



Whitepaper:

DIGITAL TRANSFORMATION IN AGRICULTURE

Digital technology has permeated almost all walks of life, and agriculture is no exception. Digital technologies and analytics are transforming agriculture like never before, making farm field operations and the entire food and beverage supply chain more insight-driven, efficient, and literally “fruitful.”

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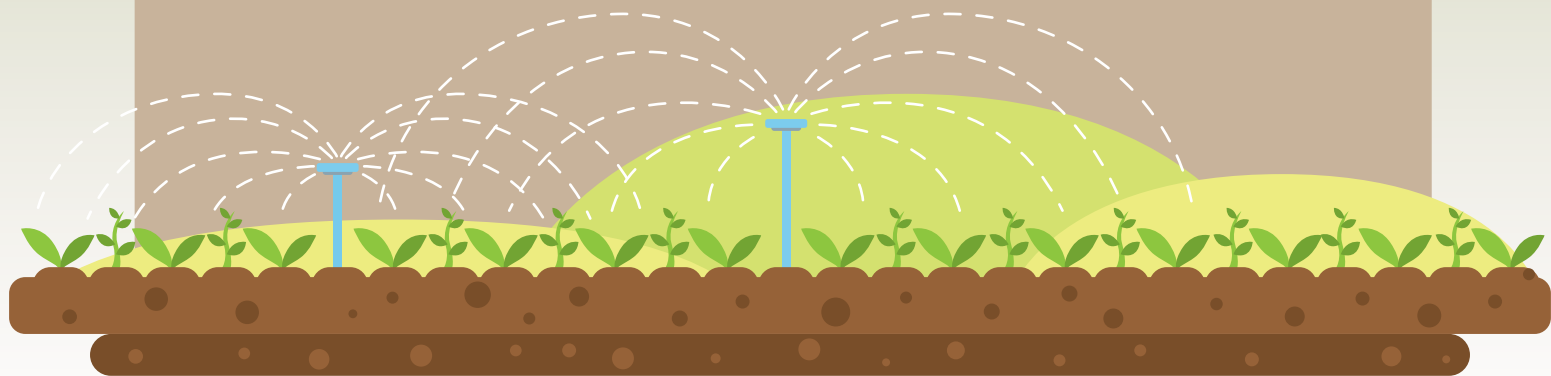
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In a Commonwealth Bank Agri Insights survey conducted in October 2016, **70%** of farmers agreed implementing the latest technology would bring significant value to their operations. Going by the estimates, application of digital technology in agriculture might increase overall profitability by **\$55 to \$110 per acre.**

Farming is an inherently uncertain business, owing to many ambiguous variables. Growing crops is a complex task as key decisions on when to plant, when to irrigate, when to fertilize, and when to harvest, are all based more-or-less on gut instinct and factors such as rainfall, insect attacks and so on, which are entirely outside the control of anyone.



How to improve yield?

Many farms across the world, small as well as large, still practice traditional farming methods. The application of digital technology can deliver reliable and accurate insights, to enable farmers to take informed decisions, reduce uncertainty, and thereby minimise risks.

The key stakeholders of the food and agriculture industry - government, academic institutions, and research organizations, generate tons of data related to seeds that deliver maximum yield, scientific understanding of pest lifecycles, latest cropping techniques, new micro-fertilizers, foodborne outbreaks, molecular epidemiology, and more. If digital technology is implemented in the field of agriculture, these relevant information can be passed on to farmers to increase yield.

For instance, digital livestock identification and monitoring systems offer near real-time information about the geolocation of the livestock, biometric information of the livestock, such as weight changes, activity levels, blood composition, heart rate, milk characteristics, and so on. If these information are fed into a business intelligence platform, churned in an analytic engine, and delivered to decision makers, facilitate greater control over the process.

Digital technologies such as the Internet of Things, big data analytics, and visualization capabilities can **boost agriculture** in a big way. A cloud-based analytics engine allows field agents to offer recommendations to farmers on an individual basis about how to manage nutrition for crops, the right quantity of fertilizer application, irrigation best practices, seed quality, and to address specific crop issues.

A mobile application, on the field agent's smartphone or the farmer's tablet, pulls in information from the cloud, to notify effective protection against severe weather or pests, apply the right fertilizers, do the right cropping methods, and more. Farmers may collect objective information about the status of their soil, water, crops, and animals, and apply these to take the right decision and achieve an optimal level of efficiency.

For example, Connected Crop Solution app, connects field agents, agro-input company, and farmers. The app facilitates dissemination of information to improve agent productivity, increase crop yield, and boost produce sales. The solution integrates and processes data from multiple sources into a single hub, delivers it to end-users via smartphone app.

Increased Thrust on Food Safety

A major reason for breach of food safety regulations is contamination of the foodstuff. Regulations and enforcement varies widely between nations. While first world countries may have stringent and robust compliance, third world countries are notorious for lax compliance. All these pose a challenge in a global trade environment, where import of foodstuffs from other countries is common.

Technology offers an effective solution to enforce safety standards across geographies. A collaborative agricultural ecosystem connecting all stakeholders along the value chain improves safety, creates a common knowledge base via open standard data platforms and data sharing mechanisms, help farmers identify risks and pre-empting issues before it causes damage. Methods such as pathogen detection, interventions for microbial reduction, and electronic traceability pre-empt contamination.

Centralized cloud-based data repositories allow efficient management, real time update and seamless access to the most relevant information. The application of digital technologies through all stages of the food processing industry, including production, processing, packing, transportation, distribution, and storage make it easy to:



Track the product in real time, improve traceability, issue timely alerts, share production information to stakeholders throughout the value chain, and prompt recalls of contaminated or expired foods.



Pin point the source of origin, the level of compliance and check the route each individual item takes to reach the end customer, enabling proactive monitoring for expired, spoiled, or tainted foods.

Digital technology furthers interoperability in the food and beverage industry.

Hardware Becomes More Dynamic

In the quest of the unlimited potential digital software can do to transform agriculture, most people overlook the potential of the hardware. The application of digital technology to hardware automates many processes and spurs innovation in agricultural practices.

Hardware such as combine harvesters, forage harvesters and tractors play a key role in agricultural production and in boosting productivity. It facilitates implementation of innovative practices such as variable-rate spraying, which yield to better crop output.

Automated systems unlock new possibilities, further increasing yield. For instance, camera-operated automatic optimized trailer filling system on the forage harvester improves efficiency and reduces wastage. Automated sequence management technology enables the machinery to perform synchronized operations, as a cog in the system, boosting efficiency and productivity to a great extent. Today's machines pack in overarching electronic vehicle architecture, driver information systems and data exchange.

Internet of Things Set to Shake Things Up Even Further

Agriculture is tipped to be "the first big industrial IoT market," with the technology facilitating revolutionary changes in farm equipment, soil, waterways, and livestock management.

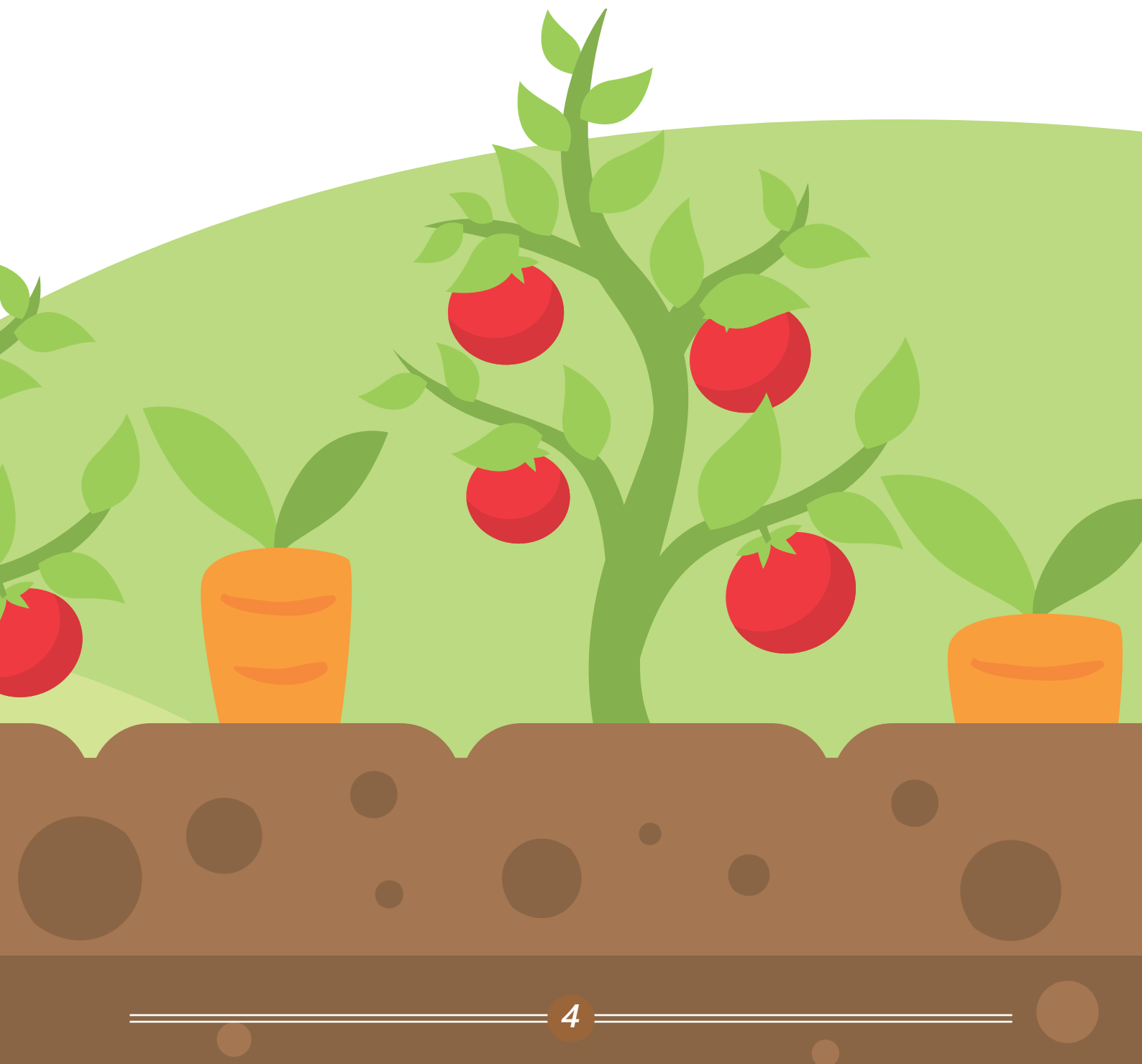
With IoT, harvesting "data" becomes just as important as harvesting the produce. When IoT data is subject to big data analytics, farmers gain valuable insight to make data-based operational decisions, and thereby optimize yield with reduced expenses.

The application of sophisticated sensors, internet-enabled devices, software applications, and cloud data storage facilities capture vast amount of data, of various hues, to be put to much beneficial use in a variety of ways, than what is being done today. For instance, insights from sensors attached to forage harvester, tractor, and other agricultural equipment allow linking harvests to the purchase capacity of crops, reduce waste or unsold inventory, offer prompt supply of replacement parts to vital machinery, and more.

Innovation is rife in developing solutions based on predictive analysis, to gather the most relevant insight from tons of data, and offer instantaneous and actionable insights to the key stakeholders. For example, smart cameras above and below the water in salmon farms provide accurate information on water's oxygen levels, temperature, and current. Subjecting the generated data to analytics enable identifying the optimum time to feed the salmon and release food accordingly. The intervention optimizes salmon's growth patterns, thereby increasing revenue and reducing food wastage and expenses.

Successful big data harvesting nevertheless requires two basic pre-requisites: high-performance communication architecture which makes available a wide range of data anytime, anywhere, in unlimited quantities, and connectivity at the farm site. Another two key assumptions are the establishment of data standards and interoperability of devices, to ensure seamless flow of data. It requires a tech partner competent in the technology to deliver cutting edge solutions that benefit farmers and other industry stakeholders.

As the adage goes, "Knowledge is power." There is an ever-increasing demand for enabling technologies that address the key challenges in the most cost-effective way possible, and what has been achieved now is just the tip of the proverbial iceberg, compared to what lies ahead.



About Suyati



Suyati is a fast-growing, digital transformation solutions company that helps you rebuild your customer experience for the digital consumer. We collaborate with businesses to strategize and implement impactful digital initiatives that position our clients ahead of the competition. We focus on delivering digital transformation solutions that support your various engagement strategies. With our niche and rich expertise in a wide range of technologies and services- CMS, CRM, e-commerce, Cloud, IoT, Data Analytics, and Product Engineering, we help companies leverage their best on web/cloud/mobile platforms.

We enable you to create insights-driven customer engagement across all touch points to build a unified marketing approach. Our custom technology solutions have been deployed successfully in companies across the globe, especially in the US, Europe and Australia.



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