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# Integration of digital technologies as a factor of post-industrial development

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**Abstract.** Digitization of economic sectors is contributing to economic efficiency growth. In the coming decades, many sectors of economy will undergo fundamental transformations such as: change of business models, change of business leaders, disruptive innovation etc. At that, like in previous industrial revolutions, changes and sequences in social, economic and geopolitical spheres will be most drastic. Modern digital economy identifies digital platform-based technologies intended to automate business-processes, minimize transaction costs, speed up assets turnover, facilitate development of competition, shaping of new professional standards and common information environment as top-priority issues.

## 1. Introduction

Nowadays, artificial intellect is involved practically in any sphere of everyday life.

These are: virtual and voice-aided assistants, chat bots, video games, intelligent vehicles, smart Internet shops capable to outguess your demands, on-line customer support services, innovative video monitoring systems, conventional services based on digital platforms and other examples that we come across in everyday life.

The majority of experts identify rapid cyber cash turnover growth and emerging of crypto-currency as most distinguishing features characterizing modern digital technologies.

Blockchain technology i.e. decentralized system of information distribution and storage in the form of databases constitutes the basis of any crypto-currency. Specialists opinion is that block-chain, artificial intellect and internet of goods will soon amalgamate into one technology which may become one of most efficiently growing directions in modern science [1, 2].

Experts consider that by 2020 more than 80% of client queries will be processed by artificial intellect-based systems. Extensive use of innovative artificial intellect-based systems and implementation thereof into various services will enable the users, in short order, to considerably improve quality of services provided, reduce transaction costs, simplify client communication and shorten query processing time [3].



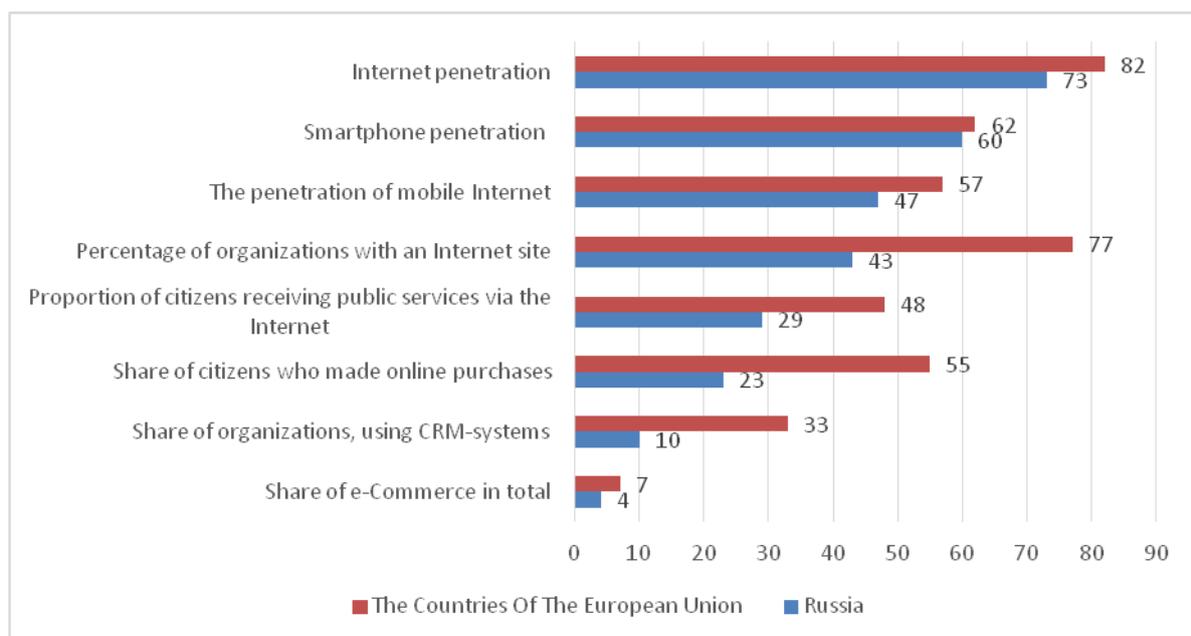
## 2. Materials and methods

Artificial intellect gained particularly important status as one of directions in modern digital technologies over the recent years having taken the role, together with overwhelming Internet promotion, of the key factor of globalization and world economy digitization. It is obvious that the states that are among the first to organically fit into the framework of the new global information systems will receive not only significant advantages, but a tangible impetus to further development.

Today's level of computer technologies development enables more active participating of artificial intellect-based innovations in economic projects, systems and spheres of human activities. Many of them are extensively used in everyday practice thus affirming efficiency thereof. Thus, Gartner company surveys held in 2016-2017 make it possible to conclude that: by 2020, artificial intellect technologies will be to one extent or another used in any newly developed computer program or service; furthermore, by 2030 it will cause global GDP growth by 14% (i.e. by USD 15.7 trillion).

In other words, role of artificial intellect in human life will be rapidly growing.

According to surveys conducted by McKinsey Global Institute, Russia has great digital technology development potential [3]. Digitization of Russian economy will cause GDP 4.2-8.9 trillion rubles increment by 2025 of which 3.4 trillion rubles will relate to production and logistic operations digitization. The said survey presents comparative analysis of access to digital services in Russia and EU (figure1).



**Figure 1.** Access to digital services in Russia and EU, %. (compiled by the author on the basis of present research).

Russia is ready for stepwise digital technologies integrating into economic and everyday life activities of common people. Indicators of Internet, smart phones and mobile internet development are lower than same indicators in EU; however, this gap is not critical. At the same time, business acknowledges poor level of digital technologies employment. Thus, proportion of companies having websites in EU is by 34 points higher than same indicator in Russia. Retardation in proportion of companies using CRM systems is more than 3 times. Today's market is full of accessible software at appropriate prices, however, the majority of Russian companies does not express interest to them and are still using Excel format thus causing productivity decrease, low quality of clients service and, as a consequence, poor company growth [4].

### 3. Discussion

Today, it is impossible to imagine financial institution activity without using digital technologies. Banks representation in the market is constantly growing together with global internet environment exploration thereby. Many banks have web-representations and, apart from conventional services, provide internet-banking services. Emerging bank crediting systems are capable not only to perform borrower's solvency scoring by means of "big data" (data system describing behavior of particular persons) but also to independently take credit granting decision [5, 6]. Beginning from middle of 1990's, fully virtual banks (accessible only for clients having computer with Internet access) appeared first in USA (Security First Network Bank, Netbank) and after that in other countries. In Russia only Tinkoff Credit Systems Bank and Rocketbank are implementing this strategy – remote services for physical persons.

Banks, which are main players in financial market, are actively using algorithms of exchange rate formation mechanism and security papers value estimation. Almost half of total volume of trade in financial markets is performed by robotic software installed in trading terminals. Procurement, installation and maintenance of HFT (high-frequency trading) systems are rather an expensive issue that is why only powerful financial market players have such potentials.

Sberbank of Russia – unconditional leader in Russian financial sector – is actively integrating robotic software to support activities of particular departments like legal, consulting, marketing and some other [6, 7]. In 2017 3 thousand workplaces became vacant due to renovations implementation.

Financial department management established a goal according to which by 2020 proportion of managerial and operational decisions taken with the use of artificial intellect should reach 80%.

Special mention should go to forecasts made by leading specialists representing the Bank of America and Bank of England [11, 12]:

- within forthcoming 10 years only in Great Britain robotic software development will cause the number of workplaces to reduce approximately by 15 million. This is an impressive figure especially if to take into account that today's GB population is about 65 million;
- new industrial revolution which is frequently called "revolution of robots" will very soon address every second employed British. Data regarding other developed countries: by 2025 robots will drive out almost 7% of entire US citizens, by 2030 – 40% of Canadians, by 2035 – half of Japanese;
- beginning from 2012 robot sales have been steadily increasing (by 29% in 2014). Therefore, if current tendencies are preserved, by 2025 proportion of products manufactured by robots with artificial intellect will reach approximately 45% instead of today's 10%.

Specific attention should be focused on "digital platform" phenomenon which is objectively representing a market economy catalyst. Currently, proportion of digital economy in EAEU countries GDP is reaching only 2.8%. Experts estimate that by 2025 this indicator should achieve the growth rate of 25% per annum owing to companies whose business will be based on digital platforms.

As of today, digital platforms have many times affirmed efficiency thereof. Multilingualism and transparency facilitate rapid involvement of new users from elsewhere. Recent times are characterized by exponential increase of digital platforms number. Thus, companies operating on the basis of digital platforms are integrating into increasing number of global economy sectors: social networks (Facebook, LinkedIn, Snapchat), retail sales (Amazon, eBay), finance (Workday, Freelancer), hotel business (Booking), transport services (Uber, BlaBlaCar), ecologically clean energy (Sungevity, SolarCity, EnerNOC), crowdfunding (Kickstarter, Gofundme, ArtistShare, Ulule.). Most striking instance thereof – "Apple" company which developed a digital platform with iOS operating system for Apple devices simultaneously providing interaction between application developers and smart phone users on the basis of Apple AppStore applied digital platform. Development of common or integration of digital platforms enables digital solutions synchronization and creation of tandems of concerned parties. Thus, in 2017 "Sberbank" and "Yandex" signed an agreement on establishment of integrated electronic trading platform based on "Yandex Market" aggregator. Total project value amounts to 60 billion rubles.

In the estimation of analysts, by 2020 technical revolution will cause appearance of about 2 million workplaces with over 7 million liquidated [13, 14]. According to McKinsey, modern digital technologies are capable to replace about 140 million employees related to intellectual service providing business all over the world. According to scientists representing Russian Presidential Academy of National Economy and Public Administration, in case of one-time nationwide automation it is expected that 49.3% of employed Russian population (i.e. 42.13 million persons) may become replaced by robots which will substitute 98% of drivers, 94% of book keepers and 72% of freight handlers.

#### 4. Conclusion

Having analyzed data provided by financial analysts it is possible to conclude that rapid development of modern technologies using artificial intellect is leading to further productivity upswing. According to experts' opinion, this indicator will grow by 25% worldwide and cause simultaneous labor costs decrease within 20–33%. First of all the so-called "disruptive innovations" will touch most advanced countries and cause technological reboot in a number of most important industrial sectors. This refers primarily to reduction of costs in health care and industry saving 8-9 trillion USD within forthcoming 7-8 years. Costs associated with population employment will reduce by similar 9 trillion USD.

Profound implementation of smart vehicles and drones will cause additional saving of 1.9 trillion USD. Aforementioned figures are based on data obtained during 2014–2017 and demonstrating reality of so-called "revolution of robots". Obviously, this revolution will be based on breakdown developments and achievements in the sphere of artificial intellect.

Main reason of increasingly growing interest to innovative digital technologies and to ways of implementing the algorithms thereof consists in rapid increase of modern computers productivity and modern information technologies quality [15].

Overwhelming majority of spheres where artificial intellect is used is displaying increasingly growing performance efficiency; this is causing such projects to receive first-priority investments and to provide a steady increase in their share of the global market. Thus, digital platforms may be treated as drivers of technological growth which are changing the structures of conventional markets and shaping the new ones. Owners of digital platforms are steadily increasing their influence elsewhere, obtain additional cost formation tools and exert influence on demand-supply proportion by creating the information asymmetry.

As a consequence, under modern conditions, only those global digital economy participants who are promoting just now various directions of artificial intellect employment (both for theoretical and practical purposes) will acquire most powerful competitive strength.

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