

ONTOLOGY CONCEPTUALIZATION AND HADITH DOMAIN: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Studies on hadith have been widely explored as the hadith act as the second source after the Quran for reference by Muslims. Among the focus of the study of hadith is mainly on the *sanad*, but the study of the hadith's *matan* is no less important for research to understand the content of the hadith. Ontology is a study that refers to the reality that is studied and is also referred to as one of the philosophical studies of knowledge. Ontologically, this paradigm places the text of a hadith centred and in a normative state. Realizing that ontology can represent a clear form of knowledge or repository, standard and simple, researchers have tried to build ontology based on Islamic knowledge consisting of the Quran, hadith and others. This article aims to produce a systematic literature review on the conceptualization of ontology and hadith domain. The systematic literature review (SLR) writing process was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) framework. This study contributes knowledge and clear understanding on the conceptualization of ontology and hadith domain by referring to previous studies.

Keywords: Ontology, Conceptualization, Hadith domain, Systematic literature review, *Matan*

1. Introduction

All Muslim knows that the hadith of the Prophet SAW is the main guide and fundamental in life after the Quran or in other words the hadith of the Prophet is the main source of Islamic teachings, in addition to the Quran. However, the narrations and writings of Hadith highly differ from the narration and writing of the Quran. To deepen the meaning of hadith research, the meaning of the hadith's *sanad* and *matan* is stated to understand the research clearly. *Sanad* is defined as a way of narration that can connect the hadith to the Prophet Muhammad SAW. Whereas *matan* is something (the words of the Prophet) that ends in a chain of chain or conversation (*kalam*) or that ends with a final chain. Hadith research is intended as a critical study of *sanad* and *matan* conducted extensively by the hadith researchers to determine the authenticity of a hadith whether it comes from the Prophet or not by using certain methods (Solihin, 2018).

Understanding the hadith through terminology and epistemology only is inadequate to know the meaning of the particular hadith. Hence, another aspect in information science which is ontology is scrutinized in this research to present the hadith unambiguously as it includes the values of understanding and the relationship of the meaning as well as the arrangement of the hadith itself.

Nevertheless, the basic meaning of the hadith is still maintained (Fageh, 2019). Referring to Ahmad Tafsir (2013), the term ontology is used to discuss the fact and structure of something which emphasizes the vital role of the hadith in studying a topic. In the area of information science, ontology has a wide range of applications. A cross-disciplinary topic known as ontology studies the precise definitions of terms used in a given domain and the relationships that promote the development of common conceptualizations of that area (Thomas, 2018). As is known, hadith is a source of Islamic law agreed upon by the *ushuliyun* after the Quran. One of the functions of the hadith itself is to explain and delineate the laws contained in the Quran. Therefore, to understand, define, and classify a topic in detail, the study of these hadiths is essential.

2. Objectives of Research

The main objective of this systematic literature review is to deepen and identify the ontology conceptualization and the hadith domain intelligibly within the current research works.

3. Methodology

PRISMA was employed in this investigation (Preferred Reporting Items for Systematic Review and Meta-Analysis). Even though PRISMA is a publication standard and is frequently used in public health and medicine, its use in our study was nonetheless acceptable since it helped us formulate precise research questions and allowed us to carry out systematic searches throughout its 27 elements (Moher et al., 2015). PRISMA also mandates a systematic search method made up of four unique procedures: identification, screening and eligibility. This reduces numerous biases and aids in the efficient synthesis of a study (Howard et al., 2019).

3.1 Identification

Identification is the process of choosing and varying the best keywords to use when searching for publications. To improve the accuracy of the publications, keywords are necessary during the search process. Keywords from previous study specifically from the database of Science Direct, Scopus, and ProQuest were also searched for related words and variations of the primary keywords in order to diversify the keywords. The outcomes of this study's identification method are shown in Table 1.

Databases	Search String
Science Direct (n=85)	("ontology" AND "hadith"), ("ontological" AND "approach" AND "hadith"), ("ontology" AND "conceptualization" AND "hadith"), ("ontology" AND "development" AND "hadith")
Scopus (n= 36)	TITLE-ABS-KEY (("ontology" AND "hadith"), ("ontological" AND "approach" AND "hadith"), ("ontology" AND "conceptualization" AND "hadith"), ("ontology" AND "development" AND "hadith"))
ProQuest (n=781)	("konsep" DAN "ontologi" DAN "hadis"), ("perkembangan" DAN "ontologi" DAN "hadis"), ("ontology" AND "hadith"), ("ontological" AND "approach" AND "hadith"), ("ontology" AND "conceptualization" AND "hadith"), ("ontology" AND "development" AND "hadith")

Table 1: Search string for searching database

The Science Direct, Scopus, and ProQuest were searched for relevant publications using the chosen keywords. These databases were chosen based on a few benefits. First, according to the comparison of databases similar to Science Direct, Scopus and ProQuest which provide advantages in terms of thorough searches, more reliable search results and more advanced search functionality (Gusenbauer & Haddaway, 2020). Martín-Martín et al. (2018) said that the benefits, in terms of quality control and an organised indexing system shall also be highlighted.

The search strategy begins with the guidance of the purpose of the study. Databases used in this study are Science Direct, Scopus and ProQuest (refer Table 1). The purpose of using these databases is to facilitate the collection of past studies related to studies. The search is performed using the terms which corresponds to the title of the study which are the terms that use the Malay language “ontologi dan hadis”, “konsep ontologi dan hadis”, dan “perkembangan ontologi dan hadis”. Whereas English terms are like “ontology and hadith”, “ontology conceptualization and hadith”, “ontology development and hadith”, “ontological approach and hadith”, “ontological conceptualization and hadith”. The composition of the selected journals is according to the current year so that the previous one follows the year limitation that has been set, which is the period from 2013 until 2022. Table 1 presents the results of the identification process of this study.

Advanced searches using fundamental functions, such as Boolean Operator (AND, OR), phrase searching, truncation, wild cards, and field code’s function were utilised to identify publications in these databases (Science Direct, Scopus and ProQuest) (refer to Table 1). 36 Scopus, 85 Science Direct and 781 ProQuest were successfully found using the keywords, databases, and search methods employed; all of these publications underwent screening as the second stage of the systematic search process.

3.2 Screening

In order to choose appropriate studies for the systematic literature review, screening is a process in which inclusion or exclusion criteria are established. The screening method was applied to a total of 902 publications that were successfully obtained throughout the identifying process. First, the publishing year has to have occurred within the previous ten years (2013 - 2022). There were various reasons why this time period was chosen. First of all, it was consistent with the idea of field maturity, as other related papers had successfully gathered trustworthy data at this time.

Only publications published in Bahasa Malaysia and English were chosen for quality control because searches on major databases revealed a significant increase in publications relating to ontology conceptualization and the hadith domain starting in 2016. This was done to prevent reading and understanding difficulties. Inclusion criteria were used in this study during this procedure. To guarantee that all chosen papers offer pertinent findings to the systematic literature review, inclusion is crucial (see Table 2). Findings from this study’s chosen publications centre on conceptualising ontologies and the hadith domain. 87 publications were removed after the screening process, leaving 55 publications for the next step.

Table 2: Inclusion criteria

	Inclusion criteria
Year of publication	Within 10 years (2013-2022)
Publication type	Scholarly publications
Language	Malay and English

Type of findings	Empirical
Focus of findings	Ontology conceptualization and hadith domain

Eligibility

A second screening procedure known as eligibility was applied to the remaining 55 papers. The eligibility screening procedure is used to make sure that all papers chosen are pertinent and suitable for inclusion in an SLR. A total of 817 papers were removed from the process since they did not concentrate on the hadith and ontology conceptions. The 817 papers were cut since some studies concentrated on ontology concepts, philosophy, and not realated to this study. 55 papers were then put through the quality assessment process, which came after this process. Figure 1 depicts the systematic search procedure used in this investigation using PRISMA.

Figure 1: Flow diagram of the SLR

A total of 10 studies were found to be relevant to the study of concept of ontology and hadith domain. The findings obtained have been summarized systematically as Table 2.

Table 2: Findings for the 10 selected SLR publication

No	Study	Title	Aim	Methodology	Findings
1	Arbaaen, A. (2021).	Ontology-Based Approach to Semantically Enhanced Question Answering for Closed Domain: A Review	This study aims to reviews the literature detailing ontology-based methods that semantically enhance QA for a closed domain	Ontology-based approaches, across QA domains	An ontological approach to semantically enhancing QA is found to be adopted in a limited way, as many of the studies reviewed concentrated instead on NLP and information retrieval (IR) processing.
2	Fairouz, B., Nora, T., & Nouha, A. (2020)	An Ontological Model of Hadith Text	To enable different types of computer systems to exploit this knowledge, various researchers used a formal representation of the semantics of Hadith.	Approach inspired by the "METHONTOLOGY" methodology	Construction of an ontology that represents the semantics of the Hadiths and the knowledge that can be extracted from these voluminous textual sources of

					knowledge in Arabic.
3	Altammami, S., Atwell, E., & Alsalka, M. A. (2020)	Towards a Joint Ontology of Quran and Hadith	This study aims to enumerate ontologies and evaluate using a corpus-based approach to visualize the overlap between these ontologies and the Hadith.	Document analysis	The presented visualization of overlaps in the Hadith keywords and the Quran ontology concepts.
4	Massry, A. J. El. (2018)	An Ontology-based approach to support Semantic Search in Hadith (Zakat Domain)	This study aims to approach consists of six inter-related components: a knowledge base which was built using ontology that contains the hadiths related to a specific Islamic pillars (zakat).	Research and survey. Building the Ontology.	Results were compared by the traditional search which demonstrates a high response to the purpose for which the system was designed and to significantly improve the process of retrieving the hadiths and greater accuracy in the results.
5	Jaafar, A. H., Pa, N. C., Hamzah Jaafar, A., & Che Pa, N. (2017)	Hadith Commentary Repository: An Ontological Approach	The ability of the ontology to produce result or answer the requirement questions	Qualitative (based on the methodology outlined and published by Noy, N., & McGuinness, D. L. (2001)	Ontology can support the storage of Hadith Commentary which is not currently available and we foresee that with the availability of the hadith commentary ontology will further help ontological based

					repositories to integrate and provide a base for an online hadith corpus and linkages among Islamic related ontologies.
6	Al-Rumkhani, A., Al-Razgan, M., & Al-faris, A. (2016)	TibbOnto: Knowledge Representation of Prophet Medicine (Tibb Al-Nabawi)	This study aims to build a domain-specific ontology (Tibb Al-Nabawi ontology) to present the Prophet's medicine in a semantic ontological representation	Document analysis (based on an authentic Tibb Al-Nabawi Hadith)	The proposed ontology can be extended in the future to automatically generate treatments for specific diseases according to the Prophet's actions.
7	Al-Sanasleh, H. A. (2016)	Towards Building a Prophetic Ontology Based on Quran and Hadith	To experiment with the suggested ontology, developed the Prophetic Question Answering Interface to Ontology (PQuestIO), which is a simple Question Answering (QA) system developed in Java.	Building the prophetic ontology using ontology development processes and tools such as, OWL-API, DL-Query, and Protégé.	The system allows users to interact with the ontology to inquire about Prophets and get answers of their questions from two trust worthy resources; the holy Quran and Prophet Mohammad's (PBUH) hadith (plural of Hadith) narrated in Sahih Al-Bukhari, the Prophets book.

8	Alagha, I. M., & Al-Masri, M. G. (2016)	An Ontology Based Approach to Enhance Information Retrieval from Al-Shamelah Digital Library	This study aims to approach that leverages ontology-based annotations to produce highly relevant search results and to offer recommendations of related topics.	The design and architecture of OntoADL	Focusing on how ontology-based reasoning can result in intelligent results that meet the user's interests
9	Rebhi S. Baraka; Yehya M. Dalloul. (2014)	Building Hadith Ontology to Support the Authenticity of Isnad	This study aims to build a domain specific ontology (Hadith Isnad Ontology) to support the process of authenticating / judging Isnad.	Qualitative, Document analysis	Evaluate the ontology through Hadith example and DL-Queries. The developed ontology will be used (in a future work) to automatically generate a suggested judgment of Hadith <i>Isnad</i> .
10	Dalloul, Y. M. (2013)	An Ontology-Based Approach to Support the Process of Judging Hadith Isnad	This study aims to develop this science through this research. We build an ontology-based Isnad Judgment System (IJS) that automatically generates a suggested judgment of Hadith Isnad	Qualitative and Quantitative	Build an ontology-based Isnad Judgment System (IJS) that automatically generates a suggested judgment of Hadith <i>Isnad</i> .

4.0 FINDINGS

Of the 10 selected publications, 1 was published in 2021, 2 were published in 2020, 1 was published in 2018, 1 was published in 2017, 3 were published in 2016, 1 was published in 2014 and the remaining 1 was published in 2013. From the 10 papers, 1 was published in each of the following, respectively: *The Journal of Information, International Journal of Advanced Computer Science and Applications, Proceedings of the 6th International Conference on Computing and Informatics, International Journal on Islamic Applications in Computer Science and Technology, 8th International Conference on Islamic Applications in Computer Science And Technology, Procedia Computer Science, IUG Journal of Natural and Engineering Studies* and 2 thesis writing from the *Princess Sumaya University for Technology King and Islamic University of Gaza*.

Based on Table 2, the literature highlights were systematically selected and compiled according to the years 2022-2016, only 10 papers are related and in accordance with the research study. Looking at Massry (2018), there is an importance of establishing an electronic system that facilitates the access to these hadiths and retrieving it and to clarifies the relationships between hadith and how it relates. The few works on Islamic Semantic Web applications are still not enough also. Therefore, ontology-based approach for supporting semantic search from hadiths is a great way to enrich Islamic electronic content in retrieving information using semantic web.

On the other hand, an ontological approach to semantically enhancing QA is found to be adopted in a limited way, as many of the studies reviewed concentrated instead on NLP and information retrieval (IR) processing (Arbaeen, 2021). Thus, the system allows users to interact with the ontology to inquire about Prophets and get answers to their questions from two trustworthy resources; the holy Quran and Prophet Muhammads (PBUH) hadith (plural of Hadith) narrated in Sahih Al-Bukhari, the Prophets book (Al-Sanasleh, 2016). Meanwhile, according to Alagha and Al-Masri (2016), focusing on how ontology-based reasoning can result in intelligent results that meet the user's interests will do help in this field eventually.

According to Amir Hamzah Jaafar and Noraini Che Pa (2017), ontology can support the storage of hadith commentary which is not currently available and the availability of the hadith commentary ontology will further help ontological based repositories to integrate and provide a base for an online hadith corpus and linkages among Islamic related ontologies. Moreover, building an ontology based Isnad Judgment System (IJS) that automatically generates a suggested judgment of Hadith Isnad. It based on the rules that hadith scholars follow to produce a suggested judgment. A prototype of the approach implemented to provide a proof of concept for the requirements and to verify its accuracy (Dalloul, 2013). Finally, research by Rebhi, Baraka and Yehya Dalloul (2014) stated that building a domain specific ontology (Hadith *Isnad* Ontology) could support the process of authenticating or *Isnad* judging. The ontology was evaluated through hadith example and DL-Queries. The developed ontology could be used (in a future work) to automatically generate a suggested judgment of hadith *Isnad*. Therefore, the concept in examining hadith from an ontological perspective can be well understood.

Next, Fairouz, Nora and Nouha (2020) mentioned that the construction of an ontology that represents the semantics of the hadiths and the knowledge can be extracted from these voluminous textual sources of knowledge in Arabic. This will eventually help the presented visualization of overlaps in the hadith keywords and the Quran ontology concepts (Altammami, Atwell & Alsalka, 2020). For instance, the proposed ontology can be extended in the future to automatically generate treatments for specific diseases according to the Prophet's actions (Al-Rumkhani, Al-Razgan & Al-Faris, 2016). In conclusion, the systematic literature review of this study on 10 studies revealed that the ontology conceptualization and hadith domain has gone ample investigation and more updated in the future as it can benefits other in these field in the future.

5. DISCUSSIONS

5.1 Concept of Ontology

The term ontology from the philosophical angle comes from a Greek word that consists of two words, namely "onto" meaning "that is" and "loggy" meaning science or teaching. Ontology is the science or teaching of existence. The simple language of ontology is the theory of being the object of philosophical study, both definite and non-existent or unlikely to exist. But in essence, the term ontology was first introduced by Rudolf Goclenius in 1636 A.D. In its development, Cristian Wolff divided metaphysics into two, namely general metaphysics and specific metaphysics. Metaphysics is generally meant to be another istilah of ontology. Ontology investigates the fundamental nature of what is fundamentally real and the different ways in which entities (exist) from different logical categories (physical, universal and abstract objects) as well as can be said to exist within traditional frameworks. Ontology is considered a theory of the general principles of things exist, whereas lately ontology is seen as a theory of what exists (Halik, 2020). In the context of this review, ontology means describing the semantics of the data, providing a uniform way to enable communication by which different parties can understand each other (Massry, 2018). This derives from the perspectives of information science field.

Referring to Ahmad Tafsir (2013), the term ontology is a term used to talk about the nature and structure of something. Ontology is an operating tool to realize the subject to a practical stage. Ontology is also called a high area for the dependence of a subject (Kartawiguna, 2015). In the study of Staab and Studer (2013), ontology becomes very important in the field of information seeking. One application that has recently seen an explosion of interest is the so-called semantic web wherein, ontologies are set to play an important role in establishing common terms between agents by ensuring that different agents have a common understanding of the terms used in semantic markers. According to Nowroozi, Mirzabeigi and Sotudeh (2018), ontology can be more beneficial in representing synonymous relationships as well as enhancing and helping searchers to improve their understanding of the concept of ontology.

5.2 The Hadith Domain

Hadith is oral traditions related to the words and deeds of Prophet Muhammad (peace be upon him). The traditional Muslim school of jurisprudence regards Hadith to constitute an important tool for understanding the holy Quran and an essential part of all matters related to jurisprudence (Baraka & Dalloul, 2014). On the other hand, according to Altammami, Atwell and Alsalka (2020), each hadith is a stand-alone statement or act by the prophet that was later written, collected, and compiled into books where scholars have categorized them into topics by relying on their deep knowledge and understanding of hadith. The Hadith consists of two parts: the actual narration, known as *Matan* and the chain of narrators through whom the narration has transmitted, traditionally known as *Isnad*. The *Isnad* consists of a chronological list of the narrators, each mentioning the one from whom he heard the hadith all the way to the prime narrator of the *Matan* followed by the *Matan* itself (Dalloul, 2013).

According to Sholahuddin (2008) in his study, the hadith is called *al-Jadid* or "the new" opposite *al-Qadim* or "the old". Hadith is generally understood as something derived from the Prophet (peace be upon him). While hadith is also referred to as *sunnah* which in principle there is no difference between hadith and *sunnah*. However, hadith refers to the text of the hadith found in the books of hadith whereas, *sunnah* refers to what takes place in the practice of Muslims. Looking at Ibn Taymiyyah's

perspective, both hadith and *sunnah* have the same meaning that is everything that happens to the Prophet after prophethood both in terms of words, deeds and decrees (Fageh, 2019).

Based on Altammami, Atwell and Alsalka (2020) research, the hadith structure is especially different in that it consists of two parts, as shown in Figure 1. The *Isnad* is shown in bold, representing the reverse chronological chain of scholars who verbally transmitted the Hadith before it was written into books. The *Isnad* is usually followed by *Matan*, which is the actual teaching or prophetic words.

Yahya bin Bakir told us that Alith told him from Aqeel from Ibn Shihab who said Anas bin Malik told me that the prophet peace be upon him (PBUH) said, "Whoever loves that he be granted more wealth and that his lease of life be prolonged then he should keep good relations with his kith and kin."

Figure 2: Hadith example, *isnad* in bold followed by *matan*.

Hadith has its commentary given by various scholars. It describes and provides understanding to the hadith especially to non-native Arabic speakers. Without commentary, the lateral meaning of the *matan* (text of the hadith) can be understood out to the original scope and could result in an incorrect interpretation (Amir Hamzah Jaafar & Noraini Che Pa, 2017). Basid (2016) study entitled "*Takhrij al-Hadith in perspective of Ontology and Axiology studies of Hadith Science*" states that in the reading of hadith, it is not enough just a dictionary and hadith book as a reference. This is because, the hadiths are collected in many books of hadith. Therefore, the study of Takhrij al-hadith appears as a method for tracking the original source of a hadith. The application of this method has two main variants, namely; conventional (*sanad* and *matan*) and modern (computer). Fazlur Rahman (2020) defined *sunnah* as a conceptual basis. The importance of understanding a conceptual basis is to relate to the understanding of the development of hadith or during medieval Islam where at that time the word hadith was always identitized with practical norms or behavior models contained in the hadith (Suryani, 2020). *Al-Sunnah* is a source that details the explanations contained in the Quran and acts as a strengthening of the truth of its teachings. Through His Messenger, al-Sunnah has proven that the teachings of Islam contained in the Quran are practical in all human life systems throughout the ages (Aminudin, Mohd Radzi & Nik Yusri 2006).

5.3 The Relationship Between The Ontology Conceptualization and Hadith Domain

According to Solihin (2018) in his study, the ontology of hadith in terms of hadith research is explained. In order to know the purpose of the investigation of hadith, the first case is stated about the meaning of the *sanad* and the *matan* of the hadith. Therefore, the study includes criticism of the *sanad* according to the hadith. *Sanad* is a method of narration that can connect the *matan* of hadith to the Prophet, while the *matan* of hadith means something (the words of the Prophet) that ends in a *sanad*, *kalam* or which ends with a final *sanad*. In conclusion, the investigation of hadith is intended as a critical study of the *sanad* and *matan*. Hadiths that are carried out by hadith reviewers with the aim of finding out whether a hadith is coming from the Prophet or not using certain methods.

According to al-Shafi'e that the original *sunnah* is the *sunnah* of the Prophet not as they thought. The original *sunnah* is the *sunnah* that is conveyed explicitly through a clear, formal, authentic line of transmission called hadith. The *sunnah* can be known and discovered through the method of transmission, not passed down through tradition or from one generation to the next (Maimun, 2015).

In the context of the discussion on the definition of *Al-Sunnah*, hadith scholars state that it is broader and more comprehensive than other definitions. The discussion of the group of hadith scholars on *Al-Sunnah* not only discusses the aspect of *dirayat* alone but also covers the field of narration.

Therefore, it is found that these hadith scholars are those who have deep expertise in the field of law-*hakam* as well as abilities in the aspects of the rules of law production. As a clear example, al-Bukhari as stated by Ibn Hajar in the writing of his authentic book, al-Bukhari not only collected authentic hadiths only. His writing is accompanied by the advantages of *fiqhiyyat* as well as problems that are quite thorough and neat as a result of understanding and strength of inference from the quality of hadith. According to al-Nawawi, al-Bukhari not only collected hadith but also conducted a study of *ahkam* (Islamic laws) and made hadith as arguments which were then linked in each chapter title he wanted. In this regard, Islamic scholars argue that al-Bukhari's *fiqh* is found in every chapter description in an authentic book (Aminudin, Mohd Radzi & Nik Yusri, 2006). The study of hadith is an in-depth and critical study of hadith and chain of transmission by using certain methods to determine the authenticity of a hadith as evidence of the truth of religious teachings. Hadith is the illuminator or interpreter of the Quran, careful study must be done so as not to be deviated and stuck with wrong thoughts. Comes to the ontology, the ontology helps in representing the hierarchical structuring of knowledge about things by subcategorizing them per their essential qualities. These could be applied to the knowledge structure of hadith domain which contained substantial branches of hierarchies.

6. CONCLUSION

Ontologies which defined as the explicit formal specifications of the terms in the domain and relations among them. Every knowledge base, knowledge-based system, or knowledge-level agent is committed to some conceptualization, explicitly or implicitly. This conceptualization must be based on something which is common or known to enable seamless data transfer and facilitate portability. Realizing that ontologies can represent a well-defined, standardized and straightforward form of knowledge or repositories, researchers have tried to construct an ontology based on Islamic knowledge which comprises of Holy Quran, Hadiths and etc. as highlighted by most of referred scholarly works in the review (Saad et al., 2010; Azmi & Badia, 2010; Ali, 2013; Khan et al., 2013; and Baraka & Dalloul, 2014).

Acknowledgement

This article is supported by the Ministry of Higher Education (KPT), under the Fundamental Research Grant Scheme (FRGS)- RGS/1/2020/SSI0/USIM/02/1 dengan tajuk "Model Baharu Pengekstrakan Makna Kontekstual Hadis Peranan Wanita Dalam Domain Kekeluargaan Berdasarkan Pendekatan Ontologi" in cooperation with the Faculty of Quranic and Sunnah Studies, Universiti Sains Islam Malaysia (USIM).

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