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Reconstruction of the Ethics of Artificial Intelligence Development in Islamic Philosophy and Muhammadiyah Thought

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Abstract

This study aims to analyze the perspectives of al-Islam and Muhammadiyah on the development of Artificial Intelligence (AI) within the framework of ethics, epistemology, and the concept of blessing (*barakah*). The research employs a qualitative approach using a library research method, through the analysis of literature on Islamic philosophy, Muhammadiyah thought, and studies on technology ethics and AI. The data were analyzed using content analysis and hermeneutic techniques to identify normative principles relevant to responding to AI development. The findings indicate that Islam views technology as an instrument of the human mandate of *khalifah* (vicegerency), which must be directed toward public welfare (*maslahah*), justice, and balance between worldly life and the hereafter. The concept of Islamic ethics including *tawhid*, *adl*, moral character (*akhlaq*), and social responsibility serves as the normative foundation for evaluating and utilizing AI. Knowledge (*ilm*) is understood as a religious obligation that is not morally neutral; therefore, AI development must be oriented toward truth and benefit. Meanwhile, the concept of blessing (*barakah*) emphasizes sustainability and the spiritual dimension in the use of technology. From the Muhammadiyah perspective, the integration of religion and science, the strengthening of education, and community empowerment constitute the primary principles in AI development. AI is positioned as a means of civilizational renewal that must be guided by ethical values to prevent injustice or dehumanization. Thus, al-Islam and Muhammadiyah offer an integrative and normative philosophical framework for directing AI development in a responsible, just, and spiritually meaningful manner.

Keywords: artificial intelligence, Islamic ethics, philosophy of al-Islam, Muhammadiyah, science and technology, public welfare, integration of religion and science.

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Introduction

The development of technology over the past few decades has brought about a fundamental transformation in patterns of human life. Needs that were once difficult to fulfill can now be addressed more quickly, accurately, and efficiently through the support of modern computing systems [1]. Since the emergence of early-generation computers in the 1940s, this technology has undergone

significant evolution in both hardware and software aspects. Improvements in processing capacity, computational speed, energy efficiency, and data storage capabilities have driven the emergence of new innovations that expand the scope of computer use across nearly all sectors of life [2].

One of the most prominent manifestations of modern computing development is the advancement of Artificial Intelligence (AI). According to Pellas [3], the surge in computational power, combined with advances in machine learning algorithms, artificial neural networks, and natural language processing, has enabled computer systems to imitate various human cognitive functions. These capabilities include pattern recognition, large-scale data analysis, probabilistic decision-making, and increasingly natural language interaction.

Conceptually, Artificial Intelligence is understood as a computational technology designed to emulate human abilities in understanding instructions, solving problems, and making rational decisions [4]. In practice, AI has been widely applied in various strategic sectors, such as industrial automation, digital financial systems, healthcare services, intelligent transportation, adaptive education, and the entertainment industry [5]. AI systems are utilized to support predictive analytics, data classification, process optimization, and the development of autonomous systems. As emphasized by Dei [6], AI holds enormous transformational potential for social structures, economic systems, and even human existence itself.

However, the development of AI not only brings technological convenience but also raises profound epistemological and ethical concerns. The phenomenon of AI encourages a paradigm shift in understanding the relationship between humans and machines. Questions surrounding artificial consciousness invite philosophical reflection on the nature of human consciousness in a digital context [7]. Furthermore, debates have emerged regarding the possibility that AI systems could possess forms of will or moral agency resembling those of humans.

Ethical issues become increasingly crucial given that AI implementation is not free from the risks of algorithmic bias and the reproduction of social injustice. Chen et al. [8] demonstrate that biases in algorithms often reinforce pre-existing social prejudices, thereby necessitating transparency, accountability, and principles of justice in the design of AI systems. On the other hand, advancements in AI have also contributed significantly to science and healthcare. Almaiah et al. [9] show that AI systems are capable of diagnosing skin cancer with accuracy comparable to dermatology specialists, opening new opportunities in technology-based medical diagnostics.

In the economic and business context, Brynjolfsson et al. (2017) demonstrate that AI contributes to increased corporate productivity through deeper data analysis and more precise decision-making. However, as warned by Tegmark (2017), uncontrolled AI development has the potential to generate serious consequences for humanity. Babu [10] also highlights the social risks of labor disruption due to automation, which may trigger structural unemployment if not anticipated systematically. In the field of education, AI has proven to support adaptive learning systems that enhance the effectiveness of curricula tailored to individual student capabilities [11].

These dynamics indicate that AI is not merely a technological innovation but a multidimensional phenomenon involving ontological, epistemological, and ethical dimensions. Therefore, a normative framework is required to guide the utilization of AI so that it remains aligned with human values and social justice.

From an Islamic perspective, the development of science and technology is not viewed as separate from revelatory values, but rather as part of humanity's mandate as khalifah (vicegerent) on earth. The creation and utilization of technology, including AI, require profound moral consideration grounded in the principles of the Qur'an and Hadith. Islamic ethical values such as ihsan (excellence and benevolence), adl (justice), rahmah (compassion), and the concept of beneficial knowledge (ilm yan nafi') serve as normative parameters for evaluating the impact of technology on human life [12].

Within the Islamic framework, AI is positioned as an instrument (wasilah), not an ultimate objective (ghayah). Technology must be directed toward improving the quality of human life, strengthening social justice, and promoting public welfare (maslahah). The concept of barakah (divine blessing) becomes essential in assessing the extent to which technology generates long-term benefits that are not merely material, but also spiritual and social. The principles of tawakal (trust in God), gratitude, and social responsibility form the ethical foundation for managing technological innovation so that it does not deviate from divine values.

In the context of Muhammadiyah as a modernist Islamic movement that emphasizes the integration of faith (iman), knowledge (ilmu), and action (amal), the use of technology must be directed toward the advancement of a civilized and ethical civilization. The Muhammadiyah philosophical perspective provides a normative framework for examining AI holistically by integrating scientific rationality, normative ethics, and an orientation toward the welfare of the ummah.

Based on this background, this study aims to obtain a comprehensive and integrated perspective on the position and governance of artificial intelligence within the philosophical framework of Al-Islam and Muhammadiyah. This study is expected to contribute conceptually to the formulation of ethical and theological approaches to AI, while also offering a normative foundation for its utilization in promoting human well-being in accordance with divine and moral values in an increasingly digitalized global society.

Method

This study employs a qualitative approach with a library research design. The qualitative approach was selected because the study focuses on the exploration of meaning, the interpretation of values, and the construction of concepts related to the integration of Islamic philosophy, Muhammadiyah thought, and the development of Artificial Intelligence (AI) [13]. The normative-philosophical nature of the issues examined requires interpretative and reflective analysis rather than empirical quantification.

a. Type and Sources of Data

The data sources in this study consist of secondary data obtained through literature review. These data include:

1. Academic books discussing Islamic philosophy, Islamic ethics, Muhammadiyah studies, as well as theories and developments in Artificial Intelligence.
2. Scholarly journal articles relevant to AI ethics, algorithmic bias, the social impact of technology, and Islamic perspectives on science and technology.
3. Official documents and publications of the Muhammadiyah organization, including decisions, ideological positions, and normative documents related to science, technology, and public welfare (maslahah).
4. Online publications from credible sources with academic authority and thematic relevance to the research focus.

Sources were selected purposively (purposive sampling), taking into account substantive relevance, authorial authority, publisher or journal reputation, and publication recency, particularly within the discourse on AI ethics.

b. Data Collection Techniques

Data collection was conducted through two main stages:

1. Literature Review

The researcher identified, critically read, and analyzed literature related to:

a) Ethical and epistemological concepts in Islamic philosophy.

b) Fundamental principles of Muhammadiyah thought concerning science and reform (tajdid).

c) The development of AI, including its technical, ethical, and social dimensions.

The literature review was conducted systematically to identify conceptual intersections between Islamic values and contemporary AI developments.

2. Documentation

The documentation technique involved collecting official documents, organizational statements, and relevant normative texts. These documents were analyzed to understand Muhammadiyah's normative position in responding to developments in science and technology.

c. Data Analysis Techniques

Data analysis in this study employed content analysis and a hermeneutical approach.

1. Content Analysis

Content analysis was used to identify major themes, key concepts, and patterns of argumentation within the examined literature. This process included categorizing concepts such as ethics (ihsan, adl, rahmah), beneficial knowledge (ilm yan nafi'), and the principles of public welfare and social justice in the context of AI.

2. Hermeneutical Approach

Hermeneutics was employed to interpret Islamic normative texts and Muhammadiyah ideological documents within the context of modern technological developments. This approach enables contextual and reflective understanding of religious values, allowing them to be applied to contemporary discourse on AI. The data analysis process followed these stages:

a) Data Reduction

The collected data were selected and focused on aspects relevant to the research

objective, namely the integration of Islamic ethics, Muhammadiyah thought, and AI development.

b) Data Display

The reduced data were systematically organized into thematic narratives and conceptual frameworks to facilitate interpretation and synthesis.

c) Conclusion Drawing and Verification

Conclusions were drawn through critical reflection on the relationships among the analyzed concepts. Verification was conducted by re-examining the consistency of the arguments and the alignment between the data and the resulting interpretations.

d. Interdisciplinary Approach

This research is interdisciplinary, integrating Islamic philosophical studies, Muhammadiyah studies, and technology ethics. Such an approach is necessary because AI is not merely a technical phenomenon, but also a social, moral, and theological one. By combining scientific, ethical, and the concept of blessing (barakah), this study seeks to construct a holistic conceptual framework for understanding and directing the utilization of AI in accordance with Islamic values and the reformist spirit of Muhammadiyah.

Through this methodological design, the study is expected to produce a systematic, argumentative, and normatively grounded analysis that is relevant to the challenges posed by contemporary technological development.

Result and Discussion

a. Concept of Ethics, Knowledge, and Blessing (Barakah) in Islam

Literature analysis shows that ethics, knowledge, and the concept of blessing (*barakah*) in Islam constitute three integrated normative pillars that form the foundation of Muslim life. These three elements do not stand separately; rather, they reinforce one another in shaping the moral, intellectual, and spiritual orientation of human beings. In the context of the development of science and technology including Artificial Intelligence (AI) these three concepts provide a comprehensive and transcendental evaluative framework.

1. The Concept of Ethics in Islam

Islamic ethics is derived from revelation (the Qur'an and Sunnah) as well as from the intellectual tradition of classical and contemporary scholars. One of the fundamental concepts in Islamic ethics is *tawhid*, namely belief in the oneness of Allah as the central orientation of human life. *Tawhid* is not merely a theological doctrine, but an ethical paradigm that shapes human vertical consciousness as a servant (*'abd*) and vicegerent (*khalifah*). Bahri [14] emphasizes that human moral perfection lies in the harmony between individual will and Divine will.

In addition to *tawhid*, the principle of justice (*adl*) and humanity becomes a central value in social interaction. Islam emphasizes fair treatment without discrimination based on religion, race, or social status. Hadi Sucipto [15] stresses that justice in Islam is universal and transcends group identity boundaries. Justice does not merely mean equal distribution, but also placing something according to its rights and proper proportion.

The ethical dimension of Islam also includes the cultivation of noble character, such as honesty, patience, sincerity, and humility. Caprioglio [16] states that moral transformation is at the core of Islam's mission. Thus, Islamic ethics is not only normative, but also formative it shapes individual character.

Islam also teaches ecological responsibility. Human beings as *khalifah* are responsible for maintaining the balance of nature. This principle is relevant in modern technological discourse, which often generates ecological impacts.

Finally, education and the pursuit of knowledge are viewed as the foundation of ethics. Bahri [17] emphasizes that the purpose of education in Islam is the formation of a civilized human being (*insan adabi*), namely a person who understands the proper place of everything proportionally. To summarize these dimensions of Islamic ethics, the following conceptual synthesis table is presented:

Table 1. Conceptual Dimensions of Islamic Ethics and Their Implications

Ethical Dimension	Conceptual Description	Normative Implication
Tawhid	Awareness of divinity and vertical orientation	Moral and spiritual responsibility
Justice (ʿAdl)	Proportional and non-discriminatory treatment	Fair distribution of rights
Noble Character (Akhlaq)	Internalization of praiseworthy traits	Integrity and character
Environmental Responsibility	Humans as stewards (khalifah)	Ecological sustainability
Education	Formation of civilized and virtuous individuals	Moral–intellectual development

Table 1 shows that Islamic ethics possesses a comprehensive and systemic structure. *Tawhid* serves as the ontological foundation that shapes the orientation of human consciousness, while justice and noble character represent its social and personal manifestations [18]. Environmental responsibility extends the scope of ethics into the ecological realm, and education functions as the mechanism for the transmission of values. This structure affirms that Islamic ethics is not merely a set of behavioral norms, but an integrative life paradigm.

In the context of modern technology, including AI, this structure can function as a normative evaluative framework: Does technology promote justice? Does it strengthen social responsibility? Does it preserve environmental sustainability? Thus, Islamic ethics can be operationalized as an ethical framework in contemporary technology governance.

2. The Concept of Knowledge in Islam

The concept of knowledge (*ilm*) in Islam possesses both epistemological and spiritual dimensions. The Qur'an explicitly emphasizes the importance of knowledge, as reflected in Surah Al-Mujadilah (58:11). Islam obligates the pursuit of knowledge for every Muslim without gender discrimination.

According to Sarhindi [19], in the classical Islamic tradition, knowledge is not merely understood as the accumulation of information, but as a means toward truth and closeness to Allah. Knowledge functions both as a spiritual path and as an instrument of social transformation.

The relationship between science and religion in Islam is integrative rather than dichotomous. Scientific inquiry is viewed as part of the effort to understand the signs (*ayat*) of Allah in the universe. Prophet Muhammad also exemplified the pursuit of knowledge, encouraging his followers to seek knowledge even to distant places.

Table 2. Concept of Knowledge in Islamic Perspective

Aspect	Description	Value Orientation
Obligation to Seek Knowledge	The pursuit of knowledge as an obligation	Individual responsibility
Knowledge as Worship	Knowledge as a means of drawing closer to God	Spiritual dimension
Integration of Science and Religion	Science as an integral part of religious teaching	Epistemological unity
Prophetic Example	Universal encouragement to learn	Normative exemplarity
Knowledge for the Public Good	Knowledge must be beneficial	Social ethics
Commitment to Truth	Critical attitude and integrity	Epistemic validity

Table 2 demonstrates that Islamic epistemology is normative-transformative in nature. Knowledge is not morally neutral; it is bound to an orientation toward public welfare (*maslahah*) and truth. The obligation to seek knowledge reflects its deontological dimension, while the concept of knowledge as an act of worship underscores its spiritual dimension. The integration of science and religion forms a non-dualistic paradigm that is highly relevant in responding to the development of modern technology [20]. In the context of AI, this principle suggests that technological development must be guided by an orientation toward public benefit rather than mere efficiency or profit. Commitment to truth also demands transparency and integrity in algorithms and digital systems.

b. Islamic and Muhammadiyah Perspectives on Technology and Knowledge

The findings of the literature review indicate that Islam holds a constructive and integrative view of technology and knowledge. Technology is not understood as a neutral entity standing independently, but as an instrument situated within the framework of human moral and theological responsibility. In the Islamic perspective, the relationship between human beings, knowledge, and technology is rooted in the theological concept of human creation as *khalifah* (vicegerent) on earth.

1. Human Beings as Khalifah and Technological Responsibility

The concept of *khalifah* affirms that human beings are created as representatives of Allah on earth, entrusted with the responsibility to manage, cultivate, and preserve the balance of nature. This position is not merely an ontological status, but an ethical mandate that entails accountability. Muhammad et al. [21] and Rahiem [22] emphasize that the role of vicegerency requires human beings to utilize knowledge and technology wisely, non-exploitatively, and with an orientation toward collective welfare.

In the modern context, the mandate of *khalifah* extends to the governance of digital

technology, biotechnology, and artificial intelligence. This principle implies that technological innovation must be subject to norms of justice, sustainability, and ecological balance. Thus, Islam does not reject technology; rather, it directs its use within a transcendent ethical framework.

Table 3. Islamic Theological Principles in Technology Development

Principle	Conceptual Foundation	Implications for Technology
Caliphate (Khilāfah)	Humans as God's vicegerents	Moral and ecological responsibility
Trust (Amānah)	Divine trust entrusted to humanity	Ethical use of technology
Public Interest (Maṣlaḥah)	Orientation toward public benefit	Technology for societal welfare
Prohibition of Corruption (Fasād)	Maintaining the balance of the earth	Prevention of destructive impacts
Accountability	Responsibility in the Hereafter	Moral evaluation of innovation

Table 3 illustrates that the Islamic theological framework provides a systemic normative foundation in responding to technology. The principles of *khalifah* and *amanah* establish both ontological and ethical bases, while the concept of *maslahah* serves as an evaluative parameter for the social benefits of technology. The prohibition against causing harm (*fasad*) extends responsibility to long-term ecological and social impacts. The dimension of accountability introduces an eschatological aspect namely, the awareness that every human action, including the development and utilization of technology, will ultimately be held accountable [23].

Analytically, these five principles form a comprehensive system of technological ethics: ontological (*khalifah*), normative (*amanah*), utilitarian-transcendental (*maslahah*), preventive (anti-*fasad*), and eschatological (accountability). In the context of AI, for example, algorithm development must consider its social impact, potential bias, and implications for distributive justice. Thus, Islam provides an ethical framework capable of addressing contemporary technological challenges in a holistic manner [24].

2. The Command to Seek Knowledge and Islamic Epistemology

Islam explicitly emphasizes the importance of seeking knowledge. The first revelation delivered to Prophet Muhammad began with the word *"Iqra"* (read), conveying a strong epistemological message regarding the urgency of literacy, research, and reflection [25]. Knowledge is viewed as a means of human empowerment as well as a path toward spiritual awareness.

Pakzad [26] explains that in the Islamic tradition, knowledge is not understood merely as the accumulation of empirical data, but as an instrument for understanding the signs of Allah's greatness in the universe. The relationship between science and religion in Islam is integrative; they are not dichotomous, but complementary. Research into nature is regarded as a form of *tafakkur* (contemplation) and *tadabbur* (deep reflection) upon God's creation.

Within this framework, technology is a derivative product of knowledge. Therefore, the moral quality of technology is largely determined by its epistemological orientation. If knowledge is directed toward public welfare

and devotion to Allah, then the technology produced will reflect that same orientation.

To illustrate the integration of epistemology and technology in Islam, the following conceptual table is presented:

Table 4. Integration of Science, Technology, and Spirituality in Islam

Dimension	Characteristics	Value Orientation
Knowledge as an Obligation	The pursuit of knowledge is obligatory for Muslims	Intellectual empowerment
Knowledge as Worship	Scholarly activity holds spiritual value	Closeness to God
Integration of Science and Religion	No epistemic dichotomy	Unity of knowledge
Technology as an Instrument	A derivative product of knowledge	Means for public benefit
Spiritual Reflection	Contemplation (tafakkur) of creation	Transcendental awareness

Table 4 shows that Islamic epistemology possesses an integrative structure between intellectual and spiritual dimensions. Knowledge as an obligation establishes the foundation of rationality and literacy, while knowledge as an act of worship affirms the sacred dimension of scientific activity. The integration of science and religion prevents the fragmentation of knowledge that often occurs within secular paradigms.

Within this framework, technology does not possess value autonomy; it is inherently tied to the moral orientation of its creators and users. Therefore, spiritual reflection (*tafakkur*) serves as a corrective mechanism against the potential misuse of technology. In the Muhammadiyah context, the spirit of *tajdid* (renewal) and scientific *ijtihad* function as instruments to ensure that the development of science and technology remains aligned with Islamic values and the advancement of civilization [27].

c. The Muhammadiyah Paradigm on Science and Technology: Integration, Humanity, and Education

The findings indicate that Muhammadiyah views science and technology as integral components of the Islamic civilizational renewal (*tajdid*) project. The movement does not position religion and science in a dichotomous relationship, but rather within an integrative framework. Catto et al. [28] emphasize that balance between science and religion is a prerequisite for civilized progress. Science provides rational and empirical instruments for understanding reality, while religion provides moral and spiritual direction for its application.

Within this framework, technology is positioned as a means of advancing humanity. Muhammadiyah maintains that technology must be directed toward improving quality of life, expanding access to education, strengthening healthcare services, and reducing social inequality. Nevertheless, the freedom to innovate is not absolute. The use of technology must remain under the guidance of Islamic values to avoid violating principles of humanity and social ethics.

A third prominent dimension is education and human resource development. Qorib and Umiarso [29] emphasize that Muhammadiyah places education as a pillar of social transformation. Mastery of knowledge is not

merely a pragmatic necessity, but a civilizational mandate. Therefore, technological development must be accompanied by character formation, moral integrity, and ethical literacy. The conceptual synthesis of this paradigm can be seen in Table 5 below.

Table 5. Muhammadiyah's Principles of Views on Science and Technology

Principle	Characteristics	Practical Implications
Integration of Science and Religion	No epistemic dichotomy	Value-based innovation
Humanistic Orientation	Technology for societal welfare	Priority to public benefit
Tajdīd (Renewal)	Adaptive to the development of the times	Responsiveness to emerging technologies
Education as a Pillar	Excellent and high-integrity human resources	Scientific and ethical literacy
Moral Control	Value-based oversight grounded in Islamic ethics	Prevention of misuse

Table 5 shows that the Muhammadiyah paradigm is both integrative and normative in nature. The integration of science and religion affirms that technological progress must not be detached from the framework of *tawhid* and moral values. In practice, this prevents technology from being reduced to a purely utilitarian instrument that merely pursues efficiency or economic gain.

Technology as a means of advancing humanity reflects Muhammadiyah's strong social orientation. Technological progress is evaluated based on its impact on public welfare, not solely on technical advancement [2]. This approach is particularly relevant in the digital era, when technology has the potential to widen social inequality if not regulated justly.

Education as a central pillar indicates that the sustainability of innovation depends fundamentally on the quality of human beings. Muhammadiyah emphasizes not only the transfer of knowledge, but also character formation. Thus, this paradigm produces a balance between scientific rationality and moral responsibility. In the context of artificial intelligence (AI), this approach implies the necessity of ethical technology literacy alongside mastery of technical aspects [30].

d. The Philosophical Perspective of al-Islam and Muhammadiyah on the Development of Artificial Intelligence

Philosophically, the development of AI from the perspective of al-Islam must be situated within the framework of the purpose of human creation. Human beings, as *khalifah*, are mandated to cultivate the earth wisely. AI can be viewed as an instrument that assists humanity in fulfilling this trust, provided that it is directed toward public welfare (*maslahah*) [31], [32].

The second dimension concerns justice and morality. Islam emphasizes that every human action must conform to ethical principles. The development of AI must not violate principles of justice, equality, and freedom [33]. This includes the prevention of algorithmic bias, digital discrimination, and data exploitation.

The third dimension relates to the orientation of life's ultimate purpose. Islam teaches balance between worldly life and the hereafter. AI should support material well-

being without neglecting spiritual values [34]. Technology must not diminish human dignity or create dehumanization.

The synthesis of these philosophical principles is summarized in Table 6 below.

Table 6. Islamic Philosophical Principles in AI Development

Philosophical Aspect	Conceptual Foundation	Implications for AI
Vicegerency (Khilāfah)	Humans as stewards of the earth	AI supports the public good
Justice	Principle of justice (ʿadl) and equality	Non-discriminatory algorithms
Morality	Ethics as a guide for action	Responsible use
Purpose of Life	Balance between worldly life and the hereafter	AI must not be dehumanizing
Public Interest (Maṣlaḥah)	Orientation toward general welfare	Priority to social benefit

Table 6 indicates that the development of AI from an Islamic perspective is not technocentric, but rather anthropocentric-ethical. The principle of *khalifah* positions human beings as the primary moral subjects, meaning that AI must function as a supporting tool rather than a dominant entity that replaces human autonomy. The principle of *maslahah* broadens the evaluation of technology to include its social and long-term impacts.

The dimension of justice and morality requires AI systems to be designed with accountability and transparency. This is particularly relevant in addressing issues of algorithmic bias and unequal access to technology. Islam calls for the fair distribution of benefits and the protection of vulnerable groups. Meanwhile, the balance between worldly life and the hereafter introduces a transcendental dimension into AI discourse [35]. Technology must not be understood merely as a symbol of material progress, but as a means to enhance overall quality of life physically, socially, and spiritually. Thus, the philosophical approach of al-Islam and Muhammadiyah produces a model of AI development that is ethical, humanistic, and oriented toward *barakah* (blessing).

e. The Muhammadiyah Philosophical Perspective on the Development of Artificial Intelligence

Philosophically, Muhammadiyah views the development of Artificial Intelligence (AI) as part of the dynamic renewal (*tajdid*) of Islamic civilization grounded in knowledge and moral values. This approach is not reactive to technological development, but constructive and normative. AI is positioned as an instrument of social transformation that must be directed toward public welfare, the improvement of quality of life, and the strengthening of a civilized society.

1. Education and the Balance of Religion and Knowledge in AI Development

Muhammadiyah places education and scientific understanding as the primary foundation of societal advancement. Mastery of knowledge, including AI technology, is regarded as part of the intellectual responsibility of Muslims in building modern civilization. In the global context, discussions on AI ethics as addressed by Dei [6] demonstrate that AI development requires intellectual readiness and mature ethical reflection. This aligns with Muhammadiyah's

vision, which emphasizes the integration of technical competence and moral responsibility.

Furthermore, Muhammadiyah maintains that religion and science must exist in a harmonious and mutually reinforcing relationship. Stiyanova [36] asserts that AI development must be framed by moral principles to prevent deviation from human values. Within this framework, religion functions as a normative compass guiding technological innovation toward just and civilized collective goals. The conceptual synthesis of this principle is presented in Table 7 below.

Table 7. Muhammadiyah's Paradigm on Science and Technology

Core Dimension	Conceptual Substance	Strategic Orientation
Integration of Science and Religion	Rejection of dichotomy; science framed by the values of tawḥīd	Ethics-based innovation
Technology as a Means of Humanity	Technology for social welfare	Justice and public benefit
Education as a Pillar	Development of excellent and high-integrity human resources	Scientific and moral literacy

Table 7 demonstrates that AI development from the Muhammadiyah perspective cannot be separated from three primary foundations: scientific education, the integration of religion and knowledge, and ethical reflection. Scientific education is a prerequisite to ensure that society does not merely become a consumer of technology, but also a producer of innovation. This strengthens intellectual independence and enhances the community's global competitiveness.

The integration of religion and knowledge ensures that AI innovation is not value-neutral. Without a moral framework, AI has the potential to be used for exploitative, manipulative, or discriminatory purposes. Therefore, religion functions as a normative control mechanism over the direction of technological development.

Ethical reflection constitutes a crucial preventive dimension. Systematic evaluation of AI's social impacts such as the potential for algorithmic bias, privacy violations, or unequal access must be conducted. In this way, the Muhammadiyah approach establishes a balance between technical advancement and moral responsibility.

2. Community Empowerment as the Orientation of AI Development

The second dimension of Muhammadiyah's philosophical perspective is its orientation toward community empowerment. Historically, Muhammadiyah has been recognized as a socio-religious movement focused on improving welfare through education, healthcare, and social services [37]. In the context of modern technology, AI is viewed as an instrument capable of expanding access to public services, improving administrative efficiency, and supporting data-driven decision-making.

Alam [38] emphasizes that AI technology holds significant potential to enhance access to resources and improve the quality of social services. In line with this view, Muhammadiyah maintains that the objective of AI development should be directed toward the promotion of

public welfare, rather than merely the accumulation of economic profit or technological dominance. The synthesis of this empowerment-oriented framework can be seen in the following table.

Table 8. Islamic Philosophical Principles in AI Development

Philosophical Dimension	Conceptual Foundation	Normative Implications for AI
Vicegerency and Public Interest	Humans as stewards of the earth	AI supports human welfare
Justice and Morality	Principles of justice (ʿadl) and Islamic ethics	Transparent and non-discriminatory algorithms
Balance of Worldly Life and Hereafter	Integral life orientation	AI must not be dehumanizing

Table 8 shows that the empowerment orientation in AI development comprises three primary dimensions: access to services, social efficiency, and social justice. AI-based digitalization can expand access to education and healthcare services, particularly for communities that were previously marginalized. This aligns with Muhammadiyah's social mission to improve the quality of life of the ummah.

Social efficiency through the optimization of data and administrative processes enables more effective resource management. However, efficiency must not disregard the human dimension. Therefore, the dimension of social justice is essential to ensure that the benefits of AI are not concentrated solely among particular groups.

Philosophically, community empowerment indicates that AI, from the Muhammadiyah perspective, must be inclusive and transformative. Technology is not merely viewed as a symbol of progress, but as a tool to build an empowered, just, and prosperous society [39]. Through this approach, AI development can become part of the Islamic civilizational project that situates scientific advancement within the framework of values and public welfare (*maslahah*).

Conclusion

The perspectives of al-Islam and Muhammadiyah on science, technology, and particularly the development of Artificial Intelligence (AI), are integrative, normative, and oriented toward public welfare. Technology is understood as an instrument of the human mandate of *khalifah* (vicegerency), not as a morally autonomous entity. Therefore, the development and utilization of AI must be directed toward supporting humanity's role as *khalifah* on earth: to cultivate prosperity, maintain balance, and realize social justice.

The concept of Islamic ethics encompassing *tawhid*, justice (*adl*), noble character, ecological responsibility, and education serves as a normative foundation for evaluating and directing technological development. Knowledge (*ilm*) is understood as both a religious obligation and a means of drawing closer to Allah, such that technological development must remain oriented toward truth and benefit. Meanwhile, the concept of blessing (*barakah*) introduces a transcendental dimension, affirming that technological success is measured not merely by effectiveness and productivity, but by the extent to which it brings sustainable good to individuals and society.

Within the Muhammadiyah framework, science and religion are positioned in a mutually reinforcing relationship. AI is viewed as part of the *tajdid* agenda that must be advanced through education, human resource development, and moral oversight grounded in Islamic values. Human orientation becomes the primary principle, ensuring that technology enhances public welfare, expands access to public services, and reduces social inequality.

Philosophically, AI development from the perspective of al-Islam and Muhammadiyah must fulfill three core principles: supporting public welfare and the mandate of *khalifah*; upholding justice and morality in its design and implementation; and maintaining balance between worldly interests and eschatological orientation. Within this framework, AI can serve as a means of civilizational development that is scientifically advanced, socially just, and spiritually meaningful.

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