







An Assessment of Challenges of Digitalization of Agrarian Sector

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Abstract. The study asserts that the digitization of the agriculture business is a significant trend that impacts not only economic development but also human progress. Digitalization is defined as the process of turning information into a digital format, and it is a process that influences all aspects of life, bringing about qualitative changes and influencing human development. In Ukraine, where the agricultural sector is the engine of economic development, the digitalization of this sector becomes the most crucial implementation task. On the way to digitalization, Ukrainian agricultural companies have made significant strides, but a large number of problems remain unresolved and constitute potential impediments. Initial focus should be made on combining the use of digital technology with the proper training of all levels of personnel who can operate in the new environment. Then it will be possible to ensure both economic and human development goals are met. To achieve this, government activities on all levels must promote the digitalization of the agriculture economy.

Keywords: Agrarian industry · Digitalization challenges · Digitalization · Human evolution

1 Introduction

Agriculture sector digitalization in Ukraine and other countries entails modifications to Food security and the production of agricultural commodities and services. Digitalization offers vast opportunities for environmental, financial, sociological, and cultural progress. Concurrently, there exist hurdles and hazards that can result in both predicted

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and unforeseen long-term outcomes. Inequalities in the availability of digital technology result in discrepancies in the ability of individuals in Ukraine and other nations to engage in economic activities, particularly in agriculture. Large agrarian corporations are focused on using digital technologies to reduce costs and increase output, yet problems related to digital technology among villagers might cause people to resist innovations and even trigger crises. Those that fail to successfully integrate digital technology into the manufacturing process run the risk of falling behind in regards to productivity, social and financial progress. To realize the true value of the transformation of the agricultural industry by digital technology, it is necessary to establish a well-considered economic policy that prioritises human development.

2 Literature Review

Various theorists in the sphere of the agrarian sector continually discuss issues related to digitalization. Negroponte N. (1995) initiated the term “digitalization” and defined it. In his work, Negroponte explores profoundly numerous facets of the general digitalization process.

In recent years, the number of Ukrainian researchers focusing on digitalization issues in many departments and sectors of the domestic economy has increased. In Reznik N's, Kozhemiakina S'., Cherkasov A's., Zhuravka O's., and Mazunrov S. 'researches, an innovative solution to the issue of predicting new employment in the industrial sector of the Ukrainian economy was specifically sought (2018). L. Lazenbyk conducted study on the digitization of economic interactions as a factor in improving the business operations of organisations (2018).

Academics in Ukraine continue to be interested in the innovation and digitization of certain agronomic routes within the industry. For instance, N. Reznik, R. Levkina O. Sakovska, A. Ostapchuk, S. K. Gupta, and A. Ostapchuk have researched the hurdles to the development of oilseeds and their subsequent interchange on the worldwide market (2019).

Despite the significance of the research previously conducted by academics, several aspects of the digitization of the economy have gone overlooked. The essay discusses the issues in the context of human advancement, digitization of the agricultural sector because this was judged a pertinent and beneficial topic for research.

The primary objectives of this research are to demonstrate the importance of the agrarian sector to the Ukrainian economy, to outline the sector's current digitalization achievements, and to outline the principal remedies for the issues that occur as a result of digitalizing the agrarian sector.

3 Research Methodology

To attain the given research objective and complete the indicated objectives, A collection of established scientific processes and methodologies were employed The approach of template matching was utilised to conceptually establish the significance of studying the issues of digitization in the agricultural industry from the perspective of human development. Utilizing synthesis and analysis enabled for the illustration of the agricultural

sector's relevance to the economy of Ukraine and its current digitalization accomplishments. The concept of locating logical linkages was used to illustrate the importance of simultaneously introducing innovations and preparing personnel for their manipulation. For a visual depiction of the study's findings and their diagrammatic depiction, a method of developing schemes and models was employed.

4 Results

Today, The digital world permeates every aspect of society and economy, from time management to money management. The digitalization process is altering the conventional means of communication and entertainment. Millions of websites collect information, although the Internet can substitute TV, periodicals, and other publications. People are getting used to communicating through email, online communities, and weblog and exchange vital data and statistics; They have evolved into digital customers who make internet purchases. Analysts estimate that e-commerce sales of tangible goods and services increased by 30% in 2017, surpassing about 50 billion UAH by year's end. In 2018, e-commerce sales of physical goods and services were 65 billion Ukrainian Hryvnia [3]. It investigates the inclusion of local companies into the worldwide trend of digitalizing economic connections.

N. Negroponte, an American physicist, in 1995 introduced the phrase "digital economy." [9]. Since the early 20th century, exponential spread of digitalisation processes throughout every aspect of economic activity has led to the growth of the notion of a digitalization. As early as the first decade of the twenty-first century, it was apparent that only a nation that properly integrated digitalization into its economic structure would be prosperous and successful. Because all modern sophisticated market systems are digital, digitalization of the economy has become a criterion for the progress of a nation. The digital processes have necessarily been hastened in (the U.S., Europe, and Asia's developed nations). However, this idea is still ambiguously construed. Specifically, the The digital industry is dominated by information and knowledge, and networks. Digitization, in our view, can be acknowledged as an information-based process, specifically The digitization of huge volumes of information and knowledge, which contributes to qualitative gains in human and economic progress. Digitalization is essentially the process of transforming data into digital form, or "translating" text, music, and vision into a code that can be comprehended by computer.

Globally, every facet of professional life is currently being incorporated into the virtual space. Digitalization profoundly alters business by decreasing manufacturing costs and increasing labour efficiency. As a result of digitization, there are new advertising tactics that may aid in the promotion of goods, as well as new, creative approaches to management in all sectors. Some firms cannot maintain competitiveness in the current market climate if they disregard digitization. Everything in the management of a business, from the accounting system to the creation of a company's reputation, is related to digitization in some way or another nowadays.

As for the notion that Not only does digitalization determine economic growth patterns, but it also influences the human development cycle. It is vital to mention that digitalization makes people's life easier, improves their quality, creates new employment

opportunities, and consequently alters people's ways of thinking by expanding their horizons. All of them are witnesses to the enormous changes that are occurring in our time and that might be observed. This transition is described by the term "digitalization of social and economic life."

Macroeconomic Fundamentals for Ukraine Agriculture is currently one of the most dynamically expanding industries and plays a vital role in society. Due to the high number of people residing in the rural areas, it has a significant relationship with human development and is often considered as a social boost for the young people born there. It is a commonly held belief that the economy of Ukraine has experienced a number of catastrophes, but that The agricultural industry has not changed the economic engine throughout. There are four primary factors that helped Agrarians are necessary to sustain growth pace of the industry. The first reason is a relatively advantageous geographical location that facilitates global communication. Two-thirds of Ukraine's area consists of fertile soil. Weather and climate conditions are the third cause. And indeed the fourth is obligated agricultural labourers.

The agricultural industry has dominated the Ukrainian economy for the past decade. It accounts for 10 to 12% of the nominal gross domestic product of Ukraine, rendering it one of the world's top three economies. This industry employs approximately 17% of the labour force. In 2017, nominal agricultural GDP reached \$11.5 billion, a 6% increase from 2016's nominal agricultural GDP of \$10.8 billion. [1] A variety of natural resources being readily available which is a distinguishing feature of the Ukrainian agriculture sector. The agricultural region of Ukraine comprises 41,9 million hectares, or 69.4% land area. There are 33,3 million hectares of arable land in Ukraine, which is greater than the total agricultural resources of all European nations. In addition, 2.2 million hectares are devoted to hay production, 5.3 million hectares to pastures, and 1.1 million hectares to annual crops. In the agricultural sector, unlike in the majority in other industries of the economy of Ukrain, Capital and construction projects, as well as profitable debt management measures, company reorganisation, donor organisation activities, and technical assistance projects, may be examined by scholars. Existing successful projects include, among others, the EBRD and Cargill partnering venture in the building projects of a grain station in the harbour of "Yuzhny," a number of operation sources of funds in favour of agricultural producers of Ukrain, and the productive reconfiguration of Ukraine land farming's financial liabilities of about \$600 million [6].

Owing to these optimistic signs, Ukraine has the potential to become a worldwide agricultural leader. Clearly, the export of items with low added value, i.e. the exporting raw resources, remains the major objective. This is characterised by a dearth of investments in high-tech manufacturing and the absence of government programmes targeted at encouraging the creation of such products. Simultaneously huge yield-growing regions and fertile soil quality enable for successful yield-raising and subsequent sales. It is worth noting that in the United States, for instance, exports of unprocessed corn and soybeans are similarly large due to their cultivation potential. This means that a nation with such large agricultural land as well as high-quality soil will always be exported from these regions. Agricultural raw materials. This is a universal practise, not a Ukrainian peculiarity.

Concerning the digitalization of the Ukrainian agriculture industry, it should be emphasised that the worldwide digitalization and automation of all agriculture activities is predicted to occur within the next few years. This necessitates the use of cutting-edge technologies and customised IT solutions on a massive scale. Already now, Ukrainian agricultural enterprises employ inventions that have no equivalents in any other Ukrainian industry.

In the last five to seven years, the agricultural sector has undergone profound changes. The agriculture sector in Ukraine has reached a remarkable different dimension, with the principles of work, techniques, and the development of transparent business models. Prior to this, the government and international organisations paid insufficient attention to the agriculture industry's development. As the world's population continues to rise, more and more focus is being placed on the agricultural sector, and in particular on the agricultural sector of our nation, which possesses a unique agricultural potential. This prompts businesspeople in the industry to consider introducing innovations, enhancing technologies, and learning to handle all operations properly.

Today, the Farming Management System is utilised in the fields of Ukraine, which includes satellite internet monitoring, GPS navigation, mapping, and the utilisation of drones. The research centres have weather station networks. In addition to technological advancements, agricultural production is aggressively incorporating IT innovations.

Large Ukrainian agrohholdings are responsible for the majority of programmes aimed at the digitalization of the agricultural industry. For instance, Since the beginning of 2016, Kernel Agro Holding has implemented an advanced Digital Agri-Business software package across its companies. This strategy has allowed a single field to yield the most profit and output. The tool provides agronomists, engineers, and other departments with potential solutions based on previously stated methodologies. The Digital Agribusiness project is a one-of-a-kind IT system that provides utmost control over the execution of all technical tasks, including data analysis and effective production adjustment management. MHP (Ukrainian acronym for Myroniv Breand Products) has also provided an exciting solution for the digitization of agricultural product production. In addition, MHP is among the minority of Ukrainian agricultural companies having a specialised innovation division. The firm develops a variety of geographic information systems (GIS) that help in the administration of an existing land bank on its clusters. Legislators of the agriculture standing firm say that this technology allows the business to hasten data analysis processes and develop unique algorithms for effectively executing a range of consumer demands. [5].

To continue the digitization of the agriculture sector in Ukraine efficiently, it is necessary to address both general and country-specific obstacles. To make agricultural production as effective as possible, it is vital to recognise the importance of two aspects. (Fig. 1) These are technologies that are regularly adapted into digital formats and then taught to individuals. If consumers are reluctant or unable to utilise these technologies, for example due to a lack of knowledge, the corporation might face a severe catastrophe. In the past, untrained employees in massive factories destroyed new machinery that were intended to be put into production in order to keep operations operating. Obviously, such brilliant expressions of creativity do not occur in the contemporary environment, where it

is common to find underlying opposition to advances that change too rapidly for individuals to have time to adapt to them. It is not uncommon, for instance, to deploy tractors that operate without human intervention or production lines that are totally managed by a single skilled operator. This helps agricultural firms optimise expenses, operate in novel methods, and achieve high-value-added items in the end. This, however, needs the employment of skilled individuals who are able to use and manage such technologies. This may be a professional technician or a middle-level agricultural administrator. However, he or she must have technical skills and be equipped to employ the proper machinery at any moment. As a result, employee education and training become crucial aspects in offering the digitization process in practise.

There is no need to combat opposition to innovation; rather, people must be prepared for innovation. The more the penetration of technology into an agro-business, the more specific the change management programme must be to reduce the shock and stress and convince employees to accept the necessity of changes. In the agricultural industry Kernel of Ukraine, for instance, a software called “mobile agronomist” is being implemented to control the login statistics. Numerous security professionals were let go when the system was put into operation as component of a prototype in one of the nodes since creating the new product was too challenging for them. Instead of tearing people down, it is essential to engage with them and illustrate how design allows their tasks simpler and more productive. Nevertheless, some individuals are unable to accept this truth and will be discarded as a consequence [4].

In addition, to digitally alter agriculture in varied situations, several conditions must be satisfied. The fundamental ones might be seen as the minimal requirements for implementing technology. These include accessibility, affordability, the capacity to connect, various educational programmes that increase people’s informational abilities, and government regulations that encourage digital growth.

As for the supporting circumstances, they are primarily the characteristics that may lead to widespread acceptance of agricultural technology by agricultural workers. World wide web, cell telephone, and online social networks, development of digital abilities, and promotion of digital culture in agriculture are examples of such well-known elements. Almost all of these characteristics may be applied via talent development, sprint programmes, incubator use, and the introduction of various accelerator programmes (Fig. 1).

The digitization process is inaccessible to those who lack basic reading and numeracy skills. Unlike other African and Asian areas, this issue is not one that must be addressed in Ukraine. All Ukrainians, whether they live in a city or a hamlet, have fundamental knowledge and get a basic education, and they are often active in gaining a higher education. In rural parts of Ukraine, the participation rate in higher education is very high compared to that of many other nations, but it is substantially lesser in metropolitan regions (Fig. 2).

Nonetheless, “digital literacy” is a barrier for rural residents. Due to a lack of material and technological resources, basic computer instruction has not yet been included into elementary and secondary school in the communities. In contrast to affluent nations where students routinely employ, internet access has not been developed everywhere in

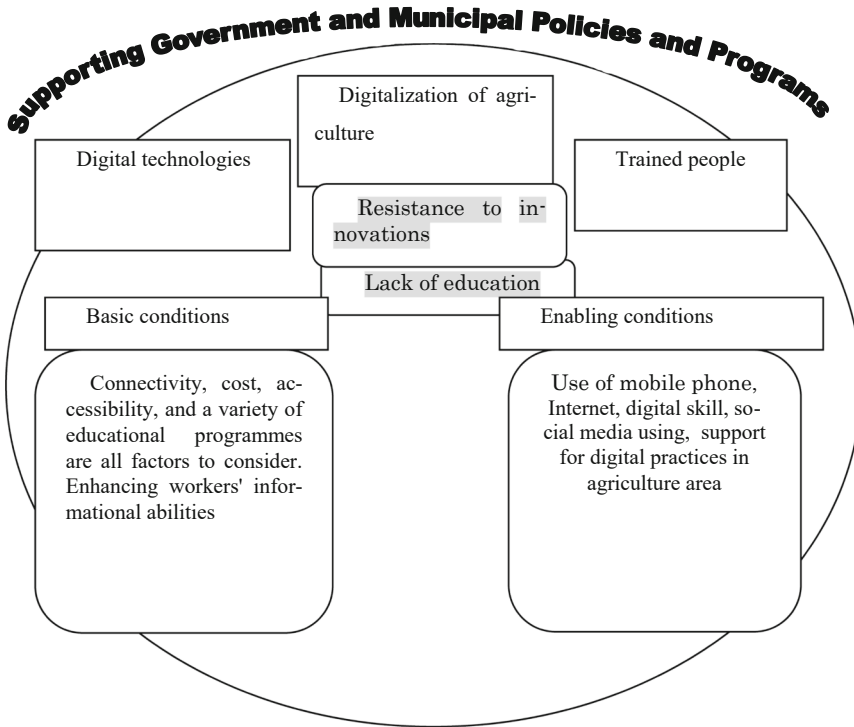


Fig. 1. Conditions and variables that characterise the digitalization of agriculture. * *Author-created source based on [2]*

Ukraine, limiting the use of modern technology and digital skills in school and everyday life.

In addition, instructors often demonstrate a lack of appropriate abilities. The World Bank identifies attempting to create the menial work in the agri-food sector while maintaining existing employment as one of the tremendous difficulties in the digitalization of agriculture. In the following 2 decades, as 1.7 billion individuals will reach the age of employment in developing countries during that time. [2] The digital transformation of economy will fundamentally alter the nature of employment and the need for labour as well as competencies. Technical knowledge will emerge as the primary prerequisite for a variety of employment in the industry, and education level will become vital. In Ukraine’s rural areas, there is still a dearth of digital tools such as laptops and tablets, which might lead to a crisis in innovation due to a dearth of individuals capable of operating modern technology and equipment.

To tackle the problems posed by the digitization of the agricultural industry and establish the conditions for successful human development, the government must implement a well-grounded strategy.

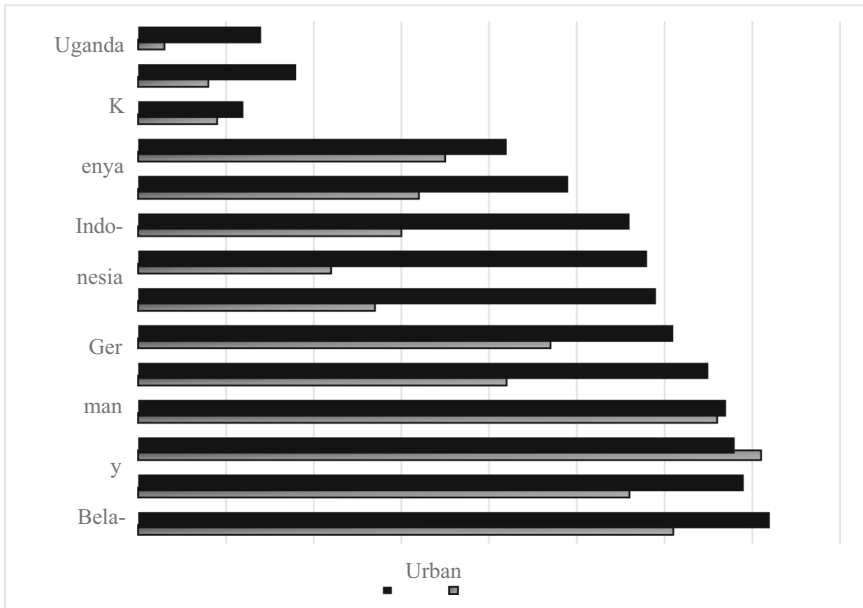


Fig. 2. Participation in higher education as a function of urbanisation (%). *Source: made up by the authors based on [2]

5 Discussion

The digitization of the agricultural industry is the dominant trend in the present environment and cannot be ignored or avoided. The decision not to deploy digital technology in the industry may expand the disparity between the Ukrainian economy and the economies of the world's wealthy nations. Considering the agricultural sector's significance to the Ukrainian economy, the process of incorporating digital technology inside it should be prioritised.

Incorporating digital technology into the sector not only aids in achieving the economic objectives of agricultural businesses especially and the industry in general and yet also addresses concerns of human development, standard of living, and psychological wellbeing.

However, rapid digitization of the agricultural industry may be met with resistance due to people's unwillingness to embrace change, education, and new management styles. Because of this, the implementation of the process of digital modernisation should be well-organized and progressive that is accelerated through concurrent worker training.

6 Conclusion

Consequently, the digitization of the agriculture industry has an important influence in the current state of Ukraine and other nations. Due to the fact that, on the one hand, the agriculture sector may be regarded a motor of economy of Ukrain and, contrary to this,

digitization is a mechanism that produces significant shift in every aspect of life, hence boosting socioeconomic growth, this is the case. Significant market players and industry leaders have designated the digitization of agriculture as their responsibility. It is crucial for them to attain consistent high outputs at minimal costs, enabling them to produce high-quality, low-cost products. This is significantly aided by advanced technologies. Simultaneously, as a consequence of digitalization, the quality of people's lives is altering, new working environments are emerging, people's perspectives are shifting, and standard of living are increasing.

Numerous important ideas and technologies are now being introduced by representatives of significant agricultural corporations and integrated into the production of agricultural commodities. However, the fundamental issue that emerges is that people in rural regions are not adequately prepared to use these technological advances. The answer to the issue is the implementation of government-sponsored initiatives to improve the e-literacy of rural residents, as well as the establishment of conducive environment and a digital culture.

Practical Implications. The study findings may be considered as a source of knowledge on the stages involved in the digitalization of the agricultural industry to promote human development and economic growth.

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