

How Digitization and Data Analytics Transform Auditing and Society

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Abstract

The main purpose of this publication is the research and study of the digital economy, as this point remains the important issue of integration into the business models based on digital platforms. The world as we know is constantly changing and digital transformation is one of the main drivers. So what is the digital economy? It is an economic activity that results from billions of daily online connections between people, businesses, devices, data and processes. The backbone of the digital economy is hyper-connectivity, which means the growing interconnection of people, organizations and machines, which is the result of the Internet, mobile technology and the Internet of Things. Nowadays, has been formed completely new "information value chain" in the economy world, consisting of firms that support the collection, storage, analysis and modeling of information. In this case, the creation of value occurs in the conversion of information into money through digital intelligence and commercial use.

The digital economy is taking shape and undermining traditional business structure; how firms interact; and how consumers receive services, information and goods.

TechCrunch, the digital economy news site recently noted, "Uber, the world's largest taxi company, has no vehicles. Facebook, the world's most popular media owner, doesn't create any content. Alibaba, the most expensive retailer, has no inventory or the world's largest housing company, doesn't own real estate. We want research what is so special about these companies that allows them to rethink the traditional boundaries and value propositions of their industry.

Keywords: Digital Platforms, Blockchain Technology, Robotic Process Automation, Digital Economy.

Introduction

The current digital transformation of public relations implies the massive "embedding" of information technologies both in traditional types of activity, and the formation of them on the basis of completely new, previously unseen forms of economic interactions. Digital platforms are a key driver of value creation in the digital economy. Over the past decade, a number of digital platforms have emerged worldwide through the use of information-based business models and the digitization of existing sectors. Today, the world's largest companies by market capitalization, such as Amazon, Alibaba, Facebook, eBay, Uber, Didi Chuxing, and Airbnb, have business models based on digital platforms. These giant companies demonstrate the power of digital platforms and covers 3/2 of the total market value in this area.

Today, it is very difficult to measure the global digital economy and the value it creates. First of all, because there is still no single definition of the digital economy. On the other hand, there are no official statistics on the main components of this economy. According to research, the scale of the digital economy is between 4.5 and 15.5% of GDP. The United States and China account for about 40% of the value added in the global ICT sector. For example, these two countries cover 75% of all blockchain technology patents, 50% of global Internet of Things spending, and more than 75% of the cloud technology market. At the same time, these countries cover 90% of the market capitalization value of the world's 70 largest digital platforms. The share of Europe in this direction is 4%, and the combined share of Latin America and Africa is 1%. (DIGITAL ECONOMY: Emerging Technologies and Business Innovation, 2018).

The most serious challenges of the digital economy are changing the existing economics in the first place. The traditional composition of the factors of production is changing, and labor is losing its importance as a factor of production. The scale effect is not relevant, and sometimes it is possible to produce at a marginal cost of almost zero. The digital economy is expected to lead to massive changes in the labor market. The development of new digital technologies, especially artificial intelligence, leads to the loss of jobs in some sectors and the creation of new opportunities in others (A.Muradov., February 13-14, 2020).

An inspection based solely on document verification is a thing of the past. After the balance sheet date, which is an integral part of any audit, we face challenges in assessing events. Today, we are faced with an interesting situation in which audit reports issued before and after the onset of coronavirus can differ significantly for companies with similar activities and other parameters. How can the impact of a coronavirus on an enterprise be assessed, and how can an auditor ensure that a client is operating today in the near future?

Robots can participate in the audit process, as well as be the subject of audits. Robotic Process Automation (RPA) allows the automation of standardized, law-based repetitive processes, and the RPA program can be programmed to communicate and interact with operating systems and information systems based on a number of predefined tasks and activities. Well-organized robots can be a virtual addition to our inspection teams.

RPA robots can perform predetermined tasks within an existing cash information technology structure, such as processing cash transactions, preparing invoices, or performing basic data setup procedures. Robots can interact with systems and applications like humans with their names and credentials (Feiqi Huang, Miklos A. Vasarhelyi , 2019).

The digital economy requires new and different skills, a new generation of social protection policies. If the digital economy prevails, workers with limited digital skills will not be able to compete with those with more adequate skills for the digital economy. As a result, various jobs are reduced due to automation. In the United States and China, the ratio of robots used in industry to the workforce has already exceeded 2.5%. Research shows that the owners of many professions - lawyer, financial analyst, doctor, journalist, insurer, librarian, tax consultant, lawyer, auditor, accountant, etc. will be subject to major reductions in the near future. In the digital economy, the demand for new professional skills in the labor market, such as network economics, blockchain technology, data analysis, artificial intelligence, three-dimensional production, neurotechnology, is growing (Hoderi, Mukhamed Al., 2019, doi:10.26577/cajsh-2019).

Literature View

The first definition of "digital economy" was used in 1995 by the American computer scientist Nicholas Negroponte based at the University of Massachusetts. However, he did not give a clear definition, using this concept to a greater extent as a figurative expression, but not a scientific definition (Negroponte, N., 1995.-272 p.). To date, scientists have not come to a common judgment regarding the digital economy. In most sources, when describing the digital economy, the emphasis is on technology and the changes associated with their use in the ways of interaction of economic agents. In this case, either specific types of technologies or some other forms of changes in economic processes can be mentioned. Scientific articles, monographs and other information of national and foreign economists on the problems of accounting, economic analysis and normative, methodological and methodical materials were the theoretical basis of the study. The issue of research and study of the international financial reporting standards implementations in educational institutions has been addressed by many authors. Foreign authors include for example B.Alnoor, F.Huang, M.Vasarhelyi, M.Hanif, N.Latif, Mukhamed Al.

Hoderi, Rim Jallouli, N.Negroponte, Tim Jordan, A. Muradov, A.B.Babkin etc. We have collected frequently encountered interpretations of the digital economy concept in Table 1.

Table 1: Interpretations of the concept of "digital economy"

Author	
Jordan, Tim. <i>The Digital Economy</i> . Polity Press, 2020.	The digital economy is an economy driven by digital telecommunications (Jordan, Tim., 2020)
Keshelava A.V. member of the Sretensky club, expert of the working group on research of the digital economy	The digital (electronic) economy is an economy, a characteristic feature of which is the maximum satisfaction of the needs of all its participants through the use of information, including personal
Deloitte	So, what is the digital economy? It's the economic activity that results from billions of everyday online connections among people, businesses, devices, data, and processes. The backbone of the digital economy is hyperconnectivity which means growing interconnectedness of people, organisations, and machines that results from the Internet, mobile technology and the internet of things (Digital economy analysis and policy, https://www2.deloitte.com/au/en/pages/economics/solutions/tmt-analysis-policy .)
professor Walter Brenner of the University of St. Gallen in Switzerland states:	<i>"The aggressive use of data is transforming business models, facilitating new products and services, creating new processes, generating greater utility, and ushering in a new culture of management."</i>
Decree of the President of the Republic of Belarus No. 8 "On the Development of the Digital Economy" dated December 21, 2017	The digital economy is an economy in which business entities are actively engaged in activities in the field of information and communication technologies, activities in the field of artificial intelligence, the creation of an unmanned control system and other areas of activity in which residents of the Park of High Technologies are engaged (О развитии цифровой экономики: Декрет президента Респ. Беларусь., 21 дек. 2017)
Babkin A.V., Professor, St. Petersburg Polytechnic University	Digital economy is a type of economy characterized by the active implementation and practical use of digital technologies for collecting, storing, processing, transforming and transmitting information in all spheres of human activity; a system of socio-economic, organizational and technical relations based on the use of digital information and telecommunication technologies; it is a complex organizational and technical system in the form of a set of various elements with distributed interaction and mutual use by economic agents for the exchange of knowledge in conditions of permanent development (Бабкин, А.В. ; под ред. д-ра экон. наук, проф. А.В.Бабкина, 2018).
Bakin A.V., economist	The digital economy is a global network of economic and social interactions implemented through information computer technologies that allow direct links between companies, banks, government and the population to be established, removes long chains of intermediaries and accelerates the execution of various transactions and operations (Бакин А.В., 2017. -658 с.).
A.Muradov., I.e.d., Rector of ASUE Proceedings of the International Conference "Digital Economy: Modern Challenges and Real Opportunities", February 13-14, 2020	The most serious challenges of the digital economy are first and foremost faced by existing economics. The traditional composition of the factors of production is changing, and labor is losing its importance as a factor of production. The scale effect is not relevant, and sometimes it is possible to produce at a marginal cost of almost zero. All this leads economics to a radical paradigm shift.

Findings

However, what is hidden under the term "digital economy", what is its role in the modern world for us, remains unclear. We all love fast and uninterrupted internet. The expectation for speed naturally increases with each generation and telecommunications uses all the possibilities of technology to be even faster. 5G systems were the most important topic of the Mobile World Congress held in Barcelona (June 28th - July 1st 2021). 5G phones will have a faster and more secure internet connection. So how and when?

Smartphones, watches, homes and cars increasingly need an uninterrupted internet connection. Increasing the number of devices connected to the network means more bandwidth. From this point of view, it can be said that developments in the field of the Internet of Things make 5G technology mandatory. The high security and data rates that 5G promises are expected to be transformative for many industries. Fast response times in this range are essential for autonomous vehicles,

drones, IoT devices and smart city applications. Like 3G and 4G technologies, 5G technology is an ad hoc network designed for devices that require a mobile Internet connection. It is estimated that more than 20 billion devices will be connected to the Internet by 2020. Today this number has exceeded 6 billion.

5G is currently being used for testing in the US. At Mobile World Congress many telecom giants announced 5G trials. Since the system infrastructure is quite expensive, operators are very careful about broadcasting in order to use 5G licenses. From the statements, it follows that 5G will not become widely available until 2020.

The most important benefit of 5G for operators is that the technology uses very high frequencies and provides very high bandwidth. It will be an important alternative in areas where fiber optic connectivity is not possible due to 5G infrastructure. These features will make it much easier to communicate with rural areas and places outside the coverage area.

Unlike the usual "analog" economy, which is represented by the economic activity of society and the totality of relations in the system of production, distribution, exchange and consumption, the digital economy includes the field of electronic goods and services using digital technologies. As a result, with the development of the digital economy, it became possible to instantly receive an electronic product or service, since there is no need to wait for the delivery of a product or service (Jallouli, Rim, et al. , April 15-18, 2019).

The manufacturer of electronic products does not need to spend money on logistics, storage of products, which can reduce its cost. In addition, electronic goods, as opposed to material ones, are practically inexhaustible, as we are placed on digital platforms, which in some sense allows us to solve the problem of limited resources and facilitate access to goods (Bhimani, Alnoor , 2003).

Each of us uses the schedule of city transport via the Internet, makes an appointment at the clinic, can take online training, parents have the opportunity to enroll their child in kindergarten, and car owners - for inspection or state registration of the vehicle. All of this is an example of electronic services provided within the digital economy (New Forms of Work in the Digital Economy, 2016).

The main advantages of the functioning of the digital economy are systematized by us and are presented in Figure 1.

According to the National Static Committee, the volume of production (work, services) of organizations in the information and communication technologies sector in 2019 amounted to 4.8% of the total GDP of the Republic of Azerbaijan, which is 1.5% more than in 2012. However, for a positive upward trend, the value of the indicator is lower than that of the leading countries of the digital economy. The first place in this indicator is taken by the USA (10.9%), and the second by China (10%).

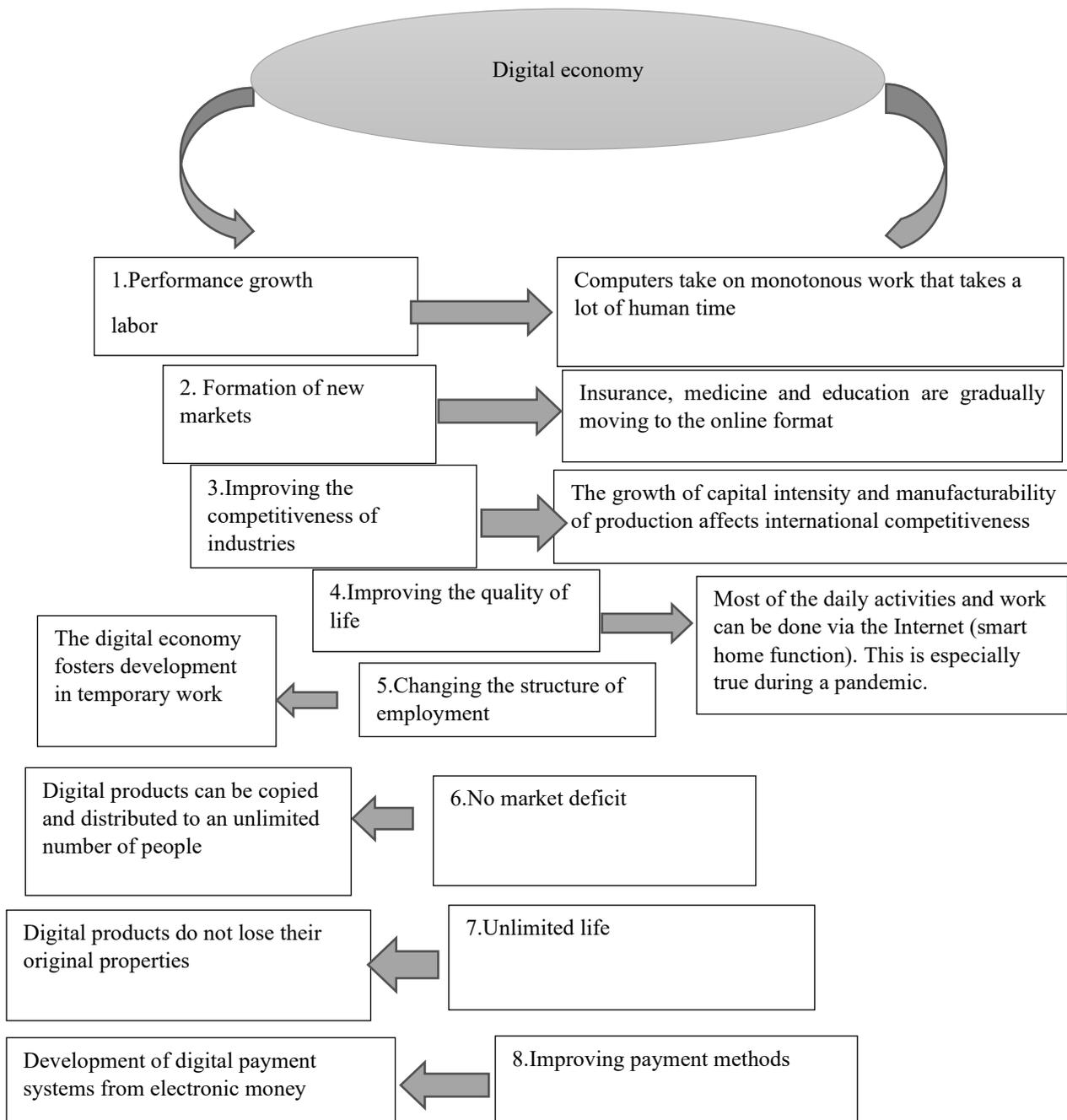


Figure 1: Advantages of the functioning of the digital economy (source: own development)

As a result of the Covid 19 effect, in the US, unemployment rates rose from 4.4 percent in April to 14.7 percent after another 20.5 million people were unemployed. With this development, the unemployment rate reached its worst level since the Great Depression of the 1930s. Just two months ago in the country, unemployment figures dropped to their lowest in 50 years. With the devastating economic impact of the coronavirus, growth figures also fell to the lowest level of the last 10 years, the worst retail sales figures in history were reported (abd-de-issizlik-orani-son-18-yilin-en-dusuk-seviyesinde).

The unemployment rate, which rose to 10% during the crisis that deeply affected the US economy in 2008-2009, fell to a record low level according to the latest report of the Ministry of Labor. The unemployment rate, which fell to 3.8 percent, was at this level since 1969 and once in April 2000.

It should be borne in mind that the development and implementation of the electronic economy is accompanied by the emergence of new risks and problems, the main of which are shown in Figure 2.

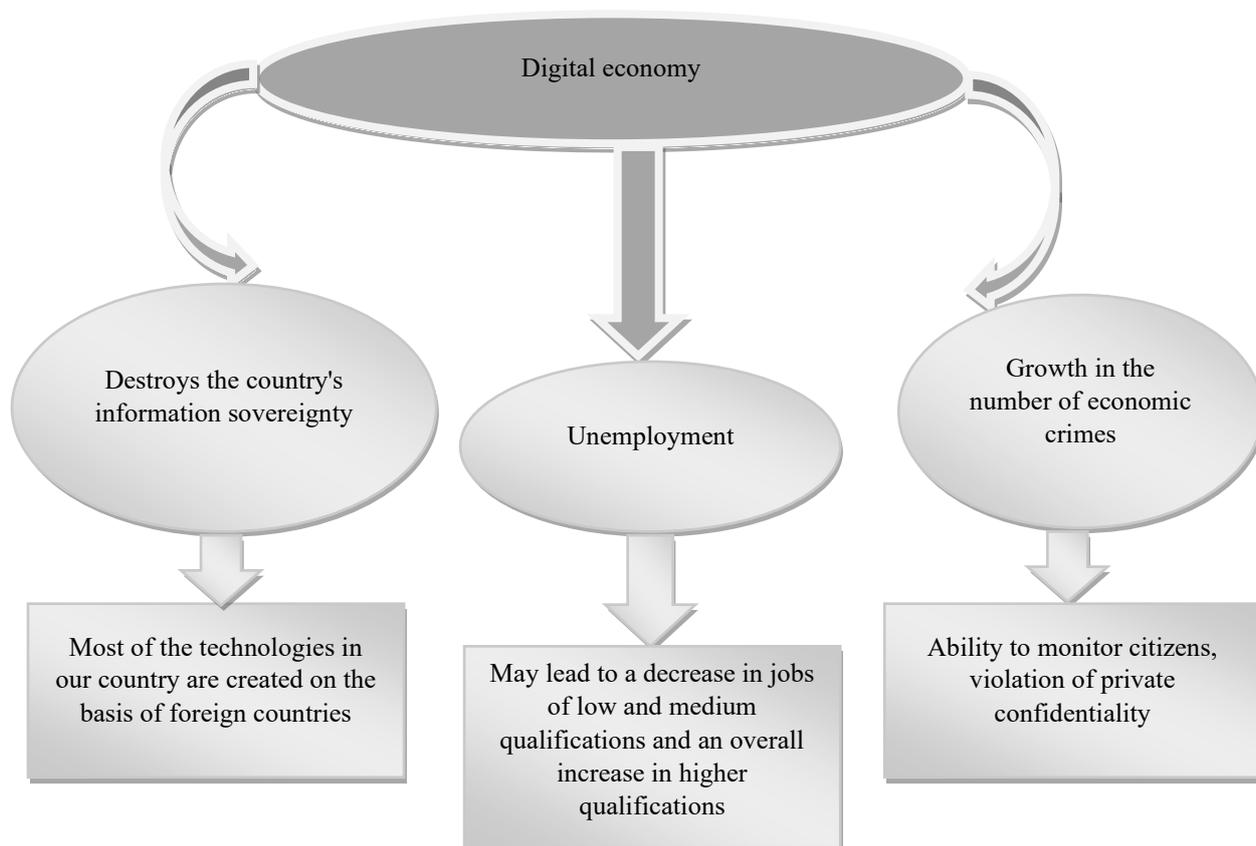


Figure 2: Disadvantages of the functioning of the digital economy.

For the Republic of Azerbaijan, digitalization of the economy, building a digital economy, introducing innovations are among the priorities. The World Bank's Digital Dividends study identifies policy priorities for improving service delivery, grouping recommendations based on the degree of digital transformation in a country (New Skills for the Digital Economy, 2016).

Turkmenistan and Azerbaijan have signed an intergovernmental agreement on the joint construction and operation of a 300-kilometer fiber-optic cable under the Caspian Sea. According to the agreement, the construction of the cable line is carried out by AzerTelecom LLC from the Azerbaijani side and Turkmentelecom Telecommunications Company from the Turkmen side.

The line will run from the bottom of the Caspian Sea from Siyazan to the Turkmenbashi city of Turkmenistan. This will lead to the formation of the Digital Silk Road between Europe and Asia through Azerbaijan. At present, the annual demand for Internet traffic in Central and South Asia and China has increased by 60-70 percent. In addition to Turkmenistan, the new cable line will allow countries such as Afghanistan, Pakistan and India to receive Internet traffic through Azerbaijan (Hanif M., Latif N., 2017). This is called connectivity, and in fact can be called the digital communication corridor between Europe and South Asia through Azerbaijan.

For example, the construction of a fiber-optic cable line through the Caspian Sea creates the Digital Silk Road between Frankfurt, Germany and Mumbai, India.

We applied this research to local and foreign audit companies operating in Azerbaijan. The group, which we evaluated as the most prepared for digital transformation, was 12% of the total number of respondents. We called this group "Progressists". The group of progressive companies includes audit services for companies that differ in size, work in different regions, in different sectors, differ in the degree of regulation. The next group of the most prepared in the technological approach of the audit service we call "Activists". There are services that perform many steps that are necessary for greater preparation for the use of digital technology. The rest of the audit services we call "beginners". Diagram 1 characterizes the current readiness to audit for each of the following new technologies (intelligent automation, robots, cloud technologies, internet of things, augmented reality, virtual reality, blockchain technology, 3d print, drones, artificial intelligence). Base of respondents: 20 progressives; 111 activists; 40 beginners.

According to the interview of Professor Vahid Novruzov to the "Republica" newspaper on 03.04.2021 on the 25th anniversary of the Chamber of Auditors, as a result of comparison with the previous years, the number of concluded contracts increased by 25 times, and the volume of services - by 40 times, in 2020 was signed 4,103 contracts worth 53.8 million manat (Vahid Novruzov, 2021). Thanks to the efforts of the Audit Chamber, the number of those wishing to

engage in auditing activities in the country grows every year, so at the present time there are 116 audit organizations and 55 independent auditors engaged in auditing.

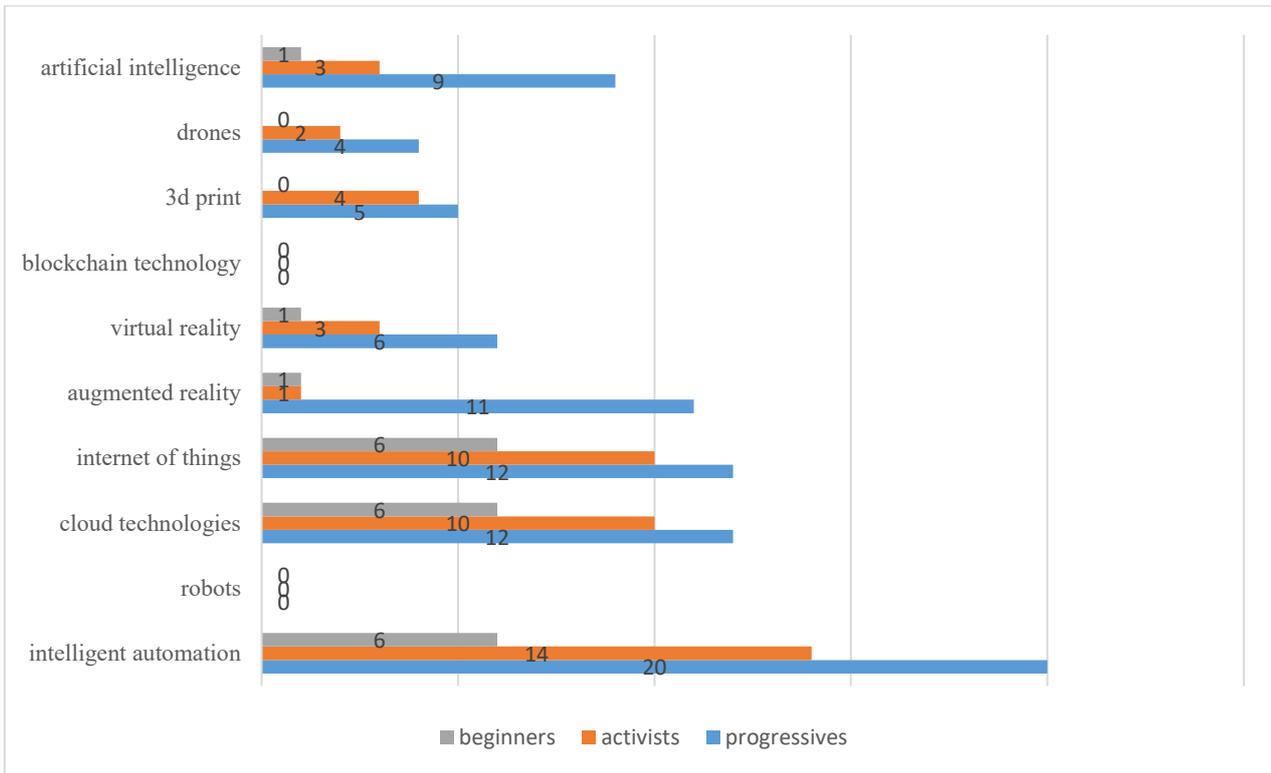


Diagram 1: Progressives prepare to conduct an audit of new technologies

The diagram 1 was published by the author based on the information published on the official website of the Chamber of Auditors. The world's top four audit companies use these new technologies, especially intelligent automation, robots, cloud technologies, internet of things and so on.

We can look at the report “Being a smarter risk taker through digital transformation: 2019 Risk in Review” (<https://www.pwc.in/assets/pdfs/services/ras/pwc-2019-risk-in-review-study.pdf>) for a breakdown of how the Progressives Group's risk management, compliance, and internal audit functions work. They assessed the respondents who participated in the study of the current state of the internal auditor profession, based on the assessment of their digital readiness in points on five dimensions.

- Vision and roadmap
- Stakeholder Engagement
- Approaches to work
- Service delivery model
- Operating activities

The group that they rated as the most prepared for digital transformation included 19% of the total number of respondents was named "Progressists". They named the next group of the most technologically prepared internal audit services “Activists”. This included 27% of the internal audit services that took part in our survey. This includes services that take many of the steps required to become more digitally prepared. They named the rest of the internal audit services we surveyed (54%) “Novice”. They are undertaking or planning to take some of the actions we have measured, but they are in the very early stages of digital transformation. We have described the results of the report more clearly in the diagram below.

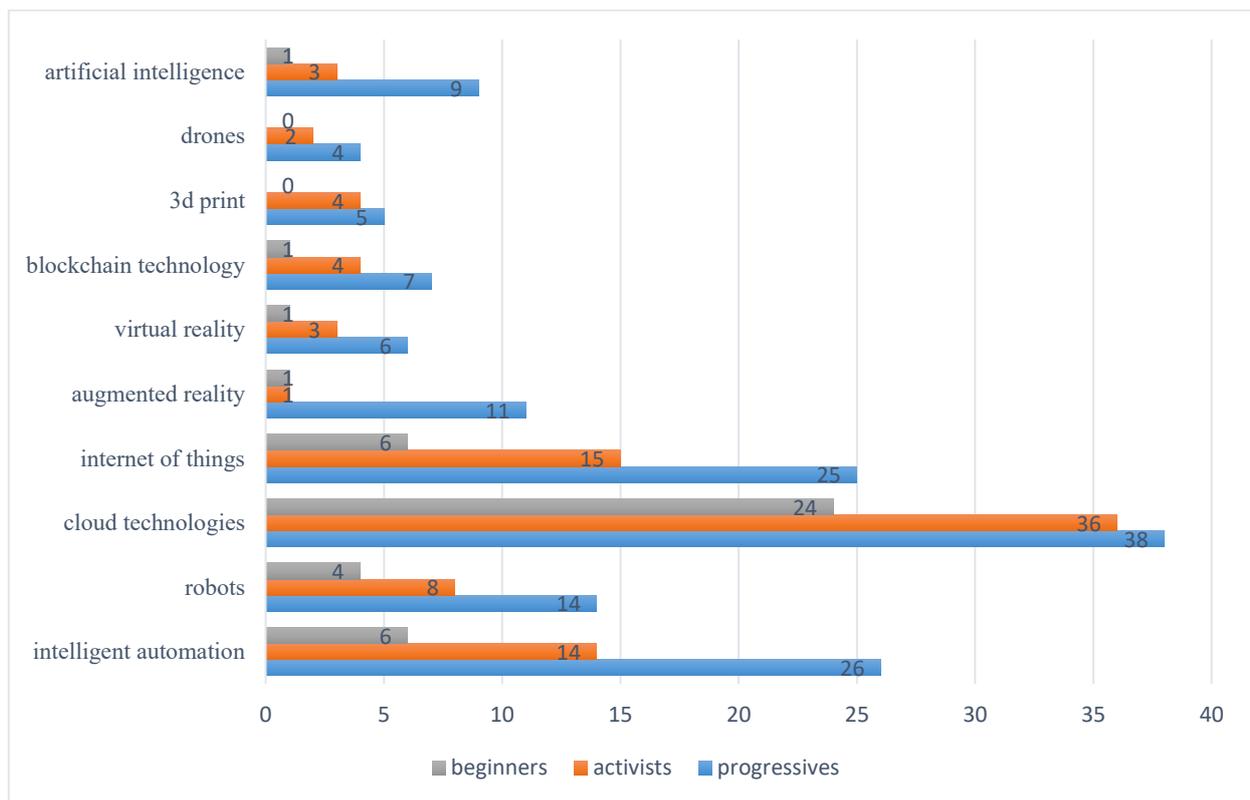


Diagram 2: Progressives prepare to conduct an audit of new technologies

Conclusion

What policies can be developing countries prioritize to make the most of the digital economy? Based on our research, the following should be taken into account when formulating the future policies of these countries in the digital economy:

1. First of all, in order to reduce the digital gap with developed countries, as well as to complete digital training, it is possible to increase investment in cheap and broadband Internet infrastructure. In this way, it is possible to continuously expand the population's access to the Internet. At the same time, it is necessary to increase these investments in other key infrastructure areas of the digital economy.
2. Industry 4.0 and Industry 5.0, brought to us by digitalization, but they are a production model that cannot always be imported. It is true that some models and technologies can be imported. The important point is that such production models are a structure that allows for sustainable development and the study of artificial intelligence. Every developing country needs a workforce that can create Industry 5.0 and entrepreneurs who can better evaluate it.
3. In the digital economy, occupations related to production are classified into two main categories: occupations that ensure the day-to-day operation of the system and occupations that provide system management. The first type of professions doesn't demand complex education and quality. but the second group of professions requires extremely high quality.
4. The digital economy has a significant impact on the labor market and the distribution of income. In contrast to the "white collars", who work at the table with a psychological, but not a physical force, "blue collars" can face the problem of unemployment. They can be replaced by production robots. "Blue collars" - these are workers who work for a salary or part-time work with the use of physical force. "Blue collars" work on the basis of manual labor. In order to prevent this problem, it is important to develop new concepts of "basic income" and "universal income", which will significantly improve the distribution of income among people.

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