



Institute of
Construction Management
and Digital Engineering

ONE STEP AHEAD WITH BIM – CHANGING OF ORGANISATIONS | PROJECTS | MINDS

BIM EXPO 2017
HANOVER, SEP 6TH & 7TH

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LEIBNIZ UNIVERSITÄT HANNOVER

**INSTITUTE OF CONSTRUCTION MANAGEMENT AND
DIGITAL ENGINEERING**



Welcome!



German Railway and Infrastructure Group

Member of the board of
an international
engineering and consulting
company

Leading function as:
Regional Manager
Construction Supervision
Project Manager

Top-Management



Leibniz
Universität
Hannover

Institute of Construction Management and Digital Engineering

Faculty of Civil Engineering and Geodetic
Science

Topics of Research:
Digital Construction | BIM | Project-
Management | X-Lab

www.baubetrieb.uni-hannover.de

Professor



albert.ing GmbH

Consultancy in the field of
digitization and Building
Information Modeling

www.albert-ing.com

Founder and CEO



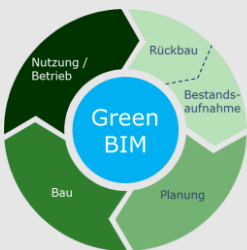
DIGITAL CONSTRUCTION

- Integrative fabrication for construction industry
- Qualification of technical staff and engineers
- Intelligent linking of generative fabrication with digital construction models



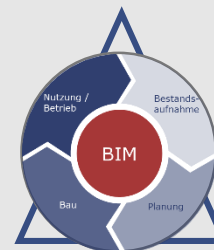
METHODOLOGIES AND DIGITAL SOLUTIONS

- Simulation of processes for optimization
- Virtual and augmented reality visualizations for integrated collaboration and public acceptance
- Intelligent model upgrading and automatization



GREEN BIM

- Lifecycle assessment and lifecycle simulation
- Integration of the Green Building certification systems using the BIM-method
- Implementation of ecology and socio-economics aspects into design and project management



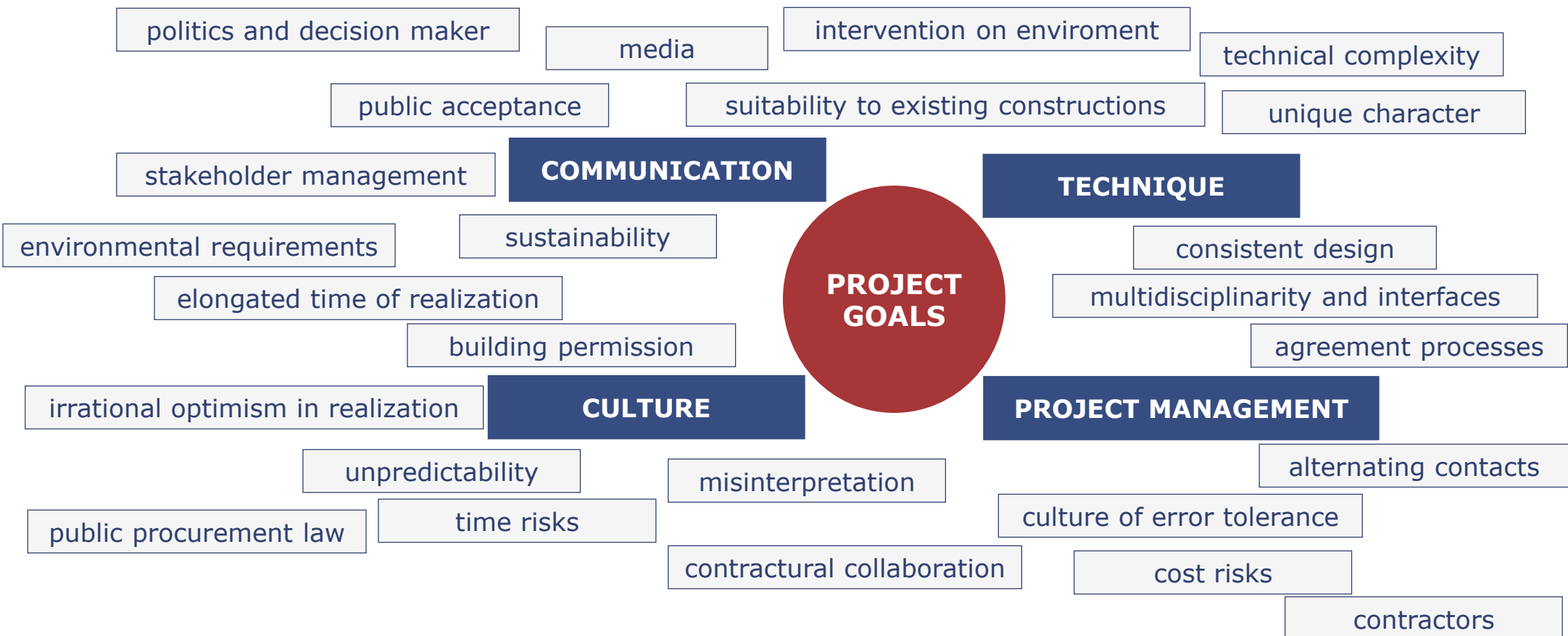
MANAGEMENT OF MAJOR PROJECTS

- Reduction of multidimensional complexity with digital solutions
- Resilient infrastructure
- Qualified and quantitative assessment
- intelligent extension and optimization of modelling

BUILDING AND CONSTRUCTION CHALLENGES IN MAJOR PROJECTS



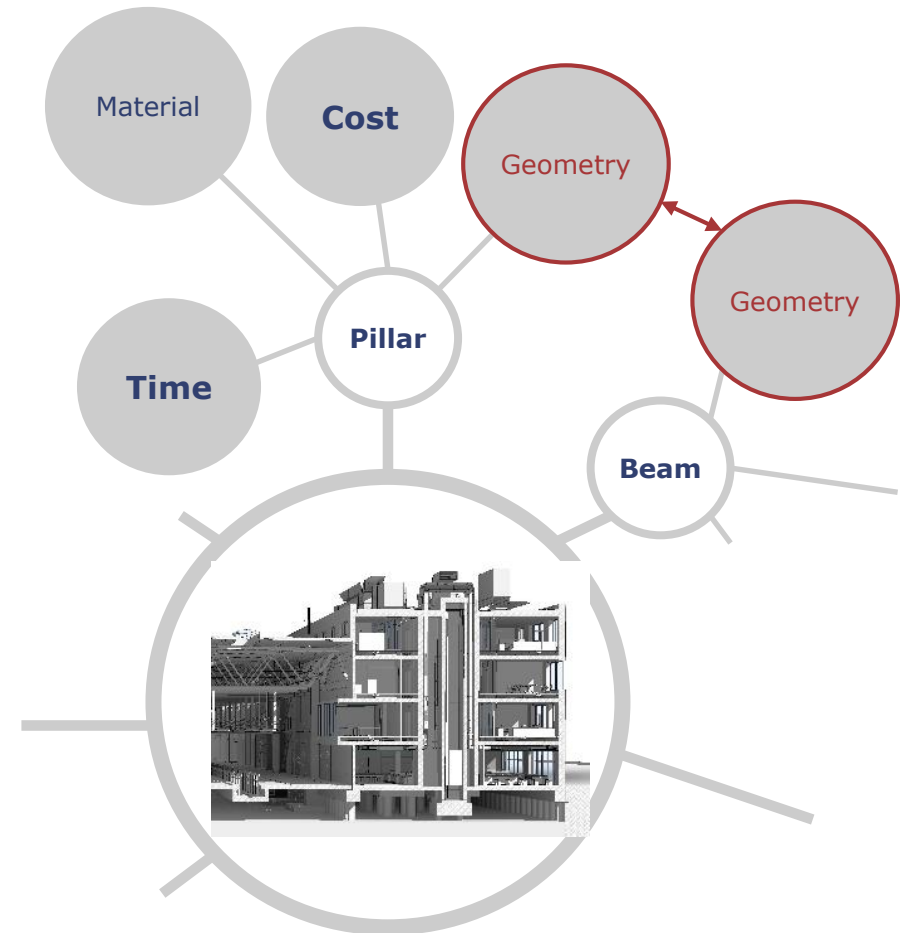
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WHAT IS BUILDING INFORMATION MODELING?

- Object-related building model **as information source and data hub** for all project partners
- **Digital acquisition and connection of all relevant data** to display physical, functional, cost- and time-related building properties
- **Support throughout the whole life cycle**
 - data acquisition from first sight through planning to usage





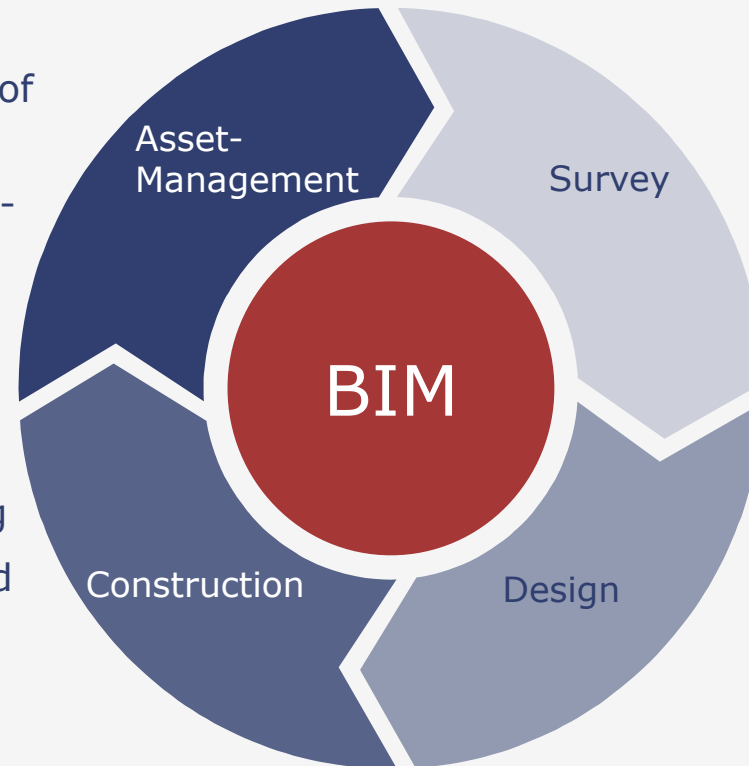
INFORMATION MANAGEMENT

ASSET MANAGEMENT

- Lifetime Asset-Management
- Planning and Documentation of maintenance and operation
- Optimized model-based, area-management
- AsBuilt-Documentation

CONSTRUCTION

- Efficient construction planning
- Automatic cost calculation and efficient tendering and billing
- Ongoing schedule and cost control
- Visualization of construction phases



SURVEY

- Time-saving surveying, e.g. with application of 3D-Laser Scanning
- Digital terrain modeling based on survey data
- Integration of as-built documentation

DESIGN

- Interdisciplinary design on basis of a shared model
- Simple collision detection and design change management
- Digital review und approval procedures
- Visualizations to increase
- Public support

COLLABORATION

DIGITIZATION DRIVEN BY POLITICS MINISTRIES TO FOSTER BIM FOR PUBLIC PROJECTS



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MINISTRY OF TRANSPORT AND DIGITAL INFRASTRUCTURE

STEP-WISE PLAN

- Major pilot projects
- 5-point plan for digitalization
- Required for all new infrastructure projects from 2020



Source: BMVI (2015), last accessed 2017-09-11:
https://www.bmvi.de/blaetterkatalog/index.html?catalog=230208#page_1

MINISTRY FOR ENVIRONMENT, NATURE CONSERVATION, BUILDING AND NUCLEAR SAFETY

DECREE + MASTERPLAN BIM



- BIM to be considered for new buildings, re-construction or extension with project costs higher than five million Euro.

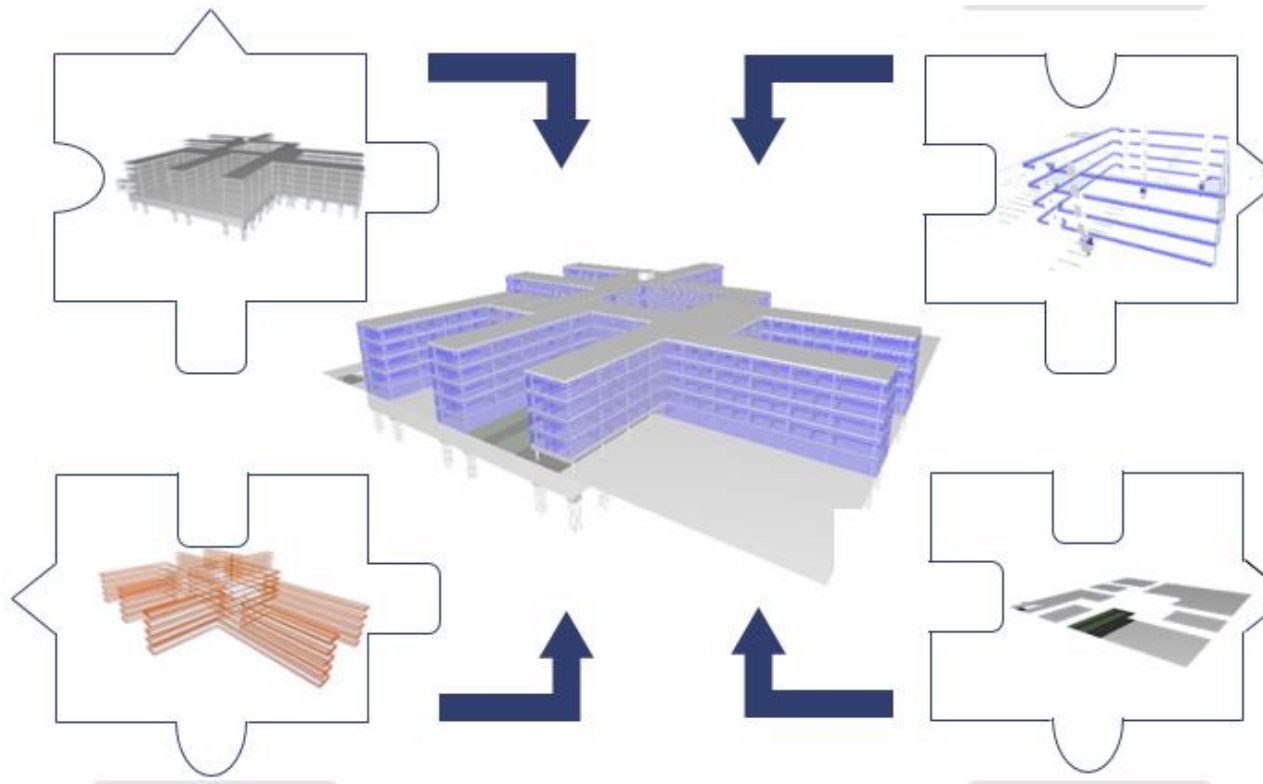
Source: BMUB (2016), last accessed: http://www.fib-bund.de/Inhalt/Richtlinien/RBBau/RBBau_Onlinefassung%20_02.Juni17.pdf

SINGLE SOURCE OF TRUTH ONE COMPREHENSIVE MODEL



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SUB MODELS BROUGHT TOGETHER IN ONE COLLABORATIVE BUILDING MODEL



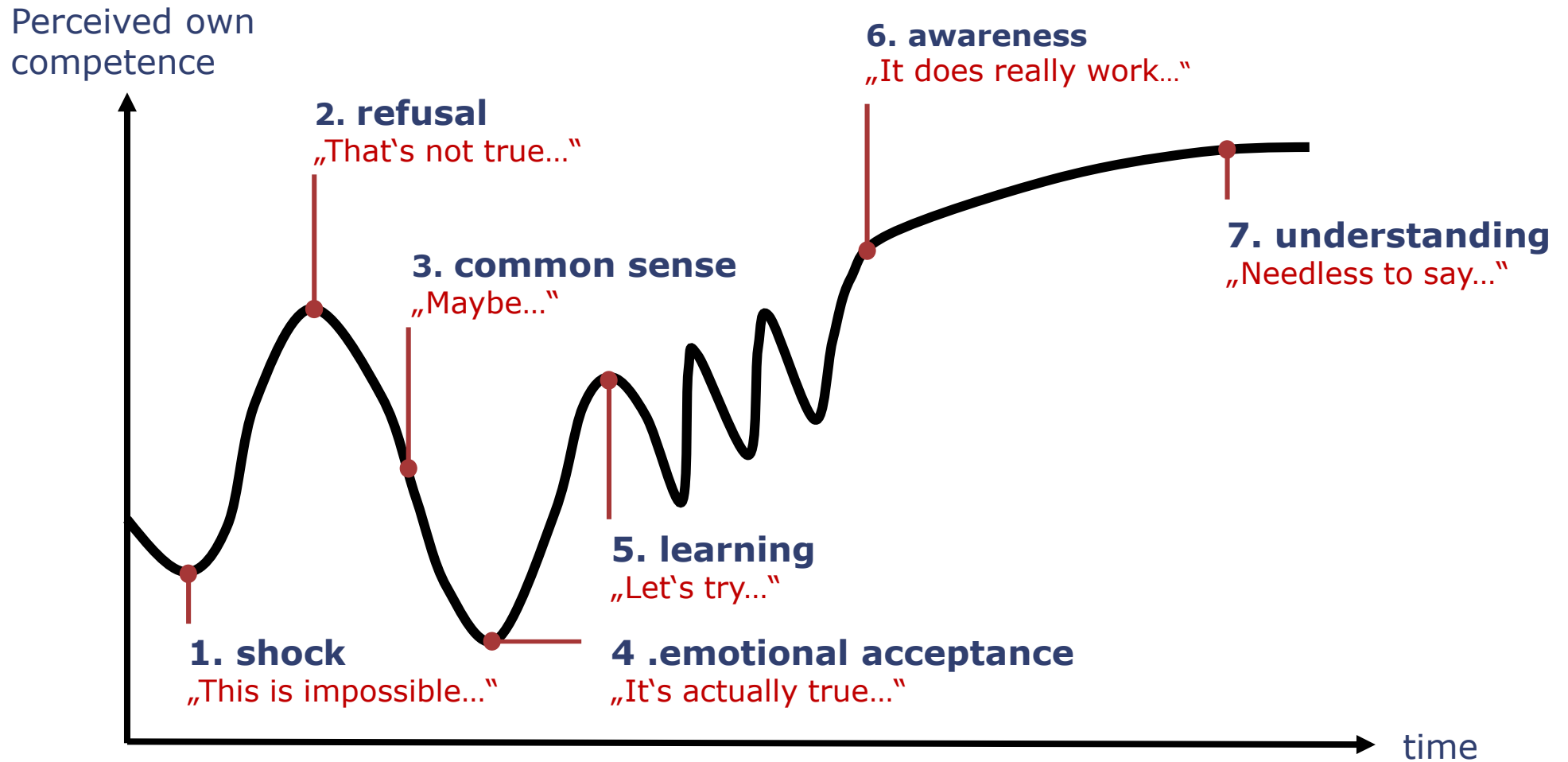
Single Source of Truth (SSOT): Building model is the only valid data basis

Collaboration, information and their perpetuation and documentation are based only on the building model. Therefore it gains a **significant contractual** relevance.

MIND SETUP CHANGE PROCESS



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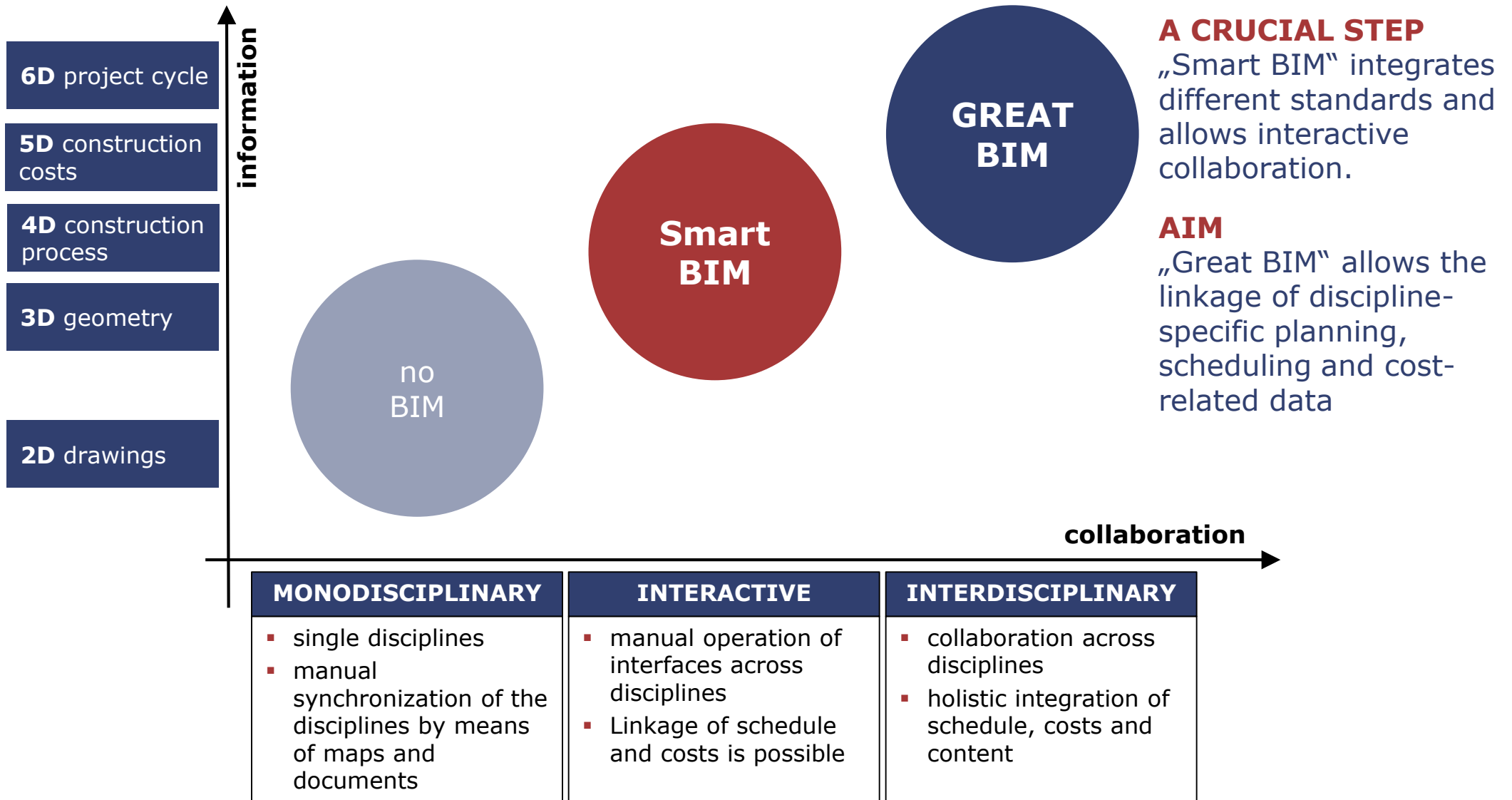


Source: Own representation based on J.P. Kotter, Leading Change, 1998

SMART BIM STEP-WISE IMPLEMENTATION



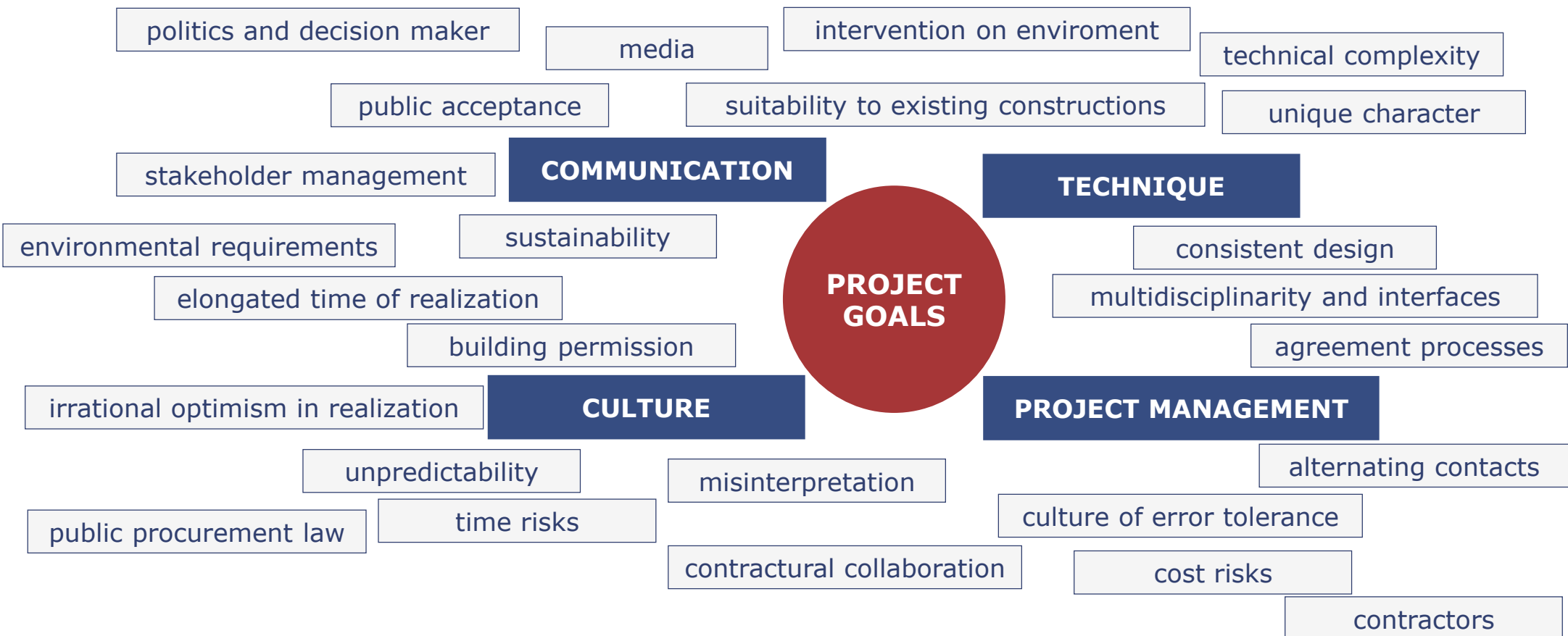
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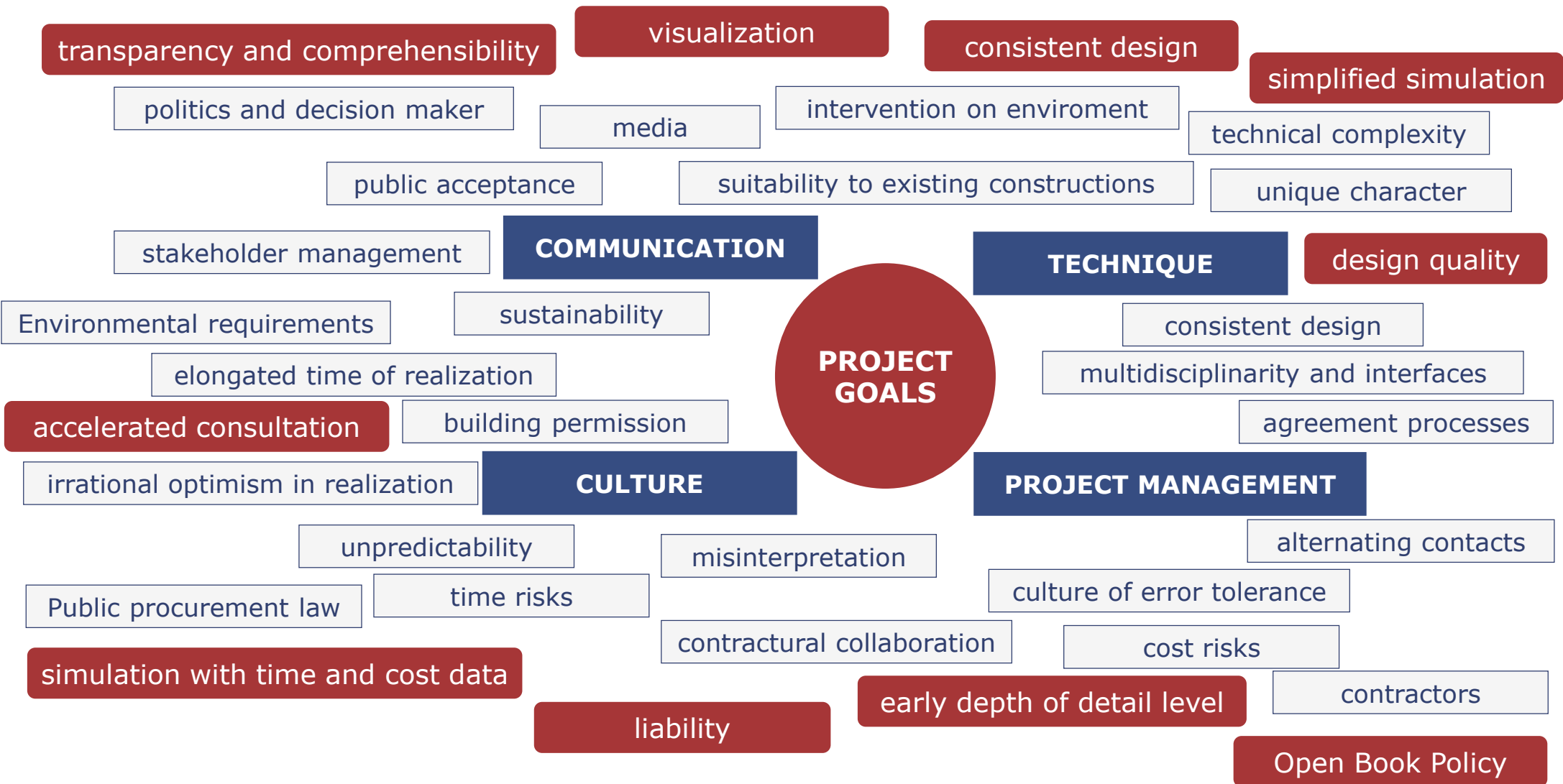


ACHIEVING PROJECT GOALS

HOW TO TARGET THE CHALLENGES



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DIGITAL ENGINEERING – BRIDGING TO THE FUTURE

Thank you!



Prof. Dr. Katharina Klemt-Albert
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