

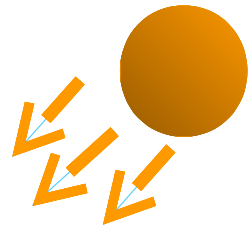


# Interest of Big Data to assess the quality of the grapes

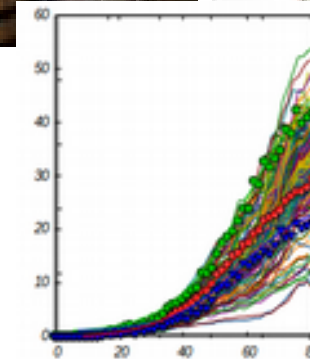
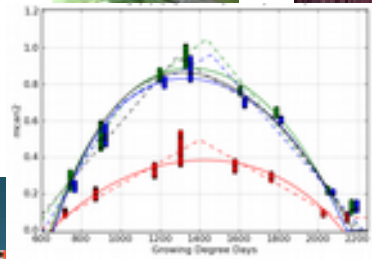
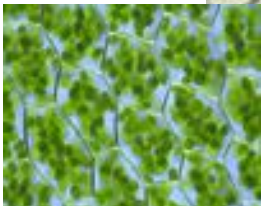
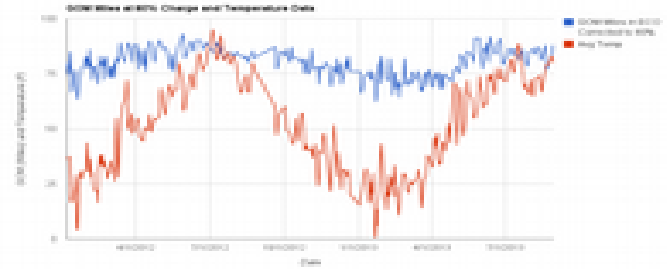


**Pascal Neveu INRA Montpellier**

# Grape quality?

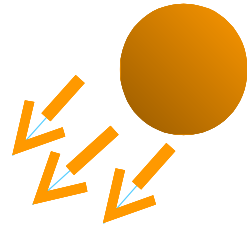


# Heterogeneous data!

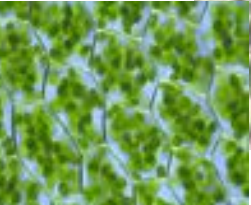




# Data integration

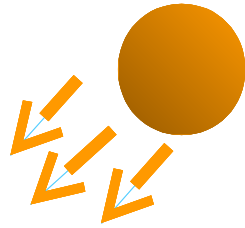


**link, associate, group, complete, combine, mix, etc**

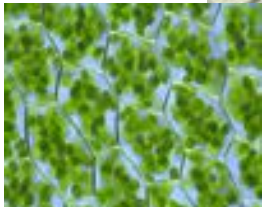




# Data integration



**link, associate, group, complete, combine, mix, etc**





# The rise of Big Data in agriculture

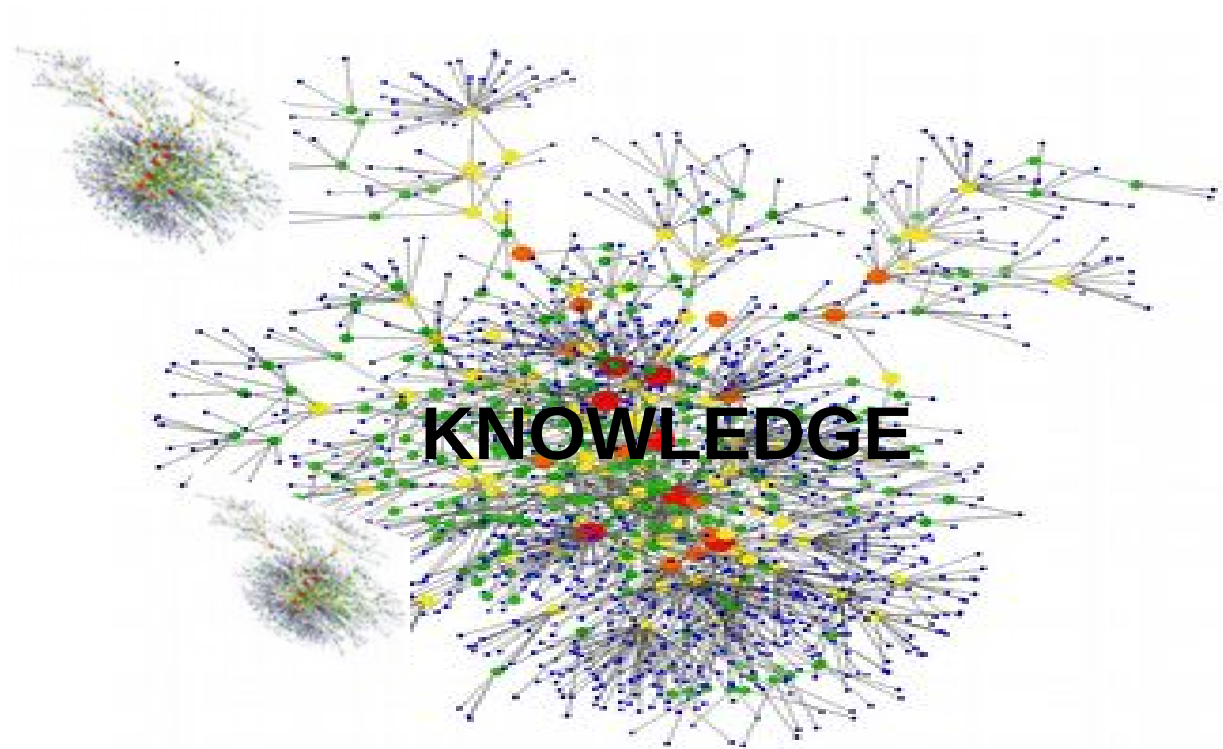
More and more data services and datasets on Web

- Wine data
- Viticulture data
- Weather data
- Soil data
- Environmental data
- Genomic data
- Economic, health etc.





# The rise of Big Data in agriculture



# Agriculture Big Data

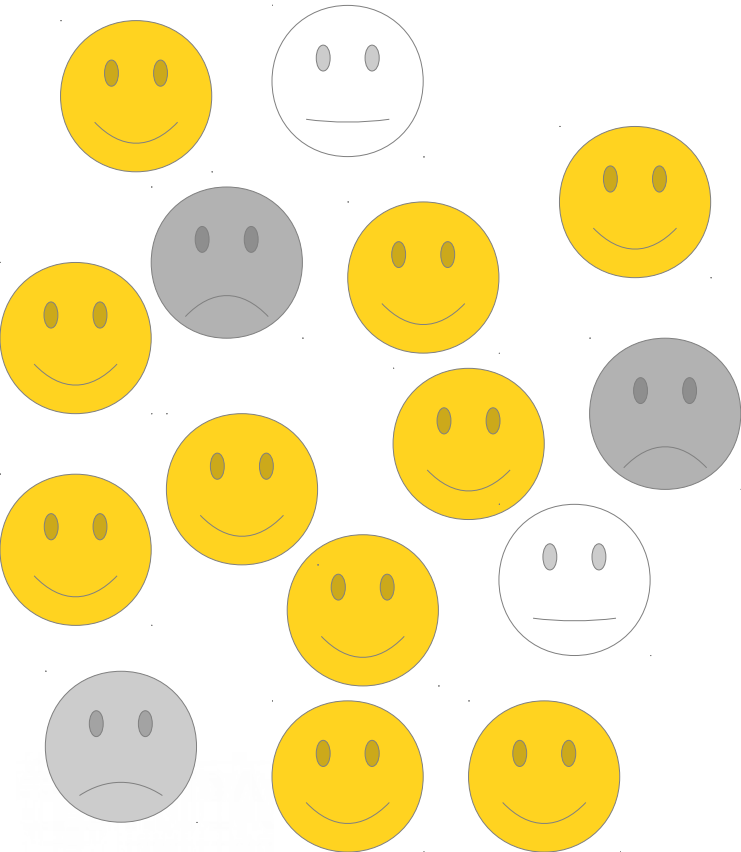
## V characteristics

- **Volume:** massive data and **growing size**  
→ *hard to store, manage and analyze*
- **Variety and Complexity:** different sources, scales, disciplines  
different semantics, schemas and formats etc.  
→ hard to understand, combine, integrate
- **Velocity:** speed of data generation  
→ have to be processed on line
- **Veracity, Validity, Vocabulary,** Vulnerability, Volatility,  
Visibility, Visualisation, Vagueness, etc.



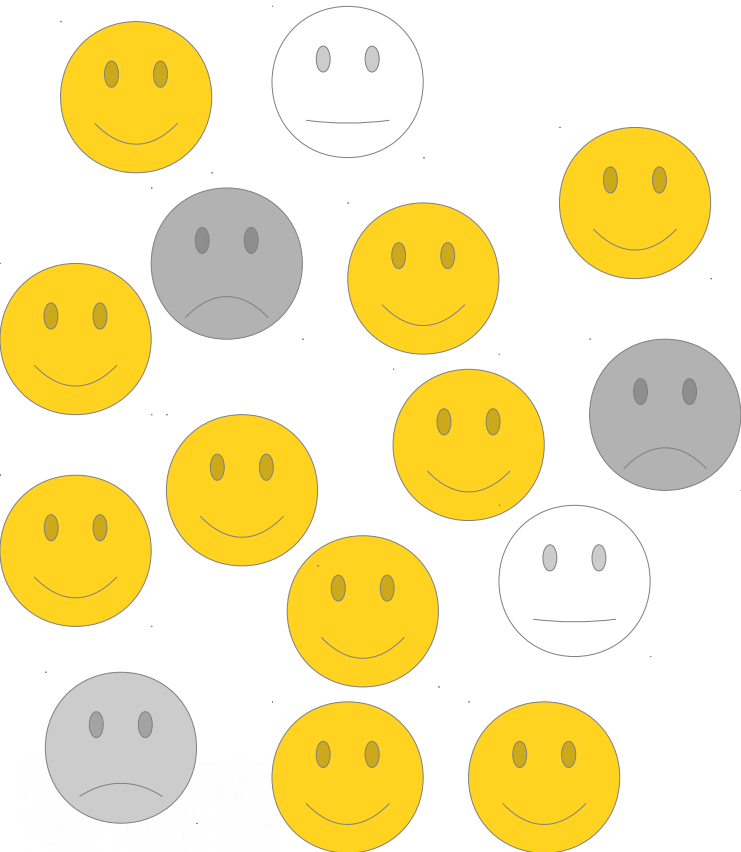
# Why Big Data is important for Agriculture?

**Population  
understanding / treatment**

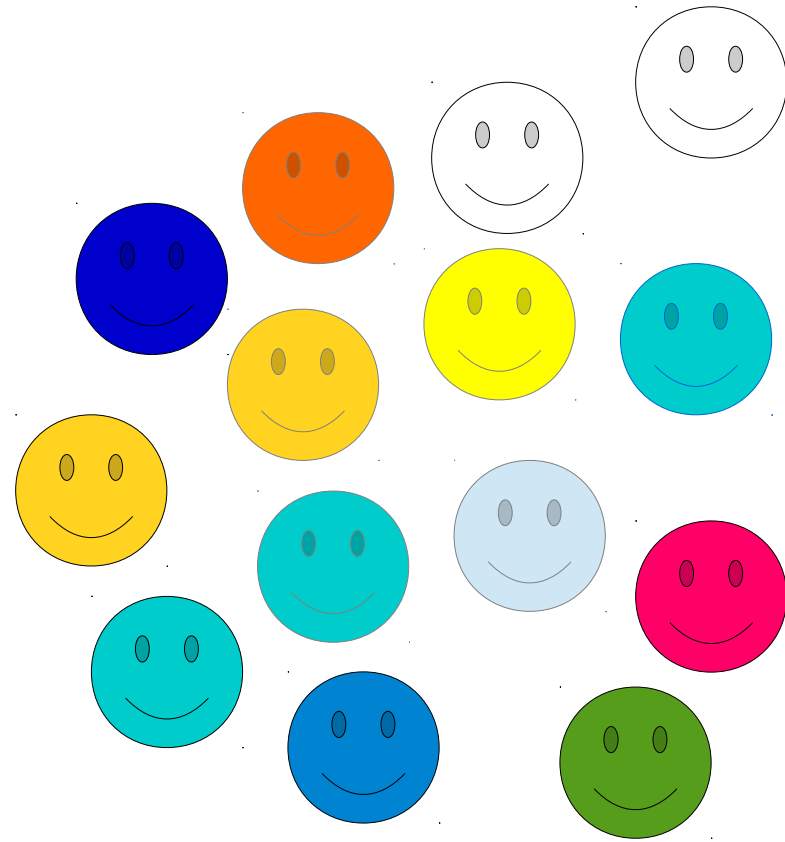


# Why Big Data is important for Agriculture?

**Population understanding / treatment**



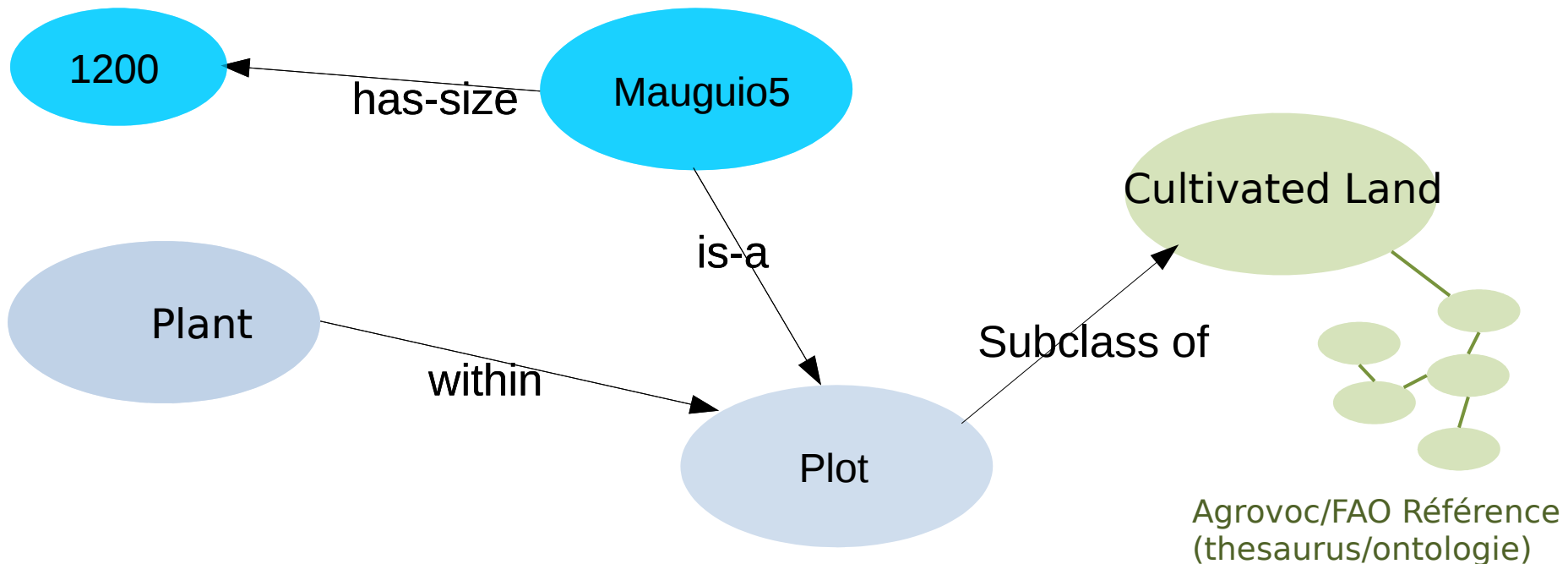
**Individualized understanding / treatment**





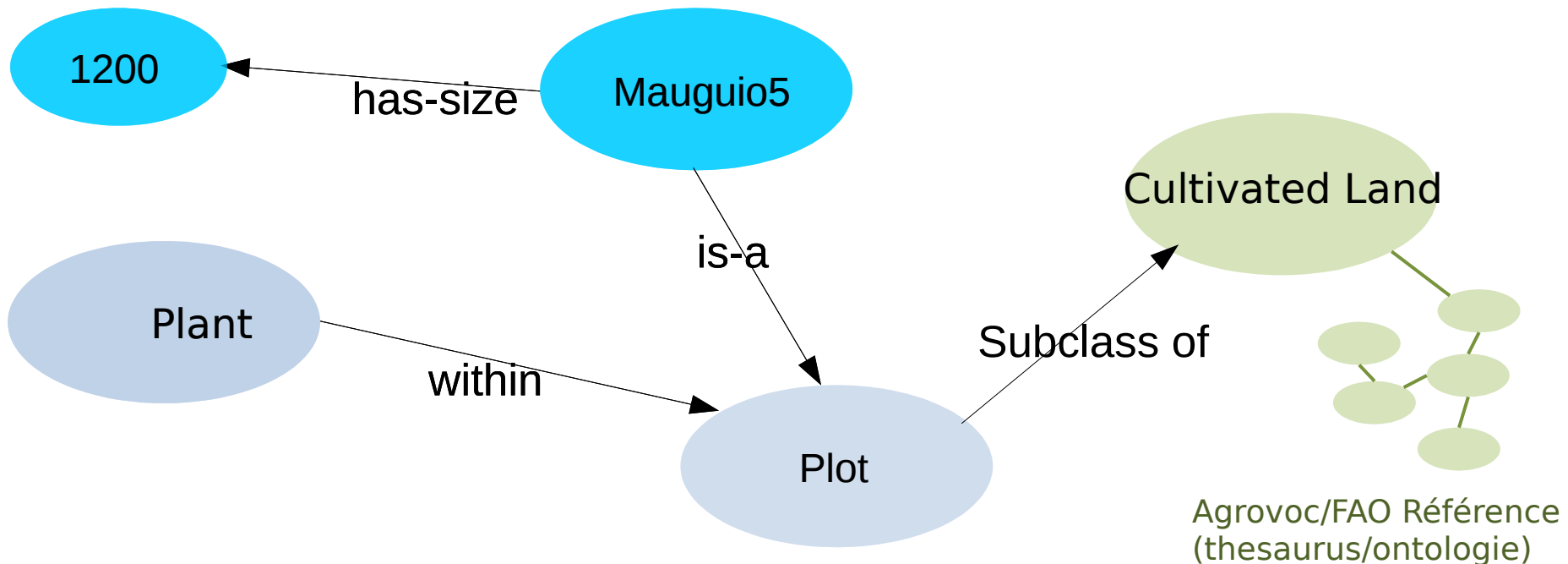
# Structuring Data

*Metadata / Ontologies provide the meaning of the data*  
→ link each data element to a **controlled, shared vocabulary**

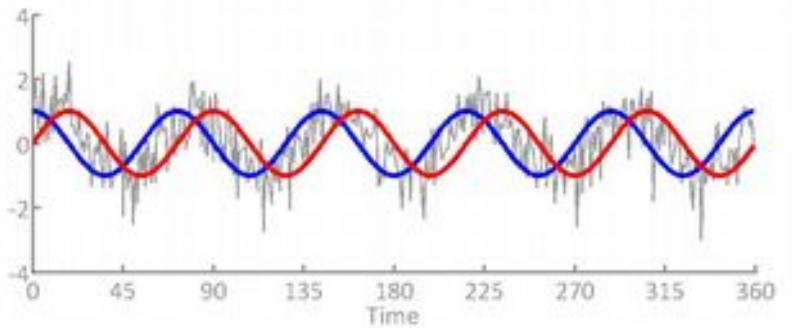
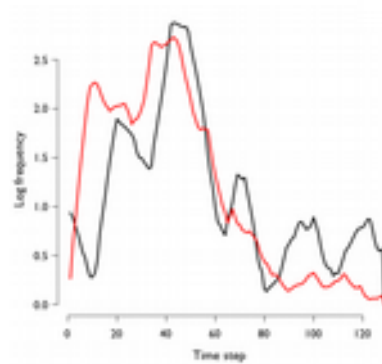
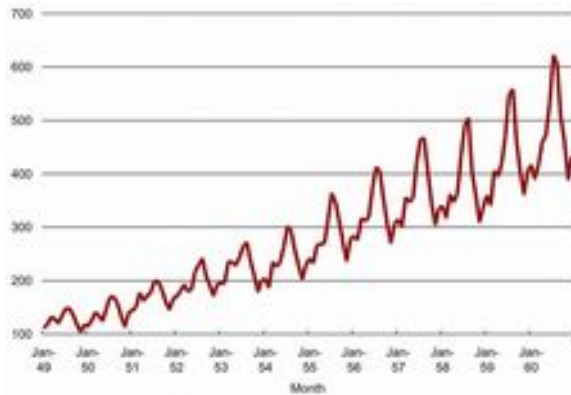
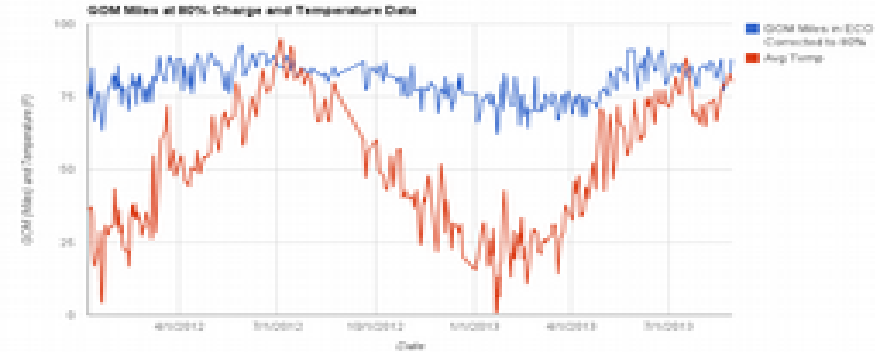
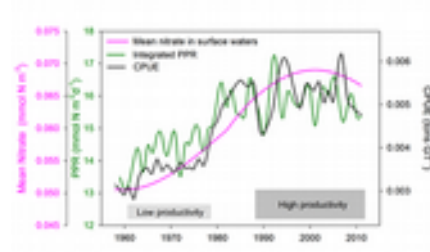
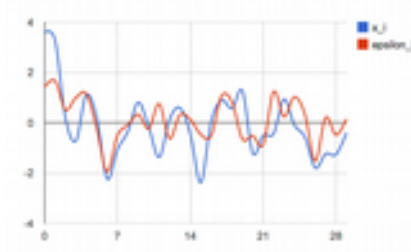


# Structuring Data

*Metadata / Ontologies provide the meaning of the data*  
→ link each data element to a **controlled, shared vocabulary and *Machine readable***

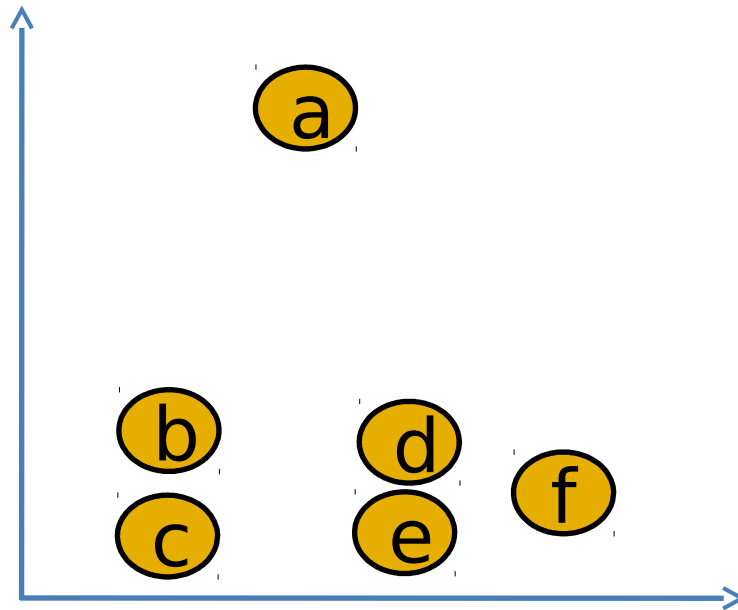


# Data analytics



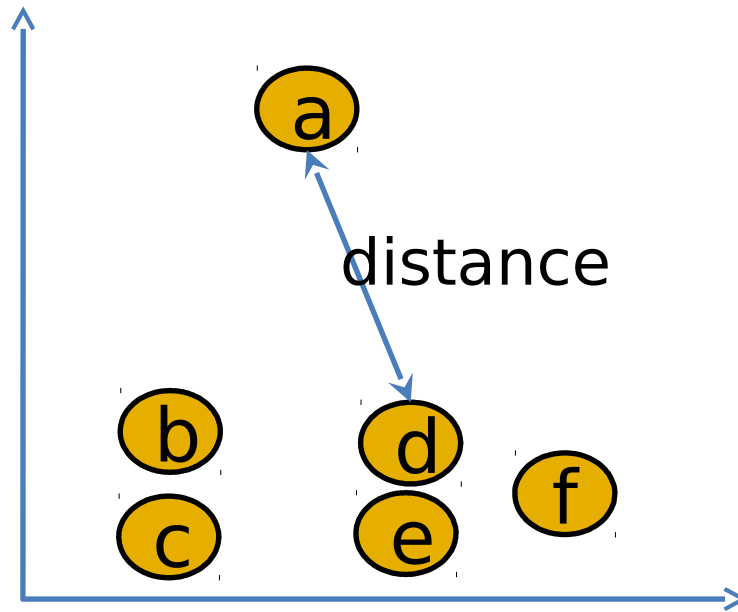
# Data analytics

## Clustering (segmentation)



# Data analytics

## Clustering (segmentation)

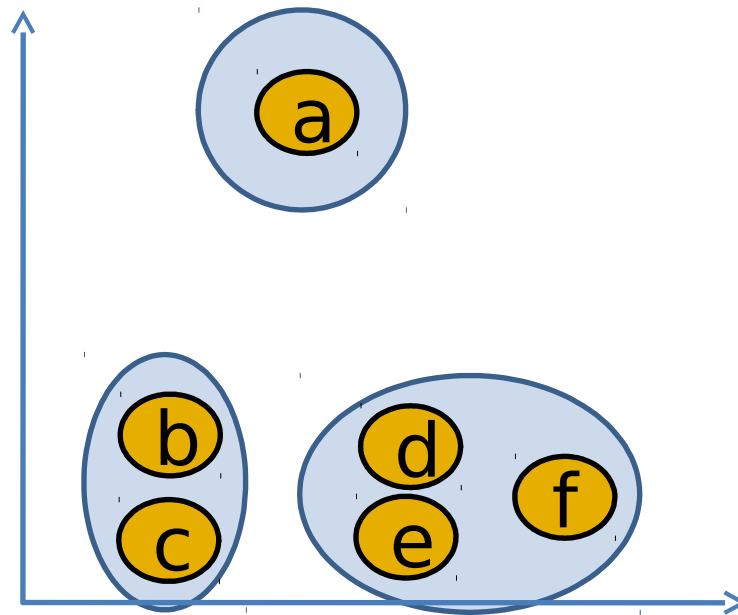




# Data analytics

## Clustering (segmentation)

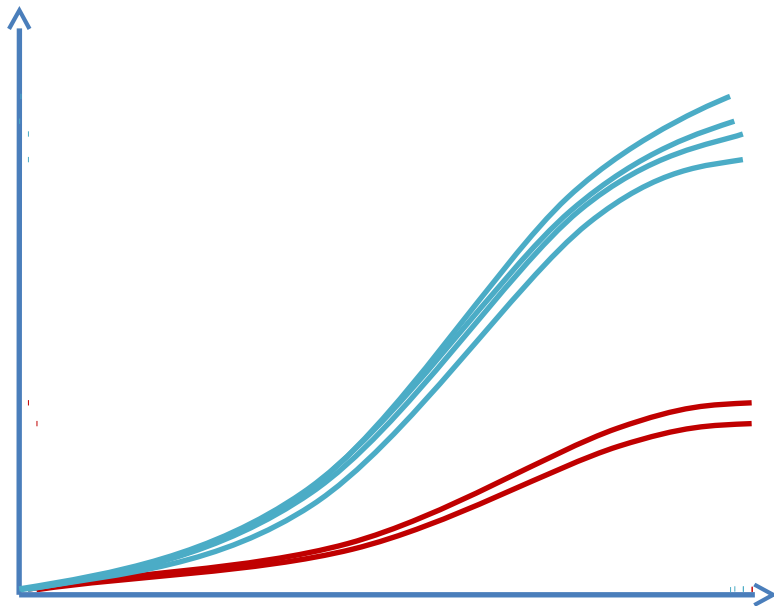
**Build groups**



# Data analytics

## Clustering (segmentation)

### Build groups



- Wine clusters
- Field clusters
- Etc.
- **Time series**

# Data analytics

## Discover Associations

Id	Bière	Chips	Marteau	Clou	...	Poisson
1	X	X				
2			X	X		
3		X				X
4	X	X				X

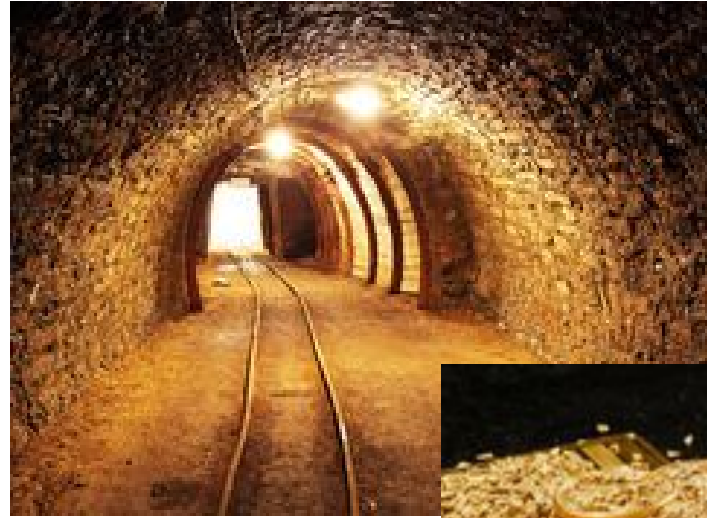
# Data analytics

## Discover Associations

**Bio-aggressor developement, find associations:**

- **Size of hedge**
- **Sort of of hedges**
- **Area humidity**
- **Type of fauna**
- **Land configuration**
- **Practices**
- **...**

# Data Science



**Search**

**Discover**

**Mine**

**Extract**

**Refine**

**Transform**



# Data Science

Video....

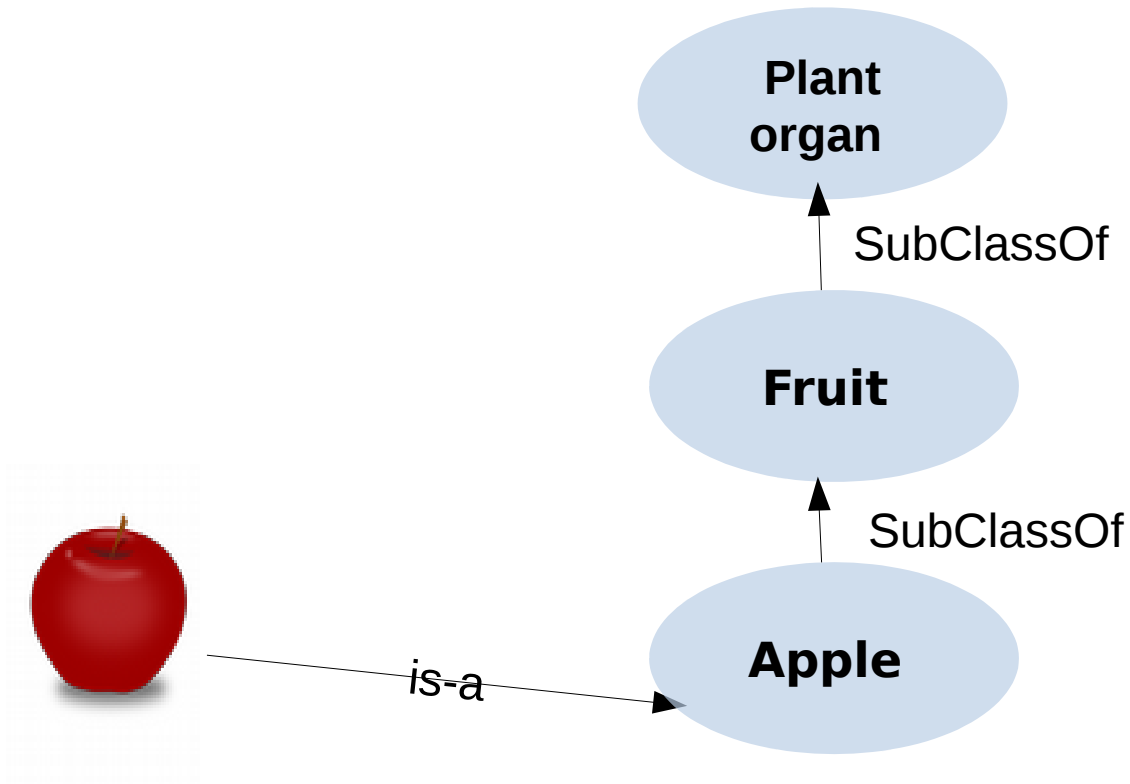


# Conclusion

- **Storage costs, new devices, Web... make Big Data**
- **Data must be group, integrate...**
- **Big data analytics open new insights**
- **Ethic and privacy needs**
- **New skill needs**
- **Big data is cultural and technical challenges**

# PHIS Example

*Ontologies provide inference*



# PHIS Example

*Ontologies provide inference*

