Advancing Humanity

Supply Chain Technology

Application in Agri-Food Supply Chain

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Dipresentasikan pada Webinar Nasional 2022: Smart Supply Chain Management

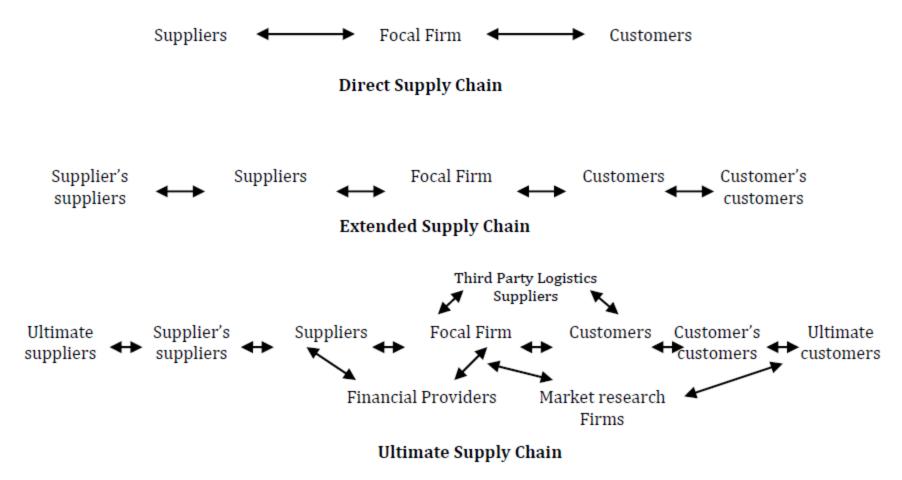
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What is a supply chain?



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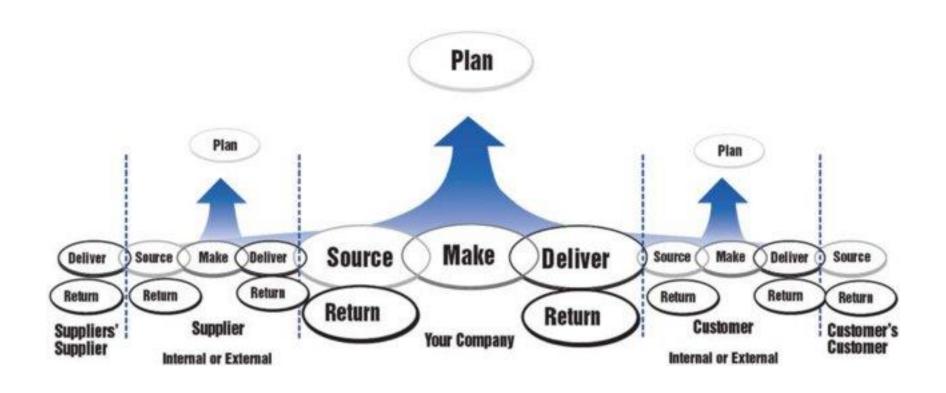
(Mentzer et al., 2001, p. 5)

Supply Chain Management (SCM)

"..encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies."

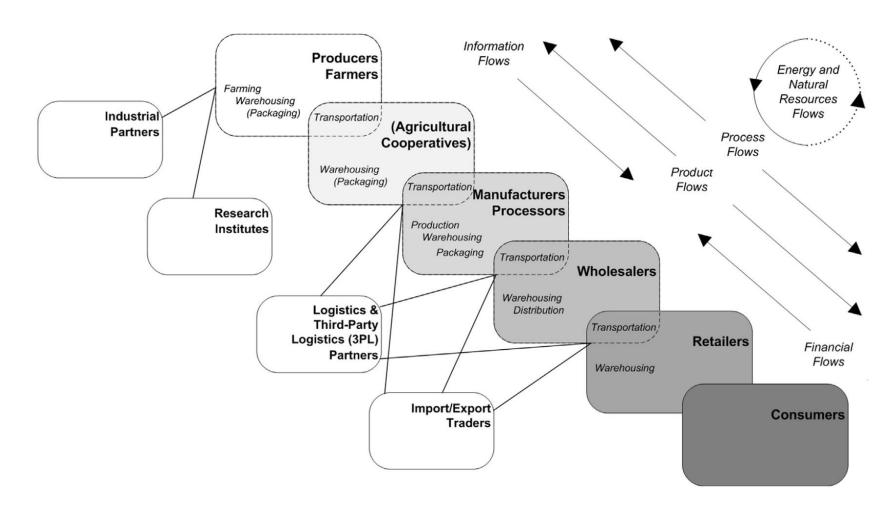


SCOR Model (Supply Chain Operation Reference Model)



Agrifood Supply Chain

a set of activities in a "farm-to-fork" sequence including farming



Agrifood Supply Chain is Unique



Perishability and product deterioration



Environment elements, including temperature and humidity, influence food quality, and therefore, the risk of product deterioration



Increased regulation and environmental pressure (e.g. traceability, sustainability issues)

The Challenge of Agrifood Supply Chain: Food Loss and Waste

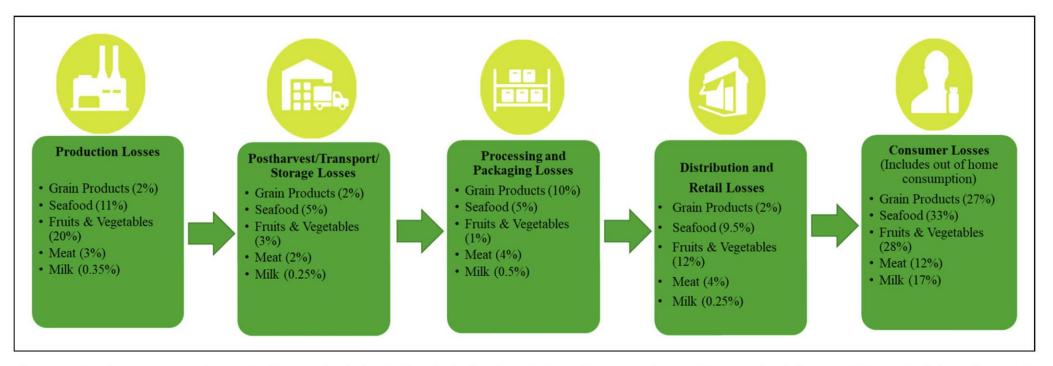


Figure 1—Food Losses at each step in the supply chain (Collectively for the US, Canada, Australia, and New Zealand; Source: WRI analysis based on FAO, 2011. Global food losses and food waste—Extent, causes, and prevention. Rome, Italy: UNFAO).

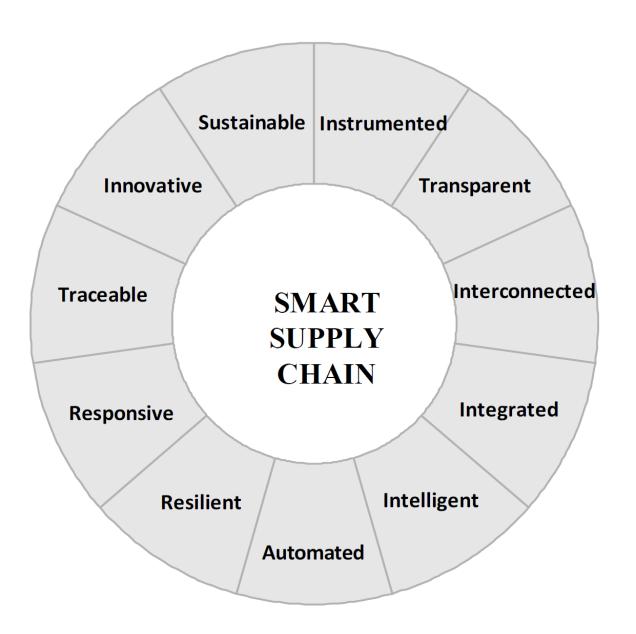
Technology drives the development of Supply chain management and the need for effective and efficient supply chain require innovation in technology



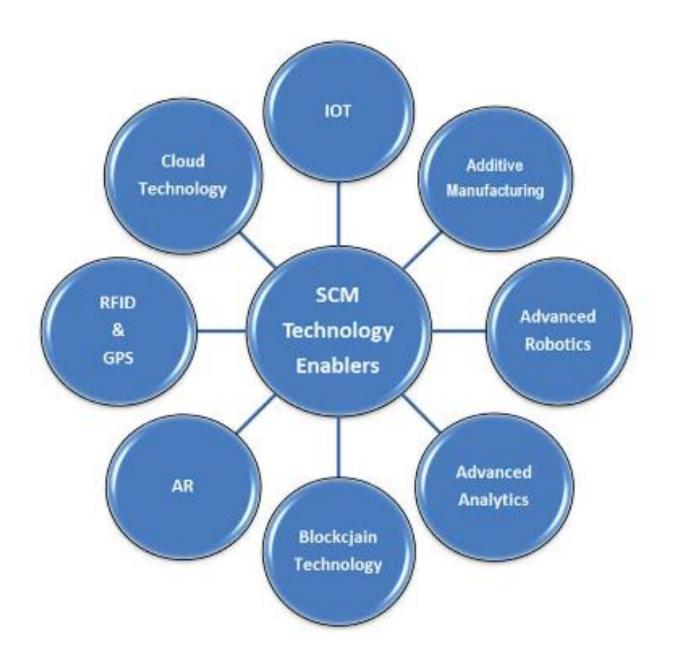
Smart Supply Chain

Smart supply chain empower the organisations by collecting unprecedented amount of information to solve issues quickly using advanced analytical capabilities and enhances traditional processes with machine intelligence, automation and other innovations to serve customers in an economical

Characteristics of Smart Supply Chain



Digital technology Enablers



Industry 4.0 — Traceable Agri-food Supply Chains













FARMER

WAREHOUSE

PROCESSING CENTRE

SERVICE PROVIDERS EXTENSION AGENTS

LOGISTICS

INDUSTRY 4.0 SUPPLY CHAIN



Real-time monitoring



Organized Inventory



Decision making



IoT, AI & ML Blockchain



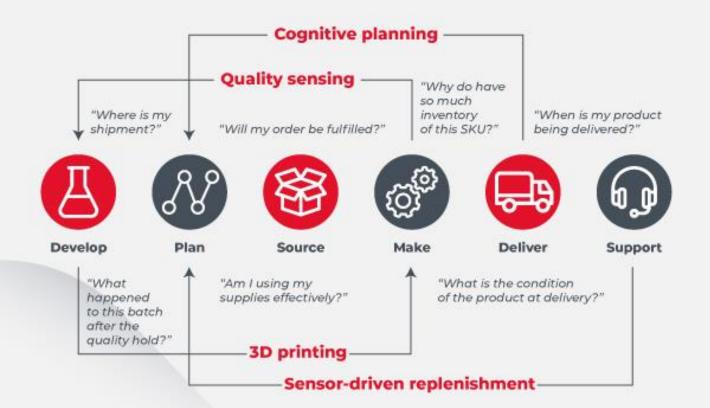
Automation



Reduced labour

Traditional supply chain vs Digital supply networks

Traditional supply chain



Digital supply networks



Digital Supply Chain: SCOR Framework

Plan

- Big Data Analytics (Forecasting & Planning)
- The Digital Twin

Source

- E-Procurement
- Supplier
 Collaborative
 Portal

Excellence Sourcing

- Blockchain Technology
- Data & Text Mining
- Digital Data Management
- Procurement Platform
- Robotic Process
 Automation &
 Artificial Inteligent
- Smart-Contract

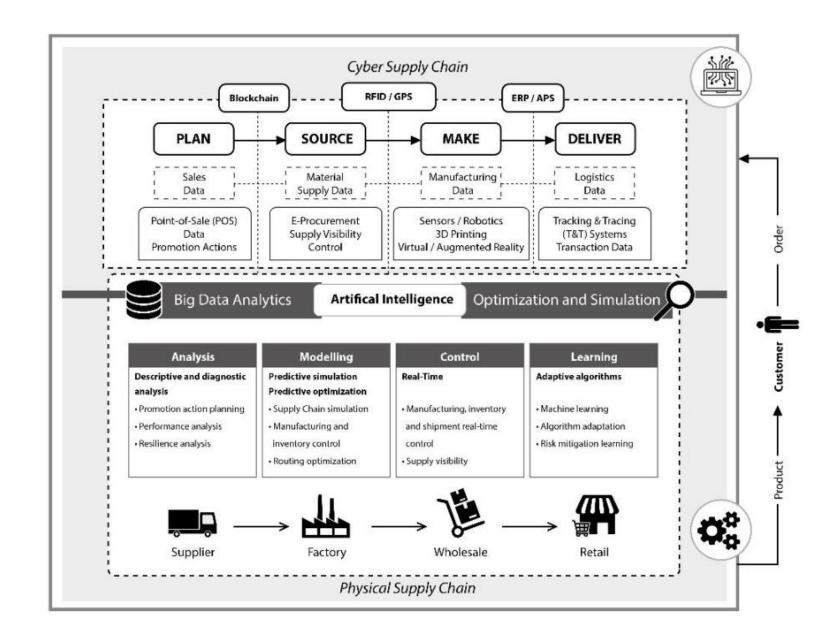
Make

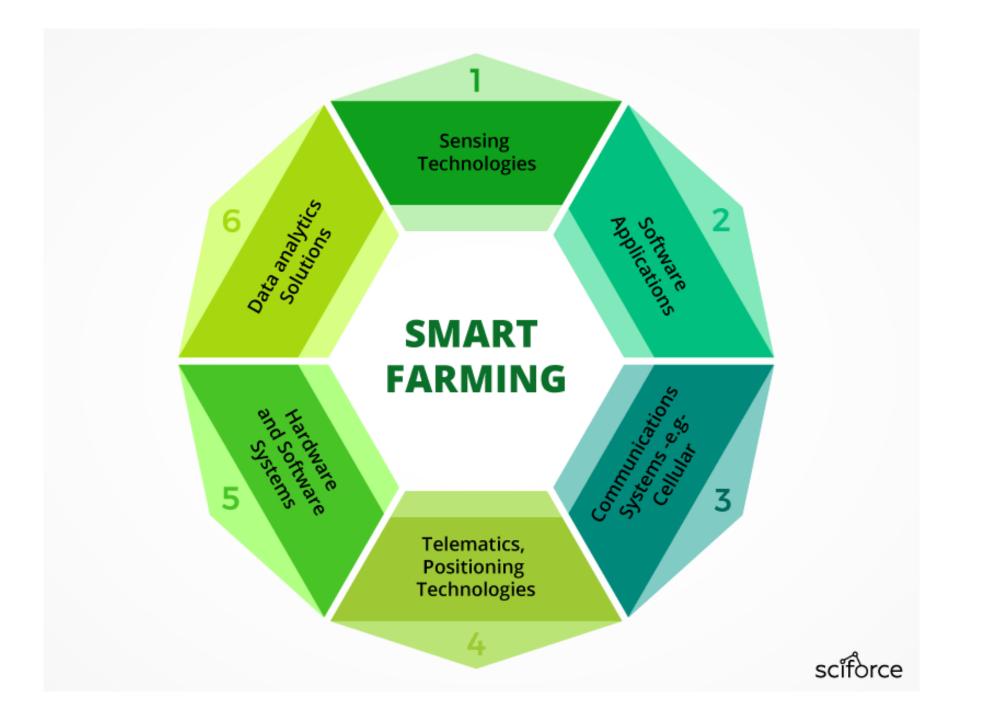
- Smart Farming
- Virtual Reality and Augmented Reality
- Robotics
- IoT

Deliver

- Drones or Unmanned Aerial Vehicles
- Smart Driverless Transportation Systems
- Smart Forklifts, Pallet Movers, and Cranes

The
Framework
of Digital
Supply Chain





Smart Farming in action

Source: Thales / Nesta.

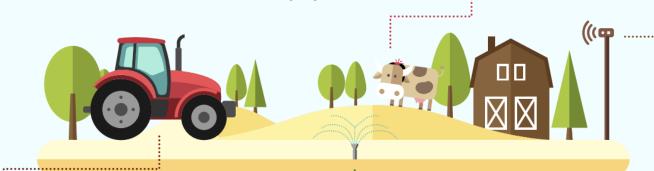
https://www.iberdrola.com/



that growers can access all the information about their farm from any device and optimise every stage of the production process.

DRONES fly over fields, locating weeds, pathogens and sick animals; and collect data about the development of crops and their needs.

send information about their health and any other data that may be of interest, such as, for instance, when an animal is ready to give birth.



SELF-DRIVING VEHICLES sow with precision, and plant seeds at exactly the right depth and separation for the type of crop, maximising the output of the land.

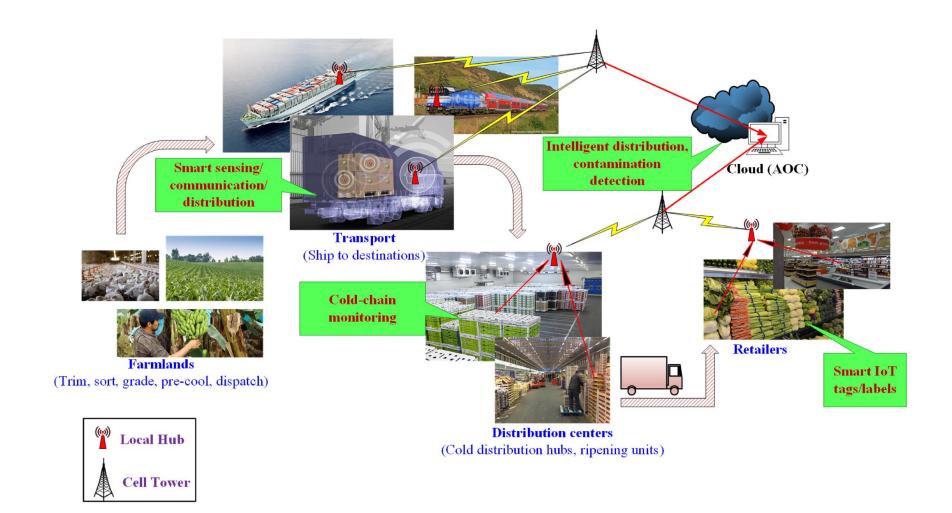
AUTOMATIC SYSTEMS irrigate, fertilise and fumigate each plot depending on its individual needs, at exactly the right time and using the

precise dosage.

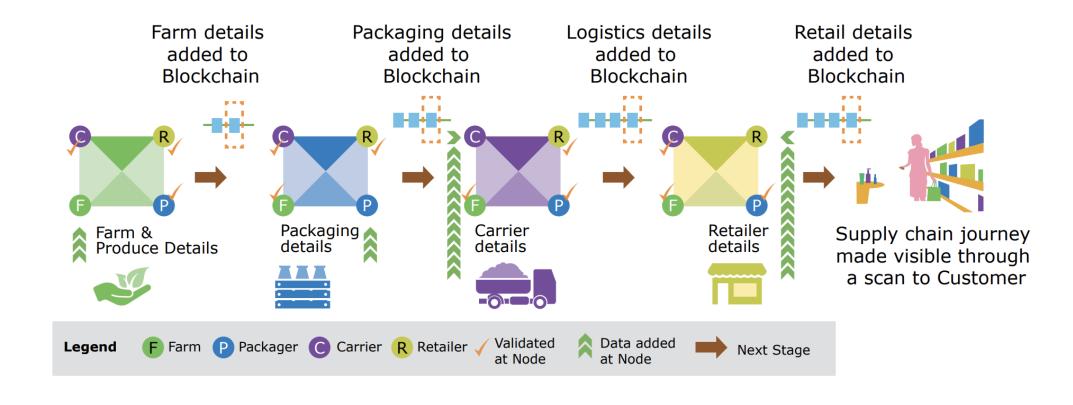
collect data about moisture, lack of nutrients or the presence of pests to determine the need for irrigation, fertiliser or pesticides.

SMART CROP-SENSORS

Smart Sensing improves efficiency



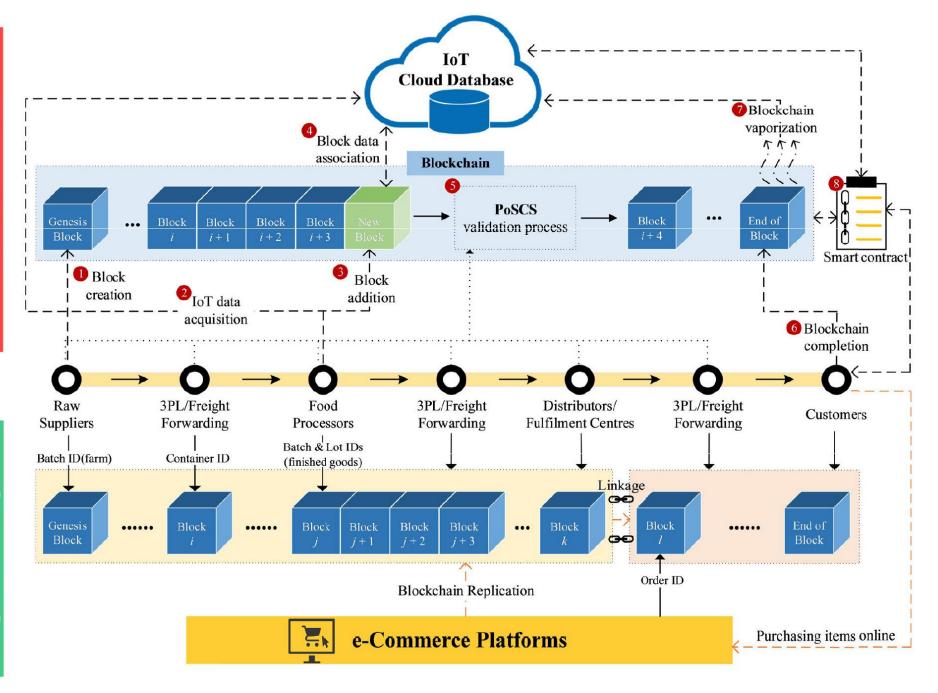
Blockchain Agrifood Supply Chain



Technological Aspect

Operational Aspect

Deployment Framework of Blockchain across agriculture supply chain



Tsang et al (2019)

AgriTech Startup Indonesia



menjembatani kebutuhan saprotan (sarana produksi pertanian)





B2B Industry with a technology-supported food ecosystem



















Peer-To-Peer Funding

Benefits of Supply Chain Technology

- Predict accurately
- Food Composition, Quality, and Safety Monitoring
- Food Safety across Supply Chain
- Reduce Waste
- Improve traceability and transparency
- Improve supply chain efficiency and effectiveness