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REGIONE AUTÒNOMA DE SARDIGNA
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MYSEA - Mediterranean Youth, NEETs and women advancing Skills, Employment and Awareness in the blue and green economy

MYSEA

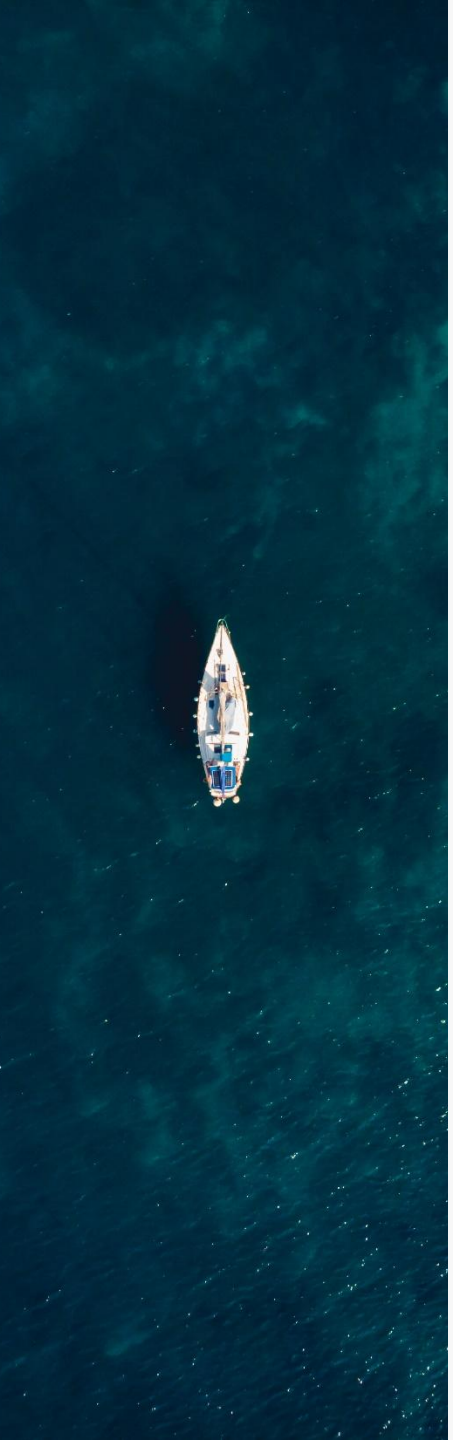
Introduction

This course provides fundamental information on the Blue and Green Economy, an overview of the trends in the agri-food and waste management sectors, information on the supply chain and elements of innovation, sustainability and environmental conservation.

Innovation

(Module 5)

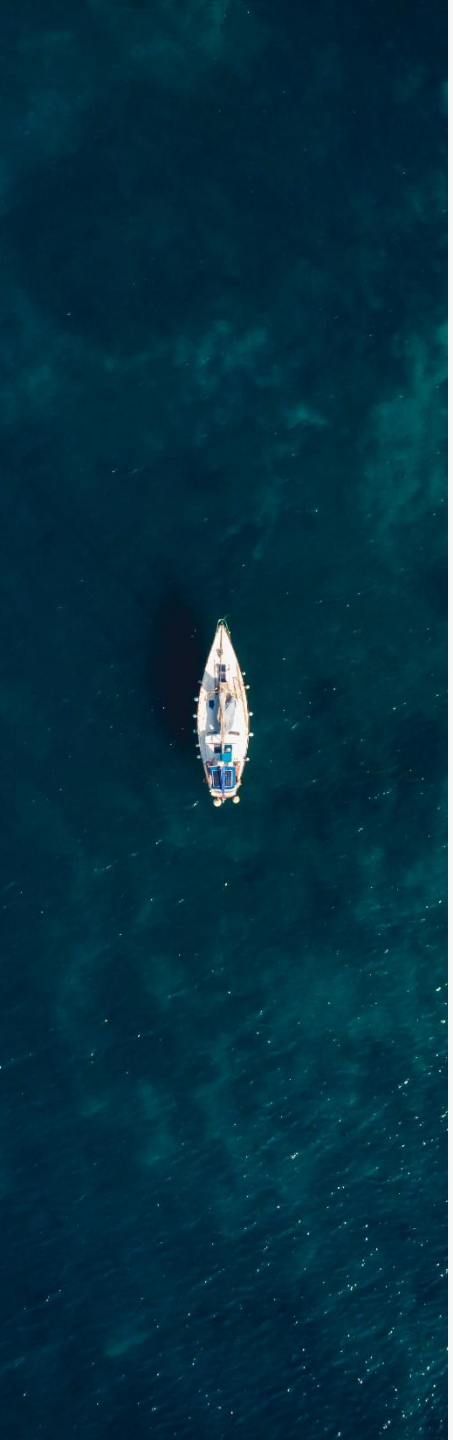
Agribusiness Trends



Transforming the Industry

The agribusiness industry is undergoing a period of considerable change across numerous fronts.

These trends touch virtually every part of the agricultural value chain, including growers, input suppliers/distributors, processors and investors, and are relevant to crops and animal proteins alike.

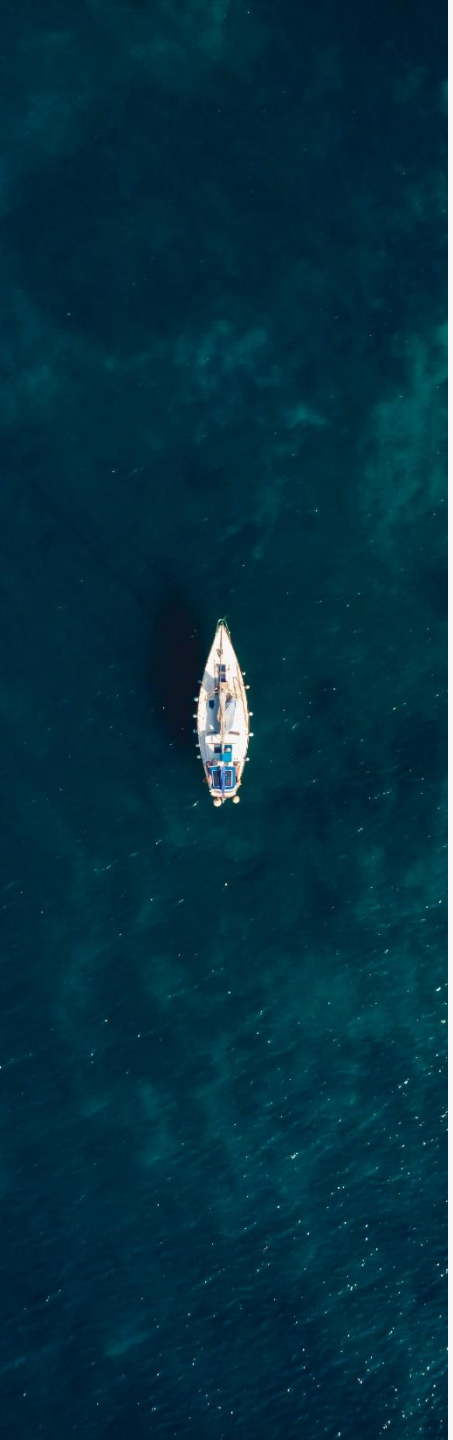


Agribusiness Trends

1. SUSTAINED LOW COMMODITY PRICES

Input providers for seeds, crop chemicals, nutrients and particularly equipment have seen moderate to severe declines in demand as farmers have been forced to tighten their belts and reduce spending.

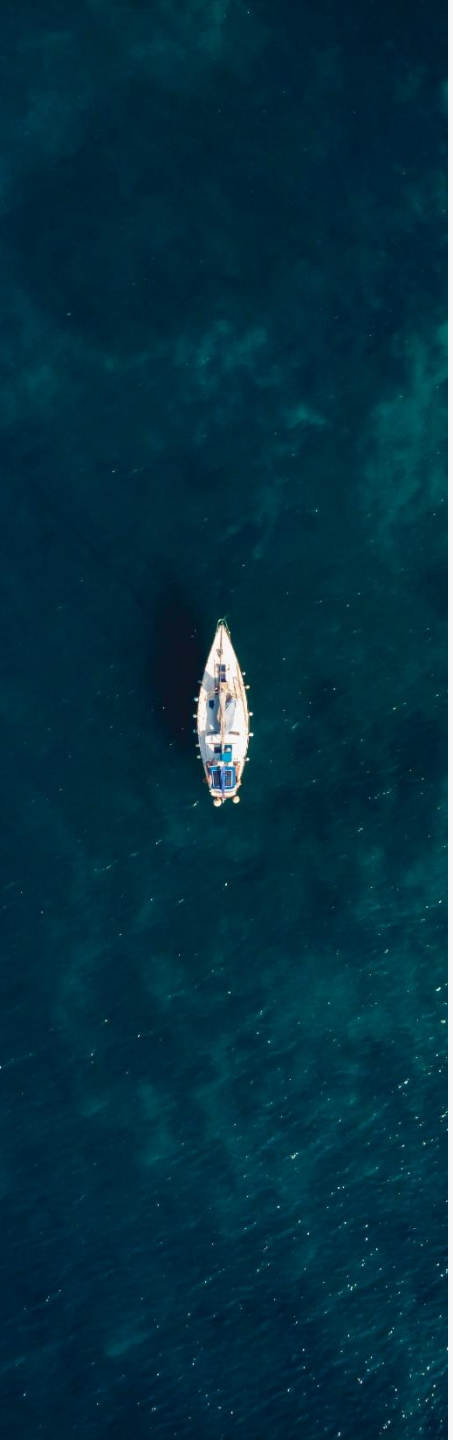
The outlook for recovery of crop prices remains uncertain and continues to weigh on input providers.



Agribusiness Trends

2.1 IMPROVING YIELDS

Over the past century yields for major crops have increased by three to eight times as a result of technological advancements, agronomic improvements, and industry investment and collaboration.

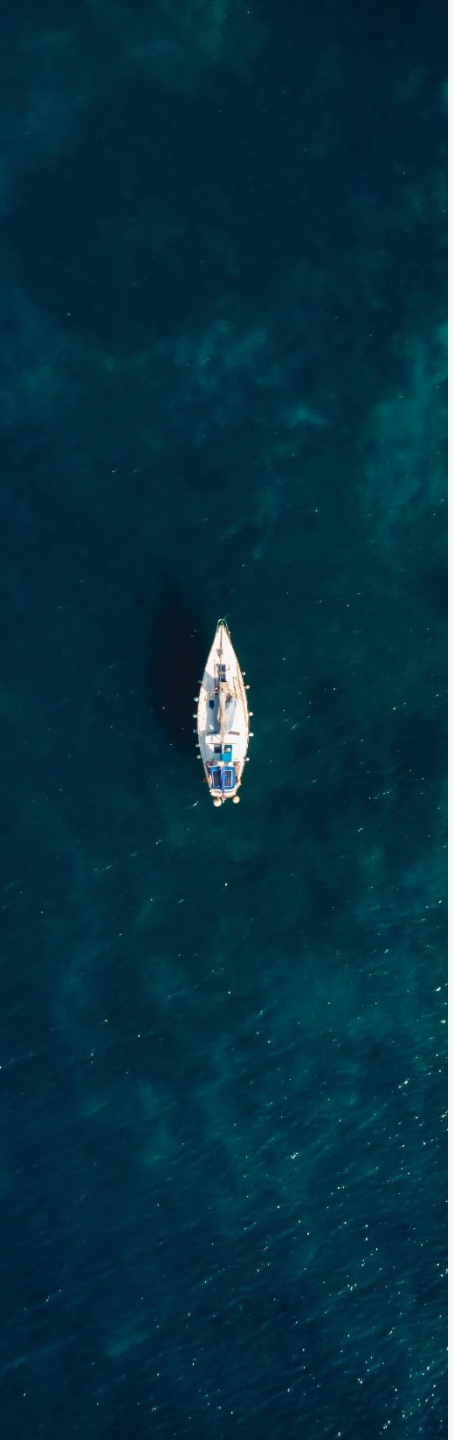


Agribusiness Trends

2.2 IMPROVING YIELDS

This pace has accelerated further in the past 20 to 30 years and more recently due to several key drivers:

- Significant growth in R&D investment in agricultural biotechnology
- Greater collaboration across industry, government and academia
- The emergence of “smart” farming and data analytics that enable precision agriculture



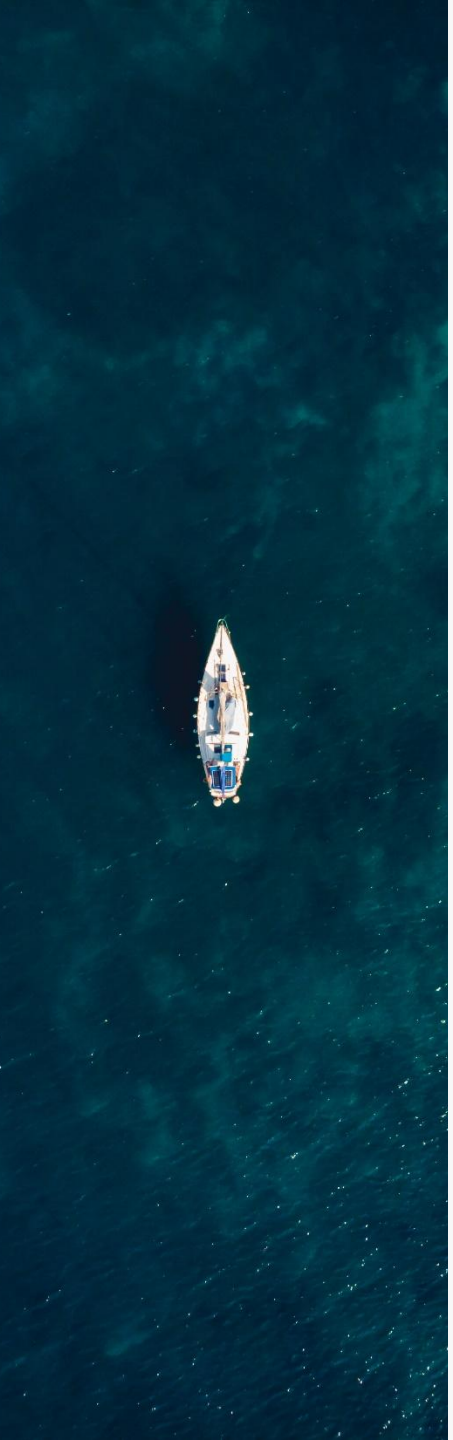
Agribusiness Trends

3.1 FOCUS ON SUSTAINABILITY

For crop growers, sustainability usually covers growing as much or more food with fewer inputs, using sustainable soil management practices, perhaps shifting from chemical to organic pesticides, and so forth.

Advances in biotechnology and precision agriculture have been important enablers of more sustainable agriculture.

At the same time, but in a different manner, organic crop, produce and animal protein growers also view their approach as a positive for sustainability.

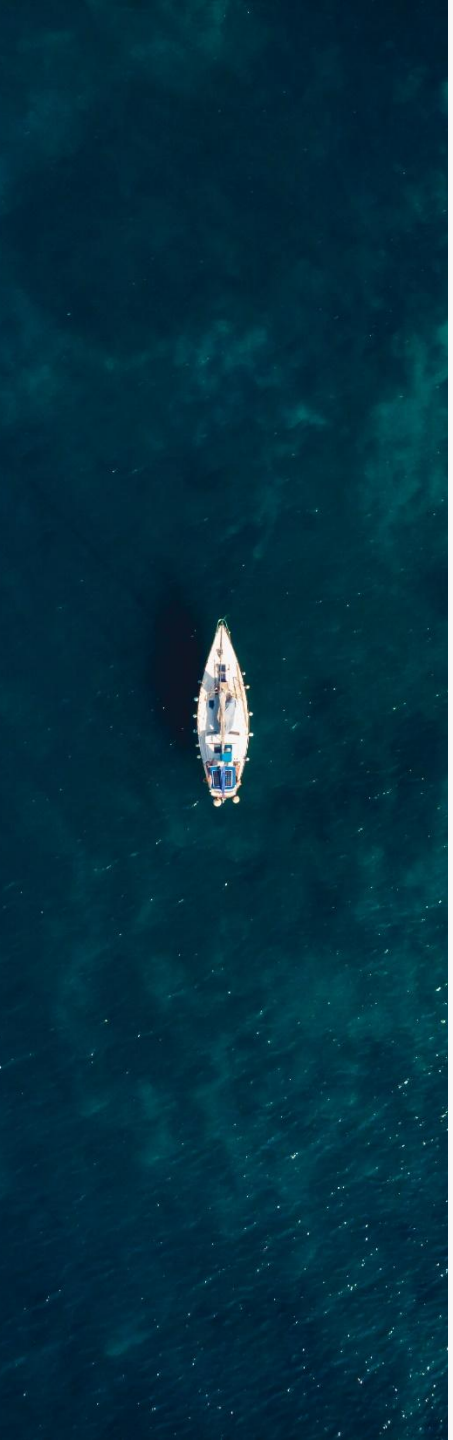


Agribusiness Trends

3.2 FOCUS ON SUSTAINABILITY

Sustainability, however one defines it, is an increasingly important issue for many parties:

- For growers, it is essential to preserving the long-term health and productivity of their soil and fields
- For public sector officials, sustainability also matters, but the underlying issues emphasized may differ between federal and local officials
- For food, beverage and other consumer-facing companies, demonstrating a pro-sustainability approach may be an important element of meeting consumer brand expectations
- For suppliers, driving yields upward and enabling growers to produce sufficient food with the arable land available are often critical sustainability objectives



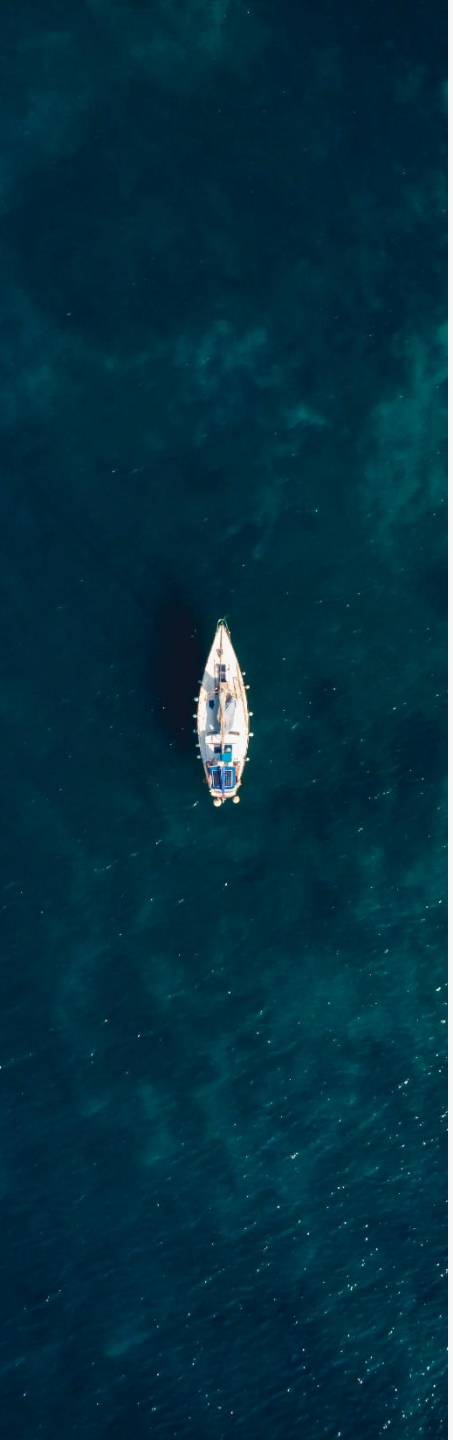
Agribusiness Trends

4.1 ARRIVAL OF AGTECH

Over the past five to 10 years, the growth of agricultural technology has been fervent, with technology being applied in radically new ways in the field, around the farm, for raising animals, and all the way across the farm-to-fork supply chain

Over the past six years, the number of AgTech deals grew at an annual average rate of 73%, with a total investment of $3.2 billion in 2016.

Over this time frame, AgTech investment by agribusiness operators has also expanded, as shown by the examples that we are going to look at now.

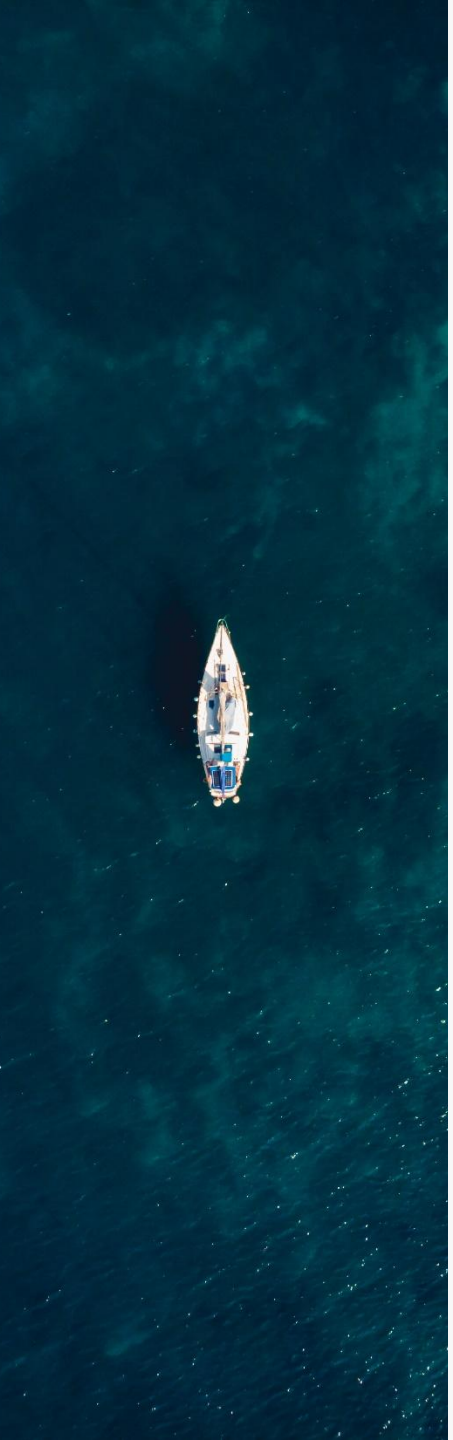


Agribusiness Trends

4.2 ARRIVAL OF AGTECH

Precision/prescriptive agricultural technologies

Software, data and equipment are providing growers with a wealth of field and crop health data, which enables yield improvements and provides intelligence to assist with variable-rate application of fertilizers and chemicals.



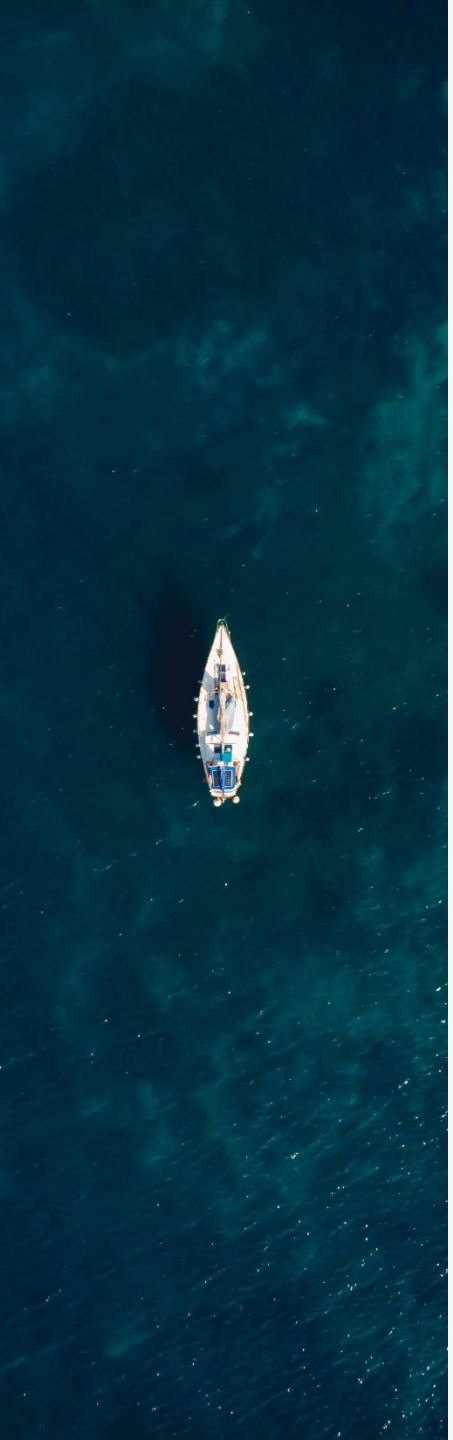
Agribusiness Trends

4.3 ARRIVAL OF AGTECH

Indoor Growing Technologies

Advancements have been made in controlled growing environments, from next-generation hydroponics to “vertical” farming, particularly for produce/greens.

While more costly to produce than their farm-raised alternatives, products from such operations can be attractive to retailers seeking a year-round supply of locally sourced, often organic offerings

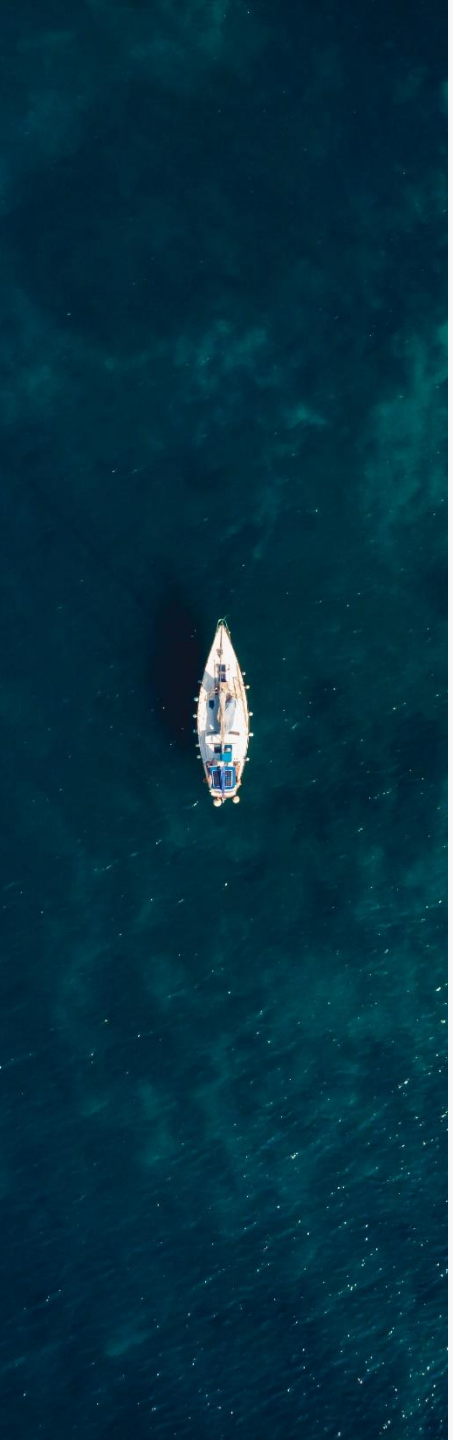


Agribusiness Trends

4.4 ARRIVAL OF AGTECH

Animal protein production

Technology has accelerated developments in animal breeding, nutrition and health in a number of ways. Animal protein producers are using technology in new ways to monitor animal health and track and optimize production.



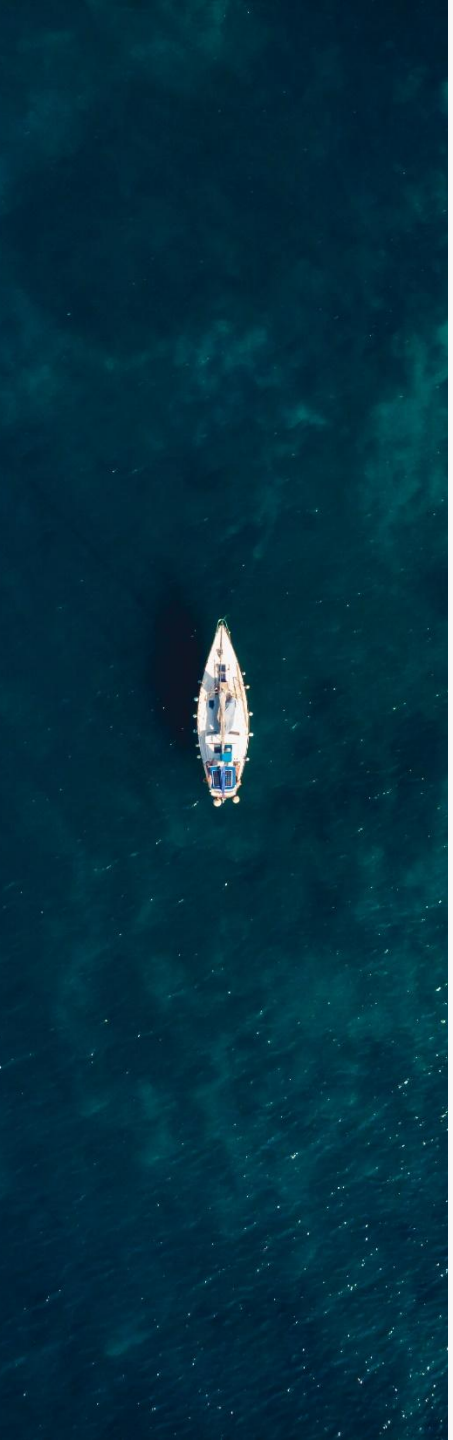
Agribusiness Trends

4.5 ARRIVAL OF AGTECH

Meat replacements

As consumer interest in nonanimal sources of protein grows, technology is driving advancements in so-called meat replacements, produced through innovative (and still very expensive) cell tissue culture technologies.

While still in their early days, such technologies and the companies behind them, such as Beyond Meat and Memphis Meats, have attracted the investment of majors such as Tyson Foods and Cargill, respectively.

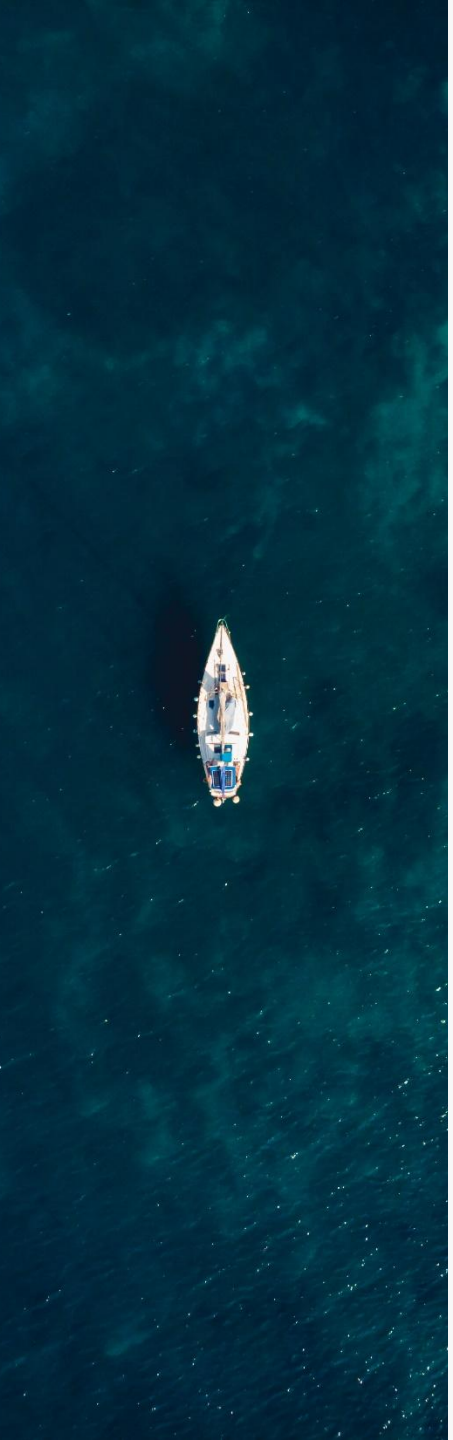


Agribusiness Trends

4.6 ARRIVAL OF AGTECH

Food safety/traceability tracking

To help address food safety concerns and enormous public scrutiny, major retailers and foodservice operators have been using technology to improve their management of food safety issues and track the origin of food products and ingredients all the way back up the supply chain.



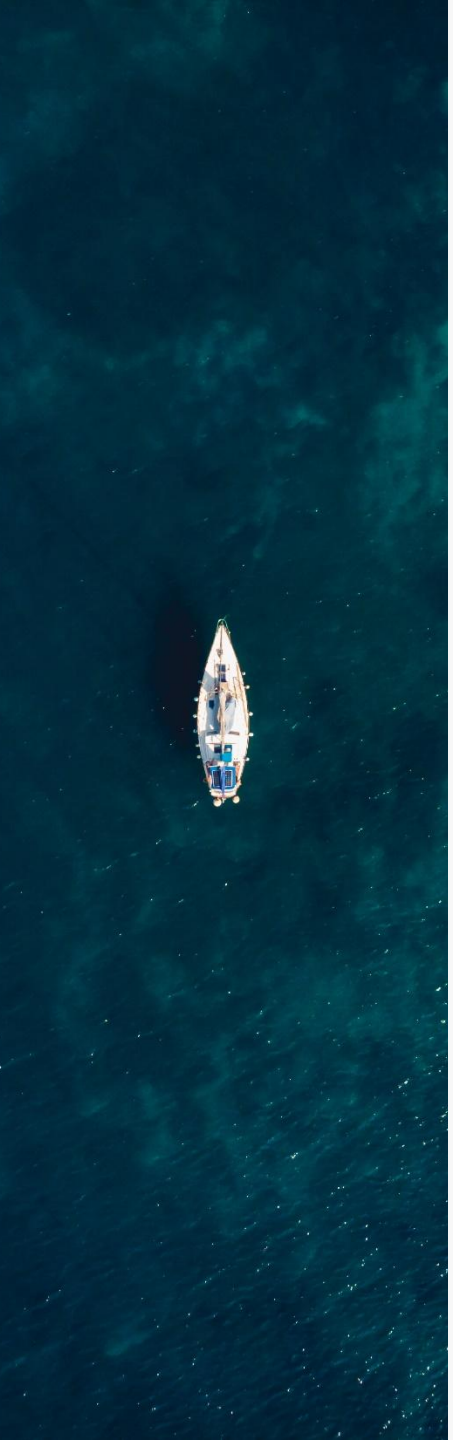
Agribusiness Trends

5.1 CLEAN LABEL-SHIFT

The seismic shift in consumer food preferences continues to drive the growth of ingredients with healthy, clean-label attributes: organic, non-GMO, antibiotic-free, gluten-free, cage-free, etc.

For food ingredients to be “organic” requires starting with non-GMO wheat, corn, soy, oils, starches and other ingredients, which in turn impacts the costs for growers, producers and consumers.

Similarly, producing eggs in a cage-free environment or raising chickens without antibiotics is typically costlier and requires significant upfront investments by growers and producers to shift their practices and qualify for the label they seek

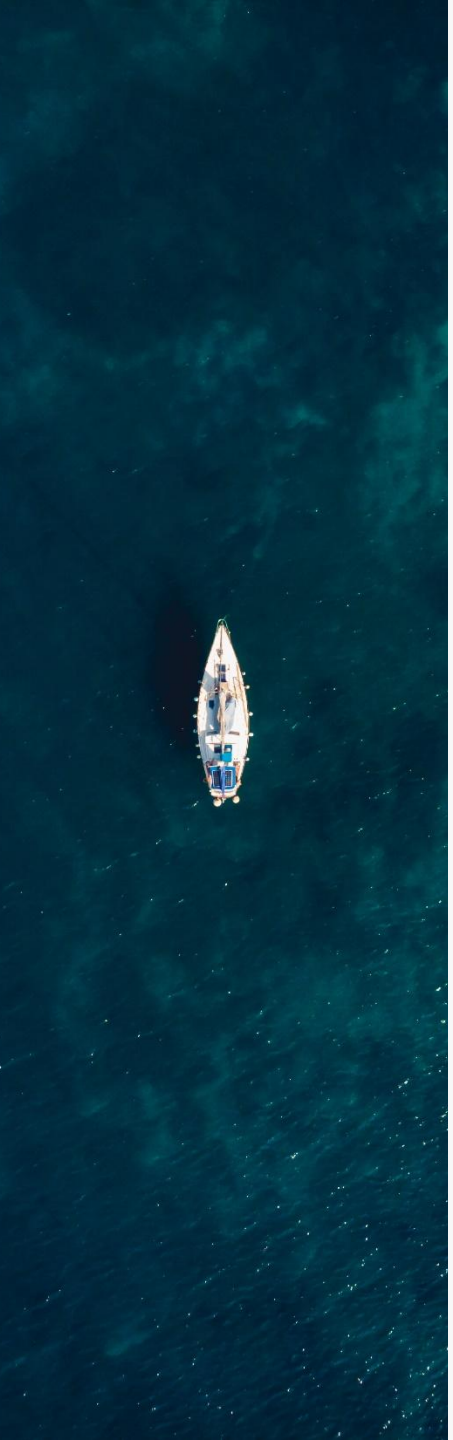


Agribusiness Trends

5.2 CLEAN LABEL-SHIFT

Similarly, producing eggs in a cage-free environment or raising chickens without antibiotics is typically costlier and requires significant upfront investments by growers and producers to shift their practices and qualify for the label they seek.

As long as there is consumer demand for the broad array of clean-label foods at the right prices, however, growers and producers will almost certainly find ways to supply them.



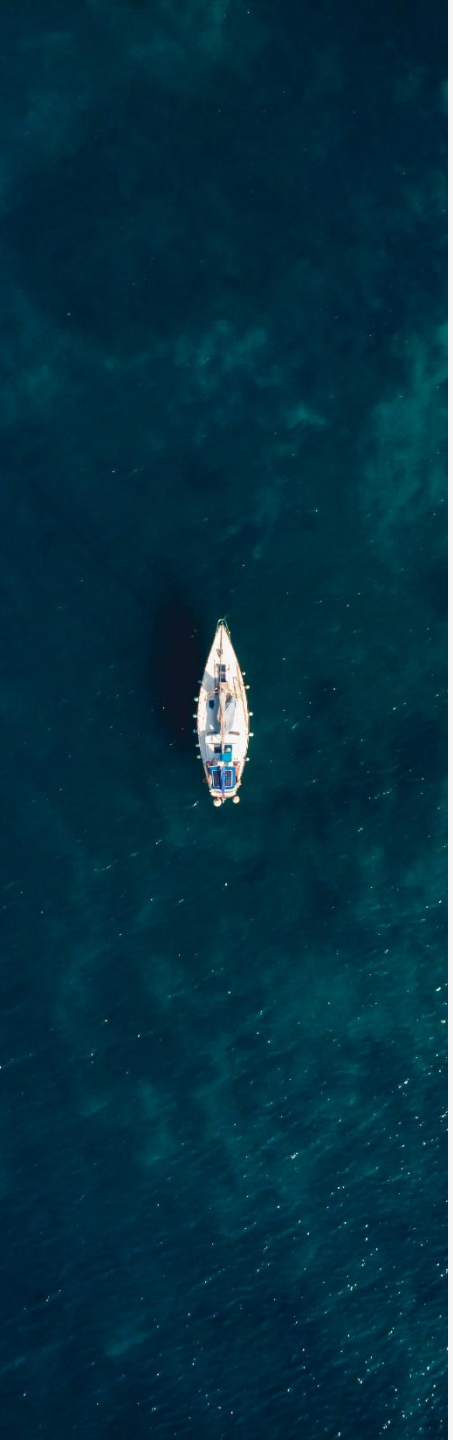
Agribusiness Trends

6. EVOLVING PROTEIN DEMAND

In more economically developed regions such as the U.S., the EU and parts of Asia, consumption of animal proteins is growing modestly, yet nonanimal proteins (plant-based, insect-based, etc.)

As plant-based proteins become more mainstream, large corporations are beginning to adjust their offerings.

Given shifting consumer preferences, and the efforts by large food companies to stay relevant, it is likely that future protein needs will be met by an even more diverse, and less animal-reliant, set of protein sources.



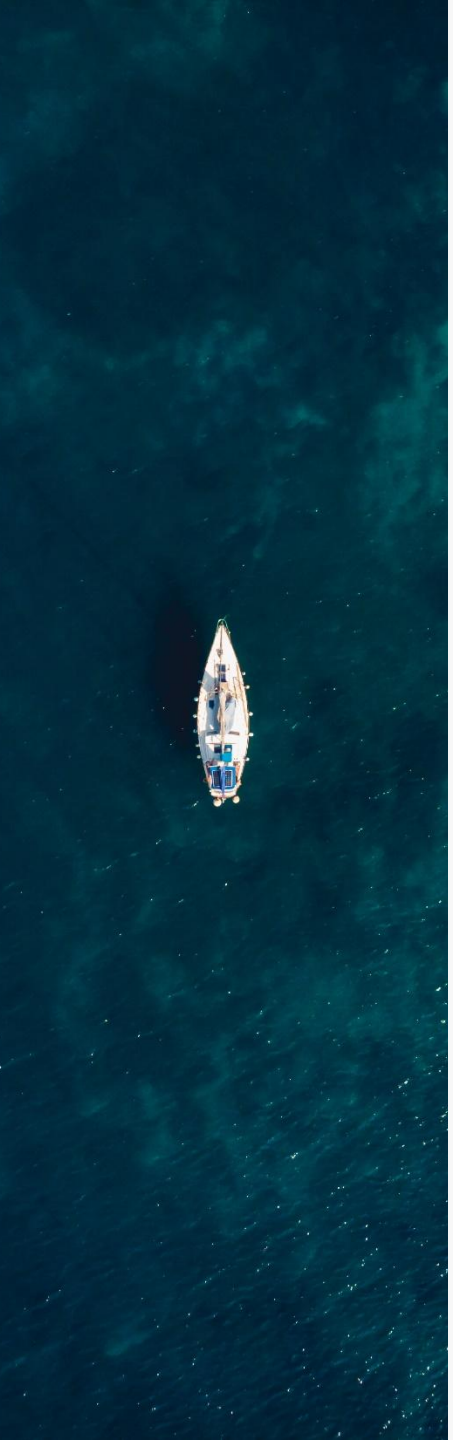
Agribusiness Trends

7. INDUSTRY CONSOLIDATION

New mergers and acquisitions are announced regularly as large regional and national players seek economies of scale and better buying power with the major suppliers.

The newfound scale of farm input manufacturers and suppliers is of concern to some growers, who fear higher prices and less choice down the road.

However, new technology and ceaseless innovation continue to fuel new companies in all these spaces.



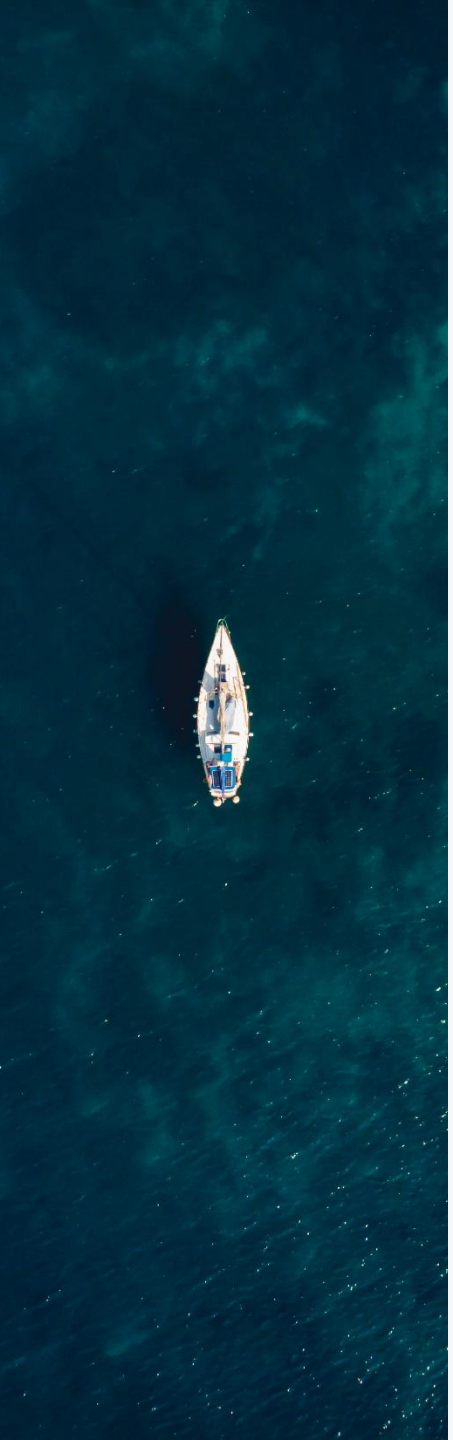
Agribusiness Trends

8. Water & Labor Trends

Water limitations and labor shortages have been persistent issues for agribusiness.

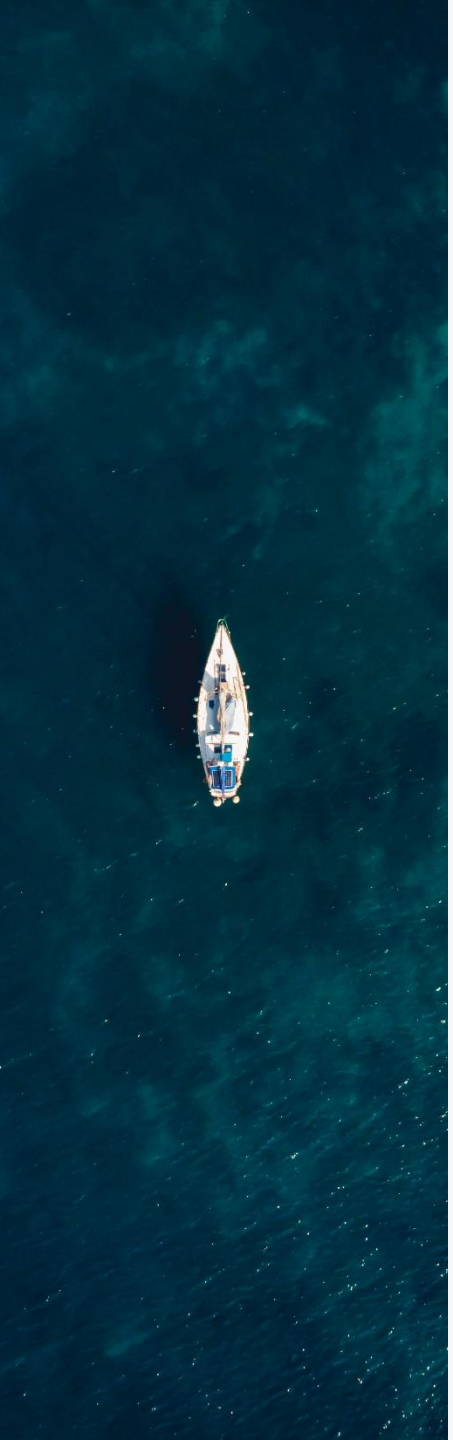
Globally, agriculture uses about 70% of available fresh water. Observed changes in climate, shifting land uses and more intensive crop production trends are all believed to be putting more strain on the world's water systems.

Reversed Logistics



Reverse Logistics

Reverse logistics refers to supply chain management that delivers things back from customers to vendors or manufacturers. After a client receives a product, reverse logistics operations such as returns or recycling are required.

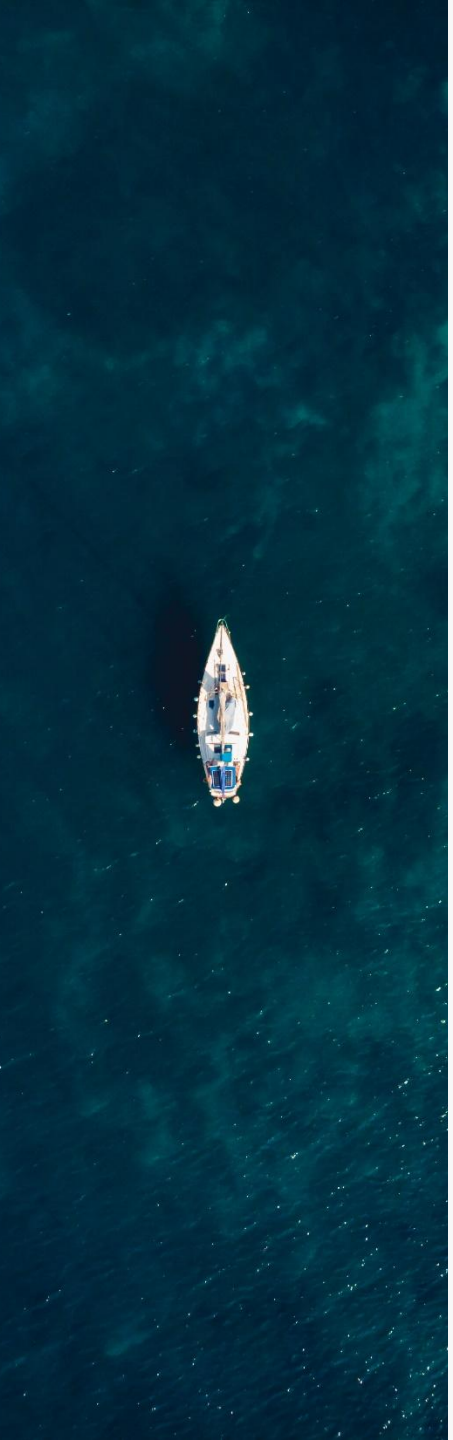


Reverse Logistics

By converting waste into sales, reverse logistics add value and nurtures customer loyalty.

Businesses reuse, recycle, and sell returns. Reverse logistics that works reduces distribution and storage expenses as well.

Following are a number of different types of reverse logistics, followed by specific steps and strategies to develop better reverse logistics.

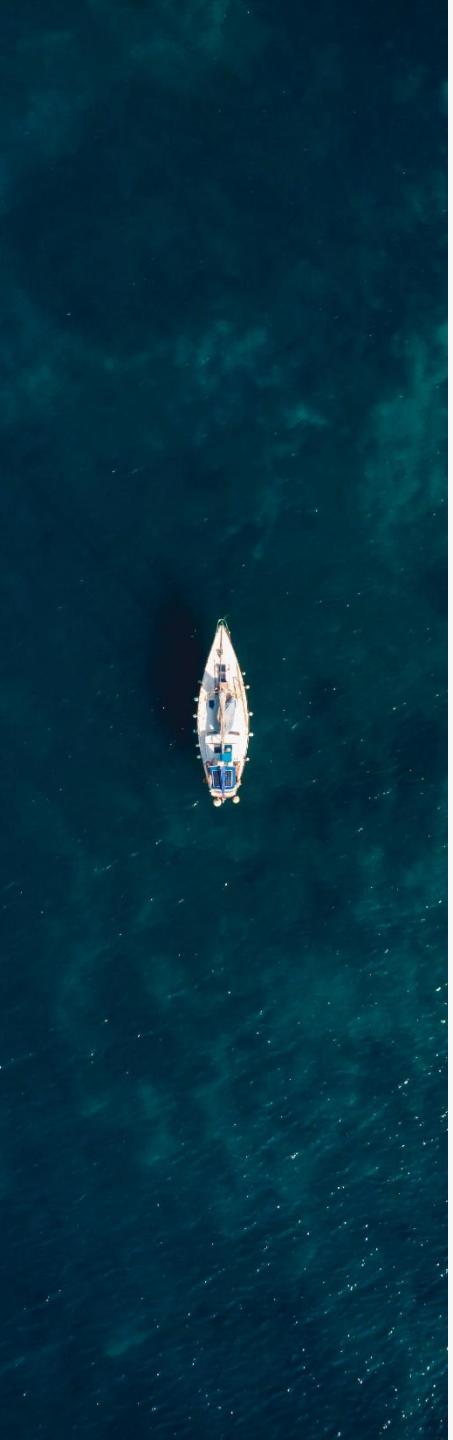


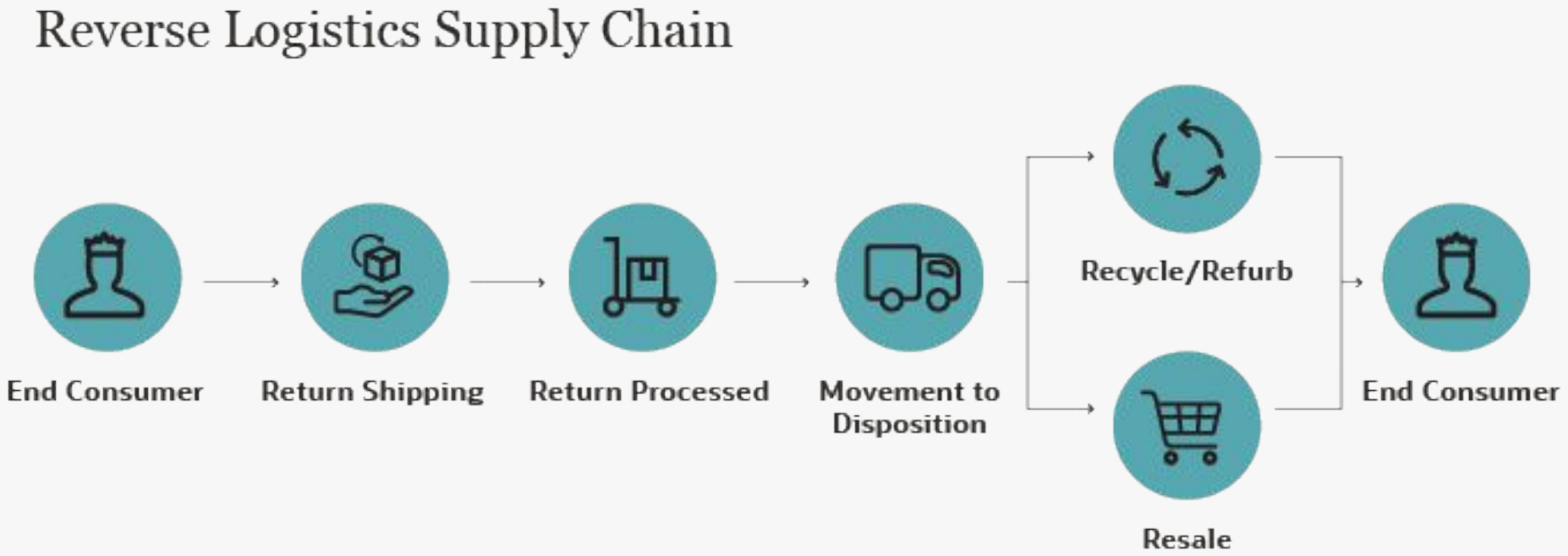
Types of Reverse Logistics

The various types of reverse logistics are referred to as reverse logistics components.

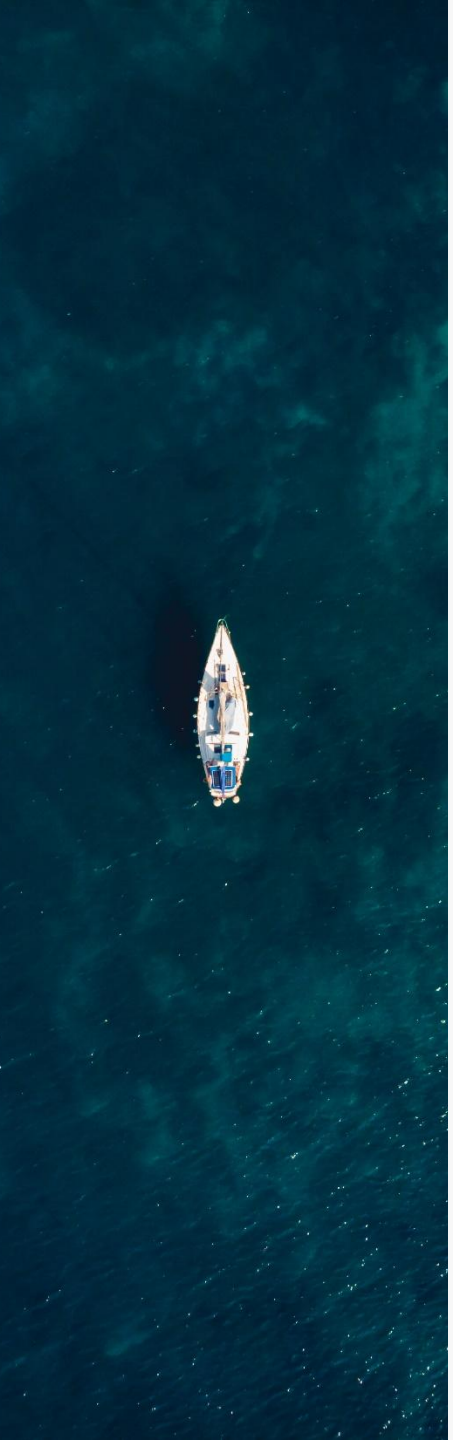
They take into consideration remanufacturing, packing, unsold items, and delivery concerns and concentrate on returns management and return policies and procedures (RPP).

Some forms of reverse logistics include leasing, maintenance, and product retirement.





Reverse Logistics Supply Chain, Image: ORACLE Netsuite



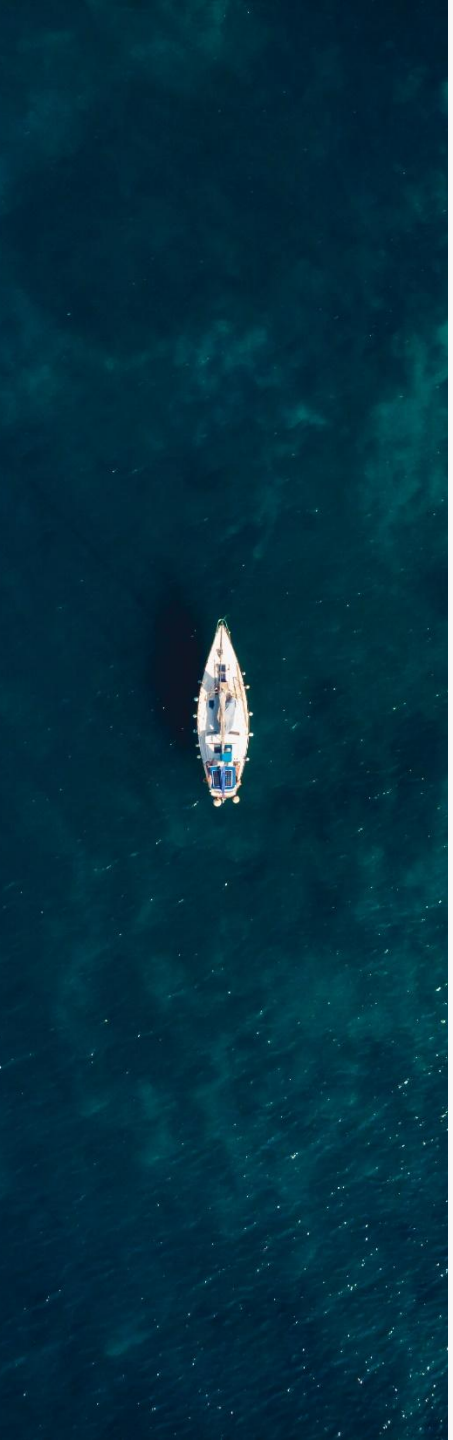
Reverse Logistic Components

RETURNS MANAGEMENT

This procedure deals with consumer product returns or preventing returns from happening in the first place.

Re-returning an item means doing so a second time.

Re-returns can also happen when a seller rejects a return and sends the item back to the buyer without issuing a reimbursement.

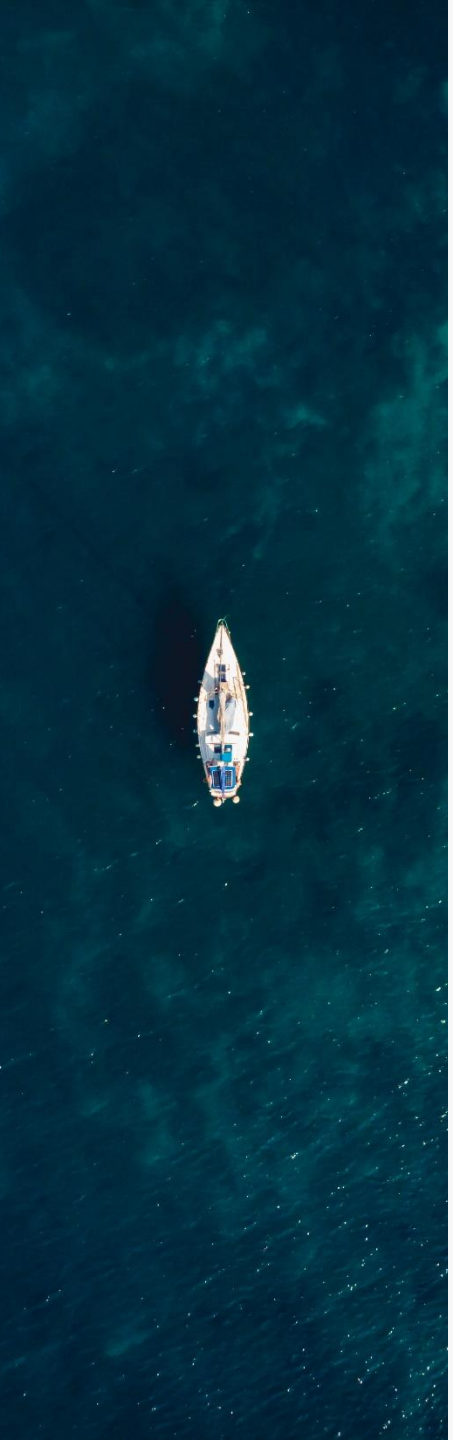


Reverse Logistic Components

RETURN POLICY & PROCEDURE (RPP)

The RPP of a corporation consists of the return rules that it discloses to customers.

These policies must be clear and consistent. Employees should also adhere to them.



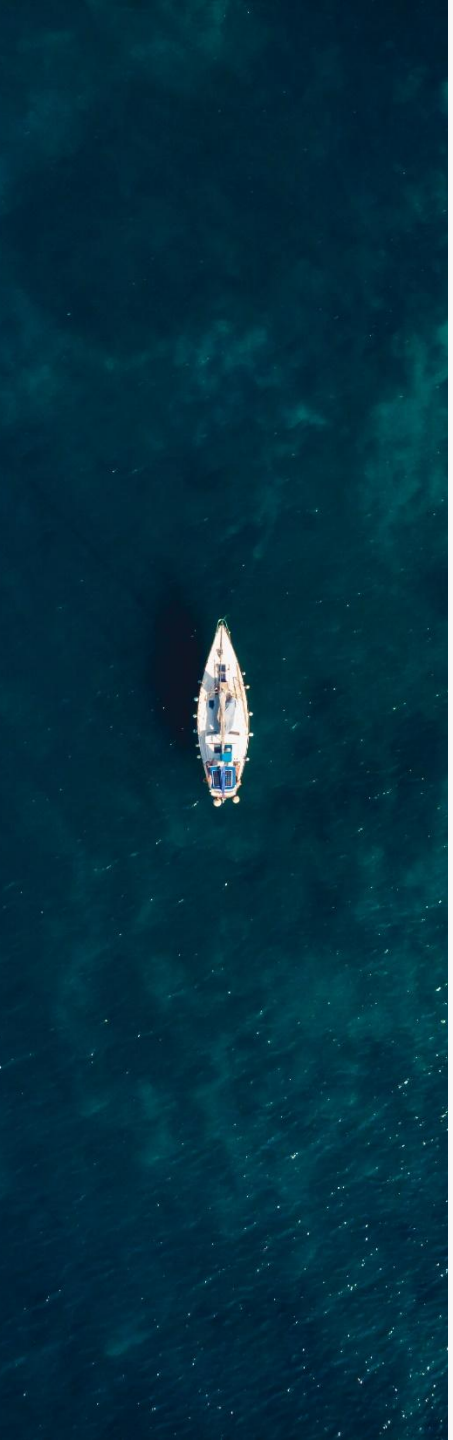
Reverse Logistic Components

Remanufacturing & Refurbishment

Remanufacturing, refurbishing, and reconditioning are all examples of reverse logistics management.

These processes involve product repair, rebuilding, and reworking.

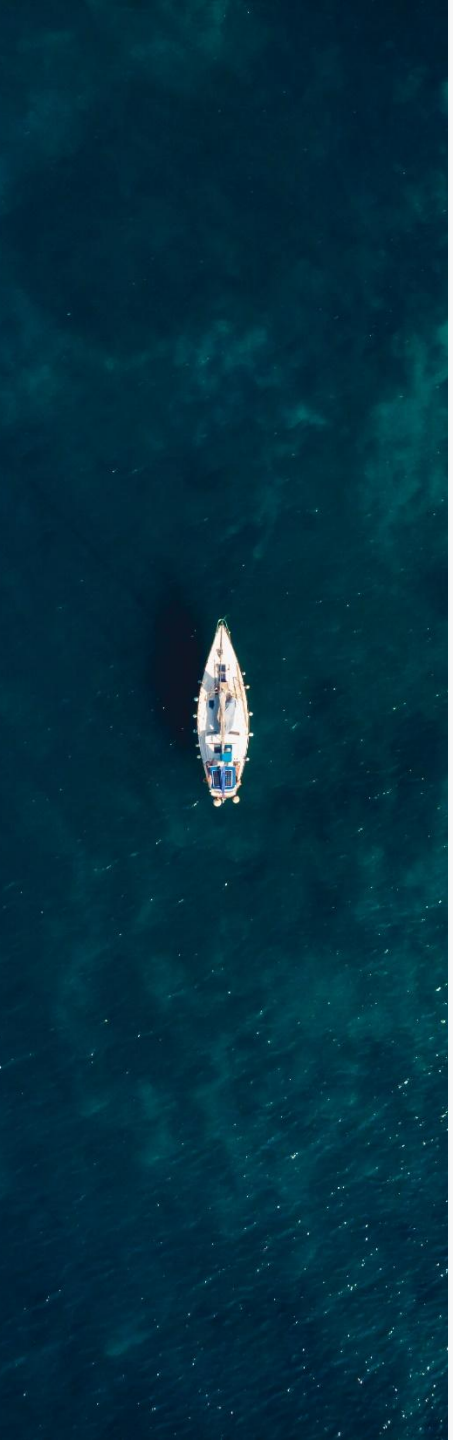
A process called cannibalization of parts refers to the practice of businesses recovering interchangeable, reusable components or resources from other goods. It entails disassembling, cleaning, and reassembling things to recondition them



Reverse Logistic Components

PACKAGING MANAGEMENT

This type of reverse logistics focuses on the reuse of packing materials in order to reduce waste and disposal.



Reverse Logistic Components

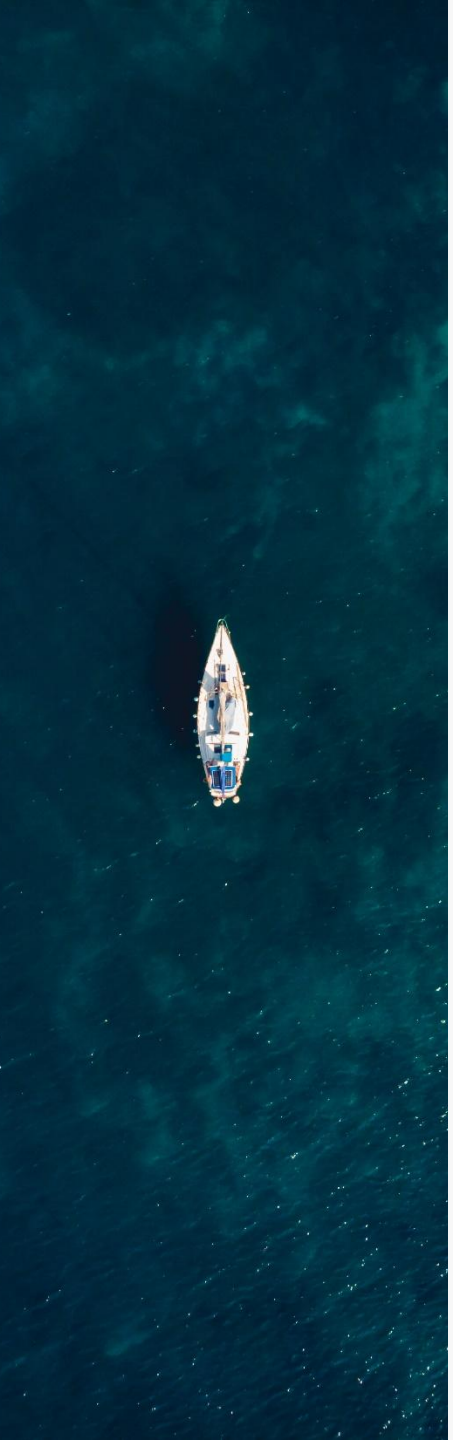
End-OF-LIFE (EOL)

When a product is no longer functioning or useful, it is deemed to be EOL.

The item may no longer meet the consumer's needs or may be replaced with a better, more recent model.

Manufacturers regularly recycle or dispose of end-of-life products.

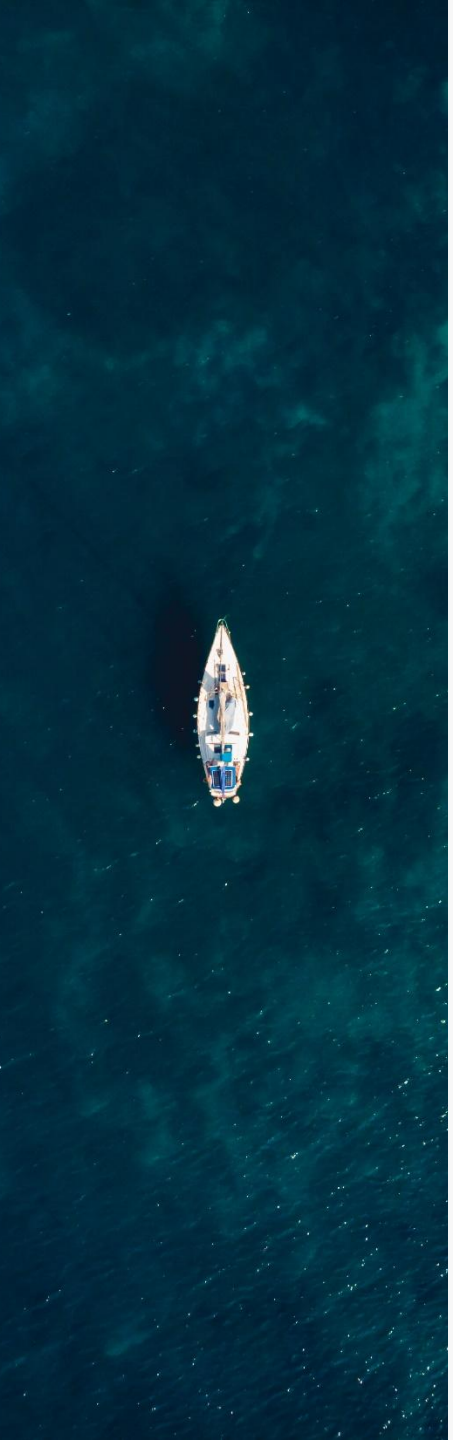
As a result of these, manufacturers and governments may experience environmental challenges.



Reverse Logistic Components

DELIVERY FAILURE

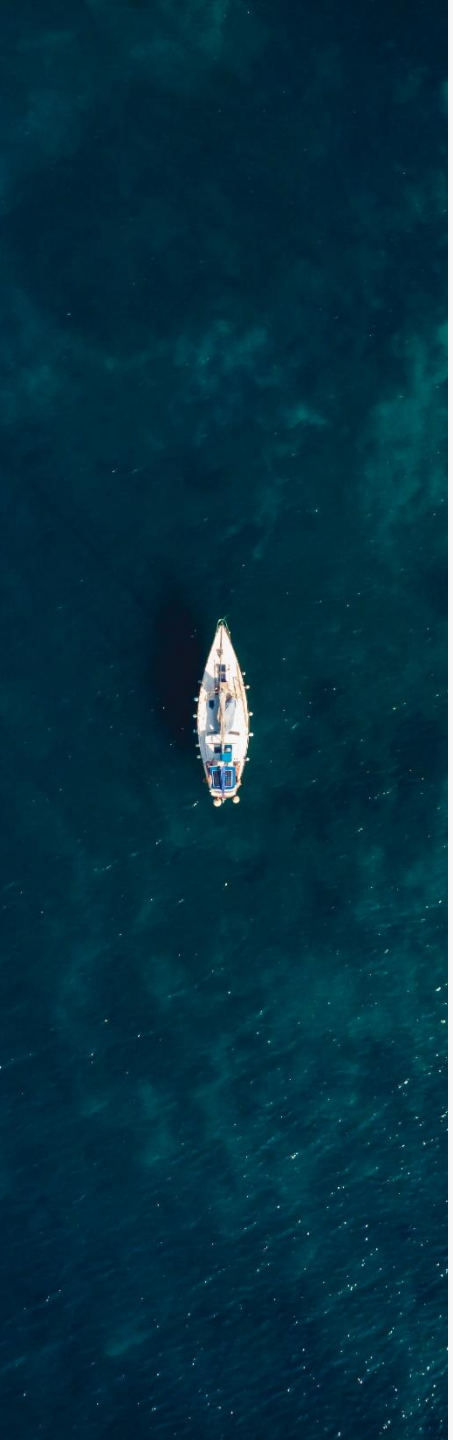
If a delivery fails, the products are returned to sorting facilities, from where they are delivered back to the facilities that they came from in the first place.



Reverse Logistic Components

RENTALS & LEASING

The firm that owns the product has the option to resell, recycle, or redeploy equipment for the lease or rental agreement.

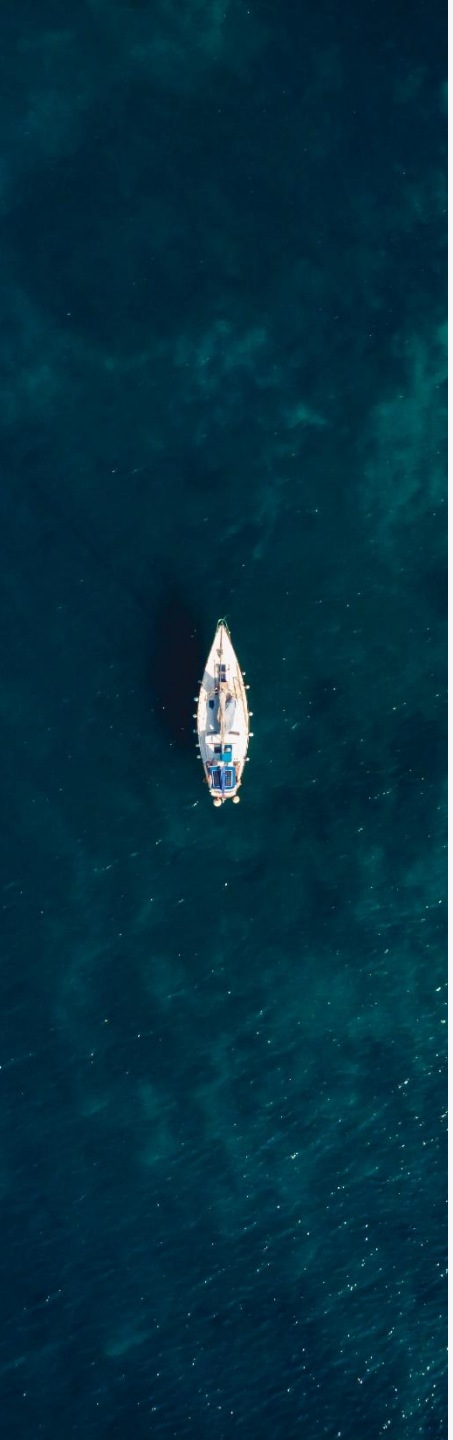


Reverse Logistic Components

REPAIRS & MAINTENANCE

Some product agreements require consumers and corporations to maintain or repair equipment as needed.

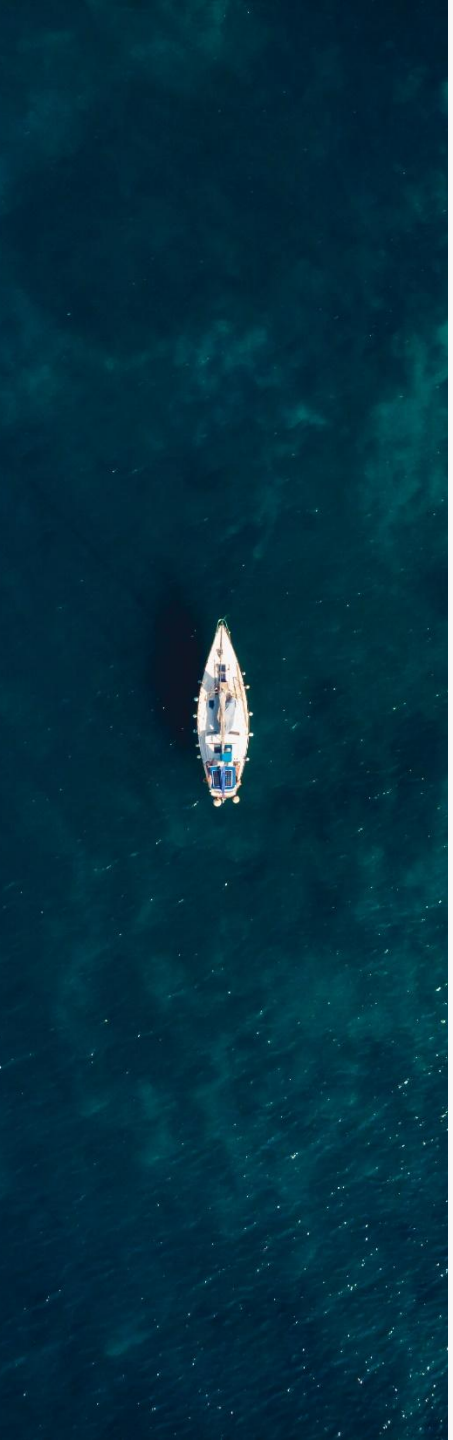
In certain cases, the company sells brand-new consumers on fixed, defective returned items.



Effective Reverse Logistics

The reverse logistics process involves managing returns and buying surplus goods and materials. The process is also responsible for dealing with any leases or refurbishments.

Reverse logistics vary across different industries, and there are different economic incentives for improving reverse logistics management.



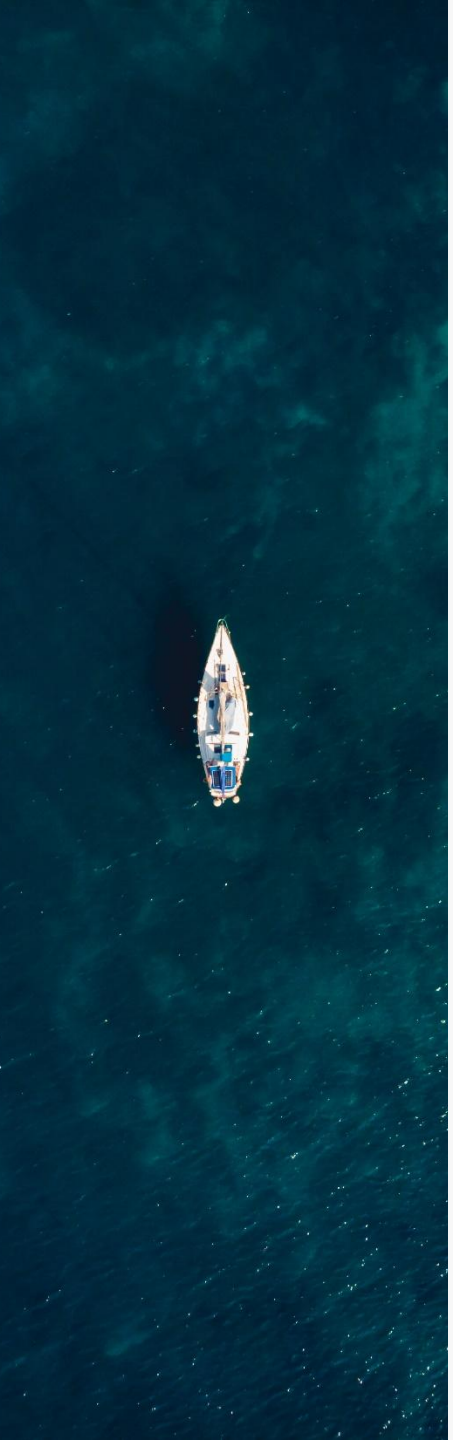
Steps to Good Reverse Logistics

1. PROCESS THE RETURN

When a consumer signals that they want to return an item, the return process begins.

This step should indicate the product's condition and authorize returns.

This method also includes scheduling return shipments, approving refunds, and swapping defective products.



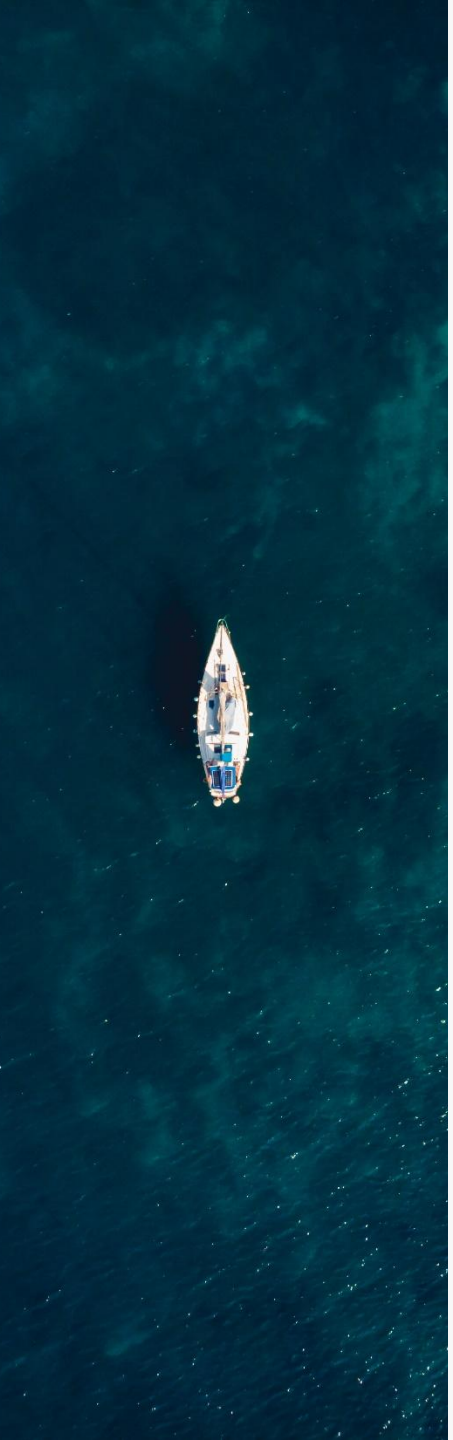
Steps to Good Reverse Logistics

2. TAKE CARE OF RETURNS

When a returned item arrives at your location or the centralized processing center, inspect it to determine what type of return it is.

NOTE: If your reverse logistics are optimized, you should know where the things are going before they arrive

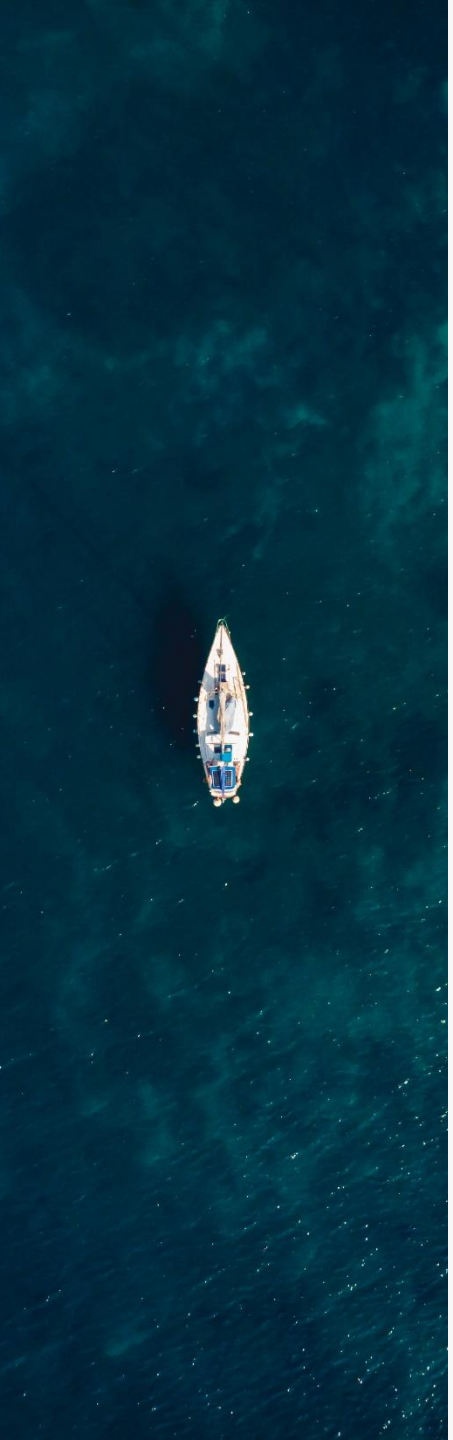
Sort things into the following categories: repair, resale as new, resale as a return, recycle, scrap, or refurbish.



Steps to Good Reverse Logistics

3. MOVE RETURNS AROUND

You may reduce your daily waste by delivering fixable items to the repair department.

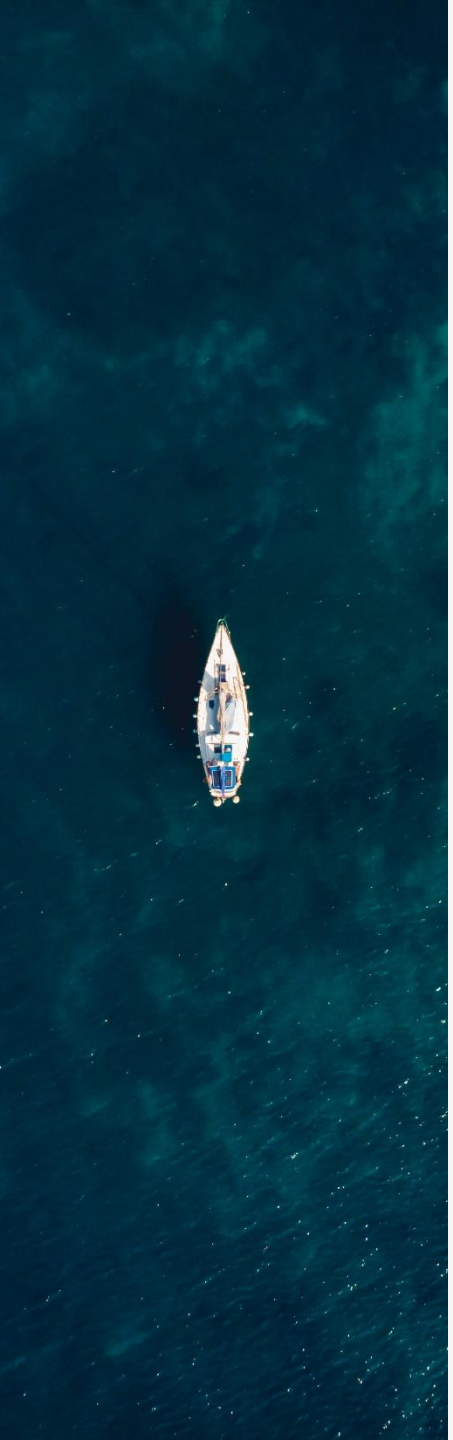


Steps to Good Reverse Logistics

4. REPAIR

After checking the returned item/equipment and assessing if it can be repaired, move it to the repair area.

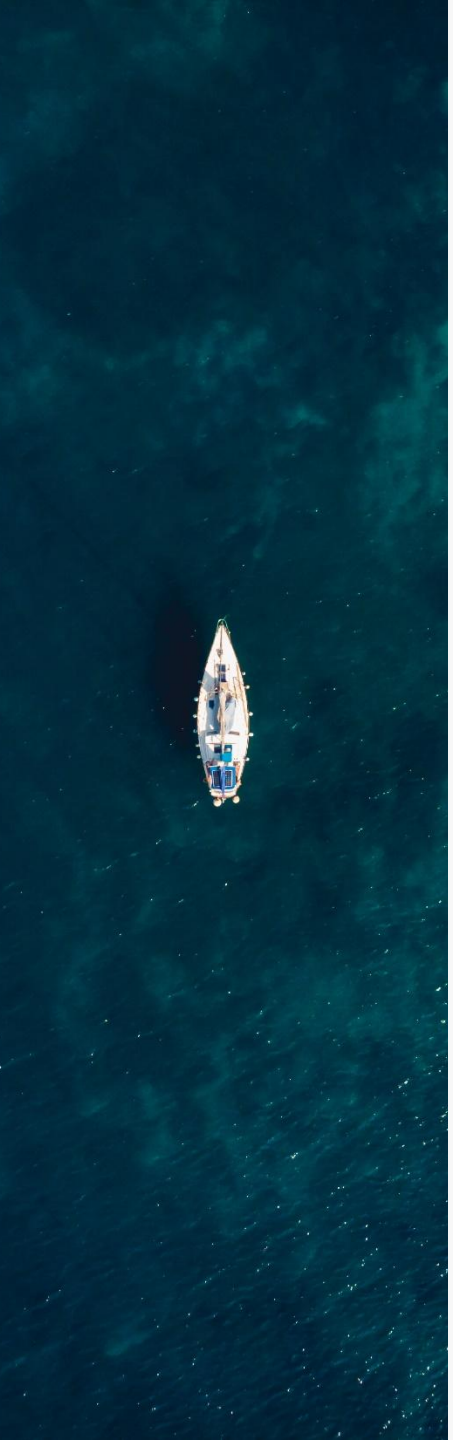
Sell any parts that can be sold if possible.



Steps to Good Reverse Logistics

5. RECYCLE

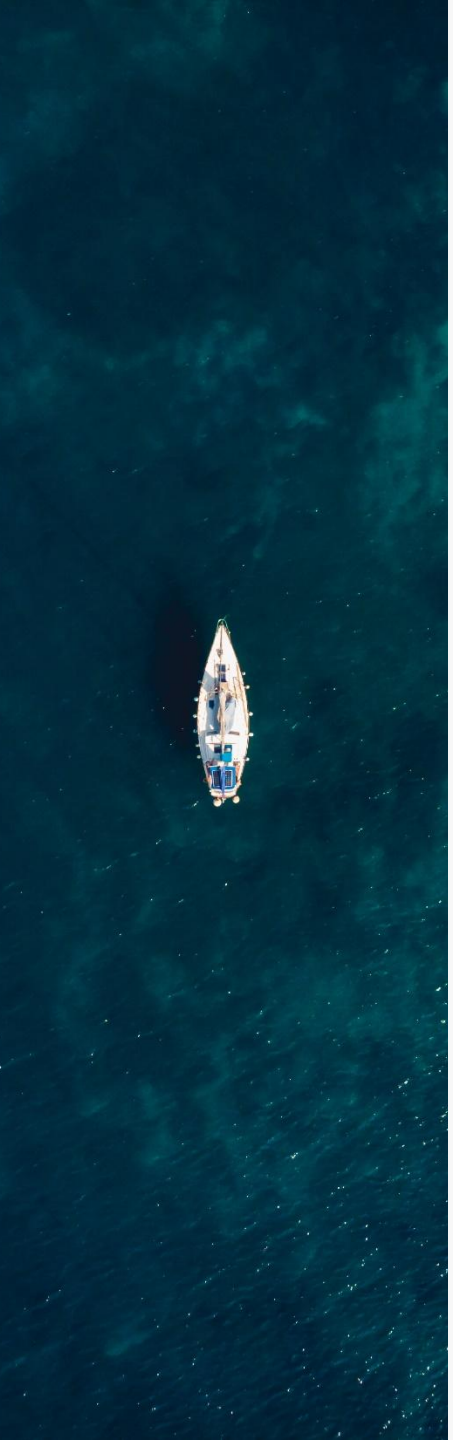
Send any items or components that you are unable to repair, reuse, or sell to a local recycling center.



Reverse Logistics Optimization

To optimize reverse logistics, companies need cohesive strategies that account for speed, efficiency and cost.

When taking action, consider policies, partners, data, capacity, logistics and transportation.



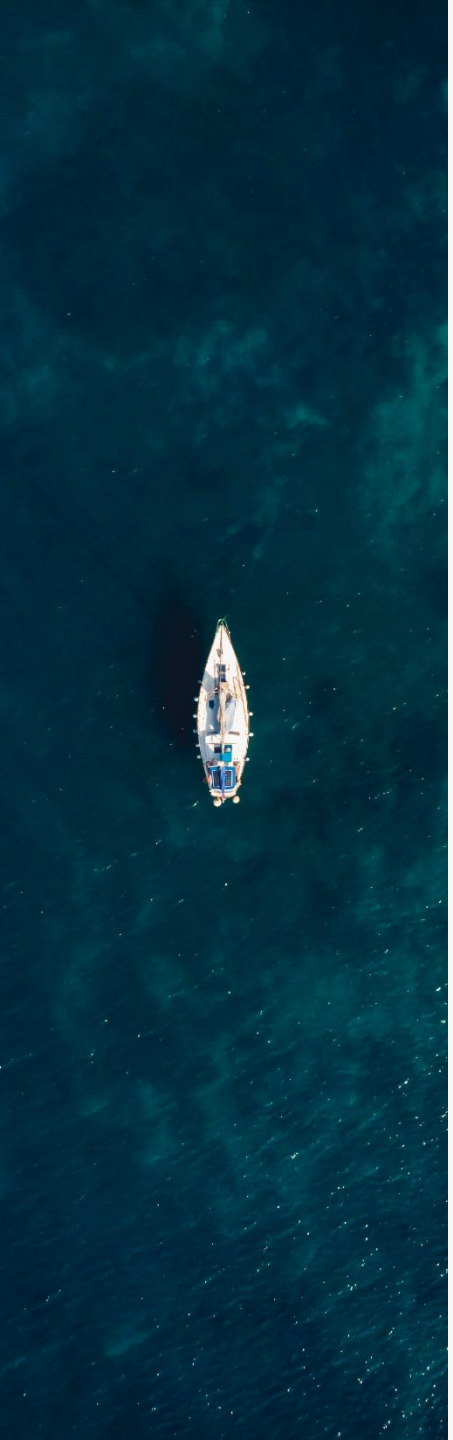
Optimization Strategies

EXAMINE THE RELEVANT LAWS AND AGREEMENTS

Examine and update your company's policy on returns and repairs.

These rules must be exact and take into account the primary causes for returns and repairs.

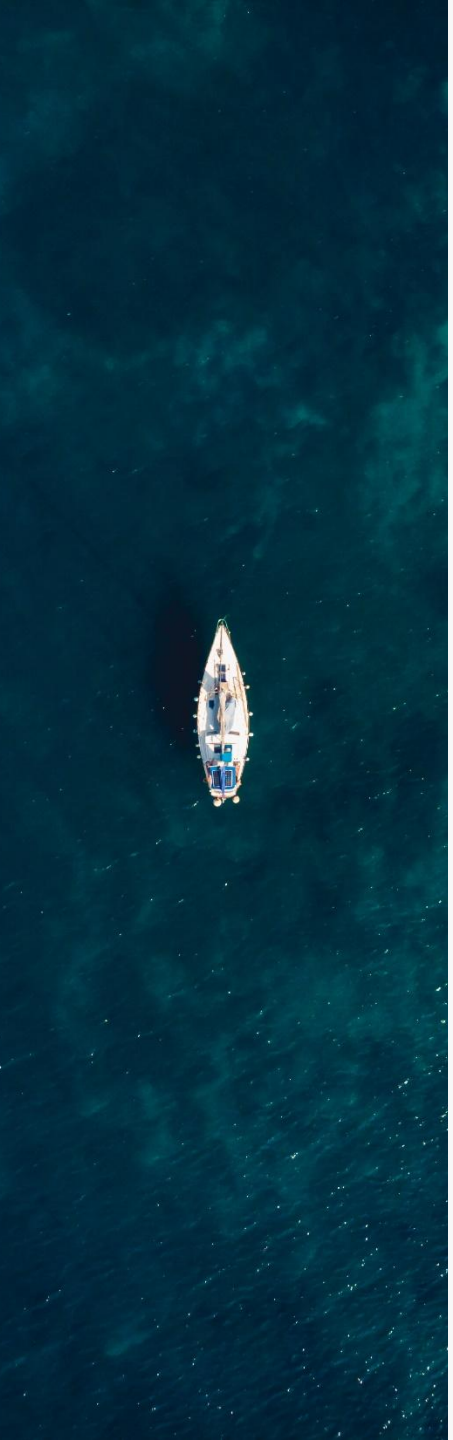
The return and repair policies of a company may set it apart from competitors.



Optimization Strategies

COLLABORATE WITH VENDORS

Working closely with suppliers may ensure that clients get a smooth, integrated experience rather than one that is difficult to navigate.

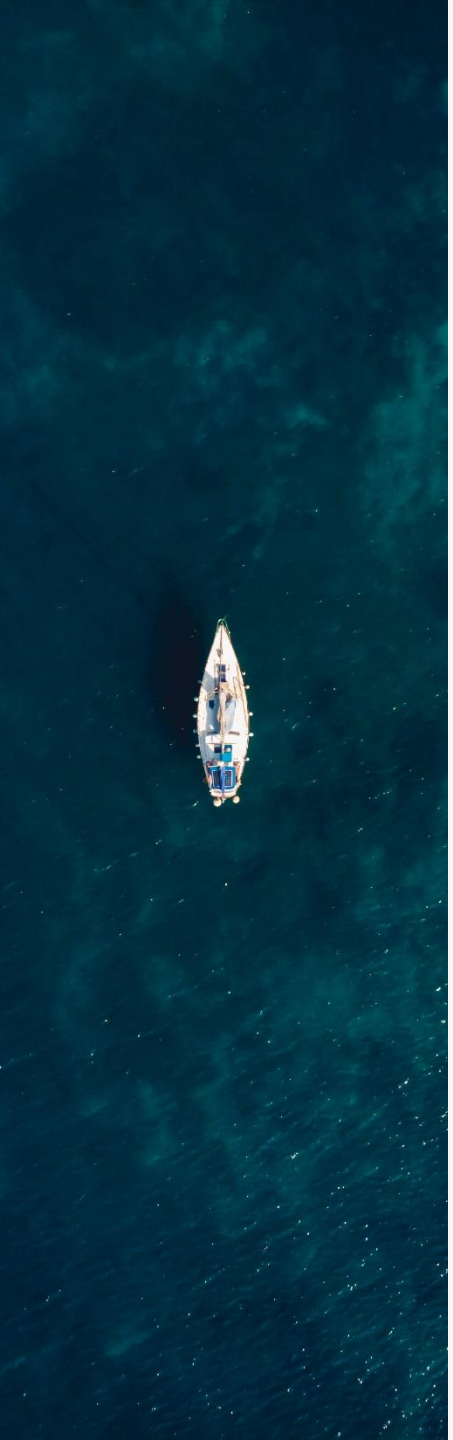


Optimization Strategies

SIMPLIFY OPERATIONS WITH DATA

By collecting return data, you may learn about the possible causes of product returns.

After that, you may make changes to your sales, product design, and forward logistics processes as needed.



Optimization Strategies

TRACK PRODUCTS BACK- & FORWARDS

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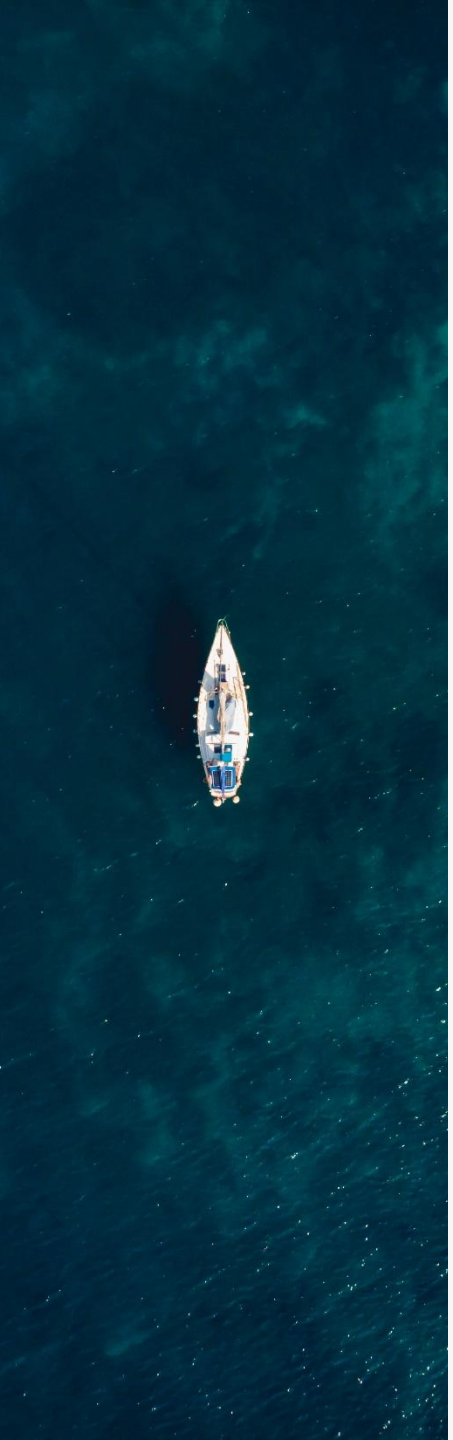
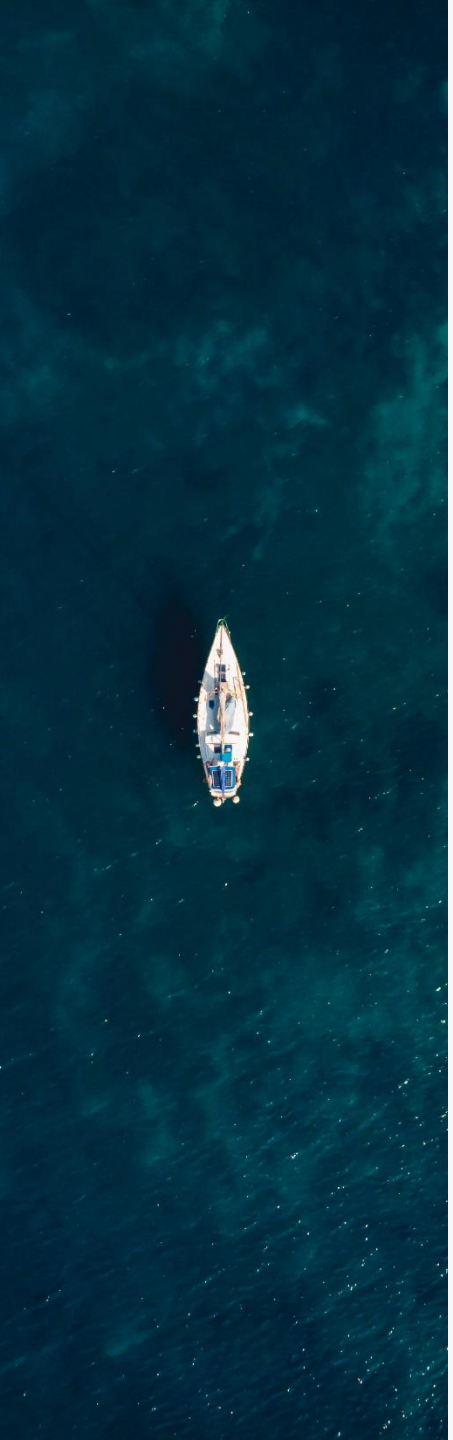
Big Data & Agriculture



Big Data in Agriculture

To optimize reverse logistics, companies need cohesive strategies that account for speed, efficiency and cost.

When taking action, consider policies, partners, data, capacity, logistics and transportation.

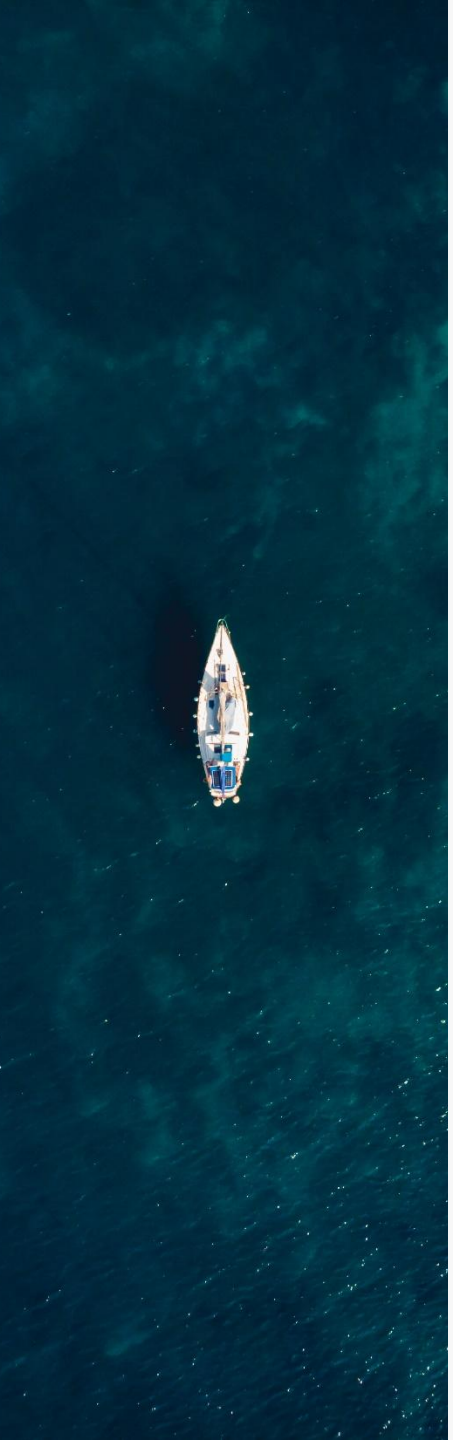


Big Data

WHAT IS IT?

Put simply, big data is larger, more complex data sets, especially from new data sources.

These data sets are so voluminous that traditional data processing software just can't manage them. But these massive volumes of data can be used to address business problems you wouldn't have been able to tackle before.



Big Data

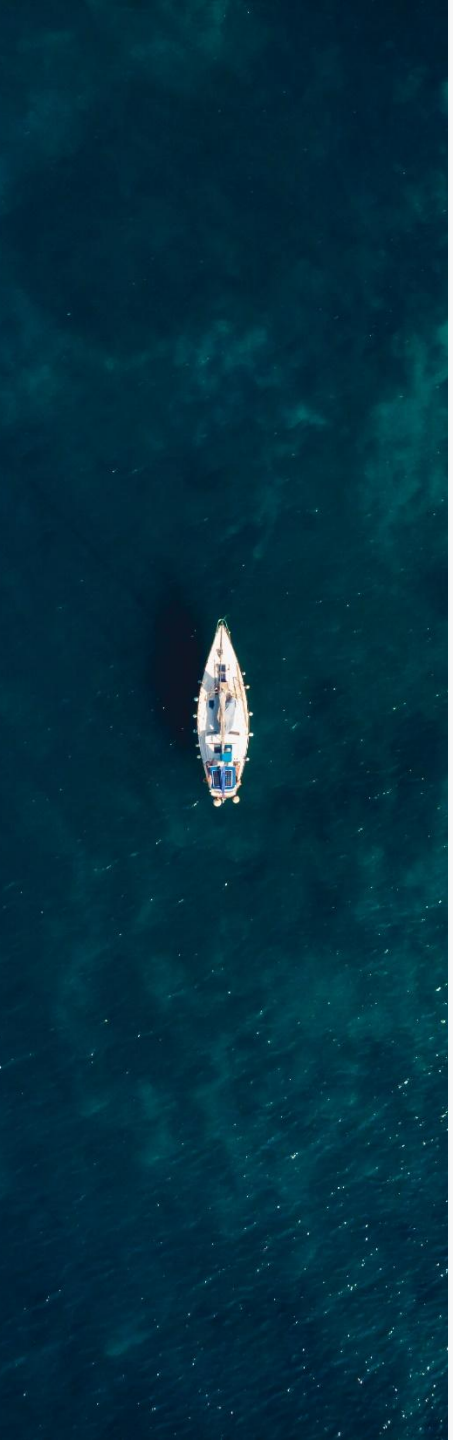
THE THREE Vs OF BIG DATA

Volume

The amount of data matters. With big data, you'll have to process high volumes of low-density, unstructured data.

This can be data of unknown value, such as Twitter data feeds, clickstreams on a web page or a mobile app, or sensor-enabled equipment.

For some organizations, this might be tens of terabytes of data. For others, it may be hundreds of petabytes.



Big Data

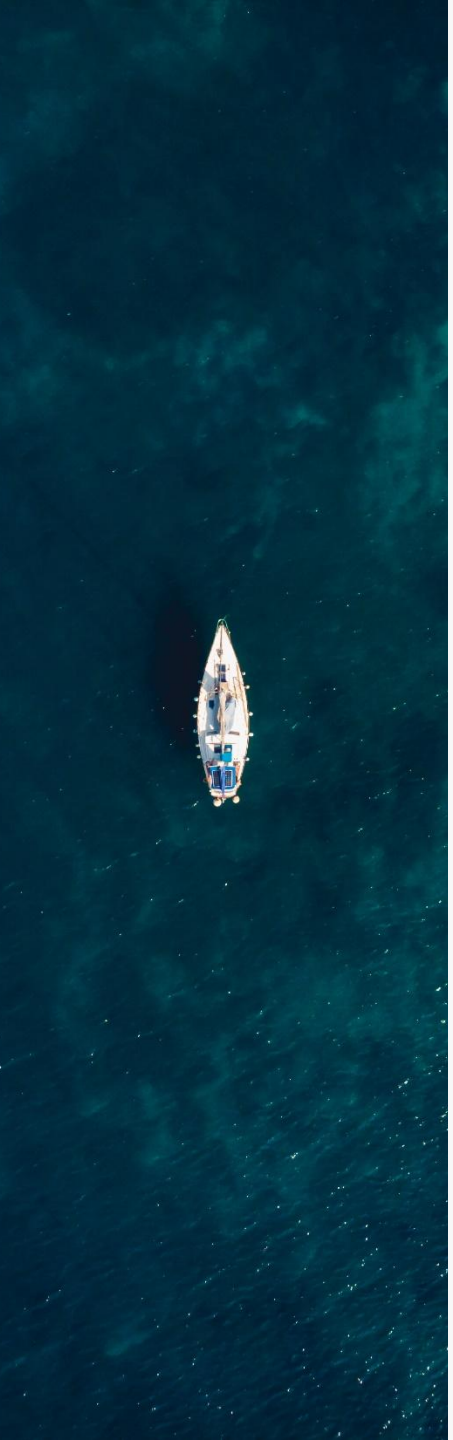
THE THREE Vs OF BIG DATA

Velocity

Velocity is the fast rate at which data is received and (perhaps) acted on.

Normally, the highest velocity of data streams directly into memory versus being written to disk.

Some internet-enabled smart products operate in real time or near real time and will require real-time evaluation and action.



Big Data

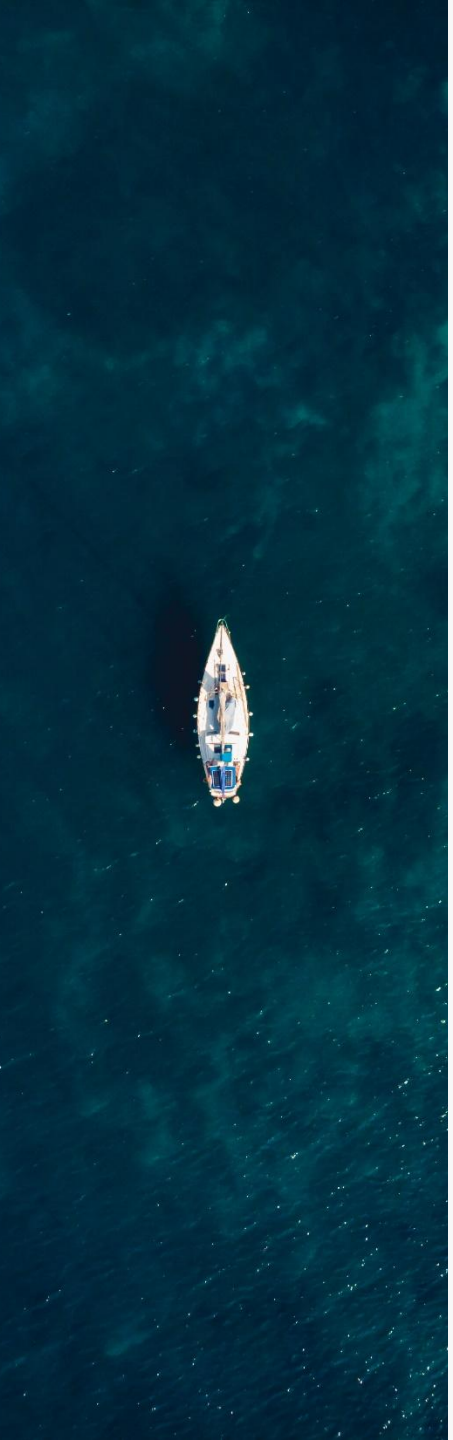
THE THREE Vs OF BIG DATA

Variety

Variety refers to the many types of data that are available.

Traditional data types were structured and fit neatly in a relational database. With the rise of big data, data comes in new unstructured data types.

Unstructured and semi-structured data types, such as text, audio, and video, require additional preprocessing to derive meaning and support metadata.



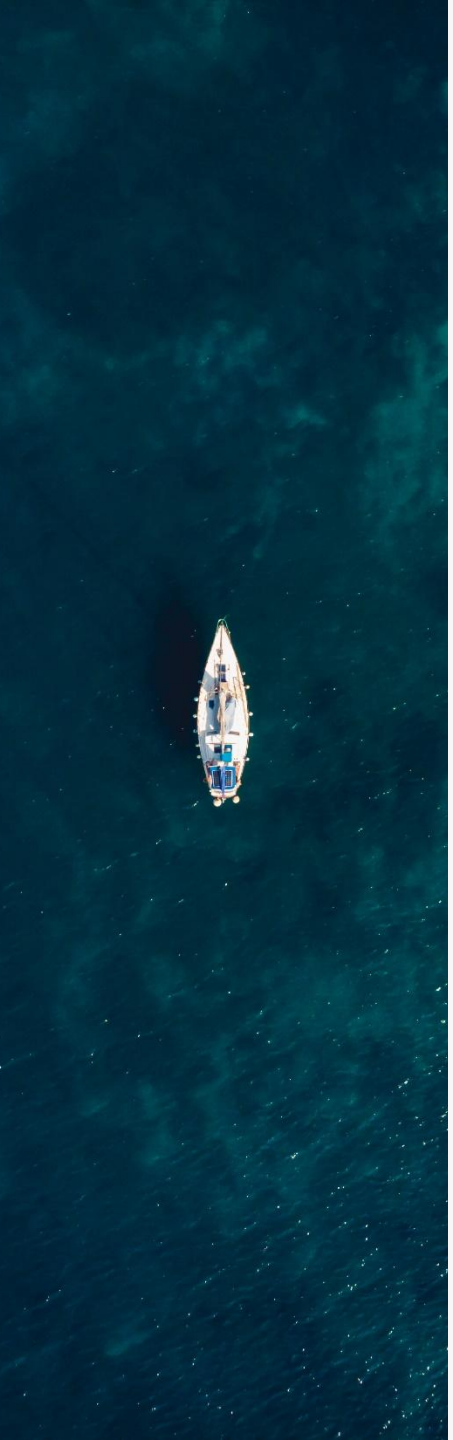
Big Data on the Farm

FEEDING A GROWING POPULATION

This is one of the key challenges that even governments are putting their heads together to solve. One way to achieve this is to increase the yield from existing farmlands.

Big data provides farmers granular data on rainfall patterns, water cycles, fertilizer requirements, and more.

This enables them to make smart decisions, such as what crops to plant for better profitability and when to harvest. The right decisions ultimately improve farm yields.



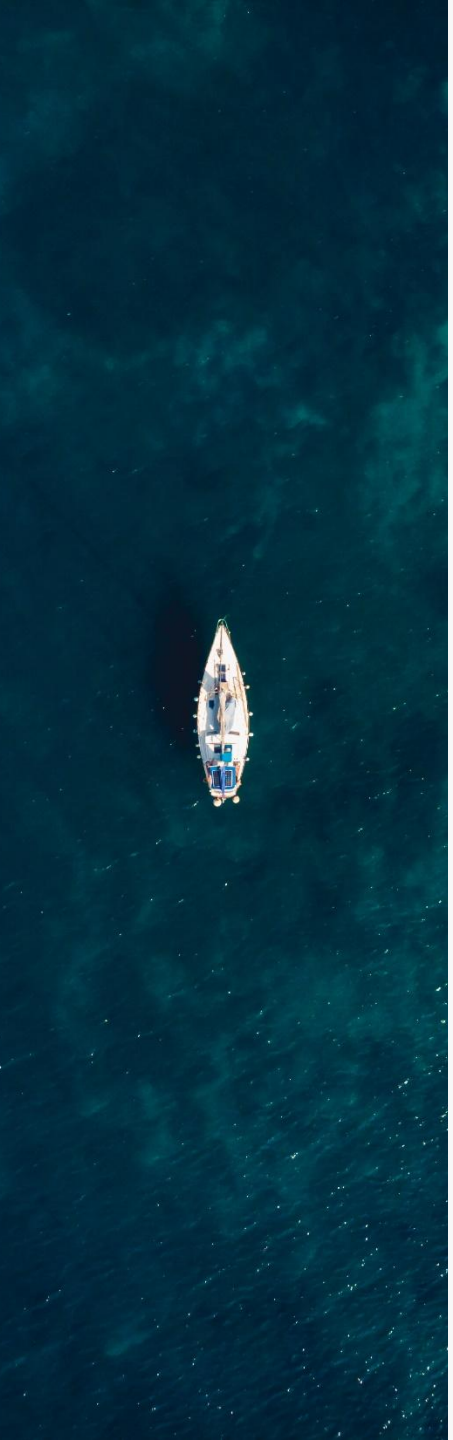
Big Data on the Farm

USING PESTICEDS ETHICALLY

Administration of pesticides has been a contentious issue due to its side effects on the ecosystem.

Big data allows farmers to manage this better by recommending what pesticides to apply, when, and by how much.

By monitoring it closely, farmers can adhere to government regulations and avoid overuse of chemicals in food production. Moreover, this leads to increased profitability because crops don't get destroyed by weeds and insects.



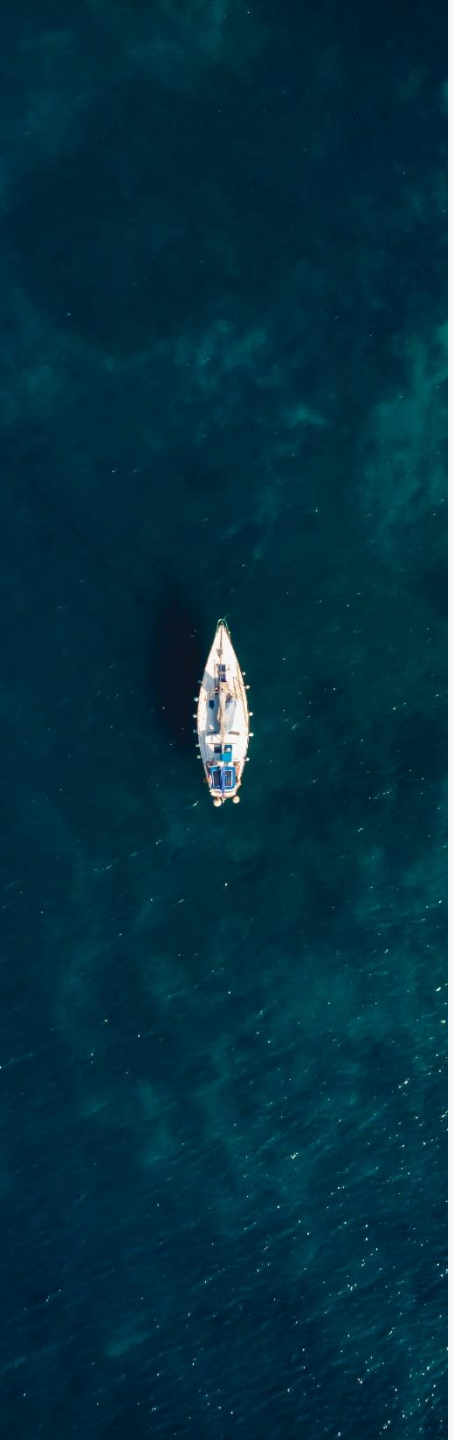
Big Data on the Farm

OPTIMIZING FARM EQUIPMENT

Companies like John Deere have integrated sensors in their farming equipment and deployed big data applications that will help better manage their fleet.

For large farms, this level of monitoring can be a lifesaver as it lets users know of tractor availability, service due dates, and fuel refill alerts.

In essence, this optimizes usage and ensure the long-term health of farm equipment.



Big Data on the Farm

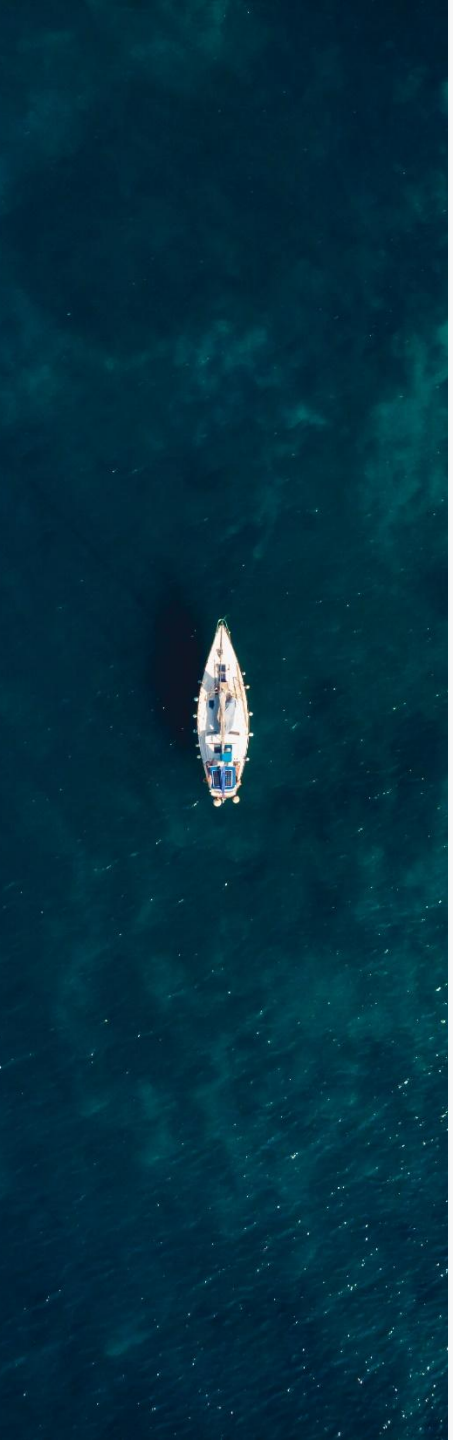
MANAGING SUPPLY CHAIN ISSUES

McKinsey reports that a third of food produced for human consumption is lost or wasted every year.

A devastating fact since the industry struggles to bridge the gap between supply and demand. To address this, food delivery cycles from producer to the market need to be reduced.

Big data can help achieve supply chain efficiencies by tracking and optimizing delivery truck routes.

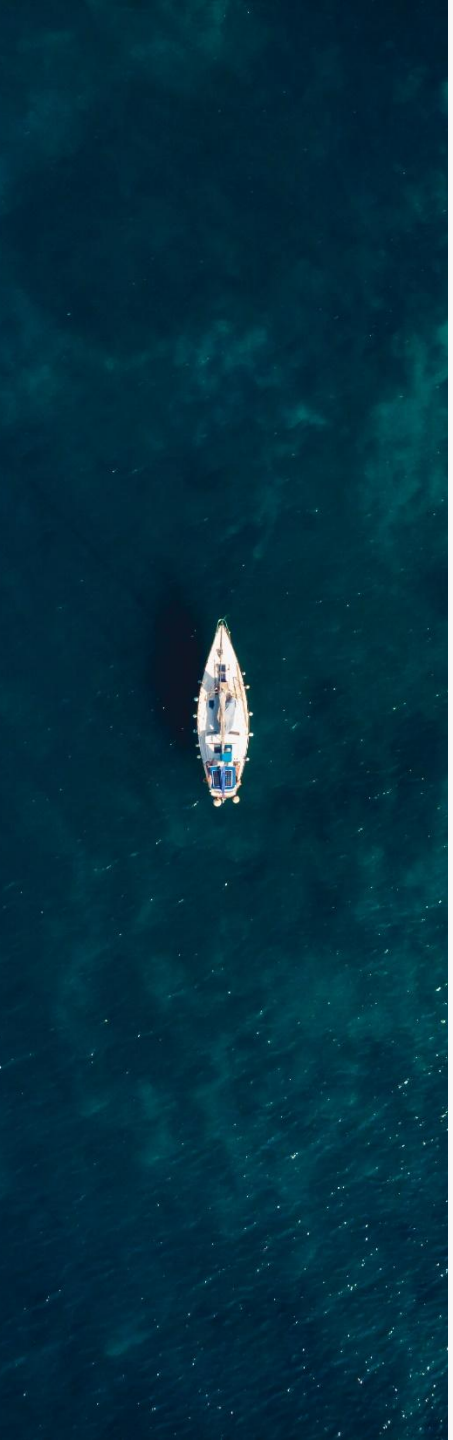
Internet of Things (IoT) & Agriculture



Internet of Things (IoT) & Agriculture

IoT smart agriculture products are designed to help monitor crop fields using sensors and by automating irrigation systems.

As a result, farmers and associated brands can easily monitor the field conditions from anywhere without any hassle.



Internet of Things (IoT)

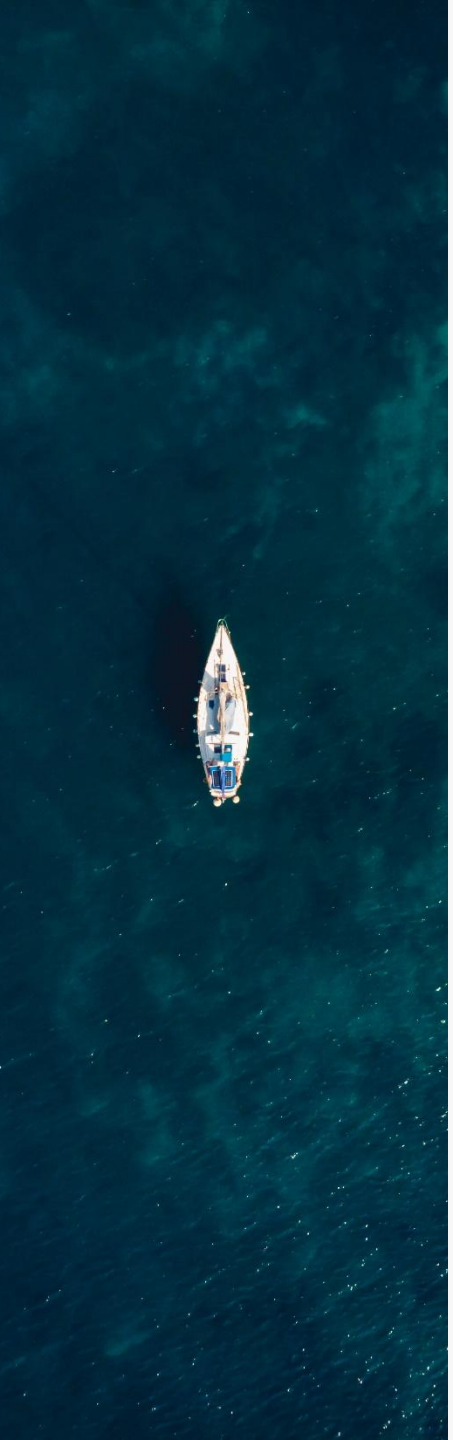
WHAT IS IT?

IoT is the abbreviated form of the Internet of Things.

IoT is a broad terminology given to every object that can relay information when connected to the network.

Agriculture implements IoT through the use of robots, drones, sensors, and computer imaging integrated with analytical tools for getting insights and monitoring the farms.

Placement of physical equipment on farms monitors and records data, which is then used to get valuable insights.



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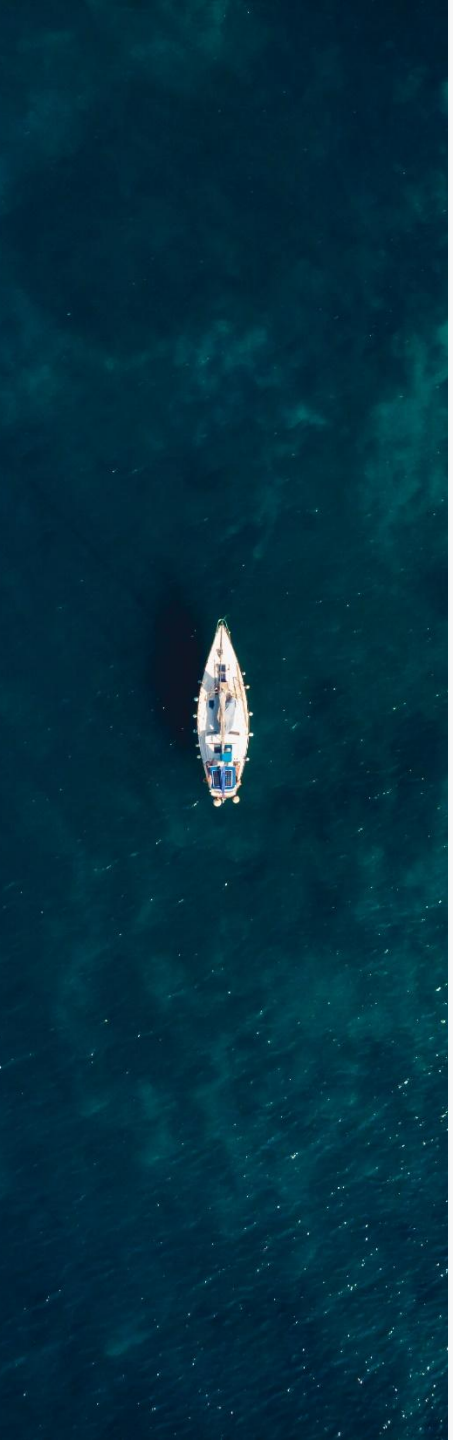


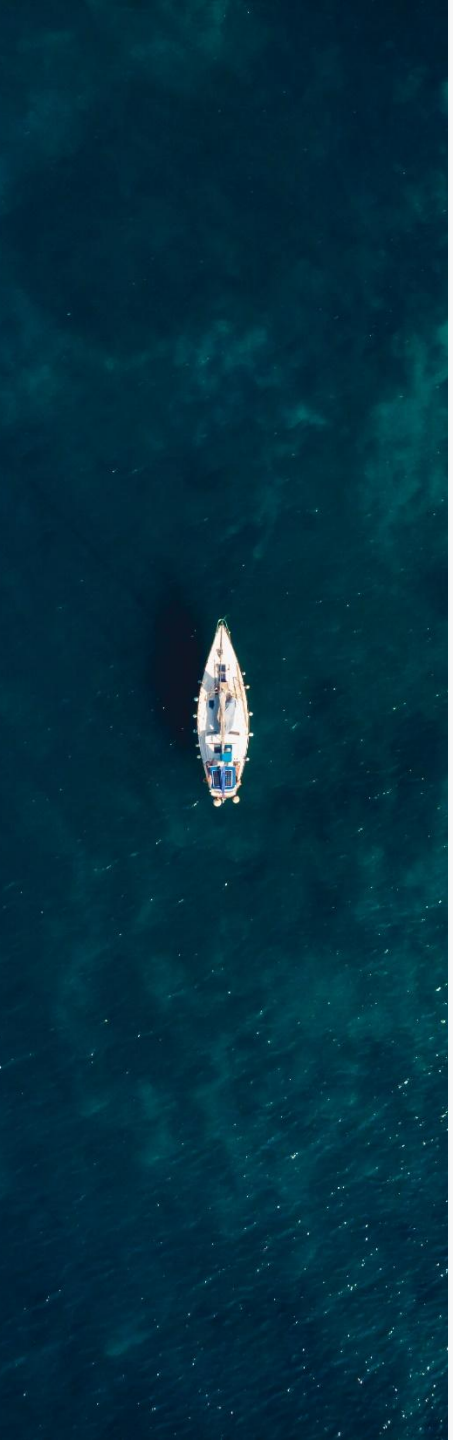
IoT & Agriculture

ROBOTICS

Since the industrial revolution in the 1800s, automation got more advanced to efficiently handle sophisticated tasks and increase production.

With increasing demands and shortage of labor across the globe, agriculture robots or commonly known as Agribots are starting to gain attention among farmers.

Recent advancements in sensors and AI technology that lets machines train on their surroundings have made agrobots more notable.



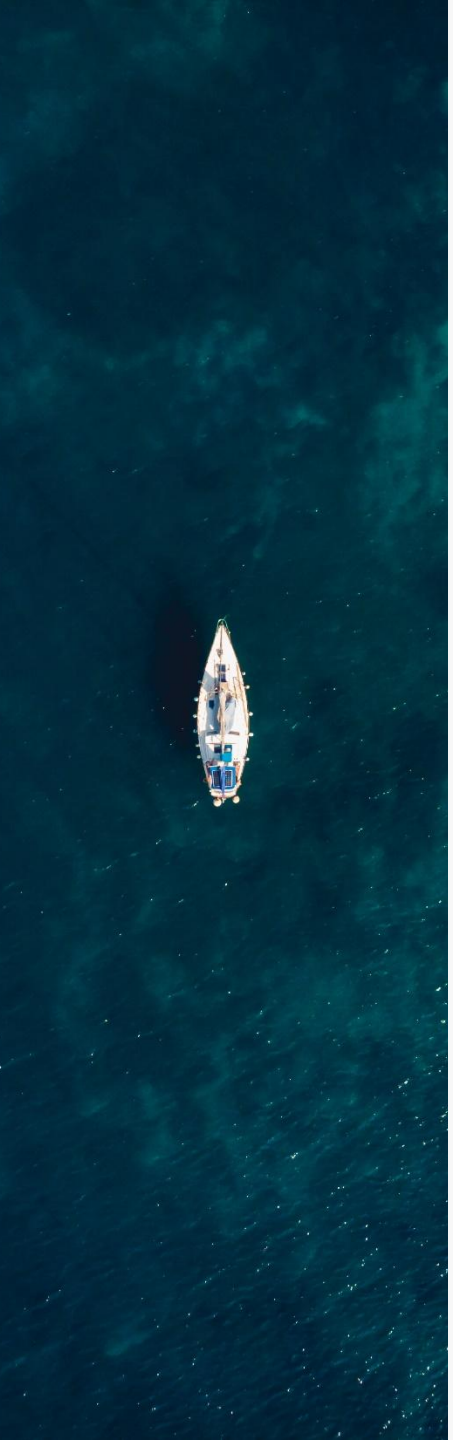
IoT & Agriculture

ROBOTICS

Weeding Robots

These smart Agri robots use digital image processing to look through the images of weeds in their database to detect similarities with crops and weed out or spray them directly with their robotic arms.

With an increasing number of plants becoming resistant to pesticides they are a boon to the environment and also to farmers who used to spread the pesticides throughout the farm.



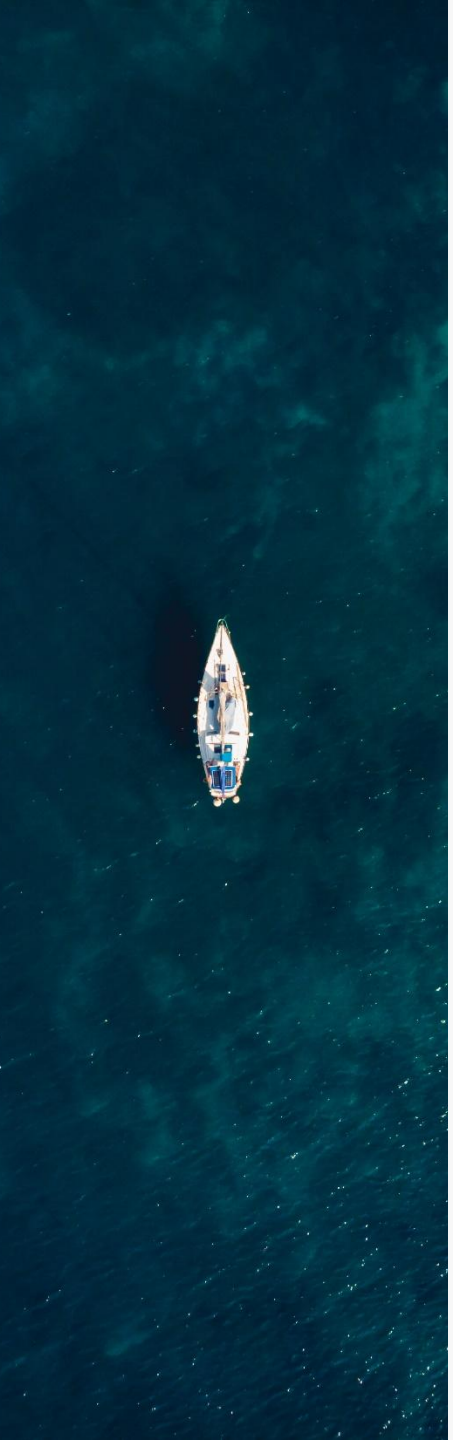
IoT & Agriculture

ROBOTICS

Machine Navigation

As remote-controlled toy cars are enabled with a controller, tractors and heavy plowing equipment can be run automatically from the comfort of home through GPS.

With advancements in IoT in Agricultural and machine learning, these tech-driven motors are enabling Advanced farming using IoT independently with features such as automatic obstacle detection.



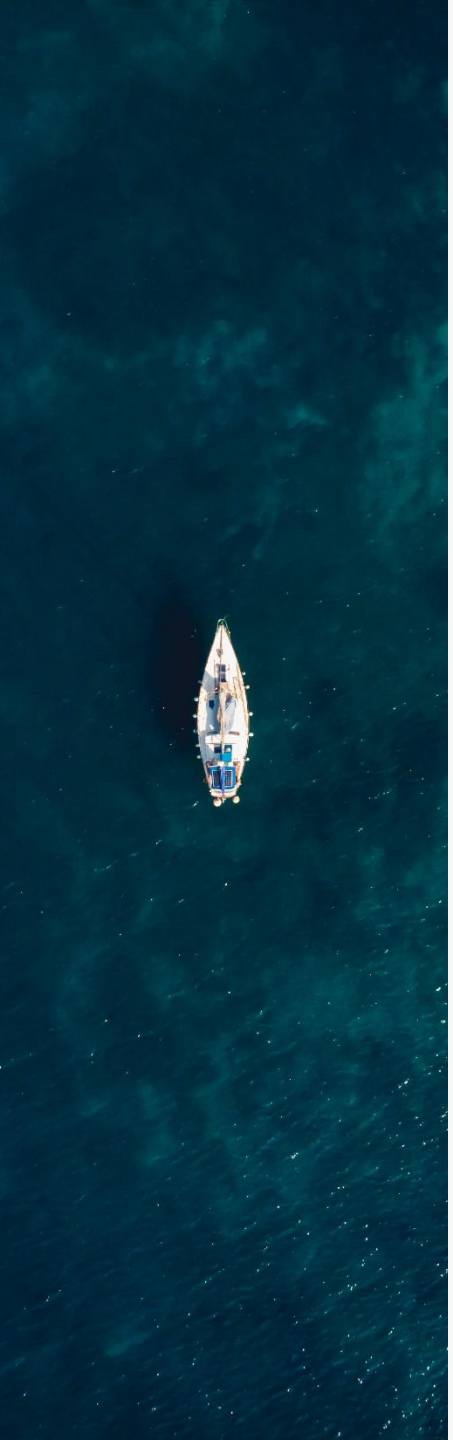
IoT & Agriculture

ROBOTICS

Harvesting Robotics

Utilizing agribots to pick crops is solving the problem of labor shortages and can operate 24/7.

These bots can work in greenhouses to aptly determine the stage of crops and harvest them at the right time.



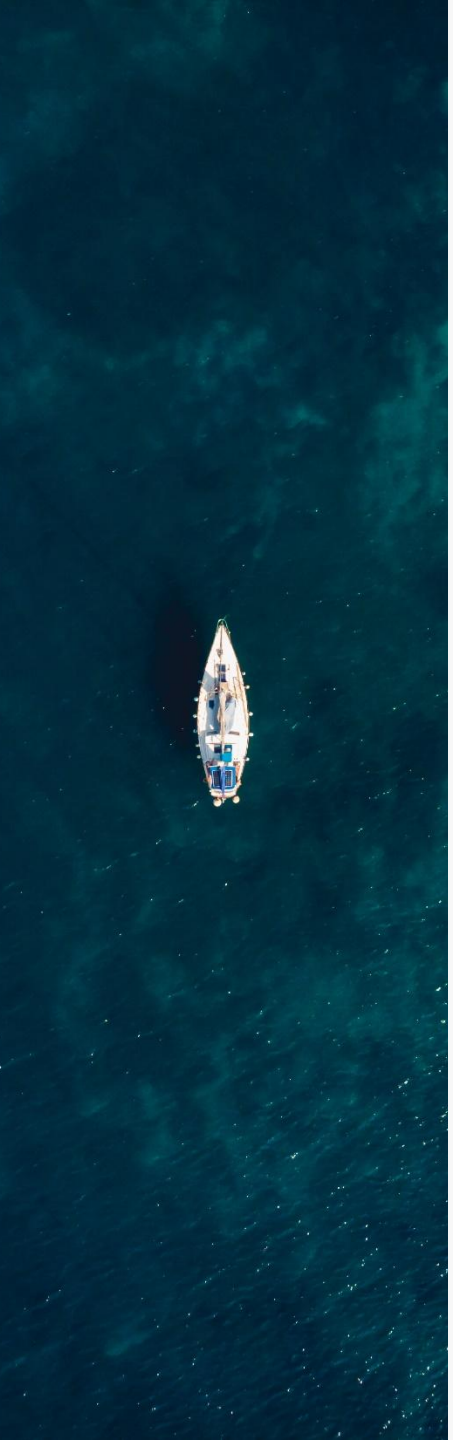
IoT & Agriculture

ROBOTICS

Material Handling

Robots can perform dreaded manual labor tasks working alongside the labors.

They can lift heavy materials and perform tasks like plant spacing with high accuracy, therefore optimizing the space and plant quality and reducing production costs.



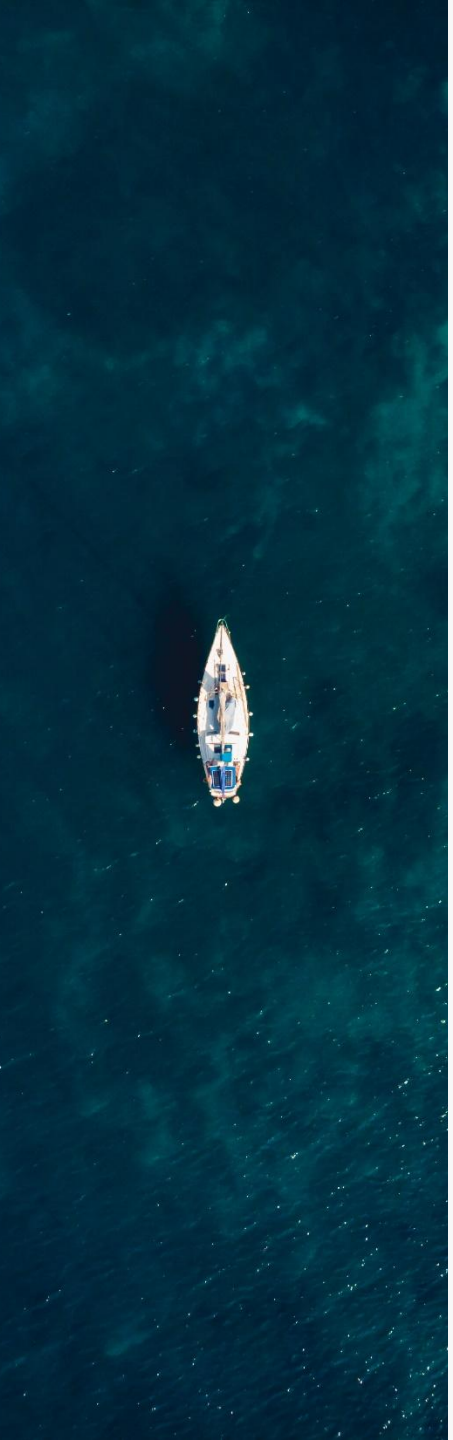
IoT & Agriculture

DRONES

Agriculture is one of the major sectors to incorporate drones. Drones equipped with sensors and cameras are used for imaging, mapping, and surveying farms.

From the drone data, insights can be drawn regarding crop health, irrigation, spraying, planting, soil and field, plant counting, yield prediction, and much more.

Drones can either be scheduled for farm surveys (drone as a service) or can be bought and stored near farms where they can be recharged and maintained.



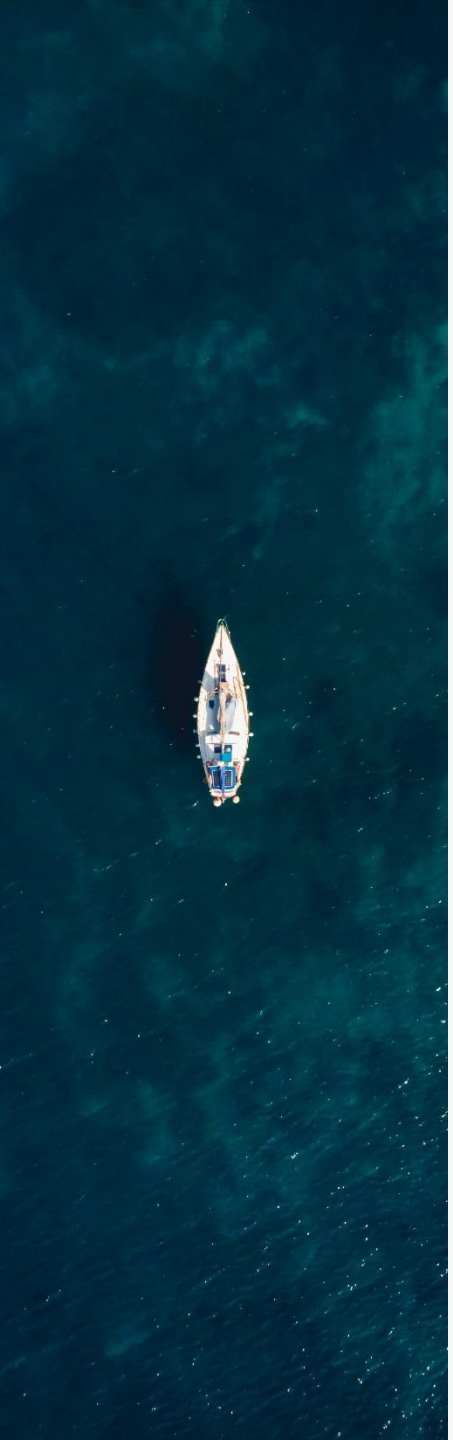
IoT & Agriculture

REMOTE SENSING

Sensors are devices sensitive to anomalies. Farmers can monitor the crops from the analytical dashboard and take action based on insights.

Remote sensing in agriculture is revolutionizing the way data is acquired from different nodes in a field.

Farmers can monitor the crops from the analytical dashboard and take action based on insights.



IoT & Agriculture

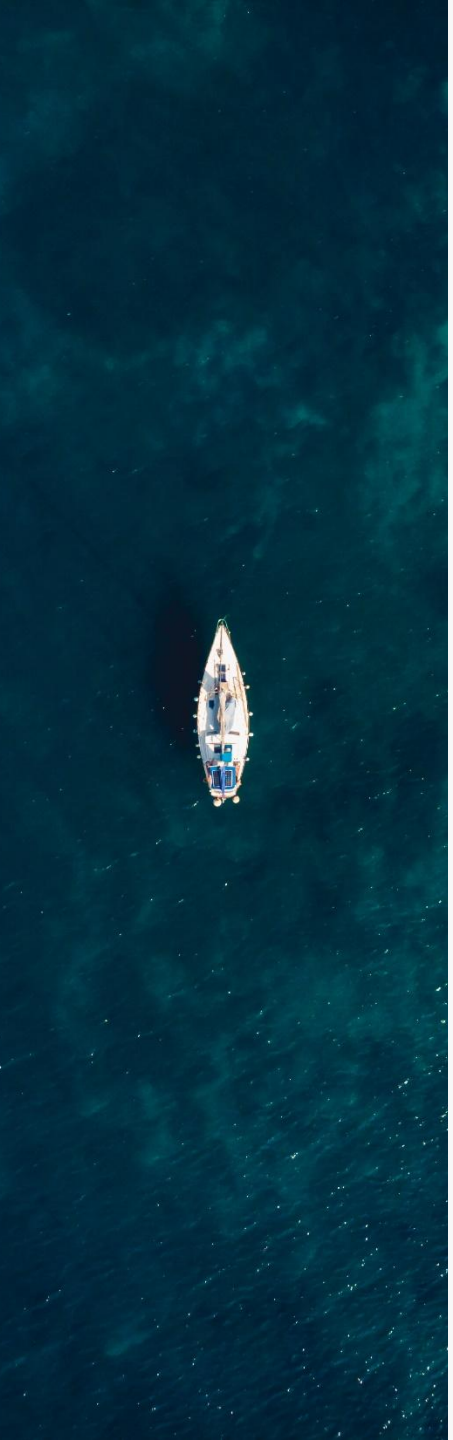
REMOTE SENSING

Crop Monitoring

Sensors placed along the farms monitor the crops for changes in light, humidity, temperature, shape, and size.

Any anomaly detected by the sensors is analyzed and the farmer is notified.

Thus remote sensing can help prevent the spread of diseases and keep an eye on the growth of crops.

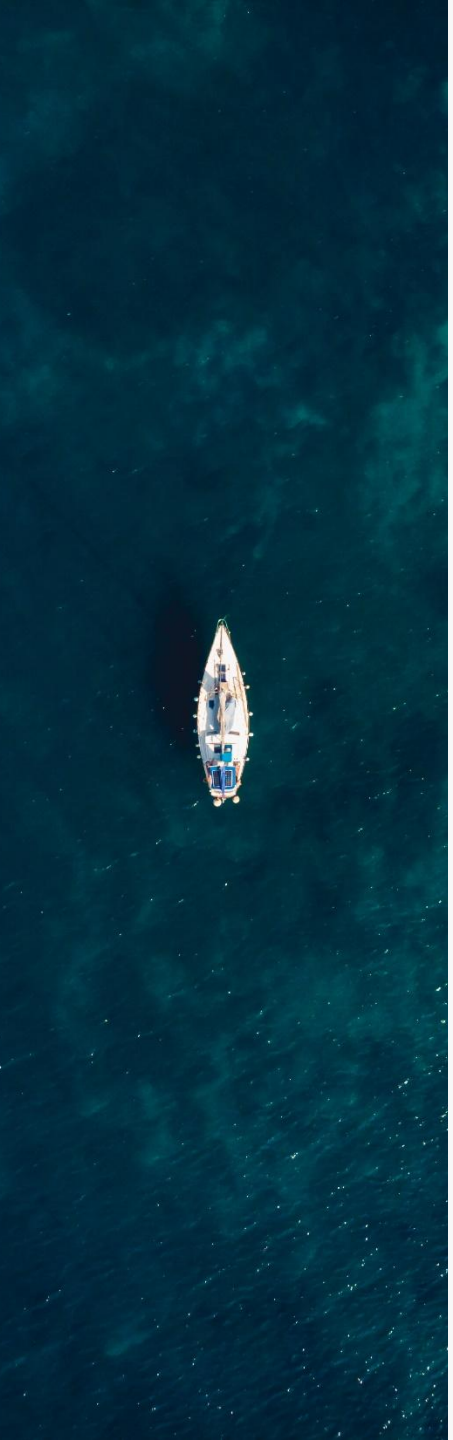


IoT & Agriculture

REMOTE SENSING

Weather Conditions

The data collected by sensors in terms of humidity, temperature, moisture precipitation, and dew detection helps in determining the weather pattern in farms so that cultivation is done for suitable crops.

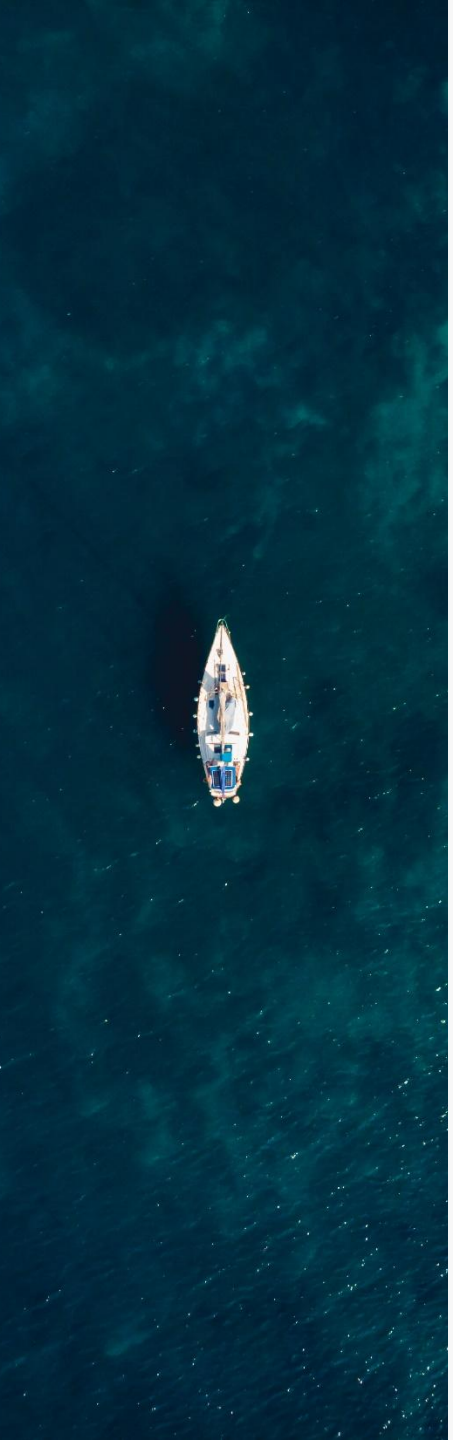


IoT & Agriculture

REMOTE SENSING

Soil Quality

Soil health analysis helps in determining the nutrient value and drier areas of farms, soil drainage capacity, or acidity, which allows to adjustment of the amount of water needed for irrigation and the opt most beneficial type of cultivation.



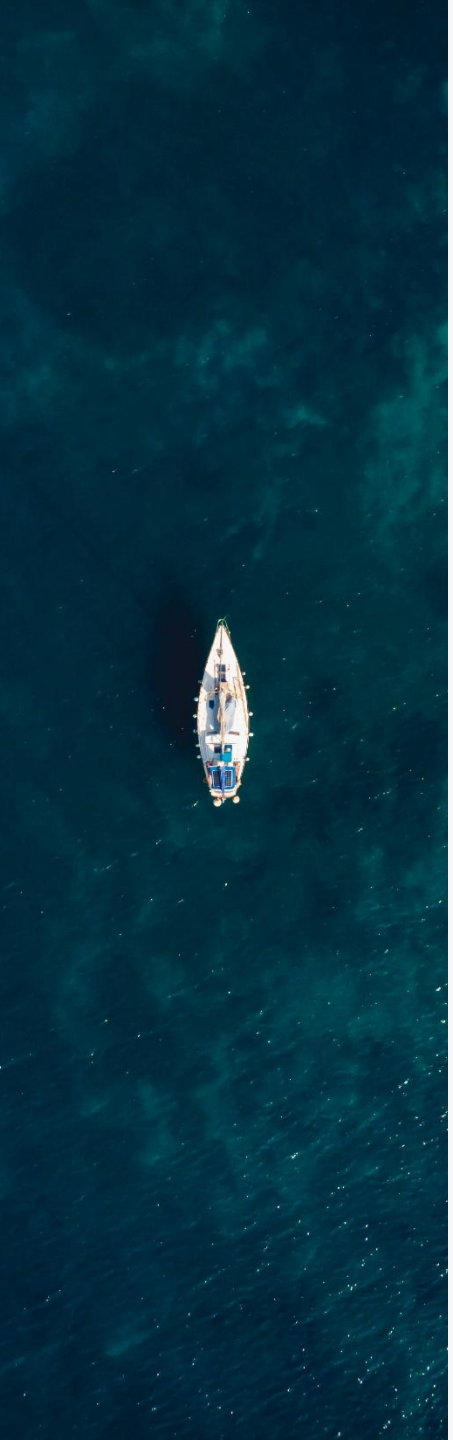
IoT & Agriculture

COMPUTER IMAGING

Computer imaging involves the use of sensor cameras installed at different corners of the farm or drones equipped with cameras to produce images that undergo digital image processing.

Digital image processing is the basic concept of processing an input image using computer algorithms.

Image processing views the images in different spectral intensities such as infrared, compares the images obtained over a period of time, and detects anomalies, thus analyzing limiting factors and helping a better management of farms.

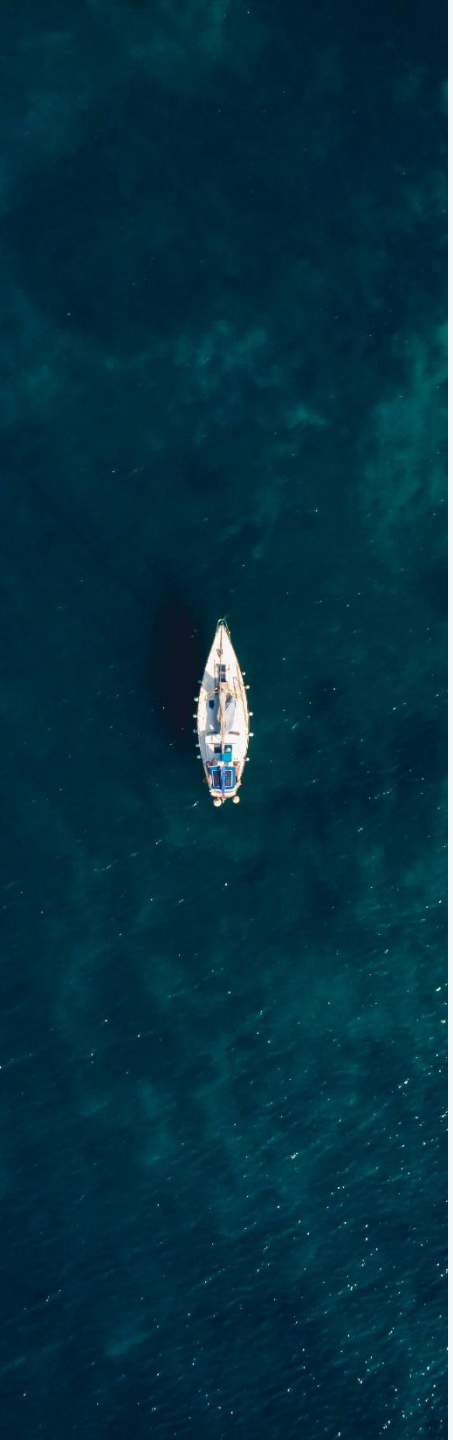


IoT & Agriculture

COMPUTE IMAGING

Quality Control

Image processing combined with machine learning uses images from database to compare with images of crops to determine the size, shape, color and growth therefore controlling the quality.

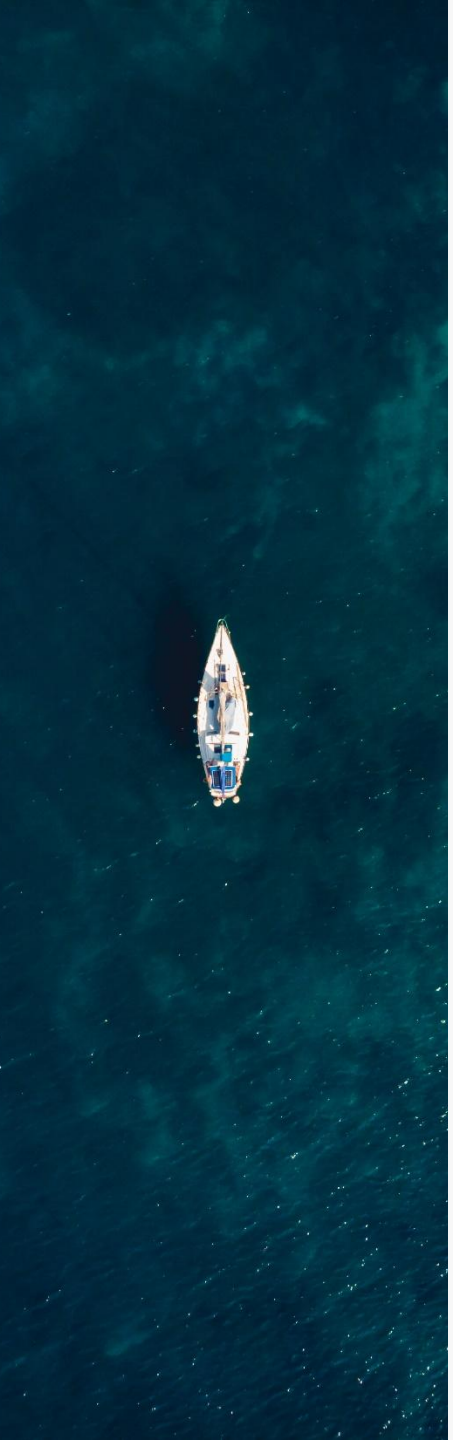


IoT & Agriculture

COMPUTE IMAGING

Sorting & Grading

Post harvest, computer imaging can increase accuracy and time-efficiency of sorting and grading agricultural and food products based on their size, texture, color and shape.



IoT & Agriculture

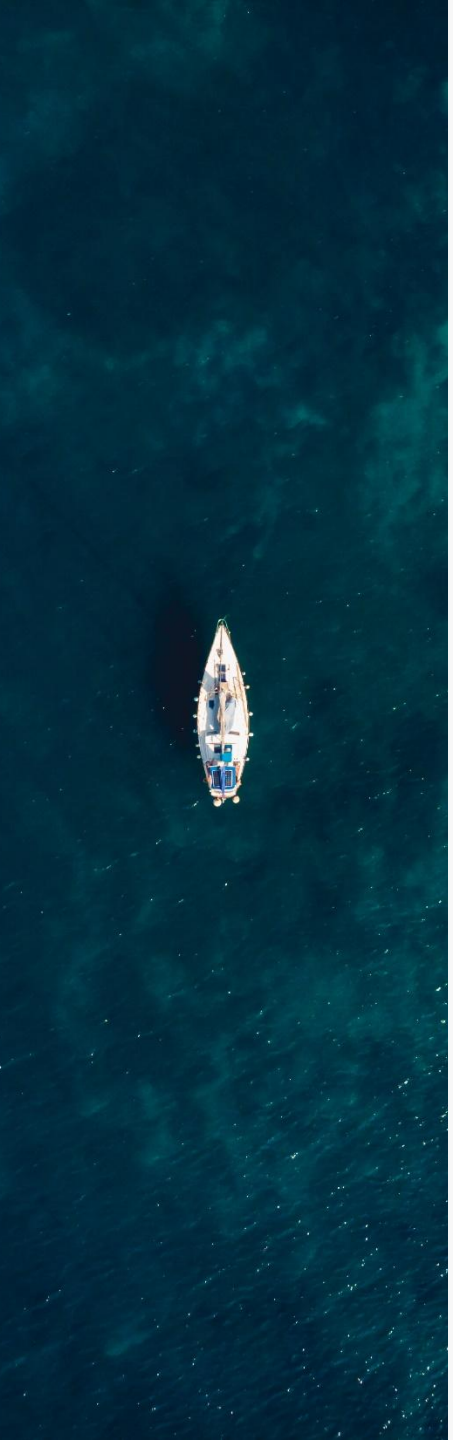
COMPUTE IMAGING

Irrigation Monitoring

Irrigation monitoring over a period of time helps in mapping irrigated lands.

It also enables optimum irrigation scheduling based on soil moisture conditions, varying weather patterns, and plant physiological conditions.

Big Data & IoT
In Agri Food

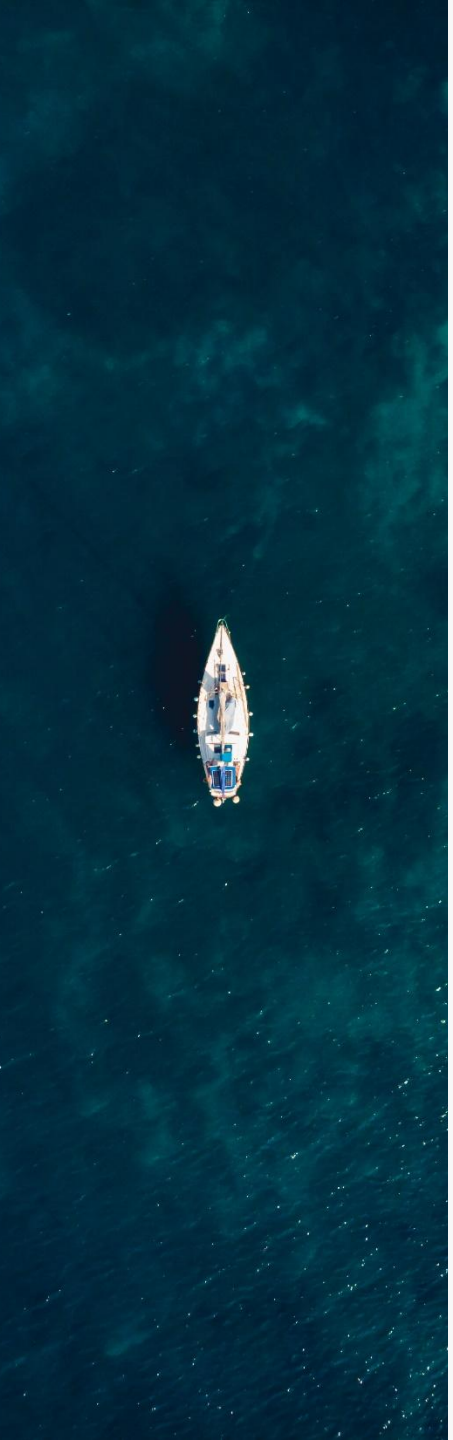


Big Data & IoT In Agri Food

Technologies empower manufacturers to reduce costs, save time and ultimately become more profitable.

Technology allows companies to capture data to identify potential risks and issues along their entire supply chain.

As a result, they can continually optimize their operations and function more efficiently and, as a result, becoming more efficient in the long run.

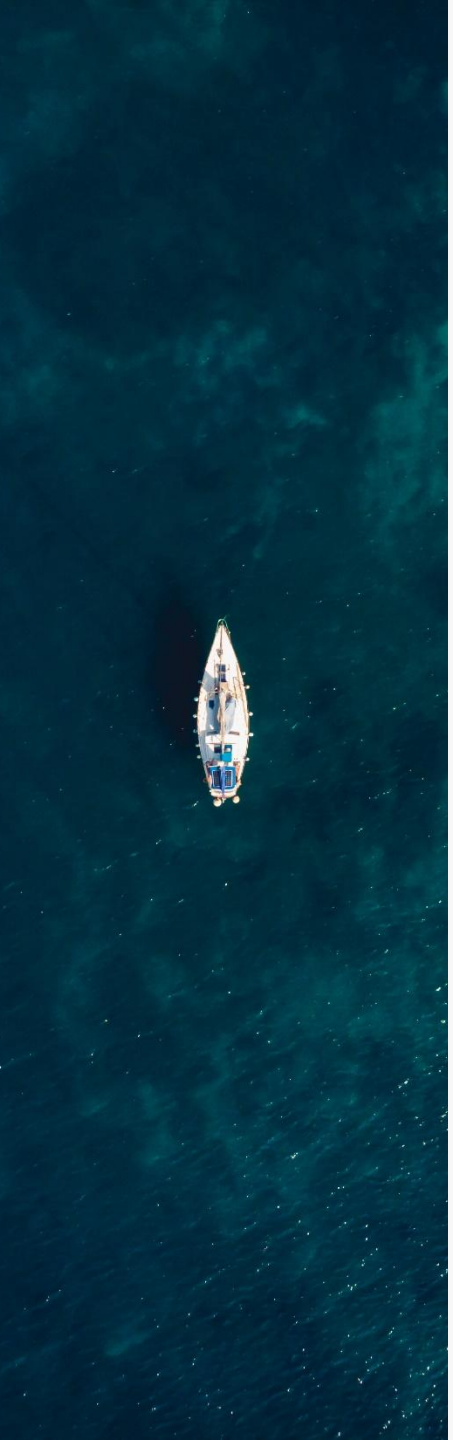


Big Data & IoT Agri
Food Logistic Efficiency

PRODUCTION & PROCESSING

By monitoring ingredients' temperatures, flow rates and distributions with the help of smart valves and actuators in the production stage, manufacturers can maximize their regulatory processes and product quality.

This technology is especially valuable for manufacturing plants with multiple product lines and thus need to initiate seamless, resource-efficient changeovers.



Big Data & IoT Agri Food Logistic Efficiency

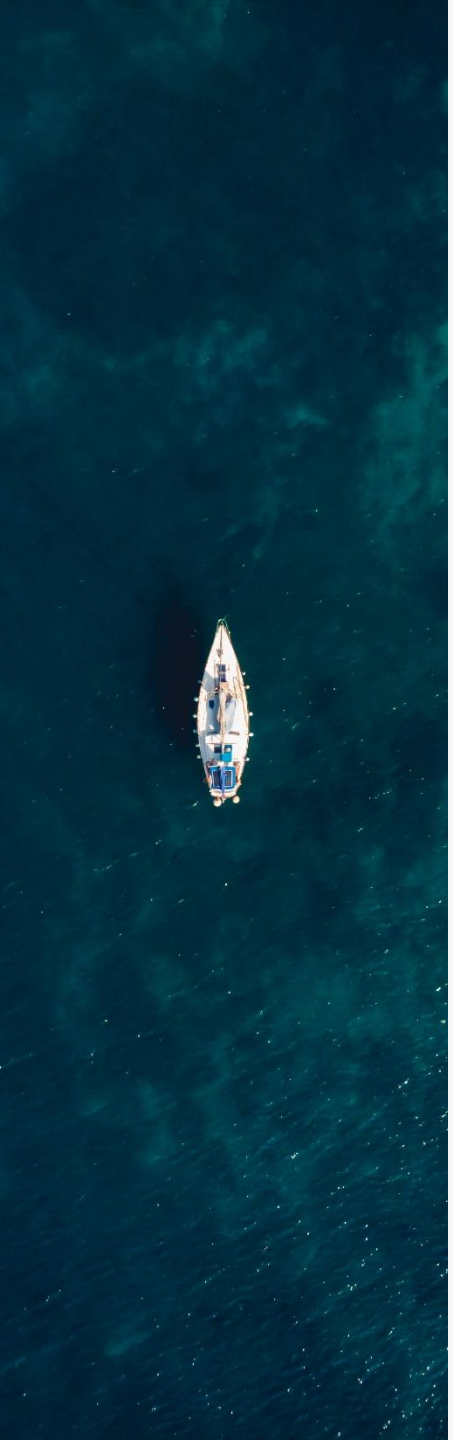
INVENTORY MANAGEMENT

Sensors allow for real-time tracking of products even when they are in storage.

IoT automation in warehouses allows food storage to be easily organized into zones to avoid issues that arise through poor handling or pests.

By using moving robots or ultrasonic systems, pests can be identified much more efficiently than if one relies merely on the human eye.

Data retrieved from pressure-sensitive sensors, food manufacturers can also track customers' behavioral trends and use this information to avoid shortages down the line. This is especially helpful with foods that are subject to seasonality, such as cocoa in the lead-up to Christmas.



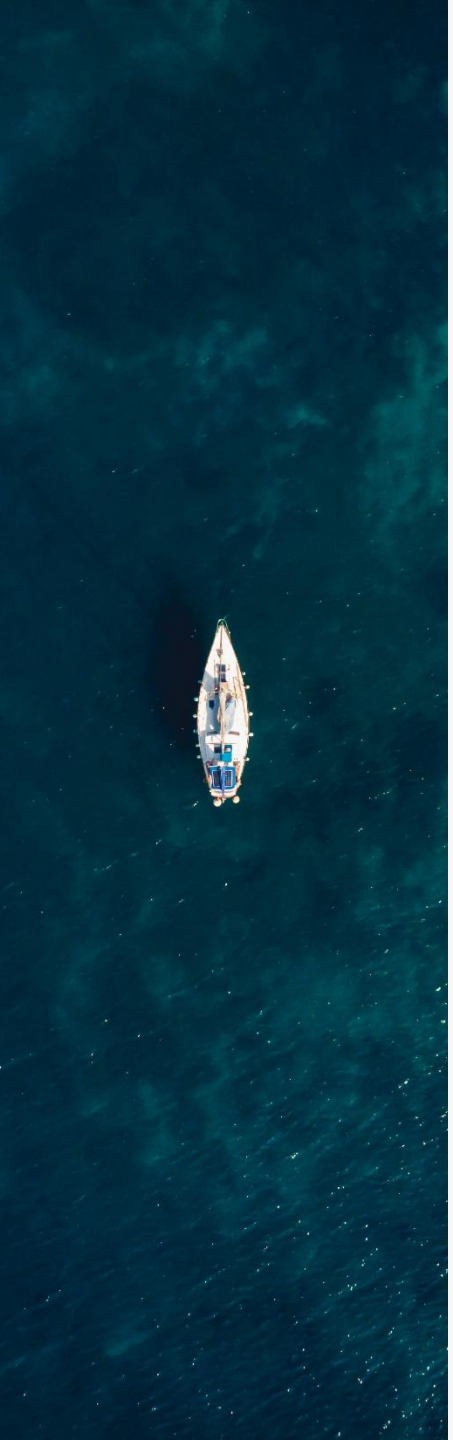
Big Data & IoT Agri Food Logistic Efficiency

PRODUCT PACKAGING & DELIVERY

Sensors are able to detect anything from degradation to damage, allowing manufacturers to develop measures to avoid these occurrences in the future.

Similarly, data points can help assess and optimize production line times, which may directly impact companies' abilities to fulfil orders and meet tight delivery deadlines.

Radio frequency identification (RFID) and GPS systems allow companies to monitor their products along the entire supply chain.



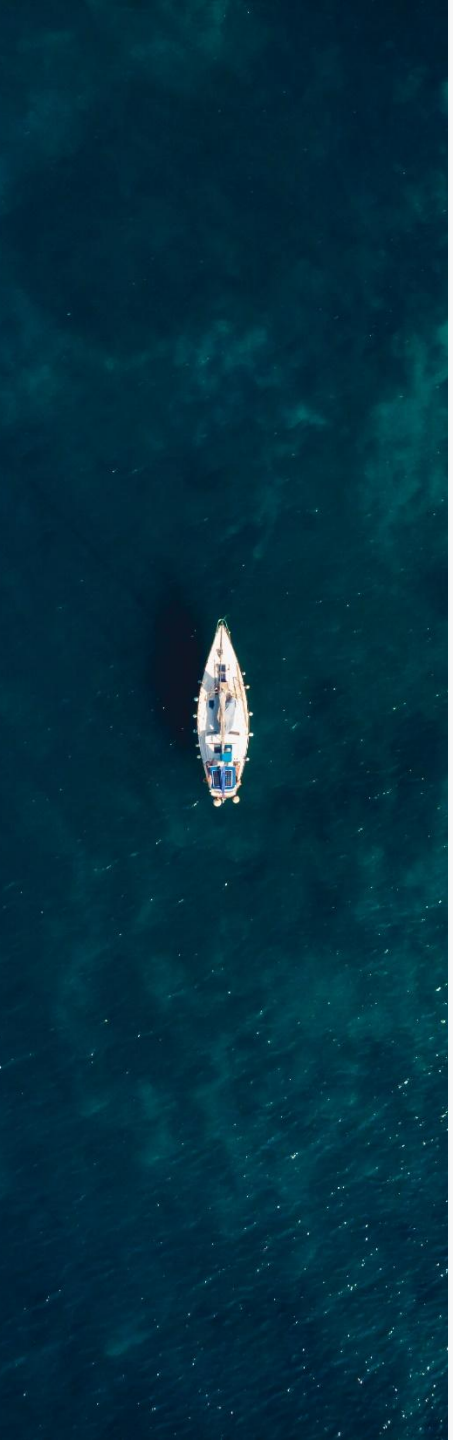
Big Data & IoT Agri
Food Logistic Efficiency

TRACEABILITY & TRANSPARENCY

Farm-to-table, farm-to-fork, farm-to-restaurant, farm-to-fridge – food producers and manufacturers begin tracking their food through the entire supply chain and proactively communicate information about their ingredients to consumers.

Ensuring traceability of and maintaining transparency are critical in building consumer loyalty and trust – this includes:

- Raw materials
- Supplies
- Ingredients
- Final products



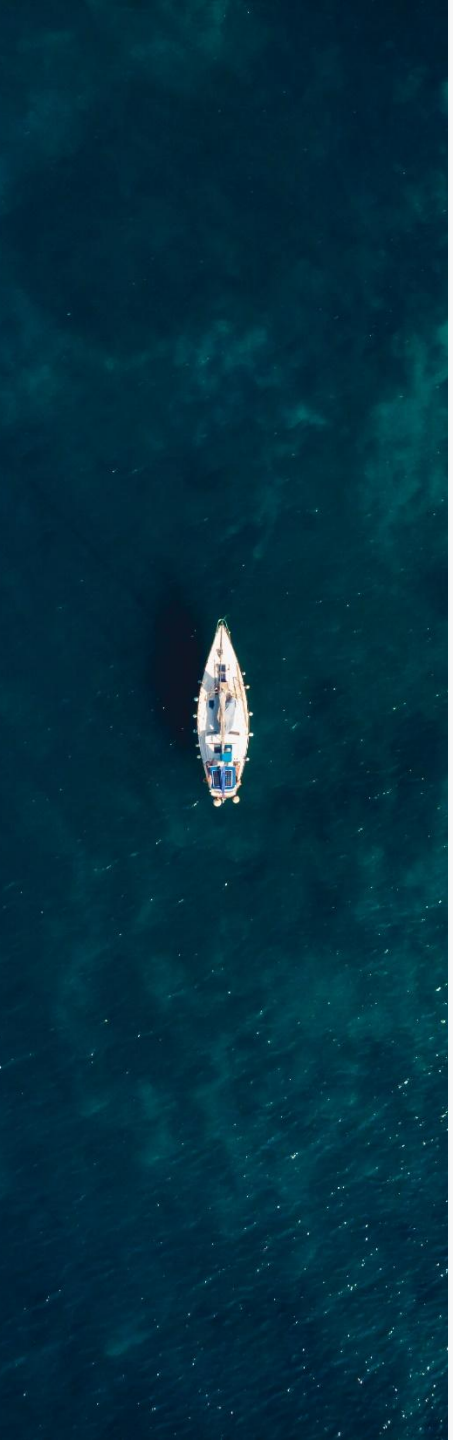
Big Data & IoT Agri
Food Logistic Efficiency

FOOD & EMPLOYEE SAFETY

With the help of technology, food manufacturers can access and make use of real-time food safety data, such as carbon dioxide, heavy metals, humidity and temperature, or shipping times and storage conditions.

This is often classified as active cold chain management.

By identifying chemical and biochemical reactions at the point of harvest, during manufacturing and even transportation, some smart sensors and cloud-based predictive analytics can even identify pathogens along the supply chain and help mitigate their spread.



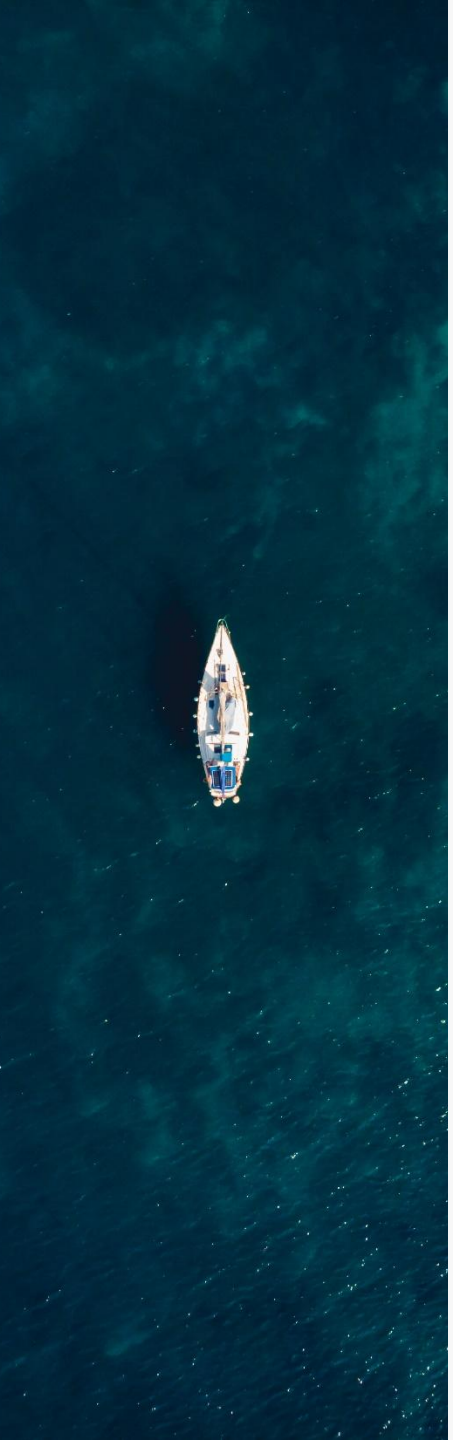
Big Data & IoT Agri
Food Logistic Efficiency

HUMAN RESOURCES & MECHANIC OPERATIONS

Food safety is not just about food but also employee safety and safety.

By monitoring factors such as staff illness, food manufacturers can continually optimize their safety standards on-site.

Similarly, by harnessing predictive software to flag potential mechanical wear or damage before it occurs, downtime is reduced and unnecessary injuries are avoided.



Big Data & IoT Agri
Food Logistic Efficiency

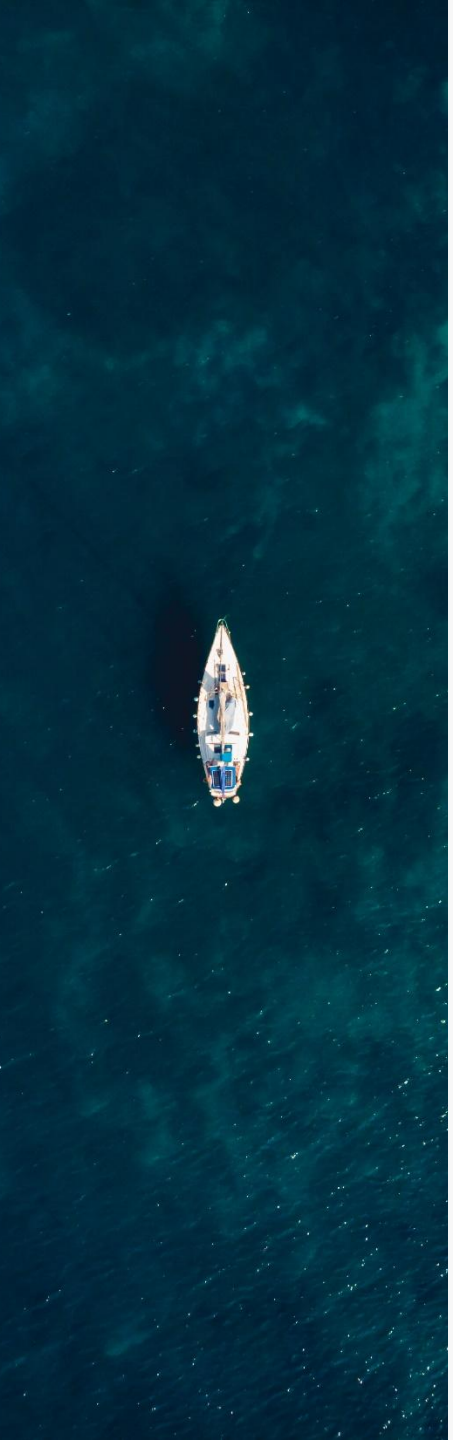
FOOD AUTHENTICITY

Tech is proving its value in combatting food fraud in the organic food industry as well.

By assigning any given product a digital identification mark, businesses are able to separate them from their counterfeit counterparts.

Examples of these product authenticity labels include simple QR codes and somewhat more complex micro-chips. Brands who harness these technologies may quickly find that they are highly beneficial in building consumer trust.

Big Data & IoT
In Waste Management



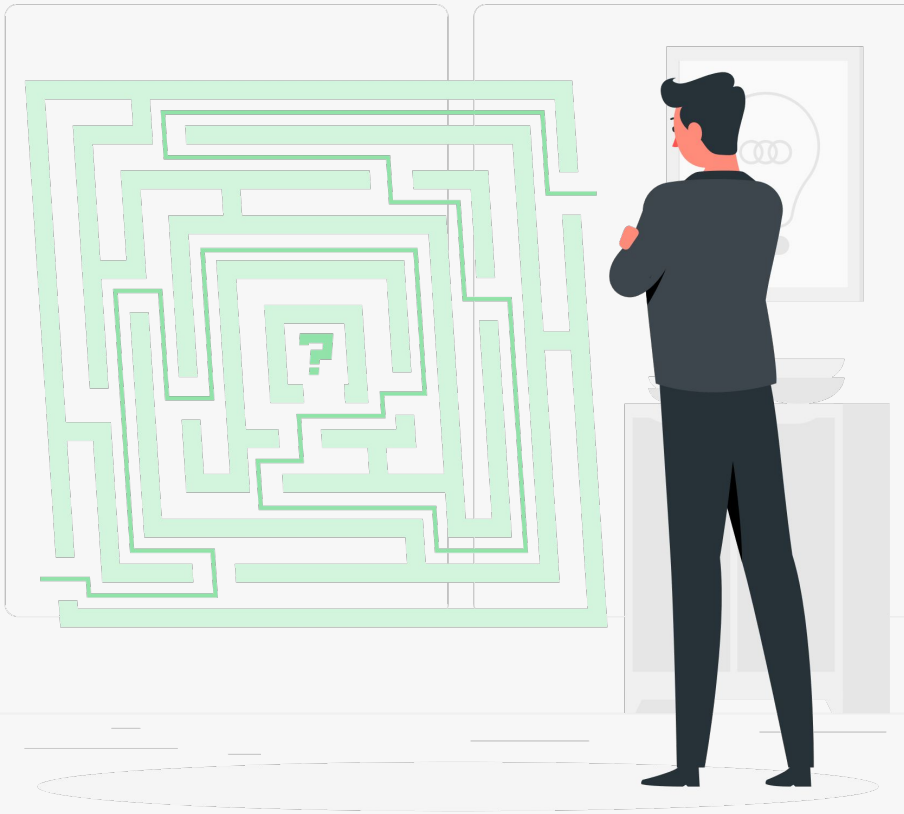
Big Data & IoT Waste Management

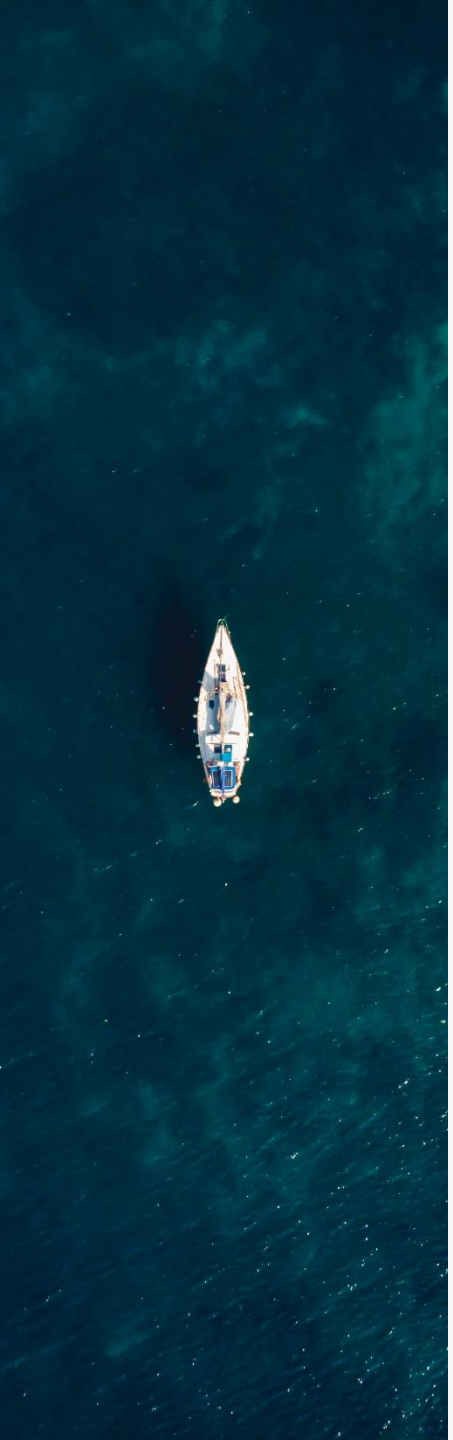
1. MANAGING SUPPLY CHAIN ISSUES

Big data compiled, driven and utilized can help in understanding the appropriate locations for street bins and where they can be used most efficiently.

Solar powered garbage bins with sensors and compactors, can alert collectors once a certain filling level is reached, and require emptying.

Big data can help in understanding the optimal garbage collecting routes, hassle free hours to do so and also provide insight regarding the areas from which particular kinds of wastes come hence, allowing for even better optimization.





Big Data & IoT Waste Management

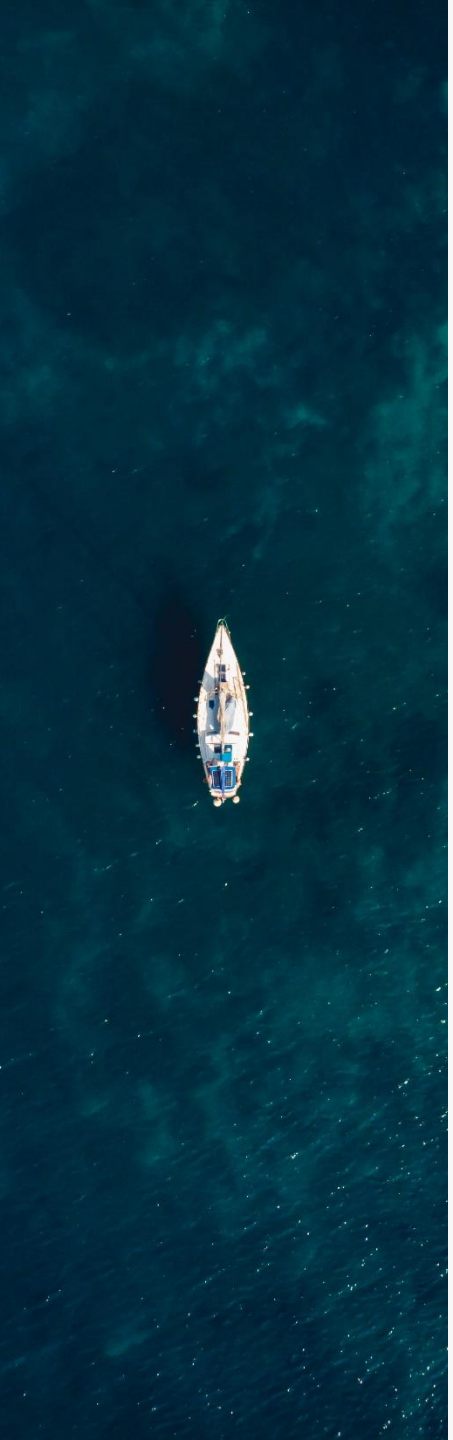
2. AI Equipped Systems

Recycling segregation is a labour intensive process with high risk of injury and diseases for humans.

Artificial Intelligence (AI) based robots programmed to pick and segregate particular kinds of trash boost recycling by making it cheaper, safer and faster.

Such systems will be changing the quantity of wastes that would hence go in the landfills.

Machines equipped with proper data will be able to seek and categorize the most different kinds of recyclable products. Waste management at superhuman speed.



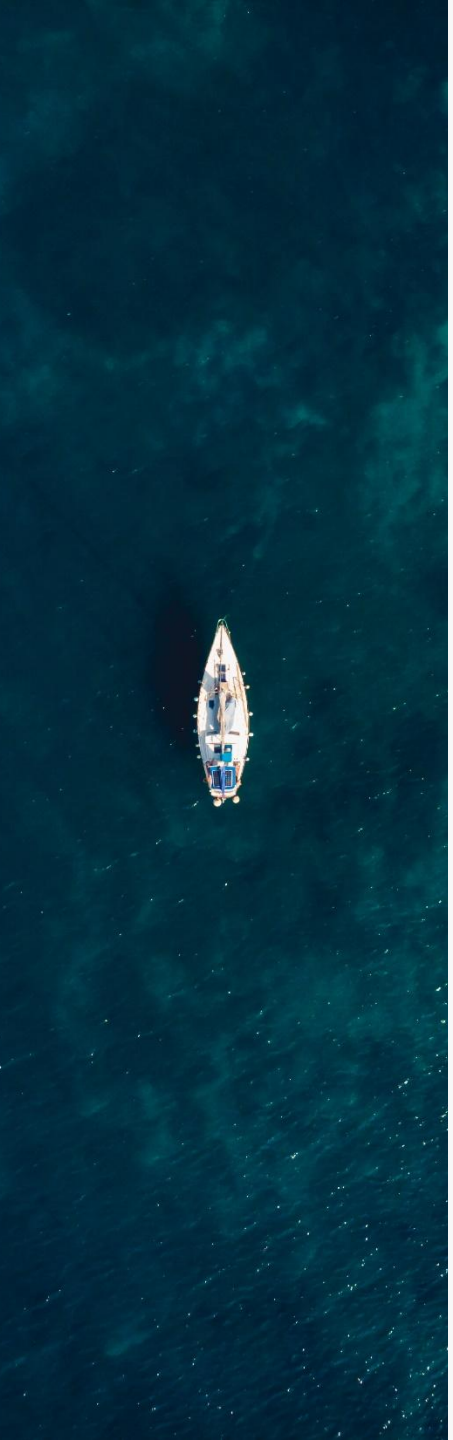
Big Data & IoT
Waste Management

3. Vehicle Recycling

What is feasible to do with the old and unused obsolete vehicles?

Big data can help in understanding the quantity and location of car abandonment.

This can help the scrap and salvaging centers to take the needed and reusable parts of a vehicle before it gets totaled. This enables such businesses to get the maximum payout and also reduces the heap of probable dump.



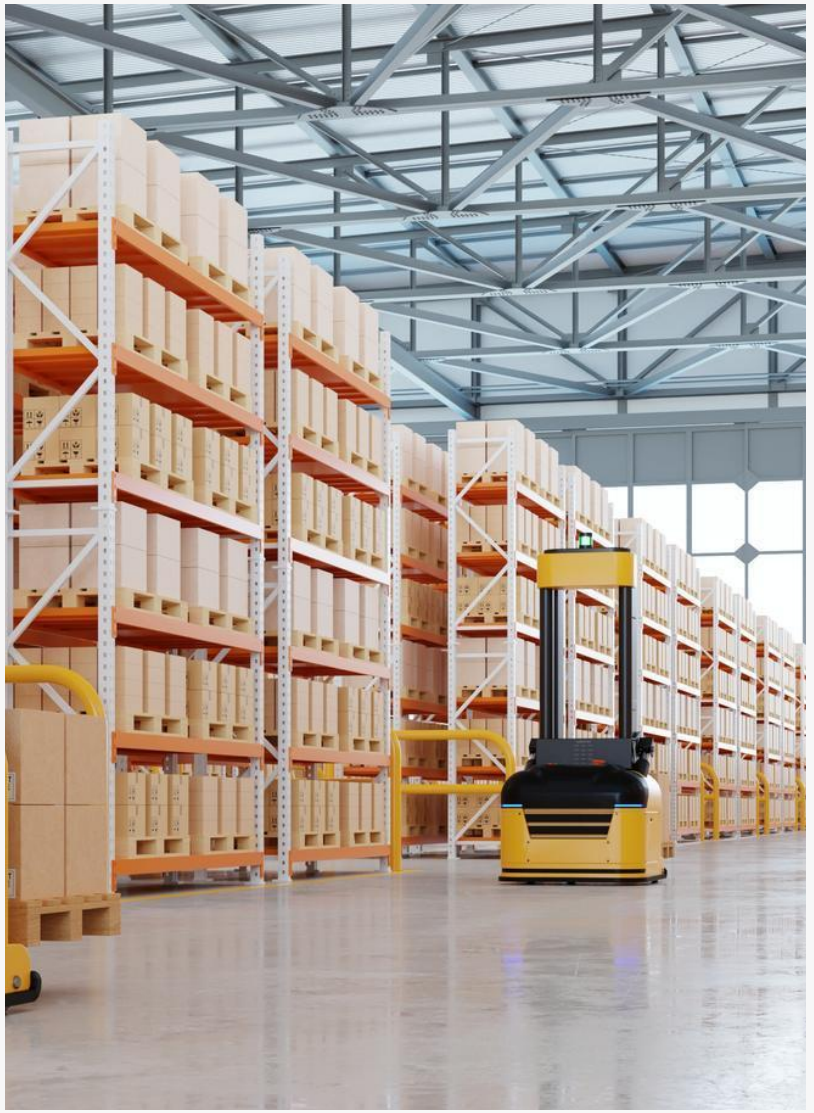
Big Data & IoT Waste Management

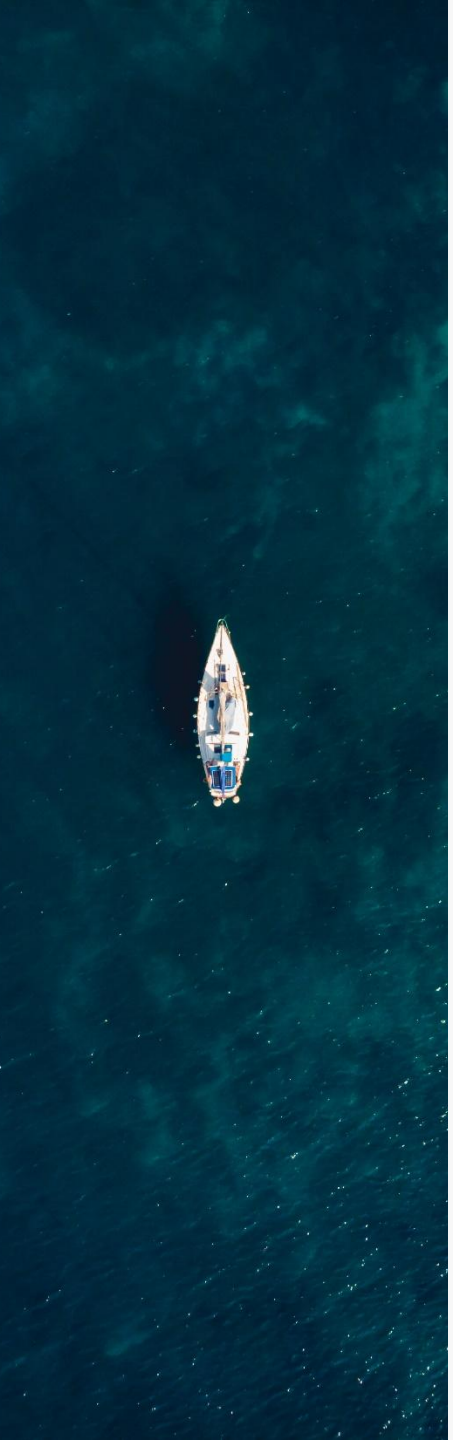
4. Improved Inventories

Big data can help in the improvement of inventories by clarifying how much of a product is needed in every industry so that neither the excess of something is produced nor purchased to eventually get wasted.

For example: In the pharmaceuticals, the medicinal stock gets outdated and the treatment cannot be the same for everyone. In such cases the stocked medicines and products of different kinds get wasted.

This information can be cross-referenced to other information like, the demand of the product in the market, users in the immediate demographic location, the medical history of the patients, efficacy of the medicine and so on to validate the information provided by the big data tools.



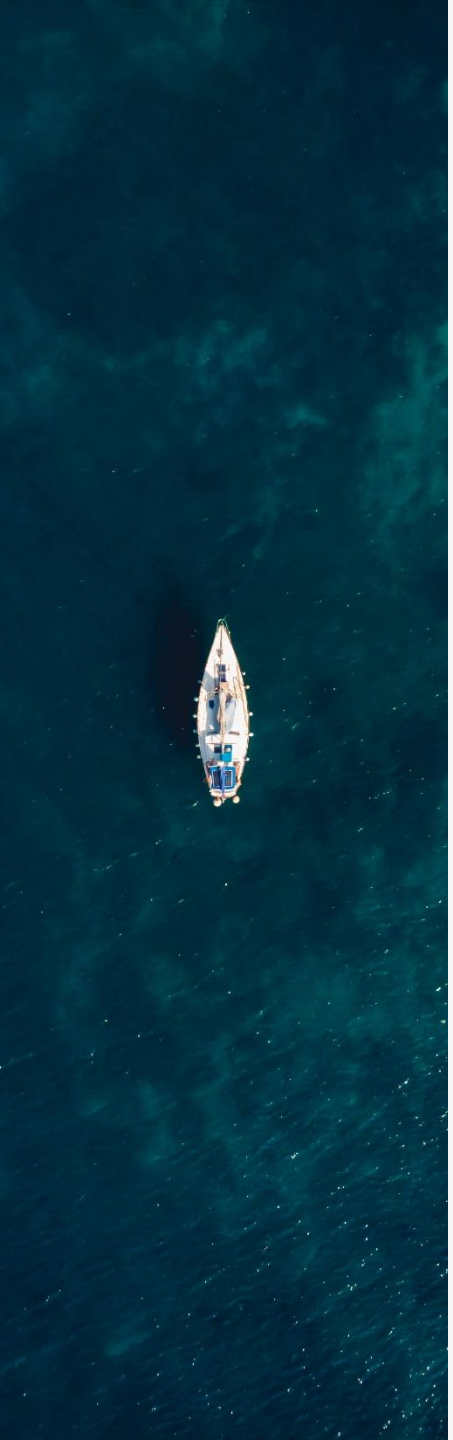


Big Data & IoT Waste Management

5. Satellite-Based Monitoring

The Amazon forest, the great barrier reef, the pacific garbage patch - satellite data can be a huge tool to get a clear insight into what is being done to the natural resources which is somehow deterring the capacity of the environment.

By using satellite data and cameras to keep an eye on the damage being done by human activities clear measures to safeguard can be found.



Resources

Oracle NetSuite, A Guide to Reverse Logistics: How it Works, Types, and Strategies

LEK, Nine Trends Transforming the Agribusiness Industry

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Talend, Big Data and Agriculture: A Complete Guide

Cropin, Internet of Things in Agriculture: What is IoT and How is it Implemented in Agriculture

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Discussion & Remarks

IDEAS

REMARKS

SUGGESTIONS

FURTHER QUESTIONS

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Thank you