

# Accessible Digital TV: a research agenda

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## EXTENDED ABSTRACT

The potential of Interactive Digital TV (IDTV) is enormous, given its reachability, the potential ability to provide highly personalized services (when users identify themselves using smartcards, for example to get access to individual e-government services, to health information and services, to social networks), and to act as yet another outlet for using the web.

However these advantages can be hindered by difficulties of using it, including accessibility barriers. Similarly to the web, however, developers of IDTV applications will have no control on the actual devices the user will be using, and will have to address the needs of a very heterogeneous audience. Input devices are likely to be a major hurdle for achieving accessibility. Remote controllers are already very complex devices based on modal interaction and overloading of controls. Furthermore, they support a limited input channel, that poses significant constraints on the kind of applications that can and should be developed.

Another hurdle to overcome is the possible resistance of users to actually use and engage in applications delivered through the IDTV. While over time we should expect that the experience of users in managing digital technologies will increase, during the first years after the switchover, the IDTV will be used also by people that are laggards in terms of technology adoption. Most of them will probably be older adults, with their own accessibility needs. Only if these needs will be met, then IDTV will be able to reach its full potential.

I think that a research agenda on accessible IDTV should include methodological aspects. Accessibility is not only conformance to a set of guidelines<sup>1</sup>. While adoption and development of accessibility guidelines is important, it should not be the only aim of the research community. In [3] I discuss some of the shortcomings of an accessibility-as-conformance viewpoint, which we might be able to avoid for IDTV.

I believe the following issues are central to the topic of accessible IDTV.

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<sup>1</sup>In [2] I listed 9 different definitions. The one I usually prefer in the context of quality assurance is: *accessibility means that disabled people can use the artifact with the same effectiveness as non-disabled people*; this definition, for the web, was first given by [6, 5]

**Accessibility Model:** Developing a model of accessibility that helps understanding, characterizing and operationalizing the concept. In particular the model should address the following questions: 1. what accessibility is and which properties should be central to it (eg. effectiveness, productivity, usability, satisfaction), 2. which factors influence accessibility and how can they be controlled (eg. experience level with IDTV, attitude towards digital devices, physical conditions under which the IDTV is used, etc.) 3. how accessibility is going to be evaluated and measured (through analytical methods like conformance review, barrier walk-through; through empirical methods like user testing, subjective assessments, etc.).

**Accessibility Evaluation Methods:** Several AEMs can be used to assess the level of accessibility of an application, but little is known about them. In particular, properties like validity, reliability, usability of Accessibility Evaluation Methods are little studied at the moment. Yet this is crucial to build confidence on methods and obtain a reasonable level of consensus. For the web this did not happen (yet), but more and more researchers are focusing on methods. For the IDTV we will need a set of agile and valid evaluation methods, i.e. 1. such that they can be deployed with limited resources (effort, knowledge, time, infrastructure), 2. that can be scaled up depending on the desired level of quality of their results, 3. that can be used to predict the true problems that will show up when the application will be used.

**Database of typical barriers:** For practitioners assessing accessibility of IDTV, and for developers as well, it would be useful to be able to draw onto scientific literature presenting evidence of certain kinds of accessibility barriers, and their consequences on users. For the web, specific interpretations of existing (generic and technology-agnostic) guidelines exist, and can be used as a (limited) reference so far. A particular important point here will be the focus on older adults [1, 4].

**Sustainable Accessibility:** We should be able to provide ways to estimate the return on investment for accessibility

ity practices. For the accessible web, long known and also emerging arguments are based on improved searchability of accessible pages by search engines, on improved ability to search for relevant content in accessible multimedia objects (eg. searching for video scenes using captions), on reduced server bandwidth (because of more compact and better modularized web pages). Unless we can do the same for accessible IDTV, then accessibility projects might not be sustainable, and hence are likely to fail.

## References

- [1] A. Arch. Web accessibility for older users: A literature review. W3C, 2008. <http://www.w3.org/TR/wai-age-literature>.
- [2] G. Brajnik. Beyond conformance: the role of accessibility evaluation methods. In S. Hartmann, X. Zhou, and M. Kirchberg, editors, *WISE 2008: 9th Int. Conference on Web Information Systems Engineering – 2nd International Workshop on Web Usability and Accessibility IWWUA08*, LNCS 5176, pages 63–80, Auckland, New Zealand, Sept. 2008. Springer-Verlag. Keynote speech.
- [3] G. Brajnik. Towards a sustainable accessibility. In *Accessible Design in the Digital World*, York, UK, September 22-24 2008. <http://www.addw08.org> York University.
- [4] J. Kim, Y. Pan, and B. McGrath. Personalization in digital television: Adaptation of pre-customized ui design. In *2nd European Conference on Interactive Television: Enhancing the Experience (EuroInteractiveTV 2005)*, Denmark, 2005.
- [5] J. Slatin and S. Rush. *Maximum Accessibility: Making Your Web Site More Usable for Everyone*. Addison-Wesley, 2003.
- [6] U.S. Dept. of Justice. Section 508 of the Rehabilitation Act. [www.access-board.gov/sec508/guide/1194.22.htm](http://www.access-board.gov/sec508/guide/1194.22.htm), 2001.