BIM (Building Information Modeling) graduated schem digital planning and building of the BMVI (Federal Ministry of traffic and digital infrastructure)

18. Industry-Forum 2017

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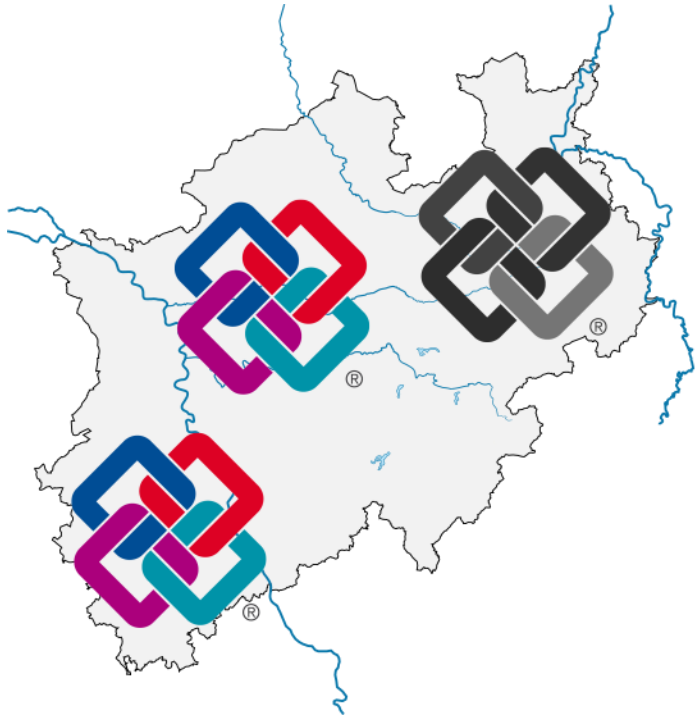
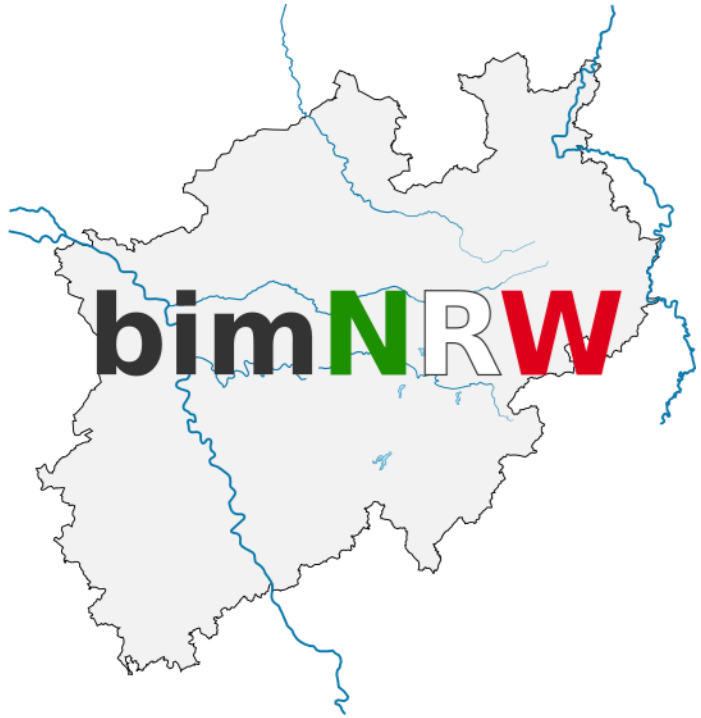
Agenda

- **The BIM Cluster NRW**
- Graduated scheme
- Potentialities and aims
  - Performance level 1
  - Fields of action and measures
- Current developing to graduated scheme
- Implementing with CADENAS


BIM
Cluster Rhein-Ruhr

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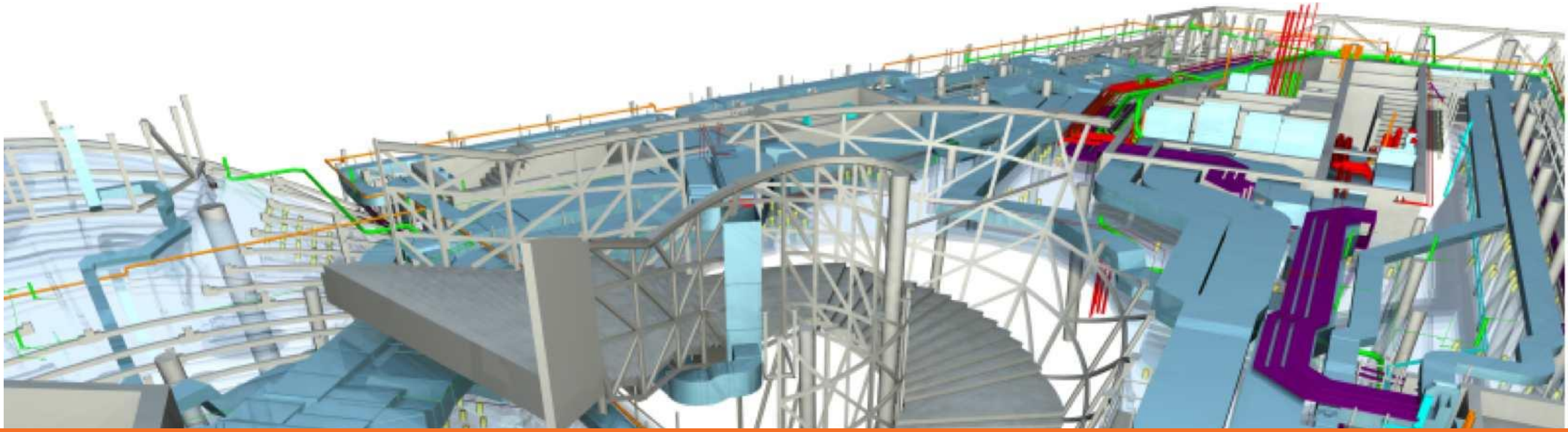

first digital, than real

To the graduated scheme

- **Graduated scheme**
- Potentialities and aims
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Development of the graduated scheme

June 2015

December 2015

January 2017

To the graduated scheme → Addressees

Large projects always lead again to delays and cost overruns

Recommendations for action in the final report of the reform commission:

–Development of a graduated scheme for infrastructure projects

–Development of a graduated scheme for building construction

–Development of BIM guidelines for cooperative planning and construction

–Unification of organizational standards

–Standardization of component descriptions

–Supporting an iniative to coordinate the BIM introduction in the entire construction and planning industry

–Close research gaps

–Support the training of BIM experts

Source: BMVI (2015-1), S. 9, 92.

The graduated scheme

- On behalf of the Federal Ministry of Transport and Digital Infrastructure (BMVI).
- Needs commitment from representatives of all sectors involved in planning and construction as well as public and private contractors.
- Should counteract unfavorable developments
- A model that

-the way to describe the application of digital planning, construction and operation.

-to increase the security of costs, deadlines and qualities.

The graduated scheme is aimed at:

–Public contractors of infrastructure construction

–Contractor of infrastructure construction

–Other public or private entities that can benefit from the guide as a basis

Source: BMVI (2015-2).

The graduated scheme→ Addressees

Source: Own representation according to BMVI (2015-2).

- Graduated scheme
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Performance level 1

- Describes the minimum requirements that will have to fulfill the pilot projects from 2017 and, from 2020, all new projects to be planned in infrastructure construction

- Public contracting authorities within the scope of the BMVI must then be able to implement these requirements.

- Contractors must offer their services according to the requirements of the contractors.

<u>Areas of application of the performance level 1:</u>

– Dates

– Processes

– Qualification

Source: BMVI (2015-2).

Performance level 1→Requirements: Dates

- „BIM as a planning instrument "is to be included in the contract.
- Client shall, in cooperation with the later user or operator, create Customer Information Requirements (AIA).
- It is necessary to specify exactly which
  - When
  - in which depth of detail
  - in which format
- Should be provided (Geometry + component attributes)

Source: Krieger et al. (2017).

Performance level 1→Requirements: Dates

- It is necessary to ensure that hardware and software are generally available in the market.
- Software products may not be specified (non-discriminatory).
- It is necessary to request manufacturer-neutral exchange data formats, which allow an allocation of components, rooms or objects (if necessary, a combination of different formats)
- All services must be delivered on the basis of 3D-model-based work (planning in separate departments remains intact)

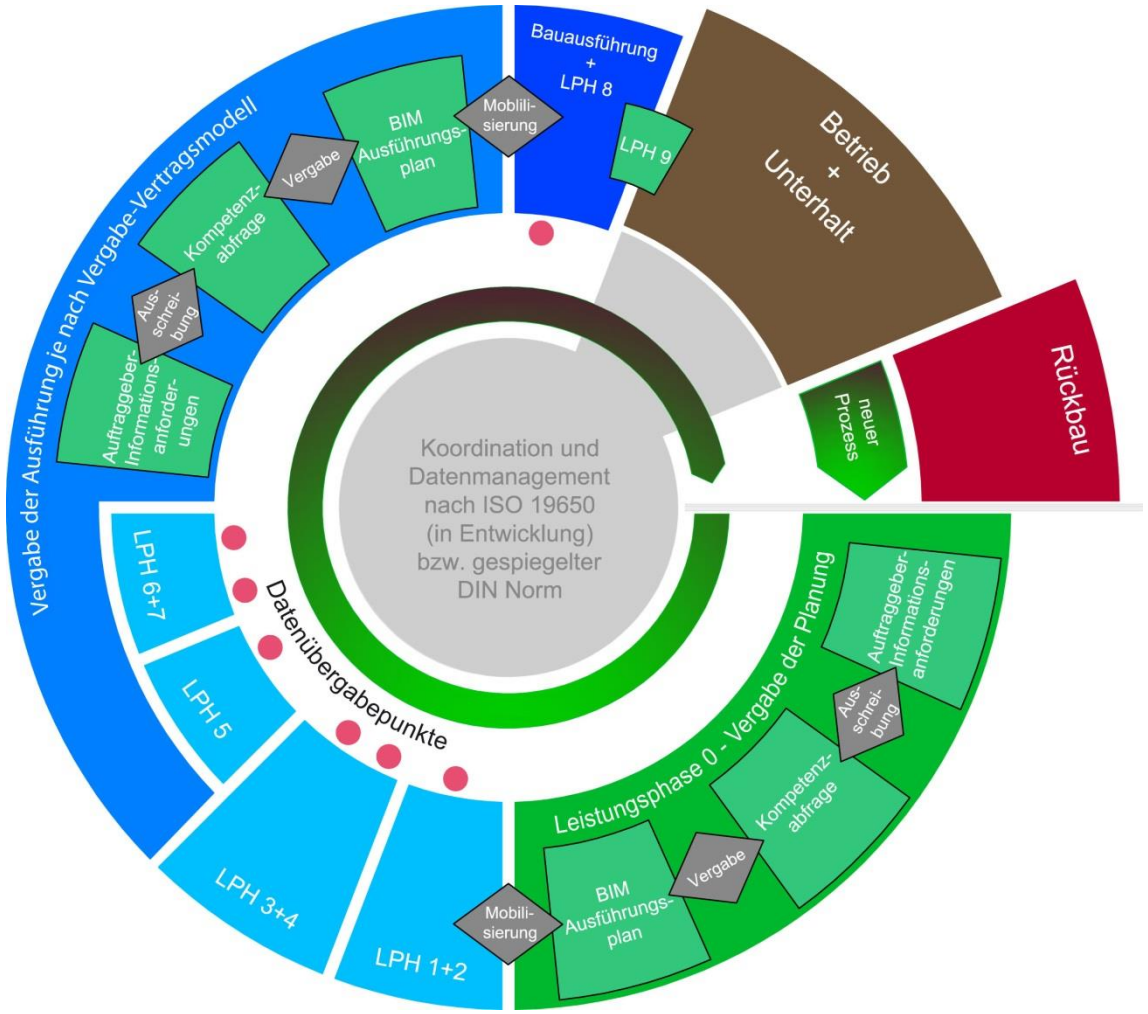
Source: Krieger et al. (2017).

Performance level 1→Requirements: Processes

- BIM Development Plan (BAP) is the timetable for each BIM project.
- It defines processes for creating the data required in the AIA, including:
  - BIM Objectives and applications,
  - Roles, functions,
  - Processes and interactions,
  - Used technology and interfaces.
- The client is responsible for the production, but may contractually transfer this to a contractor.
- The creation and provision of information takes place in a “common data environment".
- It is the basis of the processes described in the BAP for the organized storage and exchange of the generated data

Source: Krieger et al. (2017).

Performance level 1→Requirements: Reference process



Quelle: BMVI (2015-2).

Performance level 1→Requirements: Qualification

- In the procurement procedure, the contractors must:

-About the necessary BIM skills

-Partnerships

Source: Krieger et al. (2017).

Fields of action and measures

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Fields of action and measures → Dates

- Dates

–Client Information Requirements (AIA)

- Catalogs with model requirements are to be developed
- Preparation of recommendations on the drafting of contracts
- BIM is to be prepared when BIM is worthwhile
- Implementation of pilot projects
- Development of BIM databases

-Development of manufacturer-neutral data formats and standards

- German experts are to be involved in international standardization processes.
- Expansion of the IFC format for road and rail
- Development of certification procedures for the evaluation of software

Source: BMVI (2015-2).

Fields of action and measures → Processes, qualification, etc.

- Processes
  - Creation of a BIM processing plan
  - Active participation in ISO 19650
  - Creation of guides and sample examples for the BAP
  - Development of training courses

- Qualification, contracting and awarding
  - Inspect the contractors for their BIM competence
  - Use of the competitive dialogue on the award of services
  - Active inclusion of higher education institutions
  - Provide the necessary knowledge in education
  - Examination of the meaningfulness of sample contracts

Source: BMVI (2015-2).

Current developing to graduated scheme

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- **Current developing to graduated scheme**
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Current developing to graduated scheme

- ISO 19650 has been published as a preliminary draft
- VDI 2552 Sheet 5 has been published as a preliminary draft
- A BIM Maturity Metric was created
- Use of software tools was only possible by manual adjustments
- In the second stage contracts, procurement processes and the operation

will be further elaborated

- Foundation of the "BIM4INFRA 2020"

Source: BMVI (2017).

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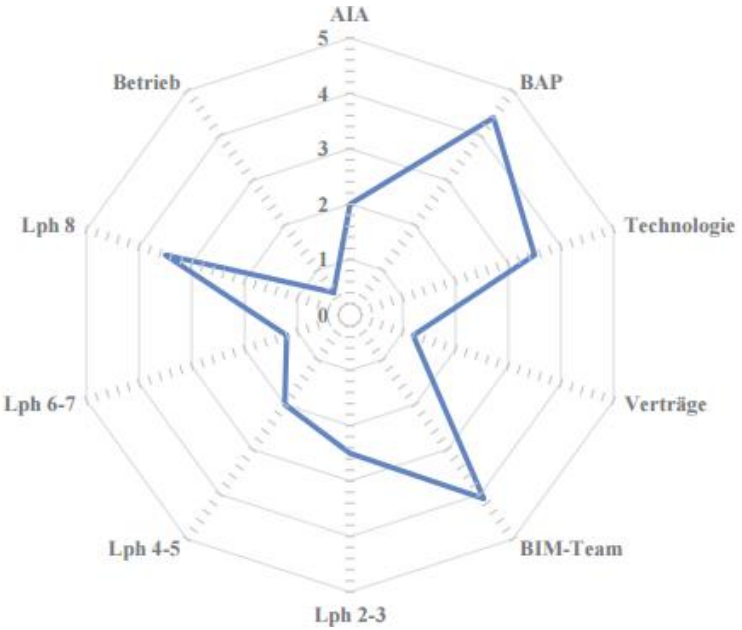

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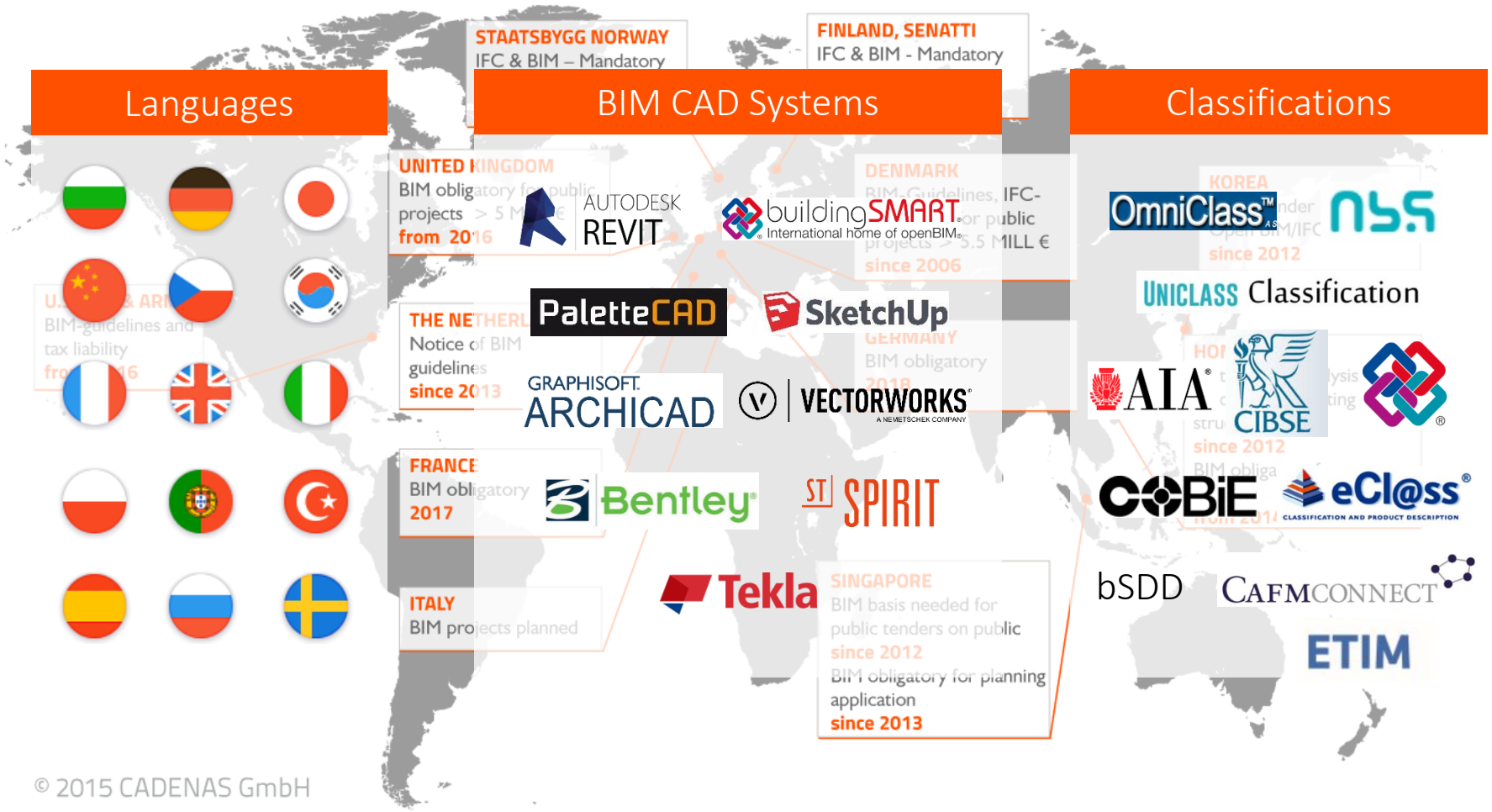
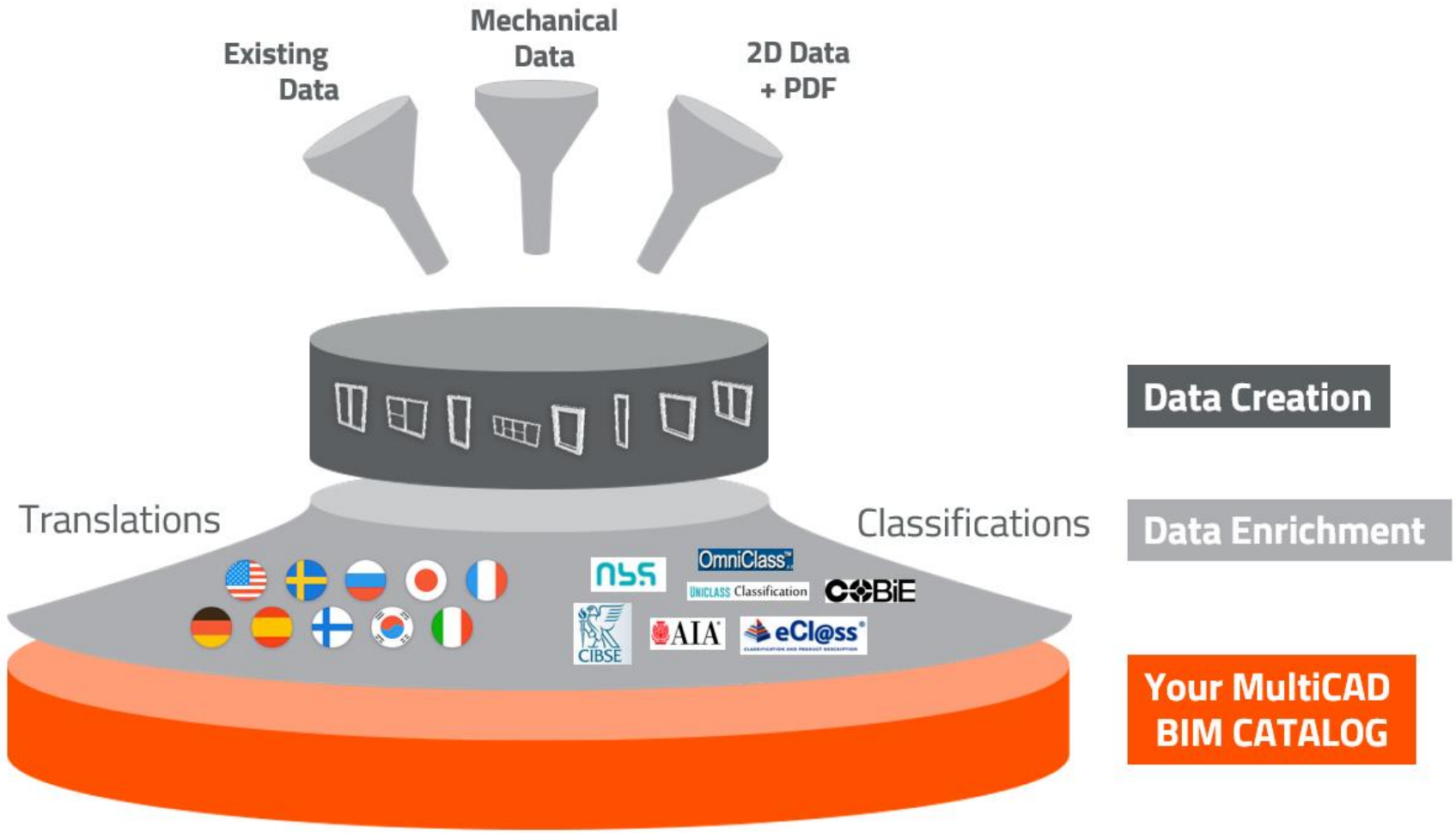
BIM Worldwide standards and software



Quelle: CADENAS.

Example CADENAS



Quelle: CADENAS.

Implementing with CADENAS

- Cooperation in the field of open component catalogs

-Open component catalogs will come, here it is important to help shape this from the beginning, to represent customer interests.

- Intensive exchange on the topic of BIM and future developments.

Cooperation in research, together with universities.

Thank you very much!

Let's work together on the BIM topic!

Sources

- BMVI (2015-1); „Endbericht: Reformkommission Bau von Großprojekten“. Bundesministerium für Verkehr und digitale Infrastruktur (BMVI), Berlin, 2015.
- BMVI (2015-2); „Stufenplan Digitales Planen und Bauen: Einführung moderner, IT-gestützter Prozesse und Technologien bei Planung, Bau und Betrieb von Bauwerken“. Bundesministerium für Verkehr und digitale Infrastruktur (BMVI), Berlin, 2015.
- BMVI (2017); “Umsetzung des Stufenplans Digitales Planen und Bauen”. Bundesministerium für Verkehr und digitale Infrastruktur (BMVI), Berlin, 2017.
- Krieger V. und Tulke J. und May I., Bramann H. und König M. (2015); „Stufenplan Digitales Planen und Bauen: Entwicklung und Umsetzung“. Planen und Bauen 4.0 (Hrsg), Berlin, 2015. Presentation.