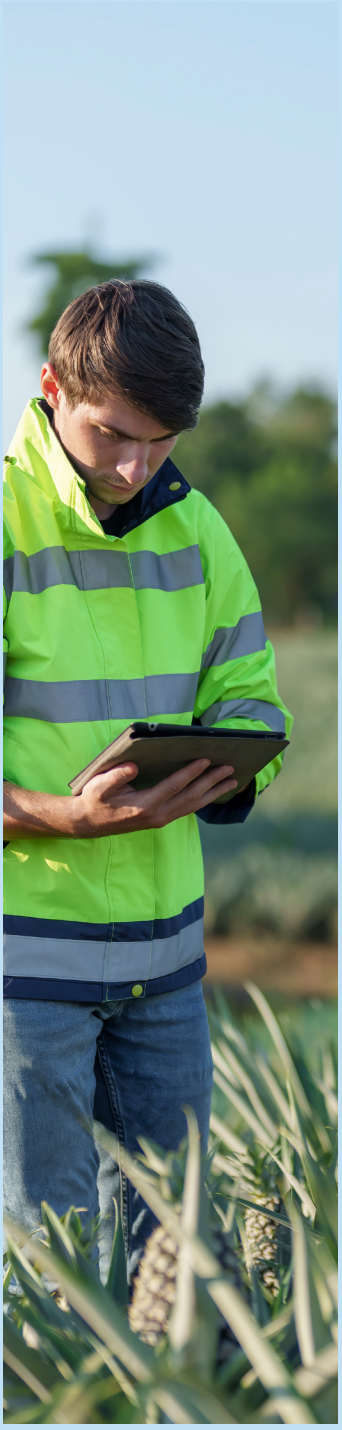
VIEW POINT



INFOSYS OPS+.AI PLATFORM: SIMPLIFYING AGRICULTURE OPERATIONS

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Let us take stock of the state of agriculture globally. An objective assessment mirrors the quantum of water in a glass: either half full or half empty, depending on the hyperlocal situation of the constituent in the agriculture ecosystem.

On the upside, the agriculture sector has made rapid strides in crop yield. For staples such as cereal, the yield of agricultural commodities has registered historical highs.[i] This turnaround was possible due to favorable weather, technological innovations for precision agriculture, and sustainable agricultural practices.

On the downside, a global food crisis is developing with access and supply of food being challenged by local geographical and weather conditions. Conflict in areas of civil strife 'disrupts food production' and supply to marketplaces and consumers. In addition, climate change 'destroys crops and undermines people's ability to feed themselves.'[ii]

Agriculture technology enables farmers and agribusiness enterprises to address challenges such as volatility in commodity prices, pestilence and work overload. Further, AgTech enables proactive risk management, which helps boost farming productivity and ensure food security for the global population expected to reach 10 billion humans by 2050.

Infosys OPS+.AI platform modernizes agriculture

The Infosys Cobalt Agri-Chemical Cloud OPS+.AI platform transforms farming practices by integrating real-time data, predictive analytics, cloud services, and cognitive automation. It embeds artificial intelligence (AI) into day-to-data agriculture operations, thereby improving efficiency, productivity and profitability.

Precision farming and integrated farm management systems leverage accurate data to automate tasks such as sowing, irrigation, weeding, and harvesting. The Infosys Cobalt Agri-Chemical Cloud OPS+.AI platform collates real-time data, including soil nutrient content, moisture level, crop growth rate, wind speed, and ambient temperature, from satellite imagery, IoT devices, sensors, and weather reports. Algorithms interpret diverse types of data to simplify operations: determine the optimal time for sowing and harvesting, identify crop disease or pests and undernourishment in plants and livestock, and create schedules for irrigation, application of fertilizers, and pesticide treatment.

AI-powered dashboards consolidate data, enable real-time monitoring, and provide centralized decision support tools to better manage every stage of the cultivation process and crop lifecycle. Notably, in addition to sharing insights for crop management and yield improvement, AI-powered predictive analytics forecast harvest quantity, and estimate demand for produce and prices in specific markets. Holistic insights enable farmers and agribusinesses to not only optimize resources consumption, but also maximize margins.

Infosys Cobalt Agri-Chemical Cloud OPS+.AI platform provides modular solutions for smart operations:

Connected operations

The pre-configured Infosys Connected Operations application harmonizes enterprise-wide operations by establishing a connective layer between data, machines, processes, and people to facilitate the integration of engineering, operational and information technology. This enables enterprises to automate operations – processing, distillation and delivery. It also helps enterprises leverage smart warehouse management solutions for maximizing equipment utilization at facilities across locations. Significantly, advanced automation optimizes processes, boosts operational efficiency, and mitigates risks.

Asset management

The ready-to-deploy Infosys Asset Performance Management module creates digital twins of equipment to enable predictive maintenance. Case in point: An Infosys AI solution to predict corrosion rate in shell-and-tube heat exchangers enabled an agri-chem manufacturer to extend equipment lifespan by 5-10 years and save US$ 1.5 million in operational expenditure, annually. The solution combined Design of Experiments (DoE) and first principles engineering model for real-time analytics of parameters such as temperature, evaporation and condensation in heat exchangers.

Crop monitoring

Infosys Crop Monitoring and Detection solution drives farm equipment connectivity via sensors, IoT devices, GPS trackers, and telemetric systems. Connected equipment monitor plant growth and trigger early detection as well as targeted treatment of crop diseases. Notably, predictive models integrate data from on-field sensors and imagery to facilitate informed decisions for crop lifecycle management.

Infosys Cobalt Agri-Chemical Cloud OPS+.AI platform enables data-driven farming by focusing on key business imperatives:

Reconcile data heterogeneity

The Infosys platform addresses the heterogeneity of data in agricultural systems across dimensions. Firstly, it factors the differences in spatial and temporal scale as well as construction of agriculture data. For instance, satellite imagery is often captured in two-year intervals at 30-meter resolution, while samples of soil are collected from specific points and extrapolated to the field scale, in a timespan of days. Secondly, it takes into account the diversity of systems in the agriculture commodity value chain. Open and closed feedback loops are required to integrate subsystems – from manufacturing units and processing facilities to farm and commodity marketplaces.

Finally, it transcends analytical models and simulation tools available for specific issues. For instance, Crop Environment Resource Synthesis (CERES) models to simulate crop growth and the DeNitrification-DeComposition (DNDC) models to simulate biogeochemical cycles. Infosys Cobalt Agri-Chemical Cloud OPS+. AI platform offers systems-level modeling capabilities for end-to-end analysis and crop / livestock management.

Ensure interoperability

The Infosys platform establishes a connected agriculture value chain and fosters trust in AgTech by ensuring data interoperability between data formats and enterprise systems. In addition, compliance with data standards promotes interoperability and drives rich functionality including single sign-on. Notably, Infosys Cobalt Agri-Chemical Cloud OPS+.AI platform eliminates technology issues such as vendor lock-in, while addressing requirements across user groups, including farmers.

Seamless data interoperability exponentially enhances the value of the Infosys platform. Moreover, it offers a decision support system for site-specific issues as well as seasonal requirements. For instance, options to optimize the use of equipment and labor during harvesting, or opportunities to maximize land use through off-season farming.

Augment the human experience

Infosys Cobalt Agri-Chemical Cloud OPS+.AI platform drives human-centric operations. It incorporates the user experience as part of the technology portfolio to create a connected agriculture ecosystem and commodity value chain. Persona-based AI / ML solutions address specific needs of stakeholders, which drives technology adoption at digital agri-chem enterprises.

The Infosys Cobalt Agri-Chemical Cloud OPS+.AI platform reimagines operations by providing predictive insights and recommendations for real-time decision making. The platform offers visibility across agriculture subsystems and processes, which facilitates risk mitigation. Significantly, in-built analytical models and simulation tools create a sustainable agriculture ecosystem.

i. https://www.fao.org/worldfoodsituation/csdb

ii. https://www.wfp.org/global-hunger-crisis

About the Author

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Leads sales for Infosys's Chemicals, Agriculture, and Metals & Mining industries. He specializes in helping large corporations with transformation strategies, including **energy transition, responsible AI & automation, and human experience-based digital solutions.**

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