ISLAMIC MANUSCRIPT COLLECTIONS ON THE WEB: AN EVALUATION OF THE USER INTERFACES

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ABSTRACT:

This paper presents a survey conducted to provide an overview of the functions and features of digital library user interfaces within the Islamic manuscript context. Based on Internet and bibliographical keyword search, the survey identifies 49 digital libraries that contain Islamic manuscript collections. The findings illustrate varying patterns for browsing, searching, navigation, and page-viewing systems as well as uncommon yet relevant tools and features offered by the interfaces for digital libraries.

1. INTRODUCTION

Being both cultural artifacts and literary documents, Islamic manuscripts (IM) have been extremely valuable for various disciplines including art history, sociology, anthropology, archaeology as well as comparative literature. These manuscripts cover a wide area of research by the very definition of the word 'Islamic', not only as a faith but in the sense of cultural, intellectual and material outcomes of the whole Islamic Civilization. As a primary source, the IMs present the literary, cultural and material history of the Islamic Civilization in three main Islamic languages – Arabic, Persian and Turkish (Riedel, 2010). In the past twenty years, there has been an increasing effort in the digitization of these artifacts, which is followed by the dissemination of this content over the internet through digital libraries (DL). However, the questions of 'why' and 'what' of the IMs should be archived/preserved/presented in digital are two fundamental questions that are still being discussed. These questions are highly relevant to design since the 'what' and the 'why' directly affect the 'how' which is the design of the digital application. A detailed study on 'what' and 'why' within the context of digital being of Islamic Manuscripts is beyond the scope of this paper and will be discussed in another publication.

In studies on user interfaces of DLs, various aspects of the interface design have been researched and evaluated. These investigations include searching and navigation (Baldacci (et al.), 1999; Oliveira (et al.), 1999; Marchionini (et al.), 1998), design (Thong (et al.), 1981; Fox (et al.) 1993) and presentation of information (Oliveira (et al.), 1999; Marchionini (et al.), 1998; Hill (et al.), 2000); user interaction, customization and authentication (Dorner (et al.), 2003). Majority of the research in evaluation of the DLs focus on usability studies (Xie, 2006) rather than the functions and features that the user interfaces offer. For usability evaluation, a number of different criteria have been suggested such as learnability, memorability, low error rates (Nielsen, 1993; Kling (et al.), 1994), effectiveness and efficiency (Jeng, 2005). To have an overview of the current state of the user interfaces, a different kind of investigation on DLs is necessary. This study is motivated by the need for research to explore how the Islamic Manuscripts are (re)presented in the digital libraries and what the interface design provides to the users of these DLs.

In this paper, we report on an overall analysis of the functions and features of the user interfaces of DLs containing Islamic manuscripts. The paper is structured as follows. The Introduction is Section 1. In Section 2, we explain the methodology. In Section 3, we present the findings of the survey including evaluation of the interfaces in terms of browsing, searching, page viewing and navigation, as well as supplementary features and tools that the interface provides.

Figure 1: An illustrated Islamic Manuscript, Zubdat–al Tewarikh (The Essence of Histories) in Museum of Turkish and Islamic Arts, Istanbul Turkey.

2. METHODOLOGY

To review the Islamic manuscripts on the web, we carried out a survey which recorded the online applications related to the Islamic manuscripts. The selection of the samples for the survey was undertaken in March 2012 and was based on Internet and bibliographic research (e.g. articles in journals and conference proceedings) on the subject. The initial focus of the survey was limited only to illustrated manuscripts. Due to insufficient number of samples, the scope of the survey is widened to include Islamic manuscripts in general. Therefore, the Internet search was performed using the main keywords such as "Islamic manuscripts", "illustrated manuscripts", "illuminated manuscripts", "digital library", "online library", "virtual museum", "online museum" as well as the associated keywords including "Turkish manuscripts", "Arabic manuscripts", "Persian manuscripts", "Islamic painting", "miniature painting" and the like.

A preliminary review was performed on the user interfaces of the identified DLs to determine the functions of the user interfaces to be analysed. In addition to repeating patterns of functions, interesting or innovative features of the DLs were

also identified. Then, a matrix is constructed that contains a list of functions and features and a list of DLs in columns and in rows, respectively. After construction of this matrix, the DLs are further examined with a specific focus on these aspects.

3. FINDINGS

In this study, we have identified 59 currently available online applications that are providing access to digitized content of IM collections. 10 of these were not considered as DL but as exhibition, museum or collection catalogues displaying some select preview images of the manuscripts. A full list of identified DLs and their links can be found in the Appendix.

3.1 Browsing

By visual inspection, we have identified four different techniques that the DLs have implemented for browsing the collection. These browsing techniques include the use of searching, providing a list of items, a sortable list of items, and filterable list of items. Searching can also be considered as a browsing technique. However, it can be said that this method is the most inefficient way for browsing a collection. Although it does not seem to be a preferable method, 4 out of 49 DLs use this method.

Approximately half of the examined DLs (22 out of 49) provide a fixed list of items in their collection mostly including the title and the author. In case of large number of items, the list is paginated rather than infinite scrolling. Two more improved techniques that the DLs utilize for browsing is to make the list of items sortable or filterable based on various criteria such as author, date, subject, genre, geography or language. Of the 49 DLs that are examined, some (15) prefer the sortable list of items while few (8) utilize a filtering system that allows better controls and richer interaction for browsing (See Figure 2).
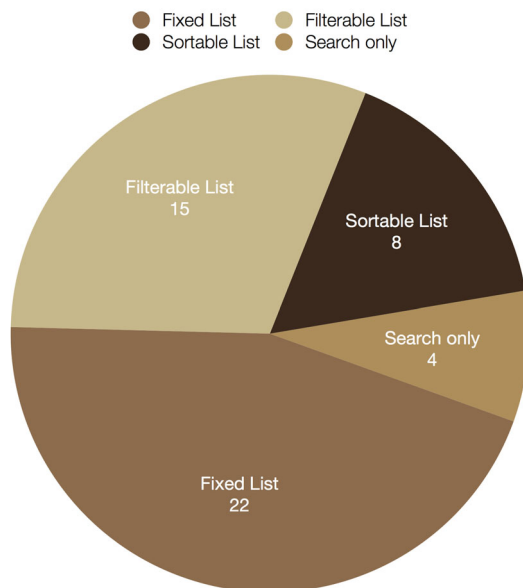

Figure 2: Distribution of browsing techniques in 49 DLs

Another point to consider for the browsing interface is the use of thumbnail images in the list. Less than half of the DLs (20 out of 49) provide a thumbnail image of the manuscripts in the list of items. Although most of the manuscripts do not contain any print title on their covers to recognize, the visual

information (e.g colour, texture, size, and shape of the manuscript cover) conveyed through the thumbnail image assists in distinguishing the items in the collection.

3.2 Searching

A large majority of the DLs for Islamic manuscripts, 40 out of 49, offer keyword search only in the metadata to find items in library while 6 DLs do not provide a searching feature at all. A small number of DLs we identified, 2 out of 49, provide partial text search option in addition to metadata search. This feature is achieved by including the transcribed (in some cases translated) content of front matter (incipit, basmala, etc.), back matter (excipit, colophon), and content headings of manuscript text into the search database (See appendix, item #11 and #25). From 49 DLs that is examined, only one provides the feature of full text search. It enables users to search both within the modern Arabic transcription and within the English translation of the text. (See appendix item #1). (See Figure 3)
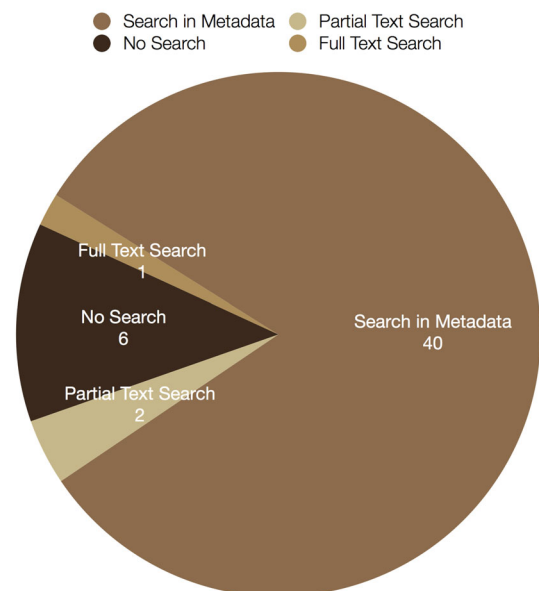

Figure 3: Searching systems in 49 DLs

3.3 The Page-viewing Interface

3.3.1 Overview of the Manuscript: Being able to get an overview of a manuscript is an effective way for browsing purposes. In a large number of DLs (30 out of 49), this need is addressed by displaying the pages of the manuscripts as thumbnail images. Among these 30 DLs that provide a document overview, two thirds of the DLs (20) display all the pages of the manuscript in the same window. Users can scroll through the thumbnails to see all the content of the manuscript. While, the remaining 10 DLs present the document overview in a paginated fashion, i.e. 5 or 10 folios per page. It is important to note, however, that a considerable number of DLs (19) do not support the document overview feature at all.

Figure 4: User interface of The Walters Museum, Baltimore Islamic Manuscripts Collection. (Displaying document overview in thumbnails, download as pdf, add to collection, share in social media and add tags features)

3.3.2 The Layout: Among the DLs in this survey, we have identified four different types of layouts for the page-viewing interface. Type 1 can be called as One-page Single Image Display which shows one page of the manuscript as a single image file. Type 2, Two-Page Single Image Display, is the two-page version of the former. This shows two pages of the manuscript as a single image file. Type 3, One-page Scroll Display contains a page of the manuscript as a single image similar to Type 1. However, in Type 3 the pages can be scrolled horizontally or vertically for smoother interaction than that of the Type 1. The most advanced layout is Type 4, the Book-like Display, which shows each page of the manuscript as a separate image in a book-like layout. This type includes both the Flash-based page-flip viewing interfaces and the conventional HTML interfaces.

The way that the DLs present the manuscripts through these interfaces varies. Although most of the DLs, 32 out of 49, use a single layout type for exhibiting the manuscripts, a notable amount of DLs (14) offer the option for users to choose from multiple layouts. The remaining 3 DLs do not provide an interface for viewing the manuscripts; instead they only give a download link to a PDF of the manuscript.

3.3.3 Page Navigation: From the 46 page-viewing interfaces, we have identified three main navigation techniques that are most commonly used. Technique 1 uses buttons to go next and previous pages with increments by 1. Technique 2 allows jumping directly to a desired page number either by manually entering the value, by selecting from the number from a drop down list, or by using a horizontal slider. Technique 3 utilizes the document overview and enables user to jump to a desired page by selecting the thumbnail of that page. Technique 1 provides liner navigation though the pages while Technique 2 and Technique 3 provide a non-linear navigation. A vast majority of the DLs (41 out of 46) employ a combination of these navigation techniques in the page-viewing interface. 38 out of 41 DLs use Techniques 1 and 2 simultaneously while 24 out of 41 provides the option for the users to choose among the techniques 1, 2 and 3 in the same interface.

In addition to these common navigation techniques, we have also identified two different ways for enabling page navigation. First technique is jumping to a page using the content headings of the manuscript. 5 out of 38 of the DLs offer this technique. Second is using a real-like representation of an open book where users can see the sides of the pages underneath the open pages. By hovering and clicking on a page, users can navigate within the manuscript. This technique is based on an open-source book reader by Internet Archive and used by 4 out of 38 DLs.

3.3.4 Zoom Type: Two different zoom types are identified, i.e. high-detailed zoom and open larger image. For most of the DLs, the zooming seems to be considered as a significant feature of the interface since 30 out of 49 DLs provide a high-detailed zoom option. While, 8 DLs out of 49 allow users to see only a relatively larger image opened in the same or in a new window upon clicking on the image or a button. Interestingly, a considerable number of DLs (11) does not offer any type of zoom or enlarged image of the page, although being able to zoom is an important need for inspecting manuscripts. Page-viewing interfaces of 35 DLs (out of 49) do not provide the option to rotate the page of a manuscript. Among the 14 DLs which provide rotation, almost all of them (13) provide rotating with 90 increments in clockwise or counter-clockwise direction. The rotation feature of the remaining one offers a more detailed control by enabling to rotate the page by 1° increments.
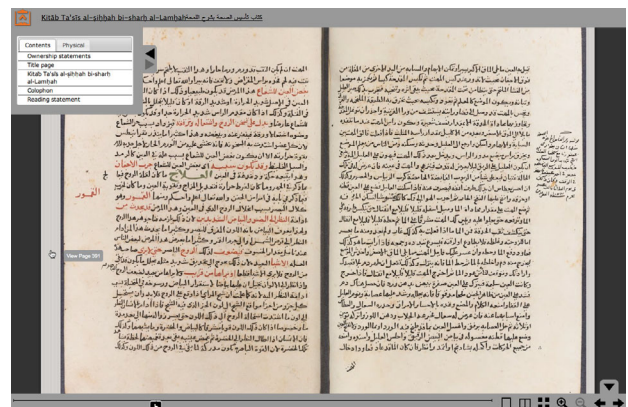

Figure 5: User interface of Princeton University, Islamic Manuscripts Collection. (Navigation by content headings and clicking to real-like representation of a page in an open book.)

3.3.5　Full-screen Viewing: Another function identified in the interfaces of DLs is the option to explore the content in full screen. Full-screen feature removes the distractions and unnecessary items from the page and also enables the user to see the content in a larger screen by hiding the interface elements of the browsers. Among the 49 DLs, only 13 of them provide a full screen option for the page viewing interface, although presenting the content in full-screen is highly beneficial for a more focused reading and researching experience.

3.4　Supplementary Features and Tools

In terms of supplementary tools for users, the following features have been found in the 49 DLs: download option for full content of the manuscript (14), download a selected page of the manuscript (3), compare two pages of the same or another manuscript side by side (2), copy the permanent URL of a manuscript in the collection for referencing (19) or permanent URL of a specific page in a manuscript (2), add manuscripts to a personal collection for easy access (10), create annotations on a page (2), manipulate the brightness and contrast of the image (1), request reproduction rights and licenses (3), use magnifying glass for detailed inspection of a certain area of the image (1), export citation of the manuscript (2), provide starting and ending sentences of the manuscripts in the description (2), and store clipped images from the manuscript in a clipboard (2).
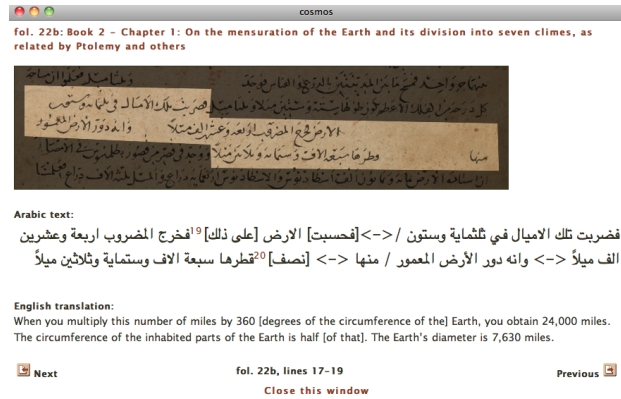

Figure 7: Displaying the Arabic text and English translation of the selected line in The Book of Curiosities – University of Oxford Library.

As for sharing, we have identified three different patterns to allow sharing: share via email only (3), share via social media (3) and share via both email and social media (9). Among these, there are two types of sharing the manuscript. The first one is to share the link or an image of a manuscript (10). The other is to share a specific page (3) of the manuscript. Moreover, another feature identified for sharing is to provide an HTML code for embedding a widget containing the manuscript to another website (1).
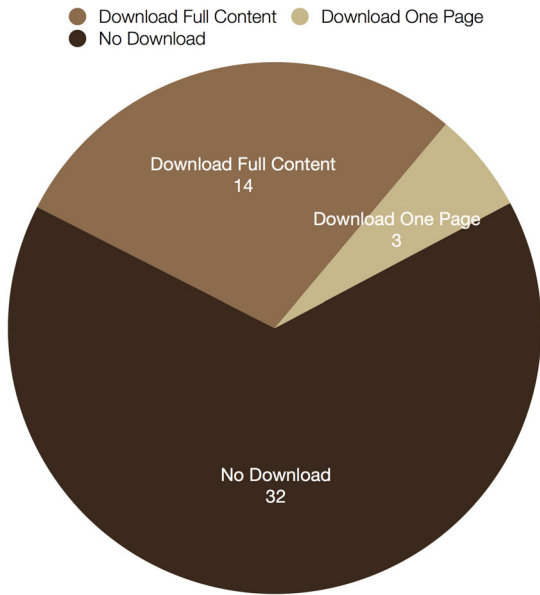

Figure 6: Options for downloading a manuscript in 49 DLs.

In terms of providing contextual information about the manuscripts, the most common feature is to display a short descriptive text about the manuscript. One of the unique features observed in this category is to provide users the translation and transcription of the manuscript as well as explanations about diagrams and illustrations with a mouse over interaction (1). Among the other features related to the contextual information are giving external links related to the manuscript (1), having a glossary (1), and providing direct links to certain pages of the manuscript within the description (1).
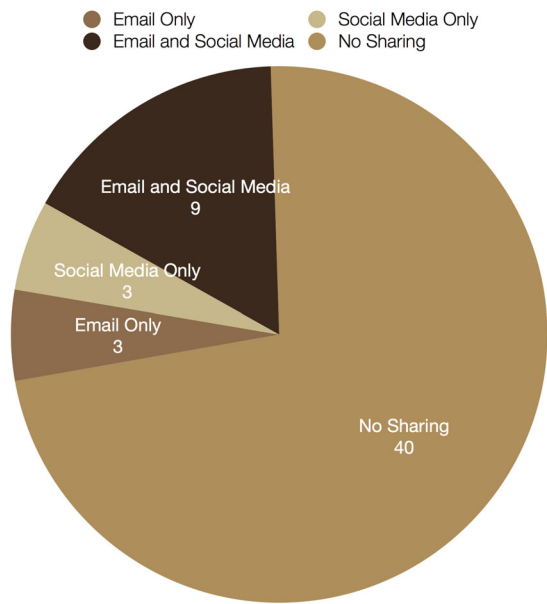

Figure 8: Options for sharing a manuscript in 49 DLs.

Use of user-generated content (UGC) is relatively rare among the DLs in this study. The identified features within the context of UGC are to post public or private comments on the manuscripts (4), to display ratings provided by the users about a manuscript (2) and lastly to add tags to a manuscript (2).
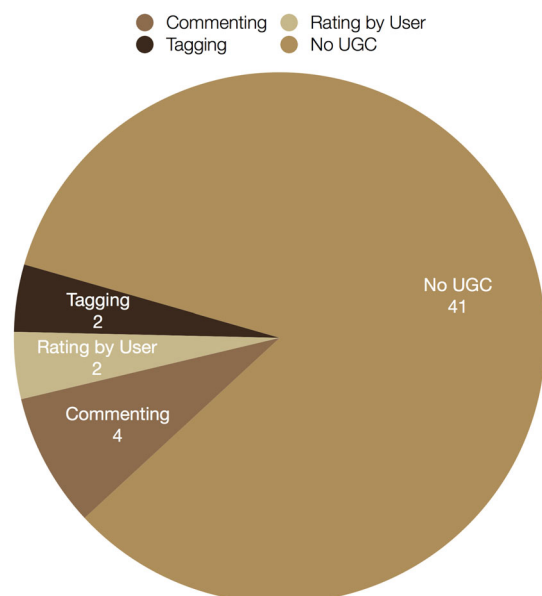
Figure 9: Use of User-generated Content (UGC) in 49 DLs.

4.   CONLCLUSION

In this paper, we have identified 49 digital libraries that present digitized collections of Islamic manuscripts and evaluated the functions and features their user interfaces. A very limited number of DLs seems to consider the specific qualities of the manuscripts in the design of their interfaces. Firstly, a vast majority of the Islamic manuscripts use Arabic script but the most of the DLs do not address to this in their design. For example, the lack of full or partial text search, typing for searching in Arabic script, a virtual Arabic keyboard for different Islamic languages, transliteration of the Arabic script to Latin character set. Secondly, some of the manuscripts are illustrated and these illustrations/paintings are of high importance both from the point of view of visual culture and art history. Utilizing additional features and tools for the illustrated manuscripts would facilitate the users to better examine and provide an enriched experience about these manuscripts.

In addition, the interfaces of most of the DLs do not seem to follow the recent trends and developments in the web user interface design. Some of these trends and developments are using HTML5 and Web 2.0; connecting with social media; sharing and networking possibilities; gathering and publishing user-generated content; mobile device compatibility and using responsive design systems.

Based on the findings, it can be concluded that there is need for further research and development in terms of the interface design for DLs in this context. The direction of further research might be towards the study of the specific qualities of the Islamic manuscripts, conducting user needs analysis (i.e. determining various user groups and getting their input into the design) and incorporating new techniques and technologies for the design and implementation. This would provide more useful and effective ways to utilize these cultural artifacts in the digital domain through richer interfaces and smoother interactions.

After this analysis of how the IMs presented, the focus of our future research will be on why and what of the IMs should be represented in digital domain. Moreover, we are considering sharing the results of this research with the DLs that are included in this study. The feedback would be highly significant and create valuable discussions from various points of views.

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7.   APPENDIX

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