REVERSE PROCESS DESIGN
A method for process monitoring and optimization

H. A. Tan, T. Kirmayr, P. Noisten

Fraunhofer Institute for Building Physics, Valley
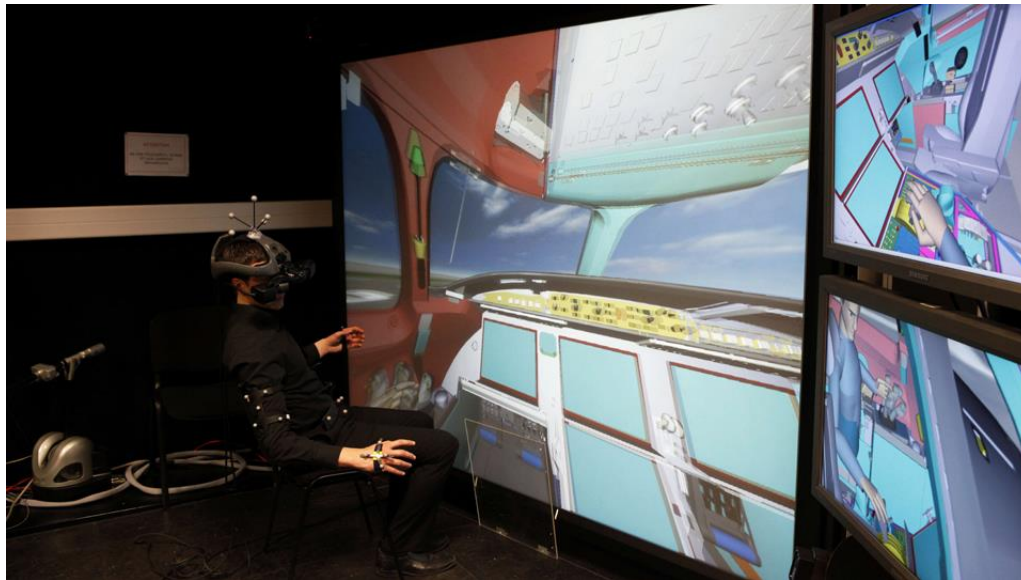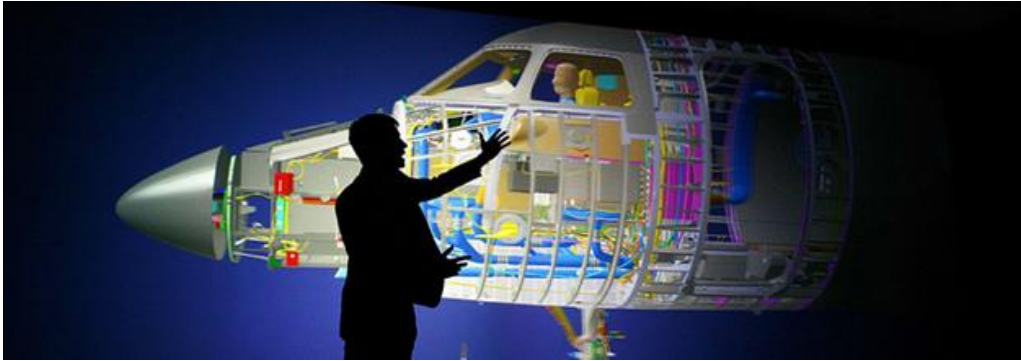
BIMiD

Mittelstand-Digital

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BIMiIBP: "PHYSICAL FOLLOWS VIRTUAL"
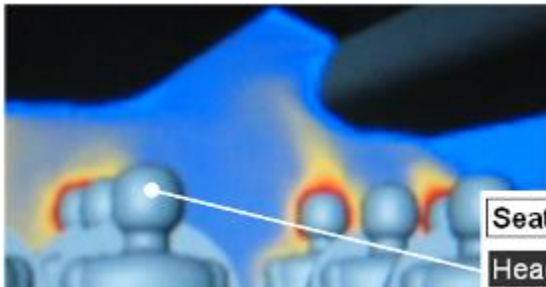# Analogy to aviation construction

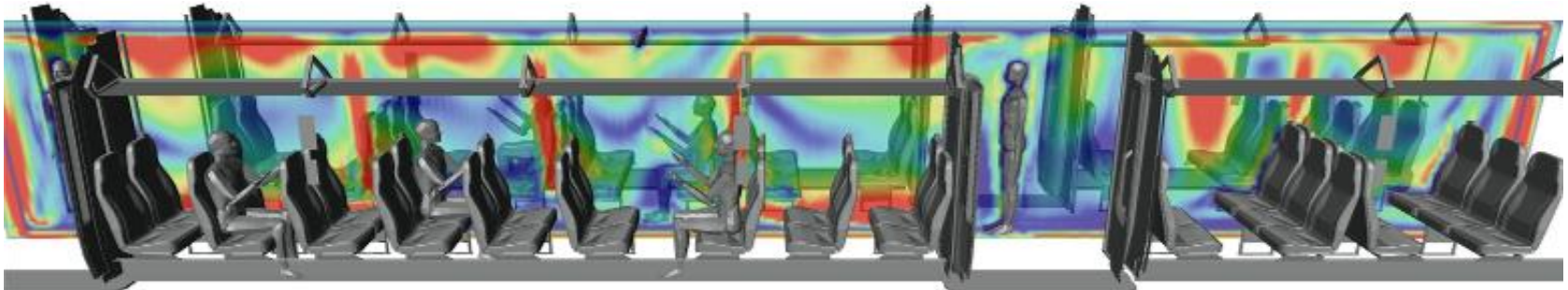„THE FIRST ONE

TO BE BUILT IS

THE FIRST ONE

TO FLY"

Source: Dassault Systems PLM

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BIMiIBP: SETUP OF A VIRTUAL DEVELOPMENT PLATFORM
Analogy to the automotive industry

Seat 24C	vote
Head	slightly warm
	neutral
rm	neutral
and	neutral
m	slightly cool
nd	slightly cool
	neutral
	neutral

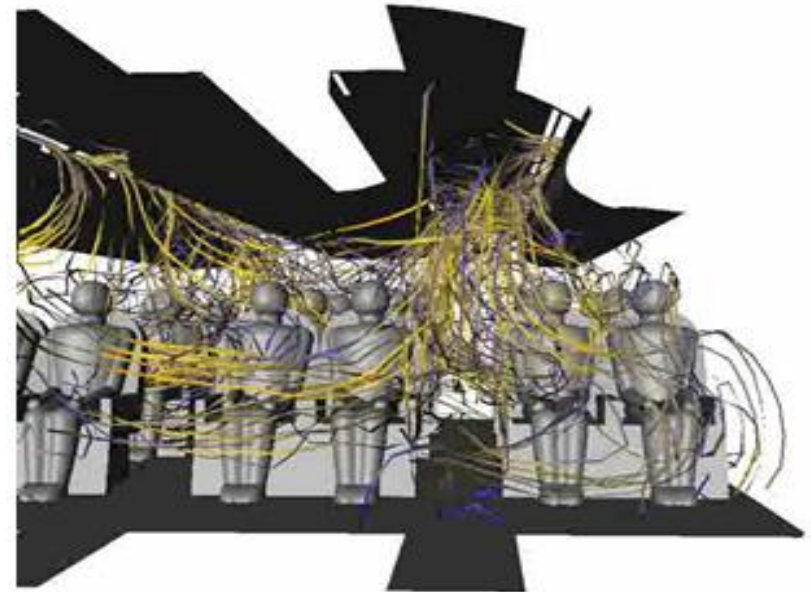Mitglied im Firmenförderkreis des IFV BAHNTECHNIK e.V. (08/2014)

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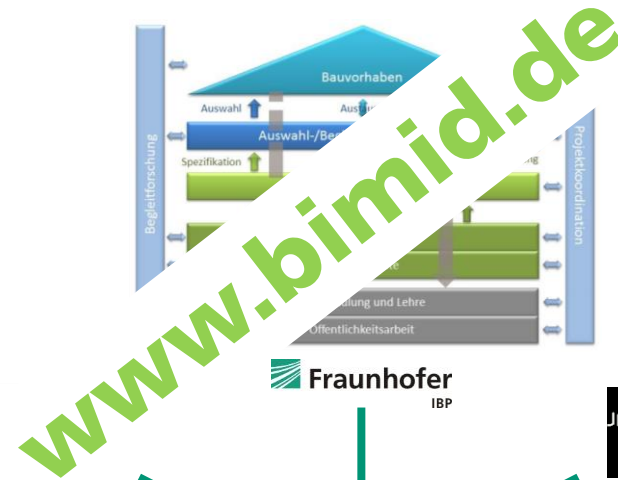Interdisziplinärer Forschungsverbund Bahntechnik e.V.
Das Netzwerk der führenden Unternehmen der Bahnbranche
in Deutschland   www.ifv-bahntechnik.de
und Europa   www.railway-network.eu

ifv Bahntechnik

Source: Fraunhofer IBP

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Current BIM-Projects

Foshan New City

BIMiD

www.bimid.de

AGENDA

- Current needs

- The Reverse Process Design – From Theory

- The Reverse Process Design – To Practice

- Summary and Outlook

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CURRENT NEEDS

How to get a LEAN BUILDING PROCESS ?

LEAN BUILDING PROCESS

REDUCE DATA CONTENT TO THE MINIMUM NECESSARY !
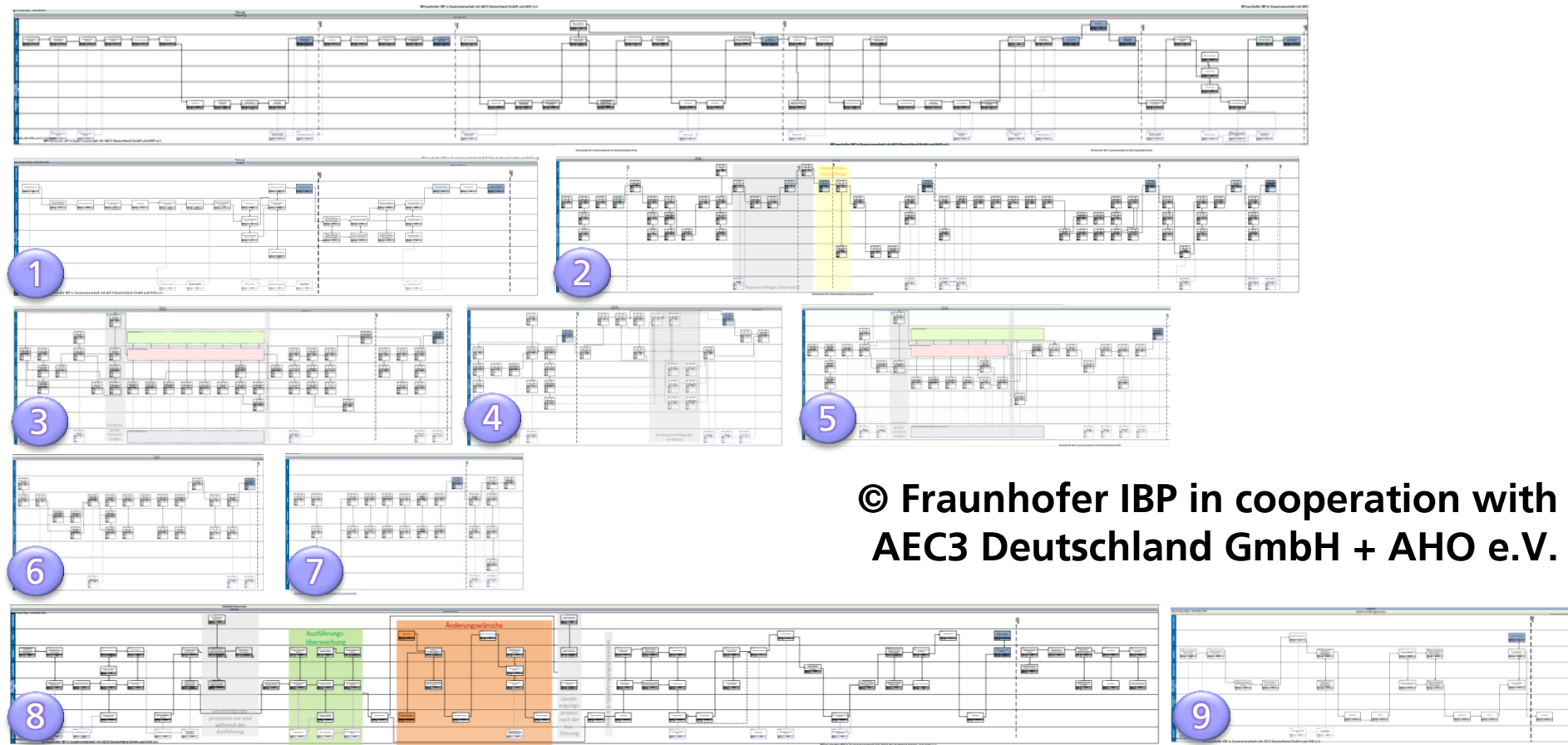
BIG DATA
Intelligent Selection

LEAN BUILDING PROCESS

ANSWER THE QUESTION:

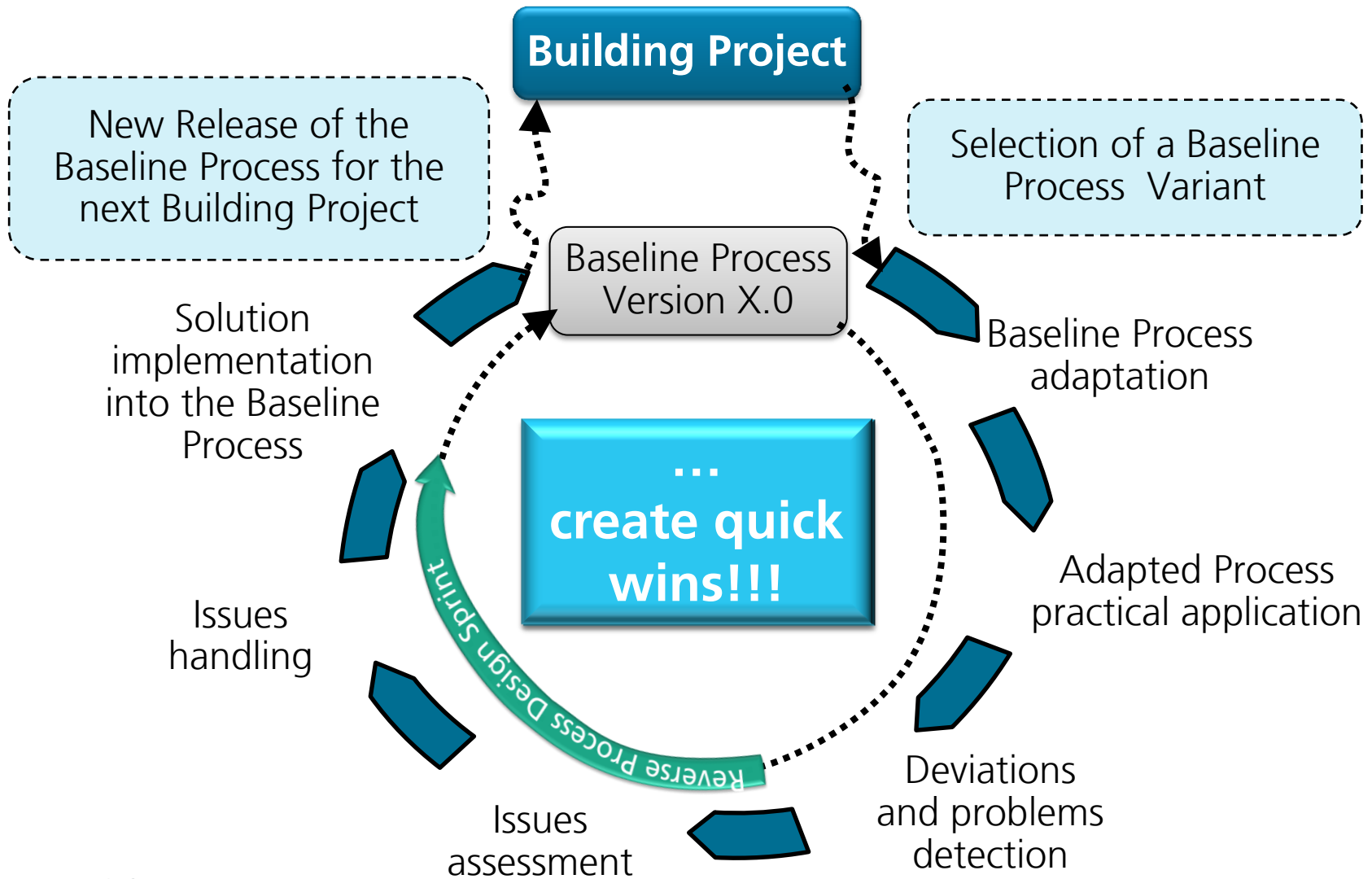### WHO NEEDS WHICH PIECE OF DATA AT WHAT TIME IN WHAT QUALITY AND FORMAT?

REVERSE PROCESS DESIGN IN THEORY
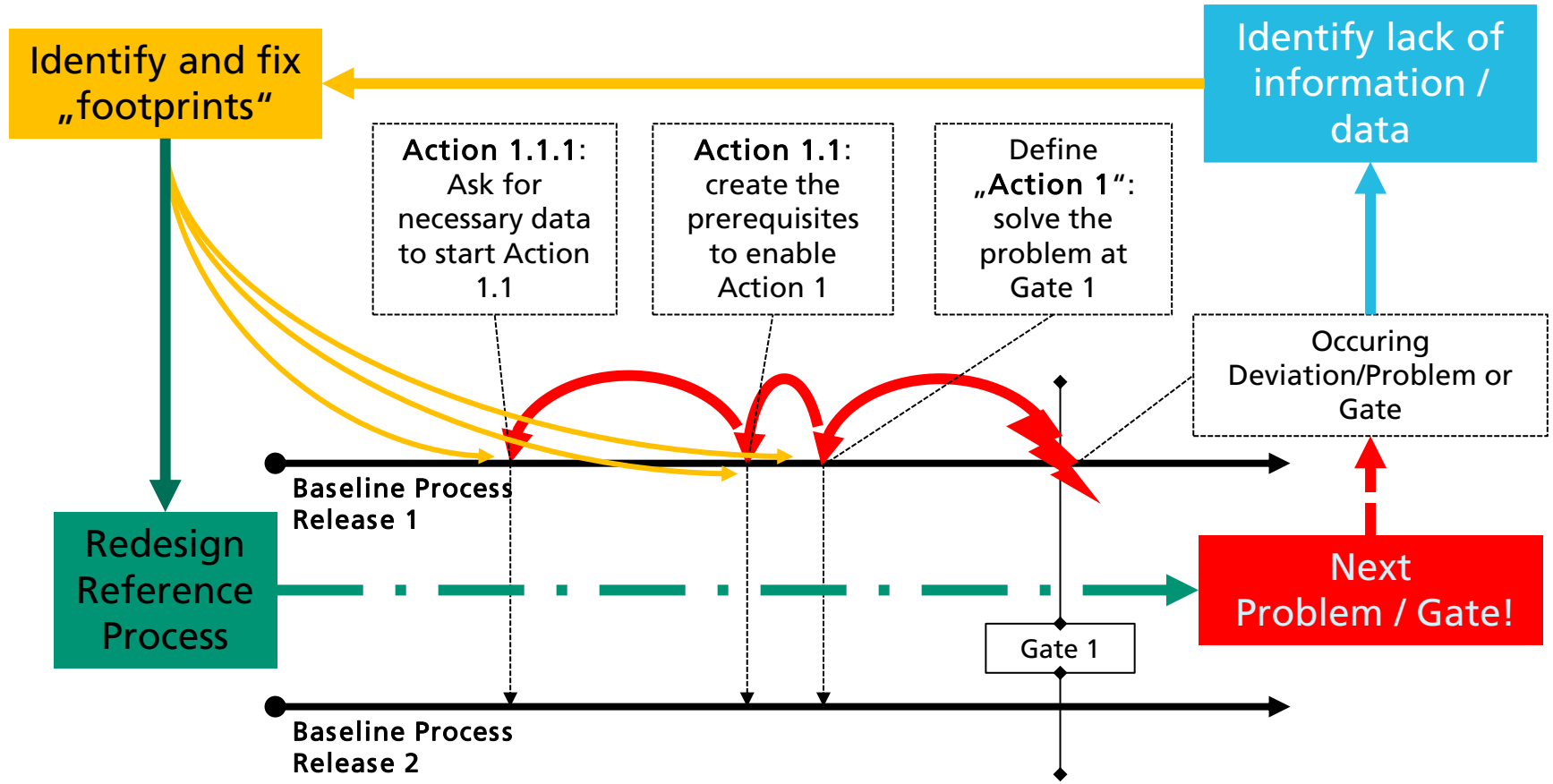
BIM REFERENCE BUILDING PROCESS MAP (BIM-RBPM)

© Fraunhofer IBP in cooperation with AEC3 Deutschland GmbH + AHO e.V.

Source: Fraunhofer IBP

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PROCESS MANAGEMENT CYCLE

Building Project

New Release of the Baseline Process for the next Building Project

Selection of a Baseline Process Variant

Baseline Process Version X.0

Solution implementation into the Baseline Process

Baseline Process adaptation

… create quick wins!!!

Reverse Process Design Sprint

Issues handling

Adapted Process practical application

Issues assessment

Deviations and problems detection

Source: Fraunhofer IBP

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REVERSE PROCESS DESIGN (RPD)

Source: Fraunhofer IBP

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FINDINGS

- Building projects contain iterative steps

- Lessons learned are saved in the Building Process Map

- Lean Management:
    - Execute Process Management Cycles to Monitor and Optimize

- Reverse Process Design
    - *Who* delivers *when*, *what* to *whom*, and in which *Quality*?
    - Fluid and high quality information flow

REVERSE PROCESS DESIGN IN PRACTISE

REVERSE PROCESS DESIGN
Practical Example: Process Workshop

PROCESS ENHANCEMENT = COLLABORATION!

CREATE AWARENESS !

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Source: Fraunhofer IBP

REVERSE PROCESS DESIGN 1
Practical Example
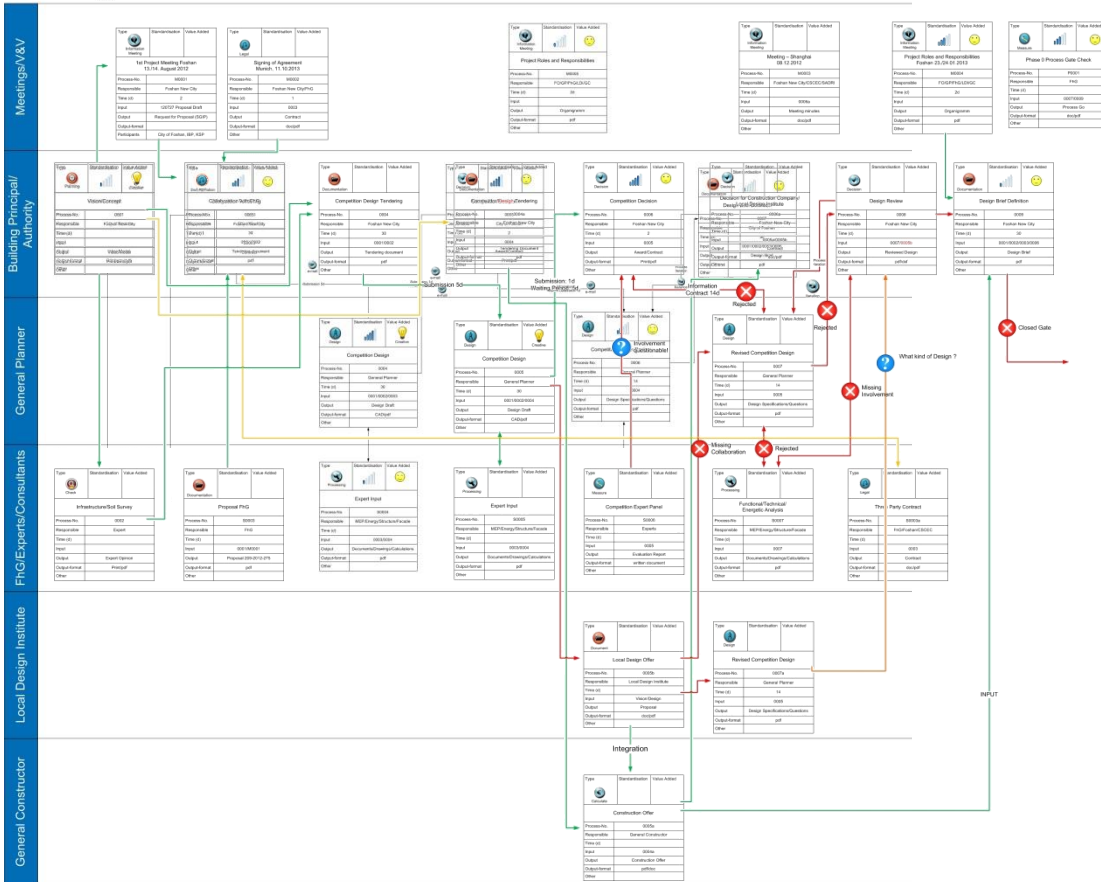
Source: Fraunhofer IBP

REVERSE PROCESS DESIGN SPRINT
Practical Example
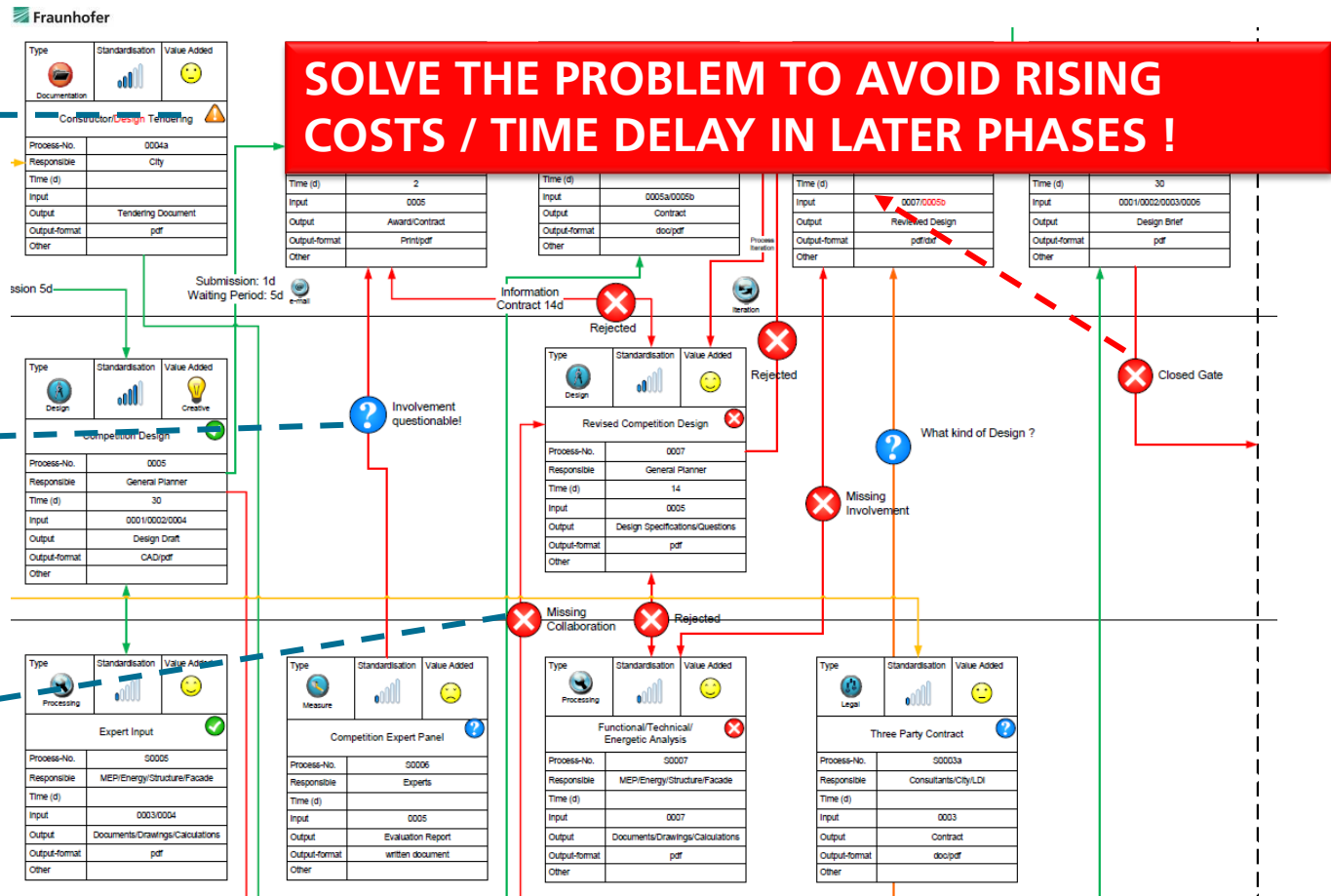
REVERSE PROCESS DESIGN SPRINT
Identification of KPIs or Perfect Programming

TASK OF RPD SPRINT:

Create a good requirement/KPI base for a contract with general constructor by using a design competition

- KPI Definition –
  What are the most important targets?

- Definition of Design Corridor

- Launch Design Competition with
  request for adressing KPIs

- Draw „Performance Line" of
  specific design

Design Reference, e.g. well known building

50%   70%   90%

1   Absolute Minimum   Design Corridor   Absolute Maximum

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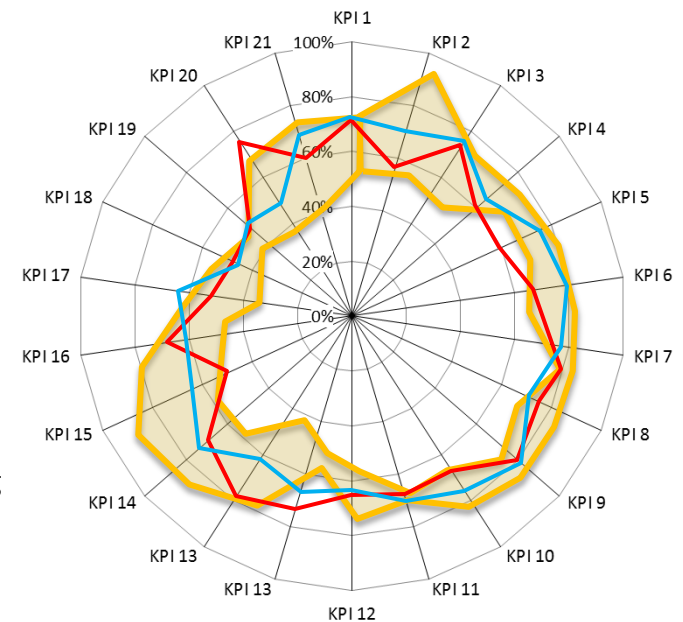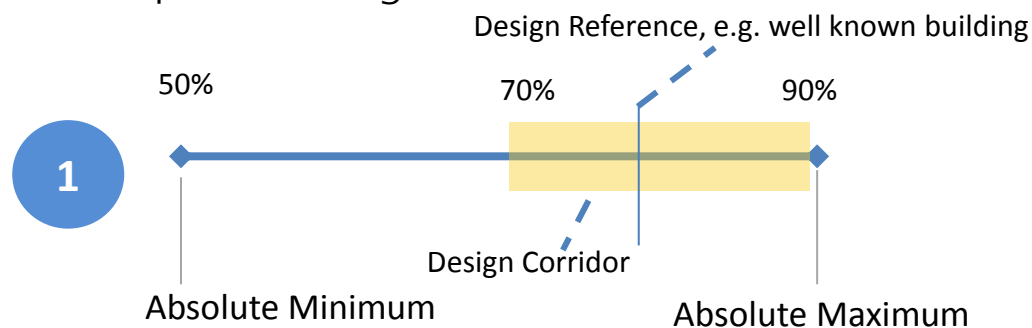
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REVERSE PROCESS DESIGN SPRINT 2
Lean Process Design

„WHO NEEDS/DELIVERS WHAT AT WHICH TIME IN WHAT SHAPE/FORMAT"

Reference Process

Own Company Process
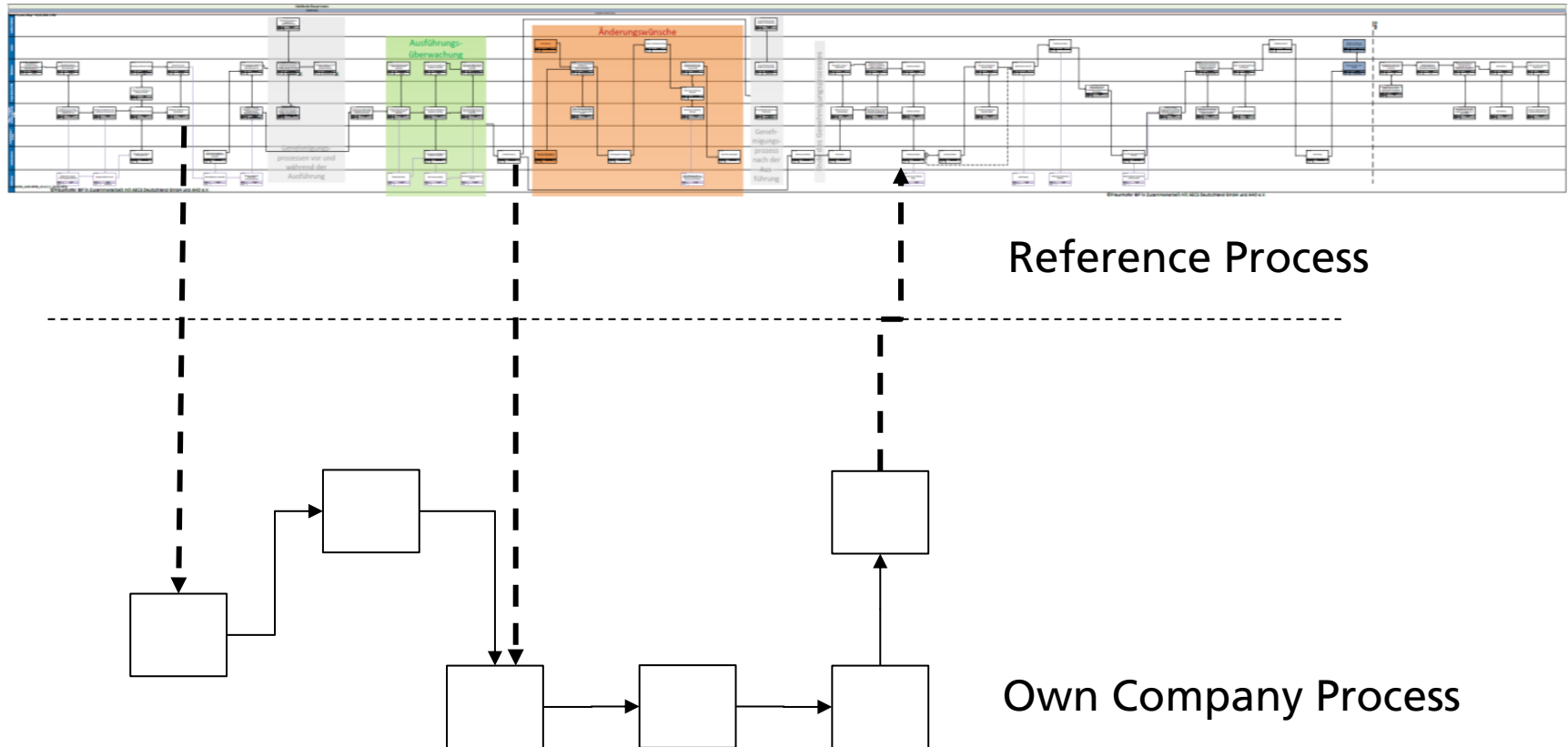
REVERSE PROCESS DESIGN SPRINT 2
Lean Process Design

THE SUM OF ALL DATA NEEDS OF THE FOLLOWING PROCESS STEPS DEFINES
THE DATA NEED AT THAT POINT OF THE PROCESS – Reverse Thinking

LETS TALK ABOUT WHAT TO SKIP – Lean Thinking

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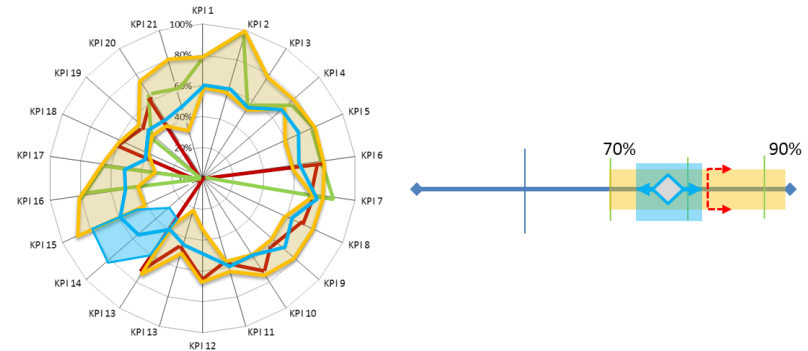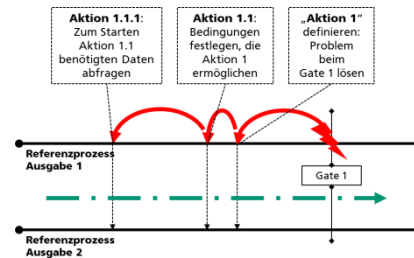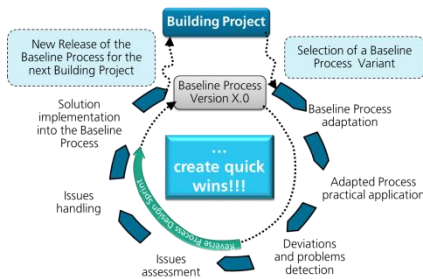
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WORKSHOP

SUMMARY AND OUTLOOK

SUMMARY

- We always have a process to start with – so don't wait!!!

- To make BIM efficient we need to define the minimum necessary information to be exchanged

- The Quality of Data/Information Exchange need to be controlled (e.g. Solibri)

- A Baseline Process is essential to create orientation as well as a safe for all kind of optimization and experience

- Reverse Process Design could help to optimize a Baseline Process step by step…

- … and helps to define the minimum necessary information

- Quick Wins by RPD Sprints enhance motivation and educate "lean thinking"

QUESTIONS?

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