



**Theoretical and conceptual principles for enhancing the taxonomy of IT  
business models in the context of Ukraine's  
digital transformation**

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**Abstract.** The article examines the formation and classification of the IT business sector in Ukraine, providing a comprehensive analysis of key trends, challenges, and development prospects. Reviewing relevant literature, statistical data, and market reports, the study outlines the IT business landscape in Ukraine and proposes an updated classification of IT companies.

The practical significance of the research is underscored by its relevance to academic researchers, IT professionals, and policymakers. The findings contribute to strategic decision-making within the IT business sector, offering insights into IT infrastructure enhancement and providing industry investment recommendations.



The proposed classification system can improve the understanding of market dynamics and support the development of legislation and business strategies that foster the growth of Ukraine's IT sector.

The scientific novelty lies in introducing a new definition of the term "IT business" within the Ukrainian context, along with a detailed classification of IT companies. The article distinguishes between service-based and product-based IT businesses, categorising them into outsourcing, outstaffing, consulting, and product companies, including startups, scale-ups, and large corporations.

The authors analyse various IT company classifications, segmenting them based on operational models, product and service offerings, and market orientation. IT enterprises are typically divided into software developers, IT service providers, and product-based companies.

A new classification based on IT service models, such as SaaS (Software as a Service), PaaS (Platform as a Service), IaaS (Infrastructure as a Service), and SECaaS (Security as a Service), is presented, reflecting the evolution of the IT market. The article also addresses the role of outsourcing companies in Ukraine, constituting a significant portion of the IT landscape, dividing them into international corporations, small and medium-sized enterprises (SMEs), and startups.

**Keywords:** IT business, IT market entities, public cloud services, software as a product, hardware as a product.

## **Теоретико-концептуальні засади удосконалення класифікації форм ІТ-бізнесу крізь призму цифрової трансформації України**

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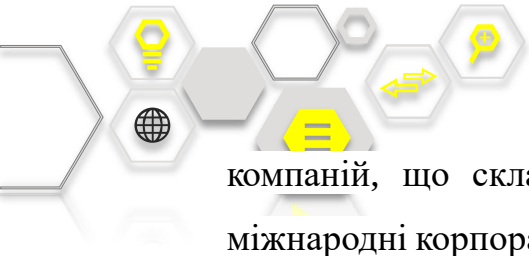
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**Анотація.** У статті проведено дослідження процесів формування та класифікації ІТ-бізнесу в Україні, здійснено комплексний аналіз ключових тенденцій, викликів та перспектив розвитку сектору. На основі аналізу літературних джерел, статистичних даних та ринкових звітів охарактеризовано сучасний ІТ-бізнес України та запропоновано оновлену класифікацію ІТ-компаній.

Практична значущість дослідження полягає у його корисності для науковців, ІТ-фахівців і політиків. Результати дослідження сприяють прийняттю стратегічних рішень для розвитку ІТ-бізнесу, покращенню ІТ-інфраструктури та наданню рекомендацій щодо інвестування в цей сектор. Запропонована класифікація може бути використана для глибшого розуміння ринкової динаміки, а також підтримки розробки законодавчих ініціатив та бізнес-стратегій, спрямованих на зростання українського ІТ-сектору.

Наукова новизна полягає у введенні нового визначення терміну «ІТ-бізнес» в українському контексті, а також у розробці детальної класифікації ІТ-компаній. Визначено розмежування між ІТ-компаніями, що орієнтовані на надання послуг, та тими, що займаються розробкою продуктів. В межах цих двох груп здійснено подальшу диференціацію на аутсорсингові, аутстафінгові, консалтингові та продуктові компанії, включно з категоріями стартапів, середніх компаній та великих корпорацій.

Запропоновано нову класифікацію ІТ-компаній за моделями надання послуг, зокрема SaaS (програмне забезпечення як послуга), PaaS (платформа як послуга), IaaS (інфраструктура як послуга) і SECaaS (безпека як послуга), що відображає еволюцію ринку ІТ. Окремо розглянуто роль аутсорсингових



компаній, що складають значну частку ІТ-ринку України, із поділом на міжнародні корпорації, малі та середні підприємства (SMEs), а також стартапи.

**Ключові слова:** ІТ-бізнес, суб'єкти ІТ-ринку, публічні хмарні сервіси, програмне забезпечення як продукт, апаратне забезпечення.

**Introduction.** An analysis of the IT sector in Ukraine indicates a significant drop compared to the pre-war years. However, the IT sector in 2024 remains one of the main parts of the state economy, accounting for about 5% of Ukraine's GDP as of February 2024. At the same time, there is a significant problem with a clear definition and classification of IT business. The lack of a unified approach to selecting different types of IT companies creates difficulties for analysts and regulatory authorities, which complicates the management of the industry, the development of state support programs, and the forecasting of its further development.

The problem is that the IT business in Ukraine is represented by many forms and spheres of activity, from software development and consulting services to outsourcing and startups. The characteristics and criteria by which these types of activities can be identified and systematised have not been sufficiently studied, making it difficult to understand the industry's structure at the national and international levels.

In the conditions of global competition and the transition to a digital economy, it is necessary to develop conceptual approaches to the definition and classification of IT business in Ukraine, which will not only improve the strategic management of this industry but also contribute to the attraction of foreign investments, the development of innovations and the creation of new jobs.

**Analysis of recent research and publications.** An active growth of interest in IT business research in Ukraine and internationally has characterised recent years. In the context of the Ukrainian market, the IT sector significantly impacts the country's economy, export growth, job creation and foreign investment attraction. However, research related to the definition and classification of IT business in



Ukraine could be more extensive, which makes it easier to systematise knowledge about the industry.

One of the works in this direction is the study of the IT services market conducted by A. V. Golydbin and N. V. Yazvinska in the work "IT services market features and specifics of promotion on it" [1]. In this work, the authors considered IT service production and implementation specifics. They also researched the marketing toolkit of communications to promote IT services on the market successfully.

At the same time, in the article "Features of the organisation of IT companies and basis of accounting in Ukraine" [2], scientists A. N. Mamontova and M. O. Tataryn studied the basics of the organisation of IT companies and the accounting process in modern conditions. In the research process, two business models were separated – product and service, and a generalisation was made regarding the distribution of IT companies according to the characteristics of economic activity.

In the work of T. V. S'omkina, O. V. Lytvynova and O. O. Loban "Features of the Ukrainian IT companies' business models" [3], the main business models that formed the basis of the activities of the Top 50 developers and vendors of software of a standardised type and estimated in Ukraine to meet the needs of such products in both domestic and foreign markets.

Some academic publications focus on conceptual analysis of the IT business, but they mainly consider the sector in the context of the digital economy. For example, the publications of the National Bank of Ukraine consider the economic contribution of the IT industry to the national GDP, focusing on the growth of IT services exports, but need to provide a precise distribution of companies by their types of activity.

The results of the literature analysis indicate the insufficiency of structured studies that could offer a comprehensive classification of IT business in Ukraine. Most of the available material is fragmentary or needs to provide a clear systematisation, emphasising the importance of developing conceptual approaches to understand and classify the field entirely.



**Previously unsettled problem constituent.** Despite the existence of several studies devoted to IT business in Ukraine, there are still several important aspects that require further elaboration.

IT businesses in Ukraine are highly diverse, including outsourcing companies, product development, startups, and other forms of activity. However, some classification systems delineate the boundaries between different types of companies, making it difficult to systematise the industry for analytical research and government regulation.

Most of the existing IT business classifications are based on international approaches that only sometimes correspond to the local conditions and challenges of the Ukrainian market. In Ukraine, specific segments, such as outsourcing, which require adapted analysis models, have received extraordinary development.

In scientific and analytical works, there still needs to be a clear criterion by which it would be possible to segment IT companies, applying such parameters as the type of services, the level of innovation, the scale of operations and the target markets.

This research will lay the groundwork for understanding Ukraine's IT market through a detailed classification of IT businesses and an analysis of their economic impact.

**The aim of the article.** This article aims to study the specifics and features of the IT business in Ukraine and develop a systematic classification of its various types. The main goal is to carry out a conceptual analysis of existing approaches to the definition of IT business, to study the characteristics of various segments of the IT sector in Ukraine, and to propose a structured model for the classification of IT companies that considers their economic, organisational and technological activities.

**Results.** Understanding the essence of information technologies' market niche or sector (hereinafter IT) in Ukraine is an important and relevant issue for the modern market of the latest technologies. Despite difficult external conditions, the sector maintains its economic position, transforms, continues dynamic development in



Ukrainian and foreign markets, and currently occupies a leading position among exporters of services.

In recent years, before the war, a particular sector of the economy was actively developing and expanding in Ukraine, it was replenished with new players, including large-scale companies and representatives of small and medium-sized businesses [4].

In addition, the IT sector attracted Ukrainian and foreign investors, offering quality services and unique, innovative solutions [5].

The IT sector indirectly stimulates the development of other sectors of the economy, particularly in the technological sphere, the military sector, or industry, which helps modern entrepreneurs automate business processes and improve their activities [6]. At the same time, large-scale communities are created for mutual support of industry enterprises at the local and national levels [7].

Despite the challenges of today, specialised experts predict the further development of the sector and significant prospects in the reconstruction processes of Ukraine after the war. [8]. Institutes of public authority (the state) also stimulate and support Ukrainian companies specialising in IT, creating appropriate programs and providing grants to train new specialists [9].

In our opinion, the main object of economic relations in the field of information technologies of Industry 4.0 is the information market. According to the Law of Ukraine "On Scientific and Technical Information", the information market is a system of economic, organisational, and legal relations regarding selling and purchasing information resources, technologies, products, and services [10].

Based on this wholly outdated but valid definition, we consider it expedient to form our definition of the term information technology market – it is a complex dynamic system covering a wide range of products, services, and economic relations related to the development, implementation, and use of computer systems and networks for the purchase and sale of information resources, technologies, products and services used for the creation, storage, processing, transmission, and visualisation of information.



In our opinion, the leading entities of the IT market include:

1. Producers of IT products and services: companies and individuals who develop software, manufacture hardware, provide IT services, etc.
2. Consumers of IT products and services: natural persons who use IT products and services for personal needs and legal entities who use IT products and services for business.
3. Intermediaries in the IT market: companies that facilitate the purchase and sale of IT products and services, such as distributors, resellers, co-working spaces, hackathons, training studios, etc.
4. State authorities: state authorities that regulate the IT market, provide financial support for the development of the IT industry, stimulate innovative activities, etc.
5. Public organisations: associations that represent the interests of IT market participants, promote the development of IT culture, protect the rights of consumers of IT products and services, etc.

Investigating the scientific issue of strategic management of IT business development in Ukraine, we will focus only on the entities of IT product manufacturers, which will be generally defined as IT business.

For this, it is necessary to understand the term IT business in the scientific literature.

Considering IT business as an object of financial management, a group of Ukrainian scientists [11] defines IT business as entrepreneurial activity in information collection, storage, processing, and distribution.

Another definition of IT business in the world "is providing information technology, software development, and consulting services [12].

We believe forming one's scientific understanding of the term is essential. Thus, an IT business (business in the information technology market) is any company or organisation that develops, sells, implements, maintains information technology, or otherwise uses IT for profit.



The key features of the IT business are the use of information technologies, the introduction of innovations, the organisation's rapid growth rate, and the activity's global nature.

Our next step should be to classify the types of IT businesses scientifically.

In scientific studies, you can find the classification of IT businesses depending on the type of product they offer: web studios, digital agencies, IT companies, advertising agencies in the online sphere, SMM agencies, IT outsourcing companies, creative agencies, web design studios, copywriting agencies, freelancers [13]. However, such a classification does not look scientific because the criteria do not define similar and distinctive characteristics that confirm such a division.

According to other classification options, IT businesses in Ukraine are divided into two large groups depending on the business model of providing IT services: service and product. In turn, service companies also differ in the type of service provision, including outsourcing, outsourcing, and consulting. Product companies differ depending on their market share and how they are managed. Among the product IT business companies, the following are distinguished: startups, scaleups, and corporations. [14, 15].

For a better analysis of the classification of IT businesses in Ukraine, it is necessary to pay attention to the official analyses of the IT sector, which, although not scientifically confirmed, are based on scientific research methods. One of these is the most extensive study of Ukrainian IT presented in the document "Book of Ukrainian Tech. 2022-H1 2023: ADAPT & EVOLVE".

According to this study, the authors identified the following types of companies depending on the involvement of employees in the industry: outsourcing and outstaffing (56%), product, including startups (26%), R&D (9%), and technical departments of local non-IT companies (5%). It is also worth paying attention to the existence in this classification of a share of freelancers (2.1%), as well as sales offices of international tier1 companies, digital, IT-related agencies, and call centres (1.9%), which we do not classify in the IT category in our work – businesses [16].



Summarising the research on the types of IT businesses represented in Ukraine, we offer our vision of the classification of different types of companies, which will be based on different market segments in which IT businesses carry out their commercial activities (Table 1).

For a better understanding of the market segments and the leading products and services provided in these segments, it is worth defining each of them.

The Public Cloud Services (PCS) market is a segment of the IT business market that provides cloud computing. IT resources are provided by a third-party service provider over the Internet. These resources are available to all users who pay to use them [17].

This segment includes businesses that provide software, platform, infrastructure, and security as a cloud service. [18].

Software-as-a-Service (SaaS) providers are businesses that provide a user of cloud services with access to application computer programs using cloud computing technology through an online service or agent computer programs [19].

Platform-as-a-Service (PaaS) providers are businesses that provide cloud users with access to sets of computer programs (operating systems, system computer programs, computer programming software, database management software) through technology cloud computing [19].

Infrastructure as a Service (IaaS) providers are businesses that provide a user of cloud services with access to computing resources, storage resources, or electronic communications systems using cloud computing technology [19].

Security as a Service (SECaaS) providers are businesses that provide and develop cloud-based cyber security services [19].

Table 1

## Types of IT businesses depending on market segmentation

| Market segmentation   | Products and services                 | Tier-1 IT business                | IT business in Ukraine |
|-----------------------|---------------------------------------|-----------------------------------|------------------------|
| Public Cloud Services | Software as a service (SAAS)          | Sales Force, Dropbox              | SerpStat, iFin         |
|                       | Platform as a service (PAAS)          | OpenShift, Magento Commerce Cloud |                        |
|                       | Infrastructure as a service (IAAS)    | DigitalOcean, Linode              | De Novo                |
|                       | Security as a service (SECaaS)        | CloudFlare, Incapsula             | Osavul                 |
| Software as a Product | Independent Software Vendors (ISV)    | Adobe, Magix                      | Ajax Systems, Petcube  |
|                       | Systems Integrators (SI)              | AVI-SPL, Vistacom                 | deltAlyz, Noltic       |
| Hardware as a Product | Computer Hardware Manufacturer (CHM)  | HP, Dell, Lenovo, Acer            | Kodisoft               |
|                       | Original Equipment Manufacturer (OEM) | Wesco, Nokia                      | i3 Engineering         |
|                       | Data Center Manufacturer (DCM)        | CORE 4, Nvidia                    | Hosting.ua             |
|                       | Telecommunications Providers (Telco)  | AT&T, Verizon                     | Kyivstar               |

**Source:** Own elaboration [17-19, 23-30]

The market of public cloud services is not limited to the specified services, as was mentioned earlier; however, the four specified services are defined at the legislative level in Ukraine and are considered accordingly in our scientific work. In addition to the already mentioned SaaS, PaaS, IaaS, and SECaaS, there are many other models of public cloud services that IT businesses develop and sell in the world (Table 2).

After reviewing the first market segment outlined in Table 1, we must focus on the subsequent segment. The software-as-a-product (SaaSP) market represents a specific sector within the broader IT industry, characterised by a business model where end users purchase a perpetual software license. This license grants indefinite use of the software, accompanied by complimentary updates for a predefined period and the option for paid support services from the software vendor [20].



**Table 2**

**Explication of various models of public cloud services**

| <b>Products and services</b>           | <b>Explication</b>                                                                                                                                                                                                                                                                         |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Communication as a Service (CaaS)      | This model provides on-demand access to communication resources such as video conferencing, chat, telephony, and application programming interfaces (APIs) for communication functionality. The entire communications suite is accessed without managing servers or software.              |
| Function as a Service (FaaS)           | This serverless computing model allows code snippets (functions) to be deployed without managing servers or infrastructure. Users pay only for the resources they use at runtime. FaaS is ideal for microservice architecture and event-driven applications.                               |
| Backend as a Service (BaaS)            | This model provides mobile and web application business logic (back-end functionality). It handles databases, user authentication, API management, and other server-side tasks, allowing developers to focus on the user interface and application logic.                                  |
| Virtual Desktop Infrastructure (VDI)   | This service provides users with virtual desktops hosted in the cloud. Users remotely access their desktops and applications from any device with an Internet connection. VDI offers centralised management, improved security, and more effortless scalability than traditional desktops. |
| Disaster Recovery as a Service (DRaaS) | This service provides backup and disaster recovery solutions in the cloud. It provides business continuity by replicating data and applications to a secondary site, enabling rapid recovery during downtime or disruption.                                                                |
| Database as a Service (DBaaS)          | This model provides on-demand access to managed databases in the cloud. Users can choose from different databases, such as relational, NoSQL, or in-memory, depending on their needs. Providers handle database management tasks such as error correction, updates, and backups.           |
| Management as a Service (MaaS)         | This model provides tools and services to manage various aspects of cloud resources, including cost optimisation, performance monitoring, and resource provisioning. MaaS helps businesses gain insight into cloud usage and optimise their spending.                                      |

**Source:** Own elaboration [21 - 23]

In the software-as-a-product market, IT businesses provide both products and services in public cloud services and even more. Therefore, for systematisation, it is appropriate to divide them according to the type of services and products they provide into two separate groups: independent software vendors and system integrators.

Independent software vendors specialise in creating and selling licensed software for end-user personal devices for mass or niche markets [24].

System integrators are businesses that specialise in implementing, planning, coordinating, scheduling, testing, improving, and sometimes maintaining computing operations to bring order among disparate vendors [25].



A computer hardware manufacturer (CHM) is a business that designs, develops, and manufactures computer components and devices, namely the physical components of a computer that work together to carry out instructions and process data. Computer hardware can be divided into four main categories [26]:

**Input devices:** These devices allow users to enter data into the computer. Examples of input devices are keyboards, mice, touch screens, scanners, and web cameras.

**Output devices:** These devices allow users to receive information from the computer. Examples of output devices are monitors, printers, speakers, and projectors.

**Processing devices:** These devices execute instructions and process data. The main processing unit of a computer is the central processing unit (CPU). Other processing devices include graphics processing units (GPUs) and coprocessors.

**Data storage devices:** These devices are used to store data. Data storage devices include hard drives, solid-state drives (SSDs), flash drives, and optical drives.

An Original Equipment Manufacturer (OEM) in the IT context is a business that designs and manufactures hardware or software that is then sold to other companies under their brand name. These companies that resell OEM products are often called system integrators or resellers. [27]

There are two main types of OEMs [28]:

1. Tier 1 OEMs: Design and manufacture core components such as chips, motherboards, and hard drives.
2. Tier 2 OEMs: use Tier 1 OEM components to assemble finished products such as computers, servers, and network devices.

A Data Centre Manufacturer (DCM) is a business that designs, manufactures, and supplies hardware and software for data centres. DCMs can be large multinational corporations and small specialised firms [29].



A telecommunications provider (Telco) is a business that provides communications services such as telephone, Internet, cable television, and mobile communications. Telco can be either public or private.

The main functions performed by telecommunications providers include [30]:

1. Building and maintaining telecommunications networks: Telcos own and operate communications infrastructure, including cable lines, cell towers, and satellites.

2. Provision of communication services: Telco offers a wide range of communication services for private and corporate customers.

3. Development and implementation of new technologies: Telcos invest in R&D of new telecommunication technologies such as 5G and fibre optic communication.

The types of telecommunication providers differ in the type of networks through which the IT business provides its services:

Fixed-line operators offer communications services, such as telephone lines and cable television, over a fixed network.

Mobile operators offer mobile services such as voice, text messaging, and mobile internet.

Integrated operators offer fixed and mobile communication services and other services such as cable television and Internet provision.

In addition, classification features of IT companies are also [31-38]:

1. registration form (Limited Liability Company (LLC); Individual entrepreneur (FOP), the permanent representative office of a foreign company).

2. place of registration (in Ukraine; abroad).

3. IT-companies' work models (Working through an Individual entrepreneur (FOP) under a contract for the provision of services; working through an Individual entrepreneur (FOP) – open space; Limited Liability Company (LLC) work: only employees; mixed model; permanent representation; informal work).



4. form of registration of relations with employees and contractors (conclusion of civil law or labour contracts; a package of contracts for work with clients).

5. taxation system (general; simplified; gig contracts).

6. specialization and field of activity (software developers; IT consulting companies; IT integrators; website development companies; game development companies; cyber security companies; IT support services).

7. work locations and organisation of business space (own commercial real estate; rented offices; coworking; office apartments; remote).

8. the degree of dominance in the IT market (leading players of the IT market, participants of the IT cluster, members of the IT Association of Ukraine).

9. cooperation with higher education institutions (presence of IT academies; joint educational and professional programs with higher education institutions; mentoring).

10. business model (B2B (Business-to-Business); B2C (Business-to-Consumer); B2G (Business-to-Government)).

11. industry affiliation: IT companies developing solutions for the financial sector (financial technologies – FinTech); companies developing technologies for medicine, such as electronic medical record systems, telemedicine (health care – HealthTech); companies that offer technological solutions for the field of education, including online platforms, interactive courses and tools (education – EdTech); companies that develop IT solutions for the automation of retail trade processes, such as e-commerce platforms, analytical systems and solutions for loyalty (retail trade – RetailTech); companies providing technological solutions for logistics, transport and delivery management (logistics – LogisticsTech).

12. business goals and purpose of solutions developed by IT companies (technological platforms, automation of business processes, communication solutions, technical support).

13. the role of IT companies in the value chain (innovators are companies that create new products or technologies and create new standards on the market;



integrators are companies that integrate existing IT solutions into customers' business processes; intermediaries are companies which connect producers of IT solutions with end users through platforms or services; infrastructure providers - companies that provide infrastructure solutions (servers, data centres, network solutions)

14. type of organisation (startups; non-profit organisations – develop technologies for the public good or solving social problems).

In conclusion, we would like to note that we formulated our definition of the terms "market of information technologies" and "IT business" and formed our classification of IT businesses based on a theoretical study of the classifications available in the scientific literature.

Further scientific research should be directed to an in-depth analysis of the economic impact of various types of IT business on the development of the Ukrainian economy, an assessment of the innovative potential of the industry in the context of global transformations, as well as a study of the role of state support and investment programs to stimulate the development of the IT sector.

However, further research is necessary to address the evolving challenges of the sector. We plan to deepen the exploration of the IT sector's role in post-war reconstruction and examine strategies for enhancing its global integration and competitiveness, contributing to the broader development of Ukraine's economy.

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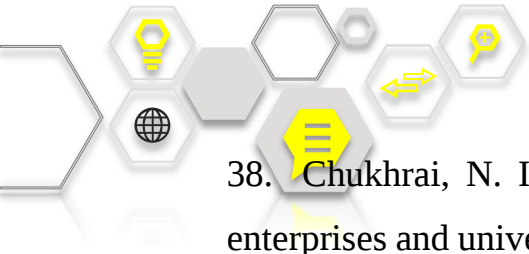
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