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ADOPTION OF INNOVATIVE MANAGEMENT DECISIONS IN CREATING A SMART CLUSTER

Introduction. *When the enterprise can no longer function comfortably due to the scale – quality decreases, stakeholder dissatisfaction increases – there is a blocking point, after which smartization is impractical and can lead to chaos. In this case, it is necessary either 1) to open branches; or 2) to separate types of activities (not the main ones, or to divide the main ones into groups); or 3) initiate and lead the creation of smart clusters. We consider this option to be the most promising based on management analysis, and it is the one that managers should consider.*

The purpose of the paper *is to develop an organizational mechanism for creating a smart cluster from the perspective of adopting innovative management decisions for scaling the smartization of business processes of an industrial enterprise.*

Results. *In the paper, the author defined the main principles of management decisions on which a smart cluster ("smart specialization") should be built, identified the key characteristics of a smart cluster and also identified barriers that prevent both innovation processes in general and the promotion of smartization and the creation of smart cloisters. We see the smart cluster as a regional policy model that stimulates economic growth based on smartization through effective coordination of state resources to develop entrepreneurship and increase the competitiveness of industries and enterprises. The combination of new industrial and innovation policy tools, which is based on the principles of initiative, transparency and flexibility, contributes to developing promising types of activities.*

Conclusion. *The strategy of "smart specialization" can effectively supplement these recommendations, and they, in turn, will strengthen the effects of "smart specialization" of the smart cluster. In Ukraine, all the necessary conditions for the successful implementation of smart clusters have not yet been met.*

Keywords: *innovative technologies, management analysis, management decision-making, smart cluster, smartization, Fourth Industrial Revolution*

INTRODUCTION

Smartization should not be an end in itself but a means of achieving goals [1]. Endlessly improving (smartize) business processes is unnecessary; smartization should be economically feasible. When the enterprise can no longer function comfortably due to the scale – quality decreases, stakeholder dissatisfaction increases – there is a blocking point, after which smartization is impractical and can lead to chaos. In this case, it is necessary either 1) to open branches, in which two scenarios are also possible: a complete repetition of the existing enterprise, but in another region, country, or the transfer of part of the leading business processes (production, logistics, etc.); or 2) to separate types of activities (not the main ones, or to divide the main ones into groups); or 3) initiate and lead the creation of smart clusters. We consider this option to be the most promising based on management analysis, and it is the one that managers should consider. Smart clusters (industrial parks, smart specialization) are a relatively new form of economic organization, which aroused scientists' interest after Michael Porter's publications [1]. Clusters in many developed countries play a significant role in shaping and ensuring the competitiveness of countries and territories [3].

The **PURPOSE** of the paper is to develop an organizational mechanism for creating a smart cluster from the perspective of adopting innovative management decisions for scaling the smartization of the business processes of an industrial enterprise.

RESEARCH METHODS

The following methods were widely used in the research process: theoretical generalization and scientific abstraction, systematic approach, induction, deduction, comparison, collection and processing. The methodological and informational basis of the work is scientific works of foreign and domestic scientists, materials from the Ministry of Economy and the State Statistical Service of Ukraine, materials from periodicals, and Internet resources.

Analysis of recent research and publications

There are various typologies of clusters. M. Porter [2] distinguishes three types of clusters based on economic development:

a) local industries: provide goods and services to the local market, limit competition with others and circulate money in the region;

b) depending on the resources of the industry: employment exists where the necessary resources are available and competes with both national and international competitors;

c) tradable industries: selling their goods and services to other countries and regions, the concentration of

employment varies by region and attracts cash flow based on resource advantages and stable base.

M. Porter notes that clusters may include government and other institutions such as universities, standard-setting agencies, think tanks, professional training organizations, and trade associations that provide specialized training, education, information, research, and technical support to the cluster.

Y. Gordon and F. McCann [4] classify clusters based on the type of interaction of cluster enterprises. They distinguish three types:

a) clusters of pure agglomeration: advantageous location of enterprises in the cluster from the point of view of e.g. labour force (actually, there are no interactions);

b) clusters of complex industrial complexes: advantageous location of enterprises in the cluster from the point of view of e.g. reducing the cost of interaction (there are some interactions, such as the interaction of the buyer and supplier);

c) social network models: advantageous location of enterprises in a cluster in terms of e.g. improved interacttions such as innovation (there are many interactions to enhance the quality of services and products)

K. Marcusen [5] distinguishes clusters according to internal and external interaction into four categories:

a) small local enterprises: small enterprises, long-term contracts between the buyer and sellers in the cluster, minimal interaction outside the cluster;

b) fan (spoke) cluster: few key enterprises that act as a hub with suppliers around them, like the spokes of a wheel; significant intra-district trade embodied in long-term obligations;

c) satellite platform areas: large enterprises located outside, making investment decisions with minimal trade within the region, no commitment to local suppliers;

d) districts anchored in the state: the state organization is the critical tenant anchor in the district.

Finally, I. Panichiya [6] identifies six categories of clusters based on various features.

a) (semi) canonical industrial districts: family enterprises with a small number of employees;

b) diversified urban industrial areas;

c) satellite platforms or agglomerations with hubs and spokes: a limited number of small enterprises working as subcontractors for large enterprises.

d) concentrated or integrated agglomerations or industrial districts: integration of some networks of the technological sector, which leads to the opening of new markets;

e) co-location zones: co-location of enterprises engaged in similar activities;

e) scientific or technological agglomerations.

The importance and high value of enterprises' geographical accumulation in the global economy era are apparent. An industry cluster is beneficial both to the economy and to individual enterprises. However, there is no secure smart cluster yet. Smart clustering is unique, created to answer modern challenges, but contains features characteristic of the clusters listed above.

RESULTS

We believe that a smart cluster ("smart specialization") should be built on the following basic principles of management decision-making:

a) territorial connectivity. The main advantage of merging into a cluster based on the territorial principle is the proximity of the subjects. This saves significant time and resources (significantly when solving complex, urgent issues), financial resources (savings on logistics, rent, cost sharing, etc.) and others. Suppose the cluster needs some unique territorially unrelated to the cluster. In that case, this is solved by moving the job, establishing cooperation remotely, opening a branch/franchise, etc.

b) availability of smart services in the territory ("smart" cooperation between territories, their interconnection), its development and infrastructure. Here, two scenarios are also possible: initially choosing such territory or creating it (Silicon Valley). Both options have advantages and disadvantages, the leading choice is either we save at the beginning (without creating anew) or later for many years (on taxes, on a more targeted organization, etc.). This leads to a third option: trial creation in an existing area and then scaling to create an ideal model;

c) the complexity of the implementation of smartization within the framework of three interrelated directions: expanding the space of smart services, forming world-class digital economy competence centres, positioning the cluster as a centre of global communications on the subject of "smart";

d) embeddedness of the cluster in the Ukrainian and global digital and legal space. The cluster should, first of all, cooperate with the pioneers of the Fourth Industrial Revolution and leaders in the fields in terms of technology, personnel, etc.;

e) constant cooperation and communication along the lines of "business-government-science", and not only at the time of the creation of the cluster [8];

f) inclusiveness for all possible participants [9; 10].

Let's list the key characteristics of a smart cluster:

– business provides an informational basis for identifying opportunities and determining priorities, and the state creates favourable conditions for the development of partnerships between participants;

– decisions to invest in certain projects are made regardless of their source of origin; priority is given to directions in which existing production assets are effectively supplemented with innovative solutions;

– any sector or region can become a platform for promising transformational projects; as a result of modernization, the boundaries between traditional and new types of activity are blurred;

– a smart cluster is progressive by definition, as it involves a constant search for new directions and opportunities;

– "smart specialization" involves many options for diversification;

– constant monitoring of the implementation and evaluation of the results of smartization according to predeveloped criteria as a basis for improvement are of great importance;

– the creation process should be highly flexible and ensure timely redistribution of state resources in favour of the most viable projects.

We see the *smart cluster as a regional policy model that stimulates economic growth based on smartization through effective coordination of state resources to develop*

entrepreneurship and increase the competitiveness of industries and enterprises. The combination of new industrial and innovation policy tools, which is based on the principles of initiative, transparency and flexibility, contributes to developing promising types of activities. The strategy of creating a smart cluster cannot be called neutral, as it implies the setting of priorities in favour of certain technologies, enterprises and areas, thereby setting the vector of priority measures of the smartization policy. Areas of activity that have the potential for structural transformation with the application of smartization are subject to development due to the concentration of resources.

Some of the barriers identified in our research hinder both innovation processes in general, the promotion of smartization and the creation of smart clusters. The primary limitations include the gap in the level of labour productivity between regions; structural "bottlenecks" caused by excessive centralization of the system; unfavourable business environment; shortage of qualified personnel; low level of cooperation between enterprises and universities; lack of long-term strategic planning for the development of the innovation sphere; fragmentation of the GDR system and science; low supply of science with infrastructure and funding from business; insufficient diversification of science and industry.

The proposed measures to eliminate these barriers are presented in Table 1.

Table 1 – **Recommendations for improving the performance of a smart cluster**

Task	Proposed measures for resolution
Improving the business climate for the purpose of industrial development	– consolidation of taxes at the national and regional levels; – reduction of trade protectionism due to tariffs and relaxation of requirements for localized production; – return of "input" VAT, the introduction of a zero tax rate on exports; – introduction of a simplified procedure for regulating food markets to stimulate competition; – increasing the technological potential; – infrastructure planning and construction; – development of professional training.
Stimulation of cooperation between the participants of the smart cluster in the sectoral and territorial aspects	– involvement of all participants in the smartization management process, including enterprises, state bodies, universities and the public, in sectoral and territorial aspects; – integration of smartization strategy (creation of smart clusters) into current long-term political initiatives; – stimulating partnership initiatives within the smart cluster by providing financial and consulting support, creating hubs, etc.
Strengthening the research base and national universities	– investing in state multidisciplinary, flexible scientific centres; – stimulation of profile diversification and internationalization of universities; – strengthening of scientific potential with the help of institutional specialization; – expansion of the spectrum of funding sources for scientific activity; – determination of priority areas of scientific research for funding.
Creation of favourable system and institutional conditions for smartization	– strengthening integration into global value chains; – strengthening of cooperation with pioneers of FIR at the national level; – increasing openness and expanding access to new technologies; – financing the purchase of necessary technologies; – reduction of the cost of capital for investing in innovative activities; – support of venture capital markets; – reduction of bureaucratization of the business environment; – preferential deposit rates on targeted loans with the possibility of non-return in case of scaling.
Improvement of state policy	– creation of mechanisms for evaluating scientific and technological initiatives with the involvement of leading experts, including foreign ones; – use of scientific and technological potential to solve problems; – diversification of institutes and mechanisms for supporting the scientific and technological sphere; – increasing the transparency and efficiency of the financial management system in the scientific and innovative sectors; – national development of technologies of the Fourth Industrial Revolution.

CONCLUSIONS

The strategy of "smart specialization" can effectively supplement these recommendations, and they, in turn, will strengthen the effects of "smart specialization" of the smart cluster.

In Ukraine, all the necessary conditions for the successful implementation of smart clusters (strategy of "smart specialization") have not yet been met. However, the country is moving in the right direction: important political initiatives are being implemented at the federal level, and the involvement of regional participants in this process is intensifying. Relying on the existing potential of the national innovation system can transform "smart specialization" into a full-fledged economic development strategy.

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ПРИЙНЯТТЯ ІННОВАЦІЙНИХ УПРАВЛІНСЬКИХ РІШЕНЬ У СТВОРЕННІ СМАРТ-КЛАСТЕРУ

Вступ. *Коли підприємство більше не може комфортно функціонувати через масштаб (знижується якість, невдоволення зацікавлених сторін зростає), виникає точка блокування, після якої смартизація не тільки недоцільна, але може призвести до хаосу. У цьому випадку необхідно або 1) відкривати філії, водночас також можливі два сценарії: повне повторення діючого підприємства, але в іншому регіоні, країні, або перенесення частини основних бізнес-процесів (виробництва, логістика тощо); або 2) відокремити види діяльності (неосновні, або розділити основні на групи); або 3) ініціювати та керувати створенням смарт-кластерів. Ми вважаємо цей варіант найперспективнішим з точки зору управлінського аналізу, і саме його варто розглянути управлінцям.*

Метою *статті є розроблення організаційного механізму створення смарт-кластеру з погляду прийняття інноваційних управлінських рішень для масштабування смартизації бізнес-процесів промислового підприємства.*

Результати*. Автор визначив основні принципи управлінські рішення, на яких смарт-кластер («розумна спеціалізація») повинен будуватися, виявив ключові характеристики смарт-кластеру та виявив і бар'єри, що перешкоджають як інноваційним процесам загалом, так і просуванню смартизації та створенню смарт-скластерів. Смарт-кластер бачиться нам як модель регіональної політики, яка стимулює економічне зростання на основі смартизації шляхом ефективної координації державних ресурсів з метою розвитку підприємництва та підвищення конкурентоспроможності виробництв та підприємств. Комбінація нових інструментів промислової та інноваційної політики, яка спирається на принципи ініціативності, прозорості та гнучкості, сприяє освоєнню перспективних видів діяльності.*

Висновки. *Стратегія «розумної спеціалізації» може ефективно доповнити ці рекомендації, а вони, зі свого боку, посилять ефекти «розумної спеціалізації» розумного кластера. В Україні ще не створені всі необхідні умови для успішного впровадження смарт-кластерів.*

Ключові слова: *інноваційні технології, управлінський аналіз, прийняття управлінських рішень, смарт-кластер, смартизація, Четверта промислова революція*