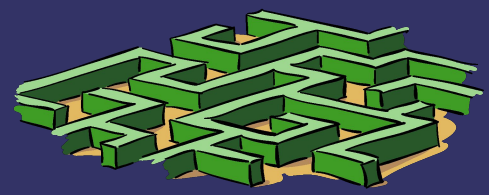
Using Modern Day AI to Solve Traditional Farming Problems

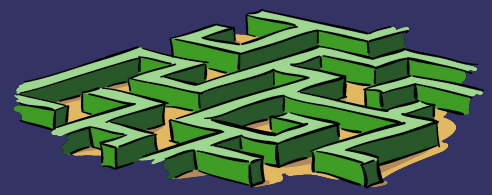


Artificial Intelligence

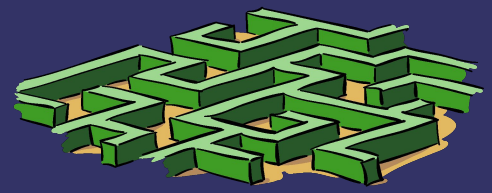
Artificial intelligence is based in such a way that a machine can easily simulate it and perform tasks, from the simplest to even more complex. The goals of artificial intelligence include learning, reasoning, and perception. AI has a huge impact in all areas of the industry

Agriculture and farming is one of the oldest and most important professions in the world. It plays an important role in the economic sector. Globally, agriculture is a $ 5 trillion industry.

The world's population is expected to reach more than nine billion by 2050, requiring a 70% increase in agricultural production to meet demand. As the world population grows, land water and resources become insufficient to continue the supply and demand chain. So we need a smarter approach and a more efficient approach to how we farm and can be most productive

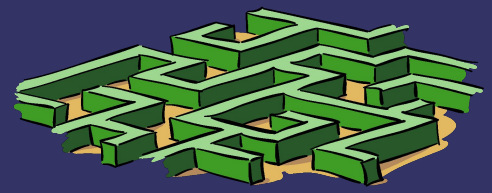


Adding Fertilizers: To maintain soil fertility is an important factor so the farmer can continue to grow nutritious crops and healthy crops. Farmers turn to fertilizers because these substances contain plant nutrients such as nitrogen, phosphorus, and potassium.
Irrigation: This stage helps to keep the soil moist and maintain humidity.
Weed protection: Weed protection is important to factor as weed decreases yields, increases production cost, interfere with harvest, and lower crop quality
Harvesting: It is the process of gathering ripe crops from the fields. It requires a lot of laborers for this activity so this is a labor-intensive activity. This stage also includes post-harvest handling such as cleaning, sorting, packing, and cooling.
Storage: This phase of the post-harvest system during which the products are kept in such a way as to guarantee food security other than during periods of agriculture. It also includes packing and transportation of crops.

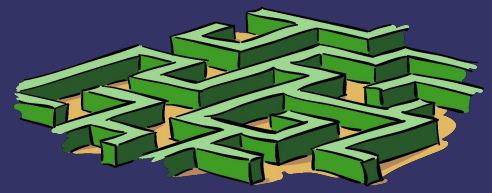


Applications of Artificial Intelligence in Agriculture

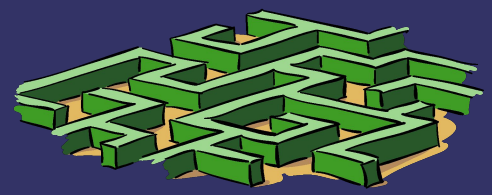
- The industry is turning to Artificial Intelligence technologies to help yield healthier crops, control pests, monitor soil, and growing conditions, organize data for farmers, help with the workload, and improve a wide range of agriculture-related tasks in the entire food supply chain. **Use of weather forecasting:** With the change in climatic condition and increasing pollution it's difficult for farmers to determine the right time for sowing seed, with help of Artificial Intelligence farmers can analyze weather conditions by using weather forecasting which helps they plan the type of crop can be grown and when should seeds be sown.



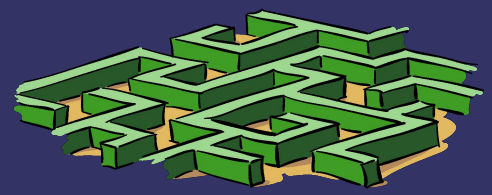
- **Soil and crop health monitoring system**: The type of soil and nutrition of soil plays an important factor in the type of crop is grown and the quality of the crop. Due to increasing, deforestation soil quality is degrading and it’s hard to determine the quality of the soil.
- A German-based tech start-up PEAT has developed an AI-based application called Plantix that can identify the nutrient deficiencies in soil including plant pests and diseases by which farmers can also get an idea to use fertilizer which helps to improve harvest quality. This app uses image recognition-based technology. The farmer can capture images of plants using smartphones. We can also see soil restoration techniques with tips and other solutions through short videos on this application.



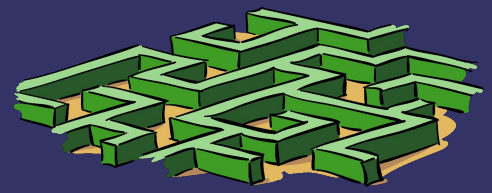
- **Analyzing crop health by drones:** SkySqurrel Technologies has brought drone-based Ariel imaging solutions for monitoring crop health. In this technique, the drone captures data from fields and then data is transferred via a USB drive from the drone to a computer and analyzed by experts.
- This company uses algorithms to analyze the captured images and provide a detailed report containing the current health of the farm. It helps the farmer to identify pests and bacteria helping farmers to timely use of pest control and other methods to take required action



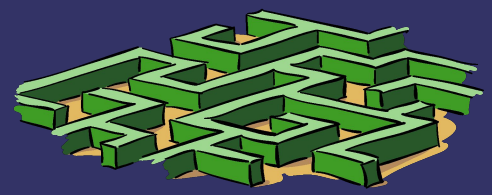
- **Precision Farming and Predictive Analytics:** AI applications in agriculture have developed applications and tools which help farmers inaccurate and controlled farming by providing them proper guidance to farmers about water management, crop rotation, timely harvesting, type of crop to be grown, optimum planting, pest attacks, nutrition management.
- While using the machine learning algorithms in connection with images captured by satellites and drones, AI-enabled technologies predict weather conditions, analyze crop sustainability and evaluate farms for the presence of diseases or pests and poor plant nutrition on farms with data like temperature, precipitation, wind speed, and solar radiation.
- Farmers without connectivity can get AI benefits right now, with tools as simple as an SMS-enabled phone and the Sowing App. Meanwhile, farmers with Wi-Fi access can use AI applications to get a continually AI-customized plan for their lands. With such IoT- and AI-driven solutions, farmers can meet the world's needs for increased food sustainably growing production and revenues without depleting precious natural resources.
- In the future, AI will help farmers evolve into agricultural technologists, using data to optimize yields down to individual rows of plants



- **Agricultural Robotics:** AI companies are developing robots that can easily perform multiple tasks in farming fields. This type of robot is trained to control weeds and harvest crops at a faster pace with higher volumes compared to humans.
- These types of robots are trained to check the quality of crops and detect weed with picking and packing of crops at the same time. These robots are also capable to fight with challenges faced by agricultural force labor.



- **AI-enabled system to detect pests:** Pests are one of the worst enemies of the farmers which damages crops.
- AI systems use satellite images and compare them with historical data using AI algorithms and detect that if any insect has landed and which type of insect has landed like the locust, grasshopper, etc. And send alerts to farmers to their smartphones so that farmers can take required precautions and use required pest control thus AI helps farmers to fight against pests.



Conclusion

- Artificial Intelligence in agriculture not only helping farmers to automate their farming but also shifts to precise cultivation for higher crop yield and better quality while using fewer resources.
- Companies involved in improving machine learning or Artificial Intelligence-based products or services like training data for agriculture, drone, and automated machine making will get technological advancement in the future will provide more useful applications to this sector helping the world deal with food production issues for the growing population.