

History of Sciences and Libraries in the Islamic World: A Mutual Relationship

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Abstract: This paper exposed the relationship between science and librarianship in the Islamic world. By using historical method or historiography, the study is aimed at exploring the relationship between sciences and libraries in the Islamic world. The study found that historically, the development of sciences in the golden age of Islam was followed by the growth of libraries. Islamic libraries have significant roles in the scholarly tradition and sciences development. Libraries have played its roles in knowledge production, transmission, and preservation. Islamic libraries were not only a place to store knowledge but also a center for knowledge studies. It was a basis of muslim ummah' scholarly tradition.

1 INTRODUCTION

In historical perspective, we have witnessed how muslim ummah achieved the glory days, especially in the field of scientific achievement reached in the later part of the seventh century and the beginning of the eighth century under the Umayyad rule, and its golden age occurred under the Abbasid rule, and in Muslim Spain. For at least five centuries, Islamic civilization was the most prominent in the world. (Hitti, 1974) therefore called that centuries as *the golden prime* of Islam because the muslim achievement on sciences. The achievement of muslim scholars on sciences was acknowledged by many scholars such as (Kneller, 1978), (Hill, 1993), (Sarton, 1927), and (Nasr, 1968).

In addition to its social stability and political factors and the level of prosperity of muslim's life, the development of science that occurred during the classical or medieval period of Islam was influenced by the roles of learning institutions including libraries. during the Islamic Golden Age there was a number of important learning institutions previously unknown in the ancient world have their origins in the medieval Islamic world, with the most notable examples being mosque, *khalafa*, *madrassa*, and libraries. According to (Micheau, 1996), Islamic libraries in the classical period have regarded to the modern library characteristics. The libraries not only

offered a service of the collection of books or manuscripts as found in prior ancient libraries, but also as a public library and lending library, a leaning center and knowledge dissemination, a public space for meetings and discussions, and equipped with a dormitory for scholars or students. The concept of the library catalog was also introduced in medieval Islamic libraries, where books were arranged into specific fields and categories.

This paper has attempted to explore the history of science and libraries in the Islamic world. In particular, the description will answer the questions on the establishment of Islamic libraries and its role in the development of sciences in the Islamic world

2 LITERATURE REVIEW

In historical perspective, the discussion of Islamic libraries was a topic of Islamic civilization history. Libraries in the Islamic world was viewed as parts of the achievements of muslim ummah. Studies of the of Islamic libraries generally became part of the discussions of Islamic history studies, especially on Islamic civilization. Historians who concerned on history of Islamic civilization discussed topic on Islamic libraries in relation to the learning institutions and or the development of sciences in the Islamic world. The achievement of sciences in that era of the

‘golden’ age of Islam reached by muslim *ummah* was immediately followed by the growth of libraries.

Many scholars such as Mackensen dan (Pinto, 1929), (Shalaby, 1954), (Thompson, 1957), (Elayyan,1990), (Micheau,1996), and (Sardar,1990) acknowledged the role of Islamic libraries in the development of muslim civilization. Islamic libraries were centre of studies, discussions, and storage of sciences as the foundation of human civilization.

For example, (Elayyan, 1990) found that there was a significant growth of Islamic libraries during the the Medieval period. In the ages, types of library such as public and private libraries, academic libraries, mosque libraries were regarded to be crucial institutions in shaping Islamic civilization. Islamic libraries were places for knowledge production, dissemination, and preservation. Scholars and muslim *ummah* gathered to read, discuss, and do study in the libraries. (Shalaby,1954), on the other hand, mentioned that Islamic libraries were important learning institutions in the Islamic world. Islamic libraries were ‘open’ institutions to all kinds of sciences to be studied and discussed.

In 1962, (Hamadeh,1962) presented a paper for his master in Chicago University entitled “Islamic Libraries during the Middle Ages”. According to the paper, Islamic libraries have particular characters and functions such as religious, scholarly, social, educational, and propagative characters. In addition, (Hamadeh,1962) stated that Islamic libraries have contributed to the development of sciences, not only in the muslim world but also over Europe. Muslim *ummah* need libraries for knowledge transmission and transformation.

3 METHODOLOGY

Historical method was used to explore the history of sciences and libraries in the Islamic world. By this method, the description of sciences and libraries development in the past time especially in the classical period of Islamic history was narrated and written with critical inquiry. The research begun with the data collection, data examination or criticism, and data presentation. In data collection, literature on Islamic history and other relevant literature were quested and located. In addition, the literature, then, were read and examined based on the objective of study. At the end, the data that were relevant to the research objectives were presented.

4 FINDINGS AND DISCUSSION

4.1 The Rise of Islamic Libraries

History of libraries in the world began from the written tradition. The birth of Islam in 610 A.D. has introduced a new tradition among Arab society, namely a written tradition. This written tradition has brought the great changes in the Arab civilization by which the Arabs were previously known to have a very strong oral tradition.

Actually, history of Islamic librarianship was stemmed from the tradition of writing which was then followed by the establishment of libraries in the Islamic world. The Qur’an was a work written in the beginning of muslim tradition. As mentioned in the first verse of Qur’an, reading and then writing are the two most important tradition influencing the Islamic civilization. The Qur’an mentioned “Read, in the name of the Lord . . . Read, for thy Lord is the most generous. Who taught by the pen. Taught man what he did not know”. The word ‘pen’ in the verse indicated the important of writing to transmit knowledge.

The teachings of reading and writing as mentioned in the first verse of Qur’an revealed to Prophet Muhammad PBUH have introduced a new tradition among muslim *ummah* that was called as literacy tradition. This tradition implied to the need of teaching institution as well as of writing literature. At the beginning period of Islam or at 8th century, Arabic-Islamic literature was written on parchment and papyrus, and the Qur’an was the literature written at the first time. The tradition of literacy continued to writing hadith, letters, acts, agreements, and so on.

According to (Elayyan,1990), the invention of paper brought from China to Baghdad at about 800 A.D has influenced the way of Arabic-Islamic books were produced. The production and dissemination of knowledge were faster and easier accordingly, and knowledge books were distributed largely in the muslim countries. As a result, in addition, book-shops and bookmarkets were scattered in Islamic cities. Book-shops in Islamic cities have played as a center of Arabic-Islamic books production and distribution as well as discussion among muslim scholars. There were one hundred book shops in Baghdad in the 11th century.

(Elayyan, 1990) added that the introduction of a new tradition of literacy has brought great influence of the rise of sciences in the Arabic-Islamic world.

The contact and transmission of different cultures from the Persian literature to Arabic have contributed to the absorption of the Greek and Persian literature and the invention of new fields of knowledge. through the translations, discussions, and instructions, muslim scholars and scientists developed secular sciences such as astronomy, medicine, geometry, arithmetic, astrology, botany, zoology, and natural sciences, and Islamic sciences such as *fiqh*, *qur'anic* sciences, hadith sciences, theology, *tasawuf* and history. (Lyon,2010) mentioned that through Arabic-Islamic sciences, muslim have contributed to the development of sciences and transformed to Western civilization.

The development of sciences and scholarly traditions in the early era of Islamic period required to the new institutions to store, organize, and preserve the literature produced by muslim scholars. The establishment of libraries were intended to and part of the advancement of Islamic civilization in the Middle Ages. (Azami,2000) mentioned that history of the Islamic libraries was at the first decade of the sixth century Hijrah. Abd al-Hakam ibn Abdullah ibn Amr ibn Sufwan al-Jumahi established a public library that contains various collections of books that was equipped rooms to read and enjoy as well. Mackensen as cited by (Sardar, 2000), the early history of the establishment of libraries in the Islamic world began in the Umayyad period as a result of the development of written tradition at the time. The first library was the library of al-Zuhri. It was stated that Al-Zuhri have collected the books and letters written by from his students and a few letters.

However, the library that was well known as the first library in the Islamic world was the library that was founded by Khalid Ibn Yazid (Pedersen,1984, Quraishi, 1970, and Ibn Nadim, 1970). J. Pedersen [1984] in his book, *The Arabic Book*, stated that Khalid Ibn Yazid Ibn Muawiyah had set up a library. (Ibn al-Nadim,1970) mentioned that Khalid Ibn Yazid Ibn Muawiyah is a good and wise person so that people was called him as the Wise Man of the Family of Marwan. He was very fond and loving of sciences. Because of his love to science, he deliberately gathered a group of Greek philosophers who lived in Egypt to come to him, and then he ordered them to translate Greek works into Arabic. This effort was considered as the beginning of translation activities in the Islamic world. For the purposes of the translation activities and to store the literatures that have been translated he established the library. This library was the first Islamic library that has large and organized collection (Audah, 1999).

The growth and development of Islamic libraries have widely spread in the Abbasid caliphates. In this periods, according to al-Baghdadi [1996], the rise of learning institutions has become important part of the development of the Muslim scholarly traditions. In addition, further al-Baghdadi, Islamic libraries were the most significant institution in the development of the tradition. In various large and small cities the Islamic libraries have widely spread and become the pride of the caliphs and governors. The Islamic libraries became the place where a variety of books and reference materials were stored and the scholarly or scientific activities were carried out.

During the Abbasid periods, there were many kinds of Islamic libraries such as mosque library, madrasa and academic libraries, private libraries, public libraries, and semi public libraries. (Krek,1980) mentioned Al-Azhar Mosque library was a famous Islamic library in the 9th century. In addition, there were large libraries such as Al-Unawi Mosque library in Damascus, Al-Mansour Mosque and Al-Kamariah Mosque libraries in Baghdad, Al-Zaitunah Mosque library in Tunis, Al-Masjid Al-Jame'a library in Merv, and Mecca and Medina Mosques libraries (Hamadah, 1981). Besides mosque libraries, private libraries owned by Islamic caliphs and scholars such as Al-Jahiz' library, Ibn Ishaq library, Ibn Khaqan library, and Abbasid caliphs' libraries have contributed to the development of sciences in the Islamic world (Elayyan, 1990).

Public libraries, on the hand, were also important learning institutions in the Arabic-Islamic history. The development of public libraries were aimed to provide access to sciences for all people. The public libraries served all people without any restrictions. Public library founded by Khalid ibn Yazid from Umayyid dynasty in Damascus in 689 A.D. was the first public library. (Pinto, 1959) added that Byt al-Hikmah founded by the order of the great Abbasid caliph Al-Ma'mun in the 9th century was regarded to be the first public library that was open for public in Baghdad.

Moreover, the growth and development of the library provided a new model for teaching institutions in the Islamic community. According to (Tibi, 1990) and (Quraishi, 1970), in the early Islamic history there were teaching institutions such as dar al-arqam, suffah, dzawiyah, and khalaqah. These institutions were intended to teach religious teachings purposes. On the other hand, the establishment of libraries was introduced a new institution to learn Islam and sciences as well. In the libraries, people learned Islamic teachings as well as studying sciences through library services and collections. (George Makdisi, 1981) mentioned that Islamic libraries were to be 'open learning institutions' that people can learn

not only Islamic sciences such as *tafsir*, *fiqh*, and *akhlak* but also can discuss secular or ancient sciences such as Math, medicine, astronomy, alchemy and chemistry, physics, and geography. He added that Islamic libraries were often referred to as *bayt al-hikmah*, *daar al-hikmah*, *daar al-Ilm*, *khizanah al-hikmah*, and *daar al-kutub* which were a combination of the words *bayt*, *daar*, and *khizanah* with the words *al-ilm*, *al-kutub*, and *al-wisdom*. This combination referred to Islamic libraries indicated that library was a new institution that open for teaching and learning all sciences, including secular sciences that was different from previous learning institutions.

(Hasan Ibrahim Hasan, 1996) added that Islamic libraries played their roles in teaching and learning of religious sciences or sciences of naqliyah or syar'iyah which are the result of the creativity of Muslims as well as foreign sciences obtained from other people. This science is also called as the aqliyah sciences or wisdom, and is sometimes referred to as the ancient sciences (*al-'ulum al-qadimah*).

4.2 The Roles of Islamic Libraries on the Development of Sciences

Based on the explanation above, It can be argued that the rise and development of sciences in the Islamic world is followed by libraries. Beside its function as a storehouse where Islamic knowledge and sciences were kept and preserved, the Islamic libraries have become learning institutions where people gathered for study in all branches of sciences, not only religious sciences but also secular sciences as well. (Muhammad Munir Marasi, 1988) mentioned that in the early Islamic history there were several institutions that function as a means of disseminating knowledge such as mosques, kuttub, madrasas, libraries, Dar al-hikmah, and hospitals.

In this case, we can see that there was a close relationship between the development of sciences and libraries in the Islamic world. the development of knowledge and science is in great need to the libraries to keep and preserve, and the libraries, otherwise, will grow up widely in the society with high respect to the knowledge

4.2.1 Providing Library Services

Like library in general, Islamic Library provides and offers library services to their users. the Islamic libraries collect literature and works from different disciplines, and organize it in a systematic organization system. According to (Sardar,1996), the Caliph al-Makmun sent several people to go to

Rumawi and Cyprus or Athens, India, Syria and Egypt to look literature for library collection.

to organize the literature, Ahmad (Amin,1998) and (Siba'i,1992) stated that library collections are organized and stored based on the subject or subject matter. the literature were classified based on their subject or the classification of science. the literature, then, were kept in a place or room such as a room for *fiqh* books, a room for medical books, a room for literary books, and so on. According to Ahmad (Syalabi,1954) that library collection were placed on shelves or storage cabinets, and a list of titles of books was attached to the shelves indicating the its contents. the list contains the titles of books and the total items, and other information about pages or other parts of the missing book, or parts of books that have been lost.

In providing library services, according to (Nakosteen, 1996) Islamic libraries offered a check-in check-out service enabling its users to borrow books from the library with particular requirements. In addition, (Nakosteen,1996) added that for particular users such as scientists, they were allowed to check out the books for the total of a hundred items.

However, according to (Syalabi, 1954), the users of library were suggested to maintain and threaten properly the book borrowed from the library, not allowed to make comments or notes on the book, and may not lend a loan book to others, or use it as collateral for anything. (Nakosteen, 1996) added that all books must be returned immediately in accordance with the provisions in a certain time. the library will send a regard to its users by saying thank you for all returned books and their use.

the descriptions above indicated that Islamic libraries pay a great appreciation of the books or literature as the part of knowledge. They collect, organize, preserve, and provide service to literature on sciences.

4.2.2 Translation of Ancient or Classical Heritage

The history of Islamic libraries can not be excluded from the translation efforts of the classical literature heritages particularly from Greek heritages. the objective of the establishment of the Islamic library by Khalid ibn Yazid that was considered as the first library was puposed as the place for the kept of Arabic translation from the Greek heritages. This translation that conducted by Khalid from Umayyad Caliphates was argued as the first attemp of translation in the Islamic world. However, this attemp of scientific translation has not supported by religious caliphs.

The translation of literature on sciences was widely conducted during Abbasid rule. According to Muhammad Ali Abu (Rayyan, 1973), translation activities during the Abbasid caliphates are divided into three periods. the first period is from the year 136-198 AH, or since the time of Caliph al-Mansur to the Caliph Harun al-Rashid. At this time there are such names as al-Bathriq Yuhana, Abdullah Ibn al-Muqaffa, and Ibn Yuhana Masawih. the second period was of 198-300 AH. or the caliph al-Ma'mun with the names of such well-known translator Hunain Ibn Ishaq, Ibn Ishaq Hunain, Yuhana al-Bathriq, and Qust Ibn Luqa al-Ba'labaki. the third period was lasted for fifty years, from 300-350 AH which were the names of translators Basyar Mata Ibn Abu Yunus (Ibn Yunan, Ibn Zakariya Yahya Ibn Adi, Abu Sulaiman al-Sajastani, Abu Uthman al-Dimasyqi, and Abu Ali Isa Ibn Ishaq Ibn Zur'ah.

For the translation purposes, the Abbasid caliph, Harun al-Rasyid founded *khizanah al-hikmah* that then was well known as *Bayt al-Hikmah* (House of Wisdom) in the period of chaliph Al-Ma'mun, al-Rasyid's son. This institution was regarded to be the first library that was open for public. the library was consisted of an astronomical observatory. In addition, the library has functioned as a center for study of sciences and translation of ancient literature as well as a place of manuscript preservation (Ahmad Amin, 1998, Syalabi, 1954). (Stanton, 1994) stated that in *Bayt al-Hikmah*, Hunain Ibn Ishaq almost translated the entire works of Galen, Aristotle's works such as Categories, Physics, Magna Moralia, and Hermenuetics, Plato's works such as the Republic, Timaeus, and the Laws, and Aphorisms works of Hippocrates, Dioscorides Materia Medica work, four astronomical work of Ptolemy, and translated the old Testament.

4.2.3 Literatures Copying and Duplication

In spite of the translation, the copying or duplicating of literature was the famous traditions during the Islamic classical periods. There was a popular profession that was called *copy writer* or *warraq* in this periods. the main task of copy writer was to copy or duplicate the literature, the original or the translated literature. A copy writer or *warraq* worked independently while others worked based on the request. Al-Isfahani according to Pedersen has copied the book of al-Aghani, and dedicated the book to the Caliph Al-Hakkam II in Cordoba. then he obtained one thousand dinars from the caliph as reward. Someone who was not known who lived in Seville around the year 1200 got a thousand dinars from the government for his services to copy and

comment on the work of al-Sibawaih (Pedersen, 1984).

Morover, (Pedersen, 1984) asserted that this copying activities were rapidly growing in the early Abbasid rules, especially after the founding of Bayt al-Hikmah in Baghdad. Number of copyists were employed here to copy the literature of science, especially during the translation efforts of foreign works. For example, In the library Bayt al-Hikmah, copying activities are handled by specialized staff who are responsible for copying literary tasks. the copying literature has become the department in the library. the department was responsible in copying and disseminating knowledge. Among the names of the copyists in Bayt al-Hikmah, there was a name such Syu'ubi Allan, a Persian. He was in charge of the books copied during the reign of Caliph Harun al-Rashid and al-Ma'mun (Ahmad Amin, 1998, Syalabi, 1954). Al-Farra, an expert in philology, was given the task by al-Ma'mun to write a work about the language. For this purpose, he provided the living facilities and two copyists that Salama ibn Asim and Abu Nasr Ibn al-Jahm will help him in copying activities. This effort was done in the library Bayt al-Hikmah. In addition, In addition, according to Pedersen (1984), the translators who worked at the Bayt al-Hikmah such as Yuhana Ibn Masawih, Hunain Ibn Ishaq, Muhammad ibn Musa al-Khwarizmi, Sa'id Ibn Harun, Thabit Ibn Qurra, and Umar Ibn Farrakhan were also the copyists.

4.2.4 Libraries as the Community Learning Centers

the most important of the function of Islamic libraries was for community learning center. the libraries have become the place where people can read and learn all branches of sciences. the public libraries in the Islamic classical periods were intended to provide public services. the large public libraries were open to all people without distinction; upon this fact the sources continually saying that anyone who could read, write or learn a subject was admitted. Such was the free admission in the libraries of Tripoli, Cairo, Shiraz, and Mosel. to facilitate in every way the use of books by students and scholars, public libraries permitted their loan sometimes against a deposit of money, at others, even without such deposit. An example of the latter is the Damiriyah library at Merv from which Yakut Al-Hamawi had borrowed 200 books. (Elayyan, 1990).

As the center for learning, the Islamic libraries havr a unique characteristic. According to (Bassam Tibi, 1990), the why of the islamic libraries were

named by Bayt al-Hikmah, or Khizanah al-hikmah, it was the theses words *bayt*, *khizanah*, and *dar al-hikmah* indicated to the place where many foreign or secular sciences were taught and assessed. the islamic libraries became the institute that was different from the madrasah or special schools that were the high-level teaching institution for the religious sciences.

4.2.5 The Advance Studies of Sciences

As mentioned above, the emergence of Islamic libraries has been colouring the models of learning institutions in the early periods. the libraries played its roles to provide library services as well as to facilitate an advance study of sciences. (George Makdisi, 1981) mentioned in his book of the Rise of College that libraries were institutions for studies of foreign sciences. In addition, according to (Majid, 1978) and (Hitti, 1974), Islamic libraries such as Bayt al-Hikmah in the golden age of Islam served as a storage facility for scientific literature with various types of subjects and languages, a place for the translation of foreign works, a place to copy various scientific literature, as well as a center for study and research institution. That is why many historians viewed that bayt al-Hikmah was as a university-level higher education institution.

In the Islamic history there are many libraries that have function as an institution for human civilization such as *Bayt al-Hikmah* in Baghdad, *Dar al-Hikmah* in Cairo, and *Dar al-Ilm* in Naishabur. the Islamic libraries, in this case, were not only as community learning center, but also as the advance studies of sciences. All branches of sciences, religious sciences and secular sciences, were studied in advance. According to (Bassam Tibi, 1990), and (Ahmad Amin, 1998) explained the why of the islamic libraries were named by Bayt al-Hikmah, or Khizanah al-hikmah, it was because the these words *bayt*, *khizanah*, and *dar al-hikmah* indicated to the place where many foreign or secular sciences were taught and assessed. the Islamic libraries, therefore, became the institute that was different from the madrasah or special schools that were the high-level teaching institution for the religious sciences. According to Stanton 91994), disciplines such as Greek philosophy, science, etc. were studied in the Islamic libraries.

As the advance studies, the Islamic libraries were considered as the higher institution for learning. (Sardar, 2000) stated that Bayt al-Hikmah in the Abbasid period has transformed to be the center for study that opened to public and also has conducted an intensive research and the advance studies such as

meetings of scientists, sholalry discussion, lectures, debates and others. In this institution scientists and muslim scholars tought sciences such as Al-Kindi, Al-Farabi, Ibn Sina and Ibn Rushd. According to one source, Al-Ma'mun, have invited scientists all over the Islamic world to share ideas, information, and knowledge in this library. For the advance studies, some books and valuable documents from medicine to astronomy were stored neatly on shelves in the library catalog.

In addition, Bayt al-Hikmah is also equipped with the observatory. This facility was used to conduct study and research, especially in the field of astronomy (Hitti, 1974, Holt, 1970). with the observatory facilities, al-Khwarizmi, the great scientist, and his colleagues can manage and then creat a astronomical calculations table that can be used to measure the distance and the depth of the earth (Haque, 1995). the table later was known as the Tables of Ma'mun which was based on the book Sindhind (Sidhanta) that was translated from India at the time of Caliph al-Mansur. This was the first astronomical work in Islam. the Europeans, then, copied and translated the book into the Greek, and named it with Astronomos, and the English called it with astronomy (Hosein, 1975).

The current digital world, scholar also served a storage for digital print of religious manuscripts such as done by (Aulia, Khairani, & Hakiem, 2017).

5 CONCLUSION

Based on the explanation above, it can be concluded that in the historical perspective there was a close and mutual relationship between Islam, science, and librarianship. the relationship between Islam and science is not only that there is theologically no conflict between Islam and science, but also there was evidence that Islam has ever gained the great achievement on sciences in the world. the development of sciences in the golden age of Islam was followed and supported by the growth of Islamic libraries. the libraries were not be function as a storehouse where sciences are kept and preserved, but also as an institution where teaching and learning process was conducted. In addition, the Islamic libraries have funtioned as the advance studies where all branches of sciences were studied and developed. By these functions and roles the Islamic libraries hava become the basis of muslim scholarly traditions and the boundary of the development of sciences in the world.

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