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Digital ecosystem structure formation depending on the archetype of distribution network participants

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Abstract

Purpose – Fundamental changes in economic relations, instability of the market environment in which enterprises operate and increased intensity of competitive influences to obtain better business conditions emphasize the importance of the nature of interaction for all participants of business processes in the distribution channel and the success of the chosen business structure. This circumstance determines the expansion of the content of the ecosystem approach to the organization of enterprise activities and the clarification of the participants' roles in such systems. The purpose of the study is to identify the key features and differences in business models of digital ecosystem participants that are critical to shaping the value of the distribution system.

Design/methodology/approach – In this paper, within the framework of the theoretical component, the authors analyze conceptual and empirical articles contained in the Web of Science database and also rely on information obtained from the study of articles by Russian academicians in specialized journals, monographs and conference abstracts. Using the method of content analysis, data on enterprises were collected and generalized into cases, which made it possible to propose possible classification properties of enterprise archetypes within the digital ecosystem and to determine the general properties of the objects under study and their interrelations.

Findings – The systematization of results allows us to present a co-competitive activity model for ecosystem participants, depending on their archetype, where they are segmented according to the dominant principle of role and activity within the system. From a practical point of view, the considered classification of the archetypes of recipient enterprises and their economic relations make it possible to structurally visualize a digital ecosystem, which significantly reduces the distance between the consumer of the product/service, the manufacturer and the seller. This reduces the time of delivery and waiting as well as the time to find a suitable option making the market more perfect. The proposed conceptual framework indicates the interdependence of the development of all participants in the product distribution and proves that successful business models take part in the market expansion. Finally, the authors' systematic review of the academic literature results in identifying certain promising directions for future research based on the consideration of open ecosystems with transparent infrastructure.

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Research limitations/implications – The results are limited by the authors' sample data and the case study approach. The study does not show the further evolution of the digital ecosystem depending on the set and configurations of ecosystem participants. The authors introduce a possible new classification of archetypes of ecosystem participants and a co-competitive activity model for ecosystem participants depending on these archetypes.

Practical implications – From a practical point of view, the considered classification of the archetypes of recipient enterprises and their economic relations make it possible to structurally visualize a digital ecosystem, which significantly reduces the distance between the consumer of the product/service, the manufacturer and the seller.

Originality/value – From a practical point of view, the considered classification of the archetypes of recipient enterprises and their economic relations makes it possible to structurally visualize a digital ecosystem, which significantly reduces the distance between the consumer of the product or service and the manufacturer or the seller. This reduces the time of delivery and waiting as well as the time to find a suitable option making the market more perfect in this respect.

Keywords Ecosystem, Digitalization, Distribution systems

Paper type Research paper

Introduction

Global trends such as the emergence of disruptive technologies, digitalization and accelerated product lifecycle are driving massive changes in most areas of activity. Distribution channels are changing, profitability zones are shifting and new players appear on the market. All these fundamentally change the balance of power in industries significantly accelerating the introduction of new business models. Involvement in universal digitalization leads to changes in all spheres of activity. Many new companies appear, while the leaders are those enterprises that build their organizational and economic ties taking into account the requirements of digital trends. In this regard, the ecosystem approach to the organization of interaction is becoming widespread.

The business ecosystem is a relatively new concept, which was introduced by Moore (1993), and it describes enterprises as an evolving system of interconnected organisms that coevolve and compete with each other. The digital business ecosystem is a system that has a digital aspect of business collaboration (Kohtamäki *et al.*, 2019). It ensures that participants find themselves in an environment where there is access to information and programs and where software components, services, applications and business models are considered as "digital species" that can interact with each other, reproduce themselves and develop in accordance with market selection laws. Numerous research papers present a number of approaches to the formation of a digital business model of an ecosystem (Karakas, 2009; Senyo *et al.*, 2019; Korpela *et al.*, 2016; Venkatraman *et al.*, 2014; Elia *et al.*, 2020; Li *et al.*, 2019; Blaschke *et al.*, 2018; Gupta *et al.*, 2019; Henningsson and Hedman, 2014; Kituyi, 2019; León *et al.*, 2016; Teece and Linden, 2017; Autio *et al.*, 2018; Coppin *et al.*, 2002; Hanna *et al.*, 2011; Rita *et al.*, 2021; Rodríguez *et al.*, 2017).

Despite the significant number of definitions of this concept, it is necessary to clarify its content. The directions related to the determination of the composition, functions and their features, as well as the peculiarities of ecosystem management methods, coordination mechanisms within ecosystems, etc. have not been sufficiently studied. This article attempts to consider the possibility of using an ecosystem structure to identify types of distribution structures at the aggregated level and to denote the roles within the ecosystem on which the researcher's attention will be focused. The paper overviews the main works devoted to the substantiation of the ecosystem concept and analyses the features and advantages of this form of production organization.

The purpose of the article is to substantiate the feasibility and scientific correctness of using the ecosystem concept as an object of economic and management research.

To achieve this goal, it is necessary to solve the tasks as follows:

(1) To explore the concept of an ecosystem that goes beyond the individual company and direct participants in the value chain and allows us to describe the indirect effects produced by the mutual influence of organizations;

(2) To clarify the theoretical basis of the ecosystem concept and to conduct a bibliographic analysis of how this concept is used;

(3) To identify the key features and differences in the business models, which are employed by the digital ecosystems' participants and are critical in shaping the distribution system value.

This article develops the concept of digital ecosystems and presents some of the archetypes of actors and their roles depending on how much the enterprise is involved in the process of creating ecosystem value.

Theoretical framework

Currently, research into digitalization processes in all areas has intensified. At the moment, a lot of research is devoted to the methods and key principles of how distribution systems, marketing channels and distribution channels are formed. There are also many practical cases describing the interaction of economic agents. Thus, the ecosystem approach has recently become one of the topics attracting the interest of the academic community and also a promising area of practical application in the activities of enterprises (Ratten, 2020; Kandiah and Gossain, 1998; Scaringella and Radziwon, 2018; Sklyar *et al.*, 2019; Stam and van de Ven, 2019; Tsujimoto *et al.*, 2018; Tsvetkova and Gustafsson, 2012; Valkokari, 2015).

The ecosystem approach is interdisciplinary, as it covers various fields of activity and includes such academic areas as sociology, economics and psychology of relationships (Corvini and Bellows, 1955; Sewell, 2004; Al-Omoush *et al.*, 2020; Ghahtarani *et al.*, 2020). For instance, Iansiti and Levien (2004) use a powerful example of biological ecosystems to show how companies can leverage new business interactions to achieve long-term success. The title of the book is taken directly from biology and refers to the types of organisms that actively maintain healthy functionality of their entire ecosystem for one simple reason – their own survival depends on it. Likewise, according to the authors, companies can protect and ensure their own success by knowingly contributing to the overall health of the network in which they operate (Blackburn, 2005). These authors concluded that different enterprise development paths depend on customer experience and operational efficiency, leading to new digital business models (Weill and Woerner, 2015, 2018). Entrepreneurial ecosystems include a network, a system of interaction between individuals and organizations such as financial intermediaries, universities and research institutions, suppliers and customers, multinational companies or government. Entrepreneurial ecosystems are also seen as a strategy for regional economic development based on creating favorable conditions for the development of innovative start-ups. Thus, the entrepreneurial ecosystem academic literature examines the development and change of entrepreneurial ecosystems over time and the internal dynamics of entrepreneurial ecosystems. Despite the popularity of the ecosystem approach, the academic literature has paid almost no attention to and largely ignored the nature of the interaction and the role of ecosystem participants.

In our study, we have considered various attributes of non-economic academic fields: for example, relations within an ecosystem can be linked to the functioning of a biological organism which, in its development, aims at reproducing its own kind. This development is associated with the replication of successful business models and

technologies in trade and production, which can be viewed as the expansion of successful types of business entities. With the help of various case situations, we have examined how entrepreneurs in different countries and over approximately the same time period create similar business models of activity. This phenomenon can be called the expansion of similarity, when a certain system tries to form a certain integral superstructure/group. To this end, a new multi-disciplinary approach to interpreting complex patterns of enterprise activity is required in order to gain a deeper and more effective understanding of the ecosystem structure. In this article, after a brief introduction to the basic concepts of Jung's analytical psychology, we propose using Jung's archetypes to implement the co-competition model (Brown, 2011; Samuels, 1983; Tallman, 2003). Basing on observations and comparison of available information about companies, we introduce archetypes of enterprises included in the digital ecosystem by analogy with the theory proposed by Carl Gustav Jung and his disciples (Jung, 2014; Olson, 2019; Robertson, 1992).

Jung defined archetypes as a system of deep-seated behavioural patterns, typical reactions and attitudes derived from the collective unconscious that is common to all human beings (Jung, 1935). Putting forward his system of psychological types, Jung provides a means for understanding ourselves and the world around us: our various behavioral patterns, relationships, marriage, national and international conflicts and organizational functioning. In human behavior, Jung denoted common traits that are similar for many people and defined six personality archetypes.

These considerations allow us to state the following: higher competitiveness of the company is present or absent in the decisions that are made at the scale of the system. We believe that each enterprise that is part of the ecosystem contains elements of certain archetypes, whose characteristics are given in this article.

Due to the obvious multiplicity of studies devoted to ecosystems, this area, as argued by Maroufkhani *et al.* (Maroufkhani *et al.* (2018), remains thematically fragmented and lacks a contribution that would clearly articulate the multiple roles and functions of enterprises participating in ecosystems. When designing ecosystems, it is necessary for state policy and regional development of the market to revise both the possibilities of cooperation and the interfaces of interaction between the stakeholders of entrepreneurial activity. Academic literature creates a theoretical basis for the study of business ecosystems, which relies on theories of economic evolution and considers important concepts such as co-evolution, self-organization, emergence, conscious choice, limited knowledge, interconnectedness, feedback and interaction of variation, selection and development (Basole *et al.*, 2018; Demil *et al.*, 2018; Gomes *et al.*, 2018; Humbeck *et al.*, 2019; Peltoniemi and Vuori, 2004; Pidun *et al.*, 2020; Rinkinen and Harmaakorpi, 2019; Scarlat, 2007).Despite the fact that business ecosystem creation is an urgent issue in the context of the digitalization of the economy, creating business models with a focus on innovative advancement is still an unaddressed problem due to the need to define the roles of ecosystem participants; enterprises do not fully understand their functionality, which hinders their development.

Academic research has an increasing contribution to the digital ecosystems' creation, but there is also a need for a deeper understanding of how ecosystem participants interact and how their roles and opportunities can be assessed and compared between existing business model structures.

From a practical point of view, the considered classification of the archetypes of recipient enterprises and their economic relations makes it possible to structurally visualize a digital ecosystem, which significantly reduces the distance between the consumer of the product or service and the manufacturer or the seller. This reduces the time of delivery and waiting as well as the time to find a suitable option making the market more perfect in this respect.

Methodology

The research methodology is described in Figure 1 and presents the process of cognition from the study of technology and the basic principles of digital ecosystems to the development and substantiation of a co-competition model based on the archetypes of enterprises of ecosystem participants as a way to improve the efficiency of enterprises in modern market conditions. The study used a systematic review of 50 articles drawn from three global databases – Web of Science, Google Scholar and Scopus. The analysis includes two stages. First, a descriptive report looks into research on ecosystems, digital and entrepreneurial ecosystems, as well as related categories present in the logic of the research as described in Figure 1. Second, we proceed with a case study based on thematic categorization of research on enterprises that are part of ecosystems.

In the first step, we reviewed the corresponding literature and analyzed case studies of the surveyed enterprises. To ensure that the case studies are consistent with our research focus, we selected businesses that participate in ecosystems or use ecosystem-based business models or those related to it regardless of industry. To identify the demand for ecosystems, which is the core of the modern manifestation of customer-centric business based on digitalization expanding the potential of enterprises, we conducted a market research in the form of a survey, in which representatives of enterprises from various industries and fields of activity took part. We believe that we have obtained satisfactory results, indicating that the business is interested in the implementation of such systems. So by analyzing the answers to the survey questions, we can say that almost all respondents (98%) are aware of digital

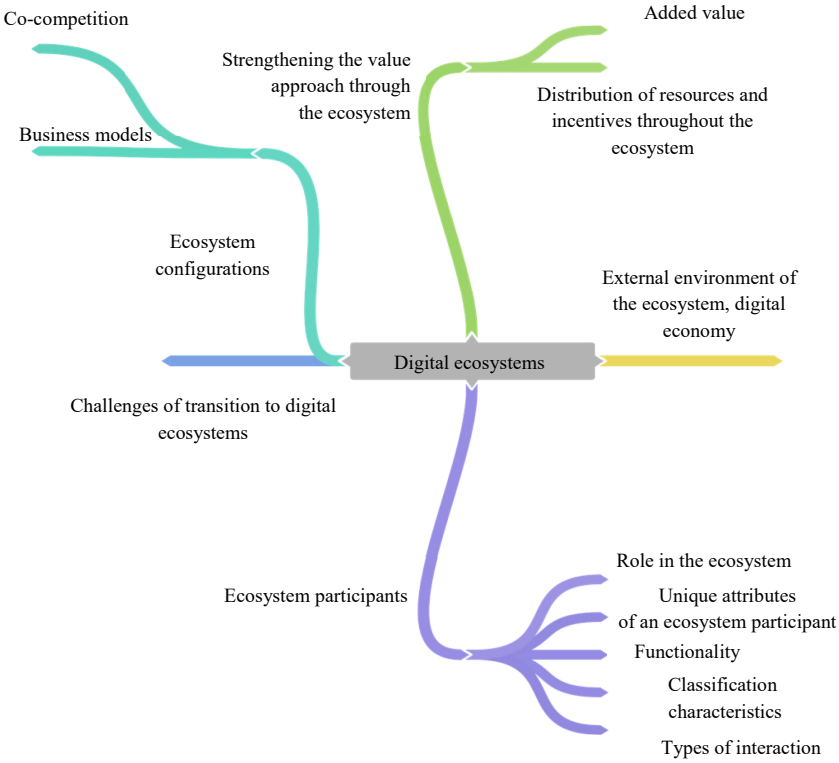

Figure 1.
Research logic

platforms and use digital platforms together with their applications and services to solve everyday tasks.

The findings from the survey and meetings with company representatives were useful for creating preliminary versions of the archetype typology and drafting the minutes of subsequent interviews.

Further, we analyzed the data relying on case studies of the respondents' enterprises. The case study method refers to the situation analysis technology, which is one of the most suitable approaches to answer the questions formulated in the study and to identify the development dynamics of enterprises' functionality within the ecosystem. The specificity of this technology lies in the fact that it is carried out in the form of a situational analysis of how enterprises react to any conditions, but this is possible only by interacting with the participants of the process, considering various viewpoints and approaches and arguing for our own position.

Primary data were collected by interviewing representatives of selected enterprises as well as by collecting information from open sources. The interview scenarios were prepared to facilitate data collection, together with the available information, a description of real economic situations was obtained, which will allow us to understand the essence of the research matter, suggest possible classification features of enterprise archetypes within the digital ecosystem and help to choose the most suitable business model.

The choice of an enterprise is a critical element of this study since enterprises must provide a significant contribution to the economy, which should be interesting and competitive in the market and use digital technologies in their activities.

So in the context of digital transformation, one of the pressing academic issues is the optimization of relationships in the chain of interaction between the manufacturer and the consumer. Significant economic and technical advantages are provided by the integration of multiple currently existing economic entities representing various industries. To do this, we consider enterprises and partners in the broader context of a distribution channel (a digital ecosystem, in which it is possible to develop incentives and criteria for ensuring close and open interaction between participants, which will contribute to the joint increase of competitive advantages).

The attempt to classify enterprises in strict accordance with archetypes has a number of limitations, since the boundaries between archetypes can be blurred and each industry can have different features at the same time (Hannah and Eisenhardt, 2018). While automotive innovation is heavily dependent on engineering, car manufacturers also need to be mindful of changing consumer preferences and, in order to remain profitable, they cannot abandon efficiency-driven innovation. Our classification of archetypes should clarify and structure the consideration of a particular business model used by a company within the ecosystem and in the process of its development. The next section contains the final versions of the resulting classification.

Ecosystem structure formation depending on the archetype of its participants

The advancement of information technologies has led to a number of qualitative changes in public relations, which stimulated the development of informal ties between various participants in the business environment and also significantly transformed relations within the companies themselves, their corporate environment and culture (Kazakov *et al.*, 2020; Adamides and Karacapilidis, 2020; De Reuver *et al.*, 2018). Under the influence of technology, enterprises become adaptive elements of the economic system. In such an emerging business ecosystem, we observe the increasing role and importance of relationship marketing – long-term relations, which allow building interaction with business partners and key consumers as full-fledged components of the emerging value chain using a new digital platform (Izakova *et al.*, 2017; Ketova and Xue, 2017).

This reveals a certain contradiction between the desire to effectively use information technologies for economic development and the formation of a dominant group of society (global information society) to obtain the largest share in the world production and sales market, on the one hand, and the need to maintain the global strategic balance of power, on the other. In an economic system oriented toward consumers and stimulating demand, where marketing innovations are actively applied, this contradiction manifests itself quite visibly.

Characterizing the fundamental importance of digitalization for the business ecosystems formation, we present data on the development of the digital economy in several countries of the world including Russia (Table 1).

In line with the data presented, Russia is among the ten leading countries according to the development of the digital economy, which implies good starting opportunities to create business ecosystems on its territory.

In this context, in addition to the above definitions, we note that the economy residing on digital principles produces a new form of business organization – a business ecosystem, which, as a rule, is used in high-tech markets and is based on platform technologies. At this stage in the development of the digital economy, a business ecosystem can be understood as a community of individuals and companies that have united around a specific digital or product platform with various connections between participants as their main assets (Markova and Trapeznikov, 2016). The most famous examples of business organization based on the business ecosystem concept are Apple, Amazon, Alibaba and 1C Company. Various digital ecosystem-based projects have been created in order to provide services for the development of the digital economy in Russia by supporting socially significant projects and initiatives in various fields, as well as by coordinating interaction between the business community, scientific and educational organizations, other communities and government authorities. These include platforms as follows:

(1) MegaFon CARGO logistic online platform (the solution allows to increase the efficiency of organizing cargo transportation of various types, dimensions and characteristics of cargo; it is a domestic digital platform designed for large companies as well as for small and medium-sized businesses);

(2) PRO-STORE digital platform for the procurement of goods for non-chain retail outlets (the solution allows to increase the efficiency of sales and procurement activities of small and medium-sized businesses in the trade sector);

(3) Naumen service management platform for consumers of commercial and government services (the solution allows a commercial or government service provider to improve the quality of customer service and reduce operating costs; it is a web-portal);

10 countries leading the global digital economy		Dynamics		Involvement		Trust	
1	The United Kingdom	1	The USA	1	The United Kingdom	1	China
2	The USA	2	The United Kingdom	2	China	2	Germany
3	China	3	Germany	3	The USA	3	The United Kingdom
4	Germany	4	France	4	Australia	4	Australia
5	France	5	Australia	5	France	5	France
6	Australia	6	Japan	6	Germany	6	The USA
7	Spain	7	Spain	7	Russia	7	Spain
8	Italy	8	China	8	Spain	8	Italy
9	Japan	9	Italy	9	Italy	9	Russia
10	Russia	10	Russia	10	Japan	10	Japan

Table 1. Digital Society Index Rating, 2018[a]

Note(s): [a]Digital Society Index Rating, 2018. Framing the Future. Dentsu Aegis Network, 2018

(4) Intelligent quarry complex of digital technologies (the solution allows to increase the efficiency of mining enterprises, including mining and transportation of solid minerals).

It is worth noting that the features of organizing commercial activities through a business ecosystem are as follows.

(1) There is a structure formed using platform technologies that can be open or closed and which are used by companies or individuals to carry out their activities and facilitate communications. The platform is the center for the business ecosystem formation that creates a commodity circulation system.

(2) The platform mechanism representing a kind of encapsulation service for the seller combines various counterparties: consumers, sellers, manufacturers of goods, sales partners, logistics, marketing and information technology. All participants contribute to the organization of the platform ecosystem, develop and support it.

To analyze the current situation of companies, we will give examples of some cases that we have considered in our study.

An example of a product-oriented archetype.

The ability to formulate ideas in an engaging way is important to attract customers and motivate employees, but it is also risky due to the enormous uncertainty associated with creating something new. A product-oriented business model is characterized by the design and creation of new products through technology integration with supply chain partners. Enterprises of this archetype include, for example, those in such industries as mechanical engineering, power engineering and construction. To be successful, companies need a professionally trained workforce and a business environment that provides strong intellectual property protection: engineering innovations are often protected by patents. There are many factors that have a positive impact on the development and implementation of innovations: developed industrial clusters as well as policies that contribute to gaining wider access to global sources of technology, knowledge and high-quality workforce.

The product-oriented archetype is a reasonably robust business model if the enterprise can create a standardized offering suitable for the mass market and if the product contains a unique value proposition. Competitive advantages can be achieved through technological breakthroughs, lower costs and unique business processes. For example, in 2012, farming equipment manufacturer John Deere created the open platform MyJohnDeere, an information system that helps a farm business model to optimize the management of production data, equipment information and farming operations. New services have included, for example, smart irrigation and soil quality improvement based on indicators derived from remote diagnostic tools.

Using the information technology (IT) platform, John Deere customers increase hourly productivity, reduce fuel consumption and equipment downtime. For John Deere, the technology implementation results in higher equipment sales, increased customer loyalty, reduced switching to other brands within the same farm, creating barriers to prevent competitors from entering the market and obtaining large amounts of data to form a more attractive value proposition to customers.

Komatsu, a construction equipment manufacturer, has developed an IT system for remote equipment health monitoring. Its implementation has ensured the availability of information on processes at all stages of the value chain. The result is less downtime and higher resale value for equipment through increased uptime and productivity. In addition, Komatsu began developing products with new features based on large datasets of equipment maintenance.

An example of a platform-oriented archetype.

A platform-oriented business model is also standardized and scaled. In contrast to a product-oriented system where various components seamlessly connect to each other, a platform serves as a foundation that integrates a complete set of products and services, defines the rules and conditions for interaction (e.g. management, workflows and processes) and, by offering features and tools for sharing, it creates opportunities for its customers. Platforms organize market interactions in a new, technological way. Market relations have existed for centuries, connecting consumers and merchants, but information and communication technologies have significantly reduced the need for physical infrastructure and assets. Today there are many varieties of platforms, but they all have an ecosystem with the same four elements: owners, providers, suppliers and users.

The architectural principles of 1C technologies cannot be considered outside its relationship with a partner network. Roles are distributed by the parent company, which designs, supports and develops the 1C: Enterprise, a technological platform. A partner network, basing on the principles of long-term cooperation and directly interacting with customers, is responsible for the sales and implementation of products and their adaptation and adjustment to specific needs as well as for the development of their own replicated solutions.

In the new economy, creative associations are becoming widespread. They represent the so-called creative workshops in which scientific and educational institutions, businessmen, industrial partners, start-ups and other participants of the creative process can interact. As a rule, business concentrated within such associations belongs to knowledge-intensive sectors such as nanotechnology, biotechnology, information and communication technologies and other high-tech industries. In addition, these platforms are a convenient way to bring together business and investors and to aggregate competing business solutions. By embodying co-competition, this system allows large companies to solve complex technological problems using open innovation. This form of business combination is developing both in Russia and abroad. This is due to the increased likelihood of finding the right commercial solution or innovative project for a company based on the effect of knowledge spillover in the networks of interactions between companies (Rumyantseva *et al.*, 2018).

Co-working centers, which have become popular in Russia, can act as possible practices for such combinations. There are many types of co-working centers, depending on the line of business: office, industrial, craft, etc. There are examples of co-working centers operating in the Rostov region today.

(1) Industrial co-working GARAZH brings together inventors and promising entrepreneurs in the industrial sphere, helping them to develop projects using the technological and humanitarian resources of the southern flagship university (Don State Technical University).

(2) The municipal center for the development of entrepreneurship NEW ROSTOV created a co-working space called UNDER THE ROOF, which is engaged in consulting on entrepreneurial activities, holding business events (conferences, expert platforms, round tables, trainings, seminars and other free training events on various aspects of entrepreneurship). It is also a space for creating free jobs and organizing events for start-up entrepreneurs and those who want to start their own business.

(3) South IT-PARK is a space for interaction of IT professionals of all levels and is supported by the state. The purpose of this hub is to form a community of entrepreneurs to facilitate the implementation of new projects through consulting and training. Thus, this co-working center creates a venture investment ecosystem in the region and offers uniform rules for investing and interaction for start-ups and investors based on the world's best practices.

(4) Co-working RUBIN.

The platforms run a variety of businesses, from dating (men and women) to games (developers and users) and various retail structures (Frishammar *et al.*, 2018). The more users join the platform, the more applications and other offerings they create, the higher the value of each of them and the larger the number of interactions. The exponential growth of Facebook users attracts more people because they believe that their friends also use the platform.

This archetype is a good option to organize activity in an ecosystem if the company can build a solid foundation, integrate a wide range of goods and services and establish rules and present opportunities to its customers. In addition, it will have to foster the creation of "traffic and attraction" that is determined by the size and activity of the user base and the potential ecosystem of co-innovation surrounding it. Its advantage is the economy of scale and volume based on the network effect and the integrity of offers, so, as a result, consumers prefer long-term use of the platform. The disadvantages of the archetype include the fact that platforms that have a longer lifecycle than their offerings must use the best processes, superior architecture and/or significantly improved cost position in order to become a prominent player in the market.

An example of a project-oriented archetype.

The project-oriented business model relies on highly customized products or services, which are usually developed with the customer's active participation. Despite the fact that projects are usually implemented for a long time and may include contracts for its separate parts, they remain one-time contracts. These customized business models are usually service-based. This can be a construction company that comprehensively designs and builds a dam and, while doing so, provides a large number of engineering services. Another example is a project of a consulting company that does not produce any tangible product at all. Since the customer is free to change suppliers of subsequent transactions, it is obvious that service companies try to develop a close relationship with the customer during the project with an eye to selling other services in the future. For example, it is common in the energy business to switch suppliers (such as General Electric, Siemens and ABB) from one facility to another in order to maintain independence with a balanced portfolio of seller–enterprise combinations. Likewise, public company auditors must prove their qualifications annually, and they are changed after several years of cooperation in order to avoid bias and to maintain mutual independence. A project-oriented business model is appropriate for a company if its competitive advantage is related to the ability and willingness to design and implement complex local projects in accordance with the specific needs of its customers. Benefits include a manageable level of complexity, the accumulation of knowledge from the provider in which the customer is interested and the process of collaborative development and implementation of the project.

To create the digital ecosystem structure in various industries and fields of activity, it is possible to introduce a co-competitive activity model for ecosystem participants, depending on their archetype, where they are segmented according to the dominant principle of role and activity within the system. Sources for detecting activity can include research and development from research centers or companies, interactions with partners in the supply chain, customer inquiries and work to improve efficiency. The degree of importance of certain actions depends on the archetype of the ecosystem participant.

The model itself is three-part and has three different sub-systems: a marketing-oriented production subsystem, a marketing-oriented distribution system and a communication core, which is responsible for full contact with consumers.

Depending on the level of involvement and activity in the presented model, we can distinguish the following archetypes of enterprises, as presented in Figure 2.

As you can see, the growing involvement of an enterprise in the process of creating value changes its development goals, from a simple executor to an initiator of strategies and

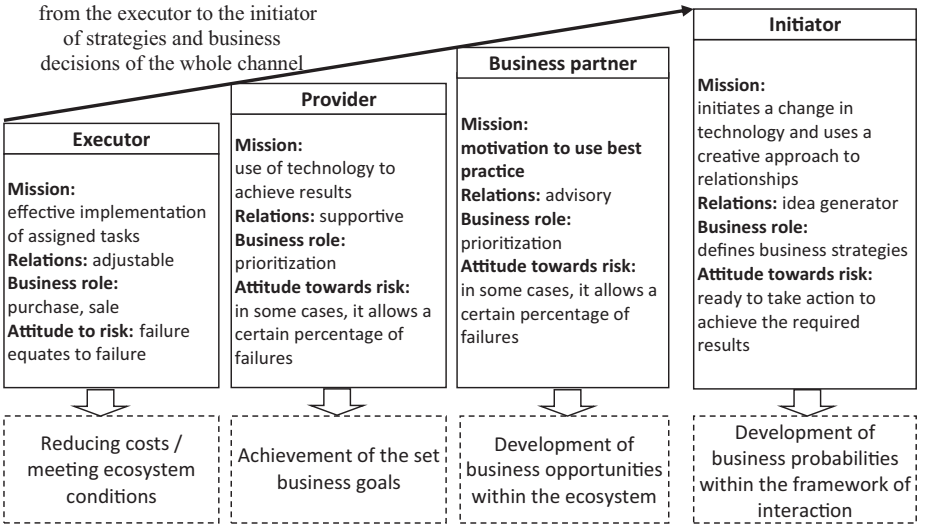

Figure 2.
Archetypes of digital ecosystem participants: from the executor to the initiator of the system

business decisions for the entire channel, which transforms this ecosystem participant from a partner into a system provider.

Discussion

Direct interaction between the closest link levels of the distribution system is popular in Russia. Meanwhile, mature practical experience in this area is still not extensive. The spread can be observed in joint global projects implemented by large foreign companies, such as Danone, Nestle, The Procter & Gamble Company (P&G), Unilever, etc. and not by purely Russian partnership initiatives. The reasons for such an insufficient development of co-creation and digital ecosystems creation in the existing Russian conditions are threefold.

The first reason is the distribution chains structure characterized by a variety of all types of market players. This is due to the focal location of large manufacturers in a geographically extended territory. As a result, when organizing a channel, the geographical component creates many intermediate participants, with whom the cooperation is onetime and strategically ineffective.

The second reason is business culture. Co-competition assumes that all parties of the business combination strive to optimize not only their own processes, but also those of their counterparties in the distribution chain and not to oust business competitors.

And the third reason is the impossibility to fully organize effective interaction within the distribution network due to insufficient information and technical support of the participants and their unwillingness to develop in this direction.

The proposed co-competitive activity model for ecosystem participants, depending on their archetype, allows us to realize the significance of the system for all potential participants and partners since it makes it possible to understand how such a complex interaction can be organized and configured on the basis of modern digital platforms.

Enterprises have come a long way in developing its entrepreneurial culture, understanding marketing and setting up new relationships within distribution systems. However, given the relatively short history of the market economy in the country, it is necessary to continue the course toward the popularization of entrepreneurship and co-competition, for example, by creating open digital ecosystems that function on a voluntary basis, support its participants

and also contribute to the dissemination of success stories of large Russian companies and start-ups that are not yet known to the general public, which will allow the participants to determine their roles and opportunities for development within the ecosystem.

To sum up the results and conclusions of this study, we can note the following.

Global changes and issues related to economic mechanisms that allow modern enterprises to sell their products cause a natural change in the relationship between market participants, which implies the improvement and renewal of business models for the enterprise operation.

This article describes research on developing partnerships based on digital ecosystems. It provides an important insight into the practice of implementing the ecosystem approach of doing business as well as into the still understudied transition of enterprises to a digital business environment. The study focuses on the analysis of the digitalization impact on new business ties creation and the nature of interactions between the distribution chain participants.

The main data source is the respondents' answers to the online survey for 2020. For this study, the research sample included southern Russian enterprises and information business entrepreneurs from other regions. The study shows how knowledgeable businesses are about the possibilities of digitalization and familiarity with the essence of ecosystem business models.

The findings suggest that most businesses do not have a solid understanding of platform tools and all of their applications. Therefore, a methodology is needed to provide targeted incentives to interaction for process participants, as well as a choice of options for combining the interests of partners and creating conditions for new digital forms of doing business with multiple communicative relationships that unite all types, functions and levels of interaction between subjects of business ecosystems directing participants to long-term cooperation.

Since the integration of enterprises into a digital ecosystem is aimed at gaining a competitive advantage due to the coordinated work of all counterparties of the system, archetypes have been proposed for enterprises in various industries. These archetypes are reflected in the activities of enterprises when justifying the transformation scenario of enterprises' business models in digital conditions and the evaluation of its effectiveness for enterprises in various industries.

This article uses theoretical data and case studies to analyze the degree to which various enterprises and their business models participate in digital ecosystems, taking into account digital transformation.

Despite this contribution, our research has its limitations. The results are limited by our sample data and the case study approach. The study does not show the further evolution of the digital ecosystem depending on the set and configurations of ecosystem participants. We introduce a possible new classification of the archetypes of ecosystem participants and a co-competitive activity model for ecosystem participants depending on these archetypes.

Therefore, the directions for further research are seen in advancing knowledge about the factors influencing the configuration of archetypes in the ecosystem and the principles of interaction between the participants of the model as well as the corresponding tools (techniques, models and algorithms).

In addition, the relations and connections established among the participants in digital ecosystems are constantly evolving; therefore, longer studies are required to show the relationship dynamics and to analyze the development of interaction over time.

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