





LOWERING KNOWLEDGE:

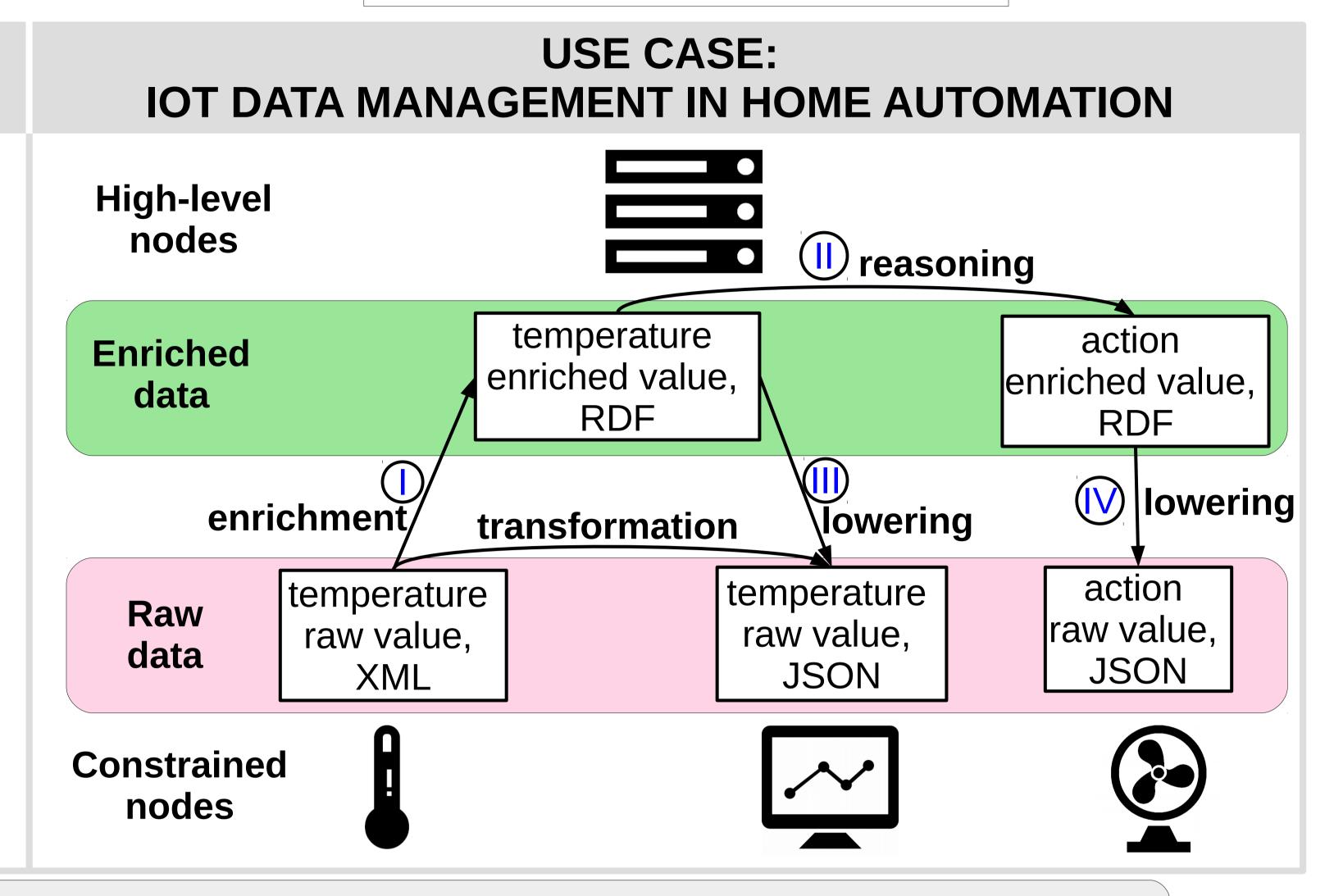
MAKING CONSTRAINED DEVICES SEMANTICALLY INTEROPERABLE

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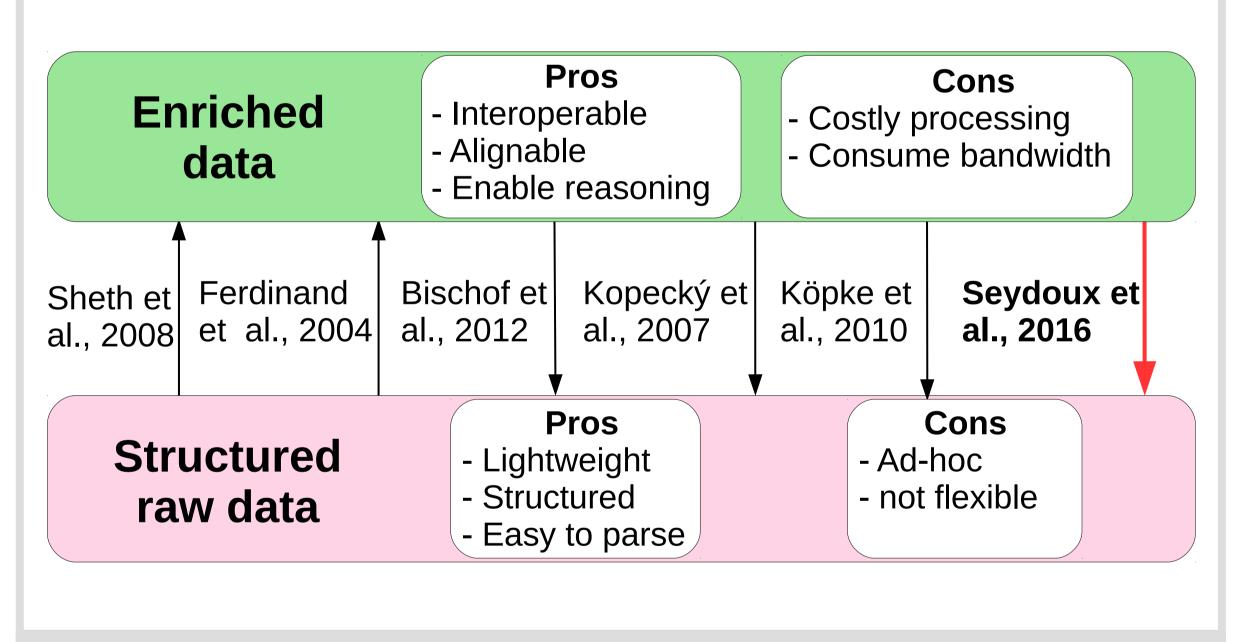
CONTEXT: INTEROPERABILITY, A CHALLENGE FOR THE IOT Interoperability stakeholders: consortiums, industrials, initiatives Interoperability issues causes: Number of devices, Silo-oriented approach Number of connected devices (Gartner) Smart city Energy IoT



WHY LOWERING IS NECESSARY

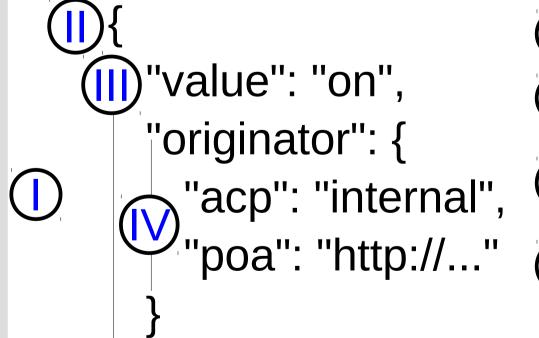
IoT devices are **constrained**, and richer knowledge necessary for interoperability is **heavy to process**

RELATED WORKS: DATA ENRICHMENT AND KNOWLEDGE LOWERING APPROACHES



HYPOTHESES AND CONSTRAINTS ON THE TARGET FORMAT

Illustration with a fan command:

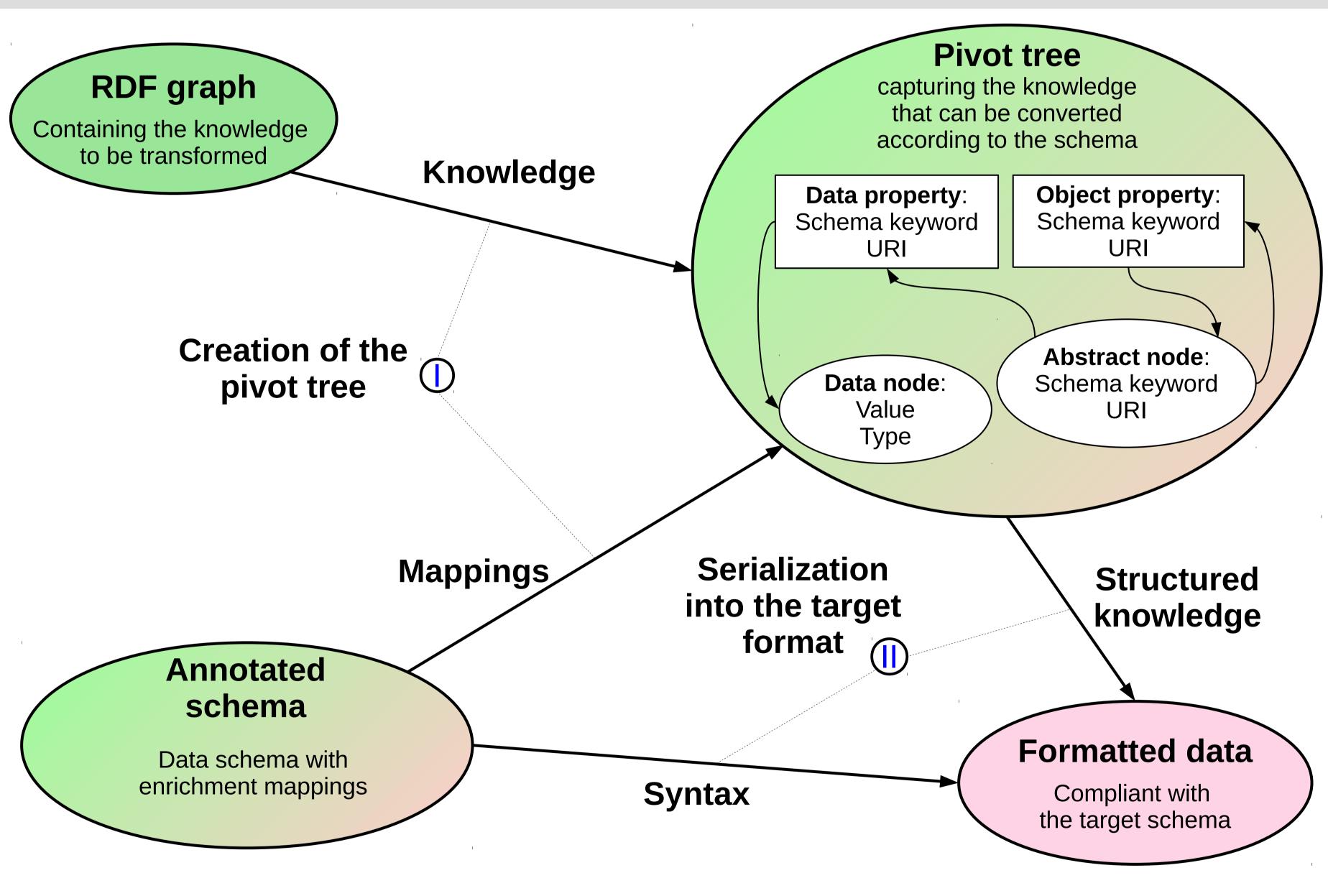


- The schema defines a tree-like structure
- The root is mapped to a RDF class
- Leaf relations are mapped to data properties
- Element inclusions are mapped to object properties

VALIDATION OF THE REQUIREMENTS

- Context of the IoT
- Tree-like data (XML, JSON) with **explicit schemas**
- Existing applicable ontologies - Validation on different data sources
- Standards
- Online API repository

CORE CONTRIBUTION: REVERSING ENRICHMENT MAPPINGS VIA A PIVOT TREE



PRELIMINARY RESULTS

		Supported scenario	Code base	Execution time	Enables reasoning	Flexibility	Supported schema types	Mapping required
	Direct schema transformation	Transformation only	Small	Fast	No	Low	Any	None
	Schema transformation generation	Transformation only	Large	Fast	No	Medium	Annotated	Two-way
	Two-way mapping	Transformation and lowering	Large	Slow	Yes	Important	Annotaated	Two-way
	Mapping reversal	Transformation and lowering	Large	Slow	Yes	Important	Annotated	One-way

WHAT IS THE BENEFIT OF OUR APPROACH?

Mapping work is cut in half for the developper, and constrained devices can be integrated in semantically enabled systems

FUTURE WORKS





