Modeling and Analysis Overview

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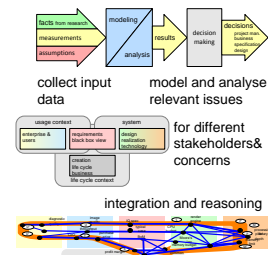
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Abstract

The course Modeling and Analysis is described. The program consists of 10 modules. The course format, iterating theory, illustration and interaction is explained. The course heavily emphasizes the practical application of the method. This presentation shows the overview of the modeling and analysis approach and the methods and techniques that will be elaborated in the rest of the course.
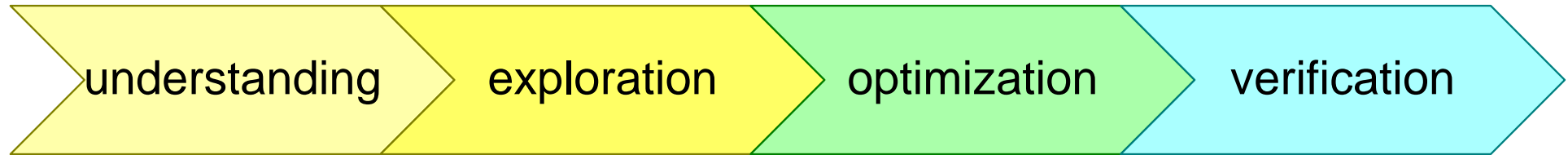

collect input data

model and analyse relevant issues

for different stakeholders& concerns

integration and reasoning

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status: preliminary
draft
version: 1.0

Positioning Modeling and Analysis in Architecting
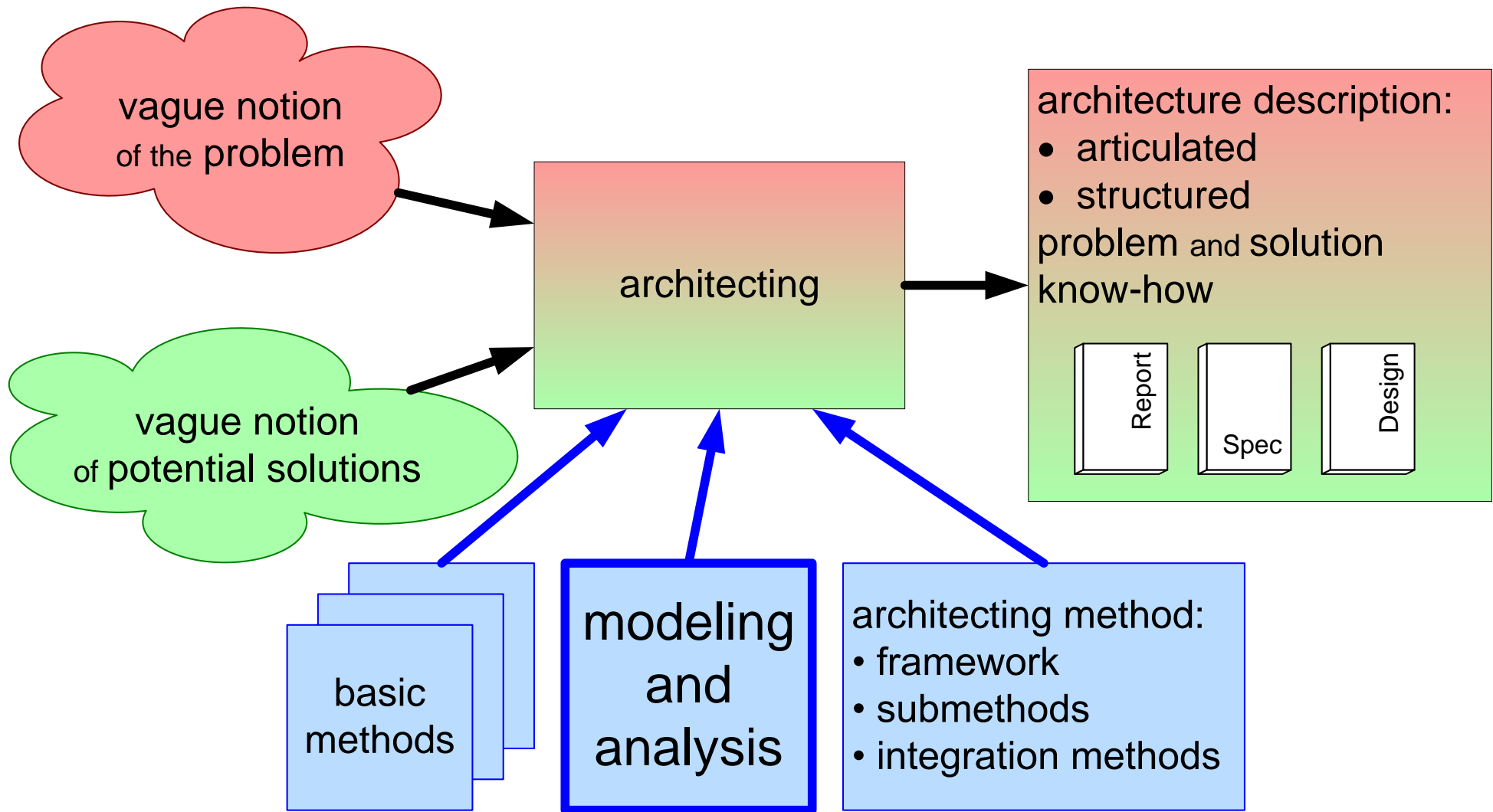
Modeling and Analysis supports:

understanding → exploration → optimization → verification

Type of model depends on project phase
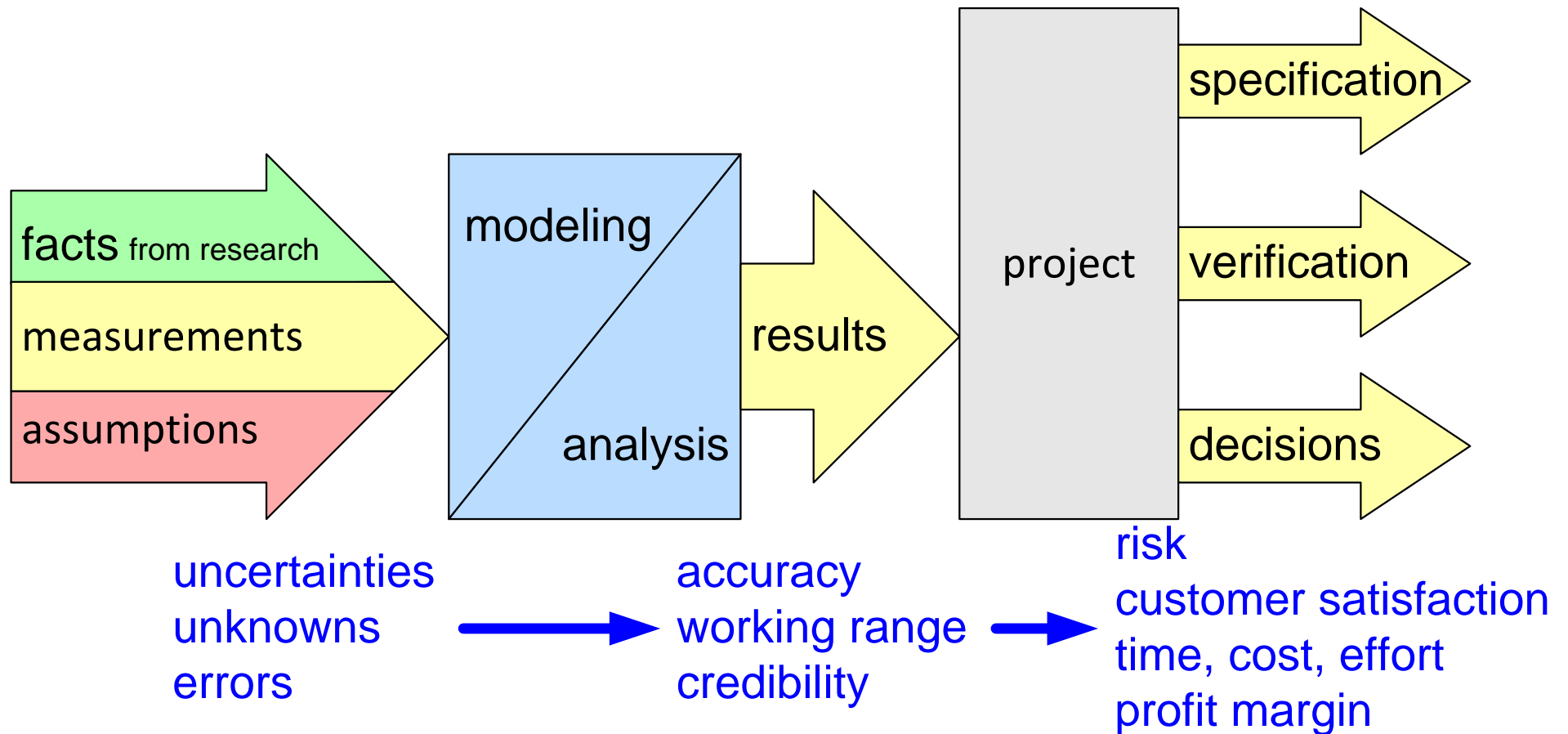
Models have a goal

Goals evolve and models evolve

Techniques are used to reach this goal

Purpose of Modeling

facts from research
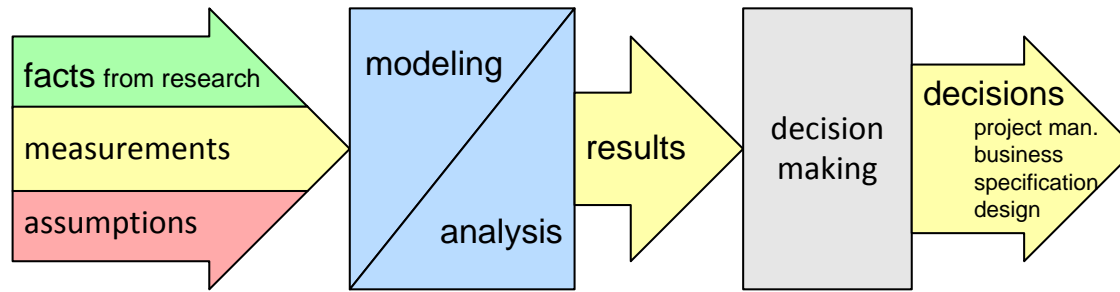measurements
assumptions

→ modeling / analysis → results → project → specification, verification, decisions

uncertainties
unknowns
errors

→ accuracy
working range
credibility

→ risk
customer satisfaction
time, cost, effort
profit margin

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What to Model?

business:
profit, etc.
operational costs
stakeholder benefits
workload
risks

key performance:
throughput, response
reliability
availability
scalability
...

(emerging?) properties:
resource utilization
load
latency, throughput
quality, accuracy
...

and their mutual relations

usage context

enterprise & users	requirements black box view

system

design
realization
technology

life cycle context

creation
life cycle business

business:
profit, etc.
operational costs
stakeholder benefits
workload
risks

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Program of Modeling and Analysis Course
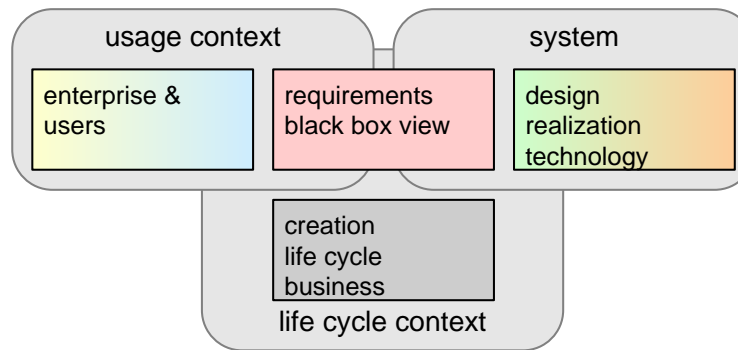
day 1	**1. overall approach** intro, overall approach, exercise overall approach
	2. input facts, data, uncertainties quantification, measurements, modeling, validation, technology background, lifecycle and business input sources

day 2	**3. system modeling** purpose, approaches, patterns, modularity, parametrization, means, exploration, visualization, micro-benchmarking, characterization, performance as example
	4. application, life-cycle modeling reiteration of modeling approach (see module 3), applied on customer application and business, and life cycle

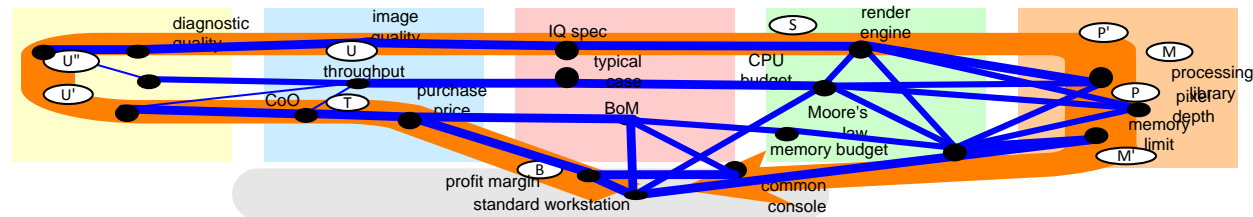|	
day 3	**5. integration and reasoning** relating key driver models to design models, model based threads of reasoning, FMEA-like approach, modeling in project life-cycle
	6. analysis, using models sensitivity, robustness, worst case, working range, scalability, exceptions, changes

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Overview of Approach

facts from research

measurements

assumptions

modeling

analysis

results

decision making

decisions
project man.
business
specification
design

collect input data

model and analyse relevant issues

usage context

enterprise & users

requirements black box view

system

design realization technology

creation life cycle business

life cycle context

for different stakeholders& concerns

integration and reasoning

diagnostic quality

image quality

IQ spec

render engine

throughput

typical case

CPU budget

CoO

purchase price

BoM

Moore's law

processing pixel library depth

profit margin

standard workstation

memory budget

common console

memory limit

Iteration over viewpoints