Selected references

Data mining for manufacturing of individually medical products

Our approach
- Collection of all relevant data along the process chain
- Complete process monitoring
- Concept creation for the process guidance of small and single series
- Data mining for process analysis
- Support of process planners and machine operators through prediction of process settings

Results
- Transparency and traceability of individual products and processes
- Gapless data collection and processing
- Product controlled selection of process settings
- Relief of the employees while manufacturing of risk-entailing products

Individualization of medical products

- Collection of all relevant data along the process chain
- Complete process monitoring
- Concept creation for the process guidance of small and single series
- Data mining for process analysis
- Support of process planners and machine operators through prediction of process settings
Selected references

**Data mining for process optimization in glass blank moulding**

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**Our approach**

- Design and development databank concepts for the collection of process and product data along the process chain for optic manufacturing (tools, wafer, press technology, optic etc.)
- Data import through machine cross-linking, standardized data formats and manual front-ends
- Import into data mining software as RapidMiner
- Advanced analytics for deduction of process optimizations through neural networks, FTA etc.

**Results**

- Extended process knowledge and complete transparency through a gapless data collection and processing
- Dependencies of machine parameters, process and product quality
- Sustainable process optimization with respect to quality, time and costs

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*Image sources: Fraunhofer IPT*
Selected references

Data mining analysis of a milling process

Our approach

- Integration of in-process measurement technology for:
  - Tool monitoring (wear)
  - Workpiece monitoring (geometry, roughness)
  - Process monitoring
- Automatization of the analysis of product, process and tool data with data mining tools
- Development of forecast algorithms for the prediction of workpiece quality parameters

Results

- Innovative measurement systems and automated data collection originating from the NC-program
- Relational database for the management of all product, process and workpiece data
- Data mining models for milling processes
- Prediction of milling parameters based on quality and time requirements of the processes
Selected references

Reliability analysis of self-optimizing production systems

Our approach

- Development of models and description forms for artificially intelligent optimization algorithms
- Adaption of classical risk management methods according to the needs of Industry 4.0 and cyberphysical systems
- Direct transfer of recent research results into industrial applications

Industry 4.0 – safe and reliable

Results

- Comprehensive set of tools and methods for the protection of artificially intelligent production systems
- Quantifiable reliability assessments for Industry 4.0 and cyberphysical systems
- Understanding and optimization of safety and security for cross-linked, autonomous systems
**Selected references**

**Simulation of product risks for stocks optimization**

**Our approach**

- Target dependant process modelling based on the SCOR-models and SIPOC
- Target dependant risk modelling based on risk identification methods according to IEC 31010
- Company specific model parametrization
- Occurrence discrete and constant simulation
- Process related risk analysis
- Action dependant scenario analyses

**Results**

- Process related risk transparency → Risko and lessons-learned inventory
- Risk costs calculation (z.B. VaR or CFaR)
- Scenario analysis
- Effectiveness assessment of risk-treating actions
- Management summary

**Layout of optimal stocks**

1. Process modelling

2. Risk modelling

3. Simulation

4. Assessment & definition of actions

Image sources: Fraunhofer IPT
Selected references
Risk management in huge development projects

Our approach

- Environment and requirements analysis for individually adjusted design of the approach for the specific project
- Parallel to the project »Risk Excellence« is executed through seamless integration in the project business
- Integration into the project specific customer and supplier handling
- Survey of KPI for the proactive control of risks

Results

- Systematic approach raises acceptance of employees and creates risk awareness
- Proactive identification and mitigation of technical and procedural project risks reduces costs and delays
- Professional communication raises the competency recognized of project partners

Customer reference »Risk Excellence«: Åsgard subsea gas compression

Dynamically scalable: »Risk Excellence«

Image sources: MAN Diesel & Turbo, Aker Solutions