MAE-P³ – A system to gain transparency of production structure as a basis for production relocation planning

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Outline

- Initial Situation
- Internationalization of the production
- Problem and Aim

- The method MAE-P³
  (Machines and Equipment, Processes, Products, Planning)
- The system MAE-P³
- Production structure optimization based on MAE-P³

- Conclusion & Discussion
The conditions on the international market are changing:
- Reduction of production lifecycle times,
- Increasing globalization,
- Raising competition

Many companies pursue an internationalization of their production based on two motives:

1. Motive: Opening of new markets
2. Motive: Reduction of production costs by relocating production from high-cost-to low-cost-locations

Large automotive electronic suppliers,
- With global production networks
- Similar products
**Internationalization of the production**

**Former Strategy**

- Plants at different High Cost Locations
- Own Product-Specters
- Preferred Processes
- Preferred Suppliers and Resources

**International production**

- High-Cost Location
- Low Cost Location
**Problem**

- Now Products are build in different High- and Low-Cost-Locations
- Different Products from different plants come together at Low Cost Locations
- Consequence is an inhomogeneous production structure in Low Cost locations
  ➔ Transparency of the production structure is missing

**Aim**

- Visualize the production structure of producing companies within a worldwide production network
- Compare the production structure
- Compare product-flows and production lines for relocation planning
The method MAE-P³ enables to compare lines and product flows visually with a matrix:

- **MAE** – **Machines And Equipment**
- **P** – Processes
- **P** – Product flows
- **P** – Planning

### Manufacturing Processes

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The system MAE-P³ is a database:

- The data of production lines and product flows are stored in lists
- The Needleman-Wunsch algorithm - of the discipline of bioinformatics - was developed to find similarities in the amino sequences of two proteins.
- The algorithm to compare protein chains is here used to compare process chains
The system MAE-P³ is programmed with

- A MySQL Database
- RubyOnRails
- Implemented in the intranet

The system MAE-P³ provides

- Search options for locations, departments, production lines, manufacturing processes and product flows
- Visualization of the production structure
- Visual comparison of production lines
- Visual comparison of production lines and product flows for relocation planning
- Visual comparison of product flows in order to optimize the production structure
To optimize the production structure, the product flow of every product will be compared.
Production structure optimization based on MAE-P³

- To optimize the production structure, the product flow of every product will be compared.

**MAE-P³ Matrix**

**Product flows**

**Pre-Assembly**

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Conclusion

With the MAE-P³ system

- The production structure of a worldwide production network can be visualized
- By comparing product flows with possible production lines, location planning can be done
- By comparing the product flows of products in a department, plant or whole production network, the production structure can be optimized
Thank you for your attention!