The German road map to BIM – A bottom-up approach

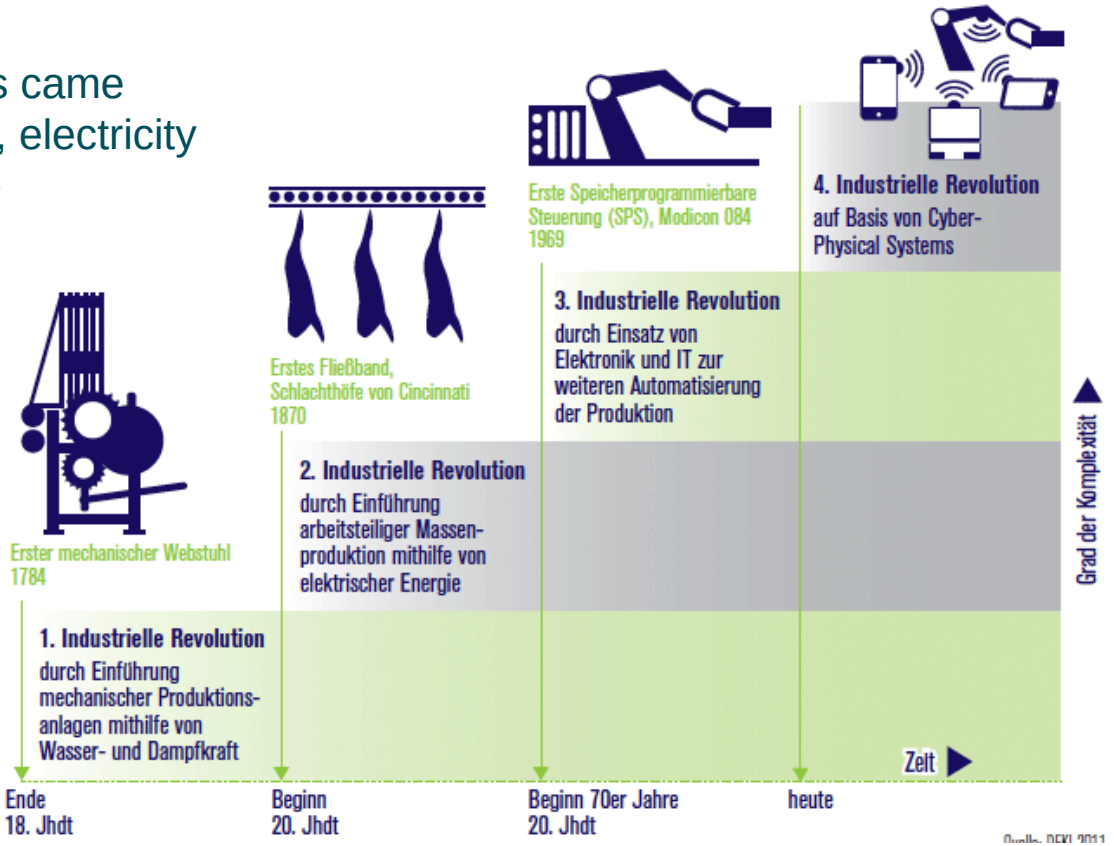
Gesellschaft zur Digitalisierung des Planens, Bauens und Betreibens mbH

planen bauen 4.0

The fourth industrial revolution

Digitisation is beginning to have a disruptive effect on our lives and our working and social environment. The Internet of Things and modern technologies facilitate fundamental improvements to the industrial processes involved in manufacturing, engineering, material usage and supply chain and life cycle management.

The first three industrial revolutions came about as a result of mechanisation, electricity and IT. Now, the introduction of the IoT and Services into the manufacturing environment is ushering in a fourth industrial revolution.

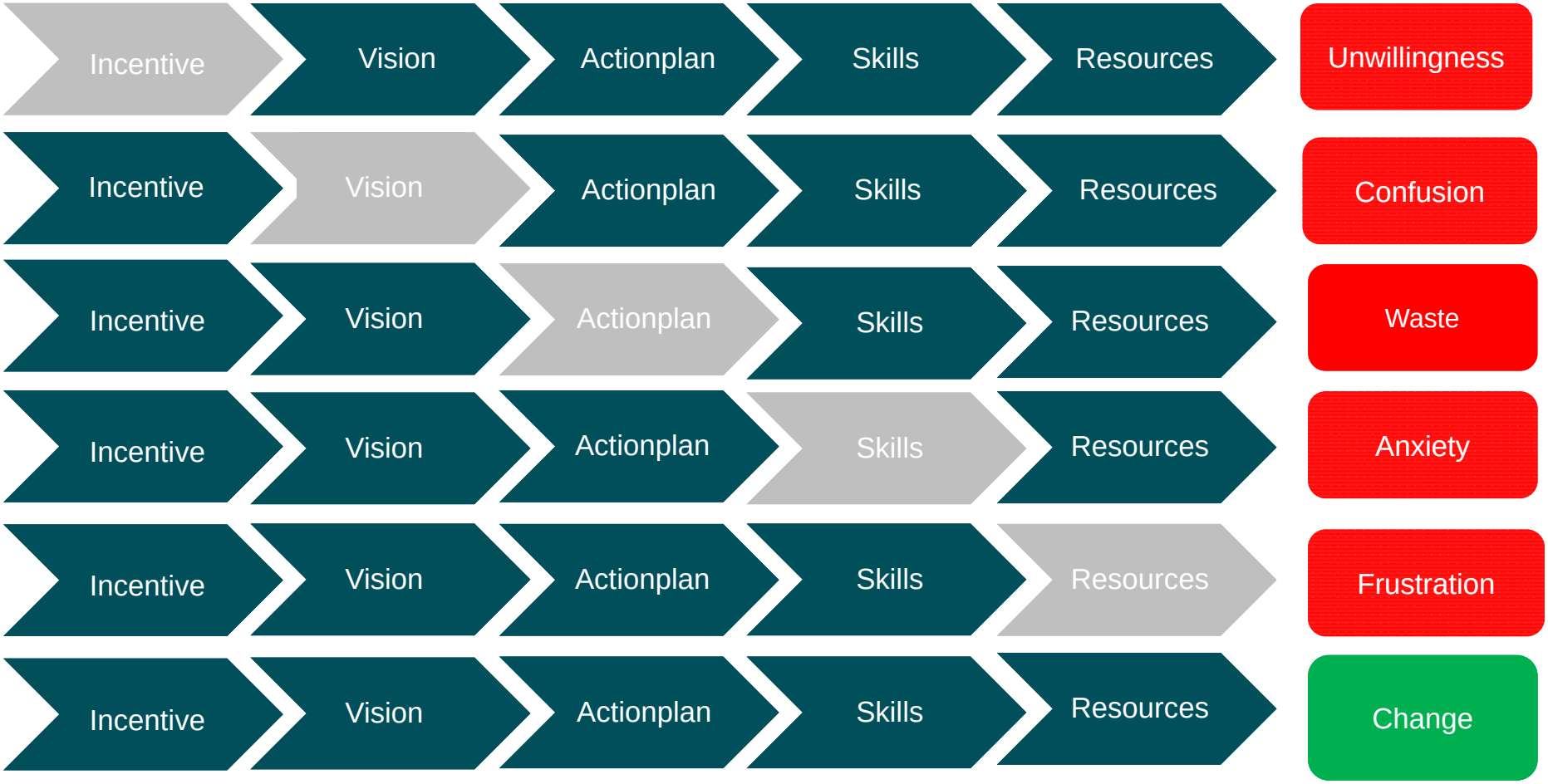


Plattform INDUSTRIE 4.0

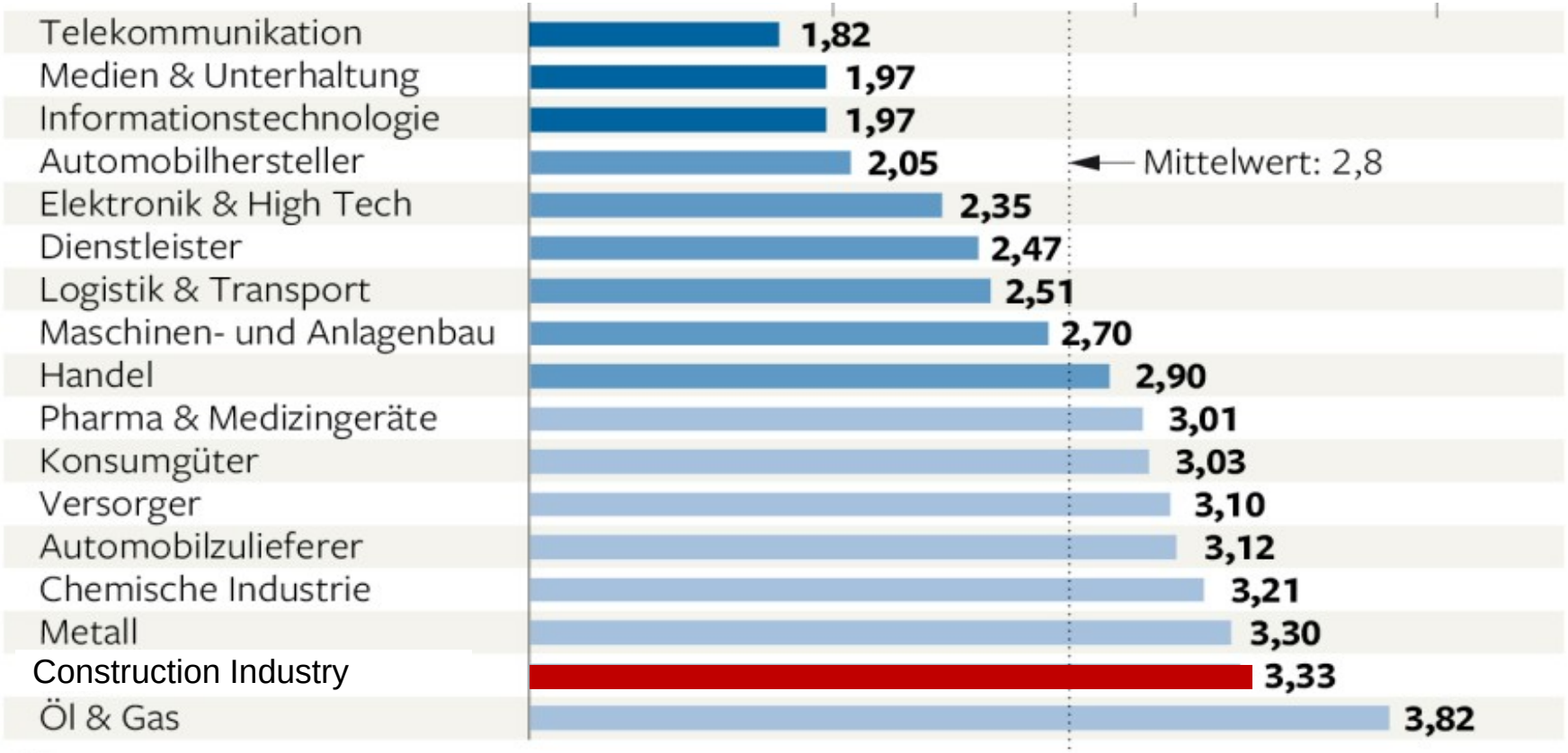

Who wants change?


Who wants *to* change?

Change

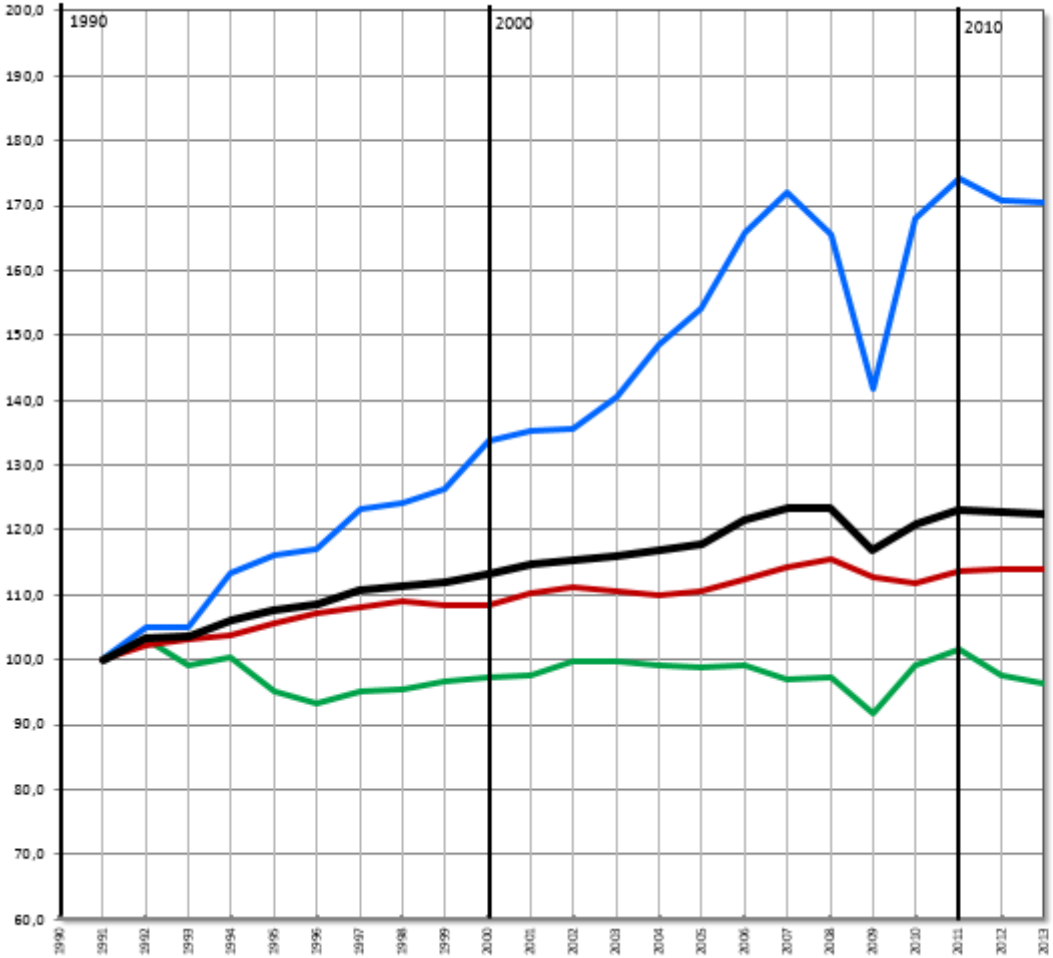

Incentive
Vision
Actionplan
Skills
Resources
Unwillingness
Incentive
Vision
Actionplan
Skills
Resources
Confusion
Incentive
Vision
Actionplan
Skills
Resources
Waste
Incentive
Vision
Actionplan
Skills
Resources
Anxiety
Incentive
Vision
Actionplan
Skills
Resources
Frustration
Incentive
Vision
Actionplan
Skills
Resources
Change

Low degree of Digitisation
1= high, 2=partly, 3= little, 4= very little



QUELLE: TOP 500 STUDIE 2014/ accenture

Productivity is declining..



Arbeitsproduktivität
je Erwerbstätigen

- Produzierendes Gewerbe ohne Baugewerbe
- Baugewerbe
- Dienstleistungsbereiche
- Insgesamt

DESTATIS
Statistisches Bundesamt

Quelle:
Statistisches Bundesamt
Fachserie 18, Reihe 1.5, 2013
Volkswirtschaftliche Gesamtrechnungen

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English Site > Germany > Berlin Airport > Unfinished Berlin Airport BER Costs 20 Million Euros per Month

Berlin Fiasco: Unfinished Airport Costs 20 Million Euros a Month

DPA

Germany's most expensive construction site: Berlin Brandenburg Willy Brandt Airport.

Berlin's beleaguered new international airport is turning out to be Germany's most expensive construction site. Round-the-clock lighting and air-conditioning contribute to energy costs even higher than those of the city's still-active Tegel Airport.

May 27, 2013 - 01:48 PM

Print | Send

Feedback

Berlin's new airport, officially known as Berlin Brandenburg Willy Brandt Airport (BER), is shaking out to be the most expensive construction site in Germany. Since last summer, work on the once -touted, long-awaited and largely completed terminal has almost come to a standstill. For months, activity has been restricted

Reform Committee „Major Projects“

„The main objectives of the committee are:

Project delivery on time & budget and increased transparency whilst meeting quality and performance criteria [...]

This includes a fundamental review of our processes, policies and guidelines“

http://www.bmvi.de/SharedDocs/DE/Artikel/UI/reformkommission-bau-von-grossprojekten.html

Reform Committee „Major Projects“

The major project committee report calls for a profound change in the relationship between public authorities and the construction industry to create a strong, fair and aligned framework for procuring, planning, constructing and operating assets in the built environment. This can be achieved through:

- A detailed user needs analysis at the earliest stage of a project,
- A detailed economic feasibility study at the earliest stage of a project,
- A collaborative way of working across the entire supply chain including multi-party partnering arrangements,
- A mature state of design before construction starts
- Early and continuous risk management including provisional costs and contingency in the public budget,
- Award of contracts to most economically advantageous tender, not lowest price
- Use of out-of-court dispute resolution
- Clear responsibility and accountability, better processes, use of centres of excellence and competence
- Increased transparency and better control
- Early and open public engagement
- Use of digital technology and methods, i.e. Building Information Modelling

Bundesministerium für Verkehr und digitale Infrastruktur

Reform Committee „Major Projects“

Press Release Federal Ministry for Transport and Digital Infrastructure 15.05.2014:

„…relevant national chambers and associations together with the industry want to form a BIM Task Group.“

Mission

- Coordinate and accelerate the implementation of BIM in Germany
- Reduce overlap and identify gaps in activities
- Prioritise and delegate
- Focal point of communication

Organisation

- Professional
- Non-Profit
- Dependent on resources from the industry and stakeholders

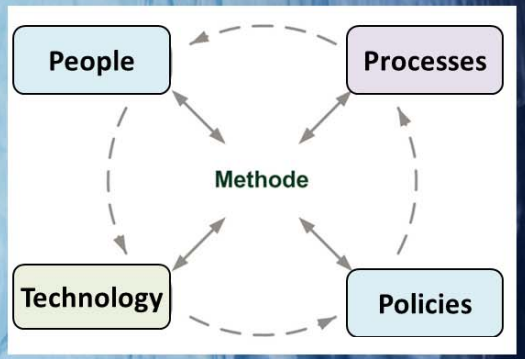
Outputs

- Sustainable and general
- Understandable and compliant
- Non Proprietary

Quick Wins:
- Professional Organisation
- Buy-in from construction value chain
- Support from public sector clients

Homework:
- Aligned Strategies
- Business Model
- Standards
- Awareness
- Road Map
- Education
- Market implementation

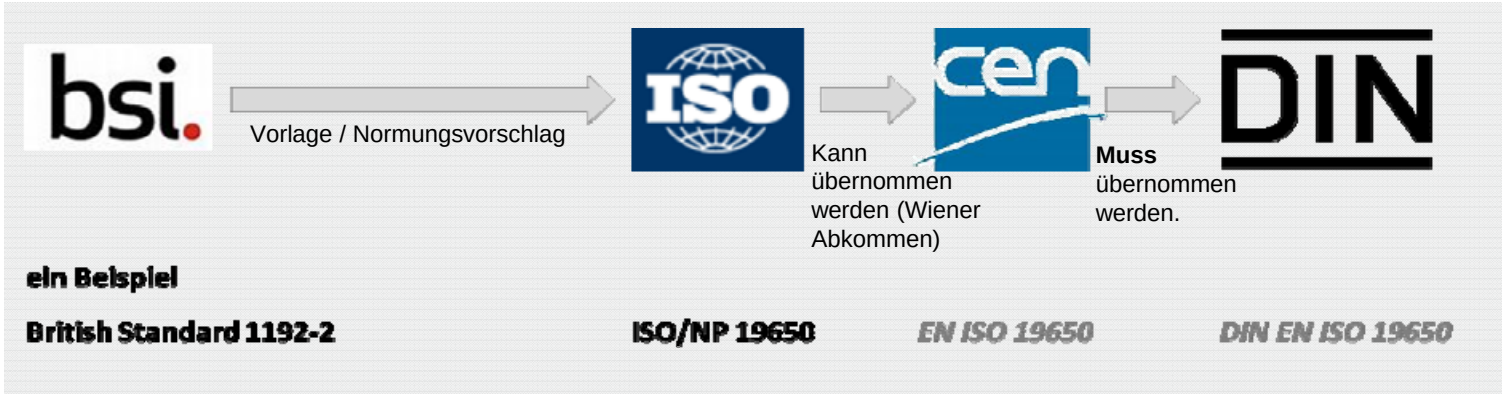
Cultural Change



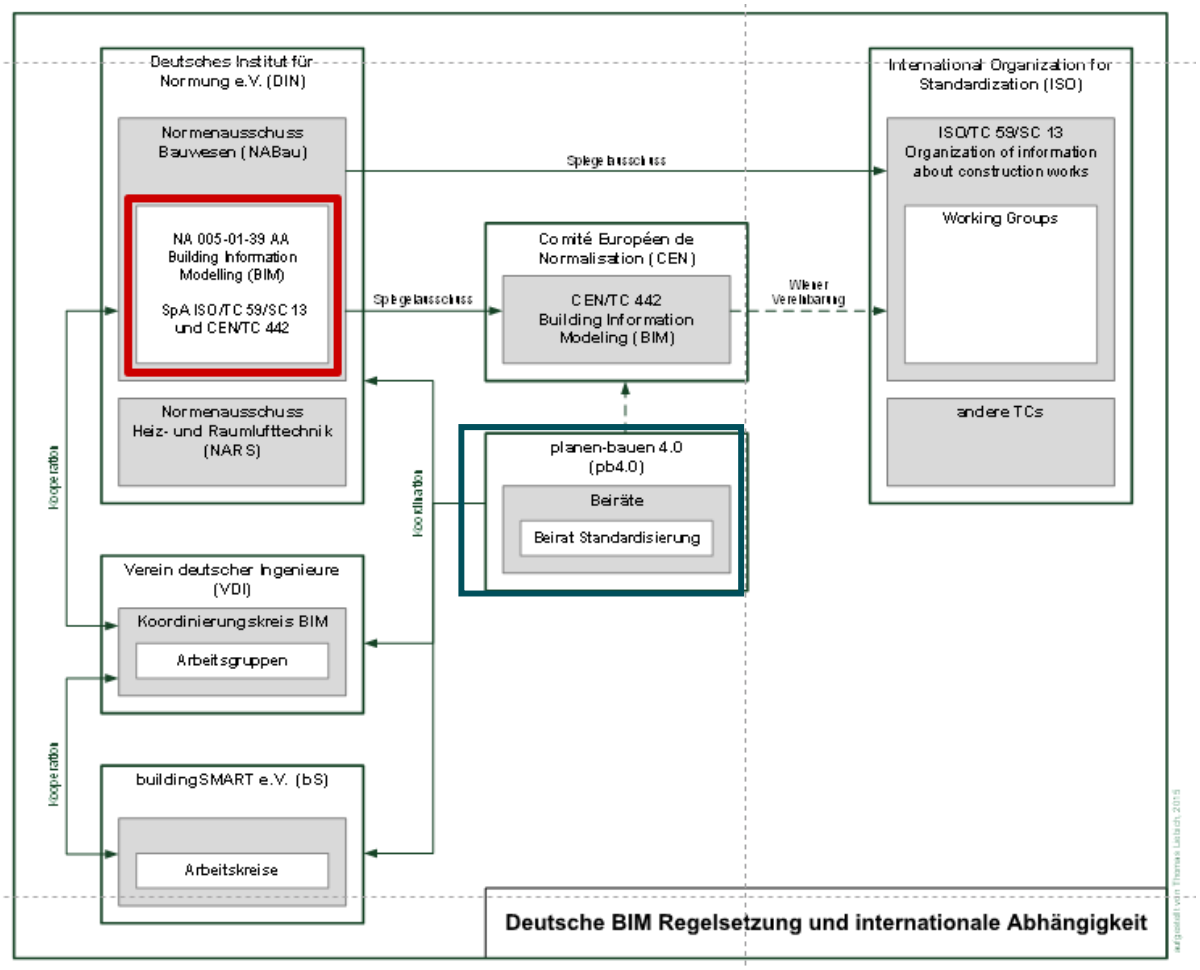
Activities pb40

- **Awareness and stakeholder engagement**
- **Support market implementation**
- **Standardisation**
- Training and education
- Research & Development
- Certification
- Pilot Projects

Standards


bsi.
Vorlage / Normungsvorschlag
ISO
Kann übernommen werden (Wiener Abkommen)
cen
Muss übernommen werden.
DIN
ein Beispiel
British Standard 1192-2
ISO/NP 19650
EN ISO 19650
DIN EN ISO 19650

German BIM Standardisation in an international context

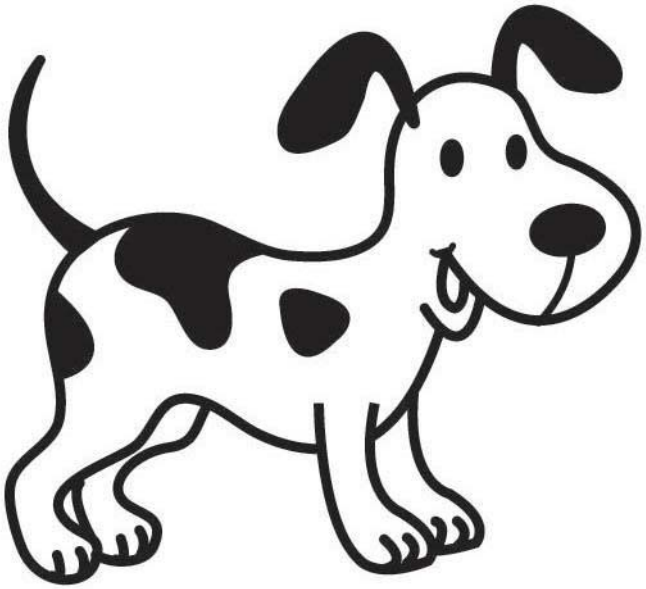


Development of an implementation road map for digital technologies and process in the construction industry

„Stufenplan“

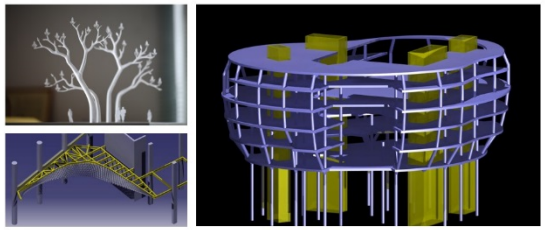
Gesellschaft zur Digitalisierung des Planens, Bauens und Betreibens mbH

planen bauen 4.0



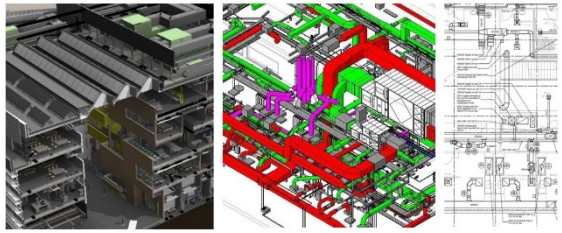
Digitalisierung der Wertschöpfungskette Bau

A BIM project | Concept/Scheme

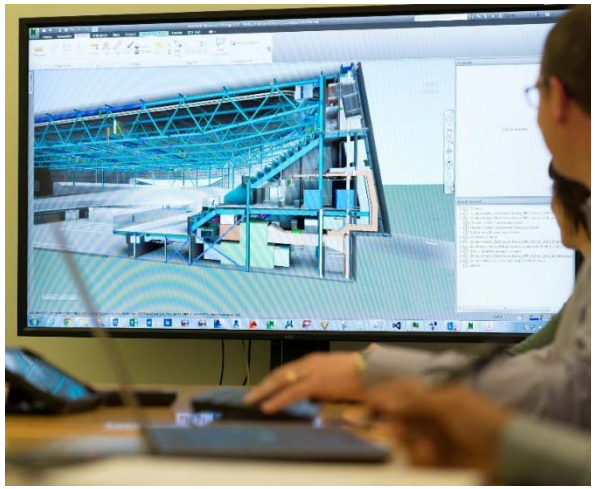


- Parametric design studies
- Early stage energy modelling
- Rapid generation of viable options
- Information based design decisions

A BIM project | Design & documentation

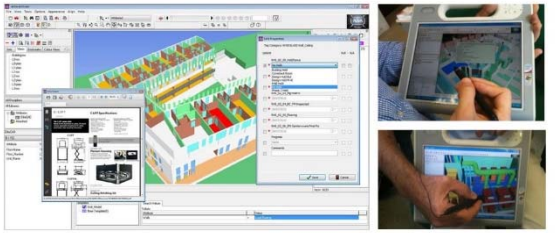


- 3D object modelling software
- Agreed methodology and standards
- Embedded information generates tags and datasheets
- Creation of 2D and 3D output



©Arup

A BIM project | Operation

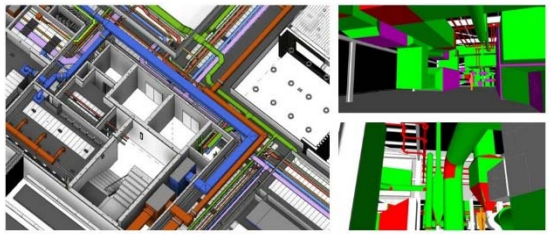


- Facilities and operations management model
- Equipment lists, specifications and maintenance information
- Monitoring and feedback systems
- Portable hardware

A BIM project | Build

- Virtual construction and coordination
- Data driven setting out and monitoring
- Improved understanding of models over drawings

A BIM project | Coordination

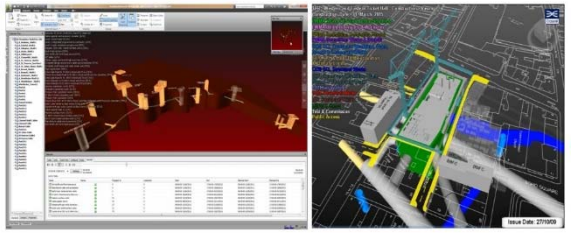


- Use of shared setting-out and coordinate data
- Direct referencing of other disciplines 3D information
- Coordination of discipline zones
- Virtual design reviews and clash detection workshops

A BIM project | Clash avoidance

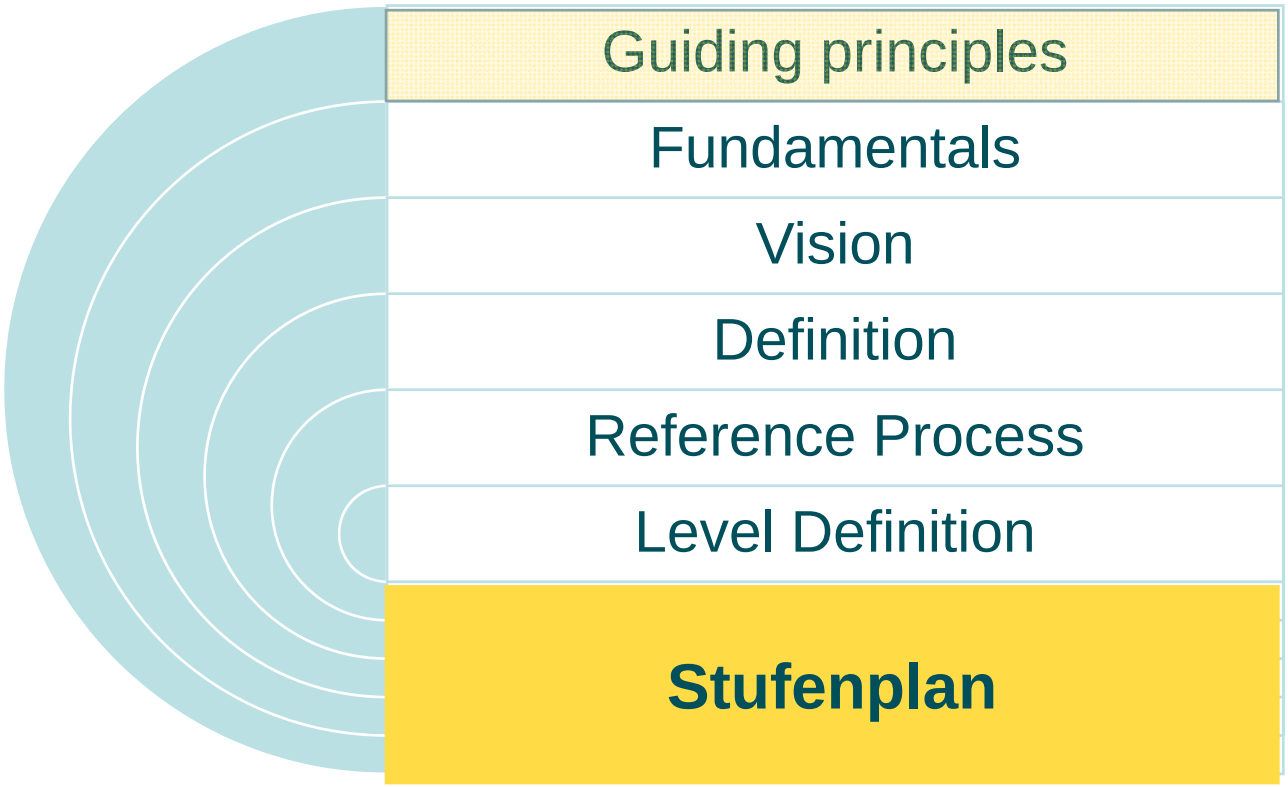
- Coarse – Clashing between different building zones or spaces
- Medium – Clashing between building components
- Fine – Soft clashing for builderswork and maintenance access

A BIM project | 4D Modelling

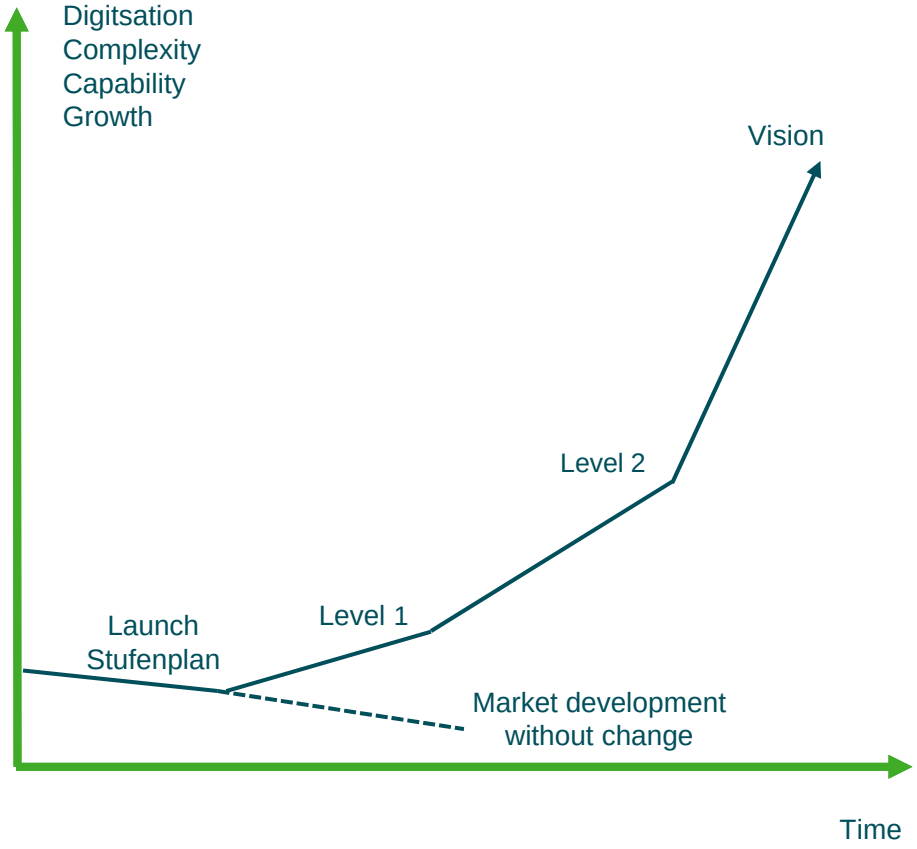


- Linking the construction programme to the project model
- Overall site phasing
- Detailed construction sequencing

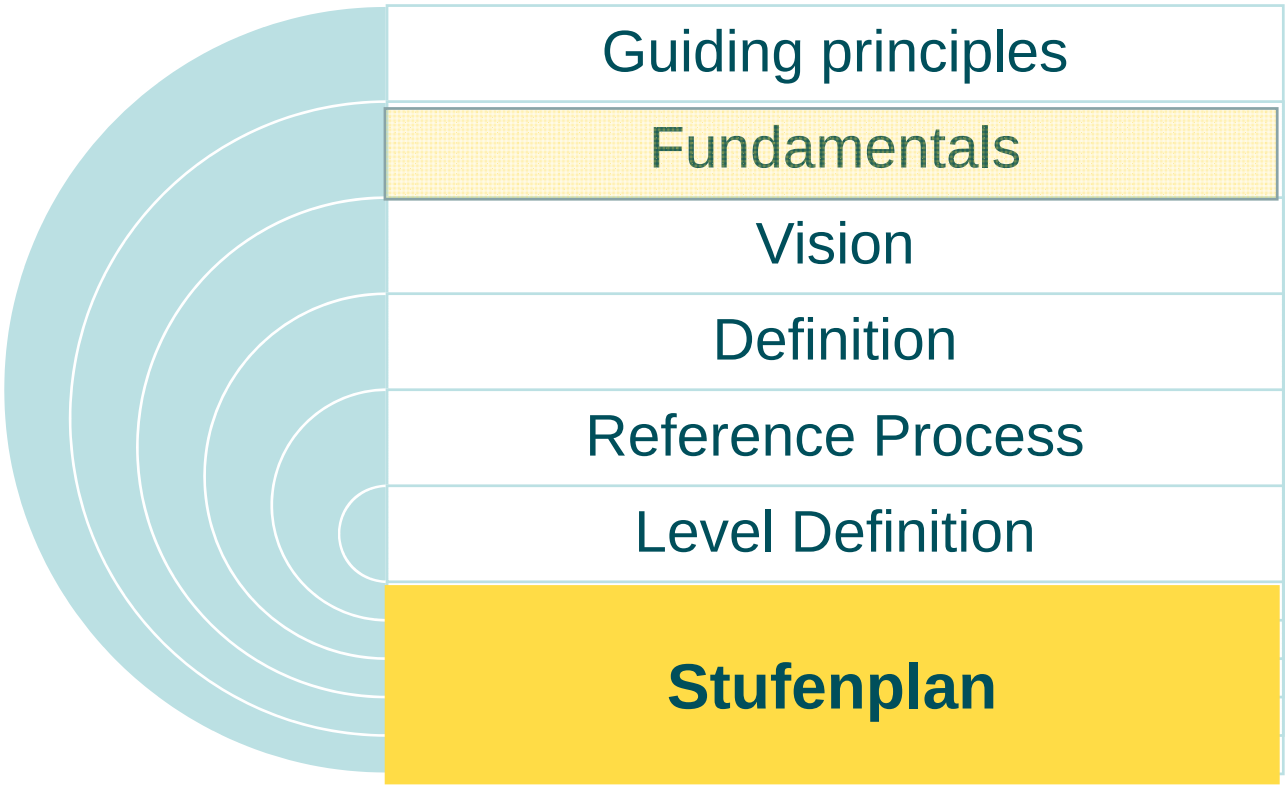
Stufenplan für Deutschland



Digitisation of the Construction Value Chain - Guiding Principles

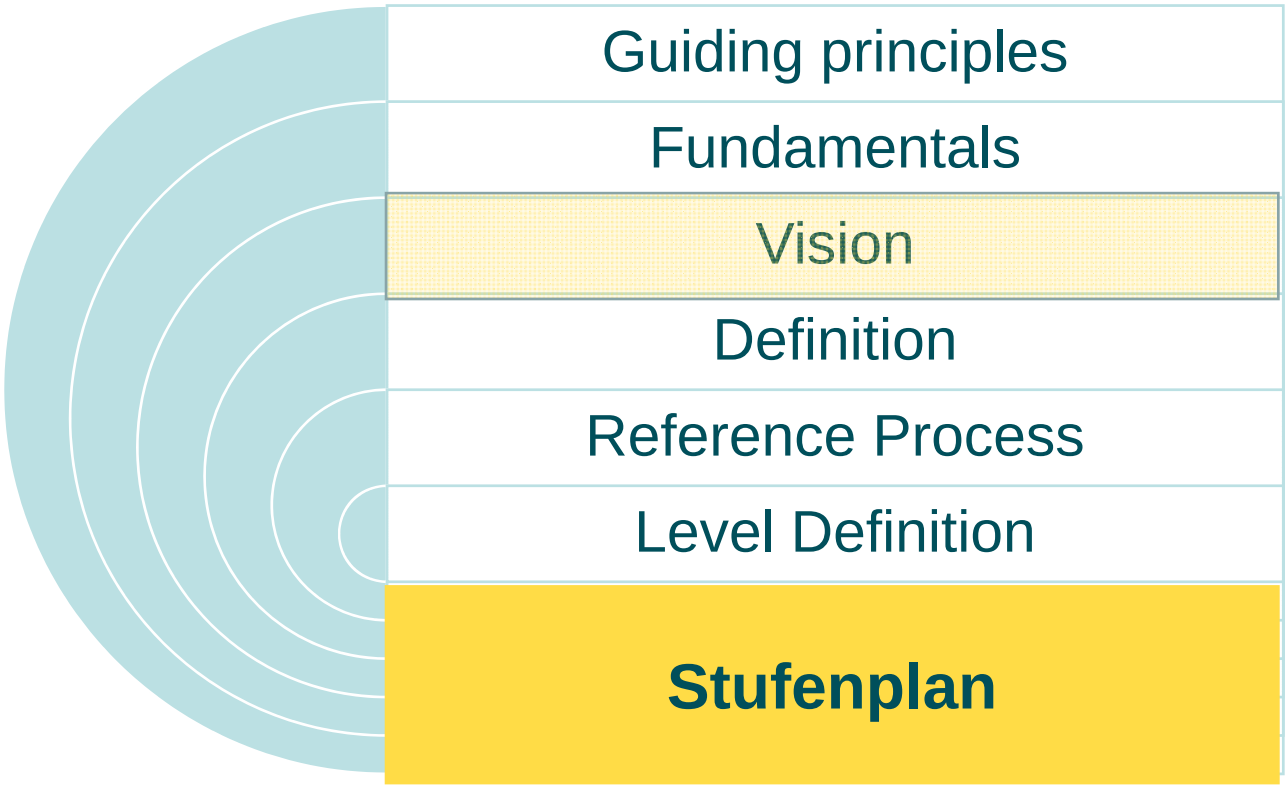


Stufenplan für Deutschland



Stufenplan - Fundamentals

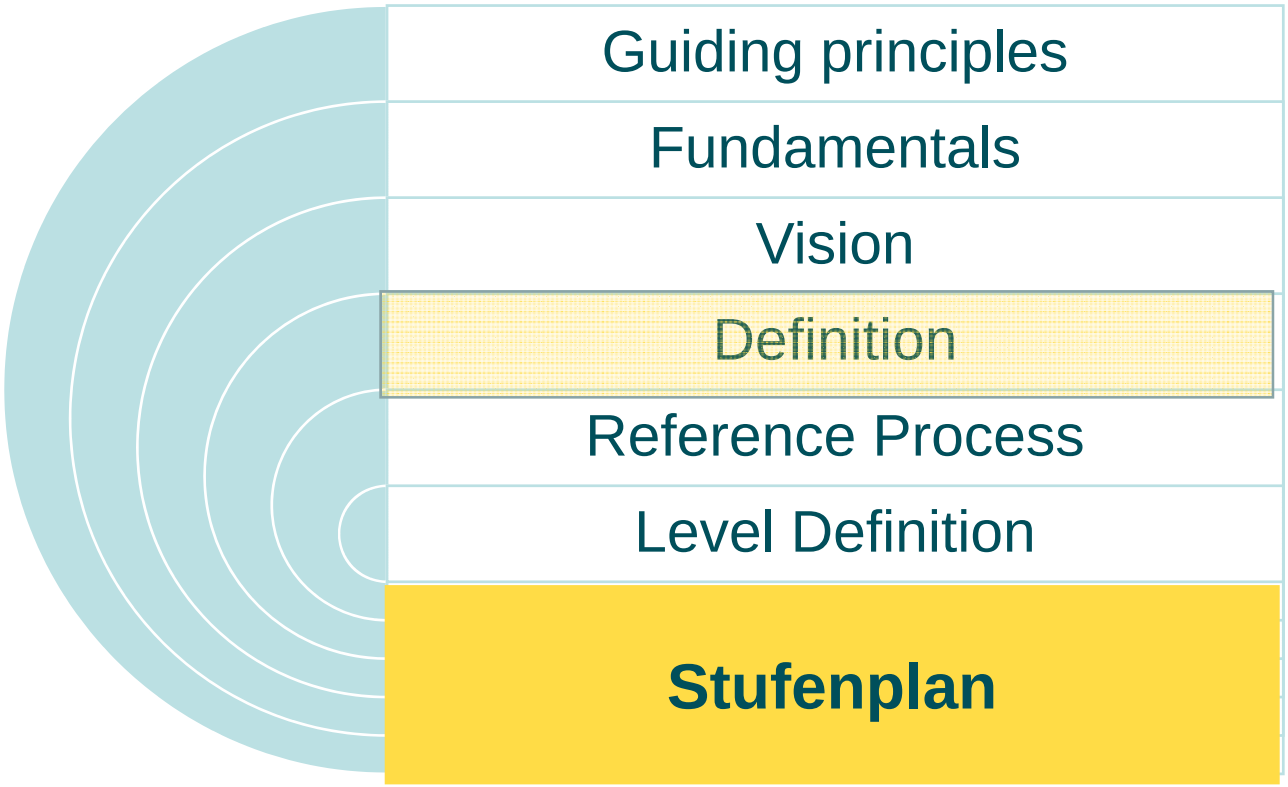
- Deliverables derived from 3D Models, hand-over of digital data
- Endorsement and appropriate communication of the Stufenplan by public sector procurers, relevant associations of the construction value chain and government will provide the market a sound basis for investment and strategic decisions
- Sufficient time for clients and supply chain to adapt to a different way of working, supported by pilot projects
- No fundamental changes to procurement, contracts and other policies for a first target level
- Adopt international standards and examples
- Consider the highly fragemented market situation in Germany with a high proportion of SMEs
- Consistent, appropriate and understandable client requirements in the procurement process enable and support market growth and prevent proprietary solutions
- The Stufenplans supports vendor-neutral, non-proprietary and independet technology, processes and solutions
- The Stufenplan is applicable for all types of projects (infrastructure, buildings, new, existing) and for the Federated Republic.


Guiding principles
Fundamentals
Vision
Definition
Reference Process
Level Definition
Stufenplan

Vision

A modern and innovative construction industry, which contributes to the development and maintenance of a sustainable and liveable built environment through the delivery of high-performing assets and its digital data.

Thus the construction value chain provides a considerable contribution to the digital transformation in economy and society addressing the challenges of the 21 century.


Guiding principles
Fundamentals
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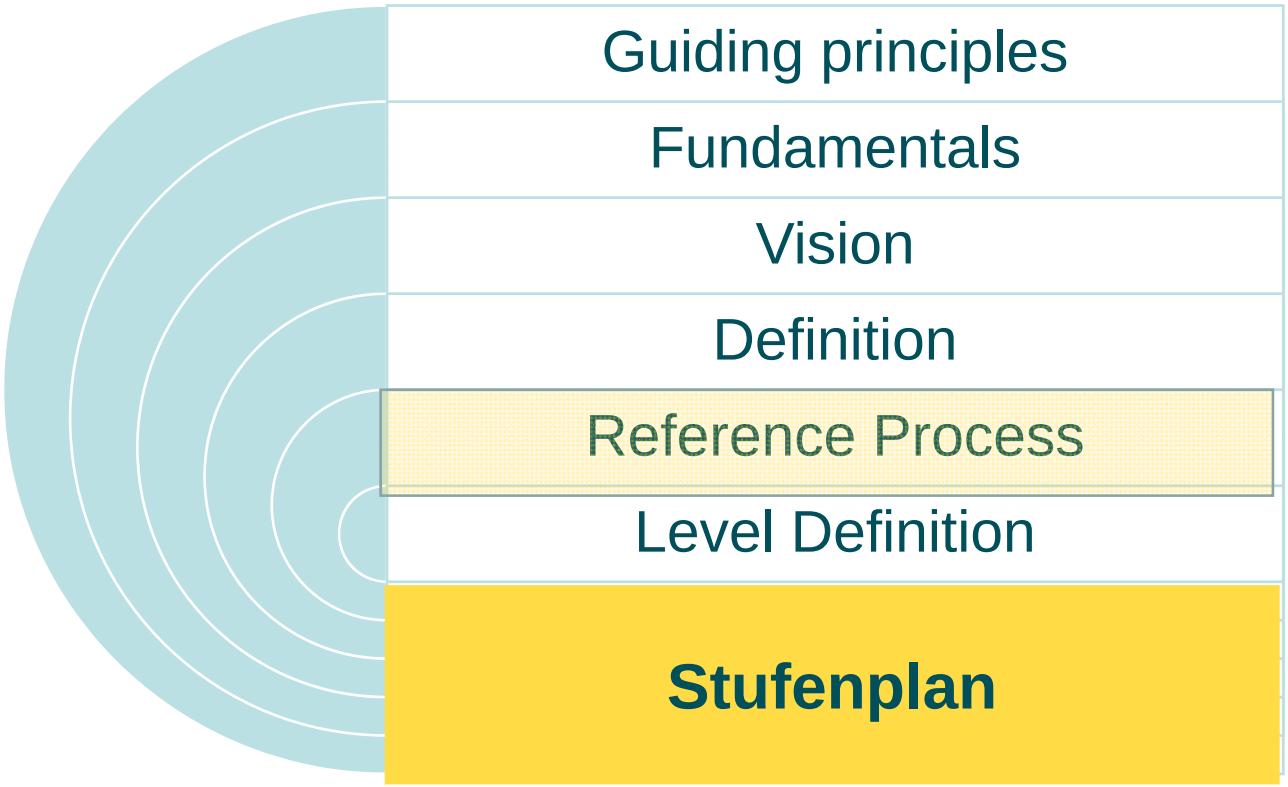
Reference Process
Level Definition
Stufenplan

Digitalisierung der Wertschöpfungskette Planen, Bauen und Betreiben

"Building Information Modeling (BIM) bezeichnet eine kooperative Arbeitsmethodik, mit der auf der Grundlage digitaler Modelle eines Bauwerks die für seinen Lebenszyklus relevanten Informationen und Daten konsistent erfasst, verwaltet und in einer transparenten Kommunikation zwischen den Beteiligten ausgetauscht oder für die weitere Bearbeitung übergeben werden." – **Proposed BIM Definition Germany**

"BIM is a descriptive term for technologically advanced, collaborative and information-centric processes in built environment design, construction and operation. BIM embeds key product and asset data and a digital computer model that can be used for effective management of information throughout a project lifecycle – from earliest concept through to operation"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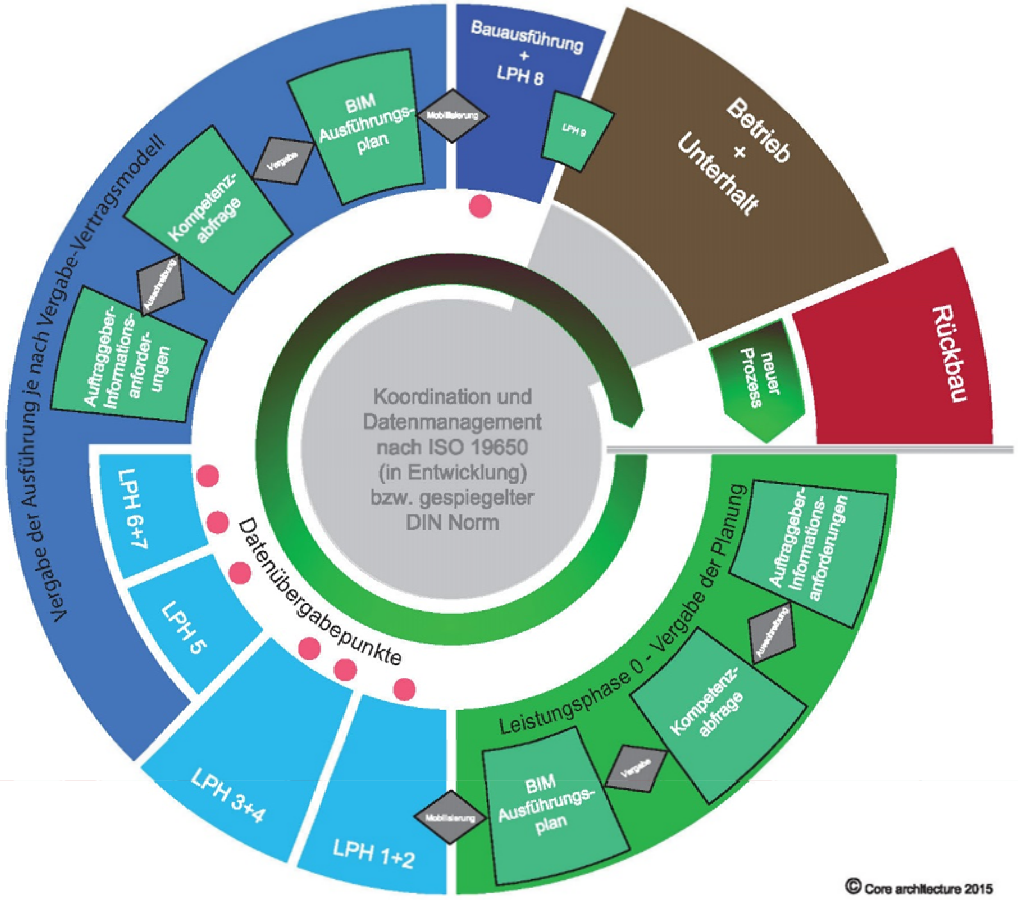
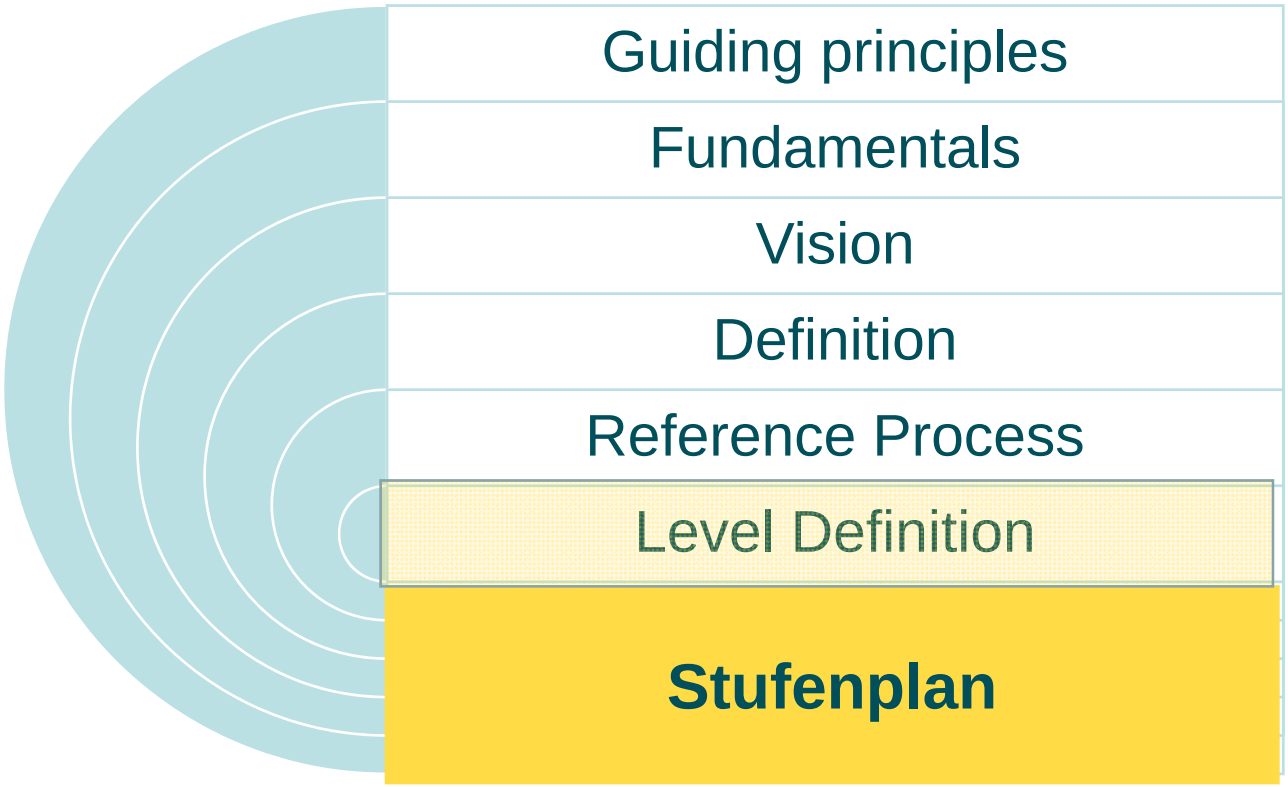
Reference-Process

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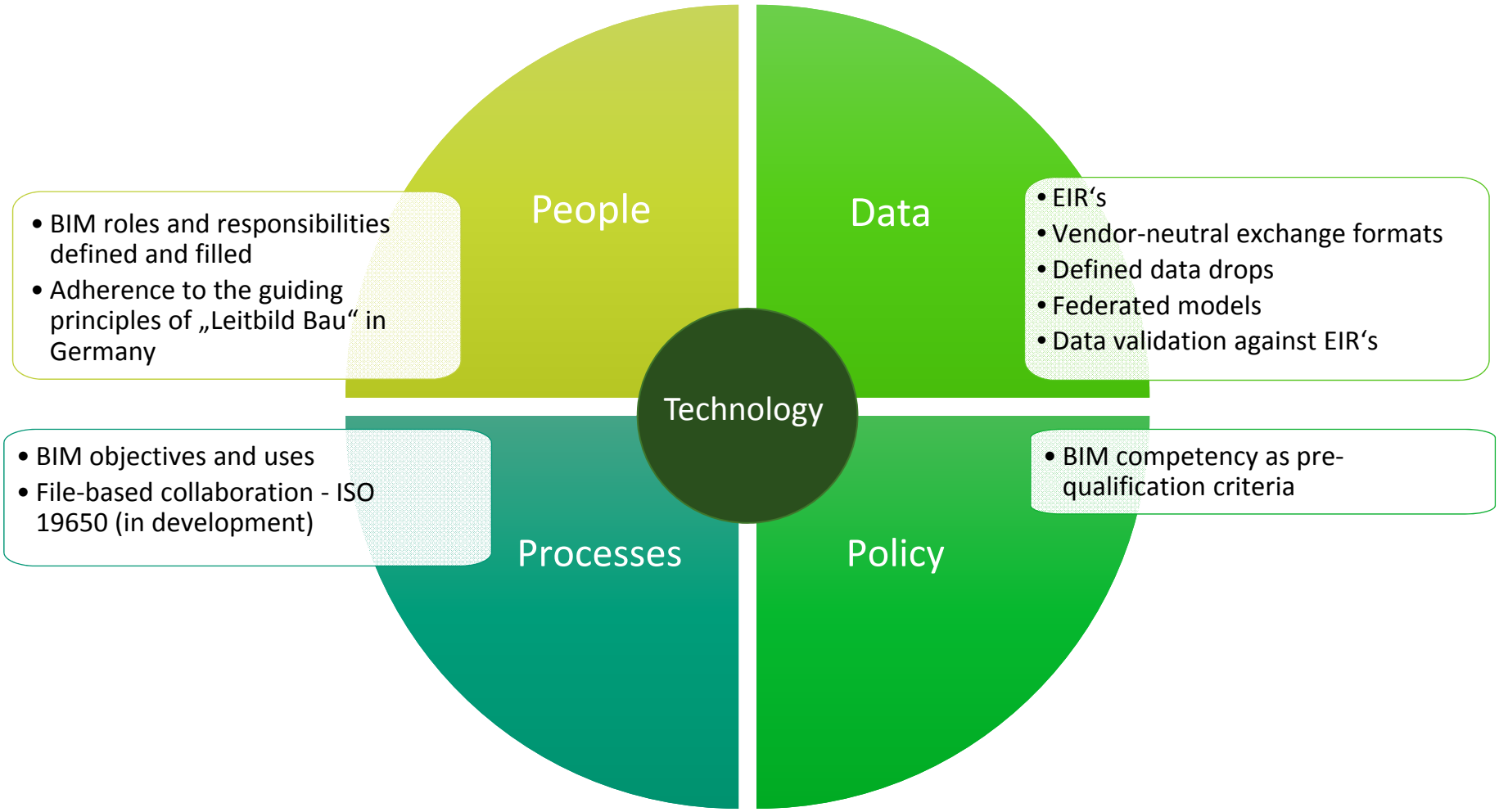
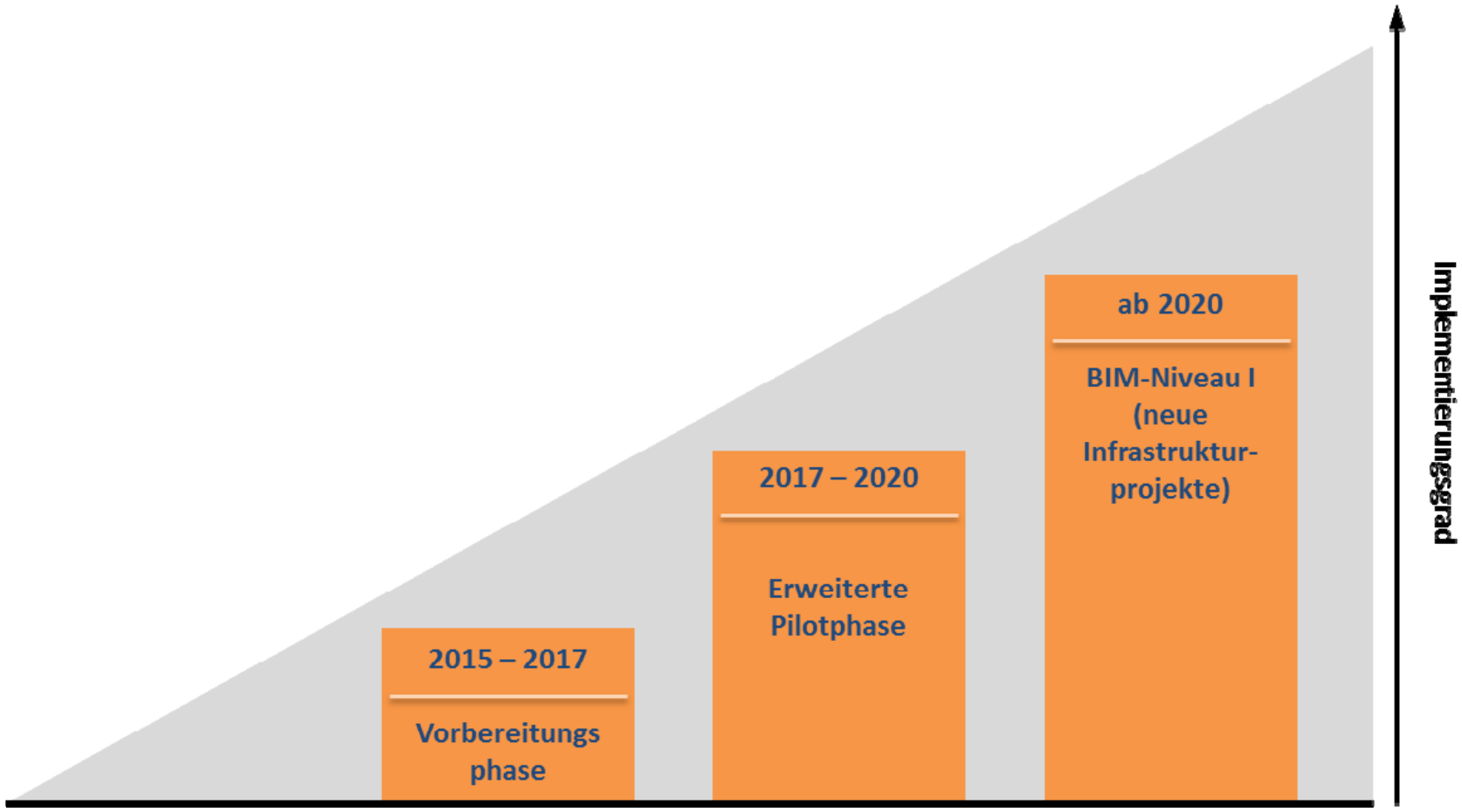
First target level description



Proposed Implementation Road Map



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