

Perambulating Libraries: Demonstrating How a Victorian Idea can Help OLPC Users Share Books

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ABSTRACT

In this extended abstract we detail how the open source digital library toolkit Greenstone [5] can help users of the XO-laptop—produced by the One Laptop Per Child Foundation—manage and share electronic documents. The idea draws upon mobile libraries (bookmobiles) for its inspiration, which first appeared in Victorian times. The implemented technique works by building on the Mesh network that is instrumental to the XO-laptop approach. To use the technique, on each portable XO-laptop a version of Greenstone is installed, allowing the owner to develop and manage their own set of books. The version of Greenstone has been adapted to support a form of interoperability we have called Digital Library Talkback. On the Mesh, when two XO-laptops “see” each other, the two users can search and browse the other user’s digital library; when they see a book they like, they can have it transferred to their library with a single click using the Digital Library Talkback mechanism.

Categories and Subject Descriptors

H.3.7 [Information storage and retrieval]: Digital Libraries

General Terms

Design and Experimentation

Keywords

OLPC XO-Laptop, Internet Archives, Greenstone Digital Library Software

1. INTRODUCTION

The invention of mobile libraries was a natural extension of the circulating library, brought about by economic and social factors in the mid-19th Century. In the UK, for example, the Warrington Perambulating Library was a horse-drawn cart established by the town’s Mechanics’ Institute at the height of the Victorian era to increase the circulation of its books [3]. In the US, Washington County established a free library in 1905 (also horse-drawn) to reach residents located in the more remote locations. Analogous to this idea, we describe here a technique that allows documents to be

shared between XO-laptops—turning it into a modern day form of mobile library.

2. EXAMPLE

Figure 1 shows the basic idea in operation. In it a user, let us call her Elizabeth, has been invited to join a Browse activity with Natasha. Sharing activities this way is an integral part of the OLPC framework, and (at the communications level) is supported by the Mesh network that XO-laptops naturally configure themselves into. One can selectively invite fellow XO-laptop users to a particular activity, or else request that they become a friend, establishing a longer term association. Through the Browse activity, Natasha has shared the home page to her digital library, from which Elizabeth can explore its contents through standard digital library search and browse functionality.

The figure shown is from the browse by titles section of the digital library. Down the right hand side, one for each item in the digital library, is the phrase *Send to MyLibrary*. Every item that Elizabeth clicks on is transferred to her XO-laptop using a form of interoperability we have called DL Talkback (described in more detail in the next section), from which it is then ingested into her digital library. Within the DL, for example, Elizabeth might have equally chosen to view particular books, skimming the content (or use any of the other capabilities the digital library provides) before deciding to transfer a copy of a book to her library. Alternatively, she might have returned to her synchronized Browse activity of the DL with Natasha to gain a more personalized account and recommendations about its contents.

3. DESIGN

Figure 2 provides a schematic overview of the DL Talkback design. The key element in the design is the serialization of the Greenstone document object model over HTTP, and because of this it makes little difference to the technique whether the transfer of a book is between two XO-laptops, or a workstation and an XO-laptop (or two workstations for that matter). The implementation builds on our work for self-contained digital libraries on mobile devices [1], as techniques suitable for these sorts of devices are equally applicable to the more minimal—when compared with mainstream laptops and desktop PCs—CPU and memory execution footprint of the XO-laptop.

The figure shows two XO-laptops that are in contact with each other over the Mesh network—as in our example with Elizabeth and Natasha—but in principle there can be many more computers on the Mesh, and they are not restricted to

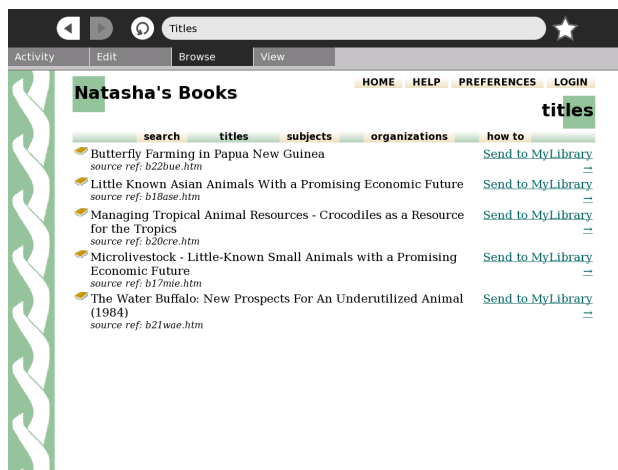


Figure 1: Using Digital Library Talkback between two XO-laptops to transfer a book from one Greenstone library to another.

being only XO-laptops. Through a wireless access point, or a computer that has chosen to share its Internet connection, it is possible for users on the Mesh to access additional on-line resources. This configuration is depicted in Figure 2 where a workstation-class Greenstone server hosts a more sizable set of resources that can be transferred to the XO-laptops.

Specifically, to demonstrate the approach, we have drawn upon the books in the Million Book Project [2]. To build our version of this digital library, we exported the metadata from the Internet Archive’s mirror of the Million Book Project using its Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) server. Next, the downloaded records were processed using Greenstone’s OAIPugin (one of a system of document processing plugins the software provides) to develop a searchable and browsable collection. Finally, the presentation layer that Greenstone provides was crafted to deliver the required functionality and activate DL Talkback.

4. CONCLUSION

While the analogy of a perambulating library has been useful in motivating the work reported here, and giving direction in the implementation, there are of course differences as well. In our work, there is an intentional blurring of the boundary between librarian and user. For us, there is a one-to-one mapping—each user manages their own mobile library. Perhaps, then, the work is more accurately portrayed as a technique for enabling individuals to turn their personal collection of books into a mobile library.

The removal of physical limits by shifting to a digital domain also impacts on the analogy. In addition to the arguable convenience that a visitor to a library does not have to be physically present, more fundamental is the change in how a book is transferred between two locations. In our system a digital copy is made—a lossless photocopy if you will, made in a matter of seconds. This in a digital library of copyrighted material would require a Digital Rights Management component to be added into the design, however we have not done so in our example as the source documents used are in the public domain. Continuing our work

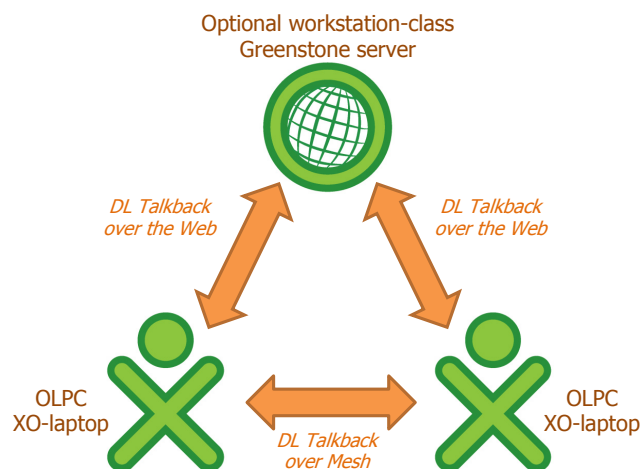


Figure 2: Overview schematic of Digital Library talkback in use.

in developing digital library software for use in developing countries [4], and in-line with the vision of the OLPC Foundation, we hope that XO-laptop users find the work reported here useful in their daily lives.

5. REFERENCES

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