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Problems of Organizing Changes in the Management of Enterprises Implementing Technologies According to Concept "Industry 4.0"

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Jan Stachowicz[1], Agata Stachowicz-Stanusch[2], Józef Ledzianowski[3]

Abstract:

Purpose: *The aim of the paper was to present the results of the discussion on the threats generated by innovative information and cognitive technologies for the purposes of socially responsible design and development of organization and management systems.*

Design/Methodology/Approach: *The sense of implementing information and cognitive technologies in modern enterprises was justified. Research reports were presented, which made it possible to formulate the effects of implementing these technologies include, first, striving to minimize companies' unit costs. It was justified that the main barriers to the implementation of those technologies, apart from the necessity to invest high financial resources, are the low level of necessary support from the management of enterprises.*

Findings: *As a result of the discussion, it was stated that the guiding principle for rational changes in enterprises in which information and cognitive technologies are implemented may be the assumptions and principles of the SMART Organization model. The company's strategy, which is created, developed and disseminated among employees in the organization, are managers – leaders. It is a strategy which in its characteristics is a strategy called entrepreneurial strategy. Positive Organization Theory, which is a platform for a system of moral and organizational values in an enterprise, is a platform for a new organizational culture as well as the principles and application of management instruments.*

Practical Implications: *In sectors such as health, banking and education, information and cognitive technologies significantly enhance their positive functions. In industrial organizations, the functions that contribute to the increase in the efficiency of mass production and the increase in the flexibility of production processes for individual customer needs are verified. The criteria for applying the technologies that have been called the "Industry 4.0" revolution will be "rethought".*

Originality/value: *The paper presents an in-depth discussion of the threats generated by innovative information and cognitive technologies for the socially responsible design and development of organization and management systems in enterprises.*

Keywords: *Concept of "Industry 4.0", organizational changes, social innovations*.

JEL classification: *M11, M15, M16, M19.*

Paper Type: *Research paper*.

[1]*Prof., Department of Management, General Tadeusz Kościuszko Military University of Land Forces, Poland, e-mail: jan.stachowicz@awl.edu.pl;*
[2]*Ph.D., Department of Management, Canadian University, Dubai, e-mail: agata@cud.ac.ae*
[3]*Ph.D., Department of Management, General Tadeusz Kościuszko Military University of Land Forces, Poland, e-mail: jozef.ledzianowski@awl.edu.pl*

1. Introduction

The implementation of information and cognitive technologies in modern enterprises for the purpose of rationalizing the organization of production processes in these organizations is determined by a large – sometimes overly optimistic – set of opportunities caused by the implementation of these technologies, but also by many unknown due to their complexity, social consequences and threats generated by these technologies. These technologies, introduced in many contemporary enterprises for the purpose of rationalizing the organization of production, are the subject of many studies and works by various teams of experts. Reports of these studies ([in Polish] "Raport Przemysł 4.0, czyli wyzwania współczesnej produkcji", PwC, November 2017 as well as "Raport Smart Industry Polska, Innowacyjność w sektorze mikro oraz małych i średnich przedsiębiorstw produkcyjnych w Polsce", Warsaw, April 2018) and the experience of implementing these technologies give grounds for the conclusion that the effects of implementing these technologies include, first of all, striving to minimize unit costs.

However, the article is also confirmed that the main barriers to the implementation of these technologies, apart from the necessity to invest high financial resources, are the low level of necessary support from the management of enterprises. It is interesting what can be read in [in Polish] "Przemysł 4.0, czyli wyzwania współczesnej produkcji" – a diagnosis that employees of Polish enterprises have great competences and the necessary education in the area of implemented innovative technologies.

It can also be concluded from the cited reports that over the next two years, more than 40% of Polish enterprises plan to allocate more than 7% of annual revenues to increase the level of digitization, while in the next five years it was assumed that the level of innovation would increase by about 50%; innovation measured by a gain, e.g. efficiency by approx. 40%, cost reduction by approx. 40%.

2. Problems and Threats Caused by the Implementation of Information and Cognitive Technologies

The widespread implementation of information and cognitive technologies is a breakthrough innovation for technical, organizational and social progress. It is the subject of works by many authors such as Tapsott (2003), Tapscott and Tapscott, (2006), Skinner (2018), and Tegmark (2009). In Poland, the works of Przegalińska-Skierkowska (2014), the works of authors associated with TNOiK, such as Kiełtyka, and Charciarek (2019), as well as the works while maintaining due modesty by Stachowicz and Nowicka-Skowron (2019) and others. A lot of original research works were also undertaken, covering a wide range of analysed projects to implement these technologies in various industries and companies in the world and in Poland. Among these studies, due to the fact that they constituted a platform for further inference, the following are distinguished:

1. Research conducted by the ADR Research Institute. The results of these studies were presented in Harvard Business Review Polska, November 2019. They justify the thesis about the special participation of employee teams in increasing employee engagement in modern companies, especially teams led by competent leaders.
2. Research conducted by Blue Media specialists published in Harvard Business Review Polska 2019. When examining Poles' attitudes towards technological changes, they state that: the necessary revolutionary technological changes are noticed by almost everyone, regardless of age, gender, place of residence, and we positively assess the impact of that technology on our lives (53% of respondents). Interestingly, the research conducted by the authors in 2019 indicates an increase in the percentage of people declaring various, increased risks and an increase in distrust towards new technologies compared to the 2018 research.
3. The works of Barcik (2019) justifing the key role of leaders with high credibility and professional knowledge in managing teams in enterprise management systems undergoing innovative organizational changes (mainly caused by technologies), in particular, in those enterprises where compliance systems and systems have been implemented innovation management. The implementation of these technologies in these organizations makes the strategy of their development towards socially responsible enterprises more realistic.
4. Fountaine, McCarthy, and Saleh (2019) conducted a survey among many thousands of high-level managers of modern enterprises, asking about the ways and motivations for the use of artificial intelligence and the use of advanced data analysis for management purposes, and ways to adjust the organizational structure of enterprises to these innovative, implemented technologies. They found that only 8% of modern enterprises implement these technologies with the mission of radically rebuilding them (also transforming their organizational cultures), and that most companies only conduct ad hoc pilot programs or use AI in individual business processes. An important effect of the works of these authors is the statement that AI-related initiatives face large cultural and organizational barriers, but the knowledge, awareness and competences of the top management of enterprises, but above all of leaders in innovation management systems in enterprises, are the main capital of effectively overcoming these barriers. In terms of necessary changes in the implementation of those technologies (Fountaine, McCarthy, and Saleh 2019) recommend three recommendations:

    1) implementation of these innovative technologies through interdisciplinary project teams combining various specialties, specialists from various departments, with different experiences;
    2) organization of these teams as agile teams – adaptable instead of rigid structures – capable of taking risks;
    3) it is necessary to develop leadership skills among managers – leaders, as well as senior management as initiators of implementations, and the dissemination of the belief that pilot programs are only the introduction

and the beginning of general organizational projects, which requires a thorough assessment of successes and problems in implementations, primarily at the level of pilot initiatives. These teams, as recommended by (A. Barcik 2019), should be led by project leaders with high competences, contemporary leaders. The quoted authors developed the concept of the model: "Organizational structure in the implementation of AI on a large scale", which can be used in the process of restructuring enterprises towards companies based on the concept of "Industry 4.0".

5. Nosalcka and Gracel (2019) defines innovative and cognitive technologies that make up the concepts of "Industry 4.0" as innovations consisting in the integration of technologies in the areas of: robotics and autonomous vehicles, process simulation (offline, online), big data, augmented and virtual reality (AR, VR), additive manufacturing (3D printing), Cloud computing, IT / OT cybersecurity, industrial internet of things (e.g. smart sensors). The author proposed 4 patterns – archetypes of organization of enterprises implementing these innovative technologies depending on: the type of production, the scope of integration of enterprise value chains, the integration caused by the implementation of these innovative technologies and the assumed goals of rationalizing the organization of production processes and management through these technologies.
6. Jan Stachowicz and Maria Nowicka-Skowron (2019) defined the basic threats and opportunities introduced by the implementation of information and cognitive technologies for the improvement of the organization of production processes in enterprises developing in the concept of "Industry 4.0", they formulated concepts – a model for improving the management of these organizations in the conditions of threats that these technologies cause in enterprises. This concept has been called in the literature: Smart Organization Enterprise Model.
7. Nosalska and Gracel (2019) developed models of work organization in enterprises implementing these technologies with two different characteristics. The model of work organization consists in the implementation of a structure with a variable composition, in which employees have generally defined duties for a specific task, creating self-organizing units.Threats generated by implemented IT and logistics technologies, as organizations managed and developed according to the "Industry 4.0" concept model, are characterized by three groups of causes. First, they are cognitive gaps as to the essence, underdeveloped functions, functions and features of these technologies that are not recognized in practice. Further, they are the cause of the lack of knowledge about the mutual influence of these technologies on different groups of members of the organization: middle management and employees. These threats are further characterized by a lack of knowledge about the impact and impact of the enterprise implementing these technologies on the behaviours and attitudes and shared values of various stakeholders of the enterprise, i.e. on the behaviour and attitudes of competitors, customers and suppliers, and local government institutions.

Secondly, the complexity and novelty features of these technologies are the causes

of as many as initially recognized (and this without taking into account the interactions) influences on the behaviour and attitudes as well as the value systems of both members of the organization and institutions of various stakeholder networks. Thirdly, social threats that are generated by new technologies are caused by underdeveloped management instruments such as: methods of motivating and stimulating employee innovation to make the necessary changes in organizational structures and in the formal and legal rules under which enterprises operate and will operate. However, the implementation processes of these innovative technologies run with great problems; their causes are:

- gaps in the knowledge of the managements of organizations implementing these technologies about the positive, but most importantly, gaps in knowledge about the risks of implementing these technologies. Too often, decisions to implement these technologies are made under the pressure of too high expectations of success,
- shortcomings in contacts: managers and IT specialists from companies implementing these technologies,
- technology often underdeveloped and implemented with high expectations of success;
- poor preparation of enterprises to carry out radical organizational changes,
- lack of organizational knowledge as to the directions of transformation of the organizational structure of enterprise management for the preparation and successful implementation of innovative projects to implement these technologies,
- methodological deficiencies concerning the necessary transformations of the organizational culture of enterprises for an effective and socially responsible implementation process of these technologies.

The analysis of the literature, but above all the research results and observations of the authors during the implementation of projects in which they were co-contractors, provide the basis for the following conclusions in the field of directing organizational work in order to solve problems of rationalization of management in enterprises implementing these innovative technologies.

The implementation of innovative technologies in enterprises and other organizations is particularly burdened with the lack of knowledge and experience in the field of programming and improving functional systems, primarily such as:

a) Innovation management and risk management systems,
b) Compliance management systems.

The platform for the rational implementation of those technologies is a mature innovation management system operating in the enterprise and a mature risk management system, in which innovative employee teams are functioning. Good examples in this area are provided not only by the practice of managing Japanese enterprises, but also the practice of managing innovations of many Polish enterprises, in particular in the automotive and machine industry.

The Compliance System is a method of internal organization that minimizes the risk of irregularities in the organization resulting from non-compliance with legal standards, but also any other internal obligations accepted on a voluntary basis. It is a management instrument that enables compliance management with regard to ethical principles, standards, norms and expectations of stakeholders in various types of organizations, in particular in financial organizations (Barcik 2019). It covers such areas of management (in accordance with ISO 26000; 2010) such as: preventing corruption, taking into account fair market practices, avoiding conflicts of interest, checking business partners, data protection, protection of human and employee rights, protection of competition and consumers, including prohibition of anti-competitive market behaviour. The Compliance management system should be integrated with other management systems in the enterprise (audits, operational risk management systems, social responsibility system). As it results from the research (Barcik 2019), compliance system management is often organized in enterprises as specialized departments, led by compliance specialists, which are called: compliance officer, compliance manager.

The increasing role and functions of: team leaders, innovative groups in enterprises, leaders of innovative teams in innovation management systems and leaders – Compliance Officers in developing innovation and the level of social responsibility in accordance with formal standards and moral and ethical values, is not always confirmed by the location of these managers – leaders in their right place in the corporate management structure.

3. Recommendations for Improving the Implementation Processes of Technologies Included in the Concept of "Industry 4.0"

The recommendation was developed on the basis of the results of analyses of literature reports as well as analyses and observations of authors collected during seminar meetings with managers and representatives of many different organizations. During these meetings and discussions, they were asked to answer the following questions:

1. What are the main directions of organizational changes proposed in their organizations to improve the processes of implementing these technologies?
2. What, in their opinion, are the future states (fates) of their organization in the face of factors and conditions brought about by the pandemic?
3. What positive factors do they find that will allow them to lead their organizations out of critical states, ensuring their further development?

I: The guiding principle for rational changes in enterprises in which information and cognitive technologies are implemented, we believe that the assumptions and principles of the SMART Organization model, developed by Stachowicz and Nowicka-Skowron (2019), may be. Convincing and confirmed by modern management practice, recommendations for rational reconstruction of management

processes in modern enterprises with the use of innovative information and cognitive technologies as a rational mix – a combination of the existing methods, instruments and forms of organization and management with the instruments proposed by new information and cognitive technologies. A company whose management processes bring it closer to the SMART Organization model is characterized by a vision, strategy and organizational culture with the following features:

S: Socially responsible enterprise – an enterprise characterized by special social sensitivity towards internal and external stakeholders. This particular responsibility of a socially responsible enterprise coincides with the key relationship between the company's activities and the needs of society. These key needs, and thus socially responsible areas, are: internal responsibility of the company and external responsibility towards entities such as: customers, business partners, local communities and local society.
The above catalog coincides with the seven key areas of social responsibility that have been proposed under the ISO Standard (ISO 26000: 2010 Standard) organizational governance, human rights, labor law practices, environment, fair operating practices, consumer issues, social commitment and development local community.
M: Wise, guided by the principle of harmonizing the system of moral and organizational values ensuring the well-being of organization members with the needs of all other stakeholders of the company, while maintaining the coexistence and cooperation of the company with the natural environment,
A: Ambitious, creative and entrepreneurial,
R: "solutions" based on modern technologies (including information and cognitive technologies),
T: subordinate to the criteria of economic efficiency and the norms of international law.

II: Entrepreneurial strategy – the leading corporate strategy

The corporate strategy created, disseminated in the organization among employees and which are developed by managers – leaders, is a strategy which in its characteristics is a strategy, referred to in management sciences as an entrepreneurial strategy.

In the decision-making processes that make up strategic management in organizations, we observe an increase in the clash of two tendencies: conscious recognition of trust between people and organizations as the driving force of cooperation and social solidarity, and, unfortunately, lack of trust as the driving forces of actions in the area of crisis management (excessive layoffs, etc.). Entities creatively designing, implementing and implementing business models in organizations are, of course, entrepreneurs-managers-leaders who are subjected to crisis conditions, e.g. a pandemic, constructing business models that make up the strategies of enterprises, which will be referred to as entrepreneurial strategies.

Today, strategy is understood not as much as a "document", but as a cognitive process - knowledge management process, in which creative managers - contemporary leaders play a special role. A strategy understood and formulated in this way is more and more often called an entrepreneurial strategy. The entrepreneurial strategy is described by the methodologies developed in the modern strategic management approach, called the configuration approach. Entrepreneurial strategy is a resource strategy in the sense that the dominant resource for the development of the organization, for building all values for which the organization has been constituted, is the knowledge of the entrepreneur and other participants of the organization, the entrepreneurial strategy is an emerging strategy according to H. Mintzberg, i.e. the strategy is an effect mutual interaction between the environment and the organization and the reaction to these mutually influencing factors. The entrepreneurial strategy is also a strategy in the understanding of K. Obłój, the entrepreneurial strategy is a model concept of the modern (entrepreneurial) approach in strategic management (paradigm), while the configuration approach is methodological recommendations rationalizing the actions and behaviors of managers in strategic processes (Obłój 2007). The methodological platform for designing and implementing an entrepreneurial strategy is the methodological approach in strategic management, which is designed and implemented today, known as the configuration approach. The authors of this approach are Brown and Eisenhardt (Brown, and Eisenhardt, 1998). In Poland, this approach is developed by Kordel (2016), Jan Stachowicz and Józef Ledzianowski (2020).

The success of management in the light of the configuration approach depends on the interaction and configuration of various factors, including internal and external, which are responsible for the development of the organization. These configurations, in turn, are derivatives of the process of identifying development opportunities of the organization. The main assumptions in the configuration approach are: equifinality, which means a variety of ways of achieving identical goals in the same environment (there is no single, optimal way to achieve the organization's goals). The next assumption of this approach is the concept of matching, understood as the correspondence between various conceptual domains of organization development, internal success factors and external conditions. This concept is subject to reduction mechanisms, which mean the possibility of distinguishing a finite number of types of organizations understood as match bundles.

Another assumption of this configuration approach is to describe the development of the company by making step changes of a qualitative nature, and not relying on evolutionary adaptation to the environment. According to the configuration theory, the organization is characterized by specific domains (conceptual constructions composed of interacting dimensions: managerial leadership, organizational structure, development strategy of the organization, and the environment of the organization (Miller 1996). These authors further consider construction of specific mental patterns of these configurations (by strategists, advisers), based on empirical observations, but above all on the basis of case studies.These authors, as the main

concepts of the "configuration discovery" processes, consider their construction as a methodological platform for the formulation and implementation of entrepreneurial strategies. are undertaken and implemented by leaders – strategists, and the efficiency of these processes further translates into the success of entrepreneurial strategies. development of high technology enterprises in terms of configuration (Stachowicz, 2016). The author assumes that the efficiency of the strategic process for enterprises is not so much the selection of the best configurations (strategic domains, e.g. based on theoretical analyzes), but such design of the process of "configuring" these domains that will guarantee the highest substantive rationality in a given period and the highest possible level using conditions resulting from social rationality, where the main criteria are the preference for moral values and compliance with social norms.

III: On the other hand, Positive Organization Theory, which is a platform for a system of moral and organizational values in an enterprise, is a platform for a new organizational culture as well as the principles and application of management instruments.

The basic assumptions of the Positive Organization Theory (in the literature called Positive Organization Scholarship), include:

- perception and understanding of the organization as a positive entity, friendly to members of the organization (positive feelings: contentment, satisfaction);
- ways to achieve that state are to use and develop human potential;
- redirecting attitudes of people in the organization from deficiencies in organization and management as a consequence of weaknesses of the human psyche to positive sides and ethical behavior of people;
- POS for organizing / implementing positive qualities, states of satisfaction and positive motivations emphasizes such attitudes as: gratitude, appreciation, cooperation, integrity, wisdom, honesty.

IV: The implementation of these innovative technologies (including those based on artificial intelligence) should be subject to the criterion of the harmonized impact of these technologies on all elements of this pattern (new strategic management, new operational management, legitimate, international law standards, new forms of organizational structure) and harmonized, mutual influence of these elements.

As mentioned before, the criterion verifying the level of harmonization of these elements should be the level and potential of the organizational culture shaped and changed according to the principles and concept of Positive Organization Theory.

V: The driving force behind the socially responsible implementation of these technologies are managers whose competences and value system (credibility) authorize them to evaluate their practice of the role of managers, commanders as

wise leaders. The theory and practice of command developed and developed on the basis of the process of evolution of the theory of leadership, closely related to the evolution of the theory of organization and management. Contemporary, based on the theory of organization and management on the conviction that: the social system is a network of activities of team members, organizations linked by mutual interactions, including information and cognitive interactions of the nature of influences, transformation of values shaping ethical and moral attitudes towards team members, including mainly trust and attitudes manifested in organizational norms as to the methods of effectiveness, innovation of tasks undertaken in teams.

Based on this contemporary leadership theory, several competency models for the preferred values of contemporary leaders have been defined and constructed. Yukl (2012) formulated the model of a transformational leader as a leader whose concepts of actions, shaped relationships with partners (members of task forces, subordinates) always and under all conditions, based on and referring to systems of moral values.

The opposite of this model is the pattern of leadership behaviors and interactions in situations where fear, time pressure, and threats to the organization are at the basis of formulating goals for undertaken tasks; In this model, there is a lack of consistency in motivation to act with the duplicated value systems in teams, and in the behavior of toxic leaders one can observe cynicism, and distrust. Rok (2009) formulated the model of responsible leadership as a model for managers of modern corporations who consciously and responsibly pursue the implementation of the development strategy as a strategy of a socially responsible organization. Tony Buzan, Tony Dottino, Richard Israel, formulated the model of an intelligent leader as a manager integrating behaviors, the innovative efforts of organization members with the entrepreneurial behavior of management to achieve the strategic goals of a modern enterprise. As a basis for formulating this model, these authors used knowledge about the functioning of the human brain, in particular the skills to search for truth and control human behavior in accordance with information believed to be reliable. An intelligent leader is a manager with a high level of emotional intelligence, which is the basis of his competences to inspire employees and awaken their creativity.

Stachowicz formulates the model of a wise leader (a wise contemporary leader: a commander, manager, project leader, task team leader) with high professional competences in the field of managerial functions, but also in the field of modern information and cognitive technologies, but also a manager, commander having high ability to influence other members of the organization, teams, communities, their attitudes and behaviors when initiating, planning, organizing implementation processes of complex project implementers that require creativity, but also influencing their – the leader – personal high moral values (sense of justice, credibility, solidarity, loyalty) at a high ethical level in shaping relationships with partners (intergrity), i.e., at a high level of emotional intelligence. Ethical values and competences as well as competences of professionalism in the performed managerial functions constitute a platform for creating mutual social relations (in branches,

teams) at a high level of trust as a basis for cooperation and innovation in undertaken, initiated and implemented by teams, organizations and undertakings.

Leadership wisdom builds the highest level of use of knowledge, creativity, but in accordance with moral values and norms, as well as with the highest possible level of the leader's emotional intelligence. A wise commander is an outstanding professional in fulfilling his command functions, but above all a manager, project manager, leader who uses his professional knowledge, uses and develops in a credible and socially responsible manner. The leader's wisdom shaped on the basis of his credibility manifests itself in building a higher and higher level of trust among subordinates – which, as it was said, is a platform for undertaking and implementing complex, risky ventures in a creative way.

The wisdom of the leaders is also manifested in the connection of the strategies of the companies they manage with the changes at the operational management level caused by the implementation of these innovative technologies; the wisdom of these managers (including leaders in innovation management systems and compliance systems) is also manifested in their competence to comply with the law and to prevent corruption processes. Corruption processes in modern enterprises and the methods of counteracting these negative phenomena are the subject of the works of Agata Stachowicz-Stanusch. Decisions on the implementation of innovative technologies in modern enterprises, unfortunately, can too often be, and are, morally questionable from the point of view of their impact on the comfort of work of employees and customers, on employee motivation, as well as on the positive, socially responsible impact of the organization on the natural and social environment. As already emphasized, this is closely related to the leadership competencies of managers; deficiencies of which competences often lead to pathological and corrupt behaviors (Stachowicz-Stanusch 2007; Stachowicz-Stanusch and Krause Hansen, 2013).

VI: It is reasonable that, regardless of the level of implementation of these various innovative technologies (including technologies based on the concept of "Industry 4.0"), companies should organize innovation management systems, compliance management systems and develop these systems towards more mature solutions.

VII: A further recommendation of the rational organization of the design, implementation and necessary development of innovative projects such as the implementation of information and cognitive technologies in enterprises is to organize these projects in accordance with the project management methodology. In enterprises that carry out many different orders from different recipients, it is reasonable to organize production as organizing and managing projects, which recommends redesigning the organizational structure as a matrix structure.

VIII: In the organizational structure of teams implementing information and cognitive technologies situated as a "team work" in the organizational structure of

enterprises, it is reasonable for them to have various types of task teams, both in terms of the goals of their functioning (depending on the function of initiating and implementing technologies). The complex task of modifying organizational structures of enterprises for the needs of innovative implementation of information and cognitive technologies is the inclusion of all these teams, as well as task teams, in the structure of management systems in the enterprise. It is postulated to use the instruments of innovation management systems in the implementation processes of these innovative technologies of various approaches, techniques, methods – successfully used in modern enterprises – known as the Toyota Production System (methods based on the Kaizen ideology, 5 why and others).

IX: Deep integration of IT management systems, also the integration of production organization systems (automation, robotization), which is the goal of rationalization caused by these innovative technologies, also causes changes in the organizational structures of large enterprises and corporations. Two trends in structural changes are taking shape (Pietrewicz, 2011). The first one is based on the pursuit of tightening, automation and integration of various management systems and production organization based on digital platforms and digital systems. Enterprises integrate as conglomerates – non-sectoral organizations. The second trend of changes in the structures of large organizations are various forms of a dispersed structure. These solutions are a response to the progressive centralization of management and the deepening lack of trust between organizations in networks of cooperating enterprises. Information and cognitive technologies in this trend of organizational changes are platforms distributed using blockchain technology (Pietrewicz, 2011), so we should look for structural solutions that, in my opinion, will constitute a certain "mix" of the two previously discussed solutions.

X: Information and cognitive technologies have shaped a new, fifth (after land, water, air and space) area of military operations – cyberspace. In this new area, strategists and engineers construct and implement new – innovative military activities. Cyber attacks of various types on strategic infrastructure (banking, energy, etc.), various methods of counteracting these threats, various forms of psychological and propaganda war are examples of using these new, innovative technologies. Cyberspace is also an IT platform as well as control, management and command instruments. Cyberspace is therefore still an area of new, unprecedented technologies and organizations for commanding military operations, but also a platform for influencing political, economic and social systems. Hence, cyberspace creates research problems of great complexity, and, of course, social and political problems. Examples of such complex problems are the dangers of using various autonomous weapons. Other particularly complex and new problems are the examples and dangers that are created by these modern technologies (mainly artificial intelligence), the unknown in their complexity, the impact on the attitudes and behavior of people – members of management and command teams, the dangers of monitoring and manipulating these human behaviors.

XI: Cyberspace forces radical changes in the system of education and preparation of command cadres. It is not only the necessity to rebuild the education program and saturate these programs, to shape new competences and skills among commanders, but it is also justifiable and necessary to shape new competences of modern commanders - commanders and leaders of a new type. These commanders and leaders of the new type are not only professionals who apply and use these new information and cognitive technologies, but commanders who are able to command in situations of threats that these technologies bring with them. These commanders, leaders of a new type, should therefore acquire and develop competences to organize military undertakings in these new situations and threats posed by cyberspace, but above all moral competences (emotional intelligence, high level of integrity), guaranteeing the construction of high standards of trust among their subordinates, among local communities, etc. These issues are devoted to, among others works by J. Ledzianowski, J. Stachowicz and others.

4. Conclusion

The times of a plague are the times of great, breakthrough, not so many crises of the hitherto dominant systems of the organization of economic, social and political life, crises of dominant ideologies, values, but the awareness of the universal - even enlightenment - of the essence, causes and effects of energy, knowledge and the values that constitute these economic, social and political systems. The plague's misfortune has exposed barriers, poverty and weaknesses to people. It would seem that the best solutions of the modern civilization system are globalization, a defective system of democracy and contemporary models of organization management, but we realized the weakness of the structure of mechanisms for organizing economic systems, the defect of the dominant solutions of the quality and comfort of people's lives; not to mention catastrophic disproportions and neglect of health and climate protection systems. Realizing the poverty and imperfections of contemporary economic, social and political life is one downside of our experience. There is also a second, better, more optimistic. Many politicians, theorists, and well-known journalists believed in the initial periods of the pandemic that it would cause dramatic changes in many areas of contemporary life that after the pandemic is over, "everything will be different", i.e., solutions in economic and political systems, and that management systems in organizations will change significantly. Well, according to the authors, the pandemic will cause not so much revolutionary changes, but will significantly deepen various crises, revealing new, hitherto unknown tendencies and new possibilities of solving critical problems, such as the aforementioned health and climate protection systems; It also reveals not only barriers and disadvantages, but also new opportunities and opportunities in the area of popularization in the processes of management and organization of production as well as in governance processes, information and cognitive technologies (concept: *"Industry 4.0"*).

The time of writing the article is a period of quarantine as one of the means of dealing with the most dangerous epidemic, which, having a global reach – as many

authorities believe, will exacerbate (and so has already swelled – crisis for years) the dominant socio-political concepts of consumption capitalism; the crisis of the concept of civilization progress based on narrowly directed scientific and technical progress (cultural and technological determinism). A socio-economic system focused on the uncontrollable, selfish needs of people – consumers, which are the needs today shaped by the excess supply of various products and services produced and provided by enterprises, management according to the criteria of narrowly and immorally understood rationality); immoral because disregarding the potential of natural and ecological resources, emotional and ethical potential of people. Many authorities scientists, philosophers, economists have been predicting this crisis for years. It took the tragedy of the epidemic to, similarly to the Middle Ages in the case of the plague epidemic, which led to a breakthrough in civilization and the formation (rebirth - reformation, further enlightenment), to hear the thesis that after the coronovirus plague a radical reconstruction of concepts and strategies shaping the progress of civilization will take place, social, economic and political. In this spirit of hope, the question should be asked will there be, and to what extent, radical changes in contemporary technologies leading to the progress of civilization, etc.. in other words, organizational progress in enterprises and monopolized the principles and instruments of management in these organizations.

In the health, banking and education sectors, these technologies will significantly strengthen their positive functions, but in industrial organizations (also in banking) those functions that will contribute to the increase in the efficiency of mass production, increase the flexibility of production processes for individual customer needs will be verified. And I believe that the criteria for applying these technologies, which have been called the *"Industry 4.0 revolution",* will be "rethought". With an emphasis on the importance of the criterion of social and moral rationality. In general, one should be optimistic that information and cognitive technologies will cease to be the main technologies developing civilization and social progress. The role of these innovative technologies will be reduced to the subordinate functions of social innovations changing the essence of management, such as crowsourcing, as well as other forms based on the so-called collaborative economy.

Further, the functions of these technologies, which are intended to be revolutionary changes in the organization of production processes, will also change according to the needs of the new enterprise management system in the post-crisis period in the period of departing from the model of capitalism, which was called consumer capitalism. These technologies are optimistic that they will support the cooperation and cooperation of organizations and enterprises to a much greater extent than the search for ways to increase the competitive potential of enterprises, furthermore that these technologies will support the processes of cooperation with institutions of more and more open societies, which modern companies will function as organizations which once more responsible for the well-being of local societies, for the natural environment. Unfortunately, these technologies, due to their enormous capabilities, control of manipulating the attitudes, behavior of individuals and

societies, can become important instruments for dismantling the democratic order and thus consolidating and developing various authoritative systems. However, the belief in the high awareness of contemporary societies builds the conviction that the tendencies and forces based on the awareness and wisdom of contemporaries will create wise leaders-leaders at all levels of management and management, and the science of organization and management will develop useful instruments.

The crises of the epidemic have revealed the necessity and importance of the so-called global ethics, which consists of systems of values and moral and organizational norms, the observance of which will take into account the needs and preferences of members of society, not only as customers but as citizens. The times of the epidemic, we believe, have made this type of ethics real and accelerated. The need to deal with complex, unknown processes and phenomena reflects the importance, skills, competences and knowledge, science and scientific discoveries, as well as the rationality of using these capitals.

In strategic management in enterprises and organizations, resources constituting intellectual capital are the main factors of success and success.The pandemic also creates new, hitherto little perceived capitals of civilization, scientific and economic progress. Undoubtedly, such are the new paradigms, increasingly discovered and disseminated in science, creating a platform for new scientific theories - explaining the phenomena and processes of social reality more effectively. Such a theory in the sciences of management and organization is undoubtedly the emergence and development of the so-called network theory of organization and management. It is written about by J. Stachowicz (2014), B. Czarniawska (2010), W. Dyduch (2014), K. Perechuda (2013), M. Bratnicki (2005) and others. This theory perfectly explains the influence and influence of each organization on the globally understood, all remaining in the economic system as a coherent, morphological field of the economy (Perechuda, 2013), the influence and influence of their members dominating in organizations on other behaviors and attitudes of other members of the organization and impact of the level of trust of organization members on the level of innovation in the organization (Stachowicz, 2016).

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