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THE ORGANIZATIONAL CULTURE AND INNOVATION OF ENTERPRISES IN THE ERA OF THE FOURTH INDUSTRIAL REVOLUTION

Abstract. The fourth industrial revolution, characterized by the development of advanced technologies such as artificial intelligence, the Internet of Things and automation, is radically changing the context of functioning of modern enterprises. In this environment, innovation is a key element of competitive advantage, and organizational culture is one of the fundamental factors enabling effective implementation of innovations. The aim of this article is to analyze the role of organizational culture as a catalyst for innovation in enterprises in the era of Industry 4.0. The paper discusses the basic elements of organizational culture, such as openness to change, cooperation between teams and organizational flexibility, which are of key importance in innovation processes. On this basis, conclusions are formulated regarding the impact of organizational culture on the ability of enterprises to compete and develop in a dynamically changing economic environment. The study has a theoretical and empirical character. For the research, the authors used the descriptive method with elements of statistical data analysis. The analysis was based on reports of such institutions as the World Economic Forum, McKinsey and secondary data regarding Polish enterprises.

Keywords: organizational culture, innovative culture, technological revolution, industry 4.0, innovation, enterprise.

Introduction

In the era of the fourth industrial revolution, also known as Industry 4.0, innovation has become one of the key factors determining the success of an organization. Technological changes related to automation, artificial intelligence and the Internet of Things are not only redefining industrial struc-

tures, but also influencing the way organizations must manage and adapt to dynamic market conditions. In this new reality, organizational culture is of particular importance, which can support or inhibit innovation processes. Organizational culture, understood as a set of values, norms and behaviors that shape the daily activities and interactions of employees, plays a key role in creating an environment conducive to innovation. Companies that build a culture focused on openness, cooperation and continuous improvement have a greater chance of success in attracting talent and quickly adapting to technological and market changes. This article will discuss key aspects of the impact of organizational culture on innovation and provide analyses of the Polish economy.

The aim of the analysis carried out is to determine the impact of organisational culture on business innovation in the context of the fourth industrial revolution. The method used in the article is the analysis of secondary data, which have been collected from studies, reports or literature (e.g. World Economic Forum or McKinsey). Based on the analysis of the data, the results were interpreted by comparing them with existing literature or data from other studies and conclusions were drawn. These are related both to the elements of organisational culture in the context of the subject's innovativeness and specific references to Polish enterprises.

1. Fourth industrial revolution

The industrial sector has undergone three significant technological transformations, each of which has had a profound impact on its practices and productivity. The first of these was the adoption of steam power in the nineteenth century, which was followed by the widespread use of electricity in the twentieth century. The third and most recent major shift in this sector began in the 1970s with the advent of large-scale computerisation (Cordes, Stacey, 2017, p. 5; Piccarozzi, Aquilani, Gatti, 2018, 10(10), pp. 1–2).

We are standing on the brink of a technological revolution that will fundamentally change the way we live, work and relate to each other. (...) the response must be integrated and comprehensive, involving all global policy stakeholders, from the public and private sectors to academia and civil society (Schwab, 2024, p. 290).

The Fourth Industrial Revolution is linked to the digitization of data in the so-called clouds, the Internet of Things or BIG Data. It is a transition

to cyber-physical systems and the creation of an intelligent (smart) factory – a smart factory. In this concept, there is no need to perform unnecessary activities and the production line, thanks to intelligent software that draws data from the global network in a just-in-time mode, will independently make decisions related to the operation of the plant. This eliminates human error and significantly shortens the entire production process, as both prototyping and line design are tested virtually (Szplit, Szplit, 2018, p. 163).

The Fourth Industrial Revolution will result in fully automated and digitized processes and the use of electronics and information technology (IT) in production and services (Sommer, 2015, p. 1512–1532).

As illustrated in Table 1, this phenomenon is also associated with the successive waves of the fourth industrial revolution. In the view of H. von Scheel, the initial phase of the fourth industrial revolution commenced in 2009–2016, the subsequent phase is anticipated to occur between 2016–2025, and the third phase of change is expected to begin in 2025. Each successive wave entails a series of changes on a global scale.¹

Table 1

The waves of the “Fourth industrial revolution”

1 st wave 2009–2016	2 nd wave 2016–2025	3 rd wave 2025...
Digitalisation	Artificial Intelligence	Quantum Computing
Internet of Things	Blockchain	Cyber Security
Advanced Analytics	Smart Automation	Neuro and Nano Technology
Cloud Computing	6G Communications	Bioinformatics
Robotics	Future of Energy	...

Source: prepared on the basis of: Lightbound, R. (2018); Protasiewicz, A., Zalesko, E. (2023), p. 431.

The current revolution is distinguished by the accelerated and extensive dissemination of novel technologies and pervasive innovations, particularly in comparison to previous revolutions, which are still evolving in certain regions of the globe (Schwab, 2016, pp. 12–13).

The advent of the Fourth Industrial Revolution, driven by factors such as market development, internationalisation and growing competitiveness, has given rise to the concept of Industry 4.0 and its associated domain of studies.

Industry 4.0 is not just about integrating technologies, it is about the whole concept of how data and resources are acquired, shared, used and organised to deliver products/services faster, cheaper and products/services

faster, cheaper, more effective and more sustainable (Piccarozzi et al., 2018, pp. 1–2).

Industry 4.0 significantly impacts the manufacturing environment, with radical changes in how business gets done. Industry 4.0 enables real-time planning of production schedules with dynamic self-optimisation, as opposed to traditional predictive production planning (Sanders, Elangeswaran, Wulfsberg, 2016 p. 816).

Expectations for the future of manufacturing (Spath, Ganschar, 2013, pp. 130–131):

- a. Automation is becoming possible for smaller and smaller series – but human labour remains.
- b. Labour will remain an important part of production.
- c. In the future, flexibility will have to be organised in a targeted and systematic way – ‘blanket flexibility’ is no longer sufficient.
- d. Industry 4.0 is more than just the networking of CPS. The future includes the intelligent collection, storage and distribution of data by objects and people.
- e. Distributed control is on the rise.
- f. Complete autonomy of distributed, self-controlling objects will not be possible in the foreseeable future.
- g. The design of intelligent production systems must take into account safety and security aspects.
- h. The roles of traditional production workers and knowledge workers will continue to merge.
- i. Production workers will increasingly take on product development tasks.
- j. Workers will need to be trained for shorter-term, less predictable work activities in the workplace.

Manufacturers need to overcome major implementation barriers, of which some are more relevant for advanced players (Raport Industry 4.0 after the initial hype, McKinsey Digital 2016, p. 12).

Top 5 barriers mentioned by manufacturers with no/limited progress in Industry 4.0. Difficulty in coordinating actions across different organizational units (Raport Industry 4.0 after the initial hype, McKinsey Digital 2016, p. 12):

- a. Lack of courage to push through radical transformation.
- b. Lack of necessary talent, e.g., data scientists.
- c. Concerns about cybersecurity when working with third-party providers.
- d. Lack of a clear business case that justifies investments in the underlying IT architecture.

Additional top barriers mentioned by more advanced manufacturers (Raport Industry 4.0 after the initial hype, McKinsey Digital 2016, p. 12):

- a. Concerns about data ownership when working with third-party providers.
- b. Uncertainty about in-vs. outsourcing and lack of knowledge about providers.
- c. Challenges with integrating data from disparate sources in order to enable Industry 4.0.

The three key success factors of Industry 4.0, as identified by H. von Scheel, are as follows (<https://von-scheel.com/godfather-of-industry-4-0/>):

- a. It is essential to consider the value that can be derived from the technology in question, rather than focusing on the technology itself.
- b. Similarly, the human aspect must be taken into account, rather than relying on tools alone.
- c. Furthermore, it is vital to establish clear objectives from the outset.

A world of customer experiences, data-based services and asset performance through analytics requires new forms of collaboration, particularly given the speed at which innovation and disruption are taking place. This is true for incumbents and established businesses but also for young, dynamic firms. The former often lack specific skills and have Lower sensitivity to evolving customer needs, while the latter are capital poor and lack the rich data generated by mature operations. As the Forum's Collaborative Innovation: Transforming Business, Driving Growth report outlines, when firms share resources through collaborative innovation, significant value can be created for both parties as well as for the economies in which such collaborations take place. One such example is the recent collaboration between the industrial giant Siemens, which spends around \$4 billion a year in research and development, and Ayasdi, an innovative machine-learning company and Forum Technology Pioneer founded at Stanford University in 2008. This partnership gives Siemens access to a partner that can help solve complex challenges of extracting insights from vast data, while Ayasdi can validate its topological data analysis approach with real-world data, while expanding market presence. Such collaborations, however, are often far from straightforward. They require significant investment from both parties to develop firm strategy, search for appropriate partners, establish communication channels, align processes, and flexibly respond to changing conditions, both inside and outside the partnership. Sometimes, such collaborations spawn entirely new business models such as city car-sharing schemes, which bring together businesses from multiple industries to provide an integrated customer experience. This is only as good as the

weakest link in the partnership chain. Companies need to go well beyond marketing and sales agreements to understand how to adopt comprehensive collaborative approaches. The Fourth Industrial Revolution forces companies to think about how offline and online worlds work together in practice (Schwab, 2016, pp. 57–58).

The concept of collaborative innovation represents a significant emerging trend in the field of business and organisational development. It entails the formation of new collaborative business models, which are enabled by the participation of individuals and entities from diverse value chains. These models are founded upon a robust foundation of intrapreneurship, which facilitates the emergence of modern, agile organisations. These organisations are capable of fostering new opportunities, pioneering radical ideas, and testing the boundaries of markets. In essence, collaborative innovation serves as a catalyst for growth and innovation (Collaborative Innovation Transforming Business, 2015, p. 8).

The shifts occurring in economic structures as a result of the fourth industrial revolution and the implementation of the Industry 4.0 concept present a range of challenges for organisations. These challenges are primarily related to the possibilities of utilising technological advancements, overcoming apprehensions and accepting the inherent risks associated with the introduction of novel solutions. The receptivity of organisational members to change is largely contingent upon the prevailing organisational culture.

2. Organisational culture

The concept of organisational culture has been a subject of interest to researchers for a considerable period of time. A review of the literature on the subject reveals a multitude of concepts and arguments that have been presented over the years, all of which are designed to convey the significant role that organisational culture plays in the functioning of the organisation. Some studies have investigated the impact of organisational culture on enterprise innovativeness. As posited by H. Schein and E. Schein, organisational culture can be defined as a set of fundamental values, norms and beliefs that are widely accepted within a given organisation (Kraśnicka, 2015, pp. 21–22).

The organisational culture of a company can influence the way in which employees perceive their duties and the values they consider important. Concurrently, it can facilitate or impede two fundamental processes associated with innovation, namely the generation and implementation of novel

concepts. Should culture become a factor driving these processes, it may be designated a culture of innovation. The term is defined as the set of organisational habits that facilitate innovation. Although frequently imperceptible, it represents a quantifiable source of competitive advantage, particularly in the contemporary economic landscape, which is characterised by a significant reliance on novel technologies and process enhancements. An innovation culture can be defined as the values, beliefs and ways of acting that are shared within an organisational or societal context and which foster the creation and implementation of new ideas and solutions. (Prokopowicz, Pawlak-Mihulka, Rudnicki, 2018, pp. 6–10)

K. S. Cameron and R. S. Quinn, in their book “Kultura organizacyjna – diagnoza i zmiana: model wartości konkurujących”, define organisational culture as a set of taken-for-granted values, not necessarily verbalised assumptions, elements of collective memory, and common expectations and definitions shared by members of the organisation. The authors also define culture in terms of its functions, stating that it reflects the dominant views within the organisation, reinforces the sustainability of the social system within the organisation, and is the source of unconscious, often uncoded, rules of behaviour applied in the organisation. Codified rules of behaviour applied in the workplace. It is expressed in the values, language and symbols shared by all members of the organisation. It also includes prevailing behaviours or routines, dominant styles of managing people and the definition of success (Cameron, Quinn, 2006, pp. 24–25).

Conversely, a culture of innovation (pro-innovative) encourages enterprise innovativeness by, among other things, motivating employees to engage in innovative behaviours. A number of issues pertaining to the role of culture in organisational functioning are highlighted. These include, primarily, trust and openness, the willingness to take on challenges and commitment, support and space for new ideas, the approach to conflicts and methods of resolving them, risk taking or the scope of freedom of action. Organizational culture can act as a catalyst for innovative behaviour amongst employees, providing a context for the generation and implementation of new ideas (Kraśnicka, 2015, pp. 21–22).

Stimulating innovative activity requires a specific organisational culture that fosters the emergence of new ideas and solutions. While there is no one-size-fits-all model for such a culture, we can identify a number of factors that increase the likelihood of innovation (Zawadzki, 2009, pp. 451–458). Culture can make it easier for employees to coordinate with the company's innovation goals. However, it is important to bear in mind that an innovation-friendly culture is a complex phenomenon, due to the limited research on

the impact of its specific elements on company innovation. Attention is also drawn to the importance of flexibility in decision-making, the control mechanisms in place and the role of intra-organisational linkages and structures.

Organisational culture plays several important functions in an enterprise, including the following: integrating, coordinating or communicative. It affects the ability of employees to accept innovation as a basic value of the organisation, as well as their greater involvement in activities for the organisation. It is emphasised that most employees can demonstrate innovative behaviour if only favourable conditions for such activity are created. (Kraśnicka, 2015, pp. 21–22) As an element of a company's intellectual capital, organisational culture plays a key role in many aspects of a company's functioning, including stimulating employee engagement, sharing knowledge and rewarding innovative attitudes. It also has a significant impact on the processes of creating and absorbing innovations from external sources. This is why it is so important to shape a pro-innovation organisational culture. It consists in creating such attitudes, behaviours and actions of employees that, in the long term, will enable the company to generate and adapt innovative solutions. Features of such a culture include (Popławski, 2007, p. 103):

- a clear and understandable strategy for the development of the company
 - management should clearly define innovation goals and communicate them to employees in a transparent and motivating manner;
- the ability of company managements to see any signs of innovation – it is important to value even small initiatives and ideas from employees that can lead to innovation;
- broadening innovation capacity – as many people and organisational units as possible should be involved in the innovation process to make use of their diverse potential and experience.

The organisational culture of a company can exert a significant influence on the generation of innovative ideas. The influence of organisational culture can be observed in a number of areas. A culture of openness to change is conducive to innovation. Companies that promote openness to change and new ideas are more likely to foster a climate of creativity and innovation. The workforce is at ease when sharing their ideas. A culture that supports creativity and experimentation is conducive to innovation. Organisations that permit their employees to take calculated risks may be more likely to succeed in the creation of new products and services, thereby facilitating the implementation of product innovations. Diversity management – organisations can more effectively adapt to changing market conditions and generate innovative ideas if they recognise and value the diversity of thoughts and experiences held by their employees.

Shaping a culture of innovation is a process, based on four main elements (Gadomska-Lila, 2011, p. 128):

1. identifying and analysing the determinants of innovation;
2. grouping/categorisation of organisational determinants of innovation;
3. selection of desired cultural patterns;
4. selection of tools to implement/improve the innovation culture.

The first is to identify and analyse the determinants of innovation, i.e. to diagnose the entity's internal level of innovation. These results are then categorised to finally select the cultural patterns desirable in relation to the situation. The final element is the selection of tools to implement or improve the company's functioning organisational culture.

An organisation with an innovative culture is characterised by an outward-looking approach and a sense of connection and empowerment among its employees, enabling them to take risks. It is a culture of teams, based on collaborative problem-solving in response to increasingly volatile and complex challenges. This culture is centred on innovation and the pursuit of novel solutions (Francik, 2003, p. 156).

The promotion of collaboration and communication between departments is of great importance in the creation of innovation. A culture that facilitates the exchange of ideas and the implementation of new solutions in a timely manner is conducive to the generation of novel ideas. The leadership style within an organisation constitutes an important factor in the formation of organisational culture. Leaders who inspire and motivate their employees can facilitate the growth of innovation.

3. Organisational culture in Poland

The objective of the study conducted by T. Kraśnicka was to ascertain the positive correlation between an organisational culture that is conducive to innovation and the level of technological innovation achieved by the enterprise in question. The author employed the number of product and process innovations and a subjective assessment of these made by a representative of the company's management staff as the measure of innovation. The results of the research partially confirmed the hypothesis, as the relationships in question are generally weak, and the level of assessments of pro-innovation organisational culture is not high. The assessment values obtained indicated that the pro-innovation culture was not particularly strong in the companies under study. The author states that the presented research results are consistent with other studies conducted in this field in Poland and inter-

nationally. The research provides further evidence of the necessity to cultivate a pro-innovation organisational culture, which can facilitate an increase in the number of technological innovations implemented within the enterprise and contribute to an enhancement in its performance and competitive position (Kraśnicka, 2015, pp. 32–33).

Table 2

Structure of the tool for measuring innovation culture

The dimension of pro-innovation culture	Factors	Number of statements in the questionnaire
1. An environment providing the necessary support for implementing innovations (Innovation Implementation)	1. Implementation context	17
2. Intentions of the organization's participants (intentions, desires) regarding innovative behavior (Innovation Intention)	2. Innovation Propensity 3. Organizational Constituency	9 13
3. Infrastructure supporting the initiation of innovation (Innovation Infrastructure)	4. Organizational Learning 5. Creativity and Empowerment	10 6
4. "Forces" directing the ideas and actions of organizational participants towards innovation (Innovation Influence)	6. Market Orientation 7. Value Orientation	8 7

Source: Kraśnicka, T. (2015), p. 24.

The authors of the study Freenovation identified four fundamental dimensions of innovation culture and 24 detailed sub-dimensions (Prokopowicz, Pawlak-Mihułka, Rudnicki, 2018, p. 19):

- A. The term "talents" is used to describe the abilities and skills of individuals within an organisation:
 - a. Openness a willingness to engage with new information and ideas.
 - b. Conscientiousness. The second factor is conscientiousness and self-control.
 - c. Capacity for empathy and emotional awareness. The capacity to empathise with and adopt the perspective of others.
 - d. Growth mentality. The conviction that others have the capacity to undergo positive transformation.
 - e. Expertise Awareness of the key areas pertinent to the company.
 - f. Creativity. The conviction in one's own creative abilities.

- B. The second category of values is that of personal values:
 - a. The strength of the organisational culture. The degree to which norms are consistently applied and the perceived importance of following company rules.
 - b. A culture of conflict. The methodology employed to resolve conflicts.
 - c. The extent to which mistakes are accepted. The extent to which failures within the company are accepted.
 - d. Honesty. The degree of honesty and directness in the feedback provided.
 - e. Individualism The extent to which individuals or groups within the company are appreciated.
 - f. Power distance The extent to which power is distributed unequally among employees within the company.
- C. The manner in which work is organized:
 - a. The reward system is an important aspect of any company's human resources management. The remuneration system is linked to the encouragement of innovative practices.
 - b. Allocation of resources. The accessibility of resources for innovative endeavours.
 - c. The system for developing new products and services. A system for the development of competencies related to innovation.
 - d. Project management. The quality of project management.
 - e. Communication A communication system that facilitates innovation.
 - f. The process of identifying and hiring individuals with the requisite skills and abilities to contribute to the organisation.
 - g. The recruitment and selection of candidates for innovation roles.
- D. The role of leadership in this context is to provide direction and guidance to ensure the effective functioning of the aforementioned processes:
 - a. The concept of autonomy is of particular importance in this context. The capacity for employees to make decisions autonomously.
 - b. The provision of support by leaders is also a key factor. The extent to which leaders provide support for innovation.
 - c. The concept of clarity of purpose is fundamental to the notion of organisational identity. The clarity of the organisation's purpose.
 - d. Security The concept of psychological safety and the importance of work comfort.
 - e. The extent to which the organisation is perceived as friendly. The degree of friendliness exhibited by leaders.

- f. The extent to which employees trust their leaders. The level of trust placed in leaders and colleagues.

The authors presented the Freenovation research results in the form of an innovation tree. The study identified the areas that were found to be most important in predicting employee innovation. The most significant factor influencing the innovativeness of the study participants was the extent to which their leaders demonstrated support for innovative activities. Effective management and leadership is predicated on a comprehensive understanding of both the individual characteristics and universal motivators that influence behaviour. Leaders who provide support for employees engaged in innovative activities are able to foster an environment in which employees are motivated to create and implement new solutions. Subsequently, the research concentrated on the pivotal factors that predict employee innovation, namely, self-perceived expertise and creativity. The final factor was autonomy in action. The authors also identified the subjective meaning of work as a significant factor. They observed that individuals who perceived greater meaning in their work exhibited higher levels of innovation (Prokopowicz, Pawlak-Mihulka, Rudnicki, 2018, p. 19).

For organisational culture to become a driver of innovation, companies need to consciously shape their environment. Managers should first and foremost drive acceptance of change by convincing employees of its necessity and benefits. It is also important to encourage new ideas by actively listening to subordinates and implementing the most promising proposals. Facilitating interaction, tolerating failure and setting clear goals while allowing freedom of action are other elements that create an environment conducive to innovation. It is important not to forget to recognise and reward creative activities, which motivate employees to explore further. The role and, at the same time, the respective competences of management are therefore of key importance (Wójtowicz, Mikos, Karaś, 2018, p. 17).

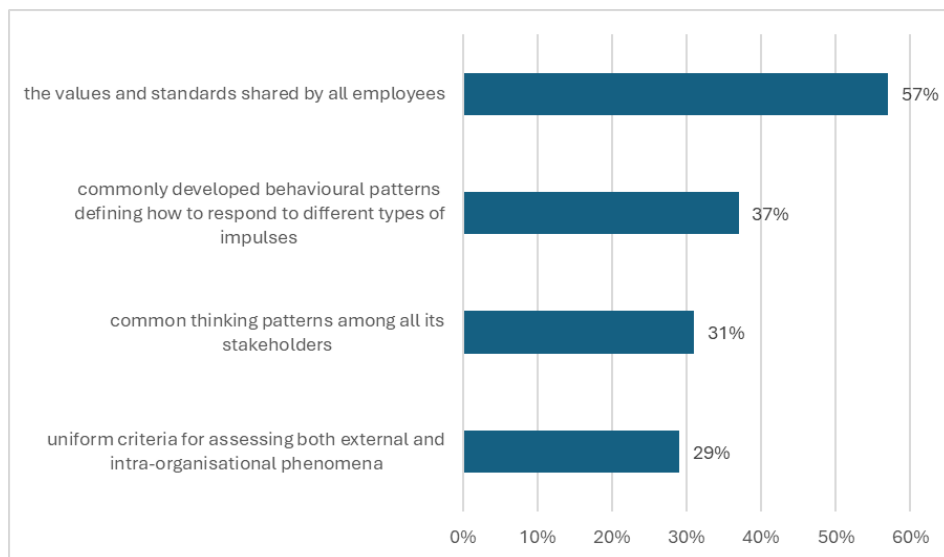
The impact of innovation strategy and formal structures on the diffusion of innovation appears to be independent of company size and crucial in both small and large organisations. The main difference is based on the fact that companies do not always use innovation culture in a fully structured and long-term goal-oriented way (Nowakowski, Nowakowska, 2017, p. 359)

The report “Organisational culture and innovativeness” presents the results of research describing the role of organisational culture from the point of view of innovativeness and its elements conducted among 987 beneficiaries of the National Centre for Research and Development. Particular categories of factors which, in the declarations of the surveyed representatives of beneficiaries, foster innovativeness in their organisations are presented

in Chart 1. Attention is drawn to the declared need for the members of the organisation to adhere to common values and norms. This is a common factor for all surveyed innovative organisations, which dynamises innovation processes (Żołnierski, 2017, p. 7, 12.).

Chart 1

Innovation drivers in the organisation



Source: Żołnierski A. (2017), p. 7, 12.

In the view of A. Strychalska-Radzewicz and D. Sobol, the innovation culture of a company constitutes an essential component of its capacity for innovation. This implies the necessity of implementing actions that shape the culture of innovation, particularly those which (Strychalska-Radzewicz, Sobol, 2023, p. 124):

- a. the promotion of continuous, collective learning through the creation of opportunities for the acquisition of knowledge;
- b. the encouragement of creativity and the personal development of employees' talent and knowledge;
- c. the treatment of employee-driven improvements as inspiring challenges;
- d. the prioritisation of the customer as the centre of the company's interest, which entails a notable openness to customers' suggestions and comments, as well as a swift response to their needs;
- e. the endorsement of values such as honesty and trust;
- f. the promotion of teamwork and a sense of community among employees;
- g. the designation of innovation as a priority;

- h. the establishment of a comprehensive the following actions should be taken to foster an innovative culture within an organisation;
- i. acceptance of actions in conditions of uncertainty;
- j. strengthening employees' internal motivation to create novelties;
- k. promoting open and honest communication;
- l. involvement on the part of superiors, who should demonstrate an attitude of openness in communication with subordinates, providing them with advice and assistance;
- m. encouraging employees to express their opinions and suggestions on topics related to their job position;
- n. supporting employees' learning, curiosity and creativity;
- o. incorporating creative thinking and innovation training into the employees' educational programme.

Moreover, the State plays a fundamental role in the creation of an innovation culture, which in turn facilitates the innovation of enterprises. This is achieved by influencing the development of scientific and educational infrastructure. This represents one of the external factors that exert an influence on the innovation of organisations. The policy implemented by the state exerts a considerable, long-term influence on a multitude of internal factors that drive innovation. Such factors include creativity, entrepreneurship, organisational culture, workforce qualifications, cooperation skills, networking and the availability of resources, in particular scientific and research facilities and institutions that support pioneering projects and accelerate their implementation (Romanowska, 2016, p. 32).

Of the intra-organisational processes analysed by F. Bylok that support innovation in large companies in Poland, the highest ratings are given to those concerning the quality of tasks implemented in terms of cooperation with employees from other teams and departments in the company, the flow of information between employee teams and departments, and cooperation between employee teams and departments in the company. Relatively lower ratings are given to the flow and creation of knowledge in the company, as well as the speed of completion of tasks requiring cooperation with employees from other teams and departments in the company. In summary, in large companies in Poland, the emphasis is placed primarily on cooperation with other teams in the company, which is based on the flow of information between them. Many intra-organisational factors have an impact on the development of innovation in companies. The study analysed several of them that can be considered important. Among the most important of these are the acceptance of the principle that innovation is a core value within the company and the building of consistent goals for the development of innova-

tive ventures that are known to employees. Further factors are the creation of a free flow of access to information and knowledge, as well as the creation of optimal conditions for cooperation between sections/departments. Taking innovation initiatives depends on the creative attitudes of employees. Shaping this aspect is influenced by the belief that innovations are more likely to succeed if employees are able to express unusual and unique solutions in their daily work and by the principle that employees who engage in innovative ventures know their personal contribution. In addition, factors directly related to employees have an impact on innovative activity, namely the expectation of flexibility and quick adaptation to change on the part of employees, while encouraging them to take on challenges, the acceptance of new ideas for innovative solutions on the part of employees, the support of employees willing to seek innovative solutions by department managers can serve to foster innovative ventures, and the expectation that innovation in the company will grow (Bylok, 2023, pp. 4027–4028).

Table 3

**Organizational culture and innovativeness
(Spearman's rank correlation coefficient)**

Characteristics of organizational culture	Correlation coefficient
Employees have time and resources to generate new ideas, changes, experiments, new ideas aimed at innovation	0.218**
Employees are rewarded for innovative technological, product, organizational, and marketing solutions	0.180*
The organization creates short-term and long-term action plans, which are regularly monitored and verified	0.154*
The organization has a defined mission that is communicated and known to all employees	0.138
Managers share knowledge of the future direction of the organization's development with employees	0.137
Managers actively support change and implement a culture of improvement, learning and innovation in the organization	0.136
Employees' creativity is supported by training, building project teams, meetings and discussions between different task teams, and so on	0.136
Each employee can submit a new idea, improvement, or change	0.105
The knowledge and skills of employees are systematically improved	0.104
Employees have a possibility of co-deciding on the scope of changes introduced in the organization	0.002

* statistical significance at the level of 0.05; ** statistical significance at the level of 0.01

Source: Szczepańska-Woszczyna K. (2018), p. 39.

The table shows the results of the analysis of the relationship between the determinants of a company's organisational culture and its degree of innovativeness conducted by K. Szczepańska-Woszczyna (Szczepańska-Woszczyna, 2018, pp. 39–40). A positive relationship was observed between the evaluation of individual elements of organisational culture and the degree of innovativeness of the company. It proved to be statistically significant for three factors, namely:

- 1) enabling employees to generate new ideas, change, experimentation and new innovation-oriented ideas;
- 2) rewarding employees for innovative technological, product, organisational and marketing solutions;
- 3) creating short- and long-term action plans that are regularly monitored and reviewed.

The higher the respondents rated these factors, the higher the company's degree of innovation. Higher scores on individual factors are associated with a higher degree of innovativeness of the organisation.

An example of a company where a culture of innovation is developed, focusing on goals rather than methods of achieving them and promoting employee involvement is a branch of the IKEA Industry group's production facility in Poland. Research conducted by A. Strychalska-Radzewicz and D. Sobol showed that the community of employees of the studied company manifests the characteristics of a collectivist community (a strong sense of belonging to the group, commitment to its goals and care for their achievement). The organisational culture in the surveyed company is in line with the business philosophy and direction of the entities belonging to the international IKEA group. The research shows that the organisational culture focuses on results and efficiency, with a clear focus on competition between employees and teams. Effective management is ensured by formal rules and regulations that emphasise the importance of employee safety and sustainability – characteristics typical of a market and hierarchy culture in the classification proposed by K.S. Cameron and R.E. Quinn. As a result, a number of innovative solutions have been introduced, particularly in the areas of products and processes, making the company innovative, flexible and ready for change. Production employees show a high degree of responsibility, willingly accept tasks involving greater autonomy and responsibility, and are characterised by commitment, creativity and belief in success. These characteristics are conducive to the further development of a pro-innovation culture in the organisation (Strychalska-Radzewicz, Sobol, 2023, p. 101–122).

Summary

In the long term, innovation brings an increase in the level of competitiveness and an improvement in the position of companies in the market. Firms engaged in innovation development can compete effectively with other firms through increased market share, higher returns on investment and overall market success (Allocca, Kessler, 2006, pp. 279–295). Findings in large enterprises provide evidence of the importance of innovation for market improvement. They show a significant correlation between factors supporting innovation and firm performance. Organizational culture is one of the key elements that can significantly affect an organization's ability to create and implement innovations in the era of the fourth industrial revolution. In an era of dynamic technological changes and intense market competition, companies that promote openness, cooperation, flexibility and employee engagement are better prepared to face the challenges of Industry 4.0.

Analysing the prevailing cultural pattern is a complex challenge, as it requires delving into the deep-seated behavioural and belief patterns of a given community. In this context, the subjective perspective of the respondents proved to be particularly important, as they brought in additional information about the company under study, highlighting aspects not visible to the external observer. Key features of a pro-innovation organisational culture include: creating an atmosphere conducive to change, developing employees' knowledge and skills, and sharing information and experience. The key elements that contribute to an innovation culture are: a clear and understandable strategy for the development of the company, a management system that promotes innovation, effective human resource management and an organisational structure that enables rapid response to and adaptation of change. However, achieving this is extremely difficult and requires considerable effort and commitment from both management and employees. In order to realise this, it is important to have a particular focus on creating appropriate human resource management systems to support knowledge acquisition, management and sharing processes.

Examples of organizations focused on the culture of innovation indicate that thanks to the appropriate approach to organizational values and norms, it is possible to effectively strengthen creativity, optimize processes and respond faster to changes in the environment. In this way, organizational culture becomes not only a factor supporting innovation, but also a key source of competitive advantage, which is of significant importance for long-term development and success in the modern business environment.

Organisational culture in Polish companies varies, but in general, not all companies can boast a fully pro-innovation culture. According to research, an organisational culture that fosters innovation is characterised by openness to change, flexibility and willingness to take risks. This type of culture requires an active and pro-innovation management that treats innovation as an integral part of the company's strategy, and an organisational structure that supports creativity, such as task teams, flat structures and high employee autonomy. However, not all Polish companies are implementing this approach. Many organisations still operate within a more formalised framework, where hierarchy, specialisation and procedures are more dominant, which may inhibit innovation. In such cases, organisational formalisation and structures limit freedom of action, making it difficult to adapt quickly to a changing business environment. Although many Polish companies, especially large and multinational ones, are trying to develop an innovation-friendly culture, some are still struggling with the challenges of implementing pro-innovation changes, both at the level of organisational structure and people management.

The creation of a pro-innovative organisational culture in Poland faces several significant barriers that may hinder the development and implementation of innovation in enterprises. Firstly, insufficient commitment on the part of leaders and managers. In Poland, many companies do not pay sufficient attention to the development of an innovative culture, which often results from the lack of a long-term vision and strategy for innovation-based development. Leaders who do not actively promote innovation may create an atmosphere of stagnation in the organisation. Many Polish companies, especially those with a long tradition, have hierarchical organisational structures and procedures that hinder rapid decision-making and adaptation to change. In such an organisation, innovation can be stifled by complex decision-making processes and excessive bureaucracy. Bureaucracy is a barrier to the free flow of information and the introduction of innovative ideas.

Secondly, the organisational culture in many Polish companies is still dominated by a lack of trust, which affects openness in communication and the sharing of ideas. Employees may feel discouraged to propose new solutions if they are unsure whether their initiatives will be accepted or implemented. In companies that do not prioritise openness and transparency, innovation often cannot thrive. Another barrier is the limited cooperation of Polish companies with universities and R&D institutes.

Companies that do not engage in cooperation with scientific centres may have difficulties in accessing new technologies or innovative solutions, which are crucial in the innovation process. The last barrier identified is

the limited cooperation of Polish companies with universities and R&D institutes. Companies that do not engage in cooperation with scientific centres may have difficulties in accessing new technologies or innovative solutions, which are key in the innovation process. The key in such a case is to promote creativity, trust and open communication, which allows knowledge and initiatives to be shared more freely.

N O T E

¹ More information: Protasiewicz A., Zalesko E., The Covid-19 Pandemic Crisis And The Technological Revolution, *Studies in Logic, Grammar and Rhetoric* 2023, no. 68 (81), <https://sciendo.com/article/10.2478/slgr-2023-0023> [access: 10.10.2024]

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