



STATE REGULATION OF THE MANAGEMENT OF KNOWLEDGE AND INFORMATION SYSTEMS IN THE DIGITAL ECONOMY

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ABSTRACT

We analysed the directions for state regulation of technologies of the digital economy in the selected countries and a supranational union (EU). The goal of this work was to reveal the features of state regulation of the management of knowledge and information systems in the digital economy in the selected countries.

The presented approaches to the regulation of the considered problem sphere are being formed, which is connected with discussions regarding the need for an increase or decrease in state interference in the companies' activities in the sphere of information and communication technologies (ICT). The government's understanding of the necessity and productiveness of mass transition to digital technologies in various sectors of the economy and infrastructure, as well as spheres of human life activities, leads to the need to create an environment that is acceptable for the growth of the country's innovative capital through the development of business and R&D sector. The considered characteristics of the formation of the regulatory framework in the EU showed that national legal regimes must have competencies for further creation of an attractive climate for the development of entrepreneurship and the scientific and technical sector in the context of implementing new solutions in the sphere of the management of knowledge and information systems.

The scientific novelty of this research consists in the identification of models for regulating the creation, implementation, and use of the technologies of knowledge and information systems management in the conditions of digitalization.



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1. INTRODUCTION

The emergence of new digital tools became a precondition for the formation of innovative approaches in knowledge and information systems management, which can create sustainable products (services),

implement business goals, and facilitate human development and nature protection. Achievement of such strategic and global goals is possible only in the case of participation of all subjects of the digital economy. This includes civil society, which must substantiate the need to support the sustainable

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development of business and science that can initiate new directions for R&D, and government that can regulate this sphere. The appearance of new approaches in the sphere of knowledge and information systems management in the digital economy requires the protection of the rights and interests of owners of new digital products (services) and support for the rights and interests of consumers. In certain cases, there emerges the necessity of the creation of a regulatory framework for the protection of rights and interests of the government, namely in the sphere of creation of requirements for taxation of economic activities in the digital economy and revenues from the results of R&D commercialisation. Also, certain countries set regulatory frameworks for the access of certain persons to the selected digital resources and products. Besides, the dissemination of digital trade platforms led to the need for implementing the regulation of the list of products for which promotion and sales have certain limitations or are forbidden. Such spheres as education and science and digital business underwent serious transformations during and after the COVID-19 pandemic, when mass transition to the digital form took place. Given the multi-aspect nature of the considered problem and its diversity in various countries and at the supranational level, this research is rather relevant.

The goal of this paper was to determine the features of state regulation of the management of knowledge and information systems in the digital economy in the selected countries. This involved the characterisation of the directions for regulation in this sphere and the identification of the types of regulation used by these countries.

2. EXPERIMENTAL SECTION

This research is based on the use of a range of methods and provisions of materials with the analysis of the regulation of the considered problem in the selected countries. We used the formalised method of assessment and analysis of information to study the state regulation of the management of knowledge and information systems in the digital economy in the selected countries. The comparative analysis allowed comparing the level of regulation of this sphere and assessing the regulation in the context of the sectors of the economy and life activities. The method of conceptual analysis enabled us to establish the character and type of state regulation. Event analysis allowed us to evaluate the implementation of various aspects of state regulation in the considered sphere with the help of the complex assessment of events connected with this process.

Let us consider the main provisions of the literature on the topic of state regulation of the management of knowledge and information systems in the conditions of digitalization.

Funta and Buttler (2023) disclosed the features of regulation of the digital economy in the EU and the USA. The authors described the specifics of this sphere, which must be taken into account for the effective creation of a favourable environment for the interaction of countries that use digital knowledge and information systems.

Aravantinos (2021) presented an analysis of the law of the EU in the sphere of regulation of competition of the digital economy market players and considered the mutual influence of the regulatory policy and the markets of products (or services) that are promoted and sold with the use of the technologies of the management of knowledge and information systems. The author showed that the regulatory system in this sphere, which is likely to be transformed, impacts the economic activities of the leading companies in the sphere of ICT around the world. This is due to their global penetration into markets of all regions, including the EU. The author emphasised the fact that the improvement of digital technologies in the management of knowledge and information systems stimulates the growth of companies presented in the market and influences the satisfaction of consumers' needs. However, in certain cases, this creates negative preconditions for national players, which have fewer advantages compared to global players. An important aspect is also the state's profit for the effective growth of global leading companies in this sphere.

Reier Forradellas and Garay Gallastegui (2021) dwelt on the features and problems of the legal regulation of implementing digitalization in knowledge and information systems management of companies in the conditions of digitalization in Spain. The authors studied the characteristics of regulation of protection of Internet users' data in the EU and Spain, in particular, with special attention to the need for improvement of the legal support for dissemination of AI tools, which are necessary for modelling the improvement of production processes.

Tareck (2023) substantiated the need for stimulation of the IT sector through the development and implementation of adequate stimuli for the development of market participants and proved the direct effect of these measures on the growth of GDP, an increase in human development and dealing with unemployment.

Vinay Kumar et al. (2024) considered the pros and cons of the methods of assessing the vulnerability of network information systems of car management to external cyberattacks. The authors demonstrated the need for using the most precise methods, including the proprietary approach MCFO-DANN to ensure a proactive type of security, which can assess, reveal, and prevent threats to various categories in real-time. Karbekova et al. (2019) identified and substantiated the key directions for the digital modernisation of the agro-industrial complex of the regions of the Russian

Federation. The authors stated that each direction for digitalization in this sector mutually supplements each other, which leads to the need for their complex implementation.

Thus, we see that there are a lot of theoretical and empirical materials on the considered topic, but disclosure of the character of regulation of the given sphere will allow expanding the scientific framework.

3. RESULTS

We analysed the approaches of various countries and supranational structures to ensure state regulation of the issues of the management of knowledge and information systems. Attention should be paid to the EU's approaches to the regulation.

The first considered aspect of regulation is the sphere of competition. Funta and Buttler (2023) noted that the EU saw the necessity for legal support of this sphere after large Internet leaders of the global market of the digital economy had accelerated corporate deals (mergers with small and medium companies in the IT market). This measure was necessary for the protection of rights for the national innovative capital (R&D in the sphere of management of knowledge and information systems) and the prohibition of monopolisation of the domestic market of the EU member states. Over the recent decades, such Internet giants as Microsoft, Facebook (Meta), Apple, Amazon, and Alphabet performed more than 400 corporate mergers, which are worth more than USD 130 billion. These corporate mergers included European start-ups, which produced promising digital solutions in the management of knowledge and information systems. Accordingly, due to the lack of regulation of the legal sphere, large corporations were able to increase intellectual capital, while the EU did not hinder its movement. Because of these threats, the EU started using the provisions of Article 102 of the Treaty on the Functioning of the European Union (TFEU) in court proceedings on misconduct in the market. This article established the necessity for reaction and prohibition of possible misconduct in the EU market from several monopolists, for this may negatively influence the trade between the EU member states and affect competition. In 2017, the European Commission took the first and most important decision on the use of the dominating position of Google in the market of information search systems. It was ruled that Google had been violating the norms of the anti-monopoly law in the sphere of functioning in the market of information search systems since 2008 in most EU member states and since 2011 in the Czech Republic (Google's share in the market was above 90 %). The fine of USD 2.42 billion was imposed (Ec.europa.eu, 2017). The main arguments in the context of ensuring the created market positions were as follows:

- When the user selects a product (service) of a certain company, Google provides the prices of similar

companies in the search box. The European Commission ruled that this approach provides competitive advantages compared to rival companies. In this case, it could be a conspiracy with companies whose products were presented in the Google search box or an independent decision of Google, aimed at attraction of a larger number of users;

- It was revealed that using targeting, Google constantly offered products (services) of partner companies, by tracking the interests and needs of consumers on the Internet.

Despite the imposition of fines, Google's model of behaviour in the market of digital search systems hasn't undergone serious changes. This might be caused by high competitive advantages, which are obvious to consumers, and Google's ability to pay fines work as before. Though this decision by the European Commission was made in 2017, Google is still the leader in the studied market. It uses its capabilities in knowledge management (targeted advertising, aimed at specific consumers) and information systems management (interaction between Google and the information systems of partner companies).

According to the provisions of the European law on competition (Aravantinos, 2021; Ec.europa.eu, 2017; Funta and Buttler, 2023), at the current stage, regulation of the competition issues in the EU member states (including in the sphere of the management of knowledge and information systems in the digital economy) is maintained by the norms of Articles 101-109 TFEU. This includes the following: Article 101 TFEU regulates the issues of control over anti-competitive actions (including conspiracies) by market participants; Article 102 TFEU determines legal aspects of preventing abuses of dominant positions in the markets and legal characteristics of the fact of companies' domination in the market environment; Article 102 TFEU also established the legal regime of control over mergers and acquisitions of companies in the EU markets; Article 104 TFEU regulates the issues of governments' interference through provision of support for companies for acquiring competitive advantages in the EU markets.

The second considered direction for the regulation is the protection of the data of digital platform users (social networks, trading platforms, e-government services, etc.).

The issues of user data protection in the EU are regulated by the following:

- Directive 2000/31/EC, which establishes the legal basis for the organisation of online commerce (Eurlex.europa.eu, 2024a). According to this document, the protection of user data within online commerce services is regulated by two directives of the EC, namely Directive 97/66/EC of the European Parliament and the Council dated 15.12.1997; and Directive 95/46/EC of

the European Parliament and of the Council dated 24.10.1995;

- General Data Protection Regulation (GDPR) dated 27.04.2016, which determines legal aspects of the process of protection, processing, and transfer of personal data of citizens (Eur-lex.europa.eu, 2024b).

According to (Forradellas and Gallastegui, 2021), this regulatory framework adopts the general rules of implementation of this process and sets the necessity for bringing national legislation in accordance with the law of the EU. The main priority of this document is that norms of national laws on data protection should not be barriers to the dissemination of the digital economy and the use of technologies for the management of knowledge and information systems in the functioning of various sectors of industry and life activities.

In Spain, the law in this sphere undergoes reformation, for barrier-free regulation of the key directions for the digital economy. The main regulatory acts here are as follows:

1) Digital Spain Plan 2025, which determines the main frameworks for implementing digitalization at the local, regional, and national levels (BrightCorp, 2024). This document is the government's initiative for an increase in the level of each citizen's literacy; achievement of gender equality within specialities connected with the use of the management of knowledge and information systems; growth of initiatives in the improvement of digital literacy in the sphere of science and education, including among students, teachers, and other personnel; increase in digital readiness and level of knowledge for able-bodied population, which will allow companies ensuring a decent level of digitalization, which stimulates an increase in the quality of processes and growth of value-added. The process of digitalization of the main sectors cannot be the final goal of its implementation, it should be formed based on the strategies of development. According to Karbekova et al. (2019), digitalisation of the agro-industrial complex must become a tool for achieving strategic goals and tasks that are adopted at the programme level of the region or country;

2) Plan for the digitalization of public administrations, which determines time parameters of implementing digitalization at various levels;

3) Law 7/2020 for the digital transformation of the financial system, aimed at the creation of regulatory norms to ensure accessible financing of R&D in the digital economy. This initiative will allow supporting the research sector of business; and protecting the financial sector from non-return of credit or investment funds in R&D. This law also ensures the implementation of the supranational law of the EC in the national legislation of Spain (Osborne Clarke, 2021; Garrigues, 2023);

4) Law No. 39/2015 dated 01.10.2015, which regulates the general administrative procedure of public governance (Global-regulation, 2024) and law No.

40/2015 dated 01.10.2015, which sets the structure and list of competencies of institutes that ensure regulation of intellectual property (WIPO, 2024). Adoption of these laws allowed creating an institutional framework of regulation of the government's participation in the main functions in the management of intellectual capital in the conditions of the digital economy (legal regime, competencies on the protection of rights and interests of subjects in this sphere, legal aspects of commercialisation of R&D);

- Organic Law 3/2018 dated 05.12.2018, which presents norms and rules of adaptation of the national law of Spain on the legal regime of personal data protection regulation in the conditions of digitalization to the regulation presented at the supranational level of the EU. Part V of this law distinguished the circle of persons that bear legal responsibility for the processing of personal data of users of digital information systems. After changes, Part V established personalised legal responsibility of the representatives of companies who ensure the management of personal data processing and use technologies in the market of digital knowledge and information systems. This part contains the legal mechanism of data processing for such persons, which includes a preliminary assessment of the range of personal data to be analysed for the achievement of certain tasks of companies; and the adoption of security measures for processing of user data. Also, there should be a company employee with legal responsibility for the protection of user data.

In the USA, the growth of problems connected with the violation of confidentiality on the Internet and the use of information that was received without permission led to multiple lawsuits, which were hard to satisfy due to the absence of adequate legal regulation.

In 2024, there was develop a draft law on the provision and guarantee of confidentiality protection on the Internet. Despite the objective needs of global IT corporations to obtain personal data for the development and introduction of new solutions in the sphere of knowledge and information systems management, priority was given to the rights and interests of citizens. The needs for the collection and processing of digital personal data are connected with the development of marketing programmes for the promotion of products (services) and the wide range of R&D, including R&D in the sphere of AI tools. These are various digital apps and software, the effective development of which requires analysis of big databases on the behaviour of consumers of different categories. For example, Vinay Kumar et al. (2024) note the importance of the creation of reliable information networks for the management of electronic equipment of cars that ensure protection from cyber-attacks. This process involves the collection and analysis of drivers' data, for the information will allow the manufacturer to take into account certain features of information systems' reactions. There is also a need for using big databases for such tools of the digital

economy as machine learning and process modelling. To create products (services) that are based on these tools it is necessary to analyse market demand and priorities of certain categories of consumers.

The main provisions of this law, which was still in discussion as of mid-May 2024, are as follows (Fung, 2024; Frost Brown Todd LLP, 2024):

- Provision of the unified standard of protection of digital personal data of U.S. citizens. Analysts think that this will make this law stricter compared to the laws at the level of individual states;
- Possibility for Internet users to refuse targeted advertising imposed by advertising companies through a collection of personal data. Even in the case of the provision of certain target interests to IT companies, users will be able to change or delete their profiles from databases. There is also a possibility to transfer personal data, collected by IT companies, to other online platforms or copy them for personal use. The procedure of refusal from the use of personal data is expected to be clear, transparent, and simple;
- Companies and organisations will be able to collect data for the purposes of their business. The list and limitations of data collection in the digital space are also strictly regulated by this draft law;
- Internet users' access to the information of IT companies on possible provision of their data to foreign residents. In this case, to prevent this in social networks, a law banning TikTok was passed;
- Providing citizens with the ability to file lawsuits against companies for the violation of their digital rights.

4. Discussion

In the course of the conducted research on the regulatory framework, we determined the models of regulation of the management of knowledge and information systems in the digital economy in the selected countries and the EU.

The considered experience of legal regulation of the issues of competition in the EU member states at the supranational level showed that a restrictive policy as to participants of the market of products (services), the production and promotion of which are based on knowledge and information systems management, is used. As shown above, the leading companies in the global IT market meet measures that restrict their use of advantages that are based on technological domination. These restrictions are necessary, but they do not fully take into account the interests of users. Users prefer the offers of digital giants, due to the convenience and advantages provided by the latter. At the level of the EU, citizens' interests are not fully considered. Despite the mentioned restrictive policy, the programme and legal documents of the EU do not contain provisions for the creation of a favourable entrepreneurial climate for the formation and development of companies from this

sphere. This could be subsidies in the sphere of taxation, reduced rental rates, and support in the sphere of commercialisation of R&D on innovative solutions in knowledge and information systems management in the conditions of the digital economy. Fines paid by leaders in the global market could be one of the financial sources for the creation of a favourable climate for EU companies.

The model of state regulation of the legal aspects of protection of ICT users' data, which is utilised in Spain, changed over recent decades. Before 2018, the model of restrictions, adopted in the EU, was used. According to this model, preventing the violation of the protection of citizens' data was the responsibility of companies and organisations that processed them. After the reforms of legislation in this sphere, the new model ensured active individualised responsibility for the mentioned violations by parties that had authorities in this sphere. This government policy shows progress in the sphere of regulatory support compared to the national approach in the EU.

In view of the formation of a formalised model of state regulation of protection of digital rights for the confidentiality of personal information of citizens in the USA, which is based on the social component, the new approach will allow creating comprehensive protection of the personal data of citizens. The adoption of the above-mentioned draft law will influence the prospects of economic functioning and innovative growth of IT companies that develop digital solutions in the sphere of the management of knowledge and information systems in the USA. The possibility of using personal data for R&D will be limited.

Certain restrictive approaches to the economic and innovative activities of the leading companies do not affect their market position but only create problems for functioning, which might influence users. Imposition of large fines for monopolization in the market of digital information search systems and social networks may lead to the companies' introducing payment for certain functions of resources, which, in turn, will negatively impact the user. We see that the policy of restrictions regarding violations in the digital competitive policy, adopted in the EU, does not allow creating attractive entrepreneurial climate for national companies. This fact is predetermined by not only the absence of stimuli for growth, which must be present but also by the insufficient potential for growth and the choice of strategy. Since users of modern technologies of the management of knowledge and information systems are well-acquainted with the offers of the leading companies, transition to less innovative products of national rival companies does not seem possible. Consumers will be striving towards obtaining the best innovative product. Given this, to create large companies in this sector, there is a need for a complex approach and attraction of all interested parties, namely

the government, representatives of IT companies, and talented personnel. The government has to provide a transparent and predictable approach, which can stimulate the business environment and R&D sector (Tareck, 2023). The considered countries and supranational structures (the European Union) demonstrate efforts for the formation of the optimal approach, though quick changes in technologies do not always allow the law to conform to the market's expectations.

5. CONCLUSION

We revealed the characteristics of state regulation in the sphere of the management of knowledge and information systems. The features of this process at various levels showed differences in its formation and reformation given the quick development of the digital economy. Approaches at the national and supranational levels are behind the needs of IT companies in the context of R&D and further introduction of innovative products (services) in the markets. Insufficiently attractive conditions of formation (tax policy, office rent, hiring qualified personnel, etc.) do not allow many national companies to achieve success that is

demonstrated by the leading companies in the global market of the digital economy.

Despite the existence of certain difficulties in the creation of conditions for barrier-free development, most countries create conditions aimed at solving the issues of implementation of new technologies in most of the sectors of the economy and support for human development. The EU member states have framework norms for the formation of the digital economy, and they might acquire new features, like in Spain. The forms may have rapid or inactive character which does not involve the government's participation in the innovative development. The USA is undergoing a period of changes in state regulation of the digital economy, connected with an increase in measures for the protection of Internet users' rights. This reform will not have a positive effect on the rapid growth of technologies but will be able to raise the level of responsibility of IT market participants. Further scientific research in this sphere could deal with modelling the development of the digital economy under the influence of the features of state regulation and initiatives of the business sector.

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