Navigating the digital landscape in the agri-food sector

PRESENTED BY: Ines & Eric Batterton of



Natural & Sustainable Kitchen Gavdens

Chances & Strategies to Grow & Expand your Business Using Modern Technology



INTRODUCTION

Eric & Ines Batterton Owners & Founders of My Nordic Garden



Natural & Sustainable Kitchen Gardens

Kitchen Gardens
Raised Beds
Therapeutic Horticulture
Herbalism

Consultations/Coaching Design Installations Planting Plans

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UN. **TO KITCHEN** anneg Your gardening planner to grow an abundant kitchen garden for your family. S & ERIC BATTERTON

1	INTRODUCTION TO DIGITAL TRANSFORMATION IN AGRI-FOOD
2	BUILDING A DIGTAL PRESENCE
3	E-COMMERCE & ONLINE SALES
4	DIGITAL MARKETING STRATEGIES
5	DATA ANALYTICS & INSIGHTS
6	MOBILE TECHNOLOGY & APPS
7	INTERNET OF THINGS (IOT) IN AGRICULTURE
8	ONLINE NETWORKING & COLLABORATION
9	CYBERSECURITY & DATE PRIVACY
10	FUTURE TRENDS & ADAPTATION STRATEGIES

MODULES



Introduction to Digital Transformation in Agri-Food

- Definition
- Key Components
- Significance
- Solutions
- Examples: Canada & Australia
- Exercises





Queensland Alliance for Agriculture & Food Innovation (QAAFI)

Soil Food Web



Diagram based on: USDA Soil Biology Primer

Interconnectedness

Diversity Resilience Information Flow Collaboration Feedback Loops Adaptability to Change Education & Awareness

Module 1: Introduction to Digital Transformation in Agri-Food

WWW World Wide Web



Dource: Spendmatters.com

1) Digital Transformation



Definition

Digital Transformation refers to the integration of digital technology in all areas of a business, fundamentally changing how it operates and delivers value to customers

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- **Cultural Shift:** invest in digital literacy
- Customer-Centric Approach: focusing



Key Components

• Technological Integration: incorporation technologies such as IoT, AI & data analytics

on needs & preferences of customers



3) Digital transformation offers solutions to these challenges:





Enhanced Efficiency through Automation & Data Driven Decision Making

Improved Supply Chain Management with Realtime Tracking & Analytics

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Greater Access to Market Information & Consumer Trends

Canada

Canada is a major agri-food producer and exporter, contributing **7% to its GDP** and ranking highly among OECD countries. It **exports about 70% of its major crop**s and nearly **50% of its beef and cattle**, positioning itself to play a significant role in the global food supply.



Increasing food production in Canada faces **challenges** due to **negative environmental impacts**. The agriculture sector contributes 10% of the country's GHG emissions, primarily from nitrous oxide (N2O) linked to **fertilizer** use and **methane** (CH4) from cattle. **Canada aims for net zero emissions by 2050**, with agriculture playing a **key role** in this climate change mitigation strategy.





Dual Challenge:

+ increasing food production to meet global demand + significantly reducing its climate footprint.

Digital agriculture technologies (DATs) are key in enhancing precision agriculture + farming more efficient, sustainable, and data-driven + tools: big data analytics, cloud computing, IoT, autonomous systems > collect and process data to improve resource use and productivity.

Precision Agriculture (PA) is a management strategy that collects and analyzes various plant and animal data to aid decision-making aligned with natural field variability. Data-rich insights from Decision-Aid Tools are crucial for addressing global challenges like climate change and resource scarcity, leading to resilient food systems.

As the Fourth Industrial Revolution progresses, these technologies are transforming agriculture, promoting efficient and sustainable farming while revealing existing inequalities and unsustainable practices within the food system.

Solution:







By the year 2025, it is projected that 75% of Canadian farms will implement at least one digital farming technology to enhance their efficiency.

The integration of Digital Agricultural Technologies (DATs) into Precision Agriculture (PA) is a key aspect of Agriculture 4.0 (smart agriculture). This shift enhances **data collection** and **processing capabilities** beyond traditional methods, supporting applications from **mobile tools** for monitoring to advanced systems using **satellites** and **GPS** for tasks like weather prediction and field mapping.

High-level tools, such as **Farm Management Information Systems (FMIS)**, offer integrated platforms for managing various agricultural tasks, enabling farmers to make informed decisions more effectively. However, successful adoption requires careful consideration of social and institutional contexts for equitable access.

Australia

Agriculture plays a significant role in Australia's economy, covering half of the country's land area. It accounts for 85% of our domestic food supply and contributes 15% to its export earnings. The sector directly employs 300,000 individuals in production and supports a total of 1.6 million people across the entire food and fiber supply chain.



The worldwide challenge lies in **boosting food production** to support a **growing population without compromising our soil and water resources**. The global objective is to **enhance the efficiency of food** and **fiber production** by **optimizing the use of water, nutrients, and physical inputs** throughout the production process. This challenge is further complicated by **rising consumer demands** concerning the origin, quality, and environmental impact of their food and fiber products.





Challenges:

+ increasing food production to meet global demand + significantly reducing its climate footprint + agricultural practices are fragmented (all digital solutions not integrated)

The capacity to unify these elements into a cohesive framework will revolutionize agricultural production and associated supply chains. The advent of digital agriculture is expected to significantly impact Australia's economy:

- projecting a 25% increase in the gross value of production throughout the Australian agricultural sector, certain areas like the grains industry potentially seeing a rise of up to 51%
- substantial social and economic advantages of digital agriculture technologies (e.g. enhancing provenance, traceability, customer feedback within the supply chains)
- these advancements will allow growers to differentiate their products through innovative marketing opportunities that highlight the origin, quality, and sustainability of their farming practices



Australian Government Department of Agriculture, **Fisheries and Forestry**

Digital Foundations of Agriculture **Strategies** (Government of Australia)

REALISING THE POTENTIAL OF DIGITAL TECHNOLOGIES

Digital technologies such as artificial intelligence, robotics and blockchain are transforming agriculture and the food system.



Farm machinery automation allows fine-tuning of inputs and traffic control, while reducing demand for manual labour.

Edge-of-field monitoring documents the quality of runoff water on farms, reducing costs related to sampling systems and allowing improvements to be made.





Increased functionality of satellites allows for improved remote monitoring of agriculture, with measurement of field areas, identification of crop types, groundcover percentage, geo-location of landscape features, and assessment of environmental impacts.

Traceability technologies and digital logistics services offer the potential to streamline agrifood supply chains, reduce regulatory burdens and provide trusted information for consumers, producers and other supply chain participants.





Soil carbon sequestration may improve farm productivity and resilience, and create new market and revenue opportunities for land managers via decarbonisation pathways.



Drone farming provides the opportunity for more frequent, cost-effective remote monitoring of large areas and enables remote interventions to boost yield and reduce losses from pests.



Smart-livestock monitoring allows for the early detection of illnesses and facilitates the provision of optimal feed and medicine mixes for each animal through connected-body-sensor data and movement tracking. Furthermore, remote sensing telemetry for stock water monitoring has been a major change for the pastoral industry.



THE SIZE OF THE OPPORTUNITY



In mid 2021, agritech products and services were estimated to be worth \$500 billion globally. This is expected to increase to

\$730 billion

by the end of 2024 [AgThentic 2021]

Digital technologies alone hold the potential to increase the gross value of production in Australia by over



\$20 billion

per year, an increase of 25% [Australian Farm Institute 2017]



For Australia, digital innovation has the potential to deliver

\$315 billion

in gross economic value over the next decade, making it a critical ingredient in the nation's ongoing economic success [CSIRO Data61 2018]



Across the world, agrifood tech startups raised \$26.1 billion in 2020. This is expected to increase to more than \$30 billion as new deals come to light. This would represent a 34.5% increase from 2019 (AgFunder 2021)

Blockchain-enabled traceability could reduce food losses by up to



30 million tons

annually, if it was used to monitor supply chain information in half of the world's supply chains (World Bank Group 2021)



Over the next 10 years, one in three new jobs in the agriculture, fisheries and forestry industry will be technology related (KPMG & Skills Impact 2019)

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4) In Conclusion

Digital Transformation is not just a trend, it is a **NECESSITY** for the agri-food sector to thrive in a rapidly changing environment.



By integrating digital tools, advanced analytics & innovative farming techniques, stakeholders can enhance efficiency, reduce waste, & improve the quality & safety of food.



5) Active Engagement Exercises

Reflect on a recent technological change you have experienced in your professional life. How did it impact your work?

Find potential digital solutions for a specific challenge in the agri-food sector.

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Analyzing

What are your initial thoughts on digital transformation in your area of work? Can you identify any current challenges?

Reflecting

Researching

RESOURCES

Forbes Magazine on Global landscape of digital agriculture www.forbes.com/councils/forbesbusinesscouncil/2023/11/22/navigating-the-global-landscape-of-digital-agriculture/

Simpson Center Canada www.simpsoncentre.ca/wp-content/uploads/2024/11/Report-1_ABDIAG_Cartpgraphy.pdf

Farmonaut on Agriculture in Canada farmonaut.com/canada/revolutionizing-canadian-agriculture-how-digital-farming-and-leadership-will-shape-farm-growth-in-the-2020s/

Strategies

Edited by Dr. Rohul S. Mor

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University of Sydney www.sydney.edu.au/agriculture/our-research/digital-agriculture.html

Digital Foundations of Agriculture Strategies (Government of Australia) www.agriculture.gov.au/sites/default/files/documents/digital-foundations-agriculture-strategy.pdf



THANK NUMBER OF STREET STREET

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MADE POSSIBLE BY: Eastern Ontario Agri-Food Network



