AgTech and AI – influential agribusiness trends in Alberta

January 21, 2021

The agribusiness industry is made up of all farming and farming-related commercial activities from source to sale. As an industry worth more than CA$95 billion annually in Canada, agribusiness encompasses every stage in the Canadian food chain from primary production to retail consumption.

As the world population continues to grow and land becomes more scarce, creativity and efficiency in farming practices through the introduction of technology has become vital. Two growing sectors of the agribusiness industry, agricultural technology (also called "agri-technology" or "AgTech") and artificial intelligence (AI), work to ensure that the land needed to produce crops is decreased, and that the productivity and yield of that farmland is increased.

AgTech includes the development, design, testing, and production of specialized software and hardware to support core agriculture activities. AgTech can apply to almost any area of agriculture, including plant monitoring, product management, field monitoring, and biometrics - to name a few.

AI, the simulation of human behaviour by machines, assists farms by improving the efficiency and productivity of their operations. The agribusiness industry now relies on AI technologies to help yield healthier crops, control pests, monitor soil and growing conditions, organize data for farmers, assist in the labour force, and streamline a variety of agriculture-related tasks throughout the industry.

Trends and developments in AgTech

The global market size for AgTech is expected to become a $725 billion (USD) industry by 2023, up from $495 billion today.[1] This substantial growth is due to a number of reasons, including the increased demand and consumption of both meat and plant-based products, growing consumer awareness about food safety and traceability, support for the use of modern agricultural techniques by governments, and, ultimately, the increased demand for agricultural production to match the growing population.

Two high-growth areas to watch in AgTech are:

1. Smart agriculture / Internet of Things (IoT): Smart agriculture uses modern technologies to monitor and manage farms through the use of sensors, cameras, and various analytic software. The IoT allows this to function by linking devices together through internet connectivity, creating a central operation system to manage farms.
2. Precision farming: Precision farming is the use of information technology, GPS, drones, and precision machinery that allow crops to grow more efficiently. These techniques allow farmers to make informed decisions about their crops based on the unique circumstances of their fields.

AgTech solutions can be applied in essentially every subsector of agriculture. This makes it poised to become an industry with tremendous potential moving forward.

Trends and developments in agricultural AI

AI substantially increases the performance of agribusinesses' advanced technologies and algorithms, such as machine learning and agricultural robotics. Unsurprisingly, it is one of the fastest growing areas of agribusiness, generating a global revenue of $585 million (USD) in 2018, with an expected compound annual growth rate of 38.3% in the coming years.[2]

AI technology is most often used in agribusiness through precision farming and predictive analytics. It helps create tools to provide farmers with guidance about water and nutrition management, crop rotation, timely harvesting, the success of certain crops, ideal planting conditions, and pest attacks.

Other emerging trends in AI are:

1. Weather forecasting and machine learning to manage climate change: AI technology can help farmers maintain consistency in crop rotations by analyzing the constantly changing climatic conditions and increasing pollution in the atmosphere. By helping farmers create plans about the type of crop that can be grown and when the seeds should be planted, in an increasingly changing climate, AI will play a vital role in ensuring stability and sustainability in agriculture in the future.
2. Cattle facial recognition: Advanced recognition and image classification technologies allow farmers to individually monitor and assess the behaviour of an animal, through analysis of its body conditions and feeding patterns. This is a relevant trend to Alberta especially, where livestock is a primary industry.
3. Agricultural robotics: AI-enabled robots help farmers overcome the challenge of accessing sufficient agricultural labour. These robots can check the quality of crops and detect weeds, while harvesting crops at a higher volume and faster pace when compared to human labour.[3] AI agricultural robots can easily perform multiple tasks in farming fields, aiding efficiency of the agribusiness industry.
4. Analyzing crop health with drones: Drones can capture data from fields, which is then transferred from the drone for expert analysis. Algorithms can then analyze these images to provide a detailed report of the farm, showing the overall health of the farm and identifying any issues more efficiently than farmers have been able to in the past.

One aspect of the agribusiness industry that will forever be certain is demand. Continued development of AgTech and AI-driven solutions will allow farmers to meet the world's continuous need for increased food while finding ways to grow productions and revenues while maintaining Canada's natural resources.

Agribusiness in Alberta – what's next?

Farmland covers about one-third of all land in Alberta – particularly in the Calgary and Southern Alberta region. Due to this, Calgary and Southern Alberta have been producing food for Canada and beyond for over a century and it comes as no surprise that the region has been responsible for creating some of the world's most sophisticated agricultural technologies too.

Calgary and Southern Alberta have the right mix of resources to become a global hub for AgTech and AI solutions. That said, companies implementing and designing AI solutions and AgTech in Alberta will need assistance to access early-stage funding, business support and facilities, networks and customers. Assistance in coordination between market shareholders, and navigating the regulatory environment and commitments will be crucial for these companies. Due to the connectivity of the AgTech and AI-based solutions, ensuring cybersecurity and data protection will also become a significant focus in the agribusiness industry.

With the development and implementation of AgTech and AI solutions such as smart agriculture and precision

farming, as well as the abundance of research and education taking place in the region – Alberta is perfectly located and poised to become a big name in this billion-dollar industry.

The authors would like to thank Kate Wiltse in connection with her assistance with this article.

1. *Research and Markets. 2019. "Global $725+ Billion Food & Agriculture Technology and Products Market Analysis 2018-2019 & Forecast to 2023" (March 2019)*↵
2. *Business Wire, "Global Artificial Intelligence in Agriculture Market Expected to Grow in Value Over the Coming Years, with a CAGR of 38.3%" (February 2020)* ↵
3. *Analytics Vidyha, "Artificial Intelligence in Agriculture: Using Modern Day AI to Solve Traditional Farming Problems " (November 2020)*↵

Your Key Contacts

Bennett Wong
Partner, Calgary
D +1 403 268 7057
bennett.wong@dentons.com

Riley Dearden
Associate, Calgary
D +1 403 268 7074
riley.dearden@dentons.com