

Semantic interoperability in healthcare information systems: a top-level ontology based solution



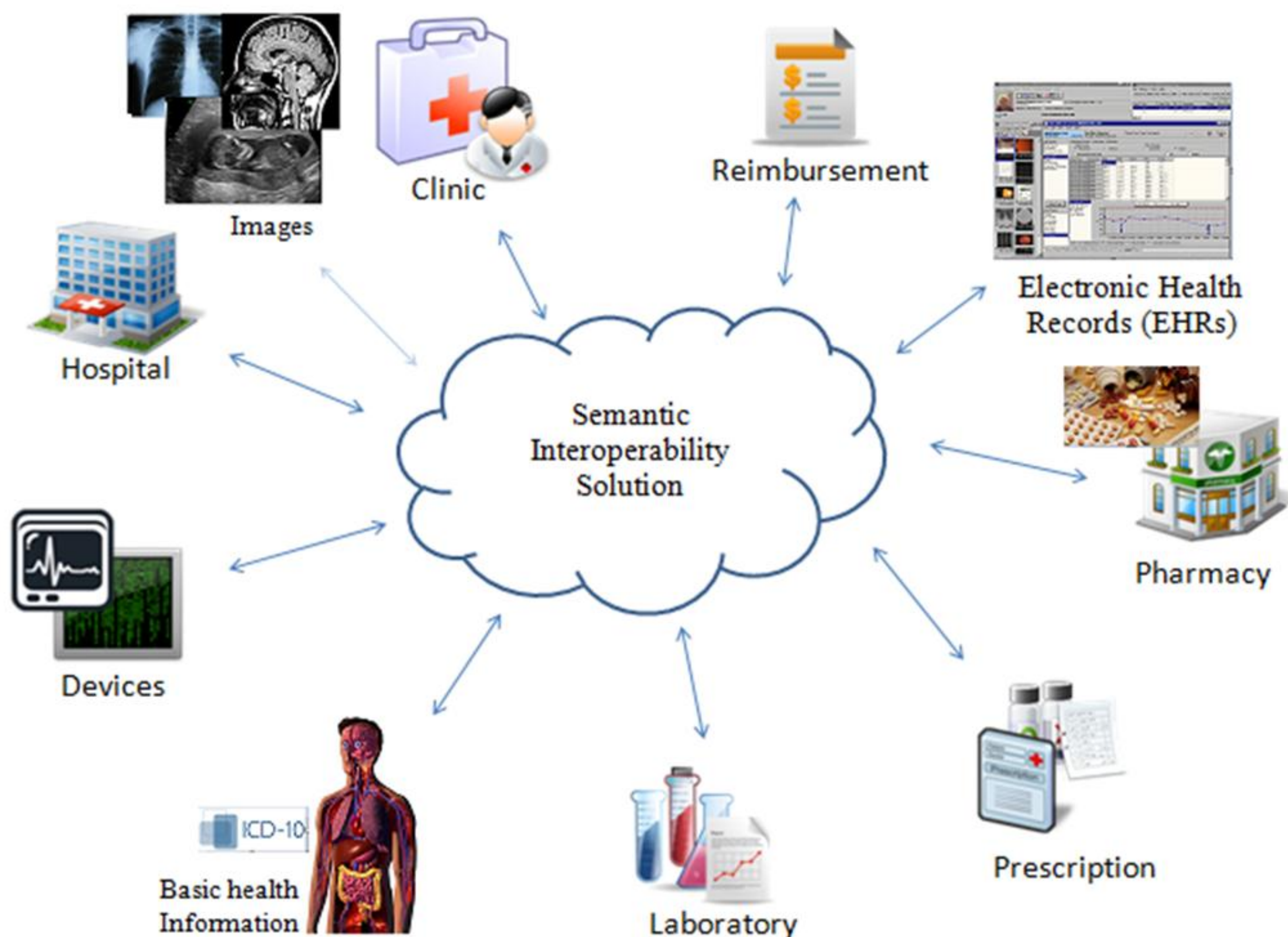
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INTRODUCTION

Biomedical information - Different formats – Different sources
Semantic interoperability between Health Information Systems



RESEARCH PROBLEM

A top-level ontology based solution could provide the semantic interoperability between the ontologies and terminologies which the healthcare information systems use?

Integration is a desirable aim in the context of enterprise engineering systems: organizations should be able to interact with the business environment in which they act, enterprise's departments should be able to interact among each other, and so forth. This goal can be achieved mainly through the some level of interoperability between systems.

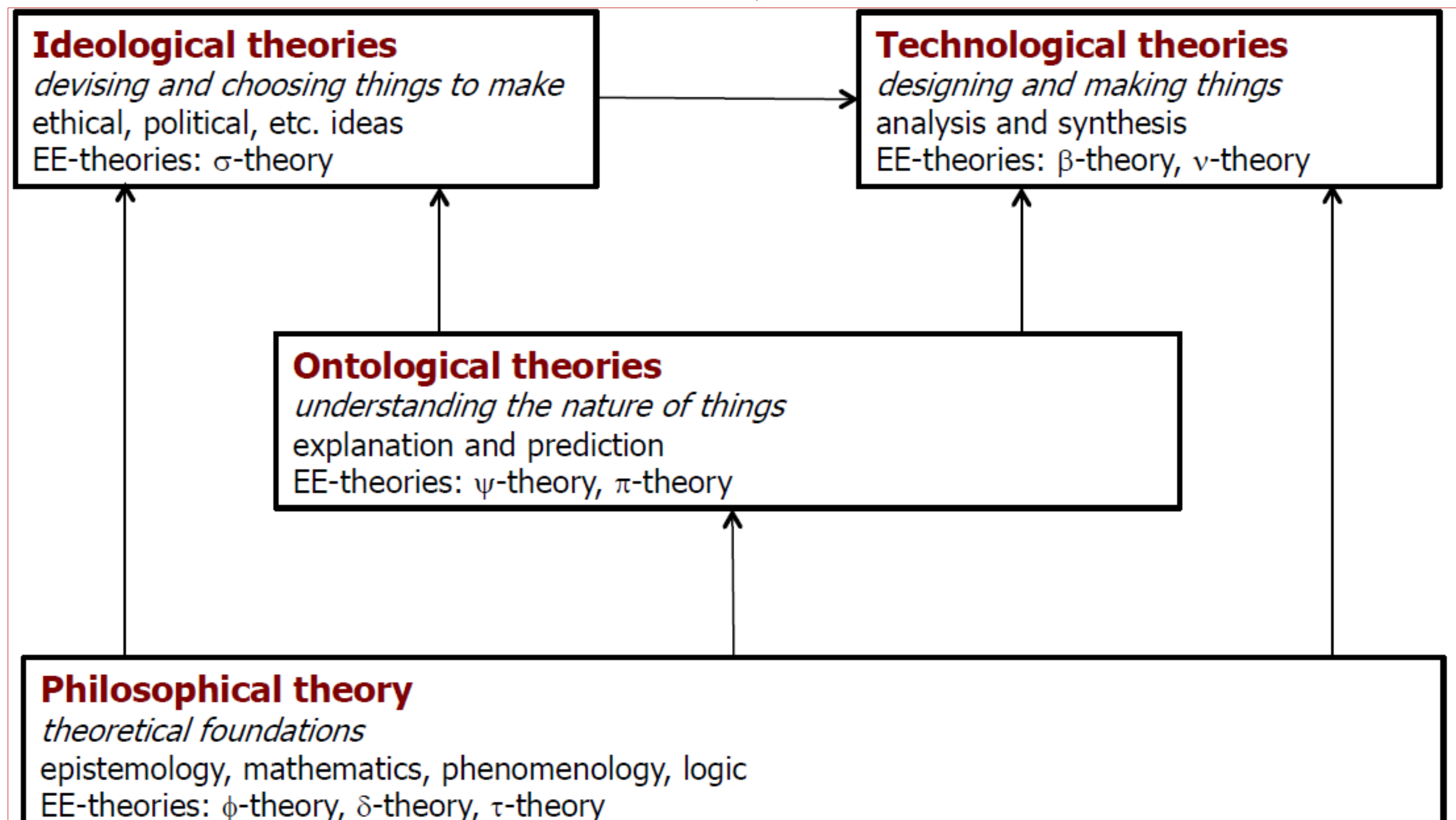


Fig. 1-EE theories in the classification scheme. (Dietz et. al., 2013)

GENERAL OBJECTIVE

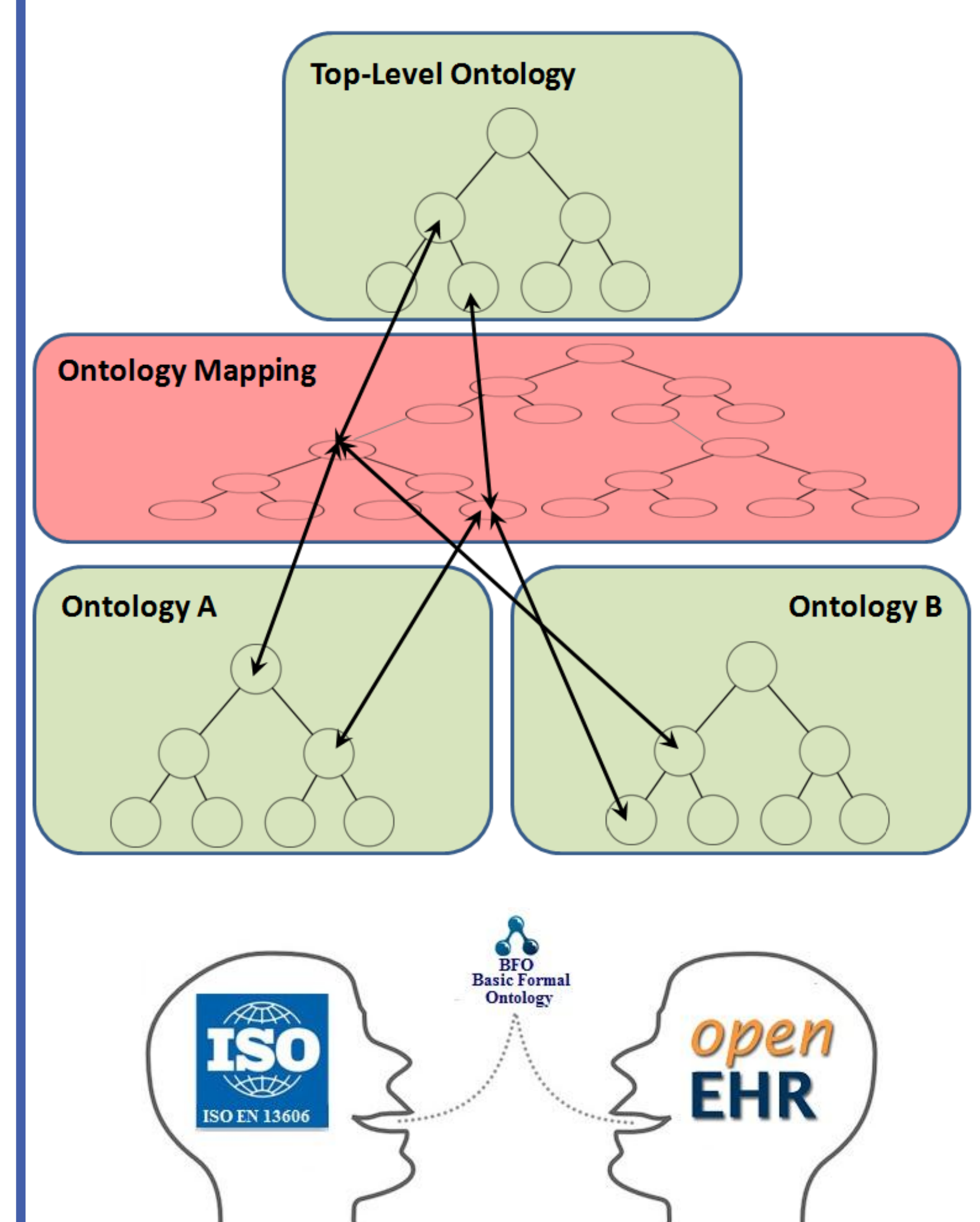
To determine a top-level ontology-based alternative to foster semantic interoperability in healthcare information systems.

MATERIALS AND METHODS

Qualitative applied research.

Next steps	Specifics objectives	Research Classification		Method	Expected results
		Considering the objectives	Considering the technical procedures		
Step 1	To verify which ontologies and terminologies are recommended by health authorities to provide semantic interoperability and which are usually adopted by healthcare entities.	Exploratory survey	Bibliographic and Documental research	Technical and scientific papers and theses in the Information Science and Computer Science	The set of ontologies and terminologies recommended by health authorities and the set effectively utilized by healthcare entities
Step 2	To analyze the mechanisms adopted by these ontologies and terminologies to provide semantic interoperability and the advantages and disadvantages found in each one.	Explanatory study	Explanatory case study	Evaluate the ontology in the content dimension and the technical dimension, to check: - The structure or architecture - The syntax of the definitions - The contents of definitions	Answer the questions: - Are the settings built following the design criteria? - What is defined by the ontology? What isn't? - Are there structures or keywords in syntactically incorrect settings? - What is the mechanisms for interacting with ontologies? - What is the formalism of knowledge representation used? - Is the ontology well documented?
Step 3	To identify what level of semantic interoperability these ontologies and terminologies are providing to interoperate with another.	Explanatory study	Explanatory case study	Ontology mapping	The common and non-common mechanisms and contents between the ontologies mapped
Step 4	To list the gaps from semantic interoperability found in these ontologies and terminologies to interoperate with another.	Explanatory study	Explanatory case study	To check the non-common mechanisms and contents	The gap list with the non-common mechanisms and contents
Step 5	To specify, based on a top-level ontology, a recommendation for a solution able to provide semantic interoperability concerning the gaps found.	Descriptive research	Experimental Case Study	To propose an ontological layer founded on BFO for health records	An ontology layer based on the Basic Formal Ontology (BFO) to the health records

EXPECTED RESULTS



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