Casual Querying: Facilitating Information Dissemination in Ad-hoc Environments

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ABSTRACT

Data-driven dashboards have now become ubiquitous. Environments such as information kiosks in public spaces, dashboards in cars, or smart televisions at home – all cater to a *casual* form of data exploration, where the user may have a quick-and-simple information need. In contrast to long and complex database query sessions for experts, casual queries pose two requirements to the query interface. First, queries (or the results to queries) need to be discoverable by the end-user. Second, a user may often not issue a query at all, in which case the system still needs to provide some information to the user. Given these requirements, we present a case study of *The Invisible Library*, an interactive exhibit that presents log analysis as public art.

1. INTRODUCTION

An often overlooked aspect of the modern library is the use of *online journals*. Unlike physical books, it is hard for patrons of the library to perceive the magnitude of its usage. However, such access can be analyzed in great detail, due to the availability of access logs and metadata about the journals themselves. Installed as an exhibit at Ohio State's flagship Thompson Library, *The Invisible Library* is an exhibit to communicate such readership through the use of analytics as public art.

Data visualization has become an important way to communicate information in daily life, not just in expert settings for domain-specific needs, but also in casual environments [1]. Beyond visualizations, we are often faced with quick, simple questions in daily life, which we term *casual queries*. In this project, we observed that library patrons would have fleeting questions, such as "which discipline has the most readership?"

To accomplish this, data from one month of anonymized library proxy logs was joined against online library journal article metadata to create a data cube on *topic*(discipline, subdiscipline) and *time*(day, hour, minute) hierarchies with `COUNT` as the measure. This cube is then visualized as a growing "Forest of Trees", where each tree represents a discipline of accessed articles, such as *Humanities* or *Science*, and each branch of the tree represents a subdiscipline, such as *Literature*. We split the visualization into two modes:

Passive Mode: In this mode, the exhibit presents information in the absence of queries using an animated visualization, attracting users to walk up to it. The query being presented is a `COUNT` aggregation on the *discipline* and *subdiscipline* dimensions, with a window query over *time* to animate the progression of readership.

Active Mode: In the active mode, the Kinect sensor in the display detects a user, and glows the orange targets to encourage discoverability. The users are allowed to issue casual queries by using a pointing gesture [2] at the visualization, sensed using a Leap Motion sensor. This will cause the tree to bloom (as shown in green in Figure 1), presenting aggregate information about the relevant subdisciplines.

The exhibit was installed a 4-month period in a relatively high-traffic area of the library, with over 1000 Leap Motion-based casual queries being issued by passers-by.

Figure 1: Analytics Dashboard as Public Exhibit: Interactive Visualization of a library's online readership logs, categorized by topic. In passive mode, the display animates readership trends as the growth of each topic over time. Users could walk up to the visualization and drill-down into individual topics by pointing at parts of the visualization. A video of the project is at http://go.osu.edu/invisiblelibrary

2. REFERENCES

[1] Zachary Pousman et al. Casual information visualization: Depictions of data in everyday life. *TVCG*, 2007.

[2] Arnab Nandi, Lilong Jiang, and Michael Mandel. Gestural Query Specification. *VLDB*, 2014.

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