**6.870 Final Project Proposal**

**Webnnel: A channel-based Web navigation system**

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**1. Introduction**

**1.1 Motivation & Ideas**

The Web has become an important medium for delivering information, and more and more people reply on it to finish their daily works. For example, users like to check e-mails, read news, watch videos, listen to music and shopping on the Web. With the success of the Web browsing on the PC environment, people start to apply similar experience to different domains, such as mobile browsing, mobile blogging, and so on. In this project, we envision an application for home environment. We plan to design a TV channel like Web navigation system. In this system, the user can use speech to select the web site and control browsing behavior. (Figure 1)

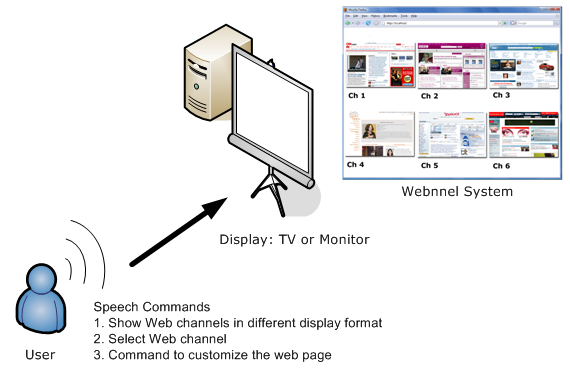


Figure 1: Anticipated scenario of Webnnel - Web navigation system

**1.2 Technology**

In this project, we will investigate the possible technologies to make Web channel available possible. It might include web content manipulation, speech recognition, and user interface (UI) design for TV channel like presentation of the Web sites.

**1.3 Expected Result**

We expect to have a Web-based system that could be used at home environment. To the human computer interaction part, users can use speech to control Web navigation and use speech to switch the Web channels -- Webnnels.

**2. Related Work**

**2.1 UI and Content Access**

Information display with TV channel format can be seen on some applications. Youtube uses frame list and flash animation to display the video clips. Joost [5] and Mogulus [7] use grid arrangement to display live TVs with multiple small screens. Even in the mobile device, Avot mV[1] uses similar display to provide video search. The idea of TV channel format to represent web sites is inspired by these kinds of applications. However, as the best we know, we do not see any application or system proposing an idea to display web sites as TV channels for the user to select frequently used web sites without typing the URL.

To the Web content access, programmers can write JavaScript programs, which are embedded into HTML or XHTML web pages, to access the web page content dynamically. Chickenfoot [3] and Greasemonkey [4] are two web scripting framework to allow users to write scripts to customize the Web pages. Accessmonkey [2] is another script framework that allows multiple users, including web users, web developers and web researchers, to collaboratively write the scripts to enhance web page accessibility. Unfortunately, all of them do not provide interface for user to customize the web page by natural behavior, such as speech or gesture.

**2.2 Speech invoked content access**

Speech invoked web content access is a suitable for people with disabilities (especially people with dysfunctional hand motor-abilities), workers who need to access information in a hands-off manner to improve their productivity or simply the general user who wishes to have a much more natural interaction in accessing web pages with spoken commands. Microsoft Windows Vista Speech Recognition system [6] provides a platform for users to control Windows applications. This supports dictation of documents and emails in mainstream applications, use voice commands to start and switch between applications, control the operating system, and even fill out forms on the Web. However it does not allow much flexibility in browsing the web.

**3. Plan of Implementation**

The Webnnel system architecture contains four components: (1) Web Content Manipulation (WCM); (2) Channel Aggregation and Presentation (CAP); (3) Speech Command Extraction (SCE); (4) Command Channel Interface (CCI). The whole system architecture is illustrated as Figure 1.

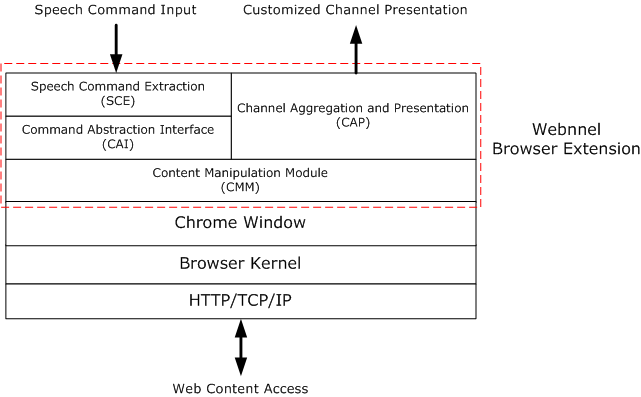


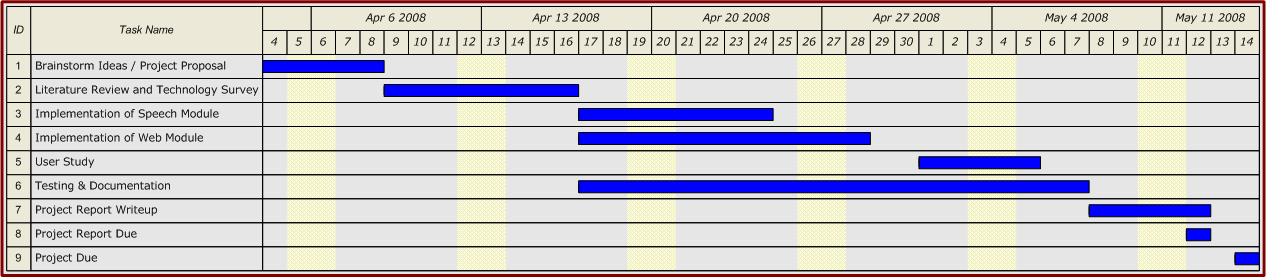
Figure 2: Webnnel system architecture

Besides normal PCs, we will need following hardware to support our final project implementation.

1. Microphone array for speech command extraction

**4. Timeline**

The following Gantt chart shows the tentative timeline we have allocated for this project.



**5. Collaboration**

The Webnnel project is collaborated by Chen-Hsiang Yu and Oshani Seneviratne. We divide our project into several tasks and each focuses on specific tasks mentioned below.

Chen-Hsiang Yu:

* Web content manipulation (CAI and CMM)
* UI design (CAP)
* Extension Development
* User Study
* Report Write-up

Oshani Seneviratne:

* Speech recognition and extraction (SCE)
* Extension Development
* User Study
* Report Write-up

Currently, we use Eclipse with SVN and Google Code online version control (http://code.google.com/p/webnnel/) to synchronize our documents (such as this proposal), references, images and project source codes.

**6. References**

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