

# Features of Training in Financial Management Technologies in the Digital Economy

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**Abstract**—This paper explores and presents the characteristics of training in financial management technologies in the digital economy.

The digital economy creates new conditions for the functioning of companies: the form of economic activity of the information community is dynamically developing. As a result, the usual forms and methods of doing business of companies around the world are rapidly changing.

In the digital economy, managers face new challenges, change the principles of financial management of companies, and new financial management technologies.

Requirements to qualification of financiers able to work in state, commercial and non-profit organizations, Russian and international companies, with large monetary operations, capital management and financing of projects, whose interests include investments, loans, transactions, debt collection and much more, in the conditions of the digital economy significantly increase.

It is necessary to train fully educated, competent, qualified professionals who possess the full range of new financial management technologies, taking into account the features of their future employment.

## I. INTRODUCTION

In the modern world, the role of the digital economy - an economic activity based on digital technologies and containing various electronic services, electronic monetary exchange (including entrepreneurial activity in the field of services selling goods and services (including electronic), usually using settlements between participants of electronic transactions with electronic money) is increasing.

The aim of the study was to identify the peculiarities of training in financial management technologies in the digital economy.

## II. METHODS

The study applied the following general scientific and particular methods: analysis and synthesis, as well as statistical analysis methods (dynamics analysis, extrapolation, graphical method).

The analysis of the dynamics of the use of information and communication technologies in Russian organizations for 2010-2017 was carried out on the basis of the data of the Federal Statistical Service on the total volume of use of information and communication technologies in domestic organizations (as a percentage of the total number of surveyed organizations of the Russian Federation) for this period.

## III. RESULTS

Thus, the analysis of the dynamics of the use of information and communication technologies in the organizations of Russia for 2010-2017 using the data of the Federal Statistical Service showed that the total volume of use of information and communication technologies in domestic organizations (as a percentage of the total number of surveyed organizations of the Russian Federation) has steadily increased during the whole period under study (Fig.1).

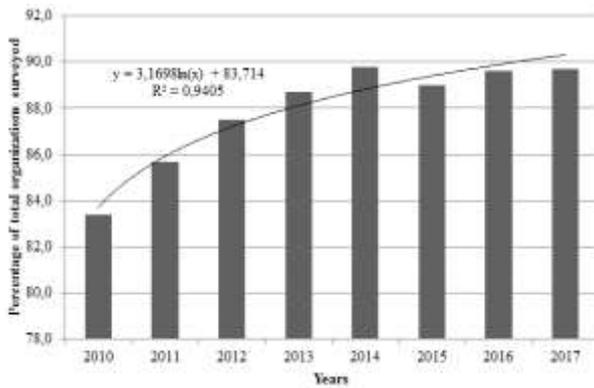


Fig. 1. Dynamics of information and communication technologies use in Russian organizations for 2010-2017 (Source: created by authors on the basis of [18])

In 2017, the volume of use of information and communication technologies in organizations (the ratio of the number of organizations that used global information networks to the total number of surveyed organizations of the Russian Federation, as a percentage) in Russia amounted to 89.7%, which exceeded the level of 2010 by 7.53 percentage points. On the basis of the calculated trend (with a high degree of approximation, the R2 is 94.05%) and extrapolation according to the logarithmic trend, it can be stated that the trend revealed during the period from 2010 to 2017 of the growth of the total volume of use of information and communication technologies in domestic organizations will take place in the country in the near future.

The process of integration into the business of virtual and augmented reality, artificial intelligence is taking place today very intensively. In addition, 3-D and 4-D printing, blockchain technology are being introduced into production; Big data is generated and accumulated; the Internet of things is formed; Remote training services (web- and chat sessions, teleconferences, TelePresence, etc.); Forms of electronic commerce such as online stores and Internet platforms [5], as well as Internet banking (remote banking technology), new electronic payment systems are rapidly developing, new types of electronic currency (virtual (digital) currency, crypto) are emerging.

The digital economy creates new conditions for the operation of companies: the dynamically developing form of economic activity of the information community is rapidly transforming the usual forms and methods of economic activity of companies around the world [21, 16].

New technologies change all spheres of life: information environment, communication skills, consumption sphere, technosphere [6], which places new requirements on personnel entering the labour market, whose professional skills are closely related to technologies of financial management.

In Russia, by Order of the Government of the Russian Federation of July 28, 2017, No. 1632-r approved the program "Digital Economy of the Russian Federation." Following the meeting of the Presidium of the Council under the President of the Russian Federation on Strategic Development and

National Projects on December 24, 2018, the passport of the national program Digital Economy of the Russian Federation was approved [7].

According to this programme, the main objectives of the human resources and education sector are "to create key conditions for training the personnel of the digital economy; improving the education system, which should provide the digital economy with competent personnel; the labour market, which should be based on the requirements of the digital economy; creation of a system of motivation for mastering the necessary competences and participation of personnel in the development of the digital economy of Russia."

Thus, the transformation of the structure of world production and the labour market, the rapid development of the digital economy force both individual states and their associations to make significant efforts to educate, attract and retain "personnel of the digital economy."

The federal project "Personnel for the Digital Economy" reflects the goals and objectives of the "Strategies for the Development of the Information Society in the Russian Federation for 2017-2030," among which "the use and development of various educational technologies, including remote, e-learning in the implementation of educational programs" [20].

#### IV. DISCUSSION

In studying the peculiarities of training in financial management technologies in the digital economy, it should be noted that the trends and challenges of the modern labour market are of particular interest, which should be taken into account in training, as changes are expected in both technical and industrial professions and in the service sector.

Tobias Funk and Christel Weber highlighted key trends in labour and training in their research on digitalization [9]. Thus, in the field of labour, the authors noted the following trends:

1. Increase in project-oriented forms of work.

Project-oriented forms of work with clearly defined goals, budgets and deadlines will increase all the time [9]. And there is no doubt that projects should be implemented in shorter periods of time with new, so-called "flexible" development processes and service requirements [14].

2. Teamwork and personal responsibility of employees.

"Flexible" development processes require effective work in teams composed of people with different qualifications, roles and interests (often also between units and companies) [15]. Interdisciplinary knowledge of the company's networked manufacturing and business processes is playing an increasingly important role at all levels [2, 19]. The traditional leadership and control model will be replaced by increasingly decentralized decision-making with the far greater personal responsibility of staff than before.

3. Increase in value of IT competences.

Information technology (IT) will play a central role in all areas of the company's business, be it procurement, production, distribution or marketing [8, 17]. This increases the proportion of network information processing and therefore a better understanding of these systems becomes necessary [4].

#### 4. More transparency in quality assurance.

Data-based systems enable consistent monitoring, measurement and documentation. This will make it possible to increase the level of transparency of the production process and productivity. Errors, deviations and faults can be detected and corrected faster, and this will ensure the quality of products and services is guaranteed.

#### 5. Local (spatial) and temporal flexibility of operation.

Network systems can be monitored and maintained at a distance, and communication and collaboration become virtual. Work orders can be executed regardless of the working time set in the company. This is accompanied by new requirements for self-organization and coordination [9].

The German authors summarized the main aspects of changes in the field of training in three main sections - mobile education, social education, game training [9]:

- a possibility of the training which is not depending on location and time. For example, using a tablet, learners and training staff can communicate at their workplaces;
- educational groups can support mutually each other and also participate in competitions, games at whom using the gathered points it is possible to estimate how many tasks were carried successfully out and at what level of competence there is each player;
- a possibility of use of networks for the exchange of versions of the solution of the tasks set in the course of training.

In the future, it will also be possible to consider different learning styles and real-time situations. There are smooth transitions from "enriching" the doctrine of teaching through accompanying online offerings to mandatory integration of online learning and classical forms of learning, so-called, "mixed learning" to full "virtualization" learning. In this direction, training is already under way, many universities are using mixed education or the transition to such a form of education has already begun.

One of the features of modern time is mass duplication (lat. duplicare) (appearance of twins; Copying) existing in reality economic entities (enterprises, organizations, firms, banks, educational institutions, shops, trading networks, etc.) in the virtual electronic world. Economic entities, through free access to Internet technology, create electronic forms of doing business, open online representative offices, thus increasing access to their goods and services, and therefore the volume of their implementation increases. As a result, in the digital economy, managers face new challenges, as the principles of financial management of companies are modified, as well as new financial management technologies are emerging.

As a result in the conditions of digital economy requirements to qualification of the financiers capable to work in the state, commercial and non-profit organizations, the Russian and international companies, with large monetary operations, management of the capital and financing of projects which focus of interest includes investments, the credits, transactions, collection of debts and many other things significantly increase: today the "digital" competence is necessary for shots except traditional skills, abilities and competences. "Digital" competence includes not only the ability and ability to solve various information and "digital" problems (Find, evaluate, validate, process, analyze, and manage digital content in general, information, and data (Often Big Data) individually) but also ability to collaborate with digital technology, information security (Personal data protection, trade secrets, etc.), online etiquette and even digital creativity [13].

One of the main features of the future employment of financiers is that, as a result of the penetration and development of information processes in various sectors of the economy, information will be a key factor in the economy [10]: a commodity, a service, a resource, a source of value added, and even a source of employment. Therefore, it is necessary to train fully educated, competent, qualified professionals who possess the full range of new financial management technologies, taking into account the peculiarities of their future employment.

People in high demand in the labor market should be well aware of the modern concept and practical technologies of financial management, both at the macro-level - the level of public financial management, and at the micro-level - the level of specific business technologies, among which should be noted: current monitoring, diagnosis of financial condition, as well as new technologies of financial management: financial benchmarking, financial engineering, controlling, etc.

Thus, development, adaptation and updating of educational programs for new requirements of labor market, formation of new, "digital" abilities, skills and competences of experts in the technologies of management of finance demanded in the changing world are necessary already today.

Education should also respond flexibly to changing market needs and actively develop the sphere of providing additional services in the form of short courses, seminars, master classes with certificates of their completion, it is necessary to constantly monitor market needs, create databases of practitioners ready to share their experience [1]. The procedure for providing additional educational services should also be flexible, based on the principles of working free educational resources. There should be free access to short-term training resources, and if necessary, the student can obtain a certificate confirming the training for a fee. With the interest of a certain group of students in free courses, special more in-depth face-to-face programs can be created.

With the constant increase in the volume of digital information, the role of the target search for the necessary information in the flow, as well as the assessment of the quality of the obtained information and its processing using statistics and econometrics methods, heuristic methods,

scenario analysis methods, etc., increases [3]. The role of methods of environmental assessment, marketing research is increasing, as the individualization of consumption is increasing, the life cycles of products and services are becoming shorter. With the development of IT technologies and software, many processes can be automated, but the choice of methods to solve non-standard problems remains with the person [11]. In this regard, as correctly noted by German and Swiss colleagues [9, 12], the role of project-oriented forms of work, ability to work in a team, responsibility for the performed area of works, flexibility, speed in the performance of works is increasing.

In summary, the development of digital technologies has a significant impact on the economy and the main task of education is to train qualified personnel able to work with digital technologies, introduce them into the production process, as well as to improve it.

### References

- [1] S.E. Abraham, L.A. Karns, K. Shaw, and M.A. Mena, "Managerial competencies and the managerial performance appraisal process", *Journal of Management Development*, 20 (10), pp. 842-852, 2001. DOI: 10.1108/02621710110410842.
- [2] C.P. Armstrong and V. Sambamurthy, "Information Technology Assimilation in Firms: The Influence of Senior Leadership and IT Infrastructures", *Information Systems Research*, 10 (4), pp. 304-327, 1999 [Electronic resource]. Available at: <http://isrjournal.informs.org/>. DOI: 10.1287/isre.10.4.304.
- [3] P. Brooks, O. El-Gayar, and S. Sarnikar, "A framework for developing a domain specific business intelligence maturity model: Application to healthcare", *International Journal of Information Management*, 35 (3), pp. 337-345, 2015 [Electronic resource]. Available at: <https://proxy.library.spbu.ru:2492/international-journal-of-information-management>. DOI: 10.1016/j.ijinfomgt.2015.01.011.
- [4] M. Carter, V. Grover, and J.B. Thatcher, "The emerging CIO role of business technology strategist", *MIS Quarterly Executive*, 10 (1), pp. 19-29, 2011 [Electronic resource]. Available at: <http://misqe.org/ojs2/index.php/misqe/article/viewFile/288/265>.
- [5] D. Chatterjee, R. Grewal, and V. Sambamurthy, "Shaping up for E-commerce: Institutional enablers of the organizational assimilation of Web technologies", *MIS Quarterly: Management Information Systems*, 26 (2), pp. 65-90, 2002.
- [6] M. Chun and J. Mooney, "CIO roles and responsibilities: Twenty-five years of evolution and change", *Information and Management*, 46 (6), pp. 323-334, 2009. DOI: 10.1016/j.im.2009.05.005.
- [7] Digital Economy of the Russian Federation Program [Electronic resource]. Available at: [http://www.consultant.ru/document/cons\\_doc\\_LAW\\_221756/2369d7266adb33244e178738f67f181600cac9f2/](http://www.consultant.ru/document/cons_doc_LAW_221756/2369d7266adb33244e178738f67f181600cac9f2/).
- [8] M. Fitzgerald, N. Kruschwitz, D. Bonnet, and M. Welch, "Embracing digital technology: A new strategic imperative", *MIT Sloan Management Review*, 55 (2), 2014.
- [9] T. Funk and C. Weber, "Digitalisierung in der Ausbildung", *Upgrade mit Strategie*, Stand: Dezember 2017, 1, Auflage, Layout und Satz [Electronic resource]. Available at: [www.svenja-klaus.de](http://www.svenja-klaus.de).
- [10] R.D. Galliers and A.R. Sutherland, "Information systems management and strategy formulation: the 'stages of growth' model revisited", *Information Systems Journal*, 1 (2), pp. 89-114, 1991. DOI: 10.1111/j.1365-2575.1991.tb00030.x.
- [11] M.G. Guillemette and G. Paré, "Toward a new theory of the contribution of the IT function in organizations", *MIS Quarterly: Management Information Systems*, 36 (2), pp. 529-551, 2012 [Electronic resource]. Available at: <http://misq.org/contents-36-2/>.
- [12] E. Herzog, R. Wehrli, M. Hassler, S. Schärer, S. Sigrist, "Zukunft digitale Schweiz: Wirtschaft und Gesellschaftweiterdenken", W.I.R.E., Think Tank für Wirtschaft, Wissenschaft & Gesellschaft [Electronic resource]. Available at: [https://www.thewire.ch/data/files/Zukunft\\_digitale\\_Schweiz\\_W.I.R.E.\\_economiesuisse\\_2017.pdf](https://www.thewire.ch/data/files/Zukunft_digitale_Schweiz_W.I.R.E._economiesuisse_2017.pdf).
- [13] V.S. Katkalo, D.L. Volkov, I.N. Baranov, and et al., "Digital skills training: global challenges and best practices", Analytical report of ANO DPO Corporate University of Sberbank [Electronic resource]. Available at: [http://obzory.hr-media.ru/cifrovye\\_navyki\\_sotrudnika](http://obzory.hr-media.ru/cifrovye_navyki_sotrudnika) (Accessed: 25.11.2019).
- [14] A. Laufer, E.J. Hoffman, J.S. Russell, and W.S. Cameron, "What successful project managers do", *MIT Sloan Management Review*, 56 (3), pp. 43-51, 2015 [Electronic resource]. Available at: <http://sloanreview.mit.edu/article/what-successful-project-managers-do/>.
- [15] Y. Li and C.-H. Tan, "Matching business strategy and CIO characteristics: The impact on organizational performance", *Journal of Business Research*, 66 (2), pp. 248-259, 2013. DOI: 10.1016/j.jbusres.2012.07.017.
- [16] C. Matt, T. Hess, and A. Benlian, "Digital Transformation Strategies", *Business and Information Systems Engineering*, 57 (5), pp. 339-343, 2015 [Electronic resource]. Available at: <http://proxy.library.spbu.ru:2454/content/121294> doi: 10.1007/s12599-015-0401-5.
- [17] J. Peppard, C. Edwards, and R. Lambert, "Clarifying the ambiguous role of the CIO", *MIS Quarterly Executive*, 10 (1), pp. 31-44, 2011 [Electronic resource]. Available at: <http://misqe.org/ojs2/index.php/misqe/article/viewFile/271/264>.
- [18] Regions of Russia, Socio-economic indicators [Electronic resource]. Available at: <https://www.gks.ru/folder/210/document/13204> (Accessed: 22.10.2019).
- [19] Z. Shao, T. Wang, and Y. Feng, "Impact of chief information officer's strategic knowledge and structural power on enterprise systems success", *Industrial Management and Data Systems*, 116 (1), pp. 43-64, 2016 [Electronic resource]. Available at: <http://www.emeraldinsight.com/info/journals/imds/imds.jsp>. DOI: 10.1108/IMDS-05-2015-0186.
- [20] Strategy for the development of the information society in the Russian Federation for 2017 – 2030 years, Decree of the Russian President of 09.05.2017 no. 203 "About the Development strategy of information society in the Russian Federation for 2017 – 2030" [Electronic resource]. Available at: [http://www.consultant.ru/document/cons\\_doc\\_LAW\\_216363/](http://www.consultant.ru/document/cons_doc_LAW_216363/).
- [21] G. Westerman, D. Bonnet, and A. McAfee, "Leading Digital: Turning Technology into Business Transformation", *Harvard Business Review Press*, 2014.