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# MODERN DILEMMAS OF THE DIGITAL GAMING INDUSTRY DEVELOPMENT AS A SECTOR OF THE DIGITAL ECONOMY IN UKRAINE

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СУЧАСНІ ДИЛЕМИ РОЗВИТКУ ЦИФРОВОЇ ІГРОВОЇ ІНДУСТРІЇ ЯК СФЕРИ ЦИФРОВОЇ ЕКОНОМІКИ В УКРАЇНІ

***The digital gaming industry is a platform for economic activity involving various entities that generate income through highly profitable areas of operation. On the one hand, the development of the digital gaming industry as a sector of the digital economy presents a range of advantages for Ukraine. On the other hand, it is limited by certain challenging aspects that, without a comprehensive solution, would hinder the ability of the domestic digital gaming industry to independently produce digital games and gaming technologies for the mass consumer. According to the above, the purpose of the article is to investigate the current dilemmas in the development of the digital gaming industry as a sector of the digital economy in Ukraine. The research identifies the main challenging issues faced by the digital gaming industry in Ukraine. Among the dilemmatic issues need to highlight the underdeveloped domestic infrastructure and resources. To minimize this dilemma, the presence of modern infrastructure is crucial for both the endemic game production industry and the endemic esports sector. Among the dilemmatic issues, the need to highlight insufficient government support for the digital gaming industry generates situations and problems that restrict and complicate the development of gaming companies and esports. To dilemma minimize, an important role is attributed to government support, such as financial initiatives, creating favorable conditions for businesses, and establishing specialized educational programs. Among the dilemmatic issues need to highlight the insufficient human resources potential in the digital gaming industry. To dilemma minimize, crucial***

*to develop and have highly skilled specialists from various fields, such as programming, design, art, and marketing. Among the dilemmatic issues need to highlight the financial risks for projects in the digital gaming industry. To dilemma minimize, crucial to attract investments from leading technology companies worldwide. Among the dilemmatic issues, important to highlight that competition in the global market. To dilemma minimize, crucial to attract investments from leading technology companies worldwide. Among the dilemmatic issues, monetization of game content and ethics stand out. To dilemma minimize, need to balance the commercial interests of gaming companies and esports with consumer and gamer rights protection.*

**Цифрова ігрова індустрія є площиною для економічної активності різноманітних суб'єктів економічної діяльності, які формують дохід за високорентабельними сферами діяльності. З одного боку, розвиток цифрової ігрової індустрії як сфери цифрової економіки формує для України низку переваг. З іншого боку, він обмежується деякими дилемними моментами, які без комплексного вирішення не дозволяють вітчизняній цифровій ігровій індустрії самостійно виробляти цифрові ігри та ігрові технології для масового споживача. Відповідно до вищенаведеного, метою статті є дослідження сучасних дилем розвитку цифрової ігрової індустрії як сфери цифрової економіки в Україні. За результатами дослідження виділені основні дилемні питання цифрової ігрової індустрії в Україні. Серед дилемних питань слід виокремити нерозвинену вітчизняну інфраструктуру та ресурси, для мінімізації яких важлива наявність сучасної інфраструктури для ендемічної сфери виробництва ігор та ендемічної сфери кіберспорту. Серед дилемних питань слід виокремити недостатню підтримку цифрової ігрової індустрії від держави. Для мінімізації цієї дилеми важлива роль відводиться державній підтримці, такій як фінансові ініціативи, створення сприятливих умов для бізнесу та створення спеціалізованих освітніх програм. Серед дилемних питань слід виокремити недостатній кадровий потенціал цифрової ігрової індустрії. Для мінімізації дилеми важлива наявність висококваліфікованих спеціалістів з різних областей. Серед дилемних питань слід виокремити фінансові ризики для проектів в сфері цифрової ігрової індустрії. Для мінімізації дилеми важливе залучення інвестицій від провідних технологічних компаній світу. Серед дилемних питань слід виокремити конкуренцію на світовому ринку. Для мінімізації цієї дилеми розробники відеоігор та кіберспортивні клуби мають бути здатними конкурувати з великими міжнародними компаніями. Серед дилемних питань монетизація ігрового контенту та етика. Для мінімізації цієї дилеми важливим є збалансування між комерційними інтересами ігрових та кіберспортивних компаній, захистом прав споживачів та геймерів та розширенням каналів доходів від етичного продажу ігор, враховуючи сучасні моделі монетизації.**

*Key words: endemic sector; esports; esports arenas; specialized gaming zones; training facilities; monetization models; digital economy; game companies.*

*Ключові слова: ендемічна сфера; кіберспорт; кіберспортивні арени; спеціалізовані ігрові зони, тренувальні бази; монетизаційні моделі; цифрова економіка; ігрові компанії.*

## TARGET SETTING

The triggers for the development of the digital gaming industry in Ukraine are the increasing popularity of video games, as it facilitates the creation, development, production, and commercialization of video games collectively constitute a new sphere of Ukraine's digital economy. The digital gaming industry serves as economic activity platform for various entities engaged in economic activities, generating income through high-profit sectors such as game design, programming, graphic design, sound design, or marketing and sales of games for different target markets (including esports). On one hand, the development of the digital gaming industry as a sector of the digital economy brings several advantages for Ukraine. Among the innovation stimulation in the software industry, computer graphics, artificial intelligence, and virtual reality are particularly notable.

Additionally, it is worth emphasizing that video game developers create innovative technologies and solutions that can find applications in other industries such as education, medicine, architecture, and many others.

However, on the other hand, the growth of the digital gaming industry in Ukraine is hindered by certain challenging issues that, without comprehensive solutions, prevent the domestic digital gaming industry from independently producing digital games and gaming technologies for the mass market.

## ANALYSIS OF RESEARCH AND PUBLICATIONS

Questions related to the development of the digital gaming industry as a sector of the digital economy in Ukraine have been addressed by numerous researchers, including Chayka Y.V. [5], Gobyk V.V. [2], Lazneva I.O. [3],

**Table 1. Analysis of dilemma issues in the development of the digital gaming industry as a sector of the digital economy in Ukraine**

Subjects of the digital gaming industry	The main dilemmas currently constraining the development of digital gaming industry entities (- the presence of dilemmatic questions; + the absence of dilemmatic questions)					
	Infrastructure and resources	Insufficient government support	Insufficient human resource capacity.	Insufficient human resource capacity.	Competition in the global market	Monetization of game content and ethics
Endemic sphere of game production						
Best Way	+	-	+	+	-	+
Action Forms	+	+	-	+	+	-
4A Games	+	+	+	-	+	+
N-Game Studios	-	+	+	+	+	+
Endemic sphere of esports						
Natus Vincere	+	-	-	+	+	+
HellRaisers	-	+	+	+	+	-
Team Spirit	+	-	+	+	+	+
Gambit Esports	+	+	+	+	+	-

Source: formed based on data from economic entities.

Skavronska I.V., and Mandziy A.R. [4]. These mentioned researchers focus primarily on the specifics and fundamental trends in the development of the digital gaming industry. Furthermore, most of the mentioned works emphasize that such development is accompanied by a significant number of challenges that require identification and systematic study.

**THE WORDING OF THE PURPOSES OF ARTICLE (PROBLEM)**

Based on the information provided, the purpose of the article is to investigate the current challenges in the development of the digital gaming industry as a sector of the digital economy in Ukraine.

**THE PAPER'S MAIN BODY WITH FULL REASONING OF ACADEMIC RESULTS**

The Ukrainian gaming industry is primarily the development of an endemic sphere with game production [1].

Many gaming companies are operating in the domestic gaming industry, and the list is constantly expanding (among the most well-known are Best Way, Action Forms, 4A Games, and N-Game Studios).

Additionally, the endemic sphere of esports is actively developing in Ukraine, with professional esports clubs forming teams of talented players in various esports disciplines (including Natus Vincere, HellRaisers, Team Spirit, and Gambit Esports).

The analysis of the experience of these digital gaming industry entities allows us to outline the main challenges currently limiting their development (Table 1), including:

- infrastructure and resources;
- insufficient government support;
- insufficient human resource capacity;
- financial risks; competition in the global market;
- monetization of game content and ethics.

The dilemma questions category is identified as situations or problems in which the choice between two or more alternatives is difficult (since each alternative has its advantages and disadvantages) or limited (due to a

small number of options to choose from) [1]. In such situations, it is challenging to decide because there is no clear or definitive answer to the question.

According to the data presented above, dilemma questions in the context of the digital gaming industry in Ukraine can include various situations or problems outlined by us in Figure 1. Let's examine each of the outlined situations in more detail.

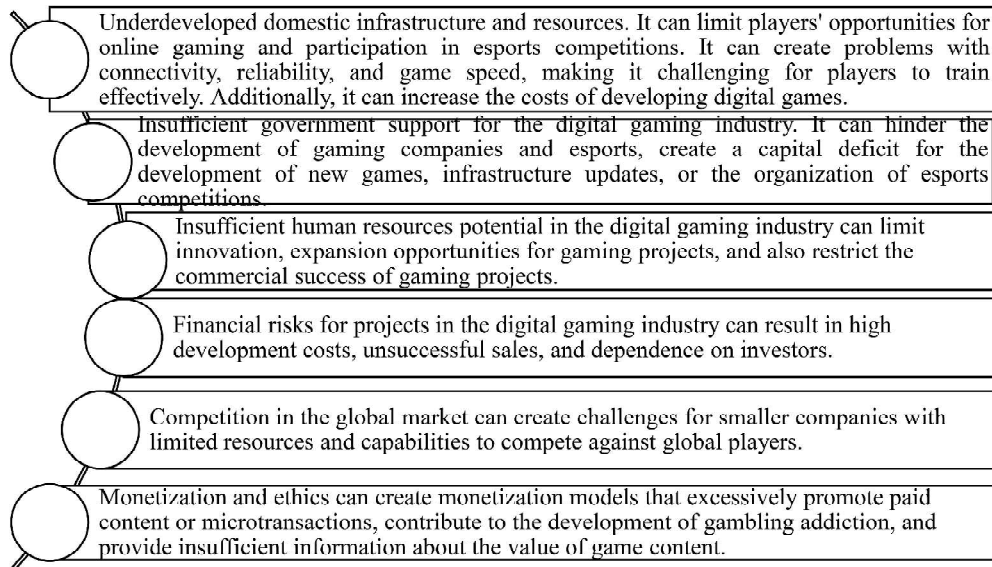
The situation where underdeveloped domestic infrastructure and resources can limit players' opportunities for online gaming and participation in esports competitions, create connectivity issues, reliability and game speed problems, complicate player training, and increase the costs of digital game development. Indeed, the development of the gaming industry requires the presence of modern infrastructure [2—3]:

1. For the endemic sphere of the gaming industry, such as high-speed internet, powerful computer systems, and robust data centers, the modular principle is applied. Currently, there is only one modular data center (DeNovo Data Center) operating in Ukraine with two separate data processing centers. Additionally, the country faces issues with high-speed internet coverage due to the high cost of renting electrical poles and excessive bureaucratic hurdles.

2. For the endemic sphere of esports, such as modern gaming esports arenas, specialized gaming zones, and training bases, Ukraine currently lacks specialized gaming arenas and training facilities for esports teams. Additionally, there is only one esports arena in operation, capable of accommodating approximately 3000 people (Kyiv CyberSport Arena, which has hosted tournaments for Starcraft II, Starladder, Intel Extreme Masters, and others).

The outlined challenges in the development of infrastructure currently pose a barrier to the effective and full-fledged functioning of the domestic digital gaming industry.

The situation related to insufficient support from the government for the digital gaming industry can complicate the development of gaming companies and esports, and create a capital deficit for the development of new games,



**Fig. 1. Specification of the content of dilemma questions in the context of the digital gaming industry in Ukraine**

Source: formed based on Table 1 and [2—3; 5].

infrastructure upgrades, or the organization of esports competitions. State support plays a crucial role in stimulating the development of the gaming industry, including financial initiatives, creating favorable conditions for businesses, and establishing specialized educational programs. However, currently, the concept of creating attractive conditions for the IT business in Ukraine ("Diia City") is still in the development stage [6]. Within this concept, there are plans to introduce protection against pressure, practices of using elements of English law, tax reduction, and simplification of tax payment, as well as the ability to choose the model of employment relationships [6]. Currently, only the order of the President of Ukraine "On measures to create favorable conditions for the development of the IT industry" No. 371/2020 has been signed, initiating the development of draft laws aimed at stimulating economic activities in the field of information technology [6]. Indeed, at the moment, the support from the government is insufficient complicates the development of the domestic digital gaming industry.

The situation is also associated with the insufficient talent pool in the digital gaming industry, which can limit innovation, expansion opportunities for gaming projects, and commercial success. Developing high-quality video games requires the presence of highly skilled professionals from various fields, such as programming, design, art, and marketing. Currently, there is a shortage of qualified professionals, which is a limitation for the rapid development of the industry. In 2020, Ukraine opened its doors to highly skilled foreign specialists in the IT industry (in particular, on March 11, 2020, the Cabinet of Ministers established a quota of five thousand for the immigration of foreign experts for employment in Ukrainian IT companies [6]).

Indeed, the domestic endemic game development and esports sectors have the opportunity to attract the most experienced and competent professionals for permanent employment. However, due to the ongoing large-scale aggression by Russia against Ukraine, the outlined

initiative has not had a significant impact on the personnel potential of the digital gaming industry. However, there are prospects for expanding the personnel potential in the digital gaming industry, provided that:

1. Promotion of e-residency procedures (allowing foreign professionals to conduct activities remotely in Ukraine [6]). The first steps in this direction have already been taken, as the government has approved a resolution "On experimenting on the introduction and implementation of e-residency" (June 2020) grants foreign professionals the right to: obtain a qualified electronic signature; a registration number of the taxpayer identification card obtain; access administrative services in Ukraine; open an online account with a Ukrainian bank [2];

2. Development of the relocation initiative for Belarusian IT specialists (this issue was first addressed with the onset of the political crisis in Belarus). In particular, the Ministry of Digital Transformation, together with IT associations, the Ministry of Economy, and the Ministry of Foreign Affairs, have already developed a set of measures for temporary relocation for workers in the Belarusian IT sector (including the establishment of a legal framework to facilitate migration and efforts to address border crossing issues [2]). Considering Belarus' hybrid status (undetermined position in the Russian-Ukrainian conflict), relocation for Belarusian IT specialists is possible [6].

The economic landscape presents significant financial risks for projects in the digital gaming industry, which can result in substantial costs for project development, poor sales, and dependence on investors. Consequently, the development and promotion of video games can be both costly and risky. Not all projects may become profitable, and there is a risk of financial losses for developers and publishers. The lack of access to sufficient financial resources can hinder the development of the gaming industry. Considering this, there are significant prospects for reducing financial risks by attracting investments from leading global technology companies. Before the start of

**Table 2. Sphere of manifestation of dilemmatic issues of monetization and business ethics in the domestic digital gaming industry**

Situation or issue	Specificity of dilemmatic issues	Characteristics of problem manifestation or situation
Impact on gameplay	If monetization models excessively favor paid content or microtransactions, it can distort gameplay and disrupt the game's balance. Players may feel compelled to spend money to achieve success, which affects their satisfaction with the game.	For example, the use of the "Pay-to-Win" model by game developers or tournament operators <sup>1</sup>
Gaming addiction	Uncontrolled implementation of monetization models that encourage players to spend excessive time and money can contribute to the development of gaming addiction. It is a serious problem that can harm the health and well-being of players.	For example, the integration of loot boxes in games or esports <sup>2</sup>
Lack of transparency	If monetization practices are not fair and transparent, players may encounter insufficient information about the cost of in-game content, spending options, and other important details. It can lead to mistrust and dissatisfaction among players.	For example, in-game items may have high prices or players may be forced to spend a significant amount of money to achieve certain goals

Note:

<sup>1</sup> This model allows players to gain advantages in the game by purchasing paid content or microtransactions that give them a significant edge over non-paying players.

<sup>2</sup> Loot boxes are randomized containers that can be purchased with real money. They contain in-game items that the player acquires randomly.

Source: formed based on [3; 4].

Russia's large-scale aggression against Ukraine, the Ministry of Digital Transformation signed memorandums with Microsoft (2020) (this document confirmed intentions to invest over \$500 million in automating the workstations of government officials and increasing productivity in the social sphere through the Azure Expansion Program) [6] and with the international technology holding company TECHIIA (2020) (this document confirmed intentions to invest in the construction of an eco-techno park, with a data center as its foundation capable of up to 500 MW, built on a modular principle [6]).

The situation of entering a competitive environment in the global market can pose challenges for smaller companies with limited resources and capabilities to compete with global players. This is because the gaming industry is a highly competitive sector in the digital economy. As a result, domestic video game developers and businesses related to the esports ecosystem are forced to compete with large international companies. 95% of domestic businesses operating in the digital gaming industry are small and medium-sized enterprises (SMEs) with limited resources, making it challenging for them to compete in the global market. Therefore, such businesses need assistance establishing their presence on the international stage through projects similar to the initiative launched by the NGO "Internet Initiatives" (the Ukrainian Bridge project helps Ukrainian IT companies make a name for themselves in Silicon Valley [6]). In addition, collaboration projects in the digital gaming industry are necessary, which will help small and medium-

sized businesses jointly create original content and find niche markets to stand out among competitors and more.

The monetization situation and ethics of game content result in monetization models that excessively promote paid content or microtransactions, contribute to the development of gambling addiction and provide insufficient information about the value of game content.

The manifestation of dilemmas in the monetization and business ethics of the domestic digital gaming industry is presented in Table 2.

Therefore, one of the key issues is finding a balance between the commercial interests of gaming companies and esports and protecting the rights of consumers and gamers. Additionally, it is necessary to expand revenue channels through ethical game sales as per modern monetization models. Initiating the development and popularization of paid add-ons, microtransactions, or advertisements while ensuring fairness and ethical gameplay standards would be important. This means that:

1. Monetization models should not create an advantage for players who spend more money than others. Players should have equal opportunities to succeed in the game regardless of their financial status.

2. Monetization models should contribute to ensuring fairness and ethical gameplay standards. Game developers should avoid practices that create the appearance of gaming addiction or manipulate players' psychological states to induce spending. It may include limiting the volume of microtransactions, clearly displaying prices for in-game items, and implementing time restrictions on gaming activities.

## CONCLUSIONS FROM THIS STUDY AND PROSPECTS FOR FURTHER EXPLORATION IN THIS AREA

Based on the research conducted, the following conclusions can be drawn:

1. Among the dilemmatic issues need to highlight the underdeveloped domestic infrastructure and resources that generate situations and problems limiting the opportunities for players to engage in online gaming and participate in esports competitions. These issues create connectivity, reliability, and game speed problems, complicate player training, and increase the costs of game development. To minimize this dilemma, the presence of modern infrastructure is crucial for both the endemic game production industry and the endemic esports sector.

2. Among the dilemmatic issues, the need to highlight insufficient government support for the digital gaming industry generates situations and problems that restrict and complicate the development of gaming companies and esports. It leads to a capital deficit for new games and issues development with infrastructure updates or the organization of esports competitions. To dilemma minimize, an important role is attributed to government support, such as financial initiatives, creating favorable conditions for businesses, and establishing specialized educational programs.

3. Among the dilemmatic issues need to highlight the insufficient human resources potential in the digital gaming industry that generates situations and problems that limit innovation and expansion opportunities for gaming

projects and minimize the commercial success of game projects. To dilemma minimize, crucial to develop and have highly skilled specialists from various fields, such as programming, design, art, and marketing.

4. Among the dilemmatic issues need to highlight the financial risks for projects in the digital gaming industry that generate situations and problems that entail high development costs, unsuccessful sales, and dependence on investors. To dilemma minimize, crucial to attract investments from leading technology companies worldwide.

5. Among the dilemmatic issues, important to highlight that competition in the global market generates situations and problems for smaller companies with limited competing resources and capabilities. To dilemma minimize, crucial to attract investments from leading technology companies worldwide.

6. Among the dilemmatic issues, monetization of game content and ethics stand out. To dilemma minimize, need to balance the commercial interests of gaming companies and esports with consumer and gamer rights protection, as well as expand revenue channels through ethical game sales, taking into account modern monetization models.

Based on the obtained results, the prospects for further research are focused on dynamic modeling of the development of the digital gaming industry as a sector of the digital economy in Ukraine.

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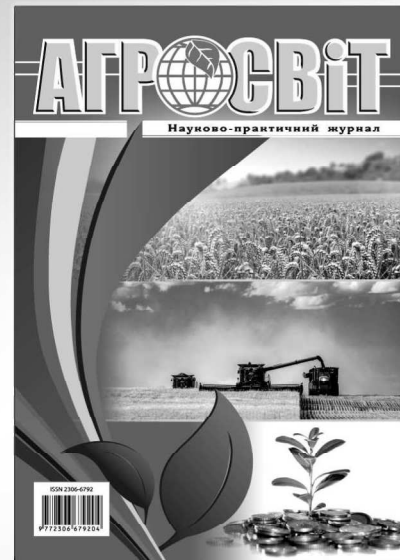
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