

Transformation of Managerial Innovations in Conditions of Digitalization of Market Relations

Svetlana Khaminich, Mykhailo Broshkov, Eduard Kuznietsov, Olena Ptashchenko, Viktoriia Milcheva, Olga Boiko

Abstract: To date, the changes provoked by the digital economy have affected all industries, from the growing interest in cryptocurrencies, developments in the field of financial technologies, the Internet of things (IoT), intuitive programming, online education and significant progress in gene therapy. Management as a science of management also undergoes innovative changes, turning into a "digital" reality. Production management is implemented through ERP systems that allow you to remotely reconfigure the production line, track deviations in the use of materials, etc. Other types of requirements are also imposed on personnel management, such as the possession and application of emotional intelligence, determined by the person's ability, in this case, the manager, to recognize emotions, understand the intentions, motivation and desires of other people, and the ability to manage their feelings and emotions of other people in order to solve practical problems. Collaboration with freelancers and working with an outsourcing pool allows you to enter the global virtual labour market and attract the best talents on a worldwide scale.

All of the above tasks can be attributed to the category of a more high-tech, high-tech level than standard management decisions. To move to this "new" level, significant modernization of both technologies and methodological approaches to the system of managerial innovations is required.

The article describes the main types of managerial innovations, offers methodologies for assessing the quality of management, and analyzes the impact of the introduction of individual tools at leading enterprises and outsiders on their effectiveness and competitiveness in the digital economy.

Keywords : Digitalization, Managerial Innovations, Market Relations.

I. INTRODUCTION

Of all types of innovations, management to this century least attracted the attention of scientists. This is because the introduction of technical and technological innovations gives tangible and measurable competitive advantages to the control object. The effect of improving management through the introduction of innovations is not so noticeable, often

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immeasurable. Nor is it evaluated that it is the updated management system that makes it possible to implement technological innovations, that it is management innovations that ensure an effective transition from the initial state of the system to the desired one.

In the new "digital" economy, the concept of economic growth has been replaced by the idea of economic development related to the process of introducing innovations in all spheres of activity [1]. The innovation sector today is the driver of the growth of high-tech and high-performance industries and the key to the competitiveness of enterprises. The problems of ensuring "innovation" of industrial development come to the fore. Moreover, because of the apparent transformation of all areas of the economy, the familiar "classical" methods, tools, criteria, known generally from economic science, also lose their practical significance due to the apparent need to actualize them taking into account the transformation of the economy [2-5].

According to the study, in the next five years, the digital revolution will displace from the market 40% of the companies that now occupy a leading position in the industry (Fig. 1). To avoid such a fate, enterprises need to change, introducing advanced solutions based on innovative technologies.

Management innovations are associated with successful innovations in the field of management. The need for managerial innovations both at the level of society and at the level of organization arises in the case of two types of problems [6-8].

Firstly, the problems of failure to achieve the goal, a decrease in manageability (growth of the organization, levels of management, delay in making and implementing management decisions).

The source of this type of problem is the contradiction between:

- new production technologies and outdated methods, processes and management structures (management technology);
- set goals and lack of resources, mismatch of resources (human, raw materials, financial, temporary, information);
- set goals and an irrational system for organizing their achievement (decision-making procedures, distribution of powers and responsibilities of managers, personnel management).

Secondly, the problems of not using the possibilities of effective system operation on the basis of the existing innovative potential.

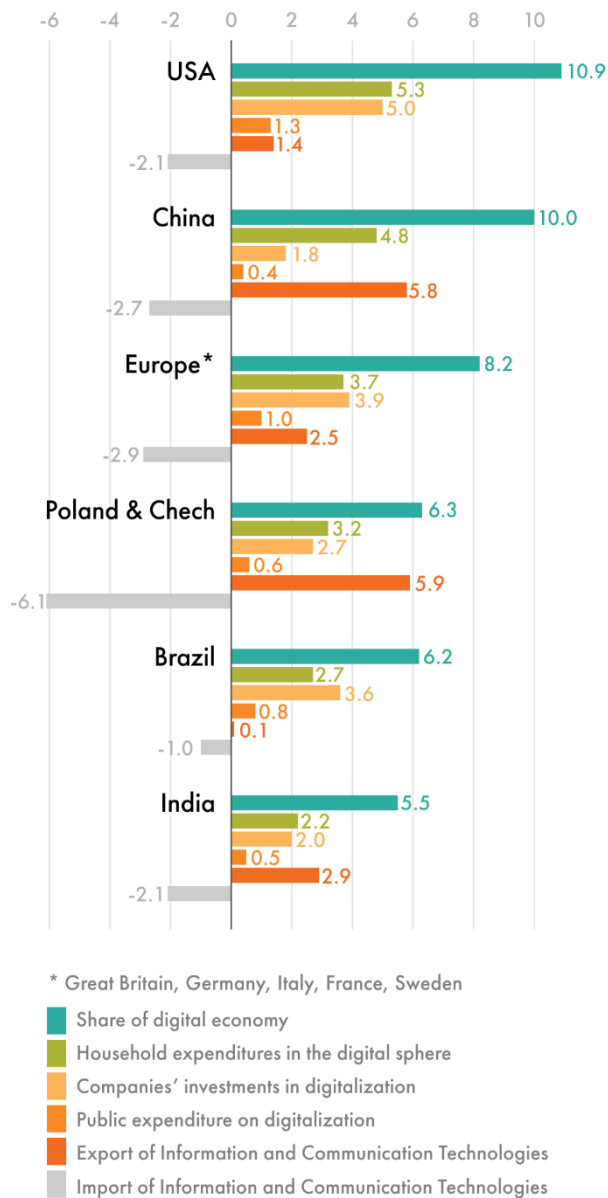


Fig. 1. The contribution of the digital economy to the GDP of various countries and its components (developed based on the research of the consulting company McKinsey in 2017)

Management innovations, in this case, are aimed at increasing competitiveness (country, company, product); increasing the financial stability of functioning, increasing the capitalization of the company. Management innovations allow solving problems that were previously solved in the management system. For example, to evaluate the final result of the work of managers and their contribution to the results of the organization's work to establish the appropriate remuneration.

II. METHODOLOGY

A. The essence of managerial innovation

Management innovations are new knowledge embodied in new management technologies, information, structural, organizational and administrative. We are talking about fundamentally new approaches to the organization of work, the structuring of tasks, the allocation of resources, the determination of remuneration for labour, the development

and adoption of managerial decisions, etc.

The following main types of managerial innovations in the digital economy are distinguished:

- 1) New business models and models of work organization and distribution of labour.
- 2) New organizational structures.
- 3) New methods for managing people and teams [9-11].

Accordingly, the introduction of new technologies, which are digital transformation, is one of the elements of a fundamentally new organization and business. Let us consider in more detail the three other species.

New business models and work organization and labor distribution.

Modern fast-growing business in the era of the digital economy is often new business models that work as a single platform for solving various client tasks. Which, in turn, implies a different approach to the organization of work. Those works that can be automated, robotic, given to artificial intelligence or outsourced, we do not initially consider as being performed by company employees. Accordingly, we come out of the types of work and optimal methods for their implementation. And this implies, among other things, a review of the work that the company's employees are currently performing. It is both an analysis of existing work, and those work that is planned to be carried out shortly, taking into account the company's transformation strategy and its business strategy.

New organizational structures

It is primarily about moving away from vertical organizational structures to flat ones. Including the formation of cross-functional business units and teams, the creation of organizational structures for each unit or organizational unit, while the construction of a separate organizational structural unit can radically differ. As a result, in one company there may be divisions or cross-functional teams with different organizational structures. In addition, an approach is used when determining the earning functions of a business and serving ones - profit centers and cost centers. This approach uses the P & L management model, which assumes full autonomous budget management of each individual profit center and cost center.

New methods for managing people and teams

Avoiding office teams, the formation of mixed and cloud (online groups). This approach involves reviewing all the work that was carried out at the company's sites, and transferring part or all of the employees to the remote work format for full or part time employment, cooperation with freelancers and working with a pool of outsourcing companies. This allows you to enter the global virtual labour market and attract the best talents on a worldwide scale, organize your business 24/7, and minimize the costs associated with holding jobs in the office or on the company's premises. It also allows not to become attached to the observance of the labor law of the country in which the company is located, to scale up the business faster and more comfortable, to save on the payroll fund due to the choice of the optimal place for tax residency and personalization of employees' social packages.

With this approach, the need for middle management disappears, and the top management (top management) is no longer a permanent team. Teams consist of executors (performing simple operations), experts (performing highly specialized and highly professional tasks) and team leaders. At the same time, leadership is situational - in different situations, different team members can act as leaders. The generation of ideas and managerial decision-making takes place collectively with the involvement of all members of the team for discussion.

Most cloud teams interact as project teams. This makes communication more flexible (reduces the hierarchy, and sometimes completely eliminates it) and results-oriented (work is assessed by achievements, not participation in work processes). Which, in turn, changes organizational forms. Cloud management structures do not have a stable corporate way - employees are united, not around one structural unit, but around the tasks and results on which they work.

Structural units as such disappear. Therefore, the transition from team to team, joining the team and making managerial decisions are more natural and faster. This significantly increases work efficiency and allows you to scale a business much quicker, which is not possible with traditional forms of labour organization.

B. Assessment of the quality of management, its impact on the efficiency and competitiveness of the enterprise in a digital economy.

Assessing the quality of management in empirical research is a difficult task associated with many problems of a methodological and methodological nature - the choice of adequate indicators and ways to obtain relevant information.

From the point of view of the methodology, it is necessary first of all to answer the question - does it mean that the currently competitive enterprise has competitive management? The grouping of enterprises by competitiveness level was formed on the basis of a statistical indicator of the level of labor productivity per 1 employed person (above or below the industry average) and subjective assessment by the respondent of the position of the enterprise relative to leading firms?

Apparently, this statement is far from always true for spot measurements, since the prevailing favourable conditions may turn out to be the most significant success factor that "overlaps" weak and uncompetitive management in terms of influence. However, if we talk about the stability of the company's position in the market, the growth of its market value, successful development at various stages of the life cycle, then the transformation of management capable of solving such problems is one of the key competitive factors in a rapidly developing digital economy.

In the methodological plan for researchers and analysts, this means that an adequate assessment of the competitiveness of management is possible on panel data, which will reflect in the dynamics the competitiveness of the enterprise and the transformations in the field of management that were carried out on it. The lack of such data forces researchers to operate with a very narrow set of indicators for assessing the quality of governance in statics

An interesting approach was implemented by IBS in the study "The Pyramid of Growth: a Successful Company

Management System", based on the hypothesis that sustainable growth implies a balanced development of the company management system in all dimensions (Fig 2).

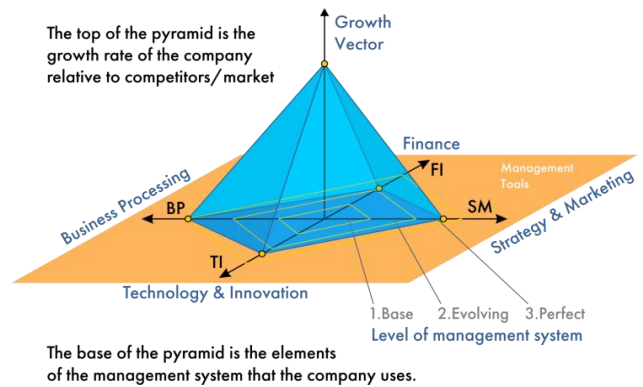


Fig. 2. Company growth pyramid using management tools.

It involves the allocation of 100 possible management tools for four functional blocks and an estimate of the number of management tools used by the company. Using less than 1/3 of the tools characterizes the level of development of the system as essential, 2/3 - developing, more than 2/3 - perfect.

III. RESULT AND DISCUSSION

By analogy with this approach, we used two fundamental indicators - the complexity of management transformation measures (the number of organizational and managerial innovations introduced) and the number of applied management technologies.

Significant differences in the prevalence of individual measures to improve governance between leading enterprises and outsiders were identified for most actions (Fig. 3.).

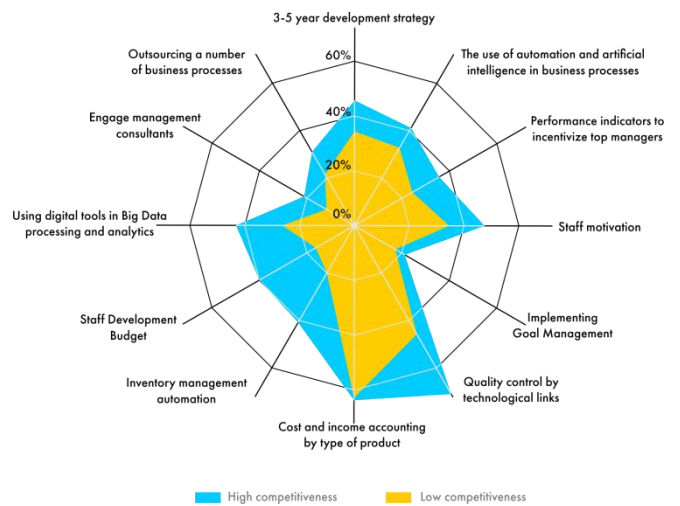


Fig. 3. The share of enterprises that improve management in certain areas.

A summary characteristic of management quality (Table 1) shows the presence of a positive correlation between indicators of management quality and the level of competitiveness of enterprises, and the influence of the totality of management technologies used in particular correlation coefficients is most

pronounced. Besides, competitive enterprises are much more often positioned in the more useful links of the value chain, use modern digital tools, invest in human capital and develop medium-term development plans.

Table- I: Characteristics of the quality of management at enterprises that differ in terms of competitiveness (in% of the number of respondents)

Management Characteristics	Leaders	Medium	Outsiders	Statistical significance of differences	Spearman correlation coefficient
Planning Horizon and Strategy					
Planning horizon for more than 3 years	28,5	23,5	19,1	0,000	0,127
Having a well-defined strategy	47,0	40,8	29,1	0,001	0,113
Management improvement					
The average number of measures to improve management (out of 14 possible)	5,2	4,4	3,5	0,000	0,200
The average number of management technologies (out of 6 possible)	3,5	2,7	1,8	0,000	0,337
Positioning in the lucrative value chain					
Engineering, design	63,9	56,4	41,0	0,000	0,143
New technology development	65,3	49,3	37,6	0,000	0,184
Automation of marketing and sales	70,3	60,0	49,6	0,000	0,138
After-sales service, repair	48,4	31,0	21,3	0,000	0,193
Legal assistance	63,0	49,9	39,7	0,000	0,154
Investment in human capital					
Share of enterprises sending employees to study outside the enterprise,%	70,4	63,6	56,5	0,027	0,093
The share of enterprises with an annual budget for staff development,%	39,7	24,4	16,3	0,000	0,178

However, even among the leaders of enterprises with truly competitive management there are few: among them, just over a quarter of enterprises plan their activities for a period of more than 3 years; no more than half improve management within the framework of the approved development strategy, and half of the enterprises do this only in 3-7 of the 12 areas that were indicated in the questionnaire using a set of 2-5 tools from 6.

Qualification of managers as a prerequisite for the implementation of organizational and managerial innovations.

Recently, there has been an increase in the level of management qualification: already, every tenth enterprise has managers with an MBA degree or a higher economic education. As a rule, employees with this level of skill occupy the positions of top managers of companies. Experts note the existing staff deficit of top managers, which led to a significant increase in salaries in 2006. In general, the qualification level of top management of competitive companies is characterized by a substantial excess of the share of managers with MBA certificates (15% and 4%, respectively) and specialists with experience in a foreign company (16% and 8%, respectively). Achievements in improving management to a large extent, depend on the

efficiency of middle management, 40-60% of competitive enterprises and 60-80% of non-competitive ones note the presence of problems in this. It is significant that from half to two-thirds of the leading enterprises have not been able to solve any issues in middle management. The most significant concern is the technical equipment and qualifications of specialists. The analysis showed that the competitiveness of enterprises is significantly affected by the presence of problems in the work of economic and, to an even greater extent, production units. So, if there are problems in the work of middle management, the share of competitive enterprises is lower by 18.5-21.2 percentage points than in the case when there were none. For HR services and the Research and Development Department, no relationship was found between the presence of problems in the work of units and competitiveness.

Having examined the individual factors characterizing the quality of management in the context of their influence on the competitiveness of enterprises, we will try to determine which of them are the most significant and informative in terms of increasing the chances of an enterprise to become a leader. To solve this problem,

the most suitable tool is the logistic regression model, for which the multicollinearity of the studied factors is not a limitation.

The level of competitiveness of enterprises acts as a dependent variable in the model, taking two values - 1 if the company is a leader and 0 if it does not fall into the group of leaders. The following variables characterizing the quality of management were used as predictors:

- the presence of links in the organizational structure that reflect different positioning in the value chain
- comprehensive measures to improve management (the number of corporate and managerial innovations introduced)

- amount of applied management technologies
- problems in the work of economic units
- problems in the work of production units
- benchmarking compared to foreign competitors
- availability of employee training outside the enterprise
- ongoing development strategy
- planning horizon
- digitalization of business processes

The following variables were used as control variables: industry affiliation (type of economic activity), number of enterprises, status of the enterprise (autonomous or a member of a business group). The results of econometric calculations are presented in Table 2.

Table- II: Management factors affecting the probability of getting into the group of leading enterprises in terms of competitiveness

Predictors	B	Standard error	EXP (B)
The presence of problems in the middle management			
Problems in the work of economic units (1 - there are problems; 0 - no problems)	-0,597***	0,203	0,550
Problems in the work of production units (1 - there are problems; 0 - no problems)	-0,561**	0,229	0,571
Change of primary owners in 2002-2004 (1 - was, 2 - was not)	0,596***	0,231	1,814
The organizational structure of the enterprise			
The presence of a marketing service (1 - yes, 0 - no)	0,461**	0,206	1,586
Strategic goals of the enterprise			
(1) Innovative Strategy	0,610***	0,221	1,841
The number of applied management technologies	0,313***	0,064	1,368
Constant	-3,421***	0,605	0,033
Number of observations	735		
Pseudo R-Square Nagelkerk	0,264		

Dependent variable: 1 - leaders in terms of competitiveness; 0 - not leaders

Estimation based on a logistic regression model. The variables characterizing the type of economic activity, the status of the enterprise (autonomous or a member of a business group) are included in the regression but are not presented in the table. *** $p < 0.01$, ** $p < 0.05$, * $p < 0, 10$

The results show that the status of the enterprise, as well as benchmarking, all other things being equal, does not affect the likelihood of the enterprise getting into the group of leaders in terms of competitiveness. The following factors have a significant positive effect:

- digitalization of business processes. (Increases the probability of getting into the group of leaders by 1.8 times);
- focus on innovation strategy (1.8 times);
- the presence of marketing service, including digital marketing, in the organizational structure of an enterprise (1.6 times);
- the number of applied management technologies - with an increase by one, the probability of getting into the group of leaders increases by 1.4 times.

Problems in the middle management level exert a significant negative impact: their presence in the work of economic and production divisions, all other things being equal, reduces the likelihood of getting into the group of leaders by 1.8 times.

When replacing the indicator of the number of measures to improve management with the presence of one or another action (13 in total), the simulation results did not change. Significant ones included the same predictors as in the first option, while none of the individual measures to improve governance were included.

IV. CONCLUSION

The transition to digitalization of business seems to be one of the critical trends of today and the coming years. Moreover, if the company does not digitize its business, it will not be able to be competitive in the near future.

However, it should be understood that for a successful digital transformation, several conditions are necessary:

- 1) Automate and convert to digital-only need already tuned business processes. Since the automation of what works inefficiently, it will not bring benefits to the business, but on the contrary, it will cause



harm.

- 2) It is crucial not just to collect information, but to obtain the necessary information and work with it correctly, creating structural units that will be responsible for digital transformation, with high-class big data analysts.
- 3) The transformation of business and company involves the introduction of changes - a new approach to the implementation of work. The staff should start working differently, support and accept differences, and also follow them, getting involved in the culture of company transformation and support for changes.

Based on this, it is not enough to analyze what and how it can be translated into numbers, introduce changes and support them. New approaches to the organization and execution of work require new approaches to management. With a difference like work, management approaches must also change. If a company carries out a digital transformation without introducing managerial innovations, it will not be able to go beyond the existing business and company management system to an entirely new level of management.

Management innovations in the context of the explosive nature of the development of the global digital economy, among other things, suggest the formation of a new business environment - open, environmentally friendly and flexible. It is aimed at creating a balance of business benefits and returns, developing the organization's social capital as one of the critical resources of the future, managing innovative exchanges, adaptive business benefits and introducing corporate social responsibility programs in the production chain. The development of flexibility of thinking and flexibility in approaches to business development, the development and implementation of managerial innovations is the basis of the culture and environmental business in a digital economy.

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