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**Building a Model of a "Living Organization" as a Response  
to the Challenges of the Industrial Revolution 4.0**

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**Abstract**

*Today's entrepreneurs face several significant provocations related to the speed and depth of change and with it, the complexity of developing a business model that meets new realities. The changes taking place in the modern business environment are called the Fourth Industrial Revolution. The author of the term, Klaus Schwab, names several components of this phenomenon: the digitalization of business, the growing role of artificial intelligence, the widespread use of Big Data, the merger of cloud computing. An obvious question arises about building a fundamentally new business model that can adapt to a constantly changing environment. In this context, he considers it appropriate to use the concept of "living organization", formulated by many scientists (Tom Peters, Peter Senge, Norman Wolfe, etc.), which, like a living organism, adapts to changes and organically perceives new elements of the system. Clarification of the elements of a "living organization" and what are the prospects for its construction in the enterprises of the Republic of Moldova is the main goal of this study.*

*The main methods of this study are: comparative analysis and synthesis of scientific literature in the field of the presented topics, analysis of statistical data presented in international and national publications, as well as empirical analysis of the research object, namely, conducting a survey of personnel of small and medium-sized enterprises in the Republic of Moldova. The main contribution of the article is to develop recommendations in the field of organizational change management for the sector of small and medium enterprises of the Republic of Moldova in order to adapt to the challenges caused by the trends of the Fourth Industrial Revolution.*

**Keywords:** the Fourth Industrial Revolution, change management, change model, living organization.

**JEL Classification:** M19, O30, O14.

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## **1. Introduction**

Today, much attention is paid to changing the management paradigm, moving to a new stage in the development of society and business. Significant changes in the environment include involved participants and change the internal environment of the organization: the behavior of managers, planning systems, organizational structure, and fundamental changes in motivational mechanisms, processes, and types of orderly control. They should not obey those functions that successfully operated many years ago. They are being replaced by other, more appropriate, and more relevant approaches and models which, like the modern environment, are significantly different from the previous ones.

Given the complexity of functioning in the current conditions, many companies are in a difficult position, on the one hand, the influence of the external environment inevitably forces changes in management, on the other hand, limited resources and a specific understanding of the direction of change, the model of change, slows down the transition process, and thereby and all business activities.

## **2. Problem Statement**

Successful companies are constantly undergoing processes of organizational change. These are changes in technology, organizational structure, changes in business processes, culture, products, business reorientation, etc. Small and medium-sized enterprises (SMEs) in this sense have fewer opportunities, on the one hand, they have fewer financial resources, staff do not always have the appropriate level of knowledge, a lack of staff affects the implementation of various additional functions that are not related to the main activity, which complicates the work and leads to great dependence on some members of the team. However, these are more flexible companies, not so constrained by the formal organizational structure and bureaucratic principles, which are quicker to carry out organizational changes or reorientation to a new type of activity. Therefore, the problem of transition is quite difficult for this category of organizations.

## **3. Research Questions / Aims of the Research**

Thus, the purpose of this study is to substantiate the conceptual vision of a new type of organization, given the prevailing conditions, namely, in the context of the Industrial Revolution 4.0. To achieve this goal, we developed the following tasks, which were implemented in the areas of research:

- Justification of the factors associated with the modern business environment, called the Industrial Revolution 4.0;
- Analysis of global trends related to Industrialization 4.0;
- Synthesis of scientific literature in the field of organizational change management;
- Analysis of the problems of SMEs in the Republic of Moldova in the context of the modern business environment;

- Conducting research aimed at developing a model for the functioning of SMEs in the Republic of Moldova.

#### 4. Research Methods

This study is carried out with the aim of implementing a post-doctoral research on the topic: “Creating the organizational change management model for small and medium enterprises through the challenges of Industrialization 4.0”, within the framework of the project numbered 22.00208.0807.10/PD I. This project includes research on the main features of Industrialization 4.0, the impact on the SME sector of the Republic of Moldova, and the development of Change management models for this type of enterprise. This study represents the results of the first and second parts of the project exactly:

- theoretical research of the fundamental concepts, related to the challenges of Industrialization 4.0, change management, innovation management;
- the specifics of the functioning of SMEs, carrying out a synthesis of concepts, a comparative analysis of approaches, and justifying one's own vision on the processes of organizational change;
- the first stage of empirical research (questioning SME staff).

Thus, the research methods are:

- *In the initial stage of the research*, the “Work Break-down Structure” (WBS) method is used, which involves decomposition of work, grouping of project elements, activity-oriented and task-oriented, which organizes and defines the overall goal of the project.

Thus, this study aims to substantiate the conclusions for building a model of a “living organization” as a response to the challenges of the modern environment. Work decomposition will contribute to this goal. Namely, a review of the existing conceptual models of change management, substantiation of the characteristics of the external environment, conducting a survey of the personnel of enterprises involved in the pilot project, and formulating conclusions.

- *The next stage* - theoretical research, specifically we refer to research in the field of organizational change management, Industrialization 4.0, innovations, specifics of the functioning of the SME sector. The methods of analysis and synthesis are used due to their successful combination; we propose the systemic vision of the selected subject.
- *In the empirical research part*, we use the following methods: observation, experiment, and modelling. To identify the processes to which SMEs in the Republic of Moldova are subjected, a statistical study was performed using the method of graphical analysis. A sociological study will be used to identify the problems and draw conclusions, using the respondents' questioning. The study was conducted in the period January-February 2022. 46 representatives of various enterprises operating on the territory of the Republic of Moldova were interviewed. Of these, 30 enterprises belong to the SME sector, or 65.2% and 16

belong to large enterprises. Representatives from various levels of government participated in the survey.

*Limitations of the study:* the subject of the study is a promising model of business organization, the possibility of its implementation in the analyzed enterprises. The object of the study is the 46 enterprises included in the pilot project, namely, employees of these enterprises. The respondents are employees of various levels: 32.6% of managers and 67.4% of subordinates. Of the total number of managers - 26.3% - representatives of the highest level and 73.7% - the average. Only the answers to which the respondents agreed were taken into account. The survey was conducted according to an individual methodology developed by the author of the work.

## **5. Findings**

### ***5.1 Modern Environment Challenges***

The concept of the Fourth Industrial Revolution was born in 2016. Its author, Klaus Schwab, founder and chairman of the World Economic Forum, under this term combines a very multifaceted concept that characterizes trends that have emerged around the world, and are not only related to the world of business, or industrial enterprises, as it might seem at first glance. The concept itself is much broader and deeper.

The term Fourth Industrial Revolution is a collective description of the changes that occur in all systems and is associated with the massive spread of a number of new technologies. Like the previous three, it "opens a new chapter in the development of mankind." Despite the fact that these technologies originate from the digital systems laid down during the Third Industrial Revolution, they differ significantly from the previous wave of innovations; in addition, technologies and ideas that are not yet known to us will play a huge role in the near future.

These technologies include artificial intelligence, robotics, additive manufacturing (3D printing), biotechnology and neurotechnology, virtual and augmented reality, and advanced materials. An important note that Schwab makes: new technologies are not just a continuation of the digital revolution, their fundamental difference is that they are able to destroy even today's digital systems and create completely new sources of value (Schwab, 2019).

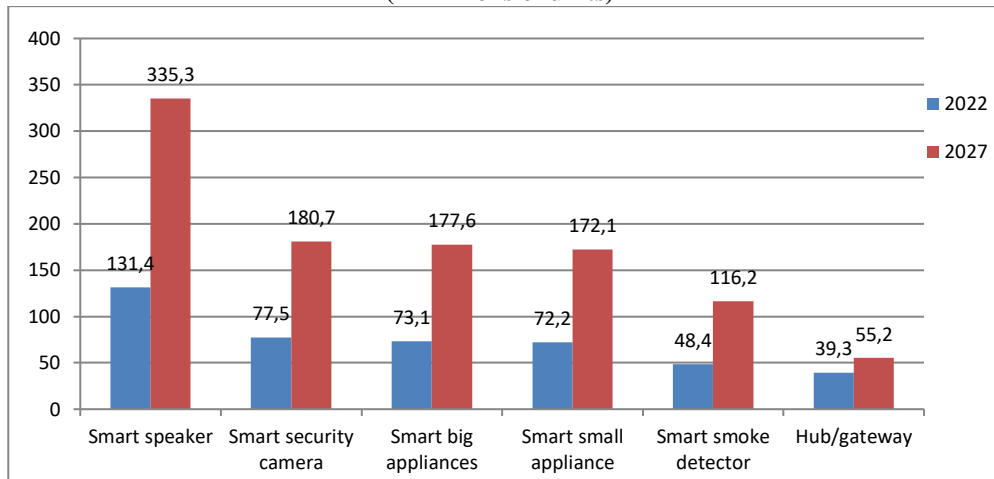
The next important aspect of modern changes is the speed of their spread; many researchers talk about its exponentiality (Schwab, 2018; Siebel, 2019; Blommaert, Broek, 2017). Consequently, the faster they spread and reproduce themselves, the faster companies will need to adapt to these changes and look for an adequate business model (Blommaert, Broek, 2017).

One of the latest books in this series, *Factories of the Future: Manager's Guide to Industry 4.0*, sets out to change existing business models and the benefits that come with future models: speed, accuracy, long-term predictability, and consideration of a wide variety of scenarios (Can Baran Ünal, 2022).

Significant changes in the entire global system of functioning of business and society are described by the study of Enis Yakut, who draws attention to the multilateral influence of Industrialization 4.0. At the micro level: changing approaches in management, marketing, supply, and technology. In the macro-environment: business globalization processes, socio-cultural changes, sustainable development, etc. (Yakut, 2022).

According to K. Schwab, “technologies become part of us” (Schwab, 2018). According to Statista, more than 130 million homes today have more than one smart device. Researchers expect that number to nearly triple in five years to reach 335 million. Additionally, it is assumed that by 2023 global spending on IoT products will reach \$1.1 trillion a year (Armstrong, 2022). Figure 1 presents data on the availability of various smart devices for 2022 and forecast values for 2027.

**Figure 1. Actual and projected number of smart home devices in the world (in millions of units)**



Source: Adapted from Statista, 2022.

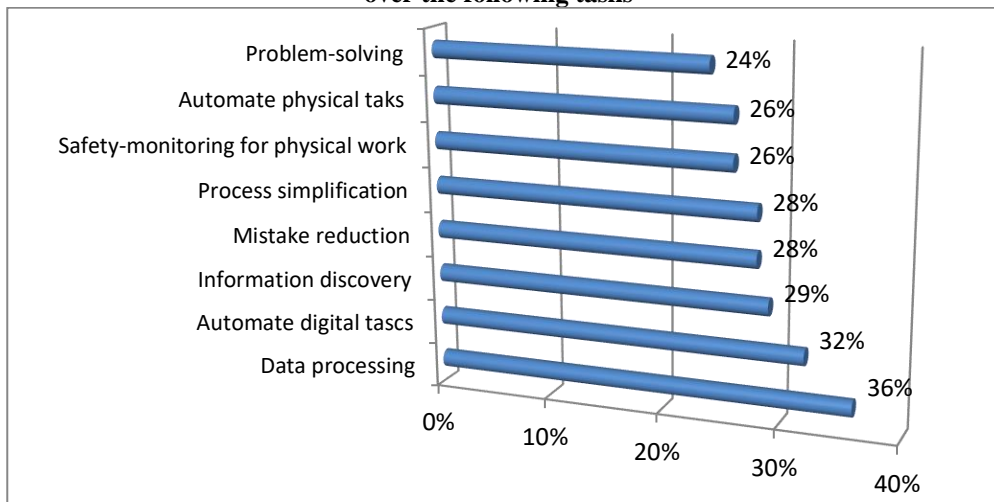
The assumption of the possibility of implanting virtual reality devices into the human body and even the brain leads the author to a serious problem of our time: where is the line between man and machine? What does it mean to be human? We, in turn, ask ourselves: how to manage such organizations in which, perhaps, the main processes will be carried out with the help of artificial intelligence? And, in general, what should be the management of the new era? In addition, given the object of study, the issue of a model for carrying out organizational changes in the current conditions is acute.

Obviously, the main issue facing society arises from concerns about the alleged connection with the introduction of new technologies and the replacement of manual labour by machines. At the same time, it must be taken into account that all areas of activity are serviceable, and secondly, with the advent of technology, among employees, more free time is released for creative work, learning new things, doing what they love. Therefore, using data from Gartner's statistical research, we arrive at

outliers in which two-thirds of the respondents tend to believe that some of their work was done with the help of artificial intelligence (Figure 2).

Although the survey was conducted among US workers, we tend to share the view that more and more employees are striving to replace routine processes with the work of artificial intelligence. This diagram shows the growing awareness among employees of the importance and effectiveness of using modern technologies. This should serve as a favourable factor in their perception. Considering that one of the most important problems in the implementation of organizational changes is the resistance of personnel, this factor is of paramount importance in carrying out major transformations associated with the Fourth Industrial Revolution.

**Figure 2. Share of US workers that would want AI to completely take over the following tasks**



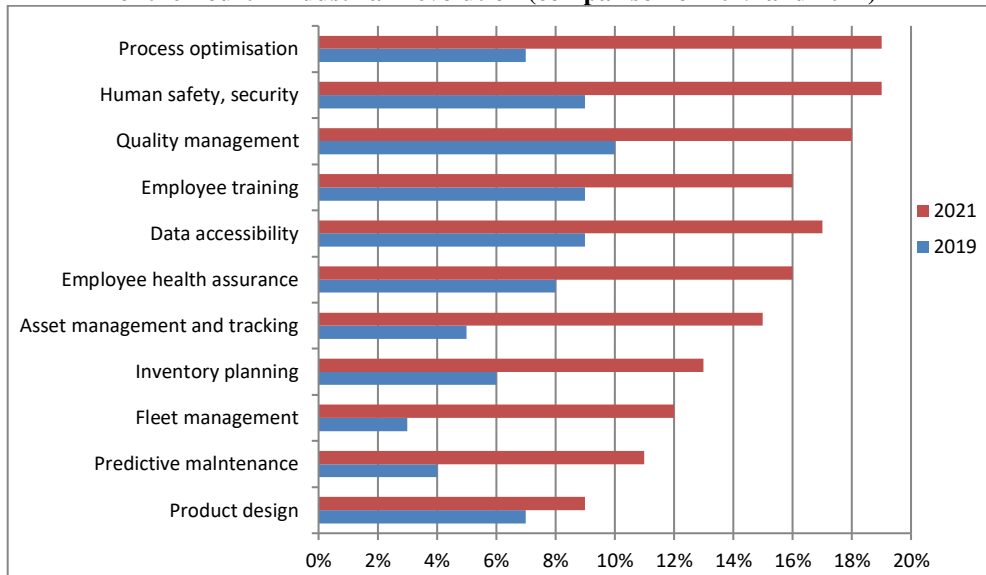
Source: Adapted from Statista, 2022.

The next sharply worthwhile initiative of the Fourth Industrial Revolution is the increase in inequality associated with the monopolization of the power of some companies (according to experts, today Google controls almost 90% of the global contextual advertising market, Facebook – 77% of mobile social network traffic) (Schwab, 2019). Such a superiority will further distinguish large global companies from the general mass. Of course, similar inequalities, according to Schwab, can undermine social cohesion, which can have an extremely negative impact on public sentiment. These opportunities may adversely affect the SME sector, which is already adopting modern technologies, and in particular the Internet of things, 6 times less than large companies today. A recent study by a group of authors in the application of technologies of the Fourth Industrial Revolution once again shows the challenges that SMEs face on the path of transformation. The authors clearly show how much the enterprises of this sector lag behind large enterprises, taking into account a large number of reasons. At the same time, researchers are considering in

detail the mechanisms for introducing Industrialization 4.0 technologies, taking into account the specifics of objects (Matt Dominik, Modrak, 2021).

In this context, it may be a favourable moment that many technologies are becoming more accessible, and even people with modest incomes use the Internet, smartphones and other means of communication, 3D printing, and some biotechnologies are also gaining accessibility.

**Figure 3. Changing interest of SME owners in processes related to technologies of the Fourth Industrial Revolution (comparison of 2019 and 2021)**



Source: Adapted from World Economic Forum, 2021.

At the same time, data from various studies testify to the growing interest in modern technologies. For example, studies conducted and presented within the framework of the World Economic Forum in order to establish trends in the development of SMEs under the influence of the COVID-19 pandemic indicate an increase in interest among SME owners in modern technologies (Merritt et al., 2021). It is obvious that the pandemic has accelerated the processes of digitalization and changed the attitude toward advanced technologies (Figure 3).

Understanding that the digitization of many processes is inevitable, without it the future of most companies is impossible, freeing up funds for business reorientation will help save time, which is so necessary in today's rapidly changing environment and gain a competitive advantage. In addition, SMEs need to develop a model for making much-needed changes, taking into account the specifics of the internal and external environment.

## **5.2 Directions of Organizational Change Management**

The challenges provoked by the processes of Industrialization 4.0 and described in the previous part of the work clearly suggest that it is pointless to act according to the management model that was effective in previous eras. But, at the same time, many companies are trying to stay afloat today, using the old management model. One of the most significant features of the Fourth Industrial Revolution is the growth of processes at an exponential rate, which is fraught with a complete blocking of the management model if it is not changed in time.

The conceptual model of the organization as a Machine is no longer valid in principle. It assumes the clarity of procedures and the certainty of the environment; these characteristics, today, have outlived their usefulness. Therefore, companies planning to operate in complex and unpredictable conditions need to radically revise their way of operating, and, above all, change the “organizational metaphor”.

Given the high likelihood that technology dominates most organizational processes, companies should focus on exceptional human qualities and the social component of organizations. Quoting Andrew McAfee and Erik Brynjolfson "the ability to work effectively with the emotional states and social motives of people will remain an exclusively human skill for a long time", while they give credit to the machine, believing that "when making decisions, forecasting, diagnosing, the computer will decide the leading role" (McAfee and Erik Brynjolfson, 2017).

Agreeing with this understanding, we add that any organization is a socio-technical system, that is, it is a combination of social, technical, and technological processes. Both systems are interdependent; changes in one system are necessarily reflected by changes in the other subsystem. Thus, the technologies of Industrialization 4.0 naturally affect social processes: culture, relationships, responsibilities, the essence of the activity of each performer, the management style, and the qualifications of employees are changing. Of course, given the complexity of many processes and the digitization of routine activities, the requirements for personnel will increase; this will concern qualifications and competence, as well as emotional intelligence, teamwork, creativity, etc.

In addition, in modern economic conditions, a huge role is given to the value-oriented approach. The limitations of the previous model, or metaphor, based on the activity of the organization as a machine, were due to the lack of consideration of this factor. Today, all scientists who study change (Peter Senge, Klaus Schwab, Andrew McAfee and Erik Brynjolfson, Norman Wolf and others), talk about taking into account the value factor.

Most of them lead us to a metaphor that characterizes an organization as a living organism. In such an organization, everything happens as in the human body. Scientists often compare organizational subsystems with human organs: individual employees with the cells of the body, teams that implement certain functions are comparable to the organs of the human body, the human skeleton is an organizational structure, etc. (Norman Wolfe, 2011).



As an organism, the company is influenced by energy fields, the primary of which will be the energy of the deep purpose (Soulful Purpose). Soulful Purpose is a powerful force that attracts the necessary energy structures to fulfil the mission. The main source of energy within the framework of this concept is people who, while expanding their capabilities, also increase organizational energy. Of course, any modern organization tries to direct its efforts in such a way that they lead to a synergy effect. In the context of the Living Organization concept, a synergistic effect can be achieved through teamwork. This intersects with Peter Senge's concept of a "learning organization", that is, a company in which employees constantly improve their level of education, there is a common goal and joint actions, a non-trivial way of thinking is encouraged, and the leader is an inspirer and motivator (Senge, 1990).

More recent research suggests the need to combine soft and hard skills in building the business model of the future. So, N. Accialini confirms this in the 4th part of his study: "Requirements and skills in demand", where he pays great attention to "soft" skills, such as change management, creativity, risk management skills, etc. (Accialini, 2022).

Other researchers, J. Nicholson and R. Murrey, are also calling on company managers to rethink conventional management and leadership practices towards a social concept called Human Operating Systems. In such a system, the greatest emphasis is on team leadership and cross-functional teams, which are the key to success. This system, in its essence, also resembles the "living" or "learning" organization, which is discussed below (Nicholson, Murrey, 2021).

Therefore, representing this concept figuratively, we note that everything starts with people and is transformed into goods and services provided to society. In addition, processes, the financial system and management, as well as direct and feedback between all elements, are integral parts of the model. Of great importance in such a model is the level of interest, involvement, and participation of all employees, who, like the organs of any organism, are of paramount importance. It is logical to imagine that the transition to management focused on the perception of the organization as a living organism will provide companies with adaptability and success in the long term.

### ***5.3 Readiness to Accept the Concept of a Living Organization by the Enterprises of the Republic of Moldova***

The complexity of taking into account all factors of the external and internal environment implies the use of such a behaviour model that can self-organize and adequately respond to the challenges of the external environment, as well as pay attention to the value component, which can only be realized when applying the concept of a Living Organization.

We emphasize that in the course of this study, we focused on the SME sector due to the extreme importance of this segment: at the beginning of 2021, the number of SMEs amounted to 57,247 units, which is 98.6% of the total number of enterprises. Of which micro-enterprises 85.4% (or 44547 units), small – 10.9% (5780 units), medium – 2.3% (1299 units). Enterprises in this sector create about 60.1% of jobs,

as well as their contribution to the formation of the GNP of Moldova is about 48% (according to the data of the National Bureau of Statistics at the end of 2020).

In the context of studying the scientific literature on this topic, we come to the conclusion that the concept of the Living Organization is closely related to the Learning Organization, according to the terminology of Peter Senge (which is confirmed, in particular, by Norman Wolfe). Therefore, in this context, consider the fundamental elements of both theories.

**Table 1. Correspondence of concepts in the concepts of the Living Organization and the Learning Organization (developed by the author based on the results of the study)**

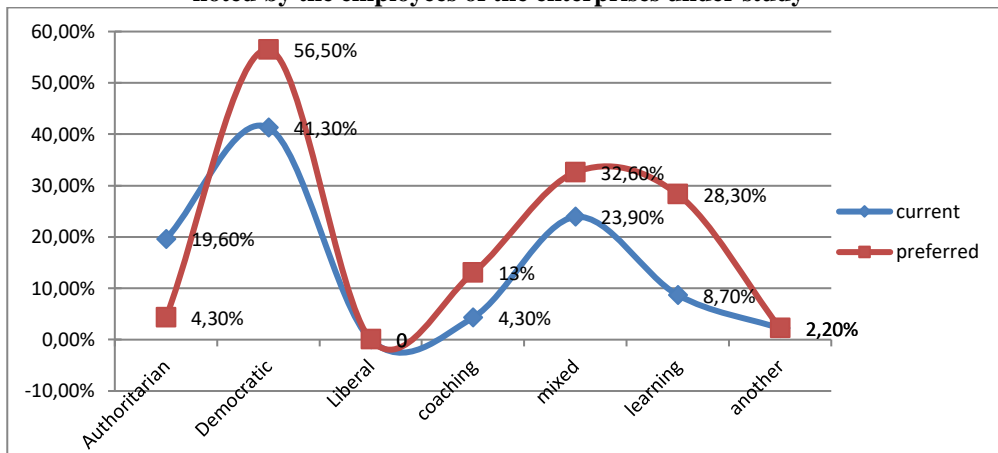
<b>Main component</b>	<b>Living Organization (by Norman Wolfe)</b>	<b>Learning Organization (by Peter Senge)</b>
<b>1. People</b>	Key characteristics in organizational interaction: personal skills, interpersonal skills technical skills	Emphasis on personal improvement (the difference between what is and a personal vision of the future). Learning the art of creating "creative tension" between dream and reality
<b>2. Teams, group interaction</b>	Relate to the field of relationships, a key property of leaders is the ability to form teams and stimulate interaction between individuals and groups	Through team interaction, learning - opening access to collective thinking, synergistic effect
<b>3. Leadership</b>	Leaders perform the vital functions of stimulating, directing, and coordinating the flow of energy within the company, motivate and inspire	Leaders are key figures in all organizational processes. An "ecological" approach to leadership is used as the interaction of various actions of leaders and organizational forces.
<b>4. Business models</b>	Everything starts with people and transforms into goods and services offered to society. Integral parts of the model - organizational structure, information flow, culture, norms and rules	Any model is built on system thinking. It is based on the dynamics of complex systems. An organization is a product of the thinking and actions of its members.
<b>5. Organizational development</b>	Increasing the level of interest, involvement, and participation of employees, creating an additional source of energy in the company as a whole, leads to "magic" results.	It is necessary to enable people to take part in new activities, thus they will develop a sustainable ability to change; this will be reflected in the results of the enterprise in the form of increased diversity, enthusiasm, innovation, and talent.

Source: Elaborated by author.

Considering the main components of the Learning Organization, in the course of the study, we will highlight some of its components, which, in our opinion, are key in understanding the possibility of the transition of SMEs to a new functioning model. So, one of the most important factors of the model are people, with their needs, abilities, and experiences. Their behaviour is influenced by a huge number of factors, in particular, the management style that prevails in the organization.

The researchers come down to the fact that it should be systematic, with the use of coaching, the staff should have the opportunity to express themselves; in this sense, creativity and initiative should be supported by the absence of fear of criticism. Let us present for comparison the leadership models used today in the organizations under study.

**Figure 4. The values of the current and preferred leadership style noted by the employees of the enterprises under study**



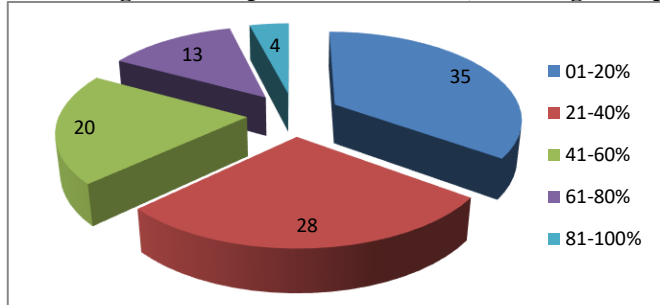
Source: Elaborated by author.

The graph shows discrepancies in the preferred and real management style; at the same time, the majority of respondents lean towards the democratic style and consider it the most used in enterprises, which, in our opinion, is a favourable factor. At the same time, we note a relatively small percentage of respondents who noted the style of management with the use of coaching – in reality, the current one – only 4.3% of cases, and preferably 13%. It should be noted that the main component in building a Living or Learning Organization is the leadership style, which includes such characteristics as coaching, training, and teamwork orientation. As can be seen from the diagram, the authoritarian style is used, 19.6% of enterprises adhere to it, and for 4.3% of respondents it is preferable. This indicates the existence of a traditional approach to managing an organization, which slows down the processes of building a Living Organization.

When characterizing team interaction, the majority of employees believe that team interaction is necessary – 87% of respondents give preference to team work, noting at the same time that their activities are mainly aimed at individual work –

67%, about what percentage of working time is spent in commands are shown in the following diagram:

**Figure 5. Percentage of time spent in team work (according to respondents)**

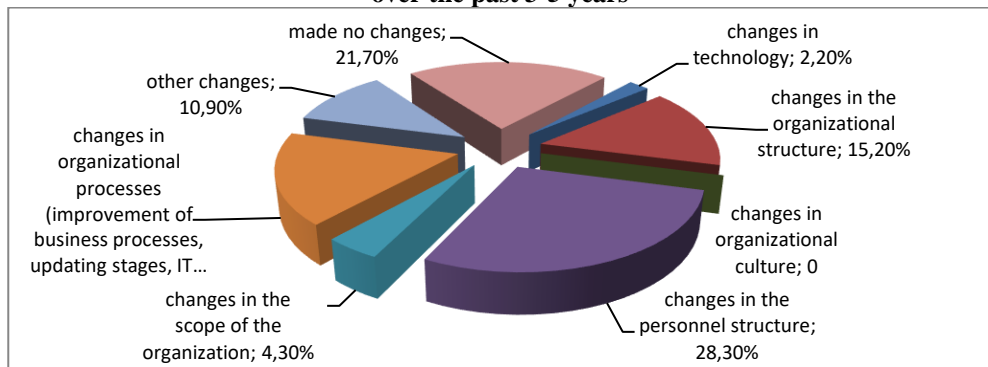


Source: Elaborated by author.

As the figure shows, only a small percentage of employees spend in team interaction: only 4% of employees note that they devote 80-100% of their time to teamwork, and the majority of employees note that less than 50% of the total working time is involved. This is contrary to the concept of learning, or living organization, in which all participants in the activity are an integral system, and the key to successful activity is the power of interaction, thereby obtaining a synergy effect and, as a result, increasing the efficiency of the organization.

When exploring the features of building business models, it is necessary to pay tribute to all elements of the business system (processes, technologies, people, structures, and corporate culture). As part of this study, we asked the respondents if there were organizational changes in their companies and what elements of the system they were associated with. We believe that this question logically represents the concept of a living organization in the context of its organic adaptation to ongoing changes. The responses of the respondents were distributed as follows (Figure 6).

**Figure 6. Types of changes carried out by the studied companies over the past 3-5 years**



Source: Elaborated by author.

The diagram shows that in 21.7% of the companies no organizational changes were carried out at all, which, in our opinion, is unacceptable, taking into account the peculiarities of the functioning environment. In addition, of those enterprises that carried out transformations, not a single company carried out changes in organizational culture, which indicates a lack of understanding of the importance of this element of the business model. Most of the changes, namely 28.3%, were made in the composition and structure of the staff, which, in our opinion, is associated with a partial reduction in staff during the quarantine period associated with the COVID-19 pandemic.

On the issue of emphasis in organizational development, the majority of respondents tend to believe that employees should be involved in the decision-making process, regarding the strategy of change: 73.9% of the staff believe that a mixed approach should be used in relation to the initiation of changes, that is, the right to initiation can come both from the bottom-up and from the top-down. In addition, 69.5% of the respondents share the need to involve employees in decision-making processes. Note that, for a learning organization, this percentage is small since in organizations of this type, all personnel, without exception, participate in the decision-making process, are free to express themselves, and are not afraid of criticism.

## **6. Conclusions**

Realizing the main goal and objectives of this study, we will justify the logical conclusions.

Based on the results of the study, it can be said with confidence that modern organizations are faced with a number of challenges that have gained maximum scope and extraordinary speed.

The concept of the Fourth Industrial Revolution is much deeper than it might seem at first glance. The emergence of technologies that revolutionize the entire human existence naturally affects management processes. The features of management during this period are associated with unpredictability, so building any static model that assumes the usual interconnection of elements does not seem logical. In this context, it seems most relevant to use the concept of a Living or Learning Organization, which will naturally respond to all the challenges and provocations of the environment.

Artificial intelligence and digitalization technologies are already gaining a leading position in many areas. This is due to their incomparable advantage in the field of efficiency, speed, and error-free. But, at the same time, technologies should develop and act for the benefit of human society, facilitate work, reduce costs, free up time for creative processes, and spiritual development.

Thus, in a Living Organization, the technical and social components should be organically combined. Since for the Republic of Moldova the dominant number of enterprises belongs to the SME sector, this study is devoted to identifying the directions for the development of enterprises in this sector in a complex environment that is emerging under the influence of Revolution 4.0 technologies.

The study shows that in many cases, enterprises have not yet developed a clear understanding of the need for changes (in 21.7% of cases, organizational changes have not been carried out in any direction for 3-5 years), many organizations still use an authoritarian leadership style (19.6%), team interaction is not always seen as a factor in successful organizational activity (only 17% of employees spend 61-100% of their working time through team interaction). These and other features of the activities of SMEs testify to the predominance of the traditional, bureaucratic approach to management, which for the most part is not appropriate when it comes to changes of this kind.

Of course, the difficulties in transformations of this kind are also associated with objective factors: financial difficulties that have worsened during the pandemic and, at the moment, political instability; inflationary processes that affect the performance of organizations, increased competition, etc. At the same time, the correct organization of many processes, the introduction of modern technologies that significantly increase the efficiency of business processes, as well as the formation of a new type of organization, are integral success factors for SMEs in a complex and undefined environment.

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