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Employees' Competitiveness in Russia: How to Improve Employees' Digital Competencies

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Abstract

This article focuses on digital skills and digital competencies as a factor of employees' competitiveness. We offer our qualifications of digital skills. In this regard, we wonder what digital skills and competencies are, and also in what ways they can be improved to increase the levels of employees' competitiveness. We consider ways to improve the effectiveness of government programs. All areas of the state program to one degree or another have an impact on digital skills and thereby on the employees' competitiveness. First of all, the state program sets the environment with such areas as regulatory regulation, information infrastructure and information security, thereby contributing to the development of digital skills, but indirectly. These three areas set the basis for the areas of personnel and education, the formation of research competencies and technological reserves, which directly increase the level of digital skills of employees, and hence their competitiveness. The state program has been implemented since 2018. Therefore, it is difficult to evaluate the results of the started government measures. As researchers, we want to suggest indicators to estimate results in the future, passing officially published results. Then we conduct a preliminary analysis of the demand for digital skills in Russia and identified three main trends. We provide conclusions and recommendations for all of them. For the further development of digital skills and competencies of employees, strengthening the competitiveness of workers in the context of digital transformation, the coordination and motivation of all economic agents: the state, companies, workers are required.

Keywords: employees' competitiveness, digital employees' competitiveness, digital competencies, digital skills.

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Конкурентоспособность сотрудников в России: Как улучшить цифровую компетенцию сотрудников

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Аннотация

В данной статье основное внимание уделено цифровым навыкам и цифровым компетенциям как фактору конкурентоспособности работников. Мы предлагаем нашу квалификацию цифровых навыков. В связи с этим возникает вопрос, что такое цифровые навыки и компетенции, а также какими путями их можно улучшить для повышения уровня конкурентоспособности работников. Мы рассматриваем пути повышения эффективности государственных программ. Все направления государственной программы в той или иной степени оказывают влияние на цифровые навыки и тем самым на конкурентоспособность работников. В первую очередь государственная программа задаёт среду такими направлениями как нормативное регулирование, информационная инфраструктура и информационная безопасность, тем самым способствуя развитию цифровых навыков, но косвенно. Данные три направления задают базу для направлений кадры и образование, формирование исследовательских компетенций и технологических заделов, которые напрямую повышают уровень цифровых навыков работников, а значит, и их конкурентоспособность. Государственная программа реализуется с 2018 года. Поэтому сложно оценить результаты принятых правительством мер. Как исследователи, мы хотим предложить показатели для оценки результатов в будущем, минуя официально опубликованные результаты. Затем мы проводим предварительный анализ спроса на цифровые навыки в России и выявляем три основные тенденции. Мы предоставляем выводы и рекомендации для всех из них. Для дальнейшего развития цифровых навыков и компетенций работников, работающих в условиях цифровой трансформации, требуется согласованность и мотивация всех экономических агентов: государства, компаний, работников.

Ключевые слова: конкурентоспособность работников, цифровая конкурентоспособность работников, цифровые компетенции, цифровые навыки.

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Introduction

Employees' competitiveness is a key factor of the company competitiveness and the country competitiveness in global markets. With the proliferation of the digital technology usage, the concept of digital employees' competitiveness arises. According to the Vodafone Institute, 85% of employees use digital skills at work. However, 56% of employees lack the necessary digital skills or the level of these skills for future work [1]. Therefore, enhancing the digital skills of employees is imperative. First of all, we will define digital skills.

"Digital skills" definition

There is no single definition of digital skills and digital competencies. Many researchers associate related concepts with digital competencies, such as digital literacy, computer literacy, information literacy and others. We turned to the classification of digital skills, which will help clarify the definition. We have analyzed several key classifications of digital skills¹ [2], [3], [4].

Table 1. Key classifications of digital skills

Level	OECD	European Commission	UKforCE
1	Low and basic activities		Digital Muggle
2		Basic digital literacy skills	Digital Citizen
3		Digital skills which relate to employment	Digital Worker
4	Advanced activities	Digital skills for the ICT professions	
5	Specialist activities		Digital Maker

Summarizing the classification data, we offer new one that includes five levels:

- Level 1 - Digital Stranger. Low level of digital skills or lack of them.
- Level 2 - Digital Buddy. Basic skills turning on a computer, using Internet browsers, sending mail, etc.
- Level 3 - Digital Craftsman. Basic skills of using office software packages.
- Level 4 - Digital Artist. Usage of advanced functions in basic software packages or basic functions of advanced packages.
- Level 5 - Digital Inventor. Creation of new software packages.

¹ The Future Digital Skills needs of the UK Economy. Development Economics, 2013. [Electronic resource]. Available at: <http://cdn.news.o2.co.uk.s3.amazonaws.com/wp-content/uploads/2013/09/The-Future-Digital-Skills-Needs-of-the-UK-Economy1.pdf> (accessed 06.08.2019). (In Eng.)

² Программа «Цифровая экономика Российской Федерации». Распоряжение Правитель'ства РФ от 28 июля 2017 № 1632-р [Digital Economy of the Russian Federation. Government of the Russian Federation]. 28.07.2017. [Electronic resource]. Available at: <http://static.government.ru/media/files/9gFM4FHj4PsB7915v7yLVuPgu4bvR7M0.pdf> (accessed 06.08.2019). (In Russ.)

³ Ibid.

Based on the proposed classification, we suggest our definitions: Digital skills - the ability to use information and communication technologies

Digital competencies (as a broader concept that includes digital skills) - knowledge of information and communication technologies, the ability and possession of information and communication technologies.

Paths to improve employees' digital competencies

There are several paths to improve employees' digital competencies. We have disclosed them in Table 2.

Table 2. Ways to improve employees' digital competencies and examples

Ways to improve employees' digital competencies	Examples
State programs	<ul style="list-style-type: none"> • "Digital Economy of the Russian Federation"; • "Digital Skills and Jobs Coalition" in European Union.
Transfer of training of the organization's employees to outsourcing to companies specializing in the development of digital skills ¹	<ul style="list-style-type: none"> • ISDI; • Digital Marketing Institute.
In-house training of employees by organizations and the development of corporate universities	<ul style="list-style-type: none"> • Sberbank Corporate University; • VTB courses.
Self-study	<ul style="list-style-type: none"> • books; • online distance courses.

There three groups of digital competencies studies:

Government documents² [6-8].

Companies studies [10-12].

Scientific research [13-21].

We consider that the most important and primary path is the state program, because the state through its policy creates the basis for other paths. We will dwell on this path in more detail.

Analysis of state programs in Russian

"Digital Economy of the Russian Federation" program was approved by order of the Government of the Russian Federation dated July 28, 2017 No. 1632-r. In the Digital Economy. It contains five directions with certain objectives and indicators systemized in Table 3³.



Table 3. Objectives and planned key indicators of the directions of the state program "Digital Economy of the Russian Federation"

Direction of the state program "Digital Economy of the Russian Federation"	The objectives of the state program "Digital Economy of the Russian Federation" directions	Key indicators by 2024 in the areas of the state program "Digital Economy of the Russian Federation"
Regulatory regulation	<ul style="list-style-type: none"> • create a new regulatory environment that will ensure a favorable legal regime that promotes the emergence and development of modern technologies, and the implementation of economic activities for their usage; • create a permanent mechanism for managing changes and competencies in the field of regulation; • remove key legal restrictions and create separate legal institutions that are aimed at addressing the priorities that form the digital economy; • form a comprehensive legislative regulation of relations that arise during the development of the digital economy; • take measures stimulating economic activity on the use of modern technologies, data collection and use; • formulate a policy for the development of the digital economy on the territory of the Eurasian Economic Union, harmonize approaches to normative legal regulation that contribute to its development in the space of the Eurasian Economic Union; • create a methodological framework for the development of competencies in the field of regulation. 	<ul style="list-style-type: none"> • 10 or more - the number of successfully functioning leading companies as ecosystem operators that are competitive in global markets; • 10 or more - the number of successfully functioning industry digital platforms designed for the main subject areas of the economy; • 500 or more - the number of successfully functioning small and medium-sized enterprises for the creation of digital technologies and platforms, as well as the provision of digital services.
Personnel and Education	<ul style="list-style-type: none"> • create conditions for training; • improve the education system, providing competent personnel; • bring the labor market to a level that meets the new requirements; • create a motivation system for the development of the necessary competencies, staff participation in the development of the digital economy. 	<ul style="list-style-type: none"> • 120 thousand people per year - the number of graduates of educational institutions of higher education whose training areas are related to ICT; • 800 thousand people per year - the number of graduates of higher and secondary vocational education who have competencies in the field of ICT at an average global level; • 40% is the proportion of the population that has digital skills.
Formation of research competencies and technological background	<ul style="list-style-type: none"> • create a support system for search and applied research that will ensure technological independence for digital technologies and national security. 	<ul style="list-style-type: none"> • 30 - the number of projects in the digital economy (at least 100 million rubles); • 10 - the number of Russian organizations that are implementing large-scale projects (\$ 3 million) in priority areas of international scientific and technical cooperation.
Information infrastructure	<ul style="list-style-type: none"> • develop communication networks for the collection and transmission of data from the state, business and citizens, taking into account the technical requirements that digital technologies impose; • develop systems of Russian centers that process data and provide the state, business and citizens with affordable, stable, safe and cost-effective data storage and processing services, allow exporting data storage and processing services; • introduce digital data platforms to meet the needs of government, business, citizens; • create an effective system of collecting, processing, storing and providing consumers with spatial data that will provide the needs of the state, business, citizens with information about spatial objects, which is relevant and reliable. 	<ul style="list-style-type: none"> • 97 percent - the share of households with broadband Internet access in the total number of households; • All large cities (1 million people or more) - steadily covered with 5G and higher.
Information Security	<ul style="list-style-type: none"> • achieve a state of security of the individual, society and the state from internal and external information threats, which ensures the implementation of constitutional rights and freedoms of man and citizen, as well as decent quality and standard of living of citizens, sovereignty, sustainable socio-economic development; • ensure the unity, stability and security of the information and telecommunications infrastructure at all levels of the information space; • provide organizational and legal protection of the individual, business, state interests during interaction in the digital economy; • create conditions for the country's leading positions in the field of export of services and technologies related to information security, taking into account national interests in international documents on information security. 	<ul style="list-style-type: none"> • 75 percent - the proportion of entities that use the standards of safe information interaction of state and public institutions; • 5 percent - the share of internal network traffic of the Russian Internet segment, which is routed through foreign servers.



Implementation directions of the state program have different impacts on digital skills and thereby on the employees' competitiveness. The state program sets the environment with such areas as regulation, information infrastructure and information security, thereby contributing to the development of digital skills, but indirectly. These three areas set the basis for the areas of personnel and education, the Formation of research competencies and technological groundwork, which directly increase the level of digital skills of employees, and therefore their competitiveness.

Table 4. Directions comparison of the state program "Digital Economy of the Russian Federation" and their impact types on digital skills and employees' competitiveness

Direction of the state program «Digital Economy of the Russian Federation»	Impact type on digital skills and employees' competitiveness
Regulatory Regulation	Indirect
Personnel and Education	Direct
Formation of Research Competencies and Technological Background	Direct
Information Infrastructure	Indirect
Information Security	Indirect

The state program has been implemented since 2018 and the first stage concerns the collection of information, building tasks and goals. Therefore, it is difficult to evaluate the results of the started government measures. As researchers, we want to propose an assessment of the demand for digital skills by employees, passing officially published results. Assessing the demand for digital skills will reveal approximate values of: The number of employees interested in mastering or enhancing digital skills. The current distribution of the most relevant digital skills for employees to master. The current distribution of interest in digital skills across Russian regions.

Analysis of digital skills demand

As a method of preliminary demand assessment, we will use search engines. The most popular search engines in Russia are Google and Yandex. Their market shares in July 2019 in the Russian Internet⁴ were 49.9% and 47.4%.

Google has been analyzing search queries since 2004, but its system is less flexible for analyzing similar queries. Therefore, for the purpose of preliminary analytics and for the subsequent deeper analysis, we used Yandex.

Yandex.WordStat as part of Yandex analytics generates the volume of search queries, including related queries. As number of competencies in 21st century is rising [23], we used different skills in our research. For example, if we want to find out how many people are looking for computer courses (search query "компьютерные курсы"), Yandex.WordStat will also include in this number people looking for computer courses for beginners (search query "компьютерные курсы для новичков").

We have selected the most common requests for software packages. For example, excluded such requests as, because in Russia their volumes are less than 2,000.

Table 5. Number and share of search queries about digital courses in Russia per month

District	Volume of search queries about computer course	Share of search queries about computer course	Volume of search queries about Excel course	Share of search queries about Excel course
Central Federal District	10 129	0.429	3 923	0.603
Northwestern Federal District	3 343	0.142	7 30	0.112
Southern Federal District	1 952	0.083	360	0.055
North Caucasus Federal District	718	0.030	74	0.011
Volga Federal District	3 507	0.149	647	0.099
Ural Federal District	1 838	0.078	309	0.047
Siberian Federal District	1 623	0.069	338	0.052
Far Eastern Federal District	4 87	0.021	126	0.019
Russia - total	23 597	1.000	6 507	1.000

We have identified the following trends regarding our tasks:

It is most likely that the people who made these searches were users of level 2 to 4 computer packages (Digital Buddy, Digital Craftsman and Digital Artist).

The most popular software package for searching courses is 1C. The Central Federal District leads in all software packages (over 0.4 share of search queries).

Therefore, we give conclusions and recommendations:

Interest in courses can be expressed both by external and internal factors that need to be identified in further studies.

A pronounced tendency to search for specific software packages indicates the need to launch local government programs to improve their skills.

It is necessary to find out the reason for the shift of the sample to one region: lack of resources, lack of motivation or other factors.

Table 6. Number and share of search queries about digital courses in Russia per month

District	Volume of search queries about 1C course	Share of search queries about 1C course	Volume of search queries about Python course	Share of search queries about Python course
Central Federal District	16 766	0.430	2 407	0.477
Northwestern Federal District	5 157	0.132	620	0.123
Southern Federal District	2 932	0.075	341	0.068
North Caucasus Federal District	929	0.024	130	0.026

⁴ LiveInternet. Site Statistics [Electronic resource]. Available at: <https://www.liveinternet.ru/stat/ru/searches.html?slice=ru&date=2019-07-31&period=month> (accessed 06.08.2019). (In Russ.)



District	Volume of search queries about 1C course	Share of search queries about 1C course	Volume of search queries about Python course	Share of search queries about Python course
Volga Federal District	5 360	0.138	798	0.158
Ural Federal District	3 040	0.078	316	0.063
Siberian Federal District	3 652	0.094	325	0.064
Far Eastern Federal District	1 118	0.029	109	0.022
Russia - total	38 954	1.000	5 046	1.000

Conclusion

In this article we uncovered ways to increase the employees' competitiveness through digital skills. We have revealed in more detail the path of state programs. We also conducted a preliminary analysis of requests for courses. In the future, a more detailed analysis of the results of the Digital Economy of the Russian Federation program will be based on:

Comparisons of indicators mentioned in the state program - declared in the program and achieved.

Comparisons of indicators not mentioned in the state program - the volume of search queries about digital courses in dynamics, as well as other indicators.

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