INNOVATIVE DEVELOPMENT OF AN ENTERPRISE IN THE CONTEXT OF THE DIGITAL ECONOMY

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Introduction. In the digital economy, the principles of innovative development are undergoing radical changes: the process is no longer linear, where a product is first developed, then transferred to production, and finally brought to the market. Instead, innovation is becoming ecosystem-based, where the creation, development, and commercialization of ideas occur through the interaction of numerous participants – companies, startups, universities, customers, and partners.

In the modern digital economy, the fundamental principles of innovative development are experiencing profound and irreversible transformations. The traditional approach, in which the process resembled a strictly linear sequence – from the emergence of an idea in closed laboratories to production and final market entry – is becoming obsolete. Previously, this path was lengthy and detached from feedback, which created high risks of product rejection by consumers.

Instead, innovation is becoming ecosystem-based. This means that the creation, development, and further commercialization of ideas now take place within a complex network of interactions among numerous participants. This process simultaneously involves:

- large corporations and agile startups exchanging experience and technology;
- scientific institutes and universities providing the fundamental base;
- end customers and strategic partners participating in testing and refining solutions at early stages.

The digital economy fundamentally changes the paradigm of innovation activity. A large-scale transition is observed from the traditional closed approach, where trade secrets were carefully protected, to the concept of open innovation and global network collaboration. In such an environment, business success no longer depends solely on accumulated internal resources or a limited number of staff members.

Modern companies actively integrate external knowledge flows, attracting talent and breakthrough technologies from around the world. At the same time, a reverse process is also observed: enterprises make part of their developments available to partners or the market through APIs, open platforms, or licensing. This creates synergy, where the joint efforts of multiple market players lead to products that would be impossible to create individually.

Main Part. In the modern conditions, a fundamental shift is taking place in the way value is created: companies not only generate innovations internally but also integrate them into global ecosystems, adapting to a changing market and the rapid development of digital technologies. This approach has become a response to the challenges of globalization, increased mobility of intellectual capital, and the rapid development of digital platforms that open new opportunities for collaboration, accelerate innovation implementation, and enhance the competitiveness of economic entities in the digital economy.

For most of the twentieth century, the so-called closed innovation model dominated the global economy and corporate management. According to this model, the entire innovation process was concentrated exclusively within a single company. Its core principle can be summarized as: “if we want to create a product or technology properly, we must do it ourselves.” This approach assumed that key knowledge, ideas, and competencies should be concentrated within one organization, while the external environment was viewed more as a source of threats than opportunities.

The implementation mechanism of this model involved large-scale investments in internal scientific-research and research-development units, corporate laboratories, research institutes, and centers, as well as the employment of top scientists, engineers, and developers. Companies sought to fully control idea generation, research, prototyping, testing, production, and commercialization. Special attention was paid to intellectual property protection: patents, trade secrets, and know-how were strictly guarded, and knowledge exchange with external actors was minimized.

The logic of this model was based on the priority of control. It was believed that only complete closure of the innovation cycle – from idea generation to market entry – could ensure competitive advantage, reduce information leakage risks, and guarantee monopoly use of research results. Innovation activities were essentially conducted “behind closed doors”, and company success depended on internal resources, investment

scale, and the ability to retain talent. This model was effective in relatively stable markets with slow technological change and high entry barriers, that explains its domination during the XX century.

The term "open innovation" was introduced by Professor Henry Chesbrough in 2003, and since then this concept has become a key approach in modern corporate management and the innovation economy. The main idea is that in a world where knowledge is widely distributed among organizations and individuals, it is inefficient for companies to rely only on internal scientific-research development. Instead of a traditional "closed" approach, when all the stages of innovation cycle are performed inside the company, open innovation involves active exchange of knowledge and ideas between internal and external sources.

The first key principle of this model is the use of external ideas. Companies can integrate knowledge and experience from universities, research institutions, startups, customers, or even competitors to accelerate the development of new products and technologies. This enables a significant expansion of the organization's innovation potential while reducing internal reserch costs.

The second principle is the outward transfer of unused internal ideas. If a technology does not fit the company's strategy, it can be sold, licensed, or used to create a spin-off company. This approach allows companies to generate additional value from underutilized internal resources while fostering the development of the innovation ecosystem.

The third principle is joint commercialization. A product's path to market may begin internally and end through external channels, or vice versa1: External ideas can be utilized at internal stages of development. This ensures flexibility in the implementation of innovations and enables a more effective integration of internal and external resources.

Together, these principles create a model in which company boundaries become permeable and knowledge flows freely in both directions, enabling faster and more efficient innovation, reduced risks, and increased competitiveness. The concept of open innovation differs fundamentally from the traditional "closed" approach and has become central to the strategies of modern technology companies and research organizations.

The modern model of open innovation assumes that a company ceases to be a closed center of research and development and transforms into a kind of "platform" that integrates the best ideas and solutions from various sources. Rather than relying exclusively on its internal R&D department, a company actively incorporates external knowledge, ensuring flexibility, efficiency, and acceleration of the innovation process.

One of the main sources of such knowledge is universities and research laboratories. Businesses fund academic research in exchange for preferential rights to acquire patents or access research outcomes. This creates a mutually beneficial partnership: science gains resources for research, while companies obtain access to new technologies and fundamental discoveries that can be rapidly commercialized.

Another direction is crowdsourcing and interaction with customers. Companies create dedicated platforms or portals where users can propose ideas for new products, modifications of existing ones, or new ways of their use. Examples of such practices can be found in companies such as LEGO and Starbucks, which systematically engage their communities in the innovation process, transforming customers into active participants in the development of brands and products.

A third important element is collaboration with competitors, or co-opetition. Sometimes competing companies join forces to jointly develop industry standards or core technologies, which allows them to share research costs and reduce the risks associated with implementing new solutions. Examples include the joint development of engines by car manufacturers or technological platforms in the IT sector. Such a strategy helps lay the groundwork for subsequent innovations, which can then be pursued individually by competitors.

All these approaches demonstrate that a company, as an innovation platform, becomes a hub that gathers the most valuable ideas and knowledge from the world, integrates internal resources with external ones, and creates conditions for the rapid, flexible, and efficient development of new products and technologies. This fundamentally changes the logic of the innovation process, making it open, dynamic, and interactive with the external environment.

Large corporations often accumulate a vast number of patents, prototypes, and other developments that effectively "gather dust" because they do not align with the current strategy or business profile. Traditionally, such assets remained unused, resulting in lost potential revenue and reduced effectiveness of research and development investments. The open innovation model proposes transforming these unused resources into additional income and strategic advantages through various commercialization mechanisms.

The first of these is licensing, where a company grants other organizations the right to use its technology in exchange for royalties or other forms of compensation. This allows financial returns from developments that do not fit into the current business model while simultaneously stimulating the growth of adjacent markets.

The second approach is the creation of spin-offs – separate subsidiary companies that focus exclusively on a specific idea or technology. Often, internal corporate experiments evolve into fully-fledged business units; examples include numerous Google services that began as internal prototypes and later received their own structure and resources for large-scale development. This mechanism enables the effective use of existing technologies, their development outside the core business, and the testing of new markets without risking the company's key operations.

The third mechanism is open source, where a company publicly makes its technology available to anyone interested. This may seem contrary to traditional approaches to intellectual property protection, but strategically it allows for the stimulation of the market in which the company intends to generate revenue through other means. An example is Tesla, which opened its patents on electric vehicles to accelerate the adoption of electric transportation infrastructure and create a favorable environment for its business.

Thus, the open innovation model transforms unused internal developments into tangible economic and strategic benefits, providing additional revenue streams, stimulating technological advancement, and creating new opportunities for market collaboration.

The contemporary concept of open innovation entails not only using internal and external knowledge but also actively integrating the company into a broad ecosystem of partners, where value creation occurs collectively. Such a hybrid approach enables the optimization of development processes, reduction of time-to-market, and minimization of risks by combining the strengths of various ecosystem participants.

One mechanism for implementing this approach is joint ventures. In this case, two or more companies pool their resources: one may provide technology or intellectual products, while the other offers market access and distribution channels. This type of collaboration allows for faster market entry, shared development costs, and reduced risks associated with demand uncertainty or technological challenges.

A second important tool is the use of external sales channels. Even if the development occurs entirely within the company, market entry can be achieved through established platforms and partner brands. For example, a small software developer can distribute its product via the Apple App Store or Microsoft Azure, leveraging their infrastructure, customer base, and marketing support. This enables rapid product scaling and a focus on technological improvement without expending resources to build proprietary distribution channels.

A third direction is the reverse innovation pathway, in which a corporation acquires a promising startup at the prototype stage and facilitates its scaling through its own resources, marketing capabilities, and infrastructure. This approach allows for the rapid integration of new ideas, risk reduction in development, and accelerated commercialization of promising technologies, while simultaneously supporting an innovative environment and the growth of the startup ecosystem.

Taken together, this hybrid approach demonstrates that a modern innovation strategy involves close collaboration and resource sharing within an ecosystem, allowing companies to effectively combine internal developments with external opportunities to create additional value and competitive advantages (Table 1).

Table 1. Differences between Models

Characteristic	Closed Innovation – Traditional (Linear) Model	Open Innovation – Contemporary (Ecosystem) Model
Source of ideas	Own R&D centers (closed)	Crowdsourcing, startups, customers (open)
Source of talent	Only internal employees	Top specialists worldwide (external and internal)
R&D	Internal research ensures success	Success achievable by combining internal and external R&D
Intellectual property	Strict control and patenting	Shared use, licensing in/out
Role of the market	Market entry only through own channels	Multiple market entry channels
Role of the consumer	Passive consumer of the final product	Co-creator, tester, source of data
Risks	Risks borne entirely by one company	Risks distributed among ecosystem participants

*Source: *compiled based on* [7]

In the digital economy, several primary models can be identified, such as platform-based models, data-driven models, efficiency-enhancement models through automation, and distribution models via digital networks. Each of these models opens up new opportunities for businesses, alters competitive dynamics, and imposes new requirements on the management of economic processes.

Thus, understanding the main economic models of the digital economy is essential for forecasting its development and for the effective implementation of digital innovations at all levels of economic activity. This process influences competition, productivity, the labor market, and the innovation potential of enterprises and countries as a whole.

In platform economies, digital platforms play a crucial role as intermediaries between different user groups or business participants. Such platforms can span various sectors, from e-commerce (Amazon, eBay) and financial technologies (PayPal, Revolut) to rental and ridesharing services (Airbnb, Uber). These platforms often operate based on network effects, meaning that the greater the number of participants on the platform, the higher the value for all its users (Table 2).

Table 2. Main Peculiarities of Digital Platforms

Peculiarities	Characteristic
Network effects	Platforms become more valuable to users as their number increases.
Minimization of transaction costs	Platforms reduce the costs of searching, verification, and contracting, significantly simplifying economic interactions between market participants.
Access to the global market	Through platforms, businesses can enter new markets without the need to establish physical offices or stores. This enables small and medium-sized enterprises to globalize their services or products.
Dynamic pricing and personalization	Digital platforms leverage large volumes of data to adapt prices and offers to specific user needs. With big data analytics, platforms can provide personalized recommendations and discounts, significantly increasing sales efficiency and customer satisfaction.
Financial infrastructure and payment processing	Platforms not only connect suppliers and consumers but often provide financial infrastructure to facilitate transactions. Examples include platforms such as PayPal or Stripe, which process payments between buyers and sellers, reducing the need for traditional banking services.
Changes in business models	The platform economy transforms traditional business models, where companies had vertically integrated supply chains and production, into a new model in which the intermediary role is played by the platform. Consequently, companies shift strategies from developing internal resources to maximizing the use of external networks, reducing costs and accelerating business scaling.
Changes in competition	Platforms change competitive mechanisms, as companies no longer compete solely at the level of products or services but also in terms of access to the largest user audience. Technologies with network effects allow the creation of monopolies or "giants" that dominate the market, which can limit competition.
Changes in the labor market	The platform economy creates new opportunities for flexible employment. Increasingly, people work on contracts or perform short-term tasks via platforms such as Upwork, Freelancer, Uber, or TaskRabbit. This leads to changes in traditional approaches to labor relations, giving rise to new employment models, such as the gig economy.
Lowering barriers to market entry	Platforms enable small businesses and startups to quickly enter the market without significant capital investment in physical points of sale or marketing campaigns. This creates new opportunities for entrepreneurs and fosters innovation across different economic sectors.
Social and economic challenges	Alongside these advantages, the platform economy also carries risks. These may include data privacy and security issues, as platforms often collect vast amounts of personal user information. Additionally, labor market challenges may arise regarding the flexibility of employment relationships, social protections for gig workers, and potential abuses of monopolistic positions by large platforms.

* Source: *compiled by the authors based on* [2, 3, 5]

The platform economy radically transforms traditional markets and business models. It creates new opportunities for entrepreneurs and consumers, lowers barriers to market entry, and stimulates innovation, while simultaneously altering competition and labor relations. Platform-enabling technologies continue to evolve, allowing them to increasingly influence various aspects of the economy, reshaping interactions among consumers, businesses, and other market participants. However, this process requires careful oversight and regulation to ensure fair conditions for all participants in the digital economy.

The digital economy not only transforms traditional business models but also enables new approaches to customer interaction, revenue management, and business process organization. One of the main trends is the implementation of subscription-based business models, e-commerce, and online services. Each of these models has its own characteristics, advantages, and challenges, but overall, they simplify interactions between businesses and consumers, reduce operational costs, and allow for the most efficient use of digital technologies.

Digitalization leads to significant changes in the labor market, creating new professions and competencies requirements for employees. There is an increasing demand for specialists capable of working with the latest technologies and driving digital transformation within companies. At the same time, these changes require constant adaptation by both employees and educational institutions, which must develop new training programs to cultivate the necessary competencies. Success in the context of digitalization depends on the ability to effectively leverage new opportunities, continuously improve professional skills, and actively engage with technology (Table 3).

Table 3. New Competencies in the Context of Digitalization

Competence	Characteristic
Technical skills and knowledge	As most emerging professions are associated with the use of advanced technologies, knowledge in areas such as programming, data analysis, machine learning, cybersecurity, cloud computing, and other digital tools becomes particularly important.
Critical thinking and problem-solving	Digitalization involves working with large volumes of information and often requires decision-making based on data analysis and interpretation. Therefore, it is essential to possess critical thinking skills, the ability to find innovative solutions, and adaptability to change.
Adaptability and learning ability	As digital technologies are constantly evolving, employees must be able to quickly adapt to new tools and processes. This requires continuous learning, self-improvement, and flexibility in professional development.
Interpersonal skills and collaboration	Despite the fact that digitalization involves the use of technologies, the importance of interpersonal skills – such as effective communication, leadership, and teamwork – remains unchanged. In the context of remote work and online collaboration platforms, these skills become even more significant.
Digital literacy and media literacy	The ability to work with digital tools, assess the reliability of information, interact through social media, and protect one's privacy in the digital environment are skills that are becoming essential for any profession in the digital economy.

Source: *compiled by the authors considering current digital trends*

Digitalization is radically transforming not only the way business is conducted but also the very structure of the economy, reshaping traditional industries and fostering the emergence of new ones. The implementation of innovative technologies such as artificial intelligence (AI), Big Data, the Internet of Things (I_oT), blockchain, as well as robotics and automation, opens up new horizons for business and economic development.

These changes have a profound impact on many sectors – from manufacturing and agriculture to finance and healthcare. At the same time, digital technologies contribute to the creation of new industries, such as the platform economy, cybersecurity, new media, financial technologies (FinTech), blockchain services, and many others.

The following practical examples illustrate these transformations:

1. Tesla and patent openness:

- in 2014, Elon Musk announced that Tesla would not initiate patent lawsuits against those who use its technologies in good faith. This is a classic example of open innovation: the company realized that the development of the electric vehicle market requires a shared infrastructure and competitors that stimulate demand.

2. The Apple ecosystem:

- Apple does not merely sell devices but creates a platform where thousands of third-party developers (through the App Store) generate value for its products. This represents network-based collaboration, where the company's success is directly dependent on the success of its partners.

3. Linux та Open Source in business:

- most modern cloud computing and servers operate on Linux. Companies such as IBM and Red Hat do not exclusively own the code but invest in its collective development, integrating external talent to improve their commercial solutions.

Summarizing the above, it can be stated that in the digital era, competition occurs not between individual products but between entire business ecosystems. The winners are those who are best able to build connections and integrate external ideas into their own context.

Open innovation is impossible without the development of innovation ecosystems. A company ceases to be an "island" and becomes part of a dynamic economic network.

Crowdsourcing: the use of collective intelligence (for example, platforms such as LEGO Ideas, where users themselves propose new product sets).

Crowdsourcing (from "crowd" and "sourcing") is a model of problem-solving that involves engaging a large group of people (a community), typically via the Internet, on a voluntary basis or for compensation.

At the core of crowdsourcing lies the concept of collective intelligence – the idea that a group of people can generate better and more creative solutions than even highly paid in-house experts.

The mechanism of crowdsourcing involves engaging a wide range of participants in solving specific tasks or generating new ideas, enabling companies to leverage collective intelligence to enhance their innovation potential. The process typically consists of four key stages:

The first stage is task definition, when a company clearly formulates the problem to be solved, whether it is the design of a new product, the identification of bugs in software code, or the selection of a brand name.

The second stage is crowd engagement, during which the task is published on an open platform accessible to a large audience with diverse experience and competencies.

The third stage is idea generation, when participants propose solutions, discuss them with others, and build upon each other's ideas, creating a collective intellectual output.

The fourth stage is the selection of the optimal solution, which may be carried out either by the company itself or by the community through voting or expert evaluation. Through this mechanism, crowdsourcing enables the rapid discovery of unconventional solutions, enhances creativity, and engages external resources for innovation development.

The concept of open innovation, introduced by Henry Chesbrough, is based on the idea that in today's economic environment knowledge is so widely distributed that no company can afford to rely solely on its own research.

Depending on its purpose, crowdsourcing can be divided into several categories (Table 4).

Table 4. Types of Crowdsourcing by Direction

Type	Essence	Example
Crowd creativity	Searching for creative ideas, design solutions, and naming concepts.	Logo design contests (e.g., 99designs).
Crowd wisdom	Using community knowledge to create content.	Wikipedia – the world's largest knowledge base.
Crowd testing	Identifying software bugs by real users.	Beta testing of new games or applications.
Crowdfunding	Raising funds for project implementation.	Kickstarter, where people fund startups.

*Source: *compiled based on* [5] Crowd creation (crowd creativity)

Crowdsourcing is the practice of obtaining ideas, services, or solutions from a large group of people, particularly from online communities. It is a powerful way to leverage the collective intelligence, creativity, and skills of millions of people worldwide. Crowdsourcing can be used for various purposes, such as problem-solving, innovation, data collection, content creation, and more (Figure 1).

Crowdsourcing and co-creation provide businesses with a range of strategic advantages that form the foundation of modern marketing and innovation management.

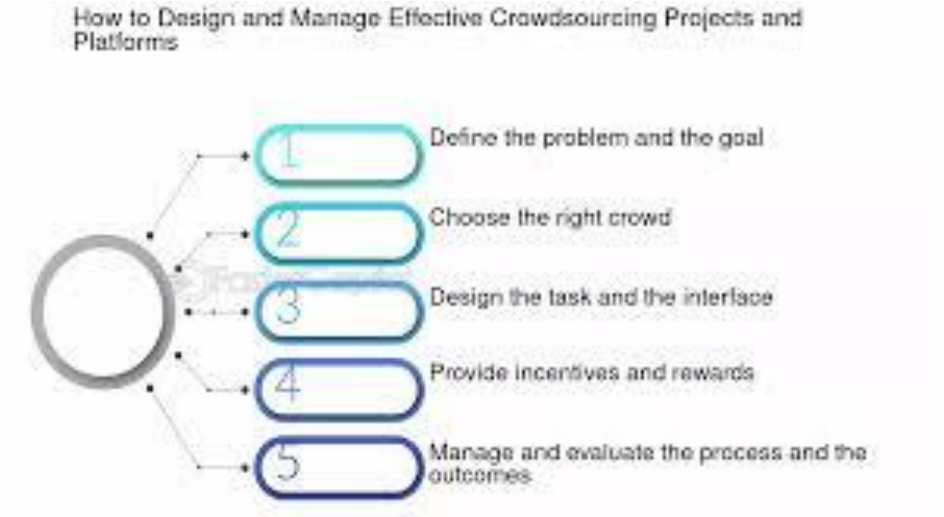

Figure 1. *Crowdsourcing: How to Use It for Problem Solving and Rapid Innovation Implementation*

First, the company gains access to talent – thousands of professionals and amateurs from around the world can contribute their ideas and solutions without the need to hire them as staff. This significantly expands the company's innovation potential and allows for resource savings.

Second, this approach reduces the risks associated with launching a new product: for example, if 10,000 people vote for a design on the LEGO Ideas platform, the company already obtains practical confirmation of demand for the product, minimizing the risk of unsuccessful investments.

Third, brand loyalty increases because users feel involved in the creation of the product, shaping them as brand advocates and encouraging repeat purchases and positive feedback. Together, these three aspects make crowdsourcing an effective tool not only for idea generation but also for developing mutually beneficial relationships with consumers and enhancing competitiveness.

The European Investment Bank identified three main reasons for transitioning to a circular economy:

1. Limited resource base usage. Demand for raw materials and resources increases every year, leading to a growing shortage of critically important types of resources.

2. Continuous development of technologies and production methods. The implementation of new technologies creates opportunities for developing and adopting circular economy business models.

3. Development of the socio-economic sector. Circular models play an important role in the context of increasing urbanization. In cities, it is possible to design, implement, and maintain systems that transform various goods, materials, and other resources in an economically efficient and environmentally safe way.

The main strategies that entrepreneurial entities in Ukraine should apply to implement the objectives and principles of the circular economy are summarized in Figure 2.

Reducing the use of primary resources: Waste recycling, Efficient use of resources, Use of renewable energy sources,

Preserving the highest value of products and materials: Remanufacturing and reuse of products, Extending the product lifecycle

Changing product usage models: Product as a service, Shared-use models, Changes in consumer behavior

Figure 2. *Key Strategies for Implementing a Circular Economy*

To implement a circular economy strategy, it is necessary to prepare a grant proposal.

Developing a high-quality grant proposal is an art that requires a combination of deep understanding of the problem, knowledge of donor needs, and the ability to clearly articulate the proposal. This is especially true for proposals aimed at supporting circular solutions, as they often require innovative approaches and interdisciplinary collaboration.

Examples of successful projects and their key features:

Agro-economy:

- Project "Smart Farming":

Implementation of a precision agriculture system that optimizes the use of water, fertilizers, and pesticides.

- key elements: use of sensors, drones, and big data analysis.;
- "Solar Greenhouses" Project:
- construction of greenhouses equipped with solar panels for electricity generation and heating.;
- key elements: integration of agriculture and renewable energy.

Within the framework of the grant program, support will be provided to initiatives that contribute to increasing sales of organic products, expanding the organic product range on store shelves – particularly by extending the shelf life of organic products – and establishing new supply chains.

Areas of support and forms of activity within the Organic Sector Grant Program include:

- promoting the sale of organic products and opening new sales channels for organic products in the domestic market;
- shortening supply chains from producer to consumer in the domestic market;
- improving the presentation of organic products on store shelves in the domestic market, including through the extension of product shelf life.

Eligible applicants for Grant No. 1 under this grant program are Ukrainian certified organic market operators who are already present in the domestic market or are ready to enter the Ukrainian market.

Resource optimization is one of the key directions of modern development, particularly in the context of the transition to a circular economy. Grant programs aimed at supporting energy efficiency and recycling provide a valuable opportunity to implement innovative solutions and reduce environmental impact.

Conclusion: Flexibility is the antidote to "death by success." Companies that cling too long to their old, successful models lose out to those willing to disrupt their own achievements in pursuit of new technological opportunities.

The circular economy provides mechanisms for creating value that do not rely on the consumption of finite resources. Consumption occurs within efficient biocycles, or usage displaces consumption, with resources being regenerated within the biocycle. Today, globalization offers significant advantages for businesses: the ability to explore new markets, benefit from reduced trade barriers, and adapt more quickly to technological progress. However, due to intensified competition, it is increasingly challenging for enterprises to achieve, maintain, and strengthen their competitiveness. The transition to circular business models represents a substantial competitive advantage for any enterprise, as modern consumers place great emphasis on product quality, environmental sustainability, and corporate social responsibility.

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