

5D Conference, 05.05.2015

BIM – Standardization: consensual process between architecture, civil engineering, building services and facility management

Prof. Rasso Steinmann, Frank Jansen



Technical standards as generally accepted rules of engineering and indispensable part of the legal framework

Verein Deutscher Ingenieure – VDI e.V.

The voice of engineers and technology

Germany's largest technical-scientific association

A developer and multiplier of engineering knowledge

A competent adviser for industry, government and technology

A service provider for engineers

Technical, professional, political and international engineering network

Technical standards as generally accepted rules of engineering and indispensable part of the legal framework

Verein Deutscher Ingenieure – VDI e.V.

- ✓ More than 150,000 individual members
- ✓ 12,000 honorary experts
- ✓ 120 full-time employees
- ✓ 400 working groups
- ✓ 2.000 valid VDI Standards
- ✓ apr. 230 standards/year



Technical standards as generally accepted rules of engineering and indispensable part of the legal framework

VDI Society for Civil Engineering and Building Services

- ✓ 16,000 affiliated VDI members
- ✓ 200 topical standards
- ✓ 100 active committees
- ✓ 5 full-time consultants + 2 secretaries

Communication platform for all parties involved in building and construction.



Technical standards as generally accepted rules of engineering and indispensable part of the legal framework

VDI Standards

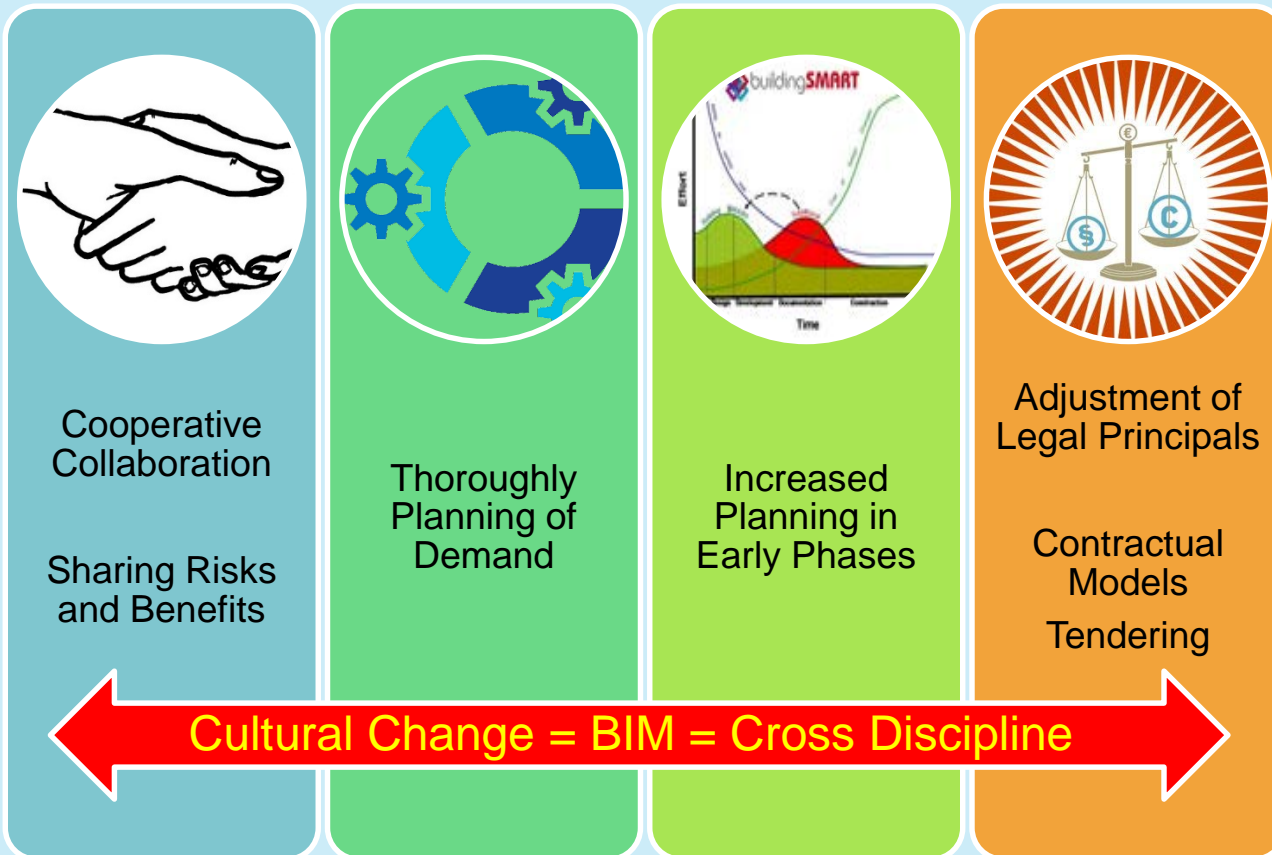
about 2000 valid VDI Standards

- describe the state of the art
- are acknowledged rules of technology
- topics range from securing loads on road vehicles to structural safety of buildings and up to biomimetics etc...
- create confidence in safety and quality

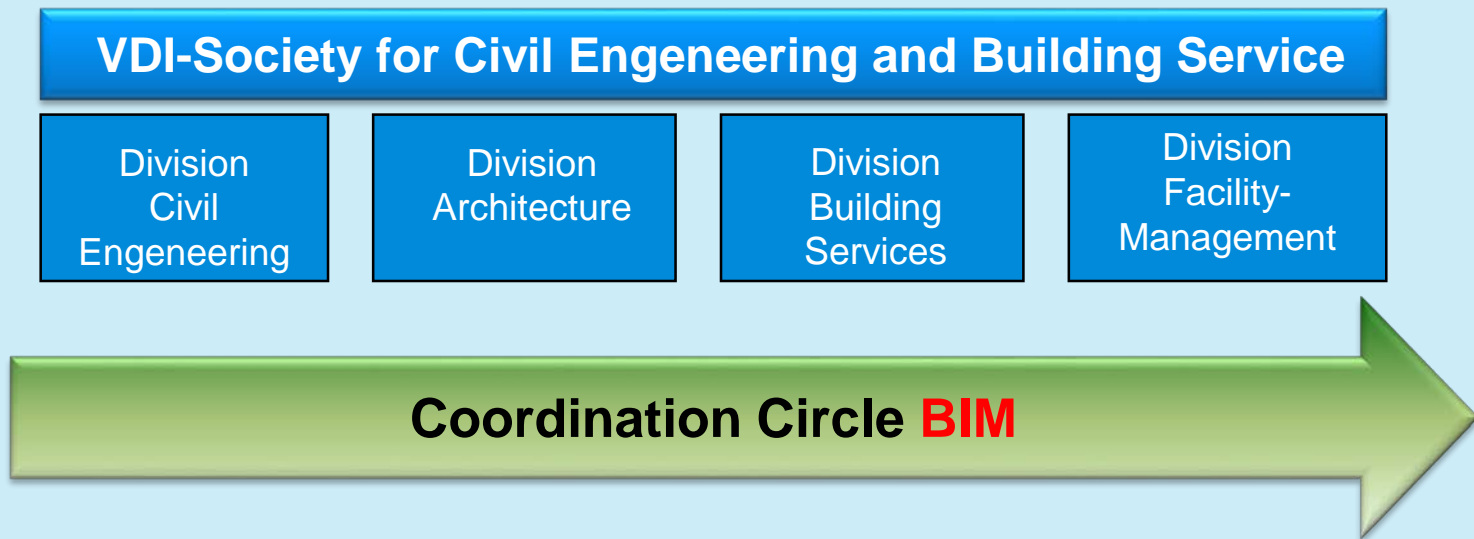


Cultural Change

Building Information Modeling is Cross Discipline



VDI Coordination Circle **B**uilding **I**nformation **M**odeling
On behalf of the VDI-GBG Council



Standards, Guidelines

Conferences

Position Papers

Publications

VDI Coordination Circle Building Information Modeling

On behalf of the VDI-GBG Council

Technology

Tools
Data formats
Servers
APIs
Division
Civil Engineering

Division
Architecture

Division
Building Services

Division
Facility Management

Basic Conditions
IPI Contracts / Regulations

Processes

Workflows
Responsibilities
Roles

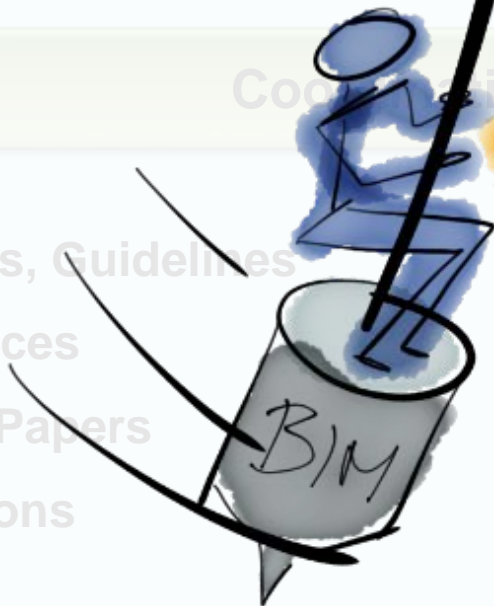


Coordination Circle BIM

People

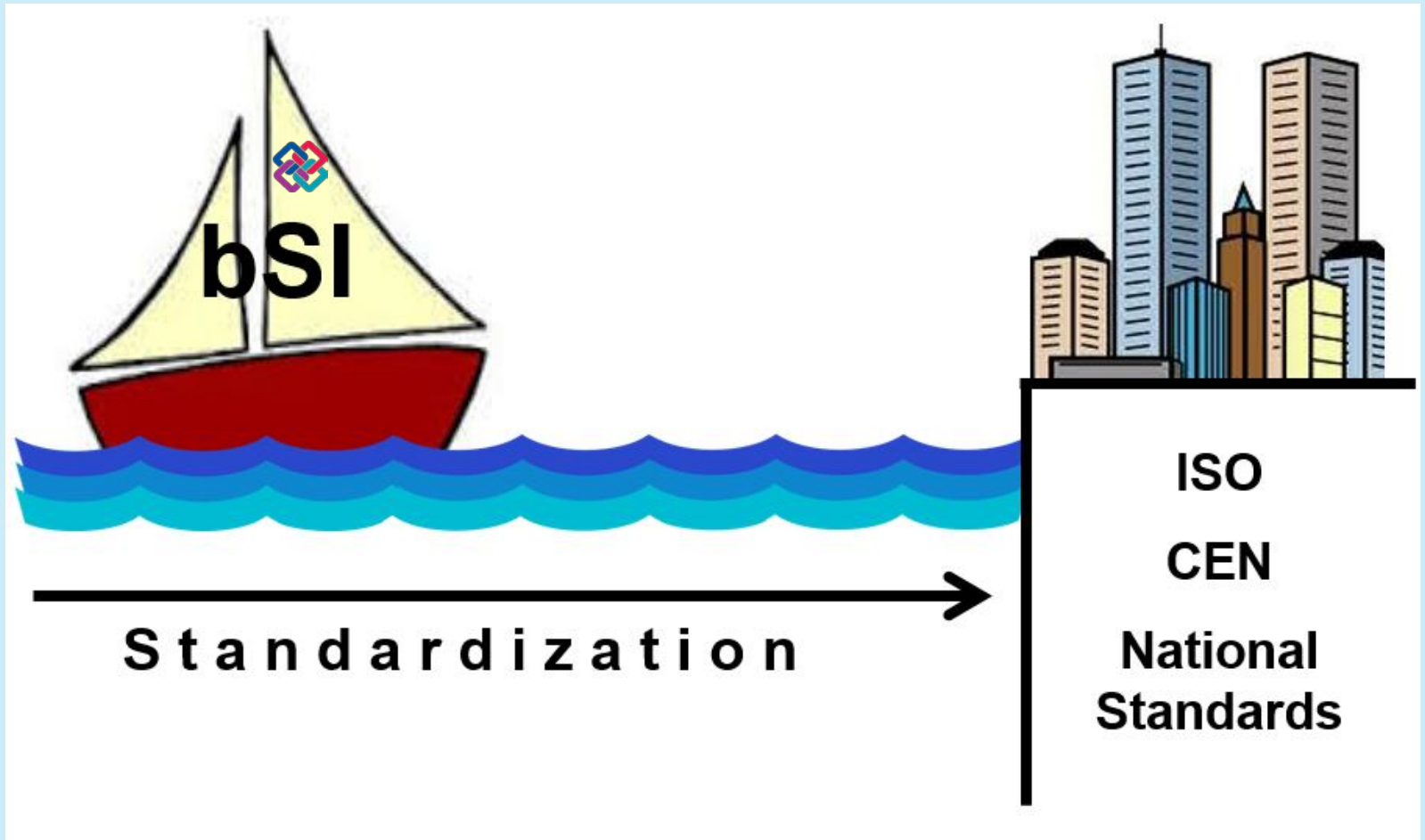
Roles
Qualification

Standards, Guidelines
Conferences
Position Papers
Publications



buildingSMART-ViewPoint:

BIM-Standardization -> Standards





Impact of BIM-Standards

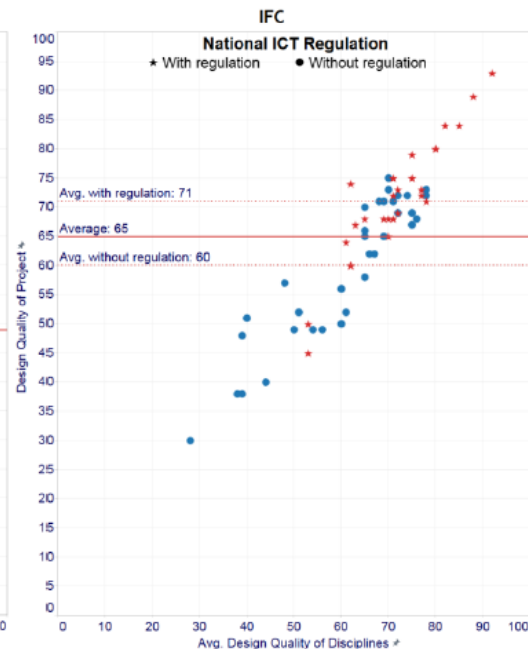
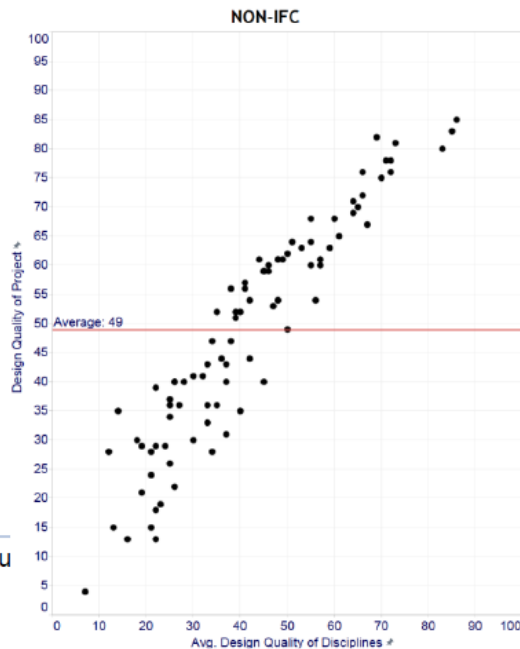
-> bSI-BIM-Award 2014: Usage of IFC is increasing quality

Statistical Analysis of 153 Different Projects, Denmark A driver for design quality in the AEC industry

MT Højgaard has analysed 153 projects and investigated how IFC influences the quality of the design material. It has yielded insight into specific patterns that are crucial for the quality of the design material. By using validated data collected from these projects, MT Højgaard can show how Industry Foundation Classes, IFC, significantly increases the quality of design materials in the AEC industry.

[Link](#)

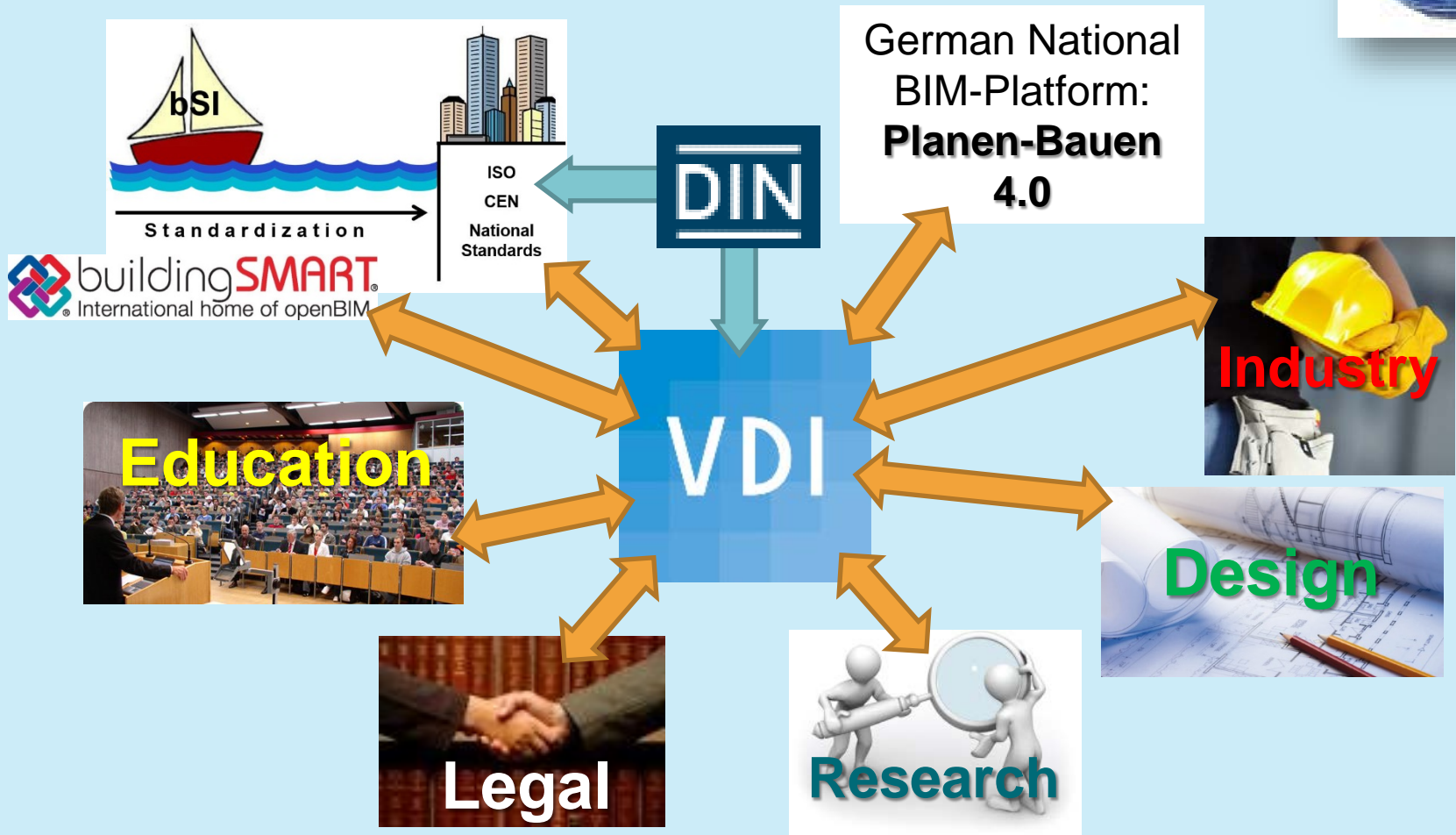
International User Group





BIM-Standardization: VDI-Viewpoint *Thinking German and Globally*

(all VDI-Standards available in German & English)



VDI Coordination Circle **B**uilding **I**nformation **M**odeling **Set-Up**

1. **Composition of the Coordination Circle**

Members:

- VDI-Committees
- Building Owners
- Science
- End-User
- Software-Developers
- Organisations/Associations/Initiatives
- ...

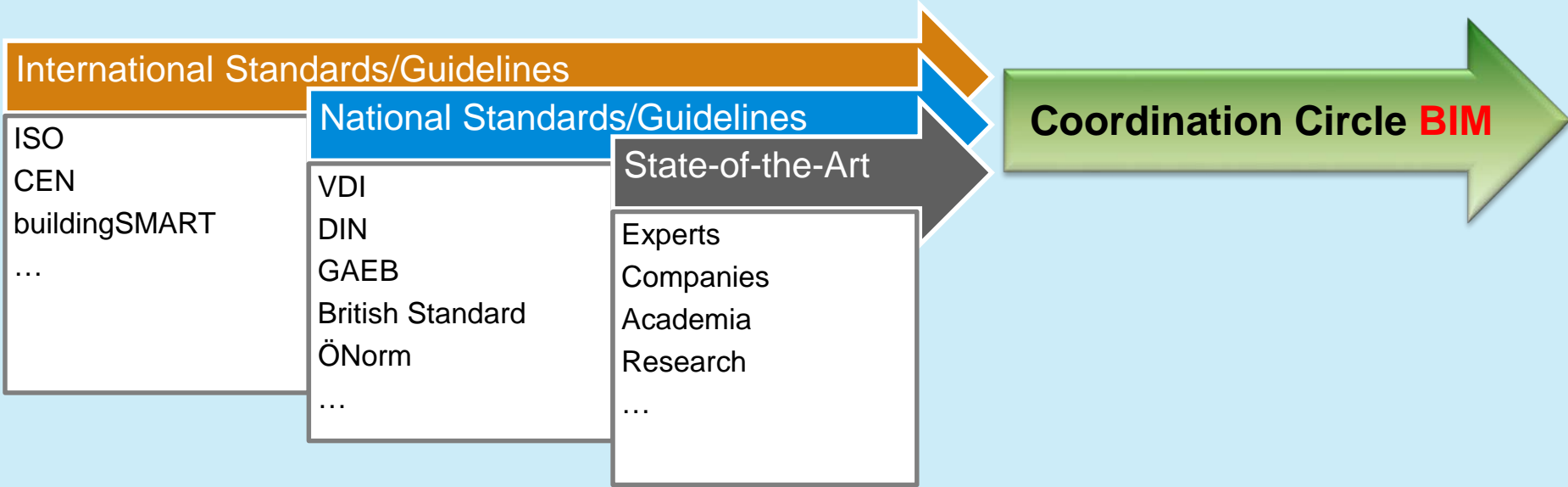
2. **Link to Advisory Council and to Consulting Councils**

- Specialist input to VDI-GBG Consulting Councils
- Standardisation/Guideline projects via Consulting Councils
- Positionspapers etc. together with VDI-GBG and VDI-SK

VDI Coordination Circle **B**uilding **I**nformation **M**odeling **Tasks**

- **Guidelines/Standards**
 - Inspection of existing guideline/standards
 - Initiating guideline/standards-projects
 - Recruiting specialist members for guideline/standards-projects
 - Expertise evaluation of developed guideline/standards
- **Conferences**
 - Initiating conferences
 - Expertise sponsorship of conferences
- **Positions**
 - Position papers, statements, recommendation to policy
- **Technical papers**
 - VDI-News, technical literature

Don't reinvent the wheel



VDI-Regulatory Strategy BIM

Building consense on BIM-topics between:

- Planers
- Contractors
- Software vendors
- Science
- Associations/Chambers
- Building owners/users
- Policy

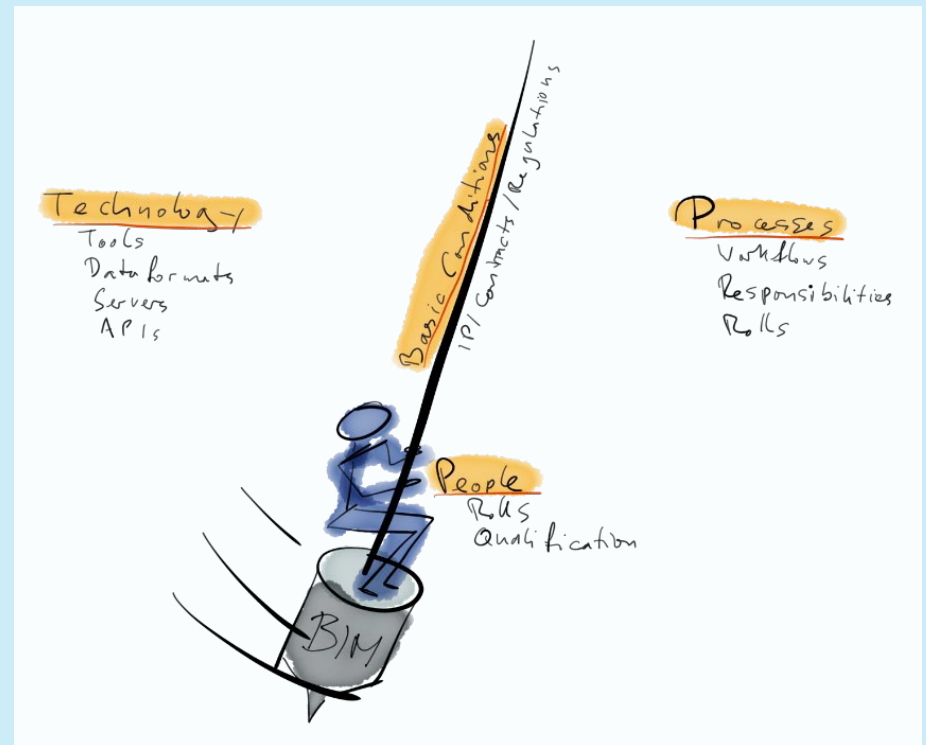


**Currently
70+ voluntary
experts**

VDI-Regulatory Strategy BIM

VDI-Coordination Circle BIM Spheres of Activity:

- Focus **People**
- Focus **Technology**
- Focus **Processes**
- Focus **Basic Conditions**



VDI-Regulatory Strategy BIM

Focus **People**

- BIM-Shareholders
- Rolls and Responsibilities
- Experiences, know-how and qualification of the shareholders
- Partnership
- Collaboration and Communication

VDI-Regulatory Strategy BIM

Focus **Technology**

- Automation
- BIM-Controlling (4D, 5D, as-built reporting, supplementary claim management)
- Data exchange
- Data management
- Bill of quantities
- Studies of variations
- Visualisation

VDI-Regulatory Strategy BIM

Focus **Processes**

- Requirements for workflows during planning, execution, operation
- BIM-Model
- Data exchange
- Sustainability
- Data management
- Quality criterial for information, tendering vs. offer
- Security

VDI-Regulatory Strategy BIM

Focus **Basic Conditions**

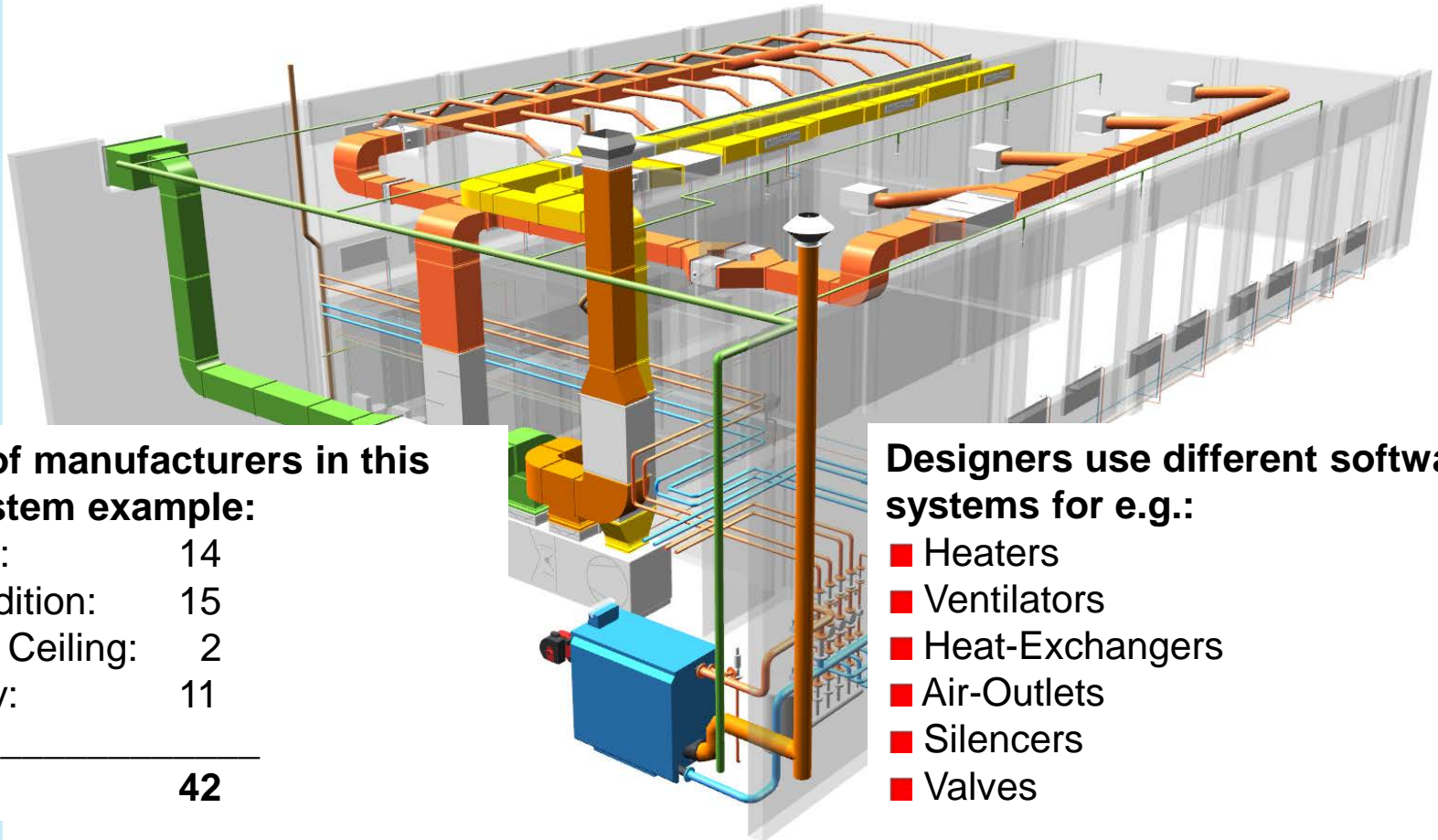
- Tendering
- Terms
- Intellectual property
- Common standards, formats, etc.
- HOAI – Conformity (German price law with phases similar to LOD)
- Responsibilities / liability
- Contractual consistence

VDI-Regulatory Strategy BIM

Validation of proposals for guideline/standard projects by VDI-Coordination Circle **BIM**:

- Is the content beneficial for end-users?
- Is it an entirely approach?
- Is the technology documented:
 - proven and being used?
 - non-proprietary (open technology)?
- Can it be achieved in a reasonable timeframe?
- Beneficial from the viewpoint of building life-cycle?
- Is it beneficial to all necessary shareholders in the value chain?

Why standards?



Number of manufacturers in this small System example:

■ Heating:	14
■ Air Condition:	15
■ Cooling Ceiling:	2
■ Sanitary:	11

total	42
--------------	-----------

Designers use different software systems for e.g.:

- Heaters
- Ventilators
- Heat-Exchangers
- Air-Outlets
- Silencers
- Valves

Why standards?

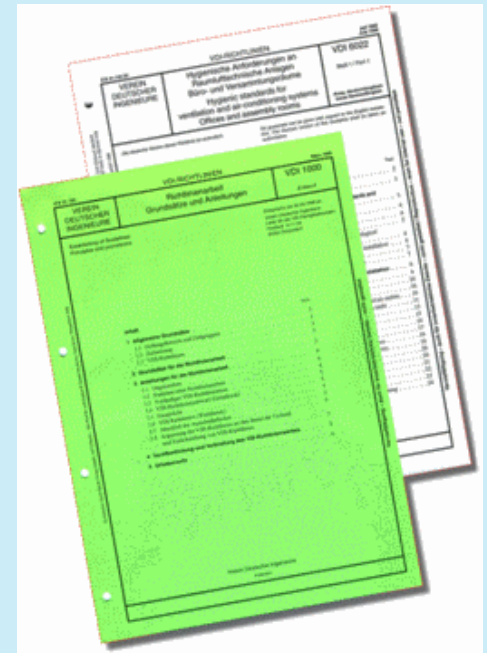
- Interoperability
- safety and reliability
- Business benefits
- planers and consumers choice
- Support of government policies and legislation

How to produce an standard?

- Observe **strict procedural rules**.
- Strive for **consensus**.
- involvement of **all interested parties**
- independence and impartiality
- Make your work **public and transparent**
- keep rules **up to date**
- ⇒ **acknowledged rule of technology (ARTs)!**

Legal obligations through ARTs?

- Application is voluntary
 - enables informed decisions
 - An ARTs is similar to an anticipated expert's opinion.
 - “condensed expertise“
 - can become part of laws and contracts
-
- ⇒ Deviations are permitted,
 - ⇒ resulting in a reversal of the burden of proof.



VDI Standards for Building Information Modeling

In general, the first parts of all VDI-Standards are structured similar in the chapters:

- Preliminary note
- Introduction
- Scope
- Normative references

However, the second part is structured in chapters according to the subjects of the content. The following slides provide an overview of such chapters of the current draft standards.

VDI 2552 Part 1 BIM – general framework

VDI 2552 Part 2 BIM – terms and definitions

- role allocation
- Objectives
- Digital infrastructure
- Models
- Process
- Data
- Legal framework

VDI 2552 Part 3

BIM - Quantity determination / Controlling

- Quantity determination for cost estimation
- Quantity determination for scheduling
- Quantity determination for call for bids and assignment
- Quantity determination for execution and deduction
- Quantity determination for operation

VDI 2552 Part 4

BIM – data exchange

- Structure of the data set
- Quality control
- Special models for planning and execution
- Special models for governmental control and approbation
- Assetmodel

VDI 2552 Part 5

BIM – data management

- Requirements for the data management
- Structure for the data management
- Collaboration
- Organization of data management systems
- Legal framework

VDI 2552 Part 6

BIM – Facility Management

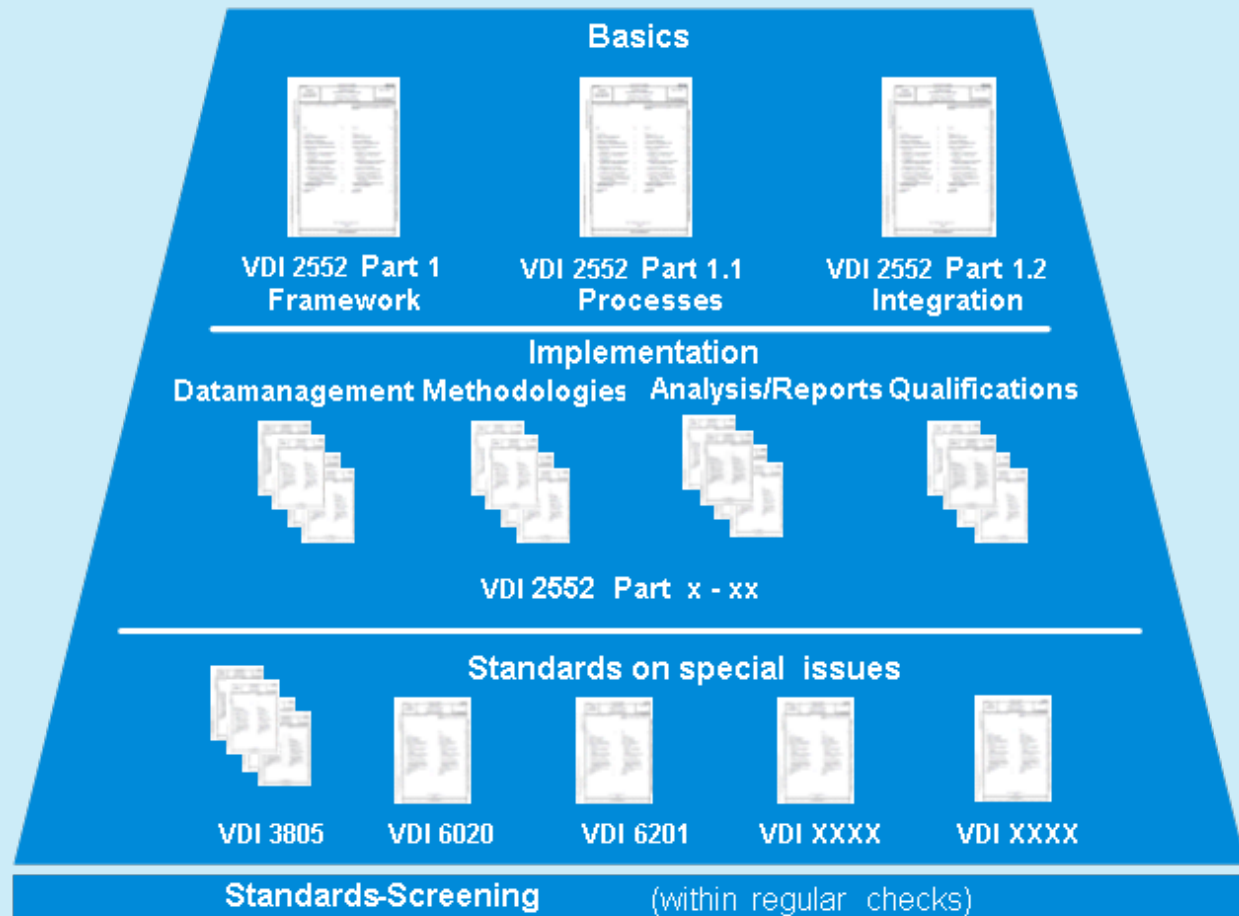
- Minimum requirements for the BIM model considering the life cycle
- Identification
- New Building
- Asset
- Revitalization
- Continuance

VDI 2552 Part X-XX

More VDI-Standards are in preparation:

- Processes
- Qualification
- ...

VDI Handbook Building Information Modeling





VDI 3805 Data Exchange in BS

ICS 05.240.99, 07.120

VDI-RICHTLINIEN

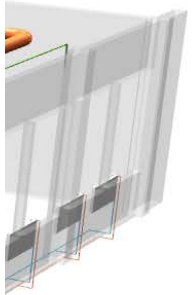
Oktober 2011
October 2011

VEREIN DEUTSCHER INGENIEURE	Produktdatenaustausch in der Technischen Gebäudeausrüstung Grundlagen Product data exchange in the Building Services Fundamentals	VDI 3805 Blatt 1 / Part 1 Ausg. deutsch/englisch Issue German/English																												
Die deutsche Version dieser Richtlinie ist verbindlich. The German version of this guideline shall be taken as authoritative. No guarantee can be given with respect to the English translation.																														
<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Inhalt</th> <th style="text-align: center;">Seite</th> <th style="text-align: left;">Contents</th> <th style="text-align: center;">Page</th> </tr> </thead> <tbody> <tr> <td>Vorbemerkung</td> <td style="text-align: center;">2</td> <td>Preliminary note</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Einteilung</td> <td style="text-align: center;">2</td> <td>Introduction</td> <td style="text-align: center;">3</td> </tr> <tr> <td>1 Anwendungsbereich</td> <td style="text-align: center;">4</td> <td>1 Scope</td> <td style="text-align: center;">5</td> </tr> <tr> <td>2 Normative Verweise</td> <td style="text-align: center;">4</td> <td>2 Normative references</td> <td style="text-align: center;">4</td> </tr> <tr> <td>3 Begriffe</td> <td style="text-align: center;">4</td> <td>3 Terms and definitions</td> <td style="text-align: center;">5</td> </tr> <tr> <td>4 Produktdatenmodell</td> <td style="text-align: center;">8</td> <td>4 Product data model</td> <td style="text-align: center;">9</td> </tr> </tbody> </table>			Inhalt	Seite	Contents	Page	Vorbemerkung	2	Preliminary note	3	Einteilung	2	Introduction	3	1 Anwendungsbereich	4	1 Scope	5	2 Normative Verweise	4	2 Normative references	4	3 Begriffe	4	3 Terms and definitions	5	4 Produktdatenmodell	8	4 Product data model	9
Inhalt	Seite	Contents	Page																											
Vorbemerkung	2	Preliminary note	3																											
Einteilung	2	Introduction	3																											
1 Anwendungsbereich	4	1 Scope	5																											
2 Normative Verweise	4	2 Normative references	4																											
3 Begriffe	4	3 Terms and definitions	5																											
4 Produktdatenmodell	8	4 Product data model	9																											

Problemangaben: VDI 3805 (Datei) deutsch
 For use address: VDI 3805 (File) German only

Informationen über die Rechte, insbesondere die Rechte an den Inhalten, sind in der Vorrede zu finden.

nicht gestattet / Not permitted - even for internal use - not permitted



different systems for e.g.:

gers

- Number of manufacturer small System**
- Heating:
 - Air Condition
 - Cooling Ceil
 - Sanitary:
-
- total**

VDI Standards and international importance

- VDI Standards are national standards
- Transfer to international Standards via DIN
- VDI 3805 becomes ISO 16757
- DIN NA 005-01-39 AA „Building Information Modeling”

Standardization as a consensual process...



VDI

VDI Agenda BIM

<http://www.vdi.de/technik/fachthemen/bauen-und-gebauedetechnik/fachbereiche/bautechnik/artikel/vdi-koordinierungskreis-bim/>





Thank you for your attention!

Contact:

VDI-Gesellschaft Bauen und Gebäudetechnik

Dipl.-Ing. Frank Jansen VDI

VDI-Platz 1

40468 Düsseldorf

Germany

+49 211 6214-313

jansen_f@vdi.de