

DIGITAL PLATFORM: A NEW ECONOMIC INSTITUTION

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ABSTRACT

There are works in the economic literature devoted to various aspects of digital platforms' activities. At the same time, there are no published studies examining digital platforms from the point of view of the institutional economy. The digital platform is viewed by the authors from an institutional point of view as a new economic institution functioning in a hybrid reality that has the characteristics of an intermediary transaction and organizational institution. In order to better describe the activities of digital platforms as a new economic institution, the authors introduce such new concepts as "information-digital capital" (IDC) and "information-digital rent" (IDR).

KEYWORDS

institutional economics, intermediation, multi-sided platforms, digital platforms, transactional institution, informational-digital capital, informational-digital rent, big data, digital technologies.

JEL Classification: D23, D42, D43, D47, D85, L11, L14, L15, L26, L86, L96, O31.

1. INTRODUCTION

Platforming is a global and dynamic process in the digital economy and hybrid reality, driven by the development and distribution of *multi-sided platforms* (MSP). We understand hybrid reality as a fusion of physical and virtual realities.

Platforming has a significant reforming power capable of rebuilding the landscape of modern market relations, transforming traditional and forming completely new markets, industries and innovative business models, changing perceptions of methods and tools for managing organizations, competitiveness, creating and disseminating innovations, and influencing individual aspects of the economic and social life of people, their freedom and independence.

Multi-sided platforms (offline and online) serve multi-sided (in particular, two-sided) markets. MSP act as intermediaries and provide opportunities for direct interaction and exchange between two or more parties of the platform participants (Evans, 2003, Rochet and Tirole, 2003, etc.). Traditional (offline) MSP have a centuries-old history (for example, rural and city fairs).

The rapid development of the platforming process in recent years is due to the development and distribution of *digital platforms* (DP), a special kind of multi-platforms that operate online. DP developed actively in the format of search engines and social networks (Google, Yahoo, Facebook, LinkedIn et al.), operating systems (Windows, Linux, Apple iOS, Android et al.), as well as in industries such as ride-sharing (Lyub, Uber et al.), short-term rental (Airbnb, HomeAway et al.), finance and crowdfunding (PayPal, ApplePay, Kickstarter, Indiegogo et al.), online auctions and retail (Amazon, eBay et al.), and in many other directions.

Platforms are a complex subject for research due to the variety of their forms and types, as well as the different nature, scope, and direction of their activities.

The institutional approach to the study of DP makes it possible to determine (a) their essential integral characteristics as an economic institution, namely, a new type of intermediary transaction and organizational institution, (b) the specifics of their activities, and (c) the distinctive qualities and functions of this institution in the system of economic institutions and market relations as a whole.

Being initially a market structure, the digital platform goes beyond the market, turning it into the post-market to a certain degree. This creates a qualitatively different, coherent or subjectively-interrelated, form of realization of the economy. With such implementation, on the one hand, the relative freedom of economic entities and their self-organization remain, and on the other hand, a flexible and mobile order is established. Such phenomena as the strong-willed management and external regulation by the activities of the subjects move to the background or disappear altogether. Thus, DP act as peculiar organizational attractors in complex dynamic systems (Osipov et al., 2018).

2. LITERATURE REVIEW

Academic works devoted to the study of various aspects of multi-sided markets and platforms began to appear at the beginning of the 21st century. Among them, some works should be mentioned, including those written by J.-C. Rochet, J. Tirole, T. Eisenmann, G. Parker, M. Van Alstyne, M. Armstrong, A. Hagiu, J. Wright, D. Evans, R. Schmalensee, M. Cusumano, A. Gawer, R. Roson, B. Caillaud, B. Jullien, R. Lee and others. At the same time, much earlier works on various aspects of the information and network economy (Katz and Shapiro, 1985, Liebowitz and Margolis, 1994, Shapiro and Varian, 1999, etc.) also attracted much interest in this problem.

In works on multi-sided markets and platforms, researchers mainly focus on the following issues:

- pricing problems and network effects (Jullien, 2000, Rochet and Tirole, 2003/2006, Caillaud and Jullien, 2003; Parker and Van Alstyne, 2005; Eisenmann et al., 2006; Armstrong, 2006; Evans and Schmalensee, 2007; Gawer, 2009; Hagiu and Yoffie, 2009; Weyl, 2010; Hagiu and Wright, 2011/2015);
- platform management issues and their architecture (Armstrong, 2006; Armstrong and Wright, 2007; Lee, 2007; Boudreau, 2007; Boudreau and Hagiu, 2008; Eisenmann, 2006/2008; Hagiu, 2009; Hagiu and Yoffie, 2009; Eisenmann et al., 2011);
- public regulation and antimonopoly policy (Evans, 2003; Rysman, 2009);

- competition issues (Rysman, 2000; Gawer and Cusumano, 2002; Rochet and Tirole, 2003; Eisenmann et al., 2006; Brynjolfsson and McAfee, 2014; Pon, 2016; Evans, 2017) and other specific issues and problems.

Also, it is worth noting that there are a number of recent publications on digital platforms (Tiwana, 2014, Evans and Schmalensee, 2016; Parker et al., 2016), which attempt to comprehensively answer various questions about the essence, architecture and varieties of DP, their differences from traditional business models, DP users and their roles, governance and self-management mechanisms, network effects, pricing, competition, and many other issues.

At the same time, there are no published studies examining digital platforms from the point of view of the institutional economy as a separate economic institution of a new kind. In this connection, the authors conduct a research on those features of digital platforms that allow them to be referred to the type of economic institutions and, in particular, to intermediary transaction and organizational institutions.

3. RESEARCH METHODOLOGY

Intermediation is an essential element of any economic system. Intermediaries of various types and specializations provide communication and opportunities for interaction and exchange between different actors (for example, producers and consumers).

From an institutional point of view, "intermediation" can be classified as an "economic institution" and a subcategory "transactional institution" (Korneva, 2008). Transactional institutions are understood as institutions that provide transactional services (Wallis and North, 1986).

The concept of "transactions" was first introduced into the scientific circulation by the American institutional economist J. Commons. He defined the transaction as an economic process associated with the transfer of ownership rights to certain property objects (Commons, 1931).

Later, the founder of the neo-institutional economic theory of R. Coase identified approaches (Coase, 1937), which were later named as the concept of "transaction costs".

In the economic literature, there are many definitions and classifications of transaction costs (Stigler, 1961; Jensen and Meckling, 1976; Arrow, 1985; Williamson, 1985; Wallis and North, 1986, etc.). In general, they can be considered as costs arising from the interaction and exchange between entities. Transaction costs need to be distinguished from transformational (production) and other costs (Wallis and North, 1986).

There are a number of types of transaction costs: the costs of information retrieval, negotiation, measurement, specification and protection of property rights, and opportunistic behavior. The existence of transaction costs is due, in the main part, to the incompleteness and asymmetry of the information necessary for the entities to carry out their activities and exchange with other counterparties.

Currently, there is a tendency in the world economy to increase the volume of transaction costs as a result of the increasing complexity of economic mechanisms and processes, as well as because of the increasing information flows, the rising volume of transactions, the process of exchange depersonification, and other phenomena.

The main role of intermediary transaction institutes is to accumulate information (digital and non-digital), tangible, intangible, financial, and other resources and provide various entities with access to these resources.

Thus, intermediaries can:

- Reduce transaction, transformation and other costs;
- Increase the pace of turnover of goods and services and create the conditions for the emergence of new markets and industries;
- Increase the actors' awareness and the sustainability of their activities;
- Increase the certainty and transparency of the institutional environment;
- Structure the interaction and exchange between actors;
- Ensure the systematic reproduction of transactions between certain entities.

At the same time, negative effects from the activity of intermediary structures are also possible.

Intermediaries operate in virtually all sectors at the micro-, meso-, macro-, and global levels. Due to the accumulation of information, intellectual, and other resources, they tend to have higher returns than those in other sectors of the economy.

The complication of economic relations has affected the isomorphism and polymorphism of the institution of intermediation, affecting its similarities and, at the same time, the variety of forms and structures. More than that, the information-intellectual intermediation becomes the leading form.

The process of value creation in such institutions is carried out with the involvement of their resources, technologies, and other opportunities. From the point of view of the formation of the added value, the intermediators differ from the traditional pipeline companies. So, within the linear value chain, which is characteristic of classical firms, the added value of any good can be determined at each stage of production. The added value of the good, formed by the intermediary, is the sum of costs the intermediary has and the margin established by the intermediary from calculating the profitability of its activity. In other words, this is the amount that consumers or buyers pay to the intermediary in order to reduce transaction and other costs.

Demand of entities for intermediary transaction services is due to a number of reasons. For example, suppliers need to incur significant financial, temporary, and other expenses for collecting, processing, storing, and updating the necessary information, selecting appropriate personnel, etc., to independently provide the level of market information required. A positive result is not guaranteed. Given that the burden of expenses is borne by the subject (since it is the main consumer of this information), the cost of the products and services produced by him can grow substantially. As a consequence, this can lead to the loss of the entity's competitive market positions.

In the case when the transaction costs are low, the entities can perform interaction and exchange directly. This form of interaction can be called an institution of direct transactions.

Intermediary transaction institutes are most adapted to the network forms of organization, including cross-border ones. Currently, the institution of intermediation is actively developing and is implemented in the form of new virtual-network organizational forms, including in the form of digital platforms.

New forms and types of intermediation, as a rule, partially or completely replace traditional intermediaries. This process is often accompanied by a change in the formats of relationships existing between entities and the organization of their activities, as well as the processes of value creation.

4. RESULTS AND DISCUSSION

Digital Platform as a Transaction Institute

The institute of intermediation has undergone a radical transformation as a result of the emergence of digital platforms. DP significantly differ from the classical varieties of intermediation institutions and often completely or partially replace them.

Digital platforms can be defined as hybrid structures (organizations, systems, and technologies) that focus on value creation by providing and facilitating direct interaction and exchange between two or more groups of external users within a single digital ecosystem of algorithmic relationships (Osipov et al., 2018).

DP allow to connect people, devices, and various cyberphysical systems into a single intellectual and information space. In addition, DP allow for interoperability and transactions in a discrete mode, without the need for users of different parties to have a simultaneous access to each other.

DP can significantly reduce various transaction, transformational, and other types of costs, including through the use of actively developing and widely disseminated digital technologies (artificial intelligence, big data, cloud computing, Internet of Things, network, mobile, and other digital technologies) and digital devices (gadgets, sensors, etc.). Digital technologies and algorithms also allow to automate the process of selecting combinations of suitable actors (matchmaking), providing more accurate pricing and other processes.

Thus, if previously transactional institutions could be arbitrarily divided into intermediary institutions and institutions of direct transactions, then with the advent of DP, the authors of this work propose to supplement this classification with the institution of algorithmic intermediation.

Digital platforms partially or completely replace the traditional intermediaries that are limited in their capabilities and use mechanisms for cyclical feedback with the user communities they form, thus orienting themselves to market signals (feedback on the quality of products and services, the reputation of suppliers and consumers, etc.).

By reducing various costs, DP facilitate the disclosure of new sources and unrealized potentials on both supply and demand sides.

As DP functions that allow them to be classified as intermediary transaction institutes, the following can be distinguished:

- Providing conditions for the movement of information, goods, and services (including the transfer of property rights) between different actors;
- Optimization of transaction costs (search and processing of information and counterparties, negotiation, measurement, conclusion of agreements, etc.), transformational and other costs of actors;
- Increasing the awareness of the actors, reducing the asymmetry of information in the markets;
- Decreasing certain barriers to access to different markets or to limited resources of spatial, financial and other barriers for entities;
- Providing rapid and algorithmized intermediation between actors, including algorithmic selection of combinations of actors potentially suitable for interacting with each other (matchmaking);
- Implementing various economic interests of actors;
- Reducing the time for implementing interactions and transactions;
- Standardization of the process of making transactions;
- Accumulating revenues from transactions;
- Eliminating the deficit of information, material, human, and other resources.

As the unique features of digital platforms that distinguish them among other types of intermediary institutions and ensure the implementation of their intermediary functions at a new and better level, the following can be distinguished (Lobel, 2016):

- Formation of large multi-sided user networks by means of network effects, which leads to an increase in the availability of both supply and demand;
- Provision of opportunities for actors to interact with unfamiliar and untested counterparties;
- Involving underutilized material, human, and other resources in economic activity, which contributes to the formation of new markets and industries;
- Fragmenting traditional resources, goods, and services into new smaller transaction units and supporting their exchange (for example, short-term rent, hourly access to property, per-minute delivery), which can reduce the costs for the actors;
- Customization, commoditization and servitization of goods and services that contribute to improving the quality of supply and reducing the costs of actors;
- Transforming the consumption pattern from the culture of "ownership" to the culture of "access", which can result in a decrease in the size of transactions, as well as accelerate the market circulation of resources, goods, and services;
- Reduction of unproductive costs of entities as a result of reduced costs for servicing physical resources and assets;
- Reduction in costs of entry to the market for entities (costs of opening a digital business, for instance);

- Providing dynamic and more accurate pricing due to the collection and intellectual analysis of big data and using artificial intelligence;
- Using dynamic feedback systems (reviews, ratings, etc.), which allow reducing information asymmetry between actors.

It should be noted that in case of opportunistic behavior of digital platforms in relation to users, transaction and other costs may increase.

Digital Platform as an Organizational Institution

Organizational institutions are understood as institutions (systems, structures and subjects) that provide the organization of an activity through various mechanisms for controlling and stimulating subjects.

Digital platforms organize conditions for user interaction and give them a relative freedom of action. At the same time, DP have their own distinctive features of management and self-management, architecture and pricing, which allows them to be attributed to a new variety of organizational institutions.

The platform mechanisms of governance and self-government include formal and informal rules of participation and interaction, elements of DP architecture, and market mechanisms (Parker et al., 2016).

Formal rules are the defined general norms and rules, the implementation of which is monitored by certain subjects (user agreements, rules of conduct and interaction of participants, guidelines, instructions, etc.). Informal rules refer to informal behavioral norms, agreements, and other mechanisms aimed at improving the quality of interaction between DP members.

Elements of the organizational architecture are, mainly, complex algorithms and technologies that automate certain routine and other operations.

Market mechanisms are oriented, as a rule, to reducing the risks of interaction within the DP and, therefore, can also influence the behavior of users by providing them with various protective and stimulating services (insurance, intellectual property protection, work safety, etc.).

At the same time, measures to ensure markets security and transparency, to provide the "density" of the markets for rapid search of counterparties, and also to reduce negative activity and "stagnation" facilitate the reducing of certain risks associated with market failures on the platforms that service these markets (Roth, 2007).

The main actors associated with DP are the sponsors, providers, complementors, and end-users. Sponsors, as a rule, own DP intellectual property rights and can make decisions on strategic issues. Providers provide organization, control, and improvement of the quality of interaction between DP members and solve other operational problems. Complementors are the developers of root and peripheral components of DP. End-users are represented by external users of DP, for example, suppliers, consumers, and other types of participants.

Different configurations of sponsors and providers can define different models of organization and management of DP: proprietary (one sponsor and provider), joint venture (many sponsors and one provider), licensing (one sponsor and many providers), and shared models (many sponsors and providers) (Eisenmann, 2008).

These models reflect the varying degree of the DP openness. Open DPs provide users (complementors, end-users, and others) with broad powers to participate, manage, and develop the DP. Developed DP, as a rule, tend to more open models. Determining the optimal level of openness is an important factor in the development of DP (West, 2003; Gawer and Henderson, 2007; Eisenmann et al., 2009; Boudreau, 2010).

One of the competitive advantages of DP in comparison with traditional business models is their special architecture. The multilevel ("devices", "networks", "programs and applications", and "data") and modular ("core" and peripheral components) structure of DPS gives it unique flexibility in scaling and connecting various resources and participants. To extend the functionality of any DP, one creates an application programming interface (API), allowing complementors to develop third-party applications that easily supplement the core DP infrastructure.

Serviced by platforms, multi-sided markets are characterized by the presence of network effects. Network effects are understood as the effect of changing the number of network users on the change in the amount of value (marginal utility) created for each user (Katz and Shapiro, 1985; Gawer, 2009; Hagiu and Yoffie, 2009; Hagiu and Wright, 2011). When the marginal utility is increased, the network effect is called positive, and, in turn, it becomes negative with a decrease (Liebowitz and Margolis, 1994; Rochet and Tirole, 2003; Evans and Schmalensee, 2007). In the case when the marginal utility for users of one group changes depending on the change in the number of members of the same user group, then this network effect is called same-side (direct). At the same time, if the marginal utility for users of one group changes depending on the change in the number of members of another group of users, then such a network effect is called cross-side (indirect) (Caillaud and Jullien, 2003; Roson, 2005; Evans, 2008).

The development and maintenance of network effects is one of the factors in the successful operation of platforms. When the DP starts, the platform companies have to solve the problem of "chicken-or-egg", which is a set of critical mass of users on different sides of the DP. For this, DPs use different strategies: the piggyback, the marquee, the follow-the-rabbit, the seeding, and other strategies (Parker et al., 2016). In contrast to the traditional linear pipeline chain of value creation, digital platforms use complex mechanisms for the creation, transfer, and consumption of value by producers, consumers, and other platform participants at different stages and in different formats (Geliskhanov and Yudina, 2018). Platform companies develop technologies and, instead of transferring them into ownership or leasing, charge DP users a fee for the value created by DP technologies and services. This value can be manifested, for example, in the form of access to the benefits created by the platform, communities, markets, services, and management tools. Since these forms of value can exist only within the framework of the DP, they are the sources of added value, which is formed by the platforms.

The goods created and exchanged within the DP can be of various forms and types, for example, in the form of information, products, services, or social currency (reputation, attention, etc.) (Parker et al., 2016).

In order to identify revenue sources, platform companies must correctly identify sources of added value, target user groups, and pricing models. Revenue sources can be, for example, commission fees from users for various types of access to the DP resources and services.

In determining pricing models, platforms often use approaches that are similar (but with their own characteristics) to price discrimination of the third degree, when users of different segments set different prices for certain goods and services. Thus, by establishing a certain price structure, DPs internalize positive externalities (primarily cross-network effects).

In the development of pricing models, platform companies, in addition to price discriminatory approaches, also use combinations of membership fees and transaction fees. Membership fees often have fixed rates and are not dependent on further activity of the participants (for example, subscription payments), while transaction fees tend to have dynamic rates (Rochet and Tirole, 2003; Armstrong, 2006).

Pricing can be influenced by factors such as the variety of multi-sided markets served by the DPs, the level of competition, the market power of the platform, the heterogeneity of products and services, the characteristics and preferences of consumers, and other parameters.

Digital Platforms, Big Data, and Digital Capitalism

Digital platforms accumulate huge arrays of diverse digital data about platform participants (including personal ones), their behavior and preferences, carried out actions, transactions, and other information. Thus, DP users become one of the data producers.

Digital data have special economic properties: this is a non-competitive good (consumption by one entity does not exclude the possibility of its consumption by another entity), which can be produced and distributed at relatively minimal costs.

Various digital technologies (including technologies for processing and analyzing big data, artificial intelligence, etc.) allow us to identify relevant information, which already has cost and consumer properties, on the basis of large arrays of raw disparate data.

Typically, this information can be used by DPs for their own purposes (for example, for predicting and influencing consumer behavior, market management, individualizing services for users, etc.) and also be provided to third parties interested in this (for instance, advertisers).

According to experts' forecasts, the total amount of data in the digital infosphere will be multiply increased and exceed 163 zettabytes by 2025. At the same time, 20% of all digital data will play a critical role in everyday human activity, with 10% of them being supercritical. About 20% of all digital data generated by 2025 will consist of real-time data (mainly from the Internet of Things devices) (Reinsel et al., 2017).

The analysis of big data is gradually turning into an instrument of adoption, including by digital platforms, of operational decisions, which causes the development of the so-called "data-driven economy" (Yudina and Geliskhanov, 2018). Capitalism in this case was called as "surveillance capitalism" (Foster and McChesney, 2014).

Structured and unstructured big data of various formats, technologies, and tools for their analysis and processing, as well as relevant information with consumer properties identified on the basis of big data, can be attributed, in our opinion, to a new category of capital, which is the information and digital capital (IDC). The accumulation of IDC becomes one of the main goals of digital platforms.

Considering that DP, as a rule, accumulate ID-capital and have exclusive rights to use it, they, in our opinion, receive a special kind of rent, the information-digital rent (IDR). IDR can be defined as a kind of information rent, which is received by the actors having exclusive rights to use unique and valuable ID-capital.

IDR brings huge financial resources to platforms from various sources (own revenues, venture and other investments, etc.). At the same time, often not owning tangible assets and resources, platform companies are becoming the largest in the world in terms of market capitalization (Osipov et al., 2018).

DPs' striving for ID-capital accumulation and IDR assignment resulted in a new version of large transactions, which are data-driven M&A transactions. An example is the acquisition of WhatsApp by the Facebook Messenger in 2014 for 19 billion USD, the main asset of which are the large networks of users and related data.

In addition, new data trading markets are actively being formed, in which there are many large and smaller niche players.

As experience shows, the presence of ID-capital is not always a competitive advantage. Despite the strong positions of competitors with a huge IDC (Facebook, Skype, etc.), platforms that did not have ID-capital at the start (WhatsApp, Instagram, and Snapchat) also managed to secure strong market positions. This may reflect the existence of other limitations for the developed DPs (regulatory, market, commercial, etc.).

Digital platforms perform conduct operations with users' personal data often without informing users how their data is collected and used. This can lead to violation of the legislation on confidentiality and protection of personal data, as well as to asymmetries between platforms and their users. At the same time, the collection of such data allows DPs to improve their services and provide better information, products, and services.

In addition to DPs that provide direct interaction in the People-to-People format, the platforms providing communication in the People-to-Machine and Machine-to-Machine formats will also actively develop in the future. In addition, decentralized blockchain platforms also have a great potential for development in many spheres of human activity.

Given that legislation in various countries of the world does not always adequately respond to the challenges of modern times associated with the development of digital technologies and platforms, it is necessary to develop flexible and holistic legal, institutional, and other solutions at both international and national levels to reduce negative risks and increase the positive effects from DPs' activities.

5. CONCLUSION

The analysis in this study showed that digital platforms can be classified as new economic institutions. DPs have most properties that are characteristic of intermediary transaction and organizational institutions.

At the same time, digital platforms have their own unique features that allow them to perform intermediary functions on a completely different, better level. In connection with this, the classification of transaction institutes is proposed to be supplemented by authors with a new institute of algorithmic intermediation.

Digital platforms form a unique and valuable asset, ID-capital, through which they receive ID-rent. ID-rent provides DPs with large financial and other resources, which then allows DPs, with proper strategic planning and management, to become the largest companies in the world by market capitalization.

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