**Summary of AL-QURAN ONTOLOGY BASED ON KNOWLEDGE THEMES by A. Ta'a, Q. A. Abed, and M. Ahmad**

The paper "AL-QURAN ONTOLOGY BASED ON KNOWLEDGE THEMES" by A. Ta'a, Q. A. Abed, and M. Ahmad presents a new approach to developing an ontology for the Quran based on knowledge themes. The authors argue that traditional ontology approaches are not well-suited for representing the complex and interconnected knowledge contained in the Quran. Instead, they propose a new approach that organizes the Quran's knowledge into a set of interrelated themes. The authors begin by identifying a set of 10 knowledge themes in the Quran:

1. Tawheed,
2. Risalah,
3. Akhirah,
4. Akhlaq,
5. Aqidah,
6. Ibadah,
7. Muamalah,
8. Tarikh
9. Qasas
10. Ayat.

They then define a set of sub-themes for each knowledge theme. For example, the sub-themes for the Tawheed knowledge theme include the **oneness of Allah**, **the attributes of Allah**, and **the names of Allah**. Once the knowledge themes and sub-themes have been identified, the authors develop an ontology that represents the relationships between the different concepts. The ontology is developed using the Web Ontology Language (OWL), which is a standard language for representing ontologies on the web.

The authors evaluate the ontology by conducting a series of experiments. The experiments show that the ontology can be used to effectively retrieve and classify Quranic knowledge. The authors also conclude that the ontology can be used to develop new applications for the Quran, such as intelligent search engines and question answering systems.

The authors have developed an ontology that represents the relationships between the different concepts in the Quran. These ontologies can be used as a model for developing our own ontologies for the Quran and Hadith

The research of these ontologies is still under development. The authors have focused on developing the ontology for the Tawheed knowledge theme, and they have not yet completed have not yet been integrated with a natural language processing (NLP) system. This means that users cannot yet query the ontology using natural language.

Overall, this research paper presents a valuable contribution to the field of Quranic knowledge representation. The authors' ontology is based on the concept of knowledge themes, which is a novel and effective approach for representing Quranic knowledge. We will use this research to carve our own Knowledge Graph by implementing the authors' ontologies and also by adding NLP capabilities.

**An experience of developing Quran ontology with contextual information support Rizwan Iqbal and Aida Mustapha**

This research paper presents an experience of developing a Quran ontology with contextual information support. The authors argue that existing Quran ontologies are limited in scope and knowledge, and that they do not support contextual information that is considered necessary for the correct interpretation of Quranic verses. The authors propose a new Quran ontology that encapsulates contextual information support, such as translations, revelation places, tafsir, and hadiths. The ontology was developed using a methodology merging approach, which made the ontology development more effective and intuitive. The authors evaluated the developed ontology and found that it satisfied the requirements specification. They also found that the ontology can be reused and further enhanced to support many Quran-related semantic applications in the future.

One of the most relevant aspects of this research paper for your project is the authors' focus on developing an ontology that supports the contextual interpretation of Quranic verses. This is an important consideration for any Quran ontology, as it allows users to better understand the meaning of the Quran in light of its historical and religious context.

The ontology includes a number of features that support contextual information, such as:

* **Revelation context:** The ontology includes information about the revelation context of each verse, such as the time and place of revelation.
* **Tafsir:** The ontology includes links to tafsir, which are commentaries on the Quran.
* **Hadith:** The ontology includes links to hadith, which are the sayings and actions of the Prophet Muhammad.

Another relevant aspect is the authors' use of a methodology merging approach to develop the ontology. This approach allows the authors to take advantage of the strengths of both top-down and bottom-up ontology development.

One limitation of this research paper is that it does not provide a detailed description of the ontology's classes and properties. This means that you will need to read the paper carefully to understand how the ontology is structured and how it can be used.

Overall, this research paper presents a valuable contribution to the field of Quran ontology development. The authors' ontology includes additional classes and properties to represent contextual information, which is an important consideration for any Quran ontology. We can use the research in this paper to improve your Knowledge Graph by implementing the authors' methodology merging approach and adding classes and properties to represent contextual information.

**Towards a Joint Ontology of Quran and Hadith Shatha Altammami, Eric Atwell, Ammar Alsalka**

This research paper presents the idea of a joint ontology of the Quran and Hadith. The authors argue that such an ontology would be a valuable resource for scholars and researchers, as it would allow for the integration of knowledge from the two primary sources of Islamic law.

The authors also discuss the challenges involved in developing a joint ontology, such as the need to reconcile differences in terminology and interpretation. However, they believe that these challenges are surmountable, and that the benefits of a joint ontology would outweigh the costs.

The authors propose a new ontology that is based on the following principles:

* **Comprehensiveness:** The ontology should cover all of the major concepts and relationships in the Quran and Hadith.
* **Accuracy:** The ontology should be accurate and up-to-date.
* **Flexibility:** The ontology should be flexible enough to support different types of applications.
* **Interoperability:** The ontology should be interoperable with existing Quran and Hadith ontologies.

The authors developed the ontology using a methodology that involved the following steps:

1. **Identify the core concepts and relationships in the Quran and Hadith.**
2. **Define classes and properties to represent the core concepts and relationships.**
3. **Populate the ontology with data from the Quran and Hadith.**
4. **Evaluate the ontology for accuracy, completeness, and consistency.**

The ontology includes a number of features that support interoperability, such as:

* **Unique identifiers for all classes and properties.**
* **Links to existing Quran and Hadith ontologies.**
* **Use of standard ontological vocabularies.**

One of the most relevant aspects of this research paper is the authors' focus on developing a joint ontology of the Quran and Hadith. This is essential, as it will allow us to create a Knowledge Graph that represents the full range of Islamic knowledge. Another relevant aspect is the authors' methodology for developing the ontology. This methodology is well-defined and comprehensive, and it can be very well be used (or take reference from the principles) to develop our own ontologies.

One limitation of this research paper is that it does not provide any implementation details for the ontology. It does provides the principles that need to be taken care, and the steps taht need to be followed. It also provides with certain examples from the Quran and Hadith, for the identification of different concepts and how they are interlinked. But it does not go into dept so as to make an ontology from the provided details.

**Statistical Parsing by Machine Learning from a Classical Arabic Treebank Kais Dukes**

The research paper "Statistical Parsing by Machine Learning from a Classical Arabic Treebank" by Kais Dukes presents a novel approach to statistical parsing for Classical Arabic. Dukes argues that traditional statistical parsing methods are not well-suited for Classical Arabic due to its rich morphology and free word order.

Dukes proposes a new hybrid parsing approach that combines statistical methods with traditional Arabic grammatical knowledge. The approach is based on a new treebank of Classical Arabic sentences that has been manually annotated with grammatical information.

Dukes evaluated the proposed parsing approach on a held-out test set and achieved an F1-score of 89.03%. This is significantly higher than the performance of traditional statistical parsing methods on Classical Arabic.

One of the most relevant aspects of this research paper for your project is the author's proposed hybrid parsing approach. This approach combines the strengths of statistical methods with the strengths of traditional Arabic grammatical knowledge. This makes it well-suited for parsing Classical Arabic, which is a language with rich morphology and free word order.

* **Extract more accurate semantic information from the Quran and Hadith text.** Dukes' hybrid parsing approach can be used to extract the semantic meaning of sentences in Classical Arabic more accurately and reliably than traditional statistical parsing methods. This semantic information can then be used to populate your Knowledge Graph with more accurate and informative data.
* **Identify and extract concept nodes more accurately.** Dukes' treebank of Classical Arabic sentences is manually annotated with grammatical information, which makes it possible to identify and extract concept nodes from the Quran and Hadith text more accurately. This will help you to create a more comprehensive and informative Knowledge Graph.

One limitation is that Dukes' thesis does not explicitly address the issue of knowledge representation. Ontologies require a formal and explicit representation of concepts and relationships between concepts. Dukes' thesis does not provide a specific methodology or framework for representing knowledge in an ontological form.

Another limitation is that Dukes' thesis does not address the issue of ontology reasoning. Ontologies are used to support a variety of reasoning tasks, such as concept classification, query answering, and inference. Dukes' thesis does not provide any specific techniques for using statistical parsing to improve the performance of these reasoning tasks.

Overall, the research paper presents a valuable contribution to the field of Classical Arabic natural language processing. The author's proposed hybrid parsing approach is well-suited for parsing Classical Arabic, and the author's new treebank of Classical Arabic sentences is a valuable resource for developing and evaluating parsing algorithms for Classical Arabic. We can use the research in this paper to improve our project by integrating the proposed parsing approach into your Knowledge Graph pipeline and evaluating your Knowledge Graph on a variety of tasks.