TAXONOMY OF HUMAN INTELLIGENCE DEVELOPMENT IN ISLAM: ANALYSIS BASED ON *MAJMŪ'ĀṬ RASĀ'IL AL-IMĀM AL-GHAZĀLI*

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by

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In the name of Allah SWT, the Merciful, the Beneficent. Praise be to the Lord of all worlds. Prayer and peace be upon our Prophet Muhammad, his family and all of his Companions.

This study is dedicated to the Center for Islamic Development Management Studies (ISDEV), Universiti Sains Malaysia, the institution which inspire me with the importance of bringing back the nostalgic achievements of classical Muslim intellectuals into the light of current phenomena. First and foremost, in the ISDEV's list, I would like to express my sincere gratitude to my passionate supervisor and co-supervisor Dr. Azrin binti Ibrahim and Dr. Shereeza binti Mohamed Saniff. Both have given encouragement for me to pursue the first idea that come to my mind when I decided to write this topic of human intelligence development in Islam. I should not forget Emeritus Professor Dr. Muhammad Syukri Salleh who suggested that I study the topic authentically from Islamic intellectual heritage and to Institute Postgraduate Studies (IPS) who supported me financially at the beginning of my journey. All the abovenamed persons and institutions are the support systems as well the backbone to this thesis.

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experts from the department of Islamic Revealed Knowledge and Heritage from International Islamic University of Malaysia (IIUM) who wrote about thinking from Islamic perspectives, Professor Dr. Jamal Ahmed Bashier Badi. He has spent his valuable time and discussed with me at length the literal and technical meaning of intelligence in Islam. He even suggested material for reading on this topic. I also visited my previous psychology department at IIUM in finding the direction of my thesis. Prior to that, I consulted Professor Amber Haque, my previous psychology lecturer at IIUM online and he responded to my email by suggesting an expert from IIUM. I am both, fortunate and unfortunate. Unfortunate as I could not find a suitable expert to interview in IIUM's psychology department. Fortunate because the head of that department who was very welcoming introduced me to another expert whose field of work and study relates to my area of interest. My discussion with Dr. Jusmawati Fauzaman produced the idea of taxonomy which is her area of expertise. She is a leading academic in this field of research.

From then on, the real journey of my thesis begun as I started to visualise what my thesis will look like. The interesting part is *Majmū'aṯ Rasā'il al-Imām al-Ghazāli* in the Indonesian version, was the book I bought during my academic trip to Medan and I have kept that book without reading it. Since I decided to study from classical Islamic scholars, the book has sparked my curiosity to see what I can gather from it. Finally, I found what I needed from that book but I have to also find the original text in Arabic to embark on my thesis to include data from authentic sources. The softcopy version can be found online which I downloaded and compared it with the Indonesian version that I have. The translation is exact to the meaning of the original text but not all the topics in Arabic versions are translated. The Malay translation of the text are on three

topics only and one topic has an English translation. The rest of the topics I have to translate using online software and seek help from an Arabic speaker, my colleague Dr. Muhammad Auwal Salisu. Beside the aid from machine and human, I personally had learned Arabic during my high school, and I took this opportunity to improve my Arabic language. I also hired Sister Najihah in editing the Arabic text to be used in Atlas Ti for word search analysis.

This thesis has also owed its completion to the contemporary scholars who has given support to its validation. To Prof Dr. Robert J. Stenberg, I appreciated the feedback to my email even though the difference in perspectives has inhibited a more substantial input. To Prof Madya Dr. Kaseh from Islamic Heritage and Civilization, Universitri Kebangsaan Malaysia (UKM), thank you for your expertise in Arabic language, Dr. Syaidatun Nazirah Abu Zahrin from Pusat Citra UKM for your constant support and materials.

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LIST OF ABREVIATIONS

AGI	Artificial General Intelligence
AI	Artificial Intelligence
CE	Common Era
CEO	Chief Executive Officer
CFA	Confirmatory Factor Analysis
CPS	Cyber Physical System
DHC	Distributed Human Computation
Eds	Editors
EI	Emotional Intelligence
EQ	Emotional Quotient
ESQ	Emotional Spiritual Quotient
et. al	et alii (and others)
HDI	Human Development Index
HIDI	Human Intelligence Development in Islam
HOTS	Higher Order Thinking Skills
ICT	Information Communication Technology
IoT	Internet of Things
IIUM	International Islamic University of Malaysia
IQ	Intelligence Quotient
IR 4.0	Industrial Revolution 4.0
ISI	Islamic Spiritual Intelligence
ISDEV	Center for Islamic Development Management Studies
KM	Knowledge Management

LTA	Limit to growth
MEDP	Malaysian Education Development Plan
MRIG	*Majmu'at Rasāil al-Imām al-Ghazālī*
MOE	Ministry of Education
MQA	Malaysian Qualification Agency
OECD	Organisation for Economic and Development
OCR	Optical Character Recognition
PBUH	Peace Be Upon Him
PLS	Partial Least Square
PRISMA	Preferred Reporting Items for Systematic Review and Meta-Analyses
RQ	Ruhani Quotient
SDG	Sustainable Development Goal
SQ	Spiritual Quotient
SWT	*Subhānahu Wa Ta'āla*
UN	United Nation
UKM	Universiti Kebangsaan Malaysia
UM	Universiti Malaya
USM	Universiti Sains Malaysia
WoS	Web of Science

TRANSLITERATION GUIDE

HURUF RUMI	HURUF ARAB	HURUF RUMI	HURUF ARAB
ṭ	ط	-	ا
ẓ	ظ	b	ب
‘	ع	t	ت
gh	غ	th	ث
f	ف	j	ج
q	ق	ḥ	ح
k	ك	kh	خ
l	ل	d	د
m	م	dh	ذ
n	ن	r	ر
w	و	z	ز
h	ه	s	س
’	ء	sy	ش
y	ي	ṣ	ص
t̲	ة	ḍ	ض

PENDEK		PANJANG		DIFTONG	
a	ـَ	Ā	آ	ay	أَيْ
i	ـِ	Ī	إِيْ	aw	أَوْ
u	ـُ	Ū	أُوْ		

Sumber : *Pedoman Transliterasi Huruf Arab Ke Rumi*, Dewan Bahasa dan Pustaka (DBP) (1992)

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TAKSONOMI PEMBANGUNAN KECERDASAN MANUSIA DALAM ISLAM: ANALISIS BERDASARKAN *MAJMŪ'AṮ RASĀ'IL AL-IMĀM AL-GHAZĀLĪ*

ABSTRAK

Taksonomi merupakan kajian yang mengkaji suatu entiti, komponen dan membuat klasifikasi entiti dan komponen tersebut. Terdapat juga kajian taksonomi yang menyusun entiti dan komponen tersebut sebagai satu struktur. Kajian entiti, komponen dan struktur kecerdasan manusia merupakan kajian berterusan dan telah memberikan banyak jawapan. Tiada konsensus yang dicapai di kalangan pakar kecerdasan untuk menentukan apakah kecerdasan manusia dan ini memberi kesan kepada perkembangannya. Oleh itu, kajian taksonomi adalah penyelesaian kepada teka-teki ini. Kajian taksonomi melalui perspektif Islam adalah anjakan paradigma dalam revolusi sains kecerdasan manusia. Dalam usaha memecahkan persoalan komposisi kecerdasan manusia, kecerdasan buatan muncul sebagai cabaran dalam pembangunan kecerdasan manusia. Pembangunan yang pesat kecerdasan buatan dilihat mampu menggantikan kecerdasan manusia dalam pelbagai aspek. Dengan menggunakan pendekatan Islam, cabaran yang dibawa oleh kecerdasan buatan mampu dikendalikan dengan memperkenalkan paradigma baharu kecerdasan manusia melalui kajian taksonomi. Objektif kajian taksonomi ini ialah mengenal pasti entiti, komponen dan struktur asas melalui kajian literasi terdahulu. Keduanya ialah menganalisis entiti, komponen dan struktur asas yang telah dibina berdasarkan kumpulan kajian penulisan *al-Ghazālī (Majmū'aṯ Rasā'il al-Imām al-Ghazālī)* disingkatkan sebagai MRIG. Objektif ketiga kajian ini ialah merumuskan taksonomi pembangunan kecerdasan manusia dalam Islam berdasarkan MRIG. Kajian ini berbentuk kualitatif asas.

Pengumpulan data menggunakan data primer dan sekunder. Data primer diambil menerusi pengesahan pakar dan data sekunder dikeluarkan daripada kajian dokumen MRIG. Data dianalisa secara perkataan menggunakan Atlas.Ti 8.4 dan kandungan untuk mengenal pasti entiti, komponen, struktur hieraraki dan juga konsep pembangunan kecerdasan manusia. Hasil analisis mendapati terdapat 21 satu entiti daripada lima komponen yang terdiri daripada komponen *rūh tabi'ī*, *rūh haiwānī*, *rūh qudsī al-nābawī* dan *rūh rabāniyaṯ* dan satu komponen baru terdiri daripada komponen ilmu. Terdapat lima peringkat struktur hierarki yang terdiri peringkat terbawah, peringkat bawah iaitu *nafs al-amaraṯ bi-al suu'*, peringkat pertengahan iaitu *nafs lawamaṯ*, peringkat atas *nafs mutmainaṯ* dan peringkat teratas. Konsep pembangunan kecerdasan manusia pula dikenal pasti sebagai aktiviti *nafs* (jiwa) dalam mencari *nūr* (pencerahan). Pengetahuan taksonomi ini merupakan alat ilmu penting dalam bidang psikologi Islam dan mempunyai implikasi praktikal kepada pembangunan manusia berteraskan Islam.

TAXONOMY OF HUMAN INTELLIGENCE DEVELOPMENT IN ISLAM: ANALYSIS BASED ON *MAJMŪ'AṮ RASĀ'IL AL-IMĀM AL-GHAZĀLĪ*

ABSTRACT

Taxonomy is a study that examine in detail about entity, component and make a classification of it. There is also taxonomy which arrange the entity and component into a structure. The study of entity, component and structure of human intelligence is an ongoing studies and has provided many answers. No consensus achieves among scholars to define what human intelligence is and this effects its development. Therefore, taxonomy study is the solution to this puzzle. Taxonomy study through Islamic perspective is the paradigm shift in human intelligence scientific revolution. In midst of human intelligence's inquiry, artificial intelligence (AI) merges as a challenge to human intelligence development. The development of AI seems to be moving progressively in replacing human intelligence and the direction of its movement is unknown. By using Islamic paradigm, the challenge of AI could be mitigated by introducing new paradigm of human intelligence through taxonomy study because new paradigm needs to answer all the basic questions. The objective of this taxonomy study is to identify basic entities, components and structural hierarchy of human intelligence development. The second objective is to analysze these basic entities, components and structural hierarchy based on collection of treatises or writings of *al-Ghazālī (Majmū'aṯ Rasā'il al-Imām al-Ghazālī)* abbreviated as MRIG. The third objective is to conclude the taxonomy of human intelligence development in Islam based on MRIG. This study is a basic qualitative design. Data is collected from primary and secondary data. For primary data, validation by experts was carried out to

validate the data derived from MRIG. Both data being analysed through word using Atlas Ti 8.4 and content analysis to identify concepts, components, entities and strcuctural hierarchy. The result of analysis revealed that there are 21 entities from five components which cocnsist of component *rūh tabi'ī*, *rūh haiwānī*, *rūh qudsī al-nābawī* dan *rūh rabāniyaṯ* and one new component which are knowledge's component. The structural hierarchy consists of five levels which are lowest level, lower level of *nafs al-amaraṯ bi-al suu'*, intermediate level of *nafs lawamaṯ*, upper level as *nafs mutmainaṯ* and highest level. The concept of human intelligence development is recognised as *nafs* (soul) activity towards *nūr* (enlightenment). The fundamental understanding of this taxonomy is instrumental knowledge in the field of Islamic psychology and has practical implication on the Islamic based human development.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Taxonomy study is purely science and in social and human science studies, it has opened the door of research to be embarked upon. The most popular in Social Science is 'Bloom taxonomy' has been fully recognised as instrument in educational development. What is taxonomy? Taxonomy in simple understanding is a scheme of classification. It is a term coined in French from Greek taxis 'arrangement' in early 19th century. In simple definition taxonomy is the science of naming, describing and classifying organism and includes all plants, animal and microorganism of the world. Human intelligence as part of this science, still battled and conflicted in resolving composition and concepts issues, hence hinder its development. This research is carried out to answer the most basic composition in the form of taxonomy and it also answer the concepts of human intelligence development using Islamic perspective to represent the holistic approach in solving the issue. The main objective of this research is to propose taxonomy of human intelligence development in Islam through identifying the basic entities, components and structural hierarchy. The identification of these entities, components and structural hierarchy are then analysed based on *Majmū'aṯ Rasā'il al-Imām al-Ghazālī* (MRIG). Therefore, the conclusion of the taxonomy of human intelligence development in Islam is based on MRIG.MRIG is the compilation of 26 articles of the writing of *al-Imām al-Ghazālī.* The selection of MRIG is due to it has been recognised as the authentic works and writing of *al-Imām al-Ghazālī* and the contents of the title tells alot about Islamic human and social

development which many scholars attempted to dig up. Furthermore, *al-Imām al-Ghazālī* himself represent Islamic human intelligence and distinguished Islamic scholar recognised by western scholar, undoubtedly. In presenting the issues, the approach adopted is to discuss the isseus at broader sense followed by the issues that lead to the focus of this study which is taxonomy and Islamic perspective.

The next sub-topic is a discussion on the issues of human intelligence in four dimensions; concept of development, Industrial Revolution, Science Revolution and Islam. The problem statement will show to the research need to be carried out followed by research objectives and research questions to systematically approached the topic selected. Scope and limitation of research also discusses and serve as guideline. The operational definition to the working title of this thesis will also be clearly defined to guide better understanding of the research undertaken. In addition, significance and contribution of the research will be highlighted to emphasise the importance of this research. Finally, is a brief explanation of the organizational of this thesis from chapter one to chapter six.

As a beginning of this chapter, background of the study is to be presented first to the reader to give some general idea. This will be followed by some pressing issues discussed as problem statement that need to be given special attention and treatment in this thesis study.

1.2 Background of study

Human intelligence's study is not a new phenomenon. However, the so called 'scientific research' of this phenomenon has been recorded to have been carried out progressively in 19th century with psychometric test. The emergence of "psychometrics" as a discipline started with Binet–Simon test that engage the question either children are slow or sick when they did not perform in school. This is how intelligence became a "psychological object. Childeren which show slow progress in education was labelled as sick by psychiatrist and treated as abnormal under asylum. Binet sought to keep children in schools and conceived of a way for psychologists to do this and create a "metric" scale of intelligence—and the associated testing apparatus—to legitimize the role of psychologists which being dominated by psychiatric in identifying and treating "the abnormal". The implication of Binet finding was a change in the earlier law of French education for children. This conceptualization of intelligence was then carried forward, through the test's influence on Lewis Terman (1877–1956) and Lightner Witmer (1867–1956), to shape virtually all subsequent thinking about intelligence testing and its role in society (Nicolas, Andrieu, Croizet, Sanitioso & Burman, (2013).

In Islamic world, the phenomena of studying this aspect can be traced back since 9th century (Amber Haque, 2002). Even it was Islam that paid particular attention to that aspect, it is difficult to classify it as human intelligence's study. It is difficult because it was inter-mingled with other field of study (Amber Haque, 2002). Instead of being proactively continued the tradition of past Muslim scholar, recent Muslim scholars had to tackle the issues raised by western scholar scientifically. Furthermore,

they also being caught in the dilemma as being highlighted by most prominent Muslim scholars in psychology, Malik Badri. The dilemma being raised indirectly touched the aspect of human intelligence aspect since it was part and parcel of psychology. The dilemma was either Muslim need modern psychology at all or is modern psychology wholly western or is there a way in which it could be reconciled with Islam (Malik Badri, 1979). The arguments and solutions provided by him are given special attention and positively applied in this thesis study.

Since then, human intelligence's composition and concept in Islam is continuously being researched only to answer a very basic pertinent issue and has been blindly imitated the western scientific approach on the subject. If human intelligence's study did not resume from the very right beginning, the research will continuously be looking for the right explanation. Therefore, this research is an attempt to start from the very right beginning by proposing a new perspective in term of 'Taxonomy of Human Intelligence Development" which provides basic solution holistically to the understanding of the phenomena. This endeavour has opted to study the taxonomy from Islamic epistemology and ontology or in other word from *taṣawūr* of Islam.

This research has another obstacle which is to find the most appropriate source of analysis. Through analysis of article journal of past Muslim scholar in the field of research, it is hardly found. One article which discusses about past Muslim scholar in the field of psychology seems to provide some answers. There are several past Muslim scholars who wrote about the composition of human nature from Islamic perspectives and their contribution are duly noted in the field of Islamic Psychology. One of the most influential Muslim scholars who discussed comprehensively about human's

composition are known as *al-Imām al-Ghazālī*. The study of his background, experiences and contributions fit into the ambience of this research. He can be also considered as the most influential and intelligent Muslim scholar in the Muslim world because he master's in philosophy, theology ('*ilm al-kalām*), Islamic jurisprudence and *Tasawuf*. The works and writings of him were many but not all is available, separated and difficult to be comprehended except his work *Ihya' ūlum al-dīn* which he himself properly documented to facilitate the Muslim reader. This research relies on the compilation of his writing which has been identified as *Majmū'aṯ Rasāil al-Imām al-Ghazālī* (MRIG) to dig up his view on the subject of the study.

Apart from that, there are several background issues that accompanied with the above statements. This thesis highlights several main issues that become the focus of this thesis study. The first issues are the issue of human intelligence and the concept of development.

1.2.1 Human intelligence and the concept of development

If we examine the meaning of development, we will find many versions of theory and concept of development. Basically, there are four main thrusts in development namely economic, political, social, science and technology (Thomas, 2001). Notwithstanding that, economic growth has been the goal in western secularistic development argued Sternberg (2019), one of the most leading scholars in human intelligence's study. Sternberg sees this matter as a problem in development. Therefore, this section is to discuss the concept of development which showed the development of human intelligence as well.

We will examine some of the theory and relate it to the phenomena of human intelligence. For example, the theory of “limits to growth (LTG)” was a theory that discusses development issues and its impact. In LTG study, Meadows et al (1972) has studied five variables: "population, food production, industrialization, pollution and consumption of non-renewable natural resources" based on computer simulation to see trend of growth by manipulating the variables. The result of study stated that given business as usual, i.e., no changes to historical growth trends, the limits to growth on earth would become evident by 2072, leading to "sudden and uncontrollable decline in both population and industrial capacity.

Limit to growth itself invited many critics because of its extreme finding and one interesting critic made by Simon (1996). He argued that the fundamental underlying concepts of the LTG scenarios were faulty because the very idea of what constitutes a "resource" varies over time. For instance, wood was the primary shipbuilding resource until the 1800s, and there were concerns about prospective wood shortages from the 1500s on. But then boats began to be made of iron, later steel, and the shortage issue disappeared. Simon argued in his book “The Ultimate Resource” that human ingenuity creates new resources as required from the raw materials of the universe. For instance, copper will never "run out". History demonstrates that as it becomes scarcer its price will rise and more will be found, more will be recycled, new techniques will use less of it, and at some point, a better substitute will be found for it altogether. This shows ‘human ingenuity’ is an important aspect in the management of natural resources. Even the term human ingenuity being used not human intelligence, the term is intetersting to be figured out. Sternberg (2019) has given new perspective to human intelligence as adaptation to environment and the

problem described in development issues were how human adapt to new challenge of development's demand. Therefore, the shortage of natural resources which could effect development that is the main concern in western economic perspective is unjustified. This argument is in line with Sternberg (2019) when discussing human intelligence as 'adaptive intelligence" that not only can adapt to new environment, but most importantly can change the environment to adapt and select the environment.

It has been proven that economic growth should not be the only focus in development because it creates many socio-economic problems such as poverty, unemployment and wealth inequality through trickle down economy[1]. Furthermore, in western theory of growth and development, land, capital, human and factory are of same level as factor in economy. By putting human as same level of factor in economy means to subject man to development and contradicts to the notion that development is supposed to be subjected to human. The misconception of man in development has been corrected by Kurshid Ahmad (1980). He outlined essential features of the concept of development by defining it as goal and value-oriented, devoted to optimization of human being in all these areas, for welfare in this world and the hereafter. He further argued that the focus of development effort and the heart of the development process is man. Development, therefore, means development of man, his attitudes and ambitions, his behavior and lifestyles and his physical and socio-cultural environment. In other words, man is to act as the premium mobile, not merely in a mechanical sense, but in the fullness of the human potential. This is true when Sternberg (2019) also criticized western civilization and their conception of development as to promote the

[1] Trickledown economics is a term used to describe the belief that if high-income earners gain an increase in salary, then everyone in the economy will benefit as their increased income and wealth filter through to all sections in society (Philippe Aghion & Patrick Bolton;1997).

concept of individualistic more than societal benefit in his discussion about “adaptive intelligence”.

The philosophical foundation and concept of Islamic development has been extensively studied by Muslim scholars and all of them based the foundation of Islamic development on *Tawḥid Uliḥiyaṯ, Tawḥid ‘Ubudiyaṯ, Khilafaṯ* and *Tadhkiyaṯ al-Nafs*, the idea pioneered by Kurshid Ahmad. (Muhammad Kamal Hassan, 1990; Surtahman Kastin Hasan, 1995; M. Manzoor Alam, 1996; Aidit Ghazali,1990; Muhammad Syukri Salleh, 2013). Henceforth, based on the above discussion the foundation of Islamic based development is comprehensive compared to secular based development which correction has to be made in all dimensions of development including in human development. The elements of *Tawḥid Uliḥiyaṯ, Tawḥid ‘Ubudiyaṯ, Khilafaṯ* and *Tadhkiyaṯ al-Nafs* are to be instilled in the aspects of human development. But to integrate all these elements requires a holistic and comprehensive outlook to facilitate the theoretical and practical understanding of their implementation in human life.

Perhaps the seven principles of Islamic based development by Muhammad Syukri Salleh (2003) are holistic and has comprehensiveness characteristic. The seven principles cover all major components of the development process. Theses seven principles are *taṣawwur* as mould of development, human as an actor of development, spiritual world, earthly world and world of hereafter as time scale in development, performing compulsory and supplementary duty (‘*ibadaṯ*) as mechanism for development, knowledge of *farḍu ‘ain* and *farḍhu kifayaṯ* as frame of development, natural resources as a tool of development, to seek Allah SWT pleasure as ultimate objective of development. These seven principles have been extensively studied by

others Islamic researcher in many aspects. The second principles human as an actor of development touch needs to be further developed and formulated so that man can carry out the development process especially in the aspects of his behavior, ambition, his attitudes, his lifestyles and his physical and socio-cultural environment.

There were two researchers of the seven principles above that contributed to this research focus and direction. The focus provided by Radieah Mohd Nor (2009) in claiming the importance of '*aql* (mind) must present in the *taṣawwur* which she seems lack to be discussed. It is thus imperative that *'aql* is called back to lay claims in being an important entity in human as an actor of development. What seems lacking to be discussed and needs to be studied from the point of this research is human intelligence development. It is thus the intention of this research to develop human intelligence in Islam by identifying taxonomy from the authentic Islamic source. As such the study of the holistic composition of the concept of man as an actor of development is one of the objectives of this study. The characteristic and attribute of *ibād al-Raḥmān, Khaira Ummaṯ, ūli al-Abṣar, ūli al-Nuha* and *ūlu al-Bāb* as identified by Shereeza Mohamed Saniff (2015) give direction to this study because it seems to provide some information on Islamic taxonomy especially in the discussion of components. Based on these two researchers' finding, intellect and elements of man have been given due importance. The findings also provide the groundwork and justification for the significance of this research to be carried out. However, this study takes into another level of research by proposing taxonomy to develop human intelligence.

To conclude the discussion of human intelligence in the context of development, we can sumize the concern of development is the management of natural

world resources effectively and efficiently to develop human civilization. Therefore, it takes human intelligence to implement the management of this world. It is true because in Islam, man has been appointed as vicegerent.

> *"It is He who has appointed you vicegerent on the earth and exalted some of you in rank above others, so that He may test you by means of what he has given you."*
>
> (Quran, 6:165)

In other verses, of the entire creation man has the highest capacity to acquire knowledge:

> *"He taught Adam all the names (all the realities of things). Then He presented those things to the angels and said- 'Tell Me the names of those if what you say is true'. They said: 'Glory be to You! We have no knowledge except that which You have given us. (We can learn nothing, except that which You have taught us direct). Then Allah said to Adam: 'Tell them their names' ' and when he had told them their names, He said: 'Did I not tell you that I. know the secrets of the heavens and the earth? (I know what you do not know at all). And I know what you disclose and what you hide'."*
>
> *(Quran, 2:31 - 33).*

Therefore, if human is not regarded as premium mobile as being promoted by Kurshid Ahmad (1980), he will be a mere subject to development. This should be the focus of development which is to develop human intelligence so that he can be the premium mobile of development. The need to develop human intelligence in real sense becomes obvious in new era of Industrial Revolution. The new human civilization has been transcended to the fourth industrial revolution where artificial intelligence is the core-player in driving new technology. The evolution of this new technology has direct impact to the development of economy but little impact to his ultimate role and objective in this world because the premium mobile that drive it is not man. Next

section will give some insight into the latest challenge of artificial intelligence faced by humans in the fast-changing world. Therefore, the next issue is a discussion on human intelligence development in Industrial Revolution 4.0.

1.2.2 Human intelligence in Industrial Revolution 4.0

In this section, we will examine human intelligence in Industrial Revolution. In fact, the latest development in human civilization known as Industrial Revolution 4.0 (IR4.0) which give credit to the development of artificial intelligence (AI)[2] rise the needs for this research. The question is how human intelligence is correlated with the development of AI? The discussion of this sub-topic is to show the evolution of technology has direct impact to the development of knowledge and skills but little impact to his ultimate role and objective in this world. The focus of Industrial Revolution is mainly to mental activity and its development. It is viewed as important aspect that foster technology development and Higher Order Thinking Skills (HOTS) has been identified as important skills to be developed for the students.

Higher-Order Thinking Skills (HOTS)[3] is a term that can be related with human intelligence as well artificial intelligence especially in the context of education. The above terms indicate something higher in nature. A unique cognitive skill

[2] Artifical intelligence is not new term but in IR 4.0 the term merge as powerful tools and engine in driving advanced future technology. Since it is sub to natural intelligence displayed by human, the term "intelligent agent" also sometime replaces the word artificial intelligence. The category also made into two; the low level and advanced level known as artificial general intelligence ((AGI). In definition, it is any device that perceives its environment and takes action that maximize its chance of successfully achieving its goals (Antonov, 2011).

[3] Higher order thinking skills (HOTS) is a concept of education reform based on learning taxonomies. It requires process involving analysis, evaluation and synthesis (creation of new knowledge) and higher than process such as learning of facts and concepts. Crtical thinking and problem solving involves in HOTS (Passig, 2003).

according to Passig (2003) is in need to achieve a successful implementation of information in real time. He added those who will have the skills of collecting information in real time, as well the ability to analyse, classify and organise it, will be those to achieve a social, cultural, and economic advantage. The profound transition from Information Communication Technology to Artificial Intelligence (AI) has increased the needs for teaching HOTS in school. Passig (2003), however in his article entitled 'A taxonomy of Future Higher Thinking Skills' predicted for society to improve condition effectively, they will need a significant number of working teams that will be able to generate personal and/or collective, ethnic, and cultural added value. Successful futures societies will have to alternate their focal efforts from negotiating information into negotiating exclusive and local values, and retail them among different culture because according to him future knowledge will have local and personal characterisation.

According to Ananiadou and Claro (2009) which surveyed on Information Communication Technology (ICT) as 21st century skills to be developed, knowledge management and its process are the set of skills and competencies needed in today's labour force. It is related to information selection, acquisition, integration, analysis and sharing in socially networked environment. Even the study made by Ananiadou and Claro place ICT as a set of new skills to be developed, overall finding indicates that most countries have their own plan and strategy. Some still unclear of the necessary new skills and competences to be developed.

The impact of technology left man to face reality paradoxically. In some other ways, it improves human life and in some others it deteriorates. Recent research

finding discovered the two-opposite truth of modern technology of ICT and to quote a saying made by Christian Lous Lange “Technology is a useful servant but a dangerous master”. The negative effect of technology on human health becomes noticeable physiologically, psychologically and socially. Technology is evolving while humans on the other hand are walking back on a path of doom (Antonov, 2011).

The impact of technology on society as described earlier holds two opposite truths. In one empirical study on the impact of ICT on humanist thinking, society either tends to be more fair, universal, tolerant, controllable, peaceful, and integrated individual or other ways around that tends to be unfair, unsupportive, individualistic, intolerant, uncontrollable, violent and non-integrated individual (Olivia Velarde Hermida and Belén Casas-Mas, 2019). While ICT still has several negative impacts on society, new challenges brought in by Industrial Revolution 4.0 emerged.

The Fourth Industrial Revolution or known as IR4.0, is a new phenomenon that will change our culture, lifestyle and the way we do our business. The terms big data, nano technology, virtual reality and artificial intelligence are the terms related to the Fourth Industrial Revolution. As common to the other revolution, it is about large-scale business resulting from the discovery of new technology in human life (Zhong, Xua, Klotz and Newman, 2017). However, the impact of the Fourth Industrial Revolution will be larger than mass production. The chart below simplifies the flow of industrial revolutions that have taken their place in human history and in the near future. The technology built from AI is more advanced and sophisticated rather than technology built from Information Communication Technology (ICT), electronic, electric power and steam engine. It is the integration and communication between

intelligent objects which could surpass human capability individually and collectively. Either it could be slave or master to human is subject to the focus and pattern of not only about human capital development or human resource management but in fact human intelligence development.

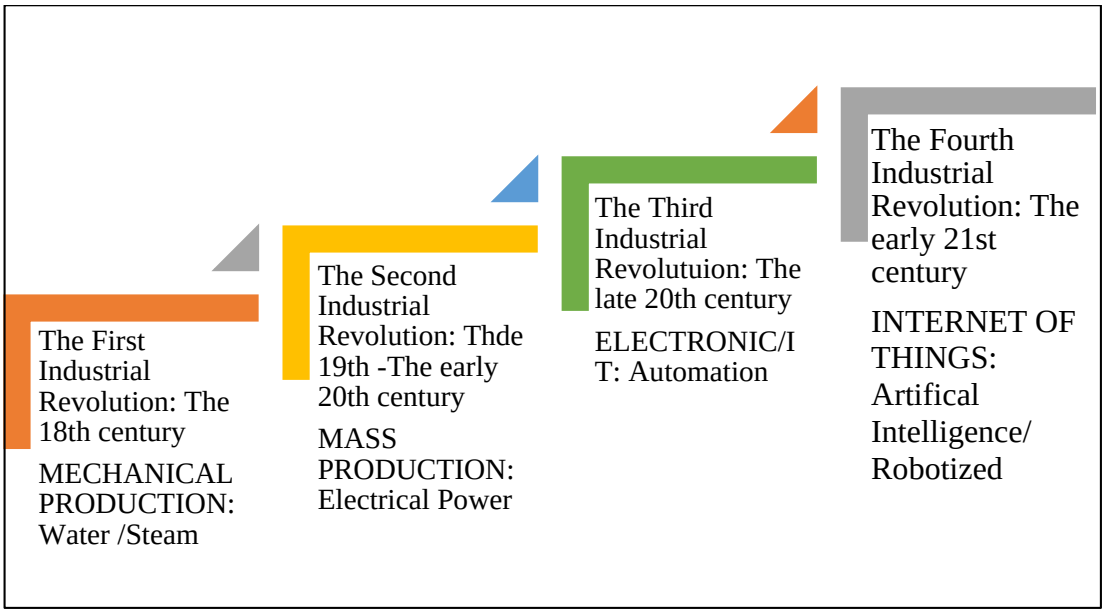

Figure 1.1 The Flow of Industrial Revolution
(Sourced from Shu Ing Tay, Lee Te Chuan, A.H. Nor Aziati &Ahmad Nur Aizat Ahmad (2018)).

Figure 1.1 describes the industrial revolution from the first to the fourth revolution. Every industrial revolution marks the new era in human history as a result of new technology discovered. The fourth Industrial Revolution has been described to be the era of Internet of Things (IoT) engineered by artificial intelligence and super intelligence[4] agent such as robot (Shu Ing Tay, Lee Te Chuan, A.H. Nor Aziati & Ahmad Nur Aizat Ahmad, 2018). The presence of artificial intelligence existed around us, living with us and next level will replace low skill job in most sector (Atindra

[4] Super intelligence is agent that possesses the ability to function in multi-level of thinking as compared to the ability to perform in low level thinking skill and single factor. Most of new technology based on artificial intelligence operates based on low level and single factor. Technology advancement will pave the way to the invention of super intelligence (Antonov, 2011

Dahal,2019). However, jobs lost to automation are not main issues and according to World Economic Forum job lost to automation could be as little as 9%.

Highly skilled job and talents will be in demand, the skills to operate things between the Internet of things (IoT) and the ability to engage in highly thinking skill. These skills are usually narrowed down to communication, collaboration, critical thinking, creativity, digital literacy, leadership, and productivity. Therefore, the demand constantly a skill-based, cross-curricular and trans-disciplinary learning that fosters collaborative learning and reflective thinking (Toufik El Ajraoui, Kalid Ben Kaddour & Zeriout, 2019). It is as consequence from every kind of job today has in touch with technology derives from the innovation of artificial intelligence.

The impact of AI on human condition externally and internally cannot be studied yet because it belongs to future technology. Therefore, researchers in computer science, brain science and cognitive psychology, knowing the benefit and risk of artificial intelligence are concerned about its safety plan and control (Antonov, A. A. ,2011; Future of life (t.t). Li, G., Hou, Y., & Wu, A. ,2017; Yudkowsky, E. 2008). According to Atindra Dahal (2019), the discussions and discourses over AI are biased, hold a serious lacuna thus need to be reconstructed to make it balanced and build better world than to browbeat people. Atindra Dahal (2019) regarded AI as the highest human development, thus did not agree. The recommendation made by her is further research and explorations are matter of the urgent need to offer panacea over such menacing academic mis- exploitation what is driving societies towards negative direction. Her recommendation hence being supported by Siti Noor Mawar A. Rahman and Azrin Ibrahim (2019) by proposing mechanism as a safety plan and control of AI and agreed

to the point human to accelerate with the progress of AI and not impeding it. Human intelligence todays must survive with artificial intelligence that is much faster, accurate and effective. Therefore, it is not a matter of competition but to gain mastery of this artificial intelligence and to make acquaint of it. Human intelligence not only to adapt to this new change but also to acquire new skills of this new demands. Education system seems to accommodate to this new change and new set of skill. New knowledge acquisition become crucial process in the context of human intelligence development (Toufik El Ajraoui, Kalid Ben Kaddour & Zeriout, 2019).

Among the issues brought in with fourth Industrial Revolution is in industrial job revolution. Today, the importance of improving the 'human capital' is best illustrated by the massive international and national efforts through educational and academic programs to enhance the administrative and productive talents of human individuals. Thus, academicians, social scientists and scholars of education have made an imperative endeavour, to expose effective measures of how to develop and improve revenues of the 'human capital' (Abdurezak A. Hash & Bashiir A, 2009).

There will be change in core skills for occupation because automated processes will be shifted to intelligent, integrated digital systems such as the industrial Internet of Things (I0T). Another pertaining issue to job revolution are the problem of skill gaps due to newly job created and retirement. New generation also needs to be tackled and encouraged to involve in skills related job because multi skilled worker are in demand in job market (Toufik El Ajraoui, Kalid Ben Kaddour & Zeriout, 2019; Atindra Dahal, 2019). However, according to a study on employability skills by CEO, besides technical skills, soft skills are considered important in today workplace. Note

that the “people-related skills” and the “personal skills” (attributes) above fit the definition of soft skills. “Soft” skills can also be called “applied” skills or “21st-century skills” (Gewertz, 2007). Soft skills have more to do with who we are than what we know. As such, soft skills encompass the character traits that decide how well one interacts with others and are usually a definite part of one’s personality. Whereas hard skills can be learned and perfected over time, soft skills are more difficult to acquire and change. Klaus (2010) compares the “bedside manner” needed by medical students to communication skills training needs for business curriculum. The soft skills required for a doctor, for example, would be empathy, understanding, active listening, and a good bedside manner. Alternatively, the hard skills necessary for a doctor would include a vast comprehension of illnesses, the ability to interpret test results and symptoms, and a thorough understanding of anatomy and physiology. The hard and soft skills must complement one another (Nieragden, 2000; Marcel. M. Robles, 2012).

Therefore, with this scenario in mind, human intelligence development will be tested to it utmost. If not prepared, it will fall victims to many mental health problems and other ethical problems. The education must meet this challenge by making sure human intelligence development is adequately developed in both skill, hard and soft skills. The challenge will be greater on determining model of educational system and what nature of development to be focused on. The education system also must give place to lifelong learning and recognised previous experience in its system of education (John McKenna, 2017).

In safety plan and control addressed by computer scientist and brain studies scientist, the tendency of AI (Artificial Intelligence) to be AGI (Artificial General

Intelligence) is predicted to be in near future. The impact of this development cannot be studied yet because it belongs to future technology. However, it creates situation according Atindra Dahal (2019) serious lacuna and unmasks the dire need in making constructive, encouraging and optimistic mind-set building academic pursuits and writings to makes an alarming call to all prominent scholars to engage with due compliance of it. Even so, the positive and negative consequences should be calculated in this development by understanding this phenomenon. As safety plan and control of AI, Siti Noor Mawar Abdul Rahman and Azrin Ibrahim (2019) proposed mechanism to control it through *maqaṣid al-shariaṯ*, *hisbaṯ* and *taṣawwur*. However, the mechanism is not being empirical studied, and this justify the need for this research to be carried out and serves as catalyst to the tension the AI will create to human. The finding marks another level of human intelligence understanding and how this finding should be incorporated in this research study. Notwithstanding the fact, the work of early Muslim scholars in developing its human intelligence seems to discontinue because of the issue of faith, intellect and ijtihad which are importance in new knowledge acquisition as well in human intelligence development in Islam.

The next section is a discussion on paradigm shift in human intelligence as a result of the science revolution. The discussion ending up to Islamic paradigm and how its development should be made pertinent and importance in this research.

1.2.3 Human Intelligence Scientific Revolution

For a decade the study of human intelligence has been based on biological or cultural perspectives and not from religious perspectives. From secular perspective mental activities (thought) is viewed the center of discussion. Basically, biological

perspectives end up producing the concept of intelligence on the capacity of mind while culturally based perspective resulted emotional intelligence and multiple intelligence. Spiritual intelligence is considered as another existence phenomenon in human experience but still not be basis from religious perspective.

The discussion of this sectio is based on Thomas Khun's scientific revolution framework. Science revoulution can be explained into five pahses. The first phase is pre-science or pre- paradigm, the second phase is normal science, the third phase is anomalies or crisis period, the fourth phase is paradigm shift and the fifth phase is post revolution. Studies of human intelligence in the first phase, has provided important information on the factor on human intelligence known as specific factor and general factor (*'g'* factor) which served as foundation in figuring the concept of human intelligence. Therefore, at the first phase of human intelligence scientific revolution, the 'g' factor has been the focus of discussion. Many scientists still believe in the general intelligence factor that underlies the specific abilities that intelligence test measure. Other scientists are skeptical, because people can score high on one specific ability but show weakness in others. General intelligence, as measured by Western psychometric tests and cognitive tasks, is not a necessary condition for human intelligence across cultures. The reason is that, for many people, Western tests and tasks are not good measures even of general intelligence. This is not to say that no processes of intelligence are universal. The processes of general intelligence, as illustrated by meta-components, or executive processes, underlie all forms of intelligent behavior are the same across cultures—recognizing the existence of a problem, defining the nature of the problem, mentally representing the problem, formulating a strategy to solve the problem, monitoring the strategy's effectiveness

during problem solution, and evaluating the effectiveness of the strategy after problem solution (Stenberg, 2019).

The second phase of human intelligence scientific revolution discusses structure hierarchy of human intelligence in more concrete and comprehensive manner. Discussion on human intelligence at this phase also including other different perspectives such in Islamic perspective. From Islamic perspective, research is to analyses the popular theories such as spiritual intelligence, multiple intelligence, emotional intelligence and other domains of intelligence (Rahman, & Shah, 2015; Baharuddin, Bin, & Ismail, 2015). Research from Islamic perspective, discusses more on entities, components of intelligence as well new measurement of intelligence. From Islamic perspective, it struggles from establishing its own theories and measurement and to tackle the challenges brought from existing secular intelligence's perspective. Therefore, from Islamic perspective, it still lacks of understanding the true conception of intelligence.

The most remarkable insight towards understanding real aspects of human intelligence was discussed by McGrew (2009). The taxonomy of that research based on Cattel-Horn-Carrol theory of cognitive abilities- CHC theory). He gives credit to Spearman as a pioneer of psychometric taxonomic effort where many theories stemmed such as Primary mental abilities, Vernon's hierarchical theory as well Cattell and Horn's Gf-Gc theory. However, the hierarchical structure of human intelligence abilities according to McGrew (2009) is better explained by CHC theoretical model. The author recommended the human intelligence researcher and scholars using the CHC framework as steppingstone to reinvigorate the investigation of the structure of

human intelligence. The original version of that framework on Carroll's Three Stratum theory is discussed under first phase section. The research by McGrew is focused on the extended theory of it and he focused on structural or factor analytic evidence for the CHS taxonomy. In his finding of the factor analytic, he quotes Danthiir, Roberts, Pallier and Stankov (2001):

> " for any taxonomic model of human cognitive abilities to be complete, all sensory modalities must be encompassed within its framework".

The strong argument of the above statement path new way of conducting research in human intelligence as taxonomy not only about certain components and it entities. The comment made by McGrew (2009) means human intelligence should include sensory components and entities in it biggest framework. Among his recommendation is the need to undertake a retrospectives reanalysis approach. Even the recommendation basically on the CHC taxonomic model, he himself admitted it is not grand finale of the era of psychometric description and taxonomy of human cognitive abilities. The third phase of Human Intelligence Scientific Revolution provides evidence a new paradigm shift vital in redefining human intelligence and all findings should be integrated to show its hierarchical structure.

In third phase of Human Intelligence Scientific Revolution the retrospective reanalysis of model in human intelligence is to investigate the model either it is two or third tier model which include the 'g' factor (Bryan & Mayer, 2020; Sternberg, 2019). From Islamic perspective, the phenomena are to analyse the highest domain which is spiritual intelligence and towards comprehensive analysis. Achmad Ushuluddin, Abd

Madjid, Siswaso Masruri and Mohammad Affan (2021), they argued IQ and EQ are two psychological processes and SQ, which is based on spirituality introduced a third process. They also argued that initial Freud's theory to consist of two psychological processes, primary and secondary. The primary process is associated with id, instinct, body, emotions, and subconscious. The secondary process is associated with ego, awareness, and rational mind. In brief, the primary process can be considered EQ (based on the associative neural network of the brain), which was pioneered by Coleman, while the secondary process can be considered as IQ (based on the serial neural network of the brain). The SQ psychological process consist of spirit and soul.

While from secular perspective, the comprehensive outlook are based on the importance of genetic for individual differences and also the discovery that intelligence changes on the historical time scale based on the investigation of Flynn effects[5]. The correlation between intelligence and economic growth is studied to identify the most recent trends of intelligence worldwide (Weisenberg, & Lynn, 2023). From the investigation, the finding showed that countries with rising intelligence become richer while those with declining intelligence become poorer. This finding is aligned with what being discussed under adaptation theory of intelligence. In comparing "general intelligence" or g with theory of adaptive intelligence is to see weather "g" factor can provide an optimal way of defining intelligence as adaptation to the environment. The similarities and differences between general intelligence and adaptive intelligence are discussed. The influence of biological based as in

[5] Flyn effects was introduced by Jim Flynn's that claimed intelligences on the historical time scales. He questioned the IQ tests and The Ravens Progressive Matrices Test do not measure intelligence. According to him, for the functioning of a modern economy and even for the moral progress is associated with the rising intelligence (Flynn, 2013)

evolutionary theory, cultural context of adaptation, behavior and thought shape adaptive intelligence. Those influences further investigated either it contributes to the perpetuation of the human and other species, or it was indifferent or destructive to this perpetuation (Sternberg, 2019). Even the ongoing trend is towards comprehensiveness of human intelligence, Islamic perspective as well secular perspective still have gap to be filled. Thus, the direction of the study of human intelligence left a big question. This issue has been addressed by Passig (2003) in his study of future thinking skills where he admitted that intelligence itself is evolutionary and it is difficult to predict the direction of human cognition's study.

The idea behind taxonomy of human intelligence remains speculative. The theory that had been established is therefore should be viewed as tipping point that provided the first working map and from Islamic perspective it has to develop its own Taxonomy of Human Intelligence. The discussion in the three phases of human intelligence scientific revolution support that the retrospective reanalysis is pivotal but the research in human intelligence need to approach the subject considering Islamic epistemological which acknowledging soul activity. As Sternberg (2022) points out intelligence cannot be fully understood through any one conceptual or methodological approach. A comprehensive understanding of intelligence requires the converging operations of a variety of approaches to it.

In intelligence study, the classification in form of taxonomy has been acknowledged as the specialized science and practise of classification of empirical observation, guides the search for information truth in most all scientific endeavours (McGrew, 2009). The classification of human intelligence is made through identifying

the broad categories of general intelligence (g) factor abilities and the specific factor abilities. Besides identifying the components, the entities of each component are detailed down with specific elaboration. The structure also being presented in schematic representation and review of the structure is continuously being analysed by other researchers and scholars in intelligence study. The significance in human intelligence taxonomy also provides a common nomenclature for describing research findings and a theoretical framework from which to test hypotheses regarding various aspects of human cognitive abilities (McGrew, 2009).

The Islamic epistemology and ontology pertaining to human intelligence should be studied rigorously and comprehensively. Even, there were many attempts by Muslim scholar in studying the words, terms and verses that connote human intelligence, but the works do not corelate directly to the study of human intelligence as in the study of the word '*aql, fikr, dhikir* and the term *ulul albab*. The term and study of human intelligence might appear in another form by early Muslim scholars. Early Muslim scholars had laid the basic foundation of the study of human intelligence and to some extent had gone beyond as in the work of *al-Ghazālī.* It is the objective of this research to value the essence of intelligence in terms of the context in which intelligence functions (Sternberg, 1997). Moreover, it is important to identify and analyze the processes of general intelligence, as illustrated by metacomponents, or executive processes, underlie all forms of intelligent behavior (Sternberg, 2019). This thesis will undertake these challenges by producing it in form of taxonomy of human intelligence development in Islam based on the works and writing of *al-Ghazālī* .