

Institution:	GOLDSMITHS, UNIVERSITY OF LONDON
Unit of Assessment:	04: PSYCHOLOGY, PSYCHIATRY & NEUROSCIENCE
Title of case study:	Accessible Media Technologies
1. Summary of the impact (indicative maximum 100 words)	

The switch of the nation’s televisions to receive digital signals is widely acknowledged as the biggest government-enforced change in British life since 1971’s decimalisation. Jonathan Freeman’s research on the human factors of digital switchover is recognised as an essential source of information to government, industry, and consumer groups (including charities such as RNIB) and therefore as a key foundation in the success of the switchover. In particular, his research influenced the design of easy-to-use TV equipment, and communications about switchover to different types of viewer, improving the experiences of millions of TV viewers in the UK and beyond.

2. Underpinning research (indicative maximum 500 words)
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Freeman has been at Goldsmiths since his appointment as Senior Research Fellow in 1999 to set up a lab supported by a £500K grant from the Independent Television Commission; this was a direct continuation of his PhD funding at the University of Essex.

From April 2001 to December 2003 he also worked half time as Project Manager (new media) for ITC's technology group; in 2002 he founded *i2 media research* limited, Goldsmiths’ first spin-out company, as a vehicle through which to conduct commissioned research and consultancy serving the UK and European media industry. Alongside his Directorship of *i2 media*, he has held a fractional academic appointment in the Psychology Department as Senior Lecturer since 2007. His research is intrinsically interdisciplinary and has been published in Psychology, Computing and Engineering/Technology literatures.

In 2001 he published a paper ^[1] on ‘presence’ (a measure of user experience of media products and services). This described a programme of research measuring the media experiences of 604 participants of TV, film, computer games and virtual reality to develop a psychometrically validated questionnaire; analysis of the data identified engagement, ease of use and positive experience as key components of media experience. It has been cited over 464 times, and the approach it took was recognised by the Independent Television Commission (ITC) as innovative, world-leading and effective. On the basis of this, the ITC invited Freeman to lead essential investigations of the usability of digital television, in preparation for the switchover of the UK’s TV to digital which would require users to learn how to operate a new system, navigate a far larger range of channels, and learn new ways to find and record programmes.

These investigations entailed a combination of in-home observation, depth-interviews and lab-based trials of digital TV equipment, and revealed that some viewers would find using new digital TV services difficult. They demonstrated links between presence and usability, and identified optimal ways of labeling the buttons on remote controls. These findings were presented to ITC as consultancy reports and were subsequently published in peer-reviewed journals ^[2, 3]. They led to a subsequent report based on a new analysis of the literature ^[4] commissioned from Freeman’s team by the Ofcom Consumer Panel. This identified older and disabled people as groups who would find the digital TV switchover most challenging. It received positive peer-review from the Panel’s academic advisory board prior to its publication and was constructed to help government, regulators, broadcasters and charities work towards a set of clearly defined goals which would make the experience of switchover as smooth as possible for potentially vulnerable consumers.

Freeman then co-authored several peer-reviewed research reports advising on communications strategies and recommendations for how to connect with vulnerable consumers and help them to make the switch to digital. The research reported in these used a diverse range of methods, including qualitative approaches (depth interviews, focus groups, observation) and quantitative approaches (surveys and lab-based experiments which used both subjective and objective measures); cumulatively they involved several thousand participants. Freeman’s segmentation of UK TV

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viewers highlighted the difficulty many older people in particular experienced using existing remote controls; his follow-up research identified the button labels and layouts which best supported their error-free operation of basic TV control functions. In 2006, Ofcom published Freeman's summary of his research and specific recommendations to improve the usability of digital TV receivers and remote controls (e.g. relating to labelling of remote control buttons, on-screen interface design and flow); this took the form of a checklist of core recommendations for easy-to-use television equipment.^[5] This was incorporated into the Core Receiver Requirements presented by the Government's Consumer Expert Group (see following section).

In 2007, Freeman led a major investigation for Ofcom's Advisory Committee for Older and Disabled people (ACOD) that involved extensive on-the-ground engagement (observation, focus groups, depth interviews) with vulnerable older and disabled people and professionals from charities and social services responsible for protecting their interests. The study identified how the organisation leading the switchover, Digital UK, could most effectively communicate with different kinds of consumers, and made clear recommendations on how best to mobilise an effective support infrastructure for vulnerable consumers through switchover ^[6].

Freeman was then commissioned by the Department for Business, Enterprise and Regulatory Reform (BERR) to compare different remote control for their usability ^[7]. This project directly impacted on the design of television equipment procured by the Switchover Help Scheme (see next section) by identifying which of two remote controls which were designed to the recommendations of earlier studies best supported error free control of digital TV by older and disabled people. The study used behavioural outcome measures (reaction time, errors) to complement subjective ratings of user experience, and has subsequently informed research undertaken by Freeman for other organisations in identifying design specifications for equipment to make digital radio, e-books, computer games, mobile social media, and smart meters accessible to a range of users.

3. References to the research (indicative maximum of six references)

The quality of this research is evidenced through the publication of its key findings in selective and rigorously peer-reviewed academic journals [e.g. refs 1, 2, 3]. Reference 1 has been cited 463 times to date. All outputs are available in hard copy on request from Goldsmiths Research Office.

1. Lessiter, J., Freeman, J., Keogh, E., & Davidoff, J. (2001). A Cross-Media Presence Questionnaire: The ITC-Sense of Presence Inventory. *Presence: Teleoperators and Virtual Environments*, 10 (3), 282-297. DOI: 10.1162/105474601300343612.
2. Dillon, C., Freeman, J., Keogh, E. (2004). Pressing the right buttons: taking the viewer there. *Interacting with Computers*, 16 (4), 739-749. DOI: 10.1016/j.intcom.2004.06.008.
3. Lessiter, J., Freeman, J., Davis, R., & Dumbreck, A. (2003). Helping viewers press the right buttons: Generating intuitive labels for digital terrestrial TV remote controls. *Psychology*, 1 (3), 355-377.
4. Freeman, J. & Lessiter, J. (2004). Vulnerable consumers in digital switchover – who are they and where do they live? [Annex 1](#) to Ofcom Consumer Panel Report on vulnerable consumers in digital switchover.
5. Freeman, J., Lessiter, J., & Dumbreck, A. (2006, March). [Summary](#) of Research on the Ease of Use of Domestic Digital Television Equipment. Report for Ofcom (UK Media Regulator).
6. Freeman, J., Lessiter, J., & Beattie, Em (2007, June). Digital Television Switchover and Disabled, Older, Isolated and Low Income consumers. [Report](#) commissioned jointly by Digital UK and Ofcom's Advisory Committee on Older and Disabled people.
7. Freeman, J., Lessiter, J., Miotto A., & Ferrari, E. (2008, May). Research report: A comparative study of remote control devices for digital TV (DTV) receivers. [Report](#) commissioned by the UK Government Department for Business, Enterprise and Regulatory Reform (BERR).

4. Details of the impact (indicative maximum 750 words)

Between 2008 and 2012 the UK's analogue TV signal was switched off, leaving only digital TV available. Millions of viewers were at risk of finding their digital TV services difficult to understand, or of losing access to TV. Freeman's research played a distinct and tangible part in the eventual success of the vast Switchover project: since 2008 his findings have been published in 20 peer reviewed outputs and over ten public reports commissioned by UK Government Departments, Charities and NGOs. It helped the organisations responsible for delivery of the Switchover (BBC, Ofcom, Digital UK, Switchover Help Scheme, and Digital Outreach) to address as many people as possible to overcome barriers to their use of new digital TV equipment.

Digital UK, the organisation leading and managing the Switchover, was equipped with a £201 million marketing budget by its broadcaster members (BBC, ITV, Channel 4, Five); Freeman's research influenced how large portions of this were spent. In particular, the work described in Section 2 (references 4-7) identified who might need the most help with switchover, what sort of help would benefit them, and how Digital UK could communicate most effectively with them. Digital UK accordingly ran targeted communications campaigns at groups that the research identified as hard to reach or vulnerable, such as housing tenants, minority ethnic audiences, older people, and disabled people. It did so in ways recommended by Freeman: these included partnering with community-based support networks, schemes and groups; establishing regional support hubs; and using a variety of media platforms. The communications were targeted on the basis of Freeman's consumer segmentation, based on the research conducted for Ofcom and Digital UK, whose value is emphasised in Digital UK's report summarising the switchover research ^[1]. It is also evident from Ofcom's extensive reference to Freeman's research on their website ^[e.g.,2] and their subsequent appointment of Freeman (*i2 media*) for numerous research and consultancy assignments.

Freeman used the findings from the underpinning research throughout the switchover, working to raise awareness of the research results through presentations to key stakeholders, industry members and Government groups. Freeman attended working groups including the Digital Television Usability Action Plan Group, the Digital Television Group's Usability Expert Group and Intellect Seminars, emphasising and advising on matters of usability and accessibility. He also undertook research projects for Digital UK that tracked the progress of switchover, the expectations and confidence levels of consumers, and evaluated the effectiveness of Digital UK outreach projects.^[3]

The greatest impact of Freeman's research, however, occurred through the [Switchover Help Scheme](#), which was set up by Government and the BBC to deliver targeted help with switchover for older and disabled consumers. The very establishment of this scheme was informed by two of his research papers based on the underpinning work described above, identifying different kinds of consumer and emphasising the importance of well-designed advice and support for the more vulnerable or isolated members of society who most value television's role in their life. The key role of the reports by *i2 media research* is made explicit in the 'How was the Help Scheme Developed?' pages on the [DCMS website](#), which cites a number of *i2 media's* reports for the DTI, BERR, and Ofcom ^[6]. Freeman's work at Goldsmiths was also cited by Peter White, the Help Scheme's Chief, in his interview for a 2011 *Guardian* article ('Digital Switchover Boss pledges help to those hardest to reach') ^[7].

His design checklist for easy-to-use television equipment was incorporated into the advisory guidelines produced by the Digital Television Group; it was subsequently used by the Government's Consumer Expert Group, which worked with the Departments for Trade & Industry (DTI) and Culture, Media & Sport (DCMS) to generate Core Receiver Requirements [CRRs]. The Department for Business, Enterprise and Regulatory Reform [BERR] then commissioned Freeman to conduct a comparative evaluation, which confirmed that CRR-compliant controls were indeed the easiest to use ^[4]. These were then endorsed by The Help Scheme, which stated on its website that "*Equipment provided as standard through the Help Scheme must meet a set of CRRs designed to ensure it best meets the needs of older and disabled people, such as easy-to-use menus, remote controls, rescanning capabilities and access to useful functions including Audio Description and subtitling.*

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The CRRs are managed by DCMS and the BBC.” Manufacturers thus had to comply with the CRRs in designing equipment eligible for procurement by the Help Scheme for provision to its customers.

The Switchover Help Scheme was a great success: it sold (or, in the case of consumers on low incomes, gave) a set-top box and remote control to over one million disabled and older people, and in a survey 95% of end-users said they would recommend it. Thus for instance, one user who was quoted in a Help Scheme progress report explained: “*As an elderly lady with sight and hearing problems everything was very straightforward. I am enjoying all the new channels – thank you*”^[5].

Freeman has continued his work making media more accessible in the UK, beyond Switchover. He has been commissioned by the Royal National Institute for the Blind [RNIB], commercial organisations and other government departments to develop guidelines for ‘easy-to-use’ digital radio equipment and accessible audiobooks and e-books for blind and partially-sighted users. His research has been used by the RNIB in their recommendations and guidance for both consumers and equipment manufacturers^[8, 9].

The continuing relevance of the impact of Freeman's work was evidenced in October 2013 when *i2 media research* won a place on the Ofcom Consultancy Framework for the period 2013-2018.

5. Sources to corroborate the impact (indicative maximum of 10 references)

The materials listed below are all available in hard copy on request to Goldsmiths Research Office.

1. [Digital TV switchover: Research methods and insights](#) (2012), by Daniel Welch, Strategy and Research Executive, Digital UK.
2. [Report](#) by Andrew Stirling from Ofcom, informed mainly by i2 Media Research.
3. [Report for Ofcom](#) about consumer expectations.
4. Digital Television [Usability Action Plan](#) evidences the consequences of i2's work for BERR.
5. Help Scheme [Progress Report](#).
6. Peter White, Chief Executive of the Switchover Help Scheme, cites i2's research [here](#).
7. The BIS/DCMS Digital Switchover pages on '[How the Help Scheme was Developed](#)'.
8. RNIB webpages on [choosing a digital radio guide/checklist](#).
9. RNIB [Guidance](#) for [radio equipment manufacturers, and audiobook](#), and [e-book publishers](#).

The following can be contacted for oral corroboration (*details provided separately*):

- Former Project Director, Digital Television Switchover, Ofcom
- Head of Digital Inclusion, DCMS (ex BIS)
- Director General, Digital Television Group
- Chief Executive, Digital Switchover Help Scheme
- Strategy Director, Digital UK