

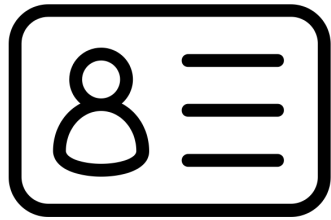


# What to do with data?

Area 4 – Manage It  
Lesson 4 – 2.3  
Sequence ID – 53

Agrosap





# Our team of experts



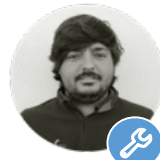
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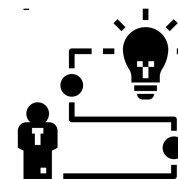


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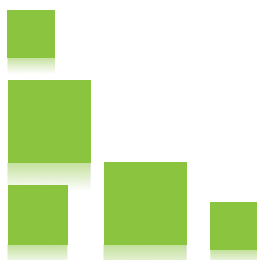
## AGROSAP (R&D department)



Passionate about research & digital skills in agriculture



+12 years experience on PA hardware, sensors & development





## DISCLAIMER

### A4.L12.T3 What to do with DATA

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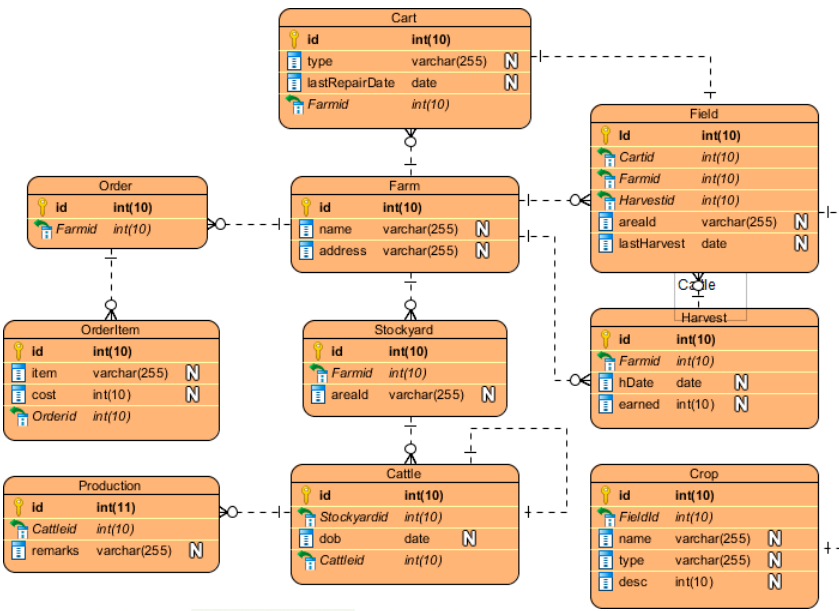
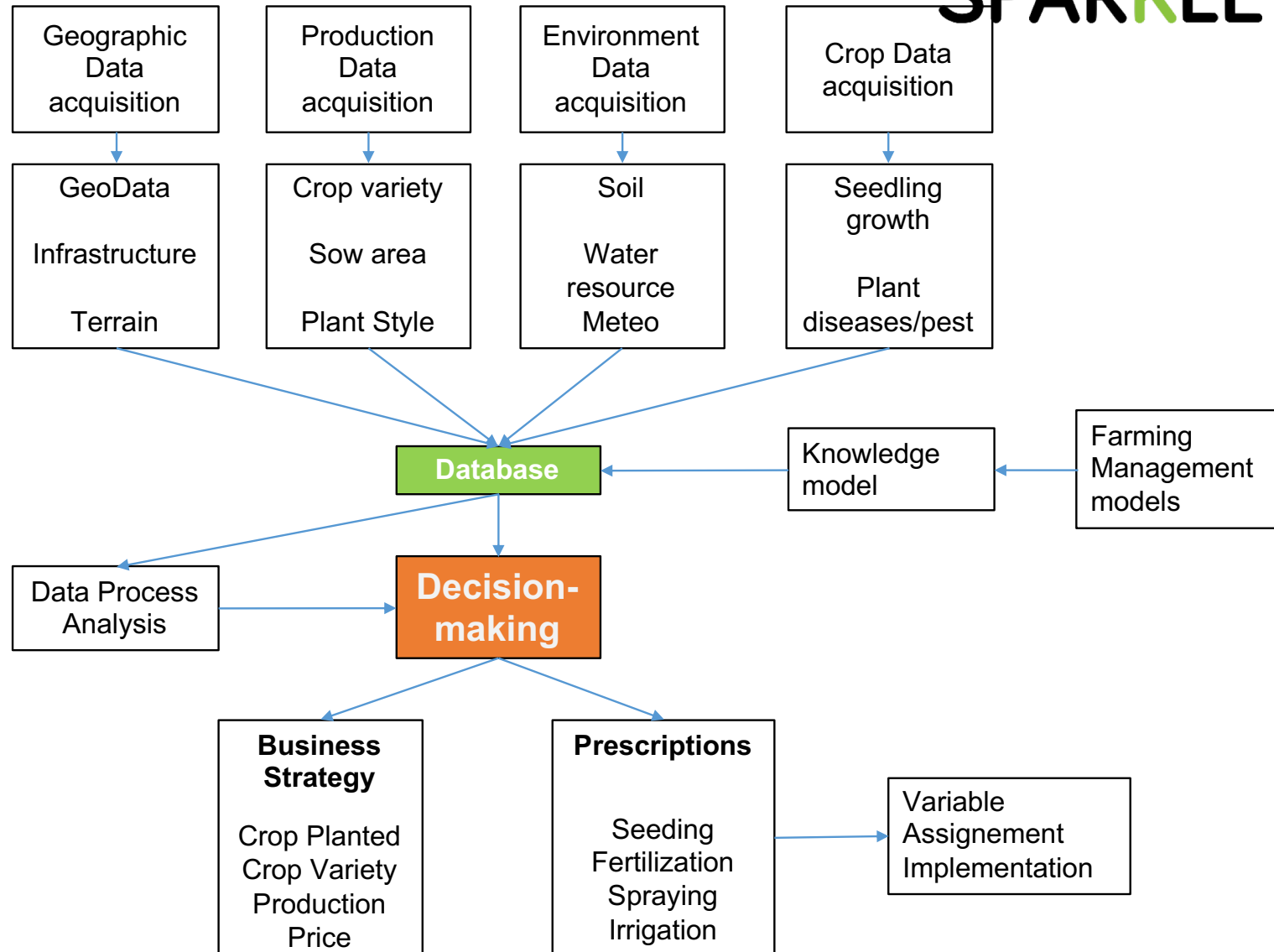
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# Decision-making systems. Database



In the use of data, having a centralizing structure (**database**) is the best strategy for adequate decision making



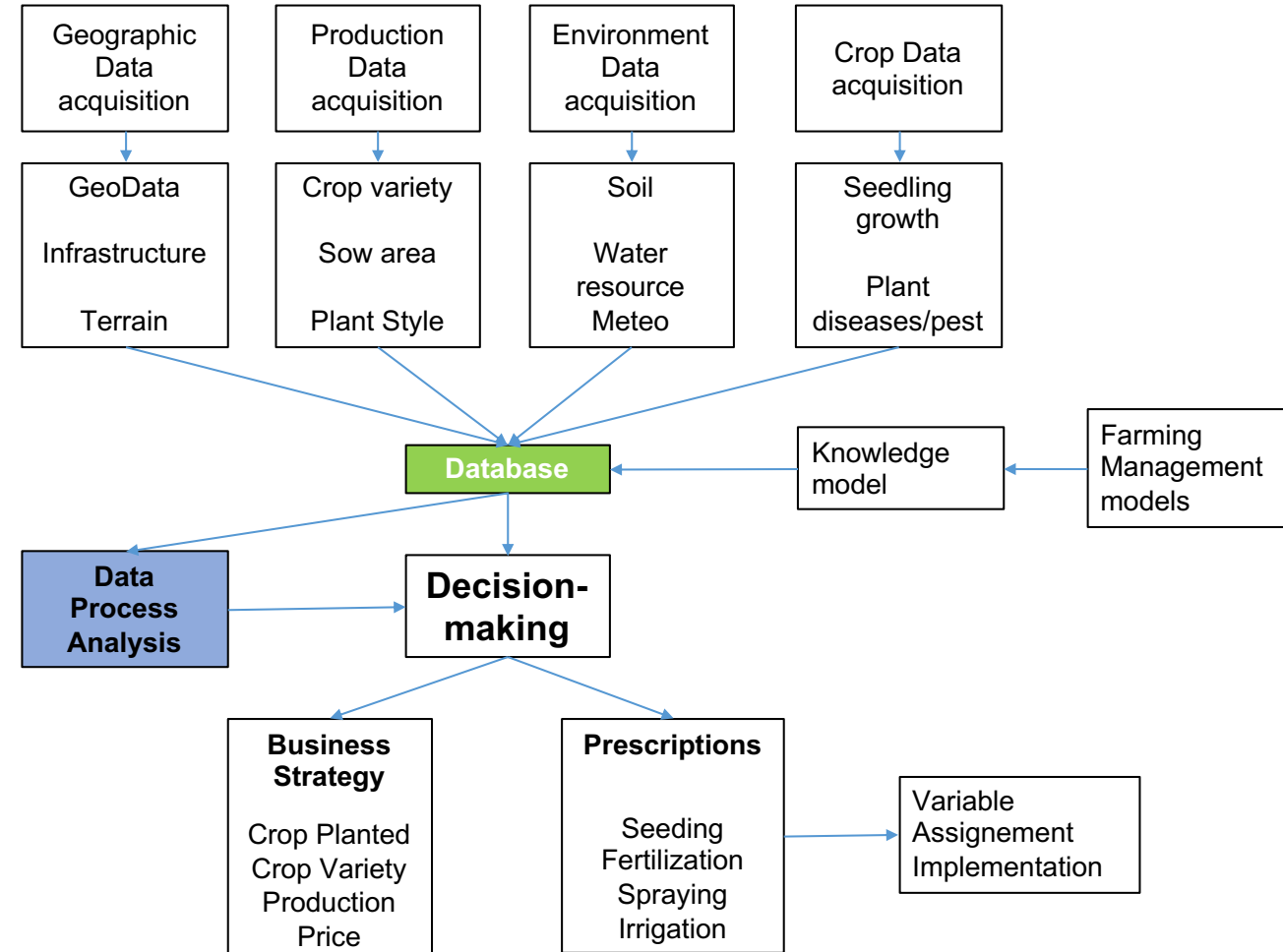
# Data process and analysis

current agricultural data situation:  
**unstructured, fragmented and dispersed**

Data organization for further analysis

Statistics software, automatic  
analysis based on ML, automatic clustering and  
Integration of fuzzy logic algorithms

Decision-making systems



# Data process and analysis

Wich algorithms could we use for data analysis?

Classical approach: Descriptive statistics & data analytics

Machine Learning models

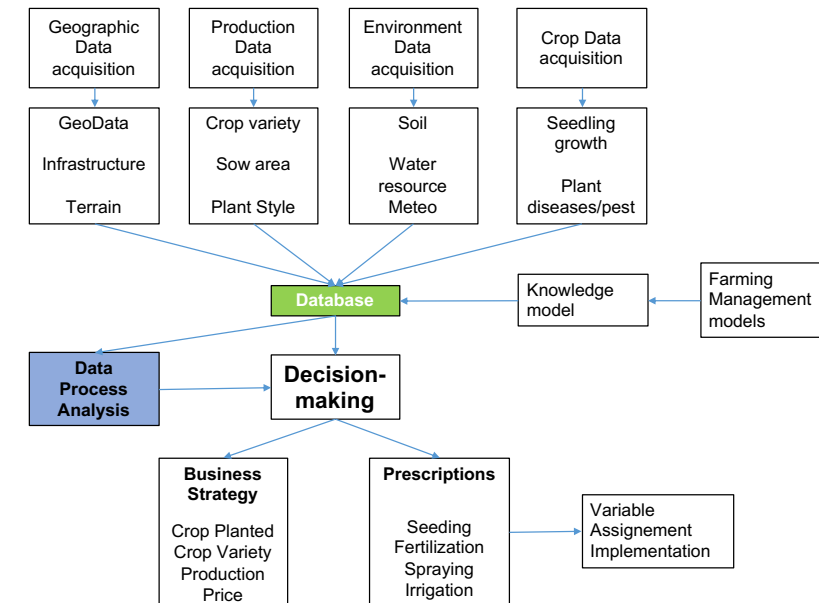
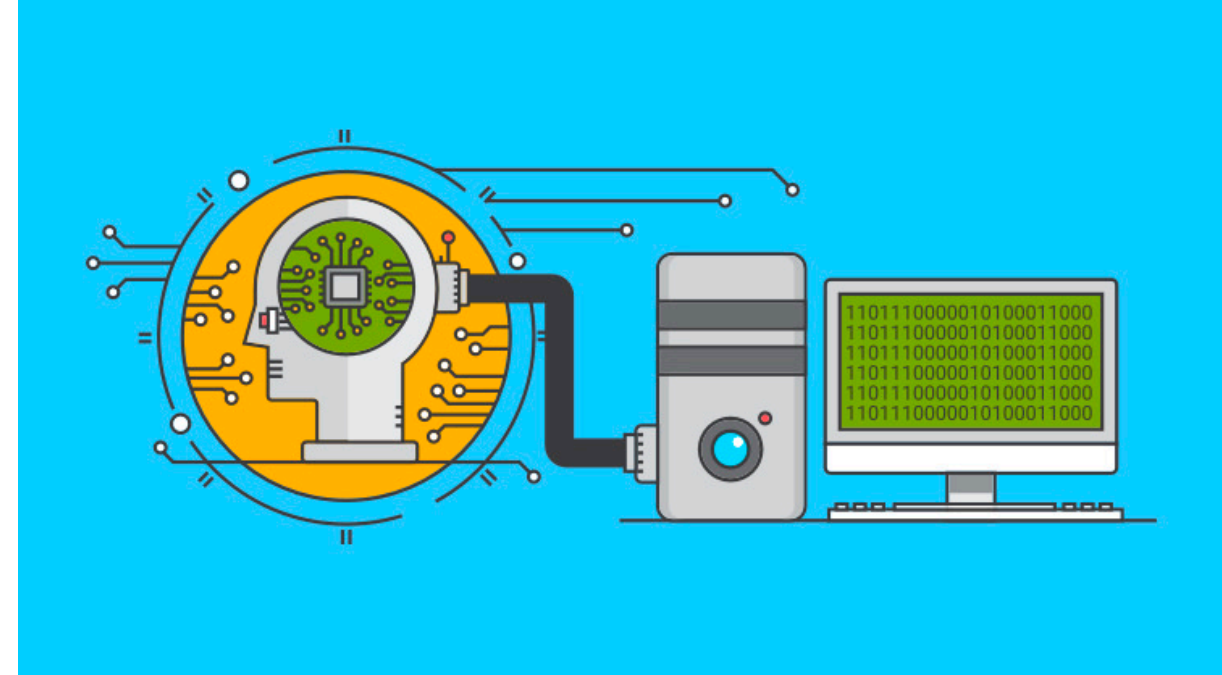
Depending on data types:

Supervised models

Unsupervised models

Reinforcement methods

## Integration on Decision-Making systems





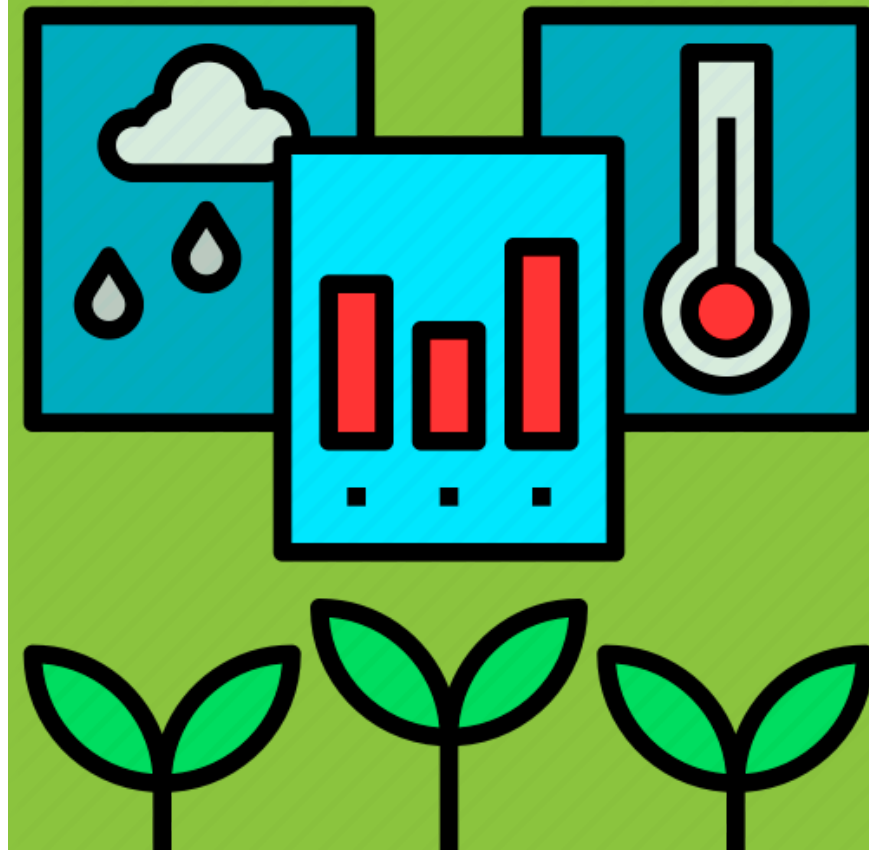
# Decision-making. Expert systems

Full and accurate diagnosis-based decision in precision crop management needs an Expert System.

Decisions can be made according to specific circumstances at specific locations.

Algorithms developed should include scientific basis, technological information, legislation and phenotypic data to be managed.

**AND EXPERT'S KNOWLEDGE**





# Expert systems. Diagnosis-based SPA.



-Design and implement global production plan

-Determine:

- Quantity of fertilizer, ratio, method and yield target
- Planting density
- Irrigation time and water volume
- Cultivation management and tasks performed

-Yield predictions

-Task scheduling

-Field factors (soil, climate cond.)

-Planting form, seeding method,  
hoe weeding.



# Multi-source data



Multi-source data fusion for variable management and operation.

Today's farm manager has to choose between different technology providers and data providers to use the most appropriate information.



## Data Collection

Sensors, maps, open data,  
real time, georeferenced...



## Process & Computing

Data analysis, ML,  
BigData, edge computing



## Data Storing

Local, in the cloud,  
open-data, blockchain



## Spreading

User interfaces, multi-device

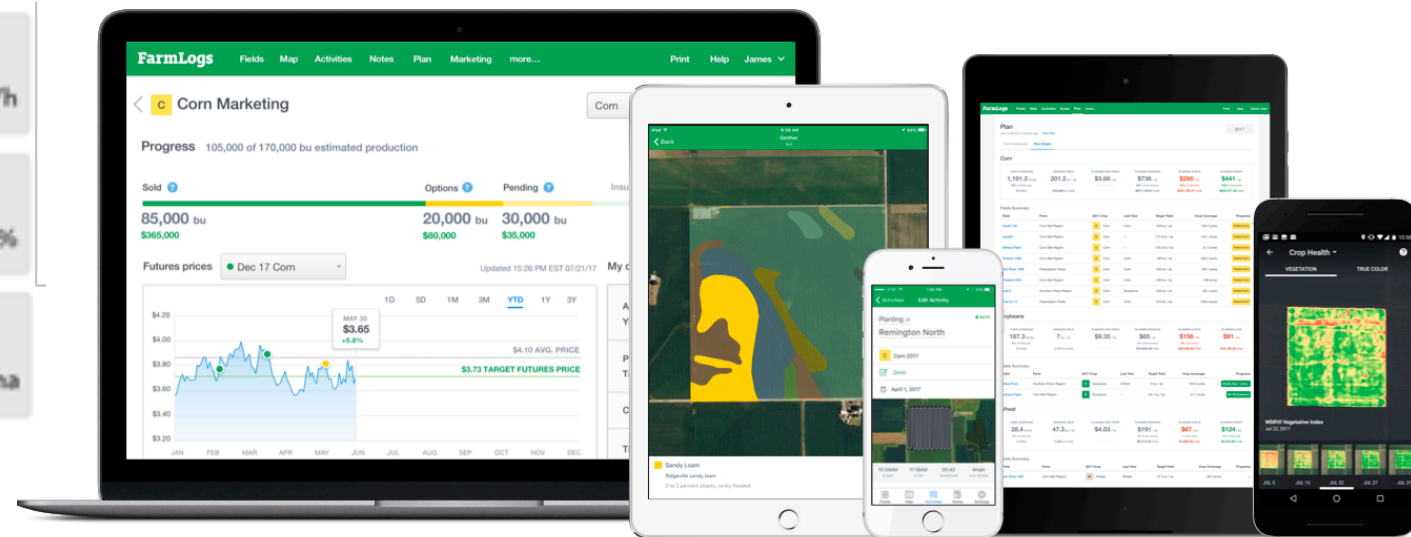
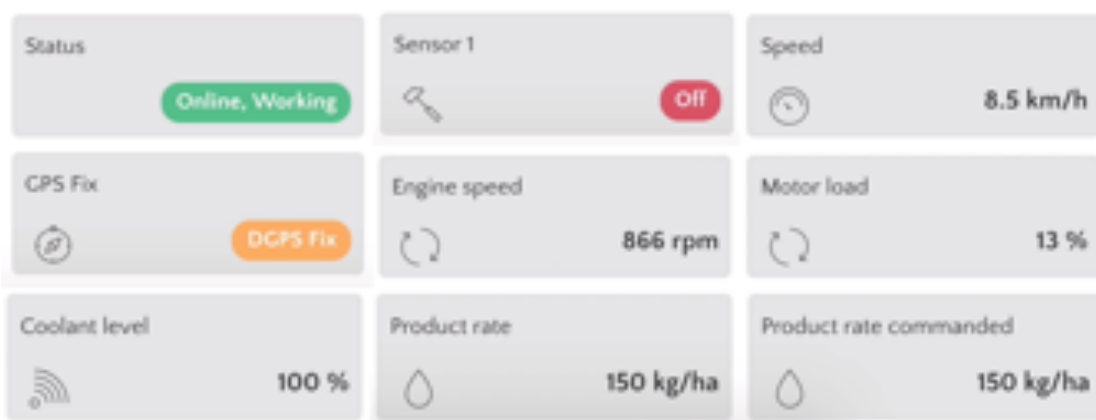
# Added value through information reporting



One of the outputs that can add most value to information is a **rapid reporting system**.

Have the information **at a glance in a visual, graphical and intuitive way**, allows a decision-making based on more accurate data and in semi-real time.

Importance of being adaptable to multi-device platforms.



# Challenge: Data interoperability

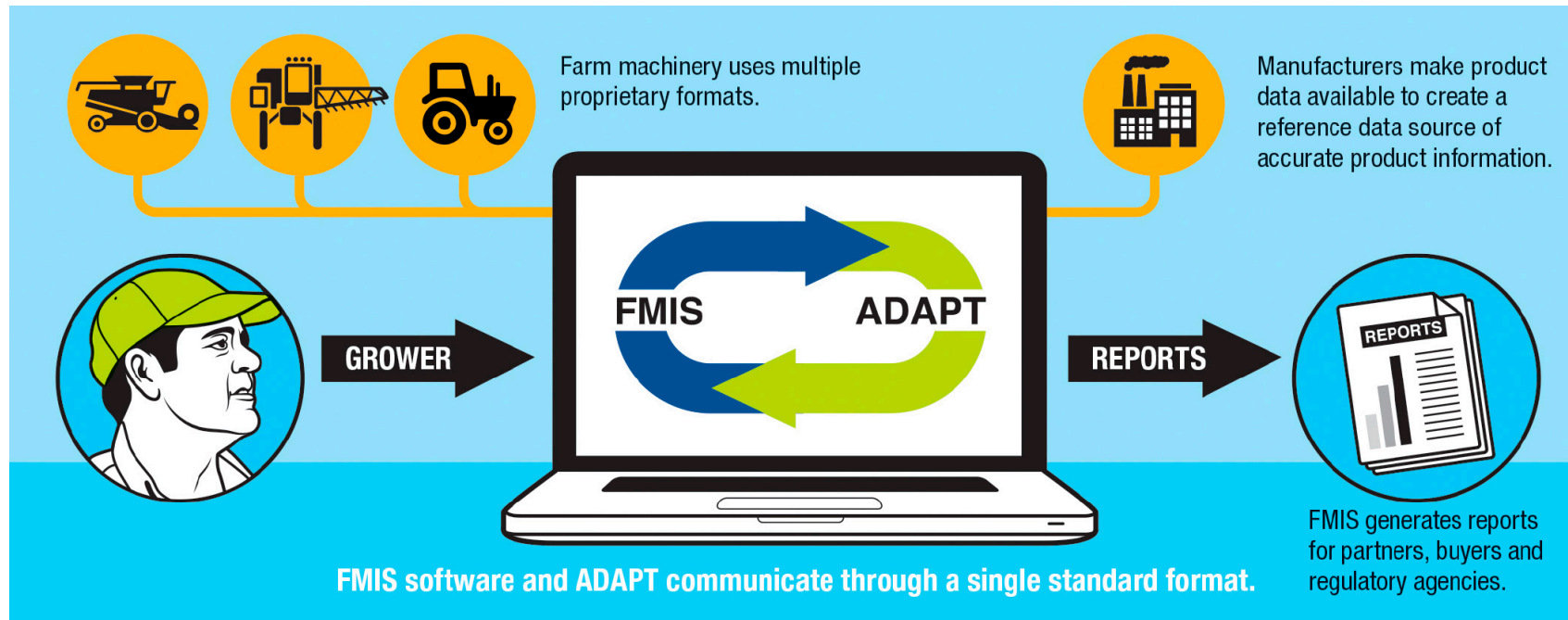


Lack of standards in terms of agricultural data, metadata and catalogues.

Interoperability will play a major role in next years in terms of valuating data.

For task controllers, ISOXML has been one adopted solution to manage equipment, workers, products used and farm activities.

ISOBUS is growing as adopted standard for machine-implement communications.



# Data ownership & profit



Data Ownership is a common issue when defining data-value

As a general distribution, we can establish three levels:

- 'Primary data' generated on farms belongs to the individuals or companies that generate it
- 'Computed information': Data that is computed and translated into actionable information is often considered the property of the computing provider.
- 'Aggregated Data', from data cooperatives, belong to the actors involved in their aggregation (farmers, local data-centers, local computing).

*Some actual trends...*

## Co-ownership of the data

*...but...*

**Privacy & Ownership of the information**



# Data ownership & profit

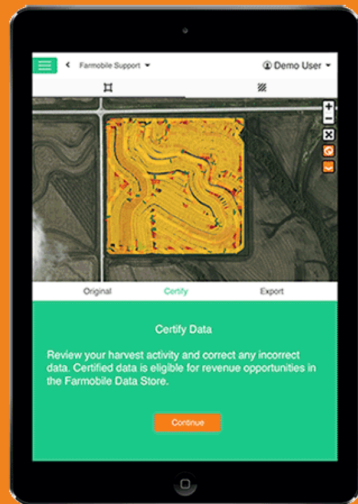


An interesting initiative:

## DATA MARKETPLACE

In order to get profit, (informed) farmers will be able to exchange their own data.

Companies will pay for this data to improve their **processes, products and targets**



## TURN DATA TO DOLLARS

IT'S YOUR DATA. FARMOBILE'S EXCHANGE OFFERS FARMERS THE UNIQUE OPPORTUNITY TO CREATE A REVENUE STREAM FROM THEIR DATA.

### PARTICIPATING FARMERS:

- Subscribe to Farmobile
- Collect data with the Farmobile PUC
- Certify Electronic Field Records
- Receive offers
- Accept or decline offers
- Get paid!

