The Muslim world and the development of science and technology: phase in history

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ABSTRACT
Science and technology are inseparable. When scientific knowledge is translated to actions and products that enhance adaptability to one’s immediate environment, technology is then realized. Technology, the world over is the backbone of development. It is tantamount to progress, be it old, new, modern or scientific. It is generally a way of doing things that enhances better livelihood, sustainability and prosperity. Development as a result of technological advancement could be gradual, spontaneous, sporadic or drastic. The intention of this research work is to trace the historical circumstance of the Muslim world in the aspect of science and technology. The paper is also out to consider the concept of the Muslim world as against the Arab nations, the Islamic world, the Middle east and the North-east Africa. Such clarification of concepts will bring to the fore, the idea of progress and its contributions to the global development, taken into cognizance cultural imperialism, Intellectual capital theft assumptions and insinuations. This aspect is of a particular interest to the writer due to the experience of imperialism, imposition and full colonization which were claimed to be factors in the neglect of African indigenous knowledge and technology, such imposition witnessed by sub Saharan Africa was not so prolonged and fully experienced by the Muslim world, hence, there may be a reason to determine, in the course of this research work, the period the Muslim world deviated from the path of technology, considering the current turbulence in the Arab world and finally the global relevance of such early technology. The paper is theoretical, relying on the secondary sources. The paper concludes with recommendations towards further development of the identified intellectual property of the Muslim world.

Keywords: science and technology, development theories, the muslim world and global relevance.

1 INTRODUCTION
There existed an unfound bipolarity between the Africans in the sub-Sahara and those in North Africa. Apart from the linguistic divisions, it was quite obvious that the experience of colonial domination, imperialism and slave trade that were cogent factors in the neglect of African indigenous technology, were experienced, but not so profound in the North Africa. One tends to wonder why the Muslim world could not emerge as the leading countries in science and technology despite the acknowledgement of Egypt as the cradle of ancient civilization. Also the terms the Muslim world is all-embracing, used to include even the countries of South East Asia, the Turkish community, West Africa including the Middle East and some groups of people in Europe and America with the Middle East as the modern centre of the Muslim world. The claim of some scholars about the North East Africa and the denouncing attempt to claim that
there was nothing like the Middle East but formerly North East Africa. The above claim simply shows that the Middle East had a lot of areas of convergence and divergence not only with Africa, but with the western and central Europe, Asia and other continents of the world. This factor particularly led to the enlargement of the size of the Muslim world through the events of war and peace.

The actual melting point of Islam and the West was the invasion of the Turks-Mongol which allowed the westernization of early Muslim Science and technology. The rule of the Turks-Mongol spelt the dark age of the Muslims and the Islamic world (Revival began in the eighteenth century). Trans-Saharan trade was one of the major connections between the Africans in the South of the Saharan and the Muslim World.

While the connections and disconnections were historically important, the focus of the paper was the aspect of early science and technology which were not converted to modern development, with keen interest on the time the Muslim world actually deviated from the path of development, considering the turbulence experienced by the Muslim world in North Africa, Middle East and Asia. The phases of science and technological discussion are classified into historic periods of (i) 600 – 1400, (ii) 1450 – 1818 and (iii) 1820 – millennium.

Finally, the global relevance of such science and technological discovery were also examined along with the list of inventions and the inventors to reflect the westernized forms and reasons were given for the deviation, the beginning of the revival and how the revival of the Muslim world could enhance global inventions and relevance upon recommendations. Islam as a religion of more than 350 million Muslims, occupying a wide belt stretching from the Atlantic to the pacific, across Africa, parts of Europe and Asia, Hussein (1956). Islam past and present-the Atlantic https://www.theatlantic.com/magazine/archive/1956/10/Islam this figure as al 1956 retrieved 21/05/2019. The population of the Muslim world has arithmetically increased according to UNNDP Report.

Population progression of the Muslim world determined by the estimate that the Muslim world has a total population of over 1.2 billion out of 6.176 billion of the world population (UNDP, HUMAN DEVT REPORT 2007/2008). Hence, the study of a population of people that covers about 20% of the total people all over the world is quite eminent. such population would be desired to contribute meaningfully to the current demand of globalized science and technological trend.

More authentically, the 2012 population projections by the pew research centres forum on religion and public life, the Muslim world population was fixed at 1,571 198 000 representing 24% of the world total population and the speculation is that Muslim world population is expected to increase by 35% by 2030.
2 INDIGENOUS SCIENCE AND TECHNOLOGY

Science and technology are used interchangeably, whereas one naturally leads to the other, sciences is an approach. The methods that show specific set of knowledge. Indigenous sciences are ancient set of knowledge. The adaptability of such set of knowledge to systematically meet the need of the people in a particular society is called technology. Technology is technology whether old or new. (Olaoye 2009) such indigenous science were built on the foundation of rational and logical thinking involving philosophical and theological undertone. Kibbani (2019) considered science and technology in Islamic context as cultural ethics informed by the Quranic injunctions which ordered those who are wise to look at God’s signs in His creation and to ponder over them. Kibbani also claimed that Science and technology were parts of Islamic value system. While acknowledging early participation of the Muslims in the methods that are classified as modern science, he mentioned such methods as observation, practical experimentation and verification holding the belief that nothing should be considered outside the divine realm.

Akpomuvier, (2011) expressed his view on particularistic and universalistic modes of knowledge that is based on the wealth and the uniqueness that constitute non-material aspects; such is the knowledge that marks out a culture from the other. Such knowledge endures and may not change even after the event of a revolution and that the universalistic modes are the technology-based found throughout the world depending on the same principle. The first of its kind were noted to have originated from Africa. Lovejoy, (N.D) has this to say “To some extent, what is often considered to be modern science has developed in non-western location such as China, the Islamic world, the indigenous Amerindian population of America and Africa”.

In the discussion of Bahiste (2019) on indigenous knowledge; foundation for first nations, it is made known that African, Arab and Asian nations were not the only group of people that suffered from the workings and machination of Eurocentric complex that created tension between indigenous and eurocentric ways of knowing, Canada also experienced this as reflected in Canada’s working partnership with first nation to improve upon the quality of aboriginal life and education through research conducted with educational renewal initiative and these in a way show that apart from the physical calamities of war, slave trade, colonialism and imperialism, the psychological war that was waged against the indigenous science and technology in the less developed countries was the strategies of euro-centricity, namely comments on the systematic and capability of the local technology in meeting the current needs, cognitive imperialism and even outright denial of the existence of non-European knowledge were used as an ideology of oppression. (Blaut,1993&Ascher,1991). Schissel and Wosherspoon, (2003) concluded that the exclusive use of Eurocentric strategies has failed and that the blind reliance on the citation of Greco-Roman references was a pointer to the fact that Syrian/ Lebanese, Mayan, Hindu and Arabic culture
contributed to European arts, science and technology. Such claims were substantiated with the non-European knowledge like the concept of Zero, Algebra notations, the use of decimal and solutions of complex equation.

In the African union, consolidated plan of action for science and technology was specified in the Addis Ababa declaration that “North African countries of Libya, Algeria, and Tunisia were independent of UNESCO except Egypt because they were exposed to the Arab science and technology policy forum. (AU consolidated plan for action, January, 2007).

In article 29 of the United Nations’ declaration on the Rights of Indigenous people: Indigenous people have the right to control, develop and protect their sciences, technologies, cultural manifestation including human and other genetic resources, seeds, modern knowledge of properties of Fauna and Flora, oral traditions, literature, design, visual and performing arts.

3 DEVELOPMENT THEORIES

Halperin, ed (2023) discussed extensively the theories of development despite the fact theories of development in development economics are relatively new. The definitions relied on the application of tools and approaches to the institutional aspects of the society. These models, majority of the time are used in relation to improvement of quality of life in developing economies. The following are identified Modernization, Classical, Dependency, World systems, Globalization development, Sustainability and Indigenous/traditional theories.

www.britannica.com identifies four main theories but with the inclusion of classical, Sustainability and traditional/indigenous theories, seven theories of development shall be discussed, elucidating the features.

- **Modernization theory** is a US and Eurocentric normative model relating to the imposition of western values and comparison of western values with other values, with a view to underrating the other. In such development model, western value is used as yardstick.
- **Dependency theory** has its source in neo-Marxist socialist ideology upheld by scholars like Samir Amin, Walter Rodney, Gunter Frank and Frantz Fanon. In a globalized world, some countries are looser while some are winners. It explains the circumstances of the symbiotic relations and an unequal one between the developed and the underdeveloped countries and that it has negative impression of the capitalist arrangement as the western values. There are perfect correlations between modernization theory and dependency theory from the perception of Reyes (2001)
- **World system theory** purports that there should be total inclusion of all economies in the world economy. This was achieved through the introduction of legitimate trade and the colonial
economy. Hence, the whole world was integrated into the world economic order bringing about international hierarchy of unequal situation. This is also known as Modernization theory which claimed that once developing society comes in contact with the Western Europe and North American Society, they will be impelled towards modernization. Hence, there is a perfect correlation between the goals of Modernization, World System and Dependency Theories.

• **Classical theory of development** Rostow (1962) identified linear stages of growth model, structural changes, international dependence revolution and neo-classical free market – this is different from liberalized paradigm of the recent times. The Muslim/ Islamic world exhibited classical development but failed to attain structural changes. Hence, the stages identified by Rostow were not complete.

• **Globalization theory** provides constructive suggestions about communication and international ties trade, finance and economic co-operation, turning the whole world into a global village. Hamid et al (1993) generalize the notion of religion as part of the culture and that the Muslims and the non-Muslims should be included in the global co-operation. It is referred to as a modern attractive version.

Globalization is a tactical way of including the Muslim/Islamic world in the international relations and economic systems of the whole world, which some of them were not prepared for.

• **Sustainable development** became popular after the 1987 World Commission on Environment and development. Sustainable Development is the development that meets the needs of the present without compromising the ability of the future generation to meet their own needs. (World Bank,1993) Considering all the theories of development discussed above, almost all are related to western models and yardstick for development.

• **Indigenous /traditional development** The very last theory is pertinent to this research work and it is directly related to Human Capital and Intellectual Property. It should be considered along the line of modernization of local technology and indigenization of modern technology. The synergy that is essential for attaining development.

4 THE ARAB WORLD, THE MUSLIM WORLD AND THE ISLAMIC WORLD

In the process of conceptualizing the Muslim world, relative terms like the Islamic world and the Arab nations must be considered. The Arab world stretches from Morocco in North Africa to Persian Gulf, it is more or less equal to the area known as Middle East and North Africa (MENA) they are those countries where Arabic is the dominant language with Islam as the dominant religion. Twenty-two (22) Arab countries are identified as Algeria, Bahrain, the Comoros Island, Djibouti, Egypt, Iraq, Jordan, Mauritania, Lebanon, Libya, Morocco, Kuwait, Qatar, Palestine, Oman, Saudi Arabia, Somalia, Sudan,
Syria, Tunisia United Arab Emirate and Yemen. The Arabs make between 15 and 18% of the world Muslims (Arab cultural awareness, 58 fact sheets, 2006 & Islam civilization/middle east June 24 2012 retrieved 17/5/2019)

The fact that Islam originated and developed in Arabic culture, other Muslims have the tendency to be influenced by Arabic customs in the Muslim and Islamic non-Arabs who have cultural and religious affinities with the Middle East. (Bassiuni 2012: Islamic civilizations) The Muslim world refers to all countries that have substantial percentage of Muslim population.

Between 600 and 1450 A.D, there was a change based on mass migration, conquest, cross-cultural trade and exchanges, enhanced by the introduction of a new religion which spread rapidly throughout the Middle East, Northern Africa, West Africa, Europe and South East Asia, it is from this context that Islamic era of the Muslim world would be realized. The spread of the religion impacted upon the political, economic, artistic, scientific and technological expressions through regional network and contacts, with different parts of the world (Smith,2019). The Islamic world, used to replace the Muslim world, which is exemplified by a population, comprising more than 25% of the total world population According to Daghasteni, (1996), Islamic World stretches from Indonesia to Algeria and from Turkey to Togo totaling (57) fifty-seven independent states.

This view is against the concept of Arab nation which constitute the countries that have people of Arab descent as majority in the North Africa and the Middle East, this seems to be the basis for Pan-Arabism which unlike Pan-Africanism short-lived. However, scholar like Watson, (1983) equated the Muslim world with the Arab world. This paper however is based on the Muslim world which could interchangeably be used as the Islamic world, a larger concept than the Arab world. Islam is the bond of unity among the Muslim/Islamic world.

5 THE MIDDLE EAST AND THE CONCEPT OF NORTH EAST AFRICA

In the comments of Ogundele, (2008) The Middle East was supposed to be part of the African continent in an effort to trace ancient civilization to Africa. “The womb of the world”. In his book The Genesis of Man: Issues and Challenges. Ancient Africa was bigger in size than modern day. Africa was originally the Garden of Eden. The northeastern and eastern sections of Egypt made up of Havilah (Arabia), Mesopotamia (Iraq) and Israel among other localities constituted the original garden of Eden.
6 FIRST PHASE IN THE DEVELOPMENT OF SCIENCE AND TECHNOLOGY 600-1450

Islam was not the only civilization that emerged during the era but it was known and considered as Islamic era because of the expansion of trade and cultural exchange (Bahiste 2019). China expanded to have hegemony over many areas in Asia, the Maya, Aztec and the Inca states controlled large territories in West Indies, the Romans obviously evolved major urbanized cities. There was unitary of knowledge, no-clear-cut demarcation of the knowledge of Arts, Science, Philosophy, Astronomy Medical Writings Logic and Mathematics. (Kibbani, 2019).

As a missionary religion, the learned officials known as Arab Scholars spread the values of the religion to the other parts of the world. As early as the 10th century, formal education referred to as Madrasa had been established. The spread had its negative impact because from the khan Academy publications on development and spread of Islamic cultures, “the spread led to political fragmentation and decentralization, emergence of regional rulers and formation of diverse religions and state institutions, various invasion of the Muslim Turks, the Mongols, and the confrontation between the Muslim and the Christians in Western Europe and the fall of the Abbasids regime”.

Despite all these shortcomings, the interaction had important achievement of internationalism multiculturalism, transfer of technology and cultural diffusion. It should be noted that even in the pre-Islamic era, there was the tradition of reading and writing known as “Muallaqat” (literary emergence) in the city of Mecca; poets and writers would have their writing on walls. That tradition of reading and writing continues with the introduction of Quran, its recitation, memorization and transmission This development from the view of Bassiouni (2012) made the great centres of religious learning to also become the centres for knowledge and scientific development.

Kibbani, (2019) identified early schools of companions of the prophet of Islam with the evolution of science subjects like Astronomy, Physics, Chemistry, Optics Pharmacology, Botany, Zoology, Geology, Mineralogy, Medicine, Dentistry, Surgery Logic, Mathematics and Philosophy. Between 12th and 15th centuries, they flourished and the madrasas were supported by the wealthy individuals in the society through “waqif” Trust. The Persian became part of the caliphate and there were Islamic states of northern India; Arabic sailors during the period of spread dominated the Mediterranean linking Muslim empires in India, China Venice, Genoa. Also the Arab scholars and the northern Berbers linked up with the south of the Sahara -West Africa land through the age-long trans-Saharan trade. As great learning centres developed in the Middle East, learning centres developed in all peripheral areas.

In 641, when Egypt became part of the Muslim state, Syria, Bagdad, Persia and Indian cultural-values were diffused into the Islamic culture as a result, Islamic philosophy was influenced by the writings of Socrates, Plato and Aristotle as exemplified by the writings of the great Muslim philosophers. (Iqbal 2002 & file: //j://.htm) of Ibn Sina and Farabi. in early science of history, historiography literature.
The science knowledge and scientific development enhanced the development of madrasas as earlier noted. Bagdad had 300 schools, Alexandria had 12,000 students in the 10th century, the madrasas used to have mosques and boarding facilities; education was free and some famous madras were called Universities by the Europeans.

The teachers taught religion, sciences, mathematics and astronomy. Such knowledge was used to fix religious calendar, time for prayer, assess religious tax, divided estate inheritance (Ihsanoglu, 2004). Cairo had colleges of Construction and marvelous grandeur in the 16th century. The teaching staff numbered between 40 and 60 (Dodge 1961). There were connections between the madrasas in Cairo and the ones in Istanbul (Gran, 1979).

The French invasion equally enhanced knowledge explosion. European sciences were learned and combined to the already added aspects of algebra, equations and astronomy. Scholars came from far and wide to include Iran and Moshed, the border of Turkistan and India. The curriculum was subjected to periodic review based on the new demand of the society.

The madrasa in Mecca and Medina, Damascus and other parts of the Middle East totaled 159 in the 15th century. In North Africa, the Zaytuna madras of Tunis was paying 30 professors and the University made a clear division between Hanafi school of law and the Maliki school (Sraeib, 1995). There was the concentration of madrasa in Constantine, the Qarawijjin madrasa of Fez and Timbuktu as the great learning centres in West Africa and the Ilm school of Ilorin in the Yoruba southern Nigeria (Smith, 1995). Bornu capital, Birni Ngazagamu was reputed for learning and on the other side of the continent was Ethiopia’s highland Harare and Comoro Island that permeated high cultural diffusion as experienced in western Sudanese empire of Mali and Bantu-Arabic intermarriages that produced the Swahili group along African Eastern Coast.

There was cultural assimilation, a typical example of 11-khan, the Mongol ruler that conquered the last caliphate who eventually converted to Islam. The records of Islamic era were kept by two great travelers; (i) Ibn Battuta and (ii) Marco polo (file:///j:/i:/htm). Ibn Battuta, a Moroccan legal scholar left his home on pilgrimage and moved from there to Mesopotamia, Persian and sailed down the Red sea, the Black sea to Kilwa and Later Spain, Mali and the trading cities of central Asia, upon which he wrote the thesis of his experienced. Marco polo travelled to meet the Chinese ruler Kubklai Khan who convinced him to stay. He later served him as an envoy, representing him in different part of China for about 17 years. His experience was resourceful to Europe. He provided information about the existence of a place like China, Marco polo initially came from Venice and of note was the fact that there were thin or rather imperfect boundaries which led to intermingling of Christians, Jews, Muslims and the Western Hemisphere which kept them in regular contact however, the world affair was dominated by the Arabs, Turks, the Mongols, the Vikings and the Chinese. (file:///j:/i:/htm retrieved 5/18/2019).
REKNOWNED ISLAMIC SCHOLARS OF SCIENCE AND TECHNOLOGY

<table>
<thead>
<tr>
<th>SCHOLAR</th>
<th>DATE(CE)</th>
<th>RESIDENCE</th>
<th>FIELD OF CONTRIBUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jabir bn Haiyan</td>
<td>Died 803</td>
<td>Kufa</td>
<td>Medicine, Alchemy, Chemistry</td>
</tr>
<tr>
<td>Yakub ibn Ishaq Al-Kindi</td>
<td>800-873</td>
<td>Baghdad</td>
<td>Philosophy, Mathematics, Physics, Astronomy, Medicine</td>
</tr>
<tr>
<td>Mohammad Bin Musa Al-Khwairizmi</td>
<td>Died 840</td>
<td>Baghdad</td>
<td>Mathematics, Astronomy, Geography</td>
</tr>
<tr>
<td>Thabit Ibn Qurra</td>
<td>836-901</td>
<td>Baghdad</td>
<td>Mathematics, Astronomy and Mechanics</td>
</tr>
<tr>
<td>Ali Ibn Rabban Al-Tabari</td>
<td>838-870</td>
<td>Merv</td>
<td>Medicine</td>
</tr>
<tr>
<td>Abu Abdullah Al-Battani</td>
<td>868-929</td>
<td>Raqqa, Iraq</td>
<td>Astronomy, Mathematician, and Astrology</td>
</tr>
<tr>
<td>Abu’l-Abbas Ahmad Ibn Mohammad Ibn Kathir al-Farghani</td>
<td>C.860</td>
<td>Cairo, Samarra</td>
<td>Astronomy, Engineering</td>
</tr>
<tr>
<td>Abu Al-Nasr Al-Farabi</td>
<td>870-950</td>
<td>Baghdad, Damascus, Cairo, Aleppo</td>
<td>Science, Philosophy, Logic, Sociology, Medicine, Mathematics</td>
</tr>
<tr>
<td>Abul Asan Ali Al-Masu’di</td>
<td>D.954</td>
<td>Traveled extensively, Cairo</td>
<td>Geography, Physics, History</td>
</tr>
<tr>
<td>Abu al-Qasim Khalaf bin’ Abbas Al-zharawi</td>
<td>936-1013</td>
<td>Cordoba</td>
<td>Surgery, Medicine, Ophthalmology, Dentistry</td>
</tr>
<tr>
<td>Abul Wafa Muhammad Al-buzjani</td>
<td>940-997</td>
<td>Baghdad</td>
<td>Astronomy, Mathematics</td>
</tr>
<tr>
<td>Abu Ali Asan Ibn Al-Haitham</td>
<td>965-1040</td>
<td>Cairo, Spain</td>
<td>Physics, Optics, Mathematics</td>
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<tr>
<td>Abu Al-Asan Al-Mawardi</td>
<td>973-1048</td>
<td>Baghdad</td>
<td>Political science, Sociology</td>
</tr>
<tr>
<td>Abu Raihan Al-Biruni</td>
<td>980-1037</td>
<td>India</td>
<td>Astronomy, Trigonometry, Mineralogy, Geography, History</td>
</tr>
<tr>
<td>Ibn-Sina</td>
<td>1058-1037</td>
<td>Jurjan, Hamadan, Ishafan</td>
<td>Medicine, physics, mathematics, music, geology, mineralogy, economics, politics</td>
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<tr>
<td>Abu Hamid Al-Ghazali</td>
<td>1058-1128</td>
<td>Baghdad, Damascus</td>
<td>Philosophy</td>
</tr>
</tbody>
</table>

Source: http://www.islamicsupremecouncil.org/publications/articles/54-t-...

7 SCIENCE AND TECHNOLOGY IN EARLY MODERN ISLAM 1450 – 1818

The period was identified with the decline of Islamic era of Science and technology. Smith, (1995) adduced a number of factors for the decline of Islamic era, such ranges from the ethos of intellectual secrecy; to the abandonment of experimental research; speculations that the explosion of knowledge would have negative impact of drifting people towards atheism in the society and rejection of innovations and reports of educational research, despite the fact that libraries have been established, the Islamic science development deteriorated from 1450 A.D. The Mongol at this period contradictorily aided learning through establishment of strong connections with China.

Technology like the use of fire arms was crucial to the rise to power of the Ottoman empire (Smith, 2019) the Savafids survived upon the glory of ancient Iran with bored barrel wheel – lock and flint-lock,
cast-iron huge bronze mortars, developed their weaponry relying on local initiatives and borrowing from China, Middle East and Europe. There was competition between the Ottoman and Savafids struggling to fill the vacuum created by the decline of Islamic Science era, this was done through inventions of arteries improvement in transportations and communications. The development that characterized this period was aided by the construction of long bridge and canal from the Mediterranean to the Red sea but later abandoned, there were construction of bridges and dam over some rivers. Agricultural revolution through irrigation was encouraged. The previous experience of climate change, decrease fertility of marginal land and insecurity from invaders sharpened their skills in this era towards weather wheels and complex underground irrigation (Watson, 1983, Iqbal, 2002). There was the movement from proto-industry to modern industry; skilled urban artisans produced diversified range of products, there was the purchase of manufactured goods which did not prevent the Ottoman proto-industry.

As at 1709, there had been a boom in the textile industry in Greece, Bulgaria and Eastern Thessaly – Textile workshop disposed products for exportation along the Black sea meaning that Textile production started earlier before the cotton revolution in 1750 Britain “By 1709 the state withdrew from civilian direct production and entrepreneurs risked their capital and enabling environment was created by the Sultan in terms of quota and tariff. Fez cap was produced, running into million in Tunisia exported to Morocco, Ottoman Empire, south of the Sahara and Europe. (Ihsanoglu 2004) Hafezel Esfahani invented mechanical clock, water mills and machines to smoothen papers card, wool and ink. The Persians fabricated the Chinese type of porcelains. There were urbanization and the population of the urban growing to 20 million in the 17th century (Smith, 2019)

Iran introduced new weaving technique and the Islamic world attained shipping revolution from 1650 with the local advantage of available teak the best wood for naval construction through Muhammad Ali industrial revolution. In West Africa, professional training was taken along the side of regular education (Reichmuth, 2000). The activities of the Muslims in Iran, Morocco, Egypt and Ottoman empire were close to breaking the yoke of inevitable weakness but military conquest of Islamic states, lack of efficiency and loyalty in the royal homestead, insufficient revenue for lavish court life and population increase made the revival lopsided – this is the period when Ibn Khaldun gave an insight” that one might have expected a new group with fresh sense of cohesiveness to restore political strength (file:///G:/E htm retrieved 5/18/19 5.53)

One of the consequences of domination was that the Muslims were cut off from controlling the land route to the East and within the periods of blockages, the Europeans had surpassed the Muslims in seafaring technology.
Muslim merchants were also inhibited by imperial policy over taxation the reprisal policies that elicited responses from the Muslims which took different forms; official, unofficial Islamizing and Europeanizing.

Hence, 18th and 19th century was characterized by Islamic activism: a number of militant groups developed; Sufism and the Wahabiyyah. The fact that Islamic values had been diluted with the idea of syncretism called for reconstruction that invalidated many traditional practices.

In West Africa, series of activist movement dominated the 19th century in Tukulor, Maccina, Futadjallon and Sokoto – such activities presented the argument that the Quran and the Sunnah could provide the basis for a reconstruction of Islamic society. In the Indian ocean, Islamic activism was geared towards intellectual and educational line around the introduction of shari’ah and of significance is the fact that all Islamic activism was directed to the Muslims who were involved in syncretism rather than the non-Muslims.

8 BRITISH HEGEMONY 1818 – 1932

By 1818, the British had dominated over India and other colonies. Not all Muslim territories were colonized but all experienced technological, cultural and economic dependency based on the set back suffered from withdrawal from research in science and technology. Saudi Arabia in the central Arabia escaped this and the interference only came when oil was explored in 1930, however the dependency was punctuated by Islamic activism. So by the turn of the 20th century, secular ethnic nationalism had taken over. There was the problem of identity that made Pan–Arabism as an ideology, unworkable. Under the issue of secular nationalism, some issues that connect Gender, dissemination of information, knowledge explosion and availability of literature and lack of mentorship were addressed. Iqbal, (2002) is of the opinion that without Islam, the Muslim could never regain their strength. The aggressive recovery of the past became the theme of Islamic recovery this led to the emergence of young Turks, Salafiya and Kamil as predicted by Ibn Khaldun.

Pan- Arabism paved way for Pan - Islamism which was based on the scripture of Islam as the foundation of social and political order. Pan Islamism in 1924 witnessed the dissolution of Ottoman caliphate because the Muslim community thereby lost its major religions and political representations. Mecca was seized by an Arabian leader Abd Al-Aziz Ibn Sa’ud, which led to the founding of the modern state of Saudi Arabia in 1932 – as an achievement of Pan – Islamism, Rashid Rida, a – Syrian /Egyptian scholar considered Saudi Arabia as a model Islamic state. Right from this time, the seat of Islamic affair changed to a new centre. Ataturk Mustapha Kamil facilitated this with his policy, which spelt the formal end of the Ottoman caliphate. He rebuked Islam for contributing to the Turkish backwardness and
relegated Islam to private sphere. Saudi Arabia on the other had regulated the public life according to Islamic norms, using a rigorous interpretation of Sharia’s Islamic law. (File:///G:E.htm)

Egypt became a constitutional monarch after 1922 but later the trend of brotherhood developed into 1952 revolution led by Gamal Abdul Nasser that ousted the monarchy. Similar movement in Palestine, Syria, Jordan and North Africa – the virus of decolonization spread to the sub-Saharan Africa, citing Egypt as an example hence, 20th century was the period of political emancipation through decolonization.

Temporary peace was maintained until 1967 when the Islamic state was defeated in Arab – Israel war, on realizing that the Socialist-inclined Pan Arab ideology may not contain the prevailing situation, a new alliance was formed between Saudi Arabia and Egypt. In 1962 earlier Saudi regime had established a “Muslim World League” in Mecca with the participation of scholars and intellectuals from all over the Muslim world. The league was with the intention of unifying Muslims and promoting the spread of Islam throughout the world (Altwaijri, 2014). 1970 witnessed the formation of Islamic radical groups, the trend continued in North Africa, South Asia and their activities ranged from conflict with the government authorities to bloody civil wars in Algeria and Egypt. Political rearrangement of this period allowed for the politicization of religious activism up to the recent present.

9 COMPLICATIONS OF DIVERGENCE AND THE DECLINE ERA

- Going through the phase(s) of History of the Muslim world, the point of divergence is pinned down to the period of reconstruction that was not actually backed up by making recourse back to the development of science, technology and further research.
- Politicization of the religion in the Islamic world culminated into insurgent activities and the problem of fundamentalism
- The concept of islamophobia, actions and reaction and trans-national Islamic radical organizations.

Emigration of Muslims from the Middle East to the U.S.A, Canada and U.K.

Based on the contributions of Ferdous & Uddin, (2015) the causes of decline are identified as colonial dominance, especially in Asia and Africa, low standard of education as high standard was considered anti-religious, lack of facilities and the destruction of existing ones through activism, high level of illiteracy and the dictatorial posture of the leaders who engaged in self-preservation in power rather than scientific development. More so, major share of the resources goes into the military provisions rather than investments in research, education, science and technology.
10 THE CHALLENGES OF THE MUSLIM WORLD IN GLOBALIZATION ERA

The challenge became more overwhelming with the emergence of new technologies (microelectronics, biotechnology and synthetic materials) creation of new products bringing about a wide gap in the level of economic development of the West and the Middle East which tends to create unfound tension. Hence the division into three categories according to Human Development Index thus:

Out of 177 countries surveyed for Human Development Index (HDI) by the UNDP in 2007 – 8, there are 70 countries with high HDI ranging from 0.968 to 0.800. In this classification only 10 Muslim countries are included. The classification actually excluded some Muslim world. There is no gainsaying in the fact that Islamic countries exhibit different socio – economic nerves, three distinct categories are recognized:

(i) Countries with high scientific and industrial base
(ii) Countries with medium scientific base
(iii) Countries with low scientific base

A long list of reports of inadequacy of the educational institutions and the low human and capital resources are exposed by Guessoum (2016), Altwaijri (2014) and UNDP Human Development Index

- The OIC countries in 2005 held an extraordinary session of the Islamic summit during which the Ten year Programme of Action to meet challenges facing Islamic Ummah – Members states were urged to participate in international efforts to support programmes aimed at alleviating poverty and capacity building in the least developed member states by supporting industrialization, emerging trade, transfer of technology alleviating debt burden and eradicating diseases through improvement and reformation of the educational institutions. More so, it has been realized that increased clashes based on fundamentalism have been affecting spiritual and cultural unity of the Muslims Ummah, the Islamic Jurisprudence Consultative Council for the Reproachment of Islamic Jurisprudence was created under the aegis of Islamic Educational Scientific and Cultural Organization(ISESCO), a supreme consultative forum towards achieving these objectives. The workability of indigenous/traditional theory will be very high if substantiated with human capital, structural capital and relational capital development as exemplified by the concept of intellectual capital and property. (Boaventura et al, 2022) All these can be supported by territorial development factor analysis. Though the above Author’s focus is on distance learning, which could deny a territory its intellectual capital, it is equally relevant here. In the hay days of the Muslim Scientists, the relationship between the Greco-Roman and the core West affected the regional and network economy negatively for the Muslims and positively for the West. Obviously the relationship might not really be one-sided, hence the question of Intellectual Capital theft remained unanswered because as the west borrowed from the Muslims, they must have borrowed
from the West too. In spite of the fact that Intellectual Capital is referred to as the collective knowledge, skills and experience, culture, information assets and unique capability that determine the framework for success, (Indeed Editorial Team, 2022) and not Success itself, meaning that contentious effort must be made to transform the opportunity to success. Obviously, the relationship between the Muslim world and the West did not bring about equality in terms of scientific development and social progress, at the same time, the West could not be accused of Intellectual theft. Intellectual theft is the crime committed when someone manufactured, sells or distributes counterfeit or pirated goods (code 42. Com, 2022). There is a marked difference between manufactured goods, raw materials and raw indigenous knowledge. The borrowed knowledge must have been processed and turned to useful products. The only aspect that could be stressed is the change of name of the inventors of some of the early indigenous scientific knowledge. That could also be excused based on the linguistic composition of the West. Those names were indigenized. The Muslim world should use the advantage of globalization and invest in Scientific research that will translate to useful products that will be identified with them.

11 RECOMMENDATIONS

Science and Technology, intellectual capital and innovations are historically evident in the history of the Islamic and the Muslim world. Such that recorded between 7th and 15th century need be rekindled allowing a synergy of the modern science and traditional technology:

- Attention should be shifted to development in science and technology in the process of retaining the traditional religious values.
- Collaborative efforts of Science Academy, Industry, Associations and Civil Society Organizations towards development of scientific research.
- Eradication of illiteracy and introduction of functional education through reform from the lowest level to the University level.
- Review of Islamic countries attitude towards radicalism, fundamentalism that caused retrogression and self-destruction.
- Observance of equality, civil liberties and social justice to promote good governance, transparency, accountability and elimination of corruption.
- Political development should be based on sound educational, scientific and technological and cultural communication development throughout the Muslim world.
- Other Muslim World in the category of Least-developed should take some lessons from their counterparts with high scientific and industrial base.
12 CONCLUSION

The extra-ordinary contributions of the Muslim world to science, technology, scholarship, literature, language, arts and craft, astronomy, mathematics, philosophy, historiography, geology, medicine and theology could not be over emphasized in the golden age of Islam between 600 and 1450 A.D. The success of the Islamic conquest had erased existing national boundaries that hitherto kept people apart—ideas were exchanged and Arabic rose to become an international language. The Arabs constituted scholars of the house of wisdom who assisted in fusing the Indian and the classical traditions that led to introduction of Arabic numerals, place value theory and algebra.

As laudable as these contributions were, the issue of Pan-Islamism, brotherhood and fundamentalism changed the direction of event, rather than placing emphasis on further development of science and technology, the political, social and religious factors came to play and all glories of science education originating from the Muslim World were lost to the West. The Europeans who adopted, adapted and assimilated the knowledge into to their own socio-cultural environment, came up with useful products that benefitted the society. This shows that indigenous knowledge may not benefit the originator if a useful product is not designed out of it.

The Muslim world now finds itself in the globalizing world with lots of tension that bothered on action, reaction and self-destructive activities. Coping with the modern trend demands became extremely difficult. Hence, the need for re-engineering the educational system, social and political institutions, paying attention to scientific research, investment and international collaboration. Efforts of the OIC countries ISESCO and other multilateral organization should be translated into meaningful action programme because development could only be achieved in the atmosphere of peace. Territorial Configuration Analysis as suggested by Castro, (2022) could also be adopted by canvassing for economic development, creation of Research Service Centre and Institutes that will serve as agents of development.
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