

Modeling an Information Architecture on Market Data for Data Governance

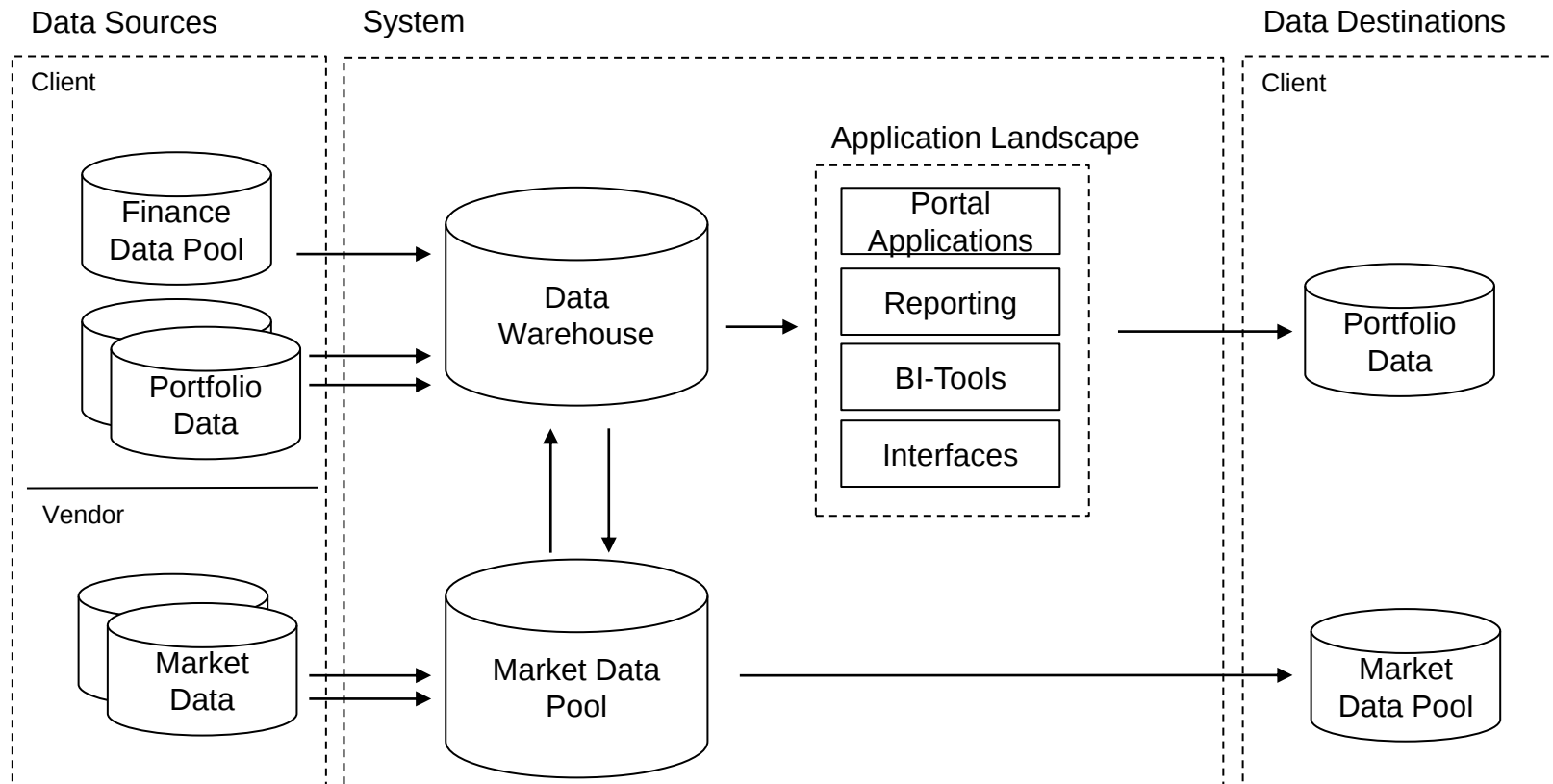
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1. System Overview
2. Research Questions
3. Research Process
4. Research Artifact I: Requirements
5. Research Artifact II: Information Architecture
6. Data Governance
7. Evaluation
8. Summary

System Overview: Visualization



Data Sources:

1. Client's Investment Data
2. Vendor's Market Data

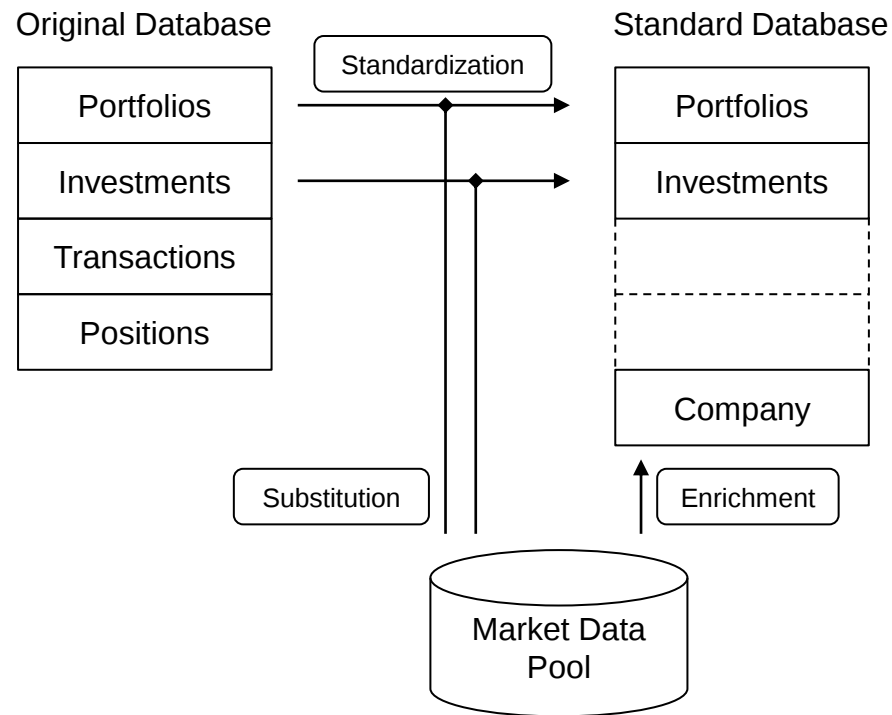
Product:

1. (Enhanced) Market Data
2. Financial report or analysis

Clients: Financial & Insurance Companies

1. Receiving Market Data
2. Outsourcing their financial reporting

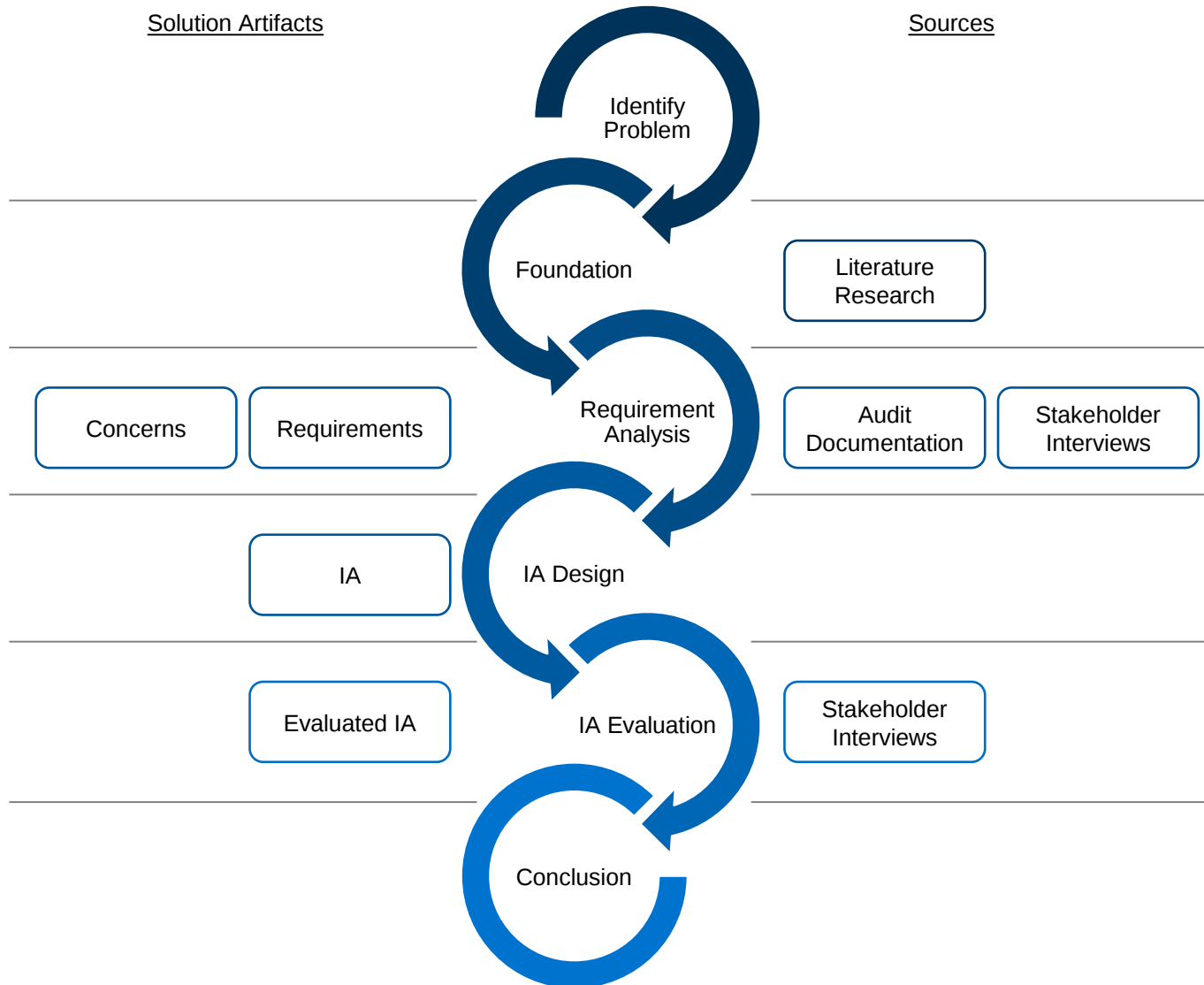
System Overview: Original vs Standard Data



Problem:

- Disclosure of information about the internal structure of a company
 - Large-scale distributed systems with high complexity, little documentation and no implemented EA
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1. What are the requirements (from laws, audits, license agreements, stakeholder) for processing Market Data?
2. How does an Information Architecture look like, designed for the purpose of answering requirements on Market Data?
3. What Data Governance measures can be implemented to support the compliance to requirements on Market Data?

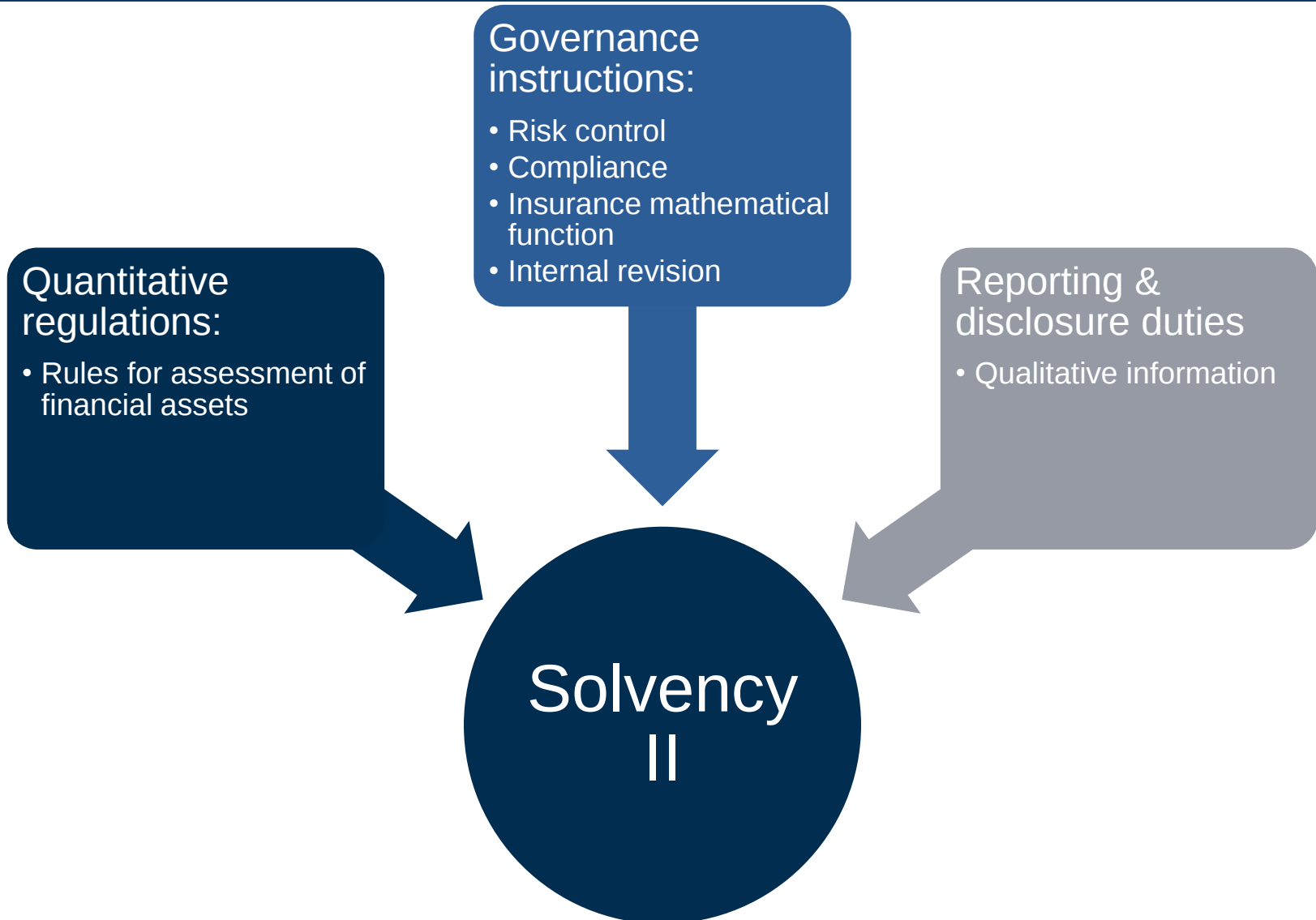


[S T 95] S.T. March and G.F. Smith: "Design and natural science research on information technology"

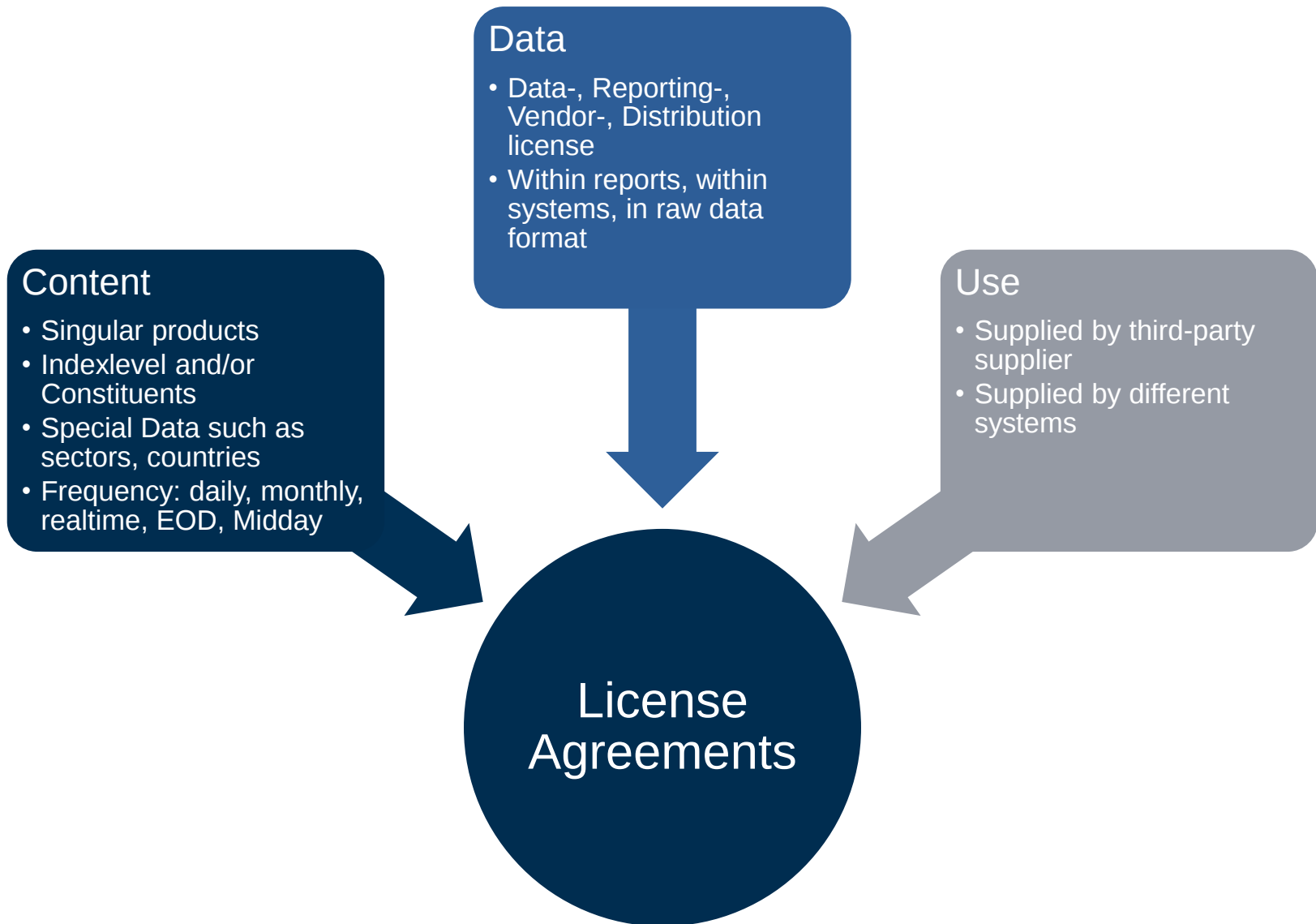
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Examples identified at IDS:

- Solvency II
Quantitative regulations, Governance instructions and Qualitative reporting
- License Agreements
By content, use and source
- Vendor Audits
List of users, Applications and type of data along the lifecycle of data
- Company internal Stakeholder
Data quality, user authorization, need for action and system understanding



[Bund 14] Bundesanstalt für Finanzdienstleistungen (BaFin): "Solvency II: Aufbau und Gesetzgebung"



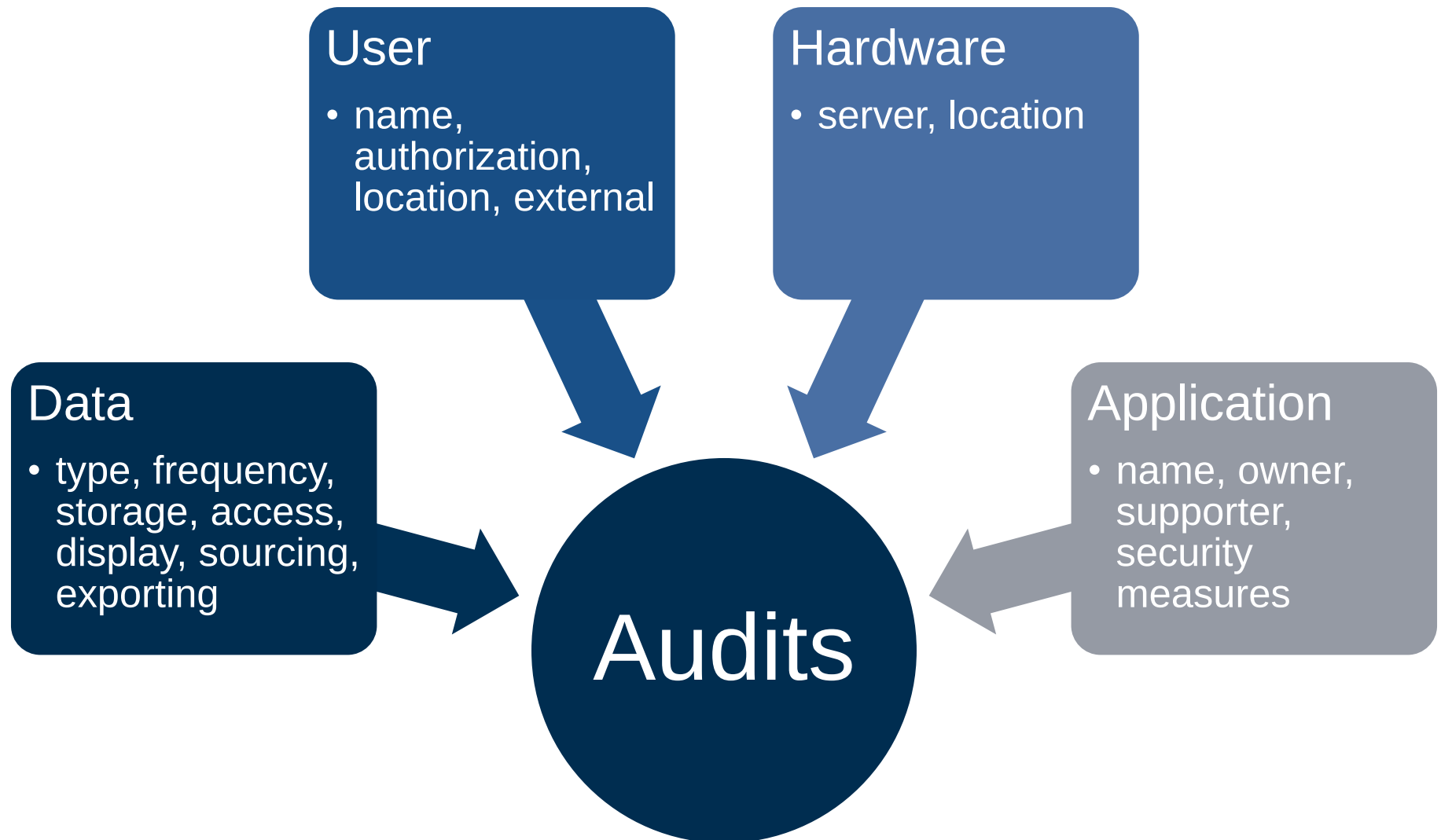
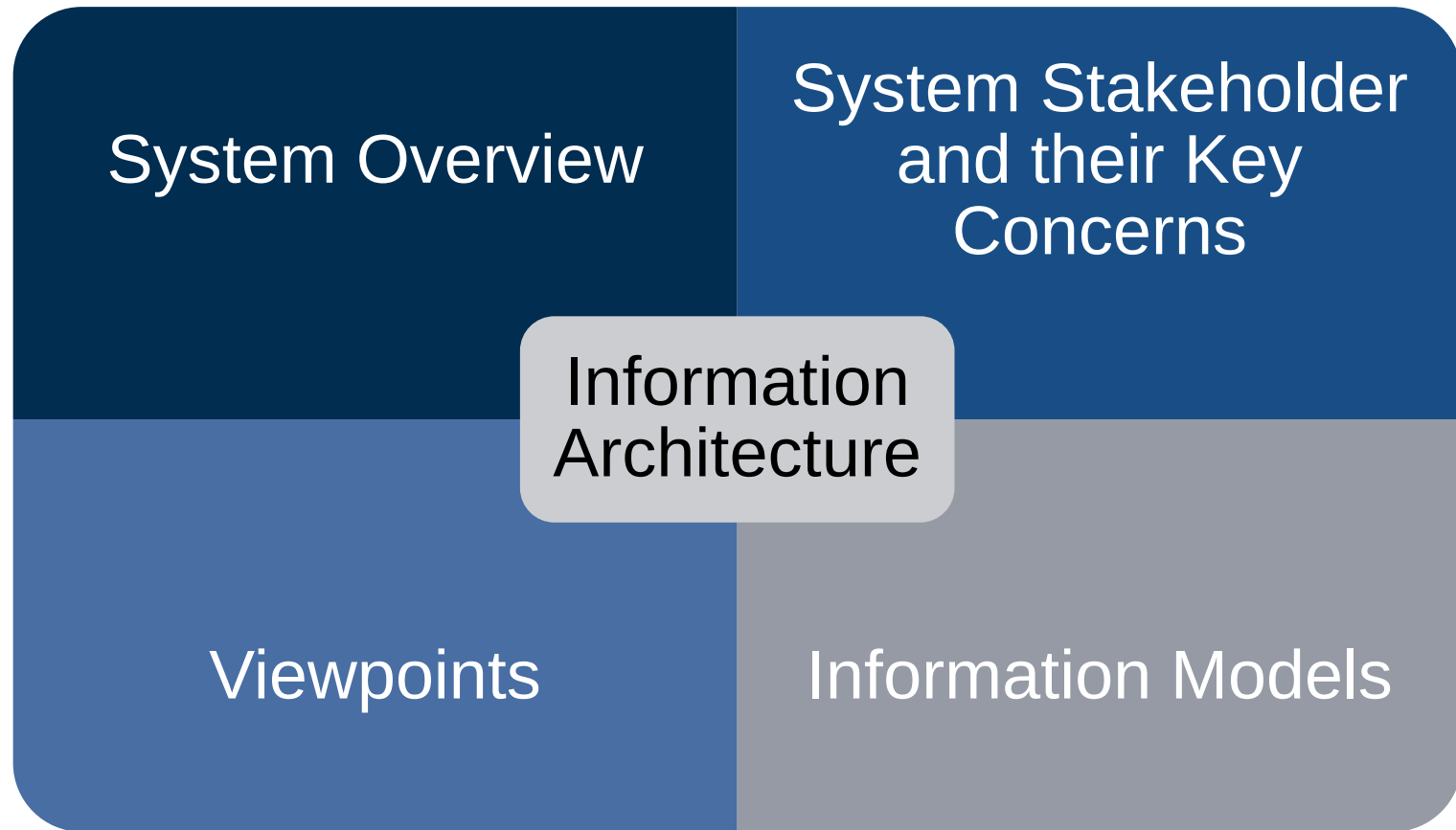


Table 3.4: List of relevant Stakeholder

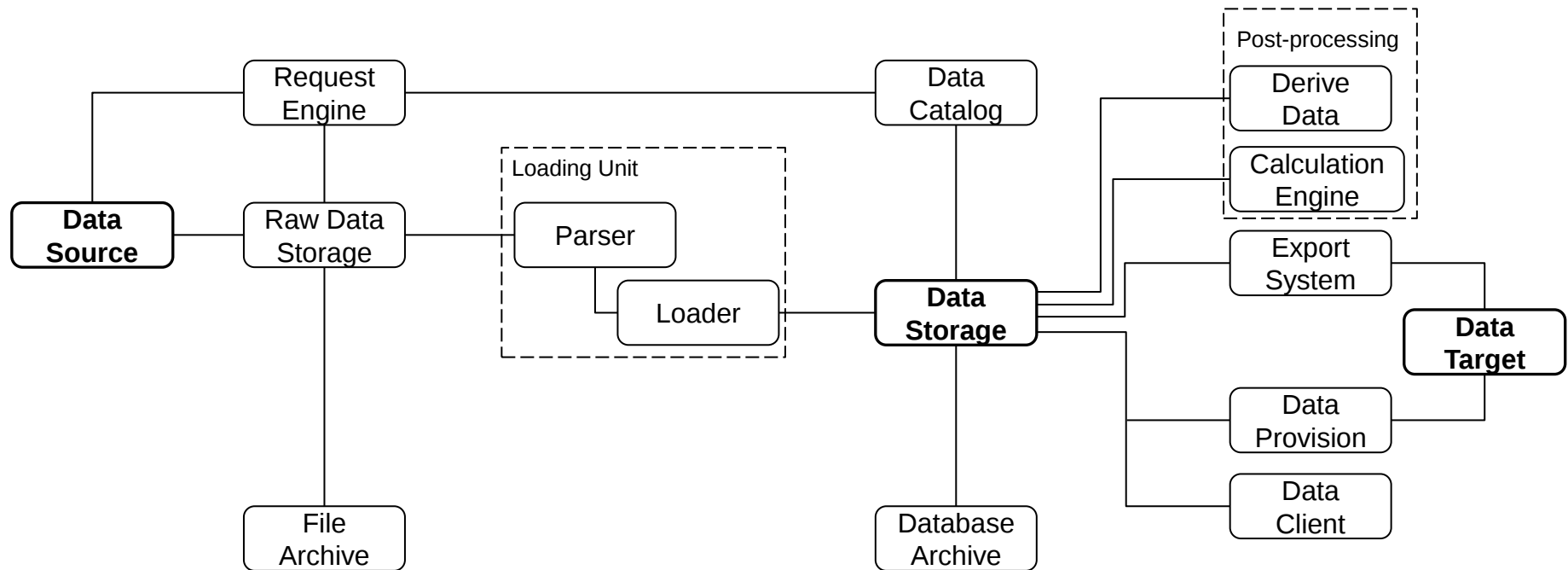
#	Name	Description
S-1	Management Board Member	Duty of legality, duty of care in a narrow sense and monitoring duty
S-2	Internal Auditor	Compliance to existing regulations & standards
S-3	Procurement Manager	Interface between vendor & company; Formal acquisition of market data
S-4	Application Owner	Front-end or back-end applications; Essentially creating reports or analyses
S-5	Account Manager	Interface between customer & company; Managing sales and building customer relationship
S-6	Database Engineer MDP	Change of MDP processes & exports
S-7	Operation Manager MDP	Run of MDP processes & support in MDP
S-8	Database Engineer DW	Change of DW processes & exports
S-9	Operation Manager DW	Run of DW processes & support in DW



[IEEE 00] IEEE Computer Society. "IEEE Std 1471-2000: IEEE Recommended Practice for Architectural Description of Software-Intensive Systems"

[S BU 08] S. Buckl, A. M. Ernst, J. Lankes and Prof. Dr. Matthes: "Enterprise Architecture Pattern Catalog"

- Structural Viewpoint: Displays components, which are processing units of data
 - Data Storage Viewpoint: Displays the components, which store data
 - Data Flow Viewpoint: Displays the data flow between components
- Infrastructure Viewpoint: Displays the hardware the components utilize
- Authorization Viewpoint: Displays the identifiable objects at each structural component
- Stakeholder Viewpoint: Displays the interaction and support of the stakeholder
- Governance Viewpoint: Displays, how governance controls can be implemented and the alignment of such



Legend

Map Symbols



Key Component



Component (application or processing unit)



Connection (data or information flow)

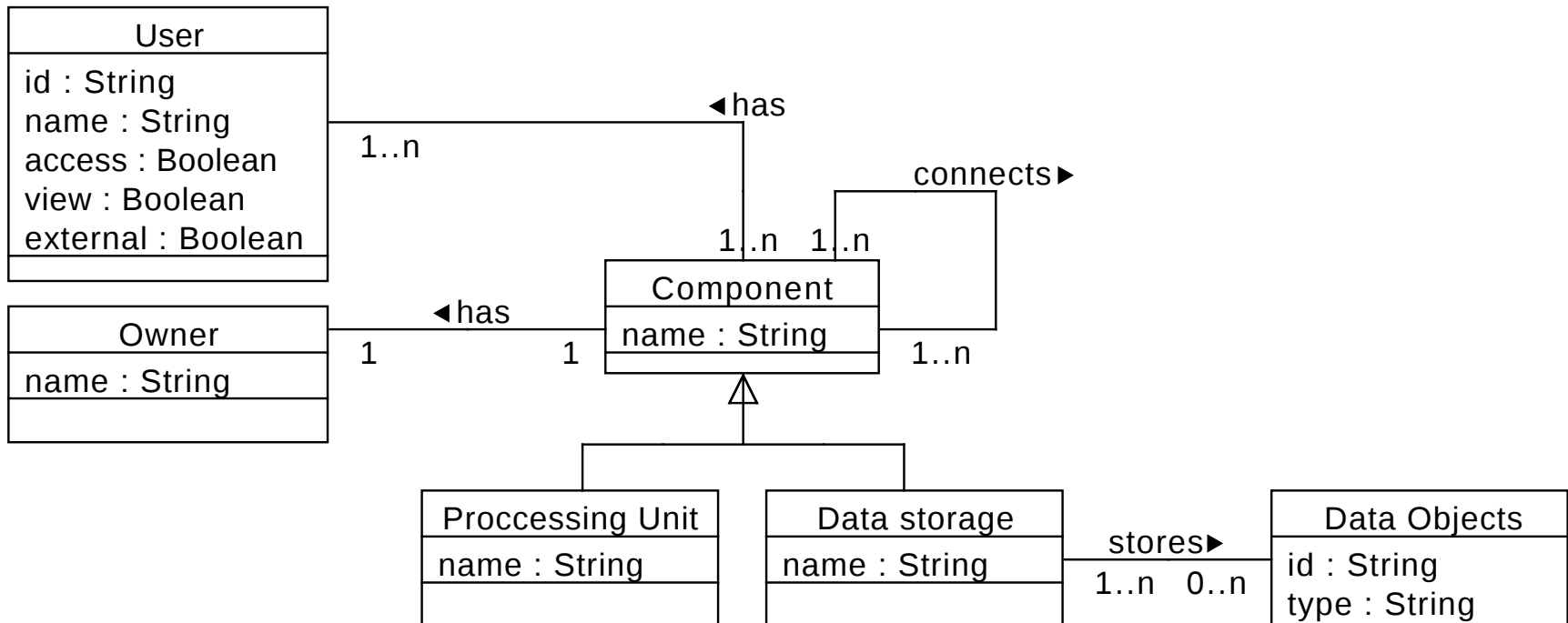


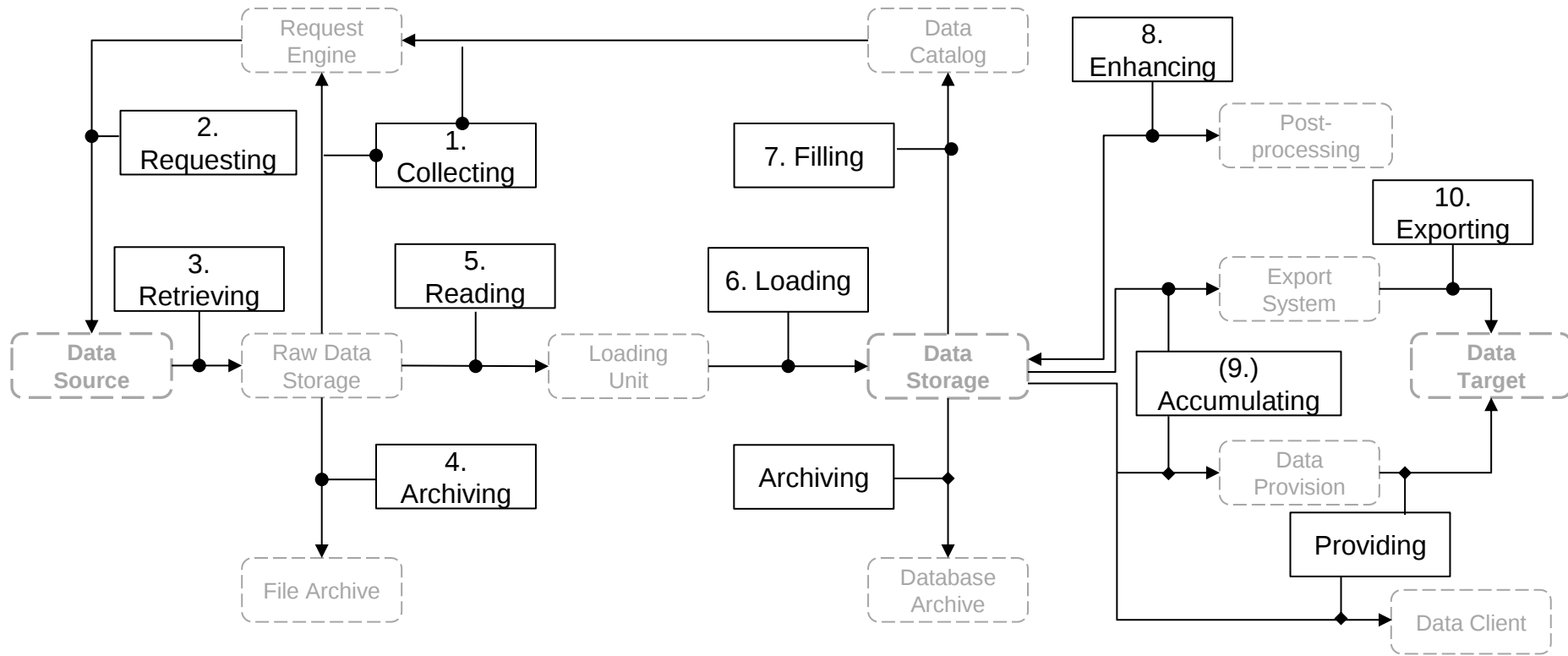
Abstraction

Visualization Rules



Component A is connected to B



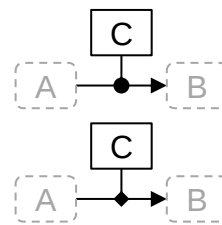


Legend

Map Symbols

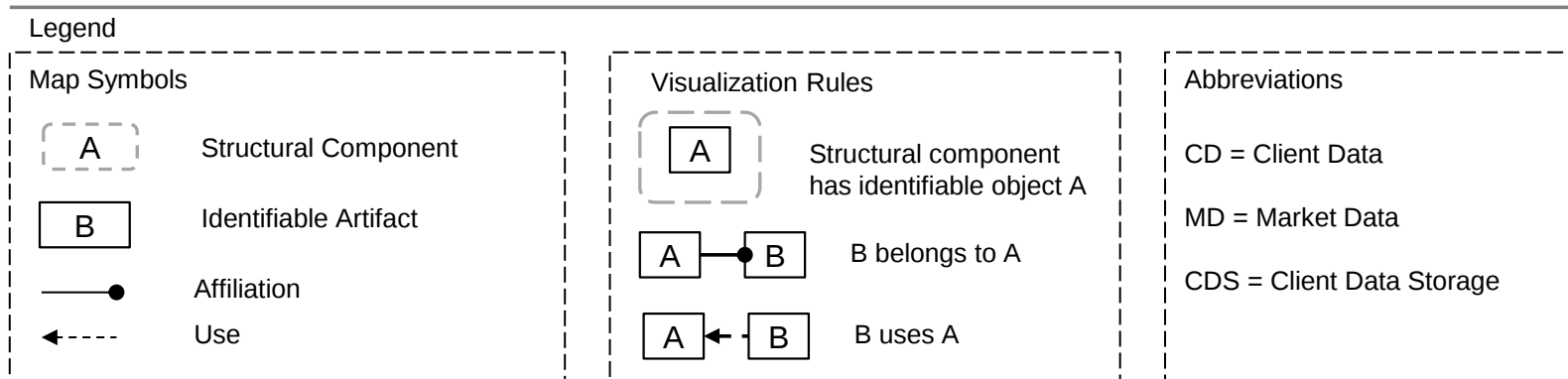
	Component
	Data Flow
	Description and Time-triggered, but Event-dependent Data Flow (= Core Data Flow)
	Description and Event-triggered Data Flow

Visualization Rules



Time-triggered, Event-dependent Data Flow from A to B and can be described by C

Event-triggered Data Flow from A to B and can be described by C



1. Data Principles – not yet being utilized
2. Data Quality – the greatest concern of most stakeholders and important for regulations such as Solvency II
3. Metadata – already heavily utilized by the company, mostly utilized in logging processes and job triggering
4. Data Access – big concern of the data vendor's, less so within the company
5. Data Lifecycle – the viewpoint models give an overview of the data lifecycle

1. State reconstruction: Contextual information on organizational processes and services
2. Assessment and measurement
 - Data analysis: Data understanding and architectural rules
 - Data quality requirement analysis: identify quality issues and set new data quality targets
 - Identification of critical areas
 - Process modeling: Model of the processes producing and updating data
 - Measurement of quality: Quality dimensions (completeness, consistency, currency, volatility and timeliness of data)
3. Improvement: Steps & strategies to reach new data quality targets

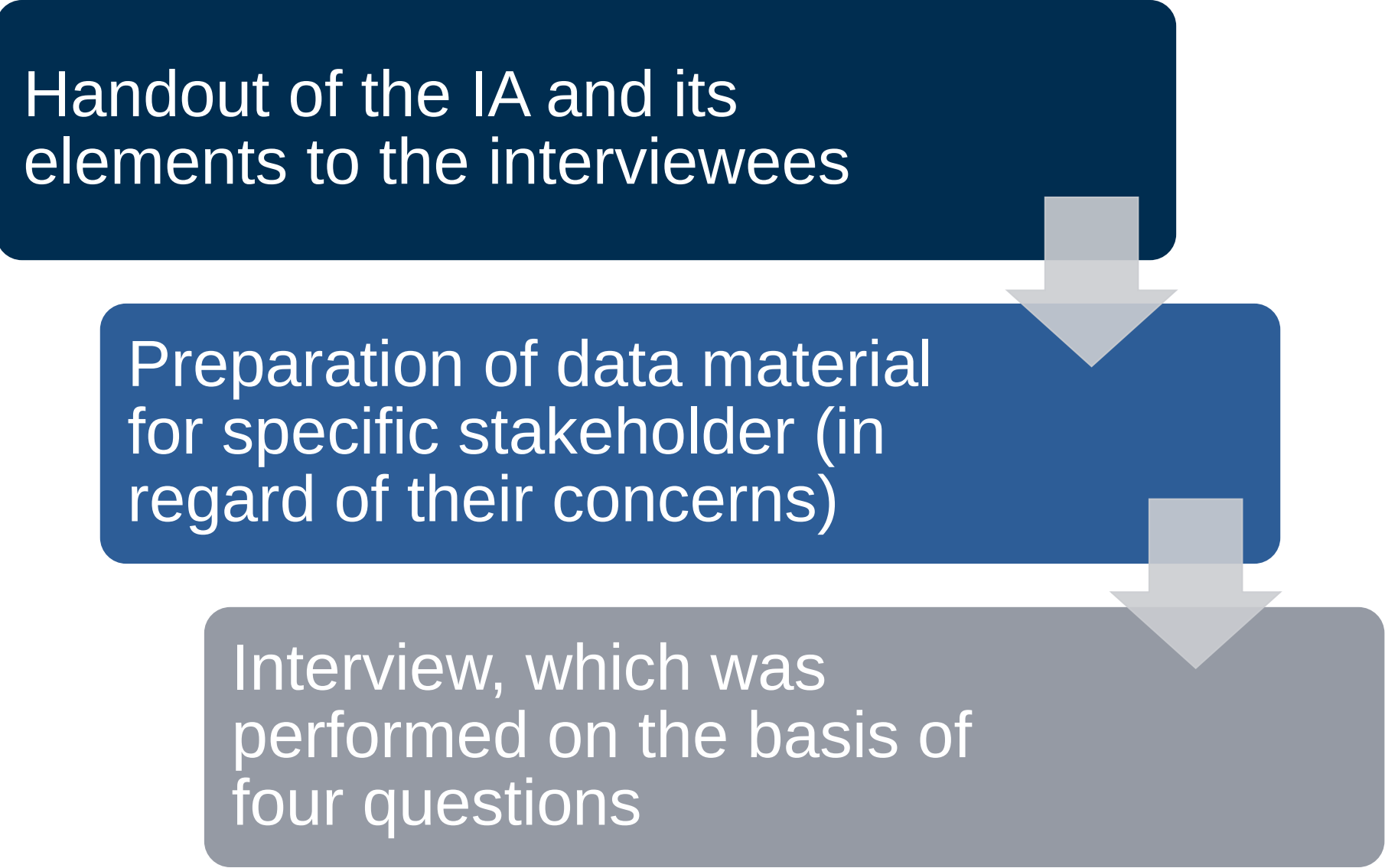
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Goal:

Proof the usability and information gain, as well as the enabling and alignment of new tasks through the Information Architecture

Stakeholder	Company Experience [years]	Work Experience [years]	Background
External Auditor	5	10	Business Management
Operation Manager MDP	4	4	Information Management
Database Engineer MDP	7	25	Computer Science
Database Engineer DW	9	20	Computer Science
Procurement Manager	4	21	Financing

Handout of the IA and its elements to the interviewees



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graph TD; A[Handout of the IA and its elements to the interviewees] --> B[Preparation of data material for specific stakeholder (in regard of their concerns)]; B --> C[Interview, which was performed on the basis of four questions];
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Preparation of data material for specific stakeholder (in regard of their concerns)

Interview, which was performed on the basis of four questions

Interview questions:

1. What is your first impression of the IA in its entirety, after having seen it for the first time? Is it practicable and understandable?
2. Are the elements of the models correct and the level of detail sufficient enough
3. Are your concerns sufficiently answered?
4. What would you have done different?

What is your first impression of the IA in its entirety, after having seen it for the first time? Is it practicable and understandable?

Stakeholder	Answer
External Auditor	• High number of components, size of MDP • Understandable viewpoints
Operation Manager MDP	• VP easily understandable (IM not so) • Really good illustration of interaction between client data and market data
Database Engineer MDP	• Impressive authorization VP, but too complex • Simple, but nothing missing
Database Engineer DW	• Simplicity, well concentrated on core components
Procurement Manager	• Helpful, simple viewpoints • Viewpoints not broken up into pieces and enclosed by itself • Good insight into information demands; Previously missing requirements

Are the elements of the models correct and the level of detail sufficient enough?

Stakeholder	Answer
External Auditor	-
Operation Manager MDP	• All MDP components illustrated and correct • No elements missing for MDP – DW interface • Perfect level of detail
Database Engineer MDP	• Everything correct and correct level of detail • Creation of misunderstanding in stakeholder viewpoint
Database Engineer DW	• All DW components are correct and included • Good level of detail
Procurement Manager	• Correct • Good level of detail

Are your concerns sufficiently answered?

Stakeholder	Answer
External Auditor	• Vendor requirements sufficiently answered • Enables stakeholder to gather the required information much faster through this information basis
Operation Manager MDP	• Data governance basis for consistent and elaborate monitoring • Event based viewpoint would have been nice • Transparency created
Database Engineer MDP	• MD interface change could have been addressed more directly, but answerable • Interesting and correct user authorization, but too complex
Database Engineer DW	• Process performance very good answerable • Regulations much more extensive • System understanding created
Procurement Manager	• Can all be answered through authorization viewpoint, but very complex and laborious to instantiate – not practical

What would you have done different?

Stakeholder	Answer
External Auditor	-
Operation Manager MDP	More information on application landscape Use to be evaluated, but governance control desired
Database Engineer MDP	Minor inconsistencies, but serves its purpose and represents everything he expected it to
Database Engineer DW	Interfaces and channels to be better described and event based viewpoint for market data changes and requirements
Procurement Manager	Another way to map market data, client data, data source and data target

Goal?

Information Architecture for market data processing company

- Requirements on market data
- Data Governance

Carried Out?

1. Literature research for theoretical background
2. Requirement analysis
3. Modeling an Information Architecture
4. Data Governance evaluation

Accomplished?

- Requirements on: Solvency II, Audits, Stakeholder interests
- Viewpoint and respective Information models: Structural, Data storage, Data Flow, Infrastructure, Authorization and Stakeholder
- Environment & means for data quality controls
- Good information basis and illustration of architecture

Not accomplished?

- Application Landscape not included
- Actual Data Quality Controls for Data Governance
- Not every concern fully answered or answerable
- Sufficient User authorization

Next up?

- More Data Governance controls and Application
- Extend the Viewpoint models
- Automatization



Any Questions?



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