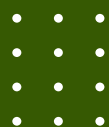


Edited by S. Stankevych, O. Mandych

# MODERN TRENDS IN AGRICULTURE SCIENCE: PROBLEMS AND SOLUTIONS



 **TEADMUS**  
SERVICE FOR SCIENTISTS

2023

**MODERN TRENDS  
IN AGRICULTURAL SCIENCE:  
PROBLEMS AND SOLUTIONS**

**Edited by S. Stankevych, O. Mandych**

**Tallinn  
Teadmus  
2023**

UDC 631.1:338.43:339.9

**Modern trends in agricultural science: problems and solutions. Monograph. Edited by S. Stankevych, O. Mandych. – Tallinn: Teadmus OÜ, 2023. 220 p.**

**ISBN 978-9916-9859-8-4**

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The monograph is a collection of the results of actual achievements of domestic agricultural scientists, obtained directly in real conditions. The authors are recognized experts in their fields, as well as young scientists and postgraduate students of Ukraine. Research is conceptually grouped at 7 sections: Plants protection and quarantine; vegetable growing in open and closed ground; horticulture, fruit growing, viticulture; breeding and seed production; agrochemistry and soil science; agriculture and modern agricultural technologies; management and strategies for future development. The monograph will be interesting for experts in plant breeding, economics, plant protection, selection, agrochemistry, soil science, scientific workers, teachers, graduate students and students of agricultural specialties of higher education institutions, and for all those who are interested in increasing the quantity and quality of agricultural products.

Keywords: agriculture, modern technologies, plants protection, quarantine, vegetable growing, horticulture, fruit growing, viticulture, breeding and seed production, agrochemistry, soil, management, strategies, development.

ISBN 978-9916-9859-8-4

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PLANTS PROTECTION AND QUARANTINE IN THE 21ST CENTURY:  
**STRATEGIC MANAGEMENT AND DEVELOPMENT OF  
MODERN FINANCIAL TECHNOLOGIES IN AGRIBUSINESS**

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Modern agribusiness has the strategic goal of creating the preconditions for sustainable development, which is necessary to ensure the food security of our country. In the current conditions of economic relations in the agricultural sector, the basic prerequisites for ensuring an appropriate level of competitiveness are the digital transformation of business processes and the use of innovative financial technologies to adapt the existing strategic management system to the modern business environment. The combination of strategic management models and the creation of specific strategies for the agricultural sector will allow business entities to develop new solutions. The peculiarities of combining existing management technologies with innovative ideas of foreign practices will allow Ukrainian agribusinesses to implement the best components of foreign strategies. Thus, improving business performance will be possible on the basis of strategic management as a basis and the development of financial technologies as a component.

Understanding strategic management through the prism of forming strategies and development models is the most appropriate. The essence of these models is largely related to business organisation systems, the effectiveness of implemented solutions, and the involvement of management mechanisms in the company's activities in general. In our opinion, it is important to focus on the intensification of financial processes in the first place. Today, the financial sector is the most vulnerable and, at the same time, has the greatest prerequisites for development. In addition, the area of financial support for business processes is fundamental to understanding the principles of entrepreneurship. Paying attention to



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financial technologies will help to mitigate all possible risks associated with obtaining the main result - financial profit - and is the basis for the development of the company's internal structure - a source of funding for the introduction of innovative management technologies.

Strategic management for agribusinesses based on the development of digital transformation models is currently undergoing adaptation. Given the fact that it is not possible to transfer the production process to the digital space, the primary task is to integrate digital tools into the financial platform of the business. Digital adaptation of financial management involves the functioning of agricultural companies at a new level for them - in a digital system. In addition, the transition of the company's financial sector to a digitalised model is imperative in times of uncertainty (caused, for example, by the global pandemic and military aggression in recent years).

Modern agribusiness in Ukraine and globally is undergoing a period of development, driven by the growing demand for food products and high-tech approaches to production due to the simultaneous peculiarities of functioning in a war. However, as opportunities grow, so does the complexity of managing the sector's finances and business processes. In this context, strategic management and the use of modern financial technologies are becoming key elements of agribusiness success.

The role of financial technology in modern agribusiness is fundamental. Financial technology, or fintech, involves the use of innovative methods and technologies to improve financial processes and services. In agriculture, fintech can be used to increase the availability of financial resources, optimise accounting and reporting, and develop digital markets.

Increasing the availability of financial resources means the following. Modern financial technologies allow agribusinesses to receive financial support faster and more efficiently through online lending, crowdfunding, and other tools. This is especially useful for small and medium-sized agricultural enterprises, which often have limited access to traditional financial institutions.

Optimisation of accounting and reporting, which is a structural component of financial technology, includes a separate section for creating a digital platform. The use of modern software solutions and financial management technologies can improve the accuracy of accounting for agricultural operations and reduce the time required to prepare financial statements. This contributes to more efficient resource management and risk mitigation.

The development of digital markets is one of the key areas of development as a factor in the digital adaptation of Ukrainian agribusiness when entering international markets. Financial technologies facilitate the creation of digital markets for agricultural products. This allows farmers and agribusinesses to trade efficiently, find new buyers and expand their business.

Strategic management and financial technologies are the basis for ensuring a gradual increase in the level of competitiveness and the prospective development of Ukrainian agribusiness for the period of post-war recovery.

The combined use of strategic management and financial technologies can lead to significant competitive advantages in agriculture. In our view, it is important to consider several key strategic aspects.

1. Digital transformation (developing and implementing a digital transformation strategy that includes the use of financial technologies can help agribusinesses optimise all aspects of production, accounting and sales).

2. Risk management (the use of analytical tools and financial technologies allows for more efficient management of risks associated with changes in agricultural prices, weather conditions and other factors).

3. Financial planning and analysis (financial technologies enable more accurate forecasts and analysis of financial performance, which helps to make informed decisions about investments and business development).

4. Ensuring cybersecurity (the development of financial technologies is also associated with cybersecurity risks, agribusinesses should develop a cybersecurity strategy to protect financial data and other sensitive information assets).

Digital transformation in agribusiness involves a comprehensive process of transforming all aspects of the business with the help of digital technologies, including financial ones. This strategy can have various manifestations and benefits that will help agribusinesses optimise and improve their operations. These areas may include the following:

- The use of financial technologies allows agribusinesses to automate the production and monitoring of agricultural operations. For example, IoT sensors and systems can monitor field conditions, crops, and livestock, and then transfer this data to cloud computing for analysis.

- Financial technology can be used to develop systems for efficiently managing agricultural inventories and resources such as seeds, fertilisers, pesticides, etc. This helps to avoid unnecessary costs and increase yields.

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- The use of financial technology simplifies financial accounting and reporting. This allows agribusinesses to instantly receive information about their financial position and risks, which helps management make informed decisions.

- Financial technologies can facilitate the development of electronic payment systems and digital markets for agricultural products. This opens up new opportunities for sales and market expansion

- Financial technologies allow collecting and analysing large amounts of data. This makes it possible to create accurate forecasts of production, demand for products and risks associated with market fluctuations.

- Digital transformation allows agribusinesses to reduce labour and resource costs through automation and process optimisation.

In general, a digital transformation strategy using financial technology can help agribusinesses increase productivity, reduce risks and increase competitiveness in today's global market environment.

Risk management is a critical component of agribusiness success, especially in the face of changing agricultural commodity prices, weather conditions and other factors that can affect revenues and expenses. The use of analytical tools and financial technologies can help manage these risks much more effectively, such as

- Agribusinesses are exposed to fluctuations in agricultural commodity prices. The use of analytical tools allows for forecasting price trends in the market and developing strategies to minimise losses in the event of falling prices or increase profits in the event of rising prices.

- Weather conditions can significantly affect the yield and quality of agricultural products. The use of modern meteorological technologies and analytical tools allows agribusinesses to monitor the weather in real time and respond to potential risks, for example, by changing crops or applying appropriate agronomic measures.

- Financial technologies can be used to assess the creditworthiness of customers and suppliers, which helps to avoid the risks of insolvency and losses associated with late payments.

- Analytical tools can help to optimise logistics processes, which reduces the risks associated with delays in deliveries and excess inventory.

- Financial technologies can provide an opportunity to monitor risks in real time, which allows for a prompt response to changes in the internal and external environment, including those related to the political and military situation in the country and, in particular, in the region where the company operates.

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The use of analytical tools and financial technologies allows agribusinesses to make informed decisions and reduce risks, ensuring a more sustainable and profitable business in the face of unpredictable changes.

Financial planning and analysis is an integral part of effective agribusiness management. The use of financial technologies makes this process more accurate, dynamic and informed. Consider the following key metrics for use in implementing digital financial technology adaptation models:

- Modern financial technology allows you to analyse historical data and create models to predict financial indicators such as profit, expenses, cash flow and balance sheet. This helps to develop plans and budgets for the future, which is important for the optimal allocation of resources.

- Financial technologies allow agribusinesses to analyse the profitability of individual projects or lines of business. This helps to identify which parts of the business are most profitable and which may need to be optimised or discontinued.

- Financial technologies allow you to accurately track costs and allocate resources to the most important and profitable initiatives. Analytics helps to identify areas where savings can be made and financial resources can be used rationally.

- Financial technologies help agribusinesses analyse financial risks and develop strategies to manage them. For example, analytics tools can help determine which risks are associated with changes in market prices or weather conditions.

- Financial technologies provide an opportunity to analyse various investment and business development scenarios, assess their impact on financial performance and make informed decisions on investing in a particular area. This creates portfolios for making informed decisions on investment and development.

- Financial technologies can be used to monitor the company's financial position in real time, which allows you to respond quickly to changes and adjust your strategy in time.

Financial technologies make financial planning and analysis more accessible, accurate and efficient, helping agribusinesses achieve financial stability and success in a competitive environment.

Modern agribusiness faces numerous challenges and opportunities associated with the development of financial technologies. Strategic management and the use of fintech can help agribusinesses achieve

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competitive advantage, optimise financial processes and ensure sustainable development in the current environment. Success in this sector requires a combination of innovative business approaches and a strategic vision of the future.

Existing digital business platforms in Ukraine, such as Diia.Business, Monobank, and others, allow companies to follow their existing models of business processes. Understanding the peculiarities of agricultural production should create a separate platform that takes these peculiarities into account. It should be noted that each company can use modern digital tools for its own use and transfer its business to the cloud, which will increase the security of data storage. At the same time, it is important to take into account all the factors that may negatively affect such processes: cyber attacks, data value, privacy, etc. Modelling digital transformation lies in different areas and directions of the company's activities. It should be noted that each individual service or department that currently operates its own working systems should switch to a standardised model of operation. This may not always be a convenient and quick process. Therefore, special attention should be paid to structuring within the company when planning ways to implement digital business transformation models.

### **References**

1. Project of the Recovery Plan of Ukraine. Materials of the "Digitalization" working group. National Council for the Recovery of Ukraine from the Consequences of War (2022) [online] [https://uploads-ssl.webflow.com/625d81ec8313622a52e2f031/62c4577defe5bf7afedc5b4a\\_%D0%94%D1%96%D0%B4%D0%B6%D0%B8%D1%82%D0%B0%D0%BB%D1%96%D0%B7%D0%B0%D1%86%D1%96%D1%8F.pdf](https://uploads-ssl.webflow.com/625d81ec8313622a52e2f031/62c4577defe5bf7afedc5b4a_%D0%94%D1%96%D0%B4%D0%B6%D0%B8%D1%82%D0%B0%D0%BB%D1%96%D0%B7%D0%B0%D1%86%D1%96%D1%8F.pdf)
2. Yurchuk N.P. (2018). Information systems and technologies as an innovation in the business process management system. Efficient economy. No. 5. [online] <http://www.economy.nayka.com.ua/?op=1&z=6323>
3. Afanasyeva I.I. (2021). The information system of management accounting in the conditions of digitalization of the economy. Economy and management 1. Issue 49. P. 32-40
4. Tereshchenko L. (2021). Modeling technologies of management information systems in the enterprise management system. Economy and society. No. 27. <https://doi.org/10.32782/2524-0072/2021-27-55>
5. Grynko A., Grynko P. (2022). Digital transformation of business: theories, problems, mechanisms. Scientific Collection "InterConf", (123), p. 41-49.