Push Me Pull You: Simple Multibrowsing

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ABSTRACT
This poster describes the concept and implementation of a multibrowsing service that requires minimal intervention for client and viewer devices. The 'push me pull you' service described here requires no intervention to either browser or network connection and works on arbitrary browsers and connection, so allowing widespread access and use of the service. The service allows simple and implicit switching between personal and shared ways of working and so supports a 'diverge-converge' model of group browsing. Some other scenarios of usage are provided (eg a distributed whiteboard) as well as results of a focus group which assessed the value and acceptability of this service. There will probably be a demo with the poster so delegates can experience the service for themselves.

KEYWORDS: Multiuser UI, Multibrowser, Ubiquity

INTRODUCTION
Multibrowsing was described in a technical note [1] in Ubicomp 2001 [2]. This summarised the main feature of multibrowsing as allowing the movement of web content between multiple displays. These displays can be public (like a wallboard) or private (for example on a user's desktop display or PDA). Multibrowsing supports various scenarios for instance:

- diverge-converge browsing in a group where individual participants contribute to a common goal by independently finding and then sharing relevant resources
- sharing of material, such as presentation slides, in group discussions
- team and public noticeboards
- the exploitation of a public display to overcome the presentation on a restricted personal display for instance a half-VGA PDA display

These are common scenarios and the provision of technology to support them could encourage users to make a first step towards group use of the web.

However, it is critical that multibrowsing services are simple to access and use. Reliance on custom software and devices will prevent usage. The ideal multibrowsing service should require no intervention in either the personal browser or any public display device. The push-me pull-you (PMPY) service described here supports multibrowsing with no intervention on any of the client devices. PMPY utilizes the existing web and browsers as a ubiquitous computing environment.

FUNCTIONS AND USER INTERFACE
PMPY provides the following capability:

- A web page currently displayed in a browser can be pushed to another browser running as a PMPY viewer (PMPY push)
- A web page being displayed by a viewer can be pulled to another browser (PMPY pull)
- A PMPY session retains a list of the pages that have been pushed (PMPY History)

A key feature of the PMPY service is the 'PMPY session'. Pages are shared within a session. The number and type of devices attached to a session is flexible and arbitrary. Users Join and Leave sessions, or View sessions as manual choices from the PMPY control centre web site. Joining a session enables the PMPY Push, Pull, and History functions. A Viewer can be run on any session regardless of the current joined session.

The entire range of functions can be accessed by entering

URLs in the participant's browser. To make usage practical, the users do in fact need to store the URLs for the functions, ideally as links in a Links or Location bar. This capability is found as a basic feature in all commercial browsers for PCs.

Pocket PCs and other PDAs may not have a Links bar due to the restricted screen space. In Pocket Internet Explorer, it is possible to list the PMPY controls as favourites. This requires the user to access the favourites list before selecting the PMPY control.

PMPY operations do not affect the use of the native browser features. There is no PMPY mode for the browser. This means the PMPY service simply extends the native browsers and connections into a multiuser service.

IMPLEMENTATION

Architecture

A Client/Server concept is used to implement the PMPY application. As in every web environment the client is just a web browser. This web browser displays the HTML script that it receives from the server, i.e. the web server. Nearly all the code runs at the server. Only a few lines of code (JavaScript) are needed at the client. The PMPY functions and the storage run at the server.

Like the multibrowser implementation described in [1], the displays can assume one or more different roles. The PMPY roles are:

PMPY Browser: this can push pages to and pull pages from a PMPY viewer. The functions work even if there is no viewer running

PMPY Viewer: this displays the most recently pushed page in the session being viewed. The viewer works even if there are no participants in the viewed session.

SCENARIOS

The PMPY service adds value to the following common scenarios:

Sharable presentation. Users access a common session. The presenter pushes slides previously saved as html files to a large wall display acting as a viewer. Users pull slides they wish to examine at their own pace. Participants can respond to the presenter with slides or other resources pushed to the session. The session history retains a list of the pushed URLs for later reference.

Teleconference: Users access a session related to the teleconference. Participants run a Viewer on the session either on a shared display if there is a group at one location, or on personal desktop machine. They may also Join the session if they wish to push material to the session. The session history retains a list of the pushed URLs for later reference.

Noticeboard: Users access a session perhaps named after a physical location. They then push to and pull from a Viewer in that physical location. The noticeboard may be also be viewed from any connected device by running a viewer on the session.

Browsing record. We have found that the session concept aids recovery of pages. Users can push interesting pages and the URLs are retained in the session history. URLs are stored implicitly into the current session. The sessions can be used as personal and group external memories, quite apart from the screen sharing service.

SUMMARY

PMPY is a simple and very accessible service and provides support for a number of common scenarios. The service can allow group interactions to occur that have previously required complex or long software installations, or specialist devices. In contrast, PMPY utilizes only technology that is nearly ubiquitous. Our poster and demo shows how the service works and give its audience a taste of the user experience that we hope will encourage further work on simple but powerful technology.

REFERENCES

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