A Model Facilitating Set Top Box Accessibility

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Abstract
This paper presents an outline model facilitating the accessibility of Digital Set Top Boxes and related equipment. The objectives of the proposed model include:

- Integrate accessibility features into mainstream devices without adversely affecting the cost of the product,
- Facilitate access for most disabled users by improvements to the standard user interface
- Facilitate indirect support for users with more extreme disabilities

The paper explores the implications of "Design for All" as it relates to Set Top Box technology.

1. Background

In "Guidelines for designers of digital TV user interfaces" (RNIB, 2004), the Royal National Institute of Blind People (RNIB) estimate that by 2015 50% of the UK population will be over 50. They will hold 80% of the disposable income. As the population ages, an increasing proportion of potential customers will be affected by a variety of disabilities. In most cases, there will be a number of minor to moderate sensory, motor and cognitive issues that will impact to a greater or lesser degree on the capabilities of the individual. In a smaller number of cases more extreme disabilities will develop with age.

Digital TV with its associated potential for interactive services such as on-line voting, healthcare, and many types of enhanced entertainment and communications, will increasingly become the medium of choice for house-bound and socially isolated disabled users. It is important to optimise this opportunity by ensuring that this rapidly evolving technology can be accessed by the largest possible proportion of the disabled potential customers outlined above.

The accessibility model presented here, though initially aimed at the design of set top boxes, can by extension, also be applied to integrated digital televisions, and other communications and entertainment platforms.

The proposal takes as its basis, the many existing examples of accessibility guidelines, and was developed following an extensive review of current UK, US and EU documents, executed between September 2006 and February 2007.

2. Applying "Design for All" principles

"It is acknowledged that there will always be some people who, because of their severe impairments, need specialist equipment or assistive technology to modify the method of making input to, or receiving output from, a piece of mainstream technology." (ETSI 2002)

"Design For All", as interpreted by ETSI suggests the following 3 level model which caters for all degrees of disability:

1. mainstream products designed according to good Human Factors practice, incorporating considerations for people with impairments, that can be used by a broad range of users;
2. products that are adaptable to permit the connection of assistive technology devices;
3. specially designed or tailored products for very disabled users.

The following sections outline an interpretation of the above "Design for All" principles which gives disabled users the best chance of being able to access a given service, while at the same time not making products too complex and/or expensive.

We propose a model which distinguishes between features which should be included as part of the core product, and those which the core product will support indirectly by the provision of API level hooks exposed via a standardised interface (yet to be specified). Our model emphasises flexibility and the need for the system configuration to be capable of adjustment to take advantage of the interfaces available to the user.

3.1 Core Accessibility Features
Features that can reasonably be expected to be included as part of a mainstream product are those which are:

- not too difficult to implement,
- effective for a large number of users, and
- will not introduce a large amount of extra complexity to the product.

Examples might include adjustable font size, and possibly audio description and subtitling.

3.2 Indirectly Supported Accessibility Requirements
These are requirements which are not likely to be included as part of the core product. They:

- cater for the needs of a small number of potential customers,
- are more difficult to implement, and
- would greatly increase complexity if included as part of the mainstream device.

These might include speech recognition, and a self voicing Electronic Programme Guide.

3. Implementing the Model

In addition to the enhanced accessibility features provided as part of the core product, the proposed accessibility model suggests that future Set Top Boxes and successor devices should include:

- Software hooks/SDK/API.
- Connection protocol such as HTTP to allow remote devices to access these hooks.
- Wireless connectivity providing maximum flexibility for remote connection.
- This solution would enable 3rd-party suppliers to cater for the needs of small groups of users with specialist user-interface requirements by the use of:
- Remote Assistive Interface Device – A dedicated Enhanced Remote Control unit specialised to the needs of a specific disability user group.
- Personal Communications Equipment – Generic communications devices such as PDA's and mobile phones, enhanced to provide a user interface tailored to the needs of a specific disability user group.

4. Accessibility Breakouts

The term "Accessibility Breakout" has been coined to describe products and concepts which start life as a solution to a problem caused by disability, – a case in point being audio book technology originally designed for use by blind people, but now having "broken out" of the accessibility arena into the mainstream market place. The approach to Set Top box accessibility outlined in this paper, has this potential benefit in that it also provides enhanced flexibility and opportunities for non-disability–related services such as:

- Remote operation and fault fixing.
- Streaming to other devices.
- Mashing" with other services.

5. Conclusion

The proposed accessibility model arose as a result of research relating to guidelines for the further development of accessible set top boxes. Plans for its development include:

- Collaborative development of the guidelines,
- Production of an open standard for the interface between the core STB and the 3rd-party interface device,
- Further collaborative research addressing the implications of the accessible "Social Set Top Box" as the focus for entertainment, Education and Communications in the home of the 21st century.

References

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