

# Module Modeling and Analysis: Simulation

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## Abstract

This module addresses Modeling and Analysis Simulation. Especially light weight simulation is discussed.

# Module Content

## *goal of this module*

to be able to decide when to go from modeling to simulation

to understand success factor for simulation

## *content of this module*

High level method

Success factors for simulation

## *exercise*

Threads of Reasoning

# Light Weight Simulation

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## Abstract

Many simulations suffer from the fact that the investment and the maintenance costs more than the harvested value of the simulation results. In this presentation we show a light-weight approach to simulation. Key success factors are discussed to keep the simulation light-weight and to get useful results nevertheless.

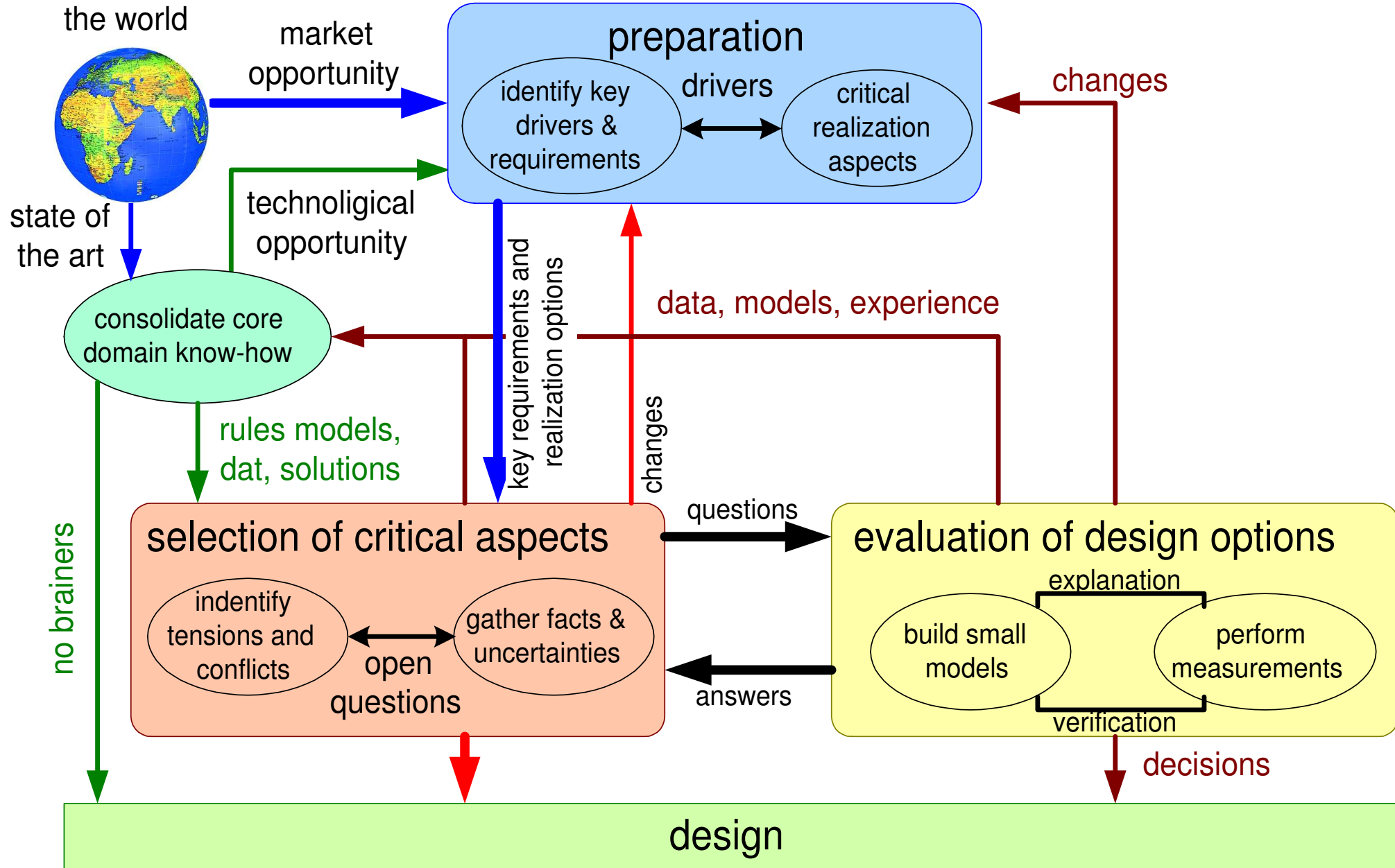
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# High Level Method

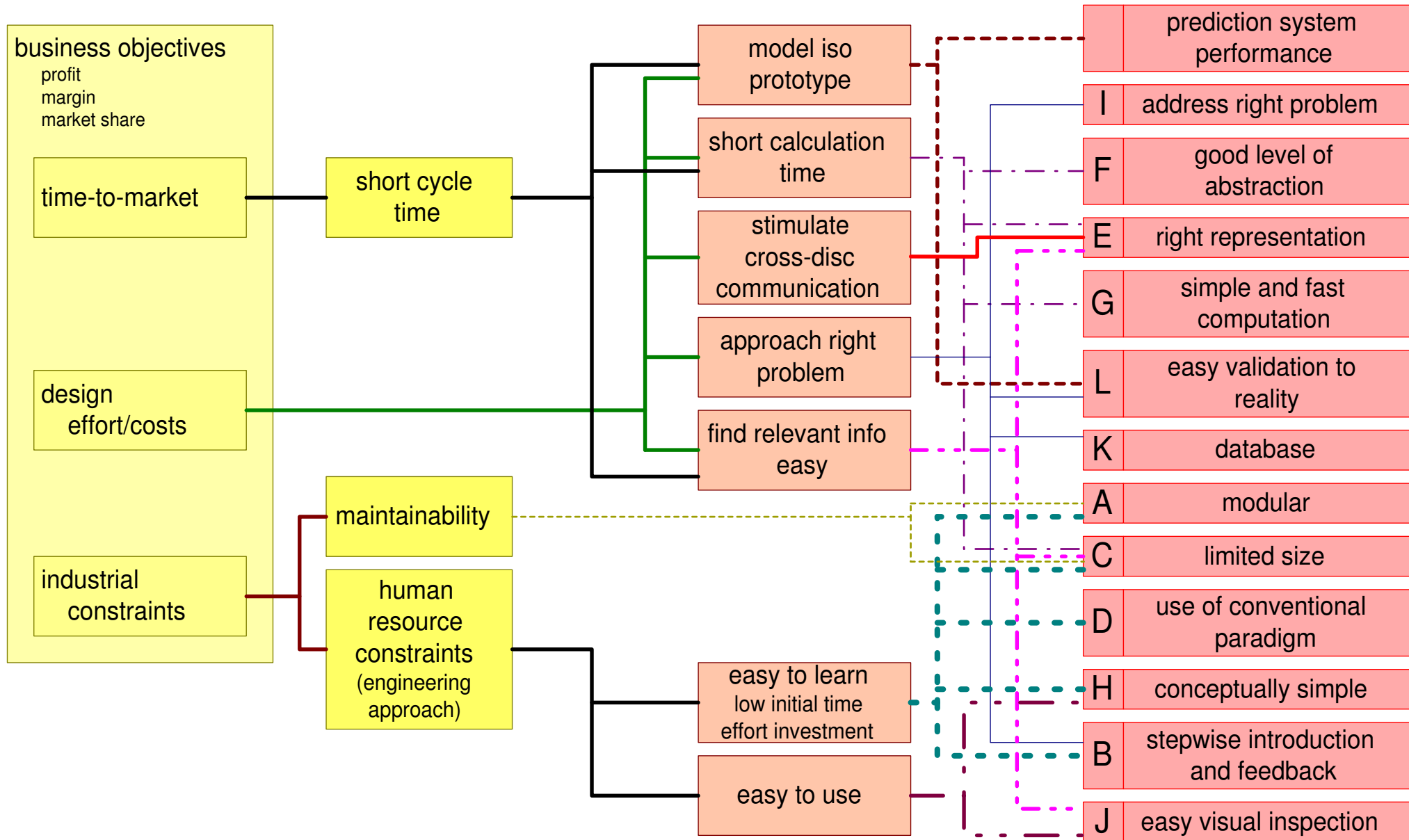


# High Level Method Stepwise

1A. Identify (customer) key drivers	in terms of stakeholders and concerns
1B. Identify critical realization aspects	for instance due to cost, performance, robustness, technological maturity, et cetera
1C. Consolidate core domain know how	make implicit know how explicit
2A. Identify tensions and conflicts	
2B. Gather facts, identify uncertainties	figures of merit, design rules
3A. Build small models <i>hours .. weeks</i>	addressing tensions, using facts, and creating insight in the uncertainties
3B. Perform measurements	for calibration and validation

- Iterate many times
- Provide overview by means of visualizations

# Success Factors Light Weight Simulation



Light weight simulation is based on  
research performed in the *Boderc* project.

Especially the work of

*Jan Beckers* (Océ) and *Maurice Heemels* (ESI)

has contributed.

## Make a threads of reasoning graph

- Identify critical or sensitive design and technology issues
- Use key driver graph
- Identify tensions
- Extract the essential relations



- +The "big picture" is created
- +The rationale of choices is made explicit
- ~ It is not easy to get order in the huge chaos
- ? Did we extract the essence?

## *Conclusions*

Simple goal-driven simulations are effective

The simulation stays close to the domain

Good simulations are created incrementally

## *Techniques, Models, Heuristics of this module*

Success factors for simulation

Good simulations are domain dependent

Simulation modularity