Library Resource Promotion via Browser Extension

(Technical Paper)

The Great Exhibition - A Common Format for Technological Sharing

(STS Paper)

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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General Research Problem: Promoting Unfamiliar Technologies and Resources to the Public

How can unfamiliar resources and technologies best be promoted to the public at large?

There has been, and often remains, a gap between the time when a new technology is initially released, and the time when it is widely accepted by both the general public and applicable industries. Promotion frequently helps to boost these new and unfamiliar technologies into the so-called "public eye." Both my technical and STS research projects highlight this idea of promotion, with the end goal of broader technological usage and acceptance by the general public. My technical topic revolves around the development of a browser extension that advertises the resources available through UVA's libraries, working to create broader awareness of the libraries' offerings. My STS topic centers on the first World's Fair, The Great Exhibition of the Works of Industry of All Nations. Colloquially referred to as the Great Exhibition of 1851, this event showcased over 100,000 technological exhibits from 32 countries to its over six million public visitors. The two particular cases discussed in my Technical and STS topics, respectively, are separated by over 160 years and are of very different scales. Together they serve to highlight the broad spectrum of technological promotion scenarios present throughout history. Clearly, technological promotion is something that truly transcends time and space. It is an issue whose analysis would likely be beneficial not only to present-day promoters, but for generations to come.

Technical Research Problem: Library Resource Promotion via Browser Extension

How can a browser extension best promote University of Virginia library resources?

At the University of Virginia (UVA), a wide range of resources are available to both members of the library system and guests, yet knowledge of these resources is still limited for many. The UVA library system has access to a multitude of physical and online resources including books, movies, and other databases. However, as reported by the University of Virginia Library Statistics Report (2017), the total number of people using the library has reduced from 104,280 in 2010/11 to 72,938 in 2016/17. According to a survey of both graduate and undergraduate students conducted by UVA, around 35-40% only occasionally use physical library materials, and another 33-37% never take advantage of them (Public Report: Qualtrics Survey Software, n.d.). According to Ms. Robin Ruggaber (personal communication, September 18, 2019), Director of Strategic Technology Partnerships & Initiatives at the UVA Library, the main reason behind this problem is that people are not aware that these resources are being offered by the library. Many researchers and casual users alike often seek out some of these same resources through more convenient online methods of access through sites like Amazon, Google Scholar, or Netflix, which are available for free at the library. This means that content consumers often pay a fee for the convenience that is provided to them by accessing material that they unknowingly have access to for free. To solve this problem, our team is developing a Google Chrome browser extension which recommends items from the UVA library system whenever an item is searched that the UVA library may have access to in its system.

The aforementioned resource knowledge deficit is something that has been addressed in the past,

and needs to be tackled again. Roughly a decade ago, a browser extension was created that made recommendations of library resources to its users, presenting them with materials that corresponded to what they were presently viewing online. By automatically querying the plethora of library databases and catalogs for relevant results, the extension worked to better inform its users, saving them both time and, potentially, money in their everyday content searching. This existing extension is regrettably no longer functional or available, prompting the library to request the creation of an updated version, in the form of a Google Chrome browser extension. My teammates and I will be working to implement this updated version over the 2019-2020 academic year, with improved functionality and more features. Bringing back such a service will boost the visibility of lesser-known resources, and once again help individuals within the UVA community to potentially save both time and book-buying money.

The benefits that such a browser extension yields to its users are plentiful, not only including the reduction of resource ignorance, but also an easily-expandable platform for future improvements and expansions. The development of an extension for the most popular web browser on the internet that will automatically appear on search will make access to UVA library resources highly convenient ("Browser Market Share", 2019, "Browser Market Share Worldwide", 2019). This convenience will be compounded by the inclusion of login functionality, allowing for automatic authentication of users, yielding immediate digital resource access. By providing access to free resources through member accounts, and some free resources for the public, we will save many users the potential cost of paying for a product on a site like Amazon. In all of these manners, our extension will save users both time and the costs of accessing these resources through other methods. Being embedded within the Chrome browser, the extension will

eliminate the extra steps users have to take, such as traversing through the library website, then searching through the Virgo database and then obtaining the result.

In addition to casual users, academic researchers will benefit greatly from the institution of such a proposed tool. Students and researchers at the University of Virginia sometimes visit the library, only to discover that their desired material was either not available at the library or not in the library system at all. They then have to wait for it to become available or request an interlibrary loan (ILL). With the addition of our Google Chrome extension, a researcher will be able to see the availability of an item at the library through their web browser and potentially request ILL immediately. This will save researchers precious time, meaning they will not have to go to the library to check availability and request ILL.

Lack of knowledge about the university resources and ease of online shopping are two of the most significant factors in the decline of use of the UVA library. The extension we are developing for the library suggests UVA library's books and resources to users while they are searching for books on Amazon, Barnes and Nobles, and Google Scholar. The extension will look over the webpages and look for keywords like ISBN, UPC, and product name, then suggest the relevant resources that are available in the UVA library in an interactive popup bar at the top of the browser containing information of the resources such as title, author, availability and location. Further, we will extend the project to use Machine Learning (ML) and Artificial Intelligence (AI) to suggest the book and train ML/AI based on the user's interaction with the suggestions.

After several client meetings and revision, we have come up with a list of requirements for the extension. These requirements, however, are not final: as we build the product using agile methodology, there is room for additional requirements or improvements coming from clients and test users feedback.

Minimum requirements for this project include:

- Searching for a book on Amazon, Barnes and Noble, and Google Scholar results in the extension showing a banner with the book name, author, availability or method of accessing the material, and location of the library if available.
- Clicking the extension icon will also show the results of a search from the listed three websites. Also, users can do additional searches in the extension with search results shown below the search bar (in the extension).

Desired requirements:

- Using asynchronous functions to respond rapidly to users' browsing result.
- Embedding user login functionality.

Optional requirements:

- Extending the chrome extension to search in other universities library.
- Using Machine Learning to analyze search history and show customized recommended books.
- Security of the extension to be further solidified, so users do not misuse the extension and cause any harm to the library database.

STS Research Problem: The Great Exhibition - A Common Format for Technological Sharing

How did the Great Exhibition of 1851's structure successfully share new international technological innovations with the masses, creating a format that would go on to be copied for all subsequent World's Fairs, while the structure of previous exhibitions had not done the same?

As previously alluded to, The Great Exhibition of the Works of Industry of All Nations was a historical event of unprecedented international technological sharing that seemingly succeeded across the board, becoming a "pre-eminent symbol of the Victorian age" (Auerbach, 1999, p. 1). From its custom-made venue, the 900,000 square foot Crystal Palace erected on a 26 acre site in London's Hyde Park, to the sheer magnitude of its exhibitor, display, and visitor participation figures, the event was nothing if not monumental. In spite of anticipated financial losses, the Exhibition profited a staggering £186,437, which was used to found the Victoria and Albert Museum, the Royal College of Art, and the Royal College of Music, along with London's Natural History Museum and Science Center. Although there were precedents for technological exhibitions, such as the French Expositions of the 1800s, which hesitantly allowed British manufactures to be placed on display, none had previously embraced international cooperation to the same extent that the Great Exhibition did (Fay, 1951, p. 5). A plethora of groups and factors, both internal and external, influenced the exhibition's development, eventually sculpting it into a truly revolutionary event. Further understanding of the exhibition's development, the groups that influenced its creation, and its eventual actualization, allow for a deeper understanding of how the Great Exhibition in particular was able to surpass its technological sharing goals while other expositions did not have such success.

The primary driving force behind the event itself was the exhibition's Royal Commission. The group was carefully crafted by Prince Albert, husband to Queen Victoria and driving mind behind the event, and Sir Henry Cole, who had coordinated numerous smaller exhibitions for the Royal Society for the Encouragement of Arts, Manufactures and Commerce (Hobhouse, 2002, p. 5). The commission, a group with fewer than two dozen members, had to be delicately populated, in order to balance out those of differing viewpoints and levels of *de facto* political power (Auerbach, 1999, p. 27). Responsible for everything about the exhibition, from the impartial judging of exhibits and the distribution of prizes to proper incorporation of foreign exhibits to the exhibition building's site and design, this group came to the decisions that eventually sculpted the event into its final form. Further analysis of the rationale behind the commission's decisions, and the various viewpoints represented therein, should provide insight into the exhibition's eventual technological sharing success, leading it to become the baseline template for all future World's Fairs.

While numerous books exist on the Great Exhibition of 1851, these consist primarily of historical accounts and details of how the exhibition itself was created. Often, these resources present their evidence in a vacuum, making very little mention to predecessors to the Great Exhibition and differences in their development processes. One of these key forerunners was the series of French exhibitions, known as *l'Exposition Publique des Produits de l'Industrie Française* (Exhibition of Products of French Industry). Initially opened in Paris in the year 1798, the exposition was influenced heavily by the effects of the French Revolution (Courtin, 2016). In fact, the initial idea for a festival paying homage to industry was conceived of by none other than

Maximillian Robespierre, the creator of the infamous Festival of the Supreme Being. However, the idea was given legs four years after his death, by Minister of the Interior François de Neufchâteau. As a member of the French Executive Directory, Neufchâteau posed the idea of an industrial exhibition as a celebration of the anniversary of the New Republic, quickly receiving support from all sides (Chandler, n.d.). An exhibition committee was then formed, which not only made decisions regarding displays, awards, and building design, but even looked to appropriate other cultural aspects, such as triumphal processions, into their event. Examining the makeup of this committee, too, and comparing it and its decision-making process to that of the Great Exhibition's Royal Commission should serve as an interesting case study on how these two similar-sounding events were created in such different political climates.

By gathering both primary and secondary source materials from books about the Exhibition of Products of French Industry, and possibly other previous technological exhibitions, I intend to piece together complete pictures of the driving bodies behind each, making careful comparison to the Great Exhibition's Royal Commission. By examining the perspectives of these groups' members, their respective sizes, planning decisions, and attitudes on various exhibition issues, from building design and location to the allowance and placement of international exhibits, I intend to determine and highlight those factors which had direct influence on the success or failure of each exhibition. Ideally, a direct comparison to less-successful committees will illuminate the successes of the Great Exhibition's Royal Committee, providing insight on how technical promotion was accomplished so spectacularly at the event itself.

While information about the success of the Great Exhibition of 1851 is plentiful, the factors in

particular that resulted in that success are not as clear. With the most pertinent factors identified, further insight into how exactly technological promotion can best be achieved may be gained. Knowing exactly what decisions were critical in the development of such a successful event allows for the possibility of mapping onto future such promotion ventures.

Conclusion

Analysis of the Great Exhibition of 1851 not only allows for a dive into one of history's most profound events of successful technological promotion, but also provides a background for how that event's success was obtained. Determining the answer to the overarching question "How can unfamiliar resources and technologies best be promoted to the public at large?" for a particular event in the 1850s while simultaneously working on a similar promotion venture in the 2010s will likely yield insights into timeless elements and decisions that will always need to be made. Knowledge of which of these decisions ended up being critical to success, and what the 'ideal' choices have been in the past will not only hopefully positively influence my browser extension development, but also provide others with deeper insight into how exactly technological promotion can best be achieved.

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