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Crossroads between Islamic Spirituality and the Fourth Industrial Revolution

Presečišče islamske duhovnosti in četrte industrijske revolucije

Abstract: Current research acknowledges the unprecedented effects of the Fourth Industrial Revolution (4IR) on socio-economic development, human interpersonal relations, and day-to-day life. It is worth scrutinising how this shift may cost infrastructural development, economic growth, and human development worldwide, shaping the planet's future. Within the scope of maintaining human's centrality in the era of 4IR, it is critical to draw serious attention to the relevance of spirituality in developing new and existing technologies. This study examines the Muslim framework of spirituality and its proposed pathways for 4IR. This study further concludes that for Muslims, spirituality adds meaning and value to the ethical design, production, and management of 4IR and enables it to better serve the composition of human societies and their emerging needs without harming the well-being of the planet, its resources, or the future of humankind.

Keywords: Fourth industrial revolution, 4IR, Islamic spirituality, Islamic ethics

Povzetek: Sedanje raziskave priznavajo neslutene učinke četrte industrijske revolucije (4IR) na družbenoekonomski razvoj, na medčloveške odnose in na vsakdanje življenje. Vredno je globlje preučiti, kaj bo takšen premik zahteval od razvoja infrastrukture, od ekonomske rasti in od človeškega razvoja po celotnem svetu in kako bo oblikoval prihodnost planeta. Priznavajoč ohranitev osrednje vloge človeka v dobi 4IR, se je nujno resno posvetiti pomenu duhovnosti pri razvijanju novih in obstoječih tehnologij. Naša študija preučuje islamski duhovni okvir in njene smernice za 4IR. Študija nadalje ugotavlja, da duhovnost muslimanom podeljuje smisel in vrednost etičnemu načrtovanju, proizvodjanju in upravljanju v razmerah 4IR in ji omogoča koristnejše delovanje v prid človeškim družbam in njihovim porajajočim se potrebam, ne da bi pri tem povzročala škodo blagostanju planeta, njegovim virom ali prihodnosti človeštva.

Ključne besede: četrta industrijska revolucije, 4IR, islamska duhovnost, islamska etika

1. Introduction

The 1st Industrial Revolution of the 18th century marked a new era of human civilisation and was shortly followed by the 2nd Industrial Revolution of the late 19th century, which saw a magnified capacity in heavy industry. The 20th century witnessed drastic digital and computational advancements known as the 3rd Industrial Revolution. The induction of the dot.com internet in the 1990s, also known as the 3rd era, revolutionised mass media, telecommunications, heavy industries, and the medical sector (Schwab 2016). The Fourth Industrial Revolution (4IR) involves interconnectivity, automation, machine learning, real-time data insights across machines, individuals, organisational sustainability, and forges more holistic, advanced, and interconnected business and organisational ecosystems. 4IR encompasses all additional automation and computerisation deployed by companies to improve production cycles and unify all operations into unified digital ecosystems. It is concerned with interconnectivity across various mediums of automation, industrial and domestic, advanced machine learning, real-time data insights across machines, people, and organisational sustainability (Nagy et al. 2018).

The prospect of global connectivity with unprecedented processing power, storage capacity, and increased access to information, multiplied by emerging technological breakthroughs in fields such as robotics, the Internet of Things, autonomous machines, nanotechnology, biotechnology, material science, energy storage, and quantum computing (Schwab 2016) predicted an imminent revolution of global economy and society beyond recognition. The progress of the 4IR is undoubtedly advantageous to improving the quality of life, the future of cities, research, education, and much of the development sectors. Plutschinski points to 4IR's potential in treating and preventing disease, improving agricultural output, and enhancing the quality of life; however, the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance (2017).

The implications for the questions of meanings, values, identities, relationships, and community are extensive. Furthermore, while 4IR technologies offer humans immense opportunities for better lives, they also pose many ethical challenges to transform the way people navigate their daily lives, economies, and communities. The emergence of a complex ethical environment demands policy considerations of higher management circles, emphasising ethics. This is also a cultivation of strong ethical cultures through ethical policies and exemplary leadership, which sets humanistic precedence (Kim and Thapa 2018). Technologies such as the Internet of Things, artificial intelligence, cyber-physical systems, and automation have all exhibited an evident influence on individual life perceptions, environments, and ethical decision-making processes (Nagy et al. 2018). New technologies such as nanotechnology, artificial intelligence, and many others will create a new system of meaning and a much more intimate relationship with human bodies. They would become so internalised and integrated with the human body that they would expand the human potential to the point of transforming the innermost part of human nature (Platovnjak and Svetelj 2019, 672).

Current research acknowledges the unprecedented and yet sometimes detrimental effects of 4IR. Privacy violations, cyber intrusions, and the use of civil technologies for military purposes are prominent policy issues, alongside specific jobs and human services to grow obsolete (Shahroom and Hussin 2018). The legal considerations of incorporating new algorithmic software into judicial proceedings, securitisation, and law enforcement are also significant. The use of facial recognition software or predictive policing has been called out as a breach of privacy that would usher in an Orwellian era of the surveillance state. In assessing twelve emerging technologies, artificial intelligence and robotics stood out with the highest risk scores with simultaneously some of the highest positive benefits scores (World Economic Forum 2019). Where biotechnology is considered, the design of microorganisms and higher living systems in the 4IR era may assist in meeting the need and demand for biofuel or invaluable medicinal breakthroughs (Terry 2018). However, there have been concerns about harnessing biotechnology to develop micro-organisms for biological weaponry or other disruptive purposes despite the existing potential. These issues might be relentless and repercussions for societies if such technologies are approached without ethical considerations (Hooker and Kim 2018).

Ethical implications are extensive in range, addressing more immediate concerns such as the algorithms used by big Tech corporations resulting in political polarisation to more serious questions of whether gene editing should be creating 'designer babies'. The problem of non-transparency in the many areas of artificial intelligence is not only technical but also ethical. For example, AI algorithmic systems help us during emergencies and the current COVID-19; however, despite their advantages, their often-non-transparent nature raises many questions of ethicality (Strahovnik, Miklavčič and Centa 2020, 321–334). More critically, investigating the socio-economic bias inherent to AI, machine learning and information aggregating processes, and how to design algorithms better to avoid implicit bias. Many studies further indicate an epidemic of depression, a sharp rise in anxiety levels, and an overall feeling of loneliness harboured by unfulfilling interconnectivity. A group of experts gathered by the European Commission delivered a framework to orient the implementation of 'human-centric' AI-based systems intended for any societal good. The inherent assumption in all progressive and development discourses that technology is aimed for the greater good raises the question of whether it genuinely serves the best interests of all its users, or rather only a tiny minority (Savin-Baden and Burden 2018, 102).

Developing communities, in particular, hold the most significant risk of being left behind in the wake of the rapid technological revolution (Business Consultants Inc. 2012). Dalmia and Sharma warn that without advanced preparation, there is a significant risk of losing tremendous autonomy and agency to machines, thus altering the course of humanity without fully grasping the consequences and creating massive global inequality between the 'techno super-rich' and a large underclass (2017). The dissemination of holistic technologies across various sectors to prosper society and the world is more significant than ever. Educational reform

in 4IR shifting would diminish the gap of job incompatibilities that have been replaced by new technologies (Shahroom and Hussin 2018).

The rapid transformative change also poses significant risks to the social fabric if ungrounded in value norms. 4IR now more than ever before begs whether the individualistic standards of empirical science confirmed through superior technology can alleviate the potential ethical concerns and consequences. Although the utopian idea that modern technology can produce the perfect being and perfect world, based on the ideal of unprecedented material well-being, may have been realised partly, this prosperity has been attained at the price of human freedom and the biosphere. Schuurman noted that societies' stand on the edge of a volcano verging on eruption despite our new prosperity (Schuurman 2007). The role of ethics, spirituality, and values is as necessary for guiding 4IR's progression and development as they are for inspiring sustainable long-term solutions to privacy challenges, re-training, unemployment, and re-conceptualising work-life dynamics.

Technology continues to be viewed in terms of the machine model, which guided the application of the power of technology in a tyrannical way. This 'technological culture' subverts the meaning of life and creates a host of problems, the solution to which is impossible so long as we remain thinking and acting within existing parameters of the persisting technical model (Schuurman, 2010). Nevertheless, with so few (if any) ethical or legal guidelines in place for 4IR, it is difficult to predict how the near future of growing technologization will ultimately be traversed or whether the tech industry is capable of uniting to ensure the building of ethical technologies with long term sustainable goals (World Economic Forum 2019). Studies reinforce the link between ethics and organisational growth, providing further rationale for why companies should consider ethical approaches to 4IR technologies; one study found positive correlations between organisations that strongly considered the ethics of 4IR and company growth rates, suggesting positive prospects for such endeavours (World Economic Forum 2019).

The rapid growth and complexity of 4IR and its far-reaching outcomes also alert the critical need for man's spiritual education and self-discipline. Just as there is an urgency to rethink ethical, technological innovation and 4IR, there is also a need to recover the foundational qualities important for biosphere protection, chief among them, gratitude, humility, righteousness, inter and intra human care practices, in addition to the just distribution of resources considerate of the well-being of future generations. In the following, we will first define Islamic spirituality and then discuss the pathways between Islamic spiritual intelligence and 4IR.

2. Overview of Islamic spirituality

Spirituality continues to draw increased scholarly attention as a sign of growing acknowledgement for the inner of man and the need to rethink current approaches to technologisation. There are differing opinions on what spirituality entails,

and it thus far remains restricted to inconclusive definitions of its relation to conventional religious belief and other aspects of the relationship between humans and their experienced life (Lantieri 2001). Levin (2000), Vaughan (2002), Zohar and Marshall (2000), Nasel (2004), King (2008), among others, provided interesting definitions and perspectives on spirituality and spiritual intelligence. However, despite the profusion of their diverse perspectives, they broadly overlook the tools, frames of reference and repertoires practically used in an individual's inter and intra spiritual experience. Such approaches may not necessarily appeal to the Muslim audience or ideally fit their frame of reference and experience.

According to the Qur'an, the domain of the spirit (*ruh*) is inaccessible; humans only have limited knowledge of it (Qur'an 17:85). Taking the term *ruhaniyyah* as the prevalent translation for spirituality, however, Nasr defines it as the inner spiritual dimension of traditional religions dealing with the noumenal and formless that can be directly experienced, extending beyond mental categories, but is not anti-intellectual (Nasr 2006, 209). Islamic spirituality is multi-dimensional and multi-faceted as spiritual intelligence (Utz 2011) and is neither inherited nor bequeathed based on blood, colour, class, race, or sex. Spirituality sets man above all material and is reflected in the presence of a relationship with Allah, affecting individual self-worth, senses of meaning, and connectedness with the other and nature.

Spirituality transcends the pursuit of inner peace to fundamental questions of meaning and ethics. Spirituality seeks to discipline the inner and rewire the self in the face of temptations, probing unchecked attachments to materialism and extravagance while redefining meanings and pathways to satisfaction and happiness. It further allows for self-discovery, self-mastery and unshackles the self from greed. Spiritual discipline is set around core beliefs and requires wariness of intents, motivations, and actions. It begins with the knowledge of the divine and is associated with learning, and hence, should not be viewed as anti-intellectual. Its posited potential and advantage lie far beyond the conventional scientific definitions.

Islamic spirituality upholds the unity of spirit and commands halal life's enjoyment and balanced lifestyle. It promotes community interaction, cooperation, and solidarity. If ones' spirituality were to echo into the environment, it would dispel the notion of 'machine master' since technology is now aligned with an intrinsic and human-centric affective, cognitive, material, and spiritual development process. Spirituality views wealth as trust and blessing and calls for sharing the 4IR resources amongst developing and underdeveloped nations and communities.

3. Pathways between Islamic spiritual intelligence and 4IR

Recent literature shows signs of affiliation among several types of intelligence and 4IR, including emotional and ethical intelligence (Oosthuizen 2017). Seemin-

gly, some Islamic spiritual intelligence constructs have prospective relations with cross-functional skills emerging in the 4IR era. Schwab noted that the 4IR could compromise humanity's traditional sources of meaning (work, community, family, and identity) or else can lift humanity into a new collective and moral consciousness based on a sense of shared destiny (World Economic Forum 2019). This points to the need for rethinking the positions of spirituality as a powerful asset for 4IR. In the following section, we shall explore the possible inter-connections found in Muslim spirituality and 4IR.

3.1 Islamic spirituality as a signifier of existential meaning

When considering the ethical issues faced by organisations and corporations working with 4IR, whether related to privacy, algorithmic bias, or lack of inclusivity in technology design (Murphy, Garg and Buckley 2020), Benioff believes a 'trust revolution' is needed if businesses are to embrace the potential of the 4IR fully. For him deploying AI will require a kind of reboot in the way companies think about privacy and security (Devon 2018). 4IR technologies present many ethical challenges with impending changes poised to transform the way we live, work, and interact with each other (Murphy, Garg and Buckley 2020). In terms of the organisational changes, 4IR will affect: 1) Why we work; 2) What we do, especially to the need for constant upskilling and developing of additional skills in creativity and interpersonal skills; 3) How we work, significantly as digital economies will drive new ideas, resulting in expansion and combination of new information and new business; and 4) Where we will work given that the blending of physical and organisational boundaries will continue (Africa 2018).

New perceptions, identities, ethics, communication, production, consumption, behaviours, and standards will form the new reality with newly emerging yet complex and fast-growing technology. At the core of these exceptional developments lies the need to agree on core concepts and values of life that safeguard humanity, honorability, equality, and man's stewardship. In this context, one may appreciate the role of spirituality in identifying essential meanings, values, and boundaries and acknowledging high power and its ability to lead, guide and sustain the human value of 4IR.

The search for meaning and purpose leads individuals to seek meaningful work (Vaill 2000). The purpose pertains to key fundamental questions, while meaning and purpose are construed according to existing beings' web of hierarchical relations. Islam appears to have advanced the meaning and direction of life according to the Unity of God whilst emphasising the responsibility and accountability of individuals and communities. Belief increases the sense of accountability and commitment (Sarif 2015). This is crucial to raising individuals' engagement towards achieving their goals. While spirituality is not immediately recognised as a prime driver of capital growth and technological development, Max Weber devotes considerable attention to the protestant work ethic, which he credits with the rise of capitalism (2003). This is by no means unique to Calvinist theology alone. Spirituality universally speaks against sloth and waste while emphasising the need for

one to situate their work and efforts within a larger context of divine meaning to answer a higher calling.

Islamic spirituality revolves around the principle of *tawhid* (Unity of God) (Al-Faruqi 1986). It helps refine and enrich persuasions, drives, and attitudes people hold by affecting the form and substance of their work and relationships with themselves, families, communities, fellow humans, and surroundings. Spirituality points towards the power that inspires individuals to find a particular purpose that gives meaning to their lives (Javanmard 2012). This represents individuals' continuous struggle to search for the meaning of life, work, world, and ethical system (Meyer and Herscovitch 2001). Spirituality gives individuals their merits before the Creator, meaning to their work while recognising their inner faculties and external circumstances. In Muslim spirituality, what matters most is setting life's goals according to the pursuit of God's will (Musrifah 2019). Spirituality is directed towards responsible production, balanced consumption, and just resource distribution, considering the duty of sharing resources, including digital wealth, and ensuring that none is denied access to fundamental technological rights. Spirituality acts as the yardstick to set man above matter, capitalise on spirit-matter integration and enriches the vision, approach, and application of 4IR.

3.2 Islamic spirituality as a moral compass for 4IR

Morality is the by-product of inner dispositions, manifestations of spirituality, and intellectual ability to observe one's behaviour (Mawdudi 2010, 17). Islamic morality is one of the dimensions of spiritual intelligence (Baharuddin and Ismail 2013). Given the inescapable question of ethicality and morality of 4IR, one cannot ignore the role and effect of spirituality. Spirituality is inherently moral and vice versa. Morality operates hand in hand with spirituality and develops proportionally with the spiritual discipline. This is perhaps why al-Jurjani argued that ethics is a rooted state of the soul by which acts emanate smoothly without the need for reasoning.

Spirituality, however, is a prerequisite for moral investment in 4IR. This should be discussed that spirituality is a gradual yet intelligent undertaking synergising reality with the spirit through purification and moral reform. This results in the business of morality to gain meaningful added value for 4IR, especially when it embraces the inner and outer, individual and community, present and future, and change of motivations, attitudes, and lifestyles. Through spiritual exercises, Muslims are encouraged to work on better states of purity, honesty, integrity, trust, respect, dignity while abstaining from falsehood, deception, manipulation, cheating, stealing, fraud, falsification, slander, mischief, and all forms of harm, aggression, or oppression. Muslims also cultivate better ethics of business and technology for 4IR and ensure fair knowledge sharing and technological dissemination, especially for the underprivileged, while removing socio-economic inequalities and disparities. God's remembrance, gratefulness, and mindfulness reinforce the moral, mental landscape with the self, others, and the environment. Virtues are realised through active community engagement (Omar 2016, 83) and are fulfilled through associations (Miskawayh 1966).

Artificial intelligence only represents the tip of a moral risk iceberg; limited AI already poses moral risks in several areas. A critical problematic example is autonomous weaponized drones, where the decision to take a life can already be technologically passed on to complex decision-making algorithms which are educated through extensive machine learning to optimise strike efficiency, instead of conduct moral evaluations inclusive of bystanders, justification, the rule of law, legality and so forth. While decisions to take a life, remain the token action of a human operator, ethics rooted in changing electorates, fear of public backlash, and the like are generally unable to impede for long the march of technological progress and the imperatives of strategic security when confronted with opponents devoid of moral qualms. A spiritually graded 4IR, however, would provide a more resilient, stable, and cohesive moral approach that does not compromise on quality or primacy but ensures the safeguarding of humanity.

Big data is now a staple of modern decision-making, guiding public policy design, corporate strategy, and informing global value and supply chains, effectively bringing humanity closer in their pursuit of self-fulfilment and actualisation. In the face of rapid development and change, little legislation has been introduced to counter the rising spectra of data for sale, effectively commodifying the violation of privacy, reducing the human to a bundle of commercial potential. Modern jurisprudence is still racing to keep up with the synthesis between big data and accurate psychometrics, which can influence elections, guide consumer choice, and more accurately target demographics. This raises critical moral questions that cannot be engaged with by using a traditional zero-sum cost-benefit toolkit. These include questions surrounding the morality of using deeply personal information or social media manipulation for profit. Spirituality then can provide integral, timeless answers to these critical questions without impeding development but somewhat mitigating risk by providing firm ground for more effective legislation, countermeasures, and corporate culture.

Moreover, while many more new jobs will be created in new sectors of development (Africa, 2018), these jobs are still subject to several societal and ethical consequences affecting beneficiaries, resulting in a global segregated job market of 'low-skill/low-pay' and 'high-skill/high-pay' segments; workforce with job losses; Network Economy, and radical changes to senses of identities whether related to our sense of privacy, notions of ownership, consumption patterns, cultivate our skills, meet people and nurture relationships (Plutschinski 2017).

3.3 Spirituality, 4IR and the Environment

4IR technologies are instrumental to many current and future environmental vital actions. For instance, IoT and Big Data Technologies are critical to many environmental care initiatives that prompt responses and alter waste reduction or carbon footprints control and management. While vastly successful, mitigation of potential risks and unforeseen circumstances should have licensed man as the primary of conscious ethical judgment and decision-making in such a process. He would require holistic attention to personal spiritual, ethical, social, and enviro-

mental discipline. The unfolding of humanity and earth's future remains to be seen; for now, the way to man's spiritual and ethical reform is perhaps the surest path to environmental protection.

One of the significant foundations of environmental sustainability lies within the ethics of stewardship. The latter is defined as »the responsible use (including conservation) of natural resources in a way that undertakes a full and balanced account of the interests of society, future generations, and other species, as well as of private needs, and accepts significant accountability to society« (Worrell and Appleby 2000, 263). Infrastructure, technology, financing, levels of wealth or poverty, rights, knowledge, skills, leadership, and good relations can all support communities' stewardship action (Bennett et al. 2018).

Stewardship depends on intrinsic and extrinsic motivations with the capacity to act, which help define the questions delineating duties, obligations, responsibilities, and scopes of action for stewardship (Bennett et al. 2018). The intrinsic power found in spirituality is set to shape much of the stewards' mindsets, choices, and attitudes. This is not dissimilar to how many education programs and social marketing campaigns look to change people's mental models or alter intrinsic motivations through creating connections with nature and changing people's ethics, values, or beliefs (McKenzie-Mohr et al. 2011; Leisher et al. 2012).

Man's self-connectivity, however, is fundamental to his inter-connectivity with earth and ethical performance. This explains Islam's keen interest in man as the principal driver and catalyst alongside his natural bonding with the earth. Those beliefs and persuasions are expected to propel resilient eco-spiritual capital resistant to self and environmentally negligent and destructive decisions through spiritual practice.

Spirituality acts as a pointer for man's interaction with the earth; it outlines the values for sustained earth ethics. Here, the role of spirituality concerning the fulfilment of Islam's higher objectives becomes visible, with the ensuing law emerging from these maxims as fundamentally interested in man's uprightness in promoting and reinforcing its legal rulings. This notion presumes a natural residual capital set to raise man above optimal ethical functionality standards and conscientiousness, enhancing both man's linkages with earth and connection to the divine. Spirituality is set to reshape the broad ethical vision of 4IR by redefining the concept of man-earth and human inter-relationships within a stewardship framework in progressive technology.

4. Conclusion

This study concludes that spirituality is a viable enabler and drive of 4IR. The research concludes that for Muslim populations, targeting the development of Islamic spiritual intelligence, primarily via education, is critical to the innovation, integration, and management of 4IR. The latter should be approached with an

ethically laden worldview, belief and moral system, and spiritual capabilities. The ethical assessment of 4IR starts with holistic and interdisciplinary education, which best informs the collective on the correct ethical choices and the best innovative, managerial, and applicative choices regarding 4IR. However, the educational landscape in the present day and age needs to be re-assessed in an impending borderless world. Education requires investment in new leadership development to better respond and cope with technology, but more importantly, perhaps, the need to appreciate man's inner consciousness for more meaning-laden human socio-political organisation and civilisation. Specifically, educators should speak critically and hopefully about the challenges of IR 4.0 and help students take responsibility for the future development of IR 4.0 and the world while developing and adopting a comprehensive view of how technology is affecting our lives and impacting our environments (Nguyen et al. 2019, 188).

Spirituality requires both companies and governments to train young workers both in terms of spiritual morality and competency with new pedagogies besides mastering compulsory modules of computer science, automation, and foreign languages, to create a new generation of ‚workers 4.0‘ who possess the hard and soft skills needed to operate within the intelligent factory (Petrillo, De Felice, Ci-offi, and Zomparelli 2018). Failure to formulate and implement policies and safeguards on the ethical usage of technology could mean 4IR's evolution into a means for rapacious, exploitative commercialism, which could even inhibit innovation and financial growth (Murphy, Garg and Buckley 2020). Hopes for a better future located in the unprecedented integration of 4IR assumes universal infallibility in the machine. In contrast, the reality of biased technology risks systemic damage, irreversible chaos, and disintegration of the vital ecosystems of self, community, knowledge sharing and production, economy, and much more. In this critical time window, 4IR needs to adopt a holistic and multi-faceted consideration of human ethics, which emerges from an intrinsically emergent ethical lifestyle and psychology.

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