# United States AI in Agriculture Market Assessment, By Technology [Machine Learning, Computer Vision, Predictive Analytics, Natural Language Processing (NLP), Robotics and Automation], By Offering [Hardware, Software, Services], By Application [Precision Farming, Livestock Monitoring, Drone Analytics, Agricultural Robots, Weather Forecasting, Others], By Deployment Mode [Cloud-Based, On-premises], By Farm Size [Small and Medium Farms, Large Farms], By Region, Opportunities and Forecast, 2017-2031F

Market Report | 2024-09-30 | 129 pages | Market Xcel - Markets and Data

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**Report description:**

United States AI in agriculture market is projected to witness a CAGR of 20.55% during the forecast period 2024-2031, growing from USD 399.91 million in 2023 to USD 1783.61 million in 2031. The market is growing due to technological evolution and increasing adoption of precision farming methods, setting the industry for enormous developments. In varied agricultural operations, AI technologies, including machine learning, computer vision, and robots, are being introduced with an aim of optimizing crop management and improving farm productivity while reducing costs.
With weather forecast, soil status, pest invasions, and plant health represented, these technologies make it possible for farmers to arrive at their decisions based on facts. More importantly, AI is being integrated into farming instruments such as driverless tractors and intelligent watering systems that are becoming increasingly popular to automate laborious operations with the aim of increasing productivity.
Thus, increasing demand for sustainable agricultural techniques alongside growing focus on production to expand food availability due to population growth are the driving forces behind the market. Eco-friendly farming methods are possible through AI-based

systems which help in limiting water usage, fertilizer amounts, and pesticide applications. Prominent participants in the industry are emphasizing on conducting artificial intelligence related studies by cooperating with tech companies or startups so as to come up with innovative resolutions of arising issues.

Furthermore, agri-tech innovations are being driven by the rising government support and funding. However, market growth could be impeded through high start-up costs, data privacy challenges, and the need for improved technical skills among farmers. To summarize, the United States AI in agriculture market is projected to grow substantially in the forecast years, transforming the farming sector due to continuous technological advancements and growing consciousness among farmers.

In July 2024, an innovative AI-based model, Ag Assistant, was introduced by A.A.A Taranis Visual Ltd. It is powered by a generative artificial intelligence model that integrates data in several modalities, such as text, voice, and images, and has a thorough understanding of agronomy.

Data-Driven Decision Making Fuels the Market Growth

The farming industry has been greatly altered by decisions made using analysis of data. In today's world, farmers are able to optimize their operations and maximize output by using vast amounts greenhouses. It is made possible through modern tools such as artificial intelligence (AI), which use machine learning and data analytics techniques that allow agricultural producers collect, analyze, or deduce information relating to various aspects such as weather forecasts, soil sensors, satellite images, crop health monitors, and others. Consequently, this information provides insights into every aspect of farming from planting to harvesting, enabling farmers to make more informed decisions.

As an instance, AI can forecast the best time for planting, suggest accurate amounts of water and fertilizers, and detect possible insect invasions before severe outbreaks. With this knowledge at hand, farmers are able to improve crop production, cut wastage, and make better use of their resources. Besides that, forecasting market trends and demand using AI-based predictive analytics enables farmers to plan their production accordingly. In fact, in March 2024, UCF researchers led a project aimed to develop AI-powered agricultural technologies. To enable more precise and knowledgeable agricultural decision-making, the study will explore technologies that enhance field operations in the sector.

Making choices based on data raises profit margins and encourages sustainable agricultural practices due to reduced resource usage and lower environmental damage. Consequently, data-driven decision-making forms an integral part of contemporary agriculture, boosting the adoption of artificial intelligence in the sector.

Technological Advancements in AI Help in Market Expansion

The field of agriculture is undergoing a transformation, owing to the emerging AI technology that raises yield levels, cuts down expenses, and promotes sustainable practices. Some of the advancements being made in this area include machine learning, deep learning, computer vision, and robotics which are leading to more accurate and smarter agricultural approaches. For instance, farmers can monitor their crop health status and soil conditions from a distance using computer vision system, while prediction of possible pest invasion or disease occurrence, done by algorithmic machines which utilize machine learning process on such information.

In addition, self-directing farm machinery such as robotized harrows have been developed, which make it plausible for them to finish heavy labor works with more precision and pace than human laborers. Moreover, AI drones help monitor areas from above alongside spraying liquids leading to efficient use of resources and minimizing direct human involvement.

These technological advancements have made it possible for the scalability of AI solutions to be improved, thus making them more accessible and affordable to farms of different sizes. Furthermore, as AI technology continue evolving, it will lead to more creative ideas in the agricultural sector enabling better harvests at lower prices while attaining environmental sustainability objectives in a more efficient way. For instance, in April 2024, South Africa's Aerobotics PTY Ltd introduced AI based platform for helping farmers in the United States to improve fruit and nut crop yields. The technology further helps in efficiently utilizing the water resources.

Hardware Holds a Substantial Market Share

The United States AI in agriculture market is dominated by hardware components, which account for a significant portion of market share due to rising usage of sophisticated farming tools and apparatus fitted with AI technologies. Modern farms depend heavily on essential hardware components such as sensors, drones, robotics, autonomous tractors, and smart irrigation systems. These devices have AI functionalities that allow precision agriculture through collection and analysis of real-time data on soil

health, weather patterns, crop conditions, and pest occurrence.
For instance, environmental condition monitoring and data-driven irrigation optimization, fertilization, and pest control enable precision farming. Drones and robotics are widely used to survey large areas, plant seeds, and apply fertilizers or pesticides with high accuracy. Farmers are increasingly turning to these AI driven hardware solutions because they help reduce labor costs, raise productivity and enhance crop yield.
Additionally, farmers find it easier and reasonable to use such technologically improved hardware, hence facilitating their use more often. With the growing need for farming practices, hardware will increasingly be instrumental in expanding the AI in agriculture market.
In February 2024, to combat weeds, Deere & Company introduced See & Spray Premium, an AI-powered weed-sensing system that uses boom-mounted cameras to scan a crop covering more than 2,100 square feet every second, triggering individual spray nozzles when target weeds are seen.
Future Market Scenario (2024 - 2031F)
-The use of artificial intelligence enabled flying devices, robot harvesters, and driverless farm vehicles to be the primary techniques used on farms to improve their overall productivity and reduce dependence on manual labor.
-The combination of AI with other advanced technologies such as IoT, blockchain, and cloud computing will lead to development of better farming programs that will provide complete services starting from soil preparation to harvesting crops and distributing them in the market.
Key Players Landscape and Outlook
The landscape of key players in the United States AI in agriculture market is characterized by a mix of established agricultural equipment manufacturers, technology giants, and innovative startups. These companies are actively investing in research and development to enhance their AI capabilities, focusing on areas such as precision farming, autonomous machinery, and predictive analytics. Established players are leveraging their extensive distribution networks and existing customer bases to integrate AI solutions into traditional farming equipment, thereby offering more advanced and efficient products to farmers.
Technology-based companies, on the contrary, are entering the market with innovative AI platforms that provide data-driven insights, optimize farm management practices, and enhance crop yield and quality. For instance, in November 2023, Microsoft Corporation and Bayer AG strategically collaborated to launch Leaf Agriculture and OneSoil to develop availability of data for farm machinery and bringing new solutions for in-season crop detection, respectively. Both of the AgPowered Services are fueled by AI, transforming the agricultural sector globally.
The outlook for key players is positive, with continuous innovation expected to drive competition and collaboration in the market. As the demand for sustainable and efficient farming practices grow, these companies are well-positioned to capitalize on the opportunities in the evolving AI in agriculture landscape.

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