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ORGANIZATIONAL AND ECONOMIC MECHANISM INTELLECTUAL CAPITAL MANAGEMENT SCIENTIFIC-PRODUCTION ORGANIZATIONS AT CONDITIONS DIGITAL TRANSFORMATION

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ABSTRACT

The purpose of the study is to develop an organizational and economic mechanism for managing the intellectual capital of NGOs in the interests of innovation in the process of transition to activities based on digital technologies and definition necessary conditions for ensure its functioning. The object of the study is the intellectual capital of a research and production organization in the transition to digital technologies. The subject of the study is the system of economic, organizational and social relations that arise in the process of management intellectual capital in processes research and production organization in the interests of innovation. The system of management of IC NPO based on the organizational and economic mechanism is presented, which works in the interests of innovation in the process of transition to activities based on digital technologies, taking into account the necessary conditions for ensuring its functioning.

KEYWORDS: ***Digital HR tools, digital technology, personnel management***

1. INTRODUCTION

The information technology revolution, leading to the formation of a new technological order, sets the key directions for the development of the economy **:** artificial intelligence systems, global information networks, robotics, unmanned vehicles, e-commerce, big data processing technologies, high-tech products. The main challenge of our time for Uzbekistan is the formation and preservation global competitiveness in conditions of the "fourth industrial revolution."

The purpose of research and production organizations (NGOs) is research and development, their development in production, as well as commercial activities related to the implementation of the results of intellectual work. Since the hallmark of NGOs is the use of high technologies, the main sources of competitiveness are intangible factors of production (intellectual capital) and digitalization of activities (reduction of the cycle of creation and resource intensity of a new product).

Since 2011, Uzbekistan has been declining its position in the international ranking digital technologies.

As the practice of digitalization of specific enterprises has shown, with the introduction of information technologies, the expected accelerated growth in economic indicators is not observed everywhere. This is partly explained by the S-shaped dependence of economic indicators of organizations from investments in digital technologies, which has three stages of technology development: origin, leap, maturity. Reducing the duration of the stages of the S-curve of economic growth indicators organizations from investment in digital technology can to be achieved per check level existing intellectual capital and the degree of its involvement in the NGO processes.

However, despite a significant number of domestic and foreign scientific papers devoted to various aspects of the digitalization of the economy, the innovative development of knowledge-intensive enterprises, the role of intellectual capital in their effectiveness, there are practically no developments of a complex nature that allow finding theoretical justifications and giving practical recommendations of management tools that allow, with taking into account the specifics, effectively solve the problem of the development and implementation of digital technologies in research and production organization

2. MATERIALS AND METHOD

The theoretical and methodological basis of the dissertation research are the works of domestic and foreign scientists and practitioners, studying peculiarities activities research and production associations; issues of evaluation and management of intellectual property capital organizations, management changes in the process of introducing information and communication technologies; issues of formation and evaluation organizational culture, as well as materials and recommendations of scientific and practical conferences and seminars on this topic.

The instrumental and methodological apparatus of this study is based on the basic methods of general scientific knowledge, empirical and theoretical: theoretical analysis, economic and statistical analysis, generalization, abstraction, modeling, system analysis and synthesis, peer review, surveys, observations.

The scientific novelty of the research is the development of theoretical and methodological provisions for managing the intellectual capital of scientific and production associations in the process of transition to digital technologies, which contributes to the growth of the competitiveness of the association's products as a whole, the creation of organizational and economic conditions for the implementation of projects in the field of digitalization, timely adjustment of the management strategy in order to offsetting risks and reducing the cost of intellectual capital of NGOs in the process of introducing digital technologies.

Tasks research: Analyze and systematize theoretical ideas about the essence and structure of intellectual capital, its new qualities in the digital economy; Develop theoretical foundations for building an organizational and economic mechanism for managing intellectual capital in the activities of NGOs, taking into account the peculiarities of the transition to digital technologies; Reveal peculiarities implementation digital technologies in NGO, With taking into account the specifics of NGOs and the tasks of the national project "Digital Economy", determine the requirements for the structural and content characteristics of intellectual capital; Identify and analyze external and internal organizational factors for the development of the intellectual capital of NGOs in the process of introducing digital technologies, including: change management tools that reduce the risks of personnel resistance when introducing digital technologies; corporate culture as the basis for the development of intellectual capital; Develop the structure and assessment of the intellectual capital of NGOs, taking into account the specifics of the organization and the period of intensive transition to digital technologies.

3. RESULTS AND DISCUSSION

The intensified struggle for competitive advantage during the transition to a digital economy aroused interest in the study of intangible factors of production (intellectual capital) of representatives of various sciences.

On the basis of an interdisciplinary approach, a comprehensive definition of IC is proposed as *a structured* set of elements of intangible factors of production that is constantly implemented in the system of market relations, bringing income participants these relations in in accordance with the changing requirements of the market environment. The author's approach is interdisciplinary, emphasizes relevance IR in socio -economic (social-labor) relations of a certain (market) type, i.e., presupposes the existence of certain conditions for its existence; includes the idea of the dependence of the content of intellectual capital on the evolution of the socio-economic environment, emphasizes the importance of the income of all participants in relations for the implementation of IC.

A sign of the formation of the digital economy as a new stage of development is not in itself the central role of knowledge in economic development, but the prevalence of the key role of knowledge for the formation of new knowledge and technologies.

The distinctive characteristics of the digital economy as a business environment compared to the knowledge economy as a business environment are presented in Table 1.

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Table 1 - Distinctive characteristics of the digital economy as a modern stage of economic development, compiled by the author

Characteristics	Economy knowledge	Digital economy
Key source competitive advantages of the economic system	Ability creates innovations	Ability to generate synergy on the base knowledge and information
driving strength savings - logical development	Entrepreneur	State
Basis for growth labor productivity	Knowledge	Information processing technologies, communication technologies, knowledge generation technologies _ _ HR technologies that contribute to the realization of creative potential personnel in benefit organizations.
Main approaches to growth capital	Investment in intel - lectual potential	Investments in intellectual capital
Main technologies used	Technologies for the production of goods, rendering services	Communication and information technologies
Content of the concept "economy"	The substantive content of the concept, "Folk economy"	The formal content of the concept of "economic space", market or transactional system

The digital economy changes the environment for the formation of new qualities of IC: intra-network relations and interconnections between the company and the company's employees; connections inside commands (confidence, cohesion, loyalty, networking); external network relations; the relationship of the company with stakeholders (trust, mutual understanding, loyalty).

The intellectual capital of NGOs includes several groups of components:

Human capital (knowledge, abilities, skills inherent in the staff);

1. managerial capital, including three subgroups: social capital, organizational capital, consumer capital;
2. Bases knowledge organizations, accumulated and formalized in the course of previous activities;
3. Profile and related network knowledge bases available and accessible in the world's information networks;
4. Computer support of the organization (CAD - computer-aided design systems Compass, SolidWorks , Inventor , OrCAD , etc.; CAE (computer aided engineering) - engineering analysis programs designed to solve engineering problems (calculation, analysis and simulation of physical processes); CAM (computer aided manufacturing) - automated production preparation systems designed to prepare control programs for CNC machines ; MRP (manufacturing requirement planning) - systems planning needs in materials and t. item B the present time for NGOs especially in demand turn out digital technologies (DT) capable of uniting local nodes into a product life cycle information support system. For example, a single information environment on the platform of the PLM system (Product Lifecycle management).
5. Intellectual capital of partners, partially or fully available to the personnel of the organization and allowing involvement in joint developments.

Successful implementation of PLM-technology assumes the following results:

– creation general informational space NGOs;
– information support for development and production projects with the help of IETR - organizational and technical systems designed for automated preparation of accompanying documentation for complex technical products in electronic form;
– control developing design documentation;
– formation of a common digital basis for a product based on a database of various CAD systems (Compass, SolidWorks, Inventor, OrCAD);
– formation of general reference information for NGOs with the integration of the NSI database into the interface used by CAD;
– promotion speed search information;
– reducing risks in working with information (obtaining false information, obsolete versions documents, losses important production data).

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With the introduction of DT, communications cover an increasing number of employees within the internal computer network. They should unite people who perform a system of common tasks and are interdependent, in terms of results, in mainstream requiring these digital technologies. Intellectual capital acquires another structural component - social capital, independent from other structural components on the source of formation, but to a large extent affecting the other components in its expression (Table 2).

Table 2. Changes in the intellectual capital of NGOs in the process of digitalization, compiled by the author

Digital Technology Groups	Elements intellectual capital			
	Human capital	Organizational capital	consumer capital	social capital
Data processing technologies, automation office and also decision support	Competences in the field of this DH; diligence	Technologies of use of IT on workers places new job descriptions for staff. Regulation on staff training how DH users with subsequent examination tests. Regulations about control and performance evaluation	transparent a communication system that forms relationships with the staff as an internal client of the IT service	Personal responsibility of personnel using the data DH, in front of the team
Expert systems technologies	Improving communication competencies, incl. in the area inside and external network interaction	Development of technologies for the selection of personnel with a need in learning. Development of technologies for changing corporate culture. Development system of trainings of communicative competence of the network interactions	Additional training personnel as an internal client in the field of district heating, as well as continuous perfection in professional activity _	Building trust, readiness to exchange information
Information systems technologies Noah product life cycle support _ _	Developing the Ability to Network	Development technologies for motivating innovative behavior. Development of technologies for the formation of internal client orientation _ _	Adaptation of the software product with the creation of a friendly interface, those. understanding of staff internal client services IT	Formation of teamwork and team responsibility, loyalty and involvement

AT eventually decomposition IR NGOs looks next way (picture 2), what will be used when choosing and adapting the IC assessment method.

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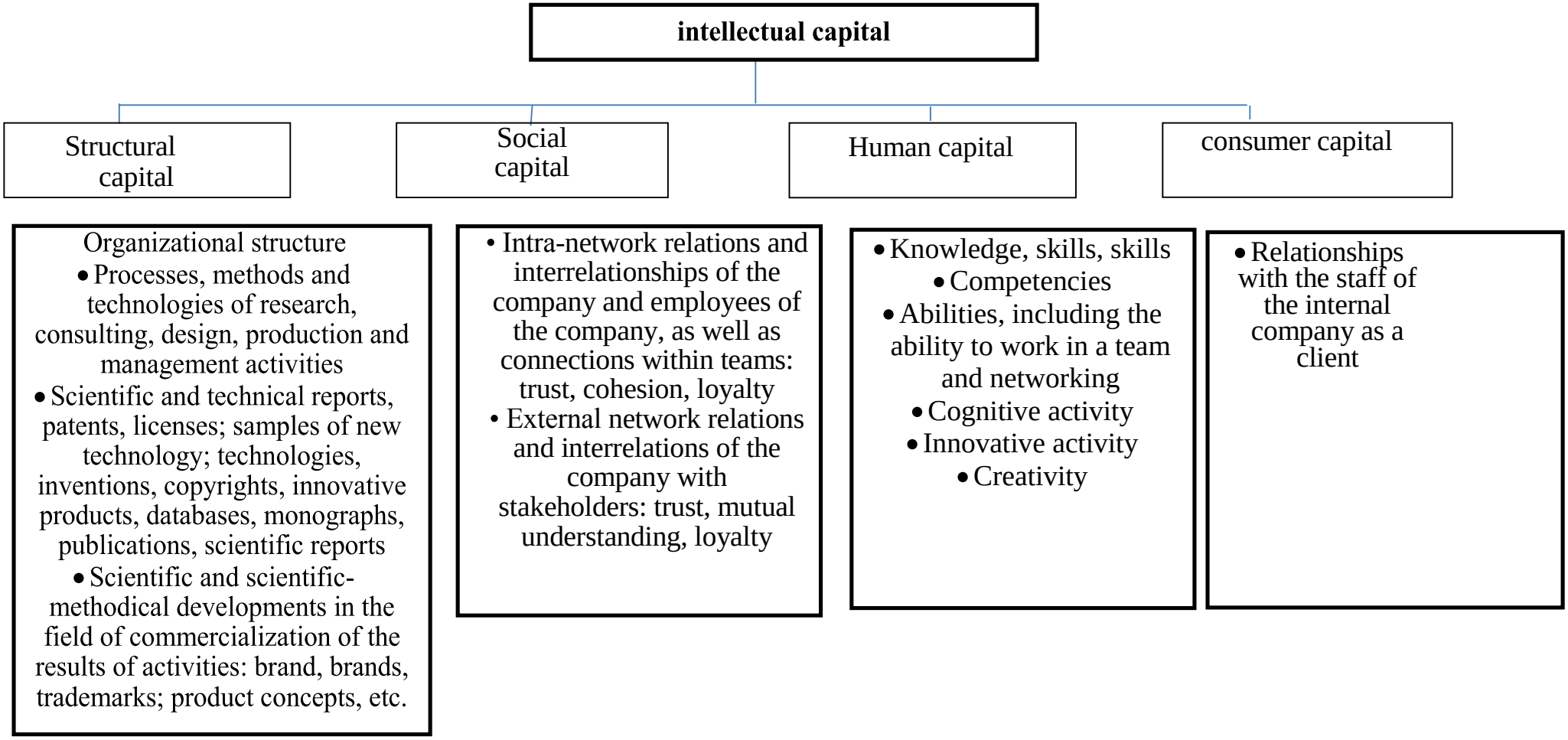

Picture 2. - Decomposition elements intellectual capital NGO, drawn up author

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Under the organizational and economic mechanism for managing the intellectual capital of NGOs in the process of transition to activities based on digital technologies, we will understand a set of approaches, methods, tools suitable for influencing an object (IC) to achieve the set goals. goals and solutions tasks in framework certain systems values and socio-economic situation (Table 3).

Table 3. - The Main Mechanism for Managing Intellectual Capital, Compiled by the Author

Basic mechanism management intellectual capital			
Organizational capital	**Human capital**	**Social capital**	**Consumer capital**
Approaches Theory intellectual capital (economically sound investments in all types of intellectual capital)			
Structural-functional and design approaches	Understanding of personnel as a resource, capital of NGOs	Trust Economy Approach _	The approach is based on measuring indicators characterizing the available and potential clients in terms of usefulness for NGOs
Methods (how ways achievements goals)			
Through the development of management technologies and regulatory documentation	Through the formation of conditions for innovative behavior of personnel: methods of analysis workers places and reasonable selection of personnel, adaptation and socialization, motivation and evaluation of personnel; personnel training and development; settlement conflicts, outplacement	Through formation trust, loyalty, involvement, teamwork, network communicative competence, group and individual responsibility, networking	Through Research and statistical methods: customer surveys, analysis of sales statistics, observation of customer behavior
Tools			
Feedback system in the network management structure	Elements of labor quality life: socio - psychological climate of the team, fair payment labor, recognition of the administration as leaders, favorable terms labor	Internal and external social networks adapted for business communications	Discounts, bonuses, product quality, product design, assortment, gifts, price, product customization, service, advertising, customer events, direct marketing, staff friendliness, complaint management

The organizational and economic mechanism for managing intellectual capital functions in the process of solving problems that contributes to the achievement of the goal: the task of ensuring the introduction of means for developing the intellectual capital of NGOs in the process of digitalization, building up and involving intellectual capital in the processes of NGOs.

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Under the management system of the IC of the NGO, we mean a system in which the functions of achieving goals are implemented at each stage for each structural element of the IC. The overall efficiency of the intellectual capital management system can be assessed as the sum of three components: the cost of savings from reducing losses at the initial stage of digitalization; the indicator of return on investment in accumulated intellectual capital (ROI) and the indicator of the cost of intellectual capital realized in the external or internal environment. The resulting value should be correlated with the cost of maintaining the intellectual capital management system.

4. CONCLUSION

The results of the study correspond to the goals and objectives set, have scientific novelty, theoretical and practical significance. The analysis is carried out and theoretical ideas about the essence and structure of intellectual capital, its new qualities in the digital economy are systematized. On the basis of an interdisciplinary approach, a comprehensive definition of IC is proposed as a structured set of elements of intangible factors of production that is constantly implemented in the system of market relations and brings income to the participants in these relations in accordance with the changing requirements of the market environment. The characteristics of the digital economy that distinguish it from the knowledge economy and create conditions for the formation of new elements of the IC are revealed: the content of the concept of "driving force of economic development"; a key source of competitive advantages of the economic system; the basis for the growth of labor productivity; main approaches to capital growth; the main technologies used. The choice of the method of direct measurement with scoring for the purposes set in this paper is substantiated. A practical example of using the method of direct measurement of IC is given on the example of a specific NGO, taking into account the elements and indicators of intellectual capital characteristic of the period of digitalization.

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