

# Interactive Television Accessibility and Usability

**Roberto Cuccu**

*University of Cagliari, Italy*

## INTRODUCTION

Today, there are more than 70 million people aged 60 and above in the European Union.

According to Eurostat, over the next 15 years, the population aged 65 and over will increase by 22%. Many of these citizens will experience dexterity, cognitive, hearing, and sight problems in later life. This means that more than one in seven adults in Europe will have hearing problems. Some 7.4 million people already suffering uncorrectable sight loss will add to the number of European citizens experiencing some form of sensory impairment (Stallard, 2003).

Interactive digital television (iTV) is evolving into an enhanced entertainment and information service. There are various degrees of interactivity in digital television: pressing a simple remote control button, sending information back and forth, or servicing providers by means of a return path. If they are to be adopted, interactive facilities need to be usable by viewers, even because, as Jacob Nielsen points out, “increased accessibility for users with disabilities almost invariably leads directly to improved usability for all users” (Slatin & Rush, 2003). Unfortunately, interactive digital television design appears to have been based on the conceptual models of keyboard-based systems, but their users, skills, goals and attitude of interaction differ. The TV audience is more diverse, some having no prior computer experience. It must be realised that iTV is not a PC and therefore cannot be treated as such.

As far as usability for interactive television, a literature review shows that the approach followed by the majority of scientific publications is also mainly PC-centric and in the majority of cases implicitly focused on the work environment. Differences between the two environments and strategies for resolution of the issues involved have been noted by academics and practitioners (Chorianopoulos, 2003). Unfortunately, traditional usability engineering techniques focus on and have been

developed to measure work-related goals like successful task completion, efficiency and error rate, parameters usually positively correlated with user satisfaction. In a usability test of three video interfaces, users preferred the interface that required more time, clicks, and had the highest error rate. According to Drucker, Glatzer, De Mar, and Wong (2002), ‘While the performance based on time to task completion and number of clicks was the worst in the novel interface, the user satisfaction was significantly better with this interface.’ Users made their choice on the basis of how amusing and relaxing an interface was.

The emergence of interactive television requires a fresh view of current paradigms. New usability evaluation techniques for interactive television must be designed and experimented with. This brings new challenges for television programme producers who have no strong tradition of minutely analysing viewer interaction with television, preferring instead to rely on survey methods such as diaries, questionnaires, focus groups, or automated monitoring to discover viewers’ attitudes (Gauntlett & Hill, 1999). Several evaluation techniques may be applicable to digital television, including analytical approaches such as heuristic evaluation (Nielsen, 1993), consisting of having a small set of evaluators examine the interface and judge its compliance with recognised usability principles («heuristics»). Building on growing evidence from studies reported in the literature, it is becoming possible to derive TV-specific heuristics. Nonetheless, nothing has yet been definitively established. Here we concentrate on empirical evaluation, based on observation and interview sessions with viewers.

According to Pemberton and Griffiths (n.d.), there are a number of areas that distinguish the use of personal computers from the use of iTV. These differences suggest that evaluating digital television might require an approach differing from that for desktop applications. They also suggest that results reliable for desktop applications may need handling with more

caution in an interactive television context. According to Gauntlett and Hill (1999) and Masthoff (2002), the major differences are:

- **Physical characteristics of interaction:** Viewers watch television at some distance from the screen, typically in an environment oriented toward relaxation and comfort. Resolution is much lower than computer display screens, and color behaves differently. Detailed information is presented via audio. All interactions are carried out via a handset (combined in some cases with a keyboard).
- **Multiple information channels are mediated via the same device:** There is conflict between watching the broadcast stream and manipulation of any interactive components; viewers must divide their cognitive resources between watching and interacting, and this may be reflected in design through allocation of screen ‘real-estate.’
- **The optional status of television viewing:** Television tends to mean leisure and entertainment rather than work or other serious pursuits. Thus, the task-oriented approach most often adopted by usability evaluators may be inappropriate.
- **Social characteristics of interaction:** The domestic setting in which TV is utilised is complex, and its numerous facets make evaluation difficult.

## BACKGROUND

Abilities may vary from person to person, and, in the course of time, in different people with the same type of disability. People may have combinations of different disabilities and combinations of varying severity levels. The number and severity of limitations tend to increase as people age and may include changes in vision, hearing, memory, or motor function. Many accessibility solutions described in this document contribute to “universal design” (also called “design for all”) by benefiting nondisabled users as well as people with disabilities. In this article, three different disabilities will be focused on: sight, visual impairment, and dyslexia.

What a person with specific impairment experiences is often an impediment due to overloading input on different abilities at the same time. A typical case is a prelingual deaf person. Although one might think

the only problem might be one of hearing, possibly to be overcome with captions or a cochlear implant, the handicap is much more severe than expected. Having acquired reading and speaking skills as a deaf person, he can generally recognise words that have been taught to him during speech training. All other terms will have to be inferred from context. In other words, in some forms of disability, the main problem lies in integrating different inputs into a comprehensible piece of information without being overwhelmed by the task.

## Dyslexia

*Approximately 4% of the population is severely dyslexic*

*A further 6% have mild to moderate problems connected with dyslexia*

*(Tiresias Organization, <http://www.tiresias.org/guidelines/dyslexia.htm>)*

Developmental dyslexia is a condition or learning disability causing difficulty in reading and writing and present despite normal intellectual, cognitive, and sensory development. People are often identified as dyslexic when their reading or writing problems cannot be explained by a lack of intellectual ability, inadequate instruction, or sensory problems such as poor eyesight.

Dyslexia is not limited to reversing the order of letters in reading or writing. Nor is it a visual perception deficit involving reading letters or words backwards or upside down, as often implied in popular culture.

The most frequent symptoms of dyslexia are:

- Difficulty in learning through language alone
- Difficulty in processing information sequentially

Dyslexics are visual thinkers and use all their senses. As they tend to think in images, they find it difficult at times to understand letters, symbols, or written words.

A dyslexic person has difficulty reading the words in a line and starting again on the next line and frequently skips whole words or whole lines. She might also add extra syllables to words due to difficulty in reading

11 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/interactive-television-accessibility-usability/13395](http://www.igi-global.com/chapter/interactive-television-accessibility-usability/13395)

## Related Content

---

### Designing OMIS-Based Collaboration for Learning Organizations

Kam Hou Vat (2005). *Encyclopedia of Information Science and Technology, First Edition* (pp. 827-830). [www.irma-international.org/chapter/designing-omis-based-collaboration-learning/14343](http://www.irma-international.org/chapter/designing-omis-based-collaboration-learning/14343)

### A Hidden Markov Model Combined With Markov Games for Intrusion Detection in Cloud

Priti Narwal, Deepak Kumar and Shailendra N. Singh (2019). *Journal of Cases on Information Technology* (pp. 14-26). [www.irma-international.org/article/a-hidden-markov-model-combined-with-markov-games-for-intrusion-detection-in-cloud/234406](http://www.irma-international.org/article/a-hidden-markov-model-combined-with-markov-games-for-intrusion-detection-in-cloud/234406)

### Information Systems Research Relevance

Shirish C. Srivastava and Thompson S.H. Teo (2009). *Encyclopedia of Information Science and Technology, Second Edition* (pp. 2004-2009). [www.irma-international.org/chapter/information-systems-research-relevance/13853](http://www.irma-international.org/chapter/information-systems-research-relevance/13853)

### Management of Telecommunications Services: A Vital New Content Area and a Course Model for the College of Business

Faye P. Teer, Young B. Choi and Harold B. Teer (2008). *Information Communication Technologies: Concepts, Methodologies, Tools, and Applications* (pp. 3259-3271). [www.irma-international.org/chapter/management-telecommunications-services/22880](http://www.irma-international.org/chapter/management-telecommunications-services/22880)

### Live Interactive Virtual Explorations at a Southern California Native American Learning Center: Case Studies and Lessons Learned

Kimberly Mann Bruch, Hans-Werner Braun and Susan Teel (2010). *Journal of Cases on Information Technology* (pp. 62-74). [www.irma-international.org/article/live-interactive-virtual-explorations-southern/46039](http://www.irma-international.org/article/live-interactive-virtual-explorations-southern/46039)