Big Data Challenges for Logistics

Industry Perspective

CNH Industrial Italia Spa

Bologna, Italy
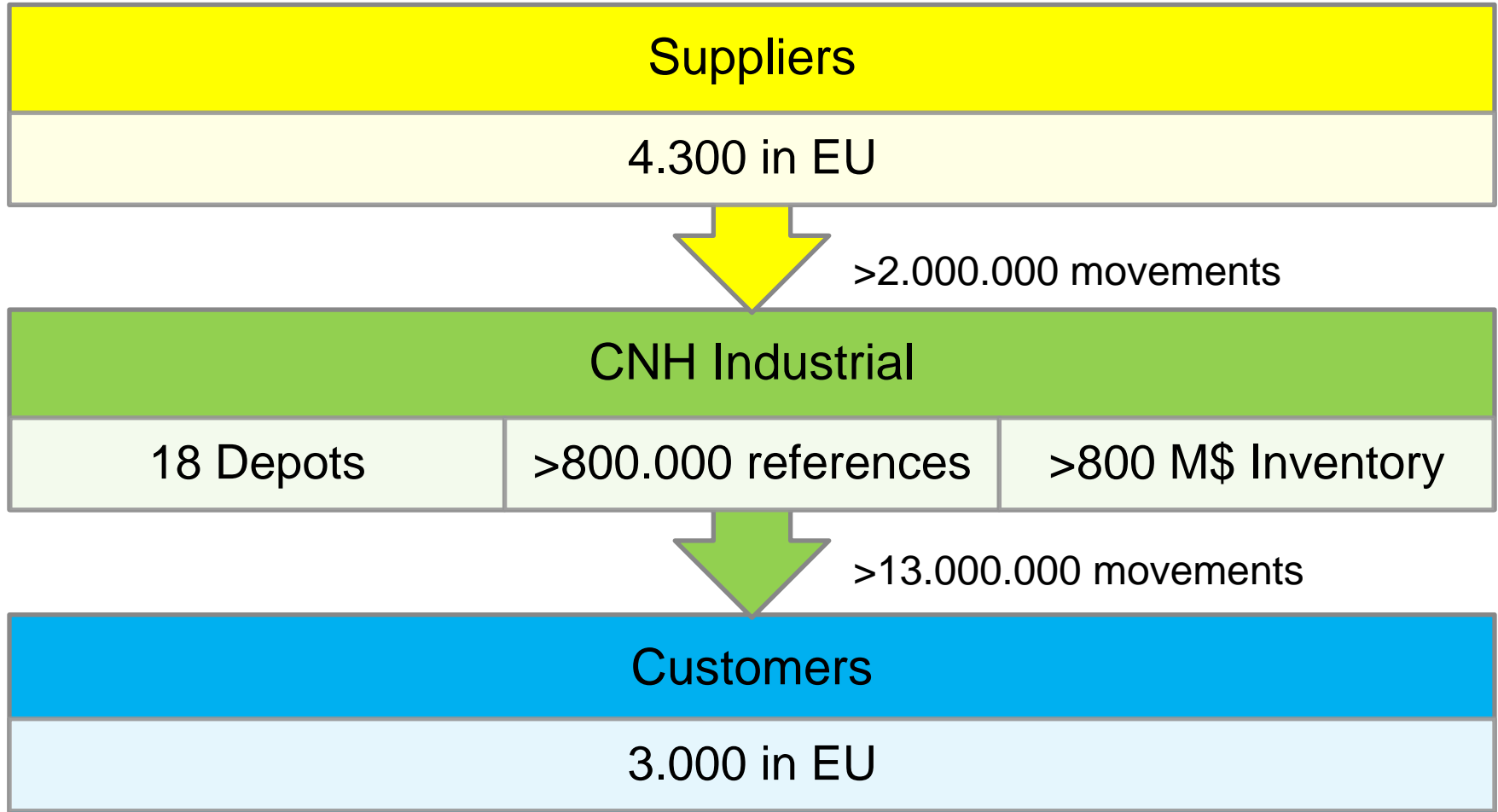
Tommaso D'Alessandro

CNH Industrial EU Business Scope

4.300 Suppliers > 18 Distribution Centres > 3.000 Customers

Suppliers
4.300 in EU

>2.000.000 movements

CNH Industrial		
18 Depots	>800.000 references	>800 M$ Inventory

>13.000.000 movements

Customers
3.000 in EU

Network Optimization

Complex Systems Optimization

800.000 references

4.300   **18**   **3.000**
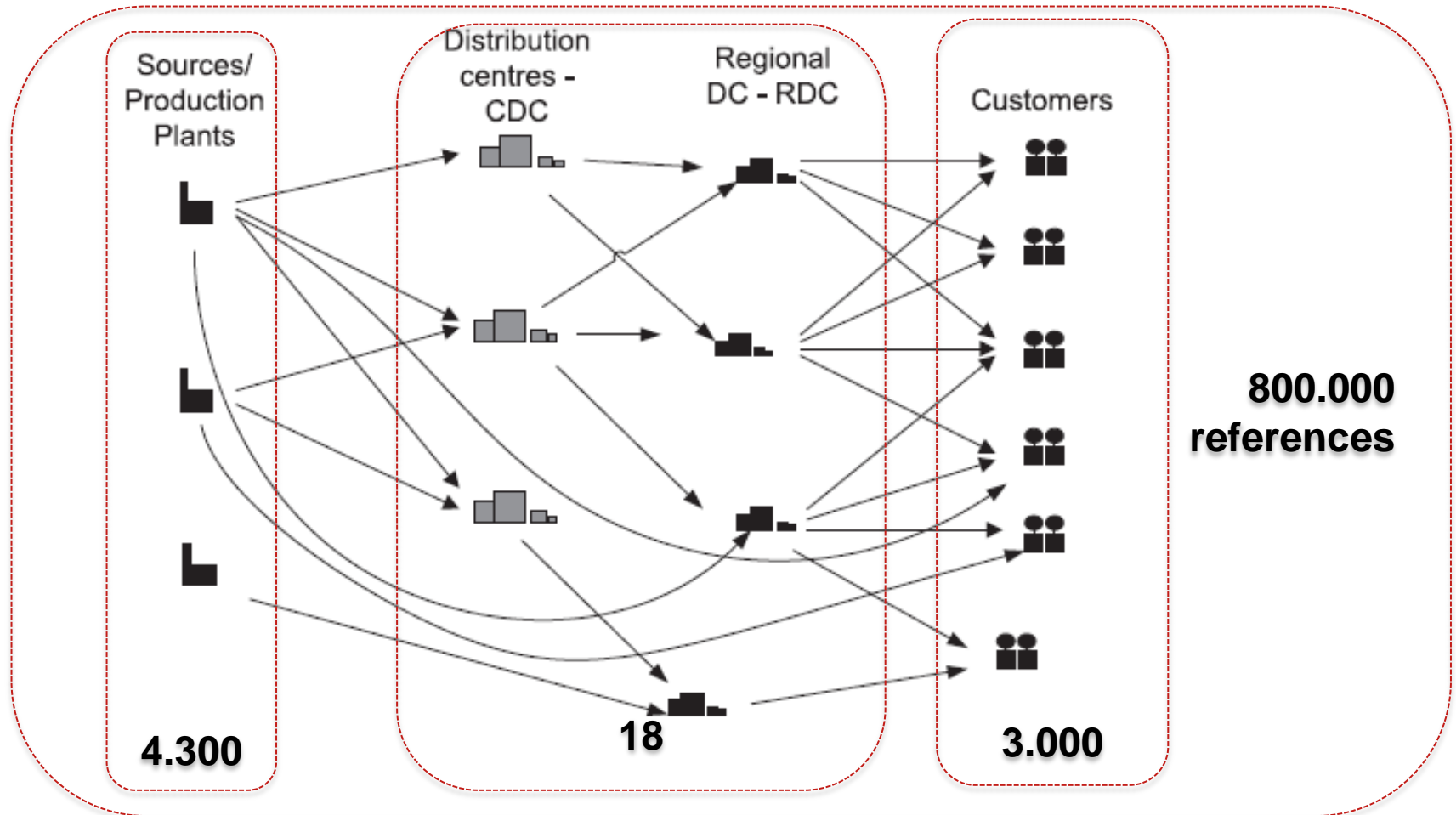
Over 10^{14} possible combinations to be evaluated

Correlated Demand
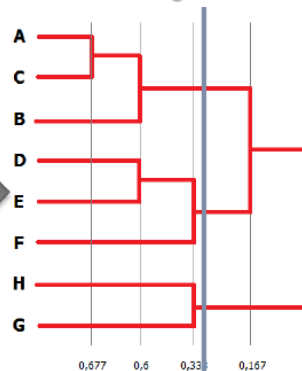
Identify Hubs in References universe

3000 customers

800.000 references

Dendrograhm

Results

Cluster	Prodotto	Popularity	Cluster Popularity
1	C	6	
1	B	4	14
1	A	4	
2	D	5	
2	F	3	11
2	E	3	
3	H	2	4
3	G	2	

Scope: over 10^{16} Iterations

Sample Strategic Issues:

- How many times items are sold together?

- Is there any set of characteristics of frequent sellers acting as hubs in the demand profile?

- Can we sell efficiency-driven families of references?

Forecasting

Best Fit for Each Item

- Need**:** Estimate future uncertain demand

- Possible Solutions:

  - **Time Series** Methods: average, exponential smoothing

  - **Causal** Methods: multiple factors regression

  - **Artificial Intelligence**: neural networks

Massive Data Modelling Analysis

Big Data Challenges

An agenda for future innovation

- Process Improvement

  - Network optimization

  - Forecasting

  - Planning

- Value Chain Analysis

  - Global Commodity Chain Perspective

  - Customer Value Insights

  - Supplier Base Analysis

- Risk Management

  - Scenarios Simulation

  - Contingency Plan

- System Thinking:

  - External Factors-Based forecast (climate, economic trend, machine park)

Questions?