



Impacts of the Fourth Industrial Revolution on Muslim Marital Life

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Abstract

The Fourth Industrial Revolution (4IR) which is referred to as the rapid integration of advanced technologies such as artificial intelligence, automation, renewable energy systems, big data, and digital communication tools, was formally identified in 2016. Although many of these technologies have been in existence before 2016, their accelerated convergence in recent years has transformed global societies at an unprecedented pace, influencing various aspects of human life, including the marital relationships of Muslims. The 4IR presents significant opportunities for Muslim couples. It offers enhanced access to formal and informal education, flexible work arrangements, improved healthcare, and more efficient communication technologies, all of which can contribute to stronger marriages and better mutual understanding. These advancements are particularly beneficial for Muslim women who often juggle domestic responsibilities alongside personal or professional development. However, the 4IR also introduces challenges, such as digital addiction, increased exposure to misleading information, shifts in gender expectations, reduced face-to-face interaction, and potential threats to family cohesion. These concerns raise important questions about how Muslim families can maintain Islamic marital values within a rapidly evolving technological landscape. This paper explores both the positive and negative impacts of the Fourth Industrial Revolution on Muslim marital life. It examines these dynamics through the lens of Islamic principles such as justice, compassion, mutual responsibility, and the preservation of family harmony. Ultimately, the study aims to deepen understanding of the interplay between technology, marriage, and faith, and to offer guidance for Muslim couples seeking to navigate the complexities of the 4IR in a manner consistent with Islamic teachings.

Introduction

The Fourth Industrial Revolution (4IR) has transformed global life, and Muslim marital relationships are not exempt from its effects. Islam upholds marriage as an act of worship and a legitimate means for reproduction, companionship, and emotional fulfilment. As the foundational unit of society, the family embodies love, care, and mutual responsibility—values increasingly shaped by technological changes. Understanding these effects through Islamic teachings is essential. This paper examines how 4IR influences Muslim marital life, outlining opportunities, challenges, and guidance for nurturing peaceful and spiritually rewarding marriages in line with Islamic principles.



Overview of the Fourth Industrial Revolution

The Fourth Industrial Revolution represents a sweeping transformation that reshapes how people live, work, and interact. Its driving force is the convergence of innovations across digital, biological, and physical spheres. These key technologies, artificial intelligence (AI), the Internet of Things (IoT), robotics, blockchain, and biotechnology, are rapidly evolving and integrating in ways that redefine industries and daily life (Ross & Maynard, 2021). AI enhances human capability through decision-making and task automation, increasing efficiency and productivity. IoT connects physical objects to digital networks, enabling remote monitoring and seamless data exchange, resulting in smart homes, cities, and industries (Varriale et al., 2023). Robotics streamlines complex or hazardous tasks with precision, while blockchain provides secure and decentralized systems that transform finance, supply chains, and data protection. Biotechnology continues to advance rapidly, offering breakthroughs in genetics, tissue engineering, and synthetic biology that influence healthcare, agriculture, and environmental sustainability. Together, these technologies blur boundaries between digital, biological, and physical realities, creating vast opportunities and new challenges (Schwab, 2017).

Muslim marital relationships, rooted in Islamic teachings and cultural traditions, are deeply affected by this global transformation. Marriage in Islam is not merely a social arrangement but a sacred covenant grounded in compassion, respect, and cooperation. The Qur'an and *Sunnah* (prophetic tradition) outline marital rights, responsibilities, and ethical conduct to promote harmony and stability (Ali, 1983; Esposito, 2016). These longstanding principles face reinterpretation as societal expectations shift. Factors such as globalisation, Western cultural influence, women's increasing access to education and employment, and exposure to diverse ideas through digital platforms contribute to evolving marital norms.

Technology accelerates access to alternative perspectives on gender roles, shared responsibilities, and family structures. It exposes Muslim couples to discussions about financial independence, collaborative decision-making, and equitable household roles. As Muslim women attain higher education and pursue careers, traditional expectations of marriage are reassessed. Couples increasingly consider practices such as prenuptial agreements, structured communication, and modern approaches to conflict resolution. Although foundational Islamic values remain intact, contemporary realities encourage reinterpretations that better reflect the lived experiences and aspirations of modern Muslim families (Robertson, 2019).

Digital communication, global connectivity, and social media profoundly influence marital dynamics and expectations. These platforms introduce opportunities to strengthen communication between spouses while also presenting risks such as privacy concerns, unrealistic comparisons, and weakened interpersonal bonds. The negotiation between traditional Islamic frameworks and modern technological lifestyles has become a central aspect of contemporary Muslim marriages. The interplay of these dimensions shapes new forms of marital interaction, negotiation, and identity.

This topic is significant because Muslim communities worldwide are navigating rapid technological shifts that directly affect marriage, a core institution in Islamic life. As 4IR reshapes cultural norms and societal structures, it is essential to examine how Muslim couples are adapting and how Islamic principles can guide the integration of technology into marital life. Understanding these dynamics enables the development of ethical and culturally sensitive approaches that harmonise technological advancement with the preservation of Islamic values.



The goal of this paper is to explore the opportunities created by 4IR for Muslim marital life such as improved communication, access to knowledge, digital religious resources, and enhanced economic participation as well as the challenges, which include digital addiction, privacy breaches, marital conflict arising from technology misuse, and value shifts influenced by global online culture. An examination of these factors highlights how Muslim couples strive to maintain strong religious and cultural identities amid rapid technological change.

By analysing the intersection of Islamic teachings, cultural expectations, and technological developments, this research contributes to ongoing discussions on faith and modernity. It sheds light on how Muslim families balance tradition with innovation, uphold marital ethics, and adapt to shifting global realities. Ultimately, the paper emphasises the importance of grounding technological integration in Islamic principles to sustain stable, harmonious, and spiritually fulfilling marital relationships.

Islamic Teachings and Traditions on Marriage

Marriage occupies a sacred and central role in Islam, functioning as both a social contract and a spiritual bond. Islamic teachings in the Qur'an and *Sunnah* outline a comprehensive framework for marital rights, responsibilities, and ethics. Marriage is highly encouraged and described as completing half of one's faith (Al-Bukhari, 1997). It fulfils spiritual, emotional, and physical needs while establishing stability and affection within the family unit (Esposito, 2011). The Qur'an highlights marriage as a source of tranquillity, love, and mercy: "*He has created mates for you from your own kind... and placed between you love and mercy*" (Qur'an 30:21).

Excessive use of digital devices in the era of the Fourth Industrial Revolution (4IR) has contributed to behavioural addiction that disrupts marital relationships. Spending less time with one's spouse weakens family bonds and negatively affects marital stability among Muslims (Kuss, 2018). The technological and social transformations associated with 4IR also influence gender roles and expectations. Increased gender equality and shifting responsibilities place new demands on spouses, especially on women who often balance family obligations with evolving societal roles. Islam, however, affirms that men and women are equal in their accountability before Allah and in their capacity to earn reward and punishment. Qur'an states: "*Whoever does good and believes, whether male or female, shall enter the Garden*" (Qur'an 4:124).

Despite spiritual equality, Islamic law assigns husbands and wives distinct marital duties. The rise of globalised culture has also introduced un-Islamic social practices, such as the erasure of gender distinctions in clothing and appearance, which conflict with Islamic values. The Prophet Muhammad (peace be upon him) warned against men imitating women and women imitating men (Al-Bukhari 5885), indicating the importance of maintaining clear gender identities in Muslim marital and social life.

Islamic teachings define structured marital roles grounded in the Qur'an and the Prophet's example. The husband is responsible for providing financial support, protection, and leadership within the family: "*Men are the protectors and maintainers of women...*" (Qur'an 4:34). This authority is balanced by the command to treat wives with kindness and respect (Qur'an 4:19). The wife's primary role traditionally centres on managing household affairs and nurturing children, contributing to a harmonious family environment. Nonetheless, Islam does not forbid women from pursuing education or employment (Abou El Fadl, 2001). Rather, Islam



encourages both genders to seek knowledge and personal development, provided family responsibilities are upheld.

A successful Islamic marriage is built on mutual love, respect, and compassion, with each spouse fulfilling their responsibilities while supporting one another's well-being (Esposito, 2011). Joint decision-making is emphasised through the Qur'anic principle of consultation (*shūrā*): "*Their affairs are determined by consultation among themselves*" (Qur'an 42:38). These principles create an ethical foundation for marital harmony, although their practical application varies in different cultural and social contexts (Rashid, 2019).

Cultural and Societal Norms Surrounding Marriage in Muslim Communities

While Islamic teachings provide core principles, marriage practices among Muslims worldwide have been shaped by diverse cultural traditions and local customs. These cultural elements intersect with religious teachings, leading to varied interpretations and marital norms (Rashid, 2019). This diversity reflects the broad spectrum of Muslim cultural experiences.

One prominent example is the tradition of arranged marriages. Although not mandated by Islam, arranged marriages have been widely practised to ensure compatibility, strengthen family ties, and sustain cultural values (Avishai, 2008). The degree of parental involvement and personal autonomy, however, differs significantly across communities. Likewise, the dowry system which is an Islamic requirement for an Islamic marriage has been embedded with cultural practices in many Muslim societies. Cultural expectations surrounding dowries vary based on regional and socioeconomic factors, demonstrating how cultural norms influence marital practices (Charrad, 2011).

Gender roles within the household are another aspect shaped by cultural interpretations. While Islamic principles outline general roles for husbands and wives, the specific division of labour often depends on cultural traditions, economic circumstances, and evolving societal attitudes toward gender (Moghadam, 2013). As societies change, some communities reinterpret these roles, blending Islamic values with contemporary expectations (Akhtar, 2018).

The diversity of marriage practices within the Muslim world reflects the dynamic nature of Islamic teachings as they adapt to different cultural contexts. Scholarly debate continues regarding the interpretation of marital principles, demonstrating the richness of Islamic intellectual tradition. As the Fourth Industrial Revolution advances, these cultural and religious frameworks will increasingly encounter new technological realities, posing both opportunities and challenges for Muslim marital life.

Technological Advancements and Their Impacts on Muslim Marital Life

Technological advancements associated with the Fourth Industrial Revolution (4IR) have significantly transformed Muslim marital life, offering both constructive opportunities and complex challenges. Digital technologies, such as social media, matrimonial websites, and virtual communication platforms have reshaped how Muslim individuals seek spouses and maintain relationships. Specialised matrimonial websites and social media platforms now allow users to create detailed profiles, specify desired characteristics, and connect with compatible matches (Bahfen, 2018). For many communities, these digital tools have broadened the traditional framework of matchmaking by enabling engagement across cultural, ethnic, and geographical boundaries. This digital expansion has particularly benefited individuals seeking partners who share specific religious values or cultural backgrounds, thus modernising the



path toward marriage. The impacts of technological advancements on Muslim marital life are further discussed as follows:

Enabling Long-Distance Communication and Relationship Maintenance

The accessibility of digital information in the 4IR era has empowered Muslim individuals to make informed decisions about marriage. However, this ease of access also spreads misinformation, confusion, and unverified content. Islam, like other world religions, has not been immune to the harmful effects of misleading or unguided online material, which can influence marital expectations and behaviours in unproductive ways.

Virtual communication tools such as video calling and messaging platforms have revolutionised how Muslim couples sustain long-distance relationships. These technologies enable couples to maintain marital bonds despite physical separation, often necessary due to academic or professional commitments (Alkhateeb, 2020). Real-time video conferencing allows spouses to engage in face-to-face discussions, share meaningful moments, and reinforce emotional connection. Similarly, messaging applications facilitate continuous communication by enabling the exchange of thoughts, emotions, and daily updates, helping couples feel emotionally close despite geographical distance. For many long-distance Muslim couples, these digital tools have become central to relationship maintenance, enabling shared experiences and ongoing engagement even while apart.

However, the incorporation of digital tools into family life has implications for the quality of interpersonal interaction. While they enhance accessibility and communication, constant digital engagement may undermine opportunities for meaningful face-to-face conversations and shared family experiences. Striking a balance between the benefits of virtual connectivity and the preservation of genuine intimacy is therefore essential for Muslim couples navigating long-distance arrangements in the digital age.

Concerns Regarding Overreliance on Virtual Communication

Despite their advantages, virtual communication tools cannot fully replicate the depth, nuance, and emotional richness of in-person marital interaction. Excessive dependence on digital communication may gradually erode emotional closeness and limit the nonverbal cues, such as gestures, expressions, and physical presence that are vital for fostering intimacy. Prolonged digital interaction may lead to misunderstandings, emotional distance, or weakened marital bonds. Some marital conflicts have arisen from these technological shifts, including cases where emotional disconnection contributed to extramarital interactions or the birth of children outside lawful marriage, resulting in the need for DNA (deoxyribonucleic acid) testing to determine paternity. These situations highlight how technology can both connect and unintentionally distance spouses, complicating marital trust and stability.

Furthermore, digital distractions within the home environment may compromise the quality of family interactions. Continuous device usage, whether for work, entertainment, or communication can reduce opportunities for shared activities, family bonding, and the creation of lasting memories. The presence of screens during family time may hinder attentive listening, empathy, and mutual understanding among spouses and children. For Muslim couples, balancing technology use with intentional efforts to nurture a genuine human connection is crucial for maintaining healthy marital and family relationships. While the 4IR provides valuable tools for sustaining communication and expanding marital opportunities, it also



requires careful moderation to preserve the emotional depth, spiritual harmony, and interpersonal warmth central to Islamic marital life.

Social Media Influence on Muslim Marital Life

Social media has significantly influenced Muslim marital life by exposing individuals to diverse cultural perspectives, marital practices, and evolving social norms. Through platforms such as Facebook, Instagram, TikTok, and online forums, Muslims increasingly engage with global discussions on gender roles, financial independence, emotional well-being, and shared decision-making in marriage (Rashid, 2019). This exposure has broadened understanding and encouraged reflection on practices that were traditionally shaped by local customs and limited social circles.

For many younger Muslims, social media serves as a space to question inherited norms, explore more equitable marital expectations, and learn from the experiences of others. It has empowered women to seek knowledge about their rights, express concerns, and advocate for balanced partnerships. The availability of counselling content, religious lectures, and marital advice online has further contributed to more informed decision-making.

However, this openness also brings challenges. Diverse viewpoints can create tension between generations, especially when younger Muslims embrace interpretations that differ from long-established cultural or family traditions. Older generations may view these shifts as threats to religious or cultural continuity. As a result, navigating these digital influences requires sensitivity, open communication, and a commitment to preserving core Islamic values while adapting to contemporary realities.

Biotechnology and Muslim Marital Issues

As digital communication reshapes the social and relational dimensions of Muslim marriages, developments in biotechnology introduce additional layers of complexity that influence marital life, family planning, and ethical decision-making. The Fourth Industrial Revolution (4IR) has not only transformed communication and social behaviour but has also expanded biomedical possibilities, creating new ethical and religious questions for Muslim couples grappling with infertility, genetic risks, or reproductive choices. In this context, biotechnology intersects directly with Islamic teachings on lineage, procreation, and the sanctity of life, making it essential to examine these advancements through a balanced religious and ethical lens.

Assisted Reproductive Technologies (ART) and Their Acceptance Within Islamic Frameworks

Advancements in assisted reproductive technologies such as in vitro fertilisation (IVF), intracytoplasmic sperm injection (ICSI), and surrogacy have presented Muslim communities with both opportunities and dilemmas. For many couples facing infertility, ART offers a medically viable pathway to fulfilling the deeply valued Islamic aspiration of having children and preserving lineage. Islamic scholarship generally supports ART when it occurs strictly within the marital bond and when no third party, donors or surrogates are involved (Serour, 2008). This perspective aligns ART with the Qur'anic emphasis on procreation, family continuity, and the stability of the marital institution.



However, other scholars raise concerns about ethical boundaries associated with ART. Issues such as the creation and disposal of surplus embryos, genetic mixing through donor gametes, and the involvement of surrogates challenge Islamic principles of lineage preservation and the sanctity of the marital relationship (Inhorn & Tremayne, 2012). These concerns highlight the need to maintain clear boundaries that safeguard Islamic notions of *nasab* (lineage) and uphold moral accountability in reproductive decisions.

For Muslim couples, these debates are not merely theoretical. The decision to pursue ART requires navigating religious guidance, cultural expectations, and personal emotional struggles. Couples must balance their desire for children with scholarly differences on the permissibility of IVF, embryo freezing, and third-party reproductive assistance. Al-Bar and Chamsi-Pasha (2015) note that many couples experience significant moral pressure as they weigh religious rulings against their aspirations for parenthood.

Furthermore, access to ART varies widely across Muslim-majority societies. Legal restrictions, economic barriers, and uneven availability of fertility clinics significantly affect couples' options (Saniei & Kargar, 2021). As a result, the ethical debates around ART intersect with social realities, making reproductive decisions even more complex for Muslim families. Given these challenges, ongoing collaboration between Islamic scholars, medical experts, and bioethicists is essential. Such cooperation can help refine ethical guidelines that honour Islamic teachings while addressing the lived realities of Muslim couples navigating infertility and biomedical choices.

Genetic Engineering and its Potential Impacts on Family Planning and Marital Dynamics

Beyond ART, rapid advancements in genetic engineering, particularly prenatal testing, carrier screening, and selective reproduction, have generated further debate within Muslim communities. On one hand, these technologies offer opportunities to prevent serious hereditary diseases, potentially improving family well-being and reducing emotional and financial burdens. Some scholars view these tools as permissible when used to protect the health of future generations, provided they do not violate Islamic principles of respect for life (Ghaly, 2016). On the other hand, genetic engineering raises concerns about ethical boundaries, potential misuse, and the slippery slope toward eugenics or gender selection. The possibility of selecting embryos based on preferred traits challenges Islamic notions of divine will, humility before Allah's decree, and accepting children as a trust rather than a product.

These technologies also influence marital decisions. Discussions about genotype compatibility like screening for sickle cell anaemia or thalassemia, have become common in many Muslim societies. While medically beneficial, these practices have led to engagement cancellations, strained marital negotiations, and even divorce when undisclosed genetic risks later surface. Thus, genetic screening directly affects marital stability, family planning, and long-term trust between spouses. As genetic technologies continue to advance, Muslim communities must navigate the delicate balance between embracing scientific benefits and upholding moral and religious boundaries. Clear guidance rooted in Islamic jurisprudence, combined with medical expertise, is crucial for helping Muslim couples make informed, ethical choices that align with their faith.

A Discussion on Artificial Intelligence (AI) and Its Integration in Marital Life

The integration of artificial intelligence (AI) into daily life has introduced new dynamics to interpersonal relationships, including marriage. As discussed in earlier sections on



biotechnology and digital influence, modern technologies increasingly shape how Muslim couples communicate, plan families, and manage their homes. Continuing from this trajectory, AI represents another phase of technological transformation that now extends into matchmaking, marital decision-making, and household management. Its impact is multifaceted since it offers opportunities for improved compatibility and organisation while also raising ethical, cultural, and religious concerns.

AI-Powered Matchmaking and Compatibility Analysis

AI-driven matchmaking has emerged as a prominent application, especially among younger Muslims seeking marriage partners through digital means. These systems utilise machine learning algorithms to analyse data related to personality traits, values, interests, behavioural tendencies, and even emotional patterns (Sidani et al., 2016). Supporters argue that such systems may help individuals identify more compatible partners by uncovering patterns that traditional matchmaking, whether through family networks or community matchmakers, may overlook. Scholars such as Paul and Ahmed (2023) suggest that AI's predictive capabilities could potentially reduce marital conflict and divorce rates by facilitating well-aligned matches from the outset.

Despite these potential benefits, several concerns remain. One significant issue is the reduction of human relationships to algorithmic outputs. Marriage in Islam is not merely a contract but a deeply spiritual bond founded on compassion, *ta'āraf* (mutual knowing), and moral character. Critics argue that reliance on algorithms may oversimplify the depth and nuance necessary for meaningful marital bonds (Paraschakis & Nilsson, 2020). There is a risk of replacing human intuition, shared experiences, and emotional discernment with computational logic.

Another concern is the possibility of algorithmic bias. AI systems learn from existing data, and if that data reflects societal prejudices that may be based on race, ethnicity, socioeconomic status, or other factors, these biases may be reproduced in matchmaking outcomes. For Muslim communities that place strong emphasis on fairness, moral equality, and the non-discriminatory teachings of Islam, this presents a serious ethical dilemma. Additionally, data security remains a major challenge. Matchmaking platforms require sensitive personal information that, if compromised, could violate privacy and expose individuals to harm.

For Muslim communities, AI-powered matchmaking must also align with religious norms. Issues such as modesty, gender interaction, family involvement, and the safeguarding of moral boundaries remain central to Islamic marital ethics (Wang, 2023). Therefore, while AI may serve as a supplementary tool, it cannot replace foundational Islamic values or the role of human judgment in selecting a spouse. The future of AI-driven matchmaking will require careful cultural adaptation, transparent ethical standards, and religious guidance to ensure its use supports rather than undermines Islamic marital ideals.

Virtual Assistants and Their Role in Household Management and Decision-Making

From matchmaking to domestic life, AI also appears in the form of virtual assistants integrated into smart homes. These digital systems, capable of interpreting voice commands, organising schedules, sending reminders, and managing connected devices, are becoming common in modern households. When used responsibly, they can ease domestic burdens and improve household coordination (Guzior et al., 2021). In Muslim households, virtual assistants may provide unique benefits such as reminders for prayer times, Qur'ān study plans, or family routines. They can support time management, track household expenses, and even help



distribute domestic responsibilities more transparently between spouses. Such functions may reduce stress, improve communication, and foster cooperation.

However, the involvement of AI in family life introduces new dilemmas. The first concern is privacy and data protection. Virtual assistants constantly collect data, learn household patterns, and store personal information. Without strong security measures, such systems may expose families to surveillance or misuse of sensitive data, a serious issue considering Islamic teachings on protecting one's private affairs (Villegas-Ch & García-Ortiz, 2023). Additionally, overreliance on technology may lead to a weakening of interpersonal engagement. Household decision-making, whether related to finances, parenting, or emotional support, is an essential component of marital intimacy. If AI systems begin to influence or even overshadow these conversations, couples may experience reduced personal initiative or diminished communication. Some scholars warn that involving AI in conflict resolution or family decisions risks compromising the human empathy and moral reasoning central to Islamic marriage (Olsher, 2015).

AI integration must also respect Islamic norms regarding privacy, gender roles, and the sanctity of personal spaces. For example, always-listening devices may conflict with the Islamic emphasis on household confidentiality. Moreover, the authority given to virtual assistants must remain subordinate to human agency and Qur'ānic principles of mutual consultation (*shūrā*).

To navigate these complexities, Muslim scholars, policymakers, and technologists must collaborate on developing guidelines for ethical AI use in domestic settings. Clear frameworks addressing privacy, responsible usage, religious appropriateness, and cultural sensitivity will help families benefit from AI while safeguarding Islamic values. It can therefore be said that AI's growing presence in matchmaking and marital life offers both transformative possibilities and substantial challenges. While it may enhance compatibility assessments and household organisation, it must be adopted thoughtfully, ensuring that technological convenience does not overshadow the human, ethical, and spiritual essence of marriage in Islam.

Opportunities and Challenges Posed by the Fourth Industrial Revolution

The Fourth Industrial Revolution (4IR) which is characterised by artificial intelligence, biotechnology, big data, block-chain, robotics, and advanced digital networks, has introduced profound transformations to social structures, economies, and interpersonal relationships. For Muslim marital life, these changes present both opportunities for enrichment and challenges that require careful navigation. Building upon earlier discussions on AI, biotechnology, and digital influence, this section examines how 4IR reshapes marital institutions and the lived realities of Muslim couples. A balanced analysis is essential because the same tools that enhance communication, education, and lifestyle also introduce new ethical dilemmas, privacy risks, and social tensions.

Opportunities

- 1. Increased Access to Information and Resources for Marital Education and Counselling:** One of the most visible advantages of the 4IR is the unprecedented access to information. Advanced digital technologies have created new avenues for Muslim couples to learn, grow, and manage marital challenges with support that was previously limited by geography, cost, or stigma. The proliferation of online platforms dedicated to marital education has been particularly transformative. A wide array of digital content, ranging from e-books and YouTube lectures to structured online courses, now



provides comprehensive guidance rooted in Islamic teachings. These resources cover essential subjects such as the *fiqh* (understanding) of marriage, emotional intelligence, communication skills, marital rights and responsibilities, conflict resolution, and parenting strategies. Many are produced by qualified scholars, counsellors, psychologists, and Islamic family institutions, which enhances their credibility and relevance. In addition to self-help materials, online marriage counselling platforms have expanded access to professional guidance. Muslim couples can now consult with licensed therapists, imams, and marital counsellors through video conferencing, live chats, and teletherapy applications (Alkhaldi et al., 2017). This is particularly beneficial for couples living in communities where culturally-sensitive counselling services are limited or non-existent. Virtual counselling also reduces the stigma often associated with seeking marital help. The confidentiality and anonymity available online encourage individuals to address sensitive issues like communication breakdowns, financial disagreements, or intimacy concerns without fear of community judgment. Digital peer-support communities have also emerged as safe spaces for sharing experiences. Online forums hosted on platforms such as Facebook, Telegram, or dedicated Muslim family websites allow couples to ask questions, share advice, and learn from the challenges of others. This sense of communal support reflects Islamic values of brotherhood (*ukhuwwah*) and mutual assistance. However, with the benefits come necessary cautions. The abundance of online content makes it essential for Muslim couples to differentiate between credible, *Shari'ah*-compliant guidance and information produced by unqualified or misguided sources. As Suud (2023) notes, digital media has amplified the voices of both experts and non-experts, making discernment critical. Couples are encouraged to rely on accredited scholars, reputable family institutions, and recognised counsellors to ensure alignment with authentic Islamic principles. Overall, the 4IR has empowered Muslim couples with knowledge, tools, and support systems that can strengthen marital bonds and cultivate healthier family environments when used responsibly.

- 2. Facilitation of Cross-Cultural Understanding and Integration of Diverse Perspectives:** Another opportunity brought by the 4IR is the enhancement of cross-cultural dialogue within the global Muslim community. Historically, interpretations of marital roles, customs, and expectations varied significantly across regions. Many Muslims encountered only the marital norms of their immediate culture. Today, digital technologies have dissolved these boundaries. Social media platforms; Instagram, X (Twitter), TikTok, and YouTube have become global meeting points where Muslims share marital advice, religious insights, cultural practices, and personal experiences. Online discussions offer diverse perspectives on topics such as gender roles, domestic responsibilities, financial planning, spousal support, and emotional well-being. This exposure encourages couples to consider alternative, and sometimes more balanced, approaches to marital life. Online marriage forums and Muslim family groups bring together individuals from Africa, the Middle East, Europe, South Asia, Southeast Asia, and the diaspora. Through these interactions, Muslims encounter varying traditions: from Malay wedding customs to Arab communication styles, from West African extended-family dynamics to South Asian dowry debates. Such exchanges expand cultural sensitivity and help challenge stereotypes that may have persisted due to isolation or lack of exposure. Cross-cultural learning strengthens the marital experience by introducing couples to new ideas, problem-solving methods, and culturally-rooted wisdom. For example, learning about conflict-resolution practices in other Muslim



cultures can inspire couples to adopt gentler communication techniques. At the same time, stories of marital resilience from other parts of the world can offer comfort and motivation. However, this exposure must be managed with Islamic maturity. Not all cultural practices align with *Sharī'ah*; therefore, Muslim couples must evaluate foreign customs through the lens of Qur'anic teachings and Prophetic guidance. Cultural diversity should enrich, but not override Islamic principles. When approached with discernment, the cross-cultural interactions enabled by 4IR strengthen unity and mutual respect within the *Ummah* (Muslim community) while enhancing the marital experience.

3. **Facilitating *Ḥalāl* (Lawful) Lifestyle and Ethical Consumption:** The Fourth Industrial Revolution has significantly transformed how Muslims access *ḥalāl* products and maintain ethically conscious lifestyles. With *ḥalāl* compliance being central to many aspects of Muslim domestic life, which include food consumption, financial dealings, entertainment, and daily household products, 4IR technologies have made it easier for couples to uphold Islamic values in modern settings. *Ḥalāl*-certified food applications (apps) now allow users to verify products, explore *ḥalāl* restaurants, and order food with confidence. These platforms list certification bodies, ingredients, and preparation methods to ensure transparency (Nanji, 2022). Similarly, online *ḥalāl* marketplaces provide access to cosmetics, clothing, nutritional supplements, personal hygiene items, and household goods that comply with Islamic standards. This supports Muslim couples in building homes anchored in *ḥalāl* consumption. Islamic fintech (financial technology) has grown rapidly. *Sharī'ah*-compliant digital banks, mobile investment apps, and budgeting software now provide Muslims with interest-free (*ribā*-free) financial services (Biancone et al., 2019). These tools help couples manage joint finances, save for family goals, invest ethically, and avoid prohibited transactions with greater ease. *Ḥalāl* entertainment platforms have also expanded. Streaming services curate content that complies with Islamic ethical guidelines, offering couples alternatives to mainstream media that may conflict with religious values (Pao et al., 2020). This allows couples to enjoy recreational activities without compromising faith. Nevertheless, Muslim couples must remain vigilant. Verification of *ḥalāl* certifications, authenticity of fintech platforms, and credibility of ethical-consumption apps must be ensured. Collaboration with reputable Islamic certification bodies and scholars strengthens the reliability of these technologies (Alam & Sayuti, 2011). When used carefully, 4IR innovations can help couples harmonise Islamic lifestyle commitments with modern convenience.
4. **Online Dispute Resolution and Mediation Platforms:** Conflict is an inevitable aspect of marriage, but 4IR technologies have introduced new avenues for managing disputes in ways that respect Islamic principles. Online dispute-resolution (ODR) platforms offer alternatives to traditional court systems and provide accessible ways for couples to address conflicts discreetly. Confidentiality is a major advantage. ODR platforms shield couples from public exposure, allowing them to resolve issues privately (Fial'ovich, 2021). This aligns with Islamic teachings that encourage concealment of marital disputes rather than public disclosure. Convenience is another benefit. Couples participate from their homes, avoiding logistical burdens such as transport, scheduling conflicts, and childcare (Trachova, 2022). This accessibility encourages more couples to seek timely help. Cost-effectiveness also makes ODR appealing, especially for families with limited financial means (Fil'ovich, 2022). Lower costs ensure broader access to professional mediators. Most importantly, mediation reflects Islamic conflict-



resolution values. Islam emphasises communication, reconciliation (*ṣulh*), and maintaining family ties (Awawda & El-Awawda, 2022). Many digital platforms even integrate religious scholars or provide gender-sensitive environments and multilingual support to reflect Islamic norms. Thus, online mediation platforms bridge modern technology with religious tradition, empowering Muslim couples to resolve disputes in ways consistent with their faith.

- 5. Digital Inheritance and Estate-Planning Tools:** One of the most advanced developments linked to the 4IR is the use of block-chain and digital asset management for inheritance and estate planning, an area often complicated by legal, cultural, and familial issues. Block-chain is a decentralised digital ledger system that records transactions in a secure, transparent, and tamper-proof manner. Once information is added to the chain, it cannot be altered, making the technology ideal for sensitive financial and legal processes. In the context of Islamic inheritance (*farā'id*), block-chain can automate and enforce *Shari'ah*-compliant distribution of assets. Smart contracts, self-executing digital agreements, can be programmed to divide wealth among heirs precisely according to Qur'anic rules (Alkathiri & Al-Ekram, 2021). This reduces human error, prevents manipulation, and minimises disputes. Digital asset management tools also allow couples to record all physical and digital assets—real estate, investments, cryptocurrencies, savings, businesses—in one secure platform (Alqaryouti et al., 2020). This ensures clarity for heirs and reduces conflict. By integrating Islamic inheritance principles with advanced technology, Muslim couples can plan their estates with greater accuracy, transparency, and religious compliance (Sait & Lim, 2006). This reflects a modern yet faithful approach to fulfilling one of Islam's most detailed legal obligations.

Challenges:

- 1. Navigating Ethical and Religious Boundaries Surrounding New Technologies**

As technological innovation accelerates, Muslim couples and communities must confront complex ethical and religious questions. New technologies, ranging from assisted reproductive technologies (ART) and genetic engineering to AI-powered matchmaking raise concerns about their compatibility with Islamic teachings, moral values, and long-standing cultural traditions (Ghaly, 2016). Because these developments touch on sensitive aspects of life such as procreation, kinship, marriage, and family structure, Muslim scholars and ethicists continually debate how to balance technological advancement with fidelity to divine law (Aramesh, 2009; Sachedina, 2009). For example, ART procedures such as in vitro fertilisation (IVF), intracytoplasmic sperm injection (ICSI), and preimplantation genetic diagnosis (PGD) have provided solutions for infertility, yet they present dilemmas concerning lineage (*nasab*), marital exclusivity, and the permissibility of third-party involvement. Practices like sperm donation, egg donation, and surrogacy remain highly contested, with many scholars deeming them impermissible because they introduce a third party into the marital bond, potentially compromising genealogical clarity (Inhorn & Tremayne, 2016). At the same time, the growing field of genetic engineering, particularly gene editing techniques such as CRISPR raises theological concerns about altering human creation (*khalq Allāh*), exceeding ethical limits, and potentially fostering forms of biological inequality (Sachedina, 2005). As new technologies evolve, Muslim societies must engage in continuous discourse, drawing on classical jurisprudence, contemporary bioethics, and scientific knowledge. A proactive engagement with scholars and experts



will help clarify permissible boundaries and ensure that technological development aligns with moral responsibility (Aramesh, 2009).

2. Addressing Privacy Concerns and Maintaining Marital Intimacy in a Digital Age

The digitalisation of daily life has introduced new concerns regarding privacy, security, and intimacy within Muslim marriages. Personal information is increasingly stored, shared, and transmitted through digital networks, exposing individuals and families to risks such as hacking, surveillance, data exploitation, and cyber harassment (Alkhateeb, 2020; Bunt, 2009). For married couples, this erosion of privacy can undermine trust and emotional safety. Social media platforms and communication technologies have also blurred traditional boundaries, making it easier to engage in inappropriate interactions or emotional infidelity (Zakaria & Kiram, 2020). Constant online presence may diminish face-to-face communication, reduce marital bonding, and introduce comparison culture, which can negatively affect contentment and expectations. Moreover, because many digital platforms prioritise visibility and sharing, maintaining Islamic values of modesty (*hayā`*) and discretion becomes more challenging. Thus, Muslim couples must navigate the tension between benefiting from digital connectivity and preserving the sanctity of marital intimacy. Educating individuals about cybersecurity, privacy settings, digital etiquette, and responsible communication is essential. Community institutions and religious educators also play a crucial role in promoting digital ethics grounded in Islamic values (Bunt, 2018).

3. Reconciling Traditional Values with Modern Societal Norms and Expectations

The rapid evolution of social norms associated with the Fourth Industrial Revolution has created tension between traditional Islamic marital values and modern expectations. Issues surrounding gender roles, autonomy, expectations of partnership, and attitudes toward technology often differ sharply between generations (Rashid, 2019; Sriya, 2018). Modern societies emphasise individual choice, mutual decision-making, and gender equality. These ideals may conflict with cultural interpretations of Islamic teachings that traditionally emphasised complementary but distinct marital roles (Mir-Hosseini, 2003). The rise of digital platforms has also influenced ideas about modesty, privacy, and family hierarchy, sometimes challenging established norms and creating friction within households. Finding harmony between these competing values requires nuanced understanding and open dialogue. Islamic teachings are inherently adaptable, but they rely on scholarly interpretation and contextualisation. Religious leaders, educators, and families must therefore address evolving expectations with sensitivity, ensuring that the essence of Islamic principles remains intact while accommodating legitimate social developments.

4. Ensuring Equitable Access to and Adoption of Emerging Technologies

The digital divide remains a major obstacle to technology adoption within Muslim communities. Socioeconomic disparities, rural–urban gaps, limited digital literacy, and cultural resistance contribute to unequal access to emerging technologies (Alkhateeb, 2020; Iqbal et al., 2021). Such inequalities hinder the ability of some families to benefit from innovations in education, healthcare, finance, and marital life. Lower-income households may lack reliable internet access or technological devices, limiting participation in digital learning or telehealth services. Older generations may struggle with technological literacy, leading to reliance on outdated methods or withdrawal from digital spaces altogether (Rashid, 2019). Cultural reservations may also slow adoption, especially when technologies are perceived as incompatible with religious norms. Addressing these disparities requires structured, community-level strategies such as



affordable technology initiatives, digital literacy programmes, and culturally tailored outreach. Ensuring inclusive access is essential for equitable participation in the opportunities presented by the Fourth Industrial Revolution.

Strategies and Recommendations for Embracing the Fourth Industrial Revolution:

Developing a Comprehensive Islamic Ethical Framework for Emerging Technologies: A clear Islamic ethical framework is essential for navigating the challenges posed by modern innovations. This framework should be grounded in Islamic principles and informed by interdisciplinary collaboration among religious scholars, ethicists, scientists, and technologists (Chamsi-Pasha & Albar, 2017; Sachedina, 2009). It must address key issues such as data privacy, algorithmic bias, lineage concerns in reproductive technologies, and the permissible scope of AI (Ghaly, 2016; Inhorn & Tremayne, 2016). Such a framework should be dynamic and continuously reviewed to keep pace with technological developments. It should articulate guidelines that protect core Islamic values such as human dignity, justice, modesty, and the sanctity of the family, while enabling Muslims to benefit from technological progress (Aramesh, 2009). Through a principled yet adaptive approach, Muslim communities can ensure that new technologies serve ethical and spiritual well-being.

Promoting Digital Literacy and Responsible Technology Use Within Muslim Communities:

To help Muslim individuals and families navigate digital transformation responsibly, communities must invest in digital literacy. Training programmes, workshops, school curricula, and mosque-based initiatives can equip individuals with the skills needed to understand online risks, protect privacy, and make informed technological choices (Alkhateeb, 2020; Rashid, 2019). Beyond technical skills, emphasis should also be placed on responsible and ethical technology use rooted in Islamic values. Muslim educators and religious leaders can play an instrumental role in teaching principles such as moderation, respect, and intentionality in digital interactions (Zakaria & Kiram, 2020). This approach strengthens the moral foundation of technology use and ensures that digital tools enhance rather than undermine marital and family relationships.

Encouraging Open Dialogue and Collaboration Between Religious Leaders, Scholars, and Technology Experts:

Constructive dialogue among religious authorities, academic scholars, and technology experts is essential for addressing emerging ethical challenges. Through collaborative discussions, these stakeholders can develop insights that bridge traditional Islamic perspectives with modern technological realities (Rashid, 2019; Chamsi-Pasha & Albar, 2017). Such engagement ensures that ethical guidelines are both religiously sound and technologically informed. These collaborative platforms foster mutual understanding, reduce tensions between modernity and tradition, and promote a balanced approach to innovation (Ghaly, 2016; Sachedina, 2009). A culture of open communication allows communities to anticipate future challenges and respond proactively.

Empowering Women and Promoting Their Participation in Shaping the Future of Muslim Marital Life:

The Fourth Industrial Revolution presents significant opportunities to advance women's participation in digital literacy, leadership, and marital decision-making. Access to education, economic empowerment, and technological tools enhances women's autonomy and strengthens their contributions to family life (Moghadam, 2013; Mir-Hosseini, 2003). Involving women in discussions about emerging technologies ensures more inclusive decision-making and supports equitable marital dynamics (Rashid, 2019). Promoting women's leadership in religious, academic, and technological spaces allows for more diverse perspectives and more socially responsive solutions.



Conclusion

The Fourth Industrial Revolution has ushered in transformative technologies that are reshaping many aspects of human life, including marriage within Muslim communities. This study examined how emerging technologies intersect with Islamic marital traditions, highlighting both the opportunities and challenges they present. Digital technologies have streamlined aspects of marital life by facilitating matchmaking, enabling long-distance communication, and exposing individuals to broader cultural and intellectual perspectives. Biotechnologies such as assisted reproductive technologies and genetic engineering have expanded options for family planning, though they simultaneously raise important ethical, legal, and religious questions related to lineage, intervention in creation, and the sanctity of the marital bond.

Artificial intelligence introduces additional benefits and complexities. AI-powered matchmaking tools, virtual assistants, and decision-support systems offer convenience and efficiency, yet they also raise concerns about data privacy, reduced human autonomy, algorithmic bias, and the potential erosion of intimate human relationships. These developments underline the need for clear Islamic ethical frameworks that guide the responsible adoption of technology in ways consistent with religious values. They also demonstrate the importance of digital literacy, interdisciplinary dialogue, and community-level support systems. Empowering women through technological access, education, and greater decision-making roles emerges as a crucial strategy for ensuring balanced and equitable adaptation to technological change.

The conclusion emphasises that while this research provides a foundational understanding, further studies are needed to address cultural and regional variations across the Muslim world. Longitudinal research examining long-term effects on marital stability, family structures, and intergenerational relationships will be particularly valuable. As technologies evolve rapidly, continuous scholarly engagement will be essential for assessing their implications and refining ethical guidelines.

Ultimately, the Fourth Industrial Revolution presents Muslim communities with both significant opportunities and profound challenges. Proactive engagement, informed ethical reflection, and the preservation of Islamic values will be key to ensuring that technological change strengthens rather than undermines marital life. Addressing these issues is essential not only for academic inquiry but also for maintaining the spiritual, social, and cultural integrity of Muslim families in an era of rapid global transformation.

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