ON THE NATURAL LINK FROM ISLAM TO INFORMATION TECHNOLOGY

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ABSTRACT: While the use of information technology (IT) in the Islamic context is known, the use of Islam in or for IT is new. This study advocates that Islam should be involved in the development phase, long before the use, of IT. In the context of IT, it is possible to get inspiration from what Allah creates such as the universe, human beings, the universe inside the human beings, the nature and much more. Ultimately, all of the creatures, including ones created by humans, have to point and will point to one ultimate destination; Allah Himself. In this manner, there is a lot to guide and teach to the new invention of mankind, by the Creator and religion Islam, which leaves no single emptiness in the universe. This study aims to make the path from Islam to IT more apparent and proposes to use this path more deliberately in a mutual way, especially for the sake of IT itself. To make this path more apparent, this study introduces the connection between Islam and IT and provides also specific examples in particular. The study specifically elaborates the subject with the human, process and technology dimensions.

KEY WORDS: *Islam, Quran, Hadith, Information Technology, ICT*

1. INTRODUCTION

The religion of Islam is perfect and complete (Quran 5:3, 30:30) (The Noble Qur'an, 2019). It leads to the people of every period, being independent of time and space. It covers a wide range of information from what to eat (Quran 16:115) to how to govern people (Quran 38:26) (The Noble Qur'an, 2019). Based on this, Muslims see Islam as a guide in every aspect of their lives and use it to improve the universe in which they are.

On the other hand, the relationship between Islam and information technology (IT) that is a remarkable part of today shows a unidirectional characteristic. Although we are familiar with the use of IT in Islamic applications and for benefit of Muslims, we are still new in the use of Islam for and in IT. In this sense, it is possible to have a connection from Islam to IT with the following two (or more) reasons: 1) everything about human beings who are the common concern of Islam and IT is the focus of Islam. 2) The human beings, the Khaliah of the Creator, Who has created the universe in the best way, are ought to establish IT with inspiring from and mimicking the perfect way of his Creator. Considered the perfect creation is already available, IT and human organisations created with the limited capabilities of man will not be better or different from this perfection. IT as a system can benefit from the patterns

of systems in the universe. In this manner, there is a lot to guide and teach to the new invention of man, by the Creator and religion Islam, which leaves no single emptiness in the universe.

This study aims to introduce the link from Islam to IT with providing specific examples. Thus, it improves the connection between these two by making the link in a mutual way. Specifically speaking, as the IT discipline consists of three main components (Simonsson and Johnson, 2006), the study will handle the subject from the human, process and technology dimensions.

The study primarily aims to provide a new perspective to the people involved in IT disciplines. Secondly, for Muslims, it aims to open a new gate to a new interpretation of Islam in this particular context.

The remaining of this paper is organised as follows: in Section 2, it is provided a background for Islam regarding the context of the study. The section also delivers a holistic and intriguing point of view to the creatures in the universe for a proper reading of them within the scope of this study. The Section 3 includes the related works. In the Section 4, the study elaborates the subject from the human, process and technology dimensions. In the Section 5, we present discussions and the Section 6 delivers conclusions.

2. BACKGROUND

2.1 *Religion of Islam as a Guide*

The religion of Islam:

- Converts society to the best through ethics by guiding with justice, fairness, honest, truth, goodness (Hameed, 2009).
- “Is comprehensive, which organise the relation between mankind and Allah, mankind them self, mankind and other creates of Allah, and mankind and environment” (Hameed, 2009) including what mankind creates such as technology.
- Associates principles with implementation through a set of worshiping, ethics and dealing acts (Hameed, 2009).
- Is a whole life guidance starting from day of birth and continues through all the life (Hameed, 2009).
- Is international for all the people over the world; regardless of their location, time, race, nation, religion, and skin colors (Quran 34:28) (The Noble Qur'an, 2019).
- Is independent from time. Islamic principles are stable and standard across time.
- Is based on the natural instinct of humankind. In the Quran verse 30:30, it is said (The Noble Qur'an, 2019): “So direct your face toward the religion, inclining to truth. [Adhere to] the fitrah of Allah upon which He has created [all] people. No change should there be in the creation of Allah. That is the correct religion, but most of the people do not know.”

There are two main religious texts of Islam: The Quran and the Hadith. The Quran is the foremost and the main criterion reference for judging all the other sources. Formally, the Hadith is mainly defined by Muslim scholars as all what prophet Mohammed says, acts, or agrees on. While the Quran delivers the main principles of Islam, the Hadith helps to understand the Quran in practice. The Quran verse 33:21 says: “There has certainly been for you in the Messenger of Allah an excellent pattern for anyone whose hope is in Allah and the Last Day and [who] remembers Allah often.” (The Noble Qur'an, 2019).

The Quran and Hadith provide the people all over the world with rules (such as in the verse 4:2), standards (such as in the verse 4:11), formula-like cause and result relations defined by the Creator (formulas like f(x)=y in form of “if, then, else”, “if you do this, this will happen”, such as in the verse 14:7), recommendations and examples of best practices such as in the verses 24:34, 12:3, 33:21 and guidance for the best way (as in the verse 17:9 and 2:2) in the, relatively, complex world.

The Quran delivers its contents in the five main areas as following (especially, the first and second item can serve for the context of this study):

- Origins and fundamentals of all sciences
- Information about the creation of the universe
- Principles of happiness in the world
- Principles of eternal happiness in the hereafter
- Essentials of striving in the cause of Allah

Information in the Quran meets the information criteria (ITGI, 2007) as illustrated below:

- Effectiveness: The Quran verse 39:23 (The Noble Qur’an, 2019) declares that Allah has sent down the best statement, a consistent Book wherein is reiteration. The verse 2:2 says: "This is the Book about which there is no doubt, a guidance for those conscious of Allah." (The Noble Qur’an, 2019). The Quran is also proven as implied in the verse 2:111:” They say, "None will enter Paradise except one who is a Jew or a Christian." That is [merely] their wishful thinking, Say, "Produce your proof, if you should be truthful." (The Noble Qur’an, 2019).
- Efficiency: In the verse 6:38, Allah says (The Noble Qur’an, 2019): "We have not neglected in the Register a thing.”.
- Confidentiality: In the verse 56:79 Allah states that: "None touch it except the purified." (The Noble Qur’an, 2019).
- Integrity: The verse 18:1 says (The Noble Qur’an, 2019): “[All] praise is [due] to Allah, who has sent down upon His Servant the Book and has not made therein any deviance.”
- Availability: (Quran 15:9) "Indeed, it is We who sent down the Qur’an and indeed, We will be its guardian." (The Noble Qur’an, 2019) till the day of reckoning. And, there is no book but the Quran which is totally backed up in the minds of people.

- Compliance: The Quran principles rest ultimately on Allah, whose knowledge and authority are absolute.
- Reliability: In the verse 2:23 it is said that: “And if you are in doubt about what We have sent down upon Our Servant [Muhammad], then produce a surah the like thereof and call upon your witnesses other than Allah, if you should be truthful.” (The Noble Qur’an, 2019).

Islamic sources are not limited only to the Quran and Hadith. Other sources by Islam scholars extend and tailor the Quran and Hadith to the context of their time and locations. Thus, while the main principles of Islam remain stable, implementation of them is shaped according to specific time and locations. Similar with the modern science, for something to be accepted, a valid proof has to be established by means of the valid methods over either the Quran or Sunnah with *Ijma* or *Qiyas*.

2.2 *The Universe as a System*

The intriguing idea linking natural phenomena and human inventions is not new. People have used living things in nature as a model for the products they have invented throughout the history (Gates, 2010). The burrs on plants uncannily similar to Velcro fastenings, bats and dolphins having their own form of sonar, how squid proved to be a working example for jet engines, and how teeth became prototypes for chisels are just some to list (Gates, 2010). People have been inspired by such as high-performance swimsuits modeled after sharkskin and the sleek front ends of Japanese bullet trains based on the long, streamlined beak of the kingfisher or a Brazilian beetle may be key to developing computers that run on light (Lee, 2011). The German company Festo (2018) uses the principles of nature to provide with new insights for their technology and industrial applications. Some other examples may include an optimisation algorithm inspired by bee colonies for solving constrained optimization problems in our modern lives (Karaboga and Basturk, 2007) and swarm intelligence inspiring artificial systems (Bonabeau, Marco, Dorigo, Théraulaz and Theraulaz, 1999). In parallel, the study of Robertson (2015) states that when studying the Quran, there are multiple ayah which imply the collective and cooperative behaviour of these animals which show that they possess a certain level of intelligence and sophistication. Another example can be seen in mimicking the human body mechanism in the design of intelligent cities (Ahuja, 1997). There is already a discipline called as biomimicry that examines the extraordinary innovations of the natural world for human inventions. All these implies that “nature is full of amazing designs and mechanisms that appear to have inspired the engineering and technology we use today” (Gates, (2010) and nature's inventions are lean and green machines that are self-sustaining and generate zero waste (Lee, 2011).

Nowadays, computers have taken the nature as well as mankind himself as a model. Humankind pursues to copy his natural intelligence by means of artificial intelligence that simulates human intelligence as working principles. As today, we discuss in the academy world that if the robots can have feelings (Wallace, 2017). With feedback mechanisms, deep learning, machine learning and such, the machines can have human-like-learning skills. With abilities coming with fuzzy logic and genetic algorithms, they can have feelings and misapprehensions, making them not static, deterministic or arithmetic. Rather, it allows them to be equipped

with the ability to move out of what they are designed to do on the first day. Technologies with artificial intelligence are evolving through the capabilities of the learning processes, just like the new-born baby. In this way, with artificial intelligence the technology climbs to the upper layer of the DIKW (data, information, knowledge, wisdom) pyramid to gain experience, learning and having context which belongs to the human talent.

This path is to the way of imitating the creation of the universe and especially the humankind himself. At the end of this way, it will be realised, again, that the universe including the human beings is perfectly created. What people do is just the imitating of the perfect creation (of Allah) within the limited capabilities as the mankind cannot create anything out of nothing or something different or better than the perfect creation (of the Creator). In this case, the most suitable thing to do is to be inspired by this perfect creation. The mankind can only be involved into the cycle of forming the already existed creatures (such as the energy) from one form to another. In this IT era, it may be called as re-forming the universe into the virtual and digital platform with the human hands.

From this point of view, there is a path from Allah to the universe, from the universe to technology. The mankind can consider the universe, including himself, as a system created perfectly during his new creation of the other instance of a system that is IT.

3. RELATED WORKS

There exist ongoing debates on the relations between Islam and science such as in (Zaimeche, 2002). There are studies in the context of IT as regards the use of knowledge in Islam as in the case of the study of Noordin, Othman, and Zakaria (2011). Apart from these, some studies on Islam and IT in general investigate the use of technology for the benefit Muslims. There are also some studies on the use of IT from the Islamic perspectives such as (Ahmed and Noordin, 2014; Ghani, 2004; Siddiqui, 2003). This study differently advocates that the natural link between Islam and IT should be put in place not only for an IT utilisation for benefit of Islamic world but also at the stage of IT development for the benefit of IT itself.

Similar to the context of this study, in the study of Ozkan (2011), the aim is to present an Islamic perspective on IT governance through COBIT (ITGI, 2007). From the people side of software development, Hameed (2008) proposes a framework for modelling principles for software engineering professionals based on Islamic ethical values. Nasruddin and Hussin (2014) comes with an idea of a Muslim desktop interface designed based on a metaphor analogy of a mosque.

4. THE PATH FROM ISLAM TO IT

In the following sections, the subject is discussed with the dimensions of human, process and technology that are the three elements that constitute the basic of the IT discipline. Although it is not fully possible to separate the boundaries between these three categories, each item is respectively taken to the centre and discussed.

4.1 Human

Among the human beings, process and technology, the human beings have a special place. The range of their potential can be significant and flexible and they have an ability to design and shape the other twofold; technology and process. Considered that technology is a solely human-made artifact and that other creatures cannot create technology without human beings' involvement reinforces the importance of them in this manner. While the severity of this significance throughout the history has been indisputable, mankind nowadays has crucial factors affecting organisations of the IT era. With exploiting the power of IT for his benefit, humankind has reinforced his importance recently.

Although the prominence of the human beings in this context is known (Hall and Wilson, 1997; Wilson, Hall and Baddoo, 2001; Hammock, 1999), human factors continue to be ignored in the IT sector (McDermid and Bennett, 1999; Melo, Santana and Kon, 2012), and this may become a serious issue (Sharp, Woodman, Hovenden and Robinson, 1999). As a typical example of such a disregarding in the context of IT, COBIT (ITGI, 2007), one of the leading frameworks in the field of IT governance, which includes a number of best practices, regards the human beings as a kind of resource type (ITGI, 2007) like the kind of infrastructure systems, servers, etc. However, among these resource types, the only "resource" bearing a soul as a life essence is the human beings. The owner and the master of the other resources is also the humankind.

The source of his potential and this privileged position of him springs from his special creation. Allah has blessed him by breathing into him of His spirit (Quran 32:9) (The Noble Qur'an, 2019), and thus given him some of His attributions with a particular will. With his unique features, the human holds the ability to move towards the righteous, the justice and the beautiful, and to bring closer the universe and himself to the pure and absolute perfection that he initially comes from. He has been separated from other creatures with these unique features. This is a chain from Allah to mankind and mankind to human-made systems. Ignoring this crucial potential of mankind by some other people and not opening up space for others is a reason for not only breaking the chain, but also missing the root of problems and therefore the solutions in which the man is the main partner.

In some frameworks designed by the modern world mentality, mankind, who is believed to have been born with the sin of eating the forbidden apple his first ancestor ate, is considered a sinner unless he is baptised. Even if it is baptized, it is assumed that human beings need to be controlled by a higher authority (that is believed representing the right) to avoid their essence from leaning against such a sin again. In its near past, being under the influence of the slavery system and logic, which gains strength within the industry age, the modern world, knowingly or unknowingly, maintains the approach of its past in IT era.

Having abilities given by Allah to the man is common to all people, not privileged to a particular human types, classes or levels. In spite of this, we see formations of levels in organisations, separating the thinker and doer from each other, within levels of "operation people" being reduced merely on quantitative perspectives within numbers, detailed plans and severe predictions. Then, such predictions are ensured by strict procedures and processes. The human capabilities are thus forced into a predefined and deterministic procedural path (Asproni, 2004) designed

by some others. This also restricts the productivity of mankind to a standard flow. On the other hand, we have begun to witness to different forms of organising people such as holacracy. Holacracy distributes authority and decision-making throughout an organisation, and defines people not by hierarchy and titles, but by roles (Robertson, 2015) as happening naturally in a human body.

Similarly, Islamic perspectives may benefit to the modern world by providing new points of views and practices. Islam gives the value to humankind and all variations of his forms as in individual, society, team, etc. Addition to that, mankind himself, decision-making methods, methods of administration, selection methods (consultation, democracy, etc.), feedback mechanisms, values and common values are not new, they are rather common issues of the history. The history of Islam and the religion of Islam as a whole have sufficient and profound resources for such issues to shed light on for the people, including of the information era. The recognised potential of the human beings and the other creatures created by Allah, especially living in groups, and the perfect system designs in the nature can provide solutions to the complexity of the information age. Moreover, Islam can support the moral and ethical matters, which are a global issue of the world, with a Quranic attitude. IT and processes created by human beings and human beings themselves should comply with Allah's authority: being good, beneficial, just and right (Ozkan, 2011). This puts forward the requirements of and supports privacy, security and ethics matters in the IT field (Hameed, 2008; Noordin, 2013).

4.2 Technology

4.2.1 The Universe as a Software

There exists a view suggesting that there is mathematics in our lives (Stewart, 2011; Stewart, 1995), even more, there are people who argue that the life can be represented by mathematics (Frenkel, 2013). There are also those who advocate that the life we live in may be a kind of simulation or a hologram rather than a real one. The physicist Van Raamsdonk of the University of British Columbia argues that "everything around us, the whole three-dimensional physical world, is an illusion born from information encoded elsewhere, on a two-dimensional chip" (Spillers, 2014). Nick Bostrom seeks answers to the question "Do you live in a computer simulation?" (Bassler, 2017). Elon Musk, a prominent figure in today's IT world, at the California's Code Conference, contributed this assertion by using the phrase "There's a billion to one chance we're living in base reality" (Musk, 2016). This similar view has been the subject of science fiction films such as Star Trek, Dark City, The Thirteenth Floor, Matrix, Inception, Tron and such.

This interesting opinion is not alone. According to Ibn Arabi, the life in this world of matter is wholly a sleep and dream (Landau, 2013). Filibeli Ahmed Hilmi comes with a similar approach in his work, Amak-ı Hayal. The hadith-i sharif stating that "You are asleep; You will wake up when you die" shows a similarity to these approaches. Quran says (6:32) "What is the life of this world but play and amusement? But best is the home in the hereafter, for those who are righteous. Will ye not then understand?" (The Noble Qur'an, 2019). When considering the Quran verse 70:4 stating "The angels and the Spirit will ascend to Him during a Day the extent of which is fifty thousand years" (The Noble Qur'an, 2019) together with the fact that while the perceived time in a dream is long, the 'real' equivalent of this

period is dramatically short, it is possible that this life which is thought to be real is a kind of dream that is dreamed together by all of those in it.

4.2.2 Software as the Universe

The world of IT is a projection of the life on another platform (Wolfram, 2006). By the help of IT, the data of events and objects can be stored in the digital media. One simple example of this is the digitalization of the collected data about the weather and using this data in another platform. As a result, the data that can be observed by a human is obtained in a different form produced by a machine.

Peter Chen, the founder of relational databases, states that assets and relationships are a natural way to organise information, as well as physical things (Winslett, 2004). This phenomenon, which is the conceptual basis of the database, is also the basis of the object-oriented software programming languages used in the recent years. Real-life design patterns are used as solutions to solve the problems of the software development world. Similar to the volumetric growth of living organism as the base of two seen in meiosis division, the memory capacity grows twice per year (Schaller, 1997) as in the organic growth. Mankind gives a life to the hardware produced from the soil, like his own, with the software. The verse (51:49) states that “And of all things We created two mates; perhaps you will remember” (The Noble Qur’an, 2019) like day-night, hot-cold, codon-anticodon, electron-proton, quark-antiquark, and binary digits used in computers. All these examples imply a similarity between the functioning of the real life we live in and the software world as a projection of the life.

Beyond the world of IT being as a projection of the life on another platform, IT has different characteristics than other inventions in the history. In the period up to the digital age, the transformation of the substance has been in a “from-hardware-to-hardware” form. In the digital age, the transformation has changed to a “from-hardware-to-software” form and thus the digital era has gained some unique capabilities. The things that have been transformed to a completely different platform have found a new expansion area. It has stretched the borders of the conventional reasoning. Today, virtual and reality environments can so be interchangeable and intertwined that the difference between the virtual and real world has blurred and become indistinguishable.

Augmented reality, virtual reality, games, social networks, artificial intelligence are examples of such interchanging and replacement between software and hardware. Three-dimensional printers can be considered as the point of transformation of a software to a hardware. Recent studies have produced chips that mimic the cognitive structure of the brain (Modha, 2017). The objects that mankind produces himself have begun to replace him. Autonomous vehicles, unmanned air vehicles, artificial intelligence robots (Wallace, 2017) are examples of this case.

The fact that the software and hardware are logically equivalent (Shihai, 2014) contributes this engagement and transition to be so natural. People have an option of implementing a particular capability either with a hardware or its equivalent counterpart, software. In a further aspect, if it is assumed that the universe is a software product as put forward before, it is revealed that this equation is rather in the “from-software-to-software” form.

4.3 Software, the Universe and Islam

Regarding the context of the study, the natural link between Islam and IT, established either intentionally or unintentionally, already exists. Let us consider IT has begun to be more successful by resembling the human beings. When, as the human beings, the technology sees with their own camera, when they make a sound like people, when they react to touching and have an intelligence, even if it is artificial, IT and humankind have become closer. The first computers were used to accept commands on the black screen in a form close to machine language, which is away from the enjoyment of mankind. Then, the technology has gained the feeling of movement on the third dimension. IT now 'see' by gaining the ability to see. Nowadays, devices with ‘touch’-screens become widespread. With the development of natural language processing, people became talking to them. It has become a thinker like a human with its artificial intelligence.

Let us consider the log management operated by angels similar to the log management in IT. However, as far as Islam is concerned, there are opportunities for improvements in IT log management. For instance, in the design of Allah we see that the log management is purely designed by Allah Who is the One calling human beings to account for their deeds. In such a design, it is not possible to fake the system. IT log management is rather designed by those accounting for their deeds. What we see in designing an audit system in IT, those developing the log management system and those using the system are same, the IT side, which may open gates to vulnerabilities. In addition, the logs recorded by the angels are used for both the negative (the Hell) as well as positive results (the Heaven) unlike in IT that uses log records for negative cases at most. Using logs for both circumstances encourages people to not only stay away from the negative deeds and also activate them to the positive directions. Using logs only for negative circumstances reinforces negative situations and leads people to be more and more passive (such as in having no logs and hence having no negative results).

Regarding opportunities for improvements by Islam, another example is manifested in identity management. While the unique identities defined by human beings are bound to the boundaries of time and space, Allah has created unique identities, such as non-repetitive fingerprints, eye retina, which are unique in all times and spaces. The other characteristic of these natural identities is that they contain characteristic features about the identity they represent. For instance, while the link between citizen identification numbers assigned to particular individuals and the holder of the identity is synthetic, the identification information created by Allah holds real information about the holder. For example, DNA studies conducted on the oldest whole skeleton found in England yielded a lot of information about the external appearance of the person of the skeleton (Andrews, 2018).

Today’s Newton Physics explains until to the border of the atoms but cannot go any further. This traditional physics rational stating that nothing comes from nothing (ex nihilo nihil fit) also contradicts with the religion of Islam. Additionally, metaphysics is mainly out of scope in the classic physics yet it has a considerable place in the Islamic belief. However, with Quantum Physics concerning inside-atoms has begun to be acquainted with many interesting information and assumptions of classical physics have been replaced with new questions. IT, a typical practitioner of the classical mathematics and physics, can benefit from Quantum Physics and metaphysics to get beyond its current limits. Unlike the

deterministic laws of Newton Physics, the Quantum logic is based on the facts derived from the experience, the behaviour of subatomic particles and unobservable systems. It also focuses on the wide perspectives of human rather than systems of observable universe. Thus it can open new doors to IT by such as copying human brain logic and programmable molecules (Benenson, Paz-Elizur, Adar, Keinan, Livneh and Shapiro, 2001).

4.4 Process

4.4.1 Software Development Life Cycle: Life

A similar effort of such convergence can be seen in software development methodologies. Although “When He decrees a matter, He only says to it, "’Be’, and it is” (Quran 2:117) (The Noble Qur’an, 2019), and “every day He is bringing about a matter” (Quran 55:29) (The Noble Qur’an, 2019), the development process of people can be quite long. Nevertheless, human beings want to be as close as possible to that absolute point of power in creation. In software development methodologies, we recently see an increase in continuous delivery, short iterations and incremental development that adds the organic growth characteristic to the development life cycle (Blom, 2010; Sharma and Hasteer 2016). It is also aimed to automate the entire production line, thus increasing its speed and ensuring continuity (McAllister, 2017). The lean approach (Womack, and Jones, 1997), which aims to prevent waste, and the kaizen approach (Berger, 1997), which aims at continuous improvement, are in parallel with the Islamic principles which regard the waste unlawful and the improvement essential. This lean approach is also another cue of that humans are taking from the natural world (Lee, 2011) that is created in due measure by Allah (Quran 54:49) (The Noble Qur’an, 2019).

Agility, which is defined as the ability to adapt to change by reacting to environment, is being involved in the software development processes as an ability (Beck et al., 2001). This is actually due to the desire of the software itself, which is the final product, to be alive like human beings. In absolute terms, concrete and fixed objects, such as bridges and buildings are not expected to react to the environment much. This characteristic manifests with a similar effect in the production stages of such products; the development processes of deterministic products can be pre-defined and processes require a minimum amount of change. Such processes are expected to behave deterministically and mostly linearly. However, the software itself is alive. In its essence, it has a spirit that gives a life to the hardware. In the development of a software, this characteristic wraps back from the final product to the development of the product and expects the software development stages to be alive and adaptive to its environment. This aspect of software development has been tried to be met with the abilities of the agile software development mentality that has gained popularity in recent years (Dingsøyr, Nerur, Balijepally and Moe, 2012). Human beings nowadays want to transfer this inherited ability being in their usual life to the software development processes.

4.4.2 Software Development Life Cycle: Cycle

Ground objects move on the linear direction, celestial objects move on circles. The ideal shape of the ground objects is the cube (linear, least moving), and the most beautiful example for Muslims is the Kaaba. The ideal shape for the celestial

objects and for those coming from the sky (the source of the life) is the sphere. The form of vitality is circular such as in the electrons circling around the nucleus of the atoms, the circling form of the soul around the heart, the circling form of the Muslims around the Kaaba and the circular rotation of the human body between the birth and death (Humankind is born without a tooth and he dies without a tooth, he is born in need of help and he becomes dependent on help as he ages, and his body made of soil returns to the soil again). The water from which every living is made (Quran 21:30) (The Noble Qur'an, 2019) gives life to the nature (as expected in Mars) takes a circular course between ground and sky and as in a water drop. The number of Pi, an irrational mathematical constant obtained by dividing the circumference of a *circle* by its diameter, also bears a mystery spring from the source of its shape. This is their attempts to reach a circular form belonging to the sky, which is the main source of the life. The form in which processes evolve to gain vitality has also taken a circular shape. Specifically speaking, it is ideal for the software development processes to have the similar circular forms. Iterative and incremental (organic) development recently have become the general characteristics of the software development methods to have a more alive form.

The claim of being linear on the other hand is a kind of claim of being absolute right and having no imperfectness as in the straight-linear-timeline (Einstein, 1916) in which leads us to the point when Allah will complete the light of Him (Quran 61:8) (The Noble Qur'an, 2019). Being linear is a way to the ultimate state of being free from errors, mistakes, faults or defects. For a human, holding the claim of being linear, involves, more or less, a secret divinity inside.

The view to the future time in the waterfall methodology, one of the common and typical types of classical software development approaches, involves a linear process mentality, like happening in a waterfall. The waterfall approach assumes that systems are fully specifiable, predictable and developed through extended and detailed planning (Stoica, Mircea and Ghilic-Micu, 2013), thus, it follows a systematic and linear approach (Royce, 1987) to software development life cycle. The more systematic (self-confident) approach makes it more linear (claiming being perfect). However, while it is normal to plan time of a work in the future, keeping the plan fixed against to changes implies a claim of knowing all the related parameters even from the present time that have a potential to affect the time in the future. However, the plan, as known by the people including those who create it will change over time on the course. The primary and fundamental reason for this is that while the time progresses linearly, the conditions derail the software development path from being linear. Software development, in addition to other factors, involves human factors, which are just one of the most difficult parts to predict, because humans does not behave linearly. Therefore, compliance with the plan loses its credibility from the very beginning.

Another mistake of the plan-oriented approaches in the software development starts when treating the farthest point and the nearest point in a plan with a same clarity. However, humankind in his life sees the distant point less clearly, and the closer one more clearly. Therefore, while it is possible for human beings to make clearer predictions in the near future, it is not possible to see the distant time with the same clarity from now. As a reaction to this situation, the software development world is trying to move away from being blindly following a plan and welcoming changes (Beck et al., 2001) as happening in the natural life.

5. DISCUSSION

In the era of IT, Islamic scholars have not kept pace with the IT advancements (Ozkan, 2011). For this reason, Islam and IT seem separate at the first glance. In essence, they share common points. Here, it is reminded the fact that Islam is perfect and complete to cover all the issues so that Islamic sources can support IT fields with a set of beliefs, ideas, and rules. When considered, let us say, these two verses: “Indeed, within the heavens and earth are signs for the believers. And in the creation of yourselves and what He disperses of moving creatures are signs for people who are certain” (Quran 45:3-4) (The Noble Qur’an, 2019) and “Indeed Allah is, of all things, Knowing.” (Quran 29:62) (The Noble Qur’an, 2019), it is possible to get inspiration from what Allah creates such as the universe, human beings, the universe inside the human beings, the nature and much more. On the basis of this study, the main idea of the paper takes us to a summary picture as the figure below that depicts ways to the interpretation of Islam for and in IT:

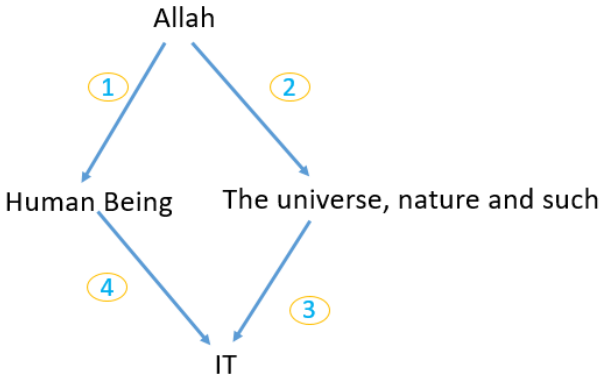

Fig. 1. The path from Allah to IT

Considering the Figure 1, despite the fact that we have built the path 4 and there are some developments on the path 3, the whole picture is still not apparent in the scientific world of IT. For the people dimension, the study proposes a concept of people that should be considered in a wider and deeper scope as in Islam placing their deserved value. Human beings have been separated from other creatures with their unique features given by Allah, which calls for considering the path number 1 in the figure. When it comes to the technology and processes, the current and common view to it is through number 4 in the figure; believing that people create IT capabilities solely with their own capabilities. The path number 3 is already in our daily use with emerging examples, yet mostly without the realisation of the full picture. Thus, this limited view to IT can be made wider and broader and built up with the paths of number 1, 2 and 3. To emphasize the main point in the Figure 1, ultimately, all of the creatures, including ones created by humans, have to point and will point to one ultimate destination; Allah Himself. In the creation of the creatures made by human beings, it is not possible to go beyond the capabilities of Allah and His perfect creation process. What we should do is to follow the path of being inspired by what has been created around and inside us.

6. CONCLUSION

Allah creates what He creates in the best and perfect way. The Quran versus 67/3-4 say that: “who created seven heavens in layers. You do not see in the

creation of the Most Merciful any inconsistency. So return [your] vision [to the sky]; do you see any breaks? Then return [your] vision twice again. [Your] vision will return to you humbled while it is fatigued." (The Noble Qur'an, 2019). The universe, human beings, the universe inside the human beings, the nature and all the other creatures are created perfectly. In the creation of the creatures made by human beings, it is not possible to go beyond the capabilities of Allah and His perfect creation process. As humankind, even we are preferred over much of what Allah has created (Quran 17:70) (The Noble Qur'an, 2019), we are not capable of creating something new in an absolute manner. What we should do is to follow the path of being inspired by what has been created around and inside us. Doing so more deliberately will smooth and fasten the process. Thus, this study aims to make this path more apparent and proposes to use it more deliberately in a mutual way, especially for the sake of IT side. To make this path more apparent this study introduces the connection between Islam and IT and provides also specific examples in particular.

This study would hopefully provide valuable insights firstly to people related to IT. Secondly, for Muslims this study would provide a novel interpretation of the Quran and Hadith by connecting their mostly known meanings to the IT related context. Also, for non-Muslim practitioners, who are managing Islamic organisations or managing Muslim workforces this study would be informative and supportive.

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