

ЭКОНОМИЧЕСКИЕ НАУКИ

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BUSINESS DIGITAL TRANSFORMATION EFFECTS ON ENTREPRENEURIAL VOCATIONAL MAP IN RUSSIA

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Abstract. Relevance: The relevance of the study is designated by the development of digital technologies which are increasingly being used to optimize business processes. At the current stage of entrepreneurial development transformation of companies is being observed and representatives of digital businesses achieve the greatest capitalization. Employees of banking organizations are replaced by bots and artificial intelligence. In this regard, the requirements for entrepreneurs and mercenary managers are changing. This requires the search for new educational approaches to training of specialists.

Purpose: to develop an author model of digital business transformation on the results of a survey (research method) conducted among the students of the Faculty of Engineering Business and Management of the Bauman State University and from Plekhanov Russian University of Economics. To reflected the modern vision of future entrepreneurs and managers for a new concept of skills mix vital for business development in the cause of digital transformation and competitive sustainability and to identify both positive and negative aspects of start-up entrepreneurs' performance in digital economy.

Methods and methodological units of research: comparative content analysis, empirical study, polling.

The main results: Contradictions of digital business through an entrepreneur prism and consumer position were revealed. The conclusion is drawn that digital economy, on the one hand, is boiled to self-reliance of subsystems (state, business, society) of the system (digital economy). On the other hand, the state, business and society are premised on the scope of competencies, as far as the role of a human in digital economy may be minimized but no completely abandoned. The key factors that affect digital transformation were defined: process optimization, data, business models, infrastructure and tools, people and competencies, culture and interaction.

Scientific novelty of the study lies in the author's concept, according to which the key role in the digital economy era is assigned to the state (state as a platform), business (digital platforms, ecosystems, radical business models), society as a key factor in digitalization. In this regard, an assessment of the digital transformation is provided through the lens of a positive, critical and pragmatic view of society (experts and respondents).

Practical relevance: The research results can be used by higher educational institutions to adapt their educational programs to the interests of economists and entrepreneurs, taking into account the growing informatization and digitalization of business processes.

Key words: digital economy, digital transformation, competitive stability, entrepreneurship, entrepreneurial competencies.

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ВЛИЯНИЕ ЦИФРОВОЙ ТРАНСФОРМАЦИИ БИЗНЕСА НА ПРОФЕССИОНАЛЬНУЮ КАРТУ ПРЕДПРИНИМАТЕЛЯ В РОССИИ

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Аннотация. Актуальность: Актуальность исследования определяется развитием цифровых технологий, которые все чаще используются для оптимизации бизнес-процессов предпринимательских структур. На текущем этапе развития предпринимательства наблюдается трансформация хозяйствующих субъектов. Цифровые компании достигают наибольшей капитализации. Сотрудники банковских организаций заменяют боты и искусственный интеллект. В связи с этим меняются требования к предпринимателям и управляющим цифровых компаний. Это требует поиска новых образовательных подходов к подготовке специалистов.

Цель: разработать авторскую модель цифровой трансформации бизнеса по результатам опроса, проведенного среди студентов факультета инженерного бизнеса и менеджмента Московского государственного технического университета имени Н. Э. Баумана и Российского экономического университета имени Г. В. Плеханова. Отразить современное видение будущих предпринимателей и менеджеров для новой концепции сочетания навыков, жизненно важных для развития бизнеса в части цифровой трансформации и конкурентной устойчивости, выявить как положительные, так и отрицательные аспекты работы начинающих предпринимателей в цифровой экономике.

Методы и методологический аппарат исследования: сравнительный контент-анализ, эмпирическое исследование, опрос.

Основные результаты: выявлены противоречия цифрового бизнеса через призму предпринимателя и потребителя цифровых услуг. Сделан вывод о том, что в настоящее время, с одной стороны, происходит самообеспеченность подсистем (государство, бизнес, общество) системы (цифровая экономика). С другой стороны, государство, бизнес и общество нуждаются в базовом наборе компетенций исполнителей бизнес-процессов, поскольку роль человека в цифровой экономике может быть сведена к минимуму, но не оставлена полностью. Определены ключевые факторы, влияющие на цифровую трансформацию: оптимизация процессов, большие данные, бизнес-модели, инфраструктура и инструменты, люди и компетенции, культура и взаимодействие.

Научная новизна: в статье сформулирована авторская концепция, согласно которой ключевая роль в эпоху цифровой экономики отводится государству (государство как платформа), бизнесу (цифровые платформы, экосистемы, радикальные бизнес модели), обществу как ключевому актору цифровизации. В этой связи дана оценка цифровой трансформации через призму позитивного, критического и прагматического взглядов общества (экспертов и респондентов).

Практическая значимость: результаты исследований могут использоваться высшими учебными заведениями для адаптации своих образовательных программ к интересам экономистов и предпринимателей, с учетом нарастающей информатизации и цифровизации бизнес-процессов.

Ключевые слова: цифровая экономика, цифровая трансформация, конкурентная стабильность, предпринимательство, предпринимательские компетенции.

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Introduction

Over the past several years, entrepreneurship has been a key focus for universities in their commitment to train highly skilled professionals capable of bringing

the national entrepreneurial system to a new level. This new level is digital economy.

The research problem relevance and shaping is drawn from the fact that the map of professions

is changed in the volatile labor market. Value creation per unit is now possible with considerably lower engagement of labor compared to the situation ten or fifteen years ago, which reflects the minimum, near-zero, cost of digital business.

According to international researchers, particularly, K. Schwab, the great beneficiaries of the fourth industrial revolution are the providers of intellectual or physical capital — the innovators, the investors, and shareholders, which explains the rising gap in wealth between those who depend on their labor and those who own capital. It also accounts for the disillusionment among so many workers, convinced that their real income may not increase over their lifetime and that their children may not have a better life than theirs (Schwab, 2019) [12].

In 1931, J. Keynes warned about the rise of technological unemployment due to the “discovery of means of economizing the use of labor outrunning the pace at which we can find new uses for labor” (J. Keynes, 1931) [6]. Many categories of professions, particularly, those involving monotonous and manual operations are already automated. Other categories will follow, as computational capabilities continue to grow geometrically. Such professions as lawyers, financial analysts, doctors, reporters, accountants, insurance agents or librarians can become partially or fully automated.

Some Russian researchers (Avilkina, Leontyeva, Ilyin, 2019), (Lyapunsova, 2018) believe that the modern economy is undergoing the transition from innovation (Orlov, 2017) to digitalization [1; 16; 11]. Therefore, it may be reasonable to revisit the concept of entrepreneurship in digital transformation.

Businesses are now moving away from traditional patterns, as they adopt digital technologies, the Internet of Things, new forms of ownership, interactive methods of negotiation and transactions. In particular, Uber, Netflix, Airbnb and others do not own cars, cable networks, hotels and other assets, but operate digital platforms to meet customers’ demand. According to

S. Falko, digitalization has shown increased influence in bringing down the level of unfinished production (Falko, 2018) [4]. As to the production of goods, traditional labor functions are replaced by artificial intelligence, as robots become engaged in the process to ensure uninterrupted production cycles and optimization of business resources. L. Yu. Filobokova argues that transactions of this type are influencing positively the territorial competitive profiles in general (Filobokova, 2017) [5]. All these processes are inevitably leading to a transformation of entrepreneurial functions and competences. According to Schwab, digital technologies that have computer hardware, software and networks at their core are not new but in a break with the third industrial revolution, they are becoming more sophisticated and integrated and are, as a result, transforming societies and the global economy (Schwab, 2019) [12].

Applied research in the field of digital business transformation is carried out by L. V. Lapidus. So in 2020, this author compiled the digital environment turbulence barometer as well as the strategy of digital transformation in education. Moreover, she revealed the Generation Z awareness of digital business transformation technologies amidst the technological shift [7, 8].

State and municipal governance is also adopting the digitalization process. The implementation of the “state as a platform” technology is being actively discussed, and a civil servant’s job duties are meant to be linked to KPIs. In other words, performance, not process, would become the key operational reference for the state as well as for businesses. E.g., some public institutions have used effective contracts for several years already, and the practice has proved successful.

Therefore, the all-digital economy (Figure 1) refers, on the one hand, to independent functions of the subsystems (state, businesses, society) within a system (digital economy). On the other hand, state, businesses, and society operate on the competence platform, so even in the digital economy, the human role may be diminished but may not be completely excluded.

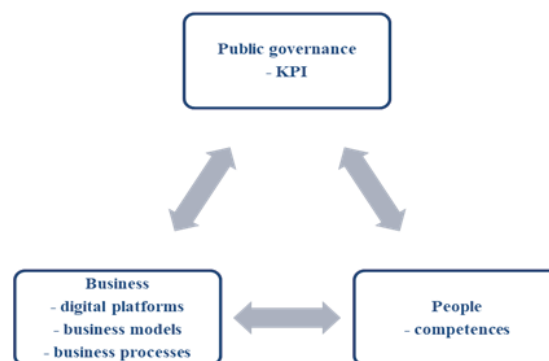


Figure 1. All-Digital Economy
Source: developed by the authors

Methods

In this research, the authors find it relevant to identify professional competences of a subsystem of the digital economy, namely, the digital business subsystem, for which they apply the method of survey and the VUCA philosophy.

The reference word for the VUCA philosophy is an abbreviation of the English words “volatility”, “uncertainty”, “complexity” and “ambiguity”. Digitalization

makes entrepreneurial risks more uncertain. According to Warneke, past success is no guarantee for future success (Warneke, 1999) [17]. A good case in point may be Kodak and Nokia, once market leaders that failed to timely adjust their policies and lost ground. Table 1 represents a projection of the modern business environment interpretation on companies operating within it and employing digital technologies.

Table 1. Projection of Modern Business Environment on Companies Operating Employing Digital Technologies

V	Kodak, Nokia
U	All digital companies
C	eBay, Amazon.com, Alibaba.com, Yandex, Mail.RuGroup
A	Microsoft, Oracle, Siemens

Source: developed by the authors

It is worth noting that the VUCA reality is the main factor behind the dependence of business competitiveness on the level of the internal environment organization and the ability to leverage the advantages of other subjects to build efficient interaction with consumers and meet their demand (Sizova, 2019) [13]. New professional entrepreneurial competences are required to pull off such managerial decisions. Firstly, the priority of business management should be individuals, understanding the value of each employee and interacting with them, while processes and instruments only come after that. Secondly, there needs to be awareness that willingness to change is considerably more important than the original plan. Thirdly, a key principle is that being constantly in touch with the customer is more important than approvals, and quality product tops documentation.

Leveraging competences would help entrepreneur to make the company competitive from anywhere (Matushkin, 2017) [9]. The business environment responded to the VUCA reality primarily by the emergence of a new type of enterprises. Many of them today are leveraging information technologies. Active use of social media and Internet has contributed to the establishment of the so-called Wikinomics (a play on words “Wiki” and “economics”). The term was first coined by researchers D. Tapscott and A. D. Williams in 2006. They describe it as a decentralized economy without territorial attribution where people solve all kinds of issues by interacting and cooperating via the Web [15].

In this context, the most successful businesses are those successfully implementing and operating digital platforms. Such platforms allow entrepreneurs to market their products anywhere globally, provided the availability of Internet access. Such platforms include eBay, Amazon.com, Alibaba.com, Yandex, Mail.RuGroup.

High intellectual capacity and flexible thinking is what makes an entrepreneur a guaranteed success case. Such people are not terrified by uncertainty. What they feel is primarily interest, as they stand a chance to show their creativity, contribute a novel feature and become a pioneer. Besides, a good manager is a good listener who gets along with people, which is very important in our changing world.

The VUCA world requires that you push yourself out of your comfort zone. Entrepreneurs should make it a habit. As a rule, the most profitable deals are found somewhere where it feels least comfortable. The sense of security may prove delusive, and if it emerges, it is an alarming sign. As we see, good intuition is quite instrumental in business.

To succeed in the current reality, an entrepreneur needs to master design thinking. It is an important skill that may be used not just to manage projects but also to implement strategies in the VUCA world. It can be viewed as a method to approach difficult and ill-structured problems so prevalent in the new reality (Brown, 2009) [3].

Design thinking of a successful entrepreneur is primarily characterized by customer-centricity and anthropocentricity, which are absolutely necessary in the perception economy. The main techniques here relate to “tacit knowledge” of the consumer, i.e. involvement is needed to meet demand. It means you need to put yourself in the consumer’s place, understand their needs, show empathy and consideration.

Entrepreneurial practice generally involves generating ideas and creating conditions to bring them to life. Arguably, the emergence of such business management approach brought about the new management paradigm referred to as Management 3.0. (Appello, 2011). An eponymous book on the topic by the well-known entrepreneur Jurgen Appello outlines a vision of the mod-

ern management and explains the need to build a new model with a substantiation of a transition to adaptive management. According to the author, the central point today is the absolute priority of humans, their values and needs [2]. Such business philosophy reflects all VUCA requirements while at the same time emphasizing the importance of being able to adapt to new circumstances and be socially responsible. [10]. The new environment requires action even with incomplete data. That is how decision-making operates today. VUCA is at once a threat and an opportunity. In any case, the best

way to predict the future is to shape it as you like it.

Interestingly, there is an answer to the VUCA challenge, and quite promising. If one expands the abbreviation in a “positive” sense, there is the antidote: “vision” (communication, belief, focus on goals); “understanding” (curiosity, empathy, open-mindedness); “clarity” (simplifying, intuition, systems thinking); “agility” (decisiveness, ‘innovate or die’, opportunities and powers). As we see, the main terms are expanded to indicate qualities and actions needed to successfully run business in today’s VUCA reality.

Table 2. Modern Digital Entrepreneurial Competences through the Lens of the VUCA World

V	Customer centricity
U	Adaptation to ever changing environment
C	Business process decomposition
A	Competitiveness

Source: developed by the authors

Professional competences sustaining entrepreneurial development in the digital economy do not generally operate as substitutions for competences of a market economy, in the same way as an entrepreneur’s digital competences are inseparable from the competences of an entrepreneur running a traditional business. Thus, in this research, the authors were primarily concerned with establishing the ability of early-career and would-be entrepreneurs to transform their entrepreneurial thinking, and capturing considerations reflecting positive and critical attitudes to business transformation.

Another method of research was a sociological survey of students, 2020. 150 respondents among third-year students of the Engineering Business and Manage-

ment department of the Bauman Moscow State Technical University and from Plekhanov Russian University of Economics participated in a discussion during seminars as part of their Entrepreneurship practicum studies. As a result, the author laid the students’ responses in a table of considerations of a digital entrepreneur (Table 1). The table is drawn below in the research results.

Results

Research findings are laid out in Table 1, representing considerations regarding digital transformation including 20 “Pros” (items Y1-Y20), 14 “Cons” (items N1-N14) and 8 “My way in digital transformation” (items I1–I8).

Table 3. Findings of Digital Business Transformation Research

20 «Pros» of digital transformation	14 «Cons» of digital transformation	8 «My way in digital transformation»
• Y1: Robots will take over jobs in hazardous production	• N1: Unemployment and subsequent decline in living standards	• I1: "Everything will be as it's going to be"
• Y2: Faultless operation	• N2: Difficulties in implementing and servicing technology	• I2: Retraining
• Y3: Improved profitability	• N3: Loss in individuality	• I3: Crypto bloggers will emerge
• Y4: Development of artificial intelligence	• N4: Complete depersonalization of humans in the economy	• I4: Improved capitalization of businesses
• Y5: Development of new types of activities in the economy	• N5: «Entrepreneurs have to be honest», it will be difficult to deceive robots.	• I5: "I will keep up with progress"
• Y6: Continuous production process	• N6: Considerable financial costs related to digitalization	• I6: I am a user
• Y7: Robots are cheap or free workforce	• N7: No regulatory framework in place, which is not safe	• I7: I am a developer, and therefore, a non-routine operator
• Y8: Improved production efficiency	• N8: Expensive services	• I8: I stand with big data

Continuation of table 3

20 «Pros» of digital transformation	14 «Cons» of digital transformation	8 «My way in digital transformation»
• Y9: Lower costs	• N9: Loss in emotions from communication	
• Y10: Increased growth rates	• N10: Retrogrades and ageing economy	
• Y11: Time-saving, process and business process efficiency	• N11: Fraud and cybercrime	
• Y12: Resource saving	• N12: False digitalization phenomenon	
• Y13: Mobility	• N13: Lack of digital culture	
• Y14: Streamlined operations	• N14: Higher barrier to entry	
• Y15: Improved consumer opportunities		
• Y16: Lower corruption		
• Y17: Smart factories		
• Y18: New professions		
• Y19: Increased publicity		
• Y20: Transparency of all outcomes		

Source: developed by the authors on the basis of the poll

1. 20 “Pros” of digital transformation

Note the following advantages of digital business transformation. Firstly, the development of artificial intelligence (item Y4) and adopting robotization in the production of goods and services will help to liberate labor from hazardous and routine jobs (Y1). Subsequently, this will contribute to more faultless and streamlined operations (Y2, Y14), improved mobility (Y13) and continuous production processes (Y6), as robots can perform uninterrupted monotonous work, and, in fact, for free (Y7).

Secondly, the implementation of digital technologies will contribute to improved profitability (Y3), growth rates (Y10) and production efficiency (Y8). Subsequently, it will bring lower costs (Y9) in business process organization (Y11) and business resources (Y12).

Thirdly, digital transformation may create new forms of business (Y5), open up new consumer opportunities (Y15), improve customer centricity, give rise to smart factories (Y17) and, eventually, facilitate the emergence of new professions (Y18).

Fourthly, digitalization will mean transparency of business process operation (Y20) and higher information publicity profile for businesses (Y19).

At the current stage of entrepreneurship, one may observe business transformations. The highest capitalization levels are attained by companies in digital business. Banking clerk jobs are taken over by artificial intelligence. According to futurologists' projections (Skinner, 2019 [6]), jobs such as mid-range managers, lawyers, accountants, hosts, performing artists and others will be gone from business by 2030 [14].

2. 14 “Cons” of digital transformation

As a result, the transformation of professions may

leave many people unemployed, which will cause a decline in living standards (N1). This is the first and foremost challenge of digitalization. To provide an estimate: back in 1990, the three biggest companies in Detroit had a cumulative market capitalization of \$36 billion with revenues of \$250 billion and up to 1.2 million employees. In 2014, the three biggest companies in Silicon Valley had a considerably higher market capitalization (\$1.09 trillion), generated roughly the same revenue (\$247 billion), but with about ten times fewer employees (137,000). (Schwab, 2019) [12].

Secondly, digitalization requires considerable front-loaded financial costs related to robotization and the deployment of artificial intelligence (N2, N6, N8). Unfortunately, similarly as with innovation, true digitalization will be substituted by traditional forms of business (the false digitalization phenomenon (N12)).

Thirdly, we will become more digitally-dependent. Today, messengers and social media are already taking over live communications. Over time, the deployment of artificial intelligence in business processes may cause losses in individuality (N3) and complete depersonalization of humans in the economy (N4). As a result, we will completely lose emotions from communication (N9). There will be also retrogrades (N10) refraining from everything digital, which will cause an even more profound disruption in business communications.

Fourthly, the digital economy is currently not protected by a regulatory framework (N7): there exists a high risk of fraud and cybercrime as a result (N11).

Fifthly, “entrepreneurs have to be honest”, as it will be difficult to deceive robots. The latter consideration is aligned with a “pro” argument, namely, lower corrup-

tion (Y16). However, there is a dilemma: from the business perspective, there is a potential negative aspect relating to the fact that entrepreneurs will have to ensure ‘clean’ accounting or set up artificial intelligence to perform transactions in an appropriate way. From the perspective of the state, digitalization, meanwhile, will support business transparency and help to mitigate tax evasion, misrepresentations of social security figures, staff counts, etc. Corruption may also create higher barriers to entry in the digital business (N14).

The lack of digital culture (N13), or entrepreneurial culture in fact, is also a negative of digital transformation at the early stage.

3.8 “My way in digital transformation”

According to survey respondents, they are already

the operators of the digital economy outcomes (“I am a user” (I6), “I stand with big data» (I8)), and some plan to become mobile app developers in the future and engage in business process programming through the implementation of artificial intelligence (“I am a developer” (I7)). In any case, digital transformation is already there, and students are prepared to keep up with progress (I1, I5), retrain (I2) to fit in the digital economy with new professions (I3) and build up company capitalizations (I4).

Discussion

The findings of the student survey concerning the “pros” and “cons” of digital transformation allow to model key components influencing digital transformation of business (Figure 2).

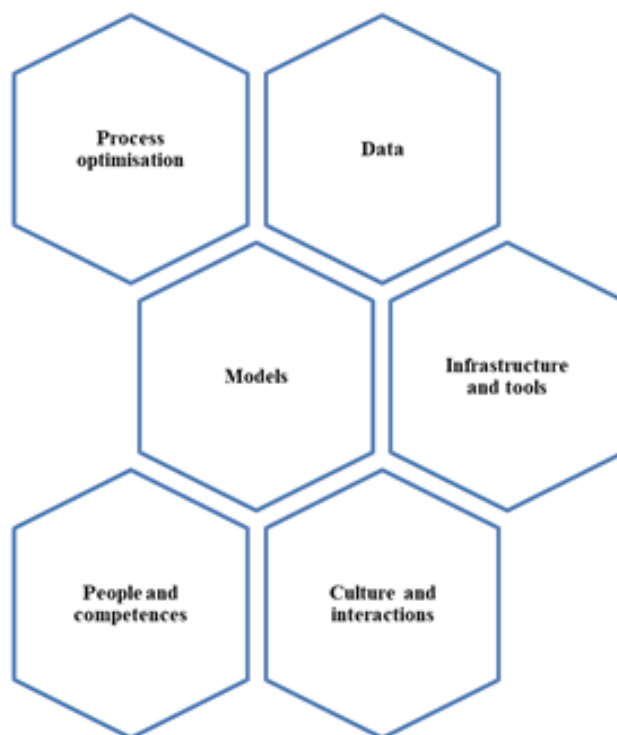


Figure 2. Model of Digital Entrepreneur Transformation

Source: developed by the authors

The first point is process optimization: the digital era brings in a cardinal change in business processes as it transforms the quantity and composition of business resources. Subsequently, the sequence of business processes becomes shorter.

The second point is data, which, in a digital economy, should be completely transferred from physical carriers into the virtual environment. As soon as it comes in a digital form, it is easily copyable virtually at no cost. Moreover, digital copy is virtually identical to the original, in contrast to a copy transferred between physical carriers.

The third point is that digitalization changes approaches to business models. Business is gradually

moving to the Internet environment, as it develops business models such as online stores, e-commerce, crowdsourcing, crowdfunding, digitalization, Freemium, Open Source and others. Lease-based and intermediary forms are becoming even more popular than ownership.

The fourth point is infrastructure and tools. The era of innovation economy was characterized by innovation entrepreneurship support mechanisms such as business incubators, technological parks, venture funds. The infrastructure of the digital economy will comprise digital centers established pursuant to the Resolution of the Government of the RF On approval of the program “Digital Economy of the Russian Federation”.

The fifth consideration is culture and interactions. The lack of a regulatory framework for the digital economy is now causing cybercrime and digital attacks, while electronic signature for many economic subjects is hardly comprehensible at all. It will take a while for both the business community and consumers of its services to truly embrace digital technologies. There are some established trends, however: social media have become a key source of information for the new generation of consumers, and businesses have to be more customer-oriented.

The sixth point is people and competences. Despite the rising scale of artificial intelligence, robotization, gamification and virtualization, humans will still be

part of the society and business. It is up to humans to engage in entrepreneurial activities and to professionally support the establishment, development and operation of entrepreneurship. Competition is gradually entering the competitive environment of an organization. Competition for talent is stiffening, and people have to adapt to change. Those with an entrepreneurial mindset are best fit for the future.

Here is a comparison of the findings with the Forum's Future of Jobs report (Schwab, 2019), representing the views of chief human resources officers of today's largest employers in 10 industries and 15 economies (Figure 3).

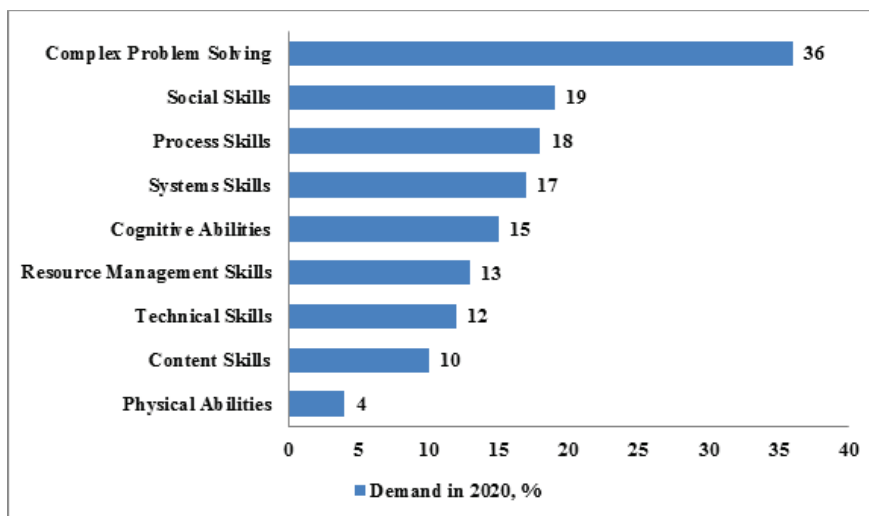


Figure 3. Demand for Professional Skills in 2020.

Source: K. Schwab. *The Fourth Industrial Revolution*. – Moscow: Eksmo, 2019. – p. 57 [12]

As can be seen from Figure 3, complex problem solving, social and systems skills will be far more in demand in 2020 when compared to physical abilities or content skills. Scarcity of a skilled workforce rather the availability of capital is more likely to be the crippling limit to innovation, competitiveness and growth. In such a context, it is a leader's ability to continually learn, adapt and challenge his or her own conceptual and operating models of success that will distinguish the next generation of successful business leaders.

Conclusion

The digital economy has become a pivot of development for the public and municipal management, business and society. At the same time, humans have been and will remain key operators in the system. However, they will have to adapt to changing conditions of the market and competition.

The findings of the authors' survey show that future professionals are willing to transform and keep up with digital progress. However, there are factors calling for changes in the digitalization process. In particular,

these include high costs of robotization, false digitalization instead of true digitalization, cyber fraud, lack of digital culture, etc.

However, artificial intelligence can help to bring down the load of routine competences borne by humans and cut down on human engagement in hazardous production and night shifts. Drones will be instrumental in supervising traffic conditions in urban highways and streets and monitoring the situation in agriculture or fire safety in remote locations and villages. Hyperloops (vacuum trains) will cut travel times between destinations. In other words, digitalization will help to optimize business processes, business resources, and business models, bring down physical and mental burden for humans, and cut transaction costs.

Digitalization will require a special focus on employees' abilities to cope with continued adaptation and master new skills and approaches. Consequently, both digital entrepreneurs and just every member of a society will find their competences are subject to a constant transformation.

The convergence of digital, physical and biological technologies sustaining the current transformations will most of the time contribute to the enhancement of human labor and cognitive functions. That means lead-

ers will have to develop talent, promote job training models and create integrated smart machines with constantly growing scope of capabilities.

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