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JRTMED was set out to promote research and to publish information on the achievements in all areas mentioned above and to provide a way for researchers, academics, policy makers, business practitioners and representatives of co-operatives to exchange views and share information and new ideas.

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IMPLEMENTING THE SMART SPECIALISATION CONCEPT IN THE REPUBLIC OF MOLDOVA: CHALLENGES AND INITIATIVES

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Abstract

The concept of smart specialisation has been embedded and has become a key element of the European Union's Cohesion Policy, being considered an effective tool in implementing the European strategy for smart, sustainable and inclusive growth. Smart specialisation strategies have been successfully implemented for several years in the EU member states.

Development and implementation of the smart specialisation strategy (S3) in the Republic of Moldova are particularly important, due to the fact that the concept of smart specialisation supports the reorientation of RDI policies towards those research activities that provide results of economic relevance, which, for a country with still a low level of investments (both public and private) in these areas, is quite relevant.

The paper analyses the actions taken and the results obtained at the current stage in this area in the Republic of Moldova, including mapping of the economic, innovative and scientific potential, identification of the preliminary priority areas for smart specialisation with potential for economic development, identification of the main niches of smart specialisation for these areas through the first application of entrepreneurial discovery process, as well as the actions to be followed for the successful development and implementation of S3 in our country.

Keywords: *smart specialisation strategy, innovation, economic transformation, regional development*

1. Introduction

Sustainable economic development and sustainable growth are increasingly dependent on the innovation and transformation capability of the economies, including the regional ones, in order to adapt to an ever-changing and increasingly competitive environment. In such conditions, much greater efforts are required to create systems able to stimulate innovation, research and development, as well as the spirit of innovative entrepreneurial development. The European Union has taken many steps to achieve this goal, with particular emphasis on smart specialisation (S3). This concept has been embedded and has become a key element of the European Union's Cohesion Policy, being an effective instrument for implementing the European strategy for smart and sustainable growth favourable to inclusion. The concept of smart specialisation has become the key-element of the European Union's Cohesion Policy and an ex-ante condition for accessing the structural funds.

Development and implementation of the smart specialisation strategy (S3) are particularly important for the Republic of Moldova, in the context of its aspirations for European integration, and because the concept of smart specialisation supports the reorientation of the RDI policies towards those research activities that offer results with economic impact.

In this context, the process of developing S3 has started in our country in the last years. This is a complex process, which involves different actors and requires their joint efforts. This process, on the one hand, is catalyzed by the challenges of the contemporary period - transforming research into a key factor of economic growth, and, on the other hand, it faces certain barriers to implementation.

The present paper analyses the results obtained in developing the smart specialisation strategy of the Republic of Moldova at the first stages of this process and the actions to be taken to redesign the research-development-innovation policies.

2. The degree of current investigation of the problem, the purpose of research

The smart specialisation concept was originally developed by the „Knowledge For Growth” high-level Expert Group [5], convened in 2005 at the initiative of European Commissioner for Research, Janez Potočnik, to get advised on the contribution that knowledge can make to sustainable growth and prosperity, the policies for promoting the creation, dissemination and use of knowledge, and the role that various actors can play in stimulating a knowledge society.

This concept was subsequently developed in a study by Foray, D. & Goenega, X. [4], who emphasized that the main purpose of smart specialisation is the prioritization process, and that resources should be concentrated in specially selected areas associated with certain types of technology, disciplines and subsystems within a certain sector or within the intersections of different sectors.

In 2012 the Joint Research Center of the European Commission has developed the Guide to Research and Innovation Strategies for Smart Specialisation [6], which contains the steps and methodology for developing these strategic planning documents.

The analysis of research and innovation systems, and policies in transition countries is contained in the works of Kleibrink, A., Larédo, P. & Philipp, S. [8], Kroll, H. [9], etc.

The Joint Research Center of the EC has launched a pilot project addressing the needs of Serbia, the Republic of Moldova and Ukraine in developing RIS3 [15]. For this purpose, the following activities were carried out with the support of international experts, who have been assisted by the local experts (one of whom is the author of the present paper): mapping of the economic, innovative and scientific potential of Moldova (Hugo Hollanders [10]), and characterisation of preliminary priority areas for smart specialisation in Moldova by SIRIS Academic [1]. Nevertheless, the entrepreneurial discovery process, the identification of the most promising areas of smart specialisation, the development of the policy mix and the creation of an efficient system for evaluating and monitoring the implementation of these policies is yet to be finalized.

Development of the smart specialisation strategy is being carried out in the Republic of Moldova for the first time. This is a new process, therefore, it requires considerable efforts to study all aspects related to this complex process and to identify the best solutions.

The purpose of this study is to debate discuss the opportunity of implementing the smart specialisation concept of the Republic of Moldova, to evaluate the actions taken in this field,

to analyse the results of the first stages of S3 development process and to identify the next steps for the successful completion of this process.

3. Methods and materials applied

A comprehensive research methodology has been applied in the study, including methods of analysis, synthesis, induction, deduction, benchmarking, observation, economical-statistical methods and others.

To conduct the study, the author has examined the EU policy documents in the field of research, development and innovation, smart development, as well as the national policy framework of this field, the publications of scientists from the country and abroad related to the topic of research. The Smart Specialisation Platform (S3 Platform) [21] and its Knowledge Repository, hosted by the Joint Research Centre (JRC) of the European Commission, were a rather helpful source to carry out this research.

4. Results and discussions

4.1 The opportunity of implementing the smart specialisation concept in the Republic of Moldova

Developing and implementing the smart specialisation strategy (S3) has become especially important for the Republic of Moldova, in the context of its aspirations for European integration, and because the *smart specialisation* concept supports the reorientation of RDI policies towards those research activities that contribute to economic transformation.

The opportunity to develop such a strategy for our country was mentioned in the Report of the team of foreign experts who evaluated the research and innovation system of the Republic of Moldova in 2015-2016 [13]. One of the recommendations of this report calls for better integration of research and innovation policy in the overall economic policy strategy; improvement of the interaction between research and innovation strategies, but also enhancement of priorities through increased stakeholder involvement. At the same time, the experts have recommended urgent reviewing of the framework conditions for innovation by implementing a coherent set of measures aimed at creating and stimulating a favorable environment for the involvement of companies in research and innovation activities.

An eloquent argument, in favor of the need to implement this concept in our country, is the position of the Republic of Moldova in international rankings. In conformity with the data of the World Intellectual Property Organization, according to the Global Innovation Index [19], our country ranked 48th among 126 countries monitored in 2018. At the same time, according to other studies, to the Global Competitiveness Report [18], the Republic of Moldova ranked 88 among 140 countries in the world ranking 2018, according to the Global Competitiveness Index. In recent years, our country has been classified as an economy based on the exploitation of production factors, being at the first stage of development of an economy based on innovation. In 2018, according to the World Bank data [20], in the ranking of countries according to their innovation capacity, Moldova positioned on the last place and ranked last in the Central and Eastern Europe.

The development level of R&D and the performance of the sector have a direct impact on the economic growth. Countries investing in research, innovation and development and pursuing consistent policies in this area have recorded significant economic and social changes, and progress in the development of the entire ecosystem. If we report on investments in R&D, the innovations registered in the economic development, then this relationship is obvious.

According to the policy documents, the target objective of the Republic of Moldova was to achieve 1% of GDP allocated to research and development, in fact this indicator has varied around 0.3% in recent years, while in some countries it attested major values (Austria – 3.16%, Germany – 3.02%, Finland – 2.76%, Poland – 1.03%, Lithuania – 0.88%, Bulgaria – 0.75%, Romania – 0.5% of GDP, the average in the EU member states was 2.07% of GDP in 2017 [17]). At the same time, according to the World Bank data, in the Republic of Moldova GDP per capita amounted to 3189 USD in 2018, this index being almost four times lower than in Romania (12301 USD per capita), 4.8 times lower than in Poland, 6 times smaller than in Lithuania, and 15.7 times lower than in Finland. The average for the countries of the European Union was 36531.7 USD per capita in 2018.

It is worth mentioning that the largest share of research expenditures in the EU countries is accounted for by companies - 66% of total research and development expenditures, followed by universities (22%), public sector (11%) and NGOs (1%). According to The Global Competitiveness Report 2017-2018 [17], pursuant to the index of companies' expenditures for research and development, the Republic of Moldova ranked 135 (among 137 countries included in the ranking). Although some regulatory documents and national policies provide certain conditions and tools to facilitate the creation, development and support of innovative enterprises (government support programs for „start-ups”, introduction of innovation „vouchers”, investment schemes for innovation, etc.), however, the existing system does not encourage investments of the business environment sector in research and development, and these tools have not yet been widely used.

A significant problem concerns the efficiency of research and development activity, the implementation of the research results in the real sector of the economy. The level of application of innovations in the economy of the Republic of Moldova is reduced, which is largely due to the low level of cooperation between research and business environment. According to the index of cooperation between universities and industry in the field of research and development [17], the Republic of Moldova holds a lower position in the ranking, occupying position 121 (among 137 countries evaluated), and according to the index, the level of technology absorption by companies, our country ranked 106th in the ranking 2017-2018 [17]. The economic effects of research, development and innovation are very small, according to the Global Innovation Index high technologies exports made up only 0.5% of the product exports in 2018 [3].

Thus, based on the above, it can be concluded that research is not yet included in an efficient innovation system and, rather, operates separately from the economy and education, while innovation and the relationship between research and the entrepreneurship sector are considered an element of critical importance for the Republic of Moldova. In this context, new approaches and policies are needed to ensure an effective communication and cooperation between the R&D sector, business environment, authorities and civil society, with the support of an adequate local governance system in the field.

European experience confirms that in the context of globalization and reconfiguration of value chains, smart specialisation certainly offers an opportunity to promote a dynamic economic process that accelerates structural changes, thereby mitigating the negative effects of technological changes and globalization on some countries, on work force employment and traditional industries, creating new ways of renewal and growth [7]. The existence of several strategic documents in the Republic of Moldova, with non-convergent priorities and limited to their own sectors of action, can lead to the diffusion of resources that are already limited, and given the absence of a critical mass in areas important to the modern economy, this limits the impact of public interventions and investments.

4.2. Approaches regarding the implementation of the smart specialisation concept in the Republic of Moldova

Although the existence of a smart specialisation strategy is not a conditionality for countries outside the European Union, as in the case of the Member States, the Joint Research Center (JRC) of the European Commission has launched a pilot project, through S3 Platform, to support Serbia, the Republic of Moldova and Ukraine in the process of their preparing for the development of RIS3 [15].

In the case of the Republic of Moldova, at the level of macro-regions of which our country is a part, smart specialisation is becoming an increasingly recognised priority. For example, the EU Strategy for the Danube Region explicitly mentions smart specialisation as a step towards achieving the goals of Priority Area 7 (Knowledge Society). The Eastern Partnership countries and the EU have set a target objective for at least one of the six participating countries to develop a RIS3 strategy by 2020 [2].

Since 2016, a series of actions have been initiated and carried out in the Republic of Moldova to raise public awareness of the concept and importance of smart specialisation, the impact of smart specialisation strategies on economic growth and the efficient use of resources, regional development. Thanks to the support of the Joint Research Center, several workshops have been organized [16], and a group of local experts (part of which is the author of the present paper) was set up. This expert group was involved in the evaluation of the state-of-the-art in the field of research, development and innovation policies and economic development, as well as their implications on economic development. The local expert group together with foreign experts participated in mapping the economic, innovation and research potential of the Republic of Moldova, and took part in the first exercises of entrepreneurial discovery.

According to the Guide to Research and Innovation Strategy for Smart Specialisation [6], the first step in developing the smart specialisation strategy is to analyse the national/regional context and the potential for innovation. In this regard, international experts and the local expert group, with the support of JRC, carried out *mapping of the economic, innovative and scientific potential of the Republic of Moldova* [10] in order to identify the smart specialisation priorities.

As part of *mapping of the economic potential* (which was based on the analysis of employment, turnover and wages), there were identified the areas with major economic potential and priority for smart specialisation, among them: agriculture and food processing;

textiles; renewable energy; ICT. At the same time, differences have been ascertained between Chisinau region and other development regions. The following priority sectors have been identified for Chisinau development region: ICT, paper and chemical products, equipment, glass products, furniture. Cluster analysis confirmed the importance of ICT. Clusters that could be developed relate to the services offered to the business environment, in marketing, design and publishing, while emerging industries focus on the development of packaging, creative, digital, and experimental industries.

In other regions, in the foreground, agriculture and food processing are priority economic areas, but there are some differences in certain industries. Textiles, clothing, footwear and renewable energy are priority economic areas for smart specialisation in some of these four regions. Cluster analysis identified several of these areas, for example, clothing manufacturing and food processing in the Northern region, processing of animal products and textile manufacturing in the Central region, environmental services, and food processing and production in the Southern and Gagauzian regions.

The evaluation of *the innovation potential* was carried out by the experts based on patent data. It should be mentioned that data on innovation activity in the Republic of Moldova were extremely limited, since official statistics did not contain such information. The National Bureau of Statistics introduced the statistical report on this aspect of activity only in 2018. The analysis revealed that food chemistry is among the technological areas with the largest number of patent applications, which would contribute to the development of agriculture and food processing industry.

To assess *the scientific potential*, the results of international publications in the identified areas of economy were analyzed, and it was found that most of the publications are devoted to agricultural and biological sciences, energy and environmental sciences.

Mapping of the economic, innovative and scientific potential of the Republic of Moldova allowed identification of potential priority areas for smart specialisation [10]. Briefly, these are shown in Figure 1.

Following these studies, subsequently, SIRIS Academic (consulting company developing and implementing strategies and policy solutions for higher education, research and innovation), with the support of JRC, carried out the characterisation of priority areas for smart specialisation in Moldova in terms of priorities' importance and their orientation (on research or technology), as part of the project „Network analysis for the identification of key stakeholders for preliminary priority areas for smart specialisation in Moldova” [1], which aimed at mapping the research and innovation ecosystem of the country.

Thus, the following *top priorities* were highlighted: chemical industries, materials and nanotechnology (the preliminary priority is slightly science-oriented); health, biomedicine and pharmaceuticals (balanced preliminary priority); agriculture and food processing (the priority is focused on technology and innovation), the following were outlined as *intermediate priorities*: electric and electronic technologies (this priority is focused on science); production technology and heavy machinery (technological and innovative priority); ICT (slightly science-oriented priority); environmental industries, services and sciences (the priority is focused on technology and innovation); energy (balanced preliminary priority), and the following were assigned to the category of *low priorities*: vulcanized and fired materials; textiles, apparel, footwear and leather goods; paper industry; furniture.

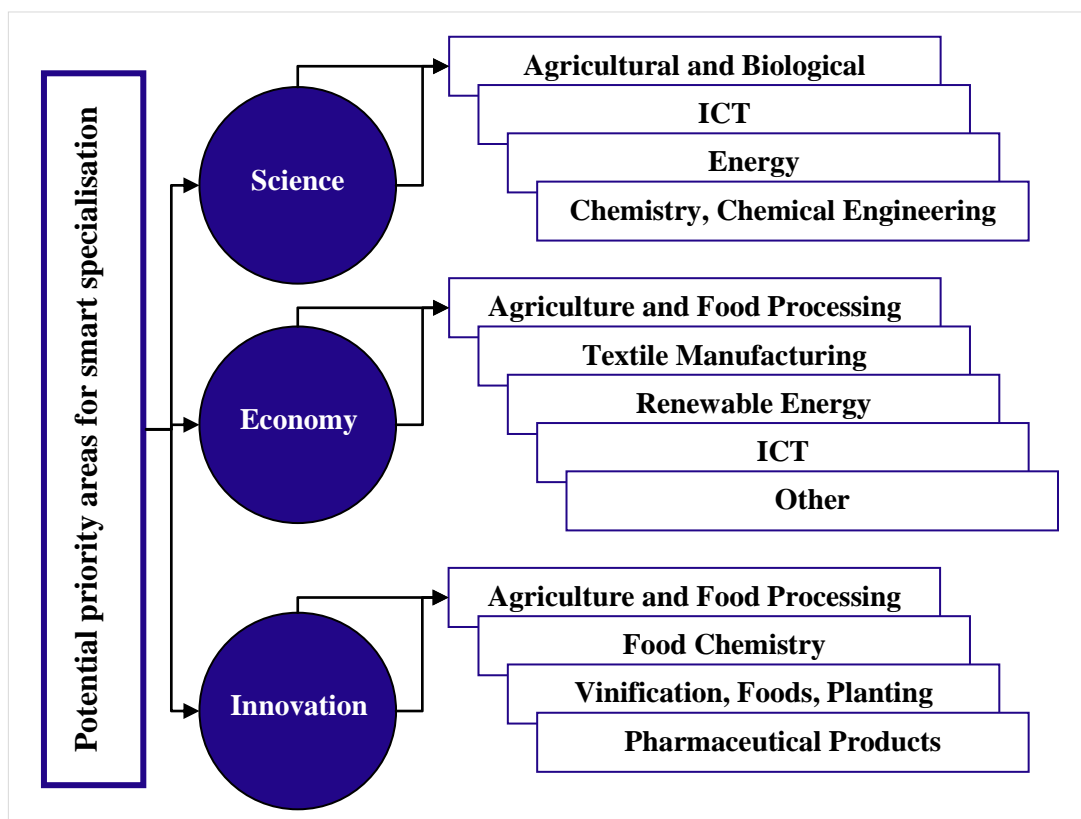


Figure 1. Potential priority areas for smart specialisation in the Republic of Moldova
Source: [10]

The SIRIS Academic study [1] has proposed the potential areas for entrepreneurial discovery process (Figure 2). The upper part of the figure reflects the sectors with the potential for innovation in predominantly commercial sectors, the lower part represents the areas of knowledge with relevant activities, which form the basis of potential knowledge.



Figure 2. Potential areas to focus on the entrepreneurial discovery process
Source: [1]

The next step in developing a smart specialisation strategy is the *entrepreneurial discovery process (EDP)*, in which the niches of smart specialisation, specific to each region, will be identified. This is a very important exercise for our country in order to move from fragmented priorities and objectives to the priorities of economic transformation, based on the efficient use of innovation potential and investments.

Identification of stakeholders relevant to the involvement in this process is significant for the successful achievement of the entrepreneurial discovery process. In May 2018, the Chamber of Commerce and Industry of Moldova, with the support of TAIEX Expert Mission, organized the Workshop „Network analysis for the identification of key stakeholders for preliminary priority areas for smart specialisation in Moldova”. As a result, a list of organizations and individuals connected to S3 priorities at the national level in each development region was prepared.

Afterwards, following the recent structural reforms in the field of research in the Republic of Moldova, the Ministry of Education, Culture and Research, being endowed with attributions and responsibilities in the field of research policy, has assumed the coordination of actions in implementing the concept of smart specialisation. To this end, in November 2018, a national team was created to promote the concept of smart specialisation in our country and to carry out EDP exercises.

Following the actions taken in the context of S3 development in the Republic of Moldova (mapping of the economic, innovative and scientific potential, identifying the preliminary priorities for smart specialisation), from June 18 to June 28, 2019, the Ministry of Education, Culture and Research jointly with the national team, with the support of JRC, organized the first workshops on entrepreneurial discovery process at the national level to identify the areas of smart specialisation in our country. These covered the following areas:

- Energy
- Information and Communication Technologies
- Agriculture and Food Processing
- Biomedicine and Biopharmaceuticals.

In order to identify the main niches of smart specialisation in the respective areas, these workshops brought together about 180 participants - representatives of the research environment, universities, central, regional and local public authorities, business environment, and civil society. The objectives pursued during the first EDP exercises were aimed at analysing the situation in certain areas, highlighting the current trends in each of the mentioned areas, SWOT analysis, formulating the vision and goals for area development, including sub-areas.

Following EDP exercises, the visions and *potential areas of smart specialisation* were identified (Table 1).

The process of entrepreneurial discovery will continue. It is necessary to involve actors relevant to the respective fields, who, through their knowledge, vision and experience, can contribute to the identification of the most promising areas of smart specialisation. The results of entrepreneurial discovery process play a decisive role in the design of smart specialisation strategy, as it allows the verification and specification of the priority areas of smart specialisation based on the consensus between all interested stakeholders.

Table 1. Potential areas of smart specialisation in the Republic of Moldova identified within the EDP and visions for development

Area	Vision	Potential areas of smart specialisation
Energy	By 2029, intelligent heating solutions will be based on the latest technologies, developed and adapted in close collaboration with the R&D sector, characterized by the existence of feasible energy storage systems, hybrid energy production systems, smart grids for energy production, distribution and consumption, benefiting of capacity building and continuous training of sector professionals.	<ul style="list-style-type: none"> ▪ Energy efficient technologies ▪ Alternative energy sources ▪ Heating solutions
ICT	By 2029, the ICT sector will be based on a legal framework developed and harmonized with European and international standards, providing an adequate investment climate for ICT business development and stimulating the public-private partnership aimed to capitalize on e-transformation opportunities in health, agriculture, energy, education, new materials and technologies, public administration.	<ul style="list-style-type: none"> ▪ Micro/nanomaterials and electronic engineering ▪ Interoperability, open data and e-Infrastructures ▪ Software engineering, mobile apps, cloud computing
Agriculture and food processing	The agri-food sector will be sustainable, precision-based, ecological, integrated into the circular economy, with a complex value chain based on modern technologies and the efficient use of natural resources.	<ul style="list-style-type: none"> ▪ Advanced biotechnologies for agriculture ▪ Sustainable agriculture ▪ Value-added food products
Biomedicine & Biopharmaceuticals	By 2029, the healthcare system in the Republic of Moldova will be based on the principles of 4P medicine (Preventive, Participatory, Personalized, Predictive), transitioning to the 6P vision (+ Public & Psycho-cognitive) in order to guarantee the universal access of the population to qualitative healthcare services and high-tech.	<ul style="list-style-type: none"> ▪ Biomedicine ▪ Biopharmaceuticals ▪ Bioinformatics&health

Source: EDP results, Ministry of Education, Culture and Research

The next stage of implementing the S3 concept in Moldova will focus *on the policy mix*, development of smart specialisation strategy (at national or regional levels), provision of sectoral and regional policies with S3 priorities, and selection of an appropriate set of instruments to achieve the set goals.

Thus, the development/updating of the national policies in the field of research and innovation should ensure their synchronization with the country's national development program, with the sectoral strategies and EU framework programs for research and innovation.

In this context, recent changes in some national policy documents should be mentioned as useful. Thus, the National Development Strategy "Moldova 2030" sets as one of the goals of country's sustainable development the increase of internal and external competitiveness, including through smart specialisation. *The National Research and Innovation Program for 2020-2023 (NRIP)* and the *Action Plan for its implementation* [14], approved in August 2019, sets the strategic priorities and directions of development in the field of research and

innovation for the next four years, including: health; sustainable agriculture, food security and food safety; environment and climate change; societal challenges; economic competitiveness and innovative technologies. The National Program, mentioned hereby for the first time, is aimed at *adopting and transposing the principles of smart specialisation*, noting the importance of this concept “to create a competitive advantage by developing specific strengths for research and innovation and matching them with the needs of the business environment in order to coherently address the emerging opportunities and market development, avoiding duplication and fragmentation of efforts”.

According to the provisions of NRIP 2020-2023, it is expected to launch a program of joint projects based on smart specialisation niches.

5. Conclusions

Establishing a knowledge-based economy and the transition from a resource-based to an innovation-based economy, which the Republic of Moldova opts for, require changing the approaches of the regional economic development and reconsidering the research-development and innovation system to turn it into an important progress factor. A key solution for an innovation-based economic development of the Republic of Moldova is the implementation of smart specialisation concept based on the European experience, which has been widely applied in the community countries and has proved its viability and necessity.

Starting from this point of view, a series of actions have been carried out in our country to raise public awareness of the smart specialisation concept by all the interested parties (academia and business environment, authorities, civil society), the first stages of the methodological cycle of smart specialisation strategy development have been carried out - mapping of the economic, innovative and scientific potential, identification of preliminary priority areas for smart specialisation with potential for economic development, identification of the main niches of smart specialisation for these domains through the first entrepreneurial discovery processes.

Successful completion of the process of smart specialisation strategy development in the Republic of Moldova and its implementation will contribute to the development of the policy framework in the field of research-development-innovation, synchronization of their priorities, efficient use of resources for research-innovation, strengthening of the academic - business environment partnerships, and innovative development of the national and regional economy.

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Rezumat

Conceptul de specializare inteligentă a fost încorporat și a devenit un element cheie al politicii de coeziune a Uniunii Europene, fiind considerat un instrument eficient în implementarea strategiei Europene de creștere inteligentă, durabilă și favorabilă incluziunii. Strategiile de specializare inteligentă au fost implementate cu succes de mai mulți ani în statele membre ale UE.

Dezvoltarea și implementarea strategiei de specializare inteligentă (S3) în Republica Moldova este deosebit de importantă, datorită faptului că conceptul de specializare inteligentă susține reorientarea politicilor de CDI către acele activități de cercetare care oferă rezultate cu relevanță economică, care, pentru o țară cu un nivel încă scăzut de investiții (atât publice cât și private) în aceste domenii, este destul de relevantă.

În lucrare se analizează acțiunile întreprinse și rezultatele obținute la etapa actuală în acest domeniu în Republica Moldova, inclusiv cartografierea potențialului economic, inovational și științific, identificarea zonelor

prioritare preliminară pentru specializarea inteligentă cu potențial de dezvoltare economică, identificarea principalelor nișe de specializare inteligentă pentru aceste domenii prin prima aplicare a procesului de descoperire antreprenorială, precum și acțiunile care trebuie urmate pentru dezvoltarea și implementarea cu succes a S3 în țara noastră.

Cuvinte-cheie: *strategie de specializare inteligentă, inovare, transformare economică, dezvoltare regională*

Аннотация

Концепция умной специализации была включена и стала ключевым элементом политики сплочения Европейского союза, считаясь эффективным инструментом в реализации европейской стратегии умного, устойчивого и инклюзивного роста. Стратегии умной специализации успешно внедряются в течение нескольких лет в странах-членах ЕС.

Разработка и внедрение стратегии умной специализации (S3) в Республике Молдова имеют особо важное значение в связи с тем, что концепция умной специализации способствует переориентации политики в области НИИ на те исследования, которые обеспечивают экономически значимые результаты, а это для страны с низким уровнем инвестиций (как государственных, так и частных) в этой области является весьма актуальным.

В статье анализируются предпринятые действия и результаты, полученные на современном этапе в этой области в Республике Молдова, включая картографирование экономического, инновационного и научного потенциала, определение предварительных приоритетных областей для умной специализации с потенциалом экономического развития, выявление основных ниш умной специализации для этих областей посредством первого процесса предпринимательского открытия, а также выявление действий, которые необходимо предпринять для успешного развития и внедрения S3 в нашей стране.

Ключевые слова: *стратегия умной специализации, инновации, экономические преобразования, региональное развитие*

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THE MANAGERS AND THE MANAGEMENT PROCESSES

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Abstract

The amplification of the role of management in the efficiency of organization and in the superior-systems of which it is a part, demands a much deeper approach to it and, first of all, to the management processes, which represent its object of study. Management processes are exercised by managers who, through the substantiated and adopted management decisions, influence the decision-making and operational behavior of the executants. Management processes, considered the most important category of processes specific to an organization, together with the basic (main) processes, which give specificity to the object of activity and the auxiliary or support processes, comprise five attributes or functions: prevision, organizing, coordinating, training and controlling/evaluating. These functions are exercised by the managers of the organization with different intensities, according to the hierarchical position of each of them. Basically, exercising each function and management processes, as a whole, is materialized in the adoption of decisions by which some specific „products” are outlined: strategies, programs, policies, organizational documents, studies, organizational projects, etc. The malfunctions registered in this area show that the managerial profession is very difficult to exercise if its owner does not have the necessary competence, professional and, above all, managerial. The solutions offered for the professionalization of managers and management come to meet those who face such deficiencies of competence.

Keywords: management, management processes, management functions, managers, professionalize

1. Introduction

Management can be approached at two levels: in a restricted sense, in this case it may be equivalent to management; in a broad sense, a situation in which management means leadership and management. This is an Anglo-Saxon concept although, it originates from a French one, used in the fifteenth century, called „menager”, in the sense of „holding the reins of a horse”; it came from the Italian word „maneggiare” (and from the Latin word „mana”, which means hand). Beginning with the sixteenth century, „menager” was translated as „holding the reins of an organization”, not just a horse (see the paper of Olivier de Serres of 1600, entitled „Le Théâtre d'Agriculture et mesnage des champs” = „The Theatre of Agriculture and the managing of fields”). The word has the same root as „manege” or „menage”, meaning hand, hence the predominantly human dimension of management. At the same time, we cannot avoid several suggestive expressions from this perspective, such as: „leading with a master hand”, „getting your hand on the organization”, „handling the organization”, „manipulation”. From the end of the 19th century to the present, we are witnessing a wide range of definitions of management, largely related to the most important category of work processes carried out at the organization level, respectively, management processes:

- Mental revolution (Brother W. Taylor, 1890);
- Prevision, organization, command, coordination, control - POCCC (H. Fayol, 1916);
- Planning, organizing, personnel, managing, coordinating, reporting, budgeting - POSDCORB (L. Gulik, 1937);
- Leading means: deciding, wanting, putting people ahead of goals, animating teams, passing on a vision, achieving results through others and being responsible for what others have done, making available to people and teams, a help for their success and so on. (O. Gelinier);
- To plan, to organize, to direct, to control – „Deming’s Wheel” - PODC (W.E. Deming, 1988);
- Management is something that relates to human beings. The task, the need, are things that determine people to produce a common result, to give efficiency to their ability and to make their weaknesses unimportant (P. Drucker, 1989);
- The processes through which those with formal responsibility, at the level of the organization or at a part of it, try to direct it or, at least, guide it in its activities (H. Mintzberg, 1989);
- A set of intentions (planning), transformed into actions through a bureaucracy (organization) and actors (training), regular actions through a piloting system (control) (R.A. Thietart, 2012);
- The process by which the results are obtained in an efficient and effective way through the cooperation of others (S. Robins et al., 2014).

Regardless of the manner of approach - in a restricted (management) or extended (leading and management) sense - management is, at the same time, science and art, it is the „newest among the sciences” and „the oldest among the arts”. Management requires the existence of two categories of characters regardless the type of organization: the managers who, through appropriate decisions, ensure its leading and management, and the executants who, through their actions, ensure the operationalization of the decisions in terms of efficiency and effectiveness.

In conclusion, management (as a science) addresses management processes and relationships, in order to discover principles and legalities that govern them and to create managerial tools that allow the achievement of goals in terms of efficiency and effectiveness.

Managers are a separate component of the human factor existing in any type of organization, involved in the exercise of management processes, that is, in the substantiation and adoption of management decisions that influence the decision-making and action of other persons, called executants. The roles of managers are clearly defined in the organization, they lead and manage: on one hand, they substantiate and adopt managerial decisions and, on the other hand, they monitor their application. The executants participate in the substantiation of decisions and, after their adoption, they effectively operationalize them through relevant actions. If managers are solely responsible for the quality of the decisions taken and, in part, for the efficiency of their application, the executants are directly responsible for the results obtained from the operationalization of the respective decisions. Managers are persons who, by virtue of the tasks, competences and responsibilities of the occupied positions, exercise management processes, make decisions by which they influence the decisions and actions of

other people; can be found as individual managers (in this case, the terminology used is extremely rich: general director, president, executive director, vice president, head of department, head of section, office manager, construction site manager, foreman, s. o.) and as group managers (participatory management bodies, such as the General Assembly of Shareholders, the Board of Directors, the Supervisory Board, s.o.). The management can be approached in different ways: as a science, in which case the object of study is represented by the management processes and the relationships they generate; as a practice, in the context of operationalizing the principles, laws, instrumentation s.o., in particular, at the organization level or other procedural or structural components. The link between management theory and practice is represented by managers (approached individually or as a team).

2. Applying / exercising the management processes

The management processes, exercised by managers, are found in several scenarios, generated by their functions or attributes: prevision, organizing, coordinating, training and control - evaluation [5, p. 23]. The application of the management processes is materialized in the substantiation and the adoption of decisions in all phases of their manifestation - prevision, operational and postoperative. The typology of the management processes functions is unfortunately not the same for authors established in different countries of the world; planning is confused with prevision, management is often identified to be a distinct function, as the decision appears as a standalone function. If we refer to the approach in the restricted sense, respectively in the broad sense of management, we find management as the depository of the management processes (management), as in: prevision, organizing, coordinating, training and control-evaluation. Also, each of the aforementioned functions is materialized in the decision making, so it is definitely wrong to identify the decision as a specific function, as long as this is a result of the management processes and each function.

2.1. Prevision

Prevision is found in any of the concepts related to the content of management, it is true, in at least two scenarios - prevision and planning - in our opinion, close, but not identical. Prevision includes decisions establishing the objectives of the organization and its components, specifying the modalities of accomplishment, sizing the resources to be committed in achieving the objectives and establishing the intermediate and final deadlines for achieving them. Given that, other management functions - organization, coordination, training and control/evaluation – are associated with the objectives and report on them. We consider the prevision as the most important management function. Without it, the management process cannot exist, without the objectives established by prevision, other functions are not justified! [5, pp. 23-24].

We try to clarify these issues with the help of answers that managers should give to the following four questions: what do the organization and its structural or procedural components do?; how is it done? what is it done with and when? The answer to the first question is given by the objectives established respecting minimum requirements (SMART)

and in a varied typology, in relation to the degree of derivation and cascading of fundamental objectives – the first degree derived, the second degree derived, specific and individual. The objectives are quantified and/or qualitative expressions of the purpose for which the organization or its component was founded and operates. The answer to the second question is given by the ways of achieving the objectives, also called strategic options, tactical or current. Their scope depends on the type, complexity and difficulty of the objectives to be achieved. Among the most complex, we mention managerial reengineering, restructuring, specialization or diversification of the production, retechnologicalization, manufacturing of a new product, fusion, absorption and so on. The objectives and the modalities of accomplishment demand a relevant answer to the following question, namely the sizing of the necessary resources. These can be human, material, financial, informational and knowledge. Finally, the answer to the last question is generated by the intermediate and final deadlines, associated with the achievement of objectives or development of modalities for achieving them.

The exercise of prevision is reflected in the process within the outline of three important activities: prognosis, planning and programming, delimited in terms of time horizon and the impact on the organization. The three activities are materialized in several „product” of the prevision: prognosis involves the elaboration of prognosis, with a large time horizon and objectives, respectively insufficiently defined, sometimes even utopian, ways of achieving it; planning is reflected in strategies and policies, global or partial, with variable time horizons (from 3-5 years to one month or up to one year); programming involves the detailing in time and space of monthly policies, with the help of programs, especially encountered in the area of manufacture, supply and sale. From this brief review of the prevision content, the difference between prevision and planning is obvious; although planning is the most important activity arising from the exercise of prevision, it is not the same, prevision being much more complex, which is reflected, as we have specified, in three significant activities in the organization' economy (prognosis, planning and programming).

In terms of trends, we point to the amplification of the anticipatory, predictive dimension of management through the elaboration and operationalization of realistic strategies and policies, rigorously substantiated through valorising the information provided by diagnostic studies and/or SWOT analyzes, by market studies or by national and sectoral strategies, to the extent the latter exist.

2.2. Organising

The exercise of the organization demands the substantiation, the adoption and the application of the decisions regarding the delimitation and dimensioning of the business and support processes, necessary for the achievement of the objectives, the delimitation and dimensioning of the structural components necessary for the exercise of the work processes and occupying management and execution positions. Three features mark this function: the procedural dimension, given by the outline of the procedural components (functions, activities, attributions and tasks) associated with the achievement of different types of objectives; structural and organizational dimension, highlighted by the establishment and functioning of

the structural components required by the exercise of business and support processes; the human dimension, expressed in the provision of competent personnel for all positions and compartments, capable of transforming information into decisions and decisions into actions, using specific methodological elements (instrumental and managerial methodologies). The trinoma processes - structures - people becomes viable and, thus, preliminary conditions are created to achieve the objectives. Since the occupancy of management and execution positions is still far from the requirements imposed by the scientific management, in the sense that their holders are not fully selected according to the criteria of professional and managerial competence, the vulnerability of this function can be invoked to a much greater extent than in the case of other management functions. Moreover, when we make critical appraisals of the management exercised in a company, public institution and s.o., we tend to focus on „poor organization” or „deficient organization”, which reinforces the assertion that „organization is the most vulnerable of management functions”. In fact, this is a generic deficiency due to several reasons, subsumed by the famous „stupidity factor”, invoked by the specialized literature:

- non-synchronization between interests and competence, translated, on the one hand, by non-synchronization between positions and their occupants and, on the other hand, by non-synchronization between the official authority with which a position is invested and the personal authority of the position holder; in a situation of managerial normality, the person occupying the position should have sufficient professional and managerial knowledge, qualities and abilities (personal authority), which will allow him to solve the problems faced by the position at the level of decision-making and actions and gives them a certain freedom of decision-making, the right to decide (official authority). Since the organization is a set of economic interests and the managers called upon to satisfy them in a concerted manner are managers, it is obvious that this disadvantage has a negative effect on the efficiency and effectiveness, in general, and at the level of procedural or structural component.
- manifestation of Parkinson’s laws; Cyril Northcote Parkinson (1909-1993), a British analyst, published the first so-called “law” in 1955 in *The Economist*, claiming that “work expands so as to fill the time available for its completion”. The three Parkinson’s laws, on which the specialized literature insists, can be summarized in [7]:
 - a) Parkinson’s first law - Any activity extends as much as to fill the entire time allocated to its execution;
 - b) Parkinson’s second law - Expenses increase as much as to equal the income;
 - c) Parkinson’s third law - Expansion means complexity and complexity means decay or, even simpler, the more complex, the closer to death.To the three laws, Parkinson added two axioms: the first - an official wants to increase his subordinates and not his rivals, and the second - the officials work for each other.
- Peter’s principle, defined and developed in the 1960s by L. Peter and R. Hull [4] by capitalizing the experience of north US companies, emphasizes that “in a hierarchy, each employee tends to rise to the level of his incompetence”. In other words, there is a risk that promotion to management positions will not take into account the requirements expressed by them in terms of personal authority and, in this way, official authority will not be able to be exercised. Suggestive is, from this point of

view, the statement of the French psychologist Gustave le Bon: „competence without authority is as powerless as authority without competence”.

- to these is added the manifestation of the Dunning-Kruger effect, also called the effect of overconfidence/over-appreciation, it defines a thinking mechanism that generates a self-evaluation error, by virtue of which ignorant, incompetent people value their level of intelligence, knowledge and competence as being much higher than in reality. (D. Dunning and J. Kruger conducted studies in this area from 1995 to 1999, the results of which were published in the Journal of Personality and Social Psychology in 1999) [6].

A mixture of reasons invoked leads to the conclusion that the factor of stupidity or „obsolescence of the organization system” is the basis of the poor organization, and this, in turn, generates non-quality and inefficiency in management. Also, Peter’s Principle, the Dunning-Kruger Effect and the Laws of Imbecility formulated by Cipolla [1] suggest a question simple as formulation, but complicated, from the perspective of solutions: why incompetent people become/are promoted in management hypostasis/positions?

Whether we refer to the overall organization of the organization, or to the organization of one component, decisions and actions specific to this function of management must focus on designing, redesigning and maintaining the operation:

- procedural organization, respectively the delimitation and dimensioning of business processes and auxiliary processes in functions, activities, attributes and tasks from the perspective of ensuring the conditions necessary to achieve the fundamental, derivative, specific and individual objectives;
- structural organization, which ensures the proper ground for the exercise of the work processes and the achievement of the objectives by „arranging” the structural components - positions, functions, compartments - in a predetermined configuration, through the hierarchical levels, the hierarchical weights and the organizational relationships; the result of the structural organization is the organizational structure;
- management of human resources, in the sense of meeting the need for managerial and executive personnel and its proper distribution to positions, functions and compartments;
- decision-making organization, that is, specifying the types of decisions to be substantiated and adopted by managers located at different hierarchical levels and the decision-making mechanisms they refer to;
- information organization, focused on the delimitation of data, information, information flows and circuits, information procedures and means of processing information, depending on the types of decisions to be adopted;
- methodological organization, materialized in the nuance of managerial tools (systems, methods, techniques) and other methodological elements that can be used in substantiating, adopting and applying decisions.

The tendency manifested in the perimeter of this function refers to the acceleration of the transition to a flexible, dynamic and efficient organization, possible to be achieved by professional managers, with a prospective attitude and a general, systemic vision on its organization and management.

2.3. Coordination

Coordination - the third function of management - approached as an extension of the organizational function, consists in harmonizing the decisions and actions of the subordinates and of the organizational subdivisions of the organization to ensure the achievement of the objectives. The coordination support is the communication, defined as the process of transmission of informational messages, on downstream or upward flows, between the manager and subordinates. On the vertical of the management system, descending or ascending flows, the communication involves the following categories of informational messages:

- descendant: managers transmit to the executants the decisions made and/or methodological indications regarding the application of these decisions;
- ascending: executants transmit to the managers informations regarding the degree of achievement of the objectives, the degree of application of the decisions and the attitude towards them.

The hypotheses in which coordination is found - as, in fact, the communication - are:

- bilateral coordination, which takes place between a manager and a subordinate, with the advantage of sending undistorted messages and the disadvantage of oversizing the manager's time budget;
- multilateral coordination, carried out between a manager and several subordinates at the same time; there is the advantage of the correct transmission of informational messages - as the manager wants it, but also the disadvantage of allocating extra time to communicate with each subordinate. It creates the possibility of different understanding of the content of the informational message due to the different level of preparation of the subordinates. From this perspective, it is necessary to call a harmonization session, as a management method, with direct impact not only on the relations between managers and subordinates, but also in terms of using the time budget of those who lead and manage the organization or some structural components of it.

The quality of coordination is determined by the fulfillment of two major requirements. The first refers to the promotion, by the managers, of some rules in the relations with those in their direct subordination [1, p. 46]:

- developing self-awareness, which involves asserting a personal belief, requesting feedback, finding trusted external specialists, performing periodic psychological evaluation tests;
- cultivating the empathic spirit, that is, the ability to understand and react effectively to the subjective experience of the other (specialists invoke, in this context, the "emotional literacy" of managers in the intellectual and emotional understanding of people);
- treat others the way you would like to be treated, considered the golden rule of effective management; the main values of this type of behavior are, in the opinion of American specialists Kohn and Connell [1, pp. 115-118] the following:

- treating people with respect by: displaying courtesy, expressing politeness, empathetic listening, accepting the opinions of others; respect for others entails respect from others;
- the correctness of the steps taken starting from the assessment of the situation under the conditions in which the roles would be reversed;
- honesty in words and deeds;
- accepting cultural, social, sexual, family, ethnic diversity by practicing empathy and maintaining an open attitude in order to understand the others, the elements that make them different and cause them to react in accordance to certain situations.
- framing within the limits of common sense (managers must use judgment and self-control in terms of setting limits for subordinates, as a way to maintain a healthy authority position);
- the ability to make critical criticism, namely to criticize the employees with tact and with maintaining self-control in approaching such a situation;
- folding on the human personality, respectively understanding the interpersonal communication styles promoted by subordinates, in order to understand their motivation and to develop different behaviors depending on the particularities of each one.

The second requirement aims to promote effective techniques of motivating the executives, such as enrichment and enlargement of the position, rotation of positions, along with a control focused on results, rather than how to obtain them.

From this perspective, the coordinating function is the most pleasant for the managers, giving them the possibility to exercise with priority the managerial qualities and skills.

2.4. Trening

The most difficult function exercised by managers, especially affecting the economic-financial condition of the organization, is the training.

Difficult to exercise because, again, the relationships between managers and subordinates are very close, the first ones having the task of appreciating what the others have done and granting them incentives or sanctions.

The training – as a distinct sequence of the management process - includes decisions and actions that determine the participation of the employees in establishing and achieving the objectives by taking into account the factors that motivate them.

The economic support of the training represents therefore the motivation of the personnel, which contributes to the harmonization of the categorical system of economic interests of the participants to the work processes.

Motivation involves correlating the material and moral-spiritual rewards sanctions with the actual results obtained from achieving the objectives. Its essence is the trinome rewards/sanctions – results – objectives.

Regardless of the form, positive or negative, motivation must meet fundamental requirements, without which its role in supporting the personnel's participation in setting and achieving goals is compromised:

- It has to be complex, that is to include both material and moral rewards/sanctions, in proportions that facilitate the manifestation of the personnel' potential, their active, effective and affective involvement;
- It has to be differentiated, in the sense that the sizing and granting of rewards/sanctions should be made according to the specificity of the person, the specificity of the group to which it belongs and the specificity of the situation to which it refers. In this way, favorable premises are created to mitigate and subsequently eliminate the collectivist, populist motivating character;
- It has to be gradual, that is, to seek to satisfy the various categories of individual needs, from simple to complex, from lower to higher level needs (see the so-called motivational stairs).

2.5. Control-evaluation

Any management process, associated with a managerial cycle, is completed through the control-evaluation function. Although less attention is paid to it - being considered the most tedious of management functions - its importance in the economy of managerial processes should not be diminished. As such, this function involves evaluating the results, comparing them with the established objectives, causally detecting the main positive and negative deviations and making corrective or prophylactic decisions.

Both during the course of the management process, and, especially, at the end of it, it is necessary the control from the manager, oriented on the results obtained by the subordinate persons and the modalities used to achieve the objectives. Measuring the results obtained, comparing them with the predetermined objectives and standards, from which result favorable or unfavorable deviations, determining the causes generating deviations and making corrections by acting on the generating causes, are all the sequences of the control-evaluation that managers must carry out in exercising this function.

The corrective decisions are aimed at changes in the state parameters of the analyzed domain (production capacities, resources involved, deadlines, modalities of accomplishment s.o.), while the updating decisions are oriented towards the revision of the predicted objectives level, considering that they do not were sufficiently substantiated.

3. The problem degree of investigation at the moment; the purpose of the research

The approach of the organization management through management processes is unanimously recognized as a way of highlighting the performance of managers. Unfortunately, there are few references on how to exercise the main sequences of management processes, treated in our article as functions or attributes, materialized in managerial decisions of a strategic, tactical or current nature. Moreover, there is no consensus as to the number and content of

these sequences - as we stated in the Introduction - a situation that amplifies the difficulties associated with a unitary approach to management processes. The purpose of our research is to identify the main malfunctions resulting from the exercise of each function of the management processes (prevision, organizing, coordinating, training and control-evaluation) and to outline ways to mitigate or eliminate the causes that generate them.

4. Applied methods and materials

In carrying out the research, we have made use of the didactic experience, scientific and managerial research, study of the specialized romanian and foreign literature regarding the management, managers and managerial efficiency of the organizations. In addition, we have used the ideas put forward over 43 years of activity at the Academy of Economic Studies in Bucharest in the numerous scientific papers - books and specialized articles - published in prestigious publisher houses or in internationally rated magazines. To these, we have added the results of the scientific research carried out over time with the help of national research grants or at the level of the business environment in Romania (public and private companies).

5. Results

The aspects presented below highlight, briefly and suggestively, the main dysfunctions or the „managerial dangers” generated by the poor performance of the functions of prevision, organizing, coordinating, training and control-evaluation. Their careful examination highlights the fact that each managerial function registers some dysfunctionalities in its exercise, generated by various causes, out of which two can be generalized: lack of professionalism led to incompetence in an important part of those who lead and manage the organizations and other structures of the Romanian economy and society; excessive bureaucracy [3].

Prevision

Major dysfunctionality: the predominantly empirical character, of a random type of management, a predominantly post-operative dimension.

Causes: fear of the unknown, anticipation of the organization future on small time horizons, empirism in management, managerial and legislative instability, lack or insufficiency of realistic, sectoral and national strategic projections, incompetence of managers, internal and external bureaucracy.

Organization

Major dysfunctionality: the rigidity of the organizational systems, their obsolence (the stupidity factor).

Causes: manifestation of „Parkinson's laws”, manifestation of Peter's principle, Dunning-Kruger effect, lack of synchronization of interests and competence, lack of decisional transparency at top level management, manifestation of „silo effect”, rigid definition of positions and functions, incompetence of managers, internal and external bureaucracy.

Coordination

Major dysfunctions: poor managerial communication.

Causes: lack of decision-making transparency at top level management („ivory tower”), ineffective managerial styles, incompetence of managers, internal and external bureaucracy.

Training

Major dysfunctionality: predominantly populist motivation.

Causes: insufficient decentralization of objectives within the organization, difficulties in evaluating individual, group and organizational performances, reducing (limiting) training to motivation, poor economic-financial situation of some Romanian organizations, incompetence of managers, internal and external bureaucracy.

Control-evaluation

Major dysfunctionality: predominantly postoperative.

Causes: lack or insufficient control and periodic evaluations, low degree of managerial involvement in the exercise of this function, non-existent or insufficient causal approach, incompetence of managers, internal and external bureaucracy.

The solutions with general validity recommended for a quality managerial performance require the professionalization of the managers and the management, both available to the Romanian organizations. The professionalization of managers and management requires:

- Stability and coherence in the legislation regarding the management of various categories of socio-economic entities (public enterprises, mainly)
- Reconsidering the role of human resources management in providing professional managers
- Amplification of managerial methodologisation degree
- Intensifying the managerial training exercised by professionals in the field
- Reinvigorating the management consultancy
- The efficiency of its own activity; the name of „professional manager” cannot be invoked if the management services provider does not know how to make his own activity more efficient. The theory and practice of management offer numerous ways of efficiency based on time-management, which can be successfully used in any organization and at any hierarchical level. We mention here the modalities and the instrumentation of scheduling and organizing the work, ergonomics of manager, use of modern collaborators of the manager, effective use of secretariat or the optimization of relations with subordinates. There are no typical recipes for using the most important resource available to a manager - time! On the other hand, there are variants of solutions that must be adapted to the manager, depending on the importance of the job, its hierarchical position in the structural configuration of the organization, the influence of endogenous and exogenous variables exerted on the organization and the organizational subdivision in which the manager works.

6. Conclusions

If we consider the content of each sequence of the management processes, the „products” resulting from their exercise and their importance in the organization’ economy, the role of management, as a decisive factor in the efficiency of any socio-economic entity, is obvious. The causal detection of major dysfunctions and the presentation of possible solutions to

improve the managerial performances demonstrate that the purpose of our research has been reached. However, it is not enough. We expect from the Romanian organizations a reconsideration of the management, in the sense of “equipping” management positions with competent managerial and professional personnel, with high vision and creative and innovative capacity. Secondly, we believe that reporting on managerial innovations produced and implemented in organizations in the European Union, US, China, Japan, etc., is more than necessary, if we want high quality and efficiency.

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Rezumat

Amplificarea rolului managementului în eficientizarea organizației și a suprasistemelor din care face parte reclamă o abordare mult mai profundă a acestuia și, în primul rând, a proceselor de management, ce reprezintă obiectul său de studiu. Exercițierea proceselor de management se realizează de către manageri care, prin deciziile de management fundamentate și adoptate, influențează comportamentul decizional și operațional al executanților. Procesele de management, considerate cea mai importantă categorie de procese specifice unei organizații, alături de procesele de bază (principale), care dau specificitate obiectului de activitate și procesele auxiliare sau suport, cuprind cinci atribute sau funcții: previziune, organizare, coordonare, antrenare și control-evaluare. Aceste funcții sunt exercitate de managerii organizației cu intensități diferite, în raport de poziția ierarhică a fiecăruia. Practic, exercitarea fiecărei funcții și a proceselor de management, în ansamblu, se concretizează în adoptarea de decizii prin care prind contur unele „produse” specifice: strategii, politici, programe, documente organizatorice, studii, proiecte de organizare etc. Disfuncționalitățile înregistrate în acest perimetru arată că profesia de manager este una foarte dificil de exercitat dacă titularul său nu dispune de competența necesară, profesională și, mai ales, managerială. Soluțiile oferite pentru profesionalizarea managerilor și a managementului vin în întâmpinarea celor care se confruntă cu asemenea deficite de competență.

Cuvinte-cheie: management, procese de management, funcțiile managementului, manageri, profesionalizare

Аннотация

Усиление роли менеджмента в эффективности организации и надсистем, частью которых он является, требует более глубокого подхода к нему и, прежде всего, процессов управления, которые представляют предмет его исследования. Управленческие процессы осуществляются менеджерами, которые посредством обоснованных и принятых управленческих решений влияют на процесс принятия решений и оперативное поведение руководителей. Процессы управления, считающиеся наиболее важной категорией процессов, характерных для организации, вместе с основными процессами, которые придают специфичность объекту деятельности, а также и вспомогательные процессы, включают пять атрибутов или функций: прогнозирование, организацию, координацию, обучение и контроль-оценку управления. Эти функции выполняются менеджерами организации с различной интенсивностью, в соответствии с иерархической позицией каждого из них. По сути, выполнение каждой функции и

процессов управления в целом осуществляется при принятии решений, в соответствии с которыми формируются определенные «продукты»: стратегии, программные политики, организационные документы, исследования, организационные проекты и т. д. Неисправности, зарегистрированные в этой области, показывают, что управленческая профессия является очень трудной для выполнения, если ее владелец не обладает необходимой компетенцией, профессиональной и, прежде всего, управленческой. Решения, предлагаемые автором для профессионализации менеджеров и менеджмента, подходят тем, кто сталкивается с такими недостатками компетенции.

Ключевые слова: *менеджмент (управление), процессы управления, функции управления, менеджеры, профессионализация*

**DIAGNOSING THE POTENTIAL OF ENTERPRISES IN THE FIELD OF
ACTIVITY G46.21 - WHOLESALE OF CEREALS, SEEDS, FODDER
AND UNMANUFACTURED RAW TOBACCO**

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JEL classification: M0, M2

Abstract

The economic development of the Republic of Moldova is largely determined by the trade relations that our country supports, both domestically and externally. The management of economic relations carried out by the enterprises of G46.21 group, which activity involves the wholesale of cereals (grains), seeds, animal feed and raw tobacco on the free market, has some peculiarities and characteristics that distinguish it, therefore it is important to diagnose their potential.

This study is focused on the comprehensive assessment of the profile of G46.21 group enterprises, according to the general and main indicators of their activity, with the aim to analyze the structure of the enterprises by form of ownership, organizational-legal form, by employees, value of fixed assets and sales income; by value structure of fixed assets and value structure of sales revenue.

The problem of analysing the potential of companies of G46.21 group is currently very relevant, because it has an essential link with the economic development of the Republic of Moldova, which in the context of globalization, growing markets and competition, make it possible to determine the competitiveness of this sector.

Keywords: *enterprises, G46.21 group, variable analysis, Cobb-Douglas function*

1. Introduction

The issue of sustainable development of the industry is associated with the formation and maximum use of its capacities - economic potential, the essence of which determines the possibility of its expansion, realized by adapting internal production factors to innovative changes in macromedia, efficient use of available resources and the best available technologies. Today, management is facing an acute problem both at the national level and at the enterprise level, namely, the use of opportunities offered by the economic conjuncture of various sectors of activity. According to the Classification of Economic Activities in Moldova (hereinafter CAEM Rev.2), companies engaged in the wholesale trade of cereals, seeds, fodder and raw tobacco are assigned G46.21 code. There were about 485 companies in the Republic of Moldova during the analysed period, qualified by this code according to their main activity. Thus, the goal of the study is to determine the economic and market conjuncture, as well as the methods, techniques, tools for analysis and effective management of the potential of G46.21 group companies.

The diagnosis made in the article aims at evaluating the status of the analysed companies in the context of incomplete information in order to identify the boundaries of their functioning and the reasons for their appearance on the market of the Republic of Moldova. At the same

time, the main task of analysis is to determine the economic efficiency of use of labour, financial and material resources to optimize management decisions that would allow companies to operate and develop efficiently. Thus in the course of the study, it is proposed to highlight the following diagnostic stages of G46.21 group enterprises:

- factorial structuring of G46.21 group enterprises;
- value structuring of fixed assets and sales revenue of G46.21 group enterprises;
- determining the dependence between the number of employees and the sales revenue of G46.21 group enterprises;
- determining the dependence between sales revenue of G46.21 group enterprises, and value of fixed assets available;
- achieving the Cobb-Douglas regression model and estimating the multiple linear regression model.

The correlation of these stages will make it possible to develop recommendations for improving and increasing the efficiency of company management in this area, in order to mobilize the potential for export promotion and penetration into new markets by using the most modern organizational and economic ways.

At the same time, the quality of information and decision-making methodologies, and the information and organizational restructuring of activities influence the efficiency of management activity.

2. The degree of current investigation of the problem, the purpose of research

Research in this field was carried out at the National Institute of Economic Research, Academy of Economic Studies of Moldova and Trade Co-operative University of Moldova. Theoretical support of the research focused on the study of works in the field of management and econometrics, including Moldovan authors, an essential quota, and Romanian scientists Ursachi Vitalie and Săvoiu Gheorghe.

At the same time, many theoretical and methodological aspects of diagnosing the potential of group G46.21 companies, due to the specificity of their economic activities, are still insufficiently analysed. In this regard, the author pursued the purpose of determining the potential of enterprises involved in the wholesale trade of cereals, seeds, fodder and raw tobacco in the Republic of Moldova by applying econometric calculations, based on the studied structural theories, current legislation and regulatory process of economic activity.

3. Applied methods and materials

The research algorithm includes the fulfilment of quantitative diagnosis of G46.21 group enterprises using a simple and linear regression model to determine the degree of dependence of the resultant and factorial variables of the sales revenue, correlated with the factors involved in the analysis (work and fixed assets).

Among the tools used to diagnose G46.21 group enterprises, the following categories can be distinguished: the first category of tools - quantitative indicators - is based on the use of various statistical data and coefficients for the analysis of sales revenue, labour, capital

productivity, etc. The second category of tools - comparative parameters - is mainly based on the assessment of primary information when the comparison parameters are selected.

Based on the diagnosis of indicators, it was found that data series on sales revenue and fixed assets contain zero and negative values, not supported by the Data Analysis toolbar in EXCEL; for these reasons, statistical modelling was performed in the EViews system.

In the process of work, general scientific research methods were used, such as: analysis and synthesis unity method, statistical analysis method, comparative analysis, tabular method, etc.

As a basis for carrying out an applicative study, theories focused on structural and functional approaches were used. This allowed approximate reflection of the diagnostic results of G46.21 group companies, having as information support, analytical materials of the National Bureau of Statistics and materials of the Food and Agriculture Organization of the United Nations.

4. Obtained results and discussions

The effectiveness of long-term functioning of any economic sector directly depends on the sustainability of its development, determined by the ability of the system to maintain its integrity and ability to reproduce its activities with the expected fluctuations of the external and internal business conditions [6, p.14]. Before proceeding to specify the model of Cobb-Douglas function type for the enterprises with CAEM code G46.21, it will be useful to characterize the profile of this category of companies by various criteria, according to which some aspects of results can be differentiated.

Thus, according to the organisational-legal form, the vast majority of enterprises are limited liability companies [3], which in 2015 amounted to about 94,3% of the total number of companies in G46.21 group (Figure 1).

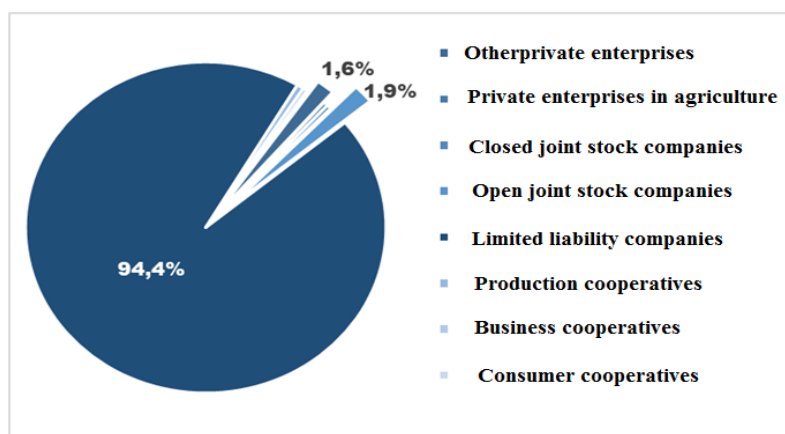


Figure 1. Structure of enterprises in G46.21 (CAEM) group by organisational-legal form, 2015

Source: developed by author, statistical database [1]

Exclusively, all the analysed companies are representatives of the private form of ownership. However, perhaps the major need for investment in the activities of the companies of G46.21 group - Wholesale of cereals (grain), seeds, fodder and raw tobacco - led to the predominance

of the collective form of ownership [2], which is valid for almost 4/5 (79,8%) of the total number of this group companies (Figure 2).

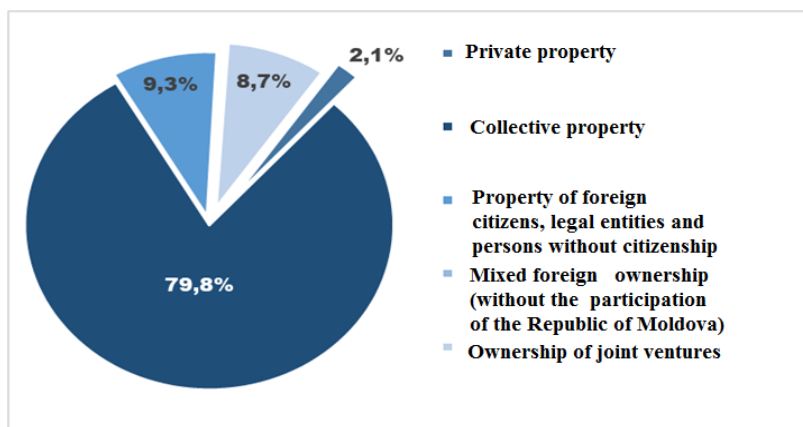


Figure 2. Structure of enterprises in G46.21 (CAEM) group by ownership form, 2015

Source: developed by author, statistical database [1]

The number of employees is one of the criteria for classifying companies by their size. Thus, the group of analysed companies falls entirely in the category of micro and small companies, and less in the category of medium sized enterprises. Thereby, about 88,2% of the reference enterprises can be qualified as micro-enterprises, while about 10,9% of the analysed enterprises are represented by small enterprises. Medium-sized enterprises, with a personnel of more than 100 employees, have a share of only 0,8% of the total number of companies in the group (Figure 3).

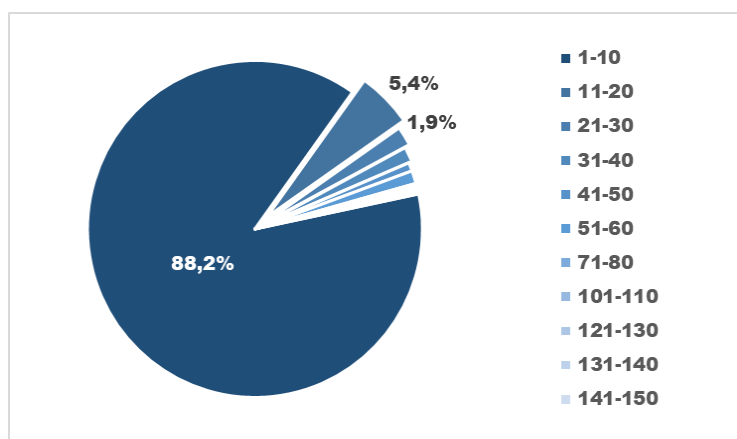


Figure 3. Structure of enterprises in G46.21 (CAEM) group by staff, 2015

Source: developed by author, statistical database [1]

According to the data on the availability of companies in G41.26 group, from the point of view of fixed capital, their distribution is as polarized, as in other criteria described above. Thus, about 96,3% of the analysed companies have a fixed capital of up to 10 million lei (467 out of 485 companies), and the remaining 18 companies have fixed assets (hereby FA) in the amount of 10 to 190 million lei. The distribution of enterprises by the value of fixed assets is shown in Figure 4.

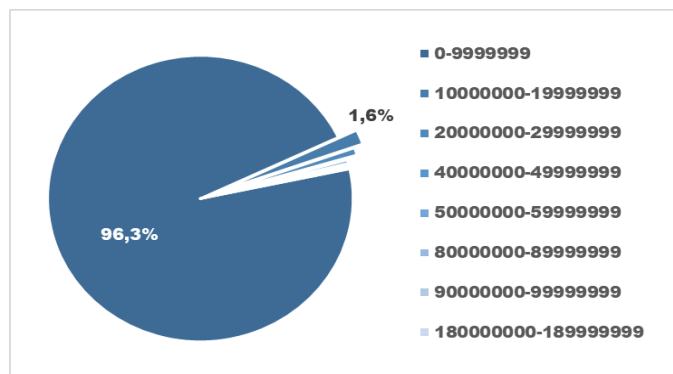


Figure 4. Structure of enterprises in G46.21 (CAEM) group by value of fixed assets, 2015

Source: developed by author, statistical database [1]

In another round, if we distribute the group companies by the total value of fixed assets owned, then their structure becomes more uniform (Figure 5). Hence, there are many enterprises (467) with low availabilities of FA, which total less than 30% (27,1%) of the total value of fixed assets. On the other hand, the remaining 18 companies own about 72,9% of the total value of fixed assets, so that this point could be useful for the modelling procedures.

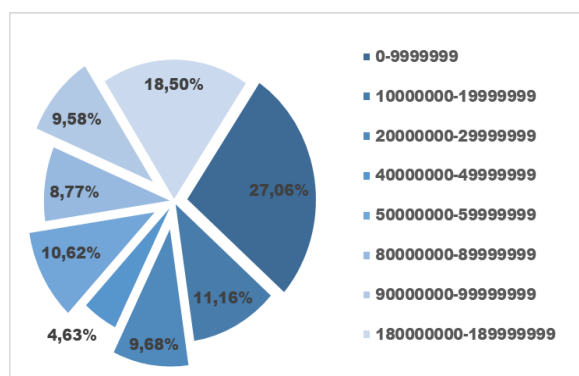


Figure 5. Value structure of fixed assets of enterprises in G46.21 (CAEM) group, 2015

Source: developed by author, statistical database [1]

The last variable to be considered and which will be the resultant variable in the Cobb-Douglas function will be sales revenue (SR). The strongly asymmetric situation on the right (mainly low-income enterprises) is also valid for this variable (Figure 6).

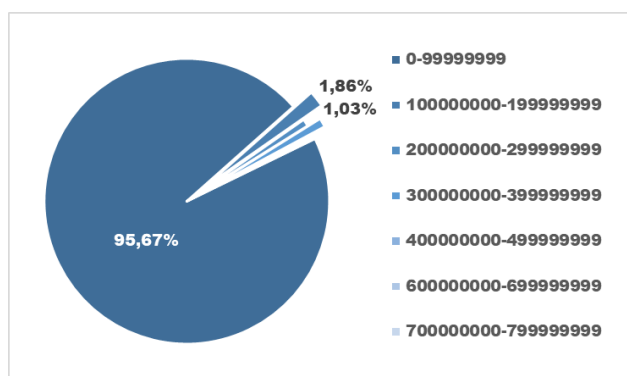


Figure 6. Sales structure of G46.21 (CAEM) group, 2015

Source: developed by author, statistical database [1]

As in the fixed assets case, the distribution of the total value of sales revenue, received by companies related to a sales revenue variation range, is more balanced than the structure of companies by the value of sales. Thus, 464 companies (95,7%) with sales revenues of up to 100 million lei totalled a value of about 3,236.61 million lei in 2015, which is more than 1/3 of total sales revenue (about 35,2%), while the remaining 2/3 were distributed among 21 companies (4,33% of their total number) registering sales revenue exceeding 100 million lei.

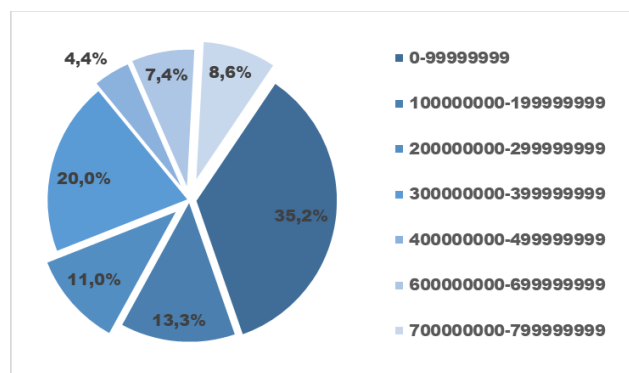


Figure 7. Sales revenue structure of G46.21 (CAEM) group, 2015

Source: developed by author, statistical database [1]

The presentation of sales revenue correlated with factors involved in the analysis, such as work (employees - L) and fixed assets (FA), when taken separately, give certain degrees of dependence between the resultant variable and factor variables. Thus, the double entry table, where the values of pairs relative to the number of employees and sales revenue are systematized, has the amounts of the sales revenues concentrated around a conventional diagonal: upper left, bottom right. So, this situation can be interpreted as follows: as the number of employees increases, revenue from returns increases, too (Table 1).

Table 1. Distribution of sales revenue (SR) among G46.21 (CAEM) companies in relation to the number of employees (L)

Row Labels	0-99999999	100000000-199999999	200000000-299999999	300000000-399999999	400000000-499999999	600000000-699999999	700000000-799999999	Total
1-10	1690686251	367791113		343750649				2402228013
11-20	800926520	287352585	215207885					1303486990
21-30	136666686	151654488	271666539	379237956				939225669
31-40	383731695							383731695
41-50	54739653	310454371		395924380				761118404
51-60	98817062		525439220	721321345				1345577627
71-80	71037173							71037173
101-110					404401703			404401703
121-130							788305646	788305646
131-140						681265500		681265500
141-150		107791914						107791914
Total	3236605040	1225044471	1012313644	1840234330	404401703	681265500	788305646	9188170334

Source: developed by author, statistical database [1]

The only difficulty in this case is a large number of companies with sales revenues of less than 100 million lei and a large variation in the number of employees. In addition, four companies with up to 30 employees, but whose registered sales income exceeds 200 million lei, can also be noticed. Using the correlogram below, one can have a fairly convincing idea of the relationship between the number of employees (factor variable) and sales revenue (resultant variable) (Figure 8). An approximation of this dependence by means of a simple

linear regression model indicates a *relationship of moderate intensity* ($R=0,77$) between the number of employees and sales revenue, and changing the number of employees by one person would bring a similar sales revenue change of about 3,6 million lei.

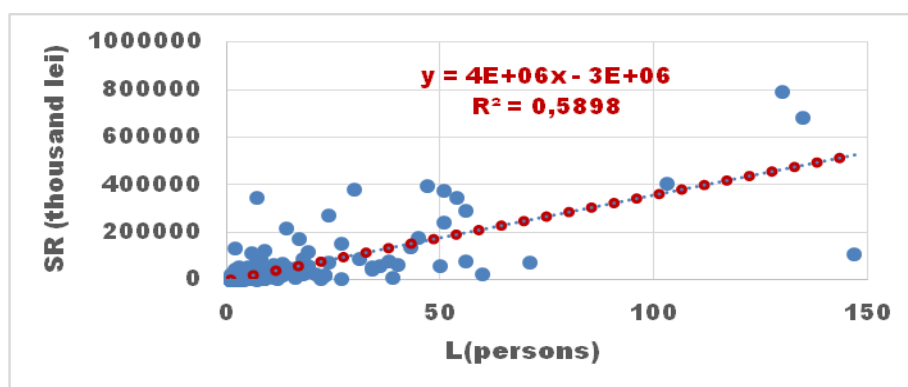


Figure 8. Correlogram on the relationship between sales revenue of companies belonging to G46.21 (CAEM) group and the average number of employees (2015)

Source: developed by author, statistical database [1]

The same situation can be observed in case of a correlated analysis of sales revenue (SR) and value of fixed assets (FA). The inclination of the total values of sales revenue to an imaginary diagonal of the contingency table (upper left – bottom right) in the conditions of the increasing order of SR and FA variables indicates the presence of a possible dependency relationship between the analysed variables (Table 2). Thus, the increase in the availability of fixed assets of considered companies determines, to some extent, an increase in sales revenue.

The time diagram suggests the same ideas, according to which the increase in the value of fixed assets leads to some increase in sales revenue. The regression line and associated indicators confirm this fact and the intensity of the relationship between the correlated variables (SR and FA) is quite high ($R=0,79$).

Table 2. Distribution of sales revenue (SR) within G46.21 (CAEM) code companies by cost of fixed assets

Row Labels	0-9999999	10000000-19999999	20000000-29999999	30000000-39999999	40000000-49999999	60000000-69999999	70000000-79999999	Total
0-9999999	2884471934	914590100	724804654	739675029				5263541717
10000000-19999999	169503347	134125127		379237956				682866430
20000000-29999999	96563999	176329244	287508990					560402233
40000000-49999999					404401703			404401703
50000000-59999999	86065760			346737769				432803529
80000000-89999999						681265500		681265500
90000000-99999999				374583576				374583576
180000000-189999999							788305646	788305646
Total	3236605040	1225044471	1012313644	1840234330	404401703	681265500	788305646	9188170334

Source: developed by author, statistical database [1]

Under these circumstances, the regression model, namely based on an estimate of the coefficient before the x variable (Figure 9), shows that an increase in the value of fixed assets

by one monetary unit would lead to an increase in sales revenue by approximately 4,86 monetary units.

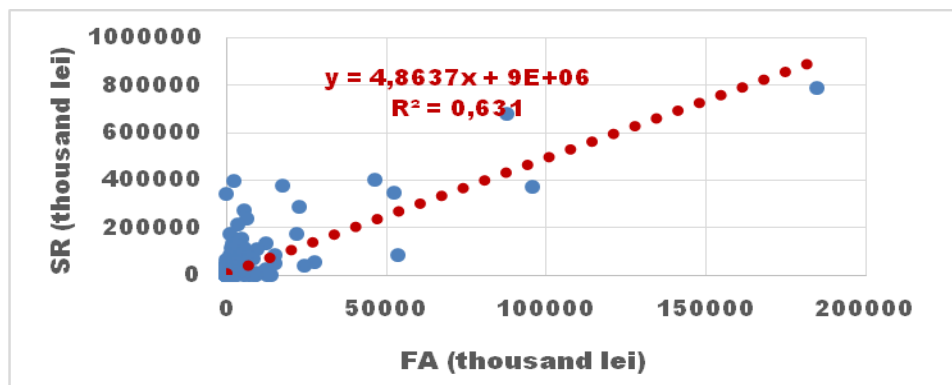


Figure 9. Correlogram on the relationship between sales revenue of G46.21 (CAEM) group companies and the cost of available fixed assets (2015)

Source: developed by author, statistical database [1]

The corresponding results allow us to use three variables in one model. Thus, initially, based on sales revenue (SR) data, value of fixed assets (FA) and number of employees (L), we undertake to specify the Cobb-Douglas function, defined by the following relation:

$$SR = A[FA]^\alpha L^\beta, \quad (1)$$

where:

SR—sales revenue;

A – dimension (proportionality between factors) coefficient;

FA—fixed assets;

α –elasticity of production by capital; shows the growth of work product in relation to variation;

β –elasticity of production in relation to labour.

Model specification operations within Eviews environment indicate an acceptable model of dependence of sales revenue on fixed assets and on the number of employees (Table 3). Thus, in general, the model is characterized by correlation indicators located above the average level ($R=0,67$, green shaded area) and by a rather large and significant Fisher statistics (yellow shaded area). (The simulation was undertaken in Eviews because the data series on sales revenue (SR) and fixed assets (FA) contain zero and negative values not supported by the Data Analysis toolbar in EXCEL).

Specific situations regarding the quality of model parameters estimates, expressed by t-statistics of the regression coefficients (blue shaded area), exceed theoretical values with increased values also. In addition, there is Durbin-Watson statistics, which tends to normal limits ($DW=2$), revealing a slight autocorrelation of model errors (gray shaded area) and, therefore, an adequate quality of the model specification procedure. In these circumstances, the Cobb-Douglas model specified for 485 companies of G46.21 (CAEM) group takes the form:

$$SR = A[FA]^\alpha L^\beta = 4.721 * FA^{1.28} * L^{1.66} \quad (2).$$

Formula (2) was deducted in the absence of influence of production factors on sales revenue; there are chances that it's value is about 4,72 lei. One percent change in capital (FA) ratio would result in a change of sales revenue by approximately 1,28%, and one percent change in labour ratio (L) would result in a change of sales revenue by approximately 1,66%. Under these conditions, according to the valuation model the labour factor has a greater impact on the results of economic activity than the capital factor.

Table 3. Assessment results of the of the Cobb-Douglas regression model regarding the dependence of sales revenue on fixed assets and on the number of employees

Dependent Variable: LOG(VV) Method: Least Squares Sample: 1 485 Included observations: 485				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(MF)	0.246652	0.050489	4.885279	0.0000
LOG(T)	0.504615	0.298679	1.689489	0.0000
C	4.721311	0.367795	12.83680	0.0000
R-squared	0.442446	Mean dependent var		9.415995
Adjusted R-squared	0.440133	S.D. dependent var		7.558241
S.E. of regression	5.655400	Akaike info criterion		6.309265
Sum squared resid	15416.07	Schwarz criterion		6.335146
Log likelihood	-1526.997	Hannan-Quinn criter.		6.319434
F-statistic	191.2452	Durbin-Watson stat		1.518522
Prob(F-statistic)	0.000000			

Source: author's estimations

5. Conclusions

After diagnosing the efficiency and potential of companies in activity group G46.21 - Wholesale trade of cereals, seeds, fodder and raw tobacco, it can be stated that based on companies structural survey carried out in 2015 in the Republic of Moldova there were approximately 485 companies whose main activity was qualified by this code; about 88,2% of the reference companies can be described as micro-enterprises, while about 10,9% of the analysed companies are small enterprises; according to their organizational-legal form, the vast majority of companies are operating as limited liability companies, which have represented in 2015 about 94,3% of the total number of companies of G46.21 group. Exclusively, all companies analysed are privately owned and fairly evenly distributed; about 96,3% of the analysed companies have fixed assets of up to 10 million lei (467 out of 485 companies), and the remaining 18 companies have fixed assets estimated between 10 and 190 million lei.

From the applied model, one can conclude: the presentation of sales revenue correlated with the factors involved in the analysis (labour and fixed assets), when considered apart, express certain degrees of dependence between the resultant variable and the factorial variables. This situation can be interpreted as follows: as the number of employees increases, the revenue from returns increases, too. An approximation of this dependence using a simple linear

regression model indicates a relationship of moderate intensity ($R=0,77$) between the number of employees and sales revenue, while changing the number of employees by one person would lead to a similar change of sales revenue of about 3.6 million lei. The same situation is observed in case of a correlated analysis between sales revenue and the cost of fixed assets. From the contingency table (upper left - bottom right) given the conditions of increasing order of sales revenues and value of fixed assets variables, one can assume the existence of a possible relationship between them. The regression model, namely based on an estimator of the coefficient in front of x variable, finds that increasing the value of fixed assets by one monetary unit would lead to an increase of sales revenue by approximately 4,86 monetary units; therefore, the change of the capital factor (FA) by 1% will lead to the change of the sales revenue by about 1,28%, and the change of the labour ratio (L) by 1% will cause a change of the sales by about 1,66%. Under these conditions, based on the considered model, the labour factor has a greater influence on the results of economic activity in comparison with the capital factor.

Based on the above, we find that the state through its authorized bodies should be involved, by means of various organizational and economic ways, in modernising the management of international economic relations. The main conceptual features of this integration at the macro-economic level are: interstate regulation of economic processes; gradual creation of regional economic associations with a common production structure; diversification of opportunities for internationalizing labour and capital markets; homogenization of domestic economic conditions in the member states of the created associations. We consider that the interaction of companies and national authorities regarding the development of external economic relations management is particularly important [5, p. 277].

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Rezumat

Dezvoltarea economică a Republicii Moldova este, în mare parte, determinată de relațiile comerciale pe care le promovează țara noastră, atât pe plan intern, cât și pe cel extern. Managementul relațiilor economice realizat de întreprinderile grupei G46.21 al cărei activitate prevede comerțul cu ridicata a cerealelor, semințelor, furajelor și tutunului neprelucrat practicat pe piața liberă are unele particularități și caracteristici care îl deosebesc, de aceea este important realizarea diagnosticului potențialului acestora.

Prezentul studiu este axat pe evaluarea cuprinzătoare a profilului întreprinderilor din grupa G46.21, după indicatori generali și principali ai activității acestora, care vizează analiza structurii întreprinderilor după forma de proprietate, forma organizatorico-juridică, după personal, valoarea mijloacelor fixe și după venitul din

vânzări; structura valorică a mijloacelor fixe și structura valorică a veniturilor din vânzări.

Problema analizei potențialului întreprinderilor grupei G46.21 este în prezent foarte relevantă, deoarece are o legătură esențială cu dezvoltarea economică a Republicii Moldova, care în contextul globalizării, creșterii piețelor și a concurenței, permite determinarea competitivității sectorului dat.

Cuvinte-cheie: întreprinderi, grupa G46.21, analiză variabilă, funcția Cobb-Douglas

Аннотація

Экономическое развитие Республики Молдова во многом определяется торговыми отношениями, которые поддерживает наша страна как внутри страны, так и за ее пределами. Управление экономическими отношениями, осуществляемое предприятиями группы G46.21, чья деятельность предусматривает оптовую торговлю крупами, семенами, кормами и необработанным табаком на свободном рынке, имеет некоторые особенности и которые его отличают, поэтому важно осуществить диагностику их потенциала.

Данное исследование посвящено комплексной оценке профиля предприятий группы G46.21, в соответствии с общими и основными показателями их деятельности, с целью анализа структуры предприятий по форме собственности, организационно-правовой форме, персоналу, стоимости основных фондов и доходов от продаж; структуре стоимости основных средств и структуре стоимости выручки.

Проблема анализа потенциала предприятий группы G46.21 в настоящее время очень актуальна, поскольку имеет существенную связь с экономическим развитием Республики Молдова, которая в условиях глобализации, роста рынков и конкуренции позволяет выявить конкурентоспособность данного сектора.

Ключевые слова: предприятия, группа G46.21, переменный анализ, функция Кобба-Дугласа

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**POSSIBILITIES OF MANAGEMENT IMPROVEMENT AND
DEVELOPMENT IN THE ACTIVITY OF CRAFTS COOPERATIVE
COMPANIES IN ROMANIA**

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Abstract

Cooperatives are a dual model, based on an economic and a social component, becoming key players in the competition-based economy and proving that they can withstand crisis periods and overcome their impact. Co-operative organizations are constantly looking for competitive forms of co-operative organizations. In many European countries, the cooperative form of the enterprise is used in an innovative aspect, encouraged by the decision makers. European authorities prefer to promote the widespread use of cooperative form in the European area, by improving the visibility, characteristics and understanding of the sector, further improvement of the Community Laws in the field of cooperatives, strengthening the position of cooperatives and increasing the contribution to the achievement of the Community objectives.

The paper highlights the significance of the Romanian crafts cooperatives, the dimensions and development trends of this system, the challenges they face and the regulatory framework of their activities, as well as the benefits it offers. The analysis of the evolution of the crafts cooperatives in Romania allowed to point out the orientations and strategic actions for the development of crafts cooperatives for the following medium term periods and their implementation would stimulate their evolution. Romanian crafts cooperatives are well structured territorially, being properly organized, by unitary UCECOM management, with an adequate management that can make more efficient use of financial and material resources.

Keywords: *decision system, crafts cooperative, participative management, cooperative company policy, operational management*

1. Introduction

Cooperatives have become an important pillar in the international and European policies of economic development, cohesion and social inclusion, due to the diversity of promoted actions, the population's degree of involvement, contribution to increasing the quality of life, and community development. The Resolution of the United Nations Organization (2001) "Cooperatives in human development", the Recommendation of the International Labour Organization (193/2002) regarding promotion of cooperatives as well as the European Commission Communiqué "Promotion of Cooperatives in Europe" (2004), the Resolution of the European Parliament (2013) "Contribution of Cooperatives in Overcoming the Crisis" and other international documents are aimed at supporting this form of activity and encourage

governments, the academic and research environment to contribute to the development of cooperatives by improving legislation, identifying and implementing innovative forms of cooperatives and co-operative activity, promoting education in the field based on international principles and best practices.

In Romania, cooperatives play a special role in the implementation of national economic and social policies, in the effective use of the priorities and objectives of national Strategies related to social inclusion and poverty reduction (2014–2020), which represents a project of economic growth for the coming years, which the Government has publicly acknowledged, together with other national and sectorial policy documents.

Crafts cooperatives play an important role within the cooperative sector of Romania. Over the course of its evolution for one and a half century, this system has asserted itself as one of the largest systems organized in Romania, continuously expanding in its fields of activity, becoming multi-sectorial, and constantly developing its own infrastructure, covering the entire geographical area of the country. In the same way, this went along various periods of ups and downs, resisting to the impact of international and internal economic crises.

In a permanently changing world, the country's crafts cooperatives face multiple external and internal problems that become a barrier to the development of this sector. Current challenges put as a priority the necessity of rethinking the forms of organization of cooperatives and their management, the fields of economic activity, the system of ownership relationships, the relationship with their members, and the motivation system. In this sense, international experience and research in this field is significant. The introduction of innovative and strategic development solutions can stimulate the development of country's crafts cooperatives, along with all the benefits arising from this.

2. Degree of investigation of the problem at present, aim of the research

A series of analyses and studies in the field of cooperation have been carried out in the last two decades, on various subject areas, at national and international levels, of which we mention: the role of cooperation in the economic and social development, at the global level, and the evolution of this system in Romania; the national structure of cooperation in Romania, both by organizational forms and at the territorial level; the goal of co-operative education; the model of the cooperative company as a form of sustainable enterprise that supports the livelihoods of the communities in which they operate; the motivation of the members to be part of cooperative companies; the organizational structure of cooperatives; rethinking of the incentive measures used in cooperative organizations; the economic and social impact of cooperatives in the local economies; the beginning and development of co-operative systems; basic characteristics of cooperatives; the effects of trust manifested among cooperative members, and between the cooperative members and the managerial team; the role of cooperative activity in the social economy; models of loyalty of the cooperating members; the relationship between cooperation and effort, as well as between reciprocity and mutual surveillance in cooperatives; the advantages of cooperatives in the market in terms of co-operative values and principles according to which they operate; the way in which cooperatives respond to the crisis and its consequences; the place of cooperatives between

state control and collaborative development; the impact of cooperatives on Community development [2, pp. 262-279].

An analysis of the content of the presented subject areas leads to the fact that the problem of improving the management of cooperative activities has never been approached so far.

3. Methods and materials applied

In order to carry out the research, international and European policy documents have been examined, especially in the field of crafts cooperatives support and promotion, as well as national ones, documents related to the development of this field. Assessment of the national legal framework related to the operation of crafts cooperative sector has been done based on the analysis of the national legislation in the field. In order to analyze the development tendency of the country's crafts cooperatives, the authors have used the information offered by the *National Union of Handicraft & Production Co-operatives of Romania (UCECOM)*, and those provided by the National Institute of Statistics (INS).

The methodological instruments are those widely used in research, including; statistical methods, methods of economic analysis, management methods and prognosis methods.

4. Results and discussions

4.1. Impact of cooperatives on the social-economic development

Cooperation, as a system, integrates various co-operative entities and represents a specific sector of the national economy, operated by cooperatives and other forms of their association at territorial and national level. Cooperatives are recognized as main actors of social economy, of occupational and inclusion policies. The Centre of Research and Information on the Public, Social and Cooperative Economy (CIRIEC) approaches cooperatives as “the most important economic agent of the social economy” in the developed studies. Cooperatives activity is characterized by a balance between the economic, social and cultural activities. Therefore, it is important to equally underline the social and cultural role played by cooperatives in the development of localities and communities. These activities are the essential difference between cooperatives and other types of organizations. Cooperatives are different compared to other economic agents by a series of specific particularities according to the following criteria: primary goal, right to vote, investment recovery rate, profit [5, p. 70; 7, p. 416]. Cooperatives being part of the social economy, next to other forms of this type of economy, (frequently called “third sector”), are largely supported in the European Union.

Co-operative models make a significant contribution to the application of priorities of the Europe Strategy 2020 for an intelligent growth, sustainable and favourable to inclusion.

Research in the field confirms that the success and longevity of cooperatives are mainly due to the fact that they are oriented, first and foremost, towards satisfying community necessities where they operate, and not toward maximizing profit for investors. Frequently, cooperatives are fully involved in, and contribute to solving the problems of the community, locality, and society problems in general.

Cooperatives contribute to the overall functioning of economic systems, in at least five ways: they play an important role in reducing market failures, thus improving the functioning of the economic system and the well-being of large groups of people; they play a key role in stabilizing the economy, especially in the sectors characterized by a significant level of maintaining production of goods and services in accordance with the needs of the people they provide for; they tend to take a long term perspective, thus being preoccupied with the well-being not only of the present generation, but also of the future ones; they contribute to a more equitable distribution of incomes.

Cooperatives contribute to the occupation of the work force, support to cooperative members, increase of incomes, development of communities and localities, satisfying the various needs of members and population in the area of their activity, etc.

Considering the development differences of the phenomenon of cooperatives in various countries, four 'cooperative models' have been pointed out: the mutual model, especially found in Germany and USA; the sociologic model found in most of the European countries, such as Spain, France, Portugal, and Belgium; the intermediary model; and the quasi-public model [4, pp. 18-22].

Generally, in the field of co-operative movement, cooperatives fall into four types, depending on the positioning and role of the members: users' cooperatives, producer's cooperatives, employees' (labourers') cooperatives, and social or community cooperatives [11, pp. 24-33].

At international level, a large variety of cooperatives operates: in agriculture, construction (including residences), commerce, credit, insurance, banking, production/processing, employers', fishing, artisanal, crafts, work (craftsmen, tradesmen, agricultural labourers etc.), small and medium enterprises, occupation, pharmaceutical, social, women's, health, education, tourism etc.

In Romania, for example, according to the legislation in force, cooperatives can take various forms, depending on the type of activity: agricultural cooperative companies, dwelling, forestry, fishing, consumption, crafts, and turning to good value, transport, credit, other [1, p. 21].

Functioning and development of cooperatives in a permanently changing environment is influenced by a series of factors, among which, according to the International Cooperative Alliance (ICA), we mention: economic, (economic system, international economy); technological (modern technology, know how); social-demographic (demographic structure, life conditions, cultural values); competition (effective competition mechanisms, equitable market conditions); involvement and loyalty of members, adhesion of the population (involvement in the activity of cooperatives, participation in decisional processes, benefits offered to members, benefits offered to communities etc).

The activity of cooperatives answers the interests of many stakeholders, benefiting from its results. In order to achieve higher performances, cooperatives should be organized around homogeneous areas of interest: farmers/members, consumers, suppliers, and government (state/local) society [3, p. 6].

Acknowledging the importance of cooperatives, the European Commission, in the communiqué "Regarding promotion of cooperative companies in Europe", has drawn up

actions to ensure the understanding of the role of cooperatives in economy, promoting cooperative entrepreneurship, mentioning, among high priority objectives, education and training, support services for businesses, access to financing.

The starting point of the strategy for a global future of cooperatives is the powerful statement cooperatives make to the world: their modality of making business is better, contributing to a more efficient balancing of the world economy. One of its important objectives views the cooperative business form, which will become acknowledged leader in the field of economic, social and environmental sustainability until 2020; a model preferred by people; rapid development form of enterprises.

4.2. Analysis of the crafts cooperative system in Romania

In the analysis of the crafts cooperative system in Romania, we have used the data base of the *National Union of Handicraft & Production Co-operatives of Romania (UCECOM)* and the National Institute of Statistics (INS).

INS keeps evidence of the following types: crafts cooperatives, consumer cooperatives and credit cooperatives, which forward balances like any other commercial company. The data supplied by UCECOM refers to the number of members, volume of economic activities, etc.

In Romania, a descending trend of evolution has been recorded regarding the number of members, the number of employees, the production value, etc. As far as the number of crafts and consumer cooperatives is concerned, from the INS data we can conclude that for 8 years this number has remained relatively constant. For the analysed period, 1% of employees from the total economy worked in the co-operative system.

The functioning framework of the cooperative system is ensured by Law 1/2005 on its organization. The Romanian co-operative system consists of the 1st and 2nd degree cooperative companies and their associations at the county and country levels. A cooperative company of the 1st degree can be organized in one of the following forms: crafts cooperative companies; consumer cooperative companies; capitalization cooperative companies; agricultural cooperative companies; housing cooperative companies; fishing cooperative companies; transportation cooperative companies; foresting cooperative companies; and others that will be formed according to the provisions of Law 1/2005 [1, p. 16].

In Romania, crafts cooperatives currently produce approximately 2% of GNP.

The Central Union of Craft Cooperatives (UCECOM) is the organization representing crafts cooperatives.

In the analysed period, INS data show a slight decrease in the number of craft cooperatives, from 800 to 788. Overall, in the analysed period, financial indicators relative to the income received by craft cooperatives recorded significant increases, in the range of 97.8 % (revenues from exploitation) and 753% (other financial revenues). As far as expenses are concerned, there is a significant increase, especially regarding the staff – 88.65 and goods – 102.3%.

In 2018, a large part of the crafts cooperatives' fields of activity belongs to the processing industries – 54.7%, followed by services – 16.5%, and commerce – 10.4%.

Directly or indirectly, 482 co-operative entities associated with UCECOM are operating in urban areas (444 craft cooperative companies, 22 county unions and 16 cooperative associations), uniting almost 12400 persons, approximately 86% of them are of double quality (associates with the capital as co-operative members and employees of their own cooperative).

At the level of the associated Crafts Cooperative Societies (SCM) there are currently 2.070 units, of which 252 production, 1574 services and 244 commercial units.

Crafts cooperative entities are acknowledged by the business environment as a significant part of the operators in production, services and commerce spheres. They are a social-economic alternative, carried out by people and for their benefit, in view of amplifying social solidarity and mutual assistance of the co-operative members. Member cooperative companies continue to actively participate in the development of local communities of which they are part.

We mention that 482 co-operative entities grouped around *UCECOM – National Union of Handicraft & Production Co-operatives of Romania*, continued to have activities of representation, economic activities, respectively in the intercommunity/export market, having an entirely private support capital. More than 99% of the cooperative companies presently associated with UCECOM are in the framework of small and medium size enterprises (IMM).

The offer provided by these companies to the market, both local, and intra and extra Community, demonstrates quality promotion by maintaining a wide range of products and services offered, due to many years of experience in manufacturing traditional products, by a high degree of flexibility of production, services and commercial units, and by a working environment adequate for cooperation at national and international level.

The main branches of the crafts cooperative entities associated with the *National Union of Handicraft & Production Co-operatives of Romania – UCECOM*, are: textiles – knitwear; ready-made clothes; leather-wear – shoes; exploitation and processing of wood, furniture and other wooden products; metalwork; metal products; foundry, machines and equipment; construction work; automobile maintenance and repair, retail and wholesale; personal and household goods repair; hairstyling, barbershop; jewellery; chemicals, plastic materials, non-metal minerals; paper and cardboard industry; food industry; other work and services.

4.3. Research on the craft cooperatives management

4.3.1. Analysis of human resource management

For the research, partial observation has been used by sampling and inquiries. In order to analyse the human resource management at the level of Romanian cooperatives, the authors have selected significant factors in this field, which are centralized and coded in Table 1.

Table 2 shows the distribution of correctly completed and received inquiries, depending on the type of the cooperative society, and the number of staff, respectively.

A computer program for data processing has been developed that carries out the linear correlation coefficient calculus between two variables.

Table 1. Coding and centralization of analyzed variables [9] [10]

Nr. crt.	Variable significance	Code attributed to the variable
1.	Employees are aware of the firm's mission	L1
2.	Each employee knows his/her role in carrying out the firm's mission	L2
3.	The management is engaged in continuous improvement of quality, productivity and competitiveness	L3
4.	The work force represents a valuable resource for the management	L4
5.	There is a continuous open communication, at all firm level	L5
6.	Between the management and the employees there are internal partnerships based on mutual support	L6
7.	Among the employees there are internal partnerships based on mutual support as well	L7
8.	Quality is defined by internal and external clients	L8
9.	Clients are integral part of the production development cycle	L9
10.	Employees are involved in the decision making process	L10
11.	Employees are free to contribute with their ideas to promoting continuous improvement	L11
12.	Process performance is scientifically measured	L12
13.	Verified data are used in the decision making process	L13
14.	Employees are continuously trained and educated to improve performances	L14
15.	All employees, at all levels, maintain high ethical standards	L15

Table 2. Distribution of inquiries by type of inquired organizations [9] [10]

Nr. crt.	Organization type/ number of staff	Number of completed questionnaires	Share (%)
1.	Cooperative companies with 5-25 cooperative members	30	30,1
2.	Cooperative companies with 26 - 100 cooperative members	35	36,0
3.	Cooperative companies with 101 - 500 cooperative members	32	33,9
	Total of questioned cooperatives	97	100%

Taking into consideration the research results based on completed questionnaires in the service provider type cooperatives in the light industry, in order to assess the degree of use of human resource management, it can be understood that there are differences between the categories of organization surveyed (cooperatives with 5-25 employees, cooperatives with 26-100 employees, cooperatives with 101-500 employees).

Thus, the worst results regarding the degree of use of human resource management were seen in cooperative companies with 5-25 employees. Organizations providing services in the light industry, with 26-100 employees and cooperative companies with 101-500 employees, consider that they "largely" or "fully" meet the above criteria.

In the case of criteria related to the assessment and monitoring of the results (regarding the satisfaction of customer requirements, labour market requirements, and financial results of the organizations, respectively) of cooperative companies with 5-25 employees, they are less likely to satisfy the theses criteria.

Therefore, it is confirmed that there is a correlation between the degree of satisfaction of the criteria referring to the results obtained and the degree of meeting the criteria referring to planning.

The carried out research identified a number of opportunities to increase the degree of compliance with the accepted criteria, among which we mention: involvement of the entire staff in solving problems; implementation of a quality management system to develop the capacity of providing traceability in assessing the results associated with the established objectives; monitoring and systemic assessment of customer needs and expectations, familiarization with the business environment, continuous improvement of the competencies of one's own staff, extending the field of activity for other products required by the market as well, development of the capacity to access European funds for financing technological development programs.

To achieve these improvements it is necessary to develop a quality oriented organizational culture, in order to obtain long term advantages, for the customers and employees of these cooperative companies and for the society as a whole.

It follows from the performed research that human resource management activities in cooperative companies are absolutely necessary at the level of all cooperatives, and, especially, in small cooperative companies, since they cannot clearly identify the problems encountered and do not have the possibility to solve them. As to how human resource management can act as a generator of changes in the mentality and behaviour of the employees, it should be noted that this is difficult to achieve, since the employees are generally old, and they lack knowledge of the economic environment in which they work, to which the phobia against 'advice' is added, determined largely by the unfavourable policy for small cooperative companies.

In Romania it is necessary that the entire system of cooperative companies follows steps of reformation, which could lead to making the Romanian system compatible with the European and international one, having as a first objective the creation of an effective management system of human resources in cooperative companies.

4.3.2. Participative management of light industry cooperative enterprises

Romania uses a new type of participative management that improves as a result of focusing on the market economy and profitability. Currently, at the macroeconomic level, there is a restrained form of participative management mainly represented by institutionalized Administration Councils, according to the legislation of cooperative companies, to which, under certain conditions, the Council of the State representatives, the Steering Committee, the stockholders' meeting, etc., are added.

The decision-making process is the essence of management, and participative management is the active involvement of the employees in this process, through close cooperation between managers and executors. First of all, strategic decisions are viewed and concretized when adopting the plans of the unit and the development programs for certain fields, for the long term, and also the decisions of maximum interest to the employees, such as the statute of the

staff, its motivation and ensuring the best possible labour and life conditions [6, p. 55]. Similarly, participative management implies the existence of decision-making processes of a large democratic nature that would ensure the employees' potential to be affirmed in the management process, by serious foundation of a decision that would be made by a simple majority vote.

Promotion of participative management identifies and emphasizes new trends in legal regulation at the micro-economic level. The main economic and financial levers and instruments should be legally regulated through the prism of exigencies imposed by the market economy, so that they would ensure incentives for initiatives, encourage individual and group responsibility of the employees, and understand the need for strict compliance with legal requirements.

Changes in the mentality of the staff, implied by the existence of a participative management, represent a complex process and aim to amplify the staff efforts in terms of participating in the development and increase the efficiency of co-operative companies of which they are a part, identifying themselves as much as possible with those, increasing their creativity and initiative in the establishing and achieving their objectives.

Participative management has profound implications for the behaviour of the management system. The impact on the structural organization is manifested by the institutionalization of the participative management bodies, which, in their turn, determine functional modifications, strengthening the goals and responsibilities of the executive personnel, in their quality of components of the participative management bodies, redistribution of tasks and competencies among the holders of the top level management positions etc. All this implies changes in the organizational relationships, in the multiplication of the network of relations among top, middle and lower managers and executors, contributing to the increase of the functionality of the organizational structure.

The impact on the decision-making process is concretized in the concentration at the level of the participative management bodies of some of the main decisions that address major problems of co-operative companies, increasing the number of employees participating in conceiving, adopting and applying decisions, which determine their more stringent implementation in excellent conditions, especially strategic and tactical.

Application of participative management implies: the use of modern management methods based on the cooperation of top managers and executive managers in rigorously organized teams that will determine the stimulation of the personnel creativity (games, simulations, brainstorming, decision-making tree, collective notebook); frequent use, in decision founding, of economic methods based on cost analysis, profitability; extension and improvement of the use of meetings, delegating, etc., methods.

The impact on the work and management style is highlighted by: promoting a cooperative, consultative type approach, creating a relaxed working atmosphere, favourable exchange of views and common analysis of the problems; use of delegation in view of the higher level of soundness of the decisions and the extension of participation of a larger number of employees in the management process; individualization of tasks and duties, simultaneously with the delimitation and reasonable combination of collective and individual responsibilities.

The selection and training of the personnel are influenced by the existence of participative management, by the fact that certain superior qualities, knowledge and skills are required, that are specified as: fairness in human relation; listening skills; easy human contact; team work; concise and accurate expression. Similarly, given the competent participation of executive managers in the decision-making process, the promotion based on the obtained results and the creative potential is imposed on the complex motivation function of the difficulties, complexity and efficiency of the work done, etc.

In order to ensure cooperative companies to have profitable activities, under the conditions of the market economy system, it is necessary to exercise participative management at their level.

Application of the methodology for improving participative management consists of a study conducted by the Administration Council of a large crafts cooperative for the production of ready-made clothes (in the study the level of salaries, prices, CAS etc. are maintained at the level of the period in which the case has been carried out, which does not adversely influence its formative usefulness), Confex – Cooperative society from Buzău, which is a manufacturer of: 1) textile confection: suits, pants, skirts, women dresses, vests, blazers, jackets, sportswear for women (T-shirts, sports pants); 2) lingerie: (knitted, cotton, artificial fibre, mixed fibres, cotton and linen, porous weave), lingerie set for women.

The cooperative company has facilities for the technological manufacturing processes and storage, as well as the necessary logistics for its own activity. The company has commercial relations only with acknowledged third parties, which justifies credit financing. The policy of the cooperative company applies to all customers who intend to have commercial relations in crediting conditions in order to be the object of verification procedures. Moreover, debt balances are constantly monitored, which leads to insignificant exposure of the company facing the risk of non-payment. Identifying and evaluating investments influenced by a crediting market without cash flow, analysing compliance with crediting contracts and other contractual obligations, assessing significant uncertainty, including uncertainty associated with the capacity of an entity to continue functioning for a reasonable period of time, all these raise in their turn other challenges. The company debtors can be affected by liquidity crises, which might impede them to honour their current debts. Deteriorating customer operating conditions might affect the managers' expectations regarding future cash flows. According to the policy of the cooperative company the suppliers are permanently sought, and they should be able to supply quality raw materials.

The quality assurance department constantly assesses potential producers, but also existing producers as well. Quality documents provided by those, necessary for authorization, as well as the quality of the supplied products and their behaviour in the technological process are taken into consideration. The main outlet market of the cooperative society is the external market but it also produces products for the local market. The nature of the cooperative company activity can bring about unforeseen fluctuations in cash inflows in the future. The company management has analysed the problem of the opportunity of drawing up the financial situation, bearing in mind the principle of continuation of activity. No potential risks were identified that could affect the liquidities of the cooperative company.

We mention that the case study is based on data collected over the course of a year, referring to the activity of the Administration Council, taking into account sufficiently edifying examples. Confex Buzău is the 1st grade cooperative company, where the activity of the participative management body has been rationalized, its activity profile being based mainly on the production of textile and lingerie.

The main problems faced by the cooperative companies of light industry involve concentration of decision-making on actions taking place in several areas: increasing the degree of decisional capitalization of the problem area (improving the decision-making index, by participation to a greater extent, of the components of the Administration Council in solving problems, decisional solutions are drawn up, of which one can choose the optimal one); amplifying the number of decisions referring to the function of production, especially those regarding programming, launching, product tracking, technical quality monitoring, due to the need to increase the degree of use of technical production capacities, as well as continuous improvement of product quality and competitiveness. Improvement of the process of participative decision making implies intensification of the use of modern decision-making methods and techniques (diagnosis, delegation, brainstorming, Delphy technique etc.).

Among the improvements associated with the decision-making process, the harmonization of decisions made with the attributes is the most important, since it ensures the fulfilment of the role of the Administration Council in efficiently making participative management operational. In this sense, it is recommended to increase the share of strategic decisions - viewing the whole of the co-operative enterprise activity in the medium and long term – and those of complex character (provisional, organizational, motivational), based on a systemic approach, so that it might ensure the correlation of the main components of the activity, through the prism of specific conditions of the market economy.

4.3.3. Policies for developing activities in crafts cooperative companies

In crafts cooperative companies it is necessary to change managerial thinking, regarding the development of new products and services, the corresponding objective being closely related to the position and even existence of relevant entities in the market. The annual values regarding intra-community deliveries, exports, respectively, produced by crafts cooperative companies, have been relatively constant, and the greatest part of these deliveries/exports belong to the light industry.

The period 2018-2022 represents a challenge for UCECOM, both in terms of opportunities and risks.

A rational general strategic vision should have in view the intelligent use of all available means to affirm crafts cooperative companies as trustworthy private economic agents, promoting active partnership relations, in the conditions of permanent preoccupation to satisfy the needs of cooperative members and communities of which they are part.

Improving operational management and becoming responsible in adopting and applying management decisions can be achieved by the involvement of the General Assembly in the management of co-operative entities. General Assemblies have a well determined role in

establishing strategies, activity program, revenue and expenditure budget, and performance criteria for the administration contract or management contract, as well as in the selection of administrators, imprinting a specific character to the activity of organization and management in the sector.

5. Conclusions

The analysis of the main economic-financial volume indicators show, in general, maintaining the present markets, and in many cases, even increasing the volume of production and services.

In the context or the uncertainty associated with the evolution of the target markets, also taking into account the relatively limited possibilities of identifying new market niches for a series of goods and services offered by the associated members, also considering the typology of the activities run in the reporting crafts cooperative entities, it is recommended that associated members conduct detailed analyses, possibly multi-annual, adapted to their real possibilities. Depending on the results of these analyses, practical solutions could be identified to improve the activity, in the sense of business development and to increase competitiveness both in the internal and extra Community market.

Considering the research results based on the questionnaires carried out at the level of service delivering cooperatives of the light industry, in order to assess the degree of use of human resources management, one can appreciate that there are differences between the categories of organizations surveyed (cooperatives with 5-25 employees, cooperatives with 26-100 employees, cooperatives with 100-500 employees). The worst results have been seen in the case of cooperatives with 5-25 employees. However in the case of cooperatives with 26-100 and cooperatives with 100-500 employees, the mentioned criterion is “largely” or “totally” met.

In the case of criteria relating to the results of assessment and monitoring (regarding the satisfaction of customers’ and staff’s requirements and the labour market requirements, and the financial results of the organizations, respectively), cooperative companies with 5-25 employees satisfy to a smaller degree these criteria. Therefore, it is confirmed that there is a correlation between the degree of satisfaction of the criteria referring to the results obtained and the degree of satisfaction of criteria referring to planning, by the services supplying companies.

As a result of the study, possibilities were identified to increase the degree of satisfaction with the accepted criteria, of which we mention: involvement of the entire staff in solving the problems; implementation of a quality management system to develop the ability of ensuring traceability in evaluating the results related to the established objectives; monitoring and systematic assessment of the needs and expectations of customers, knowledge of the business environment, continuous improvement of the competencies of their own staff, extension of the field of activity for other products required in the market as well, development of the capacity of accessing European funds to finance technological development programs. In order to implement these improvements it is necessary to develop an organizational quality-

oriented culture, pursuing to obtain long term advantages for the customers and for the staff of these cooperative companies and for the society as a whole.

It results from the study that the human resources management activity in cooperative companies is absolutely necessary at the level of all cooperatives, but especially in small cooperative companies, since these cannot clearly define the problems encountered and they are unable to solve them. With regard to how human resources management can act as a generator of changes in the mentality and behaviour of the employees, it should be noted that this is very difficult to achieve, since employees are mostly old and lack knowledge, lack information about the economic environment in which they run their activity, and they are reluctant to receive pieces of 'advice', determined by the largely unfavourable policy for the small cooperative companies.

In Romania, it is necessary that the entire system of cooperative companies finalizes the reform, which should lead to the compatibility of the Romanian system with similar systems in Europe and the world, having as its first goal the creation of an efficient system of human resources management in cooperative companies.

The main problems encountered by cooperative companies of the light industry involve concentration of the decision-making process on actions running in several areas: increasing the degree of decisional capitalization of the problem area (improving the decision-making index, by participation, to a greater extent, of the Administration Council components in solving problems, drawing up decisional solutions of which the optimum one to be chosen); amplifying the number of decisions referring to the function of production, especially those regarding programming, launching, production tracking, technical quality control activities, due to the need to enhance the degree of use of technical production capacities, as well as the continuous increase of product quality and competitiveness. The improvement of the participative decisional process implies intensification of the use of modern decision-making methods and techniques (diagnosis, delegating, brainstorming, Delphy technique etc.)

Among the improvements associated with the decision-making process, the harmonization of adopted decisions with the attributes has an important place, since it thus ensures the fulfilment of the role played by the Administration Council in efficiently making participative management operational. In this sense, it is recommended to increase the share of strategic decisions - having in view the entirety of the activity of the cooperative company run in the medium and long term - and of complex ones (provisional, organizational, motivational), based on a systemic approach, so that to ensure the correlation of the principal components of activities, through the prism of specific conditions of the market economy.

In crafts cooperative companies a change in the managerial thinking is required regarding the development of new products and services, the corresponding objective being closely related to the position and the very existence of the relevant entities in the market.

The period 2018-2022 is a challenge for UCECOM, both in terms of opportunities, and risks. A general rational strategic vision should have in view the intelligent use of all the available means for the affirmation of crafts cooperative companies as trustworthy private economic agents, promoting active partnership relations, in conditions of permanent preoccupation to satisfy the needs of the cooperative members and of the communities of which they are part.

Improving operational management and becoming responsible in adopting and applying management decisions can be achieved by the involvement of the General Assembly in the management of co-operative entities. General Assemblies have a well determined role in establishing strategies, activity program, revenue and expenditure budget, and performance criteria for the administration contract or management contract, as well as in the selection of administrators, imprinting a specific character to the activity of organization and management in the sector.

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Rezumat

Cooperativele reprezintă un model dual, bazat pe o componentă economică și una socială, devenind actori cheie ai economiei bazate pe competiție și demonstrând că pot rezista perioadelor de criză și depăși impactul acestora. Organizațiile cooperatiste caută permanent forme competitive de organizare cooperatistă. În multe state europene, forma cooperatistă a întreprinderii este utilizată sub aspect inovativ, fiind încurajată de factorii de decizie. Autoritățile europene optează pentru promovarea utilizării pe larg a formei cooperative în aria europeană prin îmbunătățirea vizibilității, caracteristicilor și înțelegerii sectorului, îmbunătățirea în continuare a legislației comunitare în domeniul cooperativelor, consolidarea poziției cooperativelor și creșterea contribuției la realizarea obiectivelor comunității.

Lucrarea evidențiază semnificația cooperăției meșteșugărești din România, dimensiunile și tendințele de dezvoltare a acestui sistem, provocările cu care se confruntă și cadrul de reglementare a activității acestora cât și beneficiile pe care la oferă. Analiza evoluției cooperăției meșteșugărești din România a permis punctarea

orientărilor și acțiunilor strategice de dezvoltare a cooperăției meșteșugărești pentru perioade viitoare de timp de durată medie, iar implementarea va dinamiza evoluția acesteia. Cooperăția meșteșugărească din România este bine structurată în profil teritorial, fiind corect organizată, prin conducerea unitară UCECOM, existând un management adecvat care poate valorifica mai eficient resursele financiare și materiale.

Cuvinte-cheie: *sistem decizional, cooperativă meșteșugărească, management participativ, politica societății cooperative, managementului operațional*

Аннотація

Кооперативы представляют собой двойственную модель, основанную на экономическом и социальном компонентах, которые становятся ключевыми игроками в конкурентной экономике и доказывают, что они могут противостоять кризисным периодам и преодолевать влияние последних. Кооперативные организации постоянно ищут конкурентные формы кооперативной организации. Во многих европейских странах кооперативная форма предприятия используется в инновационном аспекте, поощряемом лицами, принимающими решения. Европейские власти предпочитают содействовать широкому использованию формы кооперации на европейском пространстве путем улучшения видимости, характеристик и понимания сектора, дальнейшего совершенствования законодательства Сообщества в области кооперативов, укрепления позиций кооперативов и увеличения вклада в достижение целей сообщества.

В статье подчеркивается значение румынских ремесленных кооперативов, масштабы и тенденции развития этой системы, проблемы, с которыми они сталкиваются, а также нормативная база их деятельности и преимущества, которые она предлагает. Анализ эволюции ремесленных кооперативов в Румынии позволил указать направления и стратегические действия для развития ремесленной кооперации на будущие периоды средней продолжительности, а их реализация ускорит его развитие. Румынская кооперация ремесел хорошо структурирована по территориальному признаку, должным образом организована через единый менеджмент Национального Союза Ремесленных и Производственных Кооперативов - UCECOM, имеет адекватное управление, которое может более эффективно использовать финансовые и материальные ресурсы.

Ключевые слова: *система принятия решений, ремесленный кооператив, управление на основе участия, политика кооперативного общества, оперативный менеджмент*

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THE INTERACTION BETWEEN THE “GREEN” AND “DIGITAL” ECONOMY

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Abstract

The research focuses on the interaction between information technologies and the „green” economy. In the 21st century information technologies contribute to the advancement of the „green” economy. Key innovations are made through the use of IT in the context of their sustainable development. Sustainability is the quality of an anthropogenic activity carried out without exhausting available resources, without destroying the environment, and without compromising the possibilities to meet the needs of the next generation. The methods and materials used in the paper are the following: graphical analysis, methods and techniques for formalizing and systematizing information, static and dynamic methods. At the same time, the authors studied a series of 5 significant indicators over a period of time: the population growth; the impact of industrialization; the effects of pollution; the demand for food; trends of depletion of natural resources, in order to study the impact of information technologies on the “green” economy. As result, the authors determined the interaction between the “green” (Green IT) and “digital” economy, mainly through its direct effects.

Keywords: *sustainable development, innovative society, information society, information technologies, “digital” economy, “green” economy*

1. Introduction

The time that is perpetuating now seems to be alert and lively. Obviously, surprising changes are taking place. Environmental management has acquired the status of one of the most priority and acute problems of the humanity. It is quite difficult to keep pace with economic growth and at the same time to reduce the negative impact on the environment. Today, in the modern world, innovations are not simply linked to the capabilities of digital technologies, but are also largely based on them, which makes it possible to increase the pace of economic development with minimal impact on the social and natural environment. If we look closely at the events, probably the most important event that has occurred during the last century is the use of electricity in all spheres of activity. Electricity as a physical phenomenon was widely understood throughout the nineteenth century, and it has become widely used since the beginning of the 1900s. Undoubtedly, we can say: “Without electricity the contemporary

Western civilization would rapidly and irremediably degrade” [1]. The concept of „sustainable development” means a way of using resources, a so-called „ pattern of use” that tends to respond to human needs simultaneously with the protection of the environment, so that these needs could be met not only now but also in the future. This concept was introduced by the Brundtland Commission, which thus offered the most cited definition of sustainability: “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [5]. From the perspective of the complexity and the difficulty of achieving sustainable development, it can be delineated by the unity in the dynamics of several dimensions of development: ecological, economic, technical-technological, social-human, political, cultural, legislative and spatial (national, regional and global). Nowadays, digital and “green” economies are the leading technologies of the modern era and the future. In this regard, today, the solution of the issue of the priority and interrelation of such areas as digital technologies or the “green” economy is relevant and non-alternative.

The era of knowledge and the post-industrial concept of the industrial revolution (Industry 4.0) served as an “introduction” to cyber systems in 2011. These systems, that will come together, will be a network, they will fluently interact with each other, they will be configured and they will develop new behaviors, including the direction of sustainable development. The networks will help reduce errors in the production process, interact with manufactured goods and adapt to the needs of new consumers (Industry 5.0 - 7.0). In this way, there is a need for the interaction of the innovative, informational society and the “green” economy. The synergistic notion of Industry 4.0 provides for the digitization of all physical assets and their integration into the digital ecosystem, together with the partners involved in the value chain of the “green” economy. The notion of digitizing the economy by integrating sensors into the components of products and equipment, manufacturing processes, use of cyber systems, analyzing data, requires innovative offers. Sustainable development involves a complex cohesion of the three components - economy, society and environment. The term “green economy” that started several decades ago is meant to establish a harmonious state between the components that would be satisfactory for all groups of countries - developed, in transition, in development and countries with emerging economies.

2. Level of scientific development of the problem at present and the aim of the research

Initially, in 1991, there were discussions about the characteristics of age differences depending on preferences (Americans William Strauss and Neil Howe, in researching *Generations: The History of America’s Future*, 1992). Subsequently, a theory was developed, based on the differences in the values of different generations. These differences, as well as their causes, were studied in comparison with the correlation of economy and politics with the technological development of the society. After some time, the theory began to be put into practice, as it proved to be very effective in business. Currently, this theory is frequently applied. Generation theory based on age includes three main components (X, Y and Z generations) and one additional component (baby boomers) [19]. The transformation of the economic environment, supported by intelligent, cutting-edge technologies, includes the

integration of sensors, equipment, products and IT networks into a single system throughout the life cycle chain, both within an entity and in the micro- and macroeconomic environment. The basic criteria of Industry 4.0 are the integration of the physical elements of production and information systems for the development and use of cyber systems in sustainable production. The green economy, described in the UNEP Report 2011, perceives this evolution as an improvement in the social and economic status, along with a significant reduction in the environmental risks [2].

According to the authors, the factors that impede the implementation of sustainable technologies in the modern information society are:

- the large volume of information to be collected, selected, and classified;
- the territorial gap between object surveillance and decision making;
- the difference in the hierarchical structure of subordination;
- the wide variety of domains and subdivisions that solve small parts of a major problem;
- the need to make some decisions, carry out operational control, without bureaucratic delay.

The first processes of automation of environmental protection started in the 1990s of the twentieth century. The first IT programs were based on SAP EHSM (Environmental Health and Safety Management), SAP EC, Industrial Security, and Microsoft Dynamics AX, Oracle.

The first use of the term “green” and “digital” economy belongs to the American art historian Paul Fussell. In his book, “A Guide Through the American Status System“, the author identifies (Generation X -1963 - 1983, Generation Y - 1983-2003, Generation Z - after 2003). Obviously, the visions and interpretations of values are different describing the morals of modern society. Paul Fussell represents persons who are alienated from the society, rejecting the status it offers (without identification with their own generation) [17]. In 1991, writer Douglas Coupland took over the title of the novel, extending Fussell’s portrait to the whole generation [16, pp. 40-41; 17]. The book, conceived as a story, presents the memories of three strangers of approximately the same age, united in their desire to distance themselves from society, in order to better understand their purpose. The phrase had been used previously, but with a different meaning. Thus, in the United Kingdom of the 1960s, the authors Charles Hamblett and Jane Deverson gathered a number of interviews with young members of the Mod subcultures in the book entitled “Generation X” (1965). Those interviewed were under the age of 25, and were therefore born in the 1940s [17]. Nicholas Negroponte, Don Tapscott and others dealt with the emergence of the research, development stages, pros and cons of the “digital economy” [16]. David Pierce, Edward Barbier, Enil Markandia and N.V. Pakhomova, V.I. Samarukh, A.K. Tulokhonov, T.A. Akimov [16, pp. 40-41] are the leading scientists in the study of the “green economy”.

The aim of the research is to study the impact of information technologies on the “green” economy, focusing on the most efficient use of resources.

3. Applied methods and materials

In order to study the influence of IT and the information society on the “green” economy, the following aspects were considered: specialized literature, reports of the international

organizations, different scientific papers and statistical database. At the same time, the authors analyzed five significant indicators over a period of time, such as: the population growth; the impact of the 4.0 revolution; the effects of pollution; the demand for food; the incidence of diminution and degradation of natural resources, which highlights the characteristic of the state of the green economy, as well as the direction of the application of the innovative potential, including in the IT sphere, aiming at the sustainable future. The main methods of research used were: analysis, comparison, induction, deduction, forecasting, graphical extrapolation, methods and techniques of formalization and systematization of information, static and dynamic method, used in the GMES Global supervision of environment and security program [8], named after the mathematician Nikolai Copernicus (2008), which uses satellites to monitor the state of the soil, aquatic spaces, atmospheric phenomena with an effect on human health.

4. Results and discussion

The authors' research shows that information technologies have achieved remarkable development in the USA. Hardware and software have been developed by the Silicon Valley Toxics Coalition (CTCD), which include the Earth pollution data. The satellite sensors offer us the possibilities of administration, manipulation, investigation and provision of the information with spatial reference in order to solve the complex problems of planning, forecasting and management, to obtain clear images, related to the environmental changes, natural disasters, fires in tropical forests (Brazil, 2019) and in Russian forests, floods (recently in Spain), the ozone layer, the location of renewable energy areas, and the "green" economy. It is worth mentioning the joint project of UNESCO and ESA (European Space Agency), Wildlife Fund (WWF), which unites 22 member countries, on saving objects from the list of the World Cultural Heritage in three centers - Noordwijk (Netherlands), Darmstadt (Germany) and Frascati (Italy). Unique opportunities for comprehensive information monitoring and operation are a true tool capable of providing data for making the right decisions. The ability to process huge spatial information is tailored to ICT systems and generations Z, as reported by Forbes [11; 23].

People from generation Z are looking forward and are of interest (Table 1). On the contrary, the older people are not interested in providing ideas and innovations [21].

Table 1. The Specificity of Generation Z [17]

Characteristics	Past generations	Generation Z
Access to the Internet and information	A privilege	A fundamental right
Influence	Bought	Won
Intellectual property / patents	Value creators	Breaking patterns and barriers
Failures	Avoided	Accepted with opening
Plays	The do not bring value	Essential pillar to increase engagement
Uncertainty	Adaptive behavior	Anticipatory and proactive behaviour
Withdrawal from professional life	An objective	A travelling
Connectivity	A luxury ("I")	A fundamental need (from "me" to "us")

Harvard Business Review reports that the average age of entrepreneurs and founders with startups, valued at over 1 billion USD, is 20-24 and 30-34 years old - about 75% of staff [3; 25; 27].

The industrial performances of the last decades are the pillars of the great success in technology, computerization, medicine, education and daily life. Information and innovation associations (e-trade, e-government, e-medicine, e-learning, e-banking) and other similar applications in the sphere of IT and ICT are the driving forces of economic development, which may change the state of affairs. It is noteworthy that, at the moment, only developed countries benefit from the most technological discoveries. According to the authors, it is equally notable that the lives of 80% of the population of countries in transition and developing countries will be changed for the better with the help information and communication technologies [16, pp. 40-41].

Digital technologies play an important role in achieving a long-term sustainable balance between the technosphere and the natural environment, necessary for the upward development. The innovation company is ready for major changes. The information association and the digital economy open new opportunities, which, of course, have a positive impact on the life of the community or persons. Currently, there is no single explanation for the digital economy. In the modern world, the concept of the digital economy is identified with such terms as “information economy” (the 1970s), “knowledge economy” and “online economy” (the 1980s), “new economy” (the 1990s) or “network economy” and “internet economy” (the 2000s). The analysis of the publications on the concept of “digital economy” clearly showed that there is no single accurate interpretation and this led to the formation of our own ideas on this subject [9, pp. 115-128; 16, pp. 40-41]. Digital economy is an activity based on the development and use of digital information technology in economic, social and cultural systems. The first aspect analyzed by the author is dedicated to industrialization – environmental pollution and global production.

The main concept of the digital economy is the production of goods and services, but ongoing training and innovation are possible through the transfer and computerized processing of modern technologies in the framework of global trade and sustainable development. Thanks to the development of digital technologies, the consumer can quickly benefit from the services he needs, save money by buying goods in online stores at lower prices and can even start his/her own online business, becoming an entrepreneur without leaving home or the cafe (Teleworking) etc. We will mention that, in modern economy, microelectronics, as a key factor in the rapid and significant reduction in relative costs, ensures a safe and unlimited offer for long periods of time; it offers, independently or in combination with other factors, the potential for creating other products and values in conditions of an innovation society and global economy. Figure 1 shows the dynamics of waste transfers from industrial installations, with the exception of the waste industry. The IT application allows the monitoring of the waste path in order to optimize the “green” economy. The RFID program allows the monitoring of each waste disposal car. The use of drones in Pretoria Kenji Suzuki allows monitoring of waste, illegal waste ramps and promoting the “green” economy [28].

It can be seen that the highest values of waste shipments, especially non-hazardous waste, are recorded by such industries as energy, iron and steel, followed by the extractive industry and the food and beverage business; non-ferrous metals record the lowest values. Regarding the

harmful waste, the chemical substances, the energy supply, the iron and steel sector, the non-ferrous metals and other industries, register the highest values; the lowest values are found in the food and beverage sector.

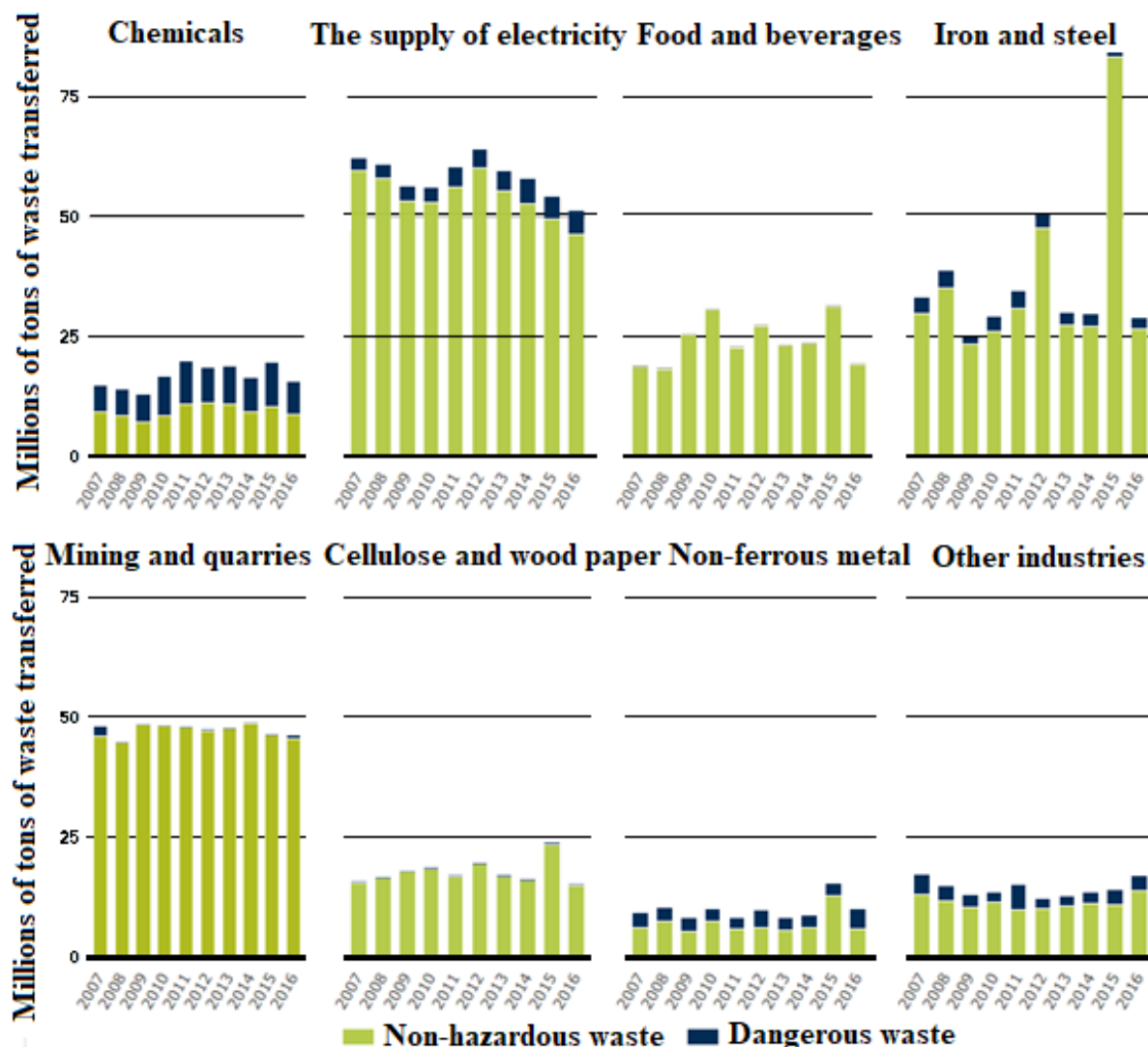


Figure 1. Transfers of Waste from Industrial Installations, with the Exception of the Recycling Industry, EEA-33 [7]

The parameters that characterize the “green” economy (degradation of natural resources) are the demand for food, the number of the population and the energetic and polluting efforts to produce food. Improving the standards of living of the population (along with the polarization of incomes) leads to the depletion of resources, reduction of renewable sources, use of new energy sources for the production and use / recycling of waste (Figure 2).

According to figure 4, in the period 1961-2000 the population grew by 98%; food production increased by 146%; the yields - by more than twice, and the arable land in use - by 8%; agricultural inputs also increased, such as: nitrogen fertilizers - 7 times; phosphate fertilizer - 3 times and irrigation water - twice. At the same time, the latest forecast shows a 71% increase in the demand for food, an increase of 127 x 10¹⁵ kcal by 2050 [4].

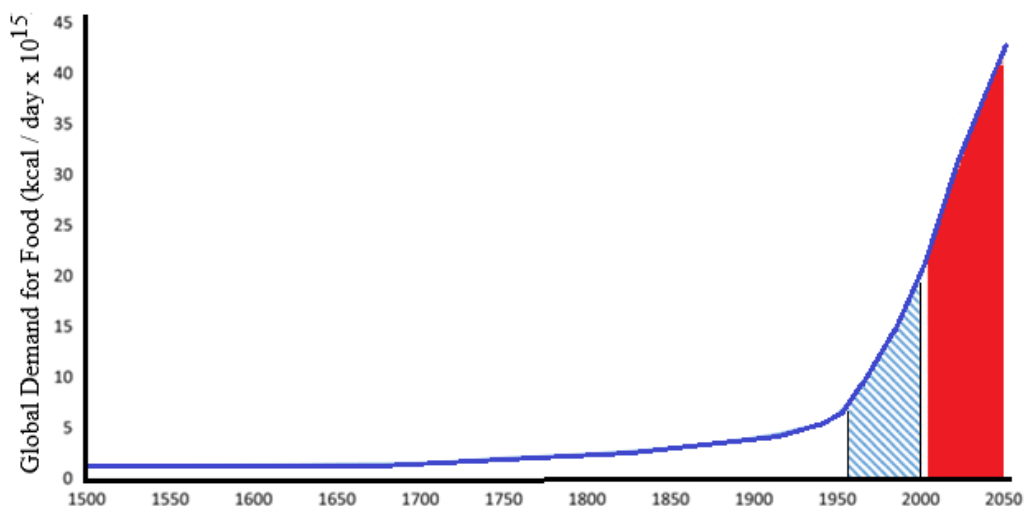


Figure 2. Global Demand for Food (kcal / day x 10¹⁵) [22]

The World Bank, in its 2016 Digital Dividend review, includes other benefits of developing the digital economy:

- increasing productivity;
- improving the competitiveness of companies;
- lower production costs;
- creating employment opportunities in the labor sphere;
- tackling poverty and social inequality.

Moreover, these are just some of the cracks in the digital economy that have a beneficial effect on our lives, providing many opportunities for the average user and, therefore, expanding the capabilities of the market itself [6, pp. 523-528]. In the information society and digital economy, particular attention should be paid to environmental issues, as they are essential for sustainable development. In the modern world, the contribution of science, innovation and new technologies is a decisive factor in the social and economic development. Due to their help, the volume of products, goods, services and their diversity are constantly growing. At the same time, a huge amount of primary resources and energy is used, which negatively affects the environment. The significance of the industrial revolution 4.0, the fifth and seventh, leads to technologies and intelligent equipment, cutting-edge technologies. The evolution of the process can be seen in Figure 3. The impact of human influence on the Earth is determined by human ingenuity and intuition, fortified by technical equipment. The development of mankind has required the creation of comfortable conditions for existence, which changes in parallel with the progress of human thinking, but frequently through the degradation of the environment.

Sustainable evolution is mainly related to the conservation of the biosphere and natural wealth, along with the technologies and the social field. At the same time, in ordinal life, ecological issues are often not given due attention.

The progressive use of resources leads to their impoverishment and exhaustion. The second aspect analyzed is based on the tendency of exhaustion of natural wealth. Figure 3 will show the global prices of goods. The use of economic leverage can diminish conflicts and contradictions in the commodity market (Figure 4).

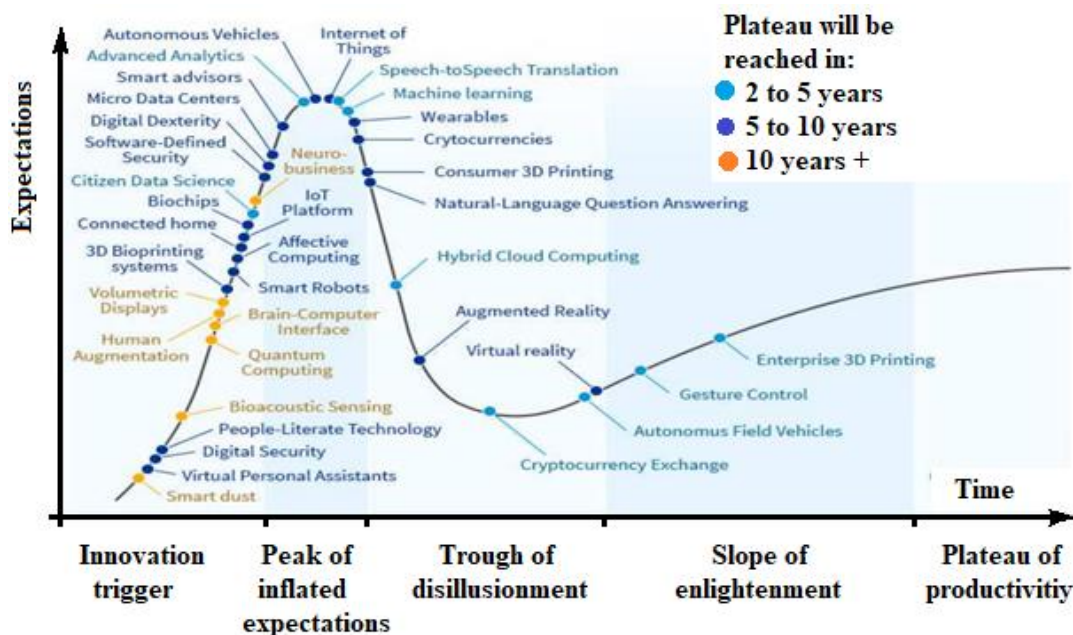


Figure 3. Evolution of New Societies and Technologies [1; 10, pp. 91-99; 17; 20]

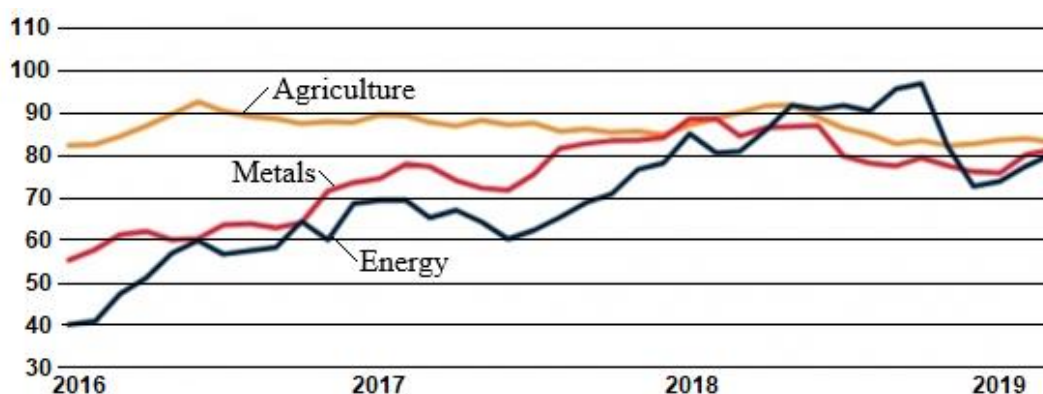


Figure 4. Global Prices of Raw Materials (agriculture, energy, metals), 2016-2019 [13]

In the first quarter of 2019, the prices for most commodities increased after the last year’s decline, and many of them recovered from the decline of Q4, 2018. Energy prices fell in 2019, with low coal and natural gas prices, while oil prices have risen slightly. Prices for non-energy sources grew in the first quarter. Most metal prices have recovered due to a decrease in the fourth quarter of 2018, due to the China’s prospect of growth and supply blockage. Prices for agricultural products increased fairly on smaller plantations in the first quarter.

There have been changes in the formation of national economies lately, in this case regarding the consolidation of the ecological constituent. Decreasing the cost of sensing technologies and spreading IT networks allows connecting each component included in the production process. The data gathered through such links offer the possibility to find out the provenance of the product, the method of production and the quantity of energy consumed. The information obtained gives businesses, cities and countries the opportunity to renew, form and allocate these resources more efficiently. It is suggested to consider the impact of the digital economy on the environment. Digital and green economies are today the leading technologies of the future. Considering what a digital economy represents, let us think about what a “green

economy” means, to understand which the main direction is and which the secondary one is. At the Rio + 20 State Conference, the term of “green economy” was created as an important tool for sustainable development. The concept of “green economy” is a pattern that leads to the growth of the welfare of the population, health and social justice, to a significant reduction of the dangerous impact on the environment [6, pp. 523-528]. Digital Moldova 2020 Strategy offers the right vector, the route, the direction of ensuring a consistent evolution of the information technology space.

In its most modest form, the “green economy” is seen as a low-carbon economic model that saves resources and includes the social economy. According to the classification of the Organization for Economic Cooperation and Development (OECD), “green” technologies cover the following areas: environmental management (waste management, water control, air pollution, restoring forests, land, etc.); energy generation from alternative sources (wind energy, solar energy, biofuels) and energy efficiency in buildings and lighting devices, in fact, “green” technologies comprise all sectors of the economy: energy, industry, transport, construction, agriculture, etc. They are introduced throughout the entire activity chain of companies, including production, consumption, management and production organization methods. The key area of research for “green” technologies is energy. Its “green” directions are increasing energy efficiency and developing new energy sources, especially renewable ones. The benefits of introducing “green” technologies include, primarily, improving the environment and human health, saving resources, increasing production efficiency and product competitiveness. The concept of ecological economy does not substitute the concept of sustainable development. Nowadays, it is frequently recognized that achieving sustainability depends almost entirely on the formation of a “fair” economy. According to the paradigms of the last decades, the company has obtained new wealth based on a non-ecological model of the “brown” economy. Sustainability remains the most important objective, but in order to achieve it, the world economy must become “green”.

The Republic of Moldova has implemented the priorities of the provisions of the Final Declaration of the UN Conference on Sustainable Development – “The future we want” (Rio de Janeiro, June 20-22, 2012) in the National Development Strategy “Moldova 2020” [18]. Through this, the Government of the Republic of Moldova has committed to make greater efforts to ensure a transition to the “green” economic development, which would promote the principles of sustainable development and thereby contribute to poverty reduction, through better governance, by integrating aspects related to environmental protection in all areas of the socio-economic development.

“Green” economic policies help developing countries achieve social and economic benefits (by introducing green energy technologies, improving resource efficiency, using more sustainable agricultural practices). Based on the above-mentioned aspects, it can be concluded that the expansion of the “green economy” cannot be achieved without digital IT technologies, which is a priority direction in all areas, including the environment, which can reduce and even eliminate the negative impact on the environment. The planning of an economic activity based on an automated system will contribute to the reduction of transport costs and transactions, to the redistribution of labor resources, which will ultimately have an impact on reducing environmental pollution, on the more active advancement of the “green economy”.

One of the mentioned parameters (degradation of natural resources and environment) is population growth (Figure 5). To illustrate the dynamics of population growth, we will present it with pessimistic and optimistic forecasts. The population growth creates the problem of food, waste, energy, material resources, and green spaces.

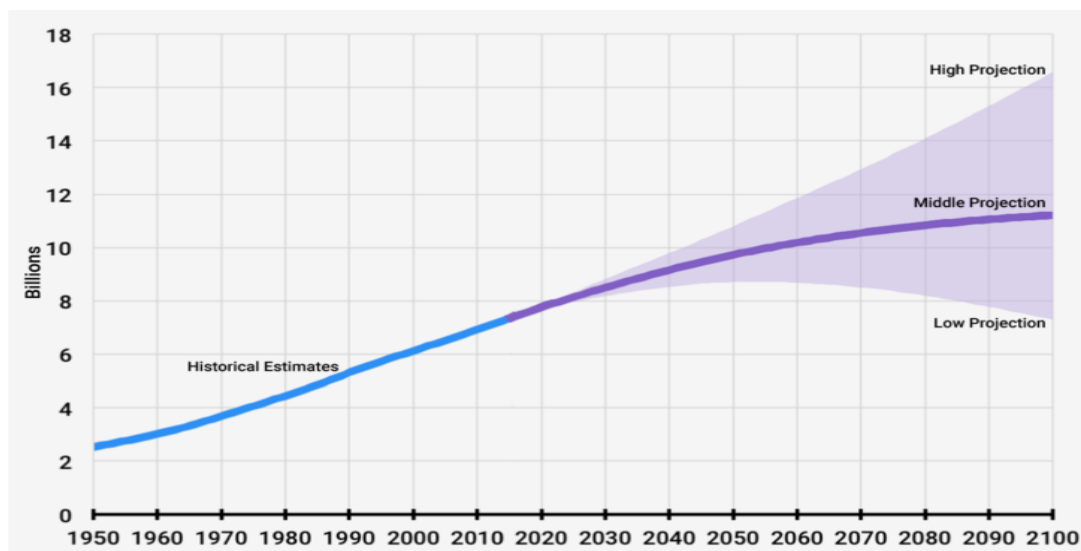


Figure 5. Projections of World Population [24]

The responsibility for society and the environment should not only be the focus of developed countries, but other states as well. We should think about how we can save energy and raw materials; find solutions on how consumers can clean the environment of the harmful effects of waste and production, how to create healthier products without pollution, etc. Successful rethinking of economic activity requires innovation and competitiveness [26]. To solve most of the environmental problems in the modern world, we need new “green” technologies, “smart” management models, improving the quality of environmental analyses, reducing waste and emissions and maximizing the reuse of resources. Large companies are increasingly considering innovative projects, integrating ecological solutions into their operations and creating products for emerging “green” markets. Today there are numerous conferences, exhibitions, forums on the modern “digital” economy, using the technologies of the “green” economy. An example of this kind could be the exhibition-forum Ecotech-2017 organized by “Deloitte” and named “Digital economy” [9, pp. 115-128].

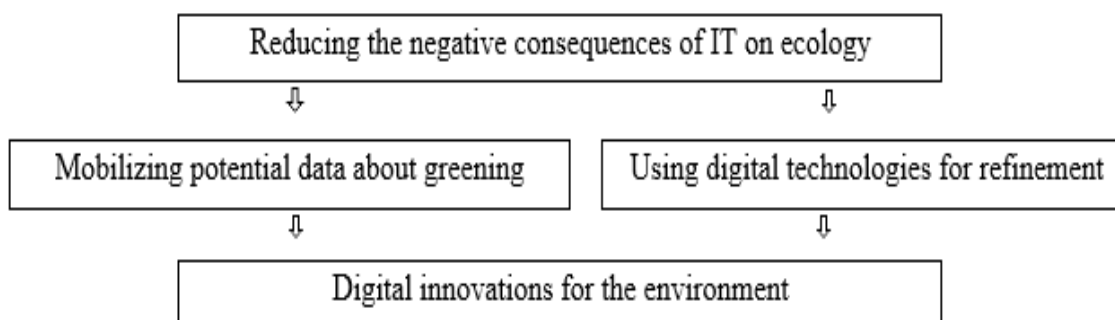


Figure 6. The Scheme of the Interaction of the Digital Economy and the “Green Economy” to Achieve Synergy [authors’ research]

The Energy and Biomass project in Moldova aims to foster the creation of a stable, consolidated, competitive and sustainable process for generating energy from alternative sources, in this case, biogas, pellets, biomass from waste and other materials. The project aims to facilitate the generation and consumption of cheap and clean energy in public structures, private households, urban and rural areas [14].

The construction of a new FIFA stadium for the 2022 FIFA World Cup has recently started in Qatar. The specific feature of this stadium is the intelligent cooling system of the building through new, efficient evaporation technologies, using a new architectural design, with minimal electricity consumption. At the end of construction, the stadium will be used by the surrounding residential areas for cooling. The construction corporation and the author of the project, Tangram Gulf, will endow the stadium with smart technologies to save traditional energy [15]. This finding is related to the cohesion of smart technologies (IT monitoring and equipment management in Qatar, a country with high temperatures). The applied technologies are designed to restore the state of the “green” economy, arguing the direction of the innovative vector for the future. The digital economy changes the human relations with the “green” economy, and with the environment. The concept of “sustainable digital economy” highlights the attitude change towards the environment and the social and economic benefit. All international organizations and developed countries have accepted synergies between the digital economy and the “green” economy. Without great alternatives, there is a strong belief that ICTs will contribute to the development of the ecological economy in three ways:

1. Reducing the direct adverse impact on industry, agriculture, distribution by using ICT, with repercussions on renewable energy, new renewable materials and technologies.
2. Improving the efficiency of ICT use for the development of the “green economy”, increasing productivity, making logistics more efficient and applying the final product. Reducing energy demand and the use of environmentally friendly materials by replacing polluting products and harmful technologies.
3. Applying measures with impact on the behavior of producers and consumers, and on social values. The field of ICT, in cooperation with other structures, is highlighted as a decisive factor in shaping the image of the environment [6, pp. 523-528]. Overcoming environmental problems nowadays, according to the authors, will be possible only with the use of the digital economy, technologies and smart installations with a synergetic effect (Figure 6).

Lately, IT companies are increasingly interested in the “green economy”, particularly the “green energy” and other green industrial solutions. Apple is expanding its innovations in China’s energy, and Panasonic is actively working with Tesla.

5. Conclusions

Humanity, in the hope and longing for a better life, produces goods on an exponential scale, which, as a result, leads to the depletion of energy resources, the unprecedented pollution of nature and ecumene. For some time, nature was opposed to the major stream of waste, but an exponential increase in production leads to the inability of nature to regenerate waste. New strategies and policies are needed to monitor processes throughout the entire product cycle

(from projection to recycling). Taking advantage of the Industry 4.0 revolution and IT projects gives hope to improve the situation. In order to reduce harmful emissions into the environment, many companies have chosen the path of an improved production model, which has been called “advanced manufacturing”. The concept is characterized by the use of new secure materials and intelligent systems, in particular, robotics and wireless sensor networks. Exploring the synergies between the “green” and digital economies can provide a joint decision with long-term implications. Reducing the negative consequences and mobilizing the potential for greening data will lead to the compulsory use of digital innovations for the environment in any area of human activity. The problem of implementing a digital economy project requires an integrated approach. In addition, the ecology cannot remain outside this problem, since the implementation of the main economic activity depends largely on the welfare of the environment [12]. Such systems process the real-time data received from sensors (terrestrial or spatial) and interact with the production control elements. The digital economy should rise to a new level by moving to the management of real economic processes, which will greatly facilitate environmental control and will proceed from “manual control” to the automated one. Automated systems, based on IT, respond to the smallest fluctuations in environmental indicators, warning staff about possible accidents and problem situations, analyzing the efficiency of the equipment use, estimating the level of environmental pollution and the amount of waste generated. The environmental authority must ensure that all relevant information about the environmental impact of the endowment with new technology and decommissioning stages reaches the public sphere and can be accessed without restriction by any factor. The use of IT technologies will reduce greenhouse gas emissions by 15% by 2020 through the use of cyber programs (GeSI) and building smart homes. “Green” energy will be based on solar and wind energy sources. In Denmark, they have already announced that, by 2040, they will ban the use of petrol and diesel cars. Tesla Motors is making progress in this area. IT brands are recognized for maintaining their image by their involvement in the “green” economy.

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Rezumat

Prezenta cercetare este dedicată interacțiunii dintre tehnologiile informaționale și economia „ecologică”. În secolul al XXI-lea tehnologiile informaționale contribuie la dezvoltarea economiei „verzi”. Principalele inovații se fac prin utilizarea tehnologiilor informaționale în contextul dezvoltării lor durabile. Sustenabilitatea este calitatea unei activități antropice desfășurate, fără a epuiza resursele disponibile, fără a

distruge mediul și fără a compromite posibilitățile de a satisface nevoile generației următoare. Metodele și materialele utilizate în lucrare sunt următoarele: analiza grafică, metodele și tehnicile de formalizare și sistematizare a informațiilor, metoda statistică și dinamică. În același timp, autorii au studiat mai mulți indicatori semnificativi într-o perioadă de timp: creșterea populației; impactul industrializării; efectele poluării; cererea de produse alimentare; tendințele de epuizare a resurselor naturale în vederea studierii impactului tehnologiilor informaționale asupra economiei „verzi”. În sinteză, autorii au determinat interacțiunea dintre economia „verde” (Green IT) și cea „digitală” prin efectele sale directe.

Cuvinte-cheie: dezvoltare sustenabilă, societate inovațională, societate informațională, tehnologii informaționale, economie „digitală”, economie „verde”

Аннотация

Данное исследование посвящено взаимодействию информационных технологий и «зеленой» экономики. В 21 веке информационные технологии способствуют развитию «зеленой» экономики. Основные нововведения заключаются в использовании информационных технологий в контексте их устойчивого развития. Устойчивость - это качество антропогенной деятельности, осуществляемой без истощения имеющихся ресурсов, без разрушения окружающей среды и без ущерба для возможностей удовлетворения потребностей следующего поколения. Методы и материалы, используемые в работе: графический анализ, методы и приемы формализации и систематизации информации, статистический и динамический методы. В то же время авторы изучили несколько значимых показателей за определенный период времени: рост населения; влияние индустриализации; последствия загрязнения; спрос на продукты питания; тенденции истощения природных ресурсов для изучения влияния информационных технологий на «зеленую» экономику. В результате авторы определили взаимодействие между «зеленой» (Green IT) и «цифровой» экономикой, в основном через ее прямые эффекты.

Ключевые слова: устойчивое развитие, инновационное общество, информационное общество, информационные технологии, «цифровая» экономика, «зеленая» экономика

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IMPROVING THE SPATIAL DISTRIBUTION OF THE AGRO-INDUSTRIAL COMPLEX (AIC) PRODUCTIVE FORCES IN THE TRANSNISTRIA REGION AS THE MOST IMPORTANT CONDITION FOR ITS SUSTAINABLE DEVELOPMENT

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JEL classification: R10, R14, R52, R58, Q15

Abstract

Successful social and economic development always serves as the main task of both a single economic entity and the state as a whole. This requires continuous scientific research of internal and external development factors. This task is of particular importance in the context of fundamental transformations in the economy as a whole and especially in the agro-industrial complex (AIC). Fragmentation of the main means of production (land) between small users, and the incompleteness of transformation of ownership relations in the rural environment negatively affect the efficiency of its use, the socio-economic development of both individual regions and the state as a whole. The paper discusses the current state and development options of the regional AIC and highlights lags in the scientific development of methodological and applied aspects of its reform. The issue of spatial distribution of AIC productive forces is of special importance in this context.

The paper proposes an economic and mathematical spatial/transport optimization model for the productive forces of AIC in the region.

Keywords: *land resources, agro-industrial complex, sectoral structure, spatial distribution of the productive forces, supply and marketing logistics*

1. Introduction

Fundamental political and economic changes took place in the post-Soviet space at the end of the XX century. The unified economic mechanism has ceased to exist, the ownership relations undergone transformation. The unified economic mechanism has broken up into many independent economic regions. Significant changes have occurred in the regional AIC. Collective agricultural organizations (collective farms) were winded up, while progress in the formation of new management forms is extremely slow. At the same time, there is a lack of scientific support for the reform of this most important industry of the region; this leads to inefficient use of land resources, inefficient structure of this industry, and an imbalance between the raw material base and production capacities of the food industry. This may affect the food security of the region.

These changes highlighted the problem of developing a new model of spatial distribution of the productive forces, as one of the most important factors in increasing the efficiency of AIC functioning, and the socio-economic development of the regions as a whole.

2. The degree of current investigation of the problem, the purpose of research

The scientific theory of the spatial development of regions goes back to the mercantilists. They focused on foreign trade and relations between states, isolated in the territorial sense. A significant contribution to economic research was made by physiocrats who analyzed the territorial contradictions between the city and the village [2, pp. 147-149].

The spatial division of labor was paid much attention in the classical economic theory. Adam Smith attached decisive importance to the absolute costs of production. David Ricardo proposed the law of comparative costs – a country must produce and export goods that are relatively cheaper for it, and import those goods which production abroad requires fewer costs than domestically.

Governments in the countries with market economy focus on ensuring economic growth, full employment, price stability and the balance of foreign economic activity.

These most important public goals cannot be achieved without taking into account the spatial development of production. In 1909, the German economist Alfred Weber published his famous “Theory of the Location of Industries” with an analysis of production location factors, and proposed methods for determining the location of production using isodapanes, that is, lines of equal transport costs per unit of output [3, pp. 97-99].

Experts recognize the great contribution of A. Weber to the formation of the theory of production location in general, but are practically unanimous in assessing the weaknesses of his theoretical concept [4, pp. 146-155]. A serious drawback was the justification of the choice for a production unit placement based on the lowest production costs, while in reality the decisive role in placement is played by the profit. The main Weber’s bias was his approach to the problem of location from the standpoint of a single production unit.

August Lösch and other researchers of this problem went further, they began to study the problems of production and industries location within various territorial entities (cities, districts, regions), as well as the development of methods for spatial analysis within an industry and intersectoral relationships in the economy as a whole.

Researchers and practitioners consider the “The Economics of Location” by Lösch as the classic theory of production placement [6, pp. 78-117]. The author fundamentally revises the methodology for choosing the production unit location, described in the works of Weber and some of his predecessors. He concludes that neither total costs nor gross revenues, not to mention their individual elements, make such a choice possible. During the analysis, each of these indicators is considered separately, however, the final and only factor determining the choice of place will be their result – net profit.

Alfred Marshall, the founder of the neoclassical approach to spatial problems of the economy, examined in detail in his work “Principles of Economics” the regional aspect of the

organization of production and analyzed the causes of the emergence of localized industries [7, vol. 1, p. 349], draws attention to the negative results of territorial concentration and indicates ways to eliminate them [7, vol. 1, p. 353].

In the Soviet period, Moldavia accumulated positive experience of the spatial organization of economic activity of the agro-industrial complex (AIC) on a scientific basis [1, pp. 228-354]. However, the transition to a market economy and the reform of forms of ownership pose new challenges for the scientific community and business to ensure the effective functioning of the most important sector in the new conditions [5, pp. 194-237].

The aim of this work is to study the current state of the regional AIC and develop a mathematical economic production and transportation model for optimizing development and location of its productive forces.

3. Applied methods and materials

In this study we used the following: statistical observation, analysis, generalization, methodological approach to research and development of proposals for improving the spatial distribution of the productive forces of the agro-industrial complex (AIC) in the region.

The materials of this study are regional statistical data on the agro-industrial complex for the period 2000-2018.

Studies of regional problems of economic regions are of particular interest. This is especially true in the current period when the supply and marketing logistics of earlier created enterprises changed dramatically as a result of the collapse of the unified economic mechanism and the emergence of new economic entities.

Given the agrarian orientation of the region's economy, decisions on the spatial distribution of production should be based on regional natural and human resources, climate, infrastructure, proximity to the sales market (consumer). At first glance, this approach may turn out to be erroneous in terms of well-known shortcomings in the quality of the labor market if the work operations on it are predominantly uniform (agricultural workers). However, the elimination of this drawback consists in the development of additional industries in the same field: agricultural engineering, processing industry, poultry and livestock farming, construction industry, and long-term storage facilities for raw materials.

Given the historical geographical location of rural settlements in the region, as well as the fragmentation of land resources among small and medium producers, an extremely difficult problem arises: ensuring the efficient use of available land resources, preserving and developing unique settlements with their social infrastructure.

For the region, this should be the most important public task.

Taking into account the new land issues (state ownership of land, division of land into shares), it is necessary to solve the problem in terms of creating economic structures and optimizing their spatial distribution, without which it is unthinkable to address the issues of efficient use of land resources, as well as the issues of socio-economic development of both rural settlements with their infrastructure, and the state as a whole.

We believe that in order to overcome the current negative situation in the agricultural sector it is fundamentally important to solve several key tasks.

The primary and, in our opinion, the main thing should be the creation of major raw material bases by:

- concentrating land in modern economic organizations (LLC, OJSC, cooperatives, partnerships, national enterprises, etc.)
- gradual synthesis of agriculture with the processing industry and thus the creation of a continuous process of growing raw materials, their processing and production of finished consumer products;
- developing mutually beneficial industrial and economic relations between participants in a unified agro-industrial system;
- integrating science and production, direct participation of scientists in solving practical problems of developing the most important industry for the region.

The development of this economic direction will require the development of other related sectors typical for agricultural regions, and, consequently, a more advanced sectoral structure of the economy based on national resources. Also, the structure of the foreign trade balance will be improved, namely, the exports of agricultural raw materials and their processing products will increase significantly. The revival of the agro-industrial complex of the republic on the basis of organizational transformations will be the beginning of positive changes in the demographic situation, the restoration of rural settlements, the increase in rural incomes, the reduction of state subsidies to rural residents from the budget, without reducing their standards of living, since they will have more job opportunities.

In our opinion, the existing administrative and territorial structure of the region, and transport and water infrastructure allow us to build an economically and socially more favorable territorial deployment of the productive forces. It should be based on:

- the soil and climatic conditions of the regions;
- the availability of labor resources and their consolidation in the historically established territorial structure;
- and the revision of the existing territorial distribution of food industry enterprises.

The region, as an economic entity, has a unique geographical location. On the one hand, there is an international highway running through the whole territory; the western border is washed by the Dniester River. This creates favorable conditions for economic development and external economic relations.

On the other hand, there are certain difficulties for the deployment of productive forces. This is mainly due to the peculiarity of the territory itself – 202 km from north to south and 40 km from west to east.

During the period of the former geographical distribution and the unified economic mechanism of the USSR and Moldavian SSR, economic decisions on the deployment of productive forces were taken with account these factors.

4. Obtained results and discussions

In the current geographical and economic borders, given the fragmentation of land among small users and their right to choose the types of activities, the supply and marketing logistics of the AIC productive forces is extremely inefficient. This led to the liquidation of such large enterprises as: Canning plant (Grigoriopol), Meat processing plant (Rybnitsa), Dairy plant (Rybnitsa) [9]. Surviving food industry enterprises use their production capacity by 30-40% due to the difficulties with supply of raw materials, while ensuring their operation entails significant unproductive transportation costs, which increases the cost of production, and, accordingly, retail prices for socially significant products. The radius of areas for the delivery of raw materials to production sites and delivery of finished products to consumers increases by 3-5 times. Excessive load on the road infrastructure leads to its premature destruction, and, consequently, additional budgetary costs to repair them.

This situation negatively affected the industry structure of AIC (Table 1).

Table1. Agricultural production for 2000-2018

Product	2000	2014	2018	2018 to 2000, %	2018 to 2014, %
Cereals and legumes, tons	135600	368966	405723	299.21	109.96
Sunflower, tons	36500	69522	93415	255.93	134.37
Potato, tons	400	6854	1910	477.50	27.87
Open ground vegetables, tons	32500	32749	27737	85.34	84.70
Fruits and berries, tons	8300	9082	16985	204.64	187.02
Grapes, tons	8200	24669	23048	281.07	93.43
Cow milk, tons	21600	7185	6767	31.33	94.18
Chicken eggs, thousand pcs.	2200	31787	172	7.82	0.54
Vegetable oil, thousand tons	8.8	0	0.083	0.94	0.00
Flour, thousand tons	51.2	0	31.7	61.91	0.00
Canned food, mln. cans	43.9	4.45	7.86	17.90	176.63
Sugar, thousand tons	0	0	0	-	-

Source: developed by authors of [9]

The data presented in Table 1 illustrate the extent of the impact of the existing problems in the regional AIC on the structure of agriculture. The region, which was the main producer of sugar, vegetables and canned vegetables in the 20th century, now significantly has reduced the production of these products. For example, sugar production is completely stopped; the production of canned vegetables decreased by 5.6 times, the production of vegetable oil decreased by more than 10 times. The main reason for this is the discrepancy between the existing spatial distribution of the AIC productive forces and the new business environment.

Thus, we cannot call effective the distribution of productive forces inherited by the region, the slowness of the reform of these forces in terms of economic and social efficiency, which implies the impact of the distribution of productive forces on the demographic situation, the preservation and development of rural settlements, health care, education, culture in the current economic conditions.

Taking into account all the above mentioned, the government should take control over the development of the general layout of productive forces, with account of the current administrative borders and territorial features of the region.

Determination of the best option for the development, specialization and distribution of production, which will ensure a minimum of total reduced costs while meeting the needs for the products, should be done using mathematical economic methods.

To calculate the optimization of the development and location of productive forces the following mathematical economic production-transport model is proposed.

The following notation will be used below:

i – index of product manufacturing point $i=1, 2, \dots, a$;

p – number of product manufacturing points;

j – index of product consumption point, $j=1, 2, \dots, n$;

n – number of product consumption points,

m_i – capacity option index at the i -th manufacturing point,

$m_i = 1, 2, \dots, v_i$;

v_i – number of capacity options at the i -th manufacturing point;

$A_i^{m_i}$ – amount of product that can be produced at the i -th point using the m_i capacity option;

B_j – the need for the product at the j -th consumption point;

$$Z_{ij}^{m_i} = (C_i^{m_i} + EK_i^{m_i}) + T_{ij}, \quad (1)$$

where:

$Z_{ij}^{m_i}$ – reduced production costs at i -th manufacturing point with m_i -th capacity option and for transportation of a unit of product from the i -th production point to the j -th consumption point;

$C_i^{m_i}$ – unit cost of the product manufactured at the i -th manufacturing point using the m_i -th capacity option;

$K_i^{m_i}$ – capital investments per unit of product at the i -th production point when using the m_i -th capacity option;

T_{ij} – transport costs for the transportation of a unit of product from i -th production point to j -th consumption point;

E – capital investment efficiency ratio;

X_{ij} – the required amount of product to be delivered to the j -th consumption point from the i -th production point;

\bar{m}_i – the required capacity of the i -th production point.

Economic and mathematical formulation

The task will take the following form:

Find the required amount of product (X_{ij}) to be delivered to the j -th consumption point from the i -th production point and the required capacity of the i -th production point (\bar{a}_i), so that the total reduced costs (3) are:

$$Z = \sum_{i=1}^p \sum_{j=1}^n X_{ij} T_{ij} + \sum_{i=1}^p \bar{a}_i (\bar{C}_i + \bar{E}K_i) \rightarrow \min, \quad (2)$$

where: the cost and capital investment \bar{C}_i and \bar{K}_i , corresponding to capacity \bar{a}_i , are minimal under conditions:

1. $\sum_{j=1}^n X_{ij} = \bar{a}_i, i = 1, 2, \dots, p$ – i.e. the total amount of product delivered to all consumption points from i -th production point is equal to the capacity \bar{a}_i of this point;
2. $\sum_{i=1}^p X_{ij} = B_j, j = 1, 2, \dots, n$ – i.e. the total amount of product obtained in the j -th consumption point from all production points is equal to the given demand;
3. $X_{ij} \geq 0, i = 1, 2, \dots, p; j = 1, 2, \dots, n$ (supplies must be non-negative);
4. $\bar{a}_i = A_i^{mi}$, i.e. selected capacity option at each production point must match one of the given options.

When preparing the initial information, it is necessary to adhere to the condition that the total amount of product according to the maximum possible capacity options of all production points should significantly exceed the total product demand for all consumption points.

When choosing equipment for a small enterprise, one should expect that it is possible to ensure full use of its capacity. For this purpose it is advisable to use the following mathematical model:

$$M = W_b \times K_{out} \times \frac{T_{use}}{t_c}, \quad (3)$$

where:

- W_b – weight of the batch of raw material to be loaded in the production plant, kg or tons
- K_{out} – output of finished product (useful substance)
- T_{use} – useful operating time of the production plant during a year (season), hours
- t_c – duration of one cycle of processing a batch of raw materials, hours.

An essential condition for the correct choice of equipment capacity:

$$M = W_b \times \frac{T_{use}}{t_c}, \quad (4)$$

where:

$\frac{T_{use}}{t_c}$ – number of cycles of raw material processing during a year (season),

$W_b \times \frac{T_{use}}{t_c}$ – amount of raw material that can be processed with the appropriate

equipment and operating mode during a year (season).

If the raw materials are seasonal (vegetables, fruits), then in this case one of the most important tasks is to increase the period of operation of the plant (enterprise). This can be achieved by means of construction of storage facilities to provide stocks of raw materials, purchase of modules (complexes) of equipment, which allows, with appropriate modification, switching to the production of other related products (for example: apple concentrate – drinks, etc.; tomato juice – various food seasonings, etc.).

In this case, the efficiency of capital investments into such enterprises and full, year-round, rather than seasonal employment of staff will be ensured [8, pp. 27-30].

6. Conclusions

Thus, it can be stated that under the conditions existing in the region, namely, fragmentation of land among small users, their economic freedom in choosing activities and lack of scientific support, the functioning of the regional agro-industrial complex cannot be effective, and there is a need to develop a scientifically-based model for the location of productive forces.

Given the geographical features of the region, such model should be based on:

- soil and climatic conditions of territories;
- concentration of land in modern business organizations (LLC, cooperatives, partnerships, etc.)
- gradual integration of agriculture with the processing industry;
- creation of modern mini-modules for the processing of agricultural raw materials and food production within the framework of economic structures.

It will also require improved rental relations between the state, which is the land owner, and the tenants. The basic principles of these relations should be commitment to ensuring the efficient use of land, leveling the differences in the socio-economic development of territories (districts), eliminating inefficient transport logistics for delivering raw materials to production sites and selling food products to consumers.

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Rezumat

Dezvoltarea socială și economică de succes constituie sarcina primordială permanentă atât a fiecărei entități economice, cât și a statului în ansamblu. Acest fapt necesită o cercetare științifică continuă a factorilor interni și externi de dezvoltare. O importanță deosebită o are sarcina dată în contextul transformărilor fundamentale ale economiei în ansamblu și, în special, a agriculturii. Fragmentarea principalului mijloc de producție (pământului) pe utilizatori mici, nefinalizarea transformării relațiilor aferente formelor de proprietate în mediul rural, afectează negativ eficiența utilizării acestuia, dezvoltarea socio-economică atât a regiunilor în particular, cât și a statului în ansamblu. În articol sunt examinate starea și dezvoltarea sectorului agroindustrial din regiune, se identifică zăbovirea în elaborarea științifică a aspectelor metodologice și practice de reformare a acestuia. Un loc special, în acest context, o ocupă problema distribuirii spațiale a forțelor productive ale complexului agroindustrial.

În articol autorii propun un model economico-matematic de transport-spațiere pentru optimizarea dezvoltării și distribuirii forțelor de producție ale complexului agroindustrial din regiune.

Cuvinte-cheie: resurse funciare, complex agroindustrial, structură sectorială-ramurală, distribuție spațială a forțelor de producție, logistica aprovizionării și desfacerii

Аннотация

Успешное социально-экономическое развитие всегда является главной задачей как отдельно взятого хозяйствующего субъекта, так и государства в целом. Это требует постоянного научного исследования внутренних и внешних факторов развития. Данная задача приобретает особое значение в условиях коренных преобразований в экономике в целом и в АПК в частности. Раздробленность основного средства производства (земли) по мелким пользователям, незавершенность преобразований отношений форм собственности на селе негативно сказываются на эффективности его использования, на социально-экономическом развитии как отдельно взятых регионов, так и государства в целом. В статье рассматриваются состояние и пути развития АПК региона, отмечается отставание в научной разработке методологических и прикладных аспектов его реформирования. Особое место в этом контексте занимает проблема пространственного размещения производительных сил АПК.

В статье предлагается экономико-математическая пространственно-транспортная модель оптимизации развития и размещения производительных сил АПК региона.

Ключевые слова: земельные ресурсы, агропромышленный комплекс, отраслевая структура, пространственное размещение производительных сил, снабженческая и сбытовая логистика

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