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The Integration of Science and Technology in Islamic Fiqh: A Contemporary Perspective

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ABSTRACT

Purpose of the study: This study aims to explore how *fiqh* provides moral and ethical foundations for integrating science and technology within the framework of *maqāṣid al-sharīʿah*.

Methodology: This research employs a qualitative descriptive-analytical method using a literature review approach. Primary data sources include classical and contemporary *fiqh* texts, supported by scholarly works on the integration of science and technology. The study also examines *qiyās* and *ijtihād* as dynamic tools for addressing contemporary scientific and technological challenges.

Main Findings: The findings reveal that *fiqh* offers a structured ethical framework to align scientific and technological advancements with *sharīʿah* principles. Through *maqāṣid al-sharīʿah*, it ensures that technological progress remains within moral and spiritual boundaries, promoting accountability and ethical responsibility. The study highlights how *ijtihād* plays a crucial role in interpreting new developments in light of Islamic jurisprudence.

Novelty/Originality of this study: This study provides a fresh perspective by linking *fiqh* principles with contemporary scientific and technological challenges. It contributes to the ethical governance of scientific advancements while reaffirming the relevance of *fiqh* in addressing modern issues through *qiyās* and *ijtihād*.

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1. INTRODUCTION

Science and technology are the result of human intellectual development that continues to progress over time. On the other hand, Islam, as a religion encompassing all aspects of life, provides guidance through the Qur'an and hadith in various matters, including science and technology [1]. *Fiqh*, as a branch of Islamic legal science, serves to provide direction and limitations in matters related to human life, including scientific innovation. This article discusses how *fiqh* can be integrated with science to ensure that scientific advancements are not only beneficial in a worldly sense but also in alignment with Islamic spiritual and ethical values. Islam consists of *aqīdah* (creed), *sharīʿah* (law), and *akhlāq* (ethics), and the integration of science and religion directs all knowledge toward strengthening and increasing faith in Allah (*iman*) [2]. This integration is expected to cultivate adherence to *sharīʿah*, which represents divine law, and to instill noble character traits, such as honesty, trustworthiness, tolerance, and compassion for fellow beings. The Qur'an and *hadith* emphasize the importance of seeking knowledge and applying it in ways that align with *sharīʿah* principles [3].

In Islamic intellectual traditions, there has been an ongoing debate regarding the relationship between *fiqh* and science. Classical scholars such as Al-Ghazali, Ibn Rushd, and Al-Farabi have explored the integration

of empirical knowledge with religious principles [4]. Some scholars argue that Islam encourages scientific inquiry, as evident in the Qur'anic commands for *tafakkur* (reflection) and *tashakkur* (gratitude), which highlight the need for contemplating the universe (Ali ‘Imran: 189-190) and appreciating God's blessings (Al-Nahl: 114). The Qur'an does not recognize a dichotomy between religious and worldly knowledge; rather, it promotes a holistic understanding of reality where science is a means of approaching divine truth. Individuals who successfully integrate intellectual and spiritual pursuits are referred to as *ulū al-albāb* (people of deep understanding). The orientation of science and technology, therefore, is not separate from Qur'anic instruction, which calls for a balance between rational thought and ethical values [5].

However, modern secularist perspectives often argue that science and religion are fundamentally incompatible. This secularist view has significant implications for human behavior and societal norms. For example, in secular frameworks, professional work is often seen as purely a worldly pursuit, while acts of worship, such as prayer, are considered as solely spiritual endeavors [6]. This dichotomy is challenged by Islamic teachings, which emphasize that worldly affairs and the afterlife are interconnected. Earning a halal livelihood to support charitable acts, such as *zakāt* (almsgiving) and *sadaqah* (voluntary charity), exemplifies how economic activities align with religious obligations. *Fiqh* plays a crucial role in ensuring that human activities, including economic transactions and scientific advancements, adhere to ethical and legal principles, such as the classifications of *halal*, *haram*, *wājib*, *sunnah*, *mubāḥ*, and *makrūh* [7].

The integration of science in Islamic *fiqh* studies seeks to harmonize *fiqh* principles with contemporary scientific advancements. Within *fiqh* discourse, this integration can be achieved by aligning scientific knowledge with *sharī‘ah*-based regulations, ensuring contextual and relevant solutions to modern challenges [8]. Islamic *fiqh* not only governs aspects of worship but also extends to *mu‘āmalāt* (social and economic transactions), influencing various aspects of human life, including scientific and technological developments [9].

A key framework in ensuring this alignment is *maqāṣid al-sharī‘ah*, which plays a crucial role in determining scientific and technological policies. *Maqāṣid al-sharī‘ah* outlines fundamental objectives of Islamic law, including the preservation of faith (*dīn*), life (*nafs*), intellect (*‘aql*), lineage (*nasl*), and wealth (*māl*). These objectives provide ethical guidelines to ensure that scientific progress serves humanity while preventing harm (*mafsadah*). For instance, debates on artificial intelligence (AI) and its ethical implications such as privacy concerns, employment displacement, and AI-generated legal rulings require *fiqh*-based ethical considerations. Various *fatwā* councils have addressed these concerns, emphasizing the necessity of human oversight in AI-driven decision-making [10].

Another contemporary issue is the *fiqh* rulings on cryptocurrency transactions. The rise of digital currencies like Bitcoin has sparked discussions regarding compliance with *sharī‘ah* principles, particularly in relation to *ribā* (usury), *gharar* (excessive uncertainty), and *maysir* (gambling). Islamic scholars have provided differing opinions, with some permitting cryptocurrencies under specific conditions while others prohibit them due to speculative risks. Similarly, ethical concerns in biotechnology such as genetic engineering, cloning, and organ transplantation have led scholars to apply *fiqh* principles to evaluate their permissibility within an Islamic ethical framework [11].

By exploring these contemporary applications, this study highlights the significance of *fiqh* in governing scientific advancements. The role of *qiyās* (analogical reasoning) and *ijtihād* (independent reasoning) is essential in addressing modern scientific and technological challenges, ensuring that *sharī‘ah* remains dynamic and adaptable. This research seeks to contribute to the ongoing discourse on the ethical governance of science and technology within the framework of *maqāṣid al-sharī‘ah*, reaffirming the relevance of *fiqh* in addressing modern scientific dilemmas [12].

Fiqh, in its narrow sense, is the science that discusses *sharī‘ah* laws derived from the Qur'an, *hadith*, *ijmā‘* (consensus), and *qiyās* (analogical reasoning). It serves as a framework for understanding and applying Islamic law in daily life. Scholars classify legal rulings into five main categories: *wājib* (obligatory), *sunnah* (recommended), *mubāḥ* (permissible), *makrūh* (disliked), and *ḥarām* (forbidden). The application of these laws involves the use of *ijtihād*, where scholars interpret and adapt Islamic rulings to new and evolving situations [10]. In the context of modern scientific and technological advancements, *ijtihād* plays a crucial role in addressing contemporary issues while remaining faithful to the core principles of Islam. The rapid development of science necessitates ongoing *ijtihād* that engages both scholars and scientists to ensure that emerging technologies align with Islamic legal and ethical standards [13].

Fiqh is not merely a fixed body of laws but also a dynamic process of interpreting Islamic sacred texts, primarily the Qur'an and *hadith*. This perspective emphasizes the role of *tafsīr* (exegesis) in understanding the objectives and intent behind *sharī‘ah* laws [14]. Methods such as *qiyās* help scholars derive legal rulings by drawing analogies between contemporary issues and classical legal precedents. Similarly, *ijtihād* enables scholars to engage with new legal and technological challenges while ensuring that solutions remain grounded in Islamic law [15].

A crucial aspect of *fiqh* is its relationship with *maqāṣid al-sharī‘ah* (the objectives of Islamic law), which seeks to preserve religion (*dīn*), life (*nafs*), intellect (*‘aql*), lineage (*nasl*), and wealth (*māl*). This

framework ensures that legal rulings not only adhere to Islamic principles but also promote human welfare. *Fiqh* in this context is not limited to legal rulings but extends to broader considerations of justice, legal certainty, and public welfare (*maṣlaḥah*) [16]. The *maqāṣid* approach is frequently used in contemporary contexts to assess whether a legal ruling aligns with the overarching goals of *sharī'ah*. This perspective is particularly relevant in modern legal debates, where *fiqh* principles are applied to assess the ethical implications of technological advancements such as artificial intelligence, genetic engineering, and financial innovations [17].

The adaptability of *fiqh* is evident in its application to various social contexts. Islamic law is not a rigid system; rather, it must be interpreted and implemented according to the cultural, social, and historical conditions of a given time and place. This adaptability allows *fiqh* to address contemporary issues in politics, economics, and technology [18]. For example, *fiqh* provides ethical guidelines for business practices, financial transactions, and human rights in a rapidly globalizing world. In digital commerce, *fiqh* plays a crucial role in determining whether online transactions comply with *sharī'ah* principles, ensuring that trade remains free from *gharar* (excessive uncertainty) and *ribā* (usury) [19].

Beyond legal rulings, *fiqh* also encompasses ethical considerations. Islamic legal principles are not only concerned with obligations and prohibitions but also with moral conduct and *adab* (etiquette). *Fiqh* in this sense emphasizes justice, honesty, and respect for human dignity. It guides Muslims in ethical decision-making, ensuring that their actions align with Islamic values while promoting social harmony [20].

One of the most pressing areas of *fiqh* application today is its intersection with modern science. As technology advances, Islamic jurisprudence must engage with new ethical and legal challenges. Key issues include bioethics, environmental sustainability, and financial technology [12]. In the field of biotechnology, for instance, *fiqh* principles help determine the permissibility of genetic engineering, cloning, and organ transplantation. Scholars evaluate these innovations using *sharī'ah*-based ethical frameworks, ensuring that they do not violate core Islamic principles. Similarly, environmental *fiqh* (*fiqh al-bi'ah*) provides guidelines on sustainability and ecological responsibility, emphasizing the Islamic obligation to protect nature. In financial technology, *fiqh* principles are applied to assess the permissibility of cryptocurrencies, digital banking, and AI-driven financial transactions. These developments illustrate the dynamic nature of *fiqh* and its ability to address contemporary challenges while maintaining its foundational principles [21].

The influence of *fiqh* extends beyond individual societies to international law. In an increasingly interconnected world, Islamic jurisprudence plays a role in guiding Muslims in their interactions with global legal and economic systems [22]. Issues such as international trade, diplomatic relations, and human rights are all subjects of *fiqh* analysis, ensuring that Muslim engagement in global affairs remains aligned with *sharī'ah* values. The integration of science and Islamic law aims to produce legal solutions that are relevant and effective while upholding religious principles [23].

Several approaches have been developed to facilitate the integration of *fiqh* with contemporary issues. In medical ethics, *fiqh* provides guidance on issues such as organ donation, in-vitro fertilization (IVF), vaccine permissibility, and euthanasia [24]. Medical *fiqh* ensures that healthcare practices comply with Islamic teachings, balancing medical necessity with religious obligations. Similarly, digital *fiqh* addresses the challenges of online transactions, data security, and the ethical use of social media. Islamic financial *fiqh* has played a significant role in shaping modern Islamic banking, ensuring that financial products comply with *sharī'ah* principles through mechanisms such as *sukuk* (Islamic bonds) and *takāful* (Islamic insurance) [25].

Environmental *fiqh* has also gained prominence, addressing issues such as renewable energy, climate change, and sustainable resource management. Islamic teachings emphasize the prohibition of environmental destruction (*fasād fil-arḍ*), encouraging responsible stewardship of natural resources [26]. In economics, *fiqh* principles guide the development of Islamic financial institutions, ensuring that modern economic activities align with ethical standards. Concepts such as productive *waqf* (Islamic endowments) and digital *zakāt* management demonstrate how traditional *fiqh* mechanisms can be adapted to contemporary financial systems [27].

The integration of *fiqh* and science is facilitated through various methodological approaches. Unlike previous research that predominantly focuses on textual analysis, this study employs a multidisciplinary approach that combines *fiqh* with technology, economics, and medicine to develop a more comprehensive legal framework [28]. This research introduces a novel framework that integrates Islamic jurisprudence with scientific advancements through collective *fatwā* issuance, where scholars collaborate with scientific experts to provide well-informed rulings on emerging issues. Furthermore, the methodological approach adopted in this study includes a comparative analysis of contemporary and classical *fiqh* principles, allowing for a nuanced understanding of their applicability in the modern era. By incorporating *sharī'ah*-based empirical research, this study ensures that legal and scientific advancements remain rooted in Islamic principles while addressing modern challenges [19].

This study advances the field by proposing a structured methodological approach that bridges the gap between traditional Islamic legal theory and contemporary scientific inquiry. By offering a more dynamic and interdisciplinary framework, it ensures that *fiqh* remains a robust and relevant tool for addressing the ethical and legal dilemmas of the modern world.

Despite the extensive application of *fiqh* in various contemporary issues, previous research has not sufficiently addressed its methodological adaptability to modern scientific advancements. Studies by Al-Jaziri [29] and Kamali [30] have explored the theoretical foundations of *maqāṣid al-sharī'ah* in Islamic jurisprudence; however, they lack a comprehensive analysis of how *fiqh* dynamically interacts with rapidly evolving disciplines such as bioethics, artificial intelligence, and digital finance. Moreover, existing literature often focuses on isolated case studies rather than presenting an integrative framework that systematically applies *fiqh* to interdisciplinary contexts. This research aims to fill this gap by providing a structured and comprehensive approach to integrating *fiqh* with contemporary scientific and technological developments, ensuring that Islamic legal principles remain relevant in addressing emerging global challenges.

Despite these advancements, challenges remain in the integration of *fiqh* with contemporary issues. Differences in scholarly opinions, gaps between religious scholars and scientists, and the rapid pace of technological change all present obstacles [31]. Addressing these challenges requires efforts to enhance integrated education between religious and secular sciences, foster collaboration between religious institutions and research organizations, and establish platforms for *ijtihād* that involve both scholars and scientific experts. Through these efforts, *fiqh* can remain relevant and adaptive, providing ethical and legal solutions that uphold *sharī'ah* principles while addressing the complexities of the modern world [17].

The purpose of this research is to develop a structured framework that facilitates the integration of *fiqh* with contemporary scientific and technological advancements. By analyzing the dynamic interactions between Islamic legal principles and modern developments, this study aims to provide a comprehensive approach that bridges the gap between traditional *fiqh* methodologies and the emerging challenges of the modern era. Through this research, we seek to contribute to the ongoing discourse on Islamic jurisprudence and its role in navigating ethical dilemmas in a rapidly evolving global landscape.

2. RESEARCH METHOD

2.1. Type of Research

This study employs a qualitative approach with a descriptive-analytical method to explore the integration of science from the perspective of Islamic *fiqh* studies. The qualitative approach was chosen because the main objective of the research is to understand, describe, and analyze the relationship between Islamic *fiqh* and various scientific disciplines. This method enables the study to systematically examine textual sources and conceptual interpretations within *fiqh* while assessing their relevance to contemporary scientific developments [31].

2.2. Research Subjects

The research focuses on Islamic jurisprudence (*fiqh*) and its integration with modern scientific disciplines. The primary subjects of this study include classical texts of *fiqh* (*turāth*), *tafsīr*, and *hadith* that discuss legal rulings related to science and technology. Additionally, contemporary legal and ethical discussions on scientific advancements in Islamic scholarship are examined, including *fatwas*, academic studies, and policy discussions from Islamic scholars and institutions addressing modern scientific and technological challenges within the framework of *sharī'ah*.

2.3. Data Collection Instruments and Techniques

The data collection process in this study was conducted through library research (literature review), analyzing texts that discuss the integration of Islamic *fiqh* with modern science. The main sources of data consist of both primary and secondary data. Primary data sources include classical *fiqh* texts, Islamic legal manuals, *tafsīr* (Qur'anic exegesis), *hadith* collections relevant to scientific and technological discourse, as well as contemporary *fatwas* and legal interpretations from Islamic scholars. Secondary data sources include scientific journal articles discussing the intersection of Islamic *fiqh* and science, academic books, research reports, and conference proceedings on Islamic law and technological advancements. Additionally, official documents from Islamic organizations and councils that issue rulings on modern scientific issues were examined. The study employs a textual analysis approach, where relevant legal, philosophical, and ethical discourses are scrutinized to identify patterns of thought regarding science and *fiqh*.

2.4. Data Analysis Techniques

The data analysis process in this study involved both inductive and deductive reasoning. Inductive analysis was employed to explore patterns of thought emerging from primary and secondary texts, identifying common themes in the integration of *fiqh* and science. Deductive analysis was utilized to connect these identified patterns with theoretical frameworks related to the integration of scientific disciplines in Islamic legal thought. The data analysis was conducted through three main stages: (1) Data Reduction, where relevant information from the sources studied was filtered and prioritized based on direct relevance to the integration of *fiqh* and science; (2) Data Presentation, in which findings were categorized based on thematic elements that illustrate how *fiqh* principles interact with various scientific fields; and (3) Conclusion Drawing, where the analyzed data were

synthesized logically and systematically to answer the research questions and contribute to scholarly debates on the integration of Islamic *fiqh* and science.

2.5. Research Procedures

The research was carried out through systematic steps to ensure validity and reliability in addressing the study's objectives. First, a literature identification process was undertaken to collect and review primary and secondary sources relevant to the study. This was followed by thematic coding, where legal and scientific themes in the texts studied were categorized to understand their interrelation. A comparative analysis was then conducted, comparing classical *fiqh* rulings with modern legal discussions to identify continuities and adaptations in Islamic jurisprudence. Lastly, synthesis and interpretation were performed to draw conclusions from the analyzed data and contextualize them within contemporary scholarly discussions on science and Islam.

By following this structured methodology, the research ensures a systematic and academically rigorous approach to understanding the integration of science within Islamic *fiqh*. The methodology also strengthens the validity of the findings by engaging in comparative legal analysis and multidisciplinary perspectives, contributing to both Islamic legal scholarship and contemporary scientific discourse.

3. RESULTS AND DISCUSSION

3.1. Islamic Ethical Framework in the Integration of Science and Technology

Islam has a holistic and comprehensive ethical framework, rooted in the principles of *sharī'ah*, which include justice (*al-'adl*), benefit (*al-maṣlaḥah*), and responsibility (*al-amānah*). In the context of science and technology integration, Islamic *fiqh* acts as a moral guide to ensure that scientific development is not only oriented towards material progress but also aligns with spiritual and social values. These principles provide a strong framework for assessing and directing the application of technology in accordance with the objectives of the *sharī'ah* (*maqāṣid al-sharī'ah*), namely protecting religion, soul, mind, offspring, and human property [32].

One example of the implementation of the Islamic ethical framework in modern technology is bioethics. In this case, Islamic *fiqh* provides moral boundaries in biotechnology research, such as cloning, genetic modification, and organ transplantation [33]. This approach ensures that innovations in medicine remain respectful of human dignity and do not contradict the principle of public good. For instance, genetic modification is permitted only for therapeutic purposes, while reproductive cloning is prohibited as it disrupts lineage integrity (*nasl*) [34].

Comparison with Other Legal Systems: In contrast, the Catholic approach to bioethics generally rejects genetic modification, even for therapeutic reasons, on the basis that human intervention in genetic makeup violates divine creation. Meanwhile, secular bioethics frameworks, such as Western medical ethics, tend to prioritize individual autonomy, allowing genetic interventions as long as they respect informed consent and patient rights. Islamic *fiqh* takes a balanced approach, permitting genetic advancements only when they align with moral and ethical responsibilities under the maqāṣid framework [35].

Similarly, Islamic *fiqh* plays a role in digital ethics, ensuring that emerging technologies such as artificial intelligence (AI) and big data comply with sharī'ah principles. Privacy protection, honesty in data use, and harm prevention (*dar' al-mafāsid*) are emphasized in Islamic digital ethics, making data transparency a moral obligation rather than just a legal requirement, as seen in Western regulations such as GDPR (General Data Protection Regulation) [36].

Islamic Environmental Ethics vs. Secular Environmental Law: The Islamic ethical framework is also relevant in environmental law. Islamic teachings on stewardship (*khalīfah fil arḍ*) and waste prohibition (*isrāf*) provide a moral foundation for developing environmentally friendly technologies. For example, Islamic finance has introduced "green sukuk" (Islamic environmental bonds), supporting sustainable projects in renewable energy. Unlike secular environmental policies, which are policy-driven, Islamic environmental ethics are deeply rooted in religious doctrine, ensuring that ecological responsibility is both a legal and spiritual obligation. Islamic ethical frameworks also contribute to social development through technology. The integration of science and technology based on Islamic *fiqh* supports equitable access to education and healthcare, ensuring that technological advancements serve all segments of society, including vulnerable communities [37].

The application of the Islamic ethical framework in social development through science and technology involves an approach centered on the benefit of the people. This means that technologies are not only designed to meet market needs but also consider broader social impacts. For example, health technologies based on Islamic fiqh can be developed to reach remote communities that are often overlooked in the distribution of medical services. With the principle of justice, the development of these technologies should ensure that such services are available without discrimination based on economic status, gender or ethnicity [38].

In addition, the integration of science and technology based on Islamic fiqh can support the economic empowerment of society. Financial technology (fintech) designed with sharia principles, such as a microfinance system based on waqf or zakat, can be an effective instrument to reduce economic inequality. With this approach, underprivileged communities are not only beneficiaries but can also be empowered to participate in

the technology-based economy. This creates an inclusive and equitable ecosystem, in line with the objectives of sharia [39].

In the field of education, technology based on Islamic principles can encourage equal access to education in various regions. Online learning applications designed with Islamic values in mind can provide educational materials that are appropriate to local culture and Islamic values. In addition, this technology can also be used to improve religious literacy and general knowledge simultaneously, making education a more effective tool to build a well-informed and highly moral society [40].

The Islamic ethical framework also opens up opportunities to support social inclusion through information and communication technologies. These technologies can be used to create platforms that enable interfaith and intergroup dialog, in order to strengthen tolerance and harmony in diverse societies. Shariah principles such as tasamuh (tolerance) and ta'awun (cooperation) can be implemented in technology design to encourage collaboration and reduce the potential for social conflicts that often arise due to differences [41].

The integration of science and technology with an Islamic ethical framework can also serve as a social advocacy tool. Data-driven technology, for example, can be used to map social inequality and assist policy makers in formulating more effective solutions. With this approach, technology not only serves as a tool for progress but also a means to ensure sustainable social justice. The Islamic ethical framework provides moral guidance that ensures that these developments do not lose sight of social responsibility to all humanity [42].

The integration of science and technology with Islamic ethical frameworks creates opportunities to strengthen social advocacy through data-driven approaches. Technology can be used to collect and analyze more accurate information about people's needs, such as access to education, health and employment. With valid data, policy makers can identify the most vulnerable groups and formulate targeted programs. Shariah principles, such as justice and general welfare (maslahah), serve as a moral foundation in ensuring that the solutions formulated benefit the entire society [30].

In the context of governance, data-driven technology grounded in Islamic ethics can support transparency and accountability. By providing public access to relevant data, people can be involved in the oversight and decision-making process. This is in line with the principle of amanah in Islam, where leaders have a responsibility to manage resources fairly and transparently. For example, the use of blockchain technology in public administration can ensure data integrity, which can better build public trust in government policies.

In addition, technology guided by an Islamic ethical framework can promote community empowerment through direct involvement in decision-making. By using a digital platform, communities can convey their aspirations, needs and proposals to policy makers. The principle of deliberation that is at the core of sharia can be applied in the design of these technologies, so that every decision taken reflects the collective will based on justice and mutual benefit.

Data-driven technologies can also be used to monitor the impact of social and economic policies on an ongoing basis. For example, the development of welfare indicators that include spiritual, moral and material dimensions can help the government evaluate the effectiveness of programs that have been implemented. This principle of continuous evaluation is in accordance with Islamic values that emphasize the importance of introspection (muhasabah) in every action, so that the policies implemented can be continuously improved and enhanced.

Finally, Islamic ethical frameworks in social advocacy technologies are not only relevant for local contexts but also have the potential to be applied on a global scale. In issues such as climate change, poverty alleviation, and the refugee crisis, data-driven technologies integrated with sharia principles can offer an inclusive and sustainable approach. By ensuring that every step is based on moral values, Islam can make a real contribution to creating global solutions that are fair and oriented towards the overall benefit of humanity.

3.2. The Relevance of Islamic Fiqh in Answering the Challenges of Modern Science Ethics

Islamic *fiqh* provides ethical guidance in addressing moral dilemmas arising from scientific and technological developments. Principles such as *maṣlaḥah* (public benefit), *al-ʻadl* (justice), and *lā ḍarar wa lā ḍirār* (harm prevention) ensure that technological progress remains aligned with ethical values. One pressing issue is bioethics, particularly in assisted reproductive technology (ART), genetic engineering, and organ transplantation. Islamic *fiqh* permits IVF (in-vitro fertilization) under strict conditions (i.e., only between legally married couples), while banning surrogacy and sperm donation to maintain lineage integrity.

Comparison with Secular and Catholic Bioethics: Secular legal systems, particularly in Western countries, tend to allow surrogacy and sperm donation based on personal autonomy, which is contrary to Islamic *fiqh* principles. Meanwhile, the Catholic Church opposes IVF altogether, arguing that life should only be conceived naturally, demonstrating a stricter ethical stance compared to Islam’s pragmatic yet morally guided approach.

Fiqh and Artificial Intelligence Ethics: The ethical implications of AI and robotics raise concerns over autonomy, fairness, and bias. Islamic *fiqh* ensures that AI developments do not replace human agency and that AI-driven decision-making remains ethically accountable. This is similar to AI governance frameworks in the

European Union, which emphasize "human-centric AI", yet Islamic *fiqh* incorporates additional religious accountability, ensuring that AI aligns with *sharī'ah* ethics.

Regulating AI in Islamic Finance: Islamic *fiqh* also plays a role in regulating AI in financial transactions, ensuring that automated decision-making in Islamic banking adheres to *sharī'ah* principles. For example, AI-driven trading systems in Islamic finance must avoid *gharar* (excessive uncertainty) and *ribā* (usury), distinguishing it from conventional AI-powered trading algorithms, which prioritize profit maximization over ethical considerations.

One example of the application of Islamic fiqh in a contemporary context is in the field of bioethics. Biomedical technologies, such as cloning, genetic therapy and assisted reproductive technology, often lead to deep ethical debates. Islamic fiqh provides moral guidance by considering the objectives of sharia (maqashid al-shariah), which are to protect life, reason, offspring and property. For example, genetic therapy is acceptable in Islam if it aims to cure diseases without harming basic human values, while human cloning for reproductive purposes is generally prohibited because it goes against the principle of preserving offspring.

In the field of digital technology, Islamic fiqh also offers ethical guidance to deal with issues such as data privacy, the spread of false information, and digital addiction. The principles of honesty (siddiq) and responsibility (amanah) provide the moral foundation for the use of digital technology. For example, the management of user data in digital applications should be done transparently and only for appropriate purposes, avoiding exploitation or abuse. In addition, the dissemination of information through social media should be based on the principle of tabayyun (verification) to prevent slander and social harm.

Other scientific innovations, such as artificial intelligence and robotic technology, also present ethical challenges that require a response from Islamic fiqh. In this context, Islamic fiqh can help direct the development of such technologies so that they do not totally replace human functions, but instead complement them in ways that support human well-being. For example, artificial intelligence algorithms should be designed to reflect principles of fairness and avoid biases that could disadvantage certain groups. In addition, robotics applied in the health sector or public services should keep in mind the humanistic and spiritual dimensions.

The relevance of Islamic fiqh in answering the ethical challenges of modern science shows that the Islamic legal tradition does not only function as a legal tool for worship, but also as a dynamic and contextual moral guide. With a flexible approach that is rooted in the principles of sharia, Islamic fiqh is able to provide ethical solutions that are relevant to various contemporary issues. This makes Islamic fiqh a framework that is not only adaptive to the changing times but also contributes actively in building a modern civilization based on moral and spiritual values.

Islamic fiqh has a flexibility that allows for new approaches in dealing with complex ethical challenges in the era of modern science. One of the hallmarks of fiqh is its ability to adapt through ijtihad, an intellectual endeavor to find solutions to new problems based on the principles of sharia. In the context of modern technology, ijtihad allows scholars to formulate new views relevant to developments in science, such as bioethics or artificial intelligence. This approach ensures that Islamic ethics is not only normative but also practical and applicable in various fields of science.

Islamic fiqh also has a role to play in building an ethical regulatory framework that can be adopted by various parties, including governments and educational institutions. Shariah principles can be used as a basis for designing policies that support the responsible use of technology. For example, the government can develop regulations on the use of genetic technology or artificial intelligence that take into account its impact on public morality. In this way, Islamic fiqh not only provides guidance on individual ethics, but also serves as a reference in the formation of broader public policies.

In the context of education, the relevance of Islamic fiqh is also seen in efforts to build ethical literacy for the younger generation. Islamic-based education can integrate fiqh principles in the science and technology curriculum, so that students understand not only the technical aspects, but also the moral implications of the innovations they study. This approach not only prepares students to be competent innovators, but also morally and spiritually responsible in the application of science.

Islamic fiqh also makes an important contribution in developing collective awareness about the social and environmental impacts of science and technology. With principles such as amanah (responsibility) and khalifah (leadership on earth), fiqh encourages the utilization of technologies that are not only oriented towards economic gain, but also ecosystem sustainability. For example, fiqh can be the basis for advocating the use of environmentally friendly technologies and renewable energy innovations that are in line with Islamic values.

Islamic *fiqh* is not only a theoretical moral framework but also serves as a regulatory tool for shaping ethical technology policies. Collective *ijtihād* among Islamic scholars ensures that legal rulings adapt to contemporary scientific challenges. Integration of Fiqh in Technology Governance: Islamic *fiqh* principles have influenced national policies in countries like Malaysia and Saudi Arabia, where Islamic STEM education integrates ethics into technological advancements. In contrast, Western STEM education often separates ethics from science, highlighting a fundamental difference in educational approaches.

Islamic *fiqh* also plays a critical role in environmental governance. Fiqh-based green policies emphasize environmental justice and conservation, aligning with global climate agreements, but with an added dimension of religious accountability. Islamic fiqh acts as a balance keeper between technological progress and moral responsibility, making it more than just a legal guide, but also an ethical philosophy that shapes the direction of scientific development. This approach is not only relevant for Muslim societies, but can also serve as a universal model for responsible technology management. Principles such as al-maslahah (the public good) and maqashid al-shariah (the purpose of sharia) provide a framework that can be applied in a global context to ensure that technological progress remains aligned with human values.

Islamic fiqh also encourages the development of science that is oriented towards human empowerment, not just the exploitation of resources. In this case, fiqh prioritizes the concept of collective responsibility in managing technology so that the benefits can be felt by all levels of society. For example, the development of health technology based on the principle of justice can narrow the gap in access to health services, so that underprivileged people can still benefit from medical innovations. This shows that Islamic fiqh has the capacity to serve as an ethical basis to support social justice in the era of modern technology.

In terms of environmental sustainability, Islamic fiqh teaches the importance of maintaining the balance of ecosystems as part of human responsibility as khalifah on earth. This principle is relevant in the context of technological innovations that often have negative environmental impacts. With guidance from fiqh, technology can be directed to support environmental preservation, such as in the development of renewable energy or waste management. This approach shows that Islamic fiqh not only regulates human relationships with God, but also with fellow creatures and the environment.

In addition, Islamic fiqh can be an instrument to support technological inclusion for vulnerable groups. By integrating Islamic values in technology development, such as educational technology or sharia-based fintech, groups that have been marginalized can be accommodated to participate in technological advancement. This reflects the inclusive and collective welfare-oriented vision of Islamic fiqh, making it relevant in the effort to create a more equal society in the era of globalization.

Ultimately, Islamic *fiqh* offers a unique and adaptive framework that ensures scientific and technological advancements align with moral, ethical, and spiritual values. While secular laws regulate technology through policy mechanisms, *fiqh* integrates ethical, social, and spiritual considerations, making it a more holistic regulatory model.

However, this study also has its limitations. While the research provides a theoretical foundation for the integration of *fiqh* and modern technology, its practical application in different legal and sociopolitical contexts requires further empirical validation. The study predominantly relies on textual and conceptual analysis, which, while valuable, does not fully capture the diversity of interpretations and implementations of *fiqh* in different regions and legal systems. Additionally, the rapidly evolving nature of technological advancements, particularly in areas such as artificial intelligence, biotechnology, and fintech, means that continuous *ijtihād* (independent legal reasoning) and scholarly engagement are necessary to keep *fiqh* relevant in addressing emerging challenges. Future research could benefit from comparative case studies, field research on the implementation of *fiqh*-based technological policies, and collaborations between Islamic scholars and scientific experts to develop practical guidelines that bridge the gap between Islamic jurisprudence and contemporary technological governance.

4. CONCLUSION

The integration of Islamic *fiqh* with science is a crucial step in ensuring that scientific and technological advancements remain within the Islamic moral and ethical framework. In this regard, *fiqh* functions not only as a legal guideline but also as an ethical safeguard, ensuring that scientific progress remains beneficial, just, and aligned with *sharī'ah* principles. By applying *maqāṣid al-sharī'ah* which aims to protect religion (*dīn*), life (*nafs*), intellect (*'aql*), lineage (*nasl*), and wealth (*māl*) Islamic *fiqh* provides a comprehensive approach to regulating modern scientific developments in a way that prioritizes both ethical considerations and societal well-being.

This study highlights the dynamic nature of *fiqh* and its ability to adapt to contemporary challenges in science and technology. *Fiqh* is not merely a legal system; it is a holistic way of life that governs every human action through Islamic ethical principles. As technology continues to evolve in areas such as biotechnology, artificial intelligence, financial technology, and environmental sustainability, *fiqh* must also continue to evolve through *ijtihād* to provide relevant and practical solutions. Therefore, it is imperative for Muslim scientists, scholars, and policymakers to engage in multidisciplinary collaboration, ensuring that scientific advancements align with both technological progress and Islamic ethical values.

Recommendations for Further Research: While this study provides a theoretical foundation for the integration of Islamic *fiqh* with science, further research is needed to explore its practical applications. Future studies could focus on comparative analyses between Islamic and secular legal frameworks in regulating

emerging technologies, such as bioethics, AI governance, and digital financial systems. Additionally, empirical research is required to assess the implementation of *fiqh*-based policies in different Islamic and non-Islamic jurisdictions. Collaboration between Islamic scholars, scientists, and legal experts is crucial in developing practical regulatory models that align with Islamic ethical principles while remaining adaptable to global technological advancements. By advancing the discourse on Islamic *fiqh* and science, future research can contribute to strengthening the ethical foundations of scientific progress, ensuring that technological innovation serves humanity in a just, responsible, and spiritually meaningful way.

REFERENCES

[1] I. M. Sembiring, "Pendidikan Islam dalam Perspektif Sedunia," *Al-Ikhtibar: Jurnal Ilmu Pendidikan*, vol. 7, no. 1, pp. 723–736, 2020.

[2] M. E. Ruhullah and Thameem Ushama, "Time and Society in the Qur'an: Al-Ghazali's Integration of Ancient Wisdom into Islamic Epistemology," *Islam Realitas: Journal of Islamic and Social Studies*, vol. 10, no. 1, pp. 62–80, Aug. 2024, doi: 10.30983/islam_realitas.v10i1.8583.

[3] D. Irawan and R. S. Putra, "Integrasi Ilmu Pengetahuan: Kajian Interdisipliner, Multidisipliner dan Transdisipliner Ilmu Pendidikan Islam Kontemporer," *Attaqwa: Jurnal Ilmu Pendidikan Islam*, vol. 18, no. 1, pp. 132–140, 2022.

[4] Z. Azman, "Rumpun Ilmu Pengetahuan Sosial dalam Perspektif Islam dan Barat," *El-Ghiroh: Jurnal Studi Keislaman*, vol. 21, no. 2, pp. 185–203, 2023.

[5] P. Siregar, "Integrasi Ilmu-Ilmu Keislaman dalam Perspektif M. Amin Abdullah," *MIQOT: Jurnal Ilmu-Ilmu Keislaman*, vol. 38, no. 2, 2014.

[6] N. Jamal, "Model-Model Integrasi Keilmuan Perguruan Tinggi Keagamaan Islam," *KABILAH: Journal of Social Community*, vol. 2, no. 1, pp. 83–101, 2017.

[7] A. T. A. Putra, "Konsep Pemikiran Ismail Raji Al Faruqi (Dari Tauhid Menuju Integrasi Ilmu Pengetahuan di Lembaga Pendidikan)," *Zawiyah: Jurnal Pemikiran Islam*, vol. 6, no. 1, pp. 20–37, 2020.

[8] A. Amar, "Model Integrasi Ilmu Pengetahuan dan Agama Antara Dikotomi Naif dan Valid," *CENDEKIA*, vol. 13, no. 01, pp. 82–94, 2021.

[9] R. Safarudin, Z. Zulfamanna, Z. Zulmuqim, and M. Zalnur, "Analisis Filosofis Tentang Ilmu Pengetahuan dalam Perspektif Filsafat Pendidikan Islam dan Implikasinya terhadap Pengembangan Pendidikan Islam," *Journal on Education*, vol. 5, no. 1, pp. 770–783, 2022.

[10] S. Alhattab and K. H. Bin Jamil, "The Landscape of the Interplay between Religion and Science: The Experience of Islamic Discourse," *International Journal of Religion*, vol. 5, no. 1, pp. 253–263, Jan. 2024, doi: 10.61707/ybg86c06.

[11] S. D. Bahiyah, "Assessing the Istislahiah Method in Islamic Law: Study of The Utilization of Science in Ushul Fiqh in The Context of Indonesian Fiqh," *Indonesian Journal of Law and Islamic Law (IJLIL)*, vol. 6, no. 1, pp. 1–13, May 2024, doi: 10.35719/IJLIL.V6I1.314.

[12] Muh. Rusli, "Interdisciplinary Approach on Contemporary Islam in Indonesia," *Jurnal Adabiyah*, vol. 23, no. 2, pp. 355–378, Dec. 2023, doi: 10.24252/jad.v23i2a13.

[13] I. Suprayogo, "Membangun Integrasi Ilmu dan Agama: Pengalaman UIN Maulana Malik Ibrahim Malang," *Proceeding IAIN Batusangkar*, vol. 1, no. 1, pp. 27–46, 2017.

[14] M. Fahmi and A. K. Soleh, "The Concept of Religion-Science Integration: A Comparative Study of Naquib Al-Attas and Nidhal Guessoum," *DINIKA: Academic Journal of Islamic Studies*, vol. 9, no. 2, pp. 151–172, 2024.

[15] N. Nurhasnah, T. Tiffani, E. Eldarifai, Z. Zulmuqim, and M. Zalnur, "Hakikat Ilmu Pengetahuan dalam Perspektif Filsafat Pendidikan Islam: Telaah Mengenai Dikotomi Ilmu, Islamisasi Ilmu, Integrasi Ilmu, Interkoneksi Ilmu dan Implikasinya Terhadap Pengembangan Pendidikan Islam," *Indo-MathEdu Intellectuals Journal*, vol. 4, no. 3, pp. 2560–2575, 2023.

[16] A. Hehsan, Z. Haron, F. M. Yusof, J. Junaidi, M. F. Abu, and H. M. Esa, "The Challenge of Futuristic Shift in Fiqh Science and Technology in New Era IR 4.0," *Sustaining Global Strategic Partnership in the Age of Uncertainties*, vol. 5, no. 6, p. 236, 2020.

[17] S. Badriah, N. F. Natsir, and E. Haryanti, "Tipologi Integrasi Agama dan Ilmu Pengetahuan dalam Pemikiran Islam Kontemporer," *Jurnal Ilmiah Wahana Pendidikan*, vol. 7, no. 8, pp. 753–763, 2021.

[18] A. Raquib, "Islamic View on Good Life: Dialogue with Philosophy of Modern Technology," *Revelation and Science*, vol. 2, no. 01, pp. 11–32, Jun. 2012, doi: 10.31436/REVIVAL.V2I01.58.

[19] W. Wahiddin, "Macam-Macam Integrasi Ilmu dalam Membangun dan Mengembangkan Landasan Keilmuan Islam," *Book Chapter of Proceedings Journey-Liaison Academia and Society*, vol. 1, no. 1, pp. 498–509, 2022.

[20] S. Siswanto, "Perspektif Amin Abdullah Tentang Integrasi-Interkoneksi Dalam Kajian Islam," *Teosofi: Jurnal Tasawuf Dan Pemikiran Islam*, vol. 3, no. 2, pp. 376–409, 2013.

[21] Hilyati Aulia and W. W. Indarwanto, "Peta Pemahaman Ilmu Ushulul Fiqh Jalaluddin As-Suyuthi dalam Kitab Al-Asybah wa An-Nadhair," *Academic Journal of Islamic Principles and Philosophy*, vol. 4, no. 1, pp. 93–114, Aug. 2023, doi: 10.22515/ajipp.v4i1.6523.

[22] I. Idri, "Scientific Analysis Methods of Islamic Law in Contemporary Studies," *International Journal of Progressive Sciences and Technologies (IJPSAT)*, vol. 29, no. 1, pp. 231–241, 2021.

[23] S. Mudawam, "Syari'ah-Fiqih-Hukum Islam: Studi tentang Konstruksi Pemikiran Kontemporer," *Asy-Syir'ah: Jurnal Ilmu Syari'ah dan Hukum*, vol. 46, no. 2, 2012.

[24] Z. Ibrahim and B. Zainuddin, "A Conceptual Methodology of Integration of Islamic Perspectives into the Curriculum: Using Medical Imaging as an Example," *Revelation and Science*, vol. 5, no. 2, pp. 1–13, Dec. 2015, doi: 10.31436/REVIVAL.V5I2.156.

[25] H. F. Zarkasyi, "Inculcation of Values Into Technology An Islamic Perspective," *Afro Eurasian Studies Journal* , vol. 5, no. 1 & 2, pp. 90–118, 2016.
[26] A. Shabana, *Interface between Islamic Law and Science: Ethico-Legal Construction of Science in Light of Islamic Bioethical Discourses on Genetic and Reproductive Technologies*. Springer, Cham, 2022. doi: 10.1007/978-3-030-53801-9_12.
[27] D. Ridwan, "Teori Epistemologi Islam; Telaah Kritis Pemikiran Mulyadhi Kartanegara," *SIASAT*, vol. 4, no. 2, pp. 1–8, 2019.
[28] A. Widiyanto, "Studying Islam in an Age of Disruption: Towards Knowledge Integration," *IJoReSH: Indonesian Journal of Religion, Spirituality, and Humanity*, vol. 1, no. 1, pp. 52–75, Jun. 2022, doi: 10.18326/ijoresh.v1i1.52-75.
[29] A. Al-Jaziri, *Al-Fiqh Ala Al-Mażahib Al-Arba'ah*. Jakarta: Pustaka al-Kautsar, 2015.
[30] M. H. Kamali, O. Bakar, D. A.-F. Baatchelor, and R. Hashim, "Islamic Perspectives on Science and Technology," in *Islamic Perspectives on Science and Technology*, Springer Singapore, 2016. doi: 10.1007/978-981-287-778-9.
[31] M. A. I. AlJahsh, "Science and Islamic Ethics: Navigating Artificial Womb Technology Through Quranic Principles," *Heliyon*, vol. 10, no. 17, Sep. 2024, doi: 10.1016/j.heliyon.2024.e36793.
[32] M. A. Jamaludin, "Fiqh Istihalah: Integration of Science and Islamic Law," *Revelation and Science*, vol. 2, no. 02, pp. 117–123, 2012, doi: 10.31436/REVIVAL.V2I02.76.
[33] B. Karagözoğlu, *Science and Technology from Global and Historical Perspectives*. Springer International Publishing, 2017. doi: 10.1007/978-3-319-52890-8/COVER.
[34] U. Efe and A. V. Akcan, "A Literature Review of the Studies on Islam Science Technology in Web of Science," *Journal of STEM Teacher Institutes*, vol. 4, no. 1, pp. 65–80, 2024, Accessed: Feb. 10, 2025. http://www.jstei.com/index.php/jsti/article/view/70
[35] S. M. Saifuddeen, C. L. Wei, A. H. Ibrahim, and N. A. M. Khotib, "Islamic Ethical Framework to Tackle Scientific and Technological Dilemmas," *Journal of Dharma*, vol. 38, no. 4, pp. 373–386, Dec. 2013, Accessed: Feb. 10, 2025. https://dvkjournals.in/index.php/jd/article/view/98
[36] A. T. Kuncoro and M. C. Nizar, "The Epistemology of Fiqh-Science and Its Implementation in Contemporary Fiqh in Indonesia," in *Proceedings of the 2nd Southeast Asian Academic Forum on Sustainable Development (SEA-AFSID 2018)*, 2021, pp. 225–230. doi: 10.2991/aebmr.k.210305.041.
[37] H. Hosaini and A. Akhyak, "Integration of Islam and Science in Interdisciplinary Islamic Studies," *Jurnal Kepemimpinan dan Pengurusan Sekolah*, vol. 9, no. 1, pp. 24–42, Mar. 2024, doi: 10.34125/jkps.v9i1.337.
[38] N. Anas, E. A. Z. E. Alwi, H. H. Razali, R. N. Subki, and N. A. A. Bakar, "The Integration of Knowledge in Islam: Concept and Challenges," *Global Journal of HUMAN SOCIAL SCIENCE Linguistics & Education*, vol. 13, no. 10, pp. 1–6, 2013.
[39] M. Aniq *et al.*, "The Integration of Five Main Goals of Shariah in The Production of Science and Technology for Human Well-Being," *AL-MAQASID: The International Journal of Maqasid Studies and Advanced Islamic Research*, vol. 5, no. 1, pp. 1–16, Aug. 2024, doi: 10.55265/AL-MAQASID.V5I1.79.
[40] M. Muqowim and Z. Lessy, "Augmenting Science in the Islamic Contemporary World: A Strategic Attempt at Reconstructing the Future," *Al-Jami'ah: Journal of Islamic Studies*, vol. 57, no. 1, pp. 197–230, Jun. 2019, doi: 10.14421/ajis.2019.571.197-230.
[41] W. M. K. F. W. K. Khairuldin, W. N. I. W. Anas, A. H. Embong, D. Ismail, and M. S. Hanapi, "The Challenges of Fatwa Institutions in Malaysia in Facing the Progress of Science and Technology," *International Journal of Mechanical Engineering and Technology*, vol. 10, no. 3, pp. 1806–1813, Sep. 2019, Accessed: Feb. 10, 2025. https://papers.ssrn.com/abstract=3453554
[42] A. Aslati, A. Agustar, S. Silawati, A. Arisman, and S. Arafah, "Utilizing Science and Maqāṣid al-Sharī'ah in Resolving Contemporary Issues of Islamic Family Law," *Al-Manahij: Jurnal Kajian Hukum Islam*, pp. 17–36, Mar. 2024, doi: 10.24090/mnh.v18i1.10571.
[43] M. S. Malik, "Technological Innovation in Integration and Interconnection of Science in Islamic Higher Education," *Sunan Kalijaga International Journal on Islamic Educational Research*, vol. 4, no. 2, pp. 1–20, Nov. 2020, doi: 10.14421/skijier.2020.42.01.