

Digital technologies: new forms and tools of business activity^a

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Abstract. The digital transformation of business activity is characterized by diffusion of innovative technologies, integration of physical and digital systems. The unprecedented digital revolution has substantially transformed forms of business activity and has given auxiliary options for implementation of new business ideas laying the groundwork for investment climate. The new forms of business activity have different propagation dynamics and they generate in most cases quite different patterns of growth and evolution. The innovative tools and operating models of business activity have got a significant effect on geography and size of prospective market, competitive environment and speed of goods substitution. Changes in global economics in the last ten years have shown that technology companies are the leaders by rates of growth and market capitalization. At the same time, their digital products and developments are key factors in the dynamic development of traditional industries of their economics. The processes of forming and development of business (entrepreneurial) initiative under conditions of introduction of digital economics' elements in different spheres of socioeconomic interaction have been covered in the article.

The perception of the concept of "entrepreneur" was largely influenced by the level of development of society and the technological setup. If in the 18-19 centuries, first of all, in the definition of entrepreneurship, the resources used (land, labor and capital) were reflected, then with the development of science and society the role of innovations and the entrepreneur's personality becomes more important. Systematization of theoretical approaches for business activity research achieved on the bases of chronological approach has a descriptive character and therefore doesn't give expected results in case of its application. The systematization based on peculiar properties of methodological approach of different economic schools is more fruitful. The given criterion enables selecting two groups of business activity concepts:

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- Concepts using a functional approach;
- Concepts using an interdisciplinary approach.

It should be noted that in all of the above approaches to the study of entrepreneurship there are three components that characterize this phenomenon: personal, economic and organizational and managerial. They are organically interconnected, which is seen in a special type of reproduction, which is called the reproduction of the entrepreneurial type. At the same time, these theoretical approaches to the analysis of entrepreneurship differ in the degree of concentration of attention on one of the components. In particular, in the methodology of the study of entrepreneurship, the German historical school emphasizes the personal component [1]; the innovative concept – economic and personal components [2]; the classic and neoclassic concepts – economic component [3]; the Neo-Austrian school – personal as well as on institutional and managerial components [4]; the institution concept – institutional and managerial component [5].

The methodology of this study differs from existing concepts in that of analyzing the development of entrepreneurship, in addition to the components listed above, much attention is paid to the component of information and technological interaction between subjects of socio-economic relations. The given component has not been accounted for in previous theories due to significant difference of scientific-and-technological progress between the periods of scientific views formation. The role of the given component at present is significant due to formation of the 6th technological setup and a new industrial base. Based on the foregoing, the authors have formulated the following definition of the term "entrepreneur": it is a subject of socio-economic relations that realizes individual opportunities to achieve the desired result by manifesting an initiative of interaction with resources and other economic entities using available and innovative tools of the current technological setup.

Digital revolution results in transformation of not only separate companies, but entire sectors of the world economy. Just as the creation of radio telegraph, steam engine and transistors led to a structural change in the global industry, the Internet, BIG-data, artificial intelligence (AI), robotics and other innovative technologies are forming the 6th technological setup before our very eyes. The peculiarity of current changes is unprecedented rates of technology changes. Critics of the early project of mapping of the human genome were confident that it would take 10,000 years to study DNA base pairs. In fact the project was completed in 10-year period with the level of costs below targeted budget. For the period from 2001 to 2007 the cost of mapping was reduced 10 times, and from 2007 to 2014 the cost fell down 10,000 times [6].

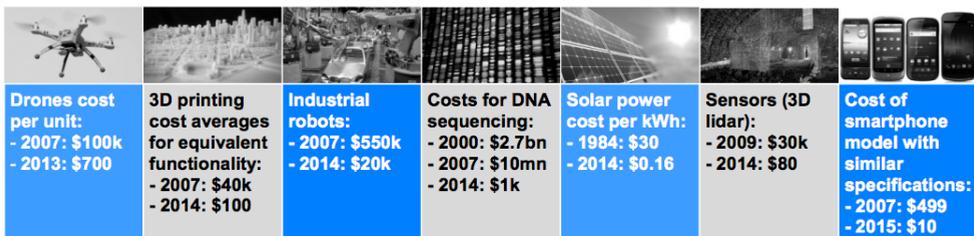


Fig. 1. Change in cost of key technologies [7].

Scientific and technological progress and the development of local and global digital platforms have contributed to the emergence of new forms of entrepreneurship, strengthening their economic and business activities at national and international levels. Moreover, in this context, the forms of entrepreneurship are understood not as a legal status, but as a level of penetration of entrepreneurship into the social and economic

interaction of the person who carries out business and the external environment, and also the principles on which this interaction is built.

According to the report of the European Fund, five new forms of entrepreneurship are actively formed and are developing: one-person enterprises, part-time entrepreneurs, parallel entrepreneurs, serial entrepreneurs and business transfers [8].

One person enterprises and individual entrepreneurs (enterprises in which there are no employees). This form of entrepreneurship includes persons engaged in entrepreneurial activities, which, regardless of their legal status, makes an important contribution to a person's income and, therefore, goes beyond the hobby. Self-employment is not a new phenomenon, although the industries where such business activity is widely spread have changed over time. In several sectors such as information and communication technologies and services connected with them, handicraft industry, and services in construction sphere and transport the level of enterprises with one person and self-employment is especially high. For example, organizations consisting of one person make up more than 50 percent of all Austrian companies and motivations for starting an entrepreneurial activity, along with self-fulfillment and work without superiors, are economic reasons: displacement from the labor market due to automation and job cuts (self-employment becomes an alternative to unemployment) [9]. An important characteristic of this form of entrepreneurship is that the entrepreneur conducts his business activities without permanent employees. However, such entrepreneurs frequently cooperate with other entrepreneurs and organizations.

Part-time entrepreneurs. There is no generally accepted definition of part-time entrepreneurs. The definitions in the EU Labor Force Survey [10] distinguish between full and part-time employment or entrepreneurship based on the spontaneous response of respondents. Thus, in some countries the part-time entrepreneur is defined as a person working less than 35 hours per week. Other sources, such as "Entrepreneurship in Missouri", identify part-time entrepreneurs in terms of how much of their income is generated by individual entrepreneurial activities. The average income of full-time entrepreneurs is \$ 29,998, while the average income of part-time entrepreneurs is \$ 4,294 [11]. However, part-time entrepreneurs are also often considered primary entrepreneurs with a transition economy testing the market to make sure that their business is economically sustainable before becoming a full-fledged entrepreneur. Other authors, such as Frederick Welter [12], believe that the key factor in the emergence of part-time entrepreneurs is the need to generate additional income to meet household everyday needs. Such enterprises, as a rule, have low growth rates and low survival rate. Part-time entrepreneurs can work, retire, participate in educational, training programs or do household activities along with doing business. The examples are a government employee, engaged in a part-time working day who runs a farming enterprise for commercial purposes as well as business consultants and IT consultants that are engaged in a part-time working day and also execute individual contracts. Students engaged in a part-time working day can be engaged in business activity in parallel with training.

Parallel entrepreneurs (Two or more enterprises work at the same time). In addition to part-time entrepreneurs, there are examples of entrepreneurs who run several different companies in parallel [13]. Digital technologies have allowed faster interaction with consumers and partners and, therefore, provided additional business opportunities. This factor allows particularly active entrepreneurs to create and manage several business projects simultaneously. These organizations can be based on general synergy effects. For example, using the same customer base which offers different goods and services. These companies can be at different stages of the life cycle; an entrepreneur can, for example, start a new business when it becomes obvious that the existing one at some point will not be competitive in the future. When this happens, the definition of a parallel entrepreneur may coincide with the category of the serial entrepreneur.

Series entrepreneurs (starting a new business after selling, closure or introduction of new leadership in the previous one). Entrepreneurs can realize that they will not need to devote 10, 20 or 30 years to their business. In the conditions of digital economy formation, there is a rapid replacement of products in the market, a dynamic and profound change in the competitive environment, which makes business cycles in the economy much faster. A modern entrepreneur understands that his experience is to launch entrepreneurial processes, rather than consolidate them [14]. You can build a successful business in a short period, perhaps in five to eight years, and then sell it. The market of purchases and investments to these types of companies has dramatically changed over the last years. In other words, an entrepreneur who prefers the process of creating a company can sell his young company or transfer its property or management to another entrepreneur, and then start again.

Business transfers and legal successions (transfer of management or ownership to a new entrepreneur, while the business continues to operate). Transfer of business means transferring the right of its ownership (to the whole or a large part) or transferring management from one entrepreneur to another, while the business itself continues to function, including labor relations with its employees and any other agreements concluded by it. Business transfers can exist in different situations. They include:

- Transfer from parents to children , traditional change of generations [15];
- After passing the entrepreneurial stage of business development, the company, as a rule, faces new strategic options and management problems that are likely to require new managerial competencies and skills;
- Transfer of ownership or part of it through redemption of top management or partial sale of business or shares.

According to the study of "Global Entrepreneurship Monitor (GEM)" [17], exactly the existing opportunities for entrepreneurial activity served as the main motives for launching business projects. The highest rates are in North America – 82.6% of respondents answered that the opportunity factor was the basis for starting their entrepreneurial activities.

Digital technologies have provided additional opportunities not only for starting an entrepreneurial activity, but also tools for the dynamic growth of companies, product replication, scaling and access to international markets. According to the White Book of the World Economic Forum "Digital transformation of industries" [7], which was prepared together with Accenture company, digital networks and channels of interaction with customers can create significant additional business value and generate new sources of income, among which one can distinguish:

1. Sale – transaction. Sale, i.e. payment and transfer of ownership of traditional industrial goods is carried out via digital platforms.
2. Leasing of power. It is monetized as remote use of human time, computing machines or other assets.
3. Licensing. Technology, brand or intangible assets are licensed for periods of time. Sale is carried out independently through digital channels without involving authors of the invention to direct sales of goods or services.
4. Subscription. The buyer prepares an automatic re-purchase of goods or services for a short or long period.
5. Commission fee. Agents collect commissions for services to organize interaction between buyers and sellers of goods and services via digital platforms.
6. Advertising. It is often used in mass media and entertainment services as a method of distribution and exchange of information about relevant goods and services, sold via digital environment.

Companies that at the beginning of their business had an analog business model in their core and during the period of their work accumulated significant information about their customers, digital transformation allowed to monetize data through their systematization

and processing using BIG-data technologies. Citigroup, for example, has created a separate company, the business model of which is based on promotion of marketing programs of insurance companies via their channels of operation with clients.

Young companies that have introduced digital technologies in their business, increasing their sources of income, outperform their peers and successfully compete with large, more mature companies. Previously, the company required an average of 20 years to reach an estimate of a billion dollars. At present startup companies achieve this plank much earlier: Google – in 8 years, and such companies as Uber, Snapchat and Xiaomi in 4 years or less (see Fig. 2). They achieved such rates to the great extent due to successful use of digital technologies. According to research of Digital IQ in Price Waterhouse Coopers, 57% of surveyed IT executives believe that an improvement in the company's digital opportunities is a top priority for the organization grows revenue [18].

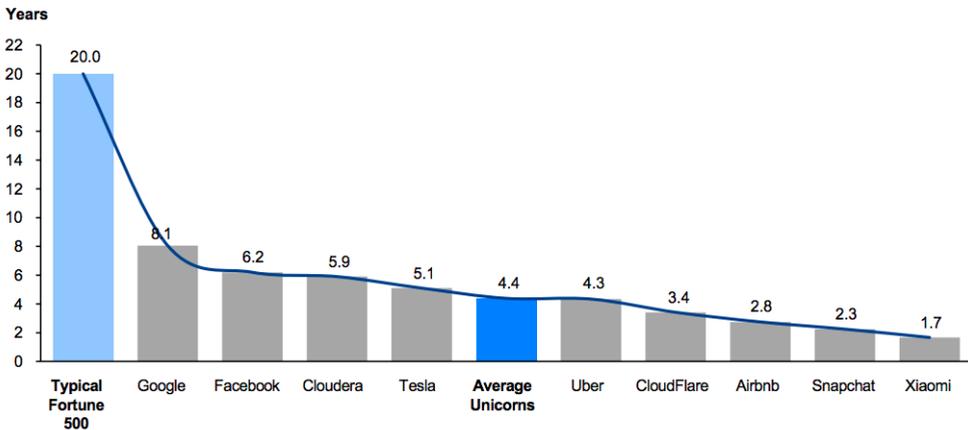


Fig. 2. Time to reach a market valuation of \$ 1 billion or more [7].

Innovative tools and methods of entrepreneurship affect not only the speed of increase in the market capitalization of companies, but also its size. In 2008, the most expensive company according to the Global Top 100 survey conducted by Bloomberg and PwC analysis was Exxon Mobil Corp [19] from the oil and gas sector with a capitalization of \$ 337 billion. After eight years, its capitalization grew by only \$ 3 billion, and the company went down to the 7th place in the ranking. Technology companies, such as Apple Inc and Alphabet Inc-CI A, showed capitalization growth of \$ 660 billion and \$ 469 billion, respectively, and ranked first in the rating. All-in-all technological companies take 25% in rating of 20 most expensive companies in 2017, though this rate was equal to 5% 8 years ago.

Company name	Nationality	Industry	Rank +/-	31 March 2017		31 March 2009	
				Rank	Market Cap (\$bn)	Rank	Market Cap (\$bn)
Apple Inc	United States	Technology	32	1	754	33	94
Alphabet Inc-Cl A	United States	Technology	20	2	579	22	110
Microsoft Corp	United States	Technology	3	3	509	6	163
Amazon.Com Inc	United States	Consumer Services	-	4	423	NA	31
Berkshire Hathaway Inc-Cl A	United States	Financials	7	5	411	12	134
Facebook Inc-A	United States	Technology	-	6	411	-	-
Exxon Mobil Corp	United States	Oil & Gas	-6	7	340	1	337
Johnson & Johnson	United States	Health Care	0	8	338	8	145
Jpmorgan Chase & Co	United States	Financials	19	9	314	28	100
Wells Fargo & Co	United States	Financials	45	10	279	55	60
Tencent Holdings Ltd	China	Technology	-	11	272	-	13
Alibaba Group Holding-Sp Adr	China	Consumer Services	-	12	269	-	-
General Electric Co	United States	Industrials	11	13	260	24	107
Samsung Electronics Co Ltd	South Korea	Consumer Goods	39	14	259	53	61
At&T Inc	United States	Telecommunications	-8	15	256	7	149
Ind & Comm Bk Of China-A	China	Financials	-12	16	246	4	188
Nestle	Switzerland	Consumer Goods	-2	17	239	15	129
Bank Of America Corp	United States	Financials	69	18	236	87	44
Procter & Gamble	United States	Consumer Goods	-9	19	230	10	138
China Mobile Ltd	Hong Kong	Telecommunications	-15	20	224	5	175

Fig. 3. The rating of companies by the size of market capitalization in Q1 2017 [19].

According to the Accenture study [20], companies that use the right combination of new technologies can increase their market capitalization by an average of more than \$ 6 billion. Accenture conducted economic modeling after its initial studies showed that only 13% of leaders from more than 900 large companies said that investing in digital technologies not only increased business efficiency but also provided new tools for its growth. Accenture believes that this low value of this indicator is mainly due to the separate deployment and implementation of investments in digital technologies. Objects of economic modeling of Accenture are companies with sales income of \$ 1 billion or more in the automotive, chemical industries, manufacturers of electronic and high-tech, energy, biological, household and communal goods and services. To develop technology combinations that could best help companies reduce their costs per employee and increase their market capitalization, Accenture surveyed 931 managers from large companies in 12 industries from 21 industrialized countries to understand how companies are implementing digital technologies and what benefits they receive from them. Then a set of 10 critical technologies has been specified: 3D-printing, AI (artificial intellect), AR/VR (mixed and virtual reality), autonomous robots, autonomous vehicles, BIG-data, block chain, digital replica (twins) of physical assets, machine learning and mobile computing. Survey data and financial data of companies were used to model economic value and identify combinations of technologies with the greatest impact on costs per employee, the maximum and minimum cost of output and its impact on market capitalization. The results of researches have been obtained by using of tools of machine computing, analysis of technological components, financial and business processes. For example, a company in sector of industrial equipment can implement additional cost saving by more than \$ 43,000 per one employee, if they combine robot engineering, technologies of 3D-printing, AI, BIG-data and block chain. Energy companies can increase market capitalization by more than \$ 16 billion if they combine technologies such as virtual reality, BIG-data and AI.



Fig. 4. Influence of the optimal combination of digital technologies on increasing the market capitalization of companies [20].

It should be noted that the initiative of digital transformations must come from the company's management and be implemented at all levels of operational activities. It is impossible to realize a successful transformation by introducing a staff unit and hiring an employee to implement this program. Successful digital transformation requires an appropriate corporate culture in which management supports innovation, encourages the introduction of new technologies, changes its own daily approach to the work process and shares risks with the company's employees. More than 80% of top managers, participating in Gartner opinion poll expect that their companies will become digital organizations by 2019 [21]. This includes both introduction of digital operations research model and acceptance of new technologies for definition of operating efficiency. According to methodology, developed by Capgemini Group [22] architecture of digital operating system consists of 6 components:

1. Channels of interaction with clients, making it possible to customize communication with due account for history of client request.
2. Business processes. They enable shaping of maximal added value of a good and services support continuous development of company.

3. Structure of organization. It opens up capabilities and reserves of improvement of company's efficiency by hierarchy of interaction and accountability with application of information and communication technologies.

4. Physical infrastructure, including property, entities, equipment and other assets.

5. IT-architecture. It coordinates interaction of infrastructure elements (for example, web-spaces, and storage clouds) for functioning of business processes.

6. Data and information. There are raw materials for analysis and understanding that can give the business a competitive advantage. Modern customer data analytics or operation can also contribute to efforts regarding introduction of other innovations in operations.

One of the main goals of building of digital operating system is provision of company's "transparency" due to the fact that under conditions of formation of digital economy this is one of the major factors of successful development. Accessibility of information about company provides its competitive ability, helps both in promotion of goods and services in the market and in search of employees and investors. Transparency and open communication at the workplace contributes to development of creative and innovative approach to execution of tasks. Clear Company research has shown that in companies with high levels of interaction and communication with employees the performance rate is 22% higher than in similar companies. They also have lower level of employees' turnover [23] in 50% of cases.

Innovations have made corrections to generally accepted concepts, principles and essence of entrepreneurship. The evolution of digital technologies makes both start-up entrepreneurs and leading companies rethink the possible ways of their development. Along with the key economic indicators of the performance of companies, a significant role is played by digital indicators, which characterize the opportunity to provide unprecedented speed of scaling and growth. Digital technologies have changed the way how entities and objects of socio-economic relations interact between themselves. The growing expectations of consumers of goods and services, the formation of new business and operational models pushes organizations to perceive digital technology as a new focus of their development strategy.

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