

Quantitative Consulting for Business

Planning your business with Bayes nets



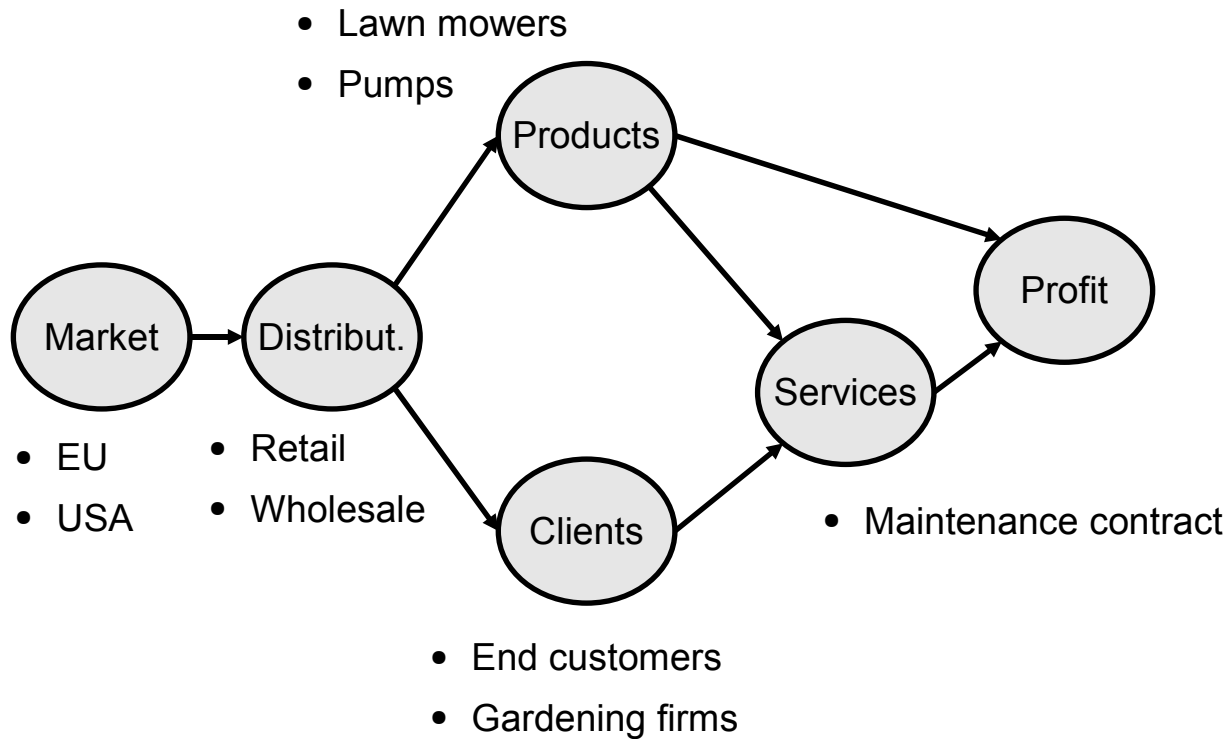
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Bayes nets give a systematic approach to creating business plans or to sizing markets.

Example: Manufacturer of electric motors

Top-down market sizing for a new line of lawn mowers and water pumps

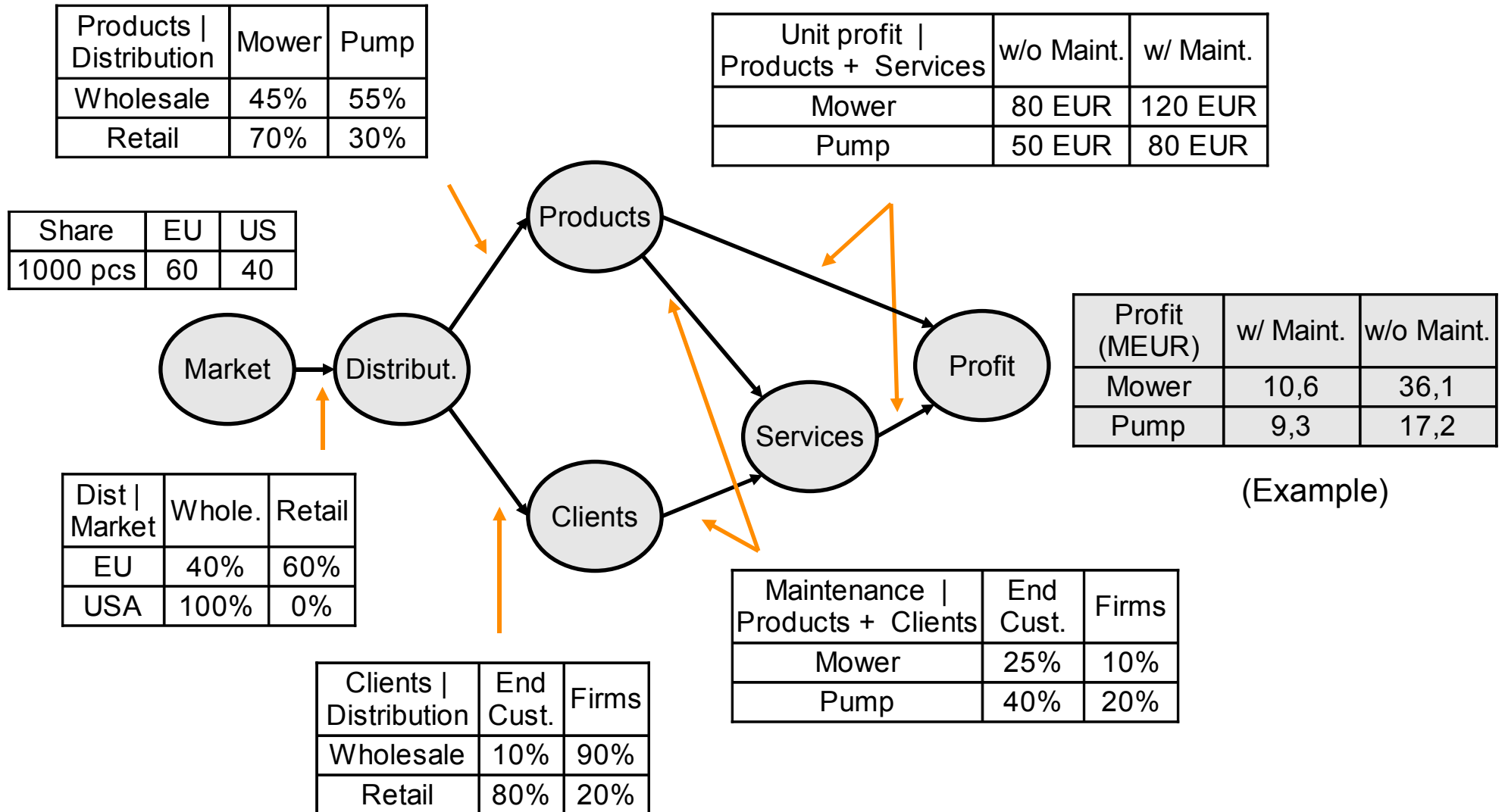


Bayes nets

- **Compact representation** of known relationships and assumptions made
- **Simple handling** of parameter variations
 - Scenario calculation
 - Sensitivity analysis
- **Good overview** over expected effects leads to more reliable planning



Known relationships and additional hypotheses are represented in tabular form. The Bayes net formalism then directly gives the results.



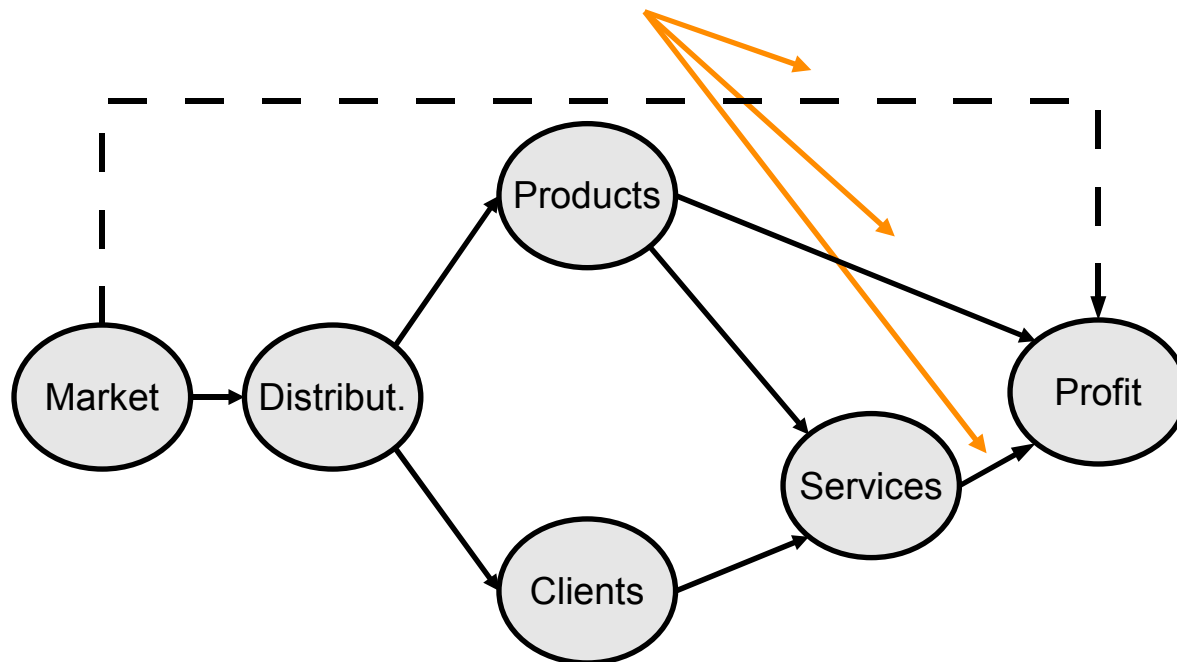


Not only do Bayes nets allow a simple treatment of parameter variations, structural changes in the hypotheses can also easily be integrated.

| Unit profit Prod+Serv+Market | Market | w/o Maint. | w/ Maint. |
|--------------------------------|--------|------------|-----------|
| Mower | EU | 80 EUR | 120 EUR |
| Pump | EU | 50 EUR | 80 EUR |
| Mower | USA | 40 EUR | 45 EUR |
| Pump | USA | 50 EUR | 60 EUR |

Integrating new hypotheses

- In the example, new data about the profitability of products and services in the US becomes available
- This new information is represented by an additional arrow. The additional data is coded into the corresponding table
- Again, the Bayes net formalism takes care of the rest:



| Profit (MEUR) | w/ Maint. | w/o Maint. |
|---------------|-----------|------------|
| Mower | 9,1 | 29,7 |
| Pump | 8,3 | 17,2 |

(Example)



Projects for the creation of business plans using Bayes nets are typically small modules in larger projects but can also stand alone.

Workshop I

- Scope of the business plan
- Definition of expected outputs
- List of available data and data to be researched
- Short introduction to the methodology of Bayes nets
- Discussion of scenarios to be developed using Bayes net graphics

Development of core tool

- Research of missing data
- Data aggregation
- Development of core tool
- Calculation of scenarios and sensitivity analyses

Workshop II

- Validation of final concept
- Discussion and validation of scenarios