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Innovation management and digitalization in agricultural holdings for the production of grain and leguminous crops in wartime conditions

Currently, crop production in Ukraine remains an unprofitable industry, despite the improved forecast for yields. From July to October 2023, profitability levels for grain and oilseeds production declined. The loss rate of wheat production has increased, despite the increase in yield levels due to lower purchase prices. Small farms and front-line medium-sized farms have low profitability in the production of grains and oilseeds. The least profitable crop among major grains and oilseeds in 2023 was barley. Small entrepreneurs have 5-10% higher production costs for all types of grains and oilseeds than average ones.

The latest developments and technologies in agriculture include autonomous robots, software, drones, computers, mobile devices, the Internet of things, and artificial intelligence. Improving irrigation systems, precision fertilization, creating field maps, and using sensors to monitor plant health are an integrative part of farming practice. Over the next 5 years, agricultural entrepreneurs in Ukraine will invest in the development of mass technologies - the use of drone sprayers, robotics; technologies of complete energy independence. It is predicted that from 2022 to 2027 the AgroTech market will more than double: from \$15 billion to \$33 billion.

Let us consider the features and advantages of innovation management and digitalization in agricultural holdings producing grains and leguminous crops in wartime conditions using the example of the Kernel agricultural holding. The electronic document flow of the Kernel agricultural holding conveniently and mobile changes business processes and is implemented in two components: through the Telegram bot (the document is approved without entering the company’s website) and the mobile use of an electronic signature. The time required to conclude contracts with partners has been reduced from a week to 1-2 days. Based on the electronic document management system using a digital signature, the implemented Farmer Portal platform and the Open Agribusiness program are also being implemented, which significantly reduces the costs of transparently concluding contracts with partner farmers.

The Kernel business digitalization system in agriculture is combined into the innovative ecosystem “DigitalAgriBusiness”. Before the start of hostilities, 100% of the fields are covered with high-quality “RTK signals” in order to implement a precision farming system, and are also monitored around the clock by drones, copters, satellite images, and IT-tools. All information about the control results is stored in the database. An additional implementation of the “GIS portal” makes it possible to mobile, qualitatively and adaptively analyze, synthesize, systematize parameters and make optimal management decisions, rational decisions of the agronomist about the start of sowing or the start of fertilizing. The logistics support system of the Kernel agricultural holding is also being optimized. The project that is being implemented is

developed by simulation and programming systems. At the same time, logistics processes are under control around the clock, as well as forms and types of cargo transportation, shipment and receipt of products with probabilistic scenarios for solving predicted problems.

Using the capabilities of the “Microsoft Navision” platform in the Kernel agricultural holding, procurement processes are automated comprehensively in a single integrity (“trading”; “CRM solutions” system), so employees can easily and quickly register contracts and regulate contracts using an electronic digital signature during the harvest period. transaction parameters and interact with partner farmers. In addition, it is planned to introduce a sales and inventory management module in a single “ERP platform” in order to optimize the management of accounting and management accounting. Digital technologies have been actively introduced at elevators, terminals, and factories of the Kernel agricultural holding. Therefore, acceptance, transshipment, and grain processing are carried out with an electronic queue in an integrated IT-system at the highest level. So, as part of the “DigitalAgriBusiness” program, humidity sensors and weather stations have been introduced at the Kernel agricultural holding; precision farming systems; GPS-trackers. Using one part of the “BigData” technology, information is analyzed in real time, and thanks to the other part of the “BigData-machine learning” technology, information about all previous production periods is synthesized, a model of future actions in problem situations is developed (supply chains are planned; yield volumes are predicted; productivity potentials in specific fields). The functional analysis of the provision of traction during railway transportation is controlled by the implemented system according to the “TransitHub” project.

Thus, in the course of the study it was established that thanks to innovation management and digitalization in agricultural holdings for the production of grains and leguminous crops, it is possible to easily manage a large bank of land area, transport large volumes of raw materials, and increase the volume of exports of grain and leguminous crops. Innovation ensures the social and economic efficient use of resources, increases labor productivity, reduces the harmful impact on the environment, and stabilizes the development of business structures in agriculture in wartime conditions.

References:

1. Kravchenko S.A., Malik L.M. (2022). Small business and the development of the digital economy. *Multidisciplinary academic research, innovation and results* : collection of works. Prague: Czech Republic, 2022. p. 162-164. URL : <http://www.isg-konf.com/multidisciplinary-academic-research-innovation-and-results/>.
2. Kravchenko S.A., Malik L.M. (2022). Competitiveness of small enterprises in the digital economy and institutionalization of business. *Інформаційне суспільство: технологічні, економічні та технічні аспекти становлення* : збірник праць. Тернопіль: ФО-П Шпак В.Б., 2022. Вип. 66. С. 40-42. URL : <http://www.konferenciaonline.org.ua/ua/article/id-457/>.