

KNOWLEDGE DIFFUSION IN NETWORK STRUCTURES IN THE CONTEXT OF DIGITALIZATION OF THE ECONOMY

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The relevance of studying network structures, and particularly clusters, remains relevant in the context of both theoretical research and applied socioeconomic development. This study aims to assess the impact of digitalization on knowledge diffusion processes within cluster entities. The methodology is based on an analysis of questionnaires from cluster participants, a study of existing knowledge diffusion models, and an assessment of the relevant regulatory framework. The study identified the main diffusion channels, barriers to effective knowledge dissemination, and the impact of the digital transformation of the economy and current legislative regulation.

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Network collaboration between organizations is a special form of integration based on certain types of integrative ties. It is the process of establishing long-term, sustainable formal and informal relationships between business entities united by vertical and horizontal ties based on voluntariness, trust, and shared goals, norms, traditions, rules, and customs [1]. Researchers emphasize that networked forms of interaction have a number of competitive advantages over other forms of cooperation. This is due to the emergence of a synergistic effect in the networked interaction of organizations.

A network structure is a form of soft integration of business entities based on the formation of long-term and sustainable organizational, economic, production-cooperative, informational, and other forms of cooperation, partnership, and enterprise relationships, primarily informal, which play a significant role in the organization of a business structure [2].

A modern and widely used type of network structure is a cluster. A cluster is a management concept that enhances the competitiveness of a particular region, industry, cluster member, or the state as a whole, and achieves certain advantages [3, p. 28]: access to specialized production factors, given the presence of competitive

suppliers and related industries in the region; accumulation of specialized information (knowledge) through monitoring the activities of other cluster members, enabling a timely response to consumer needs; and mutual complementarity across activities, which improves efficiency and quality.

Within the emerging theory of innovation and interaction within network structures, one of the key concepts is the diffusion of innovations (knowledge) [4].

The primary research tool was a 22-question questionnaire for managers of organizations within Belarusian cluster structures. It was used to assess the impact of digitalization on knowledge diffusion. The sample included five entities within the Novopolotsk petrochemical cluster, with a total of over 150 employees.

The analysis revealed the following:

A key factor in successful operation is the effective dissemination and exchange of knowledge within the company and among partners.

The main channels for knowledge diffusion include internal seminars and master classes, a corporate university, an internal portal with a knowledge base, team projects and group work, regular discussions and presentations, and regular training.

Challenges to effective knowledge dissemination include a lack of time to participate in knowledge sharing, insufficient employee motivation, and a weak communication culture in some departments.

The digital transformation of the economy improves information accessibility, increases the speed of knowledge sharing, and develops new technologies for training and development. However, this comes with the risk of losing confidential information and information overload. Priorities and resource allocation for knowledge dissemination include staff training and development, funding for training and development programs, and the creation and maintenance of a knowledge-sharing infrastructure.

Strategies for facilitating knowledge dissemination include developing a mentoring and coaching system, implementing new technologies to improve communication and training, and expanding collaboration with other companies and institutions to share experience and knowledge.

To study the impact of digitalization on knowledge diffusion, a review of knowledge diffusion models in network structures was conducted. The results can be interpreted as follows.

1. Knowledge distribution: After the diffusion process is complete, it is possible to analyze how knowledge has been distributed within the network, revealing which nodes have become knowledge hubs and which remain less informed.

2. Diffusion efficiency: It is possible to assess how successfully knowledge has diffused within the network, which includes analyzing how quickly knowledge has

spread throughout the network and how accessible it has become to a larger number of nodes.

3. Influence of knowledge sources: There are certain nodes in the network that act as knowledge sources (e.g., nodes 1 and 2). It is then possible to assess how their knowledge influences other nodes and how far it spreads within the network.

4. Changes in network structure: In this case, knowledge diffusion affects the structure of the network, which can lead, for example, to the formation of new connections between nodes or a change in their centrality.

The presence of such specific drivers of the speed of knowledge diffusion in the context of digitalization has been identified as:

- 1) digital advantages (reduced transaction costs, time savings, remote service);
- 2) digital trialability (free use for consumers, trial period, freemium model);
- 3) digital transparency (real-time transaction monitoring).

The provisions of the Belarusian legal framework governing digitalization, knowledge, and innovation were also analyzed and assessed. The results of this analysis revealed a number of significant issues. The key issue is that certain legislative and regulatory acts are outdated and do not address ongoing technological and social transformations. Another significant problem is the lack of a comprehensive and integrated strategy aimed at developing knowledge diffusion processes within network structures.

To improve the regulatory framework and develop knowledge diffusion in network structures in the context of the digitalization of the economy, the following measures are recommended.

1. Updating and revising existing laws and regulations to reflect contemporary technological and social changes.

2. Developing and adopting a unified strategy for knowledge diffusion development that takes into account the needs and interests of all network participants.

3. Facilitating the creation and development of networks, including ensuring access to information and knowledge.

4. Supporting and stimulating research and innovation in the field of knowledge diffusion.

Thus, the development of knowledge diffusion in network structures requires efforts from the direct participants of cluster structures with the rational use of digitalization tools, as well as the improvement of the regulatory framework and the adoption of appropriate measures to support and stimulate this process.

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ДИФфуЗИЯ ЗНАНИЙ В СЕТЕВЫХ СТРУКТУРАХ В УСЛОВИЯХ ЦИФРОВИЗАЦИИ ЭКОНОМИКИ

Актуальность исследования сетевых структур, и в особенности кластеров, сохраняется в контексте как теоретических изысканий, так и прикладных задач социально-экономического развития. Настоящее исследование направлено на оценку воздействия цифровизации на процессы диффузии знаний в рамках кластерных образований. Методология основана на анализе анкетных данных субъектов кластеров, изучении существующих моделей диффузии знаний и оценке релевантной нормативно-правовой базы. По итогам работы были идентифицированы основные каналы диффузии, проблемы, препятствующие эффективному распространению знаний, а также определено влияние цифровой трансформации экономики и текущего законодательного регулирования.