

Data Governance on EA Information Assets: Logical Reasoning for Derived Data

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1. Data Governance on EA Information Assets: Logical Reasoning for Derived Data

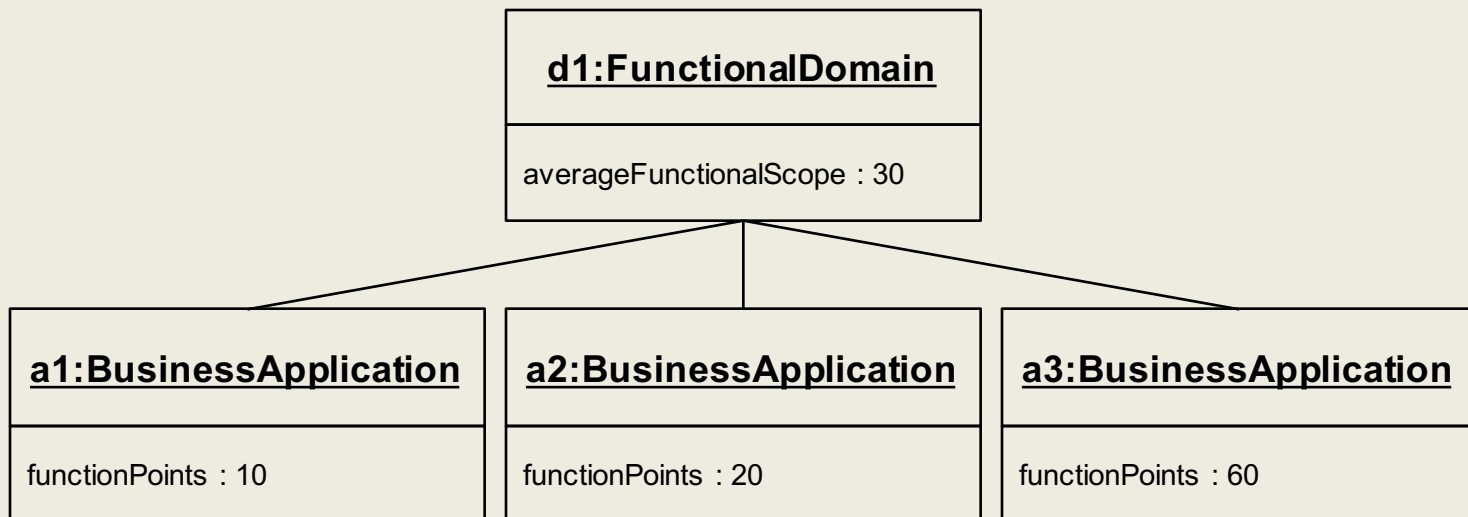
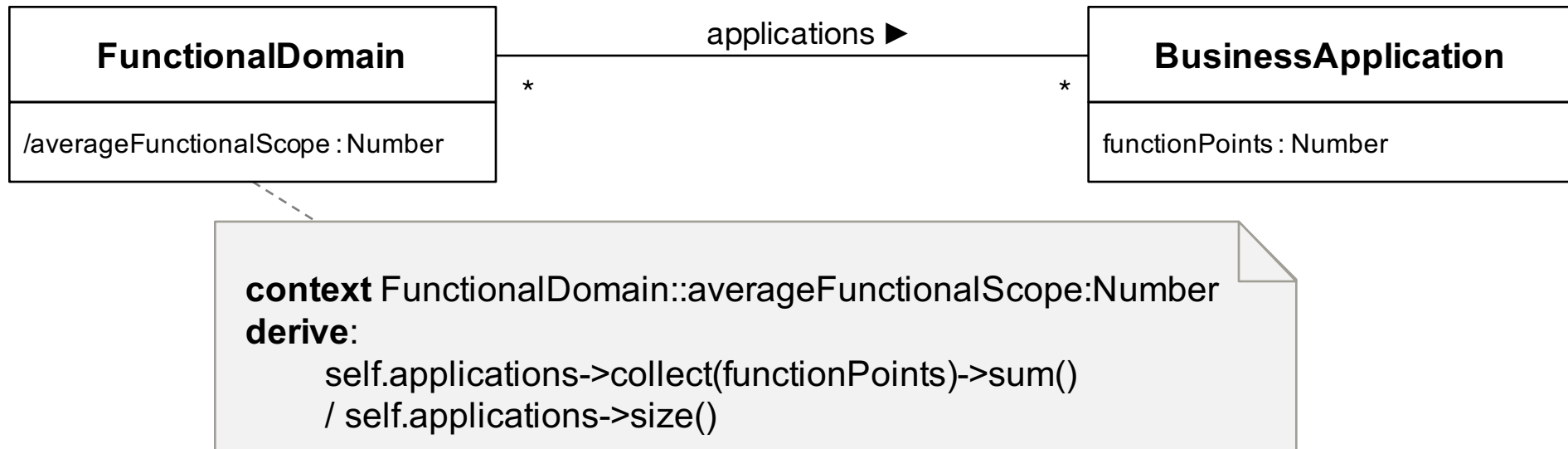
- EAM involves
 - a **variety of stakeholders**, e.g., enterprise architects, EA repository managers, data owners, etc.
 - **data of different layers** of the EA, e.g., infrastructure, application, and business layer
 - **tools** to support gathering, modeling, and analyzing this data
 - **computation of derived data through metrics** for reliable assessment of the EA
 - Regulatory frameworks (Basel II/III, Solvency, Sarbanes-Oxley Act) increase pressure to ensure proper **risk management** and **auditing processes**
- **Need for documentation of roles, rights, and responsibilities of stakeholders**

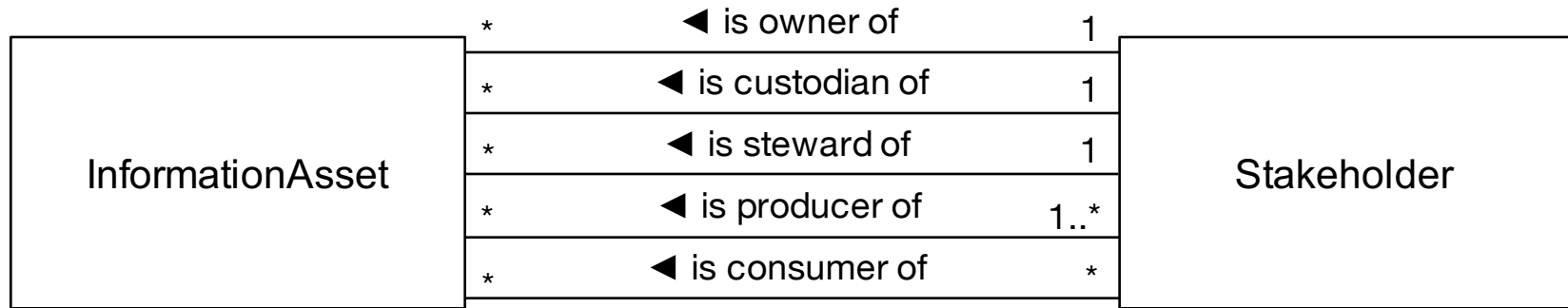
- There are governance frameworks addressing accountability and responsibility issues, e.g., Data Governance Framework (DGF)
- Definition of which stakeholders are responsible/accountable for certain EA information assets

- However, for derived EA data computed by EA metrics:
 - Do the existing governance frameworks also fit to derived EA data?
 - Are the roles for derived data derivable from the derived data's input and metric?

- **Research questions:**
 1. What is a framework for the specification of roles for EA data governance?
 2. What is a logical framework to infer roles on derived EA data based on the corresponding EA metric and its input?

Example: Average functional scope metric





Data owner:

- Ensures data quality
- Develops and implements data definition
- Responsible for interpreting and ensuring compliance

Data custodian:

- Ensures that access to data is authorized and controlled
- Responsible for safe custody, transport, storage and implementation of business rules.

Data steward:

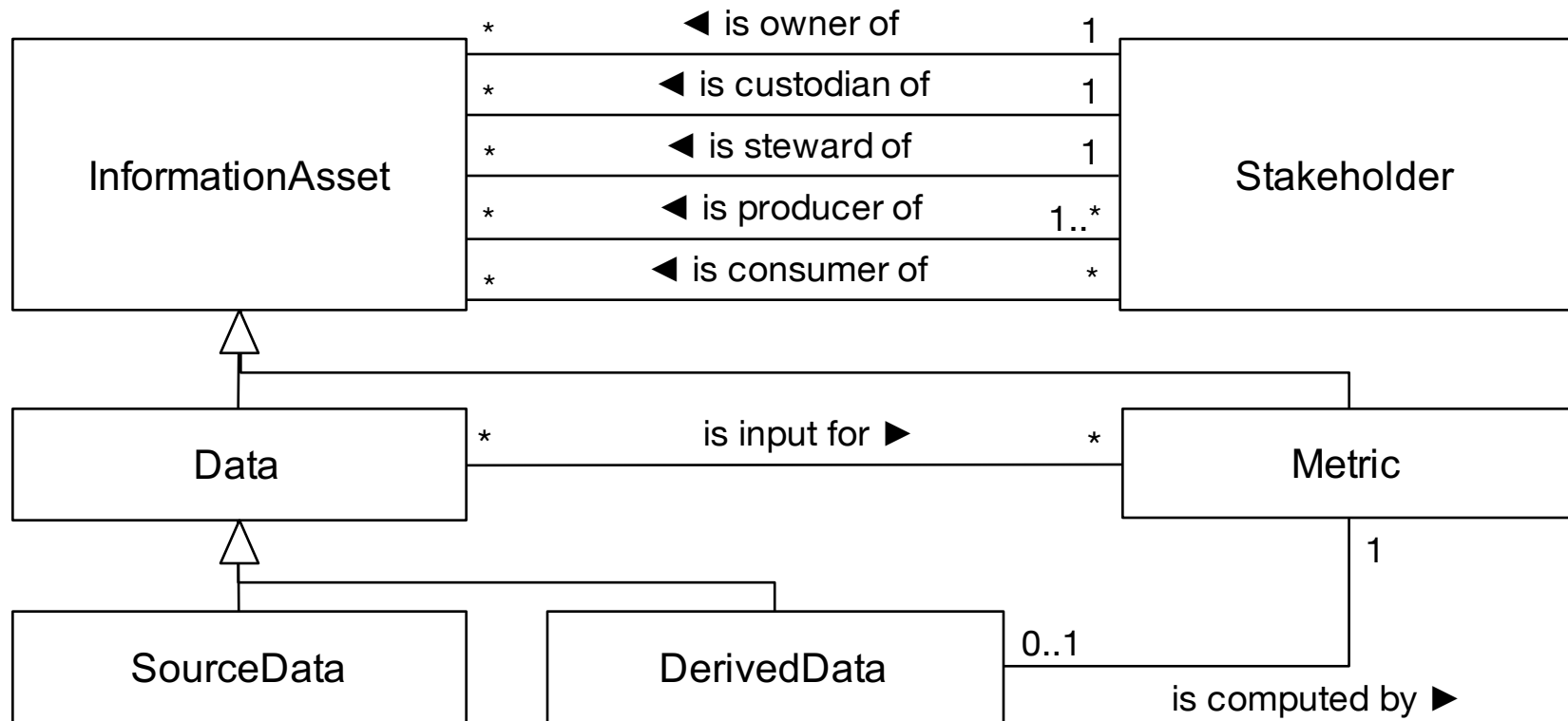
- Ensures unambiguous definition of each data element

Data producer:

- Creates and persists data elements
- Not necessarily a person

Data consumer:

- Reads, transforms, or processes existing data elements.



- Well-known in the domain of artificial intelligence as argumentation logic
- Two types of rules
 - **Strict rule** ($A \rightarrow \phi$): Cannot be defeated
 - **Defeasible rule** ($A \Rightarrow \phi$): Can be defeated by “stricter” rules
- Non-monotonic reasoning can handle **contradicting arguments**
- General example:

Monotonic reasoning:

$isBird(X) \rightarrow canFly(X)$
 $isPenguin(X) \rightarrow isBird(X)$
 $isPenguin(X) \rightarrow \neg canFly(X)$

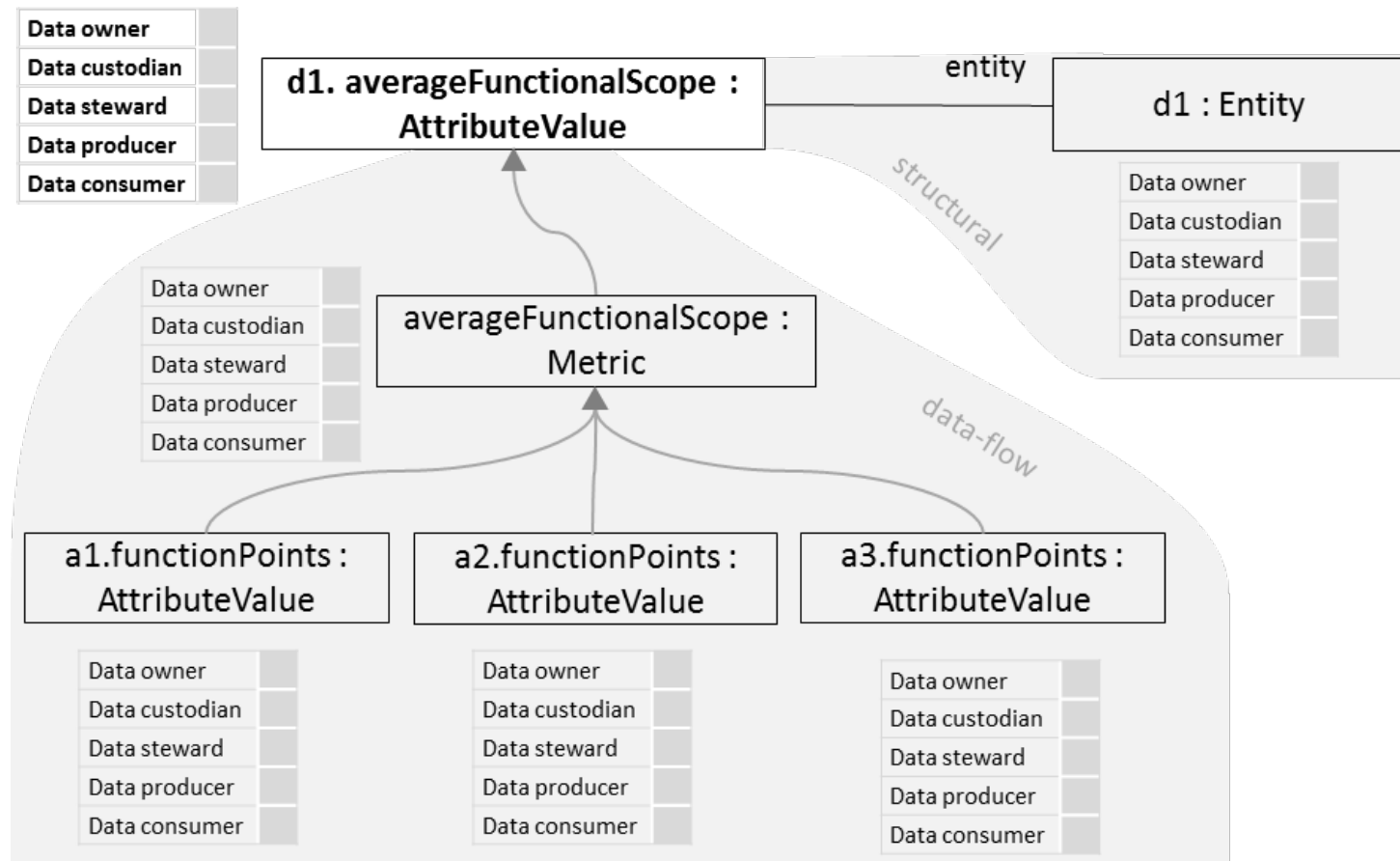


Defeasible reasoning:

$isBird(X) \Rightarrow canFly(X)$
 $isPenguin(X) \rightarrow isBird(X)$
 $isPenguin(X) \rightarrow \neg canFly(X)$



$isDerivedFrom(d, i) \wedge isDataOwner(i, p) \Rightarrow isDataOwner(d, p)$
 $isComputedBy(d, m) \wedge isDataOwner(m, q) \Rightarrow isDataOwner(d, q)$
 $isAttributeOf(d, e) \wedge isDataOwner(e, r) \Rightarrow isDataOwner(d, r)$
 $isDataOwner(d, s)$



- The model for information assets in EA captures roles for accountability and responsibility
- Use of non-monotonic logic for supporting EA data governance for derived information assets

- Definition of priorities for rules allows seamless adaption to changing data governance policies
- Organization-specific definition of rules and priorities

- **Possible future research:**
 - Role of time in data governance principles?
 - Impact of changes in data governance policies?

Thank you for your attention. Questions?



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