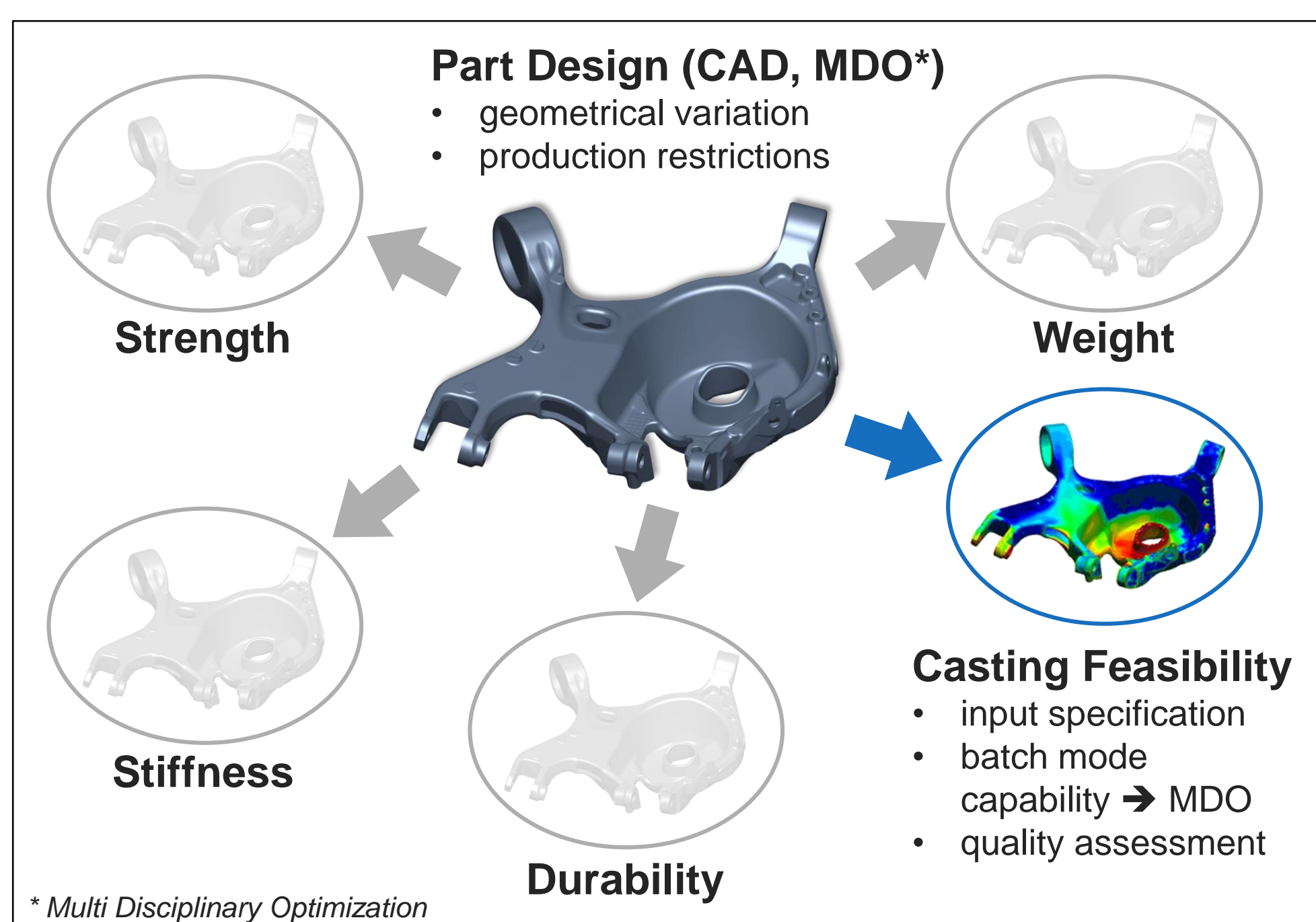


Motivation

In-service performance of cast parts not only depends on part design, but also on manufacturing effects like part orientation in the mold, gating & feeder system (size, location) and process parameters (filling rates, melt & die temperatures). Casting process restrictions and requirements are of equal importance as attribute requirements (strength, durability, stiffness).

Conventional component optimization relies on expert skills and expert guided analysis loops. MDO tools as well as design engineers require fully automated tools & expert systems to evaluate the feasibility and quality of cast parts upfront, quantitatively and efficiently.

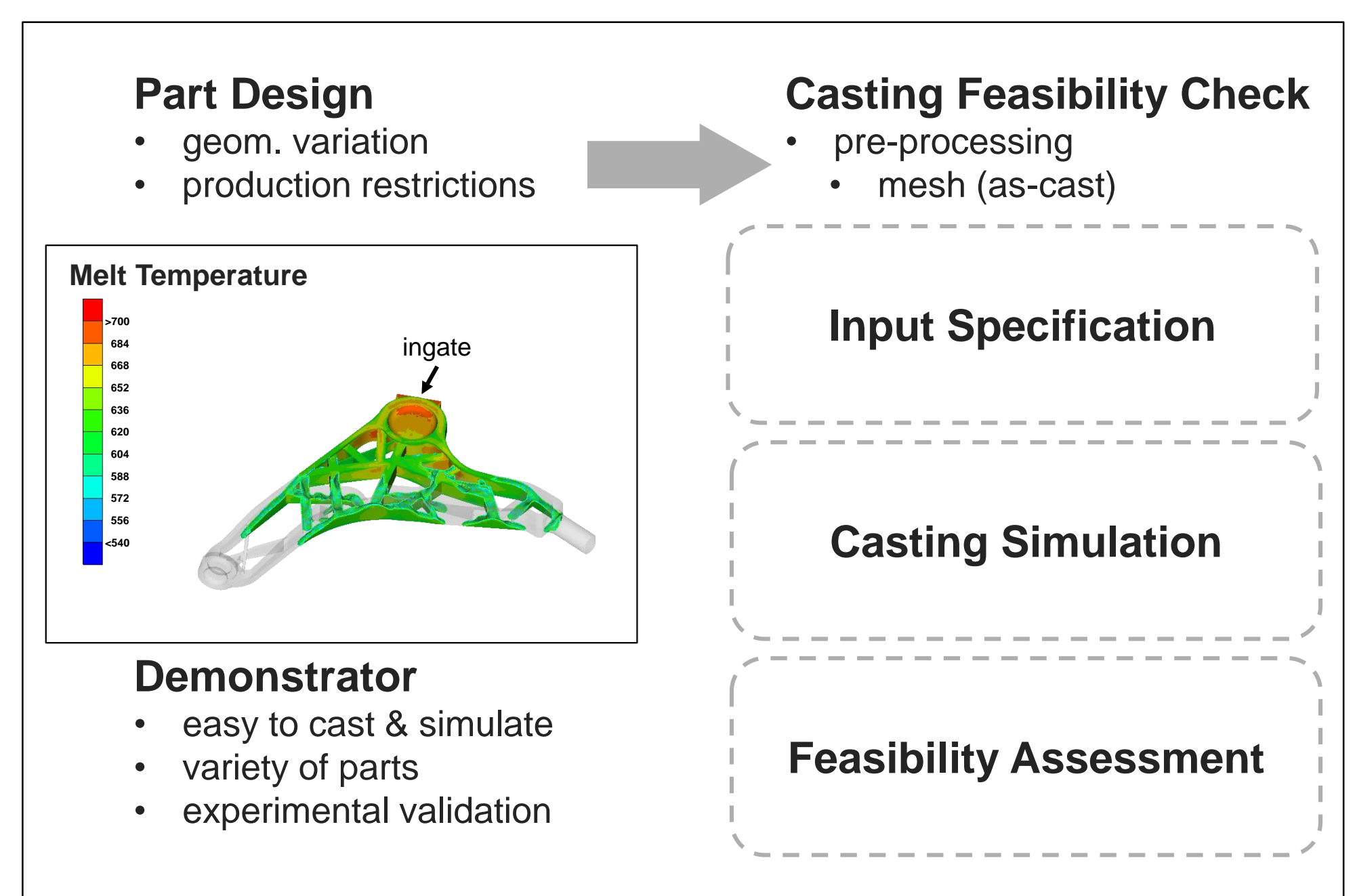


Project Objectives

Develop an automatic tool set to run casting simulations, to quantify existing casting process know-how, to make it available for automatic evaluation schemes and to provide validation example parts.

Approach

- *Input Specification* – automatic tool to specify initial casting process conditions (orientation, gating & feeder system, process temperatures, filling parameters) based on best-practice rules.
- *Casting Simulation* – automatic data exchange, automatic meshing (as-cast geometries), automatic multiple batch mode analyses, innovative method for improved efficiency.
- *Feasibility Assessment* – automatic tool to evaluate design proposals of chassis castings with respect to casting feasibility (completely filled) and cast part quality (e.g. defect distribution, microstructure).
- *Calibration and Validation* – demonstrator components to calibrate the "Feasibility Assessment" tool. Test the most relevant phenomena in cast parts like incomplete filling, porosity, inhomogeneous microstructure or misrun problems.



Project Partners

