

Ph.D. Program "Stamping Part Design For Car Body Costs"

Background

Most process decisions in manufacturing are determined by the design specifications. Thus most of the final product costs are determined during design. The lack of manufacturing process knowledge in the upstream design stage causes many costly design changes and specifications. Design work groups collaborating with manufacturing engineers in the design stage are a current approach towards dealing with this problem: this is called simultaneous engineering. However, to overcome this problem, suitable methods are required to support these teams in assigning and evaluating the material, shape, and tolerance specifications.

Goal

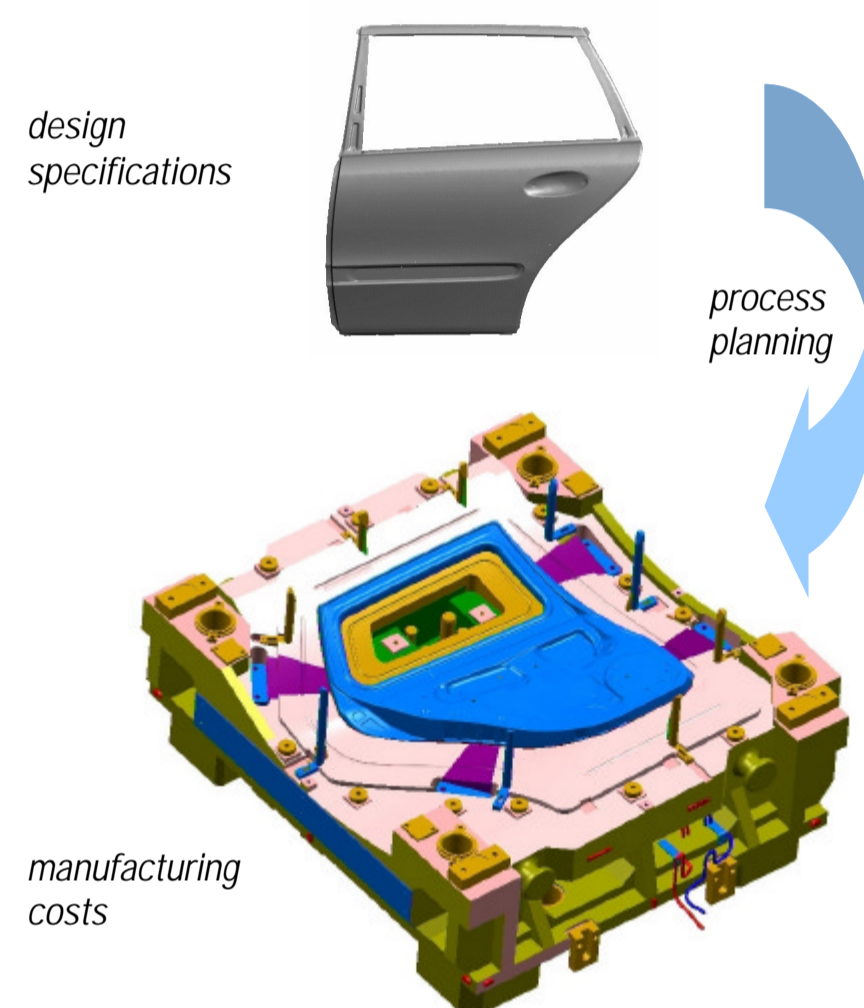
An optimisation-based (re)allocation for design characteristics of stamping parts to reduce overall production costs and to fulfil the final product requirements after assembly.

Hypotheses

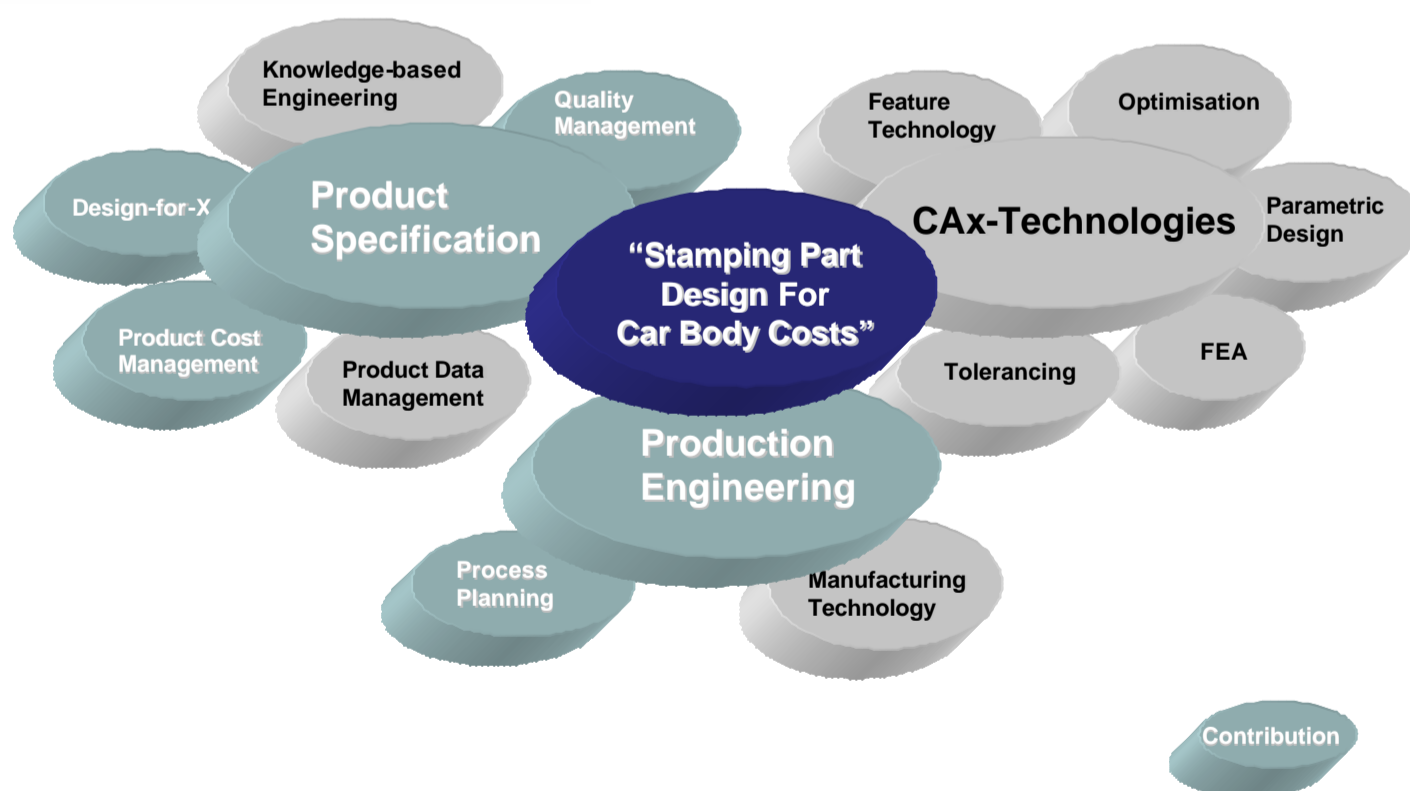
- The direct stamping part costs can be expressed as a function of its design characteristics.
- Functional constraints due to the product requirements can be mathematically formulated

Research Questions

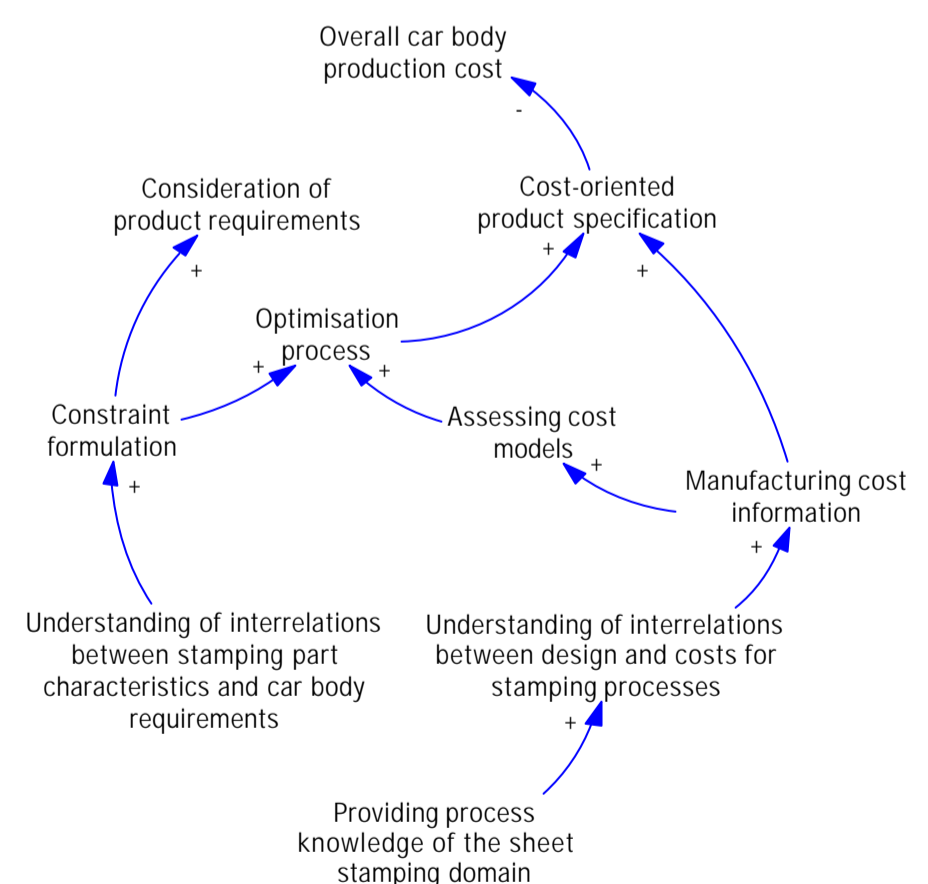
- Which design characteristics are the cost driving factors in the domain of stamping parts?
- How can the interrelation between these factors and the direct manufacturing costs be identified and described?
- Which design characteristics are suitable for optimisation?



Theoretical Foundation



Impact Model



Expected Results

- Knowledge about the impact of design decisions on the process and the costs in the stamping domain
- Cost models
- Optimisation-based allocation method
- Implemented tool

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