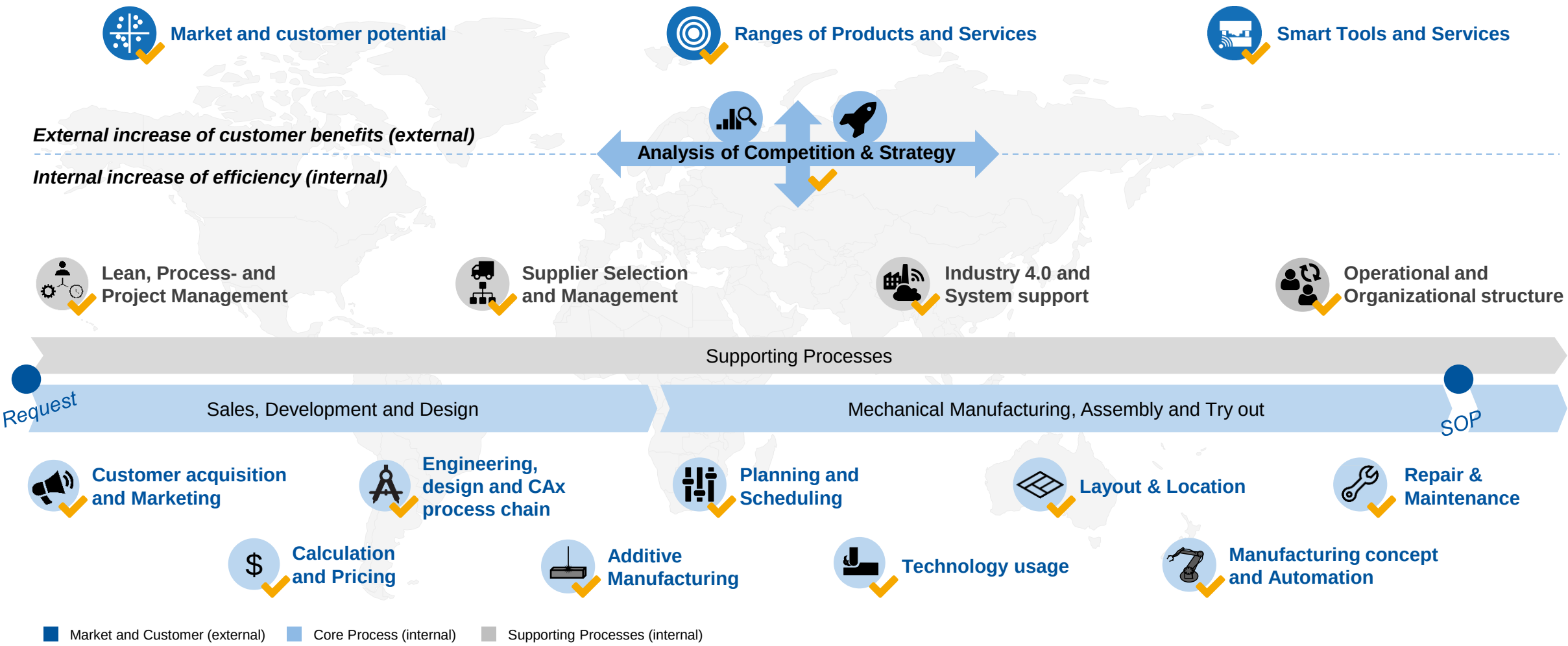
WBA
WERKZEUGBAU
AKADEMIE


# References Consulting Services

## Project focus Supporting Processes

# Consulting Services
## Overview of Topics and Content of our Consulting Portfolio



# Consulting Services
# Topics and Content in detail (I/II)

## *Market & Customer*

### Market and customer potential

- Analysis of technological trends
- Analysis of market sizes and developments
- Determination of potentials for distribution and procurement
- Identification of potential customers and buyers

### Range of products and services

- Analysis of market and customer demands
- Analysis of the company specific range of services
- Analysis of core competencies
- Development of service and business models

### Intelligent tools and services

- Analysis of internal and external requirements
- Selection of sensors and actuators
- Conception of company-wide service platforms
- Development of databased services and business models

## *Competition & Strategy*

### Analysis of competition and strategy

- Benchmarking for the determination of the organizational and technological performance
- Identification of action fields
- Identification of strategical success factors and strategy development
- Development of an implementation roadmap and deduction of specific measures

## *Supporting processes*

### Lean, Process- and Project Management

- Process analysis and process design
- Definition of key performance indicators and IT-based illustration
- Conception and implementation of a (digital) shop floor management
- Definition and implementation of agile methods of project management

### Supplier selection and management

- Definition of scopes and relevant processes for procurement
- Identification, assessment and selection of suppliers
- Initiation and development of strategic partnerships
- Holistic assessment of options for national and international tool supply

### Industry 4.0 and System support

- Analysis and maturity assessment of the Industry 4.0 status quo
- Development of objectives, concepts and roadmaps including investment budgeting for Industry 4.0
- Deduction of specific Industry 4.0 use cases including implementation support
- Recording and analysis of machine and production data

### Operational and organizational structure

- Analysis of organizational structures and assessment of the degree of value creation
- Procedural and organizational reorganizational
- Conception and implementation of agile structures of organizational
- Deduction of measures for the organizational change

# Consulting Services
# Topics and Content in detail (II/II)

## *Core Processes*

### Customer acquisition and marketing

- Analysis of market and customer demands
- Development of strategies for distribution and marketing
- Identification and selection of relevant instruments for marketing
- Fine adjustments of selected analogue and digital instruments for marketing

### Calculation and Pricing

- Analysis and optimization of the used methods of calculation
- Analysis of conducted calculations for cost optimization
- Development of solutions for data capturing and provision
- Definition of requirements and selection of calculation software

### Planning and Scheduling

- Manufacturing process analysis and derivation of standard manufacturing processes
- Conception of a virtual/physical segmentation and clocking
- Conception of hard- and software for data capturing and provision
- Definition of requirements and selection of planning software systems

### Layout and Location

- Analysis and optimization of the material flow
- Basic and fine layout design and optimization
- Conception and further specification of logistics concepts
- Planning and support for relocation and transfer to existing and newly built locations

### Repair and Maintenance

- Data capturing and analysis as well as definition of KPIs during the process to increase transparency
- Optimization of spare part management by analysis of tool life as well as process definition
- Development of concepts for predictive maintenance and repair

### Engineering, design and CAx process chain

- Conception and introduction of synchronised and agile product design processes
- Assessment and optimization of the standardization for tools and tool components
- Definition of requirements and selection of CAx systems
- Analysis and optimization of the CAx process chain

### Additive Manufacturing

- Identification of technological fields of application
- Analysis of requirements and benefits with regard to the spectrum of work pieces
- Assessment of the technologies and machine selection
- Additive manufacturing integration in existing process chains with focus on subsequent processing

### Technology usage

- Definition and improvement of the manufacturing performance
- Technology assessment and profitability assessment
- Analysis and optimization of manufacturing processes and methods
- Analysis and optimization of the operating times, idle times and set-up times

### Manufacturing concept and Automation

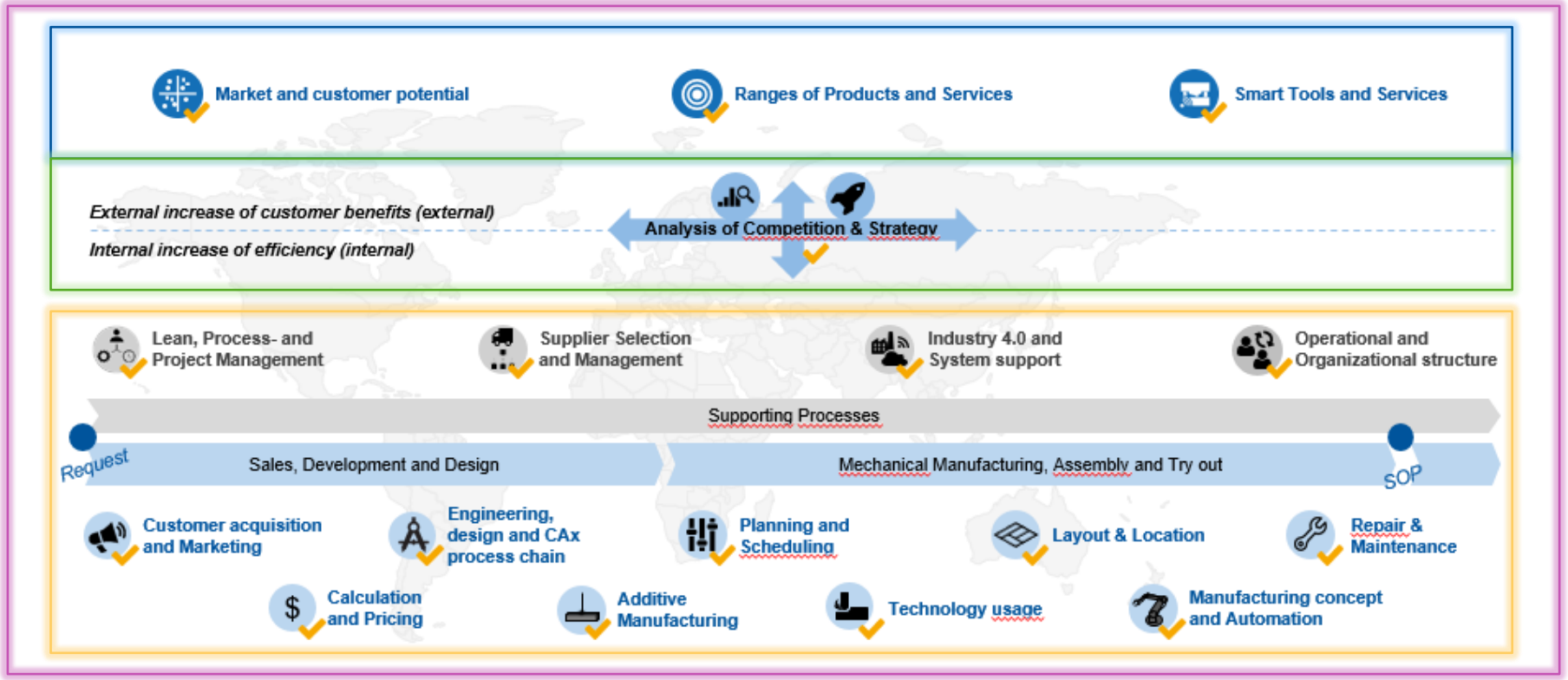
- Analysis of the actual and future range of tools and components
- Development of a manufacturing concept and technology road-mapping
- Analysis of requirements, specification and selection of machines
- Conception and selection of automation solutions

# Consulting Portfolio

## Within the consulting projects are four different project focuses

Market & Customer

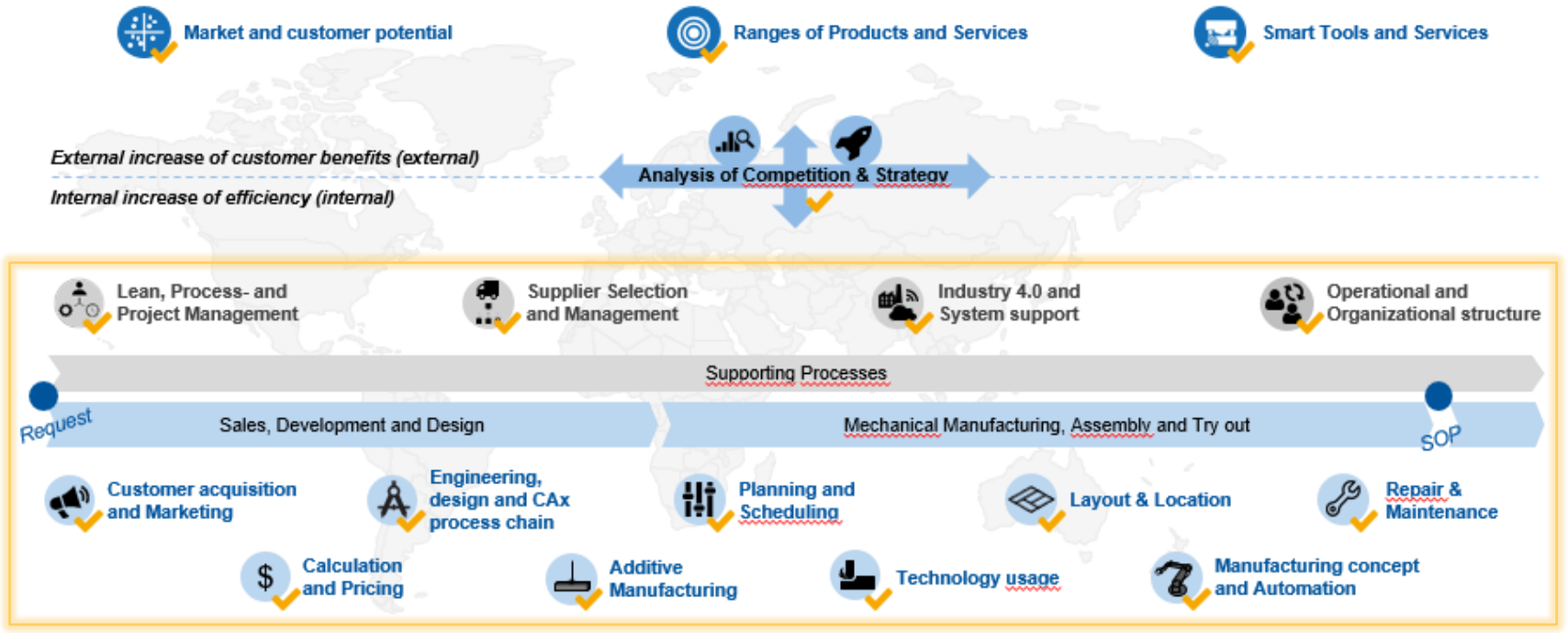
Competition & Strategy




Supporting Processes

Individual Combination

# Consulting Portfolio
## Supporting Processes

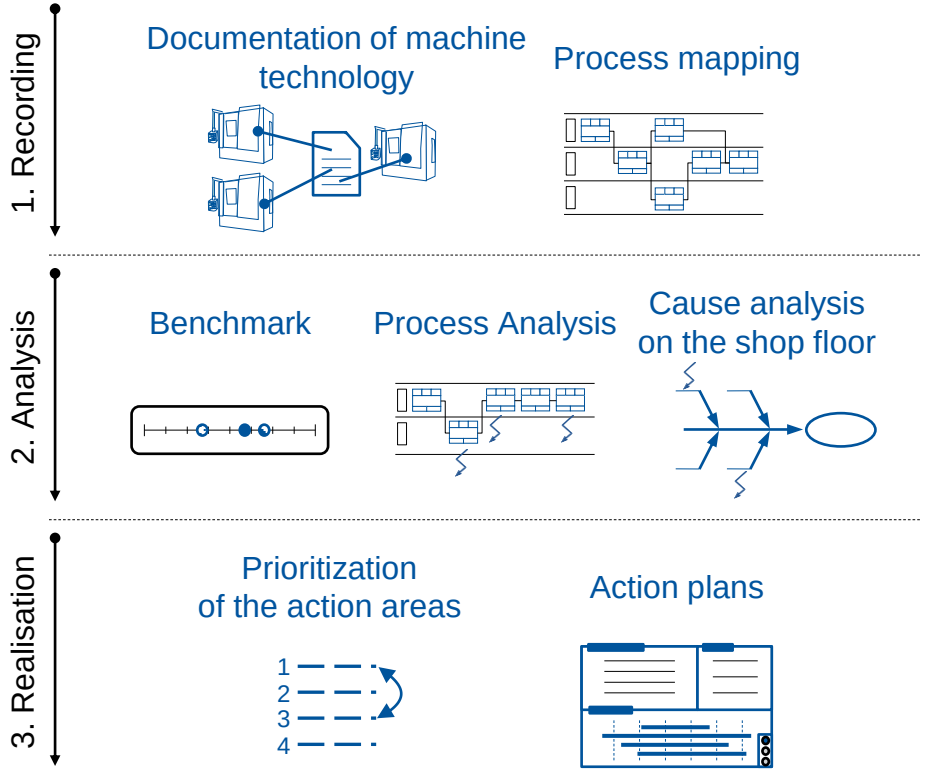



Supporting Processes

# Analysis of the milling process in large milling machinery of Audi tool and die shop to reduce non-productive times

## Approach

- Process recording and documentation of the milling large machinery and establishing **current distribution of main time and non-productive time**
- **Analysis** of the **current process** of mechanical production in the milling area and **comparison with competitors** with regard to selected key figures
- **Prioritization** of optimization possibilities and derivation of the **action plans** with corresponding **responsibilities**



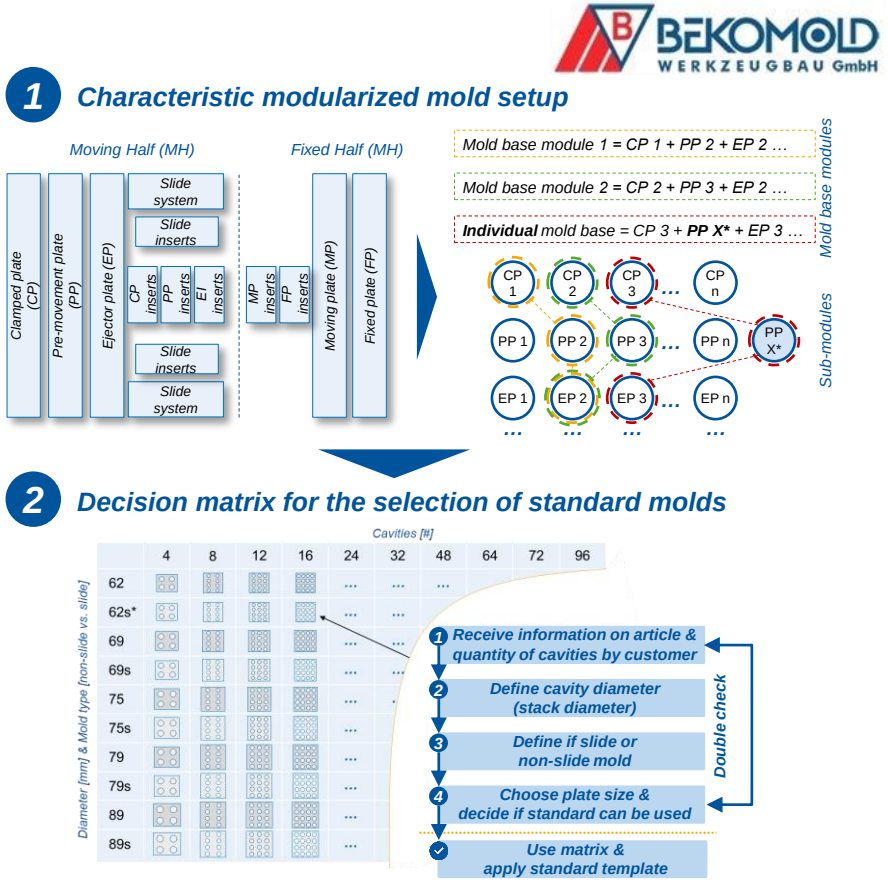

## Results

- ► **Determined competition comparison with regard to the main and non-productive times in the large milling machinery**
- ► **Identified fields of action and derived and prioritized action plans to reduce non-productive time**

# Reduction of mold variance by introducing standardized mold designs at Bekomold

## Approach

- Documentation of the mold and product range of Bekomold
- Execution of a detailed analysis of more than 200 molds with regard to assemblies and components on BOM-basis as well as with regard to number, diameter, positioning and layout of cavities
- Definition of a characteristic mold design consisting of interchangeable modules and sub-modules as well as universal standards for the various plate sizes
- Definition of required standard molds to reduce the number of variants
- Development of a decision matrix for order-specific selection of standard molds during design



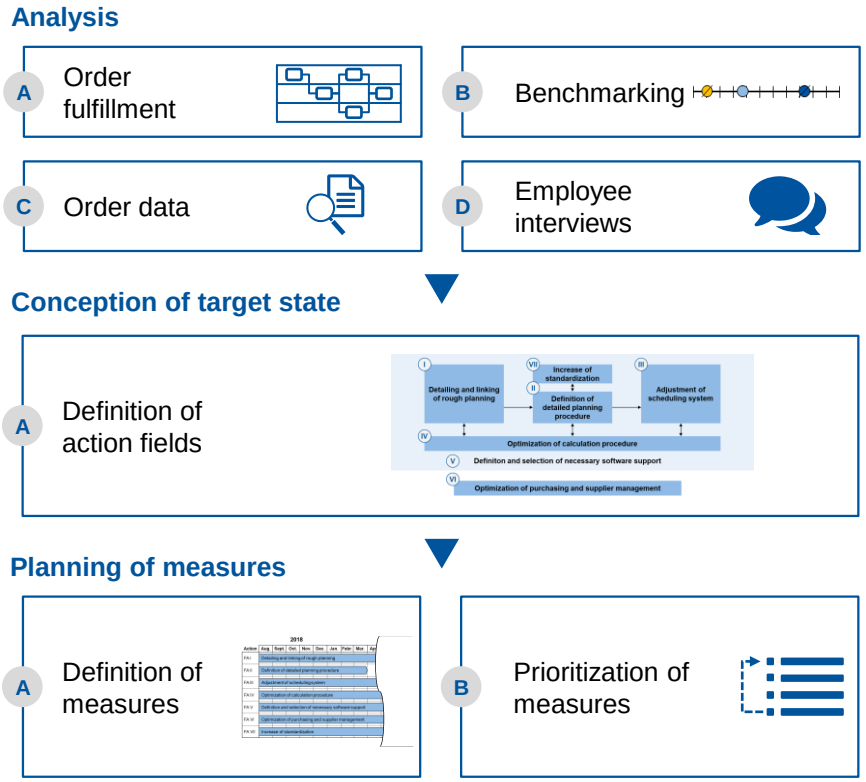

## Results

- ► **Characteristic modularized mold design consisting of interchangeable modules and sub-modules**
- ► **Developed decision matrix for the selection of standard molds in design**

# Optimization of project planning and scheduling in the internal tool shop of Otto Bihler Maschinenfabrik GmbH & Co. KG

## Approach

- Performance of an in depth analysis of the order fulfillment and planning process as well as an evaluation of project-based order data
- Deduction of strengths and weaknesses in project planning and scheduling, as well as in the whole order fulfillment process
- Development and definition of a target state for a digital interconnected project planning and scheduling consisting of rough planning, detailed planning and scheduling
- Definition and prioritization of measures for the realization of the defined target state in project planning and scheduling
- Support and controlling of the operational implementation of measures



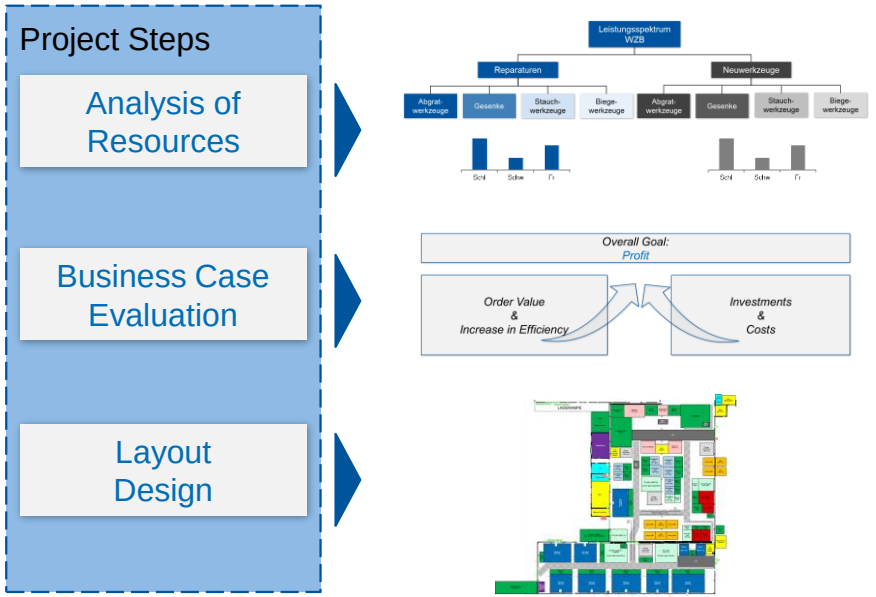

## Results

- ► **Developed and described target state for a digital interconnected project planning and scheduling**
- ► **Detailed measures with responsibilities and deadlines in order to achieve the target state**

# Centralization of the tool shop and design of the new layout at Böhler Schmiedetechnik

## Approach

- Analysis of the actual availability and demand of resources at the current tool shops as well as the calculation of the future demand of resources
- Quantitative and qualitative assessment of the tool shops' centralization within a business case and decision on the realization
- Development and design of a material flow oriented layout for the centralized tool shop
- Development of a detailed relocation plan for each resource
- Calculation of the saving potentials as well as the amortization of the centralized tool shop



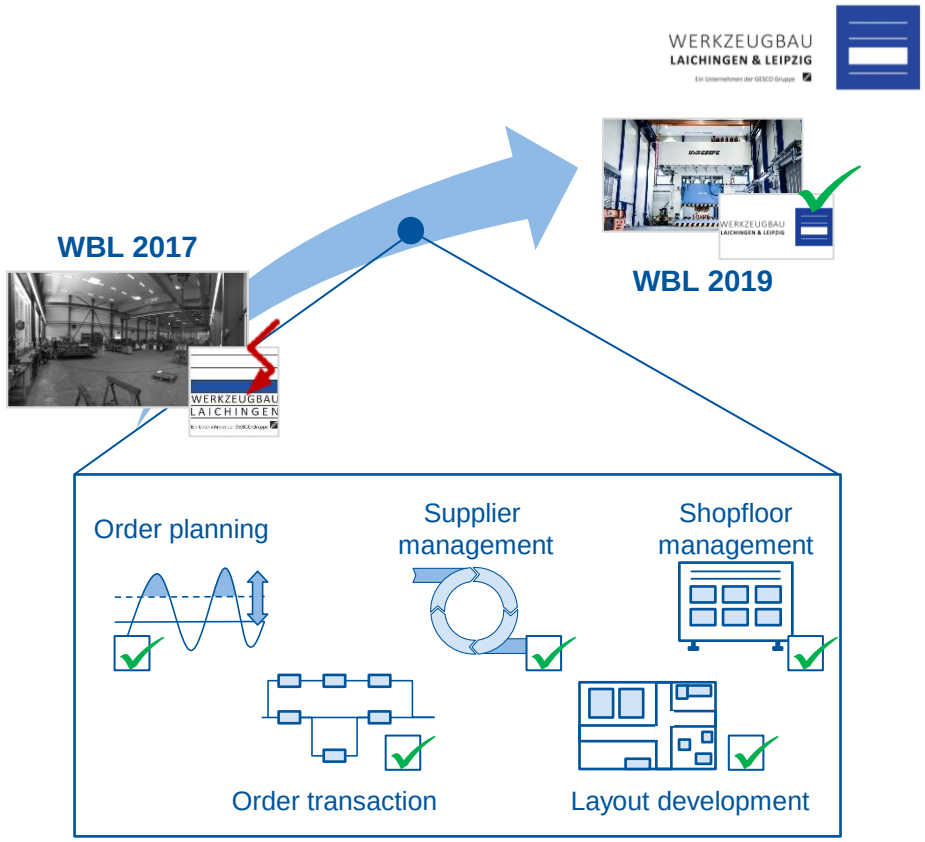

## Result

► **Centralized and optimized tool shop in terms of resources as well as layout design in consideration of budget restrictions**

# Operational implementation of the industrialization in the toolshop Laichingen & Leipzig

## Approach

- Analysis of the status quo at the two locations Laichingen and Leipzig
- Development of concepts in central fields of action
  - Conception of the optimized detailed planning and steering in Laichingen & Leipzig
  - Development of a synchronized order process including a uniform system landscape across both locations
  - Setting up a supplier management and defining a systematic and structured subcontracting process
  - Development of a material flow-oriented plant layout for Laichingen including investment and relocation planning
  - Creation and implementation of a holistic shopfloor management
- Concept implementation and identification of further optimizations




## Results

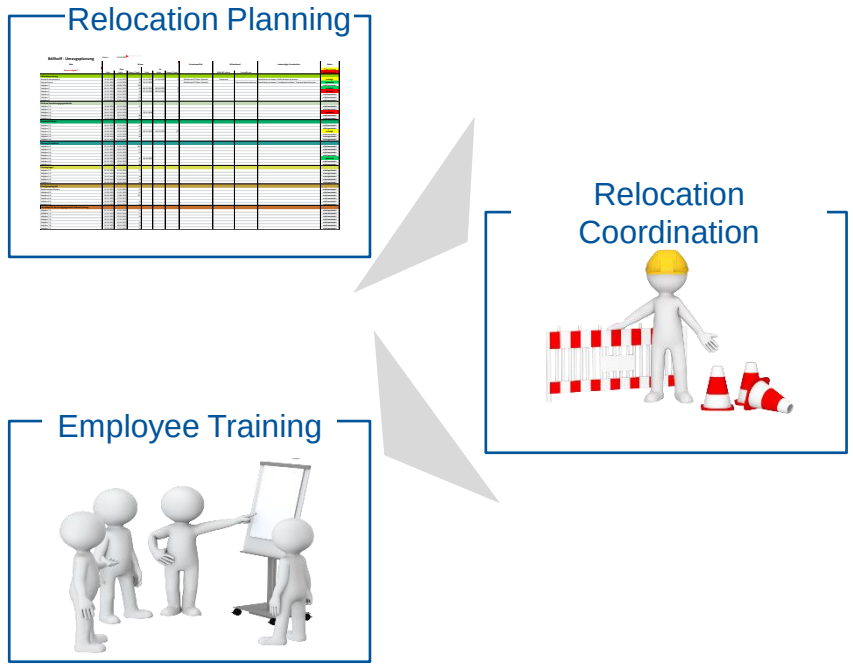
- ► **Analyzed status quo and developed concepts to improve operational excellence**
- ► **Started implementation of developed concepts as well as identified further potentials**

# Relocation coordination and employee training for internal tool shop of the Böllhoff company

## Approach

- Development of step-by-step relocation plan with detailed responsibilities as well as timing of relocation-related activities to minimize interruption of production
- Definition and acquisition of required new equipment as well as transportation services
- Coordination of relocation
- Implementation of developed layout at new site
- Training and motivation of employees for the change to the newly introduced production concept of “industrial tool making”

BÖLLHOFF
*Joining together!*



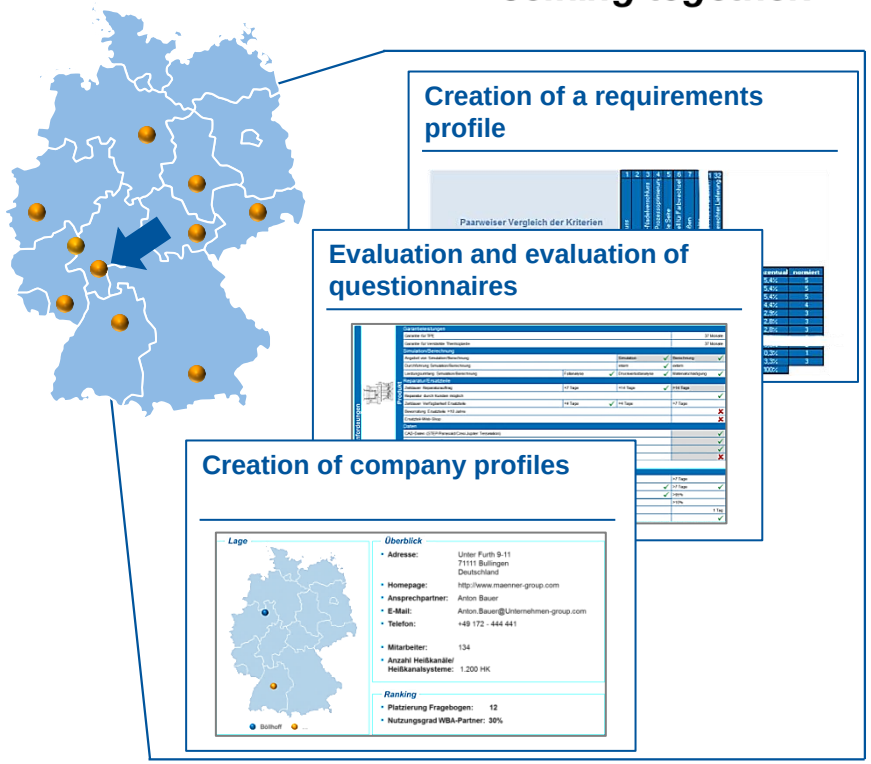

## Results

- ► **Relocation of tool shop with minimal interruption of production to production-technology-optimized factory**
- ► **Trained employees with improved understanding of industrial tool making**

# Analysis of hot runner system providers for the internal tool room of Böllhoff

## Approach

- Identification of hot runner system providers in the German-speaking region
- Creation of a company-specific requirement profile for the systematic evaluation of the suitability of the hot runner system provider
- Detailing and weighting of the defined requirements in terms of scope of services, use of technology, etc.
- Preparation and mailing of a questionnaire for the systematic collection of the relevant information from the hot runner system provider
- Validation of evaluation results through comparison with empirical values of selected partner companies and suppliers recommendation




## Results

- ► **Detailed profile of requirements for hot runner system suppliers**
- ► **Company profiles of the key players for hot runner systems in the German-speaking region**

# Technology roadmap and investment needs for the internal tool shop of Böllhoff

## Approach

- Analysis of work pieces and the manufacturing data as well as strategic decisions concerning tool production
- Investigation of future developments within the product portfolio and the related production requirements
- Evaluation and selection of the suitable manufacturing technologies for future tool production
- Development of suitable manufacturing concepts for the internal tool shop in consideration of possible production strategies
- Derivation of a technology roadmap for the selected manufacturing concept including investment decisions for technologies and associated machines

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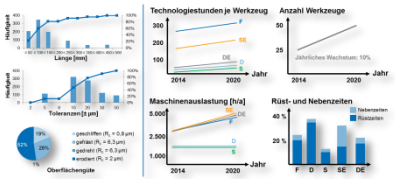
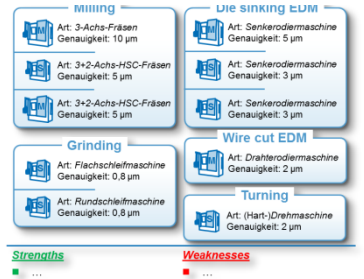
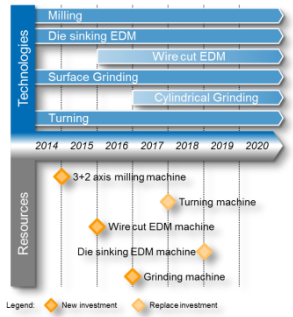
**Work piece and manufacturing analysis**






**Selection of the most suitable concept**

**Derivation of a detailed investment roadmap**




## Result

► **Comprehensive technology roadmap including investment decisions regarding technologies and associated manufacturing resources to achieve the company specific manufacturing concept**

# Analysis and optimization of the order processing in the Böllhoff tool shop

## Approach

- Quantitative analysis of the three dimensions speed, adherence to delivery dates and cost compliance in the form of a project- and tool type-specific order data analysis as well as comparison of the determined values with the competition
- Qualitative analysis of the order processing process to identify the causes of the quantitatively identified weak-nesses and to identify further optimization potentials
- Definition of immediate measures to counter initial weaknesses in the short term
- Derivation of key figures for the future continuous tracking of the performance of the tool shop
- Development of an optimized target order processing process and derivation of an action roadmap

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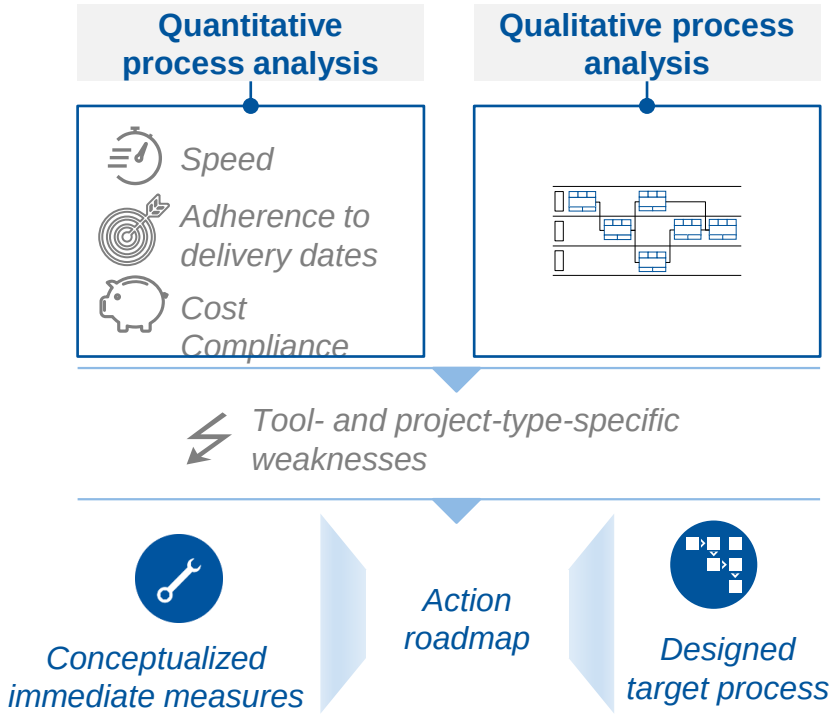


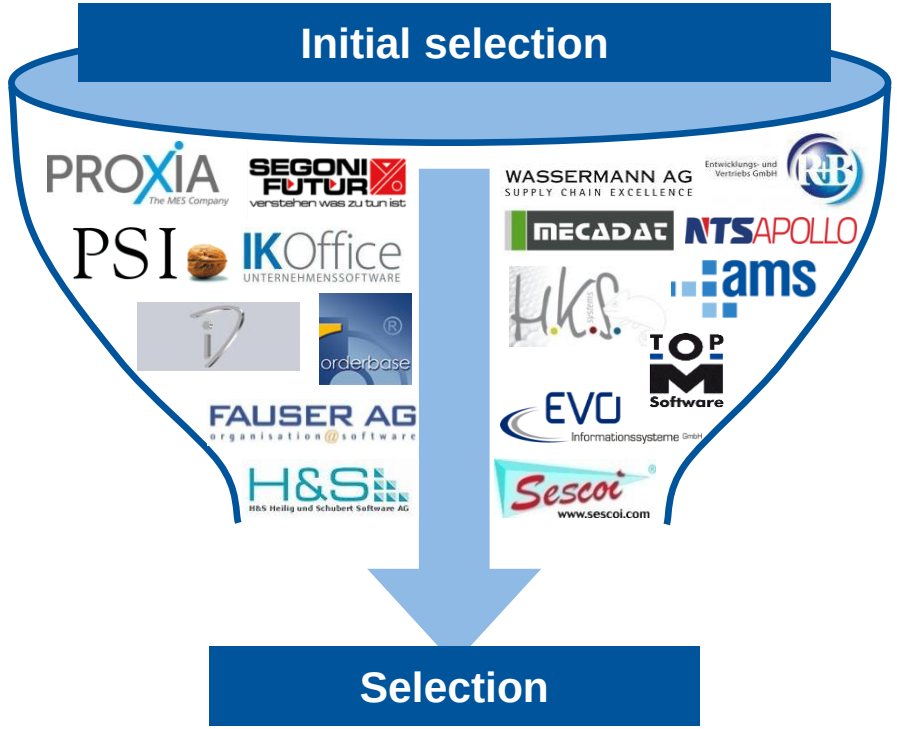

## Results

- ► **Detected vulnerabilities based on data and process analysis**
- ► **Developed immediate measures and derived target order processing process**

# Planning systematics and PPS software system selection in tool making

## Approach

- Analysis of the planning system and derivation of a future planning system
- Creating specifications for a PPS software system
  - Identification of company specific requirements
  - Description of compulsory functions
- Selection of a PPS software system
  - Analysis of available PPS software systems
  - Definition of an evaluation scheme for PPS software systems
  - Evaluation of the analyzed PPS software systems



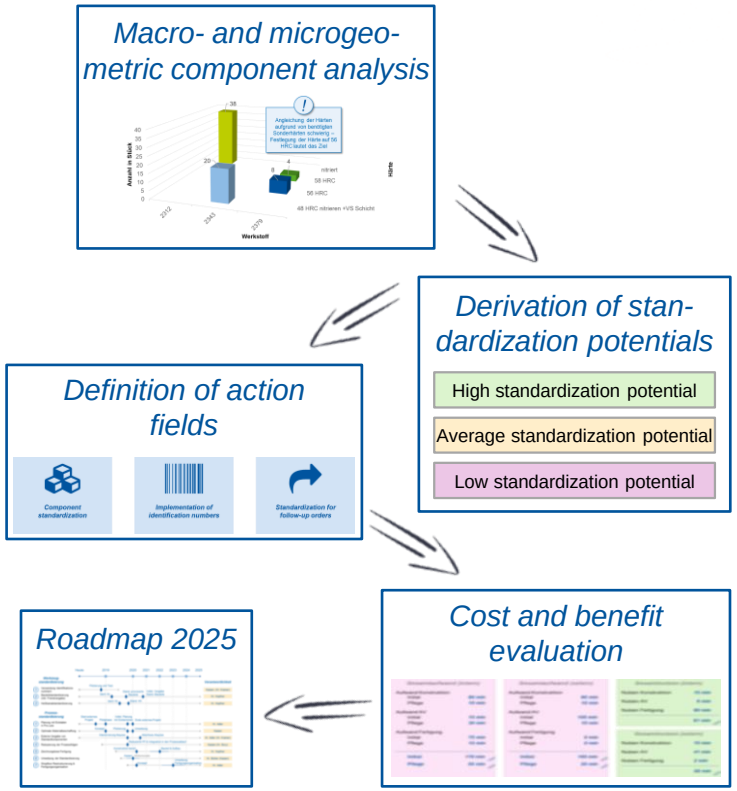

## Result

► **Selection of a PPS software system to design a system supported planning system to improve both performance and competitiveness**

# Implementation support for tool and process standardization at Braunform

## Approach

- Analyse des Produkt- und Werkzeugspektrums
- Durchführung einer makro- und mikrogeometrischen Bauteil-analyse auf Basis von 57 zur Verfügung gestellten Stücklisten
- Bewertung des Standardisierungspotenzials von relevanten Bauteilen in definierten Produkt- und Werkzeugspektren
- Verifizierung des Standardisierungspotenzials durch Mitarbeiter der Konstruktion, der Arbeitsvorbereitung sowie der Fertigung
- Definition von Handlungsfeldern der Werkzeugstandardisierung:
  - Durchführung der Bauteilstandardisierung
  - Einführung von Identifikationsnummern
  - Standardisierung bei Folgeaufträgen
- Aufwand- und Nutzenbewertung der Werkzeugstandardisierung
- Ableitung einer Roadmap 2025 zur Sicherstellung und Synchronisierung der Werkzeug- und Prozessstandardisierung




## Results

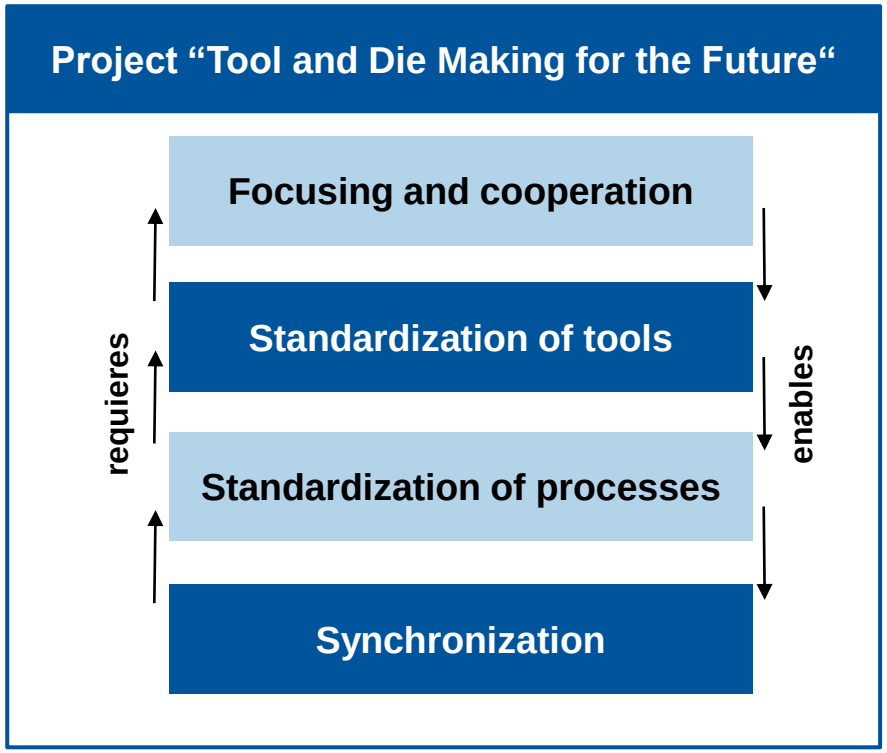
- ► **Identified standardization potentials for a systematic tool standardization**
- ► **Concrete implementation support with a derived roadmap until 2025**

# Realignment and industrialization of the internal tool shop at the location Traunreut

## Approach

- Positioning and realignment of the internal tool shop within the company
- Standardization of tools, modules and components
- Standardization of process sequences and work plans
- Segmentation of tool manufacturing and derivation of a planning procedure
- Implementation of synchronous manufacturing characterized by the flow principle

B/S/H/



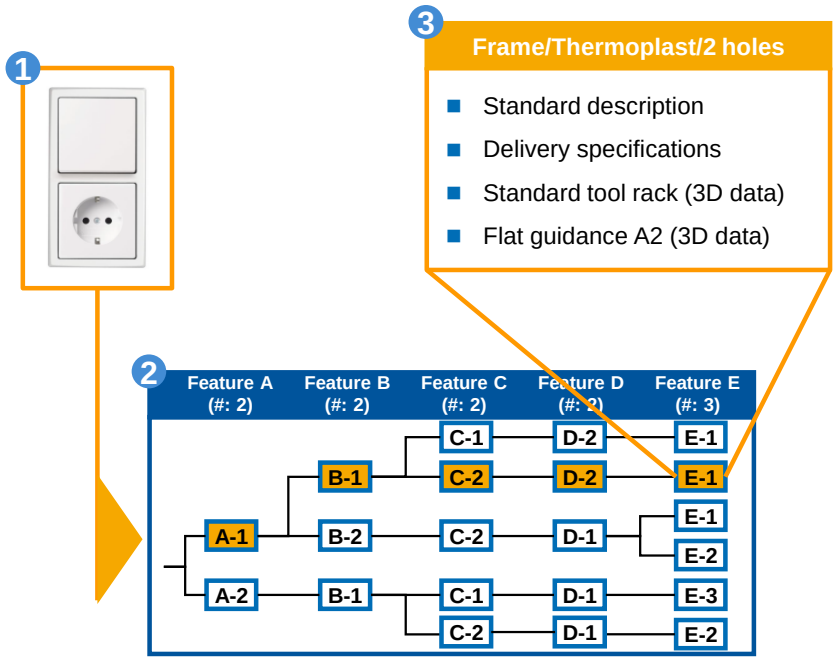

## Results

- ► **Development and implementation of a sustainable tool manufacturing**
- ► **Continuous increase of productivity (20% over the period of four years)**

# Revealing cost potentials by modularization and standardization of the tool program

## Approach

- Quick check state of modularization
- Analysis of the product range
- Analysis of tool types
- Identification of potentials:
  - Tool modularization and standardization
  - Enhancement of the tool procurement process
- Derivation of measures




## Results

- ► **Definition of 7 standard tool racks for thermoplast molds**
- ► **Definition of tool modules valid for all variants**
- ► **Conception of an IT tool to support the procurement of modularized tools**

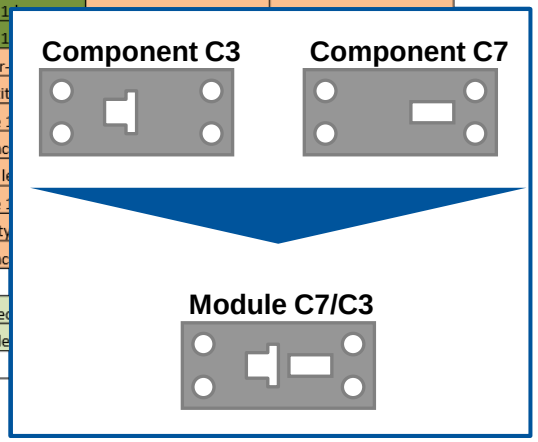
# Enhancing the degree of standardization in the construction of special facilities (carriage devices)

## Approach

- Evaluation of the current status quo regarding the degree of standardization in the manufacturing of special facilities
- Identification of standardization potentials based on similarities and requirements
- Development of approaches for standardization in the pilot group carriages
- Definition of measures and development of a target process
- Evaluation of efficient production lot sizes by an estimation of costs

CLOOS
Weld your way.

| Function | Burner infeed | Burner infeed several positions, small distances | Burner infeed manually |
|---|---|---|---|
| Technological realization | pneumatics, ball/ roller-guide, small load rating | Servo motor, spindle, ball/roller-guide, small load rating | with spindle, roller-guide, small load rating |
| Simle definition of standards | | | |
| Description of component | | | |
| Base plate | Size 1b | Size 1b | Size 1b |
| Trolley plate | Size 1b | Size 1b | Size 1b |
| Bottom plate | Size 1 | | |
| Head plate | Size 1 | | |
| | ball/roller- | | |
| | Quantit | | |
| | Size 1 | | |
| | Distanc | | |
| Guide rail | variable l | | |
| | Size 1 | | |
| | Quantity | | |
| Carriage | Distanc | | |
| Gear rod, spindle or Cylinder | 0 | | |
| Clutch/ Cylinder connection | Z-Connec | | |
| Engine and pressure unit | Cylinde | | |
| Clutch bell | 0 | | |




## Result

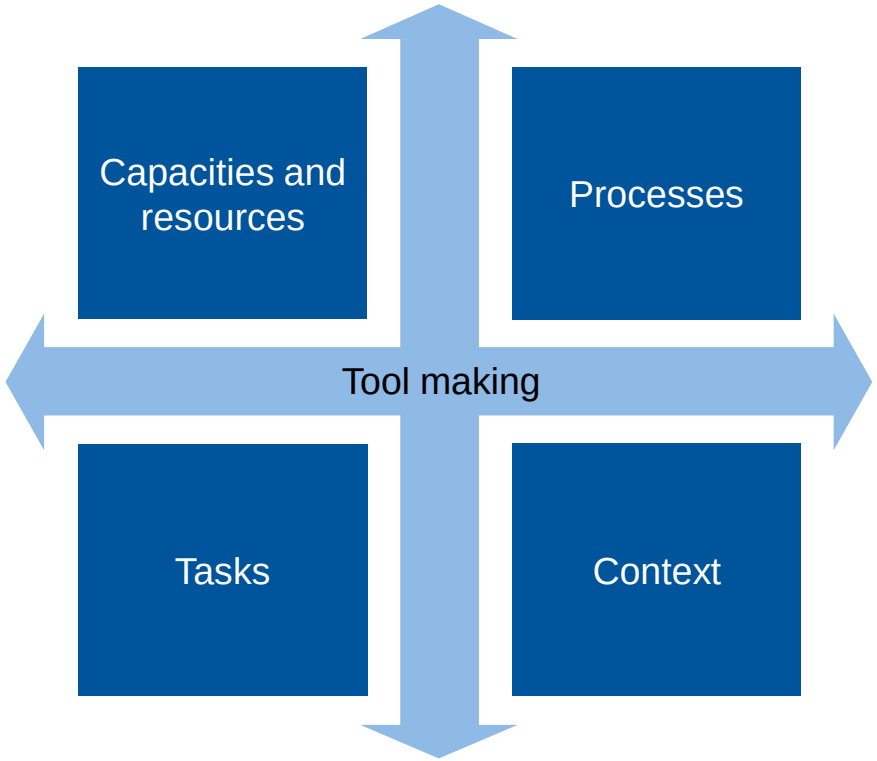
► **Evaluation and execution of standardization options with a pilot group and definition of a module roadmap including a target process for a further standardization**

# Support of the Daimler-internal project “process analysis tool manufacturing for expanding the equipment department“

DAIMLER

## Approach

- Simulation of segmentation scenarios
- Definition of the manufacturing depth
- Distribution of resources/ factory layout
- Detailed development of the process steps
- Task description
- Integrating the segments in the context
- Definition of interfaces
- Industrialization of the tool introduction



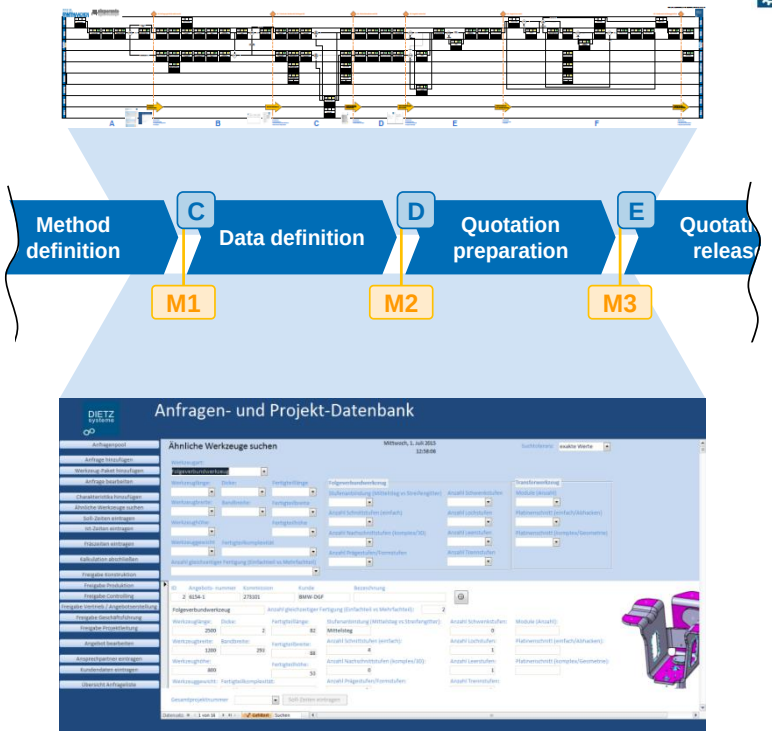

## Results

- ► **Detailed concept draft for expanding and segmenting the tool manufacturing**
- ► **Concept for a standardized tool introduction**

# Optimization of the quotation preparation process and the calculation systematic at DMW

## Approach

- Analysis of prepared quotes and realized orders regarding type of order and type of tool
- Definition of possible characteristics for a comparison
- Standardization of existing data and realized tool projects
- Derivation of a calculation systematic and implementation within the scope of a MS Access tool
- Status Quo analysis of the quotation preparation process including employee interviews
- Definition of a standardized quotation preparation process including the determination of milestones
- Derivation of a set of rules for the implementation



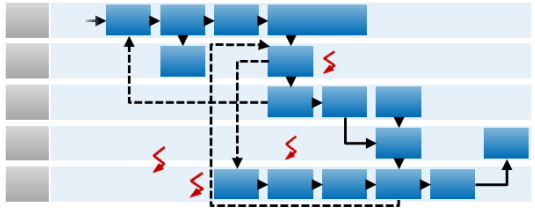

## Results

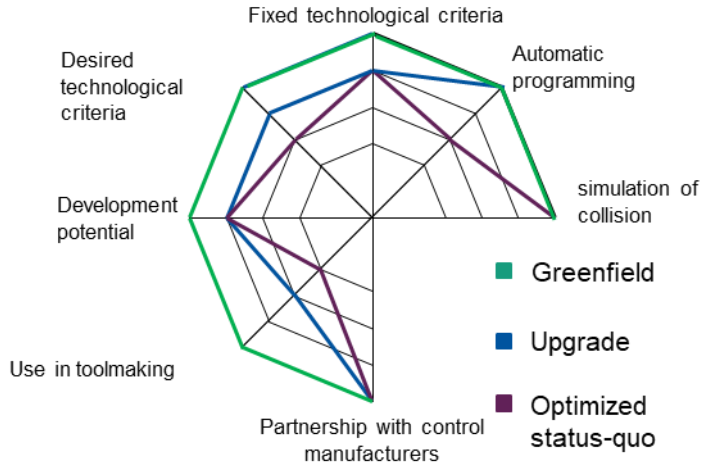
- ► **Detailed quotation preparation process including determined milestones and a defined set of rules**
- ► **Inquiry and project databank including a calculation systematic based on Microsoft Access**

# Analysis and scenario management of the CAx process chain

## Approach

- Visualization and optimization of the order processing process and the CAx process chain
  - Analysis of the entire order processing process of the tool shop
  - Analysis of the CAx systems used along the process chain
  - Checking possible starting points for optimization in the sense of a continuous CAx process chain
- Scenarios for the CAx process chain
  - Presentation of suitable software solutions for the continuous CAx process chain
  - Development of a requirement profile for CAx systems
  - Preparation of a possible target scenario for the introduction of an optimal CAx system
  - Identifying the time and cost-determining factors





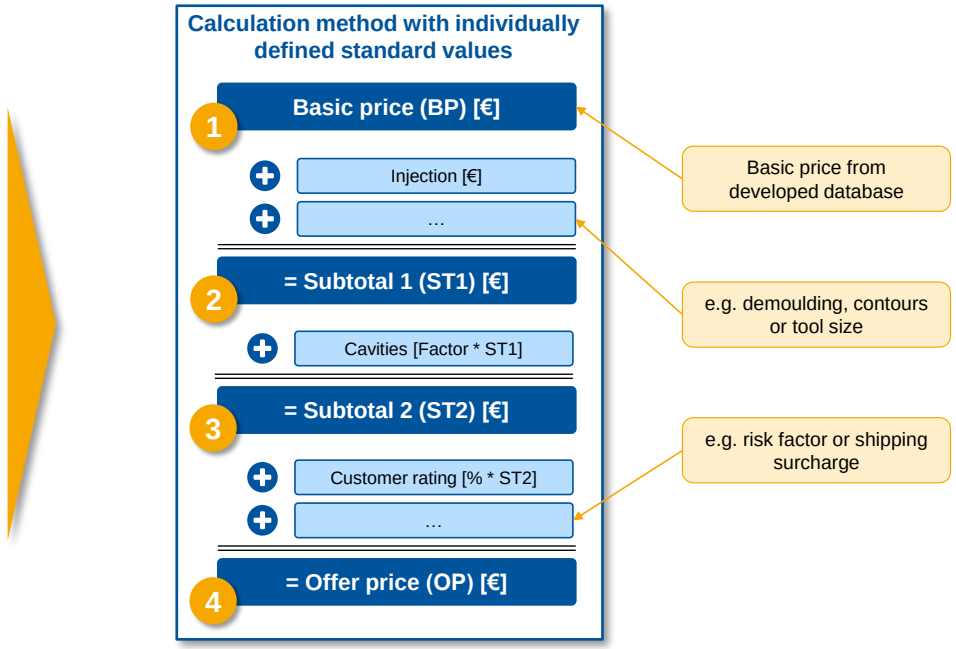

## Results

- ► **Software scenarios to leverage potential in the continuity of the CAx process chain**
- ► **Target concept as a guideline for the introduction of a CAx system**

# Execution of a workshop to optimize the tool calculation at FASSNACHT Werkzeug-Formenbau

## Approach

- Analysis of the current calculation procedure and discussion of potentials in tool calculation
- Presentation and discussion of industry standard calculation methods
- Development of a database structure for already completed tool projects for the systematic identification of similar products as a basis for calculation
- Development of a calculation method with individually defined standard values for different tool specifications
- Validation of the calculation method as well as the individually defined standard values by calculating different tool projects
- Discussion and definition of the further procedure for implementing the developed calculation method



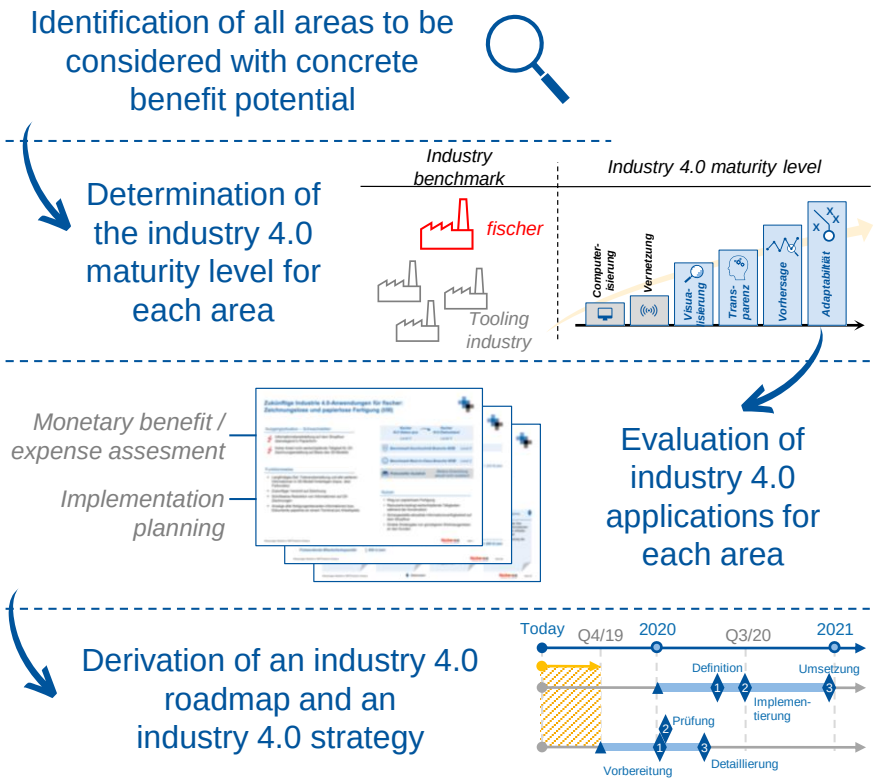

## Results

- ► **Database concept for already completed projects as a basis for calculation**
- ► **Calculation method based on product similarity with individual standard values**

# Development of an industry 4.0 strategy for fischer Werkzeug- und Formenbau GmbH

## Approach

- Analysis of core processes and identification of areas with high optimization potential
- Execution of an industry benchmark to determine the status quo as well as the targeted industry 4.0 maturity level of the individual areas
- Research and detailing or adaptation of industry 4.0 applications for toolmaking to address the identified areas
- Evaluation of industry 4.0 applications for the specific areas
- Time and content based implementation planning of the evaluated industry 4.0 applications
- Consolidation of all industry 4.0 applications for the respective areas in an industry 4.0 roadmap as well as an industry 4.0 strategy



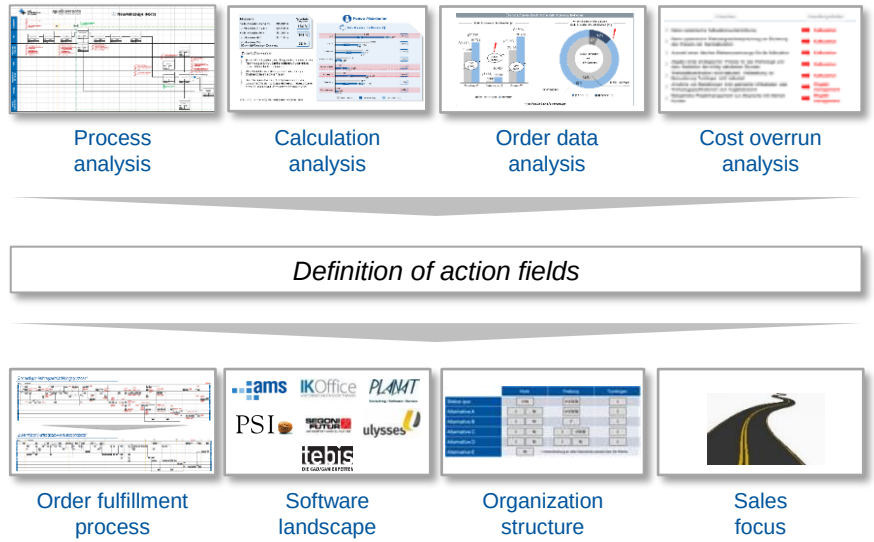

## Results

- ► **Detailed industry 4.0 applications for a future-proofed orientation of fischer toolshop**
- ► **Elaborated approach including responsibilities for the implementation of the industry 4.0 strategy**

# Comprehensive analysis and definition of processes, software, organization and sales in the fischer tool shop

## Approach

- Analysis of the current order fulfillment process in the fischer tool shop
- Detailed analysis of the applied calculation methods as well as order data and deduction of root-causes for exceeded cost and missed deadlines
- Definition of an efficient order fulfillment process and derivation of necessary measures for its implementation
- Optimization of the planning process and systematic selection of suitable planning software
- Evaluation of different options for organizing the fischer tool shop as well as deduction of a recommendation for segmenting the tool shop for new and repair orders
- Systematic definition of the future sales focus of the fischer tool shop



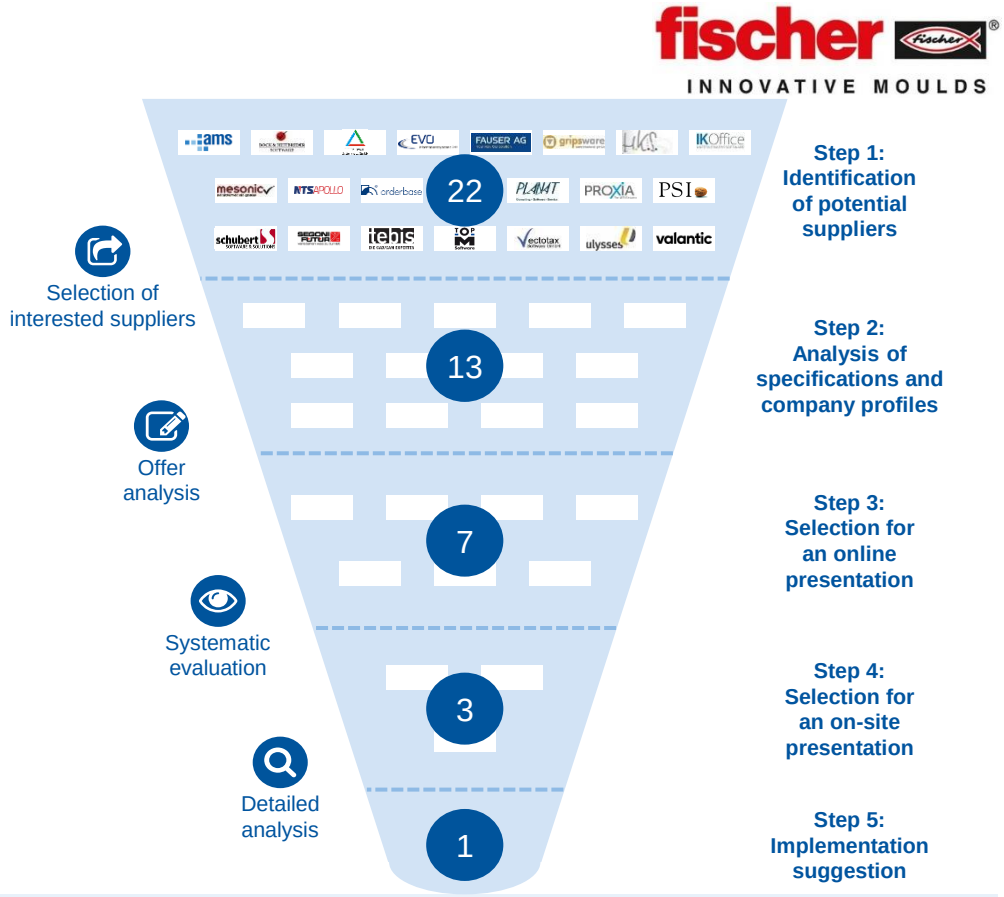

## Results

- ► **Efficient and transparent order fulfillment process which is supported by a systematically selected planning software**
- ► **Systematic and sustainable alignment of the organizational structure as well as the sales focus**

# Systematic definition of the planning process and selection of a suitable planning software for the fischer tool shop

## Approach

- Analysis of the ongoing planning process and identification of interface problems
- Deduction of requirements for the planning process as well as a supporting software for interconnected planning in rough and detailed planning as well as scheduling
- Identification of relevant planning software suppliers and pre-selection based on specifications
- Detailed comparison of the software solutions based on online and on-site presentations of the suppliers and evaluation according to the requirements defined by the fischer tool shop
- Elaboration of a recommendation for the selection of a planning software in consideration of the option to optimize an internally developed planning software



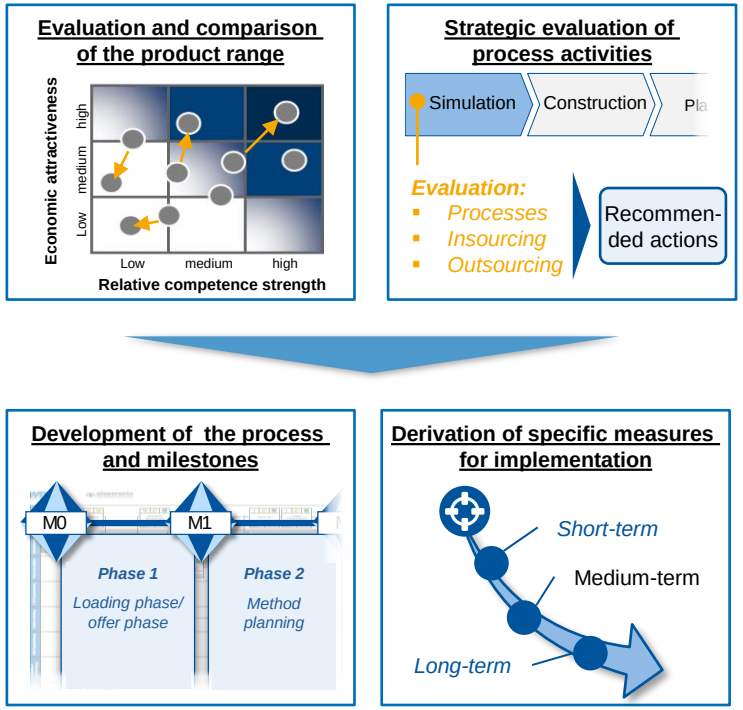

## Result

► **Improvement of cost and due date reliability by optimizing the planning process with the support of a systematically selected planning software**

# Optimization of the strategic direction and operational order processing at the Ford tool shop in Cologne

## Approach

- Analysis of core competences of the Ford tool shop
  - Identification and analysis of existing competences based on interviews with employees and benchmarking data
  - Comparison of the competences of the Ford tool shop with market competitors
  - Derivation of measures in order to strengthen core competences and increase flexibility
- Conception of an order processing with reduced interfaces
  - Identification of required process interfaces for order processing and analysis of existing interface problems
  - Definition of a target process including responsibilities and defined handover processes
  - Development of an optimized organizational structure to realize an order processing with reduced interfaces



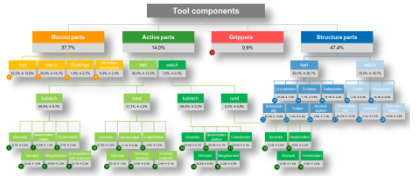

## Result

► **Approach for an efficient, profitable and capable tool manufacturing based on a strong focus on core competences and a reduced number of process interfaces**

# Manufacturing conception of the external tool shop of Gebhardt Werkzeug- und Maschinenbau

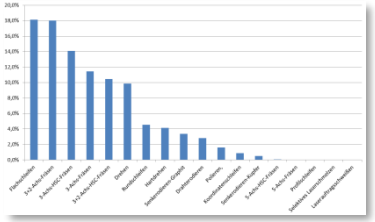
## Approach

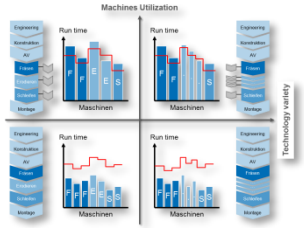
- Systematic collection of all machined work pieces including detailed characteristics over a certain period of time
- Analysis of the technological capabilities in terms of applied manufacturing technologies and used machines
- Evaluation and selection of suitable manufacturing technologies for future work pieces
- Development and assessment of possible future manufacturing concepts in consideration of technology variety and machine utilization
- Derivation of an investment roadmap for the selected concept including defined technologies and machines
- Specification of the required machines in terms of technological performance and automation equipment




**Work piece and capability analysis**

**Technology selection**






**Development of manufacturing concepts**


**Specification of the required machines**

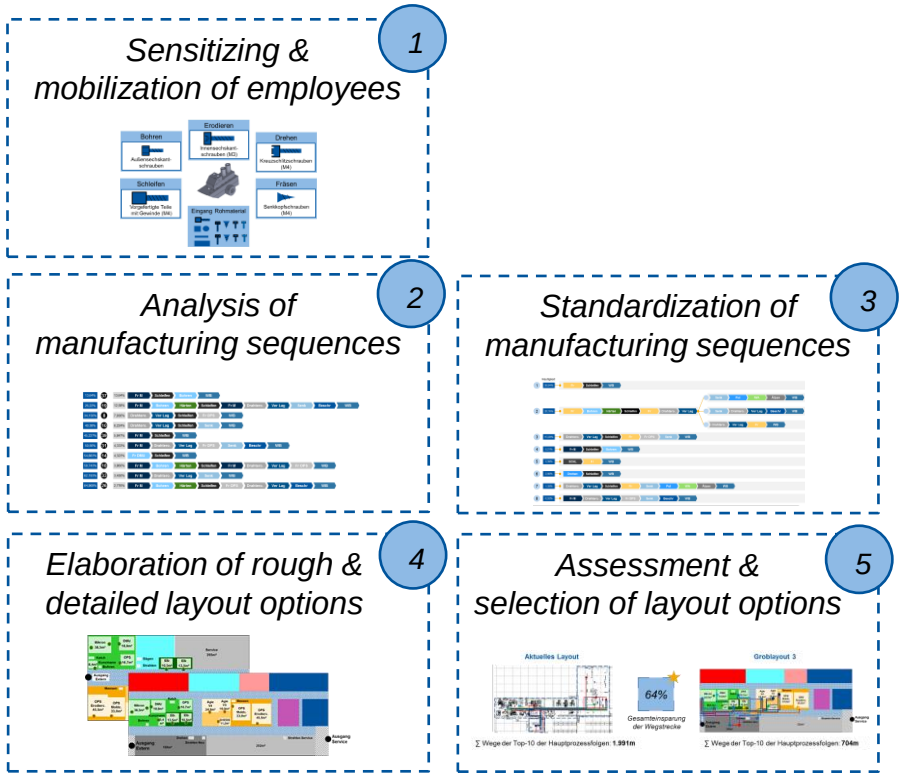
## Result

► **Development of a future manufacturing concept including specified technologies and machines in order to be suited for the production needs in the long term**

# Development of a shopfloor layout for the tool shop of a new production site at GIRA

## Approach

- Sensitizing and mobilization of employees using an educational game
- Detailed analysis of manufacturing sequences
- Development of a roadmap for the standardization of manufacturing sequences for tool components within the entire tool spectrum
- Elaboration of rough and detailed layout options collectively with the employees
- Assessment of elaborated layout options with regards to defined target figures such as material flow and expandability
- Selection of a layout option for the GIRA tool shop



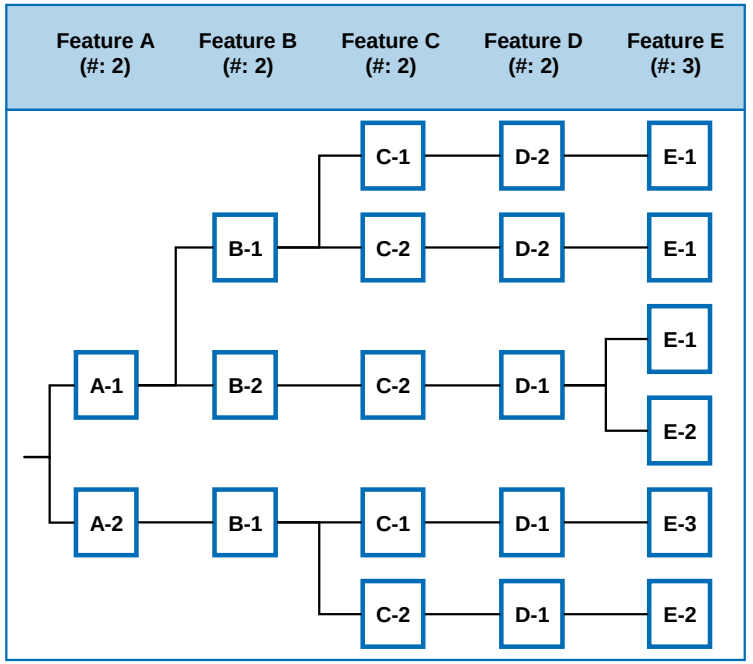

## Results

- ► **Collectively developed, detailed shopfloor layout based on defined target figures**
- ► **Elaborated, standardized manufacturing sequences and roadmap for process standardization**

# Revealing cost potentials by modularization and standardization in tool making

## Approach

- Quick check state of modularization
- Analysis of the product range
- Analysis of tool types
- Identification of potentials for tool modularization and standardization
- Derivation of measures
- Prioritization of measures by costs and benefits




## Results

- ► **Profile about strengths and potentials of the status quo in tool and process standardization**
- ► **Definition of tool modules valid for all variants**
- ► **Development of an implementation plan for the measures**

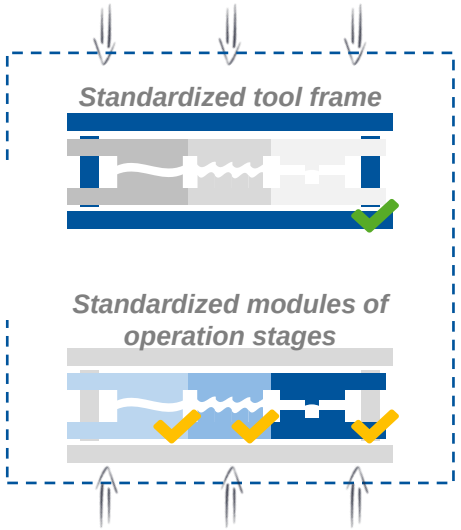
# Development of a tool standardization concept for Hajdu Autotechnika in Hungary

## Approach

- Analysis of the product and tool spectrum in terms of quantities, similarities and future developments
- Macro- and microgeometric analysis of internally and externally manufactured tool components for the entire tool spectrum
- Definition of design guidelines for internally manufactured tool components as well as future outsourcing potentials
- Standardization of tool frames, master forms for operation stages and individual tool components
- Development of a uniform nomenclature for all tool components
- Derivation of a holistic implementation roadmap including necessary measures and responsibilities

Hajdu Autotechnika

Characteristics of the **components** and the **series process**




**Design guidelines** based on macro- and microgeometric analyses

No adaption of the modules
Only adaption of the forming parts

## Results

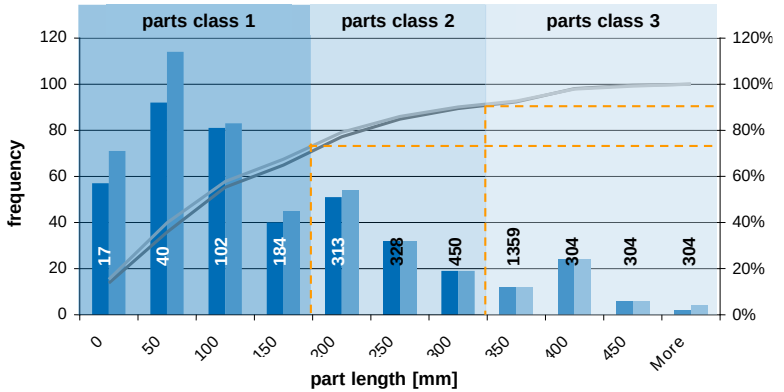
- ► **Standardized tool frame, operation stages and tool components for each type of tool**
- ► **Holistic implementation roadmap for the realization of the standardization**

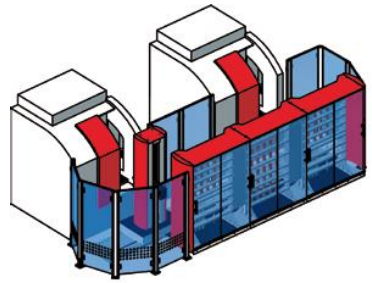
# Milling department reorganization by manufacturing concept, machine selection and recommendation for automation

## Approach

- Analysis of product spectrum and subsequent data consolidation as well as derivation of requirements
- Derivation of requirements for milling machines, clamping systems, CAx process chain and automation
- Development of manufacturing concepts and final concept selection by value benefit analysis and financial analysis
- Evaluation of an efficient automation level and development of an automation concept

Pushing Performance



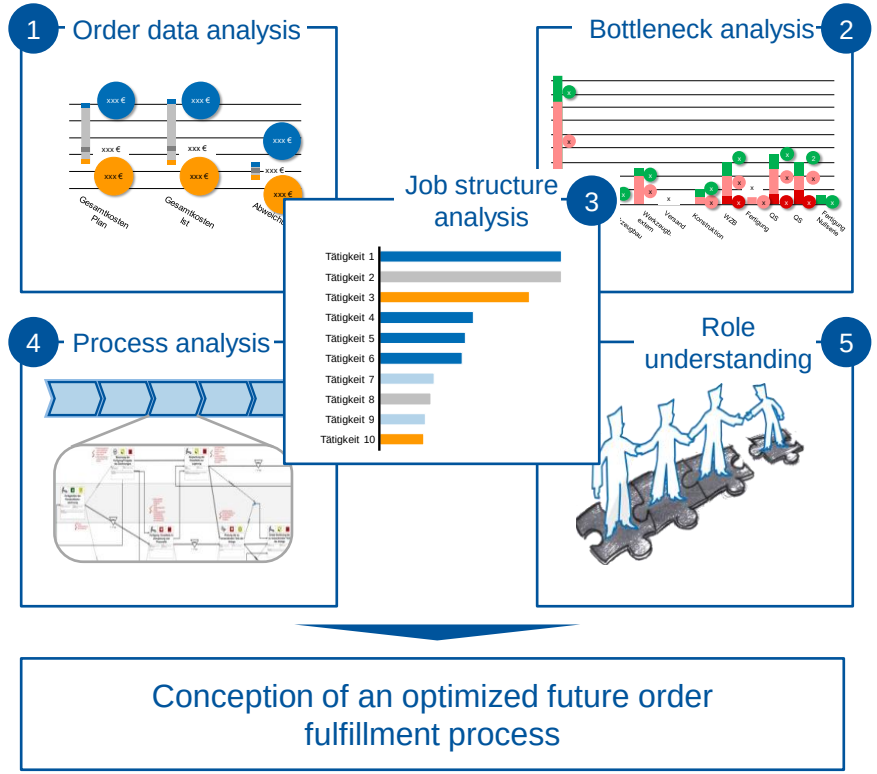
## Results

- ► **Selection of milling machines considering current part variety**
- ► **Reduction of required milling machines by 25%**

# Process analysis and process re-design for Hartmann Codier tool shop

## Approach

- Quantitative analysis of order data regarding planned and actual values of lead times and costs
- Bottleneck analysis of current tooling projects in respect of processing status and delay
- Job structure analysis for a breakdown of activities in the tool procurement
- Analysis of the order fulfillment process in combination with employee interviews as well as an analysis of the role understanding in the tool shop
- Conception of an optimized future order fulfillment process




## Results

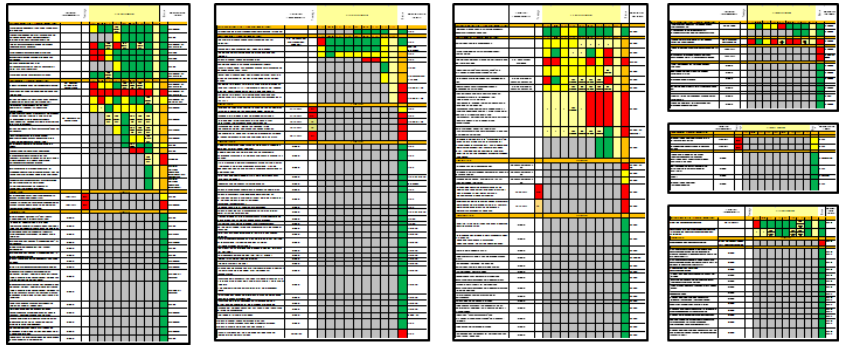
- ► **Identified potentials in the order fulfillment process in the tool shop**
- ► **Optimized future order processing process including defined milestones**

# Implementation coordination for process improvements in the tool procurement at Hartmann Codier GmbH

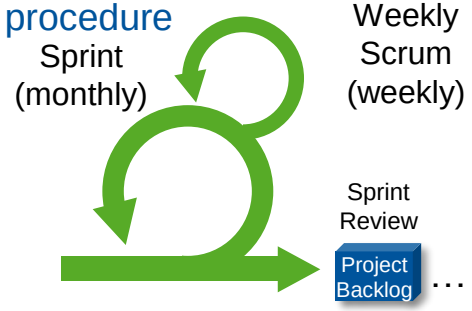
## Approach

- Definition of six improvement projects:
  - Order fulfillment process optimization
  - Introduction of project planning and management
  - Supplier qualification
  - Unifying of quality assurance
  - Optimization of IT systems
  - Introduction of KPI tracking
- Introduction of an iterative project management procedure for the implementation of the improvement projects based on the Scrum approach
- Establishment of weekly coordination sessions within the project teams
- Conduction of monthly sprint reviews to review project progress and derive measures

CIP-measures-tool



Controlling of the projects according to Scrum procedure




- Monthly sprint reviews to define the action
- Weekly stand-up meetings for implementation support

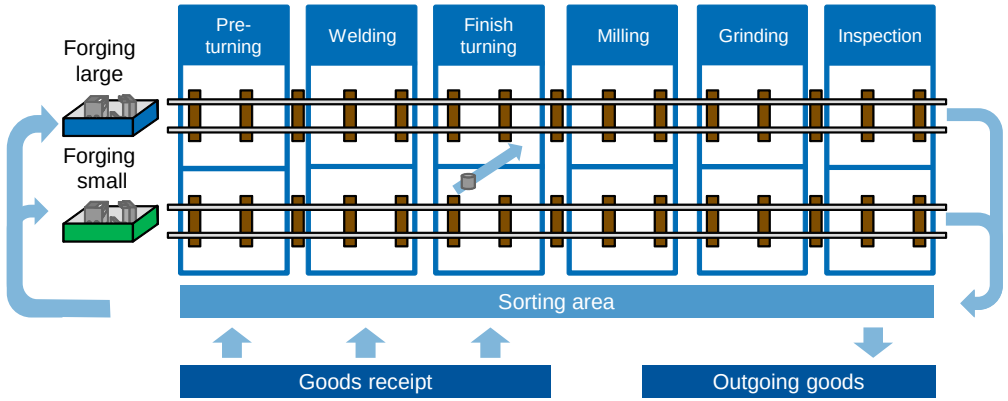
## Results

- ► **Structured coordination of six improvement projects for process optimization**
- ► **Established system for continuous improvement in defined topics**

# Conception of a productive and competitive industrial tool making

## Approach

- Status quo analysis of the internal tool  making
- Standardization of tool components and definition of manufacturing blanks
- Recording and analyzing process chains
- Definition of main process sequences
- Segmentation of the tool manufacturing
- Development of a process oriented manufacturing control concept
- Development of shaping options for the layout
- Frameworking the implementation




| Process | Day 1 | | | |
|---|---|---|---|---|
| | S | | N | |
| Pre-turning | 5 | 5 | 6 | 6 |
| Pre-heating | 3 | 3 | 5 | 5 |
| Welding | 4 | 4 | 3 | 3 |

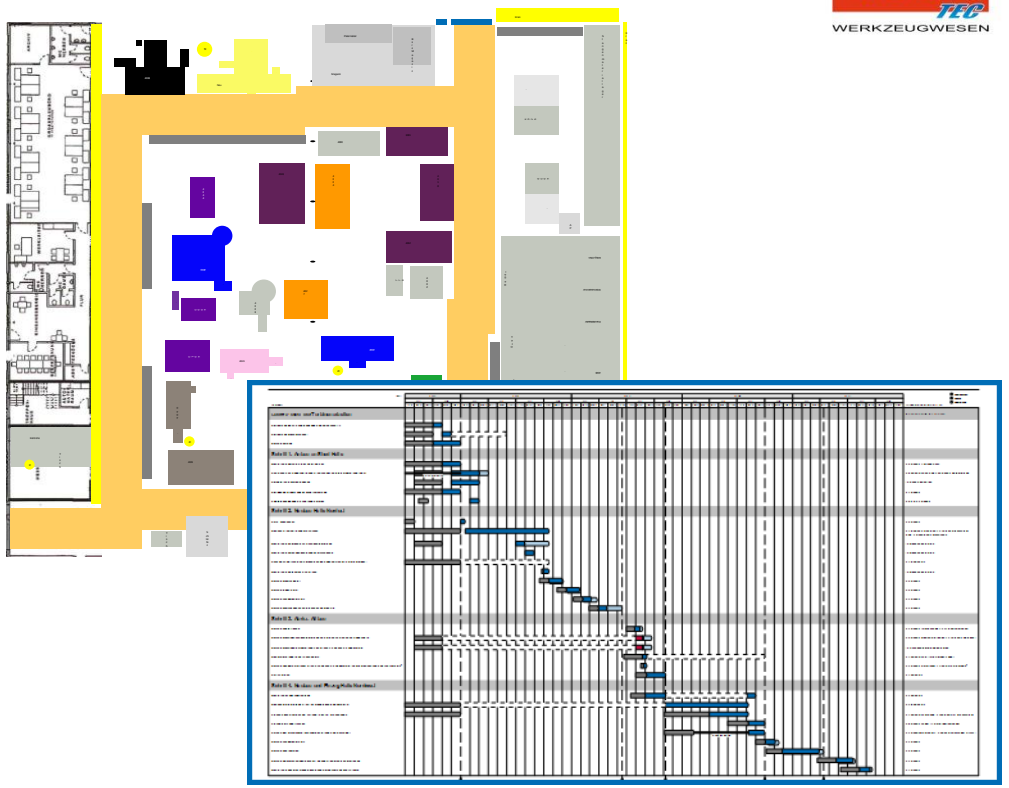
## Result

► **Industrialization concept for the tool manufacturing with higher productivity and short processing times by a new manufacturing concept and higher degree of standardization**

# Layout design and planning of the project management for a relocation of a tool shop

## Approach

- Development of a project plan for the relocation with detailled tasks
- Precise definition of tasks, deadlines and responsibilities for over 70 sub-tasks
- Identification of sub-tasks on the critical path for the monitoring of the finish date
- Definition of measures to ensure the required infrastructure of the production facility on the relocation date
- Layout planning for an optimized process flow of all manufacturing segments



## Result

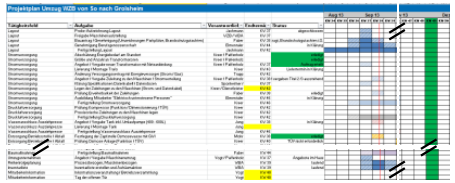
► **Detailed project plan for the systematic coordination of the individual tasks and progress controlling and development of an optimized layout for a new tool making site**

# Relocation of the tool shop and efficiency optimization of the tool supply

## Approach

- Project and cost controlling of the relocation of the tool making
- Identification of dispensable inventory through a 6S-Workshop
- Process orientated arrangement of the manufacturing areas and validation with regard to the lean principals
- Risk management ensuring a continuous tool supply
- Detailed planning of the implementation sequence and coordination of external service providers

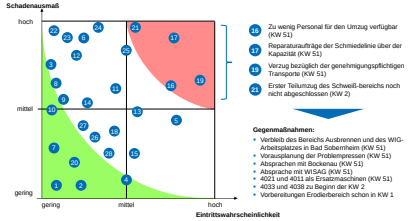
### Project controlling



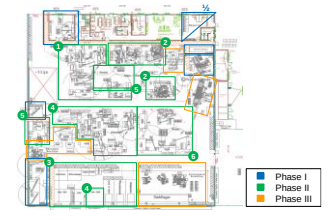
### Cost controlling

| Kostenposition | Plan | Ist | Maßnahme / Begründung | Diff. |
|---|---|---|---|---|
| IT / EDV | € 30.000 | € 27.562 | Kein eigener Server in GRO, direkte Anbindung an SO | € -2.438 |
| Transformator | € 30.000 | € 18.902 | Gebrauchter Transformator | € -11.098 |
| Maschinenumzug | € 250.000 | € 198.000 | Übernahme vieler Arbeitspakete durch WZB-Team (bspw. Regale durch eigenen LKW), kein Probelauf | € -52.000 |
| Paternoster | € 15.000 | € 10.500 | Paternoster benötigt (Lagermöglichkeiten ohne Paternoster durch teure Schränke) | € -4.500 |
| Tiefbau | € 80.000 | € 64.925 | Teerung bis zum Gastank nötig, teurere Fundamente (Köcher) nötig, um Platz zu sparen | € -15.075 |
| Ausbau Sanitäranlagen / Umkleiden / Büromöbel | € 106.000 | € 94.560 | Verkleinerter Umfang Umbaubereich Damenumkleide, Büromöbel aus Insolvenz | € -11.440 |

### Risk management




### Sequence planning



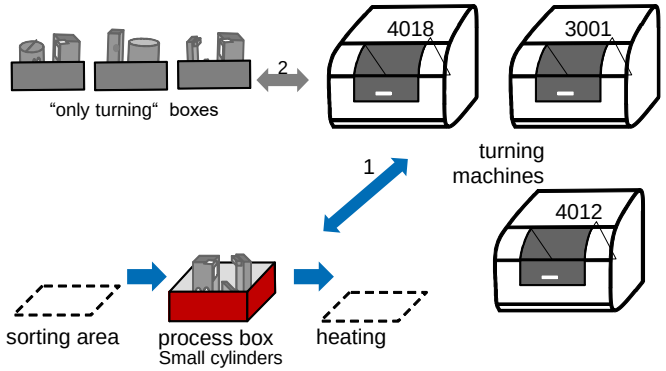

## Results

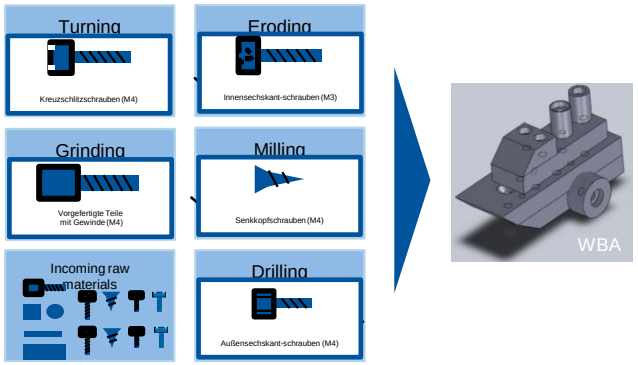
- ► **Reduction of the relocation period by 2 weeks through efficient project and risk management**
- ► **Reduction of the relocation costs by 21,5 % through stringent project and cost controlling**

# Conception and introduction of a pilot line for clocked manufacturing of tools for massive forming

## Approach

- Specification of a concept for clocked manufacturing in the process sequence
- Detailed planning of the introduction and implementation of the pilot line along with a specification of required infrastructure
- Staff training for the new manufacturing concept with an educational game which simulates the new manufacturing concept and clarifies uncertainties of the staff
- Supervision of the implementation of the pilot line and controlling of the impact on the key figures for production



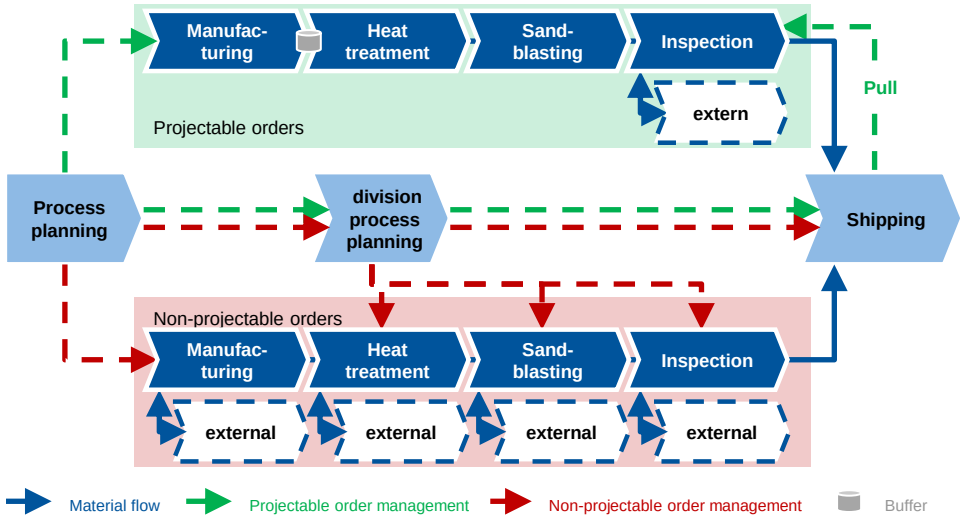

## Result

► **Introduction of a clocked pilot line for tool making to reduce secondary process time and reduction of order lead time from 7 to 3.5 days**

# Process examination and optimization in the quality control division in the massive forming industry

## Approach

- Examination of the status quo process in quality control and bordering division
- Analysis of the capacity utilization along the process chain
- Analysis and assessment of the structure of activities
- Conception of a segmented quality control for standard and express orders
- Development and assessment of a set of measures along with an implementation plan for efficient execution of quality control




## Result

► **Development of 22 measures for process optimization in context of increasing the production quality, segmented examination concept and single measures for cost reduction**

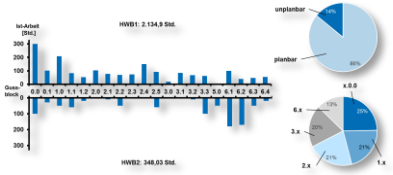
# Layout design und relocation planning for the internal tool shop of Heinrich Huhn GmbH & Co. KG

## Approach

- Analysis of tool range and manufacturing processes as well as verification of tool shop's segmentation based on conducted tool projects
- Recording and analysis of the general set-up of the new tool shop location
- Development and design of layout scenarios and their holistic evaluation conjointly with employees on the basis of defined criteria
- Planning and execution of preparatory measures for the realization of the operational relocation
- Development of step-by-step relocation plan with detailed responsibilities, external support as well as costs respectively estimates

**Project steps:**

Analysis of tools, processes and project data



Layout design

Relocation planning

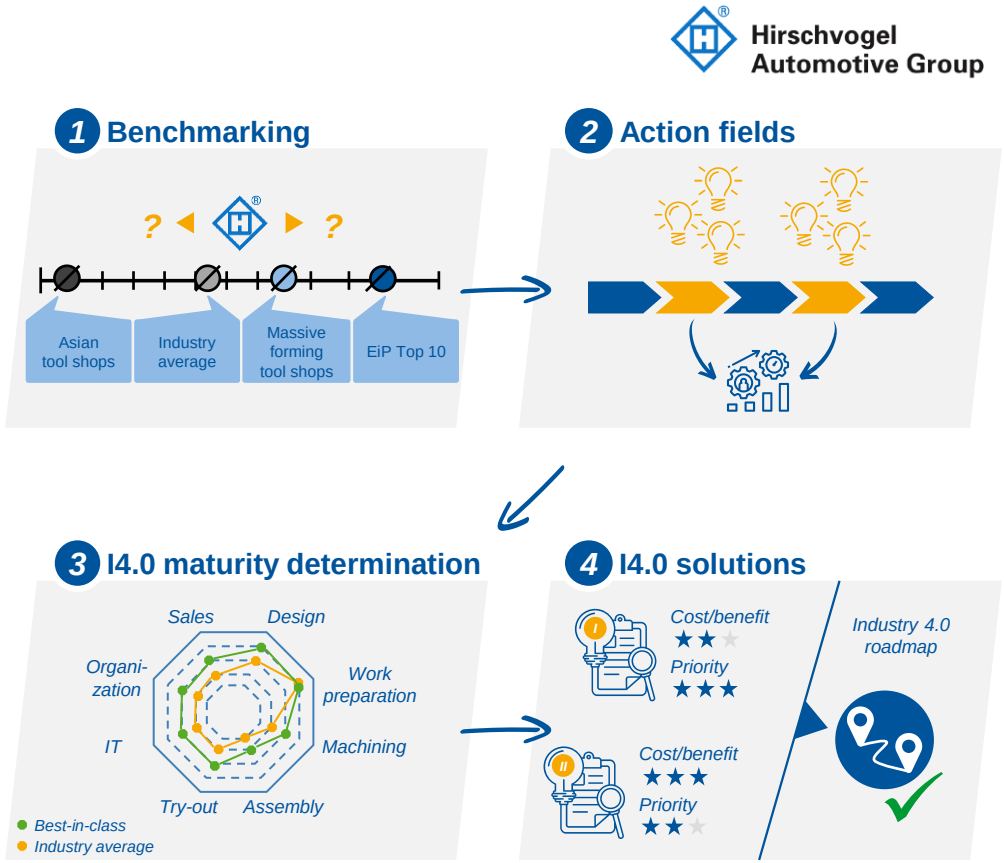
## Results

- ► **Material flow oriented layout for standardized and transparent order processing**
- ► **Detailed overview of necessary actions and activities including costs for the operational realization of the tool shop's relocation**

# Determination of performance and Industry 4.0 maturity as well as development of an Industry 4.0 roadmap in the Hirschvogel Umformtechnik tool shop

## Approach

- Execution of an organizational and technological bench-marking in order to evaluate the performance of the Hirschvogel Umformtechnik tool shop
- Derivation of action fields to increase performance and identification of potentials for the implementation of Industry 4.0 solutions
- Determination of the Industry 4.0 maturity in comparison to the industry average and best-in-class tool shops as well as development of an individual Industry 4.0 target state
- Development of solutions for the realization of the Industry 4.0 target state, including prioritization of solutions through a cost-benefit estimation and development of a Industry 4.0 roadmap




## Results

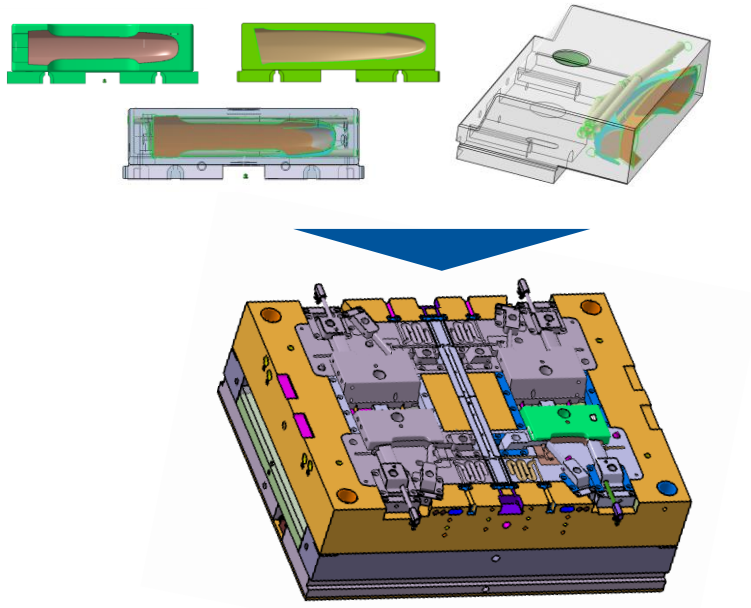
- ► **Evaluated organizational and technological performance of the tool shop of Hirschvogel Umformtechnik**
- ► **Defined Industry 4.0 maturity as well as prioritized Industry 4.0 solutions for the realization of the Industry 4.0 target state**

# Increase of efficiency in the designing department by modularizing the tool structure

Huf Tools

## Approach

- Status quo analysis
- Structuring of the tool spectrum to standardize the design
- Determination of design standards and modules to maximize the number of identical parts
- Assistance of the implementation and change management



## Result

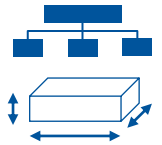
► **Reduction of lead time from 18 to 12 weeks, which results of the process standardization, subsequent to tool standardization**

# Manufacturing and automation concept design of a modern tooling production of the future at igus

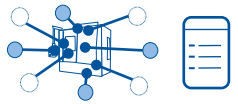
## Approach

- Recording of the requirements of the work piece spectrum in tool design
- Creation of specification sheets for the machines to be procured based on the recorded requirements
- Market analysis and pre-selection of machines on the basis of the defined specifications
- Recording and evaluation of the requirements for the introduction of automation in tool manufacturing
- Development of an automation concept incl. determination of machines to be integrated, handling units, clamping systems as well as further peripherals and identification of possible suppliers

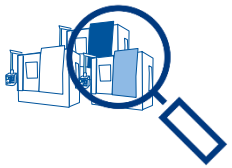
1. Work piece analysis



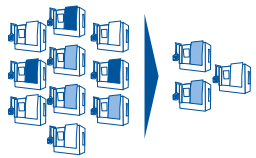
2. Creation of specification sheets



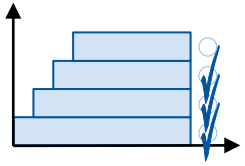
3. Market analysis



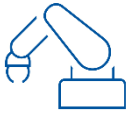
4. Preselection



Requirements for automation



Automation concept



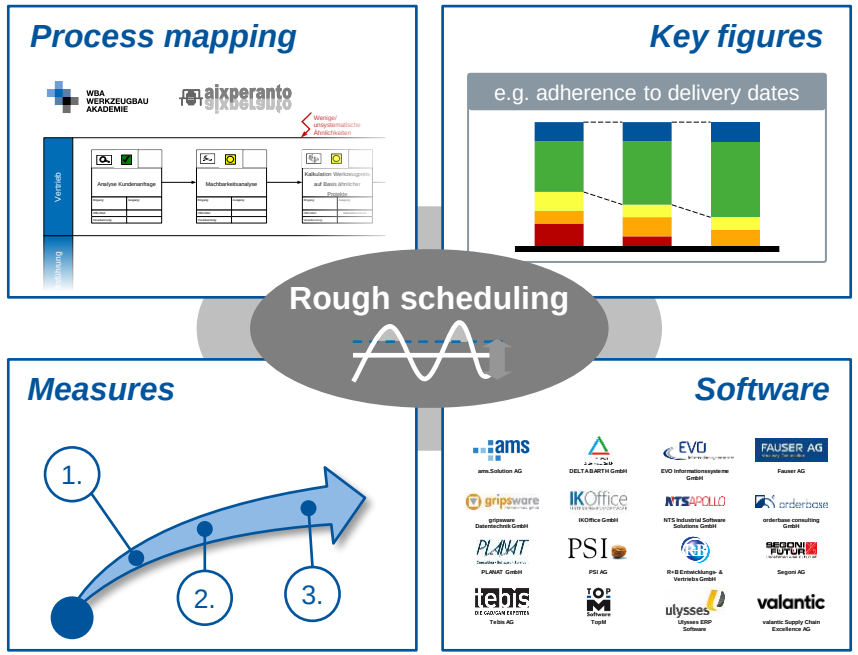
## Results

- ► **Detailled specification sheets based on the requirements of the work piece spectrum**
- ► **Preselection of commercially available machinery based on the specification sheets**
- ► **Assessed requirements for automation and derived automation concept**

# Development of a rough scheduling process and selection of a scheduling system for the tool shop of Kunststofftechnik Jantsch

## Approach

- Analysis and optimization of the order processing with a focus on cost calculation and rough scheduling
  - Analysis of the current approach on cost calculation and scheduling as well as identification of potentials regarding information exchange and documentation standards
  - Analysis of the cost calculation and scheduling performance by a comparison of KPIs with similar tool shops
  - Derivation of measures for the development of a scheduling process with increased efficiency
- Identification and evaluation of potential suppliers of software systems for calculation and planning
  - Presentation of relevant software systems for the support of cost calculation and scheduling processes
  - Evaluation of the systems based on the company-specific requirements



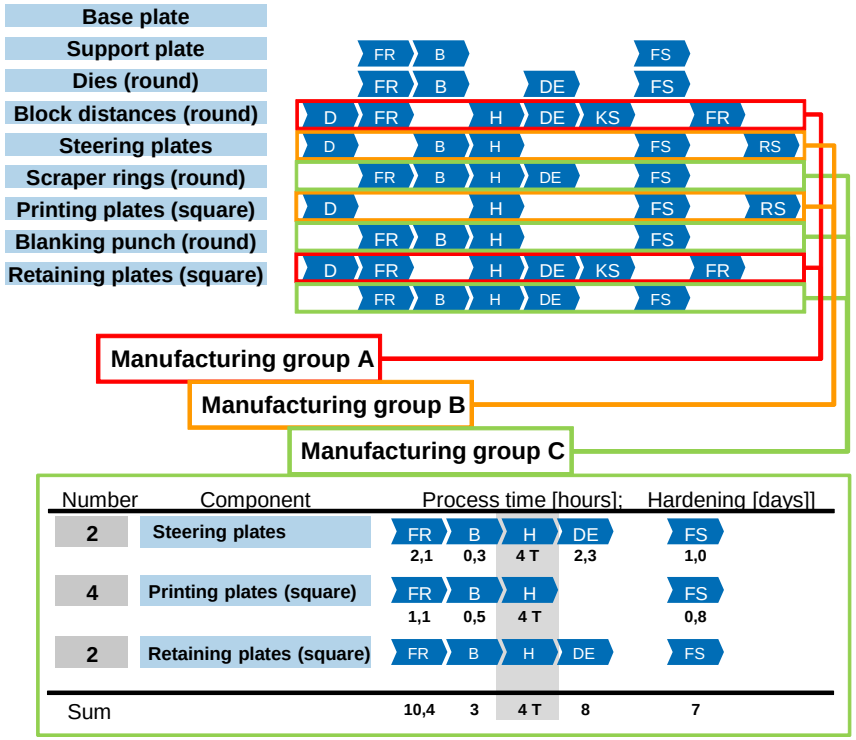

## Results

- ► **Analyzed status quo and derivation of concrete measures for increased efficiency in cost calculation and scheduling in the tool shop**
- ► **Pre-selection of suitable software systems for a systematic cost calculation and scheduling**

# Optimization of the internal order processing and tool calculation

## Approach

- Analysis of the order processing and creation of strength/ potential profiles for the individual divisions
- Development of a concept for the reorganisation
- Implementation of a new calculation system
- Redefinition of the manufacturing planning by the flow principle
- Standardization of the processes in the work preparation
- Optimized ERP system use



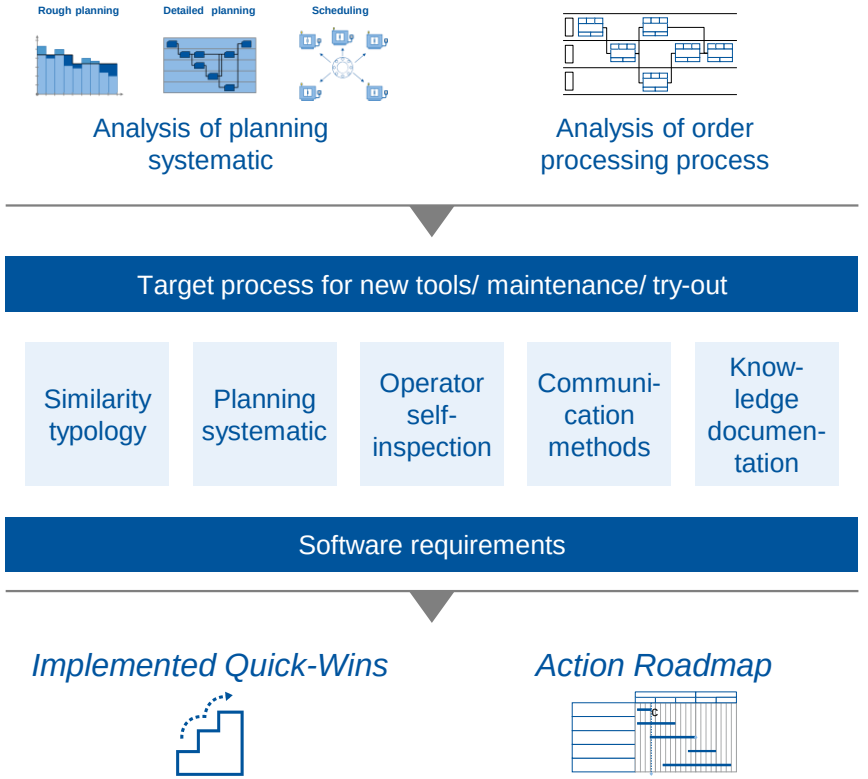

## Results

- ► **Significant enhancement of the productivity during the order processing**
- ► **Realization of a general planning and controlling system from the offer creation up to the produced tool**

# Design of the order processing process as well as planning and scheduling for the tool shop of KM Croatia

## Approach

- Analysis and evaluation of the status quo of the order fulfillment process for new tools and maintenance as well as the planning systematic
- Conceptual design of a future planning systematic in the dimensions of rough and detailed planning as well as scheduling, including the associated organizational framework conditions and necessary documents
- Development of an optimized target process for new tool production and maintenance as well as an optimization of the try-out process
- Definition of requirements for the existing software system for the best possible support along the entire order fulfillment process
- Implementation of pilot solutions (e.g. in assembly procedures, the operator self-inspection, the prioritization in quality management as well as idea management)
- Definition of an action roadmap with developed measures and responsibilities for further implementation



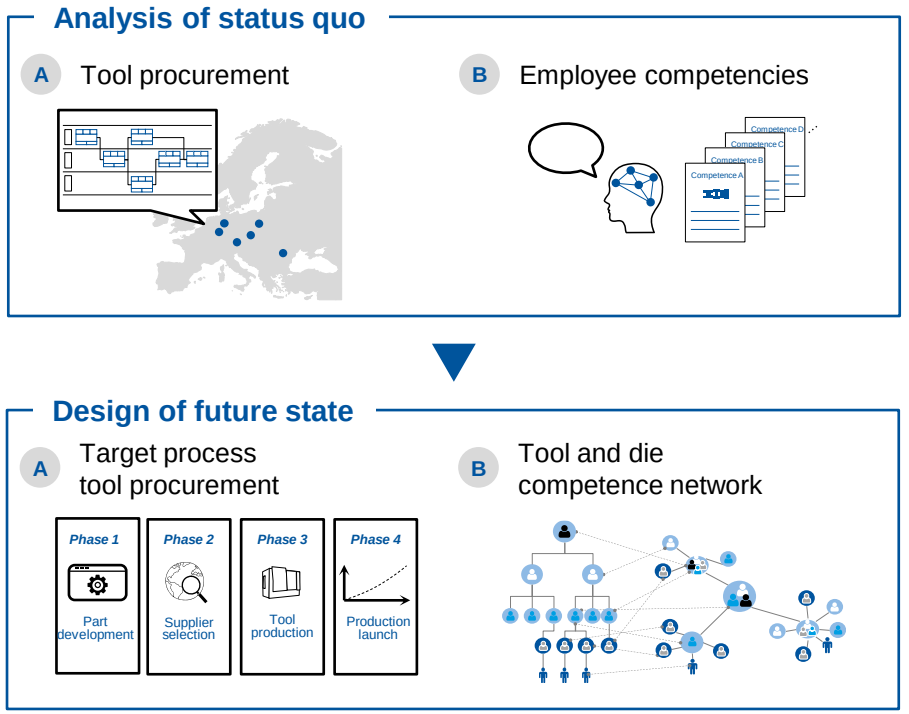

## Results

- ► **Conceptualized solutions for the design of the order fulfillment process and the planning systematic**
- ► **Achieved quick wins and derived action roadmap for further implementation**

# Analysis, standardization and design of an efficient tool procurement at Miele

## Approach

- Analysis of the tool procurement process at different national Miele sites with the aim of synchronizing the processes in order to realize synergies
- Identification of existing tool competencies (e.g. market knowledge, tool design or simulation) and the future competence need in tool procurement through employee interviews
- Definition of a tool procurement target process for the standardization and optimization of procurement across sites
- Effective integration of existing tool competencies at different Miele sites through a detailed tool and die competence network



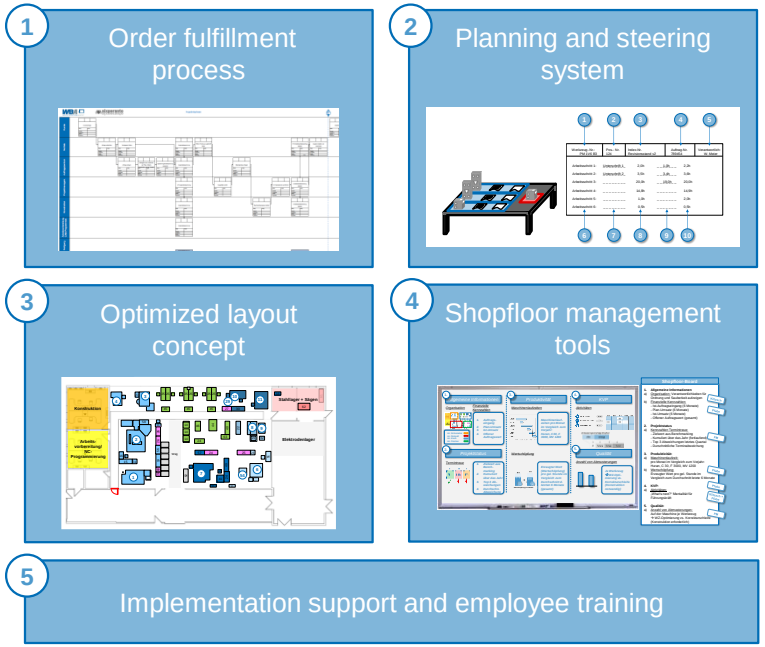

## Results

- ► **Defined group-wide target process for a synchronized tool procurement**
- ► **Detailed tool and die competence network to support tool procurement**

# Redesign of tool shop of Murrplastik Medizintechnik GmbH

## Approach

- Creation and implementation of an optimized order fulfillment process including defined milestones
- Development of a consistent system for rough and detailed planning as well as for production steering
- Implementation and visualization of planning and steering system in all departments involved and especially on the shopfloor
- Development of an optimized layout concept
- Design and elaboration of shopfloor management tools
- Conduction of trainings for employees
- Preparation of a detailed implementation roadmap



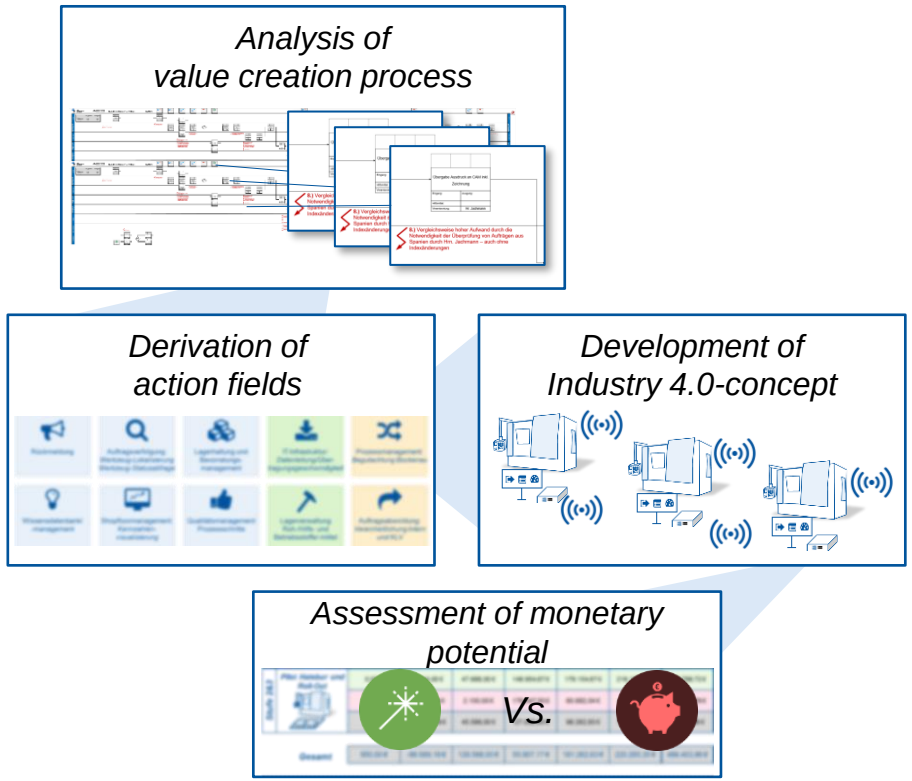

## Result

► **Redesigned tool shop with optimized order processing, planning and steering as well as production organization for economical and efficient tool production**

# Development of an Industry 4.0-concept for tool shop of Musashi Grolsheim

## Approach

- Analysis of the order processing and identification of core potentials
- Derivation of action fields based on the compiled core potentials
- Research and elaboration of various Industry 4.0-solutions
- Development of an overall Industry 4.0-concept in order to comprehensively address the action fields and to increase the Industry 4.0-degree of maturity
- Assessment of the quantitative monetary potential of the Industry 4.0-concept with regards to cost and benefit
- Definition of an implementation roadmap including roles and responsibilities



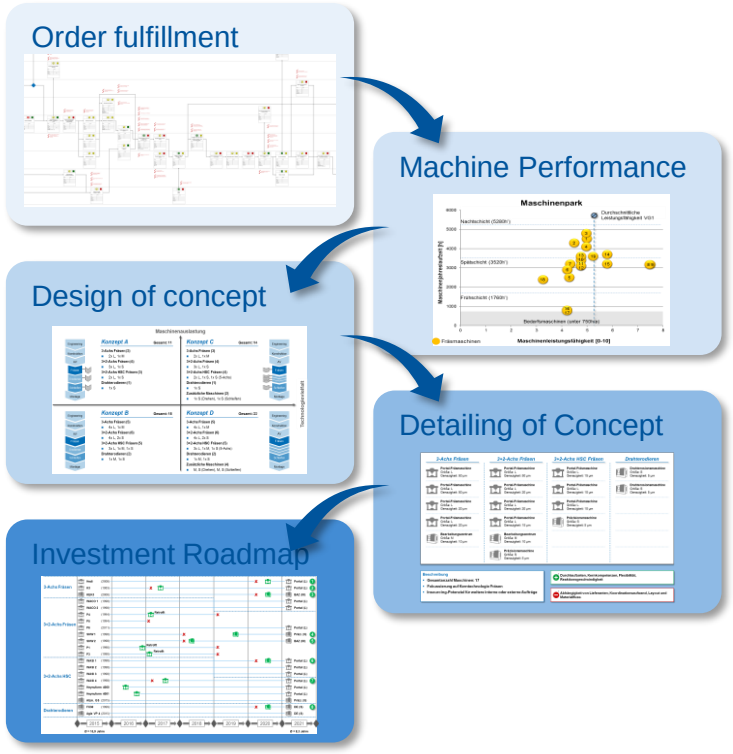

## Results

- ► **Viable Industry 4.0-concept based on current action fields**
- ► **Monetary assessment of the Industry 4.0-concept including an implementation roadmap**

# Process Analysis & Selection of manufacturing concept and resources for internal tool room of Adam Opel AG

## Approach

- Analysis of order fulfillment process, technological performance, work piece requirements and process chains
- Derivation of technological and organizational action fields and definition of improvement measures
- Analysis of future capacity demand and development of four different manufacturing concepts regarding machine utilization and number of in-house manufacturing technologies
- Evaluation of the derived concepts and selection of the concept with the best fit for the tool room of Opel
- Derivation of necessary machinery for the year 2021 under consideration of all strategic restrictions
- Derivation of a roadmap for execution of necessary changes in machinery and investment recommendations for specified machinery




## Results

- ► **Identification of action fields for improvement of organizational and technological performance**
- ► **Investment roadmap for realization of a future oriented machinery selection until year 2021**

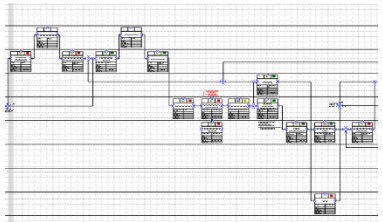
# Layout and process design for OPUS Formenbau

## Approach

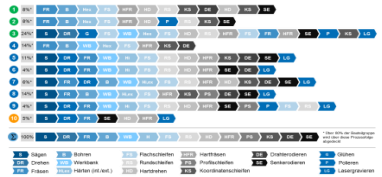
- Analysis and optimization of the entire order fulfillment process
- Recording and analysis of the tool manufacturing process steps
- Identification of the material flow and development of a flow-oriented layout design
- Identification of the information flows and conception of an administrative building
- Definition of KPIs and elaboration as part of a leading on-site concept
- Development of a visual management in course of a shop-floor management

OPUS FORMENBAU

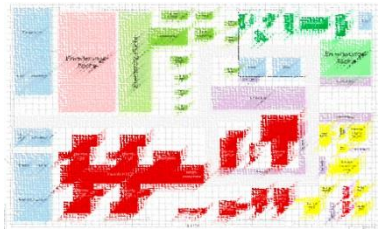
1 Analysis of order fulfillment process



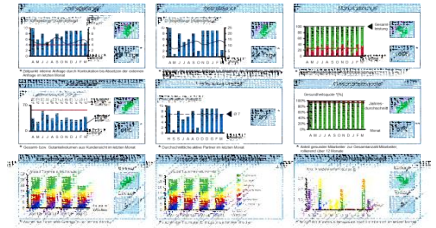
2 Analysis of manu-facturing process steps



3 Development of a layout design



4 Development of shop-floor management



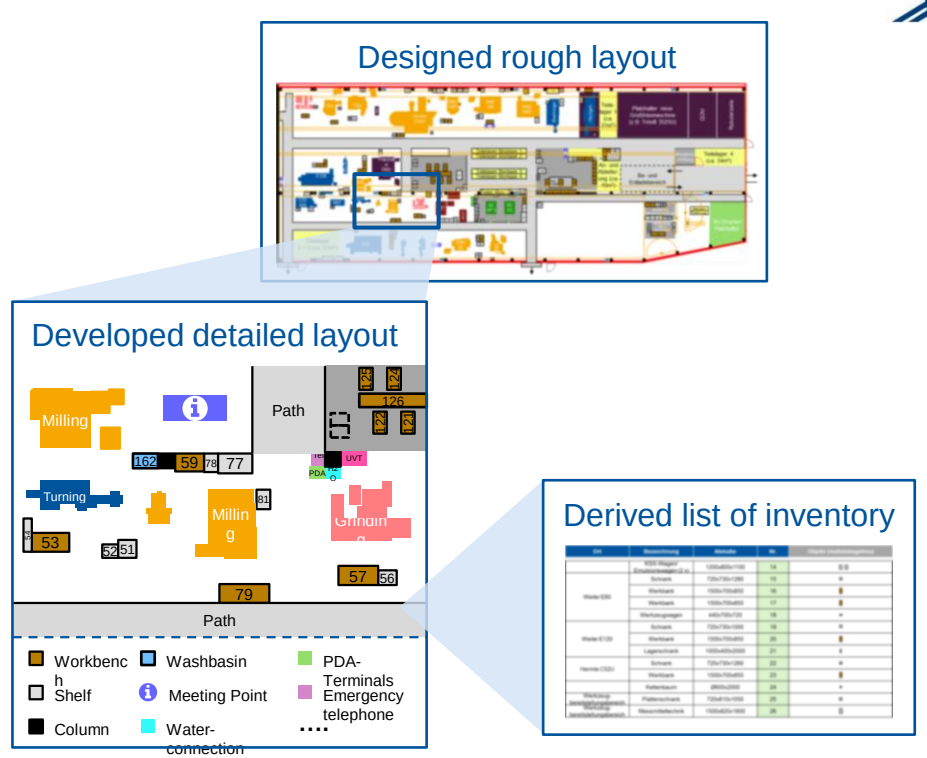
## Results

- ► **Material flow oriented layout design and information flow oriented administrative building**
- ► **Optimized order fulfillment process and individual shop-floor management**

# Layout detailing for the tool shop of Otto Fuchs KG

## Approach

- Design of the rough layout based on the manufacturing workflow and the frame conditions given by the plant structure planning
- Development of the detailed layout considering the footprint for shelves, workbenches, goods receipt, goods issue, meeting points as well as the positioning of media connections
- Arrangement and specification within designated areas, such as assembly and warehouse areas as well as areas for tooling issuance
- Verification of the detailed layout by involving a large number of employees



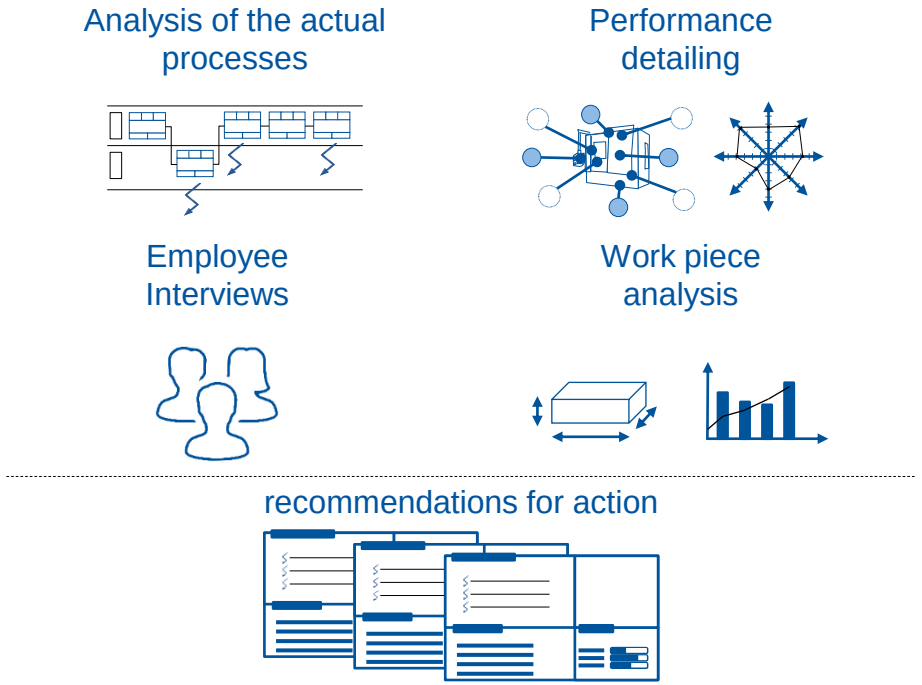

## Results

- ► **Comprehensive and future-proof rough and detailed layout of the new tool manufacturing hall as supporting input for the final construction planning**
- ► **Inventory and purchase list enabling a structured relocation to the new tool manufacturing hall**

# Analysis of the mechanical production in the internal tool shop of Phoenix Feinbau GmbH & Co. KG

## Approach

- Recording of the actual process in the mechanical production starting from the construction up to the delivery of the tool to the customer
- Conducting employee interviews with the individual departments
- Evaluation of the technological performance of existing machines
- Recording and evaluation of the detailed work piece analysis at machine level over a representative observation period
- Derivation of strategic and operative fields of action for mechanical manufacturing




## Results

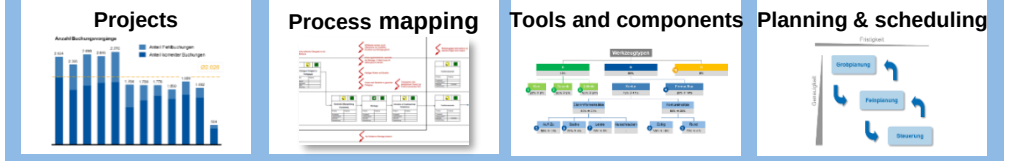
- ► **Analyzed actual process in mechanical manufacturing and determination of requirements from the work piece spectrum**
- ► **Operational and strategic fields of action on the basis of the analysis results**

# Development of an efficient order fulfillment process in the internal tool shop of Procter & Gamble

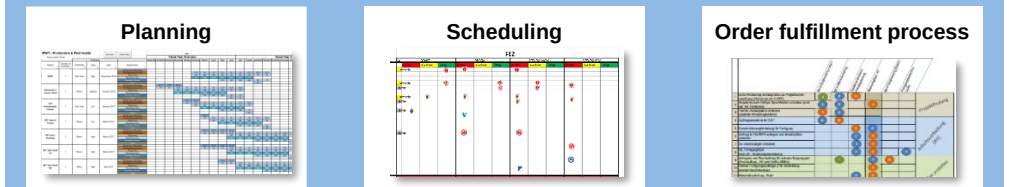
## Approach

- Analysis of the status quo analysis in different areas of order processing:
  - Projects
  - Tools and tool components
  - Order fulfillment processes
  - Planning & scheduling
- Development and definition of the central fields of action planning, scheduling and order fulfillment process
- Support for operational implementation, e.g. development of a tool for rough planning of projects
- Derivation and evaluation of measures for future implementation

**Status-quo analysis**




**Development of fields of action and operational implementation**




*e.g. development and use of a tool for rough planning*

*e.g. implementation of a scheduling approach alongside the process chain*

*e.g. updating and redefining responsibilities and tasks*

**Derivation and evaluation of measures**

## Results

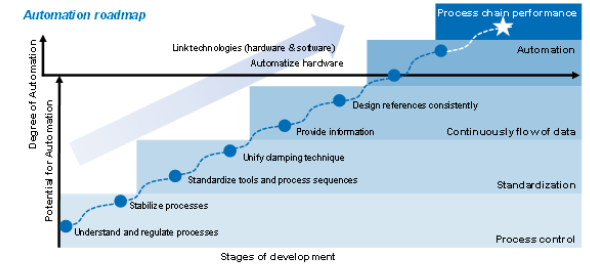
- ► **Systematic for the planning and scheduling in the internal tool shop incl. rough planning tool and implemented scheduling approach alongside the process chain**
- ► **Detailed overview of measures to be executed for an efficient order fulfillment**

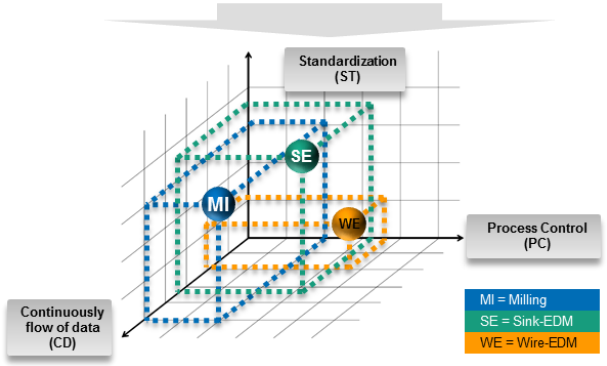
# Identification of the automation potential of the tool shop in Lohne

## Approach

- Status-quo analysis of the automation requirements
  - Identification of existing preconditions for automation of the tool shop
  - Identification of the consequences for the automation concept
  - Analysis of the mechanical production in relation to the areas process mastery, standardization and data consistency
  - Derivation of fields of action for the attainment of technologically essential requirements
- Workpiece analysis
  - Collection, analysis and validation of a representative samples with regard to macro and micro geometric properties, material technological characteristics and process-related key figures

PÖPPELMANN




## Result

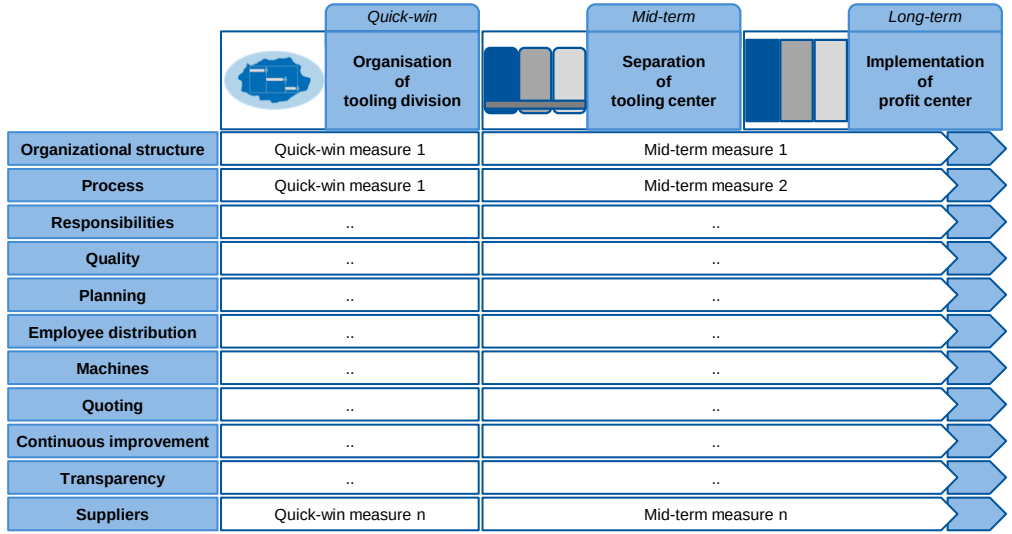
► **Detection of technological-economical rationalisation possibilities within the industrialized tool making through automation in production**

# Industrialization of tool making and set-up of structures for transfer from cost- to-profit-center

## Approach

- Analysis of processes and responsibilities along the entire process chain
- Derivation of strengths and potentials with regard to all organizational and technological aspects
- Definition of future concept of strategic positioning and organizational structure
- Set-up of a detailed plan of measures for development towards the future concept
- Support of the execution of measures

*Future concept*



| | Quick-win: Organisation of tooling division | Mid-term: Separation of tooling center | Long-term: Implementation of profit center |
|---|---|---|---|
| Organizational structure | Quick-win measure 1 | Mid-term measure 1 | |
| Process | Quick-win measure 1 | Mid-term measure 2 | |
| Responsibilities | .. | .. | |
| Quality | .. | .. | |
| Planning | .. | .. | |
| Employee distribution | .. | .. | |
| Machines | .. | .. | |
| Quoting | .. | .. | |
| Continuous improvement | .. | .. | |
| Transparency | .. | .. | |
| Suppliers | Quick-win measure n | Mid-term measure n | |

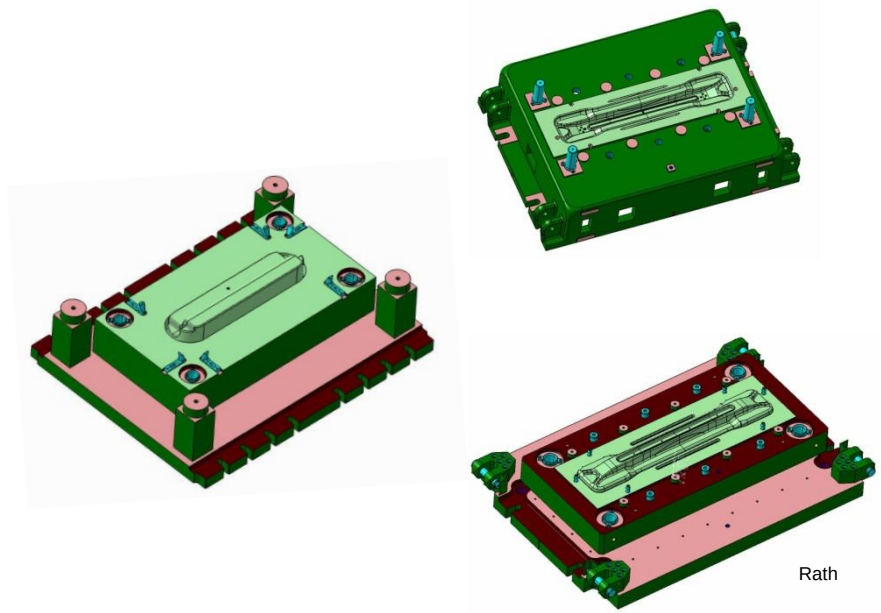
## Results

- ► **Established structures to develop from a cost-center towarads a profit-center**
- ► **Increased competitiveness through process efficiency, due date reliability, and capacity utilisation**

# Enhancing the order processing efficiency by modularizing the tool design

## Approach

- Analysis of the tool range for the single customer groups
- Selection of a main customer as a reference
- Modularization and standardization of the main customer‘s tool type
- Employee training about the construction standards
- Development of standard work plans by the work preparation



Rath

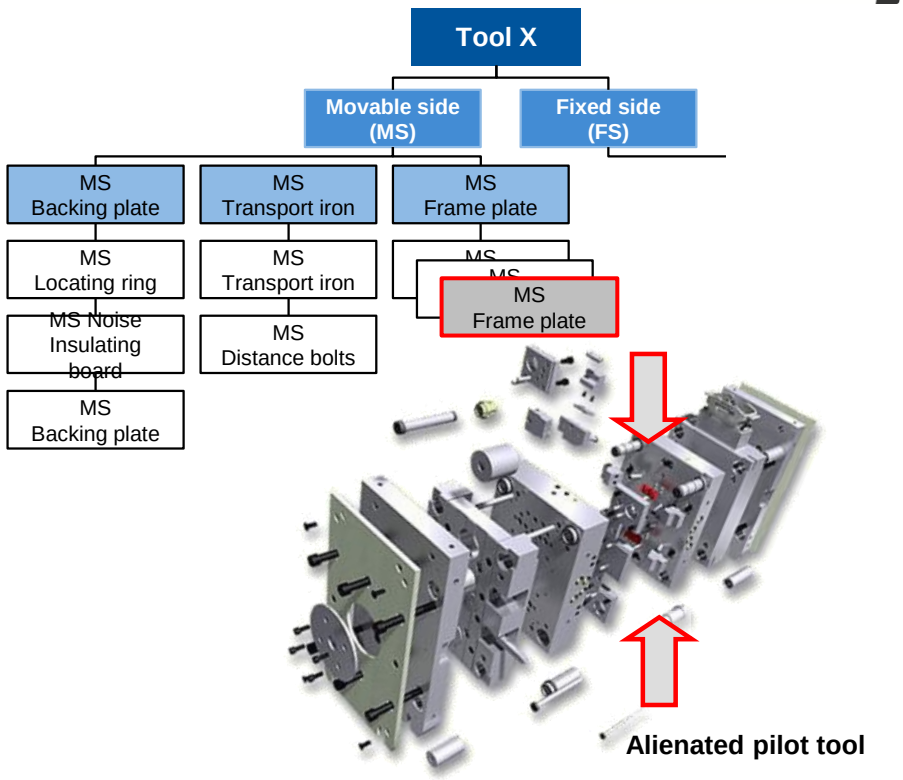
## Result

► **Significant reduction of the processing time for drawing tools by modularization and standardization**

# Initiating the industrialization of tool making through product and process standardization

## Approach

- Selection of a pilot tool
- Analysis of tool spectrum
- Identification of standardization potential in regard of the pilot tool
- Process standardization for the pilot tool
- Process synchronization for the pilot tool



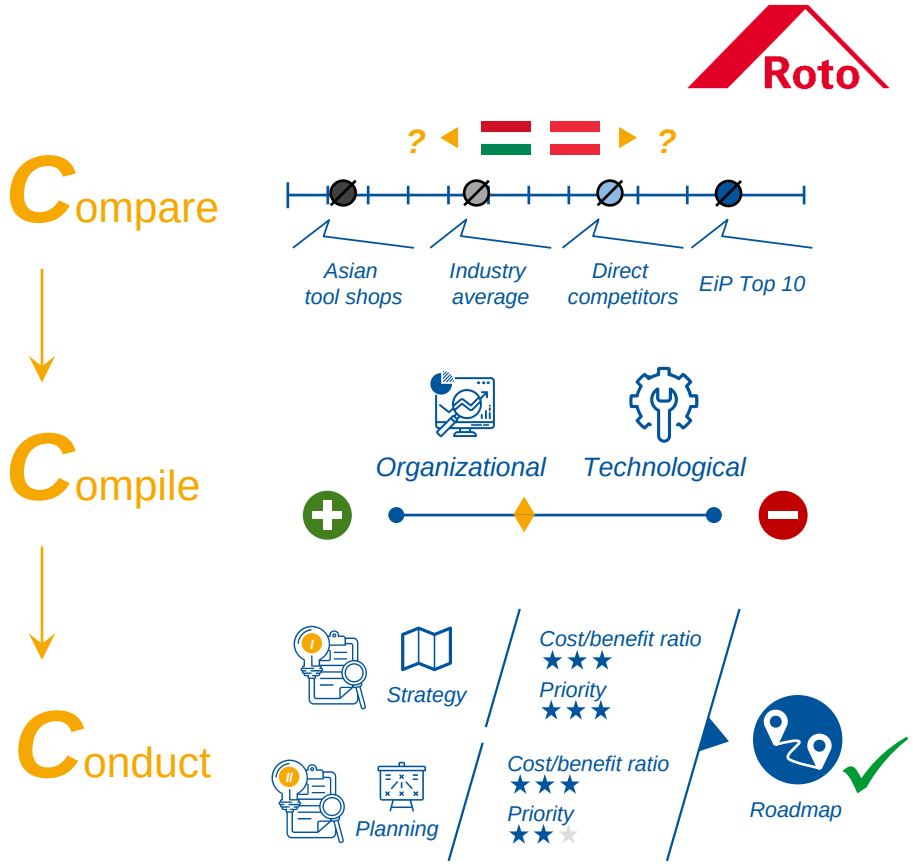

## Result

► **Successful product and process standardization for manufacturing of a pilot tool, providing the foundation for industrialized and synchronous tool making**

# Benchmarking in order to determine the performance of Roto Frank's internal tool shops in Kalsdorf, Austria and Lövő, Hungary

## Approach

- Application of the established 3C benchmarking approach to determine the performance of Roto Frank's internal tool shops in Austria and Hungary
- Selection of individual comparison groups consisting out of toolmaking companies with a similar product range in Europe and Asia
- Determination of the organizational and technological performance of the tool shops in the segments new tools as well as repair and maintenance
- Derivation and prioritization of fields of action as well as detailed description of the recommended measures in order to increase performance



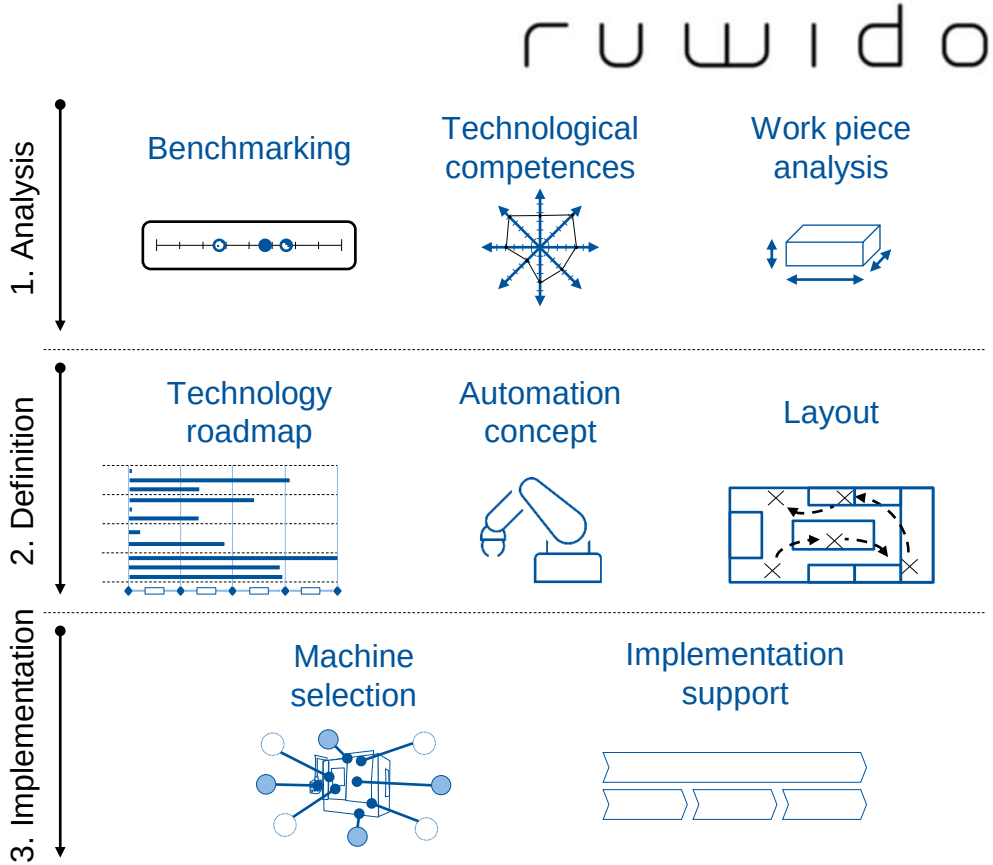

## Results

- ► **Evaluated organizational and technological performance of the internal tool shops in comparison to competitors**
- ► **Derived fields of action for the sustainable optimization of the internal tool shops**

# Automation and layout design for the implementation of a modern production at ruwido austria gmbh

## Approach

- Identification of the current technological performance of tool making by benchmarking and work piece analysis
- Derivation of requirements from the company strategy to the manufacturing technology of internal tool making
- Definition and elaboration of three fields of action:
  - Technology roadmap
  - Automation concept
  - Layout (new plant)
- Support of the operational implementation phase




## Results

- ► **Technology roadmap and automation concept based on the product spectrum and the strategic goals**
- ► **Layout concept for the new production plant and support in the machine selection**

# Technological Optimization of Toolshop at Scheuermann + Heilig GmbH

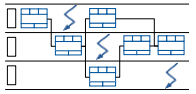
## Approach

- Analysis of the current performance of toolshop with the following methods:
  - As-is process analysis with modeling language »aixperanto«
  - Workpiece analysis on component and machine level
  - Interviews to record employee perspectives
  - Evaluation of the technological performance of existing machines
  - Derivation of requirements from the product portfolio and the corporate strategy for the manufacturing technologies
  - Assessment of the prerequisites for automation
- Detailing of concrete recommendations for action for the holistic technological optimization of toolshop
- Compilation of working groups and definition of subgoals

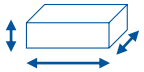
SCHEUERMANN + HEILIG
Performing Perfection

Analysis

Process Recording

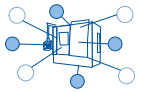


Workpiece Analysis



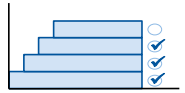
Employee Interviews

Performance Detailing



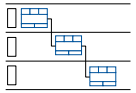
Product Portfolio

Automation Requirements

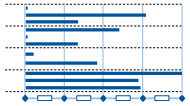


Results

Design of target process

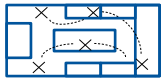


Technology Roadmap



Automation Concept

Layout Concept



## Results

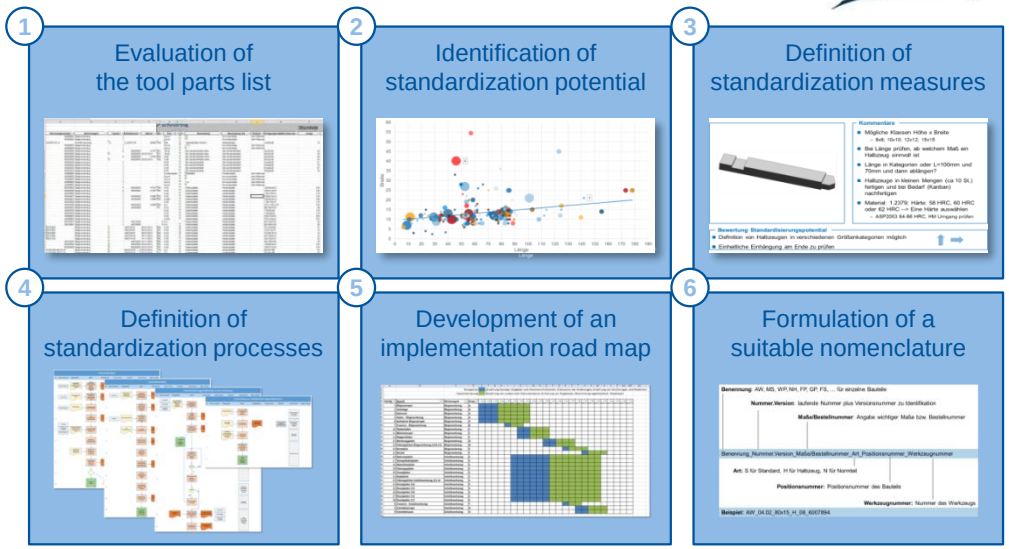
- ► **Technology roadmap with a requirement-compliant automation solution**
- ► **Target process for process organization and optimized layout of mechanical manufacturing**

# Increase of efficiency by tool-standardization

## Approach

- Analysis of 4,895 components, 11,914 spare parts and 3,584 standard components
- Evaluation of 218 different component groups
- Identification of the standardization poten-tial and definition of measures for the stan-dardization of single component groups
- Definition of standardization processes for long-term implementation
- Development of an implementation road map and definition of a suitable tool nomenclature

schnöring
WIRE & BENDING SYSTEMS
Dynamik die bewegt



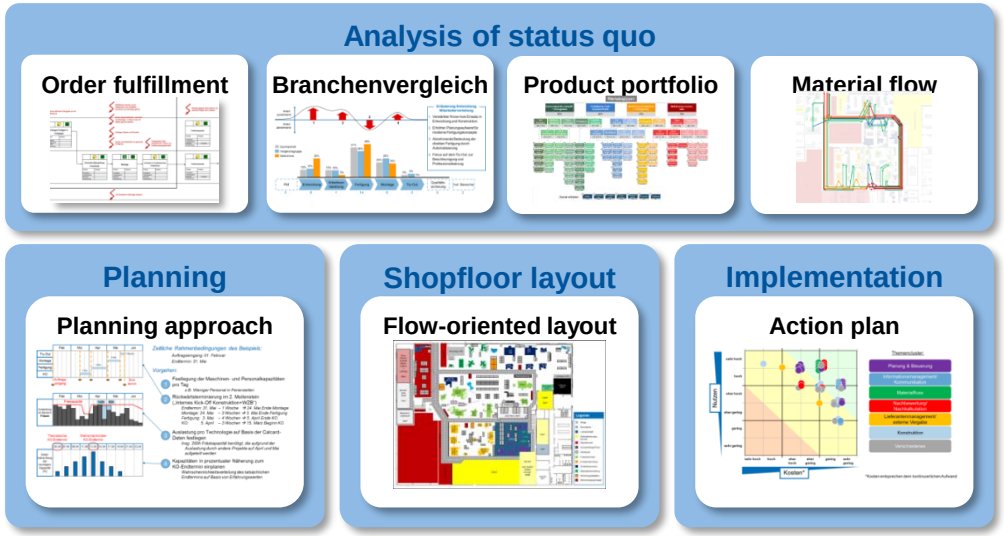

## Results

- ► **Lead time and production cost reduction by the standardization of components**
- ► **Standardization processes for sustainable long-term implementation of standardization**

# Reconception of the internal tool shop of Selectrona

## Approach

- Analysis of the internal order fulfillment process
- Conduction of a benchmarking
- Analysis of the existing product portfolio
- Definition of main process sequences
- Development of an individual planning approach
- Design of a flow-oriented shopfloor layout
- Development of a detailed implementation plan




## Results

- ► **Standardized processes and an individual and aligned planning approach**
- ► **Process-oriented shopfloor layout including a detailed implementation roadmap**

# Siebenwurst: CAx process and interface optimization in mechanical manufacturing

## Approach

- Detailed analysis of the status quo with qualitative and quantitative methods:
  - Process recording with modeling language "aixperanto"
  - Interviews to collect individual employee perspectives with a focus on CAx system usage
  - Recording of the activity structure in a defined period of time
- Identification of improvement potentials based on technical requirements in individual process steps and at department interfaces
- Derivation of recommendations for action for example:
  - Technical reassignment of employees
- Documentation in a roadmap to define responsibilities and scheduling

SIEBENWURST
MODELLBAU & FORMENBAU

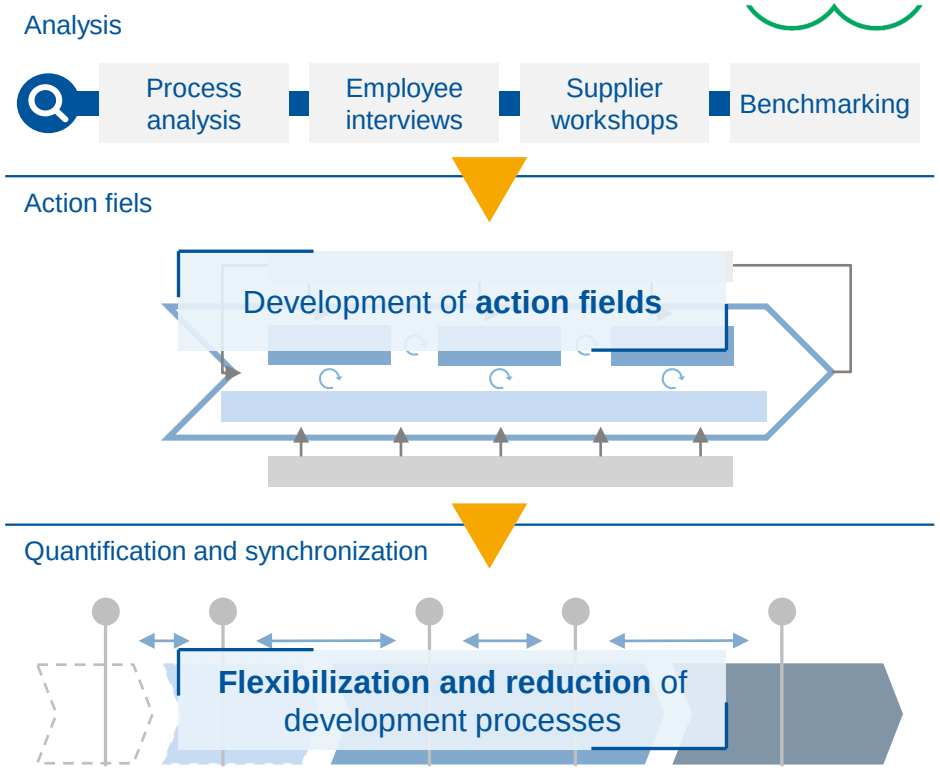

## Results

- ► **Recommendations for action to improve processes and interfaces in mechanical manufacturing**
- ► **Roadmap with recommendations for action and assigned responsibilities and scheduling**

# Determining the potential of an agile tool development and supply process at Vorwerk

## Approach

- Analysing the actual state of the tool development and supply process supported by a quantitative process data analysis
- Development of a target state with detailed action fields for a synchronized tool development and supply process that is coordinated with the product development process:
  - Definition and development of action fields with regard to increasing process flexibility and decreasing lead time of product development
  - Quantification of the identified potentials with regard to the reduction of development lead times and cost reduction
  - Development of technical concepts for the use of prototype tools for early process assurance




## Result

► **Detailed analysis and evaluation of the actual situation as well as derived and rated fields of action to reduce lead times for tools and revise procurement more flexible**

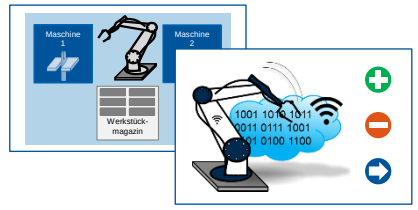
# Technical investment planning in the manufacturing area and optimization of planning and scheduling at weba

## Approach

- Detailed analysis of the component spectrum as well as of the process sequences and lead times
- Investigation of technological potentials and definition of future manufacturing technologies including automation and Industry 4.0 concepts
- Analysis of future capacity requirements and comparison with currently available machine capacities for deducing an investment roadmap
- Mapping and assessment of the planning and scheduling process
- Definition of a target state for planning and scheduling including an action plan for realization

**Analysis of process sequences**

**Identification of technological potentials**




**Capacity analysis and investment roadmap**


**Optimization of planning and scheduling**

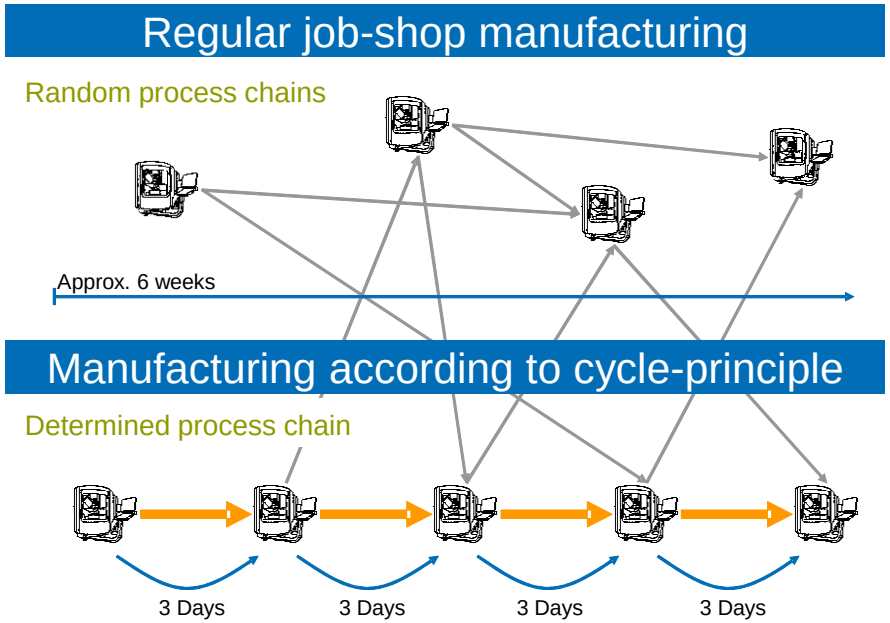
## Results

- ► **Concept for future-oriented, efficient manufacturing including defined investment roadmap**
- ► **Optimized planning and scheduling including an action plan for realization**

# Increasing the effectivity of the order processing by synchronizing the single manufacturing steps

## Approach

- Analysis of the order processing and creation of strength/ potential profiles for the individual divisions
- Development of a concept for the reorganization
- Establishment of a milestone process to structure a comprehensive order processing
- Analysis of the process chain in manufacturing
- Definition of a pilot synchronized production line and determination of the synchronization



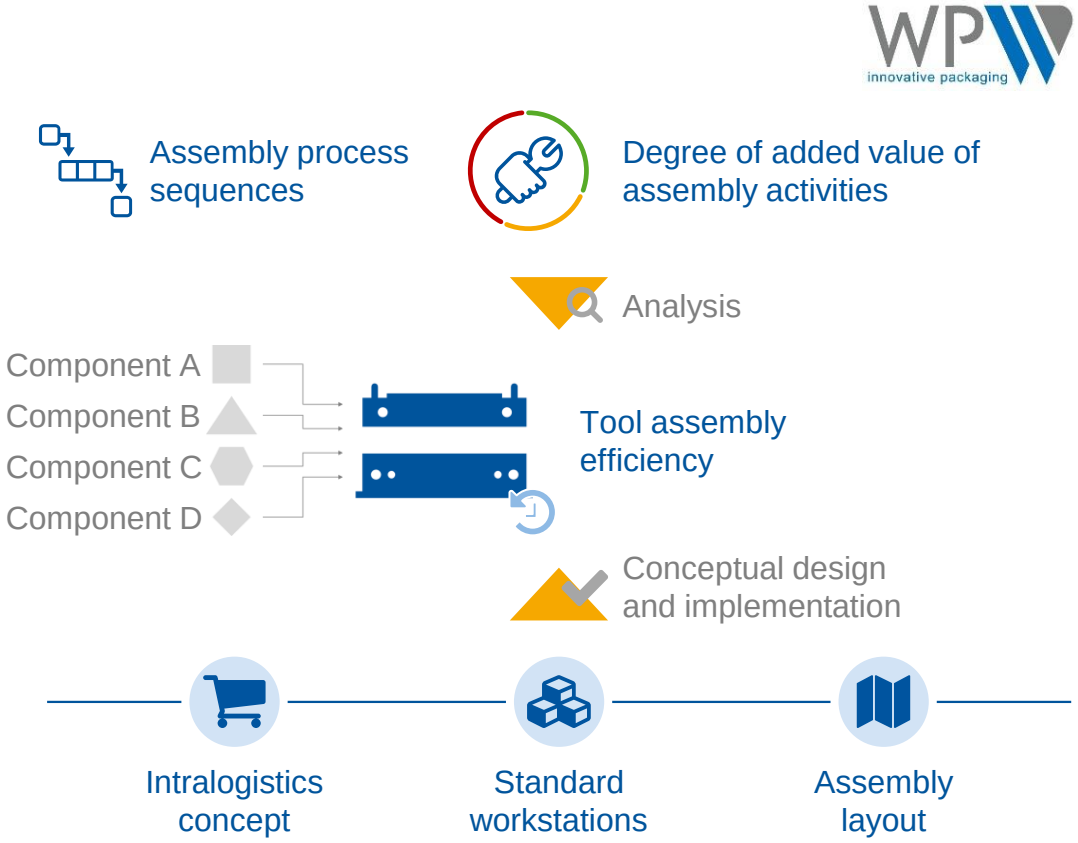

## Results

- ► **Realization of a continuous production flow and increasing both transpareny and predictability of the completion dates**
- ► **Reduction of the required manual control**

# Design of the tool assembly line and support of the operational implementation in the tool shop of Weener Plastik

## Approach

- Analysis of assembly process sequences and derivation of main process sequences
- Conducting activity structure analyses and evaluating the degree of value creation of the toolmakers' activities
- Standardization of the assembly workstations with the help of a 6S audits and conceptualized standard tools and shadowboards
- Optimization of component supply in assembly through the use of logistics trucks with dedicated personnel
- Development and evaluation of different layout scenarios to increase space efficiency and integration of the component supply concept
- Implementation of the standard workstations and the selected layout scenario



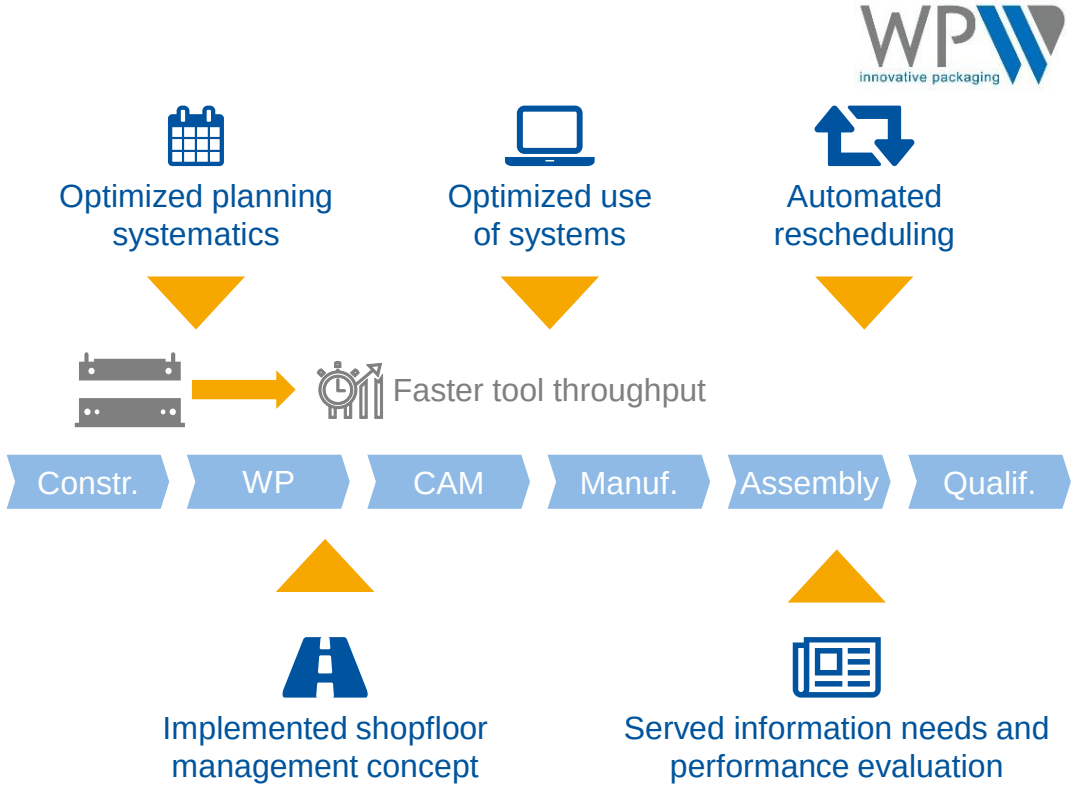

## Results

- ► **Increased efficiency through reduced non-value-added activities, optimized intralogistics and standard workplaces**
- ► **Increased space efficiency through the development and implementation of an optimized assembly layout**

# Optimization of planning and control as well as development of a shopfloor management concept for the tool store of Weener Plastik

## Approach

- Analysis of the procedure for planning in work preparation
- Optimization of the activities as well as the use of software in rough and detailed planning
- Formulation of decision rules for automated rescheduling in the existing planning software and monitoring of implementation
- Identify employee information needs and metrics to determine unit-specific performance
- Procurement of the identified information as well as key data collection and agile implementation of shopfloor boards with the help of minimum viable products
- Development of a utilization concept for the integration of shopfloor boards in continuous improvement and in order control




## Results

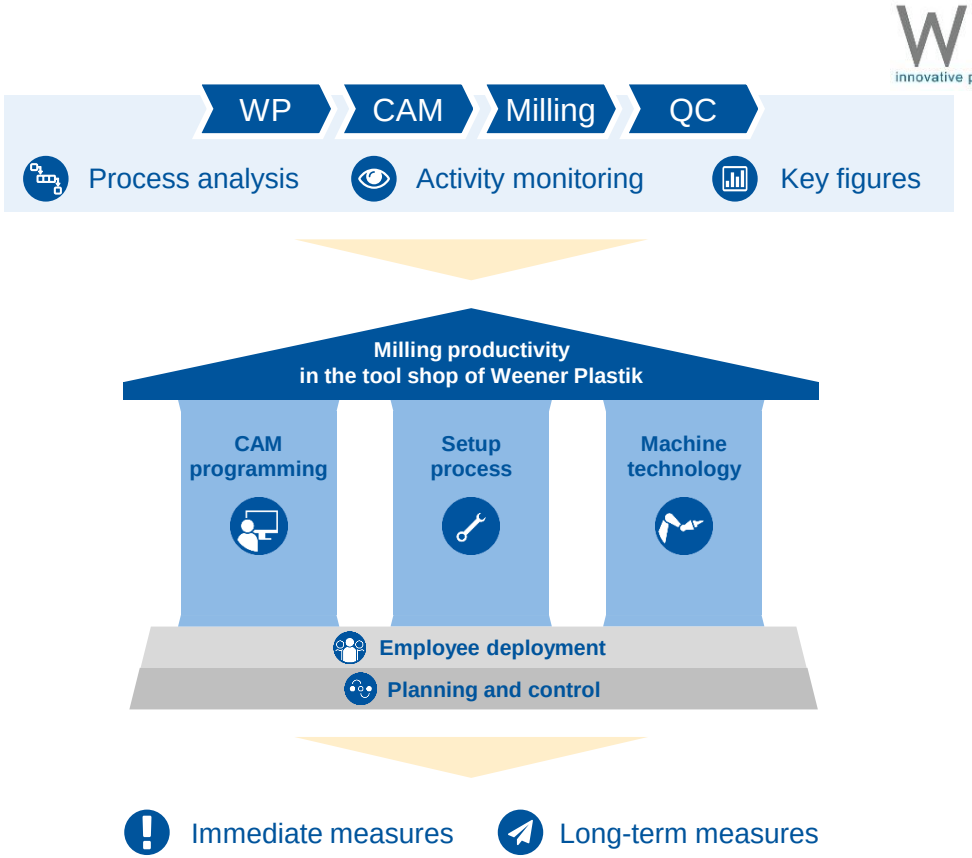
WP: Work preparation; Constr.: Construction; Manuf.: Manufacturing; Qualif.: Tool qualification

- ► **Increased efficiency and effectiveness in planning and control**
- ► **Implemented shopfloor management concept incl. digital shopfloor boards**

# Evaluation and increase of productivity in the area of milling in the internal tool shop of Weener Plastik

## Approach

- Evaluation of the preliminary, executive and downstream activities in the context of milling on the basis of a process analysis, activity observations and key figures
- Comparison of current productivity in milling with highly automated market participants as well as evaluation of the development of productivity over time at Weener Plastik
- Identification of fields of action to increase productivity in milling in the short, medium and long term
- Development and benefit assessment of measures in the fields of CAM programming, setup process, machine technology, employee deployment, and planning and control




WP: Work preparation; QC.: Quality Control

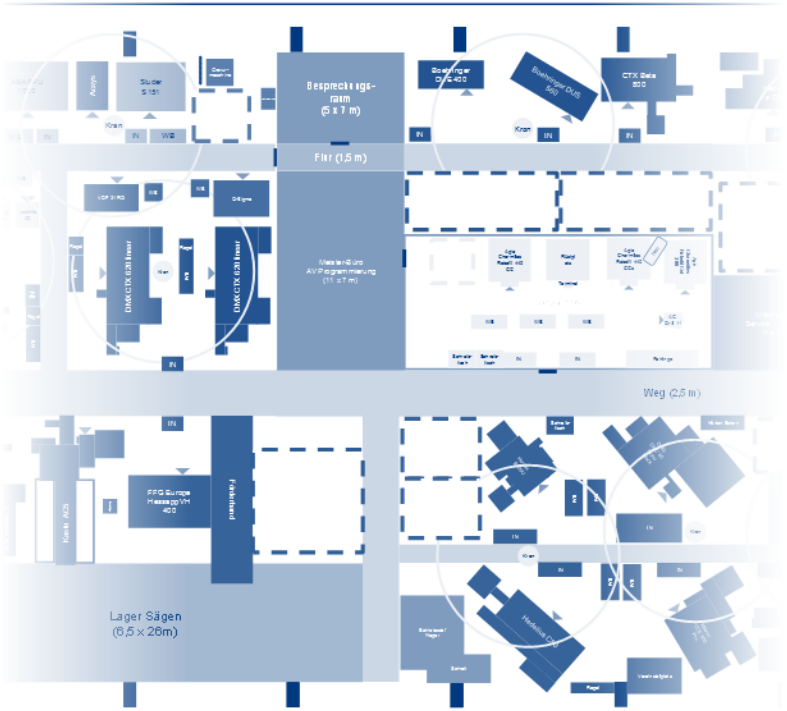
## Results

- ► **Quantity and quality evaluated productivity in milling**
- ► **Developed measures to increase productivity in milling**

# Development of a flow-oriented tool room layout

## Approach

- Analysis of organizational and technological performance as well as deduction of strengths and potentials
- Display of current layout as well as mapping of current material flows and surface area utilization
- Definition of standardized target processes and deduction of ideal material flows
- Design of a flow-oriented tool room layout capable of further growth
- Allocation of machine resources, demarcation of storage areas and spaces for goods in- and outwards
- Continuous recording of employee requirements and suggestions with regards to the layout design



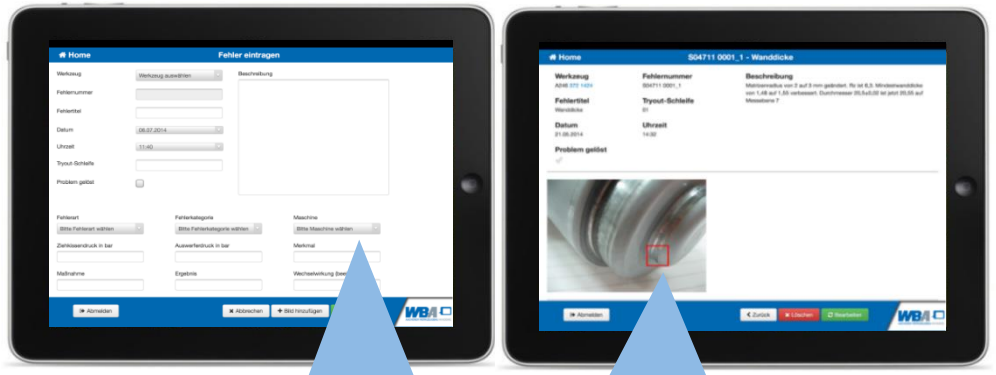

## Results

- ► **Flow-oriented tool room layout capable of further growth**
- ► **Optimized material flows as well as internal logistics and standardized machining sequences**

# Development of the tablet-application “IDA – Information Digitalization Application“

## Approach

- Joint analysis of requirements regarding a knowledge transfer application
- Definition of a concept for the application and determination of the operational environment
- Programming of the application and development of a back-end for the app configuration as well as a server infrastructure
- Testing of a pilot by participants of the consortial project
- Application adjustments and finalization as well as handover to the participants




Project consortium

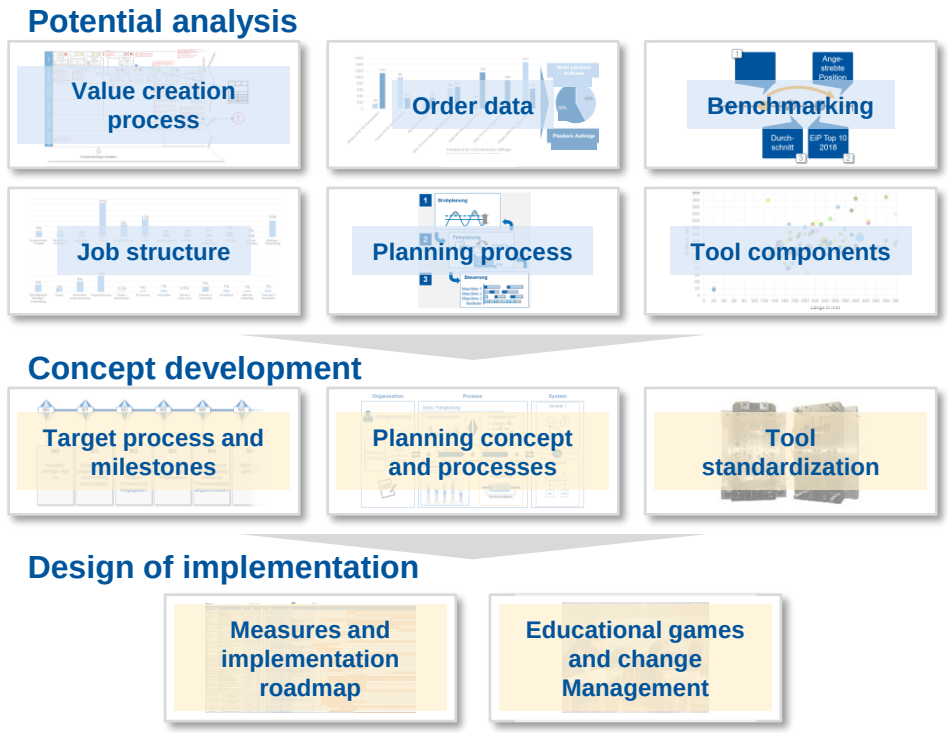
## Results

- ► **Tablet-application for error recording and knowledge transfer**
- ► **Server-infrastructure and back-end as configuration environment for the application**

# Determination of potentials in an internal tool department and design of value creation process, planning and tool standardization

## Approach

- Conduction of different analyses for identifying potentials in the tool manufacturing department
- Design of a target process for the value creation process based on defined milestones
- Development of a concept for the future planning of tool projects
- Conception and quantification of measures for tool standardization
- Derivation of implementation measures and development of an implementation roadmap
- Conduction of change management activities




## Results

- ► **Identified and quantified potentials in different areas of the tool manufacturing department**
- ► **Developed and detailed concepts for value creation process, planning and tool standardization**

# Check-up of the status quo of industrialization within an external die shop

## Approach

- Analysis of the status quo analysis in different areas within the die shop:
  - Analysis of project data and execution of comparisons for several KPI‘s
  - Analysis of order fulfillment process
  - Analysis and evaluation of tools, tool components and manufacturing processes
  - Analysis of planning and scheduling
  - Visualization of material flow on the shopfloor
- Definition of the current degree of implemen-tation in the different fields of industrialization
- Development of five action fields to implement a holistic industrialization in the die shop

**Fields of industrialization in tool and die making**

**Development of action fields, approaches and an overall roadmap**

***Standardization of tools and tool components***
- Standardization of tools for product categories and variants
- Exploitation of economies of scale through defined size ranges

***Standardization and synchronization of processes***
- Reduction of the current amount of manufacturing process chains
- Synchronization of interfaces between the different departments

***Holistic planning and scheduling***
- Approach for planning and scheduling in assembly and try out
- Improvement of planning and scheduling in manufacturing

***Market intelligence and supplier management***
- Identification of suppliers for cavities and manufacturing technologies
- Systematic qualification and further development of specific suppliers

***Material flow orientation and segmentation of shopfloor***
- Optimization of the current layout to increase transparency
- Improvement of current segmentation of machinery

## Results

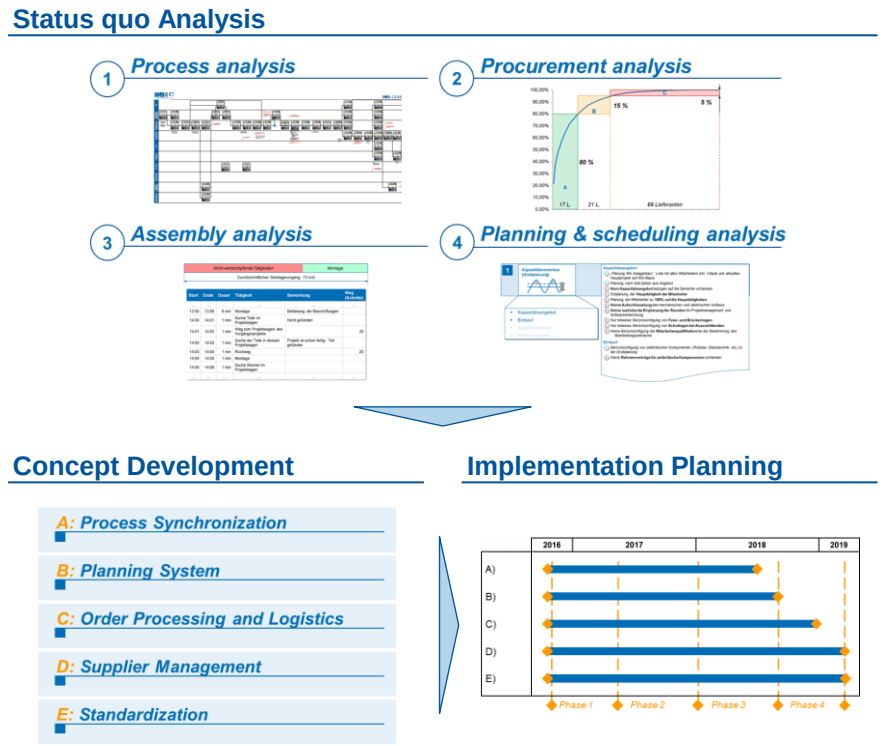
► **Status quo within the eight fields of industrialization in tool and die making incl. a description of strengths and potentials alongside the order fulfillment process**

► **Action fields incl. an overall roadmap for the holistic implementation of industrialization in the die shop**

# Development of a holistic concept for the reduction of lead times in machinery and systems engineering

## Approach

- Status quo analysis in different topics of the order processing by:
  - Process analysis
  - Procurement analysis
  - Assembly analysis
  - Planning and scheduling analysis
- Development of a holistic, detailed concept for the reduction of lead times and definition of essential action fields
- Elaboration of an implementation road map for each defined action field, consisting of detailed measures, responsibilities as well as necessary investments
- Support of the operational realization of measures




## Results

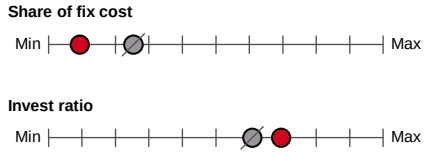
- ► **Development of a holistic concept for the reduction of lead times**
- ► **Elaboration of a roadmap for the implementation of the planned concept**

# Flexibilization of fix costs in the production of a well-known company within the construction equipment sector

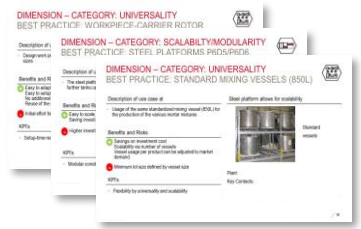
## Approach

- Conduction of a detailed comparison of the fix cost structure of the plants of a well-known company within the construction equipment sector with plants of similarly positioned companies
- Identification of Best Practices for the flexibilization of fix costs in production
- Preparation of a concept book with detailed explanations of flexible machine concepts
- Development of a systematic procurement and investment process that includes defined criteria for a flexibility check
- Derivation of an overall strategy for the flexibilization of fix costs in production

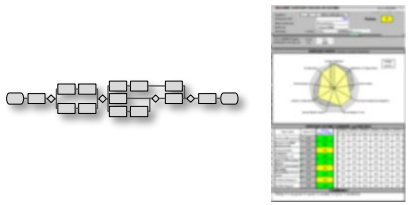
**Benchmarking**




**Machine concepts**




**Procurement process**



## Results

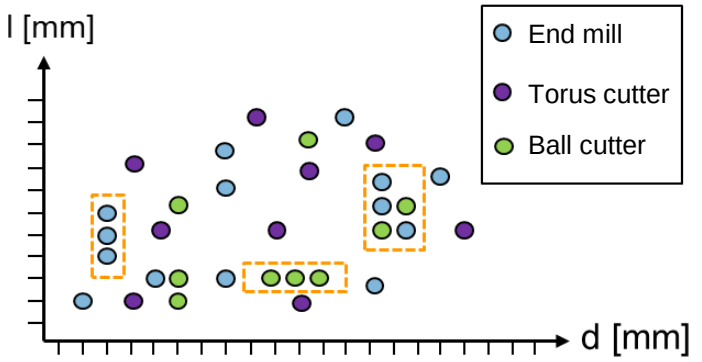
- ► **Holistic strategy and detailed procurement process for the flexibilization of fix costs**
- ► **Concept book with 43 approaches for increased flexibility in production machinery**

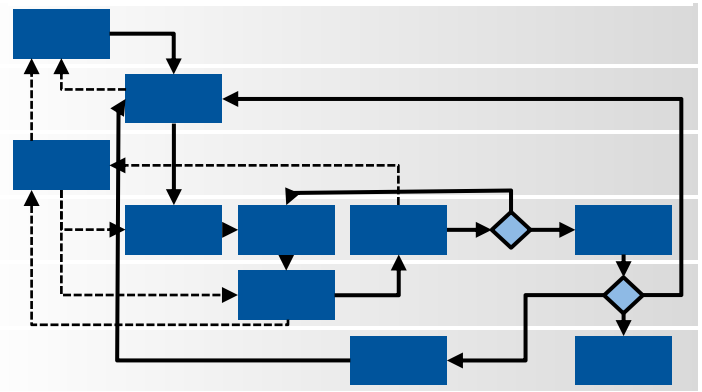
# Execution of a portfolio and lifecycle analysis for milling tools

## Approach

- Milling tool standardization
  - Determination of all milling tools listed in stock and allocation of essential technological and economic parameters
  - Proposals for adjustments of the milling tool portfolio and exemplary calculations of alternatives to “high-runner" milling tools

- Milling tool life cycle
  - Documentation of the tool life cycle with the modeling language aixperanto
  - Comparison of the tool lifecycle with partner companies as well as identification and discussion of weaknesses
  - Derivation of an ideal life cycle as well as the development of practical solutions for implementation



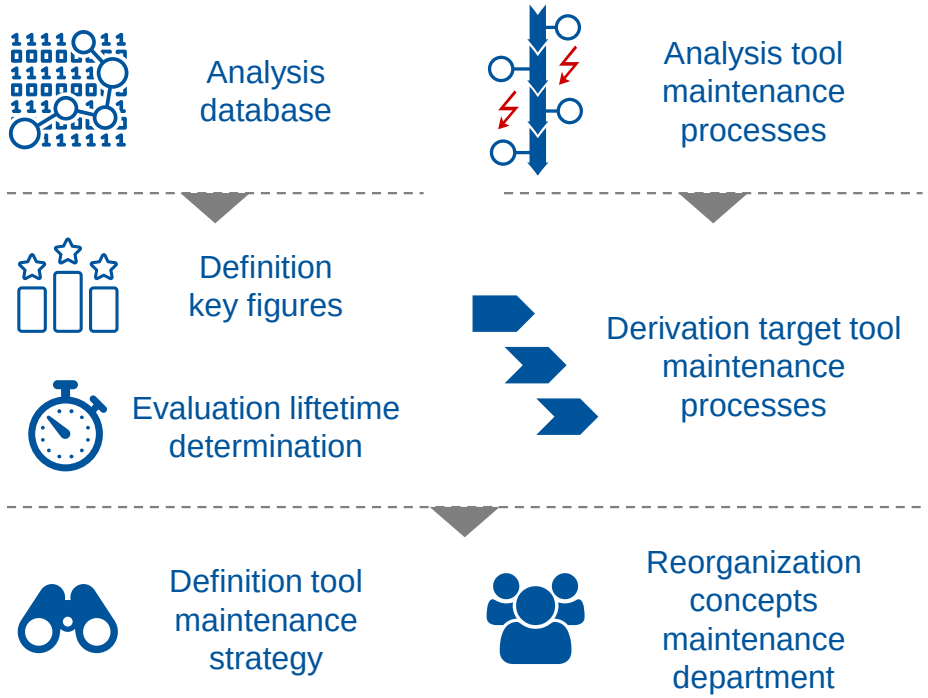
## Result

► **An ideal lifecycle for milling tools to support companies in process standardization and consolidation of milling tool portfolios**

# Efficiency increase in tool maintenance

## Approach

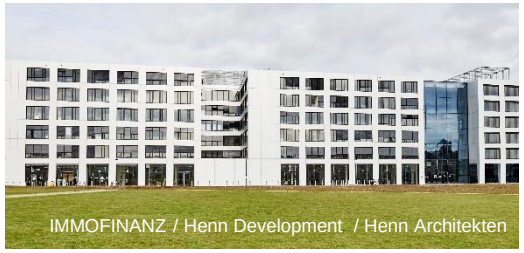
- Recording and analysis of existing data with reference to tool maintenance with subsequent derivation and definition of key figures
- Analysis of the current procedure to determine expected lifetimes and spare parts quantities of components
- Derivation of a system to evaluate and improve the lifetime of wear parts
- Definition of rules for conduction of preventive maintenance
- Analysis of the maintenance process as well as the interfaces to toolmaking with subsequent derivation of a target process to synchronize both entities
- Definition of a holistic maintenance strategy including an optimized structure of the tool maintenance organization




## Results

- ► **Analyzed status quo and developed concepts to increase efficiency in maintenance**
- ► **Defined maintenance strategy to synchronize the interfaces to the toolmaking department**

# The WBA Tooling Academy
## Contacts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