

Institution: BRUNEL UNIVERSITY (H0113)
Unit of Assessment: 15 – General Engineering
Title of case study: DTV4All – Providing access services for digital TV viewers in Europe
<p>1. Summary of the impact (indicative maximum 100 words)</p> <p>Digital Television for All (DTV4All), led by Brunel Wireless Network Group, has raised awareness of the need for standardised access services for TV viewers who require or use subtitles or any other audio-visual aids while watching digital TV programmes. They showed the European Parliament how a TV programme (without a sign language translator) could be delivered via internet with an option to use a sign language translator for those who require the service. They also presented at the International Telecommunications Union (ITU) and European Broadcasting Union (EBU) Joint Workshop on Accessibility, which led ITU, a specialised agency of the United Nations for digital technologies, to set up a Focus Group on Audiovisual Media Accessibility and to commission the report 'Making Television Accessible' (2011).</p> <p>Since January 2011, the regional public broadcaster (radio/television) of Berlin and Brandenburg in Germany, Rundfunk Berlin-Brandenburg (RBB), has broadcast the digital TV subtitle setting recommended by DTV4All on Channel 1. Through additional investment, RBB has further enhanced the subtitling service and users can now optimise the sizes of the subtitle font or the sign language translator.</p>
<p>2. Underpinning research (indicative maximum 500 words)</p> <p>The Wireless Network Group at Brunel University has led a number of large European projects, such as SAVANT (synchronised and scalable audio visual content across networks), INSTINCT (IP-based networks, services and terminals for convergence systems) and CONFLUENT, and has research expertise in creating, interacting with and delivering media through cognitive and interactive broadcasting systems and various types of media in media-saturated environments.</p> <p>Drs Itagaki (Lecturer) and Owens (Senior Lecturer) led Digital Television for All (DTV4All) (2008-2011), funded by the European Commission; the project partners included 5 major broadcasting and networking companies across Europe – Danmarks Radio/Danish Broadcasting Corporation (DR), RAI-Radiotelevisione Italiana (RAI), Red Bee Media (RBM), Rundfunk Berlin-Brandenburg (RBB), and Televisió de Catalunya (TVC) –, the research institute of the German language public broadcasters, Institut für Rundfunktechnik (IRT), and the Universitat Autònoma de Barcelona (UAB).</p> <p>The broadcasting partners evaluated subtitling, audio description, audio subtitling and signing services in 4 territories for 12 months while identifying key emerging (novel) access services, and the devices and platforms needed to support them. The other academic partner, UAB, led a large consortium of universities who were involved in various subtitling service tests, and coordinated the analyses of user feedback from them. IRT gave extensive technical support, investigated emerging access services, and provided an interface to the International Telecommunications Union (ITU), a specialised agency of the United Nations, responsible for issues concerning information and communication technologies. Subtitling tests were conducted in Spain, Italy, UK, Denmark, Germany, Poland and Belgium.</p> <p>The Brunel team investigated the technological feasibility of devices and platforms for mobile TV, high-definition TV and other internet-based TV programmes and identified the business need for establishing ubiquitous access services in Europe by mapping out the value chain of all stakeholders, including the viewers. They also coordinated all research findings from each partner; the results from the subtitling tests presented a model for digital TV subtitle services in Europe and demonstrated issues related to the speed of subtitles and the comprehension of subtitles. Audio description tests presented its effectiveness and the users' response.</p> <p>The Brunel team prepared and presented the research findings in the DTV4All Report D2.5 Final Report on Pilot Services; as a 275 page-long document, this remains the most comprehensive study of its kind ever undertaken. They also published the DTV4All report D2.6 Recommendations on the Effectiveness and Efficiency of Existing Services Improvements, which identified potential improvements in existing access services and ways of addressing key technical and organisational</p>

obstacles to the sustainable take-up of these services throughout Europe.

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

[1] Deigmoeller, J., Itagaki, T., Just, N., & Stoll, G. (2011). "Contextual cropping and scaling of TV productions". Multimedia Tools and Applications. <http://dx.doi.org/10.1007/s11042-011-0804-3>

[2] Hoffmann, H., Itagaki, T., Wood, D., Hinz, T., & Wiegand, T. (2008). "A novel method for subjective picture quality assessment and further studies of HDTV formats" IEEE Transactions on Broadcasting, 54(1), 1-13. <http://dx.doi.org/10.1109/TBC.2008.916833>

[3] DTV4All Reports are available from <http://psp-dtv4all.org>

Grant information:

Brunel University	United Kingdom
Danmarks Radio	Denmark
Rundfunk Berlin-Brandenburg	Germany
Institut Fuer Rundfunktechnik Gmbh	Germany
Rai-Radiotelevisione Italiana Spa	Italy
Universitat Autonoma De Barcelona	Spain
Televisio de Catalunya S.A.	Spain
Red Bee Media Ltd.	United Kingdom

Sponsor: European Commission

Funded under: The Information & Communication Technologies Policy Support Programme

Area: CIP-ICT-PSP-2007.2.1 - Accessible digital Audiovisual (AV) systems

Period of the grant: From 01/07/2008 to 31/03/2011

Total project cost: €2.93 million

Value of the grant: €1.46 million

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

DTV4All was specifically driven by the 'e-ethos' to provide comprehensive access services for TV viewers (both vulnerable and general) who require or use subtitles or any other audio-visual aids in watching digital TV programmes; subtitle users are not limited to those with hearing problems and people with disabilities and older people may encounter barriers when using ICT products and services. The European Broadcasting Union (EBU) stated that one of the roles of public service media was to empower citizenship through media literacy ([EBU Viewpoint 2011](#)) and that it 'actively supports the DTV4All project', 'which facilitates access to digital television for people with disabilities' (p3). [A]

DTV4All has not only contributed to raising awareness for the need for standardised access services across Europe, but also devised technical solutions to deliver the most optimal standards that it identified. This was demonstrated at two critical workshops – one for the European Commission and the other as part of a joint workshop in Geneva.

The Brunel research team led 'The DTV4All Workshop on Barrier-Free Digital Television' at the European Parliament on 28 October 2010; the workshop was hosted by the members of the European Parliament – Ms Adriana Ticau (Group of the Progressive Alliance of Socialists and Democrats) and Dr Adam Kosa (Group of the European People's Party [Christian Democrats]) – and was webcast with a sign language interpreter provided by the Brunel team. They presented the BBC's then-current accessibility services (audio description and subtitles) and demonstrated that a TV programme with a sign language translator could be delivered via two network systems – the main content via a conventional broadcast network and the additional content with a sign

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language translator via the IP network. These two streams were then synchronised at viewers' set-top-box, providing an option to use a sign language translator for those who require the service. The specification to enable this set-up is reported in DTV4All report D3.3.

This workshop was in response to the European Commission's 'Audiovisual Media Services Directive' which governs EU-wide coordination of national legislation on all audiovisual media, not just on TV, but also via the internet and on mobile phones. It states that 'like other goods and services, the audiovisual media are subject to the rules of the single European market' and sets out 'common rules' whose areas include 'accessibility for people with disabilities'.

Another workshop was held in Geneva on 23-24 November 2010 – International Telecommunications Union (ITU) and EBU Joint Workshop on Accessibility to Broadcasting and IPTV ACCESS for ALL. The ITU Telecommunication Standardization Sector develops international standards which act as defining elements in the global infrastructure of information and communication technologies (ICTs).

The participants of this workshop agreed that there was a 'clear need to coordinate the technologies that can be used to aid those viewers and listeners with disabilities to gain maximum benefit from media delivered by broadcast, cable, IPTV and Internet. The target is to make access service requirements independent of the delivery platform'. [B]

This led ITU to set up a [Focus Group on Audiovisual Media Accessibility](#) chaired by Mr Peter Olaf Looms (Danish Broadcasting Corporation, a DTV4All participant), and to produce a report, '[Making Television Accessible](#)' (2011). The document specifically quotes two reports from DTV4All – D2.5 Final Report on Pilot Services I and II (para 6.4 on p46) – and the Focus Group used another report from DTV4All, 'D4.6 Descriptions of the Mature Access Services and Guidelines for their Implementation throughout Europe', as a base document for their discussions on how the UN Convention on the Rights of Persons with Disabilities could be implemented in the Digital TV domain. [C]

Among the 10 different sub-areas that the Focus Group covers, the 'Emerging Access Services' area is coordinated by Deputy Director of the EBU (Technology and Development) and Dr Itagaki. The Focus Group aims to produce recommendations by the end of 2013, which will act as the guidelines for the implementation of the UN convention. Such recommendations are regulations within the ITU and are enforceable on ITU member countries (193 nations). In recognition of these efforts, Dr Itagaki received a Certificate of Appreciation from ITU in 2013.[D]

EBU uploaded the joint workshop on YouTube with subtitles and the Director of IRT in the video acknowledges DTV4All as 'one of the important projects' that demonstrated 'optimisation' choices for all users including those with disabilities to specify sound, subtitles or viewing of texts. [E]

In December 2010, Dr Itagaki (as the DTV4All Project Coordinator) gave a demonstration at the European Day of People with Disabilities 2010 Conference) in Brussels which was visited by HRH Princess Astrid of Belgium who is the head of Belgian Red Cross and who showed her interest in access services on TV, reflecting the importance of the work of DTV4All.

Recommendations regarding the digital subtitling standard from DTV4All were implemented by its broadcasting company, RBB, who is the regional broadcaster for Berlin and Brandenburg in Germany. Since January 2011, RBB has broadcast the digital TV subtitles through the terrestrial Channel 1 across the country. This subtitling service was further enhanced by RBB who made additional investment and offered a backup technology for their channels. The design of the broadcast DVB-subtitles was the exact outcome of the DTV4All user field test, using Tiresias Screenfont sized 45 points with the background style – normal box with average transparency 60 (FAB Subtitler XCD). A licence for Tiresias Screenfont was purchased from the Royal National Institute of Blind People as part of their additional investment. [F]

This has influenced other regional and national broadcasters in Germany to introduce digital TV subtitles, allowing users to increase the size of subtitles for hearing impaired elderly who may also have sight impairment.

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

A. The European Broadcasting Union (EBU) Viewpoint newsletter (2011):

http://www.ebu.ch/CMSimages/en/Viewpoint_2011_EN_Media_literacy_tcm6-74583.pdf
EBU stated that one of the roles of public service media was to empower citizenship through media literacy and that it 'actively supports the DTV4All project', 'which facilitates access to digital television for people with disabilities' (p3).

- B. See 'Output Documents' from the ITU-EBU Joint Workshop on Accessibility to Broadcasting and IPTV ACCESS for ALL: <http://www.itu.int/ITU-T/worksem/accessibility/20101123/index.html>
- C. Or access the document directly here: http://www.itu.int/dms_pub/itu-t/oth/06/42/T06420000060001MSWE.doc
- D. 'Making Television Accessible' Report for the International Telecommunications Union : http://www.itu.int/ITU-D/sis/PwDs/Documents/ITU-G3ict%20Making_TV_Accessible_Report_November_2011.pdf
- E. Certificate of Appreciation in recognition of the outstanding support to ITU-T Focus Group on Audiovisual Media Accessibility performed as Co-coordinator of Working Group D 'Emerging Access Services', ITU-T Focus Group (2013). Available from Brunel.
- F. ITU-EBU Joint Workshop on YouTube with the subtitle: the Director of IRT in the video acknowledges DTV4All as 'one of the important projects' that demonstrated 'optimisation' choices for all users including those with disabilities to specify sound, subtitles or viewing of texts. <http://www.youtube.com/watch?v=R7s47W4BDDs>
- G. http://www.rbb-online.de/fernsehen/untertitel_angebot/themen/dtv4all.html (in German)