
Network Economy as a New Economic System

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Abstract:

This work deals with the study of new socio-economic relations, which are established due to the introduction of information and communication technologies. Associated problems are currently widely discussed in the scientific literature primarily from a technological point of view. Moreover, the attention is paid to ongoing and future changes in various markets, including the labor market.

The article proposes to distinguish the concepts of digital revolution and digital economy. It is maintained that the digital revolution is not a technological revolution, but a social revolution that is comparable in importance to the Neolithic, Class and Industrial revolutions. It is grounded that the digital revolution results in the formation of a new economic system, which can be called the network economy.

The research objective is to determine the key features of a new type of economy, namely, the forms of the division of labor peculiar to this system, the types of transactions, the ways of coordination of activities and the foundations of power.

The scientific hypothesis of the work is the following one: the digital revolution leads not just to structural shifts in the economy and modification of the ways of market interaction, but to a fundamental change in the economic system. The research is based on the methodology of institutional theory.

The result of the study is the substantiation of the statement about the change of the paradigm of economic development – the gradual replacement of the market economy by the network economy.

Keywords: *Digital revolution, network economy, coordination of economic activity, types of transaction, value networks, economic power, corporate relations of economic agents.*

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1. Introduction

At present, a radical transformation of the system of social production is carried out, one of the key drivers of which are information and communication technologies. These current changes are called digital revolution, and the emerging type of economy is called digital or network economy. Upon that, there is still no clear definition of these concepts. In the presented article the task of scientific comprehension of a category of “network economy” and its basic characteristics is set. The scientific hypothesis of the work is as follows: the digital revolution leads not only to structural shifts in the economy and modification of the ways of market interaction, but to a fundamental change in the economic system. In this sense, the digital revolution is comparable in importance to the Neolithic, Class and Industrial revolutions and results in a fundamental change in the type of economic system – the transformation of the market economy into the network one.

The research objective is to determine the key features of the network economy – its inherent types of transactions, ways of coordinating activities and the foundations of power. The research object is the economic system, which is formed as a result of the digital revolution, the research subject is socio-economic relations arising from the introduction of information and communication technologies. The scientific novelty of the study is to apply the institutional research methodology to analyze the current changes, which led to the conclusion that the institutional environment of economic activity has drastically changed. The results obtained by the authors are argumentative and essentially different from the majority of works that focus attention on the social and economic consequences of the introduction of digital technologies.

The article includes a review of the main studies in this field, substantiation of the authors’ point of view as for the new type of economic system formed as a result of the digital revolution, as well as historical analysis of types of transactions, ways of coordination of activities and the foundations of power that allows speaking about the spiraling nature of the development of economic relations.

2. Literature Review and Current State of the Studies

The works of E. Schmidt, D. Tapscott, D. Pink, A. Sundararajan, C.B. Frey and K. Schwab deal with the impact of the digital revolution on socio-economic processes. Their studies are focused on identifying the main characteristics of a new type of economy, determining its structural elements, analyzing the impact of digital technologies on the further development of society.

It is believed that for the first time the term “digital economy” was applied by N. Negroponte, an expert in the field of information technology at Massachusetts Institute of Technology (USA), who in 1995 drew attention to a fundamental change in the foundations of social production – shifting from processing atoms to

processing bits – “when information is embodied in atoms, there is a need for all sorts of industrial-age means and huge corporations for delivery; but suddenly, when the focus shifts to bits, the traditional big guys are no longer needed” – and outlined the basic characteristics of a new business model – “virtual reality”, “less and less dependence upon being in specific place at specific time, and the transmission of place itself” (Negroponte, 1995). Tapscott describes the era of the digital economy as a revolutionary phenomenon, combining new forms of development of communications, computer technologies, as well as promoting information in order to create a global form of interaction within societies and the whole world (Tapscott, 1996).

Apart from the fundamentally new opportunities for economic development of both individual economic agents (Anderson and Wladawsky-Berger, 2016), and national economies and the world community as a whole (Gupta and Auerswald, 2017), many researchers note the existence of considerable threats associated with the digital economy: “While the digital economy creates significant opportunities for companies, it also escalates the threat of breaches in cybersecurity, misuse of intellectual property and reputational damage from open communication on the web” (PwC, 2011). Negative aspects of the digital economy are given much attention to in the article written by Tapscott (2016).

It is now difficult to determine the primacy in applying the term “digital revolution”, but one can mention the names of scientists who studied this phenomenon. They are M.W. Alstyne, R. Glass, J. Cohen, B. Leukert, G. Parker, D. Rogers, S. Choudary, E. Schmidt and K. Schwab.

According to Schwab, the revolutionary changes cover three directions: physical (“autonomous vehicles, 3D printing, advanced robotics, new materials”), digital (“a relationship between things and people that is made possible by connected technologies and various platforms”) and biological (“synthetic biology – the ability to customize organisms by writing DNA”) (Schwab, 2017). Other researchers are focused exclusively on only one of these three directions – a digital one. So, in the work by G.G. Parker, W. Marshall, Van Alstyne and Sangeet Paul Choudary it is argued that a radical change in the global economy is under the influence of digital platforms: “the answer is the power of the platform – a new business model that uses technology to connect people, organizations and resources in an interactive ecosystem in which amazing amounts of value can be created or exchanged. The platform is a simple-sounding yet transformative concept that is drastically changing business, the economy, and society at large” (Parker *et al.*, 2016). The dominant influence of the platforms on the transformation of the economy and society as a whole is also stated by E. Schmidt and J. Cohen (Schmidt and Cohen, 2017), R. Glass and B. Leukert (Glass and Leukert, 2017) and D.L. Rogers (2016).

There are also works in which the new economic reality is called the “network economy”. Here, it is necessary to mention the work by S.I. Parinov “On the Theory

of Networked Economics” (Parinov, 2002). In S. Carmichael’s work, the impact of digital technology on the strengthening of network effects in the economy is under consideration: “As our economy has grown more global and more digital, businesses have had to shift their competitive strategies, marketing techniques, and business models. One of the most powerful changes? The rise of network effects” (Carmichael, 2016). Much attention is paid to the role of network interaction in the modern economy in the works by P.L. Bernstein (1998), A. Nagurney, J. Loo, J. Dong, D. Zhang (2002); Zhang, Dong and Nagurney (2003) and P. Nijkamp (2003).

In addition to that, in spite of the variety of studies devoted to investigating the features of the functioning of a new type of economy, a number of issues, in our opinion, remain insufficiently reviewed. This should include the definition of the new mechanisms of interaction between economic agents, types of transactions, ways of coordinating activities and the foundations of power inherent to the network economy.

Furthermore, it should be noted that the term “network economy” is used to refer to two interconnected, but at the same time different classes of phenomena: (1) the economy in which the top domain of interconnection is the global information network – the Internet and digital platforms; (2) an economy based on long-lasting and stable links between economic agents. In the first case, the term “network” refers to a new technical mode of interaction, and in the second, to the nature of the links between economic agents.

In this paper we study the phenomenon of the second kind. We focused on the information and communication component of the ongoing changes and made an attempt to estimate the impact of these changes on socio-economic relations.

3. The Proposed Methods and Approaches to Solving the Tasks

The scientific novelty of the methodology of the undertaken study is a combination of neoclassical, institutional and evolutionary theories of economics, as well as economic sociology. Historical, systemic and institutional analyses are used as research methods.

4. Results

It seems to us appropriate to distinguish between the concepts of social revolution and economic system. The first type of concepts can include cardinal changes resulting in the formation of a new model of social and economic development, which are commonly called social revolutions:

- Neolithic revolution – transition from the appropriating to the reproductive type of management;

- Class revolution – division of society into classes, a clear separation of routine production activities from prestigious (valorous) activities that are not related to production;
- Industrial revolution – the widespread separation of enterprises from households, the emergence of markets for hired labor and the means of production;
- Digital revolution – spreading platforms as tools for coordinating the activities of economic agents, blurring the boundaries of firms and changing the role of households.

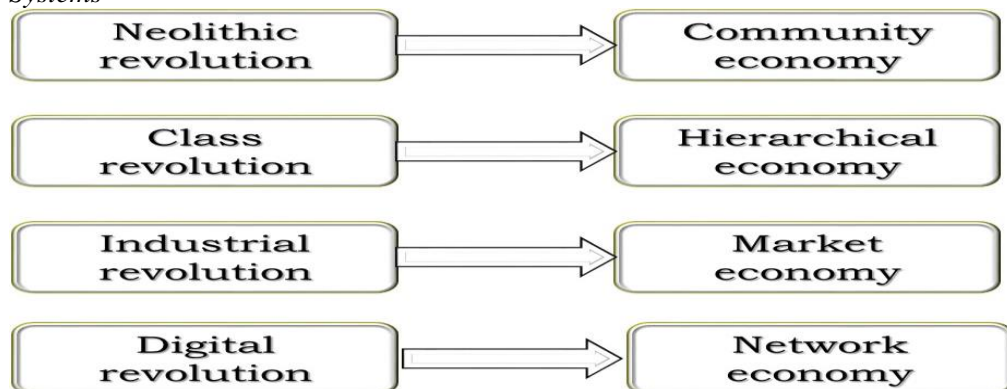
The main characteristics of global social revolutions are presented in Table 1.

Table 1. *Types of Social Revolutions*

Revolution	Essence	Basic economic units	Key domain
Neolithic	Transition from the appropriating to the reproductive type of management	Households and communities	Agriculture
Class	Establishment of the state, the formation of class society	Peasant (household) and feudal economy	Agriculture and war
Industrial	Formation of the system of markets	Enterprises and households	Industry
Digital	Globalization of communications	Digital platforms and networks	Information technology

The types of economic systems (social formations) that were formed as a result of social revolutions include community, hierarchical, market and network economies (Figure 1).

Figure 1. *The Relationship between Types of Social Revolutions and Economic Systems*



In other words, the Neolithic revolution signifies the transition from the appropriating life model to the management of the problem of limited resources based on the communal economy; the class revolution is characterized by the emergence of the state institution and a hierarchically built economy; the industrial revolution creates the prerequisites for the development of a market economy, and the digital one lays the foundations of a new type of economic system, which can be called networked. We proposed an operational definition of this phenomenon:

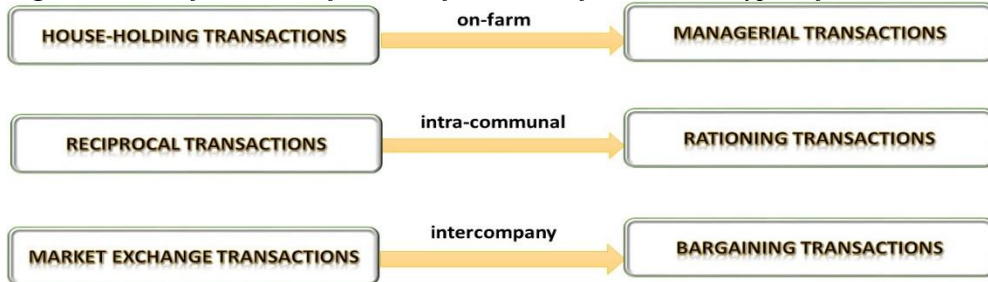
A network economy is an economic system in which interaction between economic agents occurs on the basis of direct long-term cooperative and informational links mediated by trust relationships. For a better understanding of the content of the distinguished economic systems, we have identified the forms of the division of labor typical of them, the types of transactions, the ways of coordinating economic activity and the foundations of power. The history of the development of the economy shows that the division of labor as the engine of economic progress can be carried out in three basic forms:

- On-farm division of labor, which originated within the household and is based primarily on the household members' gender and age differences;
- Intra-communal division of labor, stemmed from the need to advance expertise and use the economies of scale to perform the functions of serving all members of the community – the specialization of labor of blacksmiths, potters, shepherds, etc.;
- Intercompany division of labor, which emerged as a form of exchange of commodities between communities and became the basis for the rise of a system of modern markets.

Gradually, with the collapse of the institution of the community, an intensification of the two kinds of division of labor – on-farm and intercompany – and the displacement of the intra-communal forms of interaction into the periphery of economic life occur. In such a case, the emergence of new forms of economic organizations – profit-oriented enterprises using hired labor– provokes the replacement of the on-farm division of labor based on gender and age differences, with the technological division of labor – the division of the production process into elementary operations performed by different workers. At the same time inter-company interaction acquires the character of regular monetary exchange; and the formation of the market institution as a sustainable system of economic relations takes place.

If we use the well-known typologies of transactions by Commons (1924) and Polanyi (1966), we can say that simultaneously with the modification in the content of the division of labor, the types of transactions upgrade: archaic house-holding, reciprocal and exchange transactions gradually transform into managerial, rationing and bargaining transactions (Figure 2).

Figure 2. Transformation of Forms of Division of Labor and Types of Transactions



There are four clear (ideal) ways of coordinating activities (Dement'ev, Evsukov, Ustyuzhanina, 2017):

- Market pricing, equilibrium between demand and supply based on competition among sellers and buyers striving to maximize their profits;
- Administrative regulation in the form of direct control;
- Mutual (consultative) coordination;
- Standardization, both in the form of formal norms and routines as well as traditions.

In real life, these four ways of coordination complement and support each other. Thus, in the market, along with pricing coordination, there are standardization (normative regulation) and mutual (consultative) coordination (neo-classical and relational contracts). In addition, mutual coordination does not exclude the existence of the phenomenon of bargaining power, and standardization can find its manifestation in various forms: from traditions and routines to conventional and formal principles.

If we compare the forms of the division of labor and the ways of coordinating activities, then for intra-communal division of labor, the main way of coordination is administration supported by standardization. Intercompany interaction is correlated not only by prices that match the supply and demand among themselves, as well as the economic interests of the parties, but also by standardization –enhancing the role of formal norms governing relations between relatively autonomous economic entities. Intra-communal division of labor also applied such way of coordinating economic activity as standardization, but in a somewhat different form of maintaining traditional relations and well-established interaction routines. At the same time, the leading method of coordination was mutual coordination (consulting coordination) (Table 2).

Table 2. Economic systems and leading ways of coordination

Economic system	Basic transaction	Ways of coordination
Community	reciprocal	mutual coordination + standardization (routines and traditions)
Hierarchical	managerial	administrative regulation + standardization

		(technological and bureaucratic)
Market	bargaining	market pricing + standardization (legislative support)
Network	rationing	mutual coordination + standardization (conventional rules)

Getting around to collective forms of activity and consulting coordination does not mean the solution of two basic social conflicts – the struggle for limited resources and the struggle for power.

The problem of limited resources is the basic problem of the economy. Its solution is normally governed by the formation of rules for access to resources, which over time are regularized by ownership rights. Classical economics originated in the era of the establishment and flourishing of a market economy implicitly proceeds from the priority of property relations over the relations of power – the distribution of rights and freedoms among economic agents. However, this approach simplifies the problem of power by imposing social norms of the market economy on other economic systems.

Meanwhile, in previous epochs, property relations were derived from relations of power. As Veblen (2006) notes: *“It may be worthwhile to indicate how this ultimate ground of ownership, as conceived by modern common sense, differs from the ground on which rights of the like class were habitually felt to rest in mediaeval times. Customary authority was the proximate ground to which rights, powers, and privileges were then habitually referred. It was felt that if a clear case of devolution from a superior could be made out, the right claimed was thereby established; and any claim which could not be brought to rest on such an act, or constructive act, of devolution was felt to be in a precarious case. The relation was essentially a personal one, a relation of status, of authority and subservience”* (Veblen, 2006). In other words, the power-ownership dilemma constantly reproduced had the advantage not on the side of property, but on the side of power-status.

Property began to act as a “natural human right” and the leading foundation of power only in the era of the market economy (the capitalist mode of production). At the core of this power there was the separation of workers from the conditions of their labor and the formation of the market for hired labor. Ownership of the means of production (capital) began to determine the right to control the actions of hired workers, the right to dispose of the products produced and the right to residual income.

Another source of economic power in the area of market interaction is the monopoly position of one of the agents, which affects the parties’ bargaining power. Monopoly can be caused both by the control over an irreplaceable resource, and by the scale effect, which causes the economic inefficiency of the existence of two suppliers of a product or service.

The scale effect manifests itself not only in the form of a monopoly. In oligopolistic markets, the power of large companies over their suppliers and consumers is determined, above all, by the possibility of ensuring this effect. Suppliers who deal with an oligopolist, whether a manufacturing company (Boeing, Toyota), a network retailer (Wal-Mart, Costco) or a digital platform (Uber, Airbnb) crucially increase their sales and at the same time significantly save transaction costs.

The scale effect is particularly strong in the so-called bilateral markets, where digital platforms serve as intermediaries between a multitude of suppliers and a multitude of consumers (Rochet and Tirole, 2003). Providing interaction between the two groups of participants with minimal transaction costs, the intermediary firm attracts counterparties by significant economic advantages, which simultaneously determine their subordinate position in relation to the integrator. This source of power can be called economic coercion, which is based on the current benefits of cooperation. But subsequently, this results in a narrowing of the space needed for choice and atrophy of own market competencies (Dement'ev and Ustyuzhanina, 2016).

Platforms act not only as coordinators of interaction between two groups of participants (suppliers and consumers), but also exercise strict control over the behavior of their counterparts throughout all stages of market interaction. They select participants, create information profiles for potential clients; organize legal support for transactions; control the fulfillment of obligations and, if necessary, force participants to fulfill their commitments. The price and quality of products and services provided are significantly affected. For instance, Booking.com puts the price pressure on hotels (there are more than 1 billion accommodation facilities in more than 220 countries in the company's database) and forces them to promote the most profitable offers for tourists.

Our historical analysis of the forms of the division of labor, the leading ways of coordinating economic activity, the types of transactions and the foundations of power, made it possible to reveal spiral regularity in the development of economic systems. We have established that the era of communal economy is replaced by the era of alienation, represented by two types of economic systems – a hierarchically aligned class society and a market economy. Moreover, currently, thanks to the revolution in the field of communications, the era of alienation is gradually giving way to the era of new forms of collective activity, which can be called a network economy.

5. Discussion

In accordance with the neoclassical approach prevailing for a long time, economists considered the intra-communal forms of interaction an archaic phenomenon, which should be studied only from the historical point of view (the exception is the work by E. Ostrom (1990).) However, researchers have recently emphasized an apparent revival of many features of the intra-communal type of relations on a new spiral of

economic development. This refers to the emergence of network forms of interaction between business entities (Ustyuzhanina *et al.*, 2017).

As S. Parinov (2002) indicates: “it is logical to assume that market and hierarchical forms arose in response to the inability of the communal form of management to ensure the effective handling of the division of labor system when it began to go beyond the community. The reason is the limited possibilities of communication tools and information exchange systems existing at that time, which did not provide a broader range of people with the level of information exchange necessary for the smooth functioning of the community economy” (Parinov, 2002).

The development of information and communication technologies (ICT) allows to solve the problem of direct information exchange, and, consequently, to establish direct links between a very wide range of people. Accordingly, intercompany relations are becoming increasingly cooperative (Figure 3).

Figure 3. Dynamics of dominant types of economic interaction



It can be exemplified by the active development of the practice of sharing resources for commercial purposes. Currently, the common use of vehicles by transport companies, the pooling of routes by airlines and of radio frequencies by mobile operators is becoming widespread. A new type of economy, emerging before our eyes, a network economy, combines the features of market and communal ways of organizing economic life.

The main difference between the network economy and the communal economy is the replacement of reciprocal transactions with trade transactions. The key distinction between the network economy and the market economy is the change in the dominant way of coordination – the interaction of supply and demand, regulated by the price mechanism, is increasingly giving way to mutual coordination. The main differences between the network economy and the market economy are presented in Table 3.

Table 3. Main differences between network and market systems

Type of economy	Ways of coordination	Basic type of transaction	Basis of economic power
Market	Pricing	Bargaining	Ownership of the means of production
Network	Mutual coordination	Rationing	Position in the hierarchy of the interaction field

It would be wrong to consider the time-stable links of economic agents to be a new phenomenon. Rather, the opposite might be argued. Initially, these were the basic

forms of economic interaction, which were ignored by economists who studied market systems, since they were considered some residual effects whose importance will fade as the free market progresses. Today, it is becoming increasingly clear that the free competitive market, on which independent and unrelated agents interact, is not a rule, but an exception typical for the stage of the formation of a specific “market field”. As the market moves progressively into the maturity stage, it establishes certain game rules, its own hierarchy and entry barriers (Fligstin, 2001). Classical contracts are increasingly giving way to neo-classical and relational contracts (Williamson, 1987). Along with the company and the market, a new interaction field is formed – a value network. And this field establishes its own hierarchy of positions of participants.

It should be noted that while recognition of the firm’s hierarchical nature is generally accepted, then the idea of a hierarchy in the market is relatively new. It goes back to the works by P. Bourdieu (2000), G. Hamilton and Biggart, (1988), J. Hodgson (2015) and N. Fligstin (2001). The neoclassical theory of economics recognizes such concepts as bargaining or monopolistic power but links them exclusively to the market structure and entry barriers. Meanwhile, representatives of economic sociology and traditional institutionalism believe that in mature markets, there exist own rules of the game that allow market leaders to impose their terms of interaction on all other participants. Economic entities differ not only in economic but also in cultural, social and symbolic capitals. Similar considerations apply to value networks. They can also be viewed as fields of interaction between counterparties, on which their own hierarchies are created.

6. Conclusion

As a result of the undertaken research, it was revealed that currently the market model of the economy is increasingly giving way to a new model, which can be called a network model. The main characteristics of the network economy are: stable cooperative and informational links of economic agents; mutual coordination as the leading way of coordinating interaction; gradual replacement of bargaining transactions by rationing transactions; building a hierarchy of interaction fields, including markets and value networks. Historical analysis of the development of economic systems allows to draw a conclusion about the spiral nature of the changes.

This regularity can be traced both at the level of successive changes in the leading methods of coordination (mutual coordination – administration – prices – mutual coordination) and at the level of transformation of the institution of power (position in the social hierarchy – private property – monopoly – position in the hierarchy of the interaction field).

In the network economy, an important source of power is the ability to impose one’s own rules of interaction on other agents. This opportunity is based on the position in

the hierarchy of the interaction field. With regard to competitors, this field is the industry market, in relation to counterparties – this field is a value network. The findings obtained by the authors are the scientific basis for further research in the field of the digital economy, in particular, the study of possible forms of power distribution and added value in the value network.

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