

Spotlight on Information

Determining the specific information demand in planning, building and operation of real estate

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14th ERES Education Seminar, Kaiserslautern



“Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?”

– T.S. Eliot



Introduction – Wiebke Uhlenbruch

- Work integrated bachelor's degree in 'Wirtschaftsingenieurwesen' (Industrial Engineering and Management)
DHBW / Fraport AG
- Fraport AG, Department of facility management, Terminal 1, Frankfurt Airport
- Master's degree in 'Sustainable Building Technology'
University of Nottingham, UK
- Fraport AG, Department of facility management, Terminal buildings, Frankfurt Airport
- Since 2013: University of Stuttgart,
Institute for Construction Economics



irem
industrial real estate management



Information - Definition

“Information is any entity or form that provides the answer to a question of some kind or resolves uncertainty. It is thus related to data and knowledge, as data represents values attributed to parameters, and knowledge signifies understanding of real things or abstract concepts. As it regards data, the information's existence is not necessarily coupled to an observer (it exists beyond an event horizon, for example), while in the case of knowledge, the information requires a cognitive observer.”

- Wikipedia: 'Information'



Information - Definition

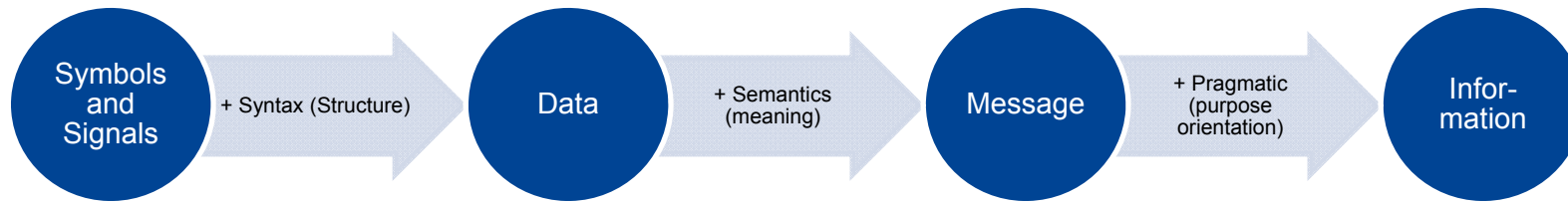
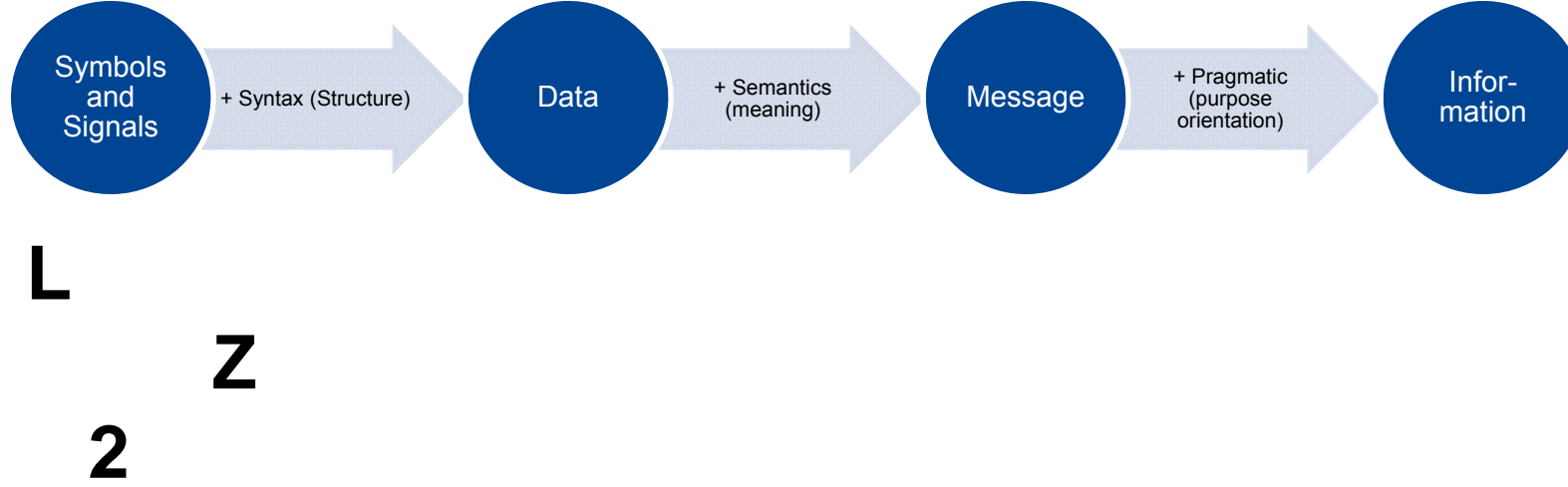


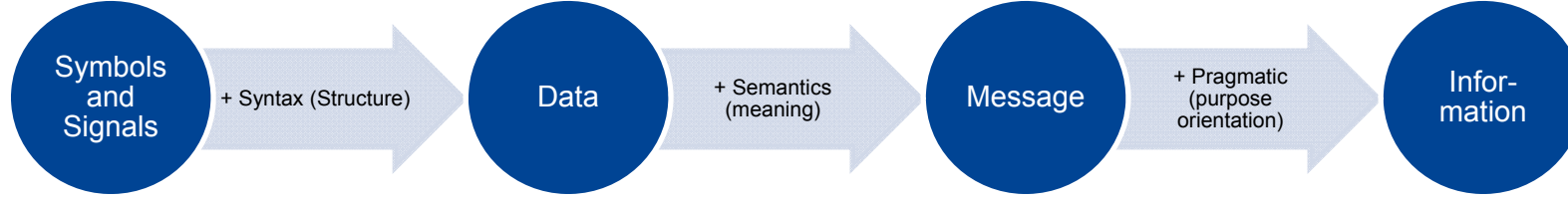
Image in dependence on: Tiemeyer, E. (Ed.) (2013) Handbuch IT-Management. 5., überarb. und erw. Aufl. München: Hanser.

Information - Definition



FWANDOPTIMIERUNG INVESTITIONEN VERGABE KONTROLLE ENERGIE PLANUNG KALKULATION MANAGEMENT IMMOBILIEN LEBENSZYK
GF
INVESTITIONEN ABRECHNUNG TERMIN PLANUNG KONTROLLE RESSOURCEN KOSTEN PLANUNG FINANZIERUNG
NGAUSSCHREIBUNG VERGABE OPTIMIERUNG
SZYKLUS IMMOBILIEN MANAGEMENT KALKULATION ENERGIE PLANUNG KONTROLLE VERGABE INVESTITIONEN OPTIMIERUN
IEKT FACILITY MANAGEMENT ABRECHNUNG KONTROLLING ENERGIE PLANUNG BAUWESEN FINANZIERUNG

Information - Definition



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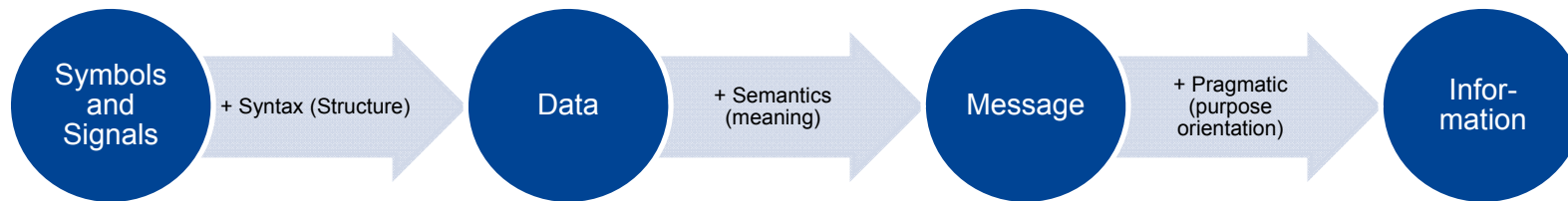
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Information - Definition



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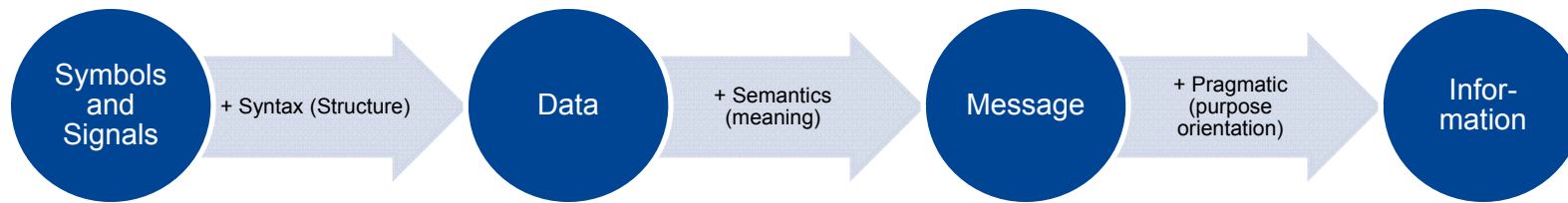
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Information - Definition



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Information - Definition

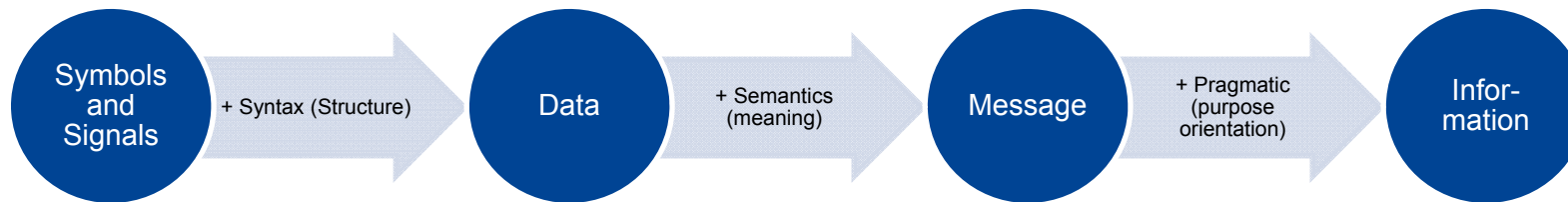


Image in dependence on: Tiemeyer, E. (Ed.) (2013) Handbuch IT-Management. 5., überarb. und erw. Aufl. München: Hanser.

Data + Meaning + Purpose = Informationen

→ **Information is data which has a meaning and a purpose.**

Information in Real Estate



FWANDOPTIMIERUNG|INVESTITIONEN|VERGÄBE|KONTROLLE|ENERGIEPLANUNG|KALKULATION|MANAGEMENT|IMMOBILIENLEBENSZYK
GF|OKONOMIE|RESSOURCENKOSTENPLANUNG|FINANZIERUNG|ENERGIEPLANUNG|LEBENSZYKLEBENSZYKLUSMANAGEMENT|IMMO
NINVESTITIONEN|ABRECHNUNG|TERMINPLANUNG|KONTROLLING|ORGANISATION|ARCHITEKT|LEBENSZYKLUSMANAGEMENT|KALKULATION|IMMO
NGAUSSCHREIBUNG|VERGÄBEOPTIMIERUNG|ENERGIEPLANUNG|FACILITYMANAGEMENT|INVESTITIONEN|VERGÄBE|BGF|ORGANISATION|KALK
SZYKLUS|IMMOBILIENMANAGEMENT|KALKULATION|ENERGIEPLANUNG|BAUWESEN|FINANZIERUNG|KONTROLLE|VERGÄBE|INVESTITIONEN|OPTIMIERUN
EKT|FACILITYMANAGEMENT|ABRECHNUNG|KONTROLLING|ENERGIEPLANUNG|BAUWESEN|FINANZIERUNG|KONTROLLE|VERGÄBE|IMMOBILIENLEBENSZYK|OKONOMIE

Information in Real Estate

„Es ist fundamental für den Erfolg eines Bauprojekts, dass diese [zu analysierenden und bewertenden] Informationen in der richtigen Qualität und Tiefe zum richtigen Zeitpunkt im richtigen Format der richtigen Person vorliegen.“

- Bundesministerium für Verkehr und digitale Infrastruktur (2015), Reformkommission Bau von Großprojekten - Endbericht, p. 88

It is fundamental for the success of major construction projects that analysable and assessable information is at hand in the right quality and depth at the right point in time in the right format for the right person.

Federal Ministry of Transport and Digital Infrastructure (2015)
Construction of Major Projects Reform Commission - Report



Information in Real Estate

Information...

- In the right quality and depth
- For the right person
- At the right point in time
- In the right format



Information in Real Estate

Information...

- In the right quality and depth
- For the right person
- At the right point in time
- In the right format

Missing data leads to...

- Repeated data collection
- Poor basis for decision-making
- Lack of Efficiency
- Lack of Comparability
- Economic damage



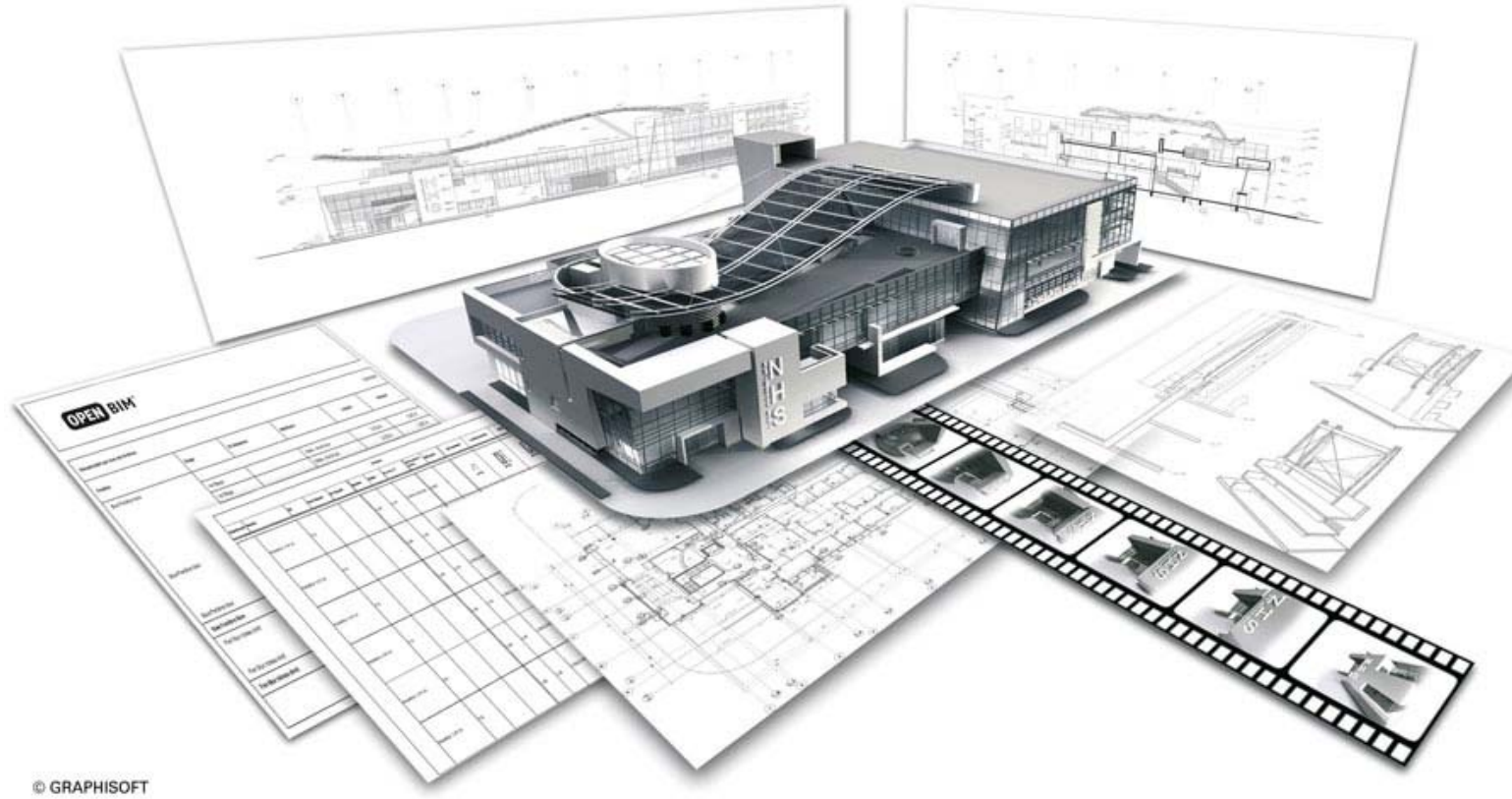
Information in Real Estate

“The objective of this study is to identify and estimate the efficiency losses in the U.S. capital facilities industry resulting from **inadequate interoperability**. This study includes design, engineering, facilities management and business processes software systems, and redundant paper records management across all facility life-cycle phases. Based on interviews and survey responses, **\$15.8 billion in annual interoperability costs** were quantified for the capital facilities industry in 2002. Of these costs, **two-thirds are borne by owners and operators**, which incur most of these costs during ongoing facility operation and maintenance (O&M).

- National Institute of standards and Technology (NIST) (Ed.) (2004), *Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry*, p. v



Building Information Modelling



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Building Information Modelling

BIM is a Method not a software

Three-dimensional

Cooperative

Digital

Transparent Communication

Covers the entire Lifecycle



Building Information Modelling

„Trotz eines umfangreichen Einsatzes an Informations- und Kommunikationstechnik scheinen Informationsprobleme in unseren Tagen zumindest nicht weniger zu werden.“

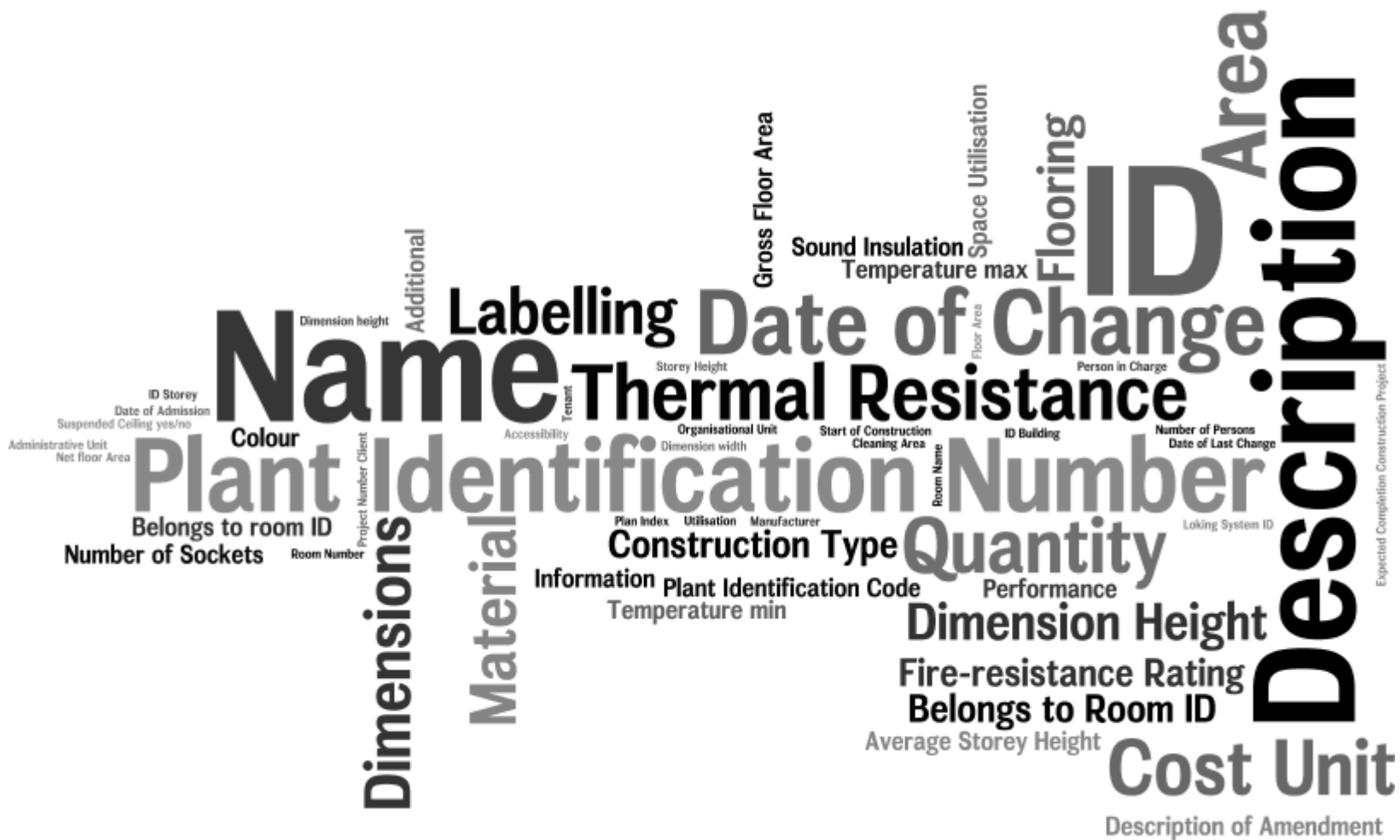
- Tiemeyer 2013, S. 578

Despite the extensive usage of information and communication technology it seems that informational problems nowadays do (at least) not decrease.

- Tiemeyer 2013, S. 578



Building Information Modelling



FKWANDOPTIMIERUNGVESTITIONENVERGABEREKONTOLENERGIEPLANUNGKALKULATIONMANAGEMENTIMMOBILIENLEBENSZYK
 GFANALYSEINVESTITIONENABRECHNUNGTERMINPLANUNGCONTROLLINGORGANISATIONARCHITEKTLEBENSZYKLUSMANAGEMENTKALKULATIONIMMO
 NGAUSSCHREIBUNGVERGABEOPTIMIERUNGMANAGEMENTKALKULATIONENERGIEPLANUNGSANWERTUNGKONTROLLEVERGABEINVESTITIONENOPTIMIERUN
 IKTACTILITYMANAGEMENTABRECHNUNGCONTROLLINGENERGIEPLANUNGBAUWESENFINANZIERUNGKONTROLLEVERGABEINVESTITIONENOKONOM

Building Information Modelling



Data in the Building Lifecycle

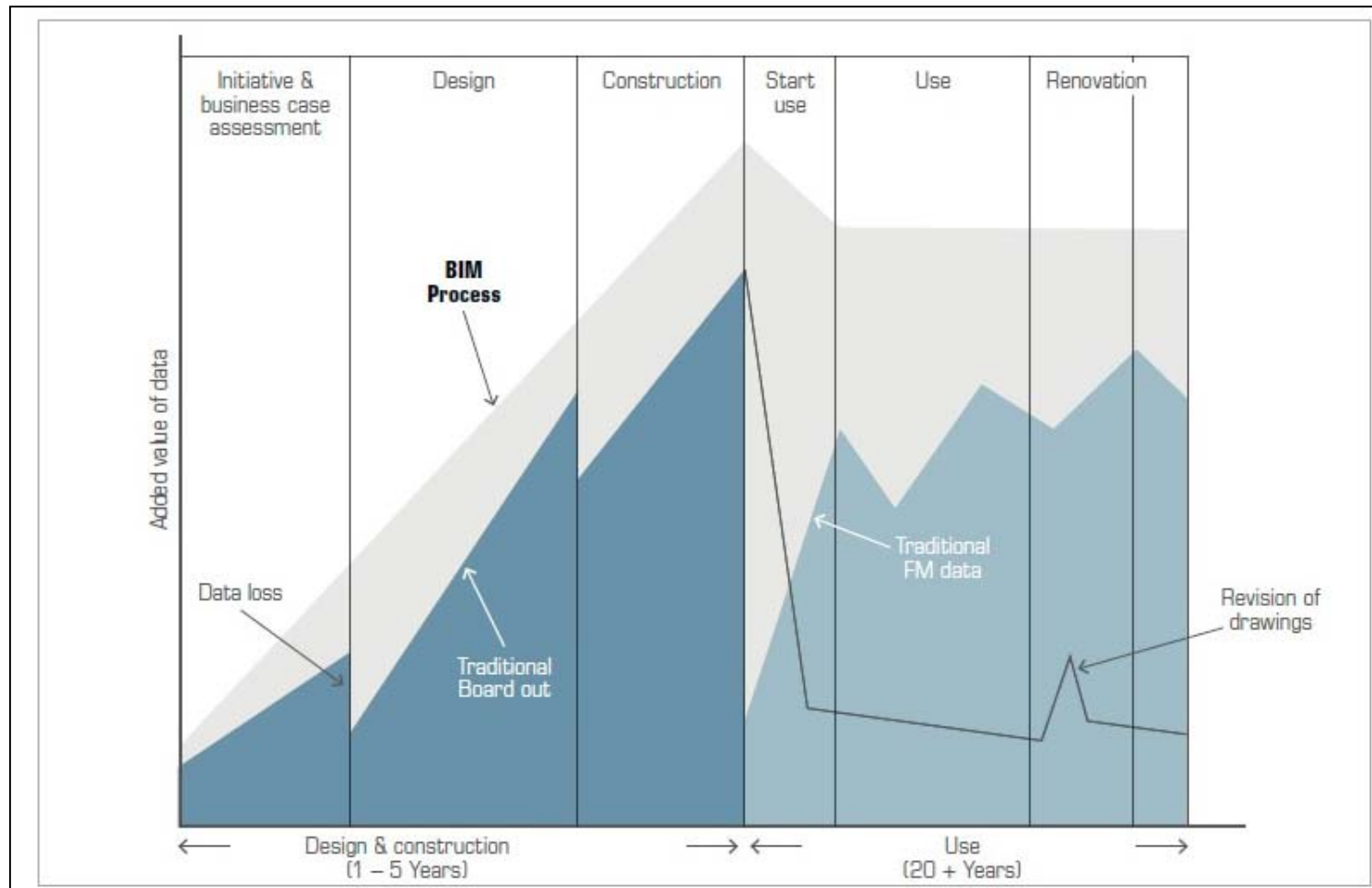


Image: Building data 3; Source: GEFMA (2018) Building Information Modeling im Facility Management, p. 13, according to: Eastman, C. (2008)

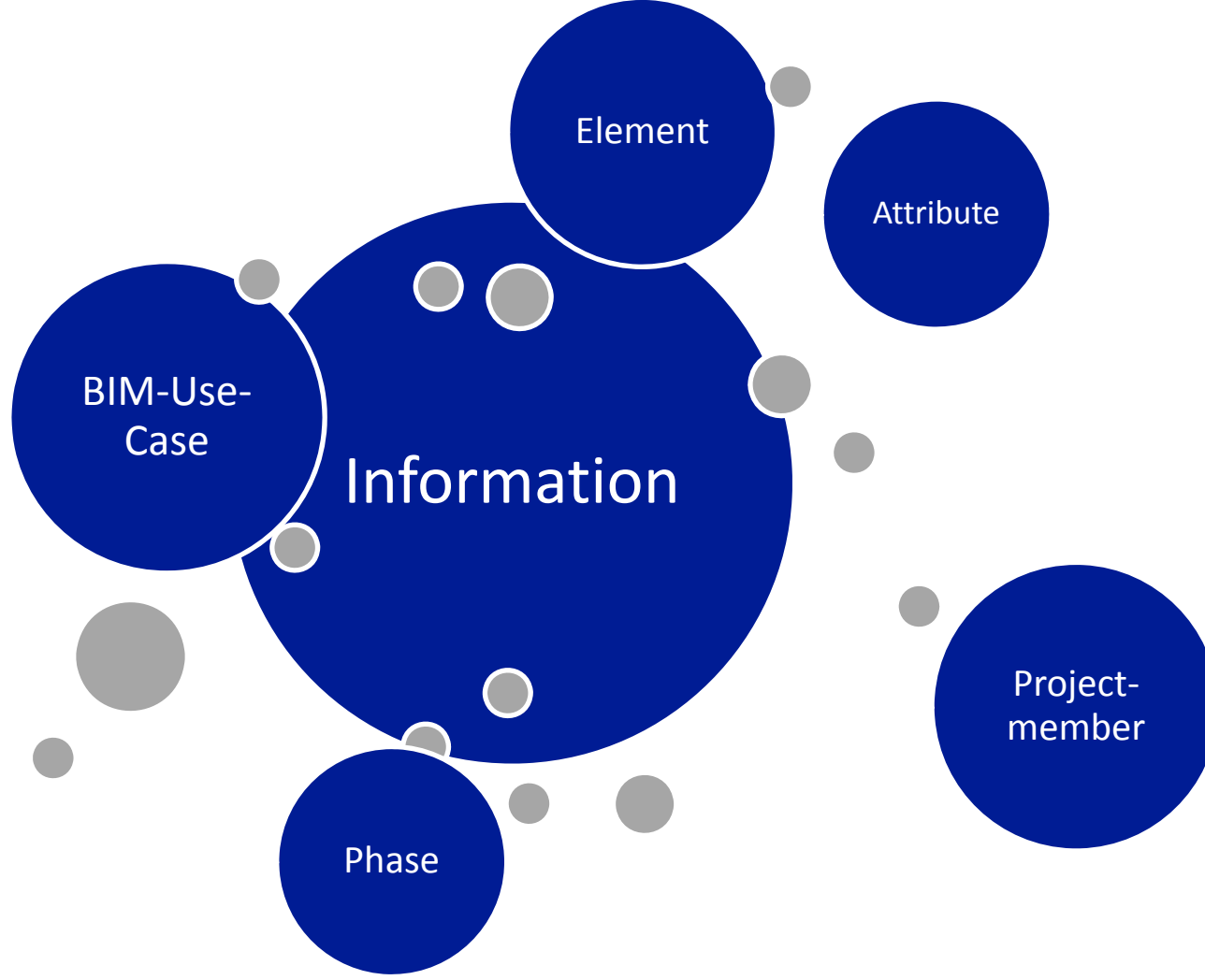
Information Demand

„Clients have to be capable of defining their BIM requirements when tendering design and construction works.“

- Federal Ministry of Transport and Digital Infrastructure (2015), Road Map for Digital Design and Construction, p. 5



Information Demand



Information Demand



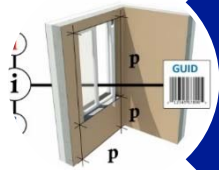
For what?

- BIM-Use-Case



When?

- Phase



What?

- Attribute und Element



Who?

- Project Members

Project 'Data Model'

Generating a data model for planning, building, construction and operation

In cooperation with:



Project Data Model – Aim of the Project

Generating a data model for Planning, building, construction and operation

- Catalogue with objects and Attributes
- Structured and Filterable according to BIM-Use-Cases and Phases
- User-optimised
 - clearly arranged
 - intuitive
 - extensible
- Focus on Operation and information transfer from one phase to another



Project Data Model – Use of the Results

The Data Model is a basis for

- Building owner's information requirements
- Information delivery manual
- Project Execution Plan

- Verification of existing information requirements
- Examination of database to find unnecessary data



Review: Existing Data Models

Examples:

- ‚Merkmalsserver‘ der ÖNORM A-6241 (<http://db.freebim.at/>
New version: <https://dev.plandata.at/freebim-import/>)
 - Very extensive ➤ unübersichtlich
 - Filterable (Phases)
 - Information can not be filtered in regard to BIM-Use-Cases
(in the new Version „results“ are filterable)
- bSDD - buildingSMART Data Dictionairy (<http://bsdd.buildingsmart.org/#>)
 - BuildingSMART ➤ IFC
 - International library of Attributes und Objekts with Genuine Unique Identifier (GUID)
 - Can not be filtered

Review: Existing Data Models

Further Examples:

- ‚BIM Profile‘, CAFM Connect
(<https://www.cafm-connect.org/bim-profile/>)
 - Not a complete database
 - Individual ‚BIM Profiles‘ (Elements with Attributes) for specific BIM-Use-Cases e.g. ‚Door inspection and maintenance‘
- BMW Group - Level of Development Generator
 - Can be filtered according to phases and BIM-Use-Cases
 - 16 BIM-Use-Cases, not very detailed especially not in Operation (FM)



BIM-Use-Cases - Examples



BIM-Use-Cases – Basis

Basis for BIM-Use-Cases:

- Literature
- Expert-Interviews



Basis for Elements and Attributes:

- Data catalogues

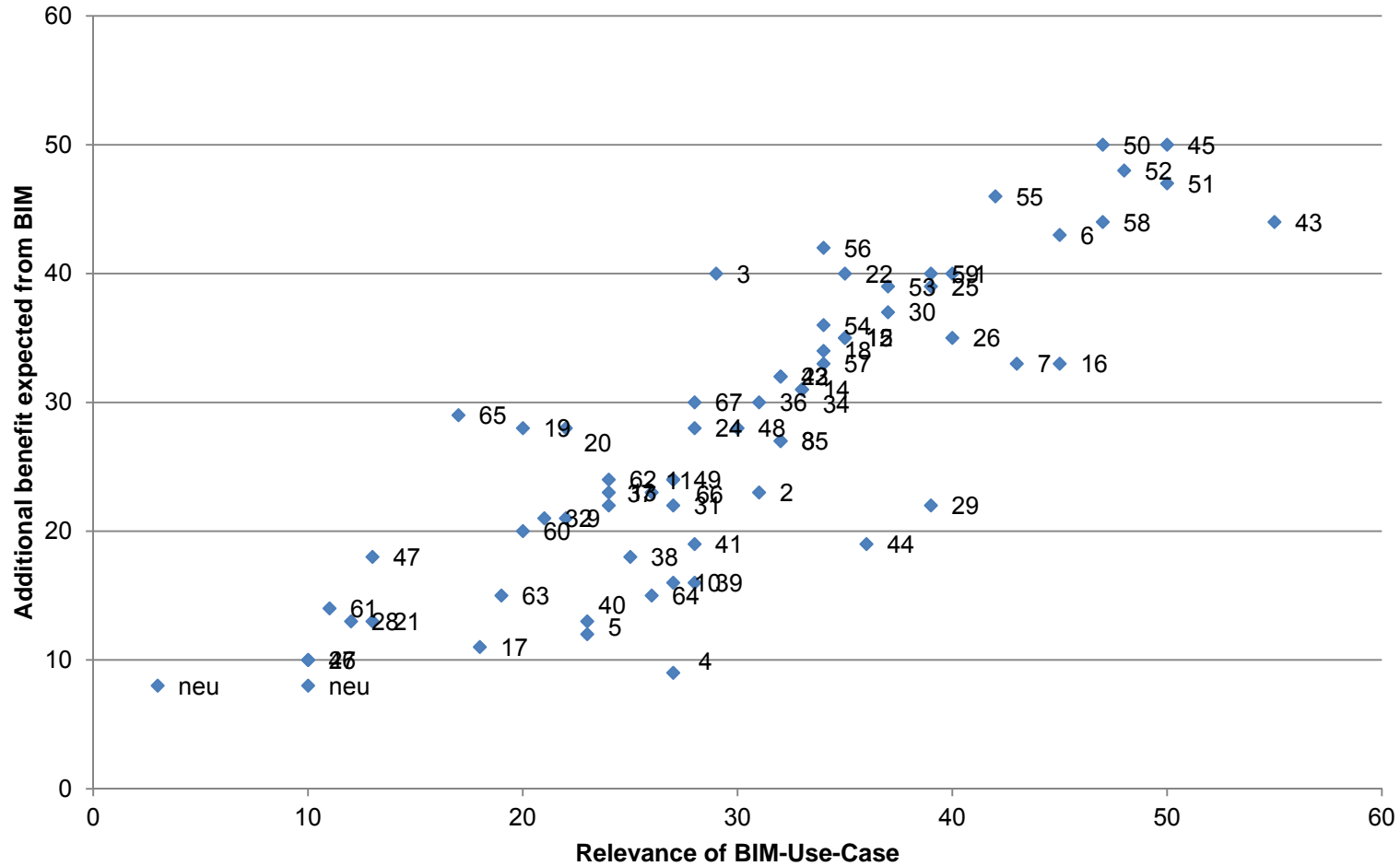
Connection BIM-Use-Case – Elements and Attributes:

- Expert Interviews



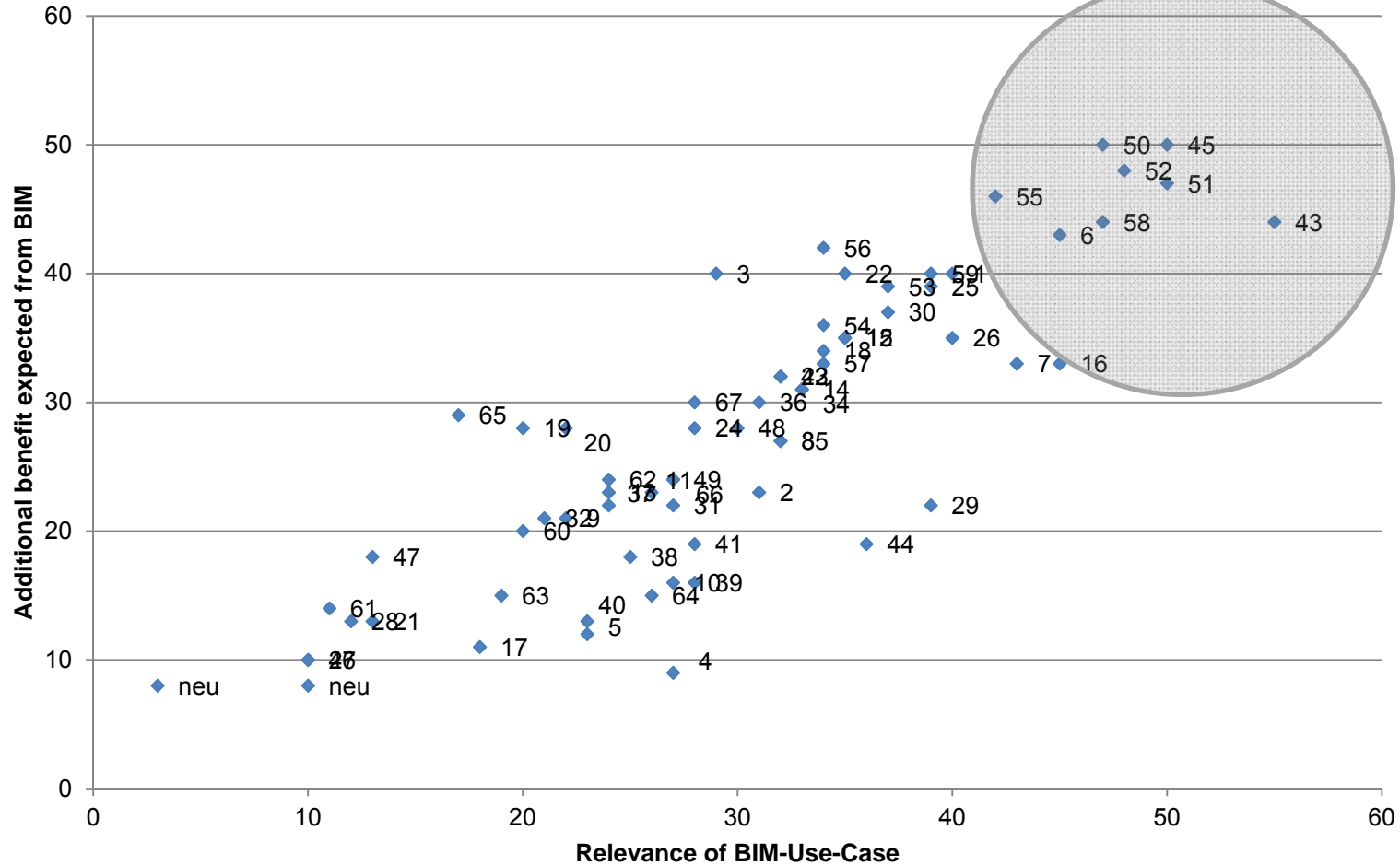
Ranking of BIM-Use-Cases – Work in Progress

BIM-Use-Cases - Relevance / Additional Benefit



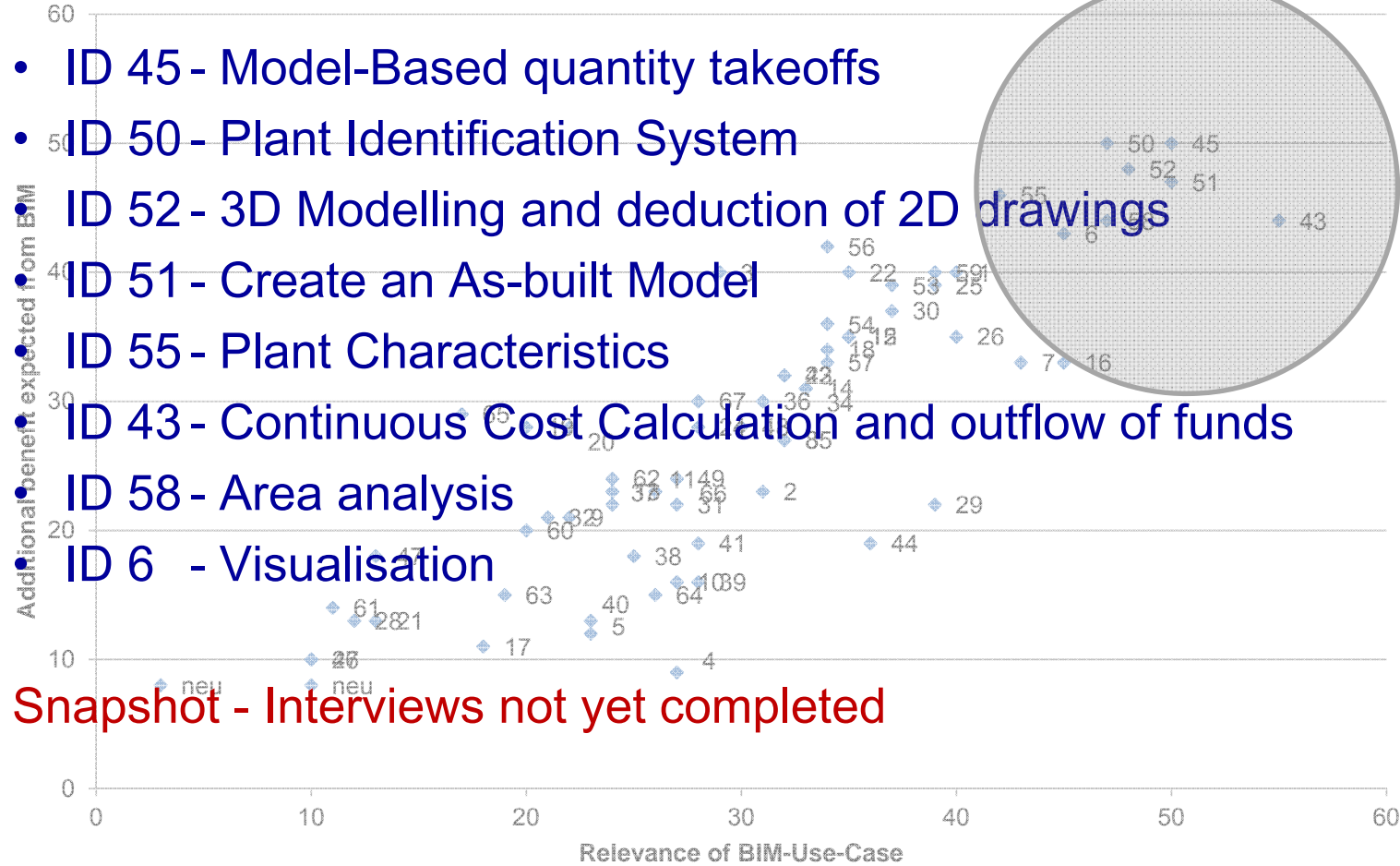
Ranking of BIM-Use-Cases – Work in Progress

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Ranking of BIM-Use-Cases – Work in Progress

BIM-Use-Cases - Relevance / Additional Benefit



Snapshot - Interviews not yet completed

Project Data Model - Outlook

The Data Model is a basis for

- Building owner's information requirements
- Information delivery manual
- Project Execution Plan

- Check existing information requirements
- Check data for redundants



Conclusions for Education

- Information is data which has a meaning and a purpose.
- Change in perspective -> Understanding other parties -> collaborative and cooperative work
- Consultancy of building owner in „ordering“ information is a new field of work for real estate professionals and is in intense demand in the context of BIM.
- There already are catalogues that help to answer the questions „What for?“ „What?“
- The Data Model will provide an adequate tool for consultancy



Contact



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