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Main Guidelines for the Change Strategy of SMEs in the Context of Industrialization 4.0

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Abstract: *Industry 4.0 brings with it irreversible transformation processes hitherto unknown to the world. The need for business transformation becomes obvious. The introduction of new technologies changes all aspects of business activities: structure, systems, personnel, procedures and rules, goals and objectives, corporate culture, and relationships with other elements of business: suppliers, customers, and other stakeholders. Often it is a question of changing the business model, which fundamentally changes all the principles of the company's activity. In this context there is a serious question: what change strategy to apply for its successful implementation. How will this strategy differ from the usual understanding of strategy and what are the factors of its success? Therefore, the purpose of this study is to justify an approach to change strategy in the context of instability, dynamism and fragility associated with Industrialization 4.0. The hypothesis of the study is the assumption that strategy in the classical view can no longer produce such an effect and therefore the new digital strategy is fundamentally different from previous approaches. The methods of this study are: the analysis of concepts and synthesis of theories of change management and strategic management, also an empirical study was conducted to identify the peculiarities of change implementation in small and medium-sized enterprises in the Republic of Moldova, after which conclusions and recommendations were substantiated in the field of changing the approach to change strategy in these companies. As conclusions, the main directions of change strategy development for SMEs in the Republic of Moldova are discussed.*

Keywords: *Industry 4.0, change, change strategy, small and medium-sized enterprises (SMEs), change model, digitalization, transformation.*

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1. Introduction

In recent decades, the world of business has developed at a great acceleration. The breakthrough technologies that researchers are talking about have changed many business processes and have been the root cause of dramatic transformations. At the same time, many companies that operate according to established principles and want to stay afloat should think about making transformational changes as soon as possible. In this context, SMEs remain the most vulnerable, lagging behind large enterprises for a variety of reasons. SMEs in the Republic of Moldova represent the vast majority of the total number of enterprises in Moldova (99.2% at the end of 2022), which corresponds to 62111 units and 274.8 billion lei in total sales. Given their extreme importance in the economy of the Republic, the present analysis is focused on the peculiarities of strategy formation for this category of enterprises, taking into account the new conditions related to the development of Industrialization 4.0. The problematics of the research is complicated by the fact that among the large number of strategies developed by companies, most of them, according to G. Mintzberg's research, never materialize. (Pijl, 2020). At the same time, an unimplemented strategy is the same as its absence.

Hypothesis of this study:

1. The strategy of change, accurately formulating trends for several years is no longer so effective in influencing the activities of companies, in modern conditions it is more appropriate to formulate a strategy with its simultaneous implementation and constant updating as necessary.

2. SMEs in the Republic of Moldova are ready to change under the influence of the processes that dictate the revolutionary changes of Industrialization 4.0.

3. Employees of Moldovan SMEs understand the need to reprioritize their change strategy.

Thus, *the purpose of this study* is to develop directions that contribute to the formation of a change strategy in the new environment. In order to realize this objective, the following *tasks were formulated*:

1. Conceptual analysis in the field of Industrialization 4.0, change management and strategic management to justify the directions for the development of a new change strategy.

2. Conducting an empirical study on SMEs in the Republic of Moldova in order to identify the peculiarities of changes and directions of development of companies in the new conditions of functioning.

3. Formulation of conclusions based on the synthesis of theoretical aspects and practical facts regarding the prospects for the development of change strategies of SMEs in the Republic of Moldova.

Literature Review

The study of the literature is divided into three areas: firstly, the essential conceptual basis is the understanding of the Fourth Industrial Revolution, the peculiarities of the development of the processes associated with this concept, as well as the essence of the technologies that give rise to the changes called Industrialization 4.0. In this context, the studies of Klaus Schwab (Schwab, 2019), Davis, (2018) Thomas Siebel (Siebel,2019), Blommaert & Broek, (2017), Ray Kurzweil (Kurzweil, 2019), McAfee & Brynjolfsson (2017), Kevin Roose (Roose, 2022) stand out, processes of change and the phenomena associated with them are highlighted and described in detail.

According to K. Schwab, the Fourth Industrial Revolution is aimed at ensuring that mankind properly utilizes all the advantages of modern technologies for the benefit of society. This is the main principle influencing our future and the future of the next generations. Like previous industrial revolutions, Industrialization 4.0 will significantly increase the productivity of enterprises and, consequently, increase the efficiency of most processes and business models. In this environment, it is important for companies and all stakeholders to focus on "system leadership", which includes three interrelated components (Figure1)

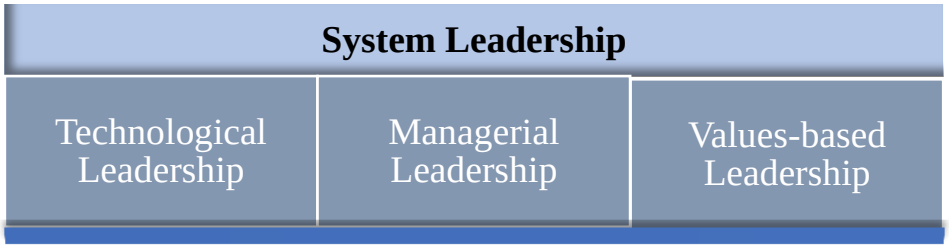

Figure 1. Modern approaches to changing the view of leadership, taking into account the combination of technical and social components
Source: Elaborated by the author based on the results of research on the concept of K. Schwab (Schwab, 2019)

Let us briefly consider the main components of these approaches, which are directly related to the formation of strategy in the modern conditions of functioning of organizations:

A) *Technological Leadership*:

- Maximum investment in digital communications, cybersecurity, data management tools, collaboration. Use of big data to develop strategic decisions, investment in technical infrastructure capable of structuring, storing, distributing, analyzing big data streams.
- Application of collective innovation strategies
- New skills and new ways of thinking required to embrace new technologies and new trends.

B) Managerial Leadership:

- The importance of the social component in a world of change, orientation on how to preserve human labor and creativity, to complement these concepts rather than replace them with machines.
- Development of new standards that take into account the use of Industrialization 4.0 technologies and orientation towards their use. For example, ISO international standards for unmanned systems, collaborative robotic systems, development of IEEE standards on safety, reliability and interoperability of electrical and digital systems.

C) Values Leadership

- The main orientation is a concern for values in conjunction with technological motivations in shaping the approach to change. Proactive action, as opposed to an approach where values are thought of as a secondary, afterthought.
- The leader's orientation to cultural and social values should act as a chain reaction in the team: the leader's example plays a primary role in the behavior of the entire organization (Schwab, 2019).

Characterizing the processes of change associated with the Fourth Industrial Revolution, Thomas Siebel, defines that "the cardinality of the processes associated with digital transformation is related to the pervasive power of four technologies: cloud computing, Big Data, Internet of Things (IoT) and artificial intelligence (AI)" (Siebel, 2021).That is, the power of these technologies, and there more their combined power, forces modern companies to carry out transformation processes as often and as fast as possible.

At the same time, Tew Blommaert and Stefan van den Broek define the Fourth Industrial Revolution as a "new normal" that will change the entire global business system. They also talk about the dominant power of breakthrough technologies, the increasing demanding nature of customers, the fact that company processes are becoming integrated and companies themselves are "shrinking" their organizational structure (Blommaert et.al, 2017).

All these examples speak about the peculiarities of the external environment, which until now were unknown to ordinary people and organizations, all the authors call for awareness of the importance of the social role of change processes, as well as for the orientation of companies in developing new strategies for sustainable development, which will first of all think about human needs, safety of functioning in the digital environment, creation of new jobs, "careful" attitude to employees and all stakeholders.

Taking into account the classical models of change, which began their development in the 50s of the 20th century, most of them evaluate the process of change from the point of view of its perception by employees (Kubler-Ross, 1998; Miner, 2005; Senge et al., 1999; Banmen, 2002;. Schein, 2016). All of them take into account the natural resistance of the staff at the first stages of the change process, as well as in cases when something in the company does not go according to plan. Taking into account the stages of perception of changes, managers should apply appropriate techniques and methods of "smoothing" the negative perception and, on the contrary, strengthen the positive aspects.

There are also models of change, which assume a step-by-step action plan, taking into account the pitfalls associated with change, for example, the existence of informal groups, going against the formal authority, or misunderstanding of the essence of change (Kotter's model), is also widely known model ADKAR, which is focused on working with people and the formation of understanding of the need for change and the desire to carry them out, through awareness, knowledge, ability, reinforcement. Also widely known is McKinsey's model, which divides the organization into soft and hard components and focuses any organizational change on the successful combination of all factors of one and the other field.

All these approaches are aimed at effective implementation of organizational change, including in a complex of different components and processes of change. To enhance the desired outcome, one or more models can be used, separating out exactly those elements that will reflect the chosen approach to a greater extent. In addition, a strategic orientation is needed to add purpose and adaptability to the change model.

Therefore, for completeness of the selected study, the third one was chosen, considering the works on strategic management: H. Mintzberg (Mintzberg, 2013, 2019), Pijl J. (Pijl, 2020), Porter M. (Porter & Heppelmann 2015, 2017), Christensen K. (Christensen, 2011), Collins D. (Collins, 2021), Peters T. (Peters, 2021), Kaplan & Norton (1996) and others.

Most of the authors write that modern approaches to planning differ significantly from what was until now. Firstly, it is connected with the speed of changes. And often the detailed formation of strategy meets the need to revise it as soon as possible, as time inevitably runs out. In addition, the extreme unpredictability of all processes exposes companies to intuitive decision-making and the formation of only strategic guidelines, as opposed to precise goals, which had to be calculated and processed thoroughly.

In addition, an interesting approach to strategy development is the approach proposed by Pijl J., who proposes the separation of causes related to the realization of executive management, i.e., current cases from the actual development of strategy for change. Besides, changes can be of different nature and scale: improvement, modernization and radical innovation. Accordingly, the work related to improvement and part of modernization tasks can be carried out by the existing business model, when radical innovation involves the development of a new business model of the company (Pijl, 2020)

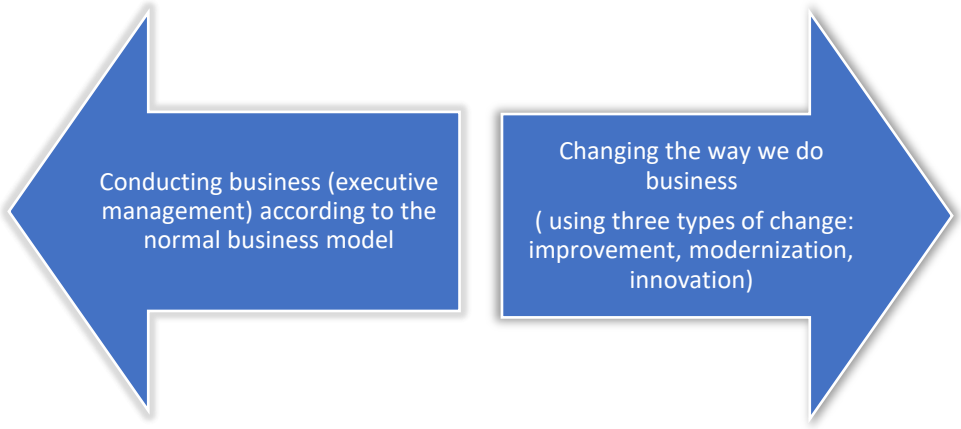

Figure 2: A figurative representation of the organization's business-as-usual and change management strategy.
Source: Executed by the author based on the results of research on the concept of Pijl J. (Pijl, 2020)

Summarizing the above-mentioned concepts, we note that numerous conceptualizations do not provide unambiguous guidelines for organizational change strategy, especially when it comes to SMEs. Therefore, the generalization of the concepts characterizing the Fourth Industrial Revolution, change management and the peculiarities of strategic planning, as well as research on the objects of the national economy on the peculiarities of such changes will help us to give a picture characterizing the peculiarities of changes in the Republic of Moldova, as well as to identify the main reference points for the formation of a change strategy.

2. Methodology

The present study is part of the work on the development of organizational change management for SMEs in the Republic of Moldova. For the completeness and coverage of the researched situation, a desk study was conducted, which included the analysis of statistical data available in the public domain, research of internet sources related to the situation of SMEs in the Republic of Moldova and in the world.

In order to substantiate the results, an empirical study was conducted with the participation of representatives of 210 SMEs from the Republic of Moldova. The research included a questionnaire survey of the personnel in order to find out the problems faced by managers and ordinary employees of enterprises, whether they understand the benchmarks they are facing in the context of Industrialization 4.0, whether they see the perspectives and what they are aiming at. The development of orientations in the change strategy is one of the components of the organizational change model, therefore, in our opinion, the present study is highly relevant and necessary for the overall understanding of the problem. The study was conducted during the period January-May 2023. The survey was conducted with the help of a questionnaire developed in Google Forms, at the same time, some open-ended questions were discussed during additional communication with employees of enterprises to reveal the completeness of the picture. Some parameters characterizing the sample are presented in Table 1.

Table 1. Main characteristics of the sample used in the present study

Characterization of the sample				
Gender, pers.	Distribution by position, pers.	Age		
		years	frequency	% of total number
Female - 110 Male -100	Manager-101 Subordinate-109	18-25 26-35 36-50 51-60 61+	74 45 76 13 2	35.2 21.4 36.2 6.2 1.0

Source: Survey results

The results of the questionnaire were processed in the SPSS program.

3. Results

To identify the peculiarities of the attitude to change management in companies, the questionnaire contained a question regarding the frequency of changes. The results showed that 30% of companies have not made organizational changes at all for the last 3-5 years, which, accordingly, negatively affects their overall condition. In our opinion, this is a rather large percentage, which characterizes inaction in turbulent conditions. Those companies that have implemented them (the remaining 70%) identified the areas of organizational change as follows (presented in Figure 3).

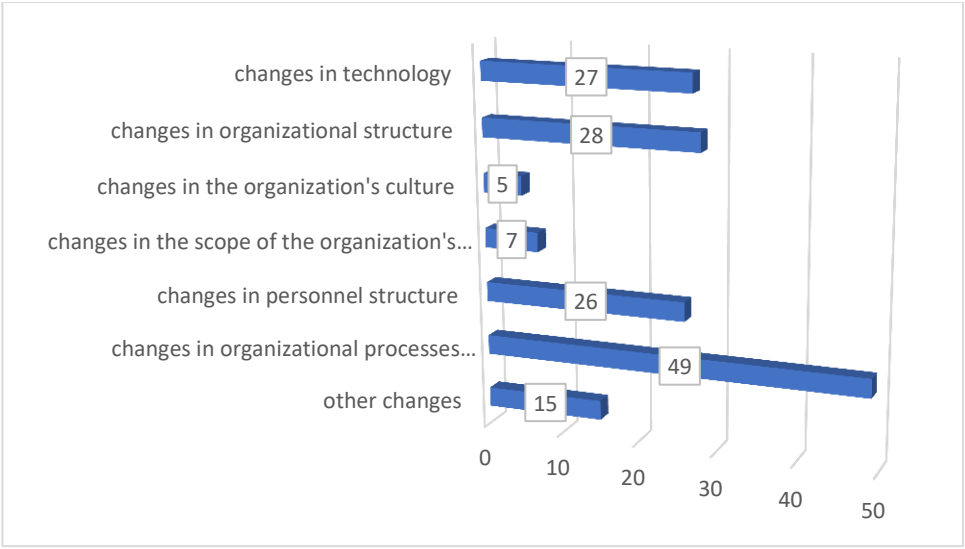

Figure 3. Types of changes carried out by the respondent companies over the last 3-5 years, number of companies
Source: survey results

As can be seen, most of the changes implemented by the company relate to changes in business processes, their optimization, in particular, related to their rethinking, redesign and implementation of information technologies. The second place in terms of prevalence is occupied by changes related to rethinking the organizational structure, which can be a logical continuation of the first type of changes, namely, optimization of business processes, and they can also be an independent type of changes. Although, as it is known, organization, being a systemic concept, when changing one variable, necessarily changes the others, even if it is not so obvious. The third in terms of prevalence are technological changes, which can also be a consequence of the process of optimization of business processes. A little less represent changes in the structure of personnel, which is associated with the need for additional recruitment of personnel with additional skills and abilities, complication of work processes, combining several procedures into one, complication of procedures, granting additional powers to personnel, etc.

In addition to exploring the nature of change and employees' understanding of the frequency of change required, the distribution of responses is as follows (Figure 4).

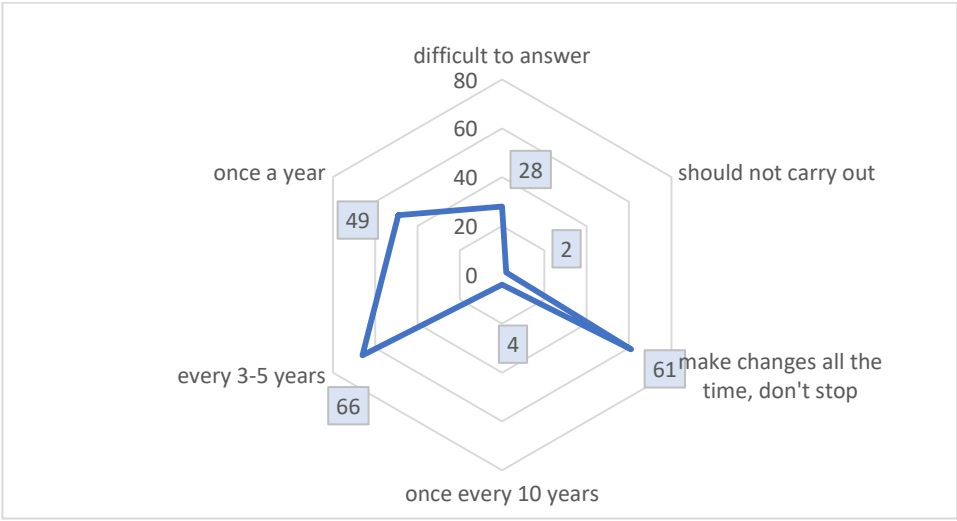

Figure 4. Distribution of respondents' answers regarding the need for frequency of changes (number of answers)
Source: survey results

The diagram clearly shows that the majority of respondents believe that changes should be made every 3-5 years (this answer was chosen by 66 respondents, or 31.4% of the total population). At the same time, the second most common answer, i.e., changes should be carried out constantly, was noted by 61 respondents, or 29% of the total number. In third place in terms of prevalence is the answer leaning towards the need to make changes once a year, which is close to the theoretical concepts that state that in the modern world, changes should be made constantly. We believe that once a year is also not a bad indicator for vision formation. Forty-nine respondents, or 23.3%, answered affirmatively here. A large number of respondents, namely 28 people, or 13.3% did not form their idea about the frequency of changes, and a very small number, namely 2 respondents (about 1%) believe that successful organizations do not need changes, which of course contradicts both conceptual and logical understanding of the nature and essence of change. Also, on the side of non-interference in the activities of the organization are 4 more people, or about 1.9%, who believe that changes should be carried out once in 10 years.

When approaching the development of the future change strategy in detail, the respondents were asked questions regarding the success factors of the future company model. One of the factors was "Partnership and cooperation with other SMEs". This factor was put forward for several reasons: firstly, it is difficult for SMEs to cope alone with the competition

presented by large organizations. Although there are not many such organizations in the Republic of Moldova, at the same time, they are more technically, managerially and financially savvy. Therefore, by joining together, SMEs can achieve a synergy effect by interacting favorably with each other. Secondly, recently, not only small but also quite large companies and even transnational corporations are thinking about pooling opportunities, forming new business models and realizing that this is the future development. So, the willingness of SMEs to team up and form strategies with other enterprises in the sector is presented in Figure 5. Respondents were presented with a scale from 1 to 10 to identify readiness, where 1- not at all ready, 10- fully ready.

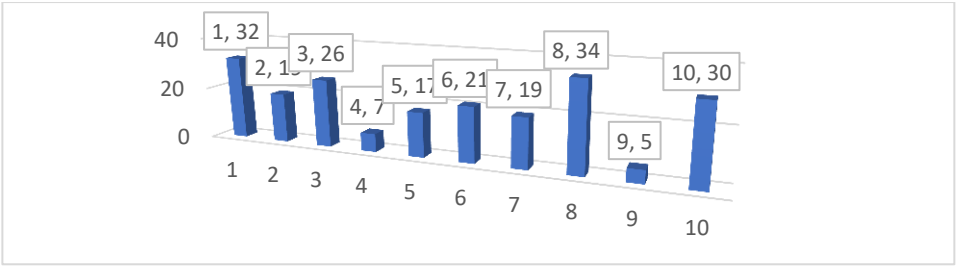

Figure 5. Distribution of respondents' answers regarding readiness for partnership and cooperation with other SMEs in the Republic of Moldova (significance from 1 to 10, where 1- not significant, 10- extremely significant)
Source: survey results

The weighted average value of this parameter is 5.41, which indicates an average willingness of companies to cooperate closely with similar SMEs. On the one hand, this is not bad, i.e. the process of cooperation is gradually being established, on the other hand, not all SMEs see themselves as part of the ecosystem, as theoretical sources say, and therefore, the process of breakthrough innovation is clearly slow, given the limited funds, ideas and other resources. Looking at the items individually, the largest number of respondents reported 8 points on a 10-point scale (34 respondents, or 16.2%), which is not a bad result. At the same time, the second most significant value is a score of 1 (32 respondents, or 15.2%), which means that companies do not consider mutually beneficial cooperation with such enterprises in the future. The third in this hierarchy is the answer corresponding to score 10 (30 respondents, or 14.3%), indicating the maximum readiness for cooperation, which can be positively assessed from the point of view of the development of prospects for long-term strategies.

The next criterion in this study that characterizes the direction of change is the question of whether SMEs need to develop a change strategy. It was taken into account that many SMEs often act more focused on the current activities of the company than on the development of a strategy. To what extent this factor is relevant for the companies surveyed - the respondents were asked to assess on a 10-point scale. As a result, the following answers were received (presented in figure 6). The distribution of points, as well as in the previous question, provided for 1- absolutely not relevant, 10- extremely relevant indicator for the company.

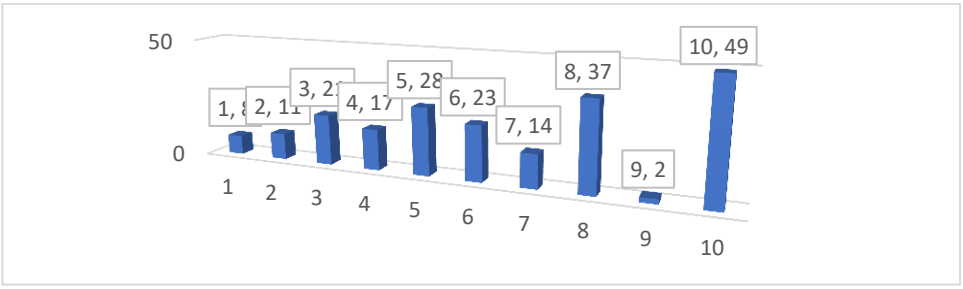

Figure 6. Distribution of respondents' answers (number of answers) regarding the need to develop an individual strategy as a factor of successful change management (from 1 to 10, where 1- extremely irrelevant, 10- extremely relevant).
Source: survey results

The results of the questionnaire show that the majority of respondents evaluate the perspective of individual strategy development as the most important element of change, 10 points was marked by 49 respondents, which represents 23.3% of the total number of respondents. Next in importance is the response of 8 points, which was marked by 37 people, or 17.6%. Next in importance is a score of 5, which was marked by 28 respondents, representing 13.3% of the respondents. The weighted average of this indicator is equal to a coefficient of 6.39, which, in our opinion, is quite a low indicator, given that absolutely everyone should think about the company's strategy.

Given the complexity and uncertainty of the external environment under the influence of Industry 4.0 technologies, one of the promising areas for SMEs is the introduction and successful use of new types of technologies (artificial intelligence, big data, Internet of Things and other technologies) in the activities of companies, which will significantly accelerate most processes, as well as change existing business models. To what extent companies are ready to adopt Industry 4.0 technologies - and

whether they are factors in the successful development of enterprises of the future, the answers to this question are presented in figure 7. Answers also mean 1- not essential, 10- extremely important).

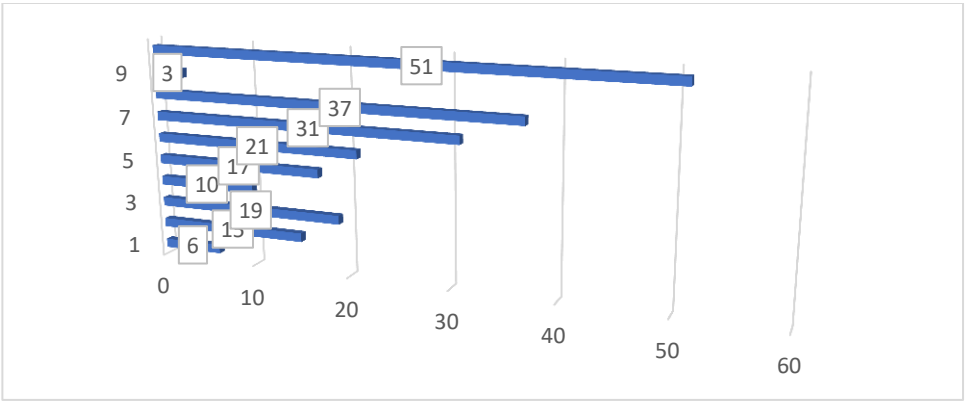

Figure 7. Distribution of respondents' answers regarding the importance of introducing information technologies, the latest programs, and artificial intelligence into their companies' activities (1- extremely unimportant, 10- extremely important)
Source: survey results

As can be seen from the Figure 7, the majority of respondents tend to 10-point assessment of the need to implement new technologies, which is a favorable point in the understanding of a large number of respondents (24.3%). Also 8-ball assessment is adhered to by 37 respondents, or 17.6%, which also represents a favorable indicator for development. Not quite favorable tendencies are observed among the respondents who gave marks up to 5 points, and this is a total of 67 people, or 31.9%, which is one third of the answers, and in our opinion, is a significant indicator characterizing stagnation and untimely implementation of changes. The arithmetic mean of this indicator is at 6.64 and is slightly higher than the previous indicators.

In order to test the hypothesis related to the formed understanding of the employees' understanding of the necessity of changes, the research formulated a question regarding the reasons of resistance to organizational changes, in which one of the reasons was the staff's lack of understanding of the necessity of changes. As a result of the survey the situation was obtained, characterized by the average weighted below the score of 5 (that's 4.41), which, in our opinion, characterizes a sufficient understanding on the part of the staff of the importance of organizational changes. The results are presented in more detail in Figure 8.

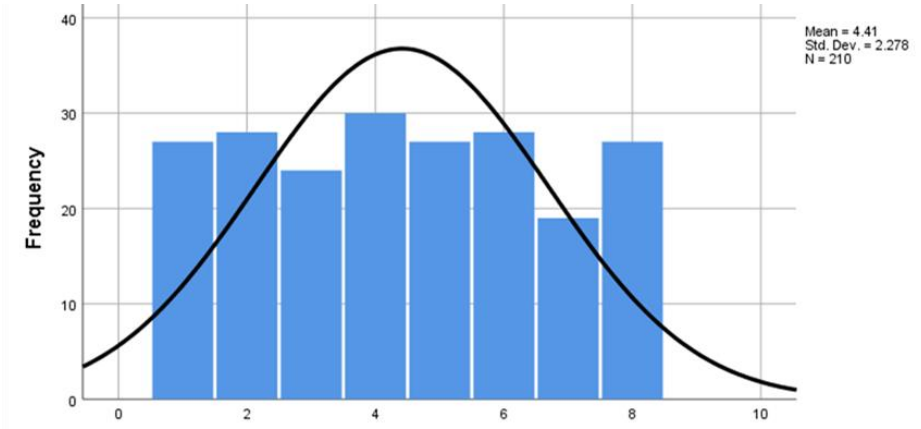

Figure 8. Assessment of misunderstanding of the need for change on the part of personnel (from 1 to 8, where 1 is not significant, 8 is significant)
Source: survey results

The answers to this question represent a relatively low percentage of resistance due to lack of understanding or unwillingness to implement changes. Therefore, it can be considered that this reason is not the most important in ranking the causes of resistance, and, consequently, most of the personnel of the surveyed organizations understand the need and importance of change.

In continuation of this understanding, the questionnaire asked about the importance of all SMEs to adapt to the process of digitalization and the changes associated with this process. To which the responses were significantly above average, with an arithmetic mean of 7.89. The distribution data are presented in Figure 9.

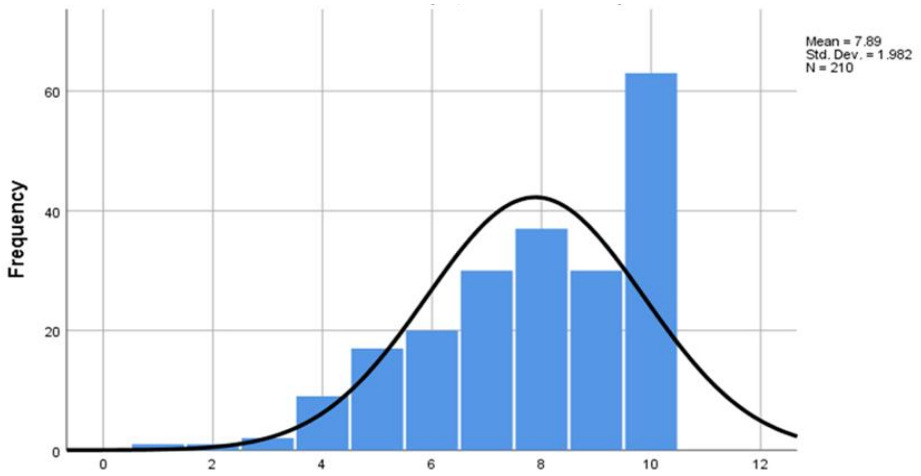

Figure 9. Distribution of answers to the question "Importance of adaptation of all SMEs to the process of digitalization and related changes". (distribution from 1 to 10, where 1-not at all important, 10-very important)
Source: survey results

This graph further confirms the understanding of enterprise personnel that Industry 4.0 brings significant changes, and that companies that do not adapt to them, or do not timely implement appropriate technologies, will not be able to survive in the long term. Therefore, when developing a strategy, it is necessary to take into account the need to implement modern technologies.

4. Limits and Discussions

Empirical research has natural ***limits*** due to objective reasons. Firstly, the research period is limited by the time of writing the paper. Considering that the development of modern technology is rapid, the time and period of research are of primary importance. Therefore, the limited period is one of the reasons for limitation. In addition to this, the sample presented in the study has certain limits, as mentioned, it is 210 enterprises in the SME sector. But considering that the research plan initially set a smaller objective, namely, 100 enterprises, we note that the study exceeded the planned figure by more than half. It should be taken into account that in this work the enterprises from all regions of the Republic of Moldova were studied and, accordingly, this determines the representativeness of the sample in geographical terms. One of the limitations of the results presented in this paper is the limited scope of the subject, which is part of a larger study. As a consequence, only a small part of the results related to the

selected topic is presented in this context. The main paper, on the other hand, contains more than 50 questions, many of which include sub-points. At the same time, the conclusions presented in this paper were drawn from a comprehensive study.

The ***originality of the study*** comes from the following: firstly, combining three conceptual areas: the peculiarities of the Fourth Industrial Revolution, strategic planning and organizational change management, secondly, the study of all these aspects in the context of SMEs, and thirdly, the elaboration of directions for the development of this sector of the economy under the conditions of Industrialization 4.0, which may be of interest not only for enterprises in the Republic of Moldova, but also for enterprises in other countries.

5. Conclusions

Focusing on the set goal and objectives of this study, we can come to the following conclusions.

Regarding the first task, namely, the analysis of three conceptual directions of modern trends of management science and symbiosis of these concepts, we will highlight the following:

- Conceptual studies of the foundations of Industrialization 4.0 give a clear idea of the magnitude of changes and the need to restructure all organizations according to new principles of operation. Klaus Schwab talks about the need to apply system leadership, which will include three interrelated areas: technological, managerial and value. The main conclusion of this approach is the need to combine new technologies with value orientations.
- Studying many concepts of organizational development, in particular, models of change, we come to the conclusion about the importance of orientation on socio-technical factors, which any organization is represented by. Thus, a change in one factor necessarily leads to a change in others. In addition, the importance of the approach to change is justified by the psychological perception of the need for change, which is largely related to the tools that successful managers apply in their practices.
- The theories of strategic management have also undergone changes in many ways. This is primarily due to the impossibility of accurately using forecasts in setting strategic goals, and the need to constantly analyze and revise both strategic and tactical goals.

The second objective was to conduct an empirical study and identify the characteristics of organizational change in SMEs in the Republic of Moldova. This task overlapped also with the hypotheses of the study, which were reduced to the irrelevance of classical strategic management, the readiness of SMEs to implement changes, as well as the understanding of the enterprises' personnel of the need to carry out organizational changes. Regarding this, several conclusions were made:

- 30% of enterprises in the sample have not made any organizational changes at all over the last 3-5 years, which, in our opinion, is a serious omission, given the emerging trends.
- The most common changes are related to changes in business processes, changes in the organizational structure, as well as the introduction of new technology. In our opinion, all these types of changes can be interrelated and one can complement the other. Organizational culture changes account for the least.
- Despite the fact that changes are not permanent at all enterprises, the majority of employees believe that they should be carried out. The most common answer regarding the frequency of implementation is a frequency of every 3 to 5 years or change needs to be continually implemented.
- Another important element of the modern change model is the focus on creating partnerships with other SMEs, through which new ecosystems, business models, etc. emerge. The willingness to transform in this way is at the level of the average, namely the weighted average is 5.41. On the one hand, this is not a bad result, but on the other hand, a higher percentage of willing participants is needed to create new ecosystems.
- Regarding the need to develop an individual strategy for each enterprise, the weighted average is 6.39, which is above average. It is worth noting the large number of respondents who marked the maximum score.
- The need to introduce the latest technologies in the work of the surveyed enterprises noted an average of 6.64 points, which is characterized as an indicator above average and allows making favorable forecasts in the future.
- We should note the high understanding of the enterprises' employees of the necessity to carry out organizational changes at their enterprises. This is also evidenced by the average index of staff resistance, calculated taking into account the lack of

understanding of the importance of changes - in the region of 4.41, i.e. below average, which positively characterizes the index of understanding and readiness of employees.

- The need to carry out the process of digitalization in all SMEs is evidenced by the indicator of weighted average answers to this question in the area of 7.89, which prepares about the correct understanding of respondents of the process of transformational change.

As the main conclusions to the paper (and the realization of the third research objective), we will highlight the following features of strategic change for SMEs in the context of Industrialization 4.0:

- ✓ Modern companies must constantly renew themselves, therefore, dividing the activities into two fields will more accurately orient the company both to the necessary transformations and to the effective current work.
- ✓ Strategic change is something that companies must deal with on an ongoing basis rather than on an ad hoc basis.
- ✓ It is appropriate and relevant for modern SMEs to create ecosystems where everyone wins, both each company, customers and other stakeholders.
- ✓ Modern technology is part of a company's strategic change. Frequent and effective interaction with all stakeholders can be enabled by modern platforms.
- ✓ Modern managers must develop in employees the feelings of the need for change, so that change becomes commonplace and employees react normally to it.
- ✓ The development of skills of interaction, ownership, continuous development, timely reaction should become the basis of managerial activity, along with adaptation and future orientation.

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