



Big Data | Advanced Analytics

Big Data in Yield Prediction

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Agenda

- What is Big Data Analytics? (refresh)
- Case Study: Palm Oil Yield Prediction
- The Challenges in Yield Prediction
- Transformational & Technological Roadmap for Agriculture Industry

Big Data Analytics



Big Data



Advanced Analytics

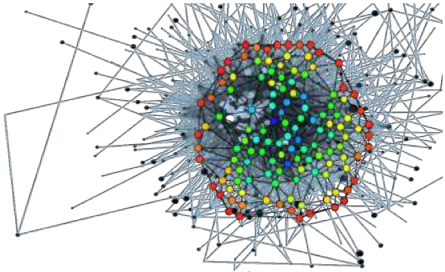


Valuable Insights

Structured or Unstructured



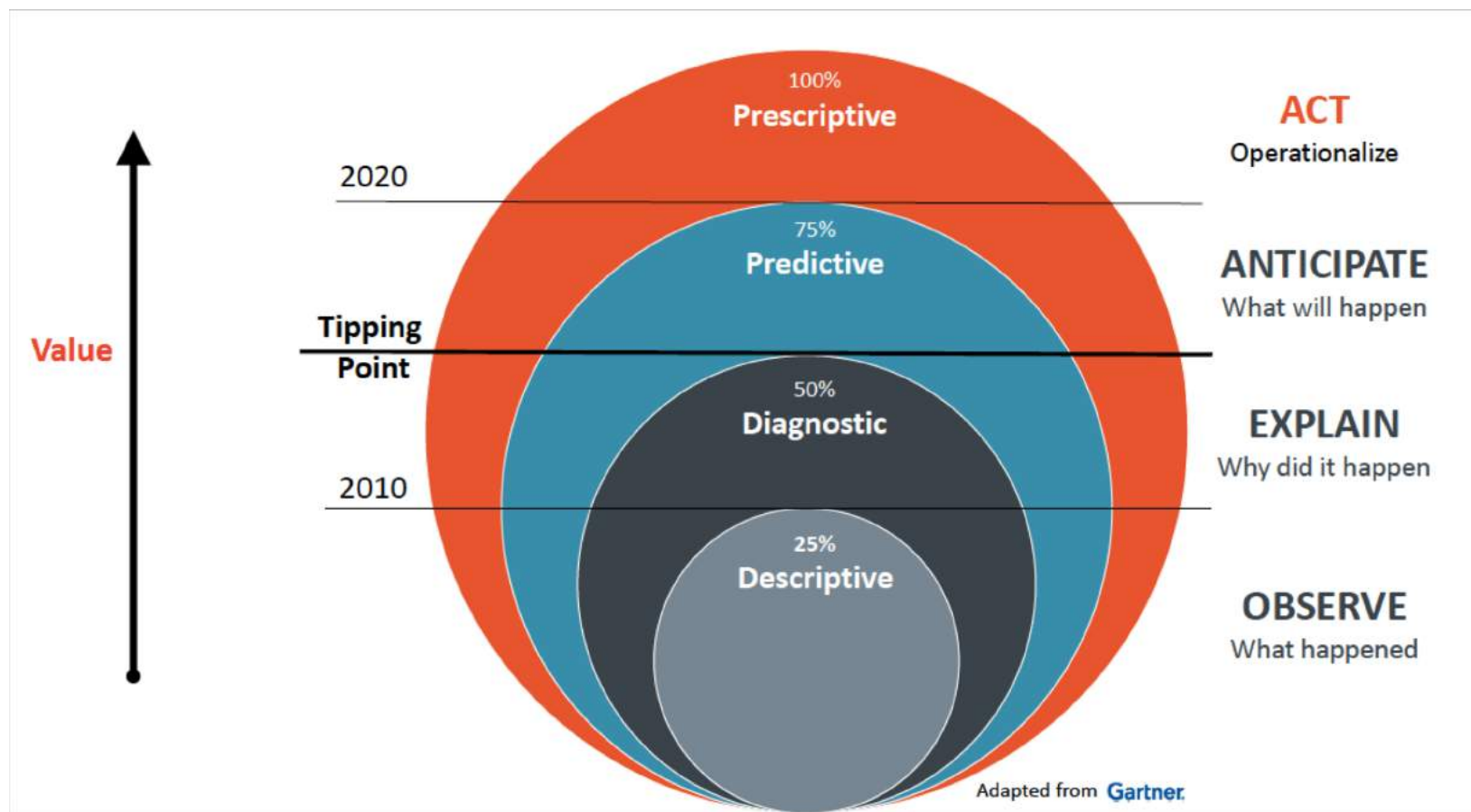
Statistical Methods
Machine Learning
Artificial Intelligence...



Identify Patterns
Predict & Forecast
Optimization
Decision Making



Predictive Analytics Transforms Insights into Action



Typical Use Cases



Marketing Response Rates



Customer Segmentation



Loyalty, Retention, Lifetime Value



Asset Maintenance



Resource Planning



Predictive Maintenance

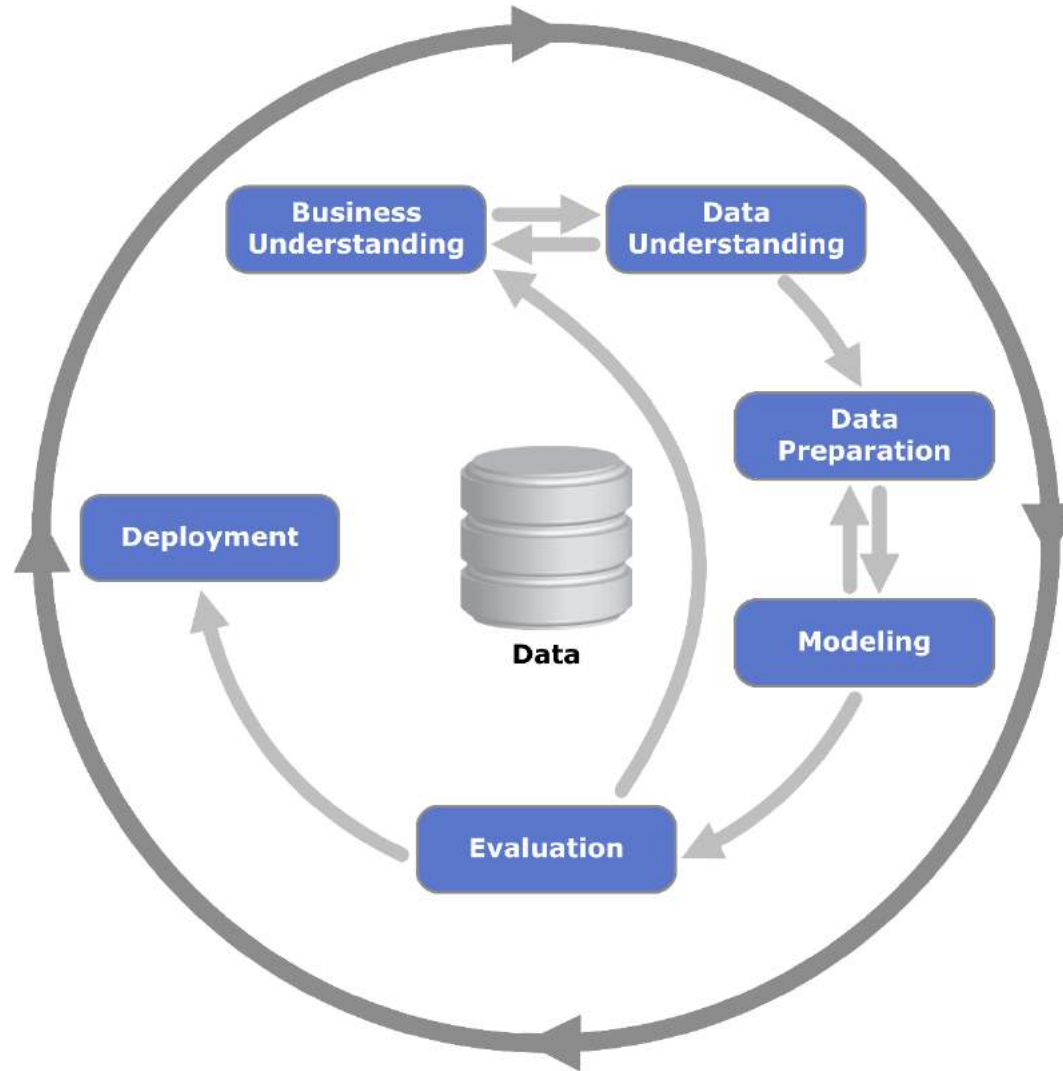


Quality Assurance



Social Media Monitoring and Sentiment Analysis

CRISP-DM

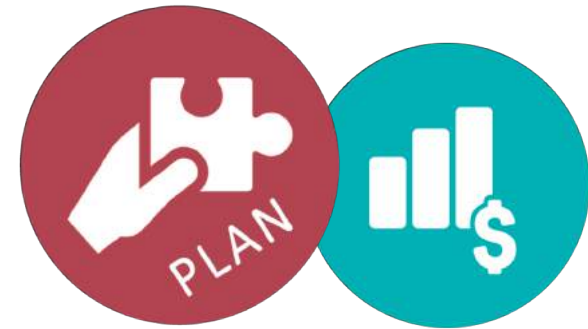


Case Study: Palm Oil Yield Prediction

Palm Oil Yield Prediction

By applying BDA, plantations can:

- Forecast production tonnage
- Identify important factors that affects crop yields

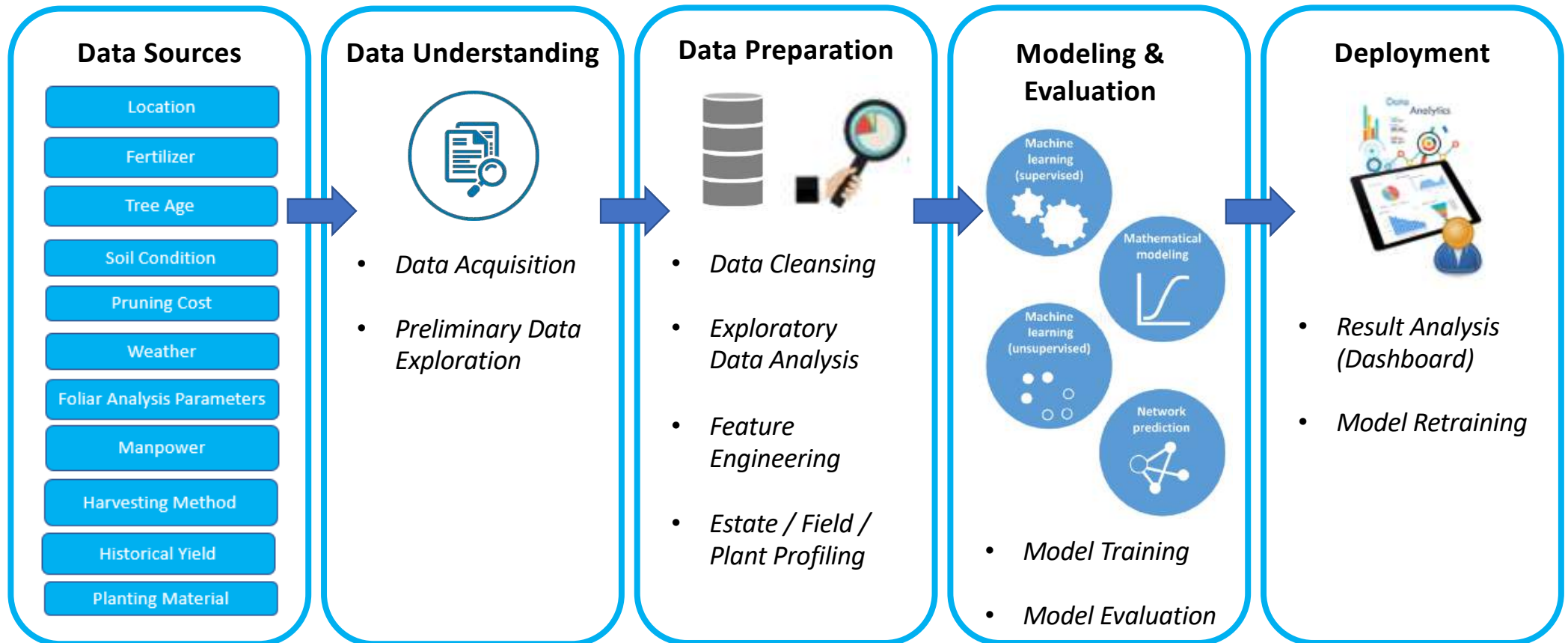


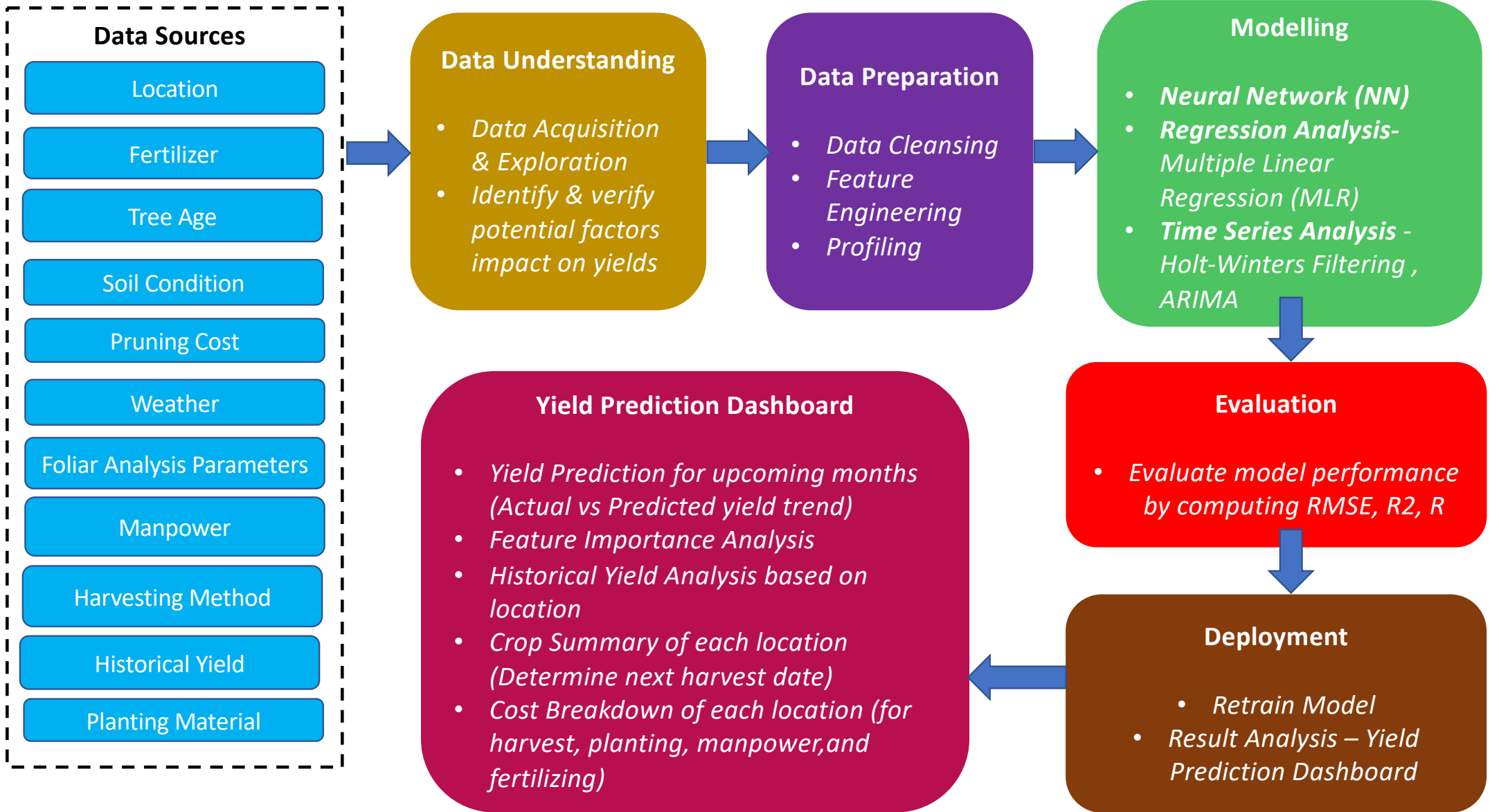
Plan Crop Sales



Optimize Crop Yields

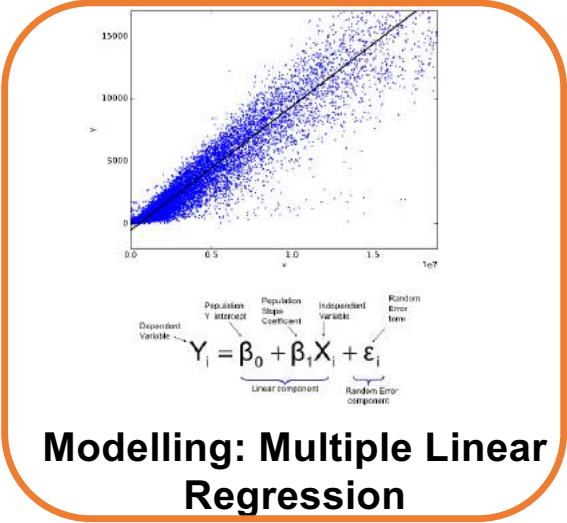
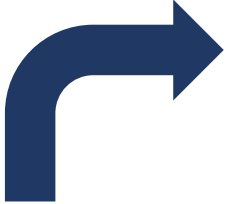
The CRISP-DM Cycle Applied for Yield Prediction



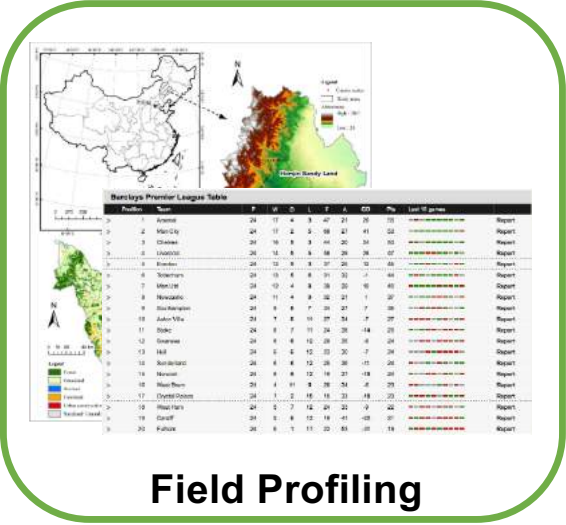


Palm Oil Yield Prediction

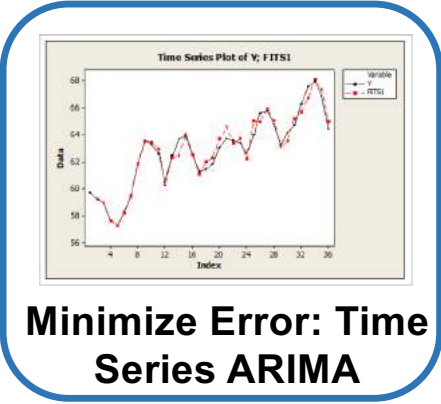
- Plant Age
- Weather
- Fertilizer
- Soil Moisture
- Rainfall
- Historical Crop Yields
- Labour



Factors Influencing Yield Output



Field Profiling



Minimize Error: Time Series ARIMA

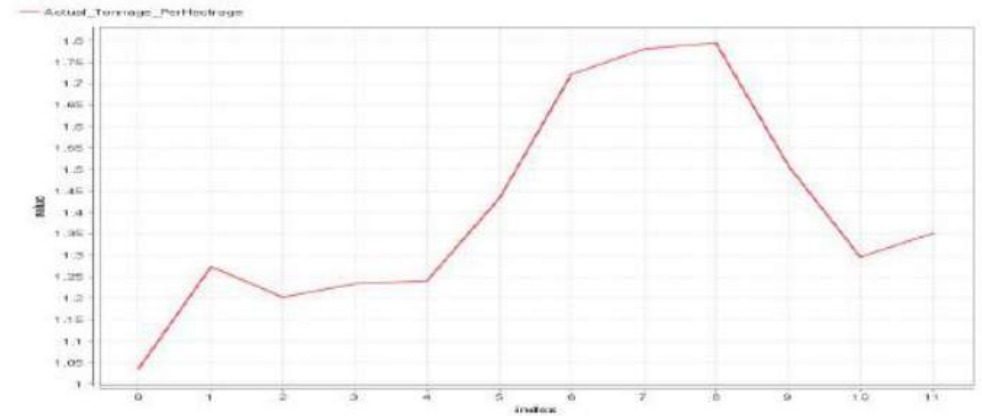
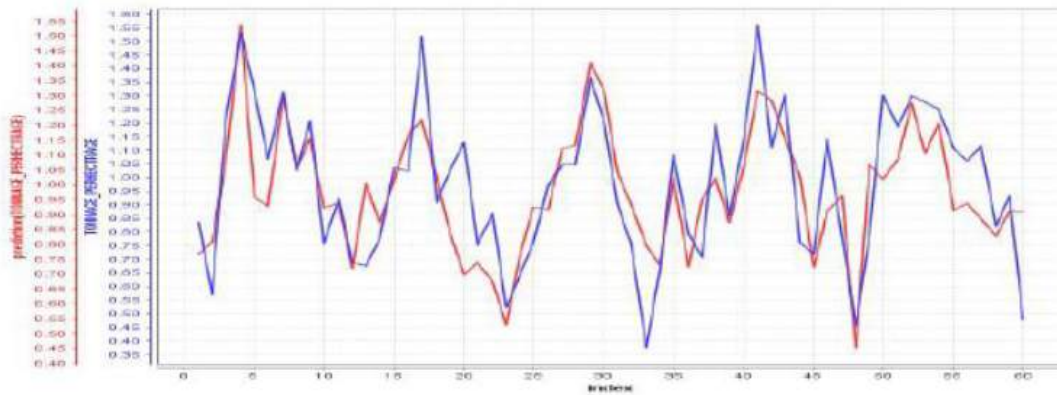


Accurate Yield Prediction

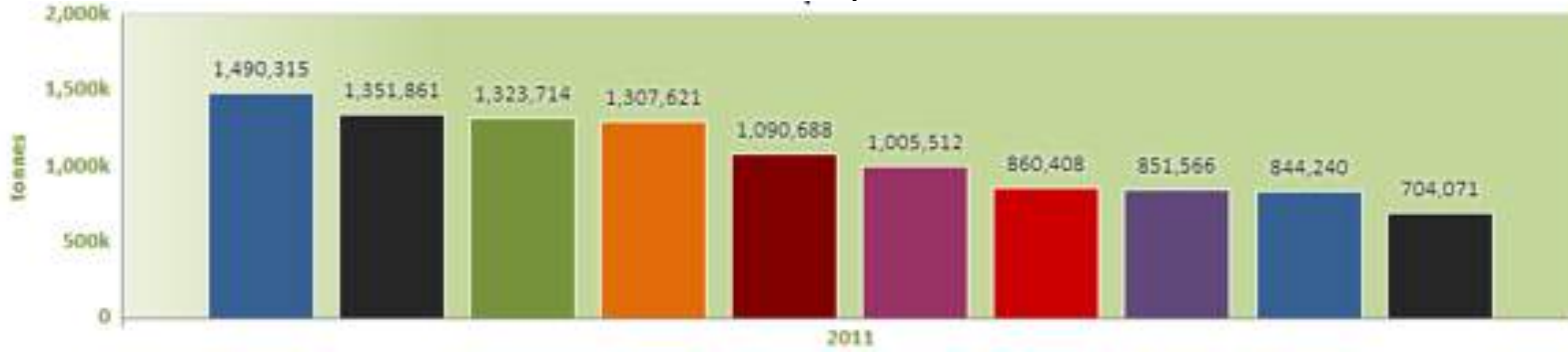
Yield Prediction / Optimization

Prediction of Tonnage Per Hectarage for 2016

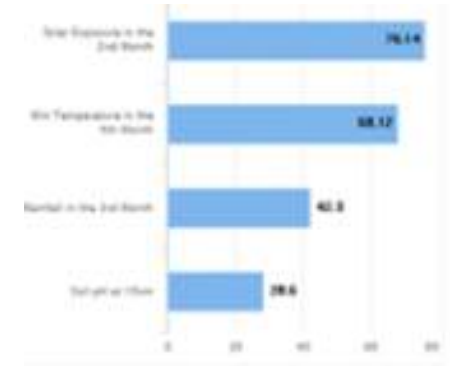
E1, F1



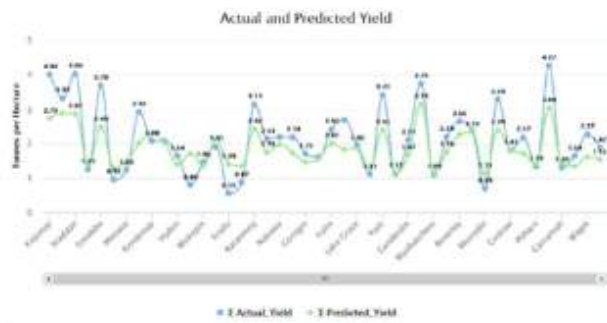
Historical Yield Analysis based on location



Feature Importance



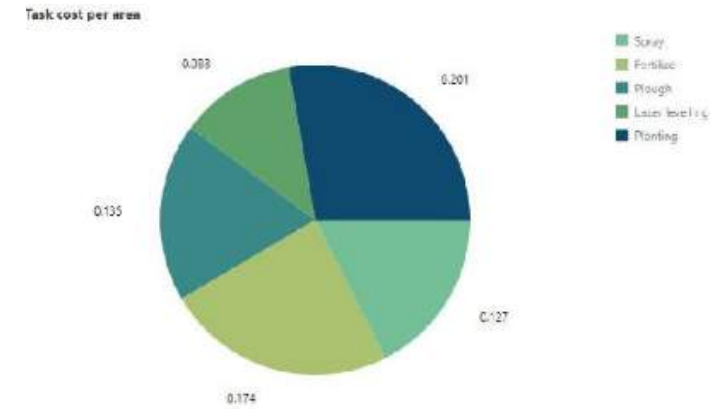
Actual vs Predicted Yield



Crop Summary

Crop	ATULFO 2015 NTH
Variety	Atulfo
Dates	8/30/2017 to 8/29/2023
Size	8
Progress	63%
Harvested	4700
Sales	2155
Cost	1570
Profit	585

Cost Breakdown



Challenges

- The need to incorporate available data into **daily operations**, makes things difficult to move:
 - **Impact to business**
 - **Availability of data**
 - **Quality of data**
 - **Methodology/technology for data management**
 - **Analytical skillsets**
 - **Etc.**

Roadmap – Transform with BDA

Advocate

Acknowledge Big Data is a strategy to help on business problems

Assemble a steering committee from various depts. to identify business objective, e.g. increase revenue by xx%

Derive a mid/long-term digital transformation roadmap

Plan

Formulate a plan to focus on three core elements: Data, Technologies, and Analytical Output

Form a multi-disciplinary analytics core team

Identify gaps: domain expertise, technology, data readiness, etc.

Execute

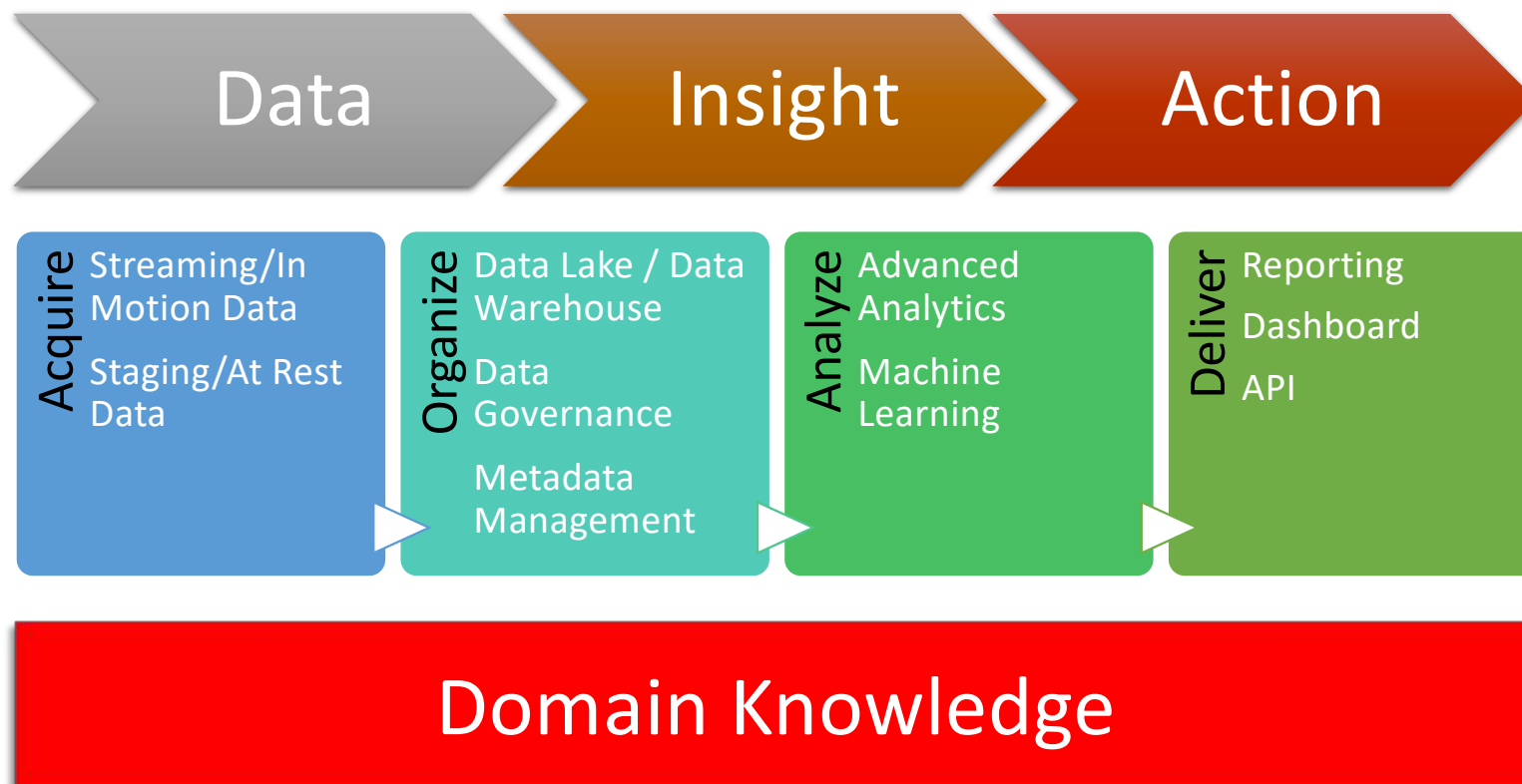
Start with high impact analytical case studies on a small scale

Fill the talent gaps

Conduct POCs on technological implementations

Conduct POCs on business cases

The Journey of Data Driven Insights





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