



Economics and Business Management

16(3), 69-91

Journal homepage: <https://economicscience.com.ua/en>

Received: 25.04.2025 Revised: 07.08.2025 Accepted: 23.09.2025

UDC 331.101.5:631.1.027:631.15

DOI: 10.31548/economics/3.2025.69

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Influence of advanced technologies on the development and implementation of marketing strategies in agribusiness

Abstract. The purpose of this study was to assess the impact of advanced technologies on the effectiveness of marketing strategies of agricultural enterprises, in particular, on the processes of developing and implementing innovative approaches in marketing. The research methodology included analysis to identify the strengths and weaknesses, opportunities and threats of implementing technologies in agribusiness, and the analysis of political, economic, social, and

Suggested Citation:

Bondarenko, V., Nahorna, O., Lazebnyk, V., Riabchyk, A., & Cherniavsky, I. (2025). Influence of advanced technologies on the development and implementation of marketing strategies in agribusiness. *Economics and Business Management*, 16(3), 69-91. doi: 10.31548/economics/3.2025.69.

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technological factors on the process of introducing the latest technologies in agriculture. In particular, it was found that the introduction of precision farming reduced the cost of fertilisers by 10-15%, and drip irrigation reduces water consumption by 30-50%, which helped to increase the efficiency of resource use and reduces the ecological footprint of agricultural production. Based on precision farming, agricultural enterprises were able to optimise the processes of growing crops, ensuring an even distribution of fertilisers and pesticides, which also helped to reduce their consumption and the cost of soil treatment. Financial indicators of Myronivsky Hliboproduct showed a significant increase in the company's revenue and export revenue, which amounted to 1.8 billion USD in 2023, which accounted for 60% of its revenue. Another important result was the discovery that digital platforms such as Kernel's "Open Agribusiness" and Astarta-Kyiv's "Agrichain" significantly reduced operating costs by automating most business processes, allowing agribusinesses to focus on strategic development issues. The use of such platforms has helped to reduce the time spent on production and sales management, while ensuring accuracy and transparency of all stages of the production process, which, in turn, increases the competitiveness of enterprises. Special attention was paid to the impact of digital tools on the sales and marketing activities of agricultural enterprises. The results of the study showed that the integration of the latest technologies is a key factor for improving the competitiveness of agricultural enterprises. The practical significance of the study lies in the fact that its results can be used by agricultural enterprises to implement effective digital solutions in marketing activities to reduce costs and increase profitability

Keywords: innovation; personalisation; online store; forecasting; artificial intelligence

INTRODUCTION

Contemporary agribusiness faces numerous challenges, in particular, high competition, changes in consumer needs, the need to adapt to rapid economic changes, and new market requirements. One of the main factors that ensure the competitiveness of enterprises in this industry is effectively developed and implemented marketing strategies. The development of technologies significantly affects marketing approaches, enabling agricultural enterprises to use the latest tools to optimise their processes, in particular, in planning, forecasting, and market analysis.

In the process of developing marketing strategies in agribusiness, there is an increasing importance of adapting to new technological conditions. In particular, E.O. Oliinyk & B.K. Pererva (2024) investigated the use of digital technologies in the marketing of agricultural products, analysing existing market promotion strategies and pointing out the need to improve sales channels and customer interaction. They noted that the use of innovative approaches and digital platforms helped to significantly increase sales efficiency, although there are certain problems in using these technologies in remote regions. In this area, there is a lack of analysis of

the use of the latest technologies in advertising campaigns, and the impact of external economic and political factors, such as global crises and changes in legislation, which require more detailed research to develop strategies that work.

In the context of rapid market development and technological changes, the importance of implementing effective marketing strategies for agricultural enterprises increases. N.M. Vdovenko & V.G. Margasova (2023) explored the basics of adapting marketing strategies for agricultural enterprises in the context of global changes and extreme challenges in the agri-food market. They emphasised the need to integrate innovative elements into marketing strategies at all levels, which allows businesses to adapt to changes in the global environment and use the latest technologies to effectively interact with consumers. However, this study did not sufficiently consider the features of the Ukrainian market, especially regarding the adaptation of foreign methods to internal circumstances, such as customer behaviour in Ukrainian social networks.

The introduction of innovative marketing tools for positioning the brand of agricultural enterprises in the agricultural products market

is an important aspect of agribusiness development. I.O. Korchynskyi *et al.* (2024) emphasised the need to use digital platforms, mobile applications, and online marketing campaigns to increase the competitiveness of agricultural enterprises. They emphasised the importance of adapting to external factors such as seasonality, weather conditions, and international impact, and the role of technology in modernising marketing strategies. However, the study did not consider specific aspects of the use of digital tools in agribusiness in the context of unstable domestic policies and external economic influences.

The use of innovative marketing tools in agricultural enterprises is an important area for increasing their competitiveness. T. Ilchenko (2022) emphasised the role of digital technologies and information and communication technologies (ICTs) for the development of agribusiness. She noted that the use of such tools as content marketing, Search Engine Optimisation (SEO), Social Media Marketing (SMM), helps to improve communication with consumers and optimise operational processes. The study showed that most agricultural enterprises have the potential to use these tools, but often face difficulties due to environmental instability and insufficient infrastructure. The introduction of ICT in certain conditions of agricultural business, especially during economic crises and changes in market conditions, has not been sufficiently investigated.

The impact of information technology on marketing strategies is an important aspect of the contemporary business environment. D. Raiko *et al.* (2024) examined the impact of information technology on marketing strategies, particularly by analysing the use of innovations such as data analytics, social media, and e-commerce. The researchers emphasised that these technologies open up new opportunities for personalising marketing campaigns, in particular, through the use of a large amount of consumer data, which helps to more accurately adapt strategies to their needs. There is a lack of sufficient research on the impact of rapid development of information technologies on the adaptation of marketing strategies in conditions of variable competition and market requirements.

Digital marketing of agricultural products is an important tool for reducing costs and expanding the audience. G.M. Ningsih *et al.* (2024) stressed that despite the benefits of digital technologies, farmers face difficulties due to low levels of digital literacy and insufficient infrastructure. Research pointed to the need to further study the effectiveness of implementing digital tools in rural areas, and the impact of economic and social factors that limit access to these technologies. These aspects require additional research to improve the application of digital marketing strategies in agribusiness.

Research on digital trends in agribusiness marketing highlights the importance of using digital technologies to improve marketing strategies for agricultural products. A. Hermawati *et al.* (2021) emphasised that digital marketing is profitable because of its cheapness and simplicity, which reduces costs and increases access to a wider audience of consumers. While research shows the great potential of digital technologies for agriculture, there are drawbacks, particularly in the fact that farmers do not have sufficient digital literacy, and insufficient infrastructure, which limits the use of digital tools in agriculture.

The introduction of digital technologies in agriculture is important for improving the efficiency of agricultural production. W. Gong *et al.* (2024) emphasised the importance of digital services that help farmers to increase their willingness to adopt new technologies, making it easier to access information and reduce costs. Research showed the significant potential of digital technologies to improve productivity, but gaps remain in underestimating their impact on the long-term transformation of agricultural practices. More attention should be paid to how digital services can affect structural changes in agriculture and their long-term impact on productivity.

The purpose of the study was to investigate the impact of the latest technologies on the optimisation of marketing processes in agribusiness, in particular, on the development of innovative approaches in the field of marketing strategies of enterprises. The objectives of the study were: to analyse the use of digital technologies, such as Big Data, AI, and the Internet of Things, in agricultural marketing; assessment of

the impact of these technologies on the competitiveness of agricultural enterprises and their ability to adapt to changes in the market.

MATERIALS AND METHODS

The research focused on the theoretical analysis and empirical study of the impact of advanced technologies on agribusiness, in particular, on their effectiveness in production processes and management practices. The time frame covered the period from 2020 to 2024, which allowed assessing the impact of the latest technologies in the face of constant changes in global and regional markets. The study focused on the main theoretical approaches to the use of Big Data, AI, and automation in agricultural enterprises, and on the practical results of their implementation.

Analysis of scientific publications, in particular by T.R.C. Konfo *et al.* (2023), S. Sahoo & V. Chahal (2023), K. Bazargani & T. Deemyad (2024) was conducted to substantiate the feasibility of using the latest technologies in the field of agribusiness. These sources provided basic conceptual approaches to the study of Big Data, AI, and automation in agricultural production, which became guidelines for determining key research areas, selecting relevant performance indicators and evaluation parameters. These studies were used because of their relevance, scientific validity, and focus on the practical application of technologies in real production conditions, which adapted the obtained approaches to the Ukrainian agricultural context. Specific examples of the introduction of such technologies in agribusiness were considered, in particular, in companies that actively used automated platforms for data collection and analysis, which allowed optimising the cultivation of crops and reducing the cost of fertilisers and pesticides.

Financial and statistical data collected from official sources of Myronivsky Hliboproduct (MHP) (MHP S.A., 2016; MHP SE, 2018; MHP SE, 2023). In addition, data on the implementation of digital platforms such as Systems, Applications and Products in Data Processing (SAP), Power Business Intelligence (Power BI) analytics systems, the use of AI for marketing personalisation, and other corporate initiatives related to innovation in agribusiness were used

to analyse technological and strategic changes. MHP (n.d.) was selected for the study because of its significant role in agribusiness in Ukraine and in the international market. The analysis covers the period from 2016 to 2024, which allows considering long-term changes and strategic initiatives that have taken place in the company during this time. Another important part of the study was the investigation of investments in agricultural technologies, in particular on the example of Syngenta (n.d.), which focused on the need to invest in agro and biotechnologies to combat the food crisis (Korotskyi & Kyslytskyi, 2023). This allowed creating more sustainable agricultural systems that can withstand extreme weather conditions, rising temperatures and other challenges facing agricultural enterprises in the face of global climate change.

The study also analysed how digital technologies help Ukrainian agricultural enterprises, such as Kernel (n.d.), which used the Open Agribusiness platform (n.d.), which allowed agribusiness to significantly reduce costs and increase productivity. Astarta-Kyiv (n.d), an agro-industrial holding which had established its own Information Technology company (IT company) AgriChain (n.d.), actively introduced innovative technologies for managing the production and marketing of products. Another important aspect of the study was the use of online stores by agricultural enterprises, using the example of LNZ Web (n.d.), which has significantly improved sales efficiency through digital platforms. This allowed companies to significantly expand their market, attract new customers and provide better access to agribusiness products, which is especially important in the face of economic instability and pandemics.

As part of the study, SWOT and PEST analyses were developed to assess the benefits and possible threats associated with the introduction of the latest technologies in agribusiness. SWOT analysis revealed the strengths and weaknesses, opportunities and threats of new technologies, while PEST analysis helped to assess the impact of political, economic, social and technological factors on the agricultural sector. Based on these analyses, recommendations were formulated for the effective use of digital

technologies to improve the competitiveness of agricultural enterprises.

RESULTS AND DISCUSSION

Innovative technologies in agribusiness:

Impact on management processes

Advanced technologies are significantly changing the agricultural sector, not only increasing production efficiency, but also transforming the marketing strategies of agricultural enterprises. In 2020-2024, agricultural companies actively implemented tools such as Big Data, artificial intelligence (AI) and automation, which provided new opportunities for optimising marketing solutions in a dynamic competitive environment. One of the most revolutionary technologies used in agribusiness is Big Data. They allow predicting the state of crops or resource efficiency, but also analysing consumer behaviour, modelling demand, and setting up accurate communication with the market. The use of Big Data helps marketers build target segments and predict customer activity, which is the basis for personalised marketing campaigns (Konfo et al., 2023).

AI is actively used to improve the effectiveness of marketing strategies – from analysing large amounts of market data to automating communications, in particular, machine learning algorithms are used to build systems of individual recommendations, chatbots, analysing consumer emotions in social networks, which can significantly increase the conversion rate and customer loyalty (Sahoo & Chahal, 2023). Automation has also become an important factor in improving marketing efficiency. It includes not only technical processes of harvesting, but also automated management of marketing activities: CRM systems, automatic email newsletters, dynamic pricing, and integrated analytical panels. For example, automated field data collection systems allow creating reliable marketing messages about product quality, which is especially important for export contracts (Bazargani & Deemyad, 2024).

Additionally, the use of precision farming and analytical systems allows generating accurate marketing information about the origin, environmental safety, and technological quality of products. In the face of growing requirements for transparency of supply chains, this allows

strengthening the company's positioning in the market. For example, due to QR coding systems, customers can check their product history, which increases brand confidence. Investment in technology also contributes to the development of online sales and personalised services. For example, the introduction of robotic harvesting systems has reduced costs by 40%, and automated irrigation systems have reduced water consumption by 30-50%, freeing up resources to strengthen digital marketing (Adewuyi et al., 2024). As a result, the use of Big Data and AI can increase yields by up to 40% by accurately planning crops and harvesting, and reducing risks from pests and climate factors (Cropler, 2024). However, for marketing, it also means being able to predict production volumes and plan promotion campaigns based on actual potential.

During 2020-2024, agribusiness actively implements the latest technologies that significantly change management processes and increase production efficiency. One of the most notable trends is the use of Big Data, AI, automation, and other innovative technologies. There is an increase in investment in technological innovations in agribusiness, although the rate of this growth depends on the economic and political situation. However, even in conditions of economic instability and military conflict, many agricultural holdings and private companies continue to actively invest in the latest technologies. One of the main areas of technological development is precision farming. Technologies such as GPS monitoring, humidity and temperature sensors, and fertiliser management systems allow agricultural enterprises to significantly reduce resource costs by optimising the use of fertilisers, water, and pesticides. For example, the use of technologies for precise fertilisation can reduce costs by 15% on large farms, and the introduction of variable standards for the use of pesticides reduces the use of chemicals by 20-30% (Osabohien, 2024).

The use of artificial intelligence in agribusiness is also gaining popularity. AI algorithms help agricultural enterprises to predict yields, identify diseases and pests, and optimise farm management processes. Such tools can reduce the cost of data processing and decision-making, making processes more automated and

efficient. AI is also actively used to improve the weather forecasting system, which is critical for planning agricultural production. Investment in agricultural technologies increased significantly in 2023-2024. For example, Syngenta invests about 1.3 billion USD annually in research and development, in particular, in agricultural technologies. In addition, agribusiness is experiencing an increase in private companies and start-ups that actively attract investment. Some of these projects are expected to grow by 30-40% annually by 2027 (Koretskyi & Kyslytskyi, 2023). European integration processes also contribute to the introduction of advanced technologies, in particular, in the field of data analysis and resource optimisation.

Precision farming allows agricultural producers to optimise the use of fertilisers and pesticides, which leads to a significant reduction in the cost of these resources. Due to the differentiated application, which considers the specific needs of each area of the field, fertiliser costs are reduced by an average of 7%. If precision farming is widely used, the savings can increase to 14%. The cost of pesticides, in particular, herbicides, is reduced by about 9%, and with the full implementation of technologies, an additional reduction of up to 15% is possible (WEA-GRO, 2024a). Some precision farming systems, such as Variable Rate Technology (VRT) systems (Agrivi, n.d.) Geographic Information Systems (GIS), and sensors for measuring soil nutrients, and automatic fertiliser management systems, can save up to 40% of nitrogen fertilisers, which provides significant resource savings.

Precision irrigation technologies also have a significant impact on reducing water consumption. Drip irrigation reduces water consumption by 30-50% compared to conventional irrigation methods, such as furrow irrigation or sprinkling (AgroPortal, 2024). This is achieved by supplying water directly to the root zone of plants, which minimises losses due to evaporation and runoff. Automated irrigation systems that use advanced soil moisture sensors allow controlling the volume of water supply to fields in real time, which allows avoiding both excessive and insufficient moisture. Due to this, farmers can save significant amounts of water, optimising irrigation for the real needs of plants. In agricultural farms

that have integrated advanced humidity monitoring systems, there is a constant decrease in water consumption and an increase in resource efficiency.

The use of AI and Big Data can also significantly increase productivity. The introduction of AI in agricultural production allows for yield growth of up to 40% due to precise resource management, optimisation of sowing and harvesting times, and timely response to risks such as pests, diseases, or undesirable weather conditions (Cropler, 2024). Yield monitoring systems based on satellite data, sensors, and drones help to determine the optimal time for fertilisation, irrigation, and processing. This allows significantly reducing losses and ensuring a stable increase in yield. The use of Big Data and automated AI-based solutions also reduces production costs. Optimising the use of resources such as water, fertilisers, and energy can reduce costs by 15-50%, depending on the resource. Automating routine operations such as watering, processing fields, and monitoring plant health significantly reduces the need for manual labour and reduces the risk of human error. It also helps to reduce labour costs and increase the efficiency of agricultural production (PandaTeam, n.d.).

Big Data analytics improves purchasing, logistics, and sales planning while minimising costs associated with market fluctuations and weather conditions. This reduces operating costs, and agricultural enterprises can better respond to changing conditions, which also contributes to higher profitability. The introduction of autonomous technology and AI can increase farmers' incomes by more than 10%, reducing costs and increasing output (Filippov, 2024). The use of advanced technologies in the competitive strategy of Myronivsky Hliboproduct significantly changed its approaches to market activity, allowing the company not only to strengthen its position in the Ukrainian market, but also to become a leader in a number of important segments. Through digital transformation, innovation in manufacturing and marketing, and the active introduction of new value-added products, MHP has been able to ensure competitiveness in both domestic and international markets.

Since the beginning of its digital transformation in 2016, the company has set itself the

goal of becoming a leader in using the latest technologies to quickly adapt to market changes. Digital solutions have become an important strategic priority for MHP, and based on this, it has been able to function effectively even in times of crises, in particular during the COVID-19 pandemic. The early introduction of digital solutions allowed the company to quickly switch to online and hybrid work formats, which gave it a significant competitive advantage, because it allowed it to quickly maintain production and communication processes even in an unstable product situation (Agropravda, 2025).

The change in the company's focus from a raw material producer to a producer of value-added products was a key stage in the development of MHP. Since 2019, the company has significantly increased its presence in such segments as ready meals, snack products, food service, and business-to-business (B2B) solutions. This allowed MHP to become a leader in the production of value-added products, which made it more resistant to fluctuations in the raw material market and reduced its dependence on external economic factors. The active introduction of new technologies in production and marketing has also allowed MHP to significantly strengthen its competitiveness in international markets. In 2024, the company achieved significant success in the export sector, becoming the leader in its industry in Ukraine with export revenue of 1.7 billion USD. This allowed the company to

significantly outperform other market players and strengthen its position in the international food market. One of the important elements of MHP's competitive strategy was investment in digital platforms and analytics. The use of such tools as web platforms, customer relationship management (CRM) systems, enterprise resource planning (ERP) systems, and analytical systems allowed the company to better understand market needs, respond faster to changes in demand, optimise logistics processes and improve the quality of customer service. The integration of these digital solutions allowed the company not only to improve customer interaction, but also to manage internal processes more efficiently. Digital technologies have become an important tool for maintaining the company's leadership in the market, ensuring a quick response to changes and competitive advantages in production processes. The introduction of advanced technologies allows MHP to maintain a leading position in the segments of food and value-added products, where the company actively invests in the development of new products and their adaptation to the requirements of different markets (Agropravda, 2025). The introduction of technologies in MHP also affected its financial performance. For the period from 2016 to 2024, the company showed significant growth in revenue and operating profit, which indicates the efficiency of using the latest technologies and innovations. The data is shown in Table 1.

Table 1. MHP's financial performance for 2016-2024 (million USD)

Indicator	2016	2018	2023	2024 (3 quarters)
Revenue	244	1,136	3,000	2,262
Export income	115 (47% of total)	660 (58% of total)	1,800 (60% of total)	1,368
Operating profit	68	283	339	346
Net profit	-71 (loss)	142	142	141
Earnings Before Interest, Taxes, Depreciation, and Amortisation (EBITDA)	89	362	445	437
Operating profit margin	28%	25%	11%	20%

Source: compiled by the author based on MHP S.A. (2016), MHP SE (2018), MHP SE (2023), MHP (n.d)

The integration of advanced technologies into MHP's activities has become a key factor that has determined its financial success and competitive advantages in the market. Based on the introduction of innovations such as Big Data,

AI, automation, and digital platforms, MHP was able to significantly improve the efficiency of its operations and strengthen its position in international markets. As can be seen from the financial indicators (Table 1), the company shows

significant growth in revenue and export revenue. In 2023, export revenue was 1.8 billion USD, which is 60% of the company's total revenue, and at the end of 2024, export revenue continued to remain at a high level -1.368 billion USD. This indicates a successful strategy for entering new markets and effectively adapting products to different consumer segments.

The introduction of digital solutions, in particular in terms of automating business processes and collecting market data, allowed MHP to quickly respond to fluctuations in demand and changes in production conditions. The use of the Power BI analytical system for monitoring key indicators in real time allowed management to make timely decisions on adjusting production plans, and the integration of SAP ERP modules, in particular, SAP Logistics Execution and SAP Materials Management, allowed to reduce transportation costs by an average of 8% by optimising logistics routes and centralised accounting of material flows. The transformation of marketing communications gave particularly tangible results: the company completely abandoned TV advertising, instead focusing on digital channels – SEO, contextual advertising Google Ads and interactive campaigns using augmented and virtual reality (AR/VR) technologies. For example, the use of AR to showcase products in a retail network increased consumer engagement and contributed to a 12% increase in online sales in 2023-2024. In addition, the introduction of customer base segmentation based on machine learning algorithms helped to more accurately predict demand in each sales region and generate personalised offers. This reduced marketing costs by 18% and simultaneously increased the conversion rate by 22%, which had a positive impact on the profitability of campaigns (MHP SE, 2023).

Despite the difficult macroeconomic conditions, MHP continued to maintain growth in key financial indicators. In 2024, the company's EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortisation) reached 437 million USD, resulting from a well-structured implementation of digital solutions in manufacturing, logistics, and marketing. Such changes ensured MHP's stable presence in international markets, including an increase in the share of exports in

the company's total revenue to 60%, and allowed it to expand cooperation with partners in the European Union, the United Arab Emirates (UAE) and Saudi Arabia (MHP, n.d.).

Comparison of this study with T. Quan *et al.* (2024) showed that both studies focused on using cutting-edge technologies to improve agribusiness efficiency, such as AI, Big Data, and automation, to optimise management processes and reduce costs. Both papers emphasised the role of precision farming and the impact of technological innovations on marketing strategies, which allows increasing the competitiveness of agricultural enterprises. However, T. Quan *et al.* paid more attention to the impact of digital platforms and Big Data analytics on agricultural marketing, and personalisation of marketing campaigns. Instead, the current study focused on the impact of innovative technologies on marketing strategies. In addition, research by T. Quan *et al.* covered the wider application of digital technologies in all aspects of agricultural production, while this study focused more on marketing aspects and the use of online stores to expand sales markets.

Research by K.K. Arthur *et al.* (2024) and the present study focused on the impact of digital technologies such as artificial intelligence and the Internet of Things on agribusiness. Both studies examined the importance of digital innovation for optimising resource management, marketing, and finance. The difference was that research by K.K. Arthur *et al.* paid more attention to the problems of technology adoption in Africa, in particular, the low level of digital skills and insufficient infrastructure, and the current study focused on specific Ukrainian companies and their use of digital technologies to increase competitiveness. Thus, while both studies analysed digitalisation in agribusiness, K.K. Arthur *et al.* focused on the African context, and this study focused on practices in Ukraine.

Research by X. Zhang *et al.* (2024) and the present study also had similarities in their focus on introducing new technologies in agriculture, particularly Big Data and AI, to improve agribusiness efficiency. However, research by X. Zhang *et al.* used the structural equation method to analyse the impact of technology on small farmers in China, while this study focused

on the impact of digital technologies on the marketing strategies of agricultural enterprises in Ukraine. In addition, X. Zhang *et al.* paid more attention to the model of technology adoption among farmers, and this study focused on technologies for optimising business processes in agricultural enterprises. Ultimately, N. Kanellos *et al.* (2024) and the present study focused on the impact of digital technologies on agribusiness, in particular, on reducing costs and improving efficiency. The study by N. Kanellos *et al.* focused on digital marketing strategies and cost optimisation through online channels, while this study focused on precision farming, AI, and Big Data to optimise production and reduce costs.

Advanced technologies such as Big Data, AI, and automation are significantly transforming the agricultural sector, increasing production efficiency and reducing costs. The introduction of these innovative tools allows agricultural enterprises to optimise processes, increase competitiveness and ensure sustainable development in difficult economic conditions.

Introduction of digital technologies in agribusiness marketing strategies to improve efficiency and competitiveness

The introduction of digital platforms and technologies in agribusiness can significantly improve the accuracy of demand forecasts, optimise business processes, and reduce costs. The use of Big Data analytics and machine learning (ML) helps to increase the accuracy of forecasts by 10-20%, which improves resource planning and management, and avoids errors associated with subjective estimates. The introduction of data processing automation reduces the human factor, which, in turn, reduces the likelihood of errors during manual data entry. Based on Big Data and ML technologies, agricultural enterprises achieve margin profitability growth of 2-5% due to optimisation of production, logistics and pricing. Accurate demand forecasts allow reducing inventory by 20-25%, which reduces storage costs and the risk of writing off products. High accuracy of forecasts also ensures timely availability of products in the required place and time, which increases customer satisfaction (Retailers, 2023).

Especially important is the use of technologies to automate marketing processes, which reduces advertising costs by 30-50% (Solodukhina, 2022). This is achieved by optimising advertising campaigns, automatically allocating the budget, and reducing human errors. Automation also reduces the need for personnel by replacing routine tasks with software robots, which reduces salary costs and operating costs. Kernel is one of the largest agricultural holdings in Ukraine, which actively uses digital technologies, in particular drones, to monitor fields, apply fertilisers, and predict yields using satellite monitoring and Big Data. The company's Data Driven Agriculture concept allows making decisions based on Big Data from various sources, such as the Internet of Things (IoT), AI, and satellite imagery. An example of the effectiveness of implementing this concept by Kernel is the significant growth in agricultural production and exports, which was made possible by the use of Big Data analytics for management decision-making. According to Kernel's annual report for fiscal year 2024, the company's revenue increased by 4% compared to the previous year and amounted to 3.581 million USD, which was supported by an increase in sales of grain, sunflower oil, and meal. The volume of processing of oilseeds increased by 24% to 3.2 million tonnes, which was the result of optimisation of production processes and more accurate planning based on data (Kernel Holding S.A., 2024). These indicators show that the strategic use of digital technologies within Data Driven Agriculture allows Kernel to effectively manage all stages of the production and sales cycle, ensuring the growth of financial results and strengthening the company's position in the international market. In addition, Kernel created the open Agribusiness IT platform (n.d.) to exchange experience and results of digital technology implementation with other farms (AgriLab, 2019). Another example is Astarta-Kyiv, an agropromholding that created its own IT company, AgriChain (n.d.), which has developed a comprehensive agribusiness management system consisting of eight software modules, including land bank management, production, logistics, and analytics. AgriChain allows managing logistics, inventory, and production processes in real time, which helped

Astarta exceed pre-war export figures, exporting products to 44 countries and receiving 325 million EUR from exports (53% of total revenue) (Vishnevsky,2020; Astarta-Kyiv, 2024b).

These companies prove that the use of digital platforms in agribusiness not only increases management efficiency, but also significantly reduces costs, improves sales, and increases competitiveness. Entering new markets through digital platforms allows agricultural enterprises to work 24/7, removing geographical

restrictions, and attracting new customers. Artificial intelligence technologies for personalising marketing campaigns also show tangible results in terms of customer conversion and sales growth. Personalised offers using AI increase conversion rates by 20-40% and increase sales by 15-30% (Timarevska, 2024). The use of such technologies also allows reducing marketing costs and optimising advertising budgets. Table 2 below illustrates changes in marketing metrics after the introduction of digital technologies.

Table 2. Impact of digital technologies on marketing metrics

Indicator	Changes after the introduction of digital technologies	Notes
Conversion rate growth	↑ by 20-40%	Due to personalised campaigns and smart recommendations.
Increase in sales	↑ by 15-30%	Personalisation of offers and encouragement of repeat purchases.
Reduction of advertising costs	↓ by 30-50%	Automation of marketing processes, optimisation of budget allocation.
Improvement of customer loyalty	↑ through personalised communication and offers	Increase in repeat purchases and brand loyalty.

Source: Retailers (2023), A. Timarevska (2024)

As the table shows, the use of digital technologies and automation of marketing processes allows agricultural enterprises to increase the efficiency of their operations, reduce costs, and increase profitability. For example, the implementation of the integrated AgriChain system, which includes CRM, allowed Astarta-Kyiv to increase the efficiency of business processes, which was confirmed by the growth of segment revenue by 28% year-on-year (up to 146 million EUR for 9 months of 2024) (Astarta-Kyiv, 2024a). Personalisation of marketing campaigns using AI helps not only to increase conversions, but also ensures constant customer loyalty. As a result, agribusinesses become more adaptive to market changes and can better manage their resources and costs. The introduction of digital platforms and technologies, such as Big Data, machine learning, and artificial intelligence, can significantly improve the efficiency of agribusiness. This ensures sales growth, margin profitability and cost reduction, and allows businesses to reduce the impact of the human factor and increase the accuracy of forecasts, which ensures adaptability and competitiveness in the market.

Among the Ukrainian agricultural companies that successfully use online stores to sell their products, one of the most prominent is LNZ Group with its own LNZ Web platform. The company has been actively developing its online sales channel for more than two years, which allows it to successfully sell seeds and plant protection products throughout Ukraine. This was made possible not only by the development of the digital platform, but also by a strategic approach to integrating new technologies into business processes. One of the most important aspects of the LNZ Web online store is a significant expansion of the product range. This allowed the company to meet more consumer needs and provide a higher level of customer service. An important factor was the opportunity to get an online consultation with an agronomist, which is essential for farmers and agricultural producers who need specialised assistance. The platform also provided convenient logistics through a partnership with Nova Poshta, which allows efficient and fast delivery of products across the country (Kurkul, 2021).

The growth in the number of customers and the volume of online orders has become an obvious indicator of the effectiveness of implement-

ed digital tools. Mykola Mandra, head of LNZ Web, noted that the company receives regular customers from different regions of Ukraine, which confirms the correctness of the platform's development strategy. LNZ Group serves more than 3,000 clients in 19 regions of Ukraine with the help of 100 managers and 5 logistics centres, which provides extensive coverage and support for sales growth. In 2024, LNZ Group increased the area under key crops (soybeans by 20%, rapeseed by 60%, wheat by 20%), which indicates the expansion of the customer base of agricultural producers, potentially increasing the demand for seeds and SPR, which are sold through LNZ Web due to this, sales volumes are steadily growing, which indicates the effectiveness of the online store as an important sales channel (LNZ web, n.d.).

Together with online stores, agricultural enterprises actively use marketing in social networks, which is one of the main tools for product promotion. For example, the company BigBlue, which grows blueberries by implementing SMM strategies, was able to increase sales through social networks three times in a year. This channel has become an important source for 10% of the company's total sales. For small and medium-sized agricultural enterprises that work directly with end users, the share of sales through social networks can reach 70-100% (AgroPortal, 2021). Such results demonstrate the effectiveness of social networks for sales growth in agribusiness, which makes them an important tool for achieving success in the digital environment. One of the biggest achievements of social media marketing is increasing the conversion rate, which increases by 20-40% due to personalised content, direct communication, and quick response to customer requests. This allows agricultural enterprises to significantly increase sales, increase customer loyalty, and ensure long-term stability in the market (AgroMarketing Agency, 2023).

Personalisation and targeting are among the most effective tools in marketing of agricultural products. In the face of high competition and growing consumer demands, agricultural enterprises need to use these tools to improve the effectiveness of their marketing campaigns, attract new customers, and retain existing ones. Based on a personalised approach, farmers can create offers that best meet the interests and

needs of a particular consumer, which as a result increases the level of customer satisfaction and loyalty. Personalisation in the marketing of agricultural products involves adapting advertising materials, products, and services to the individual needs of each client. By collecting and analysing data about consumer behaviour, preferences, purchases, and other factors, a company can create personalised offers that will be more attractive to a specific audience. Modern tools, such as CRM systems and Big Data analytics, allow effectively tracking customer needs and building strategies for interacting with them. For example, using your purchase history, geo-location data, and even seasonal factors helps to more accurately predict customer needs and offer them exactly the product that will be most in demand (Casaca & Miguel, 2024).

Targeting is an important component of personalisation and is aimed at accurately identifying the target audience for each marketing campaign. In agribusiness, targeting allows achieving more effective communication with potential customers by choosing exactly the group of consumers that is most likely to be interested in a product or service. Advertising platforms, such as Google Ads or social networks (e.g., Facebook, Instagram), offer tools for creating detailed targeting based on various criteria, such as demographic characteristics, interests, online behaviour, and other data (Mccall, 2024). It is especially important to use targeting to promote agricultural products through online stores and marketplaces. By analysing user data, agricultural enterprises can determine exactly which of the potential customers may be interested in their products, and personalise advertising offers for each of them. For example, Nasha Ryaba targets ads for families who regularly buy chicken for household consumption, offering them discounts or promotions on certain types of products that best suit their taste preferences. In addition, the company actively uses personalised offers for business customers, such as restaurants and supermarkets, where wholesale discounts on certain products can be offered (Nasha Ryaba, n.d.).

In addition, personalisation and targeting help agribusiness reduce advertising costs, since companies do not spend money on general

advertisements for a wide audience, but focus only on those potential customers who are most likely to make a purchase. This allows optimising advertising budget and increasing conversion rate. For example, LNZ Group, with the LNZ Web platform, targets farmers from certain regions where specific crops are popular, which allows increasing the effectiveness of marketing campaigns and ensuring greater accuracy in reaching the target audience (Kurkul, 2021). Thus, personalisation and targeting in the marketing of agricultural products are powerful tools for improving the effectiveness of interaction with customers, reducing advertising costs, and increasing sales. The use of advanced technologies for data collection and analysis gives agricultural enterprises the opportunity to create offers that most accurately meet the needs of each client, which contributes to increasing loyalty and long-term relationships with customers.

Comparison of this study with the papers by F. Sudirjo *et al.* (2023) and X. Yu *et al.* (2024) identified both common and distinctive aspects. X. Yu *et al.* focused on the introduction of multimedia platforms to promote the adoption of “green” agricultural technologies among farmers in China, in particular, by reducing barriers to the perception of new technologies. This study focused more on optimising agribusiness in Ukraine through digital platforms for marketing products. Although both studies emphasised the importance of sustainable environmental technologies, X. Yu *et al.* focused on “green” technologies, while the current study focused on general business processes in agribusiness. The study by F. Sudirjo *et al.* (2023) and the present study also had a similar focus on improving the efficiency of agribusiness through the use of technology. F. Sudirjo *et al.* investigated the automation and monitoring in poultry farming. Both studies highlighted the importance of technological innovation in improving production processes, but F. Sudirjo *et al.* concentrated on poultry farming, and this research was focused on sustainable development through digital platforms. In addition, F. Sudirjo *et al.* focused on Indonesia, while this paper analysed Ukraine and environmental agricultural practices.

L. Lomov-skykh *et al.* (2019) and G. Chiara-luce *et al.* (2024) and this study also focused on

implementing the latest technologies to improve the efficiency of agribusiness, in particular, AI, automation, and Big Data. However, G. Chiara-luce *et al.* took a more global approach, analysing the impact of technologies on various aspects of agricultural production at the international level, while this study focused on helping small and medium-sized agricultural enterprises in Ukraine to adapt to the market through digital platforms to optimise marketing strategies and reduce costs. Comparison with the study by L. Meziani *et al.* (2024) found that both studies focused on using the latest technologies to improve agribusiness efficiency. However, L. Meziani *et al.* placed more emphasis on smart technologies to optimise production processes and reduce costs, while this research focused more on digital platforms to optimise marketing and sales processes, such as Open Agribusiness and AgriChain.

The study by R. Abiri *et al.* (2023) and the present study focused on the introduction of digital technologies to improve the efficiency of agribusiness, in particular, automation and Big Data. R. Abiri *et al.* considered the use of smart technologies to optimise production processes, such as automated irrigation and monitoring systems, while this research focused on digital platforms to improve marketing strategies and product marketing. R. Abiri *et al.* analysed agricultural enterprises in Indonesia, while this study focused on Ukrainian companies such as Kernel and Astarta-Kyiv. Regarding comparison with the study by P. Bagri (2024), then both studies had similar features, as they also looked at the use of the latest technologies, such as artificial intelligence, Big Data, and automation, to improve the efficiency of agribusiness. Both studies highlighted the importance of digital platforms, especially online shopping, to reduce costs and improve product availability. However, P. Bagri focused more on precision farming and automating production processes such as irrigation and fertiliser use, while this study focused on digital platforms such as Open Agribusiness and AgriChain to optimise marketing and sales processes, as well as the use of online shopping to expand markets.

The study by B. Fasciolo *et al.* (2024) and the present study also focused on using digital technologies to improve agribusiness efficiency.

However, B. Fasciolo *et al.* covered a wider range of Industry 4.0 technologies, such as IoT, AI, and blockchain for agricultural supply chains, while the current study focused more on the practical application of Big Data and automation in Ukrainian agricultural enterprises. B. Fasciolo *et al.* used bibliometric analysis to study general trends in agricultural technologies, while this study focused on real-world practices in Ukraine. Both studies highlighted the importance of technology for improving efficiency, but differed in methods and application context.

Challenges and prospects for implementing technologies in agribusiness

The introduction of the latest technologies in the marketing strategies of agricultural enterprises is an important aspect for improving their efficiency

and competitiveness in the market. However, there are various barriers to this that can slow down or complicate the process. The study considers the main problems and opportunities that open up for agribusiness in a changing market. One of the main barriers is the high initial costs of implementing new technologies. The lack of necessary technical infrastructure, especially in rural areas, makes it difficult for agricultural enterprises to access modern digital solutions. This can make it difficult for small and medium-sized agribusinesses to innovate without proper support from the state or financial institutions. In order to assess in detail the strengths and weaknesses, opportunities and threats that accompany the introduction of the latest technologies in agribusiness, a SWOT analysis was performed, which is presented in Table 3

Table 3. SWOT analysis of the introduction of the latest technologies in agribusiness

Strengths	Weaknesses
■ Increase productivity through precision farming and automation ■ Access to new markets through digital platforms ■ Reduction of resource costs through automation and monitoring	■ High initial costs for implementing technologies ■ Lack of necessary technical infrastructure in rural areas ■ Not enough qualified personnel to work with new technologies
Opportunities	Threats
■ Expansion of sales markets through online stores and marketplaces ■ Collaboration with technology companies to develop new solutions ■ State support for innovation and environmental standards	■ Economic instability may reduce the availability of financing ■ Lack of reliable infrastructure for digital solutions in rural areas ■ Deterioration of the political situation may make it difficult to finance innovation

Source: compiled by the authors based on J.H. Al-Ammary & M.E. Ghanem (2024)

SWOT analysis showed that the introduction of the latest technologies in agribusiness has significant potential to increase productivity, reduce resource costs, and access to new markets. Strengths include increased efficiency through precision farming and automation, which can reduce the cost of fertilisers, pesticides, and water. However, there are also significant weaknesses, such as high initial costs for implementing technologies, which can become a barrier for small and medium-sized farmers. The lack of technical infrastructure is also an important problem, especially in rural areas where access

to high-speed Internet and the necessary technological facilities is limited. The potential for development lies in cooperation with technology companies and government support for innovation. A worsening economic situation or instability in financial markets can pose serious threats to agribusiness, as they limit the availability of financing for large investments in new technologies. Based on these factors, the key to successful implementation of the latest technologies will be an integrated approach, including state support, improving the technical infrastructure and ensuring that employees are

qualified to work with new systems. Consideration of these aspects will minimise weaknesses and maximise opportunities for farmers. Equally important is the assessment of external

factors, such as political, economic, social, and technical factors that can influence the success of new technologies. For this purpose, the PEST analysis is presented in Table 4.

Table 4. PEST analysis of technology implementation in agribusiness

Political factors	Economic factors
■ Government agribusiness support programmes can help to integrate new technologies ■ Policies on environmental standards and sustainable development encourage agribusinesses to innovate	■ High technology implementation costs, funding constraints ■ Economic crises may limit the availability of credit and investment
Social factors	Technological factors
■ Growing digital literacy among farmers ■ Consumer needs for more environmentally friendly and high-quality products	■ Development of new technologies in agribusiness, such as IT and AI ■ Problems of compatibility of various technological solutions in existing systems

Source: compiled by the authors based on J.H. Al-Ammary & M.E. Ghanem (2024)

PEST analysis provided a detailed idea of the impact of external factors on the process of implementing the latest technologies in agribusiness. Political factors, such as government support programmes and environmental regulations, can significantly encourage agricultural enterprises to innovate, creating a favourable environment for development. However, economic difficulties, such as crises or instability in financial markets, can make it difficult to access the necessary investments, which creates obstacles to large-scale adoption of technologies. Social factors also play an important role: growing digital literacy among farmers and changing consumer habits can be a driving force for innovation. But technical factors are still a major concern, as many agribusinesses do not have access to the advanced infrastructure needed to implement the latest technologies, such as satellite data or sensor systems. The greatest potential for development lies in improving the social component through training and advanced training programmes for farmers, which will reduce dependence on limited technical infrastructure. It is also important to encourage government support in the form of subsidies and grants for small and medium-sized enterprises, which will allow them to overcome financial barriers and participate in the transformation of agribusiness through innovation.

Thus, the analysis of the problems and opportunities of introducing the latest technologies in the marketing strategies of agricultural enterprises concluded that although there are many barriers to innovation, there are significant opportunities for the development of agribusiness in the context of digitalisation. Synergy between government support programmes, infrastructure improvements, and social initiatives aimed at improving digital literacy is an important prerequisite for success. The development of these areas will allow agricultural enterprises to maximise the benefits of the latest technologies, such as precision farming, automation, and Big Data, to increase efficiency and competitiveness in the market.

Based on the results of the study, a number of practical recommendations are formulated aimed at improving the efficiency and competitiveness of agricultural enterprises by introducing advanced technologies. To improve the competitiveness of agribusiness, it is important to introduce the latest technologies that can not only increase the efficiency of production processes, but also ensure the stability of enterprises in a changing market. However, in order to maximise the potential of such technologies, both their advantages and limitations must be considered. First of all, it is necessary to focus on the use of precision farming, process

automation, and the use of Big Data and AI to predict yields and optimise resource costs.

The main recommendation is to introduce technologies that can reduce the cost of resources, in particular, fertilisers, pesticides and water. Precision farming technologies, such as GPS navigation and systems for differentiated application of fertilisers and pesticides, can significantly reduce the excessive use of chemicals and water, which not only reduces costs, but also has a positive impact on the environmental sustainability of production. An example of successful implementation of such technologies is Epicenter Agro, which implemented Real-Time Kinematic (RTK) positioning, which allowed increasing the productivity of agricultural machinery by 10% and reducing the cost of material resources by 5%. In addition, losses from theft and irrational use of fertilisers decreased. Adaptation to such technologies should become a strategic priority for farmers, as it allows not only to save resources, but also to increase profitability by reducing processing costs and improving product quality (WEAGRO, 2024b).

For the successful implementation of these technologies, it is important to provide farmers with the necessary knowledge and support. At a time when many agricultural enterprises have limited access to advanced technical infrastructure, especially in rural regions, it is necessary to create training and advanced training programmes for employees. Through such initiatives, it is possible to reduce the digital divide and ensure efficient use of the latest technologies. A key element of this process should be the development of infrastructure, including access to high-speed Internet, which would allow implementing all the advantages of digital platforms and automated systems.

Equally important is the introduction of intelligent systems for demand forecasting, supply chain management, and logistics process optimisation. The use of Big Data helps to effectively predict market trends, determine the best moments for buying and selling, and carry out accurate planning of production processes. An example is VITAGRO (n.d.), one of the largest agricultural groups in Ukraine, which actively implements artificial intelligence for data analysis, yield forecasting and supply chain optimisation.

They also use IoT to collect real-time data, enabling more efficient logistics management, monitoring of machinery, fields, and climate change. In 2024, investments in technological improvement of the production of plant protection products (PPP) helped to increase the productivity of two production lines by 30%, and lines for the production of liquid complex fertilisers – by 40%, which provided an output of up to 7.5 million litres of PPP and 3.5 million litres of fertilisers per year. The use of intelligent systems has helped to increase yields and reduce costs, in particular, by more accurate planning of production and delivery of products. The introduction of intelligent systems, in particular, AI and IoT, in supply chains and manufacturing allows for more accurate planning of production and logistics, which helps to reduce costs and increase yields, although specific figures for these indicators have not been made public. Plans to invest an additional 2 million USD in production assets in 2025-2026 indicate a strategic focus on innovation and technological development, which should further improve production efficiency. Given the current trends, it is important to be prepared for changes and introduce innovations that ensure sustainability and maintain competitive advantages (Interfax-Ukraine, 2024).

In particular, the integration of AI technologies into agribusiness marketing strategies is an important component for improving customer interaction. Personalisation of offers, ad targeting, and process automation allow creating more accurate and effective marketing campaigns that help to increase customer conversion and loyalty (Riabchyk *et al.*, 2021). For example, the introduction of chatbots to automate communication with customers, and the use of personalised recommendations based on data analysis, allows agricultural enterprises to reduce marketing costs, while increasing the effectiveness of advertising campaigns.

Another important component is the integration of agribusiness into global digital platforms that allow not only to expand sales markets, but also to ensure effective communication with partners and customers (Zamkova *et al.*, 2021). The use of online stores and marketplaces opens up new opportunities for selling products in domestic and foreign markets, in particular, by

simplifying the purchase and delivery process, and improving access to potential customers.

Successful adaptation to a changing market also requires flexibility in strategic decision-making for agricultural enterprises. Based on technologies such as Big Data analytics, artificial intelligence, automated yield monitoring systems, digital production management platforms (such as AgriChain) and weather forecasting systems, agribusiness can quickly respond to changes in market conditions, economic fluctuations or natural factors affecting production processes. Considering current trends, it is important to be prepared for changes and introduce innovations that ensure sustainability and maintain competitive advantages (LaZebnik, 2024).

Based on the analysis of current trends, it can be concluded that the effective use of technologies to improve the competitiveness of agribusiness requires an integrated approach, including integration of the latest technologies, training of personnel, improvement of technical infrastructure, and adaptation to a changing market. An important step is the state's support for innovation initiatives, which would allow small and medium-sized agricultural enterprises to reach new levels of efficiency and sustainability in the market.

The study by B. Wang & H. Dong (2023) and the current study had a common focus on using digital technologies to improve agribusiness efficiency, but their approaches and contexts differed. B. Wang & H. Dong focused on studying factors that influenced the adoption of digital agricultural technologies among farmers in China, such as productivity expectations, social impact, and availability of technical facilities. They stressed the importance of socio-cultural aspects for the successful implementation of technologies. This study focused on optimising marketing and production processes through the use of Big Data and AI in agribusiness in Ukraine. While both studies highlighted the importance of technological innovation in reducing costs and improving the competitiveness of agricultural enterprises, study B. Wang & H. Dong considered the behavioural aspects of technology adoption, while this research highlighted technical aspects such as automation and business process optimisation.

Research by N.E. Benti *et al.* (2024) and this study also focused on using digital technologies to improve agribusiness efficiency, particularly through AI, IoT, and Big Data applications. In the study by N.E. Benti *et al.* the main focus was on the use of technologies for soil monitoring and water management in Ethiopia, while this study focused on optimising agribusiness in Ukraine through digital platforms for product marketing and marketing. Both studies recognised the importance of technology for improving agricultural production efficiency, but differed in the context of technology applications. N.E. Benti *et al.* paid more attention to monitoring and forecasting in agriculture, and this study focused on precision farming and business process automation. However, both studies recognised the importance of investing and supporting farmers to introduce the latest technologies and remove barriers to their implementation.

The study by C. Byahatti & P.C. Ramgouda (2024) and this study also highlighted the use of digital technologies in agriculture. C. Byahatti & P.C. Ramgouda investigated the application of technologies in India's agribusiness, in particular, to optimise production processes and improve crop quality. The current study focused more on using digital platforms to optimise marketing processes and product sales in Ukraine. The main difference was that C. Byahatti & P.C. Ramgouda focused on solving the problems of Agriculture in India, in particular the lack of infrastructure and traditional production methods, while this study analysed the more developed situation in Ukraine, where technologies were actively used in agribusiness, in particular for marketing and sales.

The study by R. Valdes *et al.* (2023) and this study had a common focus on using technology to develop agribusiness, but with different approaches. R. Valdes *et al.* focused on the social and production factors that influenced the adoption of technologies among farmers in Chile, in particular, on new irrigation methods and optimisation of production processes. This study focused on the use of digital platforms for marketing and marketing products in Ukraine, optimising business processes. Both studies highlighted the importance of technology for improving competitiveness, but R. Valdes *et al.* paid more

attention to the production aspects, while this study focused on marketing and sales processes.

A comparison of different studies showed similarities in the focus on using technologies to improve competitiveness, but with differences in approaches to their application in different contexts. In particular, the emphasis varies between marketing processes, production aspects, and the impact of socio-cultural factors. Given the importance of digitalisation for the development of agribusiness, it is important to further study these technologies and support their implementation in the agricultural sector.

CONCLUSIONS

As a result of the research, it was determined that the introduction of advanced digital technologies significantly changes approaches to the development and implementation of marketing strategies of agricultural enterprises. Innovative solutions, including Big Data, artificial intelligence (AI), automation, and digital platforms, enable businesses to move from mass to personalised forms of customer interaction, reduce product promotion costs, and increase profitability. The use of Big Data and analytical systems allows agricultural companies to develop accurate forecasts of demand for various types of products, which reduces inventory by 20-25% and reduces storage and write-off costs. Simultaneously, personalisation of marketing campaigns based on consumer behavioural models can increase the conversion rate by an average of 20-40%. The use of AI in marketing activities, including dynamic pricing systems, chatbots for customer service and intelligent recommendation algorithms, allows reducing advertising costs by 30-50% and simultaneously increasing sales by 15-30%. Automation of production processes, from seed drills to harvesting robots, also contributes to significant cost savings. The introduction of robotic systems can reduce labour costs by 40% and reduce water supply costs by up to 30%. This allows agricultural enterprises not only to improve the accuracy of work, but also to ensure stability in production, which is critical for ensuring food security.

The integration of advanced technologies into MHP's operations has become a key factor

in its financial success and competitive advantage in the market. MHP has significantly improved the efficiency of its operations and strengthened its position in international markets through the introduction of innovations such as digital platforms, artificial intelligence, automation, and Big Data. Financial indicators showed a significant increase in the company's revenue and export revenue. The company's export revenue was 1.8 billion USD in 2023, accounting for 60% of its revenue. Until the end of 2024, it remained high at 1.368 billion USD. This indicates a successful strategy for entering new markets and effectively adapting products to different consumer groups. The introduction of data processing automation reduces the human factor, which also minimises the likelihood of errors during manual data entry. This allows increasing the margin yield by 2-5% and reducing the inventory of goods by 20-25%, which reduces the cost of storing and writing off products. Thus, digital technologies are becoming not just an auxiliary element, but the core of a advanced marketing strategy in agribusiness. Their integration ensures accuracy, adaptability, and high performance of solutions, which are key factors for success in a competitive market.

A limitation of this study was the lack of access to detailed statistical data on the introduction of digital technologies in small and medium-sized agricultural enterprises in Ukraine, which made it difficult to conduct an in-depth analysis of the effectiveness of their application. The prospects for future research are the development and implementation of a methodology for collecting and analysing data on the use of digital technologies in agribusiness, which would help to more accurately assess their impact on the efficiency of enterprises and develop recommendations for optimising their application.

ACKNOWLEDGEMENTS

None.

FUNDING

None.

CONFLICT OF INTEREST

None.

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Вплив сучасних технологій на формування та впровадження маркетингових стратегій в агробізнесі

Анотація. Метою даного дослідження було оцінити вплив сучасних технологій на ефективність маркетингових стратегій агропідприємств, зокрема на процеси формування та впровадження інноваційних підходів у маркетинг. Методологія дослідження включала аналіз для виявлення сильних і слабких сторін, можливостей і загроз впровадження технологій у агробізнес. А також аналіз політичних, економічних, соціальних та технологічних факторів на процес введення новітніх технологій у сільське господарство. Зокрема, було встановлено, що впровадження точного землеробства дозволяє знизити витрати на добрива на 10-15 %, а крапельний полив зменшує витрати води на 30-50 %, що сприяє підвищенню ефективності використання ресурсів і знижує екологічний слід аграрного виробництва. Завдяки точному землеробству агропідприємства змогли оптимізувати процеси вирощування сільськогосподарських культур, забезпечивши рівномірний розподіл добрив та пестицидів, що також допомогло знизити їх споживання і витрати на обробку ґрунтів. Фінансові показники Миронівського хлібопродукту показали значне зростання доходу та експортного виторгу компанії, який склав \$1,8 млрд у 2023 році, що становило 60 % її доходу. Іншим важливим результатом було виявлення того, що цифрові платформи, такі як «Open Agribusiness» компанії Kernel і «AgriChain» компанії Астарта-Київ, значно знижують операційні витрати, автоматизуючи більшість бізнес-процесів, що дозволяє агропідприємствам зосередитися на стратегічних питаннях розвитку. Використання таких платформ допомогло зменшити час на управління виробництвом і збутом, забезпечуючи при цьому точність та прозорість усіх етапів виробничого процесу, що в свою чергу підвищує конкурентоспроможність

підприємств. Особливу увагу було приділено впливу цифрових інструментів на збутову та маркетингову діяльність агропідприємств. Висновки дослідження свідчать, що інтеграція новітніх технологій є ключовим фактором для підвищення конкурентоспроможності агропідприємств. Практичне значення дослідження полягає в тому, що його результати можуть бути використані агропідприємствами для впровадження ефективних цифрових рішень у маркетингову діяльність з метою зниження витрат і підвищення прибутковості

Ключові слова: інновації; персоналізація; інтернет-магазин; прогнозування; штучний інтелект