavana et al. (2016), and Simón et al. (2016), our goal is to gain empirical insights into the development of policies to promote and enhance specific types of entrepreneurship like social entrepreneurship and at the same time their contribution to regional sustainability. Hence, we link this part to the work of Zahra et al. (2014), who postulated intersectional studies on social entrepreneurship and international entrepreneurship.

Differences in actions towards creative and innovative companies

One of the main challenges for the strategic management of cities besides entrepreneurship is cluster formation, or any other local structure and organization needed to generate an innovative climate at a regional level (Audretsch, 2015). In this sense, policies targeted at science and technology parks, co-working spaces, technology business incubators, and growing firm clusters seem to be of particular importance (Cooke, 2004). While there is no paucity of research evidence supporting the effectiveness of clusters, we aim to research a direction proposed by Lehmann and Menter (2018). Thus, we argue that regional economic performance is mainly dependent on adequate incentive systems, which encourage universities to engage with industry clusters and infrastructure supporting efficient knowledge and technology transfer. Spigel and Harrison (2017) suggested that government plays a prominent role in leading support programs and bringing actors – mainly firms, public agencies, and universities – together to create public goods.

In this area of public-private sector cooperation in cities, Germany has a long tradition, starting from 1983, the first opening of the German innovation and technology center in (West) Berlin (Heuer 1989). However, according to the Global Entrepreneurship Monitor (GEM) (GEM Report, 2018), in the latest report, both Germany and Poland demonstrate comparable and relatively low overall early-stage entrepreneurial activity. Germany has placed a strong focus on government programs, infrastructure, and financing. Innovation polices supporting new firms started by young people are of particular importance. The GEM results also show that in Poland, the government took various actions supporting the growth of entrepreneurship (e.g., the Constitution for Business) that significantly improved the social perception of entrepreneurship over recent years. Still, current taxes and bureaucracy are not well balanced for entrepreneurial activities and entrepreneurial education at schools. Vocational centers and universities are not effective in building students' entrepreneurial skills and values. Hence, we expect these differences between Germany and Poland to have repercussions for generating knowledge spillovers and entrepreneurship in cities that consequently trigger growth, employment creation, and competitiveness.

METHODOLOGY AND RESEARCH METHODS

Research approach

For our research sample, we selected all of the largest Polish and some German cities. Poland is bordered by Germany to the west**.** Poland covers an area of 312,685 km² and has a population of 38.5 million (in 2015). The capital and largest city is Warsaw, with about 1.7 million inhabitants. Germany is the largest export market for Polish products and services, with an export share of 27.1%. Germany is Europe's most industrialized and populous country. It is famed not only for its technological achievements but also for its contribution to the world's cultural heritage. Poland is Germany's eighth largest export partner, with an export share of 4.4%, ahead of Switzerland. Germany has a population of 81.7 million people (2015); its capital and largest city is Berlin, with about 3.3 million inhabitants. An area of 357,022 km² makes Germany the seventh largest country in Europe.

Despite many differences between the two countries, they also share many similarities. Viewed globally, the two cultures are rather similar, especially from a non-European perspective. Germany is the largest in absolute terms, and Poland is the largest post-Soviet country bordering Germany. Despite a substantial gap between Poland and Germany in terms of annual gross domestic product (GDP 586M USD vs. 4B USD) and GDP per capita (15K USD vs. 48K USD), Poland's economy has been steadily narrowing the gap in the last 25 years after the fall of communism and catching up with Western countries. For example, in 2019, Polish GDP per capita exceeded Portugal's. Over the last 25 years, the Polish economy doubled in size, as measured in terms of real GDP. In terms of GDP per capita (at purchasing power parity), Poland narrowed the gap by nearly half, moving from 32 to 60 percent of the European Union (EU) – 15 average. Key elements of the Polish success story resemble that of the German post-war economic experience, especially relying on social and economic inclusiveness as a driver of economic success (Piatkowski, 2019). Given its economic importance and strong integration in EU value chains, Germany is a source of potentially significant spillovers to other EU countries (European Commission, 2018). The choice of Germany for comparative research was also dictated by a literature review on KSSE theory, where a large number of studies, especially works by the most cited authors in the field like Audretsch and co-workers, were conducted in Germany (e.g. Audretsch & Keibach, 2008; Audretsch et al., 2010).

Research sample

The Unit of Analysis for our study was the policies and strategies in the selected cities. The most popular studies in social scientific research are not exhaustive and complete measurements, but rather measurements based on non-exhaustive and non-random approaches, although it is also fair to say that such studies provide less accurate results than the measurement of the entire population. This conclusion particularly holds for research based on non-random samples, such as target or typical samples as collected over the Internet in Computer-Assisted Web Interview (CAWI) research, which rarely meet the criterion of representativeness in the results, allowing conclusions to be drawn describing a broader community.

According to Churchill and Iacobucci (2010, p. 500): "in such studies, the units are most often selected on the conviction of their desired result." For example, the sample can be constructed with respondents that allow the researcher to get a new perspective on the problem being investigated, where a cross-section of opinion on the subject might not be important. These studies can even be carried out using the researcher's own (often subjective) knowledge about the population and directed by the objectives of the study to what will guarantee more insight or valuable information than any random approach could. As Wasilewska argued (2008, p. 30): "… the essence of purposeful selection of respondents is that only those individuals whose opinion matters provide the researcher optimal information from the point of view of the objective of the study. The researcher selects only those respondents for study, according to his/her best knowledge of the phenomenon being studied". Besides, there is no need to search for all units across the entire population, because some professionals and other experts who are hard to find are only available in specific situations and places like Internet networks. Such databases are even more valid than standard places of data collection like the offices of an organization, for they provide easy and rapid access to people gathered in one place and time, whereas the selection of respondent units for the sample depends on the researcher's judgment, which is made arbitrarily in terms of desirable relationships between traits and the objective of the research.

To sum all these arguments up, when it is impossible or very difficult to compile a list of all units of the population, but the data obtained through arbitrary selection of respondent units are sufficient for the purposes of the study, then it is also appropriate to use non-random samples designed in extraordinary conditions, such as CAWI research. Using such sampling procedures can be justified under one condition: the researchers are looking for the specific behaviours, views, and attitudes of only those who provide

better insight and make up the core of the study. There is, therefore, no need for the sample to be entirely representative, although in our case, the group of respondents recruited reflected the best-selected sampling units, which were supposed to provide the best knowledge on the topic of the investigation. As part of the selection of units for the research sample, these respondents were to provide knowledge about the unusual problem and facts and hence were recruited online through the agency of CAWI research.

Research procedure

We analyzed all the major cities in Poland with a population exceeding 250,000 inhabitants (Warsaw, Kraków, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Bydgoszcz, Lublin, Białystok, Katowice) because, according to Audretsch et al. (2015), only large cities (urban areas with more than 250,000 inhabitants) benefit most from entrepreneurship where it positively affects their economic development. We also analyzed seven German cities, which were participating in the Federal Ministry of Economic Affairs and Energy (BMWi) programme, "Exist Start-up Germany," or in the "leading-edge cluster competition" of the German Federal Ministry of Education. The "Exist Start-up Germany" programme ended in 2017. According to the Global Startup Ecosystem Ranking (2015), Berlin was the world's most successful city in the number of new start-ups and venture capital investments. Munich, in turn, is one of the leading European university centers, with an extensive start-up network and business accelerators complemented by a vibrant venture capital activity. The "leading-edge cluster competition" by the German Federal Ministry of Education was a component of the High-Tech Strategy for Germany, involving 15 of Germany's leading-edge clusters located in Munich, Dresden, Stuttgart, Karlsruhe, Cologne and Dusseldorf, the cities selected for the research.

To investigate cities' entrepreneurial strategies in depth and within their real-world context, we adopted a multiple-case study methodology described by Lin (2018) preceded by a systematic literature review based on a bibliometric analysis of the existing literature to identify the main characteristics of KSSE theory in the urban context (Armitage & Keeble-Allen, 2008). Also, systematic literature reviews were recognized methods for studying evidence-based policies (Pittaway & Cope, 2007).

Multiple-case studies allowed us to perform both an in-depth examination of each case and to identify contingency variables that distinguish each case from the others. We relied on multiple sources of evidence, primarily strategic documents of the selected Polish and German cities and semi-structured interviews with the decision-makers representing municipalities from the analyzed cities in Poland. In addition, we also gathered information

from additional sources as appropriate, e.g., websites and documents related to the event in a triangulating fashion.

First, we analyzed documents describing the strategic intents of cities, such as vision statements, strategic plans, mission statements, action plans, policies, declarations, etc., which we collectively termed "strategic documents." Next, we developed the diagnostic tool for the strategic management of cities' policies based on the key topics recurring in the literature on entrepreneurship. For each analyzed city, we took into consideration at least two separate strategic documents, e.g., a city's development strategies or plans (we studied 34 strategic documents from 11 Polish cities and 13 strategic documents from German cities).

Choosing an inductive approach through thematic analysis of the content of strategic documents (a data-driven approach) is supported by data gleaned from questionnaires. Such an approach is based on the assumption that not all necessary information is provided in the strategic documents. The objective of the study was to obtain an understanding of a phenomenon and to answer our research question. We made the assumption that the information included in the strategic documents may not provide a comprehensive view of the situation in the cities, as some crucial facts may be omitted. To mitigate the risk, we conducted a complementary on-line survey using CAWI by means of an on-line service (LimeSurvey). We directed our requests to persons occupying managerial positions in the analyzed cities representing city development departments or units. The questions included in the strategic document studies relate to the survey questions and tackled some issues not covered there. We were especially interested in information such as social entrepreneurship activities and actions towards creative and innovative companies, e.g. co-working spaces, which are usually not mentioned in strategic documents.

We developed the questionnaire used in the first stage of our research according to O'Leary's (2014) eight-step planning in textual analysis. The questionnaire took the form of a diagnostic tool. For the semi-structured interviews, we used purposive sampling to select the respondents. According to Babbie and Mouton (2001), a purposive sample is selected on the basis of the knowledge of a population and the purpose of the study. Such samples are selected on the basis of certain features. Therefore, we surveyed a group of respondents perceived to be knowledgeable about entrepreneurship programs for this study. We interviewed 20 respondents from 11 Polish cities comprised of representatives of the cities' development, strategy, or entrepreneurship departments. We divided the questionnaire into the following four sections:

Section I. Enterprise policy and strategy as a key part of urban economic development
Section II. Social entrepreneurship in the city
Section III. Promotion of youth entrepreneurship using public communication
Section IV. Actions towards creative and innovative companies

The questionnaire consisted of 24 questions divided into four sections and employed multi-nominal scales consisting of criteria including 0 = no/disagree, 1 = yes/partly, 2 – yes and don't know. The extension of each answer on the scale varied depending on the specific content of the question. The questions in the questionnaire focused on the content of the documents, e.g. "Do the strategic documents of your city refer to such notions as 'enterprise policy,' 'enterprise strategy' or other terms referring to urban entrepreneurial strategy?" The primary methodology of this study was survey research, with data collected first by sending a link to the on-line survey. In total, we contacted 54 decision-makers from Poland. We received 20 completed and usable questionnaires.

The survey had its limitations. First, all the visual, non-verbal clues that can facilitate contextualizing the interviewee as in a face-to-face interview might be lost. Second, while the questionnaire for German participants was introduced in English, this might have had an impact on the research quality (it was possible to misunderstand or inaccurately understand some questions).

ANALYSIS AND DISCUSSION OF THE RESULTS

The main goal of this paper was to enrich our understanding of urban policies in Poland that support knowledge spillovers and entrepreneurship and discover the possible relationship between factors determining entrepreneurship in Polish and German cities. Bibliometric analysis of literature data allowed us to determine key factors influencing knowledge-based regional systems of entrepreneurship (Table 1) that were the subject of analysis in cities' strategic documents and semi-structural interviews.

The research question asks how urban policies in Poland support knowledge spillovers and entrepreneurship in comparison to German cities' policies. We also investigated how do Polish and German cities support entrepreneurship in different forms (including social entrepreneurship, youth entrepreneurship, creative industries). All key factors influencing knowledge-based regional systems of entrepreneurship indicated in Table 1 were included in the questionnaire. However, in Table 2, we highlight the main findings along with the key characteristics of the policies to promote

entrepreneurship in Polish and German cities. We found these characteristics to be well aligned and similar. However, there are also distinctions across the factors and between the cases. With the strength of the Lander having a significant influence on Germany's federal structure, the political structure of Germany plays a greater role in supporting such policies than the Polish *wojewodztwo* in Poland's unitary system. In all Polish cities, we saw that entrepreneurship was an important component of economic development strategy, and the local "knowledge filter" serves as a catalyst for the transformation of knowledge into economic growth (Marelba, 2010). Currently, in-force policy documents place entrepreneurship as a central tenet of regional economic development intervention that is in line with urban policies of more developed countries like the UK (Huggins & Williams, 2011). For example, in Poznań, entrepreneurship is one of the city's five priorities, while Wrocław introduced a separate document dedicated to its entrepreneurship development strategy "Entrepreneurial Wrocław 2030." The interviewees also confirmed their joined-up enterprise strategies, i.e. integrated policies across different departments and units.

Across Polish cities, regional start-up strategy involves formulating the key direct mode of entrepreneurship. One respondent claimed: "We do not use the term 'start-ups' in Warsaw 2030 Strategy; however, we understand inventors and innovators as start-ups". Many of the start-up target actions described in strategies relate to promoting initiatives that stimulate entrepreneurship, like the acceleration programs Startup HUB Warsaw, Startup Weekend Kraków, as well as Startup Weekend Kids, or Poznań Start-up Forum. However, for Berlin and Brandenburg, start-up companies are a crucial part of a regional innovation system that is clearly identified in the Joint Innovation Strategy of the States of Berlin and Brandenburg (innoBB, 2025). Given the funding options, access to excellence in higher education and research institutes in the region and to the relevant infrastructure, also by promoting start-ups, the German capital is the leading start-up city in Europe. As stated in innoBB 2025, "Berlin offers excellent opportunities for implementing ideas and entrepreneurial vision. It also provides entrepreneurs with superb conditions in which to launch new start-ups (…)." Also, the city of Munich developed the Entrepreneurship Strategy Munich and, together with the Chamber of Commerce and Industry for Munich and Upper Bavaria and four entrepreneurship centers of the Munich universities, undertook numerous activities like Munich Business Startup Office, Munich Crowdfunding Support Program, and Cultural and Creative Industries Teams. As a result, most of the startups in Munich view their location as excellent or good (Deutscher Startup Monitor, 2019). Another German example is in Karlsruhe, where the regional government also supports the start-up movement.

Table 2. Key characteristics of the policies to promote entrepreneurship – a cross-country comparison of Poland and Germany

Key characteristics	German cities	Polish cities
"Enterprise policy," "enterprise strategy" or other terms referring to urban entrepreneurial strategy in the strategic documents of the cities	Urban entrepreneurship is directly related to cities' strategies and to the national strategic documents.	Entrepreneurship is an important factor in cities' strategies. Cities' strategic documents are aligned with other programmes promoting entrepreneurship policy. Urban entrepreneurship policy is aligned to a large extent with the strategic documents at the national level.
The place of business start-ups policies in the urban entrepreneurship policy	Promotion of start-ups and their unique role in urban entrepreneurship policies ensure German cities a leading position in the European cities' rankings of innovation ecosystems.	In most cases, startups are important in urban entrepreneurship policies. Some cities introduced supporting systems for startups based on cooperation with the local business community.
The current status of cluster policy as part of entrepreneurship policy development	The long history of German cluster policy has led to significantly exploiting regional potential to foster regional competitiveness.	Cluster strategy is implemented in most cities, but there is room for improvement. Polish cities show strong reliance on EU funding.
"Social entrepreneurship" in the strategic documents of the city	Social entrepreneurship is becoming an increasingly important concept, and there are examples of cities' actions designed specifically for young social enterprises.	In most cities, a relatively small number of selected strategic documents refer to social entrepreneurship. For some respondents, the concept of social entrepreneurship was unclear due to a large number of definitions. However, there are examples of organizations or enterprises in the cities that tackle the social change and/or address social needs.
Training activities for teachers and school leaders aimed at developing entrepreneurship and creativity among young inhabitants supported by the city	Training activities are undertaken as a part of the long-term cities' policies, often in cooperation with the largest companies in the region.	Cities have taken steps systematically within the framework of long-term policies in this area to support training activities.
The role of other educational institutions, including universities, in supporting entrepreneurial activities of young people in cooperation with the city hall	In all cities, institutes of higher education have anchored entrepreneurship and became an inseparable part of the local innovation ecosystem.	Support for entrepreneurial activities of young people is approached in a number of ways, ranging from workshops, studies and training to cooperation with business incubators, business accelerators and technology parks.
Policies and actions aimed at promoting entrepreneurial attitudes among the citizens of the cities implemented by the municipal authorities	Promotion of entrepreneurial attitudes among the cities' citizens is directly indicated in strategic documents.	Cities are increasingly trying to promote entrepreneurial attitudes among the citizens through various programs financed from, e.g., EU funds. Cities also focus support on providing co-working spaces, which offer opportunities for business development and create the possibilities for innovative start-ups.
Tax relief or other financial incentives for young entrepreneurs; tax exemptions for new start-ups	There are some initiatives but to a very limited extent.	Local taxes and other financial incentives to some extent address the needs of local entrepreneurs but do not fully meet them.
Research conducted by the City Hall regarding the needs of entrepreneurs towards the city's infrastructure	This kind of research is conducted systematically.	There have been only sporadic initiatives in this area.
Incentives and preferences for companies run by young people by means of public procurement for the city's budget	There are no such initiatives.	There is no such support.

The existing literature on KSSE significantly refers to regional cluster formation, which this study aims to provide in the context of CEE countries. As entrepreneurship can be supported by mechanisms operating in clusters (Breshnahan & Gambardella, 2004), such mechanisms have received a great deal of interest within public policies. The components of these cluster policies are particularly concentrated on cooperation and collaboration across related industries, and it was empirically proved these the establishment of clusters influences the economic growth of regions. Lehmann and Menter (2018), who conducted their research in German cities, confirmed the effect of an active public cluster policy on GDP growth. The historically rooted German cluster policy has led the German government to exploit regional potential significantly to foster regional competitiveness (Audretsch & Lehmann, 2015). For example, the Joint Innovation Strategy of the States of Berlin and Brandenburg from 2011 established five main innovation clusters in Berlin: (i) Energy Technology; (ii) Healthcare Industries; (iii) ICT, Media and Creative Industries; (iv) Optics and Photonics; and (v) Transport, Mobility and Logistics. Today, every third company in Berlin is active in these clusters, and together they generate almost 40% of the total revenue of the region's economy (Innovative Capital Region 2020). According to Ni and Qiongjie (2014), the city of Munich was not very supportive of the cluster, but that attitudes changed in the city's new strategy, with some initiatives like the Munich Technology Centre. According to the Polish regional policy-makers interviewed, cluster strategies in the framework of key cities' industries are embedded in most urban policies. Understanding the importance of cluster strategy, a majority of the respondents believed that their cities should place greater emphasis on this policy.

Social and cultural entrepreneurship has gained recognition as a mainstream activity, especially in Europe, and as a global trend to promote more inclusive development. In the European context, the institutionalization of social enterprises has often been related to the intervention of public authorities, e.g. legal framework, public subsidies, etc. (Defourny & Nysses, 2010). Social entrepreneurship, whether in the form of social enterprises or in the form of work to provide some type of collective goods and services, is well recognized in Germany. According to the 2019 German Startup Monitor (DSM, 2019), 36% of German startups consider themselves to be active in the Green Economy and/or in the area of social entrepreneurship. In Poland, interviewees recognized some forms reflecting the corporate social responsibility (CSR) approach, even though the term "social entrepreneurship" is not used as such in legislation. One respondent admitted: "What do you understand by this term? We emphasize corporate social responsibility, but I don't know that it's the same." However,

the understanding of social and cultural entrepreneurship requires taking into account local specifics that shape these initiatives in different ways. One city official admitted: "In the City Development Strategy of Gdynia 2030 we refer to volunteering support, self-help initiatives, informal groups, NGOs and social economy." Most of the respondents also confirmed the existence of enterprises that deal with social problems or respond to social needs.

Previous intensive studies suggest that entrepreneurial activity will tend to be greater where investment in new knowledge is relatively high (Acs et al., 2009), especially in the context of universities (Audretsch & Lehmann, 2005). Our research shows that current polices supporting entrepreneurship education and infrastructure (science and technology parks, business incubators, co-working spaces, etc.) are well developed in all of the biggest Polish cities. One of the city council representatives admitted: "It is hard to imagine Lublin's development without an academic dimension because every fifth resident is a student. The city actively supports the transfer of knowledge, moderates contacts with business, and sets up science-business-local clusters."

Recently, Bruzzi et al. (2020) have developed an innovative multidimensional index, Knowledge-Based City Developing Entrepreneurship (KBCDE), based on 28 indicators grouped into four perspectives: (i) a social and talent-cultural perspective (STC); (ii) an economy and context economy perspective (ECE); (iii) an environmental and infrastructure perspective (ENI); and (iv) an urban innovation system perspective (UIS). The authors examined all capital cities in the EU28 and 32 other cities in the EU that are important hubs, including Munich, Kraków, Dresden, Stuttgart, Cologne, Dusseldorf, and Karlsruhe. On the basis of the dimensions identified and taking into account cities chosen to our studies, Berlin ranked as the best performer in KBCDE, followed by Munich, Cologne, Karlsruhe, Warsaw, Stuttgart, Dusseldorf, Kraków, and Dresden. However, in some components, like UIS reflecting the innovative effort of the urban innovation system, in terms of institutions and resources, Berlin was followed by Munich, Cologne, and Kraków.

The policies of many UE countries provide a set of economic initiatives like tax exemptions, deductions or tax refunds for young innovative companies (Appelt et al., 2016). Some Polish cities have also delineated their respective policies. Surprisingly, according to the OECD Economic Survey Germany: 2018 (OECD, 2018), German cities do not provide any tax benefits for business R&D activities. Yet, many initiatives to attract private capital are in both countries a part in the urban policy.

In fact, cities are in competition with each other and use different strategy planning and dedicated policies to attract capital and talent. However, the main challenge for policy-makers is that current entrepreneurial policies should

be more effective and oriented towards reinforcing the social perception of entrepreneurship, especially among young inhabitants. We also agree with Guerrero and Urbano (2014), who conducted their research in Spain, that the local government in Poland should focus on collecting quality data from universities annually to evaluate universities' contribution and efficiency. One interviewee admitted: "Activities in the city are dispersed; we have no knowledge about actions in this field."

CONCLUSION

This paper provides an overview of the major findings and current gaps in what is known so far about cities' policies to promote entrepreneurship in two large neighboring Central European countries. It seems that the previously mentioned Schumpeterian (Austrian) tradition, which emphasizes the role of the entrepreneur and innovations in the process of economic development, has the greatest impact on strategy implementation in both Polish and German cities. Neither Polish cities nor German cities have implemented any specific measures to enhance the entrepreneurial culture of residents (Audretsch et al., 2007). Despite the large gap in economic development between Poland and Germany, as measured by GDP per capita, Polish cities do not seem to lag behind their German counterparts as far as legal and institutional infrastructures are concerned.

Overall, Polish and German cities follow many of the same approaches in urban policies that support knowledge spillover. Both groups consider entrepreneurship as an important component of economics development strategy. The effect of knowledge spillover on units located in Poland may be slower and less intensive compared with the dissemination of knowledge among neighboring high-tech firms in industrial clusters. On the other hand, as opposed to knowledge sharing among businesses, cities usually do not rely on trade secrets to protect their intellectual property, and there are no major legal restrictions to the sharing of public knowledge and good practices. Once identified and properly codified and/or conceptualized, good practices may be easily shared between cities. Language may be a barrier to knowledge spillover between Poland and Germany, but municipal employees' language skills usually are sufficient to communicate freely. It is worth mentioning that many of the Polish cities in the western part of Poland (e.g., Poznań, Wrocław, Szczecin, and Gdańsk) were part of Germany (Prussia) until 1919 (e.g., Poznań) or 1945 (e.g., Szczecin) and consequently share many similarities in urban design with German cities. Thus, many of the challenges faced by German cities at their earlier stages of development are the same as those faced

by Polish cities today. Therefore, Poland's learning process and diffusion of innovations may be accelerated and optimized (so-called laggard's rent).

Polish cities depend on EU funding to a much greater extent than German cities in implementing their economic development strategies. While tax relief and financial incentives in Polish cities address local entrepreneurs' needs to a certain extent (while not fully meeting them), such tax relief and financial incentives play a much larger role in Poland than in Germany.

Policies to promote industrial clusters are important in both groups of cities, but German cluster policy is more established and started earlier. A majority of the Polish respondents believe that their cities should place more emphasis on cluster development. Therefore, we propose that policy recommendations should be centered on the support of such initiatives. Also, local governments in Poland should focus on collecting quality data from universities annually to evaluate universities' contribution and efficiency. Still, the main challenge for policy-makers is that current entrepreneurial polices should be more effective and oriented towards reinforcing the social perception of entrepreneurship, especially among young inhabitants.

Further research needs to focus on more specific aspects of youth policies, for example, how those policies are aligned with the needs of the local economies and how they support social capital development in the cities. Youth entrepreneurship should be viewed as a broader social attitude, not just an economic activity. The engagement of the youth in entrepreneurial activities should not be measured strictly by economic indicators. The experience and social capital gained during entrepreneurial activities provide an added value to the city, regardless of its economic outcomes. Such aspects of youth entrepreneurship do not seem to receive appropriate attention among researchers in the field.

One limitation in the research process worth mentioning was the lack of visual, non-verbal clues, which could facilitate contextualizing during the interview. As the questionnaire for the German participants was conducted in English, this might have had an impact on the research quality (the questions could have been misunderstood or misinterpreted by the German respondents). The differences in city development between Poland and Germany may not allow for generalizations. As stated earlier, Polish cities rely heavily on non-private, mainly EU funding. Innovation requires the commitment of resources, which in turn need to be financed. Therefore, the decision to invest in innovation depends on two critical factors, namely the initial incentive to allocate resources for innovation and the capacity to raise the necessary financial means (Peneder, 2008). Due to differences in economic development (Polish GDP per capita is roughly three times lower than in Germany), Polish cities may have different priorities regarding public

spending, and youth polices could be underfunded in Poland as a share of cities' total spending.

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Abstrakt

Cel: *Polityka promowania przedsiębiorczości odgrywa kluczową rolę w strategicznym zarządzaniu miastami. Stąd też, pytanie badawcze postawione w artykule dotyczy tego, czym polityka miejska w Polsce wspierająca rozprzestrzenianie się wiedzy i przedsiębiorczość różni się od polityk miast niemieckich. Zbadano również, w jaki sposób miasta polskie i niemieckie wspierają przedsiębiorczość w różnych formach (m.in. przedsiębiorczość społeczną, przedsiębiorczość młodzieży, przemysły kreatywne).* ***Metodyka****: W celu udzielenia odpowiedzi na tak postawione pytanie badawcze, wykorzystano metodologię wielokrotnego studium przypadku, opierając się na różnych danych źródłowych, przede wszystkim na dokumentach strategicznych największych polskich miast w kontekście porównań międzynarodowych z wybranymi dużymi miastami w Niemczech, a także częściowo ustrukturyzowane wywiady z decydentami reprezentującymi analizowane miasta w Polsce. Wykorzystując teorię przedsiębiorczości w zakresie rozprzestrzeniania się wiedzy, odniesiono się do podejścia, w którym rozprzestrzenianie się wiedzy stanowi strategiczną dźwignię, dzięki której przedsię-*

biorstwa rozpowszechniają innowacje, co przekłada się na rozwój przedsiębiorczości w regionie. ***Wyniki / badawcze i praktyczne implikacje:*** *Przeprowadzone badania pozwoliły na wzbogacenie istniejącej wiedzy w zakresie polityk miejskich w Polsce wspierających rozprzestrzenianie się wiedzy i przedsiębiorczość. Jednocześnie, dały możliwość rozpoznania związków między czynnikami determinującymi przedsiębiorczość w polskich i niemieckich miastach. We wszystkich miastach Polski i Niemiec przedsiębiorczość była ważnym elementem strategii rozwoju gospodarczego. Polskie miasta jednak, w znacznie większym stopniu niż niemieckie, wykorzystują przy jej realizacji fundusze unijne. Strategie klastrowe w ramach branż kluczowych miast były osadzone w większości polityk miejskich, chociaż większość polskich respondentów uważała, że ich miasta powinny położyć na nie większy nacisk. Głównym wyzwaniem stojącym przed decydentami będzie prowadzenie bardziej skutecznej polityki przedsiębiorczości ukierunkowanej na wzmocnienie jej społecznego postrzegania, zwłaszcza wśród młodych mieszkańców.* ***Oryginalność / wartość:*** *Badania umożliwiły zabranie wystarczających danych, aby odpowiedzieć na pytania badawcze, jednakże sugerowane jest przeprowadzenie dalszych pogłębionych badań ilościowych na reprezentatywnej próbie potwierdzających otrzymane wyniki. Ponadto, podczas badań odnotowano pewne ograniczenia wynikające z utraty osobistego kontaktu z respondentami czy zróżnicowanego poziomu rozwoju gospodarczego miast polskich i niemieckich. Jednocześnie, badania wskazały możliwości rozprzestrzeniania się wiedzy i wymiany dobrych praktyk między dwoma krajami.*

Słowa kluczowe: *strategiczne zarządzanie miastami, teoria przedsiębiorczości w zakresie rozprzestrzeniania się wiedzy, przedsiębiorczość społeczna i w sektorze kultury.*

Conflicts of interest

The authors declare no conflict of interest.

Citation

Fazlagić, J., Sulczewska-Remi, A., & L. Windham (2021). City policies to promote entrepreneurship – a cross-country comparison of Poland and Germany. *Journal of Entrepreneurship, Management and Innovation*, *17*(2), 159-185. https://doi.org/10.7341/20211726

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ISBN 978-83-959006-3-1

pISSN - 2299-7075; eISSN - 2299-7326

Journal of ENTREPRENEURSHIP, MANAGEMENT and INNOVATION
JEMI