SWARM ENGINEERING

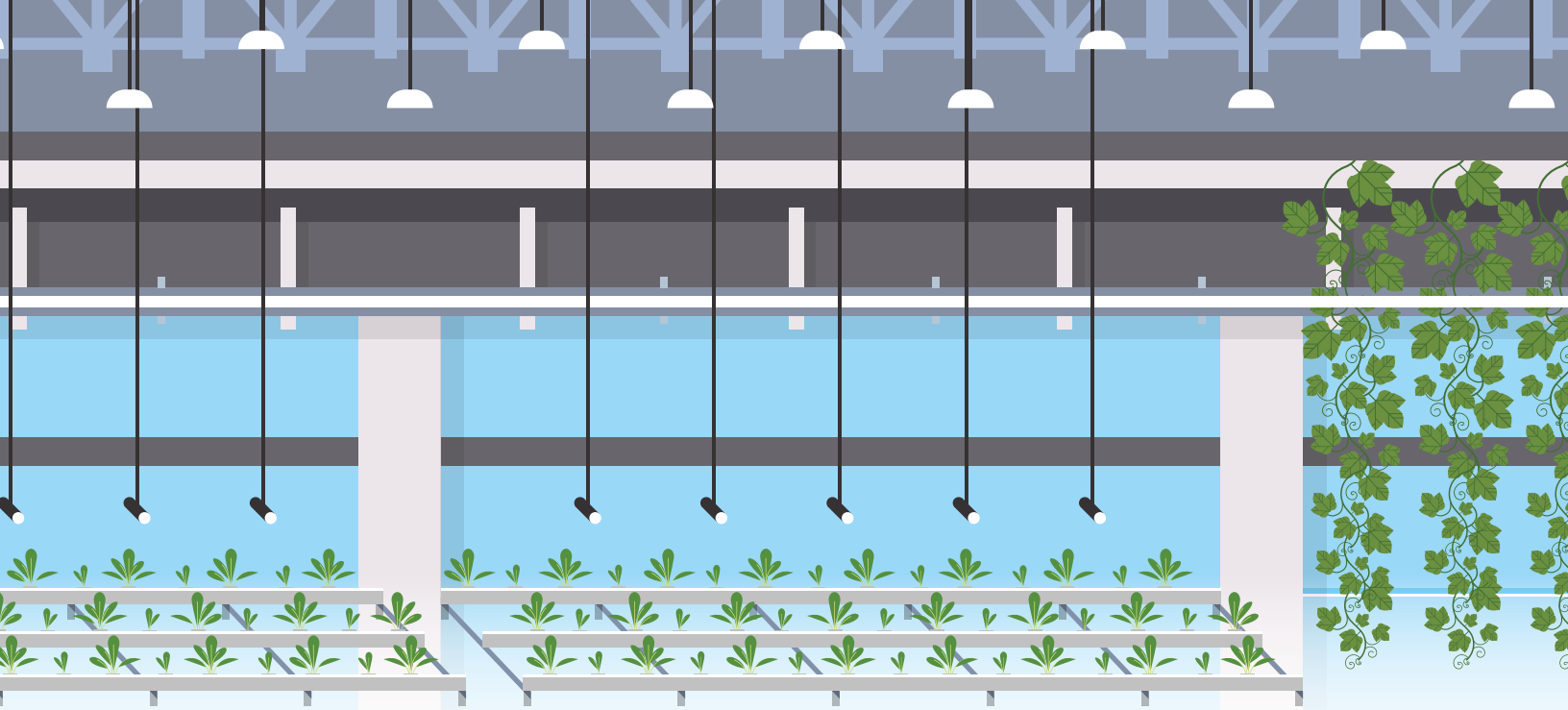
Delivering AI superpowers to the Agri-Food Supply Chain

Precognition

See the future

Challenge

Predicting the future is easy, they say, but getting it right is harder. This can be critical when judging supply and demand considerations, or in determining yield in order to sell the correct quantities of produce to your customers. Optimizing yield and maximizing profit in controlled environment agriculture (CEA) is a complex balancing act, involving temperature, humidity, soil, water, lighting, CO2 and nutrients. Trying to control these variables to maximize taste, shelf-life, and quantity is extremely difficult. Whether it's predicting plant rot or dealing with broken equipment, one false move and the entire crop is at risk. Growers are continually assessing their crops and adjusting the variables, either to improve the 'recipe' or to maximize yield. Predicting the future outcomes of living things is not an exact science, but neither is it guesswork. Sometimes it is necessary to adapt growing conditions for increases or decreases in demand, seasonal spikes, or unexpected disruptions. The first step in truly controlling the environment is to make accurate forecasts, before it is possible to manage the yield. Without an accurate forecast and a deep understanding of the impact of changes, the smallest decisions can cause catastrophic results.



Typical Approach

Most organizations use historical analytics and/or forward predictions based on other data (such as current sales orders) to make forecasts. Often, though the interpretation of the data is left to a subject matter expert. For example in a CEA such as a large fruit growing facility, an experienced workforce will checks crops, identify issues, and come up with solutions to health issues and make recommendations or direct changes to manage fluctuating demand.

This tribal knowledge can cause a bottleneck if the expert isn't on site every day, retires, or is struck down by illness. Data captured in spreadsheets is only valuable if the person tracking it can understand the information and act upon it. With an ageing workforce in many agriculture settings, the loss of expertise is a major concern for many growers, and it can hit forecasting processes extremely hard.

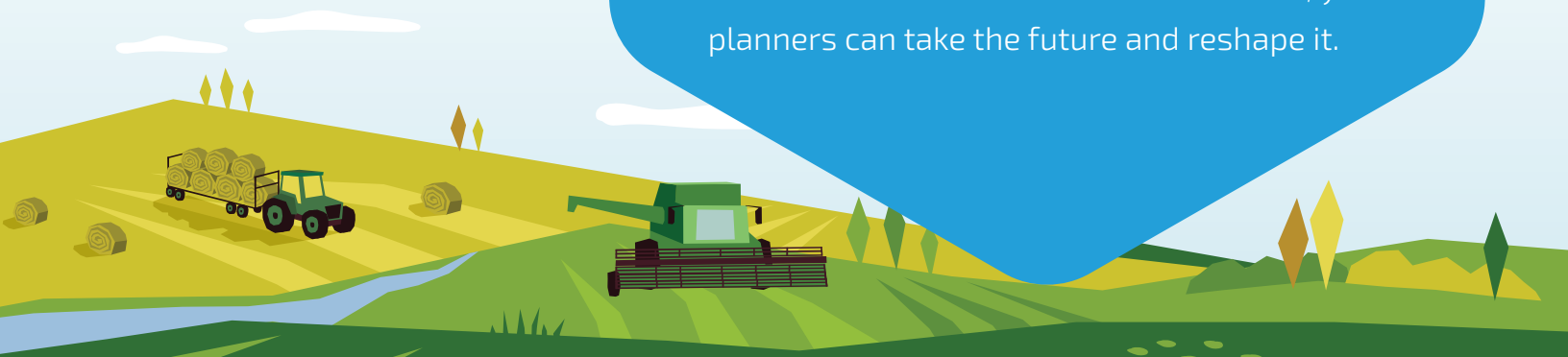
Some businesses are locked in to a forecast accuracy of 80% to 85% but might have a goal of 95%. To achieve this success rate, they may launch new data initiatives, seeking missing information to help their experts, but often the data they receive is unclear, incomplete, inaccurate, or simply overwhelms the decision makers with too much volume.

SWARM Solution

SWARM's library of machine learning algorithms identifies patterns in historical data that are invisible to humans, giving more accurate forecasts. This is then combined with guidance from your subject matter experts, to provide an AI-augmented, yet human decision on the best strategy to adopt. We take standard data from existing applications, whether that is an ERP, TMS, or simply an Excel spreadsheet, and can also accept advanced technology feeds, such as the sensors that watch plants in a CEA setting.

Cost Savings

This data can all be used to increase the accuracy and confidence of the forecast, and we go beyond the prediction to show recommended changes that could be made to bring the future closer to your desired outcome. Whether that is altering the humidity in a CEA grow room to accelerate growth, or pre-ordering more packing materials to meet the forecast increase in demand, your planners can take the future and reshape it.



Which AI superpower do you need?

Precognition
see the future

Telekinesis
move physical objects at will

Mastery
become an expert on a topic instantly

Telepathy
understand what others are thinking

Adaptability
cope with any disruption

SWARM uses a range of machine learning approaches and combines this with human operators' knowledge and guidance to accurately predict and forecast events. This could be used to better forecast crop yield, or determine future demand or supply, or even to determine how scarce resources like crop sprayers or harvesters should be deployed across a region.

See how SWARM can help your organization
swarm.engineering/start

SWARM is a solution engine for the agri-food supply chain that saves costs, reduces waste, and delivers environmental benefits. SWARM is structured around a curated market of algorithms for key supply chain processes. We provide an easy way for business users to define problems, and rapidly match them to advanced solutions without the users needing to do any software coding, or have any knowledge of advanced AI, or machine learning. SWARM is democratizing AI for the agri-food supply chain.