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Review Article

The Impact Of Global Digitalization On Ukraine's Agri-Food Industry Transformation.

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Abstract

Currently, the agri-food sector is confronting basic issues. The FAO predicts that global arable land per capita would fall from 0.6 hectares in 2000 to 0.2 hectares by 2050, while food consumption will rise by 70%. The current annual yield growth rate of 1.5% may lead to worldwide food shortages. Governments in rich and developing countries should support attempts to digitize agri-food enterprises and introduce new technologies to increase food production. Russia's conflict with Ukraine is the primary cause of the global food crisis, which might have significant political and economic ramifications. Ukraine's agricultural and food sector accounts for around 10% of its GDP. Prior to Russia's invasion, Ukraine's agro-industrial complex was a top exporter worldwide. Ukraine exports 10% of the world's wheat, 14% of corn, and 47% of sunflower oil. The Ukrainian agri-food business is facing a real challenge due to the ongoing war. The invasion caused devastation of food manufacturing processes and logistics linkages. Sowing grounds were mined, and warehouses were damaged. By the end of 2022, Ukraine had exported agricultural products worth USD 23.6 billion. Although the figure for 2022 is 15% lower than the record of 2021 (USD 27.9 billion), last year's value of exports was the second highest.

Keywords : *agri-food industry; digitalization; export; food security; innovative technologies; transformation.*

INTRODUCTION

A full-fledged war has become a true test for Ukraine's agri-food sector. The invasion led to the damage of food manufacturing systems and logistics chains. Many sowing sites were mined, and equipment and storage were demolished. By the end of 2022, Ukraine had exported agricultural products worth USD 23.6 billion. Although the figure for 2022 is 15% lower than the record set in 2021 (USD 27.9 billion), last year's export value was the second highest since Ukraine gained independence. Disruptions to Ukrainian exports worsened the surge in food prices, which, according to the FAO index, rose 54% in February 2022. Prices declined in March 2023, although remained 6.4% higher than in 2022. The digitalization of Ukraine's agri-food industry should be viewed as a source of deep systemic transformations, as it involves the use of digital technologies at the business level to optimize business operations, increase company productivity, and improve interactions with suppliers and customers. For agri-food companies, digitalization entails not only technological modernization but also a complete overhaul of business processes, including farm management systems, data processing and harvest forecasting, agricultural processing, food quality management, systems for adding value to products, warehouse management systems, and human resource management. Nowadays, digitalization has the potential to speed the transformation of the agri-food business throughout the supply chain, from manufacturing and purchasing to distribution, logistics, and financing. The following innovative technologies have the potential to revolutionize the agri-food industry: bioinformatics, synthetic biology, food design, smart farming, vertical farms, aquaculture, bioinformatics, genetics, alternative protein sources, conservation technology, and food product shelf life extension. In Ukraine, a number of agri-food businesses are transitioning to Industry 4. The largest exporters in Ukraine are "Kernel", "MHP", and "ASTARTA-KYIV". For many years, "Kernel", a big producer and exporter of sunflower oil, has effectively implemented advances for Ukraine's agro-industrial complex. Digital technology are used across the company's operations, from product development to sales. The company's information technology team automated logistics, trade, and document management.

All information about the processes involved in agri-food production is collected in the "Kernel DigitalAgriBusiness" innovative ecosystem. "MHP", Ukraine's largest chicken producer and exporter, uses biogas for energy, industrial steam, and heating. The "MHP" biogas plants contribute

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significantly to the company's energy independence and environmental responsibility. ASTARTA-KYIV, a vertically integrated agricultural holding, developed a complex system of IT solutions for agribusiness management "AgriChain," which includes management of the agricultural company's land bank (AgriChain Land), agricultural production (AgriChain Farm), crop monitoring (AgriChain Scout), AgriChain Logistics handles product logistics, AgriChain Barn manages warehouses, and AgriChain Kit handles business procedures. Digital transformations are also occurring in the dairy business. The "Bel Shostka Ukraine" company is involved in the digital modernization of the milk collection process. According to our findings, large Ukrainian agri-food companies are more likely to implement breakthrough innovations because they have significant R&D resources, whereas SMEs focus their efforts on digitalizing business operations and implementing energy-efficient technologies.

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