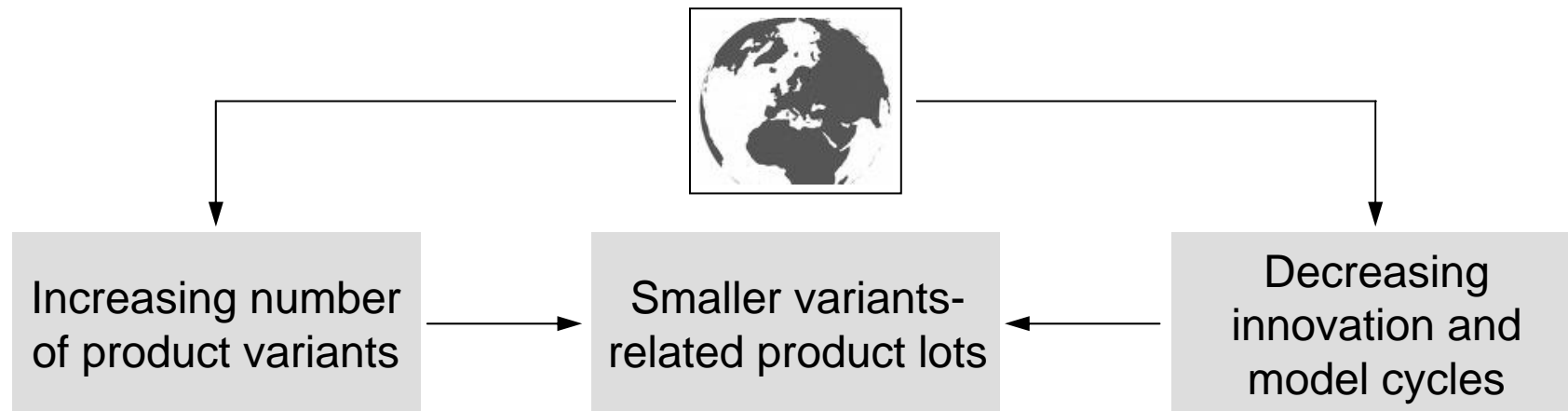# Project „Flexible Assembly Processes for the Car of the Third Millennium (MyCar)"

Problem Description (High Level)

Virtual Commissioning Methodology, Consulting & Services

Problem description for ramp-up processes

| Increasing number of product variants | → | Smaller variants-related product lots | ← | Decreasing innovation and model cycles |

Impacts on production planning and ramp-up processes

- Increasing demands in flexibility of production systems (Manufacturing of several products and product variants at one production system)

- Increasing product, process and resource complexity → Increasing error risk

- Increasing time and cost pressure („Time-to-Market")

- Increasing number of production ramp-ups – especially during running production (integration processes)

Problem description for virtual commissioning

MyCar (SP3) is focused on conceiving, designing and implementing a framework for virtual assembly platform. **The line and cell level virtual commissioning contributes to following objectives:**
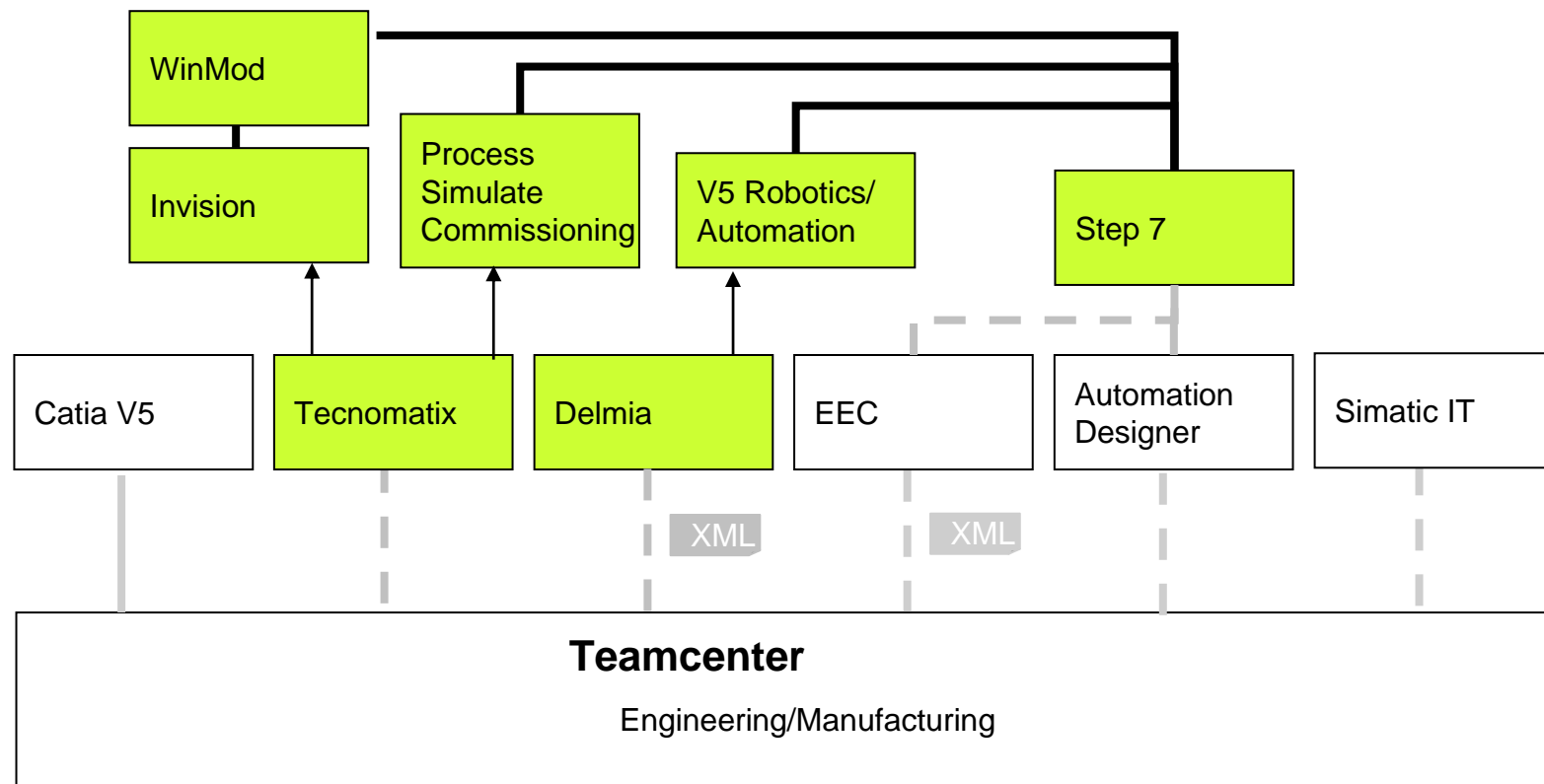- Reduction of investment costs by 20%
- Shortening of ramp-up time by 20%

Goal: Verification of mechanical behavior of the line in conjunction with PLCs in loop and the virtual commissioning of interacting production cells in a virtual line environment to enhance the maturity and quality of control engineering components prior to their real commissioning.

Innovation: The innovation consists of conceiving generalized virtual commissioning methods that support a tool independent workflow for engineering and virtual commissioning. The methods were verified by building demonstrators to engineer and virtually commission a sample cell and line on the basis of standard off-the shelf products.
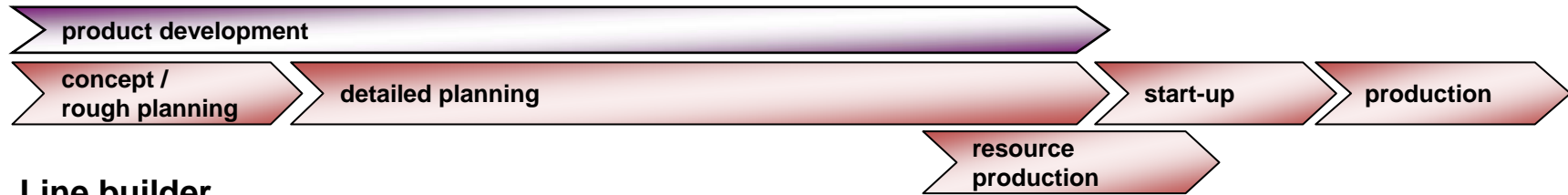
Problem description (cell & line level)

- The workflow and process along the product and production development needs a basics demonstrator to understand and define new methodologies.

- Today there is no common mechatronic engineering process for production cell and line level, a specification for virtual commissioning has to be defined.

- Requirements of the methods for the engineering process including virtual commissioning and the structure, libraries with level of details in a common data model.

- Verification of the Digital Engineering process in the different phases, for testing the results (system functions and data exchange) based on realistic scenarios, using the real PLC-Program and hardware behavior (sensor/actor).

Software landscape for „Virtual Commissioning Cell level"

Production development phases and terms

product development

concept / rough planning

detailed planning

start-up

production

resource production

Line builder

Virtual commissioning

Pre-commissioning

full volume reached

Line design

Line construction

OEM

SOP

Production trials

Ramp-up

Build up at floor shop/ final commissioning

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