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Strategies for tailoring web contents for specific devices: the case of usable and accessible contents for assistive technologies of web mobile devices.

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Introduction

Users with disabilities, and the elderly, may experience problems in accessing content on the World Wide Web. These problems however can be solved by using a series of assistive technologies, that can be defined as any product, instrument, equipment or technical system used by a person with a disability, which prevents, compensates for, supervises, alleviates or neutralizes the effects of the disability when accessing web content. Such assistive technologies facilitate processes of interaction and access to page content and also help to get the most out of the browser utilities used.

When disabled users access to web content through a mobile device they can experiment many different kinds of troubles. In order to improve the effectiveness of web navigation using mobile devices with assistive technologies we propose two actions: the implementation good practices in content development and the creation of a set of device descriptions that ensure the tailoring of contents for different mobile devices.

Potential actors in the process of accessing web contents from mobile devices

1. Device Vendors: The Device Vendor develops device descriptions for their devices. These device descriptions typically describe the supported capabilities of a device, e.g. screen size, camera capabilities, markup languages etc). The

Device Vendor makes available and maintains for accuracy device descriptions for public usage, e.g. by Content Providers or Content Adaptor.

2. Content Provider: The Content Provider provides content and services for end-user consumption. The Content Provider has the ability to determine the capabilities of an end-user's device and to tailor the content appropriately for that device. The Content Provider utilizes the available device description information to provide a good experience for end-users consuming their content.

3. Content Adaptor. The Content Adaptor utilizes device descriptions as part of their content adaptation processes. The Content Adaptor has the ability to determine the capabilities of a range of devices and tailor and adapt primary source of content in a manner appropriate for the capabilities associated with different ranges of device.

4. End User: The end-user uses their device to consume content or services that they request. The end-user expects a good user experience when consuming content from different Content Providers, e.g. served content is displayed correctly on the device.

The process of adapting content

1. The Content Adaptor initiates a query to the DDR requesting a device description for a specific range of device;
2. When the DDR receives the query it performs a look-up of available device descriptions;
3. When the appropriate device description has been identified the DDR returns the device description to the Content Adaptor;
4. The Content Adaptor receives the device description and tailors the content in a manner best suited for that range of device;
5. The Content Adaptor may either provide the tailored content back to the Content Developer or provide the tailored content to third party service provider, e.g. Mobile Operator.
6. The tailored content is consumed by end-users and they receive good user experience.

Present navigation problems for mobile devices

Nowadays, web navigation can be a trouble if it is carried out from mobile devices, some important problems that can be pointed out are:

- Web pages are designed for computer navigation, so users with mobile devices experiment important navigation problems.

- The access to web content can result poor and non-appealing.
- The data entry, for example in forms, normally is very limited and difficult.
- The usability and accessibility of contents is non effective and it causes a lot of troubles for disabled users.
- There are a wide range of mobile devices with very different technical characteristics.

The creation of effective content for web mobile devices

Taking into consideration the Web Content Accessibility Guidelines 1.0 (WCAG) and a series of basic web usability principles, content providers should create high quality adaptable and accessible contents. These content will need less action from content adaptors and will benefit disabled people and all web mobile users in general.

Some good practices are:

- Do not use frames
- Do not use tables for layout
- Create “access keys” for navigation menus and main functionalities.
- Describe clearly the purpose of each link.
- Do not cause “pop-ups” or open new windows without informing the user.
- Limit the content to that requested by the user.
- Divide the pages into usable portions of reduced size.
- Ensure the page size is adequate to the technical characteristics of different users (bandwidth, channel, final device range, etc.)
- Provide a short and descriptive page title.
- Do not use data tables that can cause problems for some users, and do not use multiple-level tables.
- Create style sheets as small as possible.
- Send the content in a format that can be supported by all final devices.
- Provide informative error messages and effective navigation devices to go from error messages to useful information.
- Maintain the number of keys to access content as minimum.
- Provide default selected values to facilitate actions to the user.

The need of DDR for assistive technologies of web mobile devices

Apart from the former good practices in the content development that content providers should take into consideration, it is needed to develop a set of device descriptions to ensure that contents can be adapted to most mobile devices and their assistive technologies.

Disabled web mobile users access to contents through different assistive technologies that can be divided into two groups:

1. Hardware devices

These hardware devices present a specific design to facilitate the access to content for users with different disabilities. Some examples of this kind of devices are:

- Pac mate. <http://www.freedomscientific.com/>. Accessible Pocket PC device
- Braille note. <http://www.humanware.com>. Accessible Pocket PC device
- Owasys 22C. <http://www.owasys.com>. Mobile phone for blind people

2. Software devices

These software devices are an application that interacts with the Operative System to solve or minimize the accessibility problems of disabled people.

- Mobile accessibility. <http://www.codefactory.es>. Application for mobile phones designed for blind people.
- Talks. <http://www.nuance.com>. Screen reader for mobile phones
- Mobile Speak. <http://www.codefactory.es>. Screen reader for mobile phones
- Mobile magnifier. <http://www.codefactory.es>. Screen magnifier for mobile phones.
- Vocon mobile. <http://www.nuance.com>. Speech recognition solution for different devices.
- Mobile speak pocket. <http://www.codefactory.es>. Screen reader for PDAs and Smartphones

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- Pocket Hal. <http://www.dolphincomputeraccess.com/>. Screen reader for PDAs

Conclusions

Content providers should take into consideration a set of good practices in order to develop effective, usable, accessible and adaptable contents for mobile devices.

The Device Description Repository should include a knowledge base with descriptions oriented to adapt the contents generated by different content providers to the existing assistive technologies of mobile devices.

The needs of users with disabilities should be taken into consideration in the creation of descriptions, so the risk of exclusion will be minimized.

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