Chapter 13

Understanding the Islamic Hierarchical Classification of Knowledge through the Taxonomy Extraction Process

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ABSTRACT
Taxonomy plays a significant role in helping librarians and scholars in understanding, organizing the diversity of knowledge and facilitating decision making. In recent big data and massive diversity of knowledge production, subject classification HQ: Family, Marriage, Women, and Sexuality is amongst the growing subject in Islamic knowledge. Taxonomy is viewed as an effective tool in organizing, and accessing and retrieving information in the library and information in the science environment. Librarians play a vital role in facilitating access to information by introducing a dedicated and structured access tool. The growth of interest in Islamic knowledge motivates librarians and Islamic scholars in initiating a specialized taxonomy in Islamic subjects. The objectives of the paper are to identify Islamic subject entries and to classify subject entries according to sub-subjects in HQ. Taxonomy extraction is a meticulous process of identifying and classifying subject entries. The process includes three main steps which are entries identification, comparison, and validation. The first step is the identification of entries or term involving: i) entries identification from the Library of Congress Subject Headings (LCSH), ii) entries identification from the Al-Quran translation and, iii) entries identification from existing Islamic subject headings. The second step is comparison. This step involves gathering and comparing all entries from the three sources. The comparison is made according to coverage of terms, suitability to context and relevance to the current issue in Islamic knowledge. The final step is validation. In this step, the selected terms underwent validity checking from a group of expert panels. The extraction process is to confirm the taxonomy extracted that represents the hierarchical classification of Islamic knowledge, and at the same time facilitates access to Islamic.
information. Hence, it serves as the main reference for subject headings and classification in Islamic knowledge. A specified and inclusive subject heading on HQ, specifically, will benefit users and the society in providing solutions and understanding Islamic knowledge. This process establishes the guidelines on Islamic subject headings focusing on subject HQ which are highly needed in the current knowledge development scenario.

**Key Words:** Subject headings, Taxonomy, Islamic knowledge, Hierarchical classification

## 1. INTRODUCTION

Taxonomy is defined as a form of classification in philosophy and science. It is also referred to as the study of classifying knowledge onto the hierarchy derived from a Greek word which means arrangement. Humans by nature classify matters in their lives for many reasons. It is essential for understanding ourselves and our surrounding, for an association, and other cognitive processes. Taxonomy extraction is the process of extracting information from the Islamic knowledge sources to build a taxonomy for a given domain. The Islamic taxonomy will allow the English speaking world to understand the unique semantic meaning of Islamic messages as described in the Al-Quran. To develop a complete taxonomy, Al-Quran will be the main source because it is divinely chosen and described as a way of life of human beings (Saad, Salim & Zainal, 2009).

The secondary sources of Islamic information in this study are the use of Al-Quran translation involved in the extraction process. Taxonomy plays a significant role in helping librarians and scholars in understanding, organizing the diversity of knowledge and facilitates decision making. Taxonomy results in a classification (Bakar, 1998). Taxonomies can be developed in many ways. They can be developed based on preconceived notions and beliefs. They can also be based on careful, selective observation as well as measurement.

The Library of Congress of Subject Heading (LCSH) is quite biased to the Islamic perspective. The LCSH provides very little subdivisions for Islamic knowledge. Islamic subject headings in LCSH are placed in the same division with Baha’ism. In contrast, Christian subject headings are placed in their division without being mixed with other religions (Sardar, 2003). However, although LCSH is biased towards Islam, it gives more advantages to cataloguers to expand the subject headings for Islamic knowledge. The history of classification in Islamic knowledge begins with the classification system of Al-Farabi and Al-Ghazali (Hamid, 2002). According to Bakar (1998), in his book titled Classification of Knowledge in Islam, classifying the knowledge in Islam begins with Al-Farabi’s Classification of sciences. Bakar (1998) further adds the standard of Sunni theology and Neo-Scholasticism. The process plays an important role in providing coherence to the Muslim education system in the modern world.
2. LITERATURE REVIEW

2.1. Subject Heading and Classification Scheme
Library subject heading and classification scheme is a major means to organize book collections with various knowledge contained. Sardar (1998) elucidates various problems associated with classifying material on Islam or in one of the many oriental languages using the three classifications aforementioned. The problem of classification for Muslim scholars is not only how to arrange books on the shelves but also how to organize knowledge, so that it can be transferred systematically to the coming generation.

Producing the classification scheme in favour to the Islamic libraries or the libraries that have the most Islamic materials has been conducted by some libraries in Islamic countries in the twentieth-century (Suja’, 2008). The libraries have arranged a variety of classification schedules intended to meet their respective needs. Just as earlier mentioned, one of the main reasons why they have to design their classification is because of some shortcomings put in the Western classifications. One of the main challenges faced by Muslim librarians and information scientists is how to create classification schemes suitable for Islamic materials. Sardar (2003) takes into account that the problem of producing appropriate classification schemes is a little more demanding. Nevertheless, to classify Islamic materials in a uniformly treated way is more and more difficult to surmount.

2.2. Subject Heading
The Library of Congress has developed the LCSH for use in its catalogues (Suja’, 2011). The list is also considered appropriate for large public libraries, some colleges, and many university libraries. When an appropriate subject heading is found, the librarian assigns it to the book record in the library catalogue. The librarian next consults the list of related subject headings to determine if any of them might be appropriate. Then the librarian looks for other subject headings that describe other aspects of the book’s content. Once all the information about a book has been entered into the library catalogue, patrons can search for the book since the book has been assigned to the subject headings using the Library of Congress Subject Heading system, and patrons can now use those same subject headings to search the library catalogue and find books on a given subject.

3. METHODOLOGY
Document analysis was applied in this study involving the comparison of subject entries between the Library of Congress Subject Heading (LCSH) and the existing Islamic Subject Heading against the Al-Quran. Al-Quran is the eternal miracle of Islam and a sole central religious text of Islam, which Muslims believe to be a revelation from Allah. Al-Quran consists of 30 Divisions (Juz), 114 Chapters (surah) and 6236 Verses (ayat). The concept of Al-Quran knowledge is defined by using the Quran hierarchy as determined by the sequence of divisions, chapters, and verses. These are the most important
components for presenting the verse as final references of the particular Al-Quran concepts in a systematic manner.

3.1. Entries identification
The identification of entries or terms involves entries identification from the Library of Congress Subject Headings (LCSH) focusing on HQ: Family, Marriage, Women, and Sexuality, entries identification from the Al-Quran translation and also entries identification from existing Islamic subject headings.

3.2. Comparison
A comparison at this stage was needed to identify the similarities and differences of the terms. Gathering and comparing all entries from the three sources involve selecting Arabic terms based on contemporary subject matters. The comparison was made according to coverage of terms, suitability to context and relevancy to the current issue in Islamic knowledge.

3.3. Validation
Selected terms underwent the validity checking from a group of expert panels including senior cataloguer, library and information science scholar and Islamic subject expert. The experts validated the subject according to the relevance and clarity of the terms. The validation process applied the Inter-rater Agreement, in which the expert agreement was computed using a likelihood scale of 1 to 5. The subject with the highest score on both criteria was selected as the proposed Islamic subject heading.

4. RESULT
The above-mentioned analysis in the methodology section had established the taxonomy extraction process. The process was systematically structured and went through a comprehensive validation procedure. The process began with the first step of entries identification where entries were identified from the Library of Congress Subject Headings, Al-Quran Translation and the existing Islamic Subject Heading. The initial process in these steps involves browsing the LCSH on the selected Subject HQ to extract the Arabic terms/entries listed. Secondly, the same process applied to the Al-Quran Translation and the existence of Islamic subject headings.

The Second step is Comparison which combines gathering and comparing the lists of entries from the first step. Comparison was made based on coverage of terms which specifically looked onto the hierarchy of entries, (broader and narrower terms, related terms, use for, and see also). The second process in these steps is focusing on the suitability of the context. Suitability of the context emphasizes on the application or use of the entries according to a situation or specific subject. The third process is assessing the relevance of the entries to the current issues in Islamic knowledge development. This process incorporated the recent development of literature written on Islamic subjects, and
compared to the recent entries in LCSH and the existence of subject headings. In these steps, the Al-Quran Translation was used as a guide to determine the appropriate entries.

The third step is validation. This step involves the experts on the related profession of Islamic subjects. The Inter-rater agreement procedure was applied to determine the relevance and clarity of the entries/terms. In these steps, experts were required to rate both criteria (relevancy and clarity) including their comments on the suitability of the entries. Entries scored above 3 (based on the scale of 1-5) for both criteria were listed as proposed entries to the taxonomy. Entries scored below 3 were considered not relevant, and omitted from the list.

The three-step process explained above resulted in the taxonomy extraction process that was developed in this study. Figure 1 below demonstrates the overall representation of the process.

**Figure 3: Taxonomy Extraction Process**

5. CONCLUSION AND RECOMMENDATION

This study concludes the importance of the 3-tier steps taken in the process of developing a taxonomy. The process may be replicated in other hierarchical knowledge. The process provides a solution to the challenges faced by Muslim librarians and information scientists in creating subject heading suitable for Islamic material. This takes into account that the problem of producing appropriate subject heading can be overcome with the application of the proposed taxonomy extraction process.
REFERENCES


