

THE CONCEPT OF RECORDING DEEDS IN THE QUR'AN: A CONCEPTUAL DIALOGUE WITH INFORMATION TECHNOLOGY PARADIGMS IN THE ERA OF DIGITAL CULTURE

Ulin Nuha,¹ Ahmad Aminuddin,² Izziya Putri Ananda³

^{1,2} Universitas Kiai Abdullah Faqih Gresik,

³STIQ Darussalam Lhokseumawe

¹Ulinnafions@gmail.com, ²ahmad.aminuddin38@gmail.com,

²izziya.putri@gmail.com

Abstract:

Digital culture has transformed paradigms of information recording, storage, management, and verification through technologies such as real-time data processing, database management systems, cloud computing, and blockchain. This study reconstructs the concept of recording human deeds in the Qur'an. This study examines the Qur'anic construction of the recording, storage, and accountability of human deeds through the concepts of Kirāman Kātibīn, Kitāb al-A'māl, and al-Lawḥ al-Maḥfūz, and explores their conceptual relevance to contemporary information technology paradigms. Using qualitative library research and the thematic (*maudhu'i*) tafsir method, the study analyzes relevant Qur'anic verses through content analysis, drawing on classical and contemporary exegetical literature as well as studies in information technology. The results show that the Qur'anic system of recording deeds is structured around three interconnected principles: recording accuracy through the Kirāman Kātibīn, transparency and accountability in information storage through the Kitāb al-A'māl, and information integrity and immutability through the al-Lawḥ al-Maḥfūz. These principles demonstrate functional correspondences with real-time recording, database management systems, cloud computing, and blockchain. However, these correspondences exist solely at the level of

conceptual analogy and do not imply ontological parity between revelation and modern technology.

Keywords: *recording of deeds; Qur'an; digital culture; information technology; thematic tafsir.*

Introduction

The transition to the digital era has transformed the processes by which information is recorded, stored, accessed, and accounted for across nearly all domains of life. The emergence of technologies such as real-time data processing, database management systems, cloud computing, and blockchain has introduced technical innovations in data management and shaped a digital culture that prioritizes accuracy, transparency, integrity, security, and auditability as core principles of information governance.¹ In digital societies, every individual action generates a digital footprint that can be recorded, stored, traced, and analyzed to inform decision-making and evaluate human behavior. Consequently, data recording has evolved beyond a mere administrative function to become a social mechanism that underpins accountability at individual, organizational, and institutional levels in contemporary society.²

These transformations have also altered the social contexts in which religious knowledge is produced, communicated, and interpreted. The development of digital media has created new spaces for the dissemination and consumption of Qur'anic knowledge, while also reshaping how religious texts and practices are encountered in contemporary society.³ Such developments have fostered interdisciplinary engagement between religion and information technology, particularly in examining how religious concepts can be interpreted in relation to technological developments and changing

¹ Peter Mell and Timothy Grance, *The NIST Definition of Cloud Computing*, NIST Special Publication 800-145 (Gaithersburg: National Institute of Standards and Technology, 2011), 2–3, <https://doi.org/10.6028/NIST.SP.800-145>; Fran Casino, Thomas K. Dasaklis, and Constantinos Patsakis, "A Systematic Literature Review of Blockchain-Based Applications: Current Status, Classification and Open Issues," *Telematics and Informatics* 36 (2019): 55–81, <https://doi.org/10.1016/j.tele.2018.11.006>.

² Deborah Lupton, *Digital Sociology* (London: Routledge, 2015), 1–19. Lupton menjelaskan bahwa teknologi digital telah menjadi bagian integral dari kehidupan sosial dan menyebabkan individu semakin diposisikan sebagai subjek data yang aktivitasnya dapat dipantau dan direkam.

³ Muhamad Yoga Firdaus, Suryana Alfathah, and Dadan Rusmana, "Komodifikasi Al-Qur'an Dalam Media Digital," *Mutawatir: Jurnal Keilmuan Tafsir Hadith* 12, no. 2 (2022): 243–60.

forms of knowledge production within digital culture.⁴ Within this context, the Qur'anic concept of recording deeds warrants renewed examination. The Qur'an not only outlines mechanisms for recording every human utterance and action but also introduces frameworks for storing and accounting for deeds as integral components of a comprehensive moral and theological system. Re-examining concepts such as the Kirāman Kātibīn, Kitāb al-A'māl, and al-Lawḥ al-Maḥfūẓ through the lens of digital culture is not intended to conflate revelation with technology. Rather, it seeks to establish a conceptual dialogue that underscores the relevance of Qur'anic values to understand paradigms of recording, data integrity, and accountability in the digital era.

The Qur'an contains several verses that explain the mechanism for recording human deeds through the concepts of the Kirāman Kātibīn, Kitāb al-A'māl, and al-Lawḥ al-Maḥfūẓ. These concepts are discussed, among others, in Q. Qāf [50]:17-18 concerning the angels who record deeds, Q. al-Kahf [18]:49 concerning the Kitāb al-A'māl as a record of human accountability, and Q. al-Burūj [85]:21-22 concerning the al-Lawḥ al-Maḥfūẓ as a representation of preserved divine decree.⁵ These three concepts can be read together as a conceptual structure encompassing recording, storage, and human accountability before God.⁶ They therefore constitute the principal foundation of this study for analyzing the principles of recording accuracy, information storage, and data validity from the Qur'anic perspective through a conceptual dialogue with modern information technology paradigms.

Studies concerning the relationship between the Qur'an and information technology have developed from various perspectives, ranging from Qur'anic exegesis and Islamic epistemology to technology ethics. Nevertheless, the focus and scope of previous studies remain diverse and have not particularly examined the Qur'anic system of recording deeds as an integrated conceptual model. Existing scholarship can broadly be grouped into three strands: exegetical studies of specific Qur'anic concepts, studies examining the relationship between the Qur'an and modern science and technology, and studies addressing Islamic ethical responses to technological development. Previous exegetical scholarship has examined individual Qur'anic concepts associated with divine records and preservation. Suhaimi (2022), for instance,

⁴ Heidi A. Campbell and Ruth Tsuria, *Digital Religion: Understanding Religious Practice in Digital Media*, 2nd ed. (London: Routledge, 2021).

⁵ Umar Sulaiman al-Asyqar, *Rabasia Alama Malaikat, Jin, Dan Setan: Mengupas Tuntas Alam Malaikat, Jin & Setan Berdasarkan Al-Qur'an Dan Hadis* (Jakarta: Qisthi Press, 2017).

⁶ Khairullah Khairullah, "Peran Dan Tanggung Jawab Manusia Dalam Al-Qur'an," *Al-Fath* 5, no. 1 (2011): 79–84, <https://doi.org/https://doi.org/10.32678/alfath.v5i1.3253>.

discusses the Qur'anic term *Imām* in relation to its meaning as a *kitāb* or record, including its association with *al-Lawḥ al-Maḥfūz* in Q. Yāsīn [36]:12.⁷ Similarly, Nuraini and Khairunnisa (2020) examine Qur'anic verses concerning divine decree and discuss the *Lawḥ Maḥfūz* as a locus associated with divinely determined events in the Qur'anic exegetical tradition.⁸ However, these studies focus on specific theological and exegetical dimensions of *al-Lawḥ al-Maḥfūz* and related concepts rather than reconstructing *Kirāman Kātibin*, *Kitāb al-A'māl*, and *al-Lawḥ al-Maḥfūz* as an integrated conceptual system of recording human deeds.

Meanwhile, research on the relationship between the Qur'an and information technology tends to operate at a more general level. Muzakkir et al. show that several Qur'anic verses are relevant to developments in information and communication technology, particularly in communication and information transmission.⁹ Likewise, Amiruddin and Alfaiz affirm an epistemological relationship between revelation and modern science by demonstrating that the two complement each other in the construction of knowledge. Both studies successfully demonstrate a dialogue between the Qur'an and modern science, but neither develops a systematic analytical framework distinctly explaining how a Qur'anic concept can be read through an information technology paradigm.

From a technology ethics perspective, Ariyadi stresses the importance of harmony among scientific development, technology, and Islamic values,¹⁰ while Ilhami et al. examine how Muslims should respond critically and ethically to digital innovation.¹¹ These studies enhance the discourse on Islam and technology, but their primary concern remains the normative dimension of technology use rather than examining Qur'anic concepts as analytical

⁷ Suhaimi Suhaimi, "Imam Ibnu Qutaibah Dan Takwil Terhadap Kemusykilan Dalam Al-Quran," *Jurnal Ilmiah Al-Mu'ashirah: Media Kajian Al-Qur'an Dan Al-Hadits Multi Perspektif* 19, no. 1 (2022): 71.

⁸ Nuraini Nuraini and Khairunnisa Khairunnisa, "Penafsiran Ayat-Ayat Takdir Dalam Al-Qur'an," *TAFSE: Journal of Qur'anic Studies* 5, no. 1 (2020): 17–35.

⁹ Abror Muzakir, Reni Kartika, and Vandi Ahmad Isnaini, "Penerapan Ayat Al-Qur'an Dalam Teknologi Informasi Dan Komunikasi," *JSSIT: Jurnal Sains Dan Sains Terapan* 1, no. 1 (2023): 30–32, <https://doi.org/https://doi.org/10.30631/jssit.v1i1.5>.

¹⁰ Ariyadi, "Ilmu Pengetahuan Dan Teknologi Dalam Sudut Pandang Islam," *Jurnal Sains Komputer Dan Teknologi Informasi* 1, no. 1 (2018): 1–44.

¹¹ Muhammad Ridho Ilhami, Muhammad Rian Saputra, and Shofia Pramudia, "Islam Dan Teknologi: Bagaimana Umat Islam Menyikapi Inovasi Digital," *Islamic Education* 3, no. 2 (2024): 373–84.

resources for understanding contemporary information-technology paradigms.

The literature review indicates that prior research generally falls into three main categories: exegetical studies of specific Qur'anic concepts, epistemological analyses of the relationship between the Qur'an and modern science, and ethical examinations of technology use from an Islamic perspective. While each of these areas offers valuable insights, the reviewed studies have not yet developed an analysis that conceptualizes the Kirāman Kātibīn, Kitāb al-A'māl, and al-Lawḥ al-Maḥfūẓ as an integrated system for recording deeds, nor have they placed this system in dialogue with paradigms such as real-time recording, databases, cloud computing, and blockchain through conceptual analogy. This gap underscores the need for a conceptual framework that engages the Qur'anic concept of recording deeds with information technology paradigms while preserving their ontological distinctions. The present study addresses this gap by employing a conceptual-analogy approach.

This study contributes by reconstructing the Qur'anic concept of recording deeds through three interconnected dimensions: recording accuracy represented by the Kirāman Kātibīn, storage and accountability represented by the Kitāb al-A'māl, and information integrity represented by the al-Lawḥ al-Maḥfūẓ. These dimensions are subsequently placed in conceptual dialogue with real-time recording, database and cloud-based storage, and blockchain-based immutability. Such a framework enables the study to move beyond a general claim of compatibility between the Qur'an and technology toward a more specific conceptual mapping while maintaining the distinction between Qur'anic metaphysics and technological systems.

Building on the evolution of digital culture, the Qur'anic concept of recording deeds, and the identified research gap, this article addresses two central questions: *first*, reconstructing Qur'an concept of recording deeds through the Kirāman Kātibīn, Kitāb al-A'māl, and al-Lawḥ al-Maḥfūẓ as a comprehensive system for recording, storing, and accounting for human actions; and *second*, examining how paradigms such as real-time recording, databases, cloud computing, and blockchain serve as conceptual analogies to elucidate this recording system, while also delineating the epistemological and ontological boundaries between the metaphysical concepts of the Qur'an and contemporary information technology systems. Accordingly, this study aims to establish a conceptual dialogue between Qur'anic values and modern digital culture, not by equating revelation with technology, but by employing technology as an analytical lens to deepen understanding of the principles underlying the recording of deeds in the Qur'an.

Literature Review

The concept of recording deeds is one of the fundamental teachings of the Qur'an, affirming that all human utterances and actions are subject to a system of recording as the basis for responsibility before God. This system demonstrates that every human deed is comprehensively documented and thereby becomes part of the mechanism of divine justice on the Day of Judgment.¹² 8 The Qur'an constructs the system of recording deeds through three principal components: the Kirāman Kātibīn, Kitāb al-A'māl, and al-Lawḥ al-Maḥfūz. These concepts are interconnected and form a system encompassing the processes of recording, storing, and preserving information. Therefore, the Qur'anic system of recording deeds concerns the monitoring of human behavior as well as principles of accuracy, completeness, and information accountability.¹³

The Kirāman Kātibīn are angels appointed by God to record all human deeds, as explained in Q. al-Infīṭār [82]:10-12 and Q. Qāf [50]:17-18. Exegetes such as Ibn Kathīr and al-Qurṭubī explain that this recording occurs continuously, with no human utterance or action escaping divine observation. Thus, the Kirāman Kātibīn represent a process of comprehensive and continuous recording.¹⁴ The recorded deeds are subsequently compiled in the Kitāb al-A'māl, the book containing all human deeds as the basis for ḥisāb. This concept is explained in Q. al-Kahf [18]:49, which depicts the book as leaving nothing out, whether small or great. Exegetes regard the Kitāb al-A'māl as objective evidence demonstrating the perfection of God's justice in the process of human accountability. The final component is the al-Lawḥ al-Maḥfūz, mentioned in Q. al-Burūj [85]:21-22. Qur'anic exegetes understand this concept as a representation of God's decree maintained under perfect protection, such that it goes through no change, addition, or reduction. Linguistically, the term maḥfūz conveys the meaning of being guarded and preserved absolutely, thereby depicting the wholeness and authority of information within God's knowledge.¹⁵ On the basis of these three concepts, the Qur'anic system of recording deeds displays a complete construction: recording by the Kirāman Kātibīn, compilation of all deeds in the Kitāb al-A'māl, and preservation of information in the al-Lawḥ al-Maḥfūz. This

¹² Nursyamsu, "Konsep Pertanggungjawaban Manusia Dalam Al-Qur'an," *Jurnal Al-Asas* 2 (2019): 52; al-Asyqar, *Rahasia Alama Malaikat, Jin, Dan Setan: Mengupas Tuntas Alam Malaikat, Jin & Setan Berdasarkan Al-Qur'an Dan Hadis*.

¹³ M. Quraish Shihab, *Tafsir Al-Mishbah: Pesan, Kesan Dan Keserasian Al-Qur'an* (Jakarta: Lentera Hati, 2002).

¹⁴ Ibn Kathīr, *Tafsir Al-Qur'an al-'Azīm*, trans. Bahrūn Abubakar and Anwar Abubakar (Bandung: Sinar Baru Algesindo, 2000), 476.

¹⁵ Ibn Manẓūr, *Lisān Al-'Arab* (Beirut: Dār Ṣādir, n.d.).

conceptual framework provides the theoretical basis for analyzing the system of recording deeds from a Qur'anic perspective before engaging it in dialogue with modern information technology paradigms.

The development of information technology has changed how data are recorded, managed, stored, and made accountable in various digital systems. In general, these mechanisms are built around three principal components: real-time data recording, data management through Database Management Systems (DBMS), and storage mechanisms that protect information integrity through blockchain technology. These mechanisms are meant to ensure that data can be recorded accurately, stored systematically, and protected from manipulation, consequently supporting openness and accountability in modern information systems.¹⁶

Real-time information recording is a data-processing mechanism that occurs immediately after an event, without waiting for batch processing. This development embodies a shift from periodic processing toward stream processing, a model that allows data to be processed continuously as it enters the system. Consequently, the latency between an event's occurrence and its recording can be reduced to nearly zero. This characteristic makes real-time systems widely applicable to situations requiring speed and information accuracy, such as financial transactions, industrial monitoring systems, and sensor-based digital services.¹⁷ Once data have been recorded, the information is managed through a database. A database is a systematically organized collection of information that can be stored, processed, and retrieved efficiently using a Database Management System (DBMS). A modern database system consists not only of operational data but also of metadata describing data attributes and a DBMS that manages storage, retrieval, security, and data consistency. Accordingly, the principal function of a DBMS is to provide and maintain data validity through primary keys, foreign keys, referential integrity, and normalization processes, ensuring that information remains accurate, consistent, and trustworthy.¹⁸

In addition to conventional database systems, technological developments have introduced new approaches to defending data integrity through blockchain technology. Blockchain is a distributed digital ledger that

¹⁶ M. Fathi Dikla and Abdul Rasyid Ridho, "Qadha Dan Qadar Manusia Dalam Al-Qur'an," *El-Umdah: Jurnal Kajian Ilmu Al-Qur'an Tafsir* 7, no. 1 (2024): 56–68, <https://doi.org/https://doi.org/10.20414/elumdah.v7i1.9899>.

¹⁷ Feri Sulianta, *Strategi Merancang Arsitektur Sistem Informasi Masa Kini* (Bandung: Elex Media Komputindo, 2019).

¹⁸ Theresia Magdalena, *Konsep Basis Data Relasional* (Jakarta: Universitas Mercu Buana, 2020); Subandi and Aulia Akhrian Syahidi, *Basis Data* (Banjarmasin: Poliban Press, 2018).

stores data in a sequence of interconnected blocks, each linked by cryptographic hash functions. Each block contains the digital identity (hash) of the preceding block, forming a data chain that is extremely difficult to alter without modifying the network's structure as a whole. This characteristic gives rise to the principle of immutability, namely the property that data cannot be changed after being validated and stored within the network. Through this mechanism, blockchain enhances information security, transparency, and auditability because changes to data can be identified and verified by nodes across the network.¹⁹ Conceptually, these three mechanisms demonstrate that modern information technology paradigms are built upon principles of recording accuracy, storage integrity, information transparency, and the capacity to audit stored data. These principles are subsequently employed in this study as analytical tools to establish a conceptual dialogue with the Qur'anic system of recording deeds. The use of these paradigms is not intended to equate the metaphysical concept of revelation with modern technological systems, but rather to leverage similarities in functional principles as an interdisciplinary analytical framework.²⁰

Research Method

This study is a library research project employing a qualitative approach and the thematic (*maudhu'i*) tafsir method. This approach was selected because it enables the researcher to comprehensively collect, classify, and analyze all Qur'anic verses related to the concept of recording deeds, thereby obtaining an integrated understanding of the relationships among the concepts under investigation.²¹ The primary data sources are Qur'anic verses related to the *Kirāman Kātibīn*, *Kitāb al-A' māl*, and *al-Lawḥ al-Maḥfūz*, particularly Q. Qāf [50]:17-18, Q. al-Infiṭār [82]:10-12, Q. al-Kahf [18]:49, and Q. al-Burūj [85]:21-22. Secondary data sources include classical and contemporary exegetical works, such as *Tafsīr Ibn Kathīr*, *Al-Jāmi' li Ahkām al-Qur'an by al-Qurṭubī*, *Jāmi' al-Bayān by al-Ṭabarī*, *Tafsīr al-Mishbah* by M. Quraish Shihab, as well as literature on information technology, particularly works discussing

¹⁹ Miswar Papuungan and others, *Sistem Basis Data* (Bandar Lampung: CV Keranjang Teknologi Media, 2023); Teguh Prasetyo Utomo, "Implementasi Teknologi Blockchain Di Perpustakaan," *Buletin Perpustakaan Universitas Islam Indonesia* 4, no. 2 (2021): 145–56; Riskha Setianingsih and Muhammad Irwan Padli Nasution, "Analisis Teknologi Blockchain Berperan Dalam Meningkatkan Keamanan Dan Privasi Data," *Jurnal Ilmiah Nusantara* 2, no. 1 (2024): 115–22.

²⁰ Niaz Chowdhury, "Immutability of Blockchain," in *Inside Blockchain, Bitcoin, and Cryptocurrencies* (Boca Raton: CRC Press, 2019).

²¹ Abd al-Hayy al-Farmawi, *Al-Bidāyah Fi al-Tafsīr al-Manḍū'i* (Kairo: Dār al-Tawzī' wa al-Nashr al-Islāmiyyah, 1977).

real-time information processing, database management systems, cloud computing, and blockchain.²²

Data were collected through a documentary study of Qur'anic verses, exegetical works, books, and relevant scholarly articles. The data were then examined using content analysis in several stages: identifying verses related to the recording of deeds; examining exegetes' interpretations; grouping the principal concepts; and comparing them with information technology paradigms through conceptual analogy. The analogy in this study is not intended to equate the nature of Qur'anic metaphysical concepts with modern technological systems, but rather serves as an analytical instrument for identifying similarities in functional principles and epistemological boundaries between the two.²³

Results and Discussion

Reconstructing the Principle of Recording Accuracy in the Qur'an

The findings show that the Qur'an establishes a system for recording deeds, based on the principle of accuracy as the primary basis for human accountability before God. This principle, despite affirming that all human utterances and actions are under divine observation, indicates that recording takes place continuously and objectively, without the possibility of information being lost or distorted. Based on a thematic analysis of Qur'anic verses, this principle of recording accuracy is represented primarily in Q. Qāf [50]:17-18 and Q. al-Infīṭār [82]:10-12, which complement one another in explaining the mechanism of recording deeds through the Kirāman Kātibīn, the angels entrusted with recording all human activity.²⁴

إِذْ يَتَلَفَّى الْمُتَكَلِّفِينَ عَنِ الْيَمِينِ وَعَنِ الشِّمَالِ قَعِيدٌ مَا يَلْفِظُ مِنْ قَوْلٍ إِلَّا لَدَيْهِ رَقِيبٌ عَتِيدٌ

(Remember) when the two recording angels receive [each person's deeds], one sitting on the right and the other on the left. He does not utter a word except that with him is an observer ready to record it. (Q. Qāf [50]:17-18).

The verse is reinforced by God's statement in Q. al-Infīṭār [82]:10-12:

وَأَنَّ عَلَيْكُمْ خَافِظِينَ كِرَامًا كَثِيرِينَ يَعْلَمُونَ مَا تَفْعَلُونَ

²² Martin Kleppmann, *Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems* (Sebastopol, CA: O'Reilly Media, 2017).

²³ Klaus Krippendorff, *Content Analysis: An Introduction to Its Methodology*, 4th ed. (Thousand Oaks: Sage Publications, 2018).

²⁴ al-Farmawī, *Al-Bidāyah Fi al-Tafsīr al-Mawḍūʿī*.

Indeed, there are over you guardians, noble and recording; they know whatever you do.²⁵

These two groups of verses demonstrate that the Qur'anic system of recording deeds is constructed through two complementary elements. Q. Qāf [50]:17-18 explains the recording mechanism as occurring simultaneously with every human utterance, whereas Q. al-Infīṭār [82]:10-12 stresses the identity, integrity, and authority of the recorders. Thus, recording accuracy is determined by the recording process as well as by the quality of the recorders, who are trustworthy and free from error.²⁶ A linguistic analysis of Q. Qāf [50]:17-18 shows that the term *yatalaqqā* derives from the root *laqqiya*, which conveys the meaning of receiving or directly apprehending something. In the context of the verse, the term indicates that recording takes place simultaneously with human action, without a temporal gap between the event and its recording. Likewise, the term *raqīb* denotes an observer who is constantly present and never negligent, while *atīd* means one who is always ready to perform his task. The combination of these terms constructs an image of a recording system that operates continuously, responsively, and with constant readiness to record every human activity.²⁷

The accuracy of the recording system is additionally emphasized by the expression *Kirāman Kātibīn* in Q. al-Infīṭār [82]:11. The term *kirāman* not only indicates the noble status of the angels before God but also describes their trustworthy and honest character, free from deviation in carrying out the task of recording. The term *kātibīn* stresses their primary function as objective recorders of all human deeds. Accordingly, the Qur'anic recording of deeds should not be understood merely as an administrative activity but as a system founded upon the integrity of the recorders and the validity of the recorded information.²⁸ A synthesis of the exegetical interpretations reveals broad agreement concerning this principle of accuracy. Ibn Kathīr explains that the angels *Raqīb* and 'Atīd accompany human beings continuously and record all their utterances and actions, so that no deed escapes recording. Al-Qurṭubī adds that the angels' constant readiness demonstrates the continuity of divine supervision over human activity. Hamka views the system of recording deeds as a manifestation of God's perfect justice, while M. Quraish Shihab

²⁵ Kementerian Agama Republik Indonesia, *Al-Qur'an Dan Terjemahannya* (Jakarta: Lajnah Pentashihan Mushaf Al-Qur'an, 2019).

²⁶ al-Asyqar, *Rahasia Alama Malaikat, Jin, Dan Setan: Mengupas Tuntas Alam Malaikat, Jin & Setan Berdasarkan Al-Qur'an Dan Hadis*.

²⁷ Manẓūr, *Lisan Al-'Arab*, 255; Al-Rāghib al-Aṣṣahānī, *Al-Mufradāt Fī Gharīb al-Qur'an* (Damaskus: Dār al-Qalam, 2009), 668–69.

²⁸ Shihab, *Tafsir Al-Mishbab: Pesan, Kesan Dan Keserasian Al-Qur'an*, 173–76; Hamka, *Tafsir Al-Azhar* (Singapura: Pustaka Nasional Pte Ltd, 2001), 9:7589–92.

emphasizes that the recording of deeds reflects the breadth of God's knowledge, encompassing all human behavior without exception. Although their emphases differ, the four exegetes agree that the Qur'anic system of recording deeds is comprehensive, objective, and continuous as the basis for human accountability on the Day of Judgment.²⁹

The linguistic analysis and the exegetes' interpretations reconstruct the principle of recording accuracy into two principal characteristics. First, recording is continuous, meaning it is not restricted by space or time, so all human activity remains under observation and record. Second, recording is accurate, meaning that every utterance and action is recorded as it occurs, without addition, omission, or distortion of information. These characteristics demonstrate that the Qur'anic system of recording deeds is founded on the principle of the validity of information, which serves as the basis of God's justice in the process of *ḥisāb*.³⁰

This finding demonstrates that the *Kirāman Kātibīn* not only explain the existence of angels who record deeds; they also constitute a systematic recording mechanism. Q Qāf [50]:17-18 affirms that every human utterance immediately becomes an object of recording, while Q. al-Infīṭār [82]:10-12 shows that the recording is carried out by angels characterized by integrity and knowledge of human activity. Therefore, recording accuracy is determined not only by recording speed but also by the credibility of the recorders and the validity of the resulting information. This principle forms the foundation of accountability for deeds in the Qur'an because all decisions on the Day of Judgment are based on an objective and perfect record.³¹ When placed in dialogue with information technology paradigms, these characteristics have a conceptual correspondence with real-time information processing. In modern information systems, instantaneous processing refers to the collection, processing, and storage of data immediately after an event occurs, allowing information to be updated directly with very low latency. Such systems are widely used in banking transactions, navigation, healthcare

²⁹ Ibn Kathīr, *Tafsīr Al-Qur'an al-'Azīm* (Dār Ṭayyibah, 1999), 7:398–401; Abū 'Abd Allāh al-Qurṭubī, *Al-Jāmi' Li Ahkām al-Qur'an* (Beirut: Mu'assasah al-Risālah, 2006), 17:13–18; Hamka, *Tafsīr Al-Azhar*, 9:7589–7592; Shihab, *Tafsīr Al-Mishbah: Pesan, Kesan Dan Keserasian Al-Qur'an*, 173–176.

³⁰ Kathīr, *Tafsīr Al-Qur'an al-'Azīm*, 7:398–401; Shihab, *Tafsīr Al-Mishbah: Pesan, Kesan Dan Keserasian Al-Qur'an*, 173–176.

³¹ Hamka, *Tafsīr Al-Azhar*, 9:7589–92; al-Qurṭubī, *Al-Jāmi' Li Ahkām al-Qur'an*, 17:13–18.

services, and industrial control because they can provide accurate, up-to-date information to support decision-making.³²

Although they originate in different domains, the Qur'anic mechanism for recording deeds and the paradigm of real-time data processing share functional principles. Both place timeliness, continuity of recording, and information accuracy at the center of a recording system.³³ However, this similarity does not indicate an identity between them. Recording deeds in the Qur'an belongs to a metaphysical system grounded in God's knowledge and carried out by angels, whereas instant processing is a technological development dependent upon hardware, software, algorithms, and communication networks. Therefore, the relationship constructed in this study is situated at the level of conceptual analogy, namely similarity of function in recording mechanisms rather than similarity of essence or system operation. This conceptual analogy offers a new perspective to understand the relevance of Qur'anic values to the development of digital culture. Studies of the Kirāman Kātībīn have generally remained at the theological level, focusing on the existence of angels as recorders of deeds. This study demonstrates that the concept also encompasses universal principles of recording accuracy, information validity, and monitoring continuity that remain relevant in modern information systems. Thus, dialogue between the Qur'an and information technology is not directed toward Islamizing technology or technologizing revelation, but toward demonstrating that the values contained in the Qur'an possess conceptual dimensions that can serve as a reflective structure for understanding contemporary technological developments.³⁴

This finding additionally reinforces the Qur'an's position as a source of values capable of participating in dialogue with developments in science without eliminating the epistemological character of each discipline. The principle of recording accuracy, as exemplified by the Kirāman Kātībīn, demonstrates that the Qur'an establishes a system of recording that supports objectivity, precision, and accountability. In this study, this principle corresponds conceptually to real-time recording in information technology

³² Kleppmann, *Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems*, 69–88; Sulianta, *Strategi Merancang Arsitektur Sistem Informasi Masa Kini*, 112–118.

³³ Peter Mell and Timothy Grance, *The NIST Definition of Cloud Computing*, NIST Special Publication 800-145 (Gaithersburg: National Institute of Standards and Technology, 2011), 2–5, <https://doi.org/10.6028/NIST.SP.800-145>; Kleppmann, *Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems*, 83–91.

³⁴ Campbell and Tsuria, *Digital Religion: Understanding Religious Practice in Digital Media*, 25–41.

and can therefore serve as an analytical instrument for explaining the system of recording deeds in a more contextual manner. The principal contribution of this study consequently does not lie in equating revelation with modern technology, but in constructing a model of conceptual dialogue that brings Qur'anic studies into critical and proportionate engagement with the development of digital culture.

Reconstructing the Principle of Transparency and Accountability in the Storage of Deeds in the Qur'an

The findings show that the Qur'anic system of recording deeds does not end with the recording of every human utterance and action, but also establishes a mechanism for storing information that is transparent, complete, and accountable. This principle is represented by the Kitāb al-A'māl, a compilation of all human deeds that will be opened on the Day of Judgment as the basis for ḥisāb. Based on the thematic analysis, this principle of storage transparency is constructed mainly through Q. al-Kahf [18]:49, Q. Yāsīn [36]:12, and Q. al-Isrā' [17]:13-14. These verses complement one another in explaining the characteristics of a complete information-storage system, ranging from data completeness and the recording of activity traces to open access to stored information.

God states in Q. al-Kahf [18]:49:

وَوُضِعَ الْكِتَابُ فَتَرَى الْمُجْرِمِينَ مُشْفِقِينَ مِمَّا فِيهِ وَيَقُولُونَ يُؤْتِلَنَا مَالٌ هَذَا الْكِتَابِ لَا يُغَادِرُ صَغِيرَةً وَلَا كَبِيرَةً إِلَّا أَحْصَاهَا وَوَجَدُوا مَا عَمِلُوا حَاضِرًا وَلَا يَظْلِمُ رَبُّكَ أَحَدًا

“The record will be placed, and you will see the criminals fearful of what is in it. They will say, ‘Woe to us! What is this record that leaves nothing, small or great, without recording it?’ They will find all that they did present before them. Your Lord does not wrong anyone.”³⁵

The verse affirms that the Kitāb al-A'māl contains complete information concerning human life, with no data omitted. The phrase indicating that it leaves neither small nor great matters unrecorded demonstrates that the recording system does not distinguish between important and unimportant actions but documents all human activity comprehensively. Ibn Kathīr explains that the book constitutes tangible evidence of all human deeds, leaving no one able to deny its contents. Similarly, al-Qurṭubī emphasizes that completeness of recording manifests God's justice because all decisions on

³⁵ Indonesia, *Al-Qur'an Dan Terjemahannya*.

the Day of Judgment are based on complete information without the slightest deficiency.³⁶ This characteristic is reinforced by Q. Yāsīn [36]:12:

إِنَّا نَحْنُ نُحْيِي الْمَوْتَىٰ وَنَكْتُبُ مَا قَدَّمُوا وَآثَارَهُمْ وَكُلَّ شَيْءٍ أَحْصَيْنَاهُ فِي إِمَامٍ مُّبِينٍ

Indeed, We give life to the dead and record what they have sent forth and the traces they leave behind. We have enumerated everything in a clear record.³⁷

This verse expands the meaning of recording deeds by incorporating the element of *āthārah*um, namely the traces or effects left after an action has been performed. Exegetes explain that this refers not only to deeds performed directly but also to their continuing effects, whether beneficial knowledge, ongoing charity, or harmful consequences left by an individual. Thus, the Qur'anic recording system not only stores primary data in the form of actions but also records the consequences and social traces produced by those actions.³⁸

The principle of transparency in storage reaches a more complete form in Q. al-Isrā' [17]:13-14. These verses explain that every person will receive his or her own record and will then be instructed, "*Iqra' kitabaka*" (Read your record). According to Ibn Kathīr, this command indicates that each individual is given an opportunity to read and verify the entirety of his or her record of deeds before receiving God's judgment. Wahbah al-Zuhaylī adds that this mechanism constitutes perfect justice because people are not judged on the basis of hidden information but through a record that can be examined and acknowledged by its owner. Therefore, transparency in the system for recording deeds lies in data completeness and open access to that data, which serves as the basis as a basis for accountability.³⁹ Based on these three verses, this study finds that the Qur'anic storage of deeds is built on three principal characteristics. First, information completeness, meaning that all human deeds, whether visible or hidden, small or great, are recorded without omission. Second, information traceability, meaning that the recording system documents not only actions but also all traces (*āthār*) produced by those actions. Third, information transparency, meaning that every individual is

³⁶ Kathīr, *Tafsīr Al-Qur'ān al-'Azīm*, 292–94; al-Qurṭubī, *Al-Jāmi' Li Ahkām al-Qur'an*, 17:382–85.

³⁷ Indonesia, *Al-Qur'an Dan Terjemahannya*.

³⁸ Shihab, *Tafsīr Al-Mishbah: Pesan, Kesan Dan Kekeragaman Al-Qur'an*, 38–41; Hamka, *Tafsīr Al-Azhar*, 9:5168–5172.

³⁹ Kathīr, *Tafsīr Al-Qur'ān al-'Azīm*, 7:68–69; Wahbah al-Zuhaylī, *Tafsīr Al-Munir* (Damaskus: Dār al-Fikr, 2009), 111–114; Rina Astuti, "Konsep Tanggung Jawab Individu Dalam Al-Qur'an: Kajian Tafsir Tematik QS. Al-Isrā' Ayat 13–14" (IAIN Surakarta, 2020), 55.

given access to the entirety of his or her record of deeds as the basis of accountability before God. These characteristics demonstrate that the Qur’anic storage of deeds is not simply a passive archive but an information system that guarantees data validity, traceability, and openness.⁴⁰

From this perspective, the Kitāb al-A‘māl has a function broader than that of a mere collection of records of deeds. It functions as an evidentiary instrument that presents all information objectively, leaving no room for denial or manipulation. This is reflected in the expression “*wa wajadū mā ‘amilū ḥādīrā*” in Q. al-Kahf [18]:49, indicating that all human deeds are presented again as they were. Thus, the Qur’anic storage system is constructed according to the principle of information objectivity, in which every stored datum remains verifiable as the basis for establishing divine justice.⁴¹ This finding possesses a conceptual correspondence with the Database Management System (DBMS) paradigm in information technology. A DBMS is designed to store, manage, and organize data, and to provide efficient access to it whilst maintaining consistency and data validity. Through indexing, data relationships in relational databases, and access control, a DBMS enables data to be stored systematically so that it can be readily traced and retrieved when needed. In this context, the function of the Kitāb al-A‘māl as a repository of all deeds shares a principle with modern databases: both provide complete, structured, and readily accessible information as a basis for decision-making.⁴²

In addition to its correspondence with database systems, the concept of storing deeds also exhibits functional similarities to the cloud computing paradigm. In cloud computing, data are stored on infrastructure that allows information to remain available and accessible according to the authority granted, and to be protected against data loss. These characteristics are similar in principle to the Qur’anic system of storing deeds, which affirms that every record is preserved until the Day of Judgment and can be brought forth again when the process of accountability occurs. Nevertheless, this similarity exists only at the level of conceptual function, not in essence or working mechanism.⁴³ In this regard, the researcher emphasizes that the analogy between the Kitāb al-A‘māl and DBMS or cloud computing is not intended

⁴⁰ Shihab, *Tafsir Al-Mishbah: Pesan, Kesan Dan Keserasian Al-Qur’an*, 38–41; Kathīr, *Tafsir Al-Qur’an al-‘Azīm*, 292–294.

⁴¹ al-Qurṭubī, *Al-Jāmi’ Li Ahkām al-Qur’an*, 17:382–85; al-Zuhailī, *Tafsir Al-Munir*, 111–14.

⁴² Jamaludin and others, *Sistem Basis Data* (Padang: PT Global Eksekutif Teknologi, 2022), 12–24; Magdalena, *Konsep Basis Data Relasional*, 5–13.

⁴³ Mell and Grance, *The NIST Definition of Cloud Computing*, 2–7; Kleppmann, *Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems*, 23–37.

to equate revelation with digital technology. The storage system described in the Qur'an belongs to God's absolute knowledge and power, whereas DBMS and cloud computing are human-made technological constructs that remain subject to constraints in capacity, security, and service continuity. Therefore, the information technology paradigms used in this study serve as an analytical lens for explaining the principles of information storage in the Qur'an, thereby enabling their understanding within contemporary digital culture.⁴⁴

Accordingly, this study reconstructs the Kitāb al-A'māl as an information-storage system that maintains the principles of data completeness, information traceability, access transparency, and accountability. This reconstruction demonstrates that the Qur'an does not simply describe the recording of deeds as a theological concept but also furnishes a set of universal principles of information governance that remain relevant for dialogue with the development of modern information systems. The contribution of this study consists in constructing a conceptual dialogue between Qur'anic studies and digital data-management paradigms without eliminating the epistemological boundary between revelation and technology.

Reconstructing the Principle of Information Integrity and Immutability in the Qur'an

The findings show that the Qur'anic system of recording deeds is built not only upon recording accuracy and storage transparency but also upon a guarantee of information integrity and immutability. This principle is represented by the concept of al-Lawḥ al-Maḥfūz, understood as the place in which God's decree is preserved from all forms of alteration, addition, or reduction. In this study, the al-Lawḥ al-Maḥfūz is not positioned as a storage medium in a technical sense, but as a theological representation of the preservation and wholeness of information within God's knowledge. Based on the thematic analysis, this principle rests primarily upon Q. al-Burūj [85]:21-22, which provides the principal foundation for discussing the preservation of revelation and divine decree.

بَلْ هُوَ قُرْآنٌ مَّجِيدٌ فِي لَوْحٍ مَّحْفُوظٍ

Rather, it is a glorious Qur'an, [recorded] in a Preserved Tablet. (Q. al-Burūj [85]:21-22).⁴⁵

Etymologically, the term lawḥ means a tablet or medium upon which something is written, while maḥfūz derives from the root ḥafiza, meaning to

⁴⁴ Campbell and Tsuria, *Digital Religion: Understanding Religious Practice in Digital Media*, 25–41; Mell and Grance, *The NIST Definition of Cloud Computing*, 2–7.

⁴⁵ Indonesia, *Al-Qur'an Dan Terjemahannya*.

guard, preserve, and protect against change. Linguistically, the combination of the two terms denotes a place under perfect protection, so that its contents remain intact and do not undergo damage or modification. Ibn Manẓūr explains that the meaning of ḥifẓ is not limited to physical protection but also includes preserving the authenticity and integrity of something against every form of alteration. Likewise, al-Rāghib al-Aṣḥānī interprets al-ḥifẓ as protection that ensures the continued preservation of information in its original form.⁴⁶

The interpretations of the exegetes demonstrate that the al-Lawḥ al-Maḥfūẓ is understood as a representation of God's perfect knowledge, which does not undergo change. Ibn Kathīr explains that all of God's decrees, including the Qur'an, are contained in the al-Lawḥ al-Maḥfūẓ before being revealed to the Prophet Muhammad, making any addition or reduction impossible. Al-Qurṭubī emphasizes that the designation al-Lawḥ al-Maḥfūẓ demonstrates God's perfect protection of His revelation from all forms of deviation. Similarly, M. Quraish Shihab views the concept as a symbol of the breadth of God's knowledge encompassing all His decrees and demonstrating that all information is preserved absolutely. Thus, the exegetical interpretations converge on the conclusion that the al-Lawḥ al-Maḥfūẓ represents the preservation of information originating from God's omniscience.⁴⁷

This understanding is strengthened by the conceptual relationship between Q. al-Burūj [85]:21-22 and Q. al-Ra'd [13]:39, which mentions Umm al-Kitāb as the source of God's decrees. Scholars explain that this verse does not indicate a change in God's knowledge but rather distinguishes between absolute decrees and decrees contingent upon particular causes. Therefore, the al-Lawḥ al-Maḥfūẓ continues to be understood as a representation of information preserved without alteration in God's knowledge, whereas the changes mentioned in Q. al-Ra'd [13]:39 belong to the sphere of decrees that God wills to change according to His wisdom.⁴⁸

Based on an analysis of Q. al-Burūj [85]:21-22 and exegetical interpretations, this study reconstructs al-Lawḥ al-Maḥfūẓ as a representation of the principle of information integrity. In this context, integrity is

⁴⁶ Manẓūr, *Lisān Al-'Arab*, 52–55; al-Aṣḥānī, *Al-Mufradāt Fi Gharib al-Qur'an*, 234–36.

⁴⁷ Kathīr, *Tafsīr Al-Qur'an al-'Azīm*, 7:383–85; al-Qurṭubī, *Al-Jamī' Li Ahkām al-Qur'an*, 17:244–47; Shihab, *Tafsīr Al-Mishbah: Pesan, Kesan Dan Keresasian Al-Qur'an*, 502–4.

⁴⁸ al-Zuhailī, *Tafsīr Al-Munīr*, 108–11; Shihab, *Tafsīr Al-Mishbah: Pesan, Kesan Dan Keresasian Al-Qur'an*, 624–26.

understood not merely as physical preservation of revelation but also as a guarantee that information within God's knowledge remains whole, authentic, and completely unchanged. This characteristic demonstrates that the al-Lawḥ al-Maḥfūẓ is not merely a symbol of storage but represents a system that guarantees the absolute authenticity and validity of information.⁴⁹ This principle of integrity complements the two principles discussed above. If the Kirāman Kātibīn represent the mechanism of recording and the Kitāb al-A' māl describes the system of storing and accounting for information, then the al-Lawḥ al-Maḥfūẓ represents the preservation of information at the highest level. These three concepts form an interconnected framework: recording occurs accurately, information is stored completely, and all decrees are preserved without the possibility of alteration. Thus, the Qur'anic system of recording deeds demonstrates an integrated relationship among recording, storage, and preservation of information.⁵⁰

From an information technology perspective, these characteristics conceptually align with the principle of immutability, a key feature of blockchain technology. Blockchain is a distributed digital ledger that stores data in interconnected blocks, each linked by cryptographic hash functions. Each block possesses a digital identity dependent upon the preceding block, so any attempt to alter stored data changes the overall chain structure and can be detected by the system. Blockchain is therefore developed to ensure information integrity, authenticity, and traceability within a distributed digital environment.⁵¹ Viewed conceptually, several similarities exist between the al-Lawḥ al-Maḥfūẓ and the immutability mechanism in blockchain. Both place information integrity at the center, such that established data cannot be altered arbitrarily. Both also emphasize preserving the authenticity of information so that it remains trustworthy as a basis for decision-making. However, these similarities exist at the level of conceptual function rather than ontological essence. The al-Lawḥ al-Maḥfūẓ belongs to a metaphysical system entirely within God's power, whereas blockchain is an engineered technological system constructed through cryptographic algorithms, consensus mechanisms, and computer networks. Accordingly, blockchain is not presented as a representation of the al-Lawḥ al-Maḥfūẓ, but only as an

⁴⁹ Kathīr, *Tafsīr Al-Qur'an al-'Azīm*, 7:383–85; Shihab, *Tafsīr Al-Mishbah: Pesan, Kesan Dan Keserasian Al-Qur'an*, 502–4.

⁵⁰ al-Asyqar, *Rabasia Alama Malaikat, Jin, Dan Setan: Mengupas Tuntas Alam Malaikat, Jin & Setan Berdasarkan Al-Qur'an Dan Hadis*, 151–60; Nursyamsu, "Konsep Pertanggungjawaban Manusia Dalam Al-Qur'an," 52–58.

⁵¹ Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System," 2008, 2–5, <https://bitcoin.org/bitcoin.pdf>; Utomo, "Implementasi Teknologi Blockchain Di Perpustakaan," 145–56; Setianingsih and Nasution, "Analisis Teknologi Blockchain Berperan Dalam Meningkatkan Keamanan Dan Privasi Data," 115–22.

analytical instrument for explaining the Qur'anic principle of preserving information.⁵²

This finding demonstrates that the values inherent in the concept of al-Lawḥ al-Maḥfūz are conceptually relevant to the development of digital culture, particularly in efforts to build information systems that uphold data integrity. Amid growing problems of data manipulation, digital document forgery, and information misuse, the Qur'anic principle of information preservation offers an ethical perspective in which data integrity is a matter of moral responsibility rather than merely a technical concern. Therefore, the dialogue between the Qur'anic concept and the blockchain paradigm in this study is not intended to seek religious legitimization for modern technology, but to demonstrate that the universal principles contained in the Qur'an remain relevant to addressing information-management challenges in the era of digital culture.

Overall, the findings demonstrate that the Qur'anic concept of recording deeds comprises three interconnected principles: recording accuracy through the Kirāman Kātibīn; storage transparency and accountability through the Kitāb al-A'māl; and information integrity and immutability through the al-Lawḥ al-Maḥfūz. These three principles constitute an integrated conceptual system of information governance from the Qur'anic perspective. Through conceptual analogy, the study shows that these principles have functional correspondences with real-time recording, database management systems, cloud computing, and blockchain. Nevertheless, these correspondences are not intended to equate revelation with technology, but to construct an interdisciplinary dialogue that enriches understanding of Qur'anic messages in the context of contemporary digital culture.

Conclusion

This study demonstrates that the concept of recording deeds in the Qur'an constitutes a system built upon three principal principles: recording accuracy; transparency and accountability in storage; and information integrity and immutability. The principle of accuracy is represented by the Kirāman Kātibīn, who continuously and objectively record human utterances and actions. The principle of transparency and accountability is embodied in the Kitāb al-A'māl as a record of all human deeds and as the basis of accountability on the Day of Judgment. Meanwhile, the principle of integrity is represented by the al-Lawḥ al-Maḥfūz, which indicates the perfect

⁵² Chowdhury, "Immutability of Blockchain," 89–102; Campbell and Tsuria, *Digital Religion: Understanding Religious Practice in Digital Media*, 25–41.

preservation of God's decrees without the possibility of alteration, addition, or reduction.

Through a conceptual-analogy approach, this study finds that these three principles have functional correspondences with modern information technology paradigms. The principle of recording accuracy is conceptually similar to real-time recording mechanisms, which emphasize direct, continuous data recording. The principle of storage transparency aligns functionally with Database Management Systems and cloud computing, which are designed to ensure information completeness, traceability, and availability. Meanwhile, the principle of information integrity and immutability is conceptually aligned with the immutability characteristic of blockchain technology, thereby safeguarding data authenticity and integrity. Nevertheless, this study emphasizes that the relationship is neither ontological nor historical but limited to conceptual analogy. The study therefore does not claim that the Qur'an has explained modern information technology or that technology constitutes proof of revelation. Instead, information technology paradigms are employed as analytical instruments to explain the universal principles underlying the concept of recording deeds, thereby contextualizing it with respect to developments in digital culture.

The principal contribution of this study lies in reconstructing the Qur'anic concept of recording deeds as an integrated information system by integrating the *Kirāman Kātibīn*, *Kitāb al-A'māl*, and *al-Lawḥ al-Maḥfūz*. This reconstruction enriches thematic Qur'anic studies by introducing an interdisciplinary dialogue between Qur'anic studies and information technology without obscuring the epistemological boundary between revelation and modern knowledge. Future research may extend this approach by examining other Qur'anic concepts related to information governance, artificial intelligence, cybersecurity, and digital technology ethics, thereby enabling more comprehensive dialogue between the Qur'an and technological development.

References

- Ariyadi. "Ilmu Pengetahuan Dan Teknologi Dalam Sudut Pandang Islam." *Jurnal Sains Komputer Dan Teknologi Informasi* 1, no. 1 (2018): 1–44.
- Aṣḥāḥānī, Al-Rāghib al-. *Al-Mufradāt Fī Ghariḥ al-Qur'an*. Damascus: Dār al-Qalam, 2009.
- Astuti, Rina. "Konsep Tanggung Jawab Individu Dalam Al-Qur'an: Kajian Tafsir Tematik QS. Al-Isrā' Ayat 13–14." IAIN Surakarta, 2020.

- Asyqar, Umar Sulaiman al-. *Rahasia Alama Malaikat, Jin, Dan Setan: Mengupas Tuntas Alam Malaikat, Jin & Setan Berdasarkan Al-Qur'an Dan Hadis*. Jakarta: Qisthi Press, 2017.
- Campbell, Heidi A., and Ruth Tsuria. *Digital Religion: Understanding Religious Practice in Digital Media*. 2nd ed. London: Routledge, 2021.
- Chowdhury, Niaz. "Immutability of Blockchain." In *Inside Blockchain, Bitcoin, and Cryptocurrencies*. Boca Raton: CRC Press, 2019.
- Dikla, M. Fathi, and Abdul Rasyid Ridho. "Qadha Dan Qadar Manusia Dalam Al-Qur'an." *El-Umdah: Jurnal Kajian Ilmu Al-Qur'an Tafsir* 7, no. 1 (2024): 56–68. <https://doi.org/https://doi.org/10.20414/elumdah.v7i1.9899>.
- Farmawi, Abd al-Hayy al-. *Al-Bidāyah Fī al-Tafsīr al-Mawḍūʿī*. Kairo: Dār al-Tawzī' wa al-Nashr al-Islāmiyyah, 1977.
- Firdaus, Muhamad Yoga, Suryana Alfathah, and Dadan Rusmana. "Komodifikasi Al-Qur'an Dalam Media Digital." *Mutawatir: Jurnal Keilmuan Tafsir Hadith* 12, no. 2 (2022): 243–60.
- Hamka. *Tafsir Al-Azhar*. Vol. 9. Singapura: Pustaka Nasional Pte Ltd, 2001.
- Ilhami, Muhammad Ridho, Muhammad Rian Saputra, and Shofia Pramudia. "Islam Dan Teknologi: Bagaimana Umat Islam Menyikapi Inovasi Digital." *Islamic Education* 3, no. 2 (2024): 373–84.
- Indonesia, Kementerian Agama Republik. *Al-Qur'an Dan Terjemahannya*. Jakarta: Lajnah Pentashihan Mushaf Al-Qur'an, 2019.
- Jamaludin and others. *Sistem Basis Data*. Padang: PT Global Eksekutif Teknologi, 2022.
- Kathīr, Ibn. *Tafsīr Al-Qur'ān al-'Azīm*. Translated by Bahrūn Abubakar and Anwar Abubakar. Bandung: Sinar Baru Algesindo, 2000.
- . *Tafsīr Al-Qur'ān al-'Azīm*. Vol. 7. Dār Ṭayyibah, 1999.
- Khairullah, Khairullah. "Peran Dan Tanggung Jawab Manusia Dalam Al-Qur'an." *Al-Fath* 5, no. 1 (2011): 71–79. <https://doi.org/https://doi.org/10.32678/alfath.v5i1.3253>.
- Kleppmann, Martin. *Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems*. Sebastopol, CA: O'Reilly Media, 2017.
- Krippendorff, Klaus. *Content Analysis: An Introduction to Its Methodology*. 4th ed. Thousand Oaks: Sage Publications, 2018.
- Lupton, Deborah. *Digital Sociology*. London: Routledge, 2015.

- Magdalena, Theresia. *Konsep Basis Data Relasional*. Jakarta: Universitas Mercu Buana, 2020.
- Manzūr, Ibn. *Lisān Al-'Arab*. Beirut: Dār Ṣādir, n.d.
- Mell, Peter, and Timothy Grance. *The NIST Definition of Cloud Computing*. NIST Special Publication 800-145. Gaithersburg: National Institute of Standards and Technology, 2011. <https://doi.org/10.6028/NIST.SP.800-145>.
- Muzakir, Abror, Reni Kartika, and Vandi Ahmad Isnaini. "Penerapan Ayat Al-Qur'an Dalam Teknologi Informasi Dan Komunikasi." *JSSIT: Jurnal Sains Dan Sains Terapan* 1, no. 1 (2023): 30–37. <https://doi.org/https://doi.org/10.30631/jssit.v1i1.5>.
- Nakamoto, Satoshi. "Bitcoin: A Peer-to-Peer Electronic Cash System." 2008. <https://bitcoin.org/bitcoin.pdf>.
- Nuraini, Nuraini, and Khairunnisa Khairunnisa. "Penafsiran Ayat-Ayat Takdir Dalam Al-Qur'an." *TAFSE: Journal of Qur'anic Studies* 5, no. 1 (2020): 17–35.
- Nursyamsu. "Konsep Pertanggungjawaban Manusia Dalam Al-Qur'an." *Jurnal Al-Asas* 2 (2019): 52.
- Papuangan, Miswar and others. *Sistem Basis Data*. Bandar Lampung: CV Keranjang Teknologi Media, 2023.
- Qurṭubī, Abū 'Abd Allāh al-. *Al-Jāmi' Li Ahkām al-Qur'an*. Vol. 17. Beirut: Mu'assasah al-Risālah, 2006.
- Setianingsih, Riskha, and Muhammad Irwan Padli Nasution. "Analisis Teknologi Blockchain Berperan Dalam Meningkatkan Keamanan Dan Privasi Data." *Jurnal Ilmiah Nusantara* 2, no. 1 (2024): 115–22.
- Shihab, M. Quraish. *Tafsir Al-Mishbab: Pesan, Kesan Dan Keserasian Al-Qur'an*. Jakarta: Lentera Hati, 2002.
- Subandi, and Aulia Akhrian Syahidi. *Basis Data*. Banjarmasin: Poliban Press, 2018.
- Suhaimi, Suhaimi. "Imam Ibnu Qutaibah Dan Takwil Terhadap Kemusykilan Dalam Al-Quran." *Jurnal Ilmiah Al-Mu'ashirah: Media Kajian Al-Qur'an Dan Al-Hadits Multi Perspektif* 19, no. 1 (2022): 61–73.
- Sulianta, Feri. *Strategi Merancang Arsitektur Sistem Informasi Masa Kini*. Bandung: Elex Media Komputindo, 2019.
- Utomo, Teguh Prasetyo. "Implementasi Teknologi Blockchain Di Perpustakaan." *Buletin Perpustakaan Universitas Islam Indonesia* 4, no. 2 (2021): 145–56.
- Zuhailī, Wahbah al-. *Tafsir Al-Munir*. Damaskus: Dār al-Fikr, 2009.

