Toward an understanding of the robot rights spectrum: an integrative framework from an Islamic economics perspective

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Abstract

Purpose – This paper aims to explore the role and relationship of ethics and morals in technology, specifically examining how Islam, as a religion that emphasizes spirituality and sacredness, can uniquely influence the concept of robot rights.

Design/methodology/approach – The existing literature on robot rights and Islamic perspectives has been critically reviewed to address the study's objectives.

Findings – In Islam, robots are viewed similarly to property ownership, where the owner holds responsibilities rather than absolute control. Islamic ownership rights are distinct compared to conventional ownership models. In Islam, private ownership is limited, as God is considered the ultimate owner of all assets. Assets, including robots, must be managed according to Islamic values and ethics. Unlike conventional ownership, where the owner can dispose of their property without justification, Islamic principles grant more rights to assets (including robots). This difference arises from the sacred origins of economic resources in Islam, which extends to the treatment of assets as inputs in an economy. Therefore, spirituality, as defined in Islam, uniquely influences the rights of robots.

Originality/value – As robotics becomes an increasingly significant part of our lives, religion plays a growing role in shaping the ethical and moral framework within which robots operate. This study is among the first to present an integrative framework and evaluate robot rights from an Islamic economics perspective.

Keywords Robot, Rights, Religion, Islam

Paper type Research paper

1. Introduction

History teaches us that humans are inherently creative beings that often need to innovate, and technology and its constant advancement, like civilization's progress through four distinct stages of industrialization, is the very embodiment of this nature. The constant evolution of capital to augment physical and mental human work processes has culminated in the development of robots and AI. Robotics embraces system-based autonomous and adaptable interfaces that communicate and deliver customised services to an organisation and its stakeholders (Wirtz *et al.*, 2018). By integrating into human-built systems and enhancing/ surpassing specific human skills and capacities, robots are able to push beyond and redefine conventional frontiers, such as in deep space and ocean exploration and even inside nuclear reactors (International Federation of Robotics, 2021). In more typical modern workspaces, robots are used from broad tasks like language translations and modern warehousing to

precision tasks like managing logistics and diagnosing illnesses (Wirtz *et al.*, 2018; International Federation of Robotics, 2021). By redefining and reshaping workspaces and institutional and regulatory frameworks, robotics has presented its new roles, opportunities and lifestyles for humankind. Thus, the prospect of robots playing an increasingly prominent role in society is material (Robertson, 2014; Reiss, 2021).

In 2021, 517,385 new industrial robots were installed in workplaces throughout the world (World Robotics Report, 2022). The stock of global robots has reached about 3.5 million units, 15% more than in 2020, with a global average production density of 126 robots per 10,000 workers (World Robotics Report, 2022). This marks a year-on-year growth rate of 31% and is 22% higher than the pre-pandemic record of robot installations in 2018 (World Robotics Report, 2022). Between 2020 and 2021, the yearly global installation of service robots climbed by 37%. In comparison, China has become the largest adopter of robots in recent years, mostly for industrial purposes. For instance, 62,000 robots were placed in the automotive industry, which is double the amount compared to the year before. Meanwhile, the robot density in Japan increased by almost 30% between 2017 and 2020 (World Robotics Report, 2022). The tendency to use robots in the manufacturing world is increasing relative to the number of workers. Complex tasks can now be managed alongside human workers to achieve higher levels of productivity. As the role of robots becomes more complex, they are engineered with more advanced Artificial Intelligence (AI), granting them more human-like attributes and autonomy.

As the abilities of robots converge toward human intelligence, issues regarding their legal rights have also ensued. Different publications have examined into robot rights (Müller, 2021; Ashrafian, 2015; Gunkel, 2018; Gellers, 2020; Bennett and Daly (2020). These studies have argued that a robot-rights should be positively associated with their intelligence levels, the capacity for emotion and sensation, empathy, self-indulgence, a sense of the past and future, comprehension of existence and exercising free will. Gellers and Gunkel (2022) argue that once artificially (super-)intelligent robots become a reality, they are eligible for what could be termed as robot or robo-rights that are increasingly similar to human rights. Events like Saudi Arabia's granting of citizenship to the robot, Sophia, followed by Japan granting resident rights to Shibuya Mirai, an AI bot with a 7-year-old intelligence, have social and ethical connotations which need to be better understood and explored from different disciplinary contexts, especially the social sciences.

The discipline of economics has historically claimed a position of neutrality, justifying it as a non–biased approach to economic inquiry. However, economics' claim to value neutrality has long been challenged by some of its own greats, including Joseph Schumpeter (2010), who argued that economic motives and their modes of inquiry are inherently inalienable from social norms. In other words, understanding the socio-ethical implications of robotics falls very much within the purview of economics and should be recognised as one of its key prerogatives.

Another unavoidable reality is that ethical classifications are strongly influenced by religious systems, and that religions are here to stay. Pew Research Center population estimates (Jenik, 2021) for the period from 2015 to 2060 indicate that the global population with a religious affiliation is expected to rise by 3%, from 84% in 2015–87% in 2060. Christians and Muslims make up the majority of this group, standing at 32% and 31%, respectively, followed by Hindus at 16%. The religion of Islam, forecasted to increase its followers by 7% during this 45-year period, was recognized as the fastest growing religion, compared to a 1% rise in the number of Christians and a 1% decline in Hindu followers,

during the same period. These trends indicate that religiosity will remain an influential aspect of human ethics and values.

As robotics plays an increasingly prominent role in our lives, so too does religion in shaping the ethical and moral landscape within which robots must exist. Like knowledge, the intention behind the advancement of technology has always been about conferring some form of benefit to mankind (Parviainen and Coeckelbergh, 2021). However, the unbridled acceptance of technological advancement may mean endorsing and internalising/ systematising processes that have lasting effects that are next to impossible to reverse, such as the present global climate crisis. Conversely, too much regimentation (in the name of protecting values and ethics) may have a stifling effect on the development of technology, retarding the possible benefits of robotics on humanity. This suggests that the ethical development of robotics is about finding the right balance. Hence, this paper attempts to qualify the nature of the "technoethical" landscape from the perspective of Islam, the fastest-growing global religion.

In the context of this paper, the research problem centres around the ethical implications and potential rights of robots, especially from an Islamic perspective. While the paper mentions various aspects of robot rights and ethics, the current literature has predominantly focused on Western perspectives on rights (Puzio, 2023; Robertson, 2014; Lin *et al.*, 2012), thereby neglecting the viewpoints from other cultural and religious contexts such as Islam. In addition, the significance of exploring robot rights from an Islamic perspective lies in the increasing integration of robots into various aspects of society. As robots become more advanced and their roles more prominent, it is crucial to consider how different cultural and religious values shape the ethical frameworks within which robots operate (Elmahjub, 2023). By incorporating Islamic ethical principles into the discussion of robot rights, the paper can offer a more comprehensive and inclusive understanding of the issue, which is essential for developing globally relevant ethical standards for robotics. Furthermore, the inclusion of Islamic viewpoints can encourage further research in underexplored areas, fostering a richer dialogue between different ethical traditions (Akilu *et al.*, 2019). This can help bridge the gap and promoting a more inclusive and comprehensive discourse in the field of robot ethics.

The objective of this paper is (i) to explore an integrative framework that systematically synthesizes Islamic ethical principles with the classification and ethical governance of robot rights. This study aims (ii) to explore how these principles can be applied within an Islamic economic context to ensure that the rights and responsibilities related to robotics and AI align with broader societal values. The framework addresses the classification of robots within Islamic jurisprudence, the moral and ethical implications of robot-human interactions and the prevention of abuse of robot rights through the lens of Islamic technoethics. By doing so, the paper seeks to contribute to the emerging discourse on the ethical management of technology within the Islamic world (ICESCO and SDAIA, 2024; UNESCO, 2022). Therefore, the literature review examines the current discourse on robot rights, with a focus on how ethical frameworks, especially from an Islamic perspective, influence this emerging field. The review synthesizes key debates in both Western and Islamic scholarship, identifies gaps in the current literature and highlights areas where further investigation is necessary. The paper continues in the next section with an elaboration of the fundamental basis of accepting technological change followed by sections that identify technoethical awareness, marketing tool and ethical standards. A distinct section deliberates on exploring comprehensive framework that integrates ethical principles from Islamic teachings with the governance and classification of robot rights, making it a significant contribution to both Islamic ethics and technoethics. The final section of the paper

concludes with the implications of the Islamic perspective on the future of robotics and robot rights.

2. Literature review

In recent years, there has been an increasing focus on how Islamic ethical principles can be applied to the rapidly evolving fields of technology recently robotics and AI. Scholars have begun to explore how the foundational concepts of Shariah law, such as ownership, responsibility and the preservation of life, can inform the ethical development and deployment of robots and AI systems. One significant contribution to this discussion is by Qadir and Suleman (2018), who argue that the principles of Shari'ah offer a robust framework for addressing the ethical challenges posed by AI and robotics. They emphasize that the Islamic concept of Maqasid al-Shari'ah (objectives of the law) can guide the development of technologies that promote social welfare and justice. For instance, they argue that AI systems should be designed to ensure fairness and equity, reflecting the Islamic principles of justice (*adl*) and responsibility (*amanah*).

Conversely, another study by Johari (2002) highlights the potential challenges in applying Islamic ethics to modern technology. Johari argues that while the principles of Shariah provide a strong moral foundation, the rapid pace of technological change can outstrip the ability of traditional Islamic jurisprudence to address new ethical dilemmas. He suggests that there is a need for continuous *ijtihad* (independent reasoning) to keep Islamic ethics relevant in the face of emerging technologies. In a more recent analysis, Arzroomchilar and Olamaiekopaie (2022) explore the specific application of Islamic ethics to robot rights. They propose that robots, while not possessing rights equivalent to humans, should be treated with a level of respect that aligns with the Islamic principle of *ihsan* (excellence in conduct). This perspective aligns with earlier Islamic teachings on the ethical treatment of animals, suggesting that even non-sentient beings are entitled to protection from harm.

These differing views highlight the ongoing debate within Islamic scholarship regarding the extent to which Shari'ah can and should be applied to modern technological advancements. While there is consensus on the need for ethical guidelines, there is significant variation in how these guidelines should be interpreted and implemented in the context of AI and robotics. This suggests a need for further research and dialogue among Islamic scholars to develop a cohesive framework that can address the complexities of modern technology.

2.1 The fundamental basis of technological acceptance/relevance

The fundamental purpose of scientific inquiry is to develop knowledge systems (or disciplines) that inform and fulfil some conception of human progress. The inherent novelty of "new knowledge" complicates the immediate understanding of its potential impacts on human existence. Without a solid, universally recognized reference system, judgments about novel or unknown phenomena are inherently based on the individual's or society's beliefs, shaping values (at the personal level) and norms (at the societal level), which are crucial for behaviour formation (Schwartz, 2012; Ionescu *et al.*, 2024; Cleveland and Laroche, 2007; Cai and Shannon, 2012). Recent studies further underscore the complexity of evaluating technological innovations and their acceptance within different societal contexts (Prabowo *et al.*, 2024).

This underscores the significance of norms and values in determining which technologies gain traction and which do not. The assessment of new technologies is inherently subjective or ambiguous due to the variability of beliefs, values, norms and attitudes across different demographics and regions. The heterogeneity in values and norms dictates the varying

thresholds for new technology or knowledge acceptance, highlighting the importance of inclusive and diversified approaches in technology development and implementation (Sokolova *et al.*, 2024).

Understanding the fundamental role of norms and values in the early stages of technology evaluation is crucial. Ethical systems, for the purpose of this analysis, are seen on a continuum from those entirely independent of religious beliefs to those fully immersed in them. This spectrum is essential for distinguishing between cultures with a tendency toward religious ethics and those with a liberal ethical orientation, the latter of which are characterized by more dynamic, adaptable and progressive ethical standards, less anchored in religious or historical traditions, making these societies more receptive to the advantages and potential disruptions of technology (Aweidah, 2024).

In societies with a strong inclination toward religious ethics, a more guarded stance toward technological innovation is observed. These communities tend to be insulated from the impacts of disruptive technologies, for better or worse. Yet, it's crucial to acknowledge the subtleties within religious ethical frameworks. The question of whether spirituality (predominant in religious ethical systems) has specific implications for robot rights, in contrast to more secular ethical systems, is an intriguing aspect (Clemente-Almendros and Popescu-Nicoara, 2024).

2.2 Balancing innovation and "technoethical" awareness

Given the enormity of the positive effects of technology on civilizational progress, should not technological advancement occur without any inhibitions? The reason technological progress should be restricted by deliberately considering the ethical implications is because the interests of tech-producers are often narrowly focused on economic gains, which leads to an oversight of third-party harms and benefits. In the long run, it is the interests of all stakeholders (the entire society) that truly matter. However, awareness of the ethical consequences of a technology occurs only when its usage and acceptance are wide enough for the public to be affected by it, which takes time. Unfortunately, by the time the ethical implications of technology become apparent, it is already in wider usage (generally accepted) and is already too late (or nearly impossible) to reverse. It is difficult to "roll back" technological changes because technology is a unique variable compared to the other factors of production (Antonelli, 2017). Technology is a transformative process that determines how inputs are converted into outputs. Newer or advanced capital and labour formations deemed undesirable after some time cannot simply be rolled back or unlearned because of this integrative attribute of technology (UN GSDR, 2023; Luppicini, 2010).

Consider the present-day climate crisis as an example. Since the first industrial revolution, most economies have shifted toward fossil-fuel-powered technologies. However, with the expansion of production systems to satisfy global mass markets, awareness of the negative climatic, environmental, and social impacts (of burning fossil fuels), also increased. The climate crisis is a result of the difficulty in roll-back or reversing our dependence on fossil-fuel-based technologies. In the most recent COP27 discussions, it was realised that the target of restricting global warming to 1.5 degrees (established in the 2015 Paris Agreement of COP21) is not feasible. Technological advancement in the field of robotics and AI is no different and is equally susceptible to unintended consequences (that only become known after widespread adoption). Thus, it is crucial that fast innovation in robotics is checked and balanced by deliberately subjecting it to an ethical framework to ensure its development is in line with human values (Schaltegger and Wagner, 2011; Silvestre and Ţîrcǎ, 2019).

The increasing pace of technological research and development over the past 30 years, has given rise to the field of "technoethics." Its primary goal is to provide insights into the

ethical dimensions of technological systems and practices to advance a technological society and to create positive value for all associated stakeholders in a way that impacts humanity in positive, goal-oriented ways while minimising the negative (including irreversible) trends or effects of technology (Brey, 2017). The field of technoethics could be broadly categorised into three important, interrelated aspects; technology philosophy, computer ethics and machine ethics or machine/computational morality (Bryden and Gezelius, 2017; Kumar, Singh, and Dwivedi, 2020). Technology philosophy is more focused on the larger-scale societal (or generic) impacts of technology. Computer ethics is focusing more on the users of technology, i.e. the ethics of people who use computers. Finally, machine ethics, which is the focus of this paper, concerns the rights of machines themselves.

So far, this section has forwarded the argument that ethical systems are a means of reigning in the potential negative effects of technology. Given the ability of ethical standards to restrict technological advancement, an important consideration is how to know that the ethical lines drawn are not too strict and restrictive. In other words, being too cautious or guarded of a society's ethics may restrict technological advancement and its associated benefits. Being too protective of ethics also means holding on too tightly to traditions, which could come at the cost of forgoing technologically induced development. Holding on too tightly to past practices can be caused by trepidation of the new and the fear that it may alter our core values and identity. (Boyles, 2018). This has led to instances where fear of the unknown has resulted in pessimism toward new, beneficial technology e.g. a jurist's fatwa banning the television. (Sikand, 2006). Such situations choke technological advancement, making it less sustainable (Dossa and Kaeufer, 2014; Gurzawska, 2020).

Thus, the core issue is not so much about whether to apply technoethical frameworks as a check and balance mechanism for robotics but rather about the extent to which they must be applied. For instance, if robots are granted too many rights or freedoms, it may threaten the rights of humans. Conversely, if they are granted too few, humans are unable to capitalize on the benefits provided by robots. In other words, the sustainability of technological progress that benefits economic development is about striking the right balance between ethics and technology. It is this balance that maximizes human rights that could be considered the equilibrium point. An example of where a good balance between ethics and technology is being struck is the Human Genome Project, where an ethical line has been drawn between human and therapeutic cloning. Unfortunately, these nuances do not exist in all domains of technological progress (Schaltegger and Wagner, 2011; Leone and Belingheri, 2017).

2.3 Robot as a marketing tool and its advantages

In this section, the study explains the advantages of using robots as marketing tools. The usage of robot has transformed the way businesses interact with their targeted audience for marketing. Mende *et al.* (2019) mentioned that the robots has transformed face-to-face service interactions significantly. For example, in many industries such as hospitality and services, the utilisation of robots has gained enormous support and provided many advantageous in terms of efficiency, cost, decision-making, scalability, creativity and content generation, marketing and provide a competitive advantage. They are used to promote products and services to customers as a mean of service innovation and increasing brand vitality (Murphy *et al.*, 2017; van Doorn *et al.*, 2017; Alserhan, 2011; Mahmood *et al.*, 2019). Indeed, Boddu *et al.* (2022), Donepudi (2020) also highlighted that an acceptance and developing robot technologies has becoming vital for future marketing strategies as the businesses can optimize the former for their own operations, minimize expenditure, reduce delivery time and production enhancement. Meanwhile, Sharma and Rahman (2022) stated that robots have been invented in such way as partners or servants in brand promotion and

influencing consumers' brand perception. On the other hand, Choi *et al.* (2019) implied that due to their characteristics of humanoid, the robots are perceived as social entities that contribute to fostering social connections. In addition, Seo and Lee (2021), Bogue (2019) indicated that the usage of robots has positive impact on consumer service experiences as the former enhance the critical elements of business marketing, service consistency, improve waiting time and productivity. For instance, the robot enables businesses to deliver content, recommendations and solutions that are tailored to the individual preferences of each customer. The robot can create a unique interaction for every user, making their experience more engaging and personal, which can create long-lasting customer relationships. Based on the above discussion, it is found that an integration of robots into marketing activities bring positive impact on business models, sales processes, customer service options as well as customer behaviour. Since marketing strategies of enterprises evolve to be more data-driven, analytical, and focused on engagement, the use of robots seems naturally impending in the future of interactive marketing.

2.4 Ethics, robotics and marketing

In the earlier section, this paper has highlighted advantages of using robots as marketing tools. However, robots may raise ethical concerns, especially when it comes to issues where they might replace human beings or take on roles that are normally reserved for humans in marketing activities. What are the ethical dimensions of giving robots a role to conduct marketing activities? Is there an ethical way to programme robots to deal with services and consumers? This section aims to address these concerns by exploring in which ways robotic technologies may play a role in marketing in the near future. Generally, ethics and marketing are highly inter-related and become essential elements in businesses. The businesses attempt to balance their commercial goals together with moral and social obligations (Husain *et al.*, 2019; Abdelkader and Abdul Latiff, 2016). Through integration of ethics and marketing responsibility in their strategies, the businesses can avoid adverse publicity and build a more sustainable and trusted brand. It shows the need of businesses to apply a proactive approach to ethics and marketing responsibility, which yield long term consequences. Since ethics become integral part for marketing strategies, as well as great promise, adoption of robots in marketing creates significant ethical challenges (Winfield, 2019). Although robots are anticipated to play a significant role in marketing services which involving direct interactions with customers, robots' ethics in marketing is concerned with the important question of how businesses should minimise the ethical harms that can arise from robots either arising from poor (unethical) design, inappropriate application, information or misuse (European Parliamentary Research Service, 2020). According to the study by European Parliamentary Research Service (2020), the main ethical dilemmas associated with the deployment of robot are related to its impacts on society, human psychology, financial system, legal system, trust and environment and the planet. These ethical dilemmas are not only relevant to general robotic deployment but are also applicable to marketing activities (British Standards Institution, 2023). In marketing, the use of robots can influence consumer behaviour, data privacy, and the ethical implications of targeted advertising and automated decision-making processes. This paper will further explore the role and significance of ethics and morality in relation to technology, particularly examining the unique influence of Islam, a religion emphasizing spirituality and the sanctity on robot rights.

2.5 Ethical standards in *Islam*

To comprehend how Islamic values may influence robot rights, it is important to understand how ethical standards are developed in Islam. In Arabic, there are two terms that are

interchangeable with the English word "ethics". These are *khuluq* and *adab*. The former is used twice in the Qur'an (Chapters al-Shu'ara: 137 and al-Qalam: 4) and relates to the traditional practices of the past that encompass philosophy, religion, and character. *Khuluq* represents the theoretical aspects of morality, in that, it is a study of principles and behaviour, the inculcation of which would lead to the best form of individual and social order (al-Qurtubi, 2014). The latter term, *adab*, alludes to more pragmatic or applied aspects of ethics such as behaviour, attitude and manners or the etiquette of keeping "things in their proper place". Examples of negative moral conduct include theft, assault, rape, murder, defamation, lying, etc. while positive attributes include honesty, compassion, sincerity and loyalty. In English semantics, *khuluq* applies to morality which provides the general guidelines or code of conduct, while *adab* is more synonymous with ethics that stipulate specific actions or behaviour. Several verses of the Qur'an and Prophetic narrations (*Hadith*) collectively form the basis of ethics and morality in Islam. For instance, a Prophetic tradition narrates that "I have been sent only for the purpose of perfecting good morals." The Qur'an establishes the fundamental moral principles and standards, and the *Sunnah* (way of life of the Prophet) involves the enactment or application of these principles in real life (Khan, 2020). In short, the Qur'an and Sunnah are the primary sources of morals and ethics in Islam. Traditional cultures and past practices are also important sources as long as they do not contradict the primary sources (Sachedina, 2022).

Similar to the scientific method, a formal process in Islam for developing ethical and moral laws, has existed and been developed since the mid of 8th century. This process is executed by Islamic jurists who are learned in Islamic literature, history and philosophy. The process involves three key components of *ahkam* (striving to identify the sources of moral conduct), *tatbeeq* (how they are to be applied or realised–the legal framework) and *maqasid* (comprehending the purpose of the ethical or moral teaching) (Ramadan, 2018; Akbar, 2022) as shown in Figure 1. Based on these three parts, Islamic jurists issue *fatwas* (or informed opinions) regarding ethics and morals. The process of deriving *fatwas* is also procedural and systematised, using tools of intellectual exertion *(ijtihad)* and discourse and consensus *(ijma)* and drawing analogies of situational relevance from the past to the present *(qiyas)*. Thus, the responsibility of determining the modern significance and relevance of any new phenomena, including technological advancements like humanoid robots, falls to the Islamic jurists who are substantively and methodologically proficient. It is this framework that determines and shapes the moral standards in Muslim society (Hagendorff, 2017; Gunkel, 2017).

Despite the growing interest in the intersection of Islamic ethics and technological advancements, there are significant gaps in the current literature, particularly regarding the integrative framework of Islamic ethical principles in AI governance. Most of the existing studies, such as those by Qadir and Suleman (2018) and Johari (2002), discuss the conceptual implications of Islamic ethics for robotics and AI. However, there is a notable lack of comprehensive framework that integrates ethical principles from Islamic teachings with the governance and classification of robot rights, making it a significant contribution to both Islamic ethics and technoethics. For example, while the concept of maqasid al-shariah is frequently cited as a guiding principle for ethical AI development (Qadir and Suleman, 2018), there is limited framework on how this principle is being operationalized in real-world AI governance. Similarly, Johari (2002) highlights the challenges of applying Islamic ethics to rapidly evolving technologies, yet there is little research that investigates how Islamic scholars and technologists are addressing these challenges through concrete policies or practices. Another gap in the literature is the lack of comparative studies that explore how Islamic ethical principles align or diverge from other religious or secular ethical frameworks in AI governance. While some scholars, like Arzroomchilar and Olamaiekopaie (2022), have
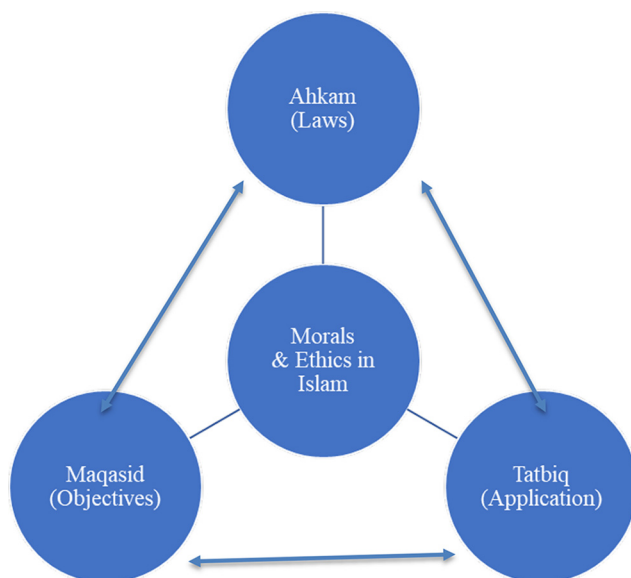
Source: Authors' illustration
Figure 1. Three key components of developing ethical and moral laws

begun to explore the unique contributions of Islamic ethics to the discourse on robot rights, there is a need for more comprehensive studies that compare Islamic perspectives with those of other major ethical traditions, such as Western human rights frameworks or Eastern philosophies.

3. Integrative framework for the classification and ethical governance of robot rights in Islam

This section deals with both the classification of robot rights and their ethical governance, all within the context of Islamic jurisprudence. It reflects the core purpose of the study, aligning with the broader objectives of the article. The area of technoethics is in general conformity with the overarching principles and values of world religions, such as the preservation of life, the propagation of social good and order and the prevention of harm. However, the way in which world religions qualify some of their ideals could drastically differ, and it is these differences that separate one religion from another.

3.1 Islam's general stance on technoethics

In Islam, although some acts of worship are ritualistic in nature (offering five daily prayers, fasting, etc.) other forms of worship are inseparable from daily life decisions and actions. Thus, deeds performed with the right intentions (sincerity in the workplace or being kind to others) are not only meant to attain individual and social well-being but also simultaneously attain spiritual well-being. As such, ethics are very much ingrained in the ideal life of a Muslim. In other words, every little action has moral implications in terms of achieving justice and social welfare, and order (Maududi, n.d). Scholars of Islam have listed several

moral principles and standards that must be implemented and maintained when developing new technologies or attaining these standards through the usage and adoption of modern technology and communication (Qadir and Suleman, 2018). These could be considered the general moral and ethical standards that must be maintained in society, and all actions whether legal, political, social, economic or technological, must conform to these standards. Examples of these include values such as moderation in consumption, proper management and utilisation of resources, prevention of abuse or harmful influences, showing respect and dignity when dealing with other entities, having good intentions, being responsible and upholding integrity (Zafir Hasan, 2015; Moosa, 2016; Khan, 2020; Abdun-Nafay and Nutkani, 2024).

The intertwining of ethics with daily life, as prescribed in Islam, provides a foundational perspective that extends into the realm of technoethics. This perspective posits that technology, and its application should be approached with the same ethical considerations and moral intentions as any other aspect of life. The emphasis on moderation, responsible management of resources and respect for others in the utilization of technology underscores the holistic approach Islam advocates for in all facets of life, including technological advancement. The Islamic moral philosophy thus offers a distinctive lens through which to view the ethical implications of technology, promoting a balance between technological progress and ethical integrity (Arzroomchilar and Olamaiekopaie, 2022; Johari, 2002).

3.2 Classification of robot rights and associated morals and ethics
Conventionally, legal rights and obligations are determined and assigned according to the nature and form of the entity for which rights are being determined. There are three basic classifications of rights–those belonging to a person, to animals and, to objects (Bennett and Daly, 2020). In Islam, a preliminary analysis of the existing literature points toward treating robots as objects, assets or property. This is in line with conventional economics' definition of capital–a man-made means to facilitate the production or provision of a service to its owner. Thus, at a basic level, a robot is an automated and mechanised object that facilitates its owner's objectives. In this sense, the starting point for analysing the rights of a robot from the Islamic economic perspective should be from the perspective of property ownership rights in Islam.

3.2.1 Humanoid robots and Islam. In Islam, the creation of machines that simulate human personality and behaviour is not a novel or modern phenomenon. Rather, there are documented examples of Muslims designing robots even in the past (Aashour, 2018). Ismail al-Jazari is considered the first to invent a robot for the sake of serving in the house. His book titled *The Book of Knowledge of Ingenious Mechanical Devices* (*Kitab fi ma'rifat al-hiyal al-handasiya*), was written in 1206, and described 50 mechanical devices, with instructions on how to construct them! According to Pacey (2021), al-Jazari is credited with the invention of the elephant clock and has been described as the "father of robotics" and modern-day engineering (Ahmad and Hassan, 2018). One of the rulers of his time asked him to design a robot that would replace all the servants he needed to tend to him when he performed ablution. This was a robot that combined the tasks of at least two servants, involving the pouring of water for his ablution, the provision of towels and notifying him about the time for prayer (Ahmad and Hassan, 2018).

In more contemporary times, regarding the robot, Sophia, Dr Magdi Ashour, the academic advisor to the Grand Mufti of the Republic of Egypt (a highly qualified Islamic jurist), clarified that robots could take shape and appearance of human beings (Ashrafian, 2015; Dahlan, 2018). In other words, like Al-Jazari's past efforts, robots could be modelled after the general form of a human, and can even be assigned a personality, provided that the

robot serves a clearly defined purpose, and a specific goal of benefit is achieved. In terms of don'ts, robots cannot be deified or sanctified in any way. In line with the general ethics outlined earlier, robots are also not to be used for purposes that promote harm and unethical conduct (Aashour, 2018). Thus, if the aforestated conditions are met, the Shariah permits the creation of a robot that emulates the human form and behaviour. An important clarification is necessary regarding designing robots as humans. Although the human form and personality can be used to model a robot, it should not copy an actual person that exists or who existed. This is the equivalent of attempting to emulate God, which is deemed impermissible (Aashour, 2018). Thus, a robot that can do the work and has the abilities of a specific person is fine, but if the robot was designed to become that person such that it is able to replace that person in every sense, that is where Islam draws the line.

3.2.2 Rights of robots (owner's perspective). The contentious nature of who should have legal authority over robots and AI highlights the challenges associated with assigning ownership rights over something that is complex and is created by multiple parties (Bennett and Daly, 2020). However, as mentioned earlier, robots and AI are simply seen as products or objects with liability issues that could essentially be managed within existing contractual and tort liability frameworks (Bertolini, 2013).

Most of the discussion on property rights in Islam applies to treating robots. According to Zuhayli and Eissa (2007), a person must exercise his/her rights based on the teachings and guidance of the primary sources of Islam. One should not exercise a right in a manner that would result in harming others, whether the harm was intended or not. From the perspective of Islam, ownership of any assets is not absolute. Production of goods and services, including robots, are made from scarce resources that have originated from God. Intellect and abilities are also considered blessings of God. Thus, God is the ultimate owner, while the legal owner must manage the asset in a way that is beneficial, or risk forfeiture. Thus, it is illegal/ disallowed for the owner of a robot has no right to destroy it, nor waste any other assets owned. A person's misuse of his rights in any way that harms him or others is known as *"ta"assuf.'* If a person acts beyond his rights, it is not considered arbitrary but is rather a transgression against the rights of others (Zuhayli and Eissa, 2007).

Zuhayli and Eissa (2007) also argues that there are two reasons for prohibiting the abuse of rights (*ta'ssuf*). Firstly, the holder of rights does not have absolute freedom to exercise them due to the legal texts of Shari'ah that prevent harm to others and prohibit monopoly and forcibly selling the money of the monopolist when needed and avert aggression against blood, money and honour, whether the harm results from the use of a legitimate right or not. Secondly, due to the tendency of collective rights, the interest that benefits from the financial private right is not limited to its owner only but also accrues to the community as well according to Islam. A person's wealth is part of the wealth of a nation, which must remain strong in preparation for emergencies. When society has a right to the money of individuals, then individuals cannot dispose of or abuse his/her property in a harmful way because that is an attack on the right of society, and an attack on itself (Ikram and Kepli, 2018; Singer, 2021).

Likewise, robots and AI are categorically positioned in this paradigm as objects/property that must be controlled by human agents or existing non-human legal entities like corporations for the benefit of society. In the context of automated vehicles, some of these liability-related issues are already being thought about. The deployment of autonomous cars onto public roads will require clarity about responsibility and insurance. For robots, liability concerns will also arise, and how these issues are handled may depend on how independently capable the robots are (Richardson, 2016).

3.3 Avenues to prevent abuse of the right

Robots and AI are developing quickly, affecting practically every aspect of civilization. The incorporation of AI into illegal and destructive activities has increased, exposing more people to risk and widening existing vulnerabilities. The treatment of robots by humans can occasionally be harsh (Bartneck and Keijsers, 2020). It is necessary to pinpoint AI model vulnerabilities and explain how malicious actors can exploit them. Social engineering, hacking, autonomous weapon systems and misinformation or fake news are identified as malicious use of robots in a study carried out by Blauth *et al.* (2022). The Figure 2 and Table 1 show five avenues highlighted by Zuhayli and Eissa (2007) for preventing abuse of rights that are widely discussed in Islamic jurisprudence for property rights can be the referral for developing preparedness and resilience against malicious use and abuse of robots and AI.

The first avenue – Intent to harm: Rights in Islam are granted based on individual and social benefits they provide. However, if a person intends to cause harm by using his right, then its use is forbidden owing to the arbitrary nature of the action, and it must be prevented, for instance, filing a lawsuit against an innocent party with the purpose of defaming them, or a dying person divorcing his spouse to evade paying her rightful share of the inheritance. These actions are forbidden based on arbitrariness and the intent to benefit oneself at the cost of harming another.

Likewise, the creation and dissemination of false information, as well as hacking into people's personal data, are instances where the owner of technology is perpetuating harm by technology or AI that is at his disposal. Some writers have suggested the words "harmful AI" and "malevolent AI" in situations when the AI programme or application itself harms people (Hibbard, 2015). It also covers the intentional use of AI by people and organisations to damage others, which encompasses both the actors' intentions and any direct or indirect unintentional effects of their actions (Blauth *et al.*, 2022; Masum, 2013; Chaudhary, 2020).

The second avenue – Intention for an unlawful purpose: If a person intends by using his right to achieve an unlawful purpose that is not consistent with the intended interest of the right, but rather hides behind the use of the legitimate right, such as taking the marriage contract as a means to divorce the woman for her first husband, and captivating the sale
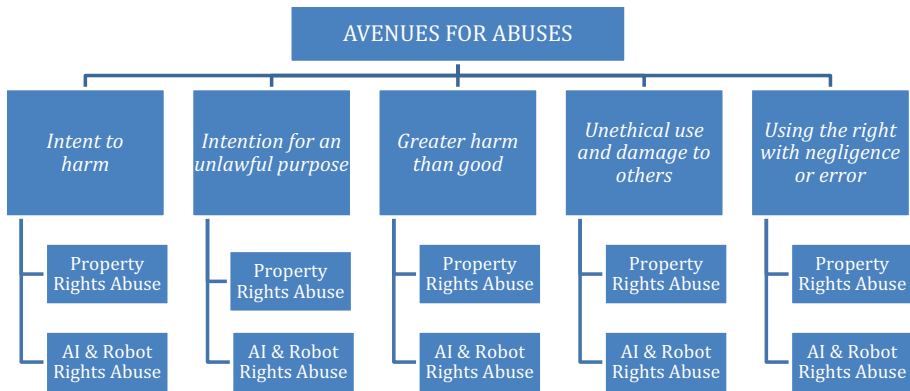
Source: Authors' illustration

Figure 2. Dimensions of the robot rights

Table 1. Summary of five avenues for abuses of property rights vs. robot rights

No.	Avenue	Property rights abuse	AI and robot rights abuse
1	*Intent to harm*	Causing harm to others against the desired benefit from the property	The creation and dissemination of false information, hacking into people's personal data
2	*Intention for an unlawful purpose*	Achieving an unlawful purpose that is not consistent of the intended interest of the property	The models used to train AI systems to provide results that differ from those anticipated by the creator
3	*Greater harm than good*	Resulting in harm to others greater than, or equal to, the intended benefit from the property	The danger of high-speed crashes develops as a result of algorithmic trading that makes judgments that are hard for humans to understand the volatility in the market
4	*Unethical use and damage to others*	Utilizing the property in an unusual way to the people's knowledge, and then harming others	The focus of verbal and physical abuse of social robots since they are in a position of obvious inferiority, and not expected to respond in kind, and cannot feel pain
5	*Using the right with negligence or error*	Making use of his property in a way that is not precautionary, careful and proven, and harming others	The dangers and hazards that come with robots if they are operated with negligence and error

Sources: Authors' extraction from various sources such as Zuḥaylī and Eissa (2007); Hibbard (2015); Carlini *et al.* (2019); Scopino (2020); Brscić *et al.* (2015); Lea (2017)

contract as a means of usury or interest, and the conversion of a non-Muslim wife with the intention of inheriting from her husband, and the gifting of money to a family member before a year with the intention of dropping the obligatory zakat. The basis of this avenue is the intent to harm as well as the first avenue, and this is defined by the evidence and presumptions that determine the intent.

Similarly, for a variety of reasons, models used to train AI systems may provide results that differ from those anticipated by the creator. Neural network-based models could mistakenly memorise and reveal information. This might be a concern, particularly if the data used to train the models is confidential or delicate (Carlini *et al.*, 2019). Such models could memorise information irrelevant to the main job throughout the learning process. It is vital to use techniques that ensure data privacy, to avoid negative effects from inadvertent memorising and publication of information by the algorithm (Moosa, 2016; Taddeo and Floridi, 2018).

The third avenue – Greater harm than good: If a person uses his right with the intention of achieving a legitimate interest from him, but his action results in harm to others greater than, or equal to, the intended benefit from him, he/she should be prevented from that to block the means, whether the harm inflicted is general to the group, or particular to a person or persons. The evidence for the prohibition is based on the legal maxim which is derived from a Prophetic tradition "Do not inflict injury nor repay one injury with another". Accordingly, the use of the right is arbitrary if it results in general harm, and it is always more severe than the specific harm, or a specific harm result in more than the interest of the owner of the right or more severe than the harm of the right holder or equal to the harm due. For instance, *ihtikar*, a

monopoly is buying what people need and saving it for sale at a time when prices are high and people need it, and a *talaqqi,* a merchant receives the arrivals from the countryside to the city to sell their crops, buys them at a lower price than the existing price and sells them to the people of the city at a high price. All of that is forbidden arbitrariness because the basis of this avenue is the amount of damage resulting from the use of the right (Alserhan, 2011; Hassan and Lewis, 2007).

Comparably, the application of AI systems in market trading makes it move at breakneck speed, however, a danger of high-speed crashes develops because of algorithmic trading that makes judgments that are hard for humans to understand the volatility in the market. (Scopino, 2020). After the 2010 flash crisis, a loss of approximately $1tn, the difficulties of automated decision-making in the financial sector became obvious. A high-frequency trader named Navinder Singh Sarao was charged with using automated software to generate significant sell orders, in an effort to drive prices lower. He cancelled orders to purchase at lower market prices after they fell, to gain from them when the market rebounded (Martin, 2020). For regulators and traders, the first market collapse of the algorithmic trading era acted as a wake-up call. It highlighted some of the difficulties associated with high-speed computerised trading and, more broadly, automated decision-making. Some high-frequency trading manipulation strategies, such spoofing and layering, were outlawed to stop situations like this from happening again (Wibowo and Mansah, 2020; Abbas *et al.*, 2019).

The fourth avenue – Unethical use and damage to others: If a person uses his right in an unusual way to the people's knowledge, and then harms others, it is arbitrary, such as breaking the parts of gadgets, or personal belongings annoying neighbours and harming their inhabiting, or renting a car and carrying it more than its load, or purchasing a cattle and beating it severely or carrying it beyond its capacity. In all of this, the act is considered arbitrary, so he/she is prevented from the abuse of rights, and the aggrieved party is compensated for the damage he/she has suffered. The criterion in this is the custom that determines whether the behaviour is habitual or unusual. The basis of this avenue is the unconventional use of the property (Carlson *et al.*, 2019; Lin *et al.*, 2012).

According to Brscić *et al.* (2015), social robots have also been the focus of verbal and physical abuse in the past. Robots are in many respects the perfect victim of abuse since they are in a position of obvious inferiority, are not expected to respond in kind and cannot feel pain, which absolves the abuser from any moral responsibility. This is not to imply that bullying by robots should be accepted. Practically speaking, mistreating a robot can result in serious harm to it as well as dangerous circumstances for everyone involved – the robot, the abuser and potential users. Even in most libertarian nations, it is not a widely held belief that any conduct is morally permissible as long as no one is hurt (Danaher, 2019; Richardson, 2016), which underlies immoral behaviour with robots. Even more upsetting is the fact that robot-directed violence has been demonstrated to be extremely persistent, and researchers have had difficulty coming up with appropriate robot responses to successfully dissuade additional abusive behaviour. Even when done to an object that is incapable of experiencing pain, such as a robot, some actions might be considered immoral from an ethical point of view (Sparrow, 2017). Abusing robots could promote treating people in the same way since humans recognise robots as social agents (Malle, 2016; Whitby, 2008).

The fifth avenue – Using the right with negligence or error: If a person uses his right in a way that is not precautionary, careful and proven and harms others, and this is what is known as error, the person is abusive or liable to default. Whether it was a mistake in the act, as if the hunter hits the shot at a catch, and it deviates and hits a human being or crosses the hunt for a human being and kills him. Similarly, unintentional traffic accidents such as killing and damaging property, and cases of exceeding the limits of legal defence from the lightest to the

heaviest, and consuming money assuming that it is a person's money. All of this is an abuse of the right, which entails compensating for the harm that befell others because the person had to be sure and pay attention or be careful in both intent and action, and if the person intended that, he/she would bear the result of his/her action to preserve people's blood and money. The basis of this avenue is the occurrence of harm, whether it is a little or a lot (Khan and Al-Jubari, 2020; Chaudhary, 2020).

Similarly, workplaces are using robots and AI more and more often with precautions. Furthermore, there is no question that this has enhanced both safety and health. Yet, the work environment can be significantly impacted by the dangers and hazards that come with robots if they are operated with negligence and error. According to a whitepaper (Lea, 2017), attorneys, legislators and software developers must pay more attention to the ramifications of these changes as robots and algorithms take on more and more daily jobs. Automation and technology open up hitherto unexplored perspectives on human agency. With these new insights, we are starting to see the possibility for new types of negligence as well as a lot of unsolved concerns, such might developers be held liable for harm a law firm suffered using their technology (Masum *et al.,* 2015; Moosa, 2016). Should legal professionals be as aware of the consequences if their monitoring of AI is shown to be deficient? The idea that a programmer may be accountable for unexpected effects contained within a line of code could sound vague. But it might only rely on the ethereal nature of software and code. As proposed by Brownsword (2017), "there will be a need to figure out a workable legal approach if lawyers find themselves sued for professional negligence where-in the first instance-they are claimed to have over-relied on machine learning but also in a second plausible scenario-where they are claimed to have under-relied on the AI that is available."

4. Concluding remarks

The objective of this paper was to explore the spectrum of robot rights from the Islamic economic perspective. The discussion of religion was included in this paper through the ethical and moral dimensions since religion is a source of ethics. First, it was argued that technological systems require some form of grounding in values and a check-and-balance mechanism so that technological advancements do not outpace human values and ethics. The example of the global climate crisis shows fossil-fuel-based technologies have overstepped into the social and environmental domains, causing havoc. It was also observed that though technological progress can be controlled by norms and ethics, too much emphasis or being overprotective of norms and ethics is likely to stifle technological development. The ideal situation would be identifying a balance where technology can be developed sustainably without compromising on ethics and social welfare (Khoirunisa *et al.,* 2023).

The paper also deliberated on how, in the absence of data to assess the benefits of a particular technology, its perception will depend on the ethics and morals of a society. Since societal cultures and religions vary, so too would perceptions. It is these varying perceptions that create a rights spectrum. Perceptions range from a tech-inhibiting view in more conservative societies, where new technology is perceived as a general threat to norms; to tech-embracing views in liberal-leaning societies, where new technology can shift people away from their core values. The spectrum of robot rights would thus vary based on the values of society. The paper subsequently identifies the important components and framework for ethics and morals in Islam, after which, it attempts to identify the boundaries of robot rights and AI in Islamic economics.

It is found that the concept of creating robots is not a new phenomenon in Islam. Historical precedent indicates that robots are to be viewed in the same light as property ownership in Islam, where the owner is responsible for liabilities the robot or AI may cause

at an individual as well as collective capacity. Ownership rights in Islam are unique in comparison to conventional ownership modes. In Islam, private ownership is more restricted as God is the ultimate owner of assets. The asset, thus, must be managed in accordance with the values and ethics stipulated in the primary sources of Islam. This is different from conventional private ownership, where the owner may even destroy his robot without needing to provide any justification. This means that Islam accords more rights to assets (and robots) in general. This difference in ownership specifically arises due to the sacred origins of the resources of an economy, which are extended to assets for which they become inputs. Thus, spirituality (as defined in Islam) does influence robot rights in a unique way.

Apparently, the incorporation of robots into marketing activities as highlighted in the paper, showcasing how these technologies revolutionize business interactions with their target audiences. Robots provide substantial benefits such as enhanced efficiency, reduced costs and improved decision-making, making them invaluable in marketing strategies. These technologies support creating personalized, engaging customer experiences that foster long-term relationships and brand loyalty. The positive impact on business models, sales processes, customer service and consumer behaviour underscores the importance of robots in future interactive marketing.

Finally, the avenues of how rights could be abused are identified, and how these harms could be mitigated. This paper has attempted to explore and examine the spectrum of robot rights from different hierarchical levels (from the point of general ethics to Islam, specifically). It is hoped that this research will generate interest to spur even more research of this nature.

This essay contributes to the theoretical implications to technoethics, Islamic economics and the global debate on robot rights. The integration of Islamic ethical principles, as presented in this paper, introduces a new dimension to the field, emphasizing that religious and spiritual values can play an essential role in determining technological governance. Islamic technoethics, guided by principles such as Maqasid al-Shariah offers an ethical framework supported in spirituality and morality. On this range, societies with strong religious ethics, such as those rooted in Islam, may adopt a more cautious approach to technology, prioritizing ethical and spiritual considerations over rapid innovation. Thus, this theoretical model offers a framework for understanding and advocating for a more balanced perspective that considers both the benefits and risks of innovation within an ethical framework.

4.1 Future research directions

Exploring robot rights from an Islamic economic perspective paves the way for numerous future research opportunities that promise to deepen our understanding and guide the integration of robots and AI into our lives in harmony with Islamic ethical values. Future research could include comparative analyses between Islamic economic principles and other ethical frameworks, such as those from Western or Eastern philosophies, to establish a more globally inclusive ethical standard for robots and AI. Moreover, advancing Islamic jurisprudence concerning AI and robotics by examining issues of liability, ownership and ethical treatment can be significant. This exploration could extend to applying existing Islamic principles on property rights, accountability and harm prevention in the context of robots and AI. Also, it is recommended that policymakers embed Islamic ethical principles in national and international AI governance frameworks to ensure AI and robot deployment aligns with values promoting justice, equity, and harm prevention.

Further research should also investigate the integration of robots in marketing from an Islamic perspective, focusing on how moral principles can guide the use of advanced

technologies in business contexts. Educational institutions are encouraged to integrate Islamic ethics with technology and AI studies to prepare ethically conscious future technologists. Furthermore, the collaboration between technologists and Islamic scholars in the AI and robotics design and development process is essential for ensuring that innovations are consistent with Islamic ethics.

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