Islamization of Technology: The Qur'anic Guidance and Sunnah in ICT Integration

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Abstract— The rapid development in Information and Communication Technology (ICT) has revolutionized modern day life, influencing communication, education, commerce and social interactions. The concerns related to ethical issues are still prevalent and results into challenges such as, privacy violations, disinformation and the exploitation of digital platforms which emphasizes the necessity to have a moral framework based on Islamic ethical principles. The proposed study examines the Islamization of Technology by integrating teachings from The Holy Qur'an and Sunnah of Prophet Muhammad (SAW) to harmonize technological progress with ethical and spiritual principles. It advocates for the creation of Islamic digital platforms which supports integrity, privacy and responsible content moderation while fostering truthful communication, ethical business practices and social welfare aligned with *Maqasid al-Shari'ah*. This approach integrates Islamic values into ICT to harmonize technological progress with Islamic ethics to ensure that digital advancements facilitate spiritual growth, knowledge diffusion and ethical governance. The Islamization of Technology perceives ICT as a tool to foster ethical conduct, improve community cohesion and tackle modern digital issues through a faith-oriented approach.

Keywords— Islamic ethics, Islamization of technology, Maqasid al-Shari'ah, Ethical Technology, Spiritual Growth through ICT.

I. INTRODUCTION

This study focuses on the concept of Islamization of knowledge based on the framework as defined in The Holy Qur'an and Sunnah of Prophet Muhammad ﷺ which serves as the major sources of guidance in the Islamization of any modern knowledge and a primary spirit. It has application rooted into any policy with the intent to integrate Information and Communication Technology (ICT) to improve information science and knowledge [1]. The main goal is to encourage the IT practitioners to have a closer look at the current developments in ICT, correlation with Islamic ethical principles and its influence on Muslim societies across the globe. The growing inventions has pushed human productivity to think on the need to explore whether the pace is moving under the guidance of Islamic teachings and how it is impacting Muslim societies across the globe [2]. It goes without saying that most people on this planet have experienced technological advancement in different stages of their life. The progress in technological innovation which enhances human productivity needs to be validate whether these developments align with Islamic teachings and ethics [3]. Technology has transformed every aspect of human life including education, transportation, medicine, space and media which enables better possibilities for human progress. However, these advancements should be in compliance with Islamic ethical teachings to ensure a positive contribution to the society.

A. The role of Islam in guiding technological advancement

ICT plays a crucial role in shaping the modern world and influencing digital technology. It has transformed lives, thought processes, human productivity and global economies. The Islamic teachings defines that new technologies should be assessed based on the ethical and moral principles found in the Holy Qur'an and the Sunnah of Prophet Muhammad ﷺ. Similarly, this assures alignment with Islamic ethical values and contributes to the betterment of individual lives [4]. Islam includes all facets of life including the integration of technology in professional, educational and daily pursuits. The basis of knowledge and advancement in Islam has its roots in divine guidance primarily sourced from The Holy Qur'an, succeeded by *Sunnah* of Prophet Muhammad ﷺ, *Ijma* and *Qiyas* and *Ijtihad* [5]. It offers a thorough framework for navigating progress in science and technology while upholding ethical integrity. Islam functions as a foundational principle for work ethics, discipline and productivity, providing a systematic

framework for navigating and excelling in everyday life [6]. It promotes creativity, collaboration and specialization, highlighting the quest for knowledge and quality across all disciplines. Islam instructs individuals on the creation, accumulation and processing of earthly resources while simultaneously acting as a catalyst for advancement, motivating Muslims to pursue righteousness in opposition to immoral behaviors [7]. By combining Islamic teachings with technical advancements, Muslims can properly leverage the capabilities of ICT, ensuring that innovation serves humanity while maintaining moral and ethical standards. This method promotes collaboration, proficiency and specialization, allowing society to evolve in a technologically sophisticated yet spiritually oriented manner [8].

B. Islamization of technology

The Islamization of technology signifies the integration of Islamic principles, ethics and values into the development, application and adoption of modern technological advancement. It emphasizes that technological improvements must not only facilitate economic and industrial development but also correspond with ethical, social and spiritual welfare [9]. It is rooted in the Holy Qur'an and Sunnah of Prophet Muhammad ﷺ which aims to promote the responsible, ethical and beneficial use of technology for the progress of mankind. In ICT, the Islamization of technology means developing digital platforms, media and computer systems which follows Islamic ethical values, promote essential knowledge and prevent harmful or immoral uses [10]. This methodology promotes innovation among Muslim scholars, engineers and legislators while preserving a harmony between scientific advancement and Islamic principles to make sure that the technology positively impacts both this world and the hereafter [11].

C. Navigating diversity among Islamic Legal Schools of scholarship for ICT integration

The four major Sunni legal schools i.e. *Hanafi*, *Maliki*, *Shafi'i* and *Hanbali*, differ in their methodologies for deriving Islamic law which can lead to diverse opinions on contemporary issues including related to technology and ICT. These differences originate from their diverse significance on sources of law and interpretative principles. The *Hanafi* school emphasizes analogical reasoning (*qiyas*) along with juristic preference (*istihsan*) when direct evidence is unavailable. It's adoption towards technology generally seen as most flexible and rational which allows for contextual and responsive application of law to changing items. Similarly, this flexibility can lead to more accommodating rulings on new technologies and digital practices if they align with Islamic ethical principles and do not involve prohibited elements. Similarly, the *Maliki* school places significant emphasis on the practices of Medina Munawara (*Amal-Ahl-al-Medina*) by considering them a strong reflection of the Sunnah of Prophet ﷺ with Qur'an, Sunnah and Consensus (*ijma*). It's approach towards technology tends to be more conservative in some respects due to its reliance on the established practices of early Muslim community of Medina. However, there are allowable independent interpretation (*ijtihad*) to address new legal issues and rulings on technology which might be considered for its societal impacts and align with established communal norms in a better way.

The *Shafi'i* school is known for its systematic and rigorous approach to jurisprudence by combining a textual approach with rational analysis. It prioritizes the Qur'an followed by the Sunnah of Prophet ﷺ, Consensus (*ijma*) and analogical reasoning (*qiyas*). It aims to balance textual evidence with rational deduction which can lead to detailed rulings by carefully weight scriptural directives with practical realities and can benefit technological advancement seeking to establish clear legal precedents. Lastly, the *Hanbali* school is known as the most textualist and strict school emphasizing the Qur'an and Hadith as primary sources and tends to be skeptical on the extensive use of juristic analogical reasoning. It is often considered more conservative due to its literal interpretation which can lead to more cautious or restrictive rulings on technologies. It might not address those technological applications or interpretation not explicitly found in Islamic foundational texts thus prioritizing adherence to clear scriptural injunctions and avoid speculative interpretations.

II. LITERATURE REVIEW

The Islamization of technology is a developing academic subject which examines how technology can be integrated with Islamic ethics, beliefs, and philosophy for the advancement in technology [12]. This notion is fundamentally grounded in the Islamic epistemological framework, which emphasizes on the equilibrium between revealed knowledge (*Naqli*) from the Holy Qur'an and Sunnah of Prophet Muhammad ﷺ, the rational knowledge (*Aqli*) obtained via scientific investigation. The academics contend that technology must not operate in a moral void but should be compatible with Islamic principles to ensure its appropriate advancement and utilization for mankind [13].

A. The role of knowledge in Islam and its ethical application

The Holy Qur'an emphasize the significance of knowledge (*Il'm*) as the cornerstone of human advancement. The first revelation of the Holy Qur'an commences with the directive

"Read with the name of your Lord who created (everything)"[1], highlighted the significance of knowledge acquisition. Similarly, Islam promotes scientific research, innovation and discovery, if they are morally directed and enhance the welfare of humanity. The great scholars including, Al-Ghazali (11th century) and Ibn Khaldun (14th century) emphasize the significance of ethical reasoning (*ijtihad*) and consensus (*ijma*) in the development of science and technology while upholding Islamic moral principles. Also, many contemporary scholars including, Ziauddin Sardar (1985) and Seyyed Hossein Nasr (1996) emphasize that the pursuit of knowledge which encourages scientific and technological progress should be manage with responsibility and intent. They assert that technological advancements when misapplied might result in issues in ethics, exploitation and adverse societal repercussions including economic inequality, disintegration of cultural identity and moral degradation [14]. Similarly, the Islamization of Technology aims to ensure that scientific progress fosters social justice, ethical purity and spiritual wellness for human beings.

B. The intersection of technology and Islamic principles

The massive progress in ICT has intensified discourse on Islamic digital ethics. The researchers assert that ICT needs to be developed in a manner which facilitates access to Islamic education through digital platforms, e-learning and mobile applications [15]. Also, it advocates for the truthfulness of digital information and rejects disinformation in the digital realm. The facilitation of online ethical engagements should be consistent with Islamic principles of integrity, respect and modesty [16]. The compliance towards Islamic financial principles is essential which provides equitable and ethical business transactions in the digital economy. The *Maqasid al-Shari'ah* establishes a framework for assessing whether technology contributes to the sustenance of individuals Faith (*Deen*), Life (*Nafs*), Intellect (*'Aql*), Lineage (*Nasl*), and Wealth (*Maal*) [17]. This principle asserts that technology must be developed and utilized to preserve human dignity, promote social welfare and ensure social justice.

III. ETHICAL FRAMEWORK FOR ISLAMIZATION OF ICT

The Islamization of ICT is governed by core concepts which ensure advancement in technology is consistent with Islamic values and moral principles. The primary concept of *Shari'ah* Compliance requires that all technological developments must conform to Islamic teachings, avoiding content or applications that violate moral and ethical standards [18]. Secondly, purposeful innovation asserts that technology should be produced with a definitive aim to enhance knowledge, ethical conduct and societal welfare.

The community involvement highlights the importance of teamwork between Islamic scholars and ICT experts. This helps make sure that technological advances meet the needs of Muslim communities and follow Islamic teachings [19]. Similarly, the Islamization of ICT can be executed through diverse practical applications including Islamic educational platforms which can offer online resources for The Holy Qur'an, Sunnah of Prophet Muhammad ﷺ and Islamic Law to keep Islamic education accessible to worldwide, digital *Da'wah* initiatives to develop social media campaigns and online outreach programs serve to promote Islamic ethical values and avoid disinformation. The Halal e-commerce platforms facilitate ethical business transactions by endorsing fair trade, transparency and interest-free financial services. Also, the AI and machine learning-driven content moderation tools can effectively filter vulnerable content, safeguarding users from exposure to improper or misleading information. The Islamization of ICT aims to create a modern and ethical digital environment for Muslim communities by using practical technology solutions.

A. Islamic Epistemology: Technology and Maqasid al-Shari'ah

The Islamic teachings emphasize on the ethical use of technology to assure it aligns with the moral and spiritual values of Islam. The Islamic epistemology encourages to seek knowledge which can strengthen belief in Allah ﷻ and can benefit human beings. The *Maqasid al-Shari'ah* or the Objectives of Islamic law defines an ethical use of technology, provides a framework for the ethical and responsible use of engineering and technology [20].

1) Faith (Deen): The development and use of technology should maintain and improve spiritual values and practices to ensure that technology should support spiritual practices and values. For example, the ICT can improve Islamic education by providing access to resources for Qur'an learning platforms, prayer time apps and online communities for spiritual discussions. The digital applications which promote Islamic values while upholding ethical guidelines to ensure that it strengthen the faith of people instead of distraction.

2) Life (Nafs): The development of technology should prioritize the protection of human life by improving the well-being of the people. The innovations in healthcare, cybersecurity, medicine, disaster management etc., can contribute significant progress in this goal to improve the safety, health and living of all human beings. For example, the AI-driven disease detection, health monitoring devices and emergency response system can give significant assistance to protect and improve human life.

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[1] Surah Al-Alaq (96: 1-5)

3) Intellect ('Aql): The development in ICT should promote intellectual development by spreading knowledge and information which transforms human life and has a positive impact on society. Similarly, it should avoid misinformation, encourage critical thinking and integrate Islamic ethics into educational structure. The online learning resources should be based on Islamic teachings to provide a balanced and moral education which helps the students to improve their faith in Allah ﷻ and can support to live their life based on Islamic Shari'ah.

4) Lineage (Nasl): Technological developments should protect family and social structure which include content moderation on digital and social media spectrum to prevent the spread of harmful information. The media platforms which promote ethical engagements and provide tools to strengthen human values by encouraging positive relationships and responsibilities, discourages activities which are against Islamic teachings.

5) Wealth (Mal): The ICT development should support ethical distribution of wealth to promote ecommerce and ethical business practices supporting transparent financial transactions. The blockchain, digital banking and Fintech should ensure fairness and accountability in financial transactions to avoid *riba'* (Usury), uncertainty and gambling in accordance with the Islamic teachings.

B. Methodology

This study develops a methodology to examine the integration of Islamic ethics into ICT. The method focuses on looking at Islamic moral principles and finding the best ways to adapt it in compliance with Islamic principles. This study integrates the thematic analysis of The Holy Qur'anic verses and Sunnah of Prophet Muhammad ﷺ with practical case studies to offer comprehensive knowledge of how Islamic principles can inform the ethical creation and deployment of technology. This methodology ensures the alignment of both technological foundations and functional uses of ICT with Islamic ethical principles. Similarly, the first step involves looking closely at Qur'anic texts and Hadiths to identify basic moral ideas related to ICT.

The proposed study describes a persistent theme which includes justice, accountability, privacy and the ethical distribution of knowledge. The contemporary ICT practices use contextual interpretation to ensure transparency in AI systems, promote ethical content regulation and uphold digital privacy. The Holy Qur'an mentioned caution against espionage and disseminating misinformation by saying *"O you who believe, abstain from many of the suspicions. Some suspicions are sins. And do not be curious (to find out faults of*

others), and do not backbite one another. Does one of you like that he eats the flesh of his dead brother? You would abhor it. And fear Allah. Surely Allah is Most-Relenting, Very-Merciful.*"* [2], which is directly relevant to data privacy and ethical media practices. Also, advocating for the pursuit of beneficial knowledge by the Hadith of Allah's Messenger ﷺ said, *"Seeking knowledge is a duty upon every Muslim, and he who imparts knowledge to those who do not deserve it, is like one who puts a necklace of jewels, pearls and gold around the neck of swines."* [3] endorsing the advancement of Islamic educational platforms and AI-driven ethical tools. This stage creates a strong ethical guide for integrating Islamic values into technology [21]. It connects key ideas with important areas of ICT such as AI ethics, cybersecurity, digital content regulation and moderation.

The second part involves looking at case studies of successful Islamic ICT platforms to see how well they work and what challenges they face. The platforms such as Muslim Pro [4], which incorporate prayer times, The Holy Qur'anic recitations, and Islamic content while ensuring a user-friendly and ethical design analysed for best practices. Similarly, the *Zakat* calculators help Muslims accurately figure out how much they should give to charity based on Islamic guidelines, showing how useful technology can be for doing the right thing. Also, the Halal e-commerce platforms ensure adherence to Islamic business principles via interest-free transactions, Halal certifications, and ethical consumer practices. Additionally, the case study findings show helpful ways to combine Islamic values with technology development, as well as challenges in creating designs that focus on user needs and ethics. These findings will help make future suggestions, including developing AI tools for fair content moderation and creating Islamic finance products which follows Shariah-compliant digital ethics.

1) Sources of Data

An effective way to gather information is important to make sure this study is based on fundamental Islamic principles and includes essential ideas from ICT experts. The main sources of information are The Holy Qur'an, Sunnah of Prophet Muhammad ﷺ, *ijma* and *qiyas* which provides an Islamic foundation for ethical practices in ICT. The Qur'anic verses can be examined to identify fundamental concepts concerning truth, justice, and damage prevention, as mentioned in Holy Qur'an which says: *"And say, 'Truth has come and falsehood has vanished. Falsehood is surely bound to vanish.'"* [5] and in another verse which says *"When Mūsā sought water for his people, We said, 'Strike the rock with your staff,' And twelve springs gushed forth from it. Each*

group of people came to know their drinking place. *'Eat and drink of what Allah has provided, and do not go about the earth spreading disorder'"* [6]. Similarly, the Islamic principles on business ethics, such as banning deception in trade as Allah's Messenger ﷺ said *"The seller and the buyer have the right to keep or return goods as long as they have not parted or till they part; and if both the parties spoke the truth and described the defects and qualities (of the goods), then they would be blessed in their transaction, and if they told lies or hid something, then the blessings of their transaction would be lost."* [7], will support the development of financial and business technologies which follow *Shari'ah.*

Also, the *ijma* refers to the unanimous consensus of Muslim scholars (*mujtahids*) on a particular legal issue in a specific era after Prophet Muhammad ﷺ. It is considered a strong source because it signifies a collective agreement based on thorough scholarly thinking [22]. When a clear consensus is reached by qualified Islamic scholars on a particular matter then it becomes binding for subsequent generations. However, attaining absolute *ijma* in complex modern issues can be challenging due to the intellectual diversity and scholarly opinions in the Muslim world. The *qiyas* is a method of deriving a legal ruling for a new issue by drawing an analogy from a similar issue that already has an established ruling in the Qur'an or Sunnah. It involves identifying a common effective cause (*illah*) between the two issues [23]. It is crucial for addressing contemporary issues that did not exist during the time of the Prophet Muhammad ﷺ. Also, this study can be used with thematic analysis of these scriptures to guarantee that ICT frameworks conform to Islamic moral standards directing the ethical design and deployment of digital instruments. Additionally, it can be used to conduct a comprehensive evaluation of current Islamic digital platforms to determine their conformity with Islamic ethical principles and user requirements. This entails assessing Qur'anic applications for content authenticity, user-friendliness and its compliance with Islamic principles. Considering a look at halal investment platforms to see if they follow *Shari'ah* guidelines including avoiding interest and making ethical investments. The Islamic educational platforms can be evaluated to determine their efficacy in integrating Islamic teachings with contemporary pedagogical approaches, facilitating effective digital learning for Muslim students.

2) *Practical Implementation*

The existing discourse on the Islamization of technology often proposed compelling ethical frameworks and philosophical understandings. However, a significant gap exists in translating these high-level principles into tangible

ICT tools, algorithms and software architectures. The vision for ethically aligned digital platforms is clear while the practical aspect remains largely unexplored. A comprehensive analysis requires delve into the specific technical components which is necessary to build, operate and maintain systems that genuinely integrate Islamic values moving beyond theoretical approach to actionable implementation strategies [24]. The type and nature of ICT tools essential to integrate Islamic ethics involves analyzing how existing technologies might be adapted or new ones can be developed. For example, a secure communication tools is a need to have a robust encryption and authentication mechanisms to uphold Islamic principles of privacy and trust potentially leveraging decentralized architectures to minimize single points of data failure or compromise. Similarly, platforms for Islamic education or community engagement can integrate open-source learning management systems (LMS), customized to filter content based on consensus from Islamic scholars and promote collaborative knowledge-seeking [25].

A detail analysis of algorithms is crucial to integrate Islamic ethical principles into it such as justice, fairness, and truthfulness which must be embedded directly into the programmable logic that drives digital systems. It means that the analysis on how algorithms for content moderation can be designed to identify and filter misinformation or harmful narratives based on Islamic ethical guidelines rather than entirely on secular metrics [26]. In Islamic finance technology (fintech), the algorithms for transaction processing will need to rigorously enforce *Shari'ah* compliance to ensure the absence of interest (*riba'*), excessive uncertainty (*gharar*), and speculative practices (*maysir*) potentially through smart contracts on blockchain. Moreover, the software architectures need to be built upon Islamic ethical requirements such as, advocating for privacy-by-design principles where data minimization and user control are built into the system from the ground up. Also, the architectures can prioritize transparency and auditability to allow for external verification of compliance with Islamic principles. The decentralized autonomous organizations (DAOs) can be explored for their potential to develop community governance and accountability aligned with Islamic principles of collective responsibility and consultative decision-making (*shura*)

3) *Feasibility and Challenges*

To effectively address the feasibility and challenges of Islamization of technology, a critical challenge is the cost associated with developing and maintaining such platforms. Different from mainstream technologies which can benefit

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[6] Surah Al-Baqarah (2: 60)
[7] Sahih Bukhari, Vol. 3, Book 34, Hadith 293

from large markets and economies of scale however, solutions-based on Islamic ethical principles often faced challenges requiring significant initial investment without immediate guarantees of its immediate adoption. The development process might involve specialized *Shari'ah* auditing and compliance checks which can incur additional expenses. Also, the sustainable funding models including *Waqf*-based financing, community crowdfunding or ethical venture capital should be explored as potential solutions to mitigate these financial barriers and to ensure long-term viability.

Similarly, the lack of talent pool equipped with technical skills combined with Islamic knowledge poses significant challenges. There is a limited pool of professionals who possess both deep expertise in advanced ICT e.g., AI, blockchain, cybersecurity and good understanding of Islamic jurisprudence and ethics. This dual competency is vital for designing systems which genuinely integrate Islamic principles into their core architecture and functionality [27]. It can be mitigated to adopt strategies to cultivate this talent such as interdisciplinary academic programs, specialized training initiatives and collaborative platforms which bring together Islamic scholars and technology experts. Also, interoperability with global systems presents a complex set of challenges. It often needs to interact seamlessly with a global digital infrastructure which is largely built on secular legal and ethical frameworks. This includes data exchange protocols, payment gateways and communication standards which will be compatible with current standards while simultaneously upholding Islamic principles specifically concerning data privacy, user consent and ethical data monetization [28]. Developing open standards for data governance based on Islamic ethical principles and advocating for ethical tech policies that recognize Islamic values to ensure these platforms can function effectively without compromising their core Islamic identity.

C. Target Audience

The proposed study aims to serve to two primary audiences i.e. ICT practitioners and developers and Islamic scholars. The ICT practitioners and developers can translate Islamic ethical principles into practical implications for system design, algorithms and software architecture by providing actionable insights rather than purely theoretical concepts. For Islamic scholars, the study demonstrates a solid foundation towards contemporary technological challenges and present potential applications of traditional ethical frameworks to modern technological challenges to encourage further academic discourse. The clear articulation of this dual focus can maintain a balanced perspective, offering both a conceptual framework for

scholars and practical guidance for those involved in technology development. The implementation of these ideas will enable the development of ICT to connect more closely with Islamic values to ensure that technology serves mankind in an ethical and responsible manner.

D. Case Studies

The concept of Islamization of Technology has moved beyond theoretical discussions into tangible and successful applications across various sectors. Many case studies have demonstrated effective integration of Islamic principles into modern digital solutions particularly in finance, investment, education and lifestyle domains. These initiatives showcase how technology can be harnessed to uphold ethical standards, enhance social welfare and facilitate religious practice in a contemporary context, proving the viability and impact of this evolving field.

1) Islamic Banking Platforms

The Meezan Bank [8] is Pakistan's premier Islamic bank and a leading example of the Islamization of finance through digital platform. It is established as a full-fledged Islamic commercial bank in 2002 and has been at the forefront of developing *Shari'ah* compliant financial products and services. It's digital transformation efforts include offering internet banking, mobile banking apps and leveraging technology to facilitate interest-free (*riba'*-free) transactions based on Islamic modes of finance such as *Murabaha* (cost-plus financing), *ijarah* (leasing) and *Musharakah* (partnership financing). The bank emphasizes transparent operations and rigorous *Shari'ah* supervision to ensure all digital offerings align with Islamic ethical standards making Islamic banking accessible to a wider population through modern digital channels. It was also one of the first banks globally to use biometric technology in its ATMs to improve security and user experience [29]. Similarly, the Islami Bank Bangladesh Limited (IBBL) [9] holds the distinction of being the first Islamic bank in Bangladesh which was established in 1983. It has played an important role in popularizing *Shari'ah* compliant banking in the country leading to the establishment of several other Islamic banks. IBBL offers a full range of commercial banking services which include deposits, investments and foreign exchange, all compliant strictly to *Shari'ah* principles. The bank has progressively adopted digital technologies including mobile banking, internet banking and digital wallets to enhance financial inclusion and service delivery in both urban and rural areas. The IBBL success lies not only in mobilizing deposits from segments previously avoids engaging with interest-based banks but also demonstrates the viability and effectiveness of Islamic banking products

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[8] Meezan Bank (www.meezanbank.com)

[9] IBBL (www.islamibankbd.com)

through widespread acceptance along with the introduction of various social welfare-based investment schemes [30]. Also, it has been active in forming associations for Islamic banks and foundations for social welfare activities showcasing a comprehensive approach to Islamic financial principles.

Moreover, the Bank Islam Malaysia Berhad [10] which was established in 1983 as Malaysia's first Islamic bank has significantly integrate technology to improve its *Shari'ah*-compliant offerings. The bank is actively developing a 100% digital bank proposition through its Centre of Digital Experience (CDX), leveraging next-generation technologies such as Cloud-Native Digital Banking and Electronic Know Your Customer (eKYC) which aims to provide branchless banking for greater accessibility. It has partnered with technology firms such as Mambu (SaaS banking platform) and Experian (eKYC) to configure *Shari'ah*-compliant products and enable seamless account opening *[31]*. Also, the bank is developing alternative credit scoring models in collaboration with fintech players e.g. Pod, specifically targeting less served segments such as gig workers, to promote financial inclusion guided by Islamic principles of fairness and risk-sharing.

2) Islamic Fintech and Investment Platforms

The Zoya [11] and Musaffa [12] are prominent case studies of applications which facilitate *Shari'ah*-compliant investing platforms. Both platforms utilize technology to help Muslim investors identify and manage portfolios that compliant to Islamic financial ethical standards based on AAOIFI [13] screening methodology. They offer features such as Halal stock screening to automate screening of thousands of global stocks, ETFs and mutual funds for *Shari'ah* compliance excluding companies involved in prohibited activities e.g., alcohol, gambling, interest-based finance and those with excessive debt. Similarly, it also includes Portfolio tracking and alerts for users to sync their brokerage accounts to track their holdings and receive alerts if any assets fall out of compliance, Zakat calculation and purification tools to automatically calculate Zakat due on investments and provide mechanisms for purifying non-halal earnings and Market insights which provides expert recommendations and alternative halal stock suggestions. These apps empower Muslim investors to make informed decisions aligned with their faith, leveraging AI and data analytics to simplify complex Shari'ah compliance processes.

3) Islamic Knowledge Platforms

The Islam360 [14] positions itself as a comprehensive digital encyclopedia and search engine for Islamic knowledge. With around millions of downloads, it provides users with a one-stop solution for accessing the Holy Qur'an with multiple translations and Tafseer (exegesis), a vast collection of authentic Hadiths, prayer times, Qibla direction, daily duas and more. The app centralizes religious texts and resources making it incredibly accessible for Muslims worldwide to learn, research and practice their faith in the digital age. Its success lies in digitizing and organizing extensive Islamic knowledge for quick and easy retrieval. Similarly, the Tarteel [15] is an innovative AI-powered app designed to help Muslims memorize, recite and interact with the Qur'an. It uses advanced speech recognition technology to listen to user's recitations and provide real-time feedback, highlighting missed or incorrect words. The key features it includes the real-time error detection by notifying users instantly on the mistakes in Qur'an recitation, Memorization mode to hides unrecited words to aid memorization, Voice search which allows users to search for verses by reciting them and adaptive mode to customize Qur'an display for easier tracking, understanding and memorization with options for text size, layout and translations. The Tarteel app showcase on how AI can be directly applied to facilitate religious practice and learning, making Qur'anic study more interactive and effective

4) Islamic Lifestyle Applications

The Muslim Pro [16] is one of the most popular Islamic lifestyle apps offering a wide range of features including accurate prayer times, Azan notifications, the complete Holy Qur'an with audio recitations and translations, a Qibla finder, daily duas and a mosque/Halal food finder. Its success lies in being a comprehensive digital companion for daily Muslim life. Similarly, the Qalbox [17] is an integral streaming service within the Muslim Pro app which offers a Muslim-friendly video-on-demand content. It provides a curated library of films, TV series, documentaries and kid's content which aligns with Islamic values and celebrates Muslim identities and cultures. It has addressed the need for comprehensive and *Shari'ah*-compliant entertainment to ensure contents compliant with Islamic ethical standards regarding modesty, themes and messaging into digital entertainment. Moreover, Hidayah [18] is an all-in-one Islamic application designed to be a daily Muslim companion which integrates many features to aid spiritual practice and learning. Its success lies in providing a clean, user-friendly interface which offers complete Qur'an with multiple translations e.g., Urdu,

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[10] BIMB (www.bankislam.com)
[11] Zoya (www.zoya.finance)
[12] Musaffa (www.musaffa.com)
[13] AAOIFI (www.aaoifi.com)
[14] Islam360 (www.theislam360.com)
[15] Tarteel (www.tarteel.ai)
[16] Muslim Pro (www.muslimpro.com)
[17] Qalbox (www.app.muslimpro.com)
[18] Hidayah (www.hidayahapp.com)

English and audio recitations by renowned *Qari's*, allowing offline access; Prayer times and *Qibla* finder for accurate prayer timings based on location and an offline Qibla compass; *Istiqamah* Tracker which is a unique feature to monitor daily *ibadah* (worship) progress and maintain consistency in spiritual routines covering obligatory prayers and sunnah acts; AI Islamic Assistant which an AI-powered chatbot that provides instant guidance on Qur'an, Hadith, prayers, Ramadan and other Islamic queries; *Dua* and *Azkar* collection for authentic supplications for various occasions and social media and content sharing offering a halal social media space where Muslims can connect, share posts and engage in discussions within a religiously permissible environment free from haram content. It exemplifies the Islamization of technology by centralizing essential Islamic tools and knowledge, leveraging AI for interactive learning and creating a digital space conducive to spiritual growth.

IV. Discussions

A. Qur'anic Guidance for ICT Integration

The Holy Qur'an emphasizes the importance of truth and knowledge, encouraging the duty of individuals and institutions to promote accurate and beneficial information. According to The Holy Qur'an which says, *"and do not confound truth with falsehood, and do not hide the truth when you know (it)"*[19] This verse emphasizes the importance of transparency and truthfulness in disseminating information. This encourages to develop digital platforms which promote Islamic wisdom, credible research and ethical knowledge distribution. Similarly, technologies including, Islamic e-learning platforms, AI-enhanced Qur'anic studies and authenticated Islamic material repositories can guarantee that users obtain precise and valuable information which mitigates disinformation and fostering intellectual and spiritual development.

A major principle taken from The Holy Qur'an is ethical communication which is essential in the digital age. The Holy Qur'an says, *"O you who believe, fear Allah, and speak in straightforward words."* [20] This directive emphasizes the necessity of honesty, respect and equity in all modes of communication especially on social media and digital platforms. To follow this recommendation, ICT systems should have rules that control inappropriate content, help find false information using AI and promote positive discussions. Promoting digital etiquette grounded on Islamic principles can alleviate problems such as cyberbullying, online harassment and misinformation,

ensuring that ICT platforms cultivate constructive and significant dialogue.

The Holy Qur'an offers counsel on privacy and security, which are essential issues in contemporary ICT. The Holy Qur'an says, *"O you who believe, abstain from many of the suspicions. Some suspicions are sins. And do not be curious (to find out faults of others), and do not backbite one another. Does one of you like that he eats the flesh of his dead brother? You would abhor it. And fear Allah. Surely Allah is Most-Relenting, Very-Merciful."*[21] emphasizing the significance of honouring personal privacy and protecting information. This principle is directly relevant to ICT, highlighting the necessity for secure data storage, ethical surveillance techniques and user protection mechanisms. Developers need to make sure that privacy-focused policies are included in digital tools. This means using strong encryption, monitoring AI responsibly, and ensuring safe online banking. Complying with these standards not only maintains Islamic ethics but also fosters trust in technology by safeguarding user information from unwanted access and exploitation.

B. Guidance from Sunnah for ICT Integration

The Sunnah of Prophet Muhammad ﷺ offers further insights on ethical ICT practices especially about moderation, responsibility and purposeful innovation. Allah's Messenger ﷺ said, *"'Be moderate and adhere to moderation, for there is no one among you who will be saved by his deeds.' They said: 'Not even you, O Messenger of Allah?' He said: 'Not even me. Unless Allah encompasses me with mercy and grace from Him'"*[22] which emphasizes the need to have balance in life and avoid excessive dependence on technology. Although ICT provides various advantages, excessive screen time and unregulated digital interaction might divert attention from spiritual and social obligations. Therefore, ICT should be designed to support helpful digital habits. This includes features to manage screen time, reminders for prayer and reading The Holy Qur'an, and AI tools that promote healthy use of technology.

The Allah's Messenger ﷺ emphasized the importance of responsibility and accountability in every facet of life, it is stated, *"Surely! Everyone of you is a guardian and is responsible for his charges: The Imam (ruler) of the people is a guardian and is responsible for his subjects; a man is the guardian of his family (household) and is responsible for his subjects; a woman is the guardian of her husband's home and of his children and is responsible for them; and the slave of a man is a guardian of his master's property and is responsible for it. Surely, everyone of you is a guardian and responsible for his charges."* [23]. This emphasizes the ethical obligation of

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[19] Surah Al-Baqarah (2: 42)
[20] Surah Al-Ahzab (33: 70)
[21] Surah Al-Hujurat (49: 12)

[22] Sunan Ibn Majah, Vol. 5, Book 37, Hadith 4201
[23] Sahih al-Bukhari, Vol. 9, Book 89, Hadith 252

technology developers, content creators and users to ensure that ICT tools are utilized responsibly and morally. Developers must stress Islamic ethical principles in application design while consumers should interact with digital content judiciously keeping away from harmful or false information. Regulations, including Islamic digital ethics policies and AI-based compliance monitoring can ensure that ICT adheres to Islamic moral values. Also, the purposeful invention becomes a fundamental Islamic concept, as Allah's Messenger ﷺ said, *"A believer is someone who loves and is loved. There is no goodness in one who does not love and is not loved. And the best of people are those who are most beneficial to others."* [24] . This emphasizes the significance of developing technology that benefits humanity. This means making Islamic apps to benefit humanity in any form in line with *Shari'ah* such as Islamic financial apps, AI tools for Zakat and charity, online mental health support based on Islamic values, ethical e-commerce etc. to focus on social benefits. The Islamization of ICT can make sure that technology helps bring about positive change, promoting fairness, ethical growth and lasting development in Muslim communities.

V. CHALLENGES AND RECOMMENDATIONS

A. Challenges

1) Secular dominance in technological advancement

A primary challenge in the Islamization of ICT is the pervasive secular dominance in technological advancement. Numerous technological breakthroughs arise from frameworks which lacks the integration of Islamic values, leading to ethical dilemmas which contradicts Islamic ethical guidelines. This results into different challenges including data privacy concerns by numerous digital platforms which consume financial gains at the expense of user privacy particularly disregarding Islamic ethical guidelines for the protection of personal information and ethical data utilization; the content moderation systems and algorithm which endorses materialistic values, immoral conduct and improper content which contravenes Islamic ethical principles and the technologies such as artificial intelligence (AI), big data analytics and social media which misuses and disseminate misinformation to promote exploitation or discrimination contrary to Islamic principles of justice and ethical behavior. Therefore, to have effective Islamization of ICT, it is essential to contest the dominant secular paradigm by adopting Islamic ethical philosophy into digital platforms and daily practice to develop a newer technology paradigm.

2) Lack of awareness and insufficient resources

Another notable difficulty is the insufficient awareness and limited resources allocated to the advancement of Islamization of ICT. While ethical aspects in technology are increasingly recognized worldwide, the integration of Islamic ethics into technical solutions is yet at its early stages. The primary challenges consist of insufficient Islamic knowledge in technology where numerous technology experts are unacquainted with Islamic principles while many Islamic scholars possess limited technical proficiency. This results in a disconnect in creating ethical oriented technological solutions. Similarly, the inadequate investment and limited financial and institutional backing for Islamization of ICT initiatives possess a significant challenge. The dedicated financial support is required and essential to facilitate research, innovation and the advancement of Islamic digital solution. Also, a limited number of academic programs or training efforts integrated with Islamic ethics with technical studies leading resolve to a knowledge gap obstructs the successful Islamization of ICT. There is a need to resolve these difficulties necessitates focused initiatives to connect Islamic ethics with technological progress.

B. Recommendation

1) Developing cooperation between Islamic scholars and technology experts

There is a need to address the difficulties to promote collaboration between Islamic scholars and technology experts. This interdisciplinary approach ensures that technical progress should be consistent with Islamic ethics. These potential efficient methodologies include collaborative research initiatives to form academic partnerships between Islamic education institutes and technology specialists to develop ethical digital tools and frameworks which comply with Islamic ethics. Similarly, conducting workshops and seminars enables cooperation through educational events to unite scholars and technology experts to have understanding and consensus on Islamization of ICT. It can address subjects such as AI ethics, data privacy in Islam and the development of Halal technology. The advancement into interdisciplinary education to develop academic programs to integrate Islamic studies with ICT training to educate future professionals with both Islamic and technical proficiency simultaneously. The facilitation of these partnerships can render the integration of Islamic ethics into technological development in a more systematic and effective way to bring positive prospects to many users.

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[24] Al Mu'jamul Awsat, Hadith: 5783, Shu'abul Iman, Hadith: 7252

2) Promote awareness and establish Islamic tech hubs

To facilitate extensive acceptance and endorsement of Islamization, better awareness and dedicated resources are required. This can be achieved by public awareness campaigns initiatives to promote campaigns which emphasizes on the importance of Islamization of technology and its advantages for Muslim communities. Similarly, the community engagement and collaboration efforts with Masjid, Islamic groups and educational institutions to advance the development and implementation of ethical digital solutions. Also, to showcase success stories which emphasize successful Islamization of ICT efforts to motivate developers and promote extensive adoption among users. Furthermore, the establishment of Islamic technology centers can furnish essential infrastructure for research, development and innovation in Islamization of ICT. These centers can contribute to the following potential objectives including, the allocation of financial support and resources to extend monetary assistance, guidance and technical resources to innovators developing Islamic technology solution, to promote ethical innovation for advocating the development of digital tools compliant with Islamic ethics to tackle modern technical difficulties while preserving Islamic integrity and to establish strategic alliances and partnership with prominent technology companies, academic institutions and Islamic groups to expand successful initiatives and improve access to Islamically-aligned ICT solutions.

VI. CONCLUSION

The integration of Islamic ethical principles into ICT offers a considerable opportunity as well as a challenge. Islamization of technology is crucial to ensure that digital tools and platforms conform to Islamic ethics, values and has a good impact on the society. The Holy Qur'an and Sunnah of Prophet Muhammad ﷺ offers explicit guidance on the clear pursuit of knowledge and the enhancement of societal welfare e.g., principles which can be applied to ICT. This study has analyzed the primary difficulties in the Islamization of technology, notably the prevalence of secular paradigms in technical advancement and a lack of resources for Islamic ICT efforts. Moreover, it emphasizes on the necessity of promoting collaboration between Islamic academics and technology specialists, to improve awareness among the Muslim community regarding Islamization of ICT and creating specialized Islamic technology centers. The proposed ethical framework introduces an implementation strategy which can align with the technology landscape within the purpose of Maqasid al-Shari'ah which is a paramount goal of Islamic law aimed at safeguarding faith, life, intellect, lineage, and wealth.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORS CONTRIBUTION STATEMENT

All authors contributed equally to this work.

DATA AVAILABILITY STATEMENT

There is no external or third-party data that support the findings of this study.

ETHICS STATEMENT

This study did not require ethical approval

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