



# TRANSFORMATION OF UNDERSTANDING HADITH IN THE POST-MULTIMEDIA ERA: BALANCING TECHNOLOGICAL ADVANCEMENTS WITH TRADITION PRESERVATION

DOI : [10.14421/livinghadis.2024.5798](https://doi.org/10.14421/livinghadis.2024.5798)

**Alwi Padly Harahap, Rahmi Syahriza,  
Asrar Maburr Faza**  
Universitas Islam Negeri Sumatera Utara  
Institut Agama Islam Negeri Langsa  
[alwi3006233002@uinsu.ac.id](mailto:alwi3006233002@uinsu.ac.id)

Tanggal masuk : 23 Okt 2024  
p-ISSN : 2528-756  
e-ISSN : 2548-4761



## Abstract

*Technological advances in the post-multimedia era have brought about significant changes in various aspects of life, including in the understanding and dissemination of hadith. Multimedia technology provides faster and wider access to hadith literature, allowing Muslims to access authentic sources more easily. Nevertheless, this transformation also poses challenges in maintaining the authenticity and preservation of the tradition of hadith understanding that has developed over the centuries. This research aims to explore how the development of multimedia technology affects the transformation of people's understanding of hadith and how it interacts with efforts to maintain the interpretive traditions inherited by classical scholars. Using a qualitative method with an interpretive-hermeneutic approach was adopted to help interpret the shifting understanding of hadith among the younger generation and religious communities. The results show that although technological advances have enriched access to hadith, there are concerns about misinterpretation due to the lack of control of authoritative scholars. However, technology also provides opportunities for Islamic scholars and educational institutions to adapt, utilizing multimedia as a means of da'wah as well as the preservation of tradition. Therefore, synergistic efforts between technological innovation and strengthening Islamic literacy are needed so that the understanding of hadith in the post-multimedia era remains authentic and relevant.*

**Keywords:** Transformation, Understanding Hadith, Post-Multimedia Era, Digital Technology, Preservation of Tradition.

## Abstrak

*Kemajuan teknologi di era post-multimedia telah membawa perubahan signifikan dalam berbagai aspek kehidupan, termasuk dalam pemahaman dan penyebaran hadis. Di satu sisi, teknologi multimedia menyediakan akses yang lebih cepat dan luas terhadap literatur hadis, memungkinkan umat Islam untuk mengakses sumber-sumber otentik secara lebih mudah. Di sisi lain, transformasi ini juga menimbulkan tantangan dalam menjaga keaslian dan kelestarian tradisi pemahaman hadis yang telah berkembang selama berabad-abad. Penelitian ini mengkaji bagaimana perkembangan teknologi multimedia mempengaruhi transformasi pemahaman masyarakat terhadap hadis, serta bagaimana hal tersebut berinteraksi dengan upaya mempertahankan tradisi penafsiran yang diwariskan oleh ulama klasik. Metode kualitatif dengan pendekatan interpretatif-hermeneutik diadopsi untuk membantu menafsirkan pergeseran pemahaman hadis di kalangan generasi muda dan komunitas keagamaan. Hasil penelitian menunjukkan bahwa meskipun kemajuan teknologi telah memperkaya akses terhadap hadis, terdapat kekhawatiran mengenai penyelewengan interpretasi akibat kurangnya kontrol ulama otoritatif. Namun, teknologi juga memberikan peluang bagi ulama dan lembaga pendidikan Islam untuk beradaptasi, memanfaatkan multimedia sebagai sarana dakwah sekaligus pelestarian tradisi. Oleh karena itu, diperlukan upaya sinergis antara inovasi teknologi dan penguatan literasi keislaman agar pemahaman hadis di era post-multimedia tetap otentik dan relevan.*

**Kata Kunci:** Transformasi, Pemahaman Hadis, Era Post-Multimedia, Teknologi Digital, Kelestarian Tradisi.

## A. Introduction

The emergence of post-multimedia technology has led to significant transformations in the comprehension and dissemination of hadith in today's era. Post-multimedia technology integrates diverse media forms like text, images, video, sound, and virtual reality, enabling more interactive and multisensory communication and information sharing. (Chunlin, Yanpei, Youlong, & Min, 2017) In the realm of hadith studies, this progress has opened up avenues for Muslims to have wider and easier access to hadith sources for Muslims. The digitization of hadith literature and the utilization of web-based and mobile applications have simplified the study of the hadiths of the Prophet SAW for scholars, students, and the general public. (Ummah, 2019) This has undeniably facilitated their ability to study, reference, and explore classical hadith books without being constrained by space and time.

In addition, advancements in multimedia technology enable scholars and preachers to disseminate their knowledge of hadith in a more engaging and impactful manner. (Istianah, 2020) Social media platforms facilitate the distribution of hadith lectures through interactive videos with accompanying text and graphics, making the message more accessible to diverse audiences. These videos are not limited to in-person lectures but can be accessed at any time by individuals worldwide. (Fadilha, 2020) For instance, teachings on the ethical aspects of daily life or specific Islamic laws can be communicated through infographics or animations, enhancing the audience's comprehension.

The rapidly advancing technologies of augmented reality (AR) and virtual reality (VR) also present thrilling and dynamic new possibilities, (Adryansyah, Quiroz, Zuhdi, & Sutabri, 2023) including in the transmission of hadith. Through VR, individuals can engage in virtual simulations that reconstruct the scenario or historical setting in which a particular hadith was conveyed. This can enable the audience to experience the profound significance of the hadith, as they find themselves in the same circumstance as the Prophet's companions when the hadith was initially conveyed. This not only enhances the learning process but also enhances comprehension of the historical context of the hadith.

However, the advancement of post-multimedia technology poses challenges, particularly concerning the authenticity and accuracy of disseminated hadith content. (Istianah, 2020) Digital platforms that facilitate information sharing also carry the risk of propagating false hadith (*mauḍū'*) or inappropriate interpretations if not adequately filtered. (Rosyad & Alif, 2023) Scholars and academics need to play an active role in ensuring that the content circulated on digital media adheres to the correct methodology of hadith science, including the

verification of Sanad (chain of narration) and Matan (text of hadith). (Istianah & Wahyuningsih, 2019) Consequently, there is a necessity for official regulations and platforms established by religious institutions to disseminate authentic hadith and offer proper guidance in comprehending them. (Bahrudin, Suliaman, & Mohamed Adnan, 2023)

Several previous studies have examined the impact of technology and culture on understanding hadith. Hadi (2020) studied the One Day One Hadith mobile application and found that this application was effective in increasing the understanding of hadith for the general public with a practical and systematic approach. Daffa (2022) revealed that understanding hadith influences the ethics of using social media, where individuals who have a good understanding of hadith tend to be wiser in interacting in the digital world. Supriyadi, Julia, Aeni, & Sumarna (2020) showed that the Encyclopedia of Hadith application makes it easier for users to search and authenticate hadith, thereby increasing digital-based Islamic literacy. Hafidhuddin (2021) studied the content of hadith studies on YouTube and found that the commercialization of religious content can shift the focus from preaching to economic motives, potentially affecting the objectivity of the delivery of hadith. Meanwhile, Febriani, Rumsiti, Maulana, & Hermawan (2024) proved that online Quran and Hadith interpretation classes through digital platforms provide wider access for young Muslims to understand religious sources interactively and flexibly.

Although the above studies provide insight into the impact of technology on hadith studies, there is a gap in understanding how the transformation of hadith understanding takes place in the post-multimedia era, especially in balancing technological advances with the preservation of Islamic scientific traditions. This study offers novelty by exploring how the integration of digital technology changes the pattern of hadith understanding, both in terms of study methodology and the sustainability of classical scientific authority in the modern era. The formulation of the problems studied include: (1) How is the transformation of hadith understanding in the post-multimedia era? (2) What are the challenges and opportunities in balancing technological advances with the preservation of hadith scientific traditions? (3) What are effective strategies for maintaining the authenticity of hadith understanding amidst the development of digital technology?

This study aims to analyze changes in the method of understanding hadith due to technological developments, identify challenges in maintaining the validity and authority of hadith science, and formulate strategies to bridge digital innovation with the values of Islamic scientific tradition. Using qualitative methods with data sources from hadith applications and social media, this study will describe how hadith is interpreted through digital platforms and community

interactions with the material. An interpretive-hermeneutic approach will be used to analyze the shift in understanding hadith among the younger generation and religious communities and find a correlation between technology and traditional values in understanding hadith. Therefore, this study is expected to contribute to developing an integrative model in hadith studies that accommodates technological innovation without ignoring the principles of classical scientific methodology, thus producing a more adaptive and responsible approach to understanding and disseminating hadith in the digital era.

## **B. Definition of Post-Multimedia and Theory of Understanding Hadith**

The concept of post-multimedia goes beyond traditional multimedia by integrating various media formats such as text, images, audio, video, and animation to create a more enriched information experience. (Noetel et al., 2021) In the post-multimedia era, technology not only combines these media formats passively but also incorporates elements of interactivity, real-time, and deeper user involvement. This concept emphasizes not only presenting content but also enabling users to interact with the media, resulting in a more immersive and responsive experience. (Triadi Antara, 2024)

Post-multimedia is characterized by interactivity, allowing users to actively participate in the process of consuming information. (Istiqlal, 2017) In traditional multimedia, information is presented linearly, with users passively viewing video, listening to audio, or reading text. In contrast, post-multimedia gives users more control over how they consume media, enabling them to customize content to fit their preferences and even participate in creating or modifying the media they are engaging with. (Nurjaman & Hamdu, 2018) This technology transforms users from passive consumers to prosumers (producers and consumers), empowering them to directly contribute to and shape content.

In addition, post-multimedia makes use of internet connectivity to deliver content in real time. This implies that the information presented is no longer fixed, but can be modified and updated to reflect current events. (Rahmanda, Pramukantoro, & Yahya, 2018) For instance, in the realm of digital news or map applications, users constantly receive current data, keeping up with unfolding developments. This paves the way for more pertinent experiences, particularly in mobile apps, online games, and social media platforms, where each user interaction can generate immediate feedback, shaping a dynamic and constantly evolving environment.

The advancement of post-multimedia technology is closely linked to the progress of artificial intelligence (AI) and machine learning. Through the incorporation of AI, post-multimedia systems can automatically analyze user

actions and preferences to offer more personalized and customized content. (Zhu, Wang, & Gao, 2020) For instance, streaming services like Netflix or YouTube utilize AI algorithms to suggest videos or movies that align with the user's viewing habits. AI can also be utilized in producing interactive content, such as games or educational apps, where the user's experience can adapt based on their interactions, resulting in a dynamically evolving storyline. (Hammedi, Essalmi, Jemni, & Qaffas, 2020)

The use of virtual reality (VR) and augmented reality (AR) are fundamental technologies in the post-multimedia era as they provide more immersive experiences. VR allows users to immerse themselves in a three-dimensional simulated environment, (Song et al., 2017) while AR integrates digital elements with the real world to enhance the user's perception of their surroundings. (Keil, Edler, & Dickmann, 2019) These technologies have a wide range of applications, from entertainment such as VR games to educational uses like medical simulations or military training, and business and marketing with AR-based shopping experiences. These experiences enable users not only to consume information but also to interact with content in ways that were previously not possible in traditional multimedia.

The post-multimedia ecosystem is significantly influenced by the Internet of Things (IoT). IoT facilitates the connection and real-time data exchange between smart devices like mobile phones, tablets, smartwatches, and home appliances, creating a more comprehensive media experience. This integrated approach allows for the reception, control, and presentation of information across multiple devices. (Malek et al., 2017) For instance, an IoT-enabled fitness app can utilize data from various sensors to offer real-time analysis of a user's health and fitness, along with personalized recommendations based on the collected data. (Gravina, Alinia, Ghasemzadeh, & Fortino, 2017)

Thus, the concept of post-multimedia goes beyond simply merging different types of media; it aims to establish a more engaging, lively, and adaptable environment. This advancement is revolutionizing how we engage with information, leading to more personalized, immersive, and real-time content, and driving innovation in fields like education, business, entertainment, and communication. It represents a significant milestone in the progression of digital media, erasing the boundaries between the physical and digital realms, and delivering increasingly immersive and meaningful experiences for users.

Furthermore, the interpretation of hadith, in both classical and modern frameworks, presents a highly intricate area that has evolved in tandem with social, political, and cultural shifts in Islamic history. To offer a more comprehensive overview, we can categorize this analysis into two primary stages: the traditional (classical) perspective and the modern (contemporary) perspective,

each with distinct methodological traits and paradigms. During the early centuries of Islam, scholars like Imam al-Bukhārī, Muslim, and Abū Dāwud were prominent in the study of hadith. Their expertise in the science of hadith led to a focus on preserving the authenticity and reliability of the Prophet SAW's hadith. Consequently, scholars dedicated their efforts to critiquing the sanad and matan to ensure the validity of the hadith.

Studying the narrators who relayed the hadith is known as sanad criticism. Scholars established the field of *'ilm al-Rijāl* (the science of narrators) to scrutinize the biographies, honesty, and trustworthiness of the narrators. They set rigorous standards for determining the reliability of a narrator. Furthermore, they also investigated the connections between narrators in the sanad to confirm that each person in the chain had truly met and directly heard the hadith from the preceding narrator. (Yotenka, Dini, Fauzan, & Ahdika, 2022)

Once the authenticity of the chain of narrators has been confirmed, scholars in the classical era would scrutinize the content or text of the hadith. They did this by assessing the matan in comparison to the fundamental principles of the Qur'an and more reliable hadith. (Qomarullah, 2022) Additionally, they would verify if the text of the hadith contradict common sense, customs, or established sharia rules. Hadith that did not meet these criteria were deemed weak (*da'īf*) or even false (*mauḍū'*). (I. Siregar & Harahap, 2024) Based on the scrutiny of the chain of narrators and the content, classical scholars categorized hadith into several groups; *ṣaḥīḥ* (authentic), *ḥasan* (good), *da'īf* (weak), and *mauḍū'* (false). These classifications were crucial in determining whether a hadith could be used as a legal basis or was simply a narrative without any sharia value.

Classical scholars typically adopt a literal approach when interpreting hadith, considering it as a text that should be understood based on its original meaning unless there are clear indications to interpret it symbolically or figuratively. (Syarifudin & Masruhan, 2021) This literal approach is commonly employed in hadith commentary books such as *Fath al-Bārī* by Ibn Ḥajar al-Asqalānī and *al-Minhāj Sharḥ Ṣaḥīḥ Muslim ibn al-Ḥajjāj* by Imam al-Nawawī.

In the modern era, Islamic scholars and clerics encountered new challenges due to advancements in modern science, societal changes, and evolving political dynamics that differed from the classical era. (Chande, 2023) As a result, there was a growing need to re-examine Islamic texts, including hadith, to ensure their relevance and applicability to contemporary times. One prevalent method for interpreting modern hadith is through hermeneutics, a theory that considers historical and social contexts when interpreting texts. (Miski, 2020) Fazlur Rahman and other Muslim scholars introduced the double movement approach, which requires interpreters to first grasp the original meaning of the text within

its historical context (the time of the Prophet), and then apply that meaning to a modern context. (Kamla & Alsoufi, 2015) Hermeneutics aims to bridge the gap between the text and evolving social realities, facilitating a more dynamic understanding of hadith.

The socio-historical approach is another method that seeks to situate the hadith within a specific historical framework, encompassing the political, economic, and cultural circumstances that influenced the teachings or actions of the Prophet SAW. (Hasanah, 2023) Nasr Ḥamīd Abū Zayd is a contemporary scholar who employs this approach to uncover the deeper significance of the text by examining the societal context of certain hadiths. Abū Zayd contends that many hadiths originated from the social milieu of their time, and may not necessarily be directly applicable in the present day. (Mufid, Massoweang, Mujizat Allah, Muslim, & Yani, 2023)

In the past few decades, there has been an emergence of Muslim feminist thinkers like Asma Barlas who argue that any hadith contradicting the Qur'an should be dismissed. This approach considers certain hadith concerning women as products of historical patriarchy and advocates for their reassessment by Islamic principles of equality. (Harahap & Wahyuni, 2024) For instance, hadith about women's rights in marriage or leadership are frequently reinterpreted to align more closely with the values of social justice.

In the contemporary era, scholars of Islam have started employing linguistic and semiotic analysis to comprehend the content of the hadith. This method delves into the use of language, terminology, and rhetorical structures in the hadith to reveal deeper significance. (Afwadzi, 2015) Tariq Ramadan and other scholars highlight the significance of grasping the linguistic and cultural context of the language utilized in the hadith, as words in classical Arabic might carry different connotations than those in contemporary language. (Saad, 2023)

Contemporary approaches to understanding hadith are also often interdisciplinary, combining history, sociology, anthropology, and even psychology. This approach allows for a richer and more comprehensive interpretation of hadith, especially in the face of modern issues such as human rights, religious pluralism, and globalization. (Nirwana, 2015) For example, hadith related to war or *jihād* are often reinterpreted in the context of today's global politics, where the concepts of peace and diplomacy are given greater prominence. (Taufiq & Alkholid, 2021)

The classical theories regarding the comprehension of hadith stress the importance of the text's authenticity and its alignment with tradition. On the other hand, modern theories lean towards being more contextual and adaptable. Traditional scholars prioritize preserving the purity of the text by concentrating on critiquing the Sanad and Matan, while contemporary scholars place more

emphasis on ensuring that hadith remains relevant in the face of evolving times and modern challenges. Both approaches play significant roles in upholding a comprehensive and dynamic understanding of hadith as a primary source of Islamic teachings.

### C. Transformation of Understanding of Hadith and Challenges in Preserving Hadith Tradition in the Post-Multimedia Era

The evolution of the interpretation of hadith involves a shift in how hadith is understood and explained over time. The understanding of hadith has progressed due to historical, social, political, and cultural influences, as well as the changing needs of Muslims in different periods. (Muhtador, 2019) In ancient times, the interpretation of hadith relied heavily on the transmission of narrations (sanad) and the authority of hadith scholars. The primary emphasis was on validating the authenticity of the Sanad and Matan (content) of the hadith. (Karim, 2019) Scholars like Imam al-Bukhārī, Muslims, and others organized hadith by giving importance to authenticity, resulting in discussions centered around the classification and critique of Sanad and Matan.

During this period, hadith was interpreted based on the exact wording conveyed by the Prophet Muhammad, with a strong focus on textual accuracy. The primary basis was the literal interpretation and adherence to the requirements of narration. For instance, the hadith regarding the obligation of women to wear the hijab was understood in a literal sense (Al-Sijistānī, 1993), emphasizing the physical covering of women's bodies, without taking into account the evolving social dynamics. (I. Siregar & Harahap, 2024) Similarly, hadiths that govern the relationship between the ruler and the people (Al-Bukhārī, 1993; Al-Naisābūrī, 1955; Al-Nasā'ī, 2018; Al-Sijistānī, 1993; Al-Tirmizī, 1975; Ḥanbal, 1995; Mājah, 2014), often strict in their interpretation of absolute obedience to the ruler, were applied without considering the changing political context. (Amir, Harahap, Rahmi, & Nazmi, 2024)

Initially, this method evolved. During the medieval period, the comprehension of hadith began incorporating aspects of rationality and contextual analysis. Thinkers like Imam al-Ghazālī and Ibn Rushd started to create a framework for interpreting hadith in light of *maqāsid shariah* (the aims of shariah) and *maslahah* (public interest). They posited that interpreting the text should align with the overarching goals of Islamic law, which include the protection of faith, life, intellect, lineage, and property. (Anwa, Awang, & Sahid, 2021) This contextual interpretation started considering the evolving social circumstances while still recognizing the text's integrity.



Significant changes have taken place in the modern and contemporary period, particularly following the onset of colonialism, modernization, and globalization. Muslim scholars and intellectuals have started to reassess many hadith within a wider social, political, and cultural context. Hadith that were once interpreted are now examined more thoroughly, considering historical and sociological backgrounds. For instance, hadith regarding women's roles, (Al-Bukhārī, 1993; Al-Dārimī, 2000; Al-Naisābūrī, 1955; Al-Nasā'ī, 2018; Al-Sijistānī, 1993; Anas, 1985; Ḥanbal, 1995) which were frequently seen as limiting women's freedom in classical times, are now viewed more inclusively. Women are recognized as having the right to participate actively in education, politics, and economics, with the understanding that these hadith need to be adapted to contemporary circumstances. (Harahap, 2023)

Another example is the hadith concerning jihad, which historically was frequently viewed as armed conflict. (Al-Bukhārī, 1993; Al-Naisābūrī, 1955; Al-Tirmiẓī, 1975; Ḥanbal, 1995) In contemporary times, numerous Muslim scholars and thinkers interpret *jihād* as a peaceful endeavor aimed at self-improvement, enhancing society, and promoting overall well-being. (Bimbo, 2019) This interpretation has evolved alongside a growing recognition of the significance of harmony and collaboration among people.

A particular example of a hadith that has evolved in interpretation is the one regarding relationships between husbands and wives, which in traditional contexts was frequently seen through the lens of the husband's authority over the wife. (Al-Dārimī, 2000; Al-Sijistānī, 1993; Al-Tirmiẓī, 1975; Ḥanbal, 1995; Mājah, 2014) In contemporary understanding, this hadith is more accurately viewed in terms of equality and partnership within the household, where both spouses have equal rights and responsibilities based on the principle of justice in Islam. (R. H. Siregar & Harahap, 2024) This evolution demonstrates that the interpretation of hadith is not fixed. It adapts to changing times while preserving the essence and authority of the hadith itself. The aim is to ensure that Islamic principles remain pertinent and responsive to the challenges encountered by Muslims across different eras and locations.

In the current multimedia age, the difficulties associated with maintaining the tradition of hadith have become increasingly intricate. This period is characterized by the vast accessibility of information via the internet and social media, where anyone can obtain and disseminate hadith without proper vetting. The context surrounding hadith is frequently overlooked, with many being interpreted in fragments without regard for their historical and social backgrounds. Hadith about jihad, (Al-Bukhārī, 1993; Al-Naisābūrī, 1955; Al-Tirmiẓī, 1975; Ḥanbal, 1995) for instance, are often exploited by extremist groups who fail to grasp the full meaning and context. (Sefriyono, Ilhamni, & Rahmi,

2022) Furthermore, the narrow interpretation of hadith by certain factions has led to fragmentation and radicalization. (Yusuf, Siregar, & Harahap, 2024)

Conversely, multimedia technology presents opportunities to promote a more inclusive and contextual understanding of hadith. Modern scholars and thinkers utilize digital platforms to offer more pertinent and responsive interpretations of social issues such as gender equality, human rights, environmental concerns, and business ethics. Hadith related to the environment, like the saying of the Prophet Muhammad that highlights the significance of nature conservation, *“If the Day of Judgment comes and one of you has a date palm seedling in his hand, then plant it”*, (Ḥanbal, 1995) is now seen as a foundation for environmental ethics in Islam, pertinent to contemporary challenges like climate change and ecosystem preservation.

This transformation hasn't always proceeded without difficulty. A significant challenge lies in maintaining the relevance of hadith understanding while safeguarding its authenticity. The primary challenge is achieving a balance between preserving genuine teachings and adapting them to a modern, dynamic context. Scholars need to engage in *ijtihād* (independent interpretation) while honoring tradition, but they must also be receptive to contemporary developments.

#### **D. Integration of Technology and Classical Tradition in Hadith Studies**

##### **1. Strategy of Combining Technology and Classical Methods**

The integration of modern technology with classical methods in the study of hadith, especially in the aspects of Sanad and Matan, is a strategic step to maintain the accuracy and authenticity of the transmission of knowledge in the digital era. Current technology can provide broad and efficient access to sources of knowledge, including classical books that were previously only accessible to academics and scholars. (Nižetić, Djilali, Papadopoulos, & Rodrigues, 2019) However, in this digitization process, it is important to ensure that the authenticity and depth of traditional methodologies are maintained.

One of the classic methods that is the main pillar in maintaining the authenticity of knowledge is the sanad, namely the chain of transmission from a teacher to his student until it reaches the Prophet or the source. (Kamaluddin, 2023) This sanad functions as the main indicator of the validity of information, helping to ensure that the knowledge shared remains accurate and undistorted. In the technological era, sanad can be integrated with digital platforms through online sanad certification, video recordings of direct teachings from scholars with valid sanads, and digital storage of sanad

records. (Annaba & Soleh, 2022) Blockchain technology, for example, has the potential to be used to track the authenticity of Sanad so that any changes in the chain of transmission of knowledge can be detected and verified. One example of this implementation can be found in the efforts to digitize the sanad of the Qur'an *qirā'at* by Islamic institutions in the Middle East, where the sanad record of each *qāri'* can be verified through blockchain-based technology. (Widyastri, Nata, Al Munawar, & Suparto, 2022) In this way, technology not only accelerates access to knowledge but also strengthens the guarantee of the authenticity of scientific transmission.

In the case of hadith studies, the main challenge in digitization is ensuring that each hadith text available online remains authentic. For example, in a hadith manuscript digitization project in Yemen, many versions of the text were found to have different wordings. (Nancy Um, 2020) This is where artificial intelligence (AI) technology plays a role in analyzing and comparing variations in the text so that researchers can more easily identify differences in versions of a hadith.

However, the use of AI in the study of hadith must still be supervised by scholars and experts to avoid errors in interpretation. An interesting case occurred when the AI system translating hadith in an Islamic application produced a meaning contrary to classical interpretation. (Taghian, 2024) This shows that although AI can help in technical aspects, understanding hadith still requires guidance from scholars with scientific authority. Thus, the strategy of integrating technology and classical methods in Islamic scientific studies demands a balance between using technology for efficiency and accessibility and maintaining the depth and authenticity that characterize the Islamic scientific tradition. Technology must be used wisely to strengthen, not replace, the authority of science based on Sanad and Matan. If done properly, this integration will preserve authentic Islamic science while anticipating the challenges of the digital era.

## 2. Utilization of Big Data in Hadith Studies

The use of big data in hadith studies presents a great opportunity to increase efficiency and accuracy in research, especially in the search for sanad and matan. Big data enables the collection, storage, and analysis of large amounts of data from various sources, (Wang et al., 2018) including hadith books, *tafsīr*, *sura*, and classical manuscripts, which were previously scattered and difficult to access. Intelligent search algorithms applied to these large databases enable the identification of patterns in sanad—for example, identifying narrators who appear frequently in a particular sanad, narrators

whose credibility is disputed, or different variants of hadith texts across sources. (Farooqi, Malick, Shaikh, & Akhunzada, 2024)

Big data technology can also be used to systematically analyze the network of narrators, build a more detailed map of the transmission of knowledge, and reveal relationships between narrators that may be hidden in traditional studies. Using machine learning algorithms, systems can be trained to recognize the pattern of sanad that is *ṣaḥīḥ*, *ḥasan*, or *da'īf* based on criteria set by expert hadith scholars. In addition, text search algorithms can help find similarities or differences in the texts of hadith spread across different books, providing researchers with instant access to compare texts and ensure the authenticity of the narration. (Wang et al., 2018)

In the context of chain verification, big data can organize and filter the narrations in a more structured way, recording the details of each narrator, their years of life, relationships between narrators, and credibility ratings given by classical hadith scholars. (Ramzy et al., 2023) This provides an advantage in more in-depth and comprehensive chain research compared to manual methods. Natural language processing (NLP) algorithms can also be used to analyze and classify hadiths, identify implied meanings, and understand the historical context and language used in the narration. (Azmi, Al-Qabbany, & Hussain, 2019)

One example of the use of this technology is a project conducted by researchers in the Middle East, who used big data and NLP to analyze more than 700,000 hadith narrations spread across various classical books. (Abdelaal & Youness, 2019) Through this technology, unique patterns were found in the transmission of hadith, such as the tendency of certain groups of narrators to narrate similar hadith, as well as the possibility of interpolation or changes in texts in several variants of the matan. Another case occurred in a study conducted in Malaysia, where big data was applied to compile hadith using Malay, making it easier for academics and practitioners to find hadith references that are relevant to contemporary discussions. (Doll Kawaid et al., 2023)

However, in its use, this modern technology must continue to go hand in hand with the methods of hadith criticism developed over centuries. Technology is only a tool that helps speed up the process and organize data more systematically. However, the validity and legitimacy of a hadith must still be studied with the principles of hadith science that have been agreed upon by scholars. Researchers must still use the *takhrīj* hadith approach by considering the context of the Sanad and Matan critically, and not relying entirely on the results provided by the algorithm.

Therefore, the ideal approach in utilizing big data for hadith studies is to make it a supporting instrument, not a substitute for classical methods. Accuracy and precision must remain the main priority so that this technology can truly enrich hadith studies without sacrificing the scientific principles that have long been the foundation of Islamic science. Thus, big data and search algorithms can contribute to presenting a broader and more systematic understanding of hadith, while maintaining the originality and authority of hadith science that scholars have inherited since ancient times.

### **3. Interactive Application to Understand Hadith**

An interactive application for understanding hadith offers an innovative and comprehensive solution for traditional and contemporary learners. The application is designed with features that integrate classical teaching methods, such as Sanad and Matan, with modern technology that facilitates access and understanding. (Daud & Junus, 2023) One of the main features is a hadith database equipped with an advanced search function, allowing users to find hadith based on keywords, themes, or sources. This feature can be combined with sanad visualization, where the chain of narrators of hadith can be visualized graphically so that users can easily see the relationship between narrators and trace the authenticity of hadith.

In addition, this application can be equipped with a feature explaining the text of various recognized books of Islamic law, such as explanations from Imam al-Nawawī, Ibn Ḥajar al-'Asqalānī, or contemporary scholars. (Nuridin, 2020) This is important considering the many understandings of hadith that are often misinterpreted or taken out of context. An example of a case that usually occurs is the understanding of the hadith about women who are considered to always be at home, even though when studied further through the books of Islamic law, the hadith has a certain social context that does not necessarily bind all conditions. (R. H. Siregar & Harahap, 2024)

The application can also include interactive discussion features, where users can participate in online forums or classes facilitated by scholars and hadith experts. This is useful in overcoming the spread of false hadiths that often appear on social media. For example, hadiths about the signs of the apocalypse are frequently misused to spread fear, even though many are weak or false. (Nawir, 2022) With the presence of a scientific community discussion on the application, users can discuss and clarify the validity of a hadith before spreading it.

For students who want to test their understanding, this application can be equipped with quizzes or exams that measure the ability to understand and memorize hadith. The practical application feature of hadith in everyday

life is a special attraction for contemporary users. For example, in the case of modern business ethics, the application can provide examples of how hadith about honesty in trading can be implemented in digital transactions and e-commerce.

Overall, the collaboration between technology and classical methodology in the study of hadith not only enriches scientific studies but also strengthens the authority and authenticity of the science that is the basis of understanding for Muslims. With a systematic and academic-based approach, the new generation is expected to be more involved in the study of hadith in a relevant and efficient way in today's digital era.

## E. Conclusion

The advancements in post-multimedia technology have greatly influenced the comprehension of hadith, with both positive and negative effects. On the positive side, this technology allows Muslims to access a variety of hadith texts through digital means, enables fast dissemination of information, and enhances interpretive methods via visualization and interactivity, making it easier for the younger generation to grasp the context of hadith. Conversely, this ease of access also presents challenges, such as the widespread distortion of hadith meanings through the circulation of less reliable content or misinterpretation caused by superficial analysis. Therefore, employing post-multimedia technology in hadith studies requires careful consideration and should always be accompanied by scholarly guidance to ensure the integrity of the knowledge is preserved.

To strike a balance between technological progress and the conservation of hadith scholarship traditions, it's crucial to prioritize cooperation between scholars and technology specialists. Scholars should engage actively in sharing and interpreting hadith on digital platforms to ensure that the information available to the broader community is accurate and aligned with Islamic scholarship principles. Furthermore, the creation of applications and websites dedicated to hadith studies must include recognized scholars to ensure that the provided interpretations and explanations are grounded in valid understanding. Implementing digital education is essential to help the community, particularly the youth, learn how to differentiate between authoritative and non-authoritative sources. In this way, technological advancements can be leveraged to uphold the tradition of hadith scholarship without compromising its integrity.

## F. Bibliography

Abdelaal, H. M., & Youness, H. A. (2019). Hadith Classification using Machine Learning Techniques According to its Reliability. *Romanian Journal of*

- Information Science and Technology*, 22(3-4), 259-271.
- Adryansyah, M. R. H., Quiroz, P. A., Zuhdi, M. I., & Sutabri, T. (2023). Perancangan Multimedia Teknologi Virtual Reality Dan Augmented Reality Sebagai Media Pameran Digital. *Technologia : Jurnal Ilmiah*, 14(3), 214-220. <https://doi.org/10.31602/tji.v14i3.11518>
- Afwadzi, B. (2015). Melacak Argumentasi Penggunaan Semiotika dalam Memahami Hadis Nabi. *Jurnal Studi Ilmu-Ilmu Al-Qur'an Dan Hadis*, 16(2), 287-319. <https://doi.org/10.14421/qh.2015.1602-08>
- Al-Bukhārī, A. 'Abdillāh M. bin I. (1993). *Ṣaḥīḥ al-Bukhārī* (M. D. Al-Bugā, Ed.). Damaskus: Dār Ibnu Kaṣīr.
- Al-Dārimī, A. M. 'Abdillāh bin 'Abdurrahman bin al-F. bin B. bin 'Abd al-Ṣamad. (2000). *Musnad al-Dārimī* (Ḥusain Sulaim Asad Al-Dārānī, Ed.). Saudi Arabiyyah: Dār al-Mugnī.
- Al-Naisābūrī, A. al-Ḥusain M. bin al-Ḥajjāj al-Q. (1955). *Ṣaḥīḥ Muslim* (M. F. 'Abd Al-Bāqī, Ed.). Kairo: Muṣṭafā al-Bābī al-Ḥalabī.
- Al-Nasā'ī, A. 'Abdirrahmān A. bin S. (2018). *Sunan al-Nasā'ī* (M. R. 'Arqaswāi, Ed.). Beirut: Dār al-Risālah al-'Ilmiyyah.
- Al-Sijistānī, A. D. S. bin al-A. bin I. bin B. bin S. bin 'Amr al-A. (1993). *Sunan Abū Dāwūd* (M. M. 'Abd Al-Ḥamīd, Ed.). Beirut: al-Maktabah al-Iṣriyyah.
- Al-Tirmizī, M. bin 'Īsā bin S. bin M. bin al-Ḍaḥḥāk A. 'Īsa. (1975). *Sunan al-Tirmizī* (A. M. Syākir & M. F. 'Abd Al-Bāqī, Eds.). Mesir: Muṣṭafā al-Bābī al-Ḥalabī.
- Amir, S. M., Harahap, A. P., Rahmi, T., & Nazmi, K. (2024). Transformative Islamic Education Based on Hadith Values: Leadership Character Building Strategy for Santri. *Al-Fikru: Jurnal Ilmiah*, 18(2), 159-172. <https://doi.org/10.51672/alfikru.v18i2.497>
- Anas, M. bin. (1985). *al-Muwattā'*. Beirut: Dār Iḥyā' al-Turās al-'Arābī.
- Annaba, A. F., & Soleh, K. (2022). Edukasi Digital: Pembelajaran Ilmu Agama Islam Melalui Kanal Youtube Dalam Pandangan Tradisi Ilmu Sanad. *Islamic Journal of Education*, 1(1), 73-85. <https://doi.org/10.54801/ijed.v1i2.132>
- Anwa, K., Awang, M. S., & Sahid, M. M. (2021). Maqasid Syariah According To Imam Al-Ghazali and Its Application in the Compilation of Islamic Law in Indonesia. *Malaysian Journal of Syariah and Law*, 9(2), 75-87. <https://doi.org/10.33102/mjssl.vol9no2.315>
- Azmi, A. M., Al-Qabbany, A. O., & Hussain, A. (2019). Computational and natural language processing based studies of hadith literature: a survey. *Artificial Intelligence Review*, 52(2), 1369-1414. <https://doi.org/10.1007/s10462-019-09692-w>

- Bahrudin, M. K., Suliaman, I., & Mohamed Adnan, M. A. (2023). The Reality and Challenges of Authoritative Regulation on Hadith Publication in Malaysia and Indonesia. *Jurnal Usuluddin*, 51(1), 81–114. <https://doi.org/10.22452/usuluddin.vol51no4>
- Bimbo, C. C. (2019). Islam Today in Modern West: Fazlur Rahman's and Tariq Ramadan's Views on Jihad. *Ulumuna*, 23(1), 71–89. <https://doi.org/10.20414/ujis.v23i1.289>
- Chande, A. (2023). Global Politics of Knowledge Production: The Challenges of Islamization of Knowledge in The Light of Tradition Vs Secular Modernity Debate. *Nazhruna: Jurnal Pendidikan Islam*, 6(2), 271–289. <https://doi.org/10.31538/nzh.v6i2.3502>
- Chunlin, L., Yanpei, L., Youlong, L., & Min, Z. (2017). Collaborative content dissemination based on game theory in multimedia cloud. *Knowledge-Based Systems*, 124, 1–15. <https://doi.org/10.1016/j.knosys.2017.02.026>
- Daffa, M. (2022). Analysis Of Hadith Understanding Of Social Media Phenomena As A Communication Tool In The Digital Era. *Riwayah : Jurnal Studi Hadis*, 8(1), 69–86. <https://doi.org/10.21043/riwayah.v8i1.11209>
- Daud, Z., & Junus, R. A. (2023). The Use of Maktabah Syamilah Software in Increasing Students' Interest of Learning Hadith: A Survey. *Journal Of Hadith Studies*, 8(2), 94–104. <https://doi.org/10.33102/johs.v8i2.249>
- Doll Kawaid, A. I. S., Syed Hassan, S. N., Aris, H., Mohd Ghazali, N., Marhusin, M. F., Azman, N., ... Mohamed Nor, Z. (2023). Pembinaan Pangkalan Data Hadis Lengkap Dalam Bahasa Melayu Untuk Data Raya (Big Data): Kajian Kes Terhadap Cabaran Yang Dihadapi Oleh Kumpulan I-Status Hadis. *Journal Of Hadith Studies*, 8(2), 82–93. <https://doi.org/10.33102/johs.v8i2.248>
- Fadilha, R. (2020). Resepsi Hadis di Media Sosial Studi Kasus Film Animasi Nussa Episode Adab Menguap. *ISLAMICA: Jurnal Studi Keislaman*, 14(2), 27–42. <https://doi.org/10.35719/amn.v8i1.21>
- Farooqi, A. M., Malick, R. A. S., Shaikh, M. S., & Akhunzada, A. (2024). Multi-IsnadSet MIS for Sahih Muslim Hadith with chain of narrators, based on multiple ISNAD. *Data in Brief*, 54, 110439. <https://doi.org/10.1016/j.dib.2024.110439>
- Febriani, I. S., Rumsiti, A. S., Maulana, K., & Hermawan, R. (2024). Living Al-Quran Dan Hadits Di Era Digital: Pemanfaatan Belajar Tafsir Online Untuk Generasi Milenial. *Geneologi PAI: Jurnal Pendidikan Agama Islam*, 11(1), 53–64. <https://doi.org/10.32678/geneologipai.v11i1.9948>
- Gravina, R., Alinia, P., Ghasemzadeh, H., & Fortino, G. (2017). Multi-sensor fusion in body sensor networks: State-of-the-art and research challenges.



- Information Fusion*, 35, 68–80. <https://doi.org/10.1016/j.inffus.2016.09.005>
- Hadi, R. T. (2020). Studi Aplikasi Hadis Era Mobile. *Islam Transformatif: Journal of Islamic Studies*, 4(1), 13–24. <https://doi.org/10.30983/it.v4i1.2629>
- Hafidhuddin, H. (2021). Kontestasi Hadis di Era Multimedia: Kajian Hadis di Youtube Mengenai Alat Musik. *Al-Bayan: Jurnal Ilmu Al-Qur'an Dan Hadist*, 5(1), 30–42. <https://doi.org/10.35132/albayan.v5i1.182>
- Hammedi, S., Essalmi, F., Jemni, M., & Qaffas, A. A. (2020). An investigation of AI in games: educational intelligent games vs non-educational games. *2020 International Multi-Conference on: "Organization of Knowledge and Advanced Technologies" (OCTA)*, 1–4. <https://doi.org/10.1109/OCTA49274.2020.9151738>
- Ḥanbal, A.-I. A. bin. (1995). *Musnad al-Imām Aḥmad bin Ḥanbal*. Kairo: Dār al-Ḥadīṣ.
- Harahap, A. P. (2023). Partisipasi Politik Perempuan: Analisis Hadis Terhadap Peran Perempuan Dalam Sistem Demokrasi Indonesia. *Moderate El Siyasi: Jurnal Pemikiran Politik Islam*, 2(2), 1–15. <https://doi.org/10.30821/moderateel-siyas.v2i2.23294>
- Harahap, A. P., & Wahyuni, A. M. (2024). Peran Perempuan Sebagai Mufassir dan Kontribusinya Terhadap Pendidikan Islam. *Ibn Abbas: Jurnal Ilmu Alquran Dan Tafsir*, 7(1), 1–21. <https://doi.org/10.51900/ias.v7i1.22548>
- Hasanah, U. (2023). Historical Approach in Understanding Hadith. *UMRAN - International Journal of Islamic and Civilizational Studies*, 10(2), 37–51. <https://doi.org/10.11113/umran2023.10n2.598>
- Istianah, I. (2020). Era Disrupsi Dan Pengaruhnya Terhadap Perkembangan Hadis Di Media Sosial. *Riwayah: Jurnal Studi Hadis*, Vol. 6, pp. 89–102. <https://doi.org/10.21043/riwayah.v6i1.6861>
- Istianah, & Wahyuningsih, S. (2019). The Hadith Digitization in Millennial Era: A Study at Center for Hadith Studies, Indonesia. *QIJIS (Qudus International Journal of Islamic Studies)*, 7(1), 25–44. <https://doi.org/10.21043/QIJIS.V7I1.4900>
- Istiqlal, M. (2017). Pengembangan Multimedia Interaktif Dalam Pembelajaran Matematika. *JIPMat*, 2(1), 43–54. <https://doi.org/10.26877/jipmat.v2i1.1480>
- Kamaluddin, A. (2023). Naqd As-Sanad: Metodologi Validasi Hadits Shahih. *Mushaf Journal: Jurnal Ilmu Al Quran Dan Hadis*, 3(2), 229–239. Retrieved from <https://mushafjournal.com/index.php/mj/article/view/136>
- Kamla, R., & Alsoufi, R. (2015). Critical Muslim Intellectuals' discourse and the issue of 'Interest' (ribā): Implications for Islamic accounting and banking. *Accounting Forum*, 39(2), 140–154. <https://doi.org/10.1016/j.accfor.2015.02.002>

- Karim, A. (2019). Pergulatan Hadis di Era Modern. *Riwayah : Jurnal Studi Hadis*, 3(2), 171–184. <https://doi.org/10.21043/riwayah.v3i2.3720>
- Keil, J., Edler, D., & Dickmann, F. (2019). Preparing the HoloLens for user Studies: an Augmented Reality Interface for the Spatial Adjustment of Holographic Objects in 3D Indoor Environments. *KN - Journal of Cartography and Geographic Information*, 69(3), 205–215. <https://doi.org/10.1007/s42489-019-00025-z>
- Mājah, A. ‘Abdillāh M. bin Y. I. (2014). *Sunan Ibnu Mājah* (M. F. ‘Abd Al-Bāqī, Ed.). al-Su’ūd: Dār al-Ṣadiq.
- Malek, Y. N., Kharbouch, A., Khoukhi, H. El, Bakhouya, M., Florio, V. De, Ouadghiri, D. El, ... Blondia, C. (2017). On the use of IoT and Big Data Technologies for Real-time Monitoring and Data Processing. *Procedia Computer Science*, 113, 429–434. <https://doi.org/10.1016/j.procs.2017.08.281>
- Miski. (2020). Nalar Hermeneutis Ulama Hadis: Larangan Perempuan Berpergian tanpa Mahram dalam Ruang Sejarah Pemahaman. *DINIKA : Academic Journal of Islamic Studies*, 2(1), 71–96. <https://doi.org/10.46388/ijass.2020.13.1>
- Mufid, A., Massoweang, A. K., Mujizatullah, M., Muslim, A., & Yani, Z. (2023). Rereading Nasr Hamid Abu Zayd’s method of interpreting religious texts. *HTS Teologiese Studies / Theological Studies*, 79(1), 1–6. <https://doi.org/10.4102/hts.v79i1.8102>
- Muhtador, M. (2019). Dinamika Memahami Hadis Nabi: Tinjauan Historis dan Metodologis. *Riwayah : Jurnal Studi Hadis*, 3(2), 185–196. <https://doi.org/10.21043/riwayah.v3i2.3704>
- Nancy Um. (2020). Yemeni Manuscripts Online: Digitization in an Age of War and Loss. *Manuscript Studies: A Journal of the Schoenberg Institute For*, 5(1), 1–44. <https://doi.org/10.1353/mns.2020.0006>
- Nawir, M. (2022). Inclusive and Exclusive Understanding of the Doomsday Prediction Hadith: Pemahaman Inklusif dan Eksklusif Terhadap Hadis Prediksi Hari Kiamat. *Takwil: Journal of Quran and Hadith Studies*, 1(2), 51–68. <https://doi.org/10.32939/twl.v1i2.1690>
- Nirwana, D. (2015). Diskursus Studi Hadis Dalam Wacana Islam Kontemporer. *Al-Banjari : Jurnal Ilmiah Ilmu-Ilmu Keislaman*, 13(2), 178–203. <https://doi.org/10.18592/al-banjari.v13i2.397>
- Nižetić, S., Djilali, N., Papadopoulos, A., & Rodrigues, J. J. P. C. (2019). Smart technologies for promotion of energy efficiency, utilization of sustainable resources and waste management. *Journal of Cleaner Production*, 231, 565–591. <https://doi.org/https://doi.org/10.1016/j.jclepro.2019.04.397>
- Noetel, M., Griffith, S., Delaney, O., Harris, N. R., Sanders, T., Parker, P., ...

- Lonsdale, C. (2021). Multimedia Design for Learning: An Overview of Reviews With Meta-Meta-Analysis. *Review of Educational Research*, 92(3), 413–454. <https://doi.org/10.3102/00346543211052329>
- Nurdin, A. (2020). Designing Powtoon-Mediated Interactive Multimedia to Leverage Students' Learning Behavior in the Qur'an and Hadith. *Edukasia Islamika*, 5(2), 158–174. <https://doi.org/10.28918/jei.v5i2.1067>
- Nurjaman, A. I., & Hamdu, G. (2018). Pengembangan Multimedia Interaktif Pelaksanaan Pembelajaran Outdoor Permainan Tradisional Berbasis STEM di SD. *Pedadidaktika*, 5(3), 85–99. <https://doi.org/10.17509/pedadidaktika.v5i3.12728>
- Qomarullah, M. (2022). Metode Kritik Matan Hadis Dengan Pendekatan Alquran Dalam Kaidah Ilmu Naqd Al-Matan. *AL QUDS : Jurnal Studi Alquran Dan Hadis*, 6(3), 1427–1450. <https://doi.org/10.29240/alquds.v6i3.4041>
- Rahmanda, R. Y., Pramukantoro, E. S., & Yahya, W. (2018). Perancangan dan implementasi kelas virtual Filkom universitas brawijaya dengan memanfaatkan teknologi webRTC (Web real-time communication). *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer*, 2(7), 2721–2729. Retrieved from <http://j-ptiik.ub.ac.id>
- Ramzy, A., Torki, M., Abdeen, M., Saif, O., ElNainay, M., Alshanqiti, A. A., & Nabil, E. (2023). Hadiths Classification Using a Novel Author-Based Hadith Classification Dataset (ABCD). *Big Data and Cognitive Computing*, 7(3), 141. <https://doi.org/10.3390/bdcc7030141>
- Rosyad, S., & Alif, M. (2023). Hadis di Era Digital: Tantangan dan Peluang Penggunaan Teknologi dalam Studi Hadis. *Jurnal Ilmu Agama: Mengkaji Doktrin, Pemikiran, Dan Fenomena Agama*, 24(2), 185–197. <https://doi.org/10.19109/jia.v24i2.18979>
- Saad, M. (2023). Reviving the Narrative of Muhammad's Life: Tariq Ramadan's Interpretative Strategies and Ethical Contextualization. *Mutawatir : Jurnal Keilmuan Tafsir Hadith*, 13(1), 1–25. <https://doi.org/10.15642/mutawatir.2023.13.1.1-25>
- Sefriyono, Ilhamni, & Rahmi. (2022). Hadis-Hadis Jihad: dari Humanisme Menuju Kekerasan Agama. *Mashdar: Jurnal Studi Al-Qur'an Dan Hadis*, 4(2), 191–204. <https://doi.org/10.15548/mashdar.v4i2.4662>
- Siregar, I., & Harahap, A. P. (2024a). Kontekstualisasi Hadis Tentang Kurangnya Kecerdasan Perempuan dan Agama. *Tajdid: Jurnal Ilmu Ushuluddin*, 23(1), 218–257. <https://doi.org/10.30631/tjd.v23i1.442>
- Siregar, I., & Harahap, A. P. (2024b). The Relevance of Hadith and Reason in Demonstrating The Status of Hadith. *Al-Bukhari : Jurnal Ilmu Hadis*, 7(1), 16–33. <https://doi.org/10.32505/al-bukhari.v7i1.8237>

- Siregar, R. H., & Harahap, A. P. (2024). Keseimbangan Peran Perempuan Sebagai Ibu Dan Pekerja: Tinjauan Komprehensif Dalam Perspektif Al-Quran Dan Hadis. *Ibn Abbas: Jurnal Ilmu Alquran Dan Tafsir*, 7(2), 133–150. <https://doi.org/10.51900/ias.v7i2.22741>
- Song, W., Liu, L., Tian, Y., Sun, G., Fong, S., & Cho, K. (2017). A 3D localisation method in indoor environments for virtual reality applications. *Human-Centric Computing and Information Sciences*, 7(1), 39. <https://doi.org/10.1186/s13673-017-0120-7>
- Supriyadi, T., Julia, Aeni, A. N., & Sumarna, E. (2020). Action Research in Hadith Literacy: A Reflection of Hadith Learning in the Digital Age. *International Journal of Learning, Teaching and Educational Research*, 19(5), 99–124. <https://doi.org/10.26803/ijlter.19.5.6>
- Syarifudin, M., & Masruhan, M. (2021). INTERPRETASI HADIS: ANTARA HERMENEUTIKA DAN SYARH AL-HADITS (STUDI KOMPARATIF). *TAJDID: Jurnal Ilmu Ushuluddin*, 20(2), 373–400. <https://doi.org/10.30631/tjd.v20i2.171>
- Taghian, M. (2024). Assessing the accuracy criteria of AI tools-aided translation: a case study of two-word Prophetic Hadiths. *CDELTA Occasional Papers in the Development of English Education*, 87(1), 217–262. <https://doi.org/10.21608/opde.2024.384369>
- Taufiq, F., & Alkholid, A. M. (2021). Kontekstualisasi Hadis tentang Jihad dan Relevansinya dalam Konflik Timur Tengah. *AL QUDS : Jurnal Studi Alquran Dan Hadis*, 5(1), 337–348. <https://doi.org/10.29240/alquds.v5i1.2471>
- Triadi Antara, K. (2024). Pengaruh IoT pada Transformasi Jaringan Multimedia: Literatur Review. *Jurnal Ilmu Komputer Dan Sistem Informasi (JIKOMSI)*, 7(1), 173–181. <https://doi.org/10.55338/jikomsi.v7i1.2736>
- Ummah, S. S. (2019). Digitalisasi Hadis (Studi Hadis di Era Digital). *Diroyah: Jurnal Ilmu Hadis*, 04(01), 1–10. <https://doi.org/10.15575/diroyah.v4i1.6010>
- Wang, R., Ji, W., Liu, M., Wang, X., Weng, J., Deng, S., ... Yuan, C. (2018). Review on mining data from multiple data sources. *Pattern Recognition Letters*, 109, 120–128. <https://doi.org/https://doi.org/10.1016/j.patrec.2018.01.013>
- Widyastri, S., Nata, A., Al Munawar, S. A. H., & Suparto, S. (2022). Transmission of Al-Qur'an Learning in Saudi Arabia and Indonesia. *International Journal of Islamic Thought and Humanities*, 1(2), 117–131. <https://doi.org/10.54298/ijith.v1i2.37>
- Yotenka, R., Dini, S. K., Fauzan, A., & Ahdika, A. (2022). Exploring the relationship between hadith narrators in Book of Bukhari through SPADE algorithm. *MethodsX*, 9, 101850. <https://doi.org/10.1016/j.mex.2022.101850>

- Yusuf, M. F., Siregar, B. B. R. N., & Harahap, A. P. (2024). Implementation of Hadith as a Foundation for Deradicalization in Contemporary Islamic Education Curriculum. *At-Turās: Jurnal Studi Keislaman*, 11(2), 160–177. <https://doi.org/10.33650/at-turas.v11i2.9358>
- Zhu, W., Wang, X., & Gao, W. (2020). Multimedia Intelligence: When Multimedia Meets Artificial Intelligence. *IEEE Transactions on Multimedia*, 22(7), 1823–1835. <https://doi.org/10.1109/TMM.2020.2969791>