

UDC 339.9

Zavorodnya Elizaveta

*Postgraduate of the Department of International Management
State University of Trade and Economics*

Завгородня Єлизавета Олександрівна

*аспірантка кафедри міжнародного менеджменту
Державного торговельно-економічного університету
ORCID: 0000-0003-0549-7020*

Melnyk Tetyana

*Doctor of Economic Sciences, Professor,
Head at the Department of International Management
State University of Trade and Economics*

Мельник Тетяна Миколаївна

*доктор економічних наук, професор,
завідувач кафедри міжнародного менеджменту
Державний торговельно-економічний університет
ORCID: 0000-0002-3839-6018*

DOI: 10.25313/2520-2294-2024-9-10329

**CLASSIFICATIONS OF THE MAIN COMPONENTS
OF COMPETITION IN THE GLOBAL MARKET
OF INFORMATION AND COMMUNICATION
TECHNOLOGIES**

**КЛАСИФІКАЦІЇ ОСНОВНИХ СКЛАДОВИХ
КОНКУРЕНЦІЇ НА СВІТОВОМУ РИНКУ
ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ
ТЕХНОЛОГІЙ**

Summary. Introduction. In the global ICT market, analysing the competitive environment and organising its elements is important for making informed decisions and strategic planning.

Purpose. Accordingly, our study is aimed at expanding the theoretical concept of competition in the global ICT market.

The main research methods used include analysis, synthesis, graphical (namely, tabular), abstraction and generalisation.

Results. In particular, the article presents the authors' attempt to define the subjects, objects, items, and means of competition in the global market of information and communication technologies. In addition, we have characterised and proposed the authors' classifications of competition subjects in the ICT market, classifications of ICT companies, classifications of ICT research institutions and ICT sectors. Thus, we have classified the ICT market players by geography of influence, role in the innovation process, influence on ICT policy and development, type of interaction, type of contribution, and organisational affiliation. To classify ICT companies, we applied the following criteria: product/service portfolio, target market, revenue model, geographic coverage, size and scale, customer engagement practices, product lifecycle stage, and partnership ecosystem. In developing the classifications of research institutions, we took into account the characteristic aspects of global ICT R&D practices, such as ownership, sectoral affiliation, sources of research funding, organisational structure and types of collaboration. The classification of ICT sectors, in turn, is based on the main economic activities, geographical coverage, growth rates, investment focus, degree of innovation and market demand.

The conclusions provide a brief summary of the main ideas and indicate promising areas for further research.

Key words: ICT sector, ICT companies, competition, competition subject, information and communication technologies market, research institution.

Анотація. Вступ. На глобальному ринку ІКТ аналіз конкурентного середовища та впорядкування його елементів є важливим для прийняття обґрунтованих рішень та стратегічного планування.

Мета дослідження. Відповідно, наше дослідження спрямоване на розширення теоретичної концепції конкуренції на світовому ринку інформаційно-комунікаційних технологій.

Методи дослідження. Серед основних застосованих методів дослідження є аналіз, синтез, графічний (а саме табличний), абстрагування та узагальнення.

Результати. Зокрема, у статті наведено авторську спробу визначення суб'єктів, об'єктів, предметів та засобів конкуренції на світовому ринку інформаційно-комунікаційних технологій. Додатково, ми охарактеризували та запропонували авторські класифікації суб'єктів конкуренції на ІКТ-ринку, класифікації ІТ-компаній, класифікації науково-дослідних установ в ІКТ та ІТ-секторів. Таким чином, суб'єктів ІКТ-ринку ми класифікували за географією впливу, роллю в інноваційному процесі, впливом на політику та розвиток ІКТ, типом взаємодії, типом внеску та за організаційною приналежністю. Для класифікації ІТ-компаній ми застосували наступні критерії: портфоліо продуктів/послуг, цільовий ринок, модель доходу, географічне охоплення, розмір і масштаб, практики залучення клієнтів, стадія життєвого циклу продукту та екосистема партнерства. При формуванні класифікацій науково-дослідних установ ми врахували характерні аспекти глобальних практик із НДДКР в ІКТ, а саме форму власності, секторальну приналежність, джерела фінансування дослідницької діяльності, організаційну структуру та типи співпраці. Класифікація ІТ-секторів, в свою чергу, сформована з урахуванням основних видів економічної діяльності, географічного охоплення, темпів зростання, інвестиційного фокусу, ступеня інноваційності та ринкового попиту.

У висновках наведено короткий підсумок основних ідей та зазначено перспективні напрями подальших досліджень.

Ключові слова: ІТ-сектор, ІТ-компанії, конкуренція, суб'єкт конкуренції, ринок інформаційно-комунікаційних технологій, науково-дослідна установа.

Problem. In the global information and communication technologies (ICT) market, understanding the competitive environment, systematising and classifying its various components is a prerequisite for effective decision-making and strategic planning. In particular, the advantages of this approach include the following: (1) classifications offer a structured method of organising complex information, which allows for further in-depth analysis and research of ICT market players; (2) classifications help businesses and policy makers develop targeted strategies by understanding the roles and functions of market players to solve unique problems and use unique opportunities; (3) classification of global ICT market players allows for comparison and benchmarking of efficiency, identifying the best.

Analysis of recent studies and publications.

The study [1] presents the authors' attempt to form an agreed theoretical concept of such economic categories in the ICT sector of the national economy as competition (indicating the characteristics and strategic guidelines of competition in the global ICT market), competitive advantages (classification of competitive advantages of ICT companies depending on the nature of their formation) and competitiveness (systematisation of the features of competitiveness of the ICT sector). Despite the authors' attempt [1], the following questions still remain from a methodological point of view: "Who are the subjects of competition in the ICT?", "What is the object of competition in the ICT?", "What are the items of competition in the ICT?" and "What are the means of competition in the ICT?".

Certain features and trends of the world market of information and communication technologies are covered in scientific works [2–14] and others. However, despite the significant contribution to the understanding

of the specifics and dynamics of the global information and communication technologies market, each of these works is based on different structural components and segments of the global ICT market, which makes the scientific results of these studies complementary rather than aimed at a consistent solution to the scientific issue of competition in the global ICT market.

In addition, studies [15] and [16] are partially similar in topic and approach, in which the authors proposed their views on the classification of ICT companies. It is worth noting that in [15], the authors proposed to classify ICT companies according to two criteria: (1) organisational and technical characteristics; and (2) managerial, financial and economic characteristics. The groups of the first criterion include subclasses based on key technological areas, the nature of business organisation, the language of software development, work technologies and work methodology. The groups of the second criterion, in turn, include subclasses by the number of employees, type of business model, source of funding, form of business organisation, and market orientation. Additionally, [16, p. 119] classifies ICT companies according to the requirements for accounting: by customer (service, product, service-product), by taxation system (companies on the general system and companies on the simplified system), by types of projects (programming companies, product development companies). However, a relative drawback of scientific works [15] and [16] is the exclusive focus on business and tax practices of Ukraine without considering the international context of the information and communication technologies market.

Purposes of the article (statement of the aim).

Accordingly, the purpose of our study is to expand the

theoretical understanding of competition in the global market of information and communication technologies. To achieve this goal, we set the following tasks: (1) to clearly define the subjects, objects, items and means of competition in the global information and communication technologies market; (2) to define criteria and propose classifications of the global information and communication technologies market players, ICT companies, research institutions and ICT sectors.

Results. Competition in the global information and communications technology (ICT) market is a dynamic rivalry between companies and countries to innovate, gain market share and achieve technological progress in the development, implementation and use of ICT products/services/solutions on a global scale [1].

In the global ICT market, the **subjects of competition** are ICT professionals, technology enterprises and TNCs (e.g., equipment and technology suppliers, start-ups and entrepreneurs, investors, venture capitalists and incubators, etc.), research institutions (in cooperation with the state and companies develop, test and commercialise technological solutions), regions and states (exercising their influence through a comprehensive system of cooperation, regulation and standardisation), which compete to maximise the demand of different consumer groups by offering technological solutions for working with their unique data (a summary is provided in Table 1).

Accordingly, the **objects of competition** are the needs of different consumer groups and market segments (i.e., data suppliers and end users) for the collection, storage, structuring, systematisation, processing, analysis and transformation of unique data flows generated by consumers in the course of their lives into an informative source of knowledge for further targeted use, placement and/or distribution. The **item of competition** in the global ICT market, in turn, is specific technological solutions and offers (i.e., ICT goods and ICT services) aimed at performing specific operations with unique data flows in accordance with individual requests and needs of target users.

Means of competition in the global ICT market are the methods and strategies used by competitors to achieve their goals. Thus, ICT companies and tech MNCs achieve their strategic goals through innovation (namely, investments in R&D and IP protection), attracting and retaining competent ICT and management talents, strategic partnerships, mergers and acquisitions, global marketing and branding, implementation of UX-oriented technology solutions, operational efficiency and economies of scale, compliance, interaction with key stakeholders, etc. In view of this, we consider it appropriate to offer the author's approach to the classification of ICT companies (Table 2).

In particular, when selecting the criteria for composing classifications of ICT companies (Table 2), we adhered to the following methodological considerations to form the theoretical basis for further empirical research:

- 1) the classification **“by product/service portfolio”** should emphasise the diversity and specialisation within the ICT sector, helping to identify core competencies and market segments for ICT companies;
- 2) the classification **“by target market”** should provide information on their strategic focus and customer base, helping to understand the types of customers, their specific needs, and how ICT companies tailor their products and services to meet these needs;
- 3) the classification **“by revenue model”** should consider how ICT companies generate revenue, sustain their operations and achieve profitability;
- 4) the classification **“by geographical coverage”** should reflect the degree of their presence in the international markets of information and communication technologies;
- 5) the classification **“by size and scale”** should focus on the company's potential, market influence, availability of resources and operational complexity;
- 6) the classification **“by customer interaction models”** should reveal the nature and strategies of their interaction with target audiences;

Table 1

Classifications of subjects (professionals, companies, states, etc.) in the information and communication technologies market

Classification criterion	Subjects
by geography of influence	global stakeholders, national stakeholders, regional stakeholders, local stakeholders, community stakeholders
by role in the innovation process	financing and investment actors, R&D subjects, ICT implementation and deployment subjects, use and feedback subjects, regulatory and standardisation subjects
by impact on ICT policy and development	high impact subjects, moderate impact subjects, low impact subjects, developing impact subjects, supporting impact subjects
by type of interaction	active participants, passive participants, influencers, supporters, opponents
by contribution type	financial donors, knowledge donors, producers/suppliers of ICT goods/services/solutions, policy and regulatory subjects
by organisational affiliation	corporate, academic, governmental, non-profit and independent organisations

Source: authors' elaboration

Table 2

Classifications of companies in the information and communication technologies market

Classification criterion	Types of ICT companies
by product/service portfolio	telecommunication companies, hardware companies, software development companies, service companies (IT services, cloud services, telecommunication services, technical support and maintenance), Internet and web services providers, IT solutions providers for database operations and analytics, IT solutions providers based on IoT and AI, content and media companies, personalised services developers
by target market	consumer-oriented; enterprise-oriented; SMEs focused on other ICT companies; education-oriented; government and public sector-oriented; healthcare-oriented; industrial-oriented; financial-oriented; energy-oriented
by revenue model	companies with subscription-based revenue model; companies with freemium revenue model; companies with advertising-based revenue model; e-commerce (transaction-based) companies; companies with licensing revenue model
by geographical coverage	global, regional, national, local, niche
by size and scale	large enterprises, medium-sized enterprises, small enterprises, start-ups, unicorns (start-ups worth more than USD1 billion)
by customer interaction models	B2B (business-to-business), B2C (business-to-consumer), C2C (consumer-to-consumer), B2G (business-to-government), G2C (government-to-citizen)
by product life cycle stage	early-stage start-ups, growth companies, mature companies, declining companies, recovering companies
by partnership ecosystem	strategic alliances, channel partnerships, technology partnerships, partnerships with equipment manufacturers, academic and research cooperation, etc.

Source: authors' elaboration

- 7) the classification “*by product lifecycle stages*” should take into account the maturity and evolution of ICT companies’ product offerings;
- 8) the classification “*by partnership ecosystem*” divides ICT companies based on the nature and extent of their collaborative relationships (e.g., taking into account approaches to using external expertise, resources and market access to drive growth and innovation).

In addition, *research institutions* (as participants in the ICT competitive environment) partake in public-private partnerships by applying for competitive grants from government agencies, private foundations and industry partners to finance research projects (with the potential creation of spin-off companies or licensing and technologies transfer for further commercialisation) and conduct interdisciplinary research

projects to create targeted solutions for different fields of knowledge (e.g. biology, healthcare, ecology, etc.) (Table 3).

According to the proposed classifications of the ICT research institutions (RIs) in Table 3, we note the following:

1. The criterion “*by ownership*” classifies RIs according to whether they are managed by *government entities* (focusing on research aligned with government policies and sustainable development goals), *private organisations* (focused on developing commercially viable technologies and innovations driven by market needs and profitability) or *public-private initiatives* (resulting from partnerships between public institutions and private ICT companies that leverage the strengths of both sectors and address both societal needs and commercial opportunities).

Table 3

Classifications of research institutions (RIs) in information and communication technologies market

Classification criterion	Types of research institutions (RIs)
by form of ownership	public, private and public-private
by economic sector	academic, industrial, public
by source of funding	government-funded RIs; industry-funded RIs; foreign-funded RIs; self-funded RIs; mixed-funded RIs
by organisational structure	centralised RIs, decentralised RIs, matrix RIs, hybrid RIs
by type of cooperation	scientific and industrial cooperation, public-private partnership, international cooperation, interdisciplinary cooperation, partnerships between industry representatives, inter-university cooperation

Source: authors' elaboration

2. The criterion “*by economic sector*” emphasises the different roles and contributions of each sector to research and innovation. Accordingly, *academic sector RIs* generate new knowledge, deepen scientific understanding and often collaborate with other sectors to apply research results for solving real-world problems; *industrial sector RIs* focus on applied research and innovation; and *public sector RIs* concentrate on research that serves the public interest and is in line with national development priorities.

3. The criterion “*by funding source*” emphasises financial support that stimulates R&D activities in ICT. Accordingly, examples of *government-funded RIs* include national laboratories, state universities, state research institutes, national innovation agencies, etc.; *industry-funded RIs* embrace corporate R&D centres, industry consortia, private universities, venture capital-funded R&D firms, technology parks, ICT companies’ innovation labs, business incubators, etc; *foreign-funded RIs* are international research consortia, research programmes of the World Bank/EU/UN/ITU/OECD, etc.; *self-funded RIs* — independent research laboratories, non-profit research organisations, institutes/centres with philanthropic/crowdfunding financing, etc; *mixed-funded RIs* — research centres of public-private partnerships, laboratories for academic-industrial cooperation, start-up accelerators at universities, hybrid technology transfer offices, etc.

4. The criterion “*by organisational structure*” indicates the hierarchical structure of the RIs, which affects decision-making and resource allocation. In particular, *centralised RIs* have a concentrated management structure in which decision-making, resource allocation and research activities are controlled from a single centre, while *decentralised RIs* have research activities and decision-making distributed among several locations or departments, promoting autonomy and flexibility; *matrix RIs* use a matrix structure in which R&D staff report to several functional/project managers or departments; *hybrid RIs* combine elements of centralised, decentralised and matrix structures.

5. The criterion “*by type of cooperation*” reveals the nature of partnerships in RIs. Thus, *academic-*

industrial cooperation involves interaction between academic researchers and industrial specialists to stimulate innovation and accelerate the commercialisation of research results; *public-private partnerships* use public resources and private sector expertise to solve social problems and create new technologies; *international cooperation in ICT* brings together research institutions from different countries to share knowledge and pool resources (examples include international research consortia/innovation networks/academic exchange programmes, bilateral and multinational research centres, etc.); within the framework of *interdisciplinary cooperation*, research institutes take into account the achievements and needs of different fields of knowledge to develop targeted ICT solutions (carried out in the format of cross-functional research institutes, interdisciplinary research laboratories and consortia, etc.); *partnerships between industry representatives* are often used to jointly develop technologies, share risks and accelerate innovation processes; *inter-university cooperation* involves scientists in joint projects, exchange of experience, etc. to deepen scientific knowledge and develop new technologies (the main forms are university consortia, joint postgraduate programmes, double degree programmes, inter-university research centres, etc.).

Furthermore, *the states* are implementing government strategies and initiatives, standards and regulations aimed at creating a favourable environment for entrepreneurship and innovation, as well as investments in modernising various aspects of digitalisation to ensure efficient operations with data flows [14].

In accordance with the nature and effectiveness of the interaction of competitors in information and communication technologies and common practices in the global ICT market, we consider it appropriate to propose the author’s approach to generalisation and classification of ICT sectors (Table 4).

It should be noted that when selecting criteria for composing classifications of ICT sectors (Table 4), we set the following objectives:

1. The classification “*by economic activity*” is to provide a comprehensive view of the main activities,

Table 4

Classifications of information and communication technologies sectors

Classification criterion	Type of ICT sector
by type of economic activity	ICT manufacturing, ICT services, Internet and digital services, ICT wholesale and retail, ICT research and development, ICT support and maintenance
by geographical coverage	local, national, regional, international, global
by growth rate	high-growth ICT sectors, stable ICT sectors, emerging ICT sectors, declining ICT sectors, transformational ICT sectors
by investment focus	capital-intensive ICT sectors, labour-intensive ICT sectors, R&D-intensive ICT sectors, technology-intensive ICT sectors, service-intensive ICT sectors
by the degree of innovation	highly innovative, moderately innovative, low innovative
by market demand	high-demand ICT sectors, medium-demand ICT sectors, low-demand ICT sectors

Source: authors’ elaboration

economic contributions and specific roles of the ICT sector (i.e., focusing on the specialisation of most of the country's ICT sector entities).

In particular, **ICT manufacturing** covers the design, production, assembly and quality control of ICT products (hardware and software) that contribute to the overall supply of technology on the market; **ICT services** include a wide range of services that support the use and management of ICT systems and technologies; examples of **Internet and digital services** include online broadcasting platforms, e-commerce websites, social media, digital marketing services, online education, etc.; **ICT wholesale and retail** play a crucial role in making ICT products available to end users; **ICT research and development** aims to innovate and improve ICT products, services and processes through scientific research and technological advancement; **ICT support and maintenance** refers to services provided to ensure the efficient and effective operation of ICT systems and technologies (i.e., troubleshooting, technical assistance, user training, regular updates, repairs and upgrades, etc.).

2. The classification **“by geographical coverage”** is to give emphasis to the degree of penetration of ICT sector entities into the local, national, regional, etc. ICT market.

Accordingly, **the local/local ICT sector** serves a specific locality and consists of local businesses, start-ups and suppliers that meet the needs of the community; **the national ICT sector** includes all national ICT companies, government initiatives and educational institutions involved in the development, implementation and regulation of ICT services and products; **the regional ICT sector** spans the boundaries of a geographical area (several countries or regions) and focuses on cooperation to enhance technological potential, share resources and address common challenges in technology adoption and infrastructure development; **the international ICT sector** spans national/regional ICT sectors, providing products and services in several countries (i.e., emphasis is placed on cross-border trade, investment and cooperation in technology development, often influenced by global trends and standards); **the global ICT sector** encompasses information and communication technologies worldwide, including all actors that contribute to the global ICT ecosystem.

3. The classification **“by growth rate”** is to illustrate how different ICT sectors affect the national economy in terms of growth potential, stability and their role in innovation and technological progress.

Thus, fast-growing ICT sectors are characterised by a significant increase in demand for products and services and a frequent use of new technologies and trends, as well as the attraction of significant investments and talent (e.g. cloud computing services, cybersecurity, AI and machine learning, 5G network development); **stable ICT sectors** demonstrate resis-

tant to changes operations with steady demand and predictable revenue streams (e.g. telecommunications, enterprise software, data centre services, IT consulting); **emerging ICT sectors** are in the early stages of growth and are characterised by new technologies or business models that have not yet reached maturity (e.g. quantum computing, blockchain technology, AR/VR, Smart City, etc.); **declining ICT sectors** experience declining demand, often due to technology obsolescence, market saturation, or changing consumer preferences (e.g., fixed-line telecommunications services, DVD and Blu-ray production, etc.); **transformational ICT sectors** are distinguished by their ability to fundamentally change the way businesses operate or consumers interact with technology, often by introducing disruptive innovations that reshape industries and create new market paradigms (e.g., Internet of Things, Fintech, EdTech, Smart Manufacturing, blockchain, etc.).

4. The classification by investment focus is to show how different ICT sectors allocate their resources, whether they prioritise capital expenditure, labour costs, research and development, technology or services.

Hence, **capital-intensive ICT sectors** are those areas of ICT that require significant financial investments in physical assets, infrastructure and technology (e.g. telecommunications infrastructure, data centres, hardware manufacturing, cloud computing, 5G networks); **labour-intensive ICT sectors** rely heavily on human labour rather than capital investment, often including tasks that require skilled and experienced personnel (e.g. ICT support services, custom software development, data entry services, technical support centres); **R&D-intensive ICT sectors** are currently AI, quantum computing, biotechnology ICT, fintech innovations; **technology-intensive ICT sectors** rely on advanced technologies to create products or services efficiently and effectively (e.g. semiconductor manufacturing, advanced robotics, ICT applications in nanotechnology, medical ICT, aerospace ICT); **service-intensive ICT sectors** focus on providing services rather than producing goods (e.g. software as a service (SaaS), ICT consulting, cloud services, cybersecurity services, digital marketing, e-commerce platforms).

5. The classification **“by the degree of innovation”** is to demonstrate the level of innovation in each segment of the ICT sector, and how they contribute to technological progress, the pace of introduction of new technologies and their role in shaping industry trends.

Accordingly, **highly innovative ICT sectors** are characterised by rapid technological development and a strong focus on research and development of revolutionary products, services or processes (e.g. AI, blockchain and advanced robotics); **moderately innovative ICT sectors** demonstrate a balanced approach to innovation, gradually introducing new technologies and improving their products and services (examples

include telecommunications, cloud computing, cybersecurity, e-commerce, etc.); **low innovative ICT sectors** demonstrate minimal technological progress and rely on established practices and technologies (e.g., outdated software, traditional data centres, fax machine production, etc.).

6. The classification “**by market demand**” is to illustrate how different segments of the ICT sector are affected by consumer and business needs, the level of demand and their overall market potential.

In particular, high-demand ICT sectors enjoy significant and sustained demand for their products, services and expertise, driven by rapid technological advancements, widespread adoption across industries, and a critical role in digital transformation and innovation (examples include AI, cloud computing, and machine learning); **medium-demand ICT sectors** are well developed and have a stable presence in the global ICT market, as the demand for their products/services/solutions, etc. is driven by the constant need to maintain, optimise and gradually update information systems (e.g., network administration, IT support services, database management, etc.); **low-demand ICT sectors** typically face limited growth prospects or a decreasing need for specialists (examples include companies specialising in the maintenance of legacy systems, certain types of hardware support or niche software applications, etc.).

Conclusions. Our study is aimed at supplementing theoretical information on competition in the global information and communication technologies market, in particular, through the authors’ definition of subjects (professionals, ICT companies, states, etc.),

objects (user needs), items (goods, services, solutions, etc.) and means of competition (methods and strategies of business behaviour of subjects).

We have categorised ICT market participants based on their geographic reach, role in the innovation process, impact on the ICT policy and development, interaction types, contribution methods, and organisational affiliation. To categorise ICT companies, we have used criteria such as product/service range, target market, revenue model, geographic scope, company size, customer engagement strategies, product lifecycle stages, and partnership networks. In creating classifications for research institutions, we have considered key aspects of global ICT R&D practices, including ownership, sector affiliation, research funding sources, organisational structure, and forms of collaboration. The classification of ICT sectors is developed by considering core economic activities, geographic reach, growth rates, investment priorities, innovation levels, and market demand.

It is noteworthy that the issues of systematisation and classification of consumer groups and their needs for ICT products/services/solutions (objects of ICT competition), ICT value propositions (items of ICT competition), methods/strategies used by competitors in the global ICT market (means of ICT competition) and measures/methods of state regulation of ICT remain prospects for further research in this area. Additionally, the justification and further setting of thresholds (minimum and maximum) for each of the groups of ICT subjects (professionals, ICT companies, states, etc.) proposed by the authors can be of interest for future case studies.

Literature

1. Завгородня Є., Мельник Т. Теоретичні засади конкуренції та конкурентоспроможності ІТ-сектору. *Економіка та суспільство*. 2023. № 52. doi: <https://doi.org/10.32782/2524-0072/2023-52-30>.
2. Zhang Y., Xu J., Yang W. Analysis of the evolution characteristics of international ICT services trade based on complex network. *Telecommunications Policy*. 2023. doi: <https://doi.org/10.1016/j.telpol.2023.102697>.
3. Чернишова Л. О., Новікова Л. В. Світовий ринок інформаційно-комунікаційних технологій: тенденції та перспективи розвитку. *Підприємництво та інновації*. 2021. № 16. С. 15–19. doi: <https://doi.org/10.37320/2415-3583/16.2>.
4. Колобердянко І., Чернявська А. Стан і тенденції міжнародного ринку торгівлі ІТ-послугами. *Економіка та суспільство*. 2021. № 32. doi: <https://doi.org/10.32782/2524-0072/2021-32-63>.
5. Ковальчук І. І., Саркісян Л. Г. Визначення трендів розвитку світового ринку ІКТ під впливом цифровізації. *Вісник студентського наукового товариства ДонНУ імені Василя Стуса*. 2019. № 1(11). С. 199–204. URL: <https://jvestnik-sss.donnu.edu.ua/article/view/6709> (дата звернення: 29.08.2024).
6. Сокол К. М. Світовий ринок інформаційних технологій в контексті глобалізації світової економіки. *Глобальні та національні проблеми економіки*. 2015. № 3. С. 78–83. URL: <http://global-national.in.ua/archive/3-2015/16.pdf> (дата звернення: 29.08.2024).
7. Кривов’язюк І. В., Стрільчук Р. М. ринок інформаційно-комунікаційних технологій та місце в ньому України. *Економічний форум*. 2018. № 7(2). С. 152–157. URL: <https://e-forum.com.ua/uk/journals/tom-4-2-2017> (дата звернення: 29.08.2024).
8. Ставицька А. В. Тенденції та перспективи оптимізації розвитку світового ринку інформаційних технологій в умовах глобалізації. *Економічний простір*. 2017. № 128. С. 24–33. URL: <http://prostir.pdaba.dp.ua/archive/128/5.pdf> (дата звернення: 29.08.2024).

9. Ставицька А. В. Оцінка позиціонування країн на світовому ринку інформаційних технологій: статистичні виміри індексного аналізу. *Науковий вісник Ужгородського національного університету. Серія: Міжнародні економічні відносини та світове господарство*. 2017. Т. 12, № 1. С. 126–130. URL: http://www.visnyk-econom.uzhnu.uz.ua/archive/12_2_2017ua/28.pdf (дата звернення: 29.08.2024).
10. Новікова А. П., Скоробогатова Н. Є. Аналіз розвитку світового та українського ринку ІТ-послуг. *Інвестиції: практика та досвід*. 2018. № 3. С. 52–56. URL: http://www.investplan.com.ua/pdf/3_2018/12.pdf (дата звернення: 29.08.2024).
11. Македон В. В., Ільченко Н. О. Кон'юнктура світового ринку іт-послуг в умовах економіки 4.0. *Ефективна економіка*. 2021. № 1. URL: <https://doi.org/10.32702/2307-2105-2021.1.8> (дата звернення: 29.08.2024).
12. Корецька В. О., Корецький О. В., Шлянчак С. О. Інформаційні технології як сучасна індустрія в світовій економіці. *Телекомунікаційні та інформаційні технології*. 2022. Т. 75, № 2. doi: <https://doi.org/10.31673/2412-4338.2022.021321>.
13. Ніколаєнко А. К. Аналіз інструментарію національного ІТ-ринку в умовах глобальних викликів. *Економічний простір*. 2023. № 188. С. 50–54. doi: <https://doi.org/10.32782/2224-6282/188-8>.
14. Zavorodnya E., Melnyk T. Factors affecting international competitiveness of ICT sector of the national economy. *International scientific journal "Internauka". Series: "Economic Sciences"*. 2024. № 8. doi: <https://doi.org/10.25313/2520-2294-2024-8-10179>.
15. Кораблінова І. А., Кульбацька Н. М. Актуальні проблеми дослідження ІТ-ринку України. *Ефективна економіка*. 2017. № 12. URL: <http://www.economy.nayka.com.ua/?op=1&z=5997> (дата звернення: 29.08.2024).
16. Лаговська О. А., Лоскоріх Г. Л. Класифікація ІТ-підприємств: обліковий аспект. Проблеми системного підходу в економіці. 2019. № 1(69). С. 115–119. doi: <https://doi.org/10.32782/2520-2200/2019-1-40>.

References

1. Zavorodnya, E. & Melnyk, T. (2023). Theoretical concept of competition and competitiveness in IT sector. *Economy and Society*, (52). doi: 10.32782/2524-0072/2023-52-30.
2. Zhang, Y., Xu, J. & Yang, W. (2023). Analysis of the evolution characteristics of international ICT services trade based on complex network. *Telecommunications Policy*, (48(3)). doi: 10.1016/j.telpol.2023.102697.
3. Chernyshova, L. & Novikova, L. (2021). World market of information and communication technologies: trends and development prospects. *Entrepreneurship and innovation*, (16), 15–19. doi: 10.37320/2415-3583/16.2.
4. Koloberdianko, I., & Cherniavska, A. (2021). State and trends of the international market on IT trade in services. *Economy and Society*, (32). doi: 10.32782/2524-0072/2021-32-63.
5. Kovalchuk, I. I. & Sarkisian, L. H. (2019). Determination of the trends of development of the global ICT market under the influence of digitalization. *Bulletin of Student Scientific Society*, 1(11), 199–204. Retrieved from <https://jvestnik-sss.donnu.edu.ua/article/view/6709>.
6. Sokol, K. M. (2015). The World Market of Information Technology in the Context of Globalization of the World Economy. *Global and National Problems of Economy*, (3), 78–83. Retrieved from <http://global-national.in.ua/archive/3-2015/16.pdf>.
7. Kryvovyazyuk, I. & Strilchuk, R. (2018). Market of information and communication technologies and place of Ukraine in it. *Economic Forum*, 7(2), 152–157. Retrieved from <https://e-forum.com.ua/uk/journals/tom-4-2-2017>.
8. Stavytska, A. (2017). Trends and prospects of optimization of the world information technology market development in globalization conditions. *Economic scope*, (128), 24–33. Retrieved from <http://prostir.pdaba.dp.ua/archive/128/5.pdf>.
9. Stavytska, A. V. (2017). Evaluation of countries positioning in the world information technology market: statistical measures of index analysis. *Uzhorod National University Herald. Series: International Economic Relations and World Economy*, 12(1), 126–130. Retrieved from http://www.visnyk-econom.uzhnu.uz.ua/archive/12_2_2017ua/28.pdf.
10. Novikova, A. & Skorobogatova, N. (2018). Analysis of the world and Ukrainian IT services market development. *Investytsiyi: praktyka ta dosvid*, (3), 52–56. Retrieved from http://www.investplan.com.ua/pdf/3_2018/12.pdf.
11. Makedon, V. & Ilchenko, N. (2021). World market of IT services in the languages of economy 4.0. *Efektivna ekonomika*, (1). doi: 10.32702/2307-2105-2021.1.8.
12. Koretska, V. O., Koretsky, O. V. & Shlyanchak S. O. (2022). Information technologies as a modern industry in the world economy. *Telecommunication and Information Technologies*, 75(2). doi: 10.31673/2412-4338.2022.021321.
13. Nikolaienko, A. (2023). Analysis of the national IT market tools in the context of global challenges. *Economic scope*. doi: 10.32782/2224-6282/188-8.
14. Zavorodnya, E. & Melnyk, T. (2024). Factors affecting international competitiveness of ICT sector of the national economy. *International scientific journal "Internauka". Series: "Economic Sciences"*. doi: 10.25313/2520-2294-2024-8-10179.
15. Korablinova, I. A. & Kulbatska, N. M. (2017). Actual problems of research of IT-market of Ukraine. *Efektivna ekonomika*, (12). Retrieved from <http://www.economy.nayka.com.ua/?op=1&z=5997>.
16. Lahovska, O. & Loskorikh, G. (2019). Classification of IT enterprises: accounting aspect. *Problems of systemic approach in the economy*, (1(69)). doi: 10.32782/2520-2200/2019-1-40.