PLATFORM BUSINESS MODELS: NETWORK EFFECTS AND VALUE CREATION LOGIC

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Abstract. One of the phenomena of the coming digital revolution is digital platforms embedded in companies' activities and completely changing the entire business. The paper shows that platform business models are more efficient than traditional business methods. It has been convincingly argued that platform solutions are an inevitable consequence of digital transformations while emphasizing that network effects and technological and digital innovations are key factors in developing platforms, which contribute to creating new networks and alliances. Particular attention is paid to the problem and the logic of creating value/value. As illustrations, statistical data on the capitalization of the world's largest companies in 2021 using platform business models - Apple, Microsoft, Alphabet, Amazon, Tesla, and Facebook are given.

Keywords: digital platforms, platform business model, network effects, value.

Introduction. The transformational processes taking place in the global economy in recent years have shown that digital business models are becoming an objective and inevitable reality (Masyuk, Temnova, 2021), with digital platforms becoming the most widespread (Geliskhanov, Yudina, 2018). Platforms are increasingly being used as a business model both at the country and regional levels, as new formats for networking and alliances emerge with the development of digital technologies. The economics of operating digital platforms is largely based on network effects as well as positive network externalities (Masyuk, Zhao Chen, 2020).

Network effects have resulted in an increase in the cost of services as a result of an increase in the number of users/customers/participants. This, in turn, encourages new/existing members to join the network to take advantage of growth opportunities and access to services and provisions. The variability of services is growing due to the formation of a diversified ecosystem, which also includes the mutual reinforcement of various segments of the network.

Method and methodology. As a research method, a comparative content analysis of global trends in the field of digital transformations and platform solutions, as well as the opportunities that digital platforms provide to businesses, was used.

Results. Digital transformations are necessary in order to achieve new results. It is on the basis of digital technologies that business models are built that were previously impossible. Moreover, the most promising business model is a model built as a platform. Suffice it to say that the most valuable companies in the world are platforms. Six of the world's top 10 companies by market cap are platforms,

including Apple Inc., Microsoft Corporation, Amazon.com, Alphabet (Google's parent company), Tesla, and Facebook.

Apple, Microsoft, Alphabet, Amazon, Tesla, and Facebook have increased their total capitalization by $2.9 trillion in 2021. In 2021, Apple and Microsoft came close to a $3 trillion market cap, while Tesla and Meta hit the $1 trillion milestone for the first time. (Table 1). Market capitalization refers to the total value of all shares of a company.

Table 1 Market capitalization of the largest platform companies in 2021*

№	Company name	Market capitalization		Grow, %
		2021(begin)	2021 (end)	
1	Apple	$2,2 трлн	$2,9 трлн	+30%
2	Microsoft	$1,7 трлн	$2,5 трлн	+50%
3	Alphabet	$1,2 трлн	$2 трлн	+65%
4	Amazon	$1,6 трлн	$1,7 трлн	+6%
5	Tesla	$677,4 млрд	$1,1 трлн	+58%
6	Meta (Facebook)	$778,2 млрд	$932,6 млрд	+20%

*Source: Compiled by the authors based on https://www.cnbc.com/2021/12/27/how-much-the-biggest-companies-grew-in-2021.html#:~:text=It%20shows%20that%20Big %20Tech, acc

Table 1 shows that Alphabet, Tesla, and Microsoft showed the largest growth in 2021 - 60%, 58%, and 50% respectively. At the same time, Tesla managed to overcome the milestone of $ 1 trillion. Despite a slower growth rate (30%), Apple is still the world's most valuable company ($2.9 trillion at the end of 2021), with a share price up 50% in 2021. The value of Amazon's shares fluctuated throughout the year, if in the middle of the year they showed an increase of 17%, then by the end of the year, this figure dropped to 6%.

The platform business model is so powerful mainly because of its network effects. The platform is a multi-sided network: in the case of e-commerce platforms like Amazon, there are buyers on one side and suppliers on the other. An example of a social media platform is Facebook, one side of the platform is social media users and the other side is advertisers.

Let us dwell in more detail on the definition of a digital platform, since a single, well-established definition does not yet exist, and different authors interpret it differently. Below are some definitions.

Digital platforms are systems and interfaces that form a commercial network or marketplace that facilitate business-to-customer (B2B), business-to-customer (B2C), or even customer-to-customer (C2C) transactions (Handbook of Research, 2021).

A digital platform in the broad sense of the word is an enterprise focused on creating value by organizing and facilitating direct interaction and exchange between two or more groups of external producers and consumers using digital technologies and infrastructure (Geliskhanov, Yudina, 2019).

From a business perspective, a digital platform can be seen as “a set of places for the exchange of information, goods or services between producers and consumers, and the community that interacts with said platform” (Watts, 2020). It is crucial to understand that the community itself is an important part of the digital platform - without this community, the digital platform has very little intrinsic value.

A digital platform is a digital design artifact (including architecture and management elements) created to facilitate multilateral market transactions (Selected Dynamics Impacting Emerging Platform Design in Africa, 2021).

A digital platform is a digital environment of groups of suppliers and consumers that participate in transactions and exchanges (The Study of Digital Marketplace in Brunei Darussalam, 2021).

A digital platform is a digital space that provides users with opportunities to collaborate, interact or make digital transactions (Development of the Digital Marketplace in the Fashion Industry, 2021).

A digital platform is a combination of digital tools and services that brings together different groups of users, creating value through interactions and transactions between them. It uses advanced technologies such as artificial intelligence, cloud computing, machine learning, and others (Nofie Iman, 2021).

A digital platform is a recognized device based on modern cloud technologies that facilitate the evolution of software or programs. However, it is not a product in itself. The services, applications, and solutions on the platform are the products that you, as a customer, will interact with and pay for (Ogundokun et al, 2020).

A digital platform is a software and technology used to connect and streamline business operations and IT systems. The digital platform serves as the company's backbone for operations and customer interactions (Youstani, Khnowaja, 2020).

A platform is “a digital space that provides users with opportunities to collaborate, interact or perform digital transactions. The digital market and the digital platform are interchangeable” (Observing Digital Marketplaces of Agricultural Products in Indonesia, 2021).

Digital Experience Platforms (DXP) is a new category of enterprise software designed to meet the needs of companies undergoing digital transformation, with the ultimate goal of providing a better customer experience (Parker, Alstyne Marshall, Choudary, 2016).

Digital platforms are complex software systems that create a digital space in which all platform participants interact (Masyuk, Bushueva, Vasyukova, Kiryanov, 2018).

Digital platforms are complex information systems that provide interconnection functions between market participants, open for use by customers and partners, application developers, service providers, and agents.

A digital platform is a system of algorithmized mutually beneficial relationships between a significant number of independent participants in an economic sector (or field of activity) carried out in a single information environment, leading to a reduction in transaction costs through the use of a package of digital technologies for working with data and changing the division of labor system (Digital Platforms, 2020).

Digital platforms integrate the capabilities of digital technologies (big data, cloud computing, artificial intelligence, blockchain, Internet of things, etc.) and, in combination with disruptive business models, significantly reform traditional markets and even entire sectors of the economy.

The essence of the platform is to provide interaction in a certain market. The platform does not directly sell services or goods. It provides interaction between market participants.

Platform value is a feature of competition that is characteristic of the digital revolution. The value of the platform undermines the established foundations of competition because it can significantly increase the gap between a competitor in an instant. Platforms create network effects, situations in which the number or type of users affects the value they receive. Network effects are often associated with "Metcalfe's law", named after the famous engineer and inventor Robert Metcalfe. According to this law, the value of a network increases in proportion to the square of the number of its users. For example, a personal phone by itself is almost useless. But as the number of users grows, the value of each phone grows. This largely explains the huge role of platforms in the digital revolution: the changes they generate in the market environment are not linear.

Next, we will focus on creating value in the platform business model. According to the authors, the platform business model is a business logic based on value creation, delivery, and implementation. This value logic is embodied as follows: first, the process of platform enterprises providing various forms of services to both sides of the platform, namely suppliers and end consumers, is a value creation process in

the platform model; secondly, platform enterprises are also responsible for providing services to providers. The process of delivering products/services to end customers is the process of delivering value and is also an important function of the platform business model.

In addition, the platform enterprise shares the foreign exchange payment from the end consumer with the supplier in a certain contractual form, which is the process of distribution and realization of value. This is consistent with the little consensus in business model research that a business model is essentially a logic of value. As noted by some scholars, the biggest contribution made in the field of business model research over the past ten years is to establish a connection between the business model and the logic of value.

Let's take Apple as an example to illustrate the business value logic of the platform model. There are three types of roles on the Apple platform: Apple as an intermediary platform, end customers are mainly iPod users, iMac users, iPhone and iPad users, and various content providers, mainly including digital media (audio and video) providers., developers of mobile and desktop applications, and several advertisers.

Apple's process of providing electronic hardware and some software to end users is a value creation process; at the same time, Apple also provides various forms of services to software developers and advertisers, which is also a value creation process.

The process of transferring large amounts of digital media application software and communication electronic devices to end customers through the Apple platform is the process by which Apple completes the transfer of value between media providers, software developers, and end consumers; the process of splitting the currency payment with media providers and software developers in a certain proportion (for example, sharing with software developers in a ratio of 3:7 for paid customer downloads) is a value distribution process as well as a value realization process.

Discussion. Although the platform business model is essentially a business value logic, the study also showed that this value logic is very different from the value logic of the traditional enterprise business model and has its own characteristics.

The value logic of the platform business model is more complex than the traditional business model. Within the traditional business model, the logic of value is expressed as "enterprise-customer". Businesses provide products/services to customers, and customers pay with currency to receive products/services. Value creation comes from the products/services provided by the target enterprise to customers; the process of providing products/services to customers is also a value transfer process, and the customer's cash payment is transformed into the realization of enterprise value. Obviously, this is a simple top-down linear value logic.

On the contrary, the logic of value in the platform business model is much more complex. First of all, in terms of the identity and function of the main part of the value logic, the main part of the value logic in the platform model includes at least three roles of different nature: the platform enterprise, the content provider, and the end consumer, and the functions and positioning of these roles are different: providers content providers provide products/services to end consumers, and platform companies provide services to factories to facilitate transactions between content providers and end consumers.

Secondly, the relationship between these roles is also very complex. There is a buying and selling relationship between content providers and end customers, but usually, they cannot transact directly. Even if they can trade, the efficiency of such transactions is usually very low. Therefore, it is necessary to rely on platform companies to improve transaction responsiveness and assortment.

At the same time, platform companies, content providers, and end consumers are on both sides of the platform and are two different types of customers, and there is a cross-network effect between these two types of customers. The strength of either side will attract the expansion of the other side, and any absence of one side will lead to paralysis of the platform, and three make up a relatively independent closed system.

In this closed system, there are two sets of value logic systems, one is the value logic between providers and end customers, and the other is the value logic between providers, platforms, and end customers. The first set of value logic, i.e., the logic of value between providers and end-users, is the premise and basis for the existence of the platform model and is dominant; while the second set of value logic serves to implement. The first set of value logic is subordinate, however, if the second set of value logic is missing or ineffective, the first set of value logic will be corrupted or even cease to exist.

But in the platform model, value transfer has become the key and core of the platform business model. This can be judged by the history of the development and evolution of the platform model. Counting from the initial market, auction, etc., the platform model has a history of thousands of years, but the slow development has not been able to play an important role in the social economy. It wasn't until human society entered the Internet era that platform business models broke through.

The biggest impact of the network on the platform business model is that it fundamentally changes the model for transferring value and efficiency between suppliers and customers. In the traditional model, suppliers are both value creators and value transmitters, such duplication of functions does not correspond to the trend of the social division of labor, and the independence of value transfer from it has become an essential requirement. The advent of platform enterprises has fundamentally changed the way goods/services are exchanged between suppliers and buyers and has greatly improved the efficiency of value transfer.

Conclusion. The conducted research allows us to conclude that the basis of the platform business model is the provision of value. Within the framework of the traditional business model, the process of providing products/services to customers is a process of creating value for subsequent customers. The essence of enterprise opportunity and competition is how to create more value for customers through innovation in products/services: even without intermediary channels, an enterprise itself can deliver products/services to customers, but delivery efficiency is usually insufficient. In the real economy, competition occurs between platforms and traditional companies (such as e-commerce and physical stores), as well as between platforms and platform companies around the efficiency of product/service delivery. This whole process is enhanced by network effects.

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