Identification of Mechatronic Units based on an Example of a Flexible Customized Multi Lathe Machine Tool
Agenda

1. Engineering process in custom machine engineering
2. Approach for the identification of mechatronic units
3. Example lath machine tool
4. Summary
1. Engineering process in custom machine engineering

- domination of sequential engineering process in (custom) machine engineering

- No integrative mechatronic thinking in the process

Assembly groups form basis for the identification of mechatronic units (MUs)
1. Engineering process in custom machine engineering

**Customer`s view**
- domination of sale
- machine functionality for customer
- usability
- energy efficiency
- maintainability
- configurability

**Production view**
- importance of production factors
- logistic complexity
- structural alternatives
- easy of assembly
- cost efficiency
- date observance

**Balance of both views of importance for the identification of mechatronic units and guarantee chances for flexibility and standardization**
2. Approach for the identification of mechatronic units

Three types of mechatronic units

- base machine
- series modules
- customized module

Further properties

- connection by interfaces
- flexible usage despite standardization
2. Approach for the identification of mechatronic units

Identification process

- Identification possible by flowchart
- Identification must be done for every machine type
- Series /customized module may migrate

Simplified flow chart for the identification of mechatronic units
3. Example lathe machine tool

Multi-spindle lathe machine tool

Base machine

- Contains all basic functionality of a machine type
- Composed from functional modules
- Mechatronic interfaces for quick connection of other modules

origin: Alfred H. Schütte GmbH
3. Example lathe machine tool

Series module „handling system“

Series module „processing head“

Customized module „processing head“

- Standardized series module
- Interface for connection with base machine
- New constructed module
- Adoption of the series module interface

mechatronic module

origin: Alfred H. Schütte GmbH
3. Example lathe machine tool

**Benefit**

- Modules standardized for production and assembly
- Customer gets specific machine with flexible functions
- Identified modules can be divided in further modules (object orientation)
- Modules can be used in whole process
- Modules use for easy programming of a machine simulation model

Simulation model of a multi spindle lathe machine tool
4. Summary

- Identification of MUs provides potential in standardization
- Different views important for the identification of MUs
- Identification of MUs possible even in customized machine engineering
- MUs provide potential for an easy programmable machine simulation model

Further Work
- Itamize und generalize approach and identifying process
Thank you!
End of presentation

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