EXPLORING OPPORTUNITIES AND RISKS OF ARTIFICIAL INTELLIGENCE RESEARCH FOR ISLAMIC ETHICAL GUIDELINES

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Abstract

Artificial intelligence (AI) technology is expanding exponentially. AI has continuously transformed the human lifestyle from chatbots, driverless vehicles, robots, autonomous weapons constructions, etc. The transformation has driven the development of guidelines from various fields to govern AI research and development but is limited from Islamic perspectives. Hence, this study aims to fill the gap by reviewing contemporary perspectives on AI opportunities and risks. A qualitative exploration using content design analysis on related literature was conducted to ascertain the extent of AI utilisations by applying used, overused, or misused. The findings were coded in juxtapositions that led to the discussion on the need for an Islamic frame of reference in

ethically guiding AI-related research. *Maqasid al-Shari'ah* is recommended as the parameter and to be integrated with other disciplines to tackle the wide-ranging ethical issues in AI to protect human rights and interests, particularly in the global Muslim community. The absence calls for developing a credible and robust framework to serve as an Islamic ethical guideline for AI research.

Keywords: Artificial intelligence; *Maqasid al-Shari'ah*; guidelines; framework.

Khulasah

Teknologi kepintaran buatan (AI) sedang berkembang dengan sangat pesat. Dari penggunaan telefon bimbit, kenderaan tanpa pemandu, robot, dan pembuatan senjata autonomi, AI telah berterusan mengubah cara kehidupan manusia. Pelbagai pihak telah berusaha merangka garis panduan untuk mengawal penyelidikan dan pembangunan AI, namun masih kurang dari perspektif Islam. Kajian ini bertujuan mengulas perkembangan AI terkini dan mengaitkan peluang dan risiko AI dengan pandangan Islam. Kajian ini menggunakan kaedah kualitatif menerusi analisis kandungan terhadap literatur yang berkaitan untuk memantau tahap penggunaan AI sama ada AI digunakan secara berlebihan atau disalahgunakan. Hasil kajian dikod dalam penjajaran yang membawa kepada perbincangan tentang keperluan untuk kerangka rujukan Islam dalam membimbing penyelidikan berkaitan AI secara beretika. Oleh itu, *Maqasid al-Shari'ah* disyorkan sebagai parameter dan disepadukan dengan disiplin lain untuk menangani isu etika yang berkaitan kajian dan penggunaan AI demi perlindungan hak asasi manusia dan khususnya masyarakat Islam global. Justeru, keterlibatan Muslim sangat diperlukan untuk membangun satu rangka kerja yang dipercayai dan kukuh sebagai garis panduan etika penyelidikan Islam AI.

Kata kunci: Kepintaran buatan; *Maqasid al-Shari'ah*; garis panduan; rangka kerja.

Introduction

Artificial intelligence (AI) is a system put into a machine, such as a computer or a robot, to act on human nature, such as emotion, the ability to think, to remember, etc. AI is software that enables a computer to serve as a human being, including decision-making, problem-solving and prediction. AI has been developed to study machines' ability to learn human behaviours, respond to human reactions like a human being and be incorporated into robots, computers, cars, and various related systems to function as human intelligence.

Initially, humans used machines or computers to assist and enhance human intelligence in improving productivity and workload. The use of computers is to aid people in locating or retrieving information efficiently. The computer functions were intended to process and display only the data collection results. With today's technological advancements, the functionality of computers has enabled them to produce faster and more accurate outcomes. The progression has led humans to develop a smart device that can work within a machine. The intelligent system has not yet mastered all human intelligence; it allows machines to think and learn like human fungi. This was when humans invented the term "artificial intelligence".

Today, the impact of AI is known, and it is expanding exponentially. From the use of smartphones, chatbots, driverless vehicles, robots, and autonomous weapons constructions, AI has continuously transformed the landscape of the human lifestyle. Whether positive or negative, AI is a powerful force, a new form of intelligent agency, already reshaping our lives, interactions, and environments.[1] Countries worldwide have begun their

[1] Floridi, Luciano et al., "An Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations," *Ethics, Governance, and Policies in Artificial Intelligence* (2021), 19-39.

efforts to use AI technology in various fields.[2] Robotics and AI, for instance, play an increasingly important role in the UK's economy and future growth.[3] Sizeable uses of AI technology in healthcare, finance, economics, aviation, automotive, and education, particularly in developed countries. Studies have shown unlimited prospects for research development in autonomous technology.[4]

Conversely, AI is also exploited in terrorist activities, identity forgery and inequality. The matters raise concerns for all AI experts because the technology could have been stretched out of reach and posed risks to humans. The problems have sparked interest from various parties worldwide, including the United Nations (UN) and the European Commission,[5] to devise AI ethical standards that concern and attempt to remove, reduce, or highlight the potential for unethical impacts or consequences of such development strategies, limitations, and regulations. The concerted effort is to unite various global parties to establish guidelines and ethics in AI research. Therefore, this paper will fill the gap by reviewing contemporary perspectives on AI opportunities and risks.

Human Intelligence and Artificial Intelligence

Humans are recognised by their very nature as intelligent beings. Human intelligence is generated through the mind by learning from experience, distinguishing things, responding to new situations, and acting to solve problems.

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[2] Anna Jobin et al., "The Global Landscape of AI Ethics Guidelines," *Nature Machine Intelligence* 1(9) (2019), 389-399.

[3] Andreu-Perez Javier et al., "Artificial Intelligence and Robotics," arXiv preprint arXiv:1803.10813, 2018.

[4] Aliff Nawi, "Penerokaan Awal Terhadap Isu dan Impak Penggunaan Teknologi Kecerdasan Buatan terhadap Kehidupan Manusia," *Asian Journal of Civilizational Studies* 1(4) (2019), 24-33.

[5] Abhishek Gupta, "The Evolution of Fraud: Ethical Implications in the Age of Large-Scale Data Breaches and Widespread Artificial Intelligence Solutions Deployment," *International Telecommunication Union Journal* 1(7) (2018), 1-7.

Human intellect is also an intellectual diversity element. There are eight different kinds of natural intelligence in the human body. [6] These include verbal-linguistic, logic-mathematical, visual-space, musical, kinaesthetic, interpersonal, and naturalistic. The diversity of this intelligence is the potential inherent in the human being. Psychologists claim that intelligence is inherited from genetics and can be enhanced through learning. Each person, however, has different levels of intelligence. Every human being has intelligence advantages and disadvantages. One may have high logic-mathematical intelligence but low linguistic intelligence or vice versa. The notion implies that human intelligence has limitations.

The term AI was first used by John McCarthy in 1956 while doing computing research in Dartmouth, United States. Other researchers have discussed how a computer system can replicate or make valuable decisions like a human mind.[7] The results of their research were optimistic as it began to grow in the late 1970s and early 1980s. Later, McCarthy's concept of AI caught Alan Turing's eye. Turing presents a hypothesis and questions about the ability of the machine to think. He conducted several related tests and found that machines can think and learn like humans. This test is called the 'Turing test', which means that a device capable of thinking resembles or is above human thought, and even the response makes it difficult to differentiate whether it is from a computer or a human.

[6] Howard Gardner, *Multiple Intelligence: The Theory in Practice* (New York: Basic Books, 1993).

[7] Stuart J. Russell & Peter Norvig, *Artificial Intelligence: A Modern Approach*, 4th ed. (London: Pearson, 2016).

Three Types of Artificial Intelligence

In general, AI is divided into three types: Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI) and Artificial Super Intelligence (ASI).[8]

i. Artificial Narrow Intelligence (ANI)

Artificial narrow intelligence (ANI) is an AI system that performs easy, simple tasks. In the blink of an eye, ANI can solve problems from easy to complex. A simple example of ANI is a system capable of detecting car oil shortages and alerting drivers by switching on the car dashboard lights. ANI has made a living around people such as online search engine games (Google, Yahoo, YouTube, TikTok, Netflix, etc.), social networks (Facebook, Instagram, X, etc.), navigation applications (Waze, Google Maps), innovative voice applications (Alexa, Siri, Cortana, Google Assistant), traffic control apps, automated answering services, autopilots, and online advertisement services. However, ANI is also limited by its specified capabilities and depends on the information provided.

ii. Artificial General Intelligence (AGI)

Second is artificial general intelligence (AGI), which is capable and comparable to human thought. It is even able to think faster and more powerfully than humans. AGI can also understand what is happening in a human-like world and learn how to handle various tasks. Although AGI does not exist at this stage, no one, including AI engineers, knows and understands how the AGI system works. The AGI system has millions of functional elements, making it impossible for humans to understand what is happening. There is a considerable debate among the world's leading AI scientists about when humans will achieve AGI; most say it is nearly 2030, some say it will not materialise in this

[8] O. Strelkova & O. Pasichnyk, *Three Types of Artificial Intelligence* (Ukraine: Khmelnitsky National University, 2017).

century, and some think it will not happen again.[9] However, it is predictable that AGI will be generated once ANI is fully achieved.

iii. Artificial Super Intelligence (ASI)

Artificial super intelligence (ASI) is the most intelligent AI of the human brain in any area. At this level, ASI can go beyond human reasoning and intelligence as it can think of something scientific and have extraordinary wisdom and social skills.[10] The ASI has yet to be described in terms of its true potential. Still, it has been portrayed by science fiction popularised in Hollywood movies such as the Terminator series, where it overcomes humans and is feared to lead to the destruction of humans on the surface. Most AI scientists expect that ASI will only be generated once the AGI is formed. ASI can also be characterised in three forms, i.e., Speed Super Intelligence, Super Super Intelligence and Super Intelligence Super. These three forms are alleged to exist in the same entity. Any form of ASI may also form two different types.

Contemporaneous Ethics and Guidelines in Artificial Intelligence Research

Various guidelines governing AI research and development have been implemented due to the opportunities and risks identified earlier. A report published in 2016 from *Stanford University's 100-Year Study on Artificial Intelligence* suggested that ethics, privacy, and security must be thoroughly addressed to ensure that the benefits of AI technology can be disseminated, as AI is now being used in many dimensions of human life.[11] The report also guides AI developers regarding human rights, welfare, and the law.

[9] Gonenc Gurkaynak, et al., "Stifling Artificial Intelligence: Human Perils," *Computer Law & Security Review* 32(5) (2016), 749-758.

[10] Strelkova & Pasichnyk, "*Three Types of Artificial Intelligence*."

[11] Peter Stone, et al., "Artificial Intelligence and Life in 2030: The One Hundred Year Study on Artificial Intelligence," arXiv preprint arXiv:2211.06318, 2022.

Alternatively, the UK Government has introduced AI-related rules and controls.[12] Five core principles are outlined: (1) AI has to be developed for the benefit of the common good and man; (2) AI operates within the parameters of intelligence and justice; (3) AI should not be used to undermine the privacy or the rights of individual, family or community data; (4) everyone should have the right to be educated and developed with AI; and (5) everyone should oppose the use of AI as an autonomous robot killing to harm, destroy or deceive human beings.

A panel of AI experts in Europe has prepared the first draft of guidelines for AI research ethics.[13] The 52 experts from different backgrounds explain how developers and users must ensure that AI respects the fundamental rights, rules and values and how technology can be efficiently and reliably created.

The Carr Centre for Human Rights, a research centre at Harvard University's Kennedy School of Government, is actively developing a draft policy to protect human rights and security in the USA.[14] The document aims to explain how human life can be saved without limiting developments in AI research. Besides, research innovations should also consider human values and the ethical risks of using such technologies. They also predict that AI, by various unexpected technologies, will likely share life with humans. The view indirectly forewarns that the advent of AI, if not properly guided or managed, would threaten humanity.

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[12] House of Lords, "AI in the UK: Ready, Willing and Able," House of Lords Select Committee on Artificial Intelligence, Report of Session 2017-19, 18 June (London: House of Lords, 2018).

[13] European Commission, "Draft Ethics Guidelines for Trustworthy AI," https://www.euractiv.com/wpcontent/uploads/sites/2/2018/12/AIHLEGDraftAIEthicsGuidelinespdf.pdf

[14] Mathias Risse, "Human Rights and Artificial Intelligence: An Urgently Needed Agenda," *Human Rights Quarterly* 41(1) (2019), 1-22.

Some Asian countries have also responded by setting up an ad hoc committee of experts to prepare a draft for the guideline. Singapore developed the Advisory Council on the Ethical Use of AI and Data. South Korea composed a *Mid- to Long-Term Master Plan in Preparation for the Intelligent Information Society*.[15] The Japanese have three ethical guidelines: *Report on Artificial Intelligence and Human Society*, *Draft AI Research and Development Guidelines for International Discussions*, and *Sony Group AI Ethics Guidelines*. [16] These diverse types of organisations, ranging from public to private, get involved in developing AI ethical guidelines and principles to signify the need for careful, comprehensive plans and efforts to safeguard human rights.

Interestingly, despite the insufficient literature that integrates AI and Islamic perspectives, the technology has gained interest and involvement from Arab countries, such as the use of security-sector patrol robots in Dubai. The United Arab Emirates (UAE) and Sophia robots are the first to be recognised as Saudi Arabian citizens.[17] However, the two robots are not made locally and involve expertise from China and the US, which explains the need for more documentation from the countries.

Malaysia is also keen on AI-related research. The technology is incorporated in the identification and prediction of water quality indices,[18] solar radiation,[19] and

[15] Jobin et al., "The Global Landscape," 389-399.

[16] *Ibid.*

[17] Federico Gustavo Pizzetti, "The Robot Sophia as a 'New Citizen' of Saudi Arabia: What about Granting Legal Personhood, 'Citizenship' and Eventually Dignity to Nonhuman Entities with Artificial Intelligence?" *Notizie di Politeia* 35(133) (2019), 63-70.

[18] Mohammed Hameed, et al., "Application of Artificial Intelligence Techniques in Water Quality Index Prediction: A Case Study in a Tropical Region, Malaysia" *Neural Computing and Applications* 28(1) (2017), 893-905.

[19] Ibrahim, Ibrahim Anwar et al., "Optimal Sizing of a Standalone Photovoltaic System for Remote Housing Electrification using

the use of neural networks (ANN) and random forests (RF) for short-term photovoltaic (PV) inputs.[20] However, these studies are confined to specific research areas and do not involve people living in the ecosystem as it does abroad, particularly in developing countries where robots, drones or used cars on driverless roads are used for commercial purposes. The government is progressing in AI, and involvement in AI technology and research with other countries requires specific understanding and guidelines to manoeuvre the subject matter ethically. We posit that an ethical guideline underpinned by Islamic philosophies can tackle opportunities and risks in AI more harmoniously.

Nevertheless, the present literature on AI technology needs to indicate more involvement from the Islamic perspective. We argue that Islamic involvement in AI research is pertinent based on two premises, i.e., it is *fard kifayah* (socially obligatory duty) upon Muslims to positively improve the quality of human life, and the recent Muslims' growing demographic trends. Foremost, the birth of many noteworthy scholarly works in various fields, philosophy, science, engineering, politics, literature, sociology, and medicine, have demonstrated that Islam has the means to manage a multitude of timeless challenges.

History has proven the invaluable contributions of Islamic civilisation to the world. Knowledge development in the Islamic world has been recognised as the catalyst for the European Renaissance that eventually gave birth to the vibrant civilisation of the latter. Secondly, the growing Muslim demographic trends, which purport the dominance of Muslim consumers' influence on future market demand

Numerical Algorithm and Improved System Models," *Energy* 126 (2017), 392-403.

[20] Muhammad Murtadha Othman et al., "Performance Comparison of Artificial Intelligence Techniques in Short Term Current Forecasting for Photovoltaic Systems," *International Journal of Power Electronics and Drive Systems* 10(4) (2019), 2148-2156.

and eventually as the most prominent target group for AI application products[21], accentuate Islamic integration in forming ethical guidelines for AI research.

Human Intelligence and Soul from Islamic Viewpoints

Muslim scholars have offered their interpretations of human intelligence and soul. Imam Abu Hanifah argued that the soul is independent of making decisions and choices.[22] Imam Abu Hamid al-Ghazali added that the intellect is a divine gift from God and should be used to acquire knowledge and serve God.[23] He also identified the soul as a person's essence and part of our divine nature. Imam al-Ghazali further argued that the soul is the mediator between the body and the spirit; hence, we can access our innermost thoughts and feelings through the soul.

Other Islamic scholars have also explored the concept of human intelligence and soul. Ibn Khaldun asserted that intellect is a unique attribute of the soul. It means various knowledge necessary to man, guiding his speculative ability and teaching him how to make a living and organise his home.[24] It is a divine gift from God and should be used to acquire knowledge and serve God. The soul is argued to be the source of all emotions and desires.[25] The soul is the mediator between the body and the spirit; we can access our innermost thoughts and feelings through the soul.

Ibn Sina pointed out that the soul is a person's substance and that it is through the soul that we can access

[21] Pew Research Centre, "The Changing Global Religious Landscape," http://www.pewforum.org/2017/04/05/the-changing-global-religious-landscape/

[22] Abu Hanifah, *Fiqh al-Akbar*, trans. Abdul Hakim Murad (London: Ta-Ha Publishers, 1998), 115-120.

[23] Abu Hamid Muhammad ibn Muhammad al-Ghazali, *Ihya 'Ulum al-Din*, vol. 1 (Beirut: Dar al-Khair, 1993), 113-114.

[24] Ibn Khaldun, *The Muqaddimah: An Introduction to History*, trans. Franz Rosenthal (Princeton: Princeton University Press, 1967), 156.

[25] Ibn al-Qayyim al-Jawziyyah, *Kitab al-Ruh* (Beirut: Dar al-Kutub al-Ilmiyyah, 1999), 264.

our higher self and come closer to God.[26] Hence, one can find that these two concepts are closely intertwined and that our mental and spiritual well-being are related. However, there is much debate about the exact nature of the soul and intellect from Muslims' philosophical and psychological traditions. Regardless, Muslim scholars' interpretations emphasise the indispensability of using the human mind and soul to serve God and strive to live in a way that is pleasing to Him.

This study postulates the connection between human intelligence and the soul from Islamic viewpoints and the current issues of AI. In many ways, AI is trying to replicate human intelligence and the soul. AI systems are created to replicate the human capacity to make decisions, acquire knowledge, and access innermost thoughts and feelings. However, AI systems are not a replica of the human soul, as they all lack the spiritual essence that can connect to God. As such, AI systems should be used to supplement, not replace, human intelligence.

Humanity and *Maqasid al-Shari'ah*

The concept of humanity in Islam is illustrated in *maqasid al-shari'ah*, the 'objectives' or 'ends' of Islamic law. The idea includes values such as justice, mercy, compassion, and well-being, all essential to the Islamic concept of humanity. These values form the basis for ethical guidelines to develop ethical practices and decisions.

Shari'ah aims to achieve good for humanity by promoting justice in society and protecting the rights of the weak and the oppressed.[27] Ibn Khaldun also stresses the importance of mercy in the Islamic faith. He asserts that compassion and affection for relations and relatives exist in human nature as something God put into the hearts of

[26] Ibn Sina, *Kitab al-Najat fi al-Hikmah al-Mantiqiyyah wa al-Tabi'iyyah wa al-Ilahiyyah*, ed. Majid Fakhri (Beirut: Dar al-Afaq al-Jadidah, 1982), 222-223.

[27] Ibn Khaldun, *The Muqaddimah*, 369.

men[28], and compassion is a quality of the believers. It is the basis of justice and mercy.

These values provide a framework for ethical guidelines that can be used to develop ethical practices and decisions. For example, justice requires that decisions be made fairly and equitably, while mercy requires that decisions be made with compassion and understanding. Compassion requires making decisions with an understanding of the needs and circumstances of those affected by the decision. In conclusion, the concept of humanity in Islam is deeply rooted in the notion of *Maqasid al-Shari'ah*, and these values provide a basis for ethical guidelines that can be used to develop ethical practices and decisions. Muslims must ensure that decisions are made relatively, compassionate, and understanding to promote a healthy and harmonious society.

Furthermore, in developing Islamic ethical guidelines for AI research, one needs to assess the needs and effects of the technology. Any decision should depend on the priority of the teachings of Islam, known as *fiqh al-awlawiyyat*.[29] The particularisation is crucial to ensure three categories of *maslahah* in the *maqasid al-shari'ah*, namely necessities (*al-daruriyyat*), needs (*al-hajiyat*) and luxuries (*al-tahsiniyat*) are preserved and maintained[30]. Al-*daruriyyat* is essential for human beings, and living without these elements will bring misery and suffering to human life. Whereas ignoring the aspects of *al-hajiyyat* will affect the majority, neglecting factors of *al-tahsiniyyat* will involve a small group of people.

Moreover, other sources of Islamic laws are referred to, including primary references (unanimous sources of

[28] Ibn Khaldun, *The Muqaddimah*, 171.

[29] Yusuf al-Qaradhawi, *Fiqh Keutamaan*, trans. Bahruddin Fannani (Kuala Lumpur: Angkatan Belia Islam Malaysia, 2001), xi.

[30] Abu Ishaq al-Shatibi, *al-Muwafaqat fi Usul al-Shari'ah* (Beirut: Dar Kutub al-'Ilmiyyah, 1424H/2003), 8.

law) and additional references (differing sources of authority) in Islamic law and jurisprudence. The primary sources are al-Qur'an, al-Sunnah, *al-Ijma'* (consensus) and *Qiyas* (analogy). Additional sources of reference are *al-Maslahah al-Mursalah* (public interest), *al-Istihsan* (juristic preference), *Sadd al-Dhara'i'* (blocking the means) and *Fath al-Dhara'i'* (opening of means), *al-'Urf* (custom), *Qawl a-Sahabi* (legal opinions of the companion), *Shara' Man Qablana* (revealed laws preceding to the *shari'ah*), and *al-Istishab* (presumption of continuity).

There are also additional elements proposed by Islamic scholars, including the right to justice and freedom, human rights and equality[31]. These elements are applied to accommodate the ever-changing development of human needs. Accordingly, these additional components are included with the five as the foundation for developing ethical guidelines in using technological materials involving AI. Along with Muslims' growing demographic trends over the past few years, and it is forecasted to outperform other religions[32], the need for Islamic ethical standards has become exceptionally relevant. The development of such guidelines that deliberate other disciplines and viewpoints are expected to tackle a range of Al-related issues to protect human rights and interests, particularly in the global Muslim community.

Methodology

A qualitative exploration of related literature using a content analysis design was conducted to ascertain the extent of AI utilisations. Based on an overview of how AI could be 'Used', 'Overused' and 'Misused', the findings

[31] Muhammad Adil Khan Afridi, "Maqasid al-Shari'ah and Preservation of Basic Rights Under the Theme? Islam and its Perspectives on Global & Local Contemporary Challenges," *Journal of Education and Social Sciences* 4(1) (2016), 274-285.

[32] Pew Research Centre, "The Changing Global Religious Landscape."

were coded in juxtaposition, i.e.,[33] AI opportunities and risks, to give rise to the need for an Islamic frame of reference in ethically guiding AI-related research.

The Used, Under-used, and Overused of AI

In contemplating the importance of AI, it is crucial to scrutinise the multifaceted 'use' of AI for humankind. The foundation works on the premise that AI is synonymous with good innovation and positive applications of this technology. Figure 1 presents four corresponding cores of opportunities and risks and the opportunity cost of underusing AI.

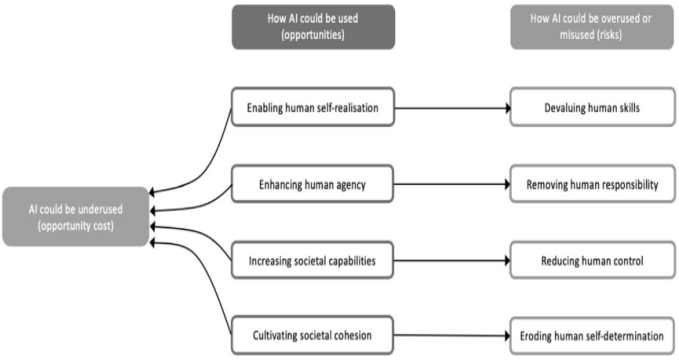


Figure 1: Overview of the four core opportunities AI offers, four corresponding risks, and the opportunity cost of underusing AI

These four corresponding relations are rooted in how AI could be 'used', 'underused', 'misused' and 'overused' in determining the extent of AI's positive or negative impacts. Based on the four core opportunities, AI could be

[33] Floridi Luciano et al., "AI4People – An Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations," *Minds & Machines* 28 (2018), 689-707, https://doi.org/10.1007/s11023-018-9482-5; Luciano et al., "An Ethical Framework for a Good AI Society," 19-39.

used to foster human nature so that its benefits can enable human self-realisation, enhance human agency, increase societal capabilities, and cultivate societal abilities. The former also allows four risks of 'overused' or 'misused', which include devaluing human skills, removing human responsibility, reducing human control, and eroding human self-determination.[34]

However, fear, ignorance or excessive reaction may lead a society to underuse AI technologies below their potential or, for the wrong reasons, may cause high costs. There are also risks associated with overused or misused AI technologies, for example, misaligned incentives, greed, or malicious intent. For this study, the four cores of used (opportunities) and overused or misused (risks) are adapted to explore the juxtaposition of AI systems and applications for humankind.

Findings and Discussion

Opportunities of Artificial Intelligence Use

Studies have shown that AI technology systems enable human self-realisation without devaluing human abilities.[35] AI capabilities are used in preventing cancer in the healthcare sector[36], assisting the process of investing and buying stocks in economics and finance[37] and providing information to pilots on aircraft positioning, air pressure

[34] *Ibid.*

[35] *Ibid.*

[36] Hassoon, Ahmed et al., "Increasing Physical Activity amongst Overweight and Obese Cancer Survivors Using an Alexa-Based Intelligent Agent for Patient Coaching: Protocol for the Physical Activity by Technology Help (PATH) Trial," *JMIR Research Protocols* 7(2) (2018): e27.

[37] G. S. Navale et al., "Prediction of Stock Market using Data Mining and Artificial Intelligence," *International Journal of Computer Applications* 134(12) (2016): 9-11.

and weather conditions in aviation.[38] AI is utilised to motivate humans' self-realisation development in their characteristics, interests, potential abilities or skills, and aspirations to challenge their limits.

AI also enhances human agency. Driving autonomous vehicles[39] and utilising robot tutors in school education[40] are executed without removing humans' responsibility. Thanks to the support provided by AI, more people can enjoy faster and better opportunities, who then share duties on how to use the agency. In other words, AI technologies present many possibilities to society in augmenting humans' capacities in discovering solutions to old problems for more efficient societal capabilities.

Notably, with its data-intensive, algorithmic-driven solutions, AI helps to deal with complex industrial coordination to support more societal cohesion and collaboration.[41] AI can reduce various costs, save time and minimise human labour. Chatbots, intelligent logistics and search engines are some of the most famous instances of AI used in businesses. Chatbots use natural language understanding and processing and can handle routine tasks. For conversational services, chatbots can entertain customer questions, answer simple tasks' voice commands,

[38] Ramgopal Kashyap, "Artificial Intelligence Systems in Aviation," in *Cases on Modern Computer Systems in Aviation* (Hershey, Pennsylvania: IGI Global, 2019), 1-26.

[39] Monika Hengstler et al., "Applied Artificial Intelligence and Trust: The Case of Autonomous Vehicles and Medical Assistance Devices," *Technological Forecasting and Social Change* 105 (2016), 105-120.

[40] L. W. Bailey, "New Technology for the Classroom: Mobile Devices, Artificial Intelligence, Tutoring Systems, and Robotics," in *Educational Technology and the New World of Persistent Learning*, ed. Bailey, L. W. (Hersyes: Information Science Reference 2019), 11.

[41] *Ibid*.

and provide product feedback through natural language interactions.[42]

Smart logistics are used for logistics planning and automated warehouse operations;[43] its proposed algorithm sets market prices, evaluates consumer behaviour and forecasts customer buying patterns.[44] The use of Alexa for Amazon, AliGenie for Alibaba, Siri for Apple and Cortana for Microsoft are companies that gain opportunities through AI in their businesses. The cutting-edge AI chatbot technology ChatGPT is exceedingly intelligent and intuitive, able to understand and respond to complicated needs in a natural and human-like way, particularly in education industries.

AI today has made robotics more inevitable. The AI system, incorporated into a device, often called an intelligent robot, allows humans to increase societal capabilities. ZORA, for example, is the first industrial humanoid treatment robot to be marketed commercially. These robots have seven senses to interact naturally with humans, like moving, hearing, talking, connecting, and thinking. A study found that ZORA robots can help and encourage children with disabilities in therapy. ZORA robots may also provide positive reinforcement to older people for continuing health care and engagement.[45] The findings indicated that using robots equipped with AI

[42] Vegesna Anusha et al., "Ontology-based Chatbot (for e-Commerce Website)," *International Journal of Computer Applications* 179(14) (2018), 51-55.

[43] Yun Zhang, "The Application of Artificial Intelligence in Logistics and Express Delivery," *Journal of Physics: Conference Series*, vol. 1325, no. 1, IOP Publishing, 2019, 012085.

[44] Dongha Kim et al., "Can Search Engine Data Improve Accuracy of Demand Forecasting for New Products? Evidence from the Automotive Market," *Industrial Management & Data Systems* 119(5) (2019), 1089-1103.

[45] Helinä Melkas et al., "Impacts of Robot Implementation on Care Personnel and Clients in Elderly-Care Institutions," *International Journal of Medical Informatics* 134 (2020), 104041.

systems has successfully assisted some communities' day-to-day tasks, particularly those in need.

The da Vinci robot is another example of a robot with an AI system widely used in medicine. Under supervision, Robot da Vinci successfully saved human lives in several surgical cases.[46] Apart from easing the doctor's job, Da Vinci's robotic is capable of helping diagnose abnormalities in human internal organs, such as cancer and ovarian abnormalities and reduce blood flow well beyond human-acquired capabilities. Nevertheless, the da Vinci robot requires high maintenance[47] and limited flexibility, which may cause unnecessary hitches for patients and surgeons.[48]

AI lacks "common sense", which is the ability to judge information beyond its programmed knowledge. Contrarily, current AI technologies, which are bound to certain limitations, could be used as an opportunity to enable human self-realisation. [49] An example is the AI robot 'Tay' developed by Microsoft and designed for making conversations on social networks. Unfortunately, the robot had to be disconnected shortly after its launch due to its inability to differentiate between positive and negative human interaction. It proves that AI is limited in terms of emotional intelligence. AI can only detect primary human emotional states such as anger, joy, sadness, fear, pain, stress and neutrality. Emotional intelligence, the higher

[46] Volkan Ozben, et al., "The Da Vinci Xi System for Robotic Total/Subtotal Colectomy vs. Conventional Laparoscopy: Short-Term Outcomes," *Techniques in Coloproctology* 23(9) (2019), 861-868.

[47] Jasmesh Sandhu, "'Robot Surgeons vs. Robosceptics': Can We Afford Robotic Technology or Can We Afford Not To?" *Journal of Clinical Urology* 12(4) (2019), 285-295.

[48] Luca Morelli et al., "Structured Cost Analysis of Robotic TME Resection for Rectal Cancer: A Comparison between the Da Vinci Si and Xi in a Single Surgeon's Experience," *Surgical Endoscopy* 33 (2019), 1858-1869.

[49] Andreu-Perez et al., "Artificial Intelligence and Robotics."

levels of human personalisation, can mitigate AI's risk of eroding human self-determination.

Humans can rely on AI solutions to be implemented and facilitated. However, the decisions and choices are still based on the outcome of humans' societal cohesion and collaboration. In an investigation on the smartification of public services, i.e., using AI chatbots, the public tends not to use AI machines unless they have initial trust in them.[50] The result suggests that any local government or policy maker should earn public support for using chatbots because, to the public, trust is not about the machine; it is the government's intention and purposes for using it. Hence, "facilitating frameworks" are necessary for designing and delegating functions to AI systems for morally good results. AI systems could, if designed effectively, amplify and strengthen shared moral systems.[51]

Artificial Intelligence Risks of Overused or Misused

Despite its usefulness, some overused or misused AI have also been ascertained to pose some social risks. One of the AI overused is in terms of job prospects. Increased or, in this case, overly dependent on AI has displaced many jobs when computers and robots replace the workforce. Studies discovered that most companies are likelier to choose machines than human labour.[52] This negative impact of devaluing human skills risks global economic instability as it might jeopardise some workers' source of income and cause fear in their inability to afford the daily necessities.

With AI technology, the confidentiality of personal data faces the absence of human responsibility risk. It opens

[50] Naomi Aoki, "An Experimental Study of Public Trust in AI Chatbots in the Public Sector," *Government Information Quarterly* 37(4) (2020), 101490.

[51] Luciano et al., "AI4People – An Ethical Framework," 689; Luciano et al., "An Ethical Framework," 19.

[52] Armin Granulo, et al., "Psychological Reactions to Human Versus Robotic Job Replacement," *Nat Hum Behav* 3 (2019), 1062-1069.

up room for the exploitation of personal data confidentiality because of a "black box" mentality, in which AI systems for decision-making are seen as being beyond human understanding and, hence, control.[53] The case of consumer personal data being manipulated was evident during the election victory for President Trump in the United States and many other countries, including Argentina, Nigeria, Kenya, India and the Czech Republic.[54] These misuses of personal data cases could intensify negative thoughts towards certain politicians and risk chaos to the political landscape of the affected countries.

The reduced human control of AI technology has also risked global security, mainly through terrorism, weapons construction and war activities. Recently, AI technology has been utilised in facial recognition systems for social purposes in monitoring, tracking and regulating Uyghur ethnicity, a significant Muslim minority in China.[55] The New York Times classifies this issue as an "existential threat to democracy".[56] These doings confirmed that AI technology is now not merely used to detect a person's face; it can ascertain emotions and behaviours. In future, this AI technology can be overused to detect and suppress humans based on demographic factors such as skin colour, ethnicity, religion, gender, etc.

Data scientists assert that computer programs, networks, machine learning algorithms, and AI learn how to act based on the provided data. AI systems rely on AI

[53] Luciano et al., "AI4People – An Ethical Framework," 689; Luciano et al., "An Ethical Framework," 19.

[54] Julie Posetti & Alice Matthews, "A Short Guide to the History of 'Fake News' and Disinformation," *International Center for Journalists* 7 (2018), 1-19.

[55] Darren Byler, "China's Hi-Tech War on its Muslim Minority," *The Guardian*, (April 11, 2019); Paul Mozur, "One Month, 500,000 Face Scans: How China is Using AI to Profile a Minority," *The New York Times*, (April 14, 2019).

[56] Mozur, "One Month, 500,000 Face Scans."

solutions to be implemented and facilitated. The eroding of self-determination causes humans to rely solely on algorithms in AI systems, which consist of a list of instructions and shortcuts to tell the machine what to do. The algorithm's output is likely to generate unequal or biased results.[57] The fatal crash involving Tesla's self-driving software was an example of AI overused when an algorithm could not distinguish between the white tractor side and the clear sky behind it. Likewise, algorithms used in Flickr Apps and Google Photos Apps were wrongly branded as discriminatory photos [58] and automated translation methods were accused of gender inequality or racial bias.[59] These proved that the algorithm still has conflicting decisions and can affect lives, especially involving rules and legislation.

More alarming, AGI and ASI have been identified to exceed human capabilities. At this stage, AI systems no longer rely on people for algorithmic code; it is capable of generating their algorithm. This phenomenon has caused concern to AI developers worldwide, including Elon Musk, Bill Gates and Steve Wozniak.[60] The nervousness is on the dramatic expansion of AI technology, which has gone ahead of all human intelligence. Stephen Hawking also cautions against the danger of AI or ASI technology

[57] Selena Silva & Martin Kenney, "Algorithms, Platforms, and Ethnic Bias: An Integrative Essay," *Phylon* (1960-) 55(1&2) (2018), 37.

[58] Loren Grush, "Google Engineer Apologizes After Photos App Tags Two Black People as Gorillas," *The Verge*, (July 2, 2015); Alex Hern, "Flickr Faces Complaints Over Offensive Auto-Tagging for Photos," *The Guardian*, (May 20, 2015).

[59] Marcelo Prates et al., "Assessing Gender Bias in Machine Translation: A Case Study with Google Translate," *Neural Computing and Applications* 32 (2020), 6363-6381.

[60] Dirk Helbing, *Societal, Economic, Ethical and Legal Challenges of the Digital Revolution: From Big Data to Deep Learning, Artificial Intelligence, and Manipulative Technologies* (New York: Springer International Publishing, 2019).

advancement if it goes out of human reach.[61] Indeed, AI's predictive power and relentless proliferation, even if unintentional, should be at the service of human self-determination and foster societal cohesion, not undermining human dignity.[62]

In hindsight, the findings and discussions on corresponding opportunities and risks of AI technology present ambivalent ideas about its impact on society. Though a complete AI has yet to be verified, [63] AI technologies at this level can mimic human cognition, including the ability to dream, think, feel emotions, and meet their targets. Though there is no evidence that this type of AI could exist before 2050, the assessments on AI impacts must be comprehensive from a technological, social, ethical and legal perspective. Therefore, the notion calls for a specific exploration of the literature on contemporary ethics and guidelines in AI research and to propose one that integrates Islamic perspectives.

Recommendation

Maqasid al-Shari'ah as a Parameter for Ethical Islamic Guidelines in AI Research

Islam has never prohibited humans from being involved in science and technology. It is *fard kifayah* (socially obligatory duty) upon Muslims to improve human life positively. The regulation is embedded in Islamic teaching known as *maqasid al-shari'ah, which* aims to preserve and protect human rights regardless of one's religion, race and position. The purpose of AI research is to help humans to get a better quality of life. Hence, an ethical guideline based on religious teachings in conducting AI technology

[61] Vijay Mishra et al., "Artificial Intelligence: The Beginning of a New Era in Pharmacy Profession," *Asian Journal of Pharmaceutics (AJP)* 12 (02) (2018), 76.

[62] Luciano et al., "AI4People – An Ethical Framework," 689; Luciano et al., "An Ethical Framework for a Good AI Society," 19.

[63] Javier et al., "Artificial Intelligence and Robotics."

research to guide and protect the Muslim community is highly commended.

The theory of the 'purposes of Divine law' (*maqasid al-shari'ah*) is proposed for this study as the parameter in developing the guideline. *Maqasid al-shari'ah* is a combination of two Arabic words, namely *maqasid* and *al-shari'ah*. *Maqasid* means an intention, purpose, objective, convenience or justice[64]; *al-shari'ah* denotes a religious matter prescribed by Allah (the Creator) through Prophet Muhammad (PBUH). The combination of *maqasid al-shari'ah* means the purpose required by *shara'* (Islamic law) to ensure righteousness and avoid harm.[65] The *maqasid* covers five fundamental human interests. The five are religion, life, intellect, lineage, and property (Figure 2).

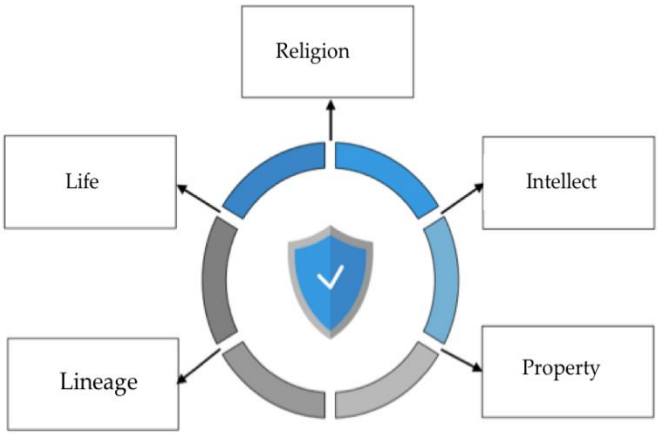


Figure 2: Five Main Components of Maqāṣid al-Sharī'ah to Underpin AI Islamic Ethical Research Guideline

[64] Zailani Muhammad Nooraiman et al., "A Review of Indicators for the Preservation of Wealth (*Hifz al-Mal*) based on *Maqasid al-Shariah*," *Journal of Islamic Philanthropy & Social Finance (JIPSF)* 4(1) (2022), 23-29.

[65] Al-Shatibi, *al-Muwafaqat*, 6.

The preservation of the five in *maqasid al-shari'ah*, which are termed explicitly as protection of faith or religion (*hifz al-din*), protection of life (*hifz al-nafs*), protection of intellect (*hifz al-'aql*), protection of lineage (*hifz al-nasl*), and protection of property (*hifz al-mal*) are prerequisite in any attempt to address contemporary issues that are challenging Islamic thoughts. Some Islamic scholars also determine the differing status of the five components of the *shari'ah*,[66]where the importance of religion is at the highest compared to the other four. The next is the importance of life, property, intellect and lineage. The hierarchy of the components in *maqasid al-shari'ah* is also overlapping and interrelated. However, the order may change depending on current needs and circumstances.

All five components in *maqasid al-shari'ah* are pertinent.[67] The components must be carefully addressed to prevent unwanted damages (*mafsadah*) like the destruction of life, detestable circumstances and perpetual loss of blissfulness. Likewise, the five components are needed to maintain lasting peace, prosperity and happiness. According to al-Ghazali, the components emphasise care of these five components that can preserve goodness (*maslahah*) in human life; neglecting these five can lead to *mafsadah*.[68] We argue that *maqasid al-shari'ah* is a solid foundation to be the parameter to safeguard human rights in areas of science and technology. *Maqasid al-shari'ah* has the appropriate parameters to preserve *maslahah* and protect *mafsadah*, which is harmful to humanity, including non-believers, regarding the risks impacted by AI technology.

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[66] Jamal al-Din Abi 'Amr 'Uthman bin 'Amr Ibn al-Hajib, *Muntaha al-Wusul wa al-Amal fi 'Ilm al-Usul wa al-Jadal* (Beirut: Dar al-Kutub al-'Ilmiyyah, 1985/1405H), 181.

[67] Nur al-Din ibn Mukhtar al-Khadimi, *'Ilm al-Maqasid al-Shari'ah* (Riyadh: Maktabat al-'Abikan, 2001), 16-17.

[68] Imran Ahsan K. N., *Theories of Islamic Law* (Islamabad: International Institute of Islamic Thought, 1994), 240.

The five objectives of the *maqasid* are closely related to the concept of human and humanity in Islam. As stated in the Qur'an, the protection of life is the protection of physical beings and the fortification of spiritual life, which is closely related to the concept of humans and humanity in Islam. The security of intellect is closely associated with the notion of humanity in Islam, as it is the intellect that allows humans to exercise free will, reason, and make moral decisions, which are essential components of the Islamic concept of humanity.

Conclusion

That AI poses striking impacts on society is not new.[69] Countries, including Canada, China, Japan, the United Kingdom, the US, and the European Union, have intensified their strategies to stimulate the development and commercialisation of AI to maintain economic competitiveness. The countries have also agreed that cooperation should involve policymakers and business leaders in developing policies to procure standard regulations. The ultimate concern is the extent of its unpredictable adverse effects.

Further, due to rapid technological developments and the need for more inclusive governance, partnership and interdisciplinary cooperation are necessities in addressing AI's impacts on society. These moves should have induced Muslim countries to participate in AI research actively. Subsequently, it will elicit the need for a specific ethical framework to serve as a foundation for Islamic ethical guidelines in AI research.

Therefore, this study proposes *maqasid al-shari'ah* as the fundamental parameter for Islamic integration in developing the proposed guideline. The application of *maqasid al-shari'ah* and other jurisdictions of Islamic laws

[69] Luciano et al., "AI4People – An Ethical Framework," 689; Luciano et al., "An Ethical Framework for a Good AI Society," 19.

discussed earlier is anticipated to be able to manage AI opportunities and risks more harmoniously. This integration is also expected to restore the connection between scientists and religious scholars, which has long been divided into two worlds. Above all, the guideline leads to developing a credible and robust framework for AI research to protect the rights and interests of the worldwide community, particularly Muslim consumers.

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