

THE ERA OF THE SINGULARITY AND THE CREATION OF A BIMODAL SYSTEM: OPPORTUNITIES AND TREATS FOR ENTREPRISES IN THE REPUBLIC OF MOLDOVA

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ABSTRACT: *One of the main characteristics of today's business environment is extreme unpredictability and volatility. In addition, the rate of change is significantly different from what it was even a few decades ago. Scientists call this state a singularity. Accordingly, the modern era is called the era of the singularity. So, in the modern world, under the influence of technology, business processes, business models, forms of interaction, culture and people themselves are changing. Rethinking the concept of business in such conditions is extremely difficult. In addition to the global nature and ambiguity of processes, the difficulties are caused by crisis phenomena that hinder the development of enterprises around the world, in particular the Republic of Moldova. In such conditions, it is especially difficult for small and medium-sized enterprises of the Republic of Moldova, given their characteristics and extreme vulnerability. In this context, the right orientation in management plays a huge role: vision, strategy, sensitivity and perception of the latest trends, customer understanding, the formation of a culture of innovation, and of course, the choice of a business model. Thus, many leading companies in the world, including those belonging to the SME sector, choose a functioning model based on a bimodal system. The importance of this approach, the advantages and dangers are discussed in this article.*

KEYWORDS: *singularity, digital transformation, changes, innovations, optimizations, bimodal system, business model, SMEs, change management model, business process.*

JEL CLASSIFICATION: M15, M19, O31, O32, O35

INTRODUCTION

The relevance of research. Recently, a large number of studies devoted to transformational processes have appeared in the specialized literature. Obviously, the trends of scientific and technological progress affect absolutely all spheres of human life and activity. In particular, the world of business is developing at a pace never seen before. Not so long ago, in 2011 at the World Economic Forum in Davos, forum chairman Klaus Schwab proclaimed the start of a new industrial revolution called Industrialization 4.0. This is not the only phenomenon to which today's environment is being compared. For example, Andrew McAfee and Eric Brynjolfsson call today's processes the "Age of Machines", defining three components: machines that will largely replace humans in the process of labor and many important operations, platforms that are becoming more common and with the help of which new interaction models are carried out and the crowd, namely, all the knowledge of a large number of the world's population, available today in the online environment (McAfee & Brynjolfsson, 2019). All these components radically change the picture of the world, transforming the activity and perception of labor processes, communication, changing the environment for companies. The question becomes logical: how to be ordinary enterprises in such a complex environment, where everything is uncertain and it is impossible to plan everything in advance. Will management be able to cope with the upcoming changes and is it even aware that something needs to be changed?

So, **the main goal of this study** lies in finding out the attitude of the personnel of enterprises regarding the need for transformational changes facing enterprises, as well as how representatives of enterprises see these processes: what they will be based on and what are the elements of the change process.

I. RESEARCH PROBLEM AND RESEARCH METHODS

Considering the characteristics and features of the modern environment, the **main problem of this study** is the lack of understanding of the depth and scale of the upcoming processes for a large number of enterprises. Considering that the object of the study are SMEs from the Republic of Moldova, a large number of them live for today and try to survive in the current crisis. Those representatives of enterprises who understand the need for such significant changes are afraid of the cardinality of the processes and try to minimize the risks. It seems to us that this approach is not effective enough in such conditions, due to the significant discrepancy between the latest technologies and existing control systems.

Thus, the **research methods** are:

✓ the method of analyzing scientific literature in the field of studying the features of the processes of Industrialization 4.0, singularity, management of changes and innovations, new approaches in the field of management.

✓ In addition, the paper presents data based on the analysis of national and foreign statistical data.

✓ To substantiate the conclusions, the paper presents the results of an empirical study conducted on 46 objects of the national economy. The study involved employees (managers and subordinates) of various Moldovan enterprises. Given the complexity of determining the direction and the versatility of many of the issues covered, meetings and discussions were held with employees, that is, the study was not limited to closed answers to questions.

✓ Applying a synthesis of conceptual frameworks and empirical research, the main conclusions of this study were formulated.

It should be noted that this study is a part of a post-doctoral project funded from the state budget of the Republic of Moldova 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.

II. THE CONCEPT OF SINGULARITY AND THE MAIN CHARACTERISTICS OF THE ERA OF SINGULARITY

Starting the study of the concept of "singularity", let's turn to the mathematical term, from where, in fact, it appeared. Singularity implies the existence of a point in space where the function ceases to "behave normally". Translated from the Latin singularis means "isolated, solitary." In the context of this study, we understand the singularity as the starting point from which the development trends differ significantly from the previous ones.

Today, the concept of singularity occupies the minds of many scientists. In particular, the modern French scientist Gilles Deleuze, who understands the singularity as "folding points, bottlenecks, points of sensitivity, illness and despondency", that is, completely different states of objects and human nature, in which either turning points occur or something begins take on a different meaning. At the same time, the point is also a continuation of some event and suggests future trends. In the field of our research, the singularity implies the moment when technology has developed to such an extent that a person ceases to understand what is happening.

Rowan Gibson, quoting the world-famous author Michael Crichton, author of "Jurassic Park", refers to the concept of linearity - "it's just an artificial way of perceiving the world. Real life is not a series of interconnected events occurring one after another... but a series of collisions in which one event can change all the previous ones in a completely unpredictable and sometimes destructive way." (McAfee & Brynjolfsson, 2019).

We note the same judgment in Nassim Nicholas Taleb, who is convinced that it is impossible to determine future events, and the desire to predict in people appears as a result of the "eclipse triad", according to which people have a false idea that they understand everything in an incredibly complex world, evaluate events based on retrospective experience (as in a history book,

when events follow one after another and logically follow from each other) as well as a tendency to exaggerate the significance of facts and create incorrect categories. (Taleb, 2010)

Considering the opinions of scientists who prove the non-linear development of modern events, it is safe to name the main limitation of the linear thinking of many modern managers to do business according to the old methods, which consists in the assumption that successful development strategies of the past can be transferred to future periods. It is obvious that extrapolation is inappropriate in this context.

So, according to Blommaert and Broek, a technological singularity is a state in which people no longer have to update computers, telecommunications systems and robotic mechanisms, as they will reprogram themselves on their own. (Blommaert & Broek, 2017)

Technological singularity leads to the emergence of a state of singularity in other sciences, taking into account the interconnections and interdependence of various sciences. In other words, modern technologies push and accelerate the development of innovations in other areas of knowledge, such as health care, biotechnology, natural science, space technology, etc.

Social Singularity, which is a virtual community of people created on the basis of social networks.

Thus, a “new normality” is being formed, which should differ significantly from the previous “normality”, taking into account the above-mentioned acceleration processes.

Back in 1993, American science fiction writer Vernor Vinge predicted that the Singularity Age would come between 2005 and 2030. His idea is supported by many writers = futurologists (Tjeu Blommaert, Stephan van Broek, Erik Kolthof, Ray Kurzweil, etc.). According to Vinge, "when a person creates a machine that is smarter than a person, history will become unpredictable, because it is impossible to predict the behavior of an intellect that surpasses the human." (Varlamova, 2018)

III. THE “NEW NORMAL” IN MANAGEMENT. TRANSITION TO BIMODAL SYSTEMS

Given the current conditions, the need for a transition to a new understanding and perception of management becomes obvious. Thus, the concept of "new normality" irrevocably enters our lives.

Synthesizing the conceptual assumptions presented by Blommaert, Broek, Schwab, we will give a brief description of this concept.

- Features of the "new normal" are manifested primarily in the philosophy of management, which, unlike previous eras, is characterized by the principles of *cooperation, connection, interaction*. That is, a systematic approach, which assumed the interconnection of the elements of the system, reveals the boundaries of the system, so partners and clients become its elements, or links.

- In addition, great attention is paid to the *individuality of the client*, to whom the entire main business process is oriented, his exceptional requirements, the implementation of exclusive settings and improvements.

- In this regard, the minimum quantity of goods produced in the future will not be considered a batch, as it was in mass production, but *a unit, focusing on a specific consumer*. And at the same time, given the consistency, the consumer himself becomes a part of the production process, which can make changes and refine something as needed and the individuality of the order.

- Of course, one of the main requirements of the management of the future will be the presence of *high emotional intelligence*, which manifests itself in empathy, sympathy, understanding of both your employees and all participants in this complex process.

- Requirements for an increased level of *emotional intelligence* are also observed among *ordinary employees*. Given the specifics of new products and services, the unique approach to the client, employees must also feel and understand the needs and preferences of both clients and colleagues (taking into account the fact that the concepts of an internal client and supplier appear within the business process).

- Payment methods are also changing. More and more attention is focused on blockchain technologies that "embed" in the ecosystem and operate organically in it, signaling payment and setting the momentum for delivery in real time.

During this difficult transitional period, many companies will have to use the so-called "bimodal" approach for some time, that is, combine the traditional approach to management to support current processes and at the same time master a new approach that will be focused on technologies of the era of the future, or era singularities.

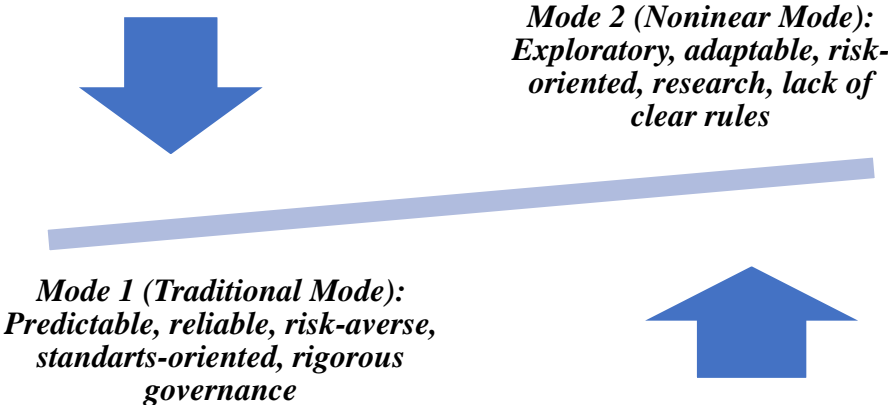


Figure 1: Logical representation of bimodal systems
Source: compiled by the author

Sometimes it is very difficult for management to make a final choice in favor of a new system or a new approach, when the old one is still acting by inertia and enjoying, albeit not breakthrough, but advantages. Researchers believe that the way out is the use of such bimodal systems.

Table: Characteristics of systems representing a bimodal approach to managing an organization (on the example of the IT department)

System 1: The Traditional Approach <i>Focus on Endurance and Efficiency</i>	System 2: Nonlinear Mode <i>Focus on Speed and Change</i>
Reliability and stability of data and systems	Flexibility of systems and ever-changing needs
Overarching Goals: Efficiency, Continuity	Focus on Experimentation and Innovation
Management principle: "Ask permission"	Management principle: "Ask forgiveness"
Establish long-term relationships with key suppliers	Flexible contracts with small suppliers, suppliers become part of the system
Traditional project management (ex, ITIL, CMMI, COBIT)	Small temporary teams with autonomy (DevOps)
Long production cycles	Short production cycles

Source: compiled by the author according to the source: Blommaert & Broek, 2017

Here are the characteristics of two management models within the framework of one system, which are given by Blommaert and den Broek (Table).

According to experts, bimodal systems can be used not only in the IT department, but also in financial, legal, marketing and other departments. The application of such systems at the level of the entire company is possible for their application to different markets depending on the level of development, or different products, while focusing each subsystem on a certain type of structure, culture and management system with separate indicators.

The critical importance of building interdisciplinary teams in new systems is evidenced by a Gartner study that found that 84% of private companies and 59% of government agencies have created so-called "fusion teams" that combine information technology and other expertise.

There are many risks involved in choosing an approach. The complexity of managing bimodal structures is one of them. But, at the same time, focusing simultaneously on several areas of activity, companies will be able to both reorient themselves in a timely manner and retain their former positions for some time.

Despite the obvious innovativeness of the approach using bimodal systems, it also has opponents who say that the approach is not new and that in the case of multi-orientation, it is necessary to use as many systems as there are factors affecting the organization, which, in our opinion, is practically impossible.

One of the main problems of implementing changes is the lack of necessary and relevant skills among managers and executors. A survey conducted by Statista in July-October 2021 among 2120 respondents from 87 countries shows what core skills CIOs and IT leaders need to develop. To the question about what they lack the most skills, the answers were distributed as follows (shown in Figure 2).

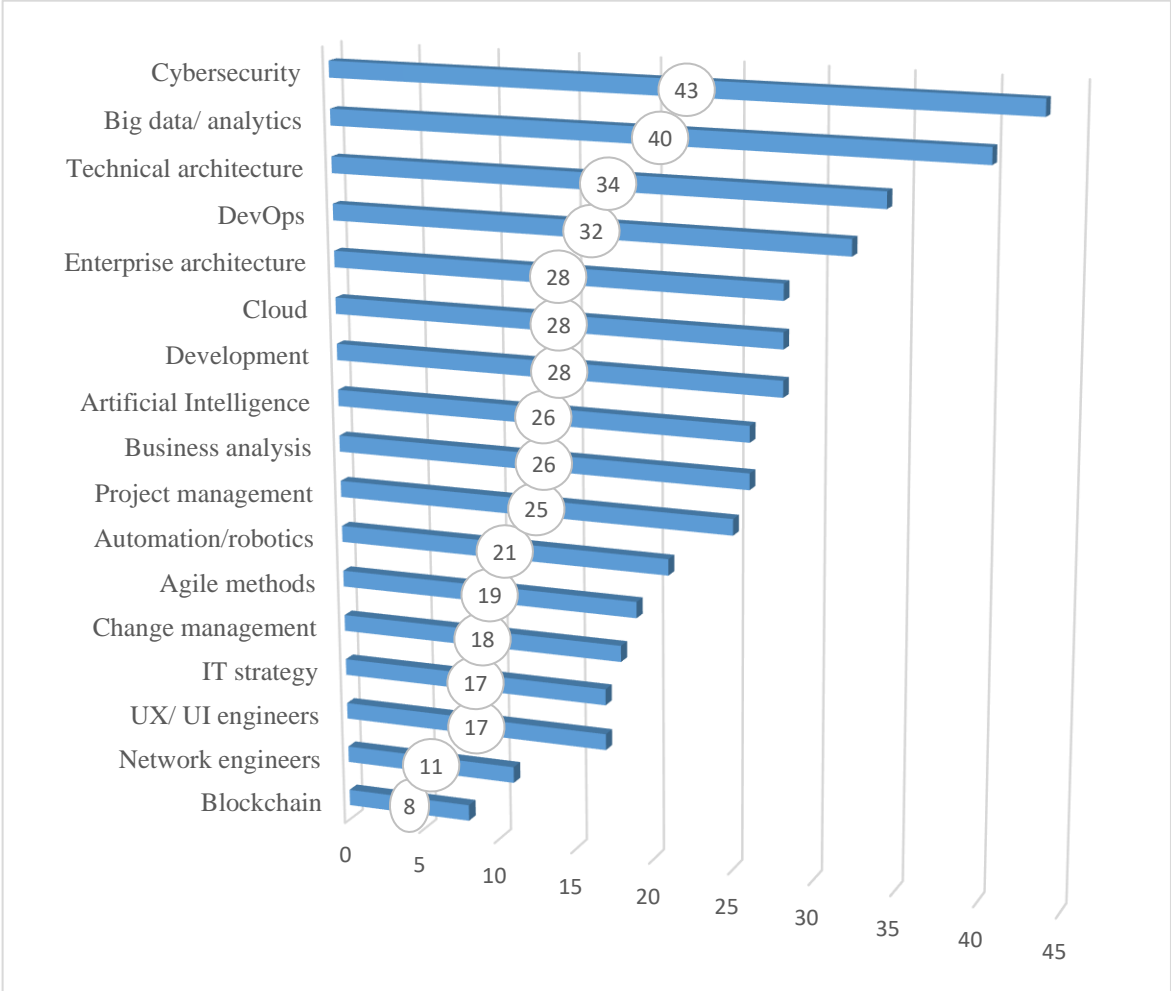


Figure 2: Areas where CIOs and IT leaders feel the need to improve their skills (in %)

Source; Statista <https://www.statista.com/statistics/662423/worldwide-cio-survey-function-skill-shortages/>

Thus, the transition to a digital strategy is associated with the possibility of making many mistakes. The Gartner edition cites the most significant of them. (Gartner, 2020)

1. Lack of understanding of the true scale of digital change. Lack of a clear vision and understanding of what is happening in the industry can lead to insufficient digital change.
2. The prevalence of perspective vision over specific studies of customer needs.
3. Management rejection and the board accept the appropriate digital transformation as part of the overall enterprise strategy, often assuming it is the job of the IT department rather than the management team. Digital transformation must be an integral part of the mission of the organization, otherwise it will not be successful.
4. Lack of specific indicators regarding digital transformation. There are ideas, visions, many examples, but no well-defined plan of your own.
5. Incrementalism in bringing about change. The problem lies in the insignificance of the changes and the lack of a complete look at them. In this case, it is not appropriate to change the current state of affairs in small steps.

6. Orientation to stability, or fixed mindset. Change in a company necessarily requires the creation of a culture of change and an openness to innovation and continuous learning. The absence of these elements leads to failure.

7. Overplanning associated with excessive bureaucracy hinders both the transition process and the further activities of the company. the desire to analyze and plan everything, characteristic of traditional thinking, does not work in conditions of turbulence.

8. Orientation to a greater extent on a technological breakthrough than on consumer preferences. Companies must use technological tools to do what others could not.

9. Cultural barriers to scaling. What is an advantage for some companies is a problem for others. It is necessary to turn culture from a barrier into an accelerator.

IV. MOLDOVAN ENTERPRISES: CHALLENGES AND READINESS FOR TRANSFORMATION

What are the main problems that accompany Moldovan enterprises during the period of transformational changes and the transition to a new non-linear approach, we learned as a result of a study on the objects of the national economy. Representatives of 46 Moldovan enterprises took part in the study, 34.8% of which do not belong to the SME sector, the remaining 65.2% are SMEs. The study involved 32.6% of managers, the remaining 67.4% were subordinates.

Exploring the main problems that are associated with such significant changes as the transition to new approaches based on the technologies of the era of the singularity, or the Fourth Industrial Revolution, the answers of the respondents were distributed as follows. The employees consider the lack of an appropriate level of motivation, the lack of IT specialists of the appropriate skill level, the lack of relevant knowledge and approaches among company management to be the most significant factor. In addition, the respondents name insufficiently strong ties between partners in the process of business relations as an important missing element. As mentioned above, this is also one of the key factors in the transition to a new plane.

As can be seen from the diagram, employees of enterprises attach the greatest importance to weak or insufficient motivation. Of course, many problems of enterprises come from objective factors associated with crisis phenomena, which have recently paralyzed not only the entire Moldovan, but also the world economy.

Crisis phenomena leave an imprint on the financial performance of companies, and as a result, the need to save resources and reduce staff. Under such conditions, it is extremely difficult to carry out any kind of change. Accordingly, motivation, as the main lever for carrying out changes, is at a level below the desired one.

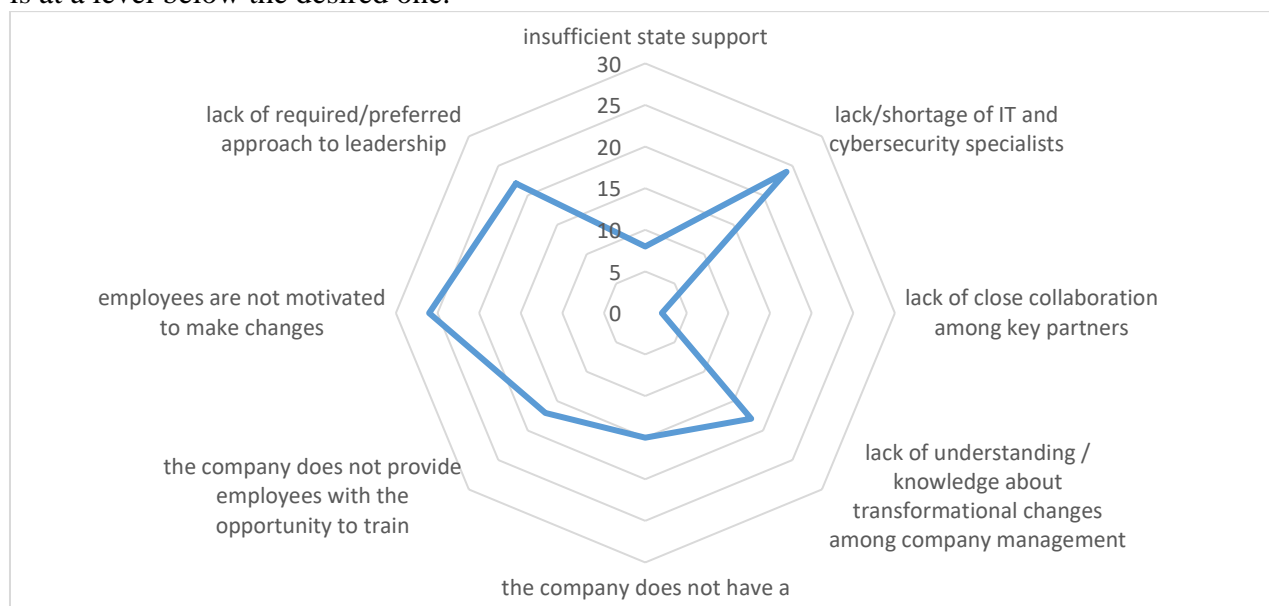


Figure 3: The main problems hindering the implementation of transformational changes at the enterprises of the Republic of Moldova (according to respondents)

Source: according to the results of the study

By highlighting the problems associated with the lack of funds, knowledge and the opportunity to learn, the staff sees the benefits of making changes, which are reflected in the results of the study.



Figure 4. Key Benefits of Implementing Changes

Source: according to the results of the study

Thus, 93.5% of the surveyed personnel see the benefits of digitalization processes and other changes associated with the latest technologies. In addition, 42.9% of employees believe that digitalization processes are being implemented at their enterprises already during 2022-2025.

So, the greatest benefits from the introduction of new technologies and related changes are presented in Figure 4.

Thus, we come to the conclusion that there is an awareness of the need for changes in Moldovan enterprises, both managers and employees of enterprises understand both the importance of the changes themselves and the digitalization process as such.

CONCLUSION

In this and other articles devoted to the study of the ways of establishing change management in enterprises of the Republic of Moldova, the main problems associated with the transformation of enterprises associated with the challenges of Industrialization 4.0 are revealed (Dorogaia, 2022). Advanced technologies, which are introduced by modern enterprises, significantly change their way of working. Obviously, using the old approaches, companies will not be able to implement them, and, consequently, will not gain a competitive advantage.

Taking into account the existing and potential problems and thinking through ways to overcome them, avoiding the possible mistakes described in this paper and promoting the skills that are necessary for the personnel of enterprises, companies will be able to adapt to the provocations of a new environment characterized by extreme uncertainty, danger and high speed of change.

One of the options for reducing risks is bimodal systems, which many global companies are successfully implementing in practice and which, perhaps (but not necessarily) over time, will be rebuilt into self-learning or innovative companies. At the same time, as long as there is a need to focus on traditional markets, demand, and established management principles, companies can successfully combine a bimodal approach

The biggest problem with this approach is the complexity of process management and, of course, the difficulty of reorienting to the duality of behavior, in addition, the staff must also reorient and play a "double game", which will be very difficult for some. At the same time,

realizing the inevitability of new approaches, bimodal systems are one of the options for getting out of this situation.

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