Museum Web search behavior of special interest visitors

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A B S T R A C T

There is a current trend to make museum collections widely accessible by digitising cultural heritage collections for the Internet. The present study takes a user perspective and explores the characteristics of online museum visitors' web search behaviour. A combination of quantitative and qualitative methods was deployed in a case study at a National Museum of Military History. Quantitatively, data from a web questionnaire survey and a user study of interactive searching behaviour were collected and analysed. Qualitatively, observation protocols were coded and analysed based on inductive content analysis. It was found that metadata elements on factual object related information, provenience, and historic context was indicated to be relevant by the majority of the respondents, characterising the group of special interest museum visitors as information hungry. Further, four main characteristics of online museum visitors' searching behaviour were identified: (a) searching behaviour has a strong visual aspect, (b) topical searching is predominantly exploratory, (c) users apply broad known item searches, and (d) meaning making is central to the search process.

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1. Introduction

A current trend is to make museum collections widely accessible by digitising cultural heritage collections for the Internet, building on the idea of the visitor-centred museum (Anderson, 2004). Online visits to museum websites have become popular and some museums report that the number of online museum visitors exceeds the number of visitors to the physical museum (e.g., Fantoni, Stein, & Bowman, 2012). This raises the question of how visitors search, use, and interact with online museum collections.

2. Problem statement

Even though extensive literature examines visitor behaviour in the physical museum (e.g., Black, 2005; Falk & Dierking, 2000; Semper, 1998), studies of museum web site visitors have primarily focused on demographic characteristics, user segmentation, and technical details of the visit taking a quantitative departure. In response, there has lately been a call for a user-centred approach to the study of how digital museum resources are used, as well as a call for increased studies of a wider variety of users (Ellenbogen, Falk, & Goldman, 2008; Jörgensen, 2004; Marty, 2007, 2008). Motivated by this call, the present case study takes a user perspective and explores the characteristics of online museum visitors' information searching behaviour. The case study adds to understanding of *why* online museum collections are used; but the study primarily explores *how* users interact with online museum

collections. The focus is on what Booth (1998a) denotes as special interest museum visitors and the following research questions guided the study:

- What characterises information searching behaviour of special interest online museum visitors?
- What characterises visitor motivation?
- How do different task types affect search attributes and search strategies?

Improved understanding of how special interest online museum visitors interact with online collections can inform interaction design and contribute to making museum collections both useful and useable.

3. Literature review

3.1. Visitor motivation

Extensive literature examines visitor motivation and behaviour in the physical museum. Lately, the importance of extending the notion of museum visitation to also to cover visits to museum web sites before or after the visit to the physical museum has been stressed (e.g., Kravchyna & Hastings, 2002; Marty, 2008). Research on museum visitor motivation is an important point of departure when aiming to strengthen our understanding of museum visitor information searching behaviour. Visitor motivation and intentionality are elements of the cultural and social context influencing how visitors search and interact with online museum resources.

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In 1998, Booth (1998a,b) reported an extensive study of information needs of both on-site and remote access visitors at the Science Museum in London. Booth (1998a) identified a need for a variety of facilities, including remote access facilities to assist in planning an upcoming visit, to browse galleries and acquire object-related information Goldman and Schaller's (2004) literature review on the most common motivations from web site visits validates Booth's (1998a) findings and lists the following motivational categories:

- Gathering information for planning an upcoming visit to the physical museum (opening hours, admissions, etc.);
- Self-motivated research for specific content information;
- Assigned research (school or job assignments) for specific content information; and
- Engage in casual browsing.

Recently, a fifth motive, "make a transaction on the website," has been added by Fantoni et al. (2012). Several studies show that planning an upcoming visit to the physical museum is the most frequently mentioned motivation for visiting a museum web site (Booth, 1998a; Goldman & Schaller, 2004; Marty, 2007). However, the present study's target group was, in line with Goldman and Schaller (2004), individuals who look at museum web sites for a content-based reason. This target group was chosen in an attempt to exclude the large number of people planning an upcoming visit. Using Booth's (1998a) terminology, user study participants in the present study were special interest museum visitors pursuing a long-standing interest or hobby (Skov, 2009). From an information-searching perspective, this information-intensive user group is of particular interest.

The concept of meaning making provides an additional approach to understanding museum visitor experience and motivation (Falk & Dierking, 2000; Silverman, 1995; Weil, 2002), stressing the museum visitor's active role in creating meaning from museum objects and exhibitions. Objects displayed in an online exhibition or collection database do not, themselves, represent facts nor do they have any fixed or inherent meaning. Therefore, online, museum visitors' interaction with and understanding of a museum object relies on the individual. Meaning making, or the process by which those objects acquire meaning for individual members of the public, will in each case "involve the specific memories, expertise, viewpoint, assumptions and connections that the particular brings" (Weil, 2002, p. 212). Silverman (1995) further adds to an understanding of meaning-making in the context of a museum experience by stating that "visitors 'make meaning' through a constant process of remembering and connecting.... In museums, people attempt to place what they encounter – be it text, object, fact, perspective – within the context of their experience" (p. 162). The concept of meaning making was explored in an online museum context (Goldman & Schaller, 2004). However, the results regarding meaning making remained too diverse to provide useful correlations, suggesting that other data collection methods than questionnaire surveys are needed.

3.2. Related studies of museum visitors' web search behaviour

Understanding online museum visitor behaviour is critical to the development of relevant and useful museum web sites. Until now, studies of how online visitors search and interact with digital museum resources remain few and scattered. A notable exception is the work by Marty (2007, 2008, 2011), who, in a series of surveys, explored aspects of visitor behaviour with the aim to help museum professionals better understand how new information technologies have changed the way museum visitors approach museums and their resources. Based on a questionnaire survey, Marty explored the museum website in the life of the visitor and showed how "online museum visitors have specific, and different, needs and expectations of museum websites before and after museum visits" (Marty, 2007, p. 356). Marty's (2007, 2008) study further indicates a positive correlation between online and in-person visits, supporting the theory that virtual museums encourage

physical museum visitation, which is also pointed to in related studies (Fantoni et al., 2012; Goldman & Schaller, 2004; Kravchyna & Hastings, 2002). In a later survey, Marty (2011) found users of personal digital museum collection systems to be object focused and motivated by a desire to create lists of objects and images online. A similar object-centred perspective was found in Kravchyna and Hastings (2002). Taking an information-seeking point of view, they found that 63% of online visitors would like to go beyond marketing information and search museum collection databases. In continuation, the authors stressed the importance of providing end users with historical context information as a frame of reference to understand individual museum objects.

Previous research on access to museum websites has improved our knowledge of user demographics, motivation, and expectations of visits, providing a better understanding of how to support different user needs. Additionally, there are more technical aspects of creating access to digitized museum collections using emerging technologies (Styliani, Fotis, Kostas, & Petros, 2009); however, they are not included here as they do not take a user perspective. The review of related studies shows that questionnaire surveys are the predominant data collection method applied. While questionnaire surveys have proven useful to describe *why* online museum collections are used and by *whom*, they have limitations of low response rates (Goldman & Schaller, 2004; Marty, 2007, 2008) and low explanatory power as to *how* users interact with rich museum content such as collection-related information.

4. Methodology

The research design was directed by two primary concerns: the involvement of real users and systems in real-life situations; and relating findings of information searching behaviour to system design and representation of museum artefacts. Both aspects are grounded in Ingwersen and Järvelin's (2005) integrated framework for information seeking and retrieval, which served as the theoretical frame for the study.

4.1. The Military Museum

The case study was carried out in the context of the National Museum of Military History (the Military Museum) in Copenhagen, Denmark. The Military Museum is a museum of cultural history, covering the history of the Danish defence and development of weapons from the introduction of firearms to the present day. The heterogeneous collections of approximately 200,000 museum objects cover a variety of media. As part of the Military Museum's digitisation strategy, online access is provided to a part of the collections on their website (www.thm-online.dk). At the time of this study the collection database covered a unique sub-collection of 1,705 museum artefacts illustrating the development of primarily hand weapons. The collection database can be accessed by browsing through historical eras or doing an analytical facet search. A record including a textual description, metadata, and digital images represents each museum artefact. In addition, high-resolution digital images of original registration materials are attached to each record (see Fig. 1).

4.2. Web questionnaire survey

The web questionnaire survey served two purposes. First, it provided initial information about online museum visitors' areas of interests, purposes of visiting the museum Website, and preferred data elements, as well as demographic data. Second, it recruited participants to the succeeding user study. The questionnaire was published on the Military Museum's Web site and, in addition, advertised in a relevant newsgroup and a printed journal. The questionnaire consisted of closed, pre-coded questions in combination with a few open-ended questions. The online questionnaire was administered over two months from February 2008