**TripleFCA: FCA-based approach to enhance Semantic Web data management**

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**ABSTRACT**

There has been a recent explosion in data as the number of RDF triples increases. With this increase, RDF datasets and their graph relationships become more complex. Accordingly, there is a need to store and handle these huge volumes of triples with highly desired scalability. Therefore, we attempt to bridge the gaps of the current RDF storage methods in RDBMS by combing the strengths and most sophisticated database physical models with the inferencing techniques that ontology and Formal Concept Analysis (FCA) support. We, thus, aim at analyzing and narrowing the gap between a state-of-the-art method by developing an RDF storage model based on ontologies with the help of FCA clustering solutions for speed and high scalability. Hence, we have proposed a new framework, TripleFCA, to maximize the information retrieval benefits and improve the query response time of RDF triple storages. Our evaluation shows that TripleFCA decreases major bottlenecks of property-table, one of the state-of-the-art RDF storage methods into RDBMS, and yields a much better performance thanks to the benefits of combining ontology and FCA over RDF storage. Our results also demonstrate the weaknesses of property-table and how they can be mitigated.

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**WHAT IS THE SEMANTIC WEB?**

- Semantics = Meaning (from Greek)  
- Current Web = Links documents to documents.  
- Semantic Web = Links data to data.  
- Allowing machines to understand data:  
  - Data should be related to one another just as documents are already.  
  - Process the meaning of Information automatically.  
  - Deduce implicit information from existing information in an automated way.

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**RDF TRIPLE STORE**

"Triple Store" is the common name given to a database management system for the storage and retrieval of RDF triples data.

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