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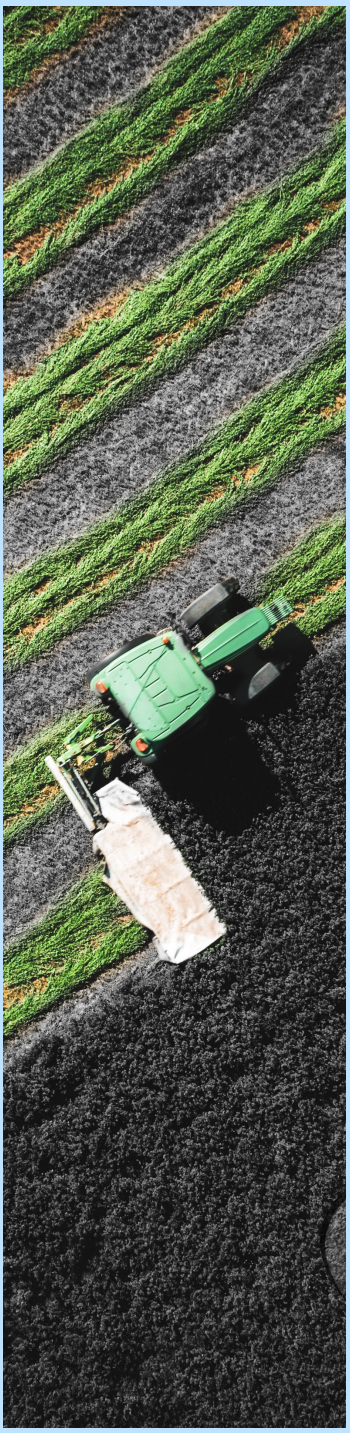

INFOSYS COBALT AGRI-CHEMICAL CLOUD - POWERED BY TOPAZ

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$ 194.52 B IN REVENUE

The agri-chemical industry is set to grow at a CAGR of 10.5% to register US $194.52 billion in revenue by 2032. The industry outlook is optimistic due to the rising demand for a wide range of chemical products in industries such as agriculture, energy, manufacturing, and pharmaceuticals among others, and will continue to register an upward trend due to the application of lightweight material in sustainability initiatives.

On the other hand, the agriculture industry is challenged to keep pace with the growing global population. The combination of shrinking arable land and unpredictable weather patterns due to global warming, further endangers crop health and growth.

Precision farming is changing the agricultural landscape wherein decisions related to crop production are taken based on the data (soil, weather, crop, etc.) to optimize utilization of the available resources for sustainable crop production.

The confluence of digital technologies such as generative artificial intelligence (GenAI), Internet of Things (IoT), remote sensing, computer vision, and cloud platforms offer solutions to shifting dynamics and business priorities:

What to grow and when?

How can sourcing and its value chain be made resilient?

How can the chemical industry contribute to the decarbonization of energy and allied industries?

How can plant utilization be maximized to improve return on capital investments?

How can crop yield be increased without compromising the quality of soil and water?

How can the agricultural value chain minimize greenhouse gas emissions?

How can agri-chemical industries introduce/innovate effective crop protection products and solutions without making any significant impact on the ecosystem?

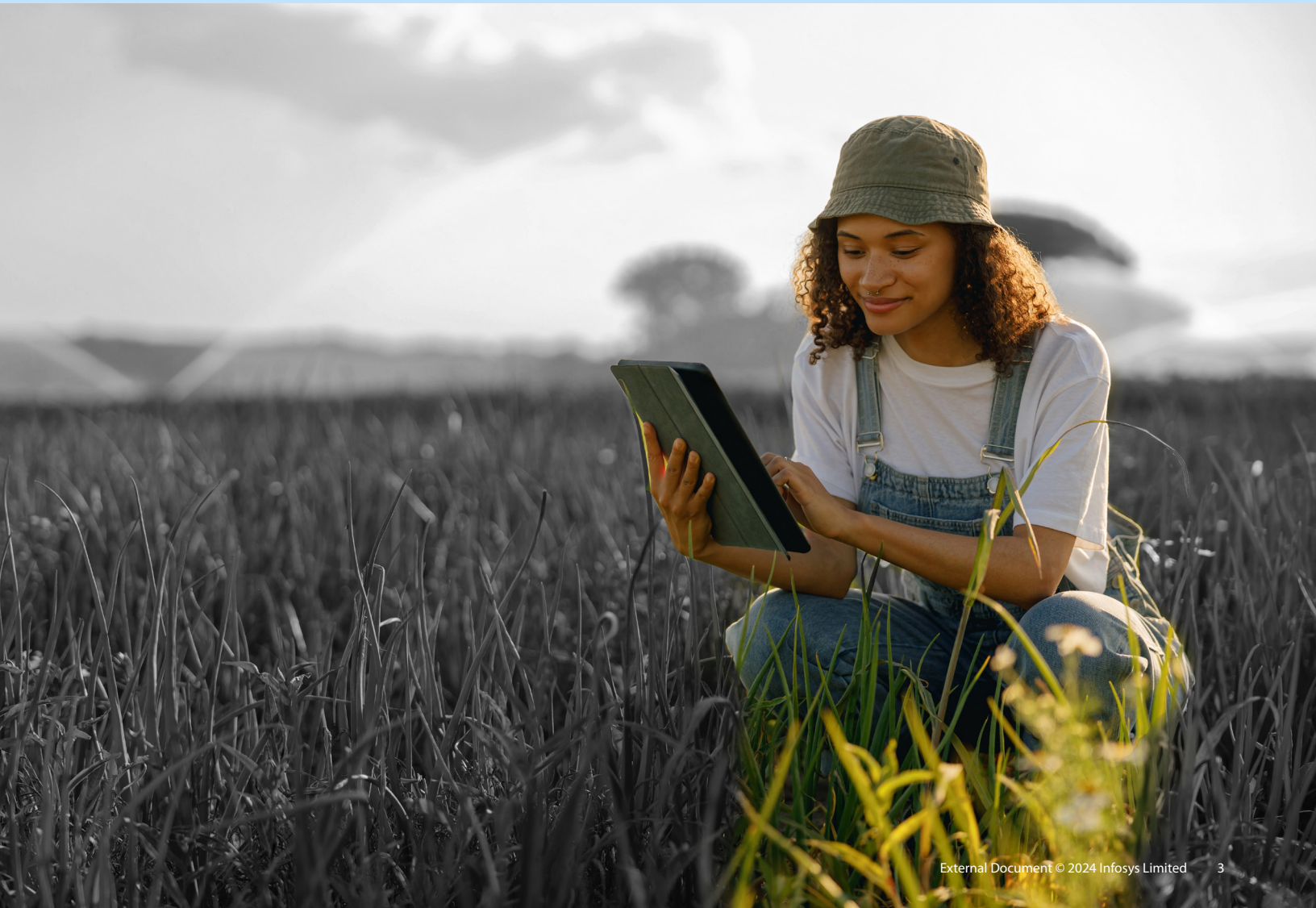
The agri-chemical industry is poised to accelerate its digital transformation journey and can achieve business objectives by capitalizing on technologies like —

IoT and IIoT systems collect real-time data from across the ecosystem. This data can be applied for predictive asset maintenance, process optimization, and ensuring industrial safety.

Big data analytics and ML algorithms identify patterns, which helps optimize processes and predict equipment failure. Analytical tools also accelerate the development of new, sustainable materials and formulations.

Artificial intelligence helps optimize supply chain operations, including demand forecasting, inventory management, and logistics planning. By considering various factors such as historical data, market trends, and external issues, AI algorithms provide accurate demand forecasts, optimize inventory levels, and identify the most efficient transportation routes. AI can help agrochemical companies reduce time to market and R&D spends when it comes to innovating new products/solutions to address crop stresses.

Cloud computing enables access to scalable and flexible resources for data storage, processing, and analysis. Cloud platforms allow chemical enterprises to store and analyze large datasets, collaborate with global partners, and capitalize on advanced modeling and simulation tools.



Infosys Cobalt Agri-Chemical Cloud — Powered by Topaz

Infosys Agri-Chemical Cloud is a set of services, solutions, and platforms, enabling the cloud-first transformation of chemical and agribusiness enterprises. It offers a model office for businesses on the cloud, drives cloud adoption, and maximizes the value of cloud investments.

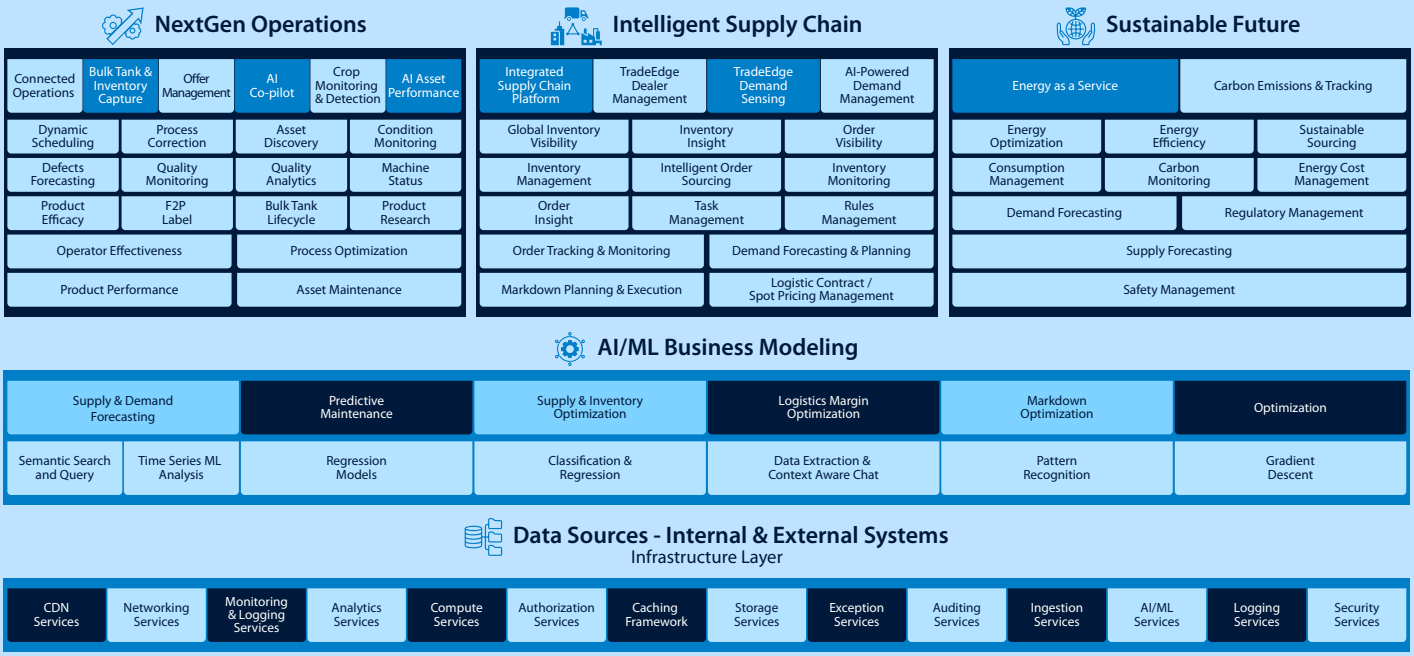
The Infosys Agri-Chemical Cloud

- Improves operational performance and ensures employee safety
- Accelerates design and innovation cycles for materials and crops
- Minimizes waste across the manufacturing value chain
- Enables end-to-end tracking and tracing of materials, while safeguarding IP/proprietary attributes across the process manufacturing supply chain
- Enhances warehouse management
- Ensures farm-to-fork traceability of farm produce for compliance with regulations
- Reduces CO_2 emissions across the process chain
- Drives production planning and inventory optimization
- Promotes good agricultural practices for sustainable production
- Provides a marketplace for the stakeholders to sell their products/services
- Enables realistic procurement plans and processes to optimize costing of end products

Scalable systems and the cognitive backbone of the Infosys industry cloud facilitate seamless onboarding of cloud providers, open source components, off-the-shelf third-party products, and data management tools. The platform is CSP-agnostic and supports adoption of new use cases, service domains, and advanced features for intelligent supply chain management, predictive plant operations, and sustainable business growth.

Infosys Agri-Chemical Industry Cloud Reference Architecture

Model Office of Agri-Chemical Industry on Cloud



The Infosys industry cloud combines advanced technologies to accelerate business outcomes. It automates processes and provides actionable insights to manage tasks with minimal human intervention. APIs and reusable script templates allow the re-platforming of existing legacy workloads on the preferred cloud platform. It breaks down monolithic applications into microservices and ready-to-consume Terraform scripts to enable Infrastructure as Code (IaC) and automation of tasks.

Technology components of Infosys Agri-Chemical Cloud solutions include file storage, Amazon Aurora, Amazon Redshift, FSx, and S3 for datastores, web app, REST APIs for application services, WAF, data encryption for IAM, Amazon QuickSight, Amazon SageMaker for ML models, time series ML analysis, classification and regression, and pattern recognition. The figure above depicts the different components of the solution which have been covered in subsequent sections of the document.

Next-gen Operations

Infosys cloud solutions accelerate the digital journey for chemicals, materials, and agribusiness enterprises by enabling smart, connected operations. It transforms business functions through AI, mobility, and phygital experiences. Infosys Cobalt Agri-Chemical Cloud — Powered by Topaz — provides accelerators to digitize plant operations across R&D operations, product lifecycle planning, design, costing, manufacturing, and quality control. It also provides accelerators for plant automation, equipment monitoring and maintenance, and process optimization. Business personas in a chemical enterprise who leverage the cloud-native solutions include capacity planners and maintenance managers. Infosys cloud solutions include:

1 Connected Operations

Infosys offers an AI-driven ecosystem for sustainable operations. The solution connects constituents across the agronomic value chain to collect real-time data. In-built analytical models and simulation tools consume this data for processing real-time recommendations and predictive insights to address plant-specific challenges and mitigate risks. Notably, a robust data-driven landscape ensures transparency and accountability for regulatory reporting and compliance with food safety and environmental standards.

MES-driven Plant Automation

Our automation solutions for chemical and agriculture businesses offer process manufacturing-specific features of SCADA / process control systems implemented at distillation, processing, and waste treatment locations. This improves operations, reduces product and inventory spillage, and optimizes plant capacity utilization.

Equipment Monitoring and Predictive Maintenance

IoT and 5G enabled monitoring and real-time data analytics based on digital twins of equipment, such as heat exchangers, evaporators, reactors, storage vessels, distillation columns, and extraction columns, help enterprises predict equipment failure, proactively plan maintenance schedules, and reduce equipment downtime.

Connected Warehouse and Connected Grain Elevators

Smart warehouse management and connected facilities, including chemical storage buildings, stockrooms, cold storages, and grain elevators for hazardous chemicals as well as non-hazardous products and edible ingredients, optimize inventory management and enhance safety.

2 Infosys Agri Data Platform

The Infosys Agri Data Platform creates a unified data estate for secure consumption, analysis, and dissemination of data across the value chain. Cloud infrastructure provides on-demand scalability and enables data security and privacy, while facilitating seamless data collection and data aggregation. Digital brain, knowledge graphs, and machine learning support intelligent data management to harvest real-time insights.

The platform incorporates AI services for automation and advanced data analysis. The poly-cloud offers flexibility and scalability, and the Infosys experience configurator delivers bespoke user experiences for diverse stakeholders. In addition, it supports Web 3.0 and blockchain for data security and transparency.

By bridging data gaps, the Infosys Agri Data Platform fosters collaboration, optimizes processes, and unlocks growth opportunities for the food and agriculture industry.

3 Bulk Tank and Inventory Management

Infosys Agri-Chemical Cloud solutions leverage the Internet of Things (IoT) to streamline bulk storage of crop protection chemicals (herbicides, insecticides, fungicides, growth regulators, fertilizers, etc.). It addresses the constraints of conventional bulk storage management: physical tank inspection (time-consuming and inaccurate), manual record-keeping (error-prone and effort-intensive), and limited data visibility (inventory level, temperature, and usage). The replacement of manual processes with a real-time data system mitigates risks of spoilage, waste, and safety hazards. Further, streamlined processes improve inventory control and ensure compliance with regulations, including the Environmental Protection Agency (EPA) standards, for storage and usage of chemicals.

The integrated solution automatically collects and transmits real-time data to a centralized platform for remote monitoring and analysis. The solution integrates with input providers and farm management software for seamless tracking of chemicals across the supply chain. Automated data collection and remote monitoring ensure accurate record-keeping. In addition, it eliminates stockouts and facilitates informed decision-making.

4 Offer Management

The Infosys cloud-based solution mitigates destocking, promotes collaboration, boosts sales, and optimizes inventory management. It supports smart contracts between farmers, food manufacturers, traders, and input providers by integrating data sources, including CRM, ERP, and EDI systems. Further, the solution accelerates B2B2C sales cycles and supports up-selling and cross-selling of products by empowering teams to leverage data-driven insights to make targeted offers.

5 AI Research Co-Pilot

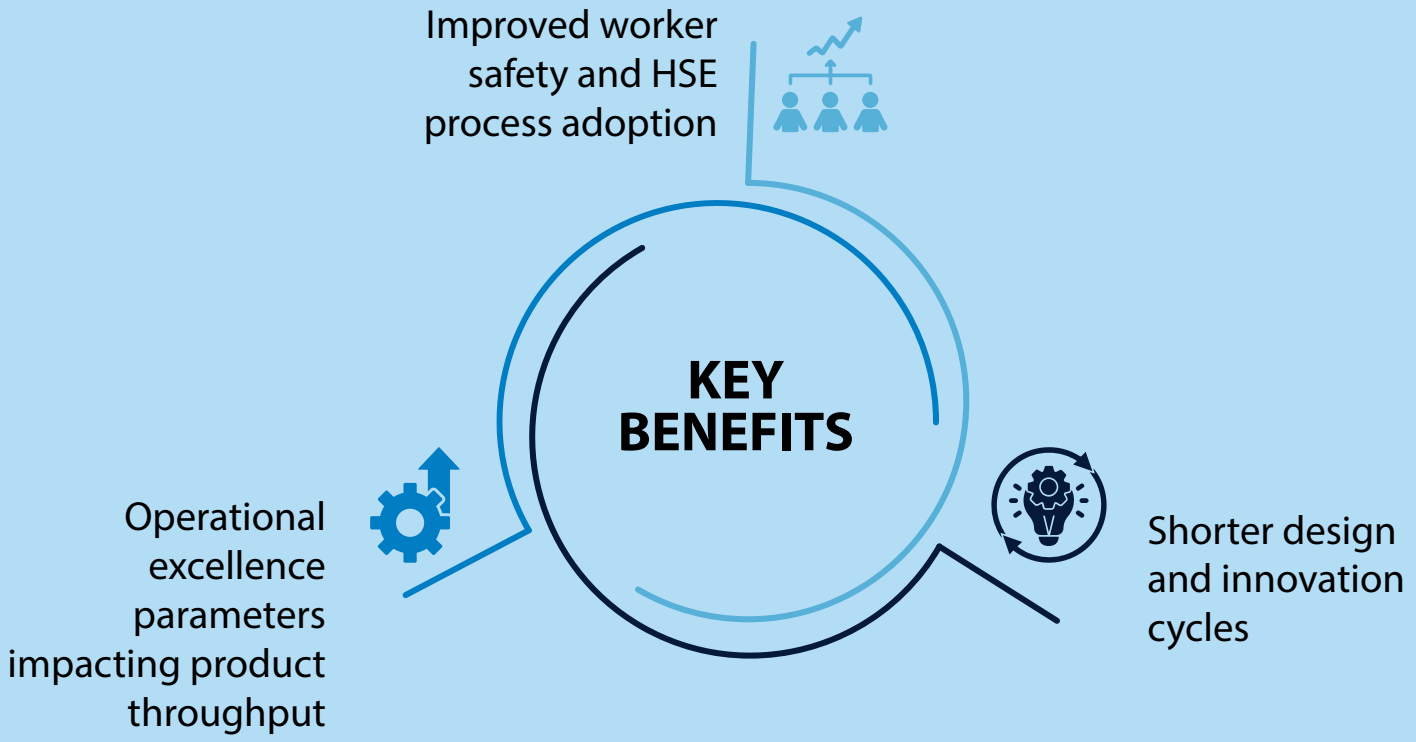
The solution enables researchers to extract context-based information from voluminous R&D documents, publications, and journals. It also facilitates seamless collaboration between chemists undertaking experiments to evaluate new products and discover new formulations.

6 Crop Monitoring and Detection

Infosys implements remote sensing solutions and applies predictive analysis to monitor plant growth and detect crop stresses. Early detection of pests and diseases prevents pest attacks/disease and pest infestations to ensure optimum yield. Variable rate application of fertilizers and crop protection products optimize the use of resources, eliminates waste, and reduces the environmental impact. In addition, the yield prediction tools enhance procurement, storage, distribution, and marketing strategies.

7 AI-Powered Asset Management

The Infosys ML-based corrosion estimator solution predicts corrosion rate in shell-and-tube heat exchangers at chemical plants. The solution uses a hybrid modeling approach combining Design of Experiments (DoE) and first principles engineering model. It extends the life of heat exchangers by 5-10 years and saves ~ US $1.5 million in operational expenditure annually. Moreover, it ensures industrial safety and HSE process excellence.



Intelligent Supply Chain

Intelligent Supply Chain solutions focus on enabling a smart and increasingly resilient Live Supply Chain for chemicals, materials, and agribiz manufacturers by **extracting insights from critical supply chain touchpoints and helping reconfigure global supply chains through the adoption of agile cloud solutions**. From sourcing innovations to inventory track and trace to logistics and dealer management processes, the Intelligent Supply Chain provides accelerators to digitize the entire process manufacturing supply chain to create agile, resilient, and autonomous "Industry 5.0 Digital Supply Chains".

1 Integrated Supply Chain Platform

Infosys Integrated Supply Chain Platform transforms isolated, analog supply chains into digital ecosystems. It empowers enterprises with AI-driven cognitive and thinking solutions to optimize supply chains, enhance decision-making, and drive business growth. It leverages advanced technologies (AI/ML, cloud computing, etc.) and data-driven insights to drive the supply chain's advancement, discover avenues for enhancement, and act as an accelerator to significantly reduce time-to-market while simultaneously exploring new market opportunities. The Infosys platform ensures multi-tier inventory visibility, optimizes planning and execution, synchronizes operations, and drives proactive decision-making across demand and fulfillment processes.

2 AI-Powered Demand Management

Infosys' AI-driven analytical solution manages inventory across categories – finished goods, raw materials, work in progress, and maintenance parts as well as consumables for assets at manufacturing units. The digital solution ensures the smooth flow of agricultural inventory to fulfill dynamic consumer demand. The forecasting tools predict region-specific demand, which enhances inventory and production planning, and distribution management. It reduces inventory holding cost by 5-10%, manufacturing cost by 3-10%, and transportation and operational expense by 1-5%. Further, it streamlines stocktaking and reconciliation at warehouses.

3 TradeEdge Dealer Management

Infosys TradeEdge Intelligent Distributor Management System, an intuitive, highly configurable order management and fulfillment platform, offers a unified interface for managing products, pricing, promotions, and retailers. It supports order-to-cash and procure-to-receive processes and inventory management. A built-in intelligent reporting module simplifies sales, inventory, and distributor monitoring.

4 TradeEdge Demand Sensing

Infosys TradeEdge Demand Sensing solution provides actionable insights by aggregating real-time product, sales, and inventory data from multiple channels. It provides granular visibility into global sales and inventory, and predictive insights for proactive inventory management strategies. It improves forecasting accuracy by 20% and optimizes delivery plans to drive at least 2% sales growth. Notably, it boosts operational efficiency by up to 100%, while eliminating out-of-stock issues.

5 Infosys Intelligent Sourcing

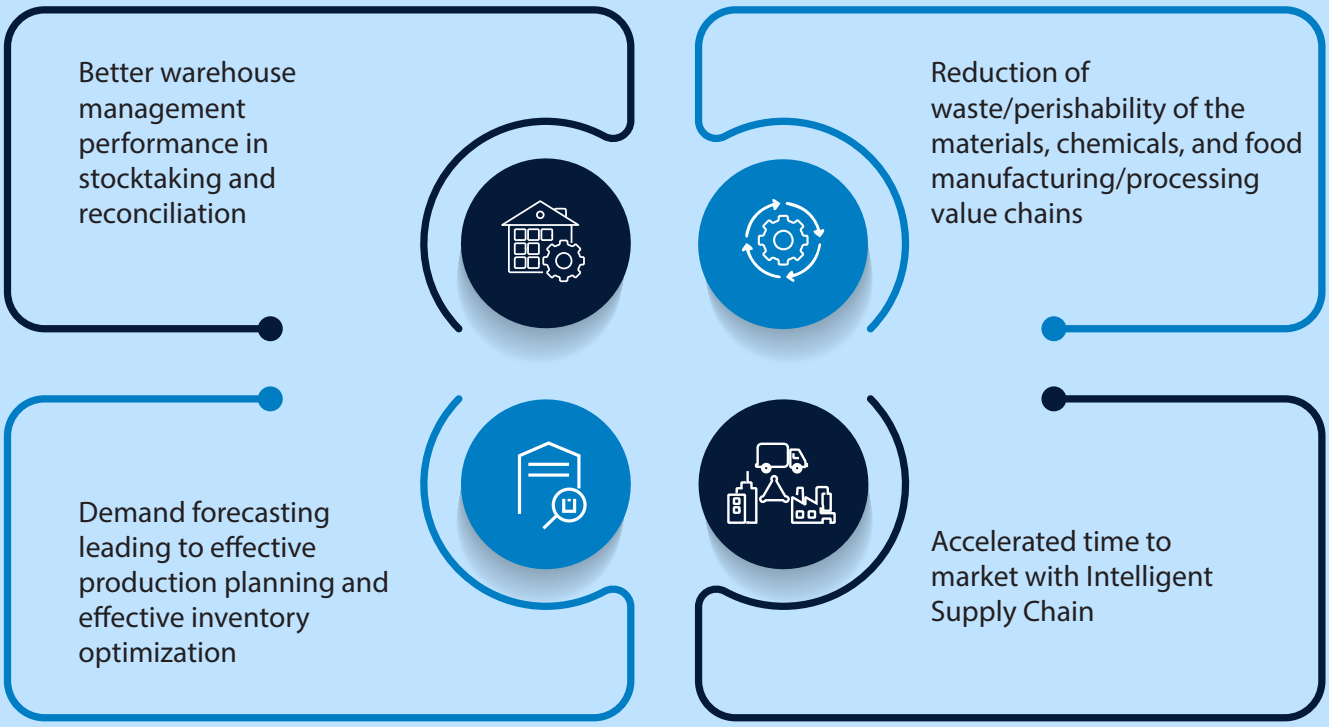
The Infosys Intelligent Sourcing (IIS) is a recommendation engine that leverages micro-services, advanced mathematical algorithms, and big data capabilities to survey the different costs associated with fulfillment of an order and recommends the "BEST POINT" of fulfillment at the lowest cost-to-serve.

Infosys Intelligent Sourcing solution takes multiple inputs like markdown price, inventory, capacity, consumption rate, shipping cost, labor cost, and many more to optimize sourcing in a dynamic way to fulfill an e-commerce order, improving the overall margins.

6 Chemicals Catalyst for Supply Chain

Infosys pre-configured solutions are designed to address industry whitespaces in order-to-cash and procurement functions in S/4 HANA platform that accelerate transformation programs roll out and adoption by deploying enhanced intelligence solutions.

KEY BENEFITS



Sustainable Future

One of the biggest challenges facing the chemical industry is reducing its environmental impact. Chemical production processes generate large amounts of waste and consume significant amounts of energy, contributing to carbon emissions. Ensuring the safety of workers and local communities is another area of concern. Infosys has developed several solutions to help customers become more efficient in their use of time, energy, money, and human and natural resources. These solutions also focus on emissions, water, biodiversity, waste, climate, and social impact.

1 Energy as a Service

It provides clean, cost-effective, optimized, and reliable energy while offering the capability to monitor and manage the consumption as our clients build smart and energy efficient infrastructure.

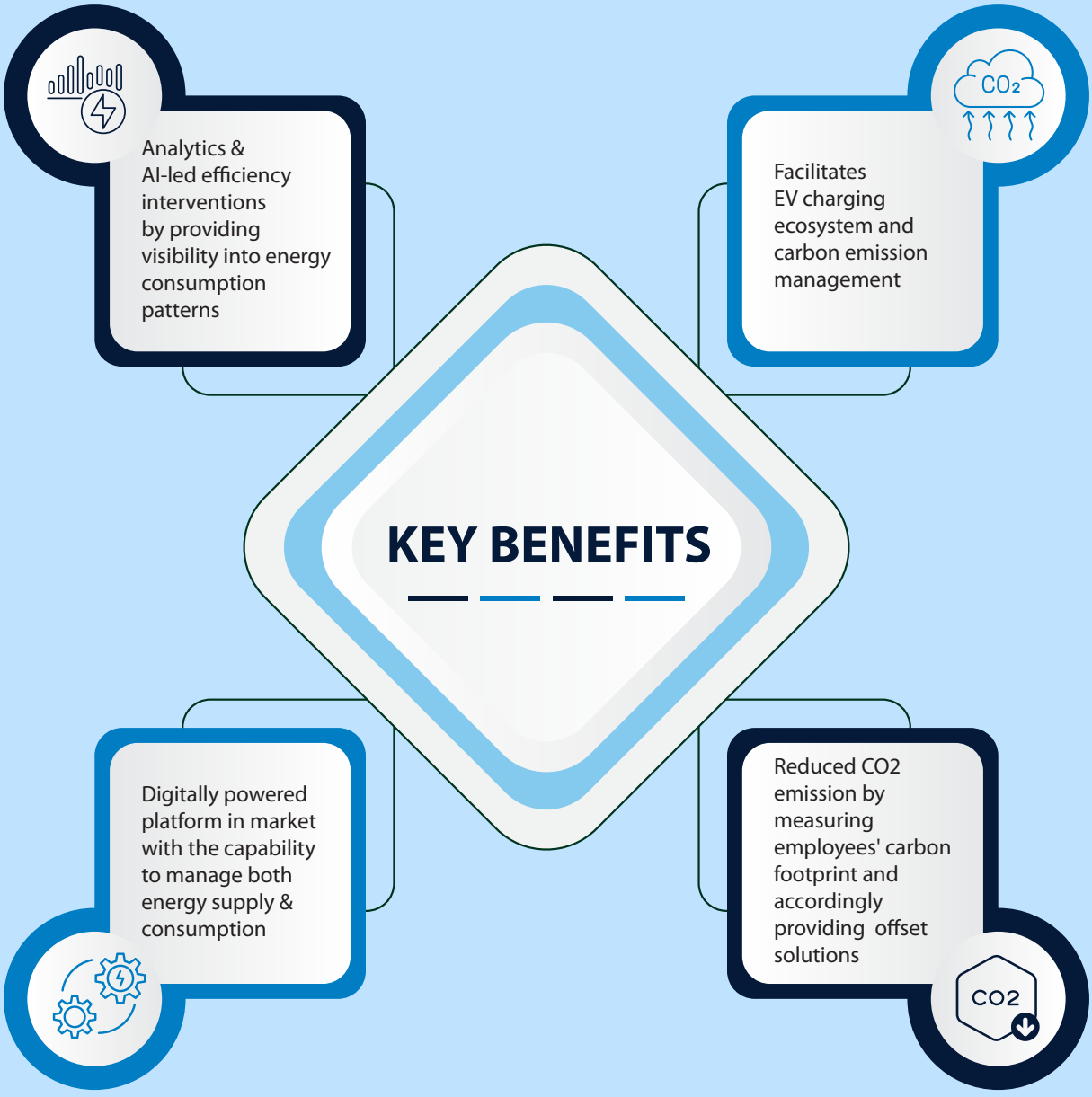
This solution helps companies achieve predictability in energy cost, higher efficiency, and increased asset life across the energy value chain.

2 Carbon Emission and Tracking

Infosys Footprint Tracker is a one-stop application that captures carbon footprint and generates a scorecard for employees. It provides interventions/suggestions that can help employees/users to reduce and optimize their carbon footprint in individual categories while providing them a sense of environmental consciousness.

3 Sustainability Accounting

Infosys Sustainability Accounting solution ensures efficient reporting and audit compliance for ISCC Plus certifications, boosting stakeholder trust and brand reputation. This solution automates tracking and reconciliation of sustainability characteristics of eco-TPU and demonstrate compliance with ISCC Plus certification scheme using a consistent and standardized process across the entire value chain. The solution enables organizations to automate ISCC certification by tracking critical control points of material movement and audit reporting process.



Infosys Cobalt Agri-Chemical Cloud powered by Topaz offers future-proof solutions for seamless global operations. Our cloud-first, AI-first approach creates a sustainable ecosystem for agriculture and food industry.

For more information, contact askus@infosys.com

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