Social Connected TV Platform by FIcontent: An Open Toolbox for Creative Developers

Nathalie Cabel  
Technicolor  
975, avenue des Champs Blanques – 35 576 Cesson-Sévigné – France  
nathalie.cabel@technicolor.com

Yehia Elkhathib  
Lancaster University  
SCC, InfoLab21, Lancaster  
LA1 4WA, UK  
y.elkhathib@lancaster.ac.uk

Robert Seeliger  
Fraunhofer FOKUS  
Kaiserin-Augusta-Allee 31 – 10589 Berlin – Germany  
orbert.seeliger@fokus.fraunhofer.de

Christoph Ziegler  
IRT  
Floriansmuehlstrasse 60 – 80939 Munich – Germany  
ziegler@irt.de

Michael Eble  
Fraunhofer IAIS  
Sch. Birlinghoven – 53754 St. Augustin – Germany  
michael.eble@iais.fraunhofer.de

ABSTRACT
The “Social Connected TV Platform” offers several content-centric software components via open APIs. The platform is designed as a toolbox and enables developers to build multimedia applications on top of it. The demo shows a selection of such applications for multi-screen and search and discovery use cases: VOD Discovery, VISION, Interactive Multi-screen Content and ARD EPG.

Author Keywords
Social TV; platform; multimedia; content; user experience; content discovery; multi-screen; application; development

ACM Classification Keywords
H.3.1 Information storage and retrieval: Content Analysis and Indexing; H.3.3 Information Search and Retrieval and H5.2 User Interfaces.

INTRODUCTION
FIcontent is an EU-funded R&D project that develops 3 technology platforms for multimedia content scenarios. One of them is the “Social Connected TV Platform”. It is designed as a toolbox that builds on top of common software components (“Generic Enablers”, GEs) and offers content-centric components (“Specific Enablers”, SEs) itself to enhance connected TV services or TV related applications for multi-screen. Therefore, technologies were created and tested that support novel uses of audio-visual media content. Developments focus on rich content, multi-screen experience, search and discovery and personalized media. Recently, the platform was deployed and made available to third parties including open API specifications. Our demonstration gives an overview on four applications already developed on top of this platform as illustration for its variety. The SEs used for the demos are documented in [1] including their APIs, while GEs are documented in [2].

DEMO #1: VOD DISCOVERY
This application combines technologies for personalized video delivery, in particular discovery algorithms and playful user experience for media and entertainment. The demonstration focuses on increasing interaction between content and users by helping end-users to intuitively search for and discover content suited to their expectations and context. The objective is to experiment with different interaction concepts for the discovery of content and their influence on the user experience.

Technologies and components
Two SEs are used in these applications: Content Similarity SE to discover content based on the weighted genres of movies and Content Atmosphere SE to get movies with the same mood.

Content and features
The discovery applications are being applied on video on demand (VOD) catalogs. They offer new ways to discover movies by combining technologies on metadata with an user experience approach.

DEMO #2: VISION
Vision is an IPTV platform built at Lancaster University, UK that offers a range of live and on-demand content. Vision manages the full delivery lifecycle, starting from ingestion from satellite and terrestrial broadcasts through to HTML5-compliant video streams. Our demo will showcase the Pause-Resume feature which maintains cross-device sessions. This allows users to view their watching history and resume playback regardless of the current or previous devices used. This is not limited to devices capable of rendering the rich web interface (such as desktops, laptops, tablets, and smart phones) but also includes gaming consoles and smart TVs.

Technologies and components
The feature is developed using the BBC’s TV Application Layer (TAL) SE along with the DataCenter Resource Management (DCRM) GE. TAL is an open source library that creates an abstraction layer for vendor-agnostic development of HTML-based TV applications. Through using TAL, Vision is reachable via a myriad of new platforms such as PlayStation 3 and a number of smart TVs. A DCRM-based infrastructure is used to host user session activity data as well as related application logic to enable seamless cross-device functionality. This facility caters to users on an individual basis, gathering their session information and watch history.

Except otherwise noted, the author retains copyright of this work under a CC-BY 4.0 license: http://creativecommons.org/licenses/by/4.0/  
TVX’14, June 25 – June 27, 2014, Newcastle, UK.  
DOI:10.6084/m9.figshare.1032654
**Content and features**

Received broadcasts (30 TV and 20 radio channels) are transcoded using dedicated hardware and are made available as live streams. Of these, 18 TV channels are continuously recorded and automatically partitioned into programmes (based on electronic programme guide (EPG) data) and then added to the VOD library which is made available to the users via the web interface. Users could also ask for any future programme to be recorded on their behalf. In this regard, Vision provides a cloud-based personal video recorder (PVR) service.

**DEMO #3: INTERACTIVE MULTI-SCREEN CONTENT**

The application shows the creation and utilization of interactive video content for social connected TV and multi-screen environments using HbbTV technologies. The use case deals with consumption, annotation and sharing of interactive TV content via a distributed, multi-screen app environment. The user is able to connect a second screen device to his HbbTV in order to watch and interact with content on the screen best suited to his context. Enrichment includes annotations, linking other related content such as images, text, etc. The content on the second screen correlates to the topic shown on the first screen. It enables interaction and offers additional information like related video content.

**Technologies and components**

The application incorporates the following SEs and GEs: Content Enrichment SE provides functions to create, distribute and play interactive video content across platforms and devices by making objects in the video clickable for the viewer. Second Screen Framework SE provides functionalities to establish a persistent bi-directional communication path from the TV to a web application running in the browser of any second screen device. Object Storage GE is used to store and manage interactive video resources linked into the second screen application.

**Content and features**

The demo shows how broadcast related content can be enriched with additional related media to be watched on a HbbTV-enabled TV set as well as on a second screen device. Interactive multi-screen content offers a personalized experience to TV viewers by providing comprehensive video and media content in addition to the linear broadcast or catch up programme. Furthermore, the viewer can freely decide when and on which device he wants to experience the content.

**DEMO #4: ARD EPG**

The ARD EPG is a connected TV application based on the HbbTV standard [3]: Users can gather information on upcoming shows on the different channels of the German TV broadcaster network “ARD” and have access to a VOD repository of shows that have been broadcasted. Second screen functionalities will be shown, like app-to-app communication and automatic app launch, which have been integrated into the application on the basis of the FIcontent technologies.

**Technologies and components**

The requirements for second screen functionalities are handled with the help of the Second Screen Framework SE [4], that provides the appropriate mechanisms via a set of JavaScript commands.

**Content and features**

The demo shows how the Second Screen Framework can be used to augment existing connected TV applications. It reveals how the user’s experience can profit from the second screen as an enhanced input device (e.g. for ARD EPG’s full-text search) and as a supplemental display for additional content. This demonstrates how the technology enables the use of each devices core assets – the TV’s large display for content presentation and the touch gesture support of second screen devices for content interaction.

**CONCLUSION AND FURTHER DEVELOPMENT**

The four applications show first outcomes of FIcontent’s Social Connected TV Platform. Experimentations across Europe shall provide insights on how applications and the platform can be improved in terms of usability and performance. To do so, FIcontent follows an iterative approach: Currently, experimentations with end users are being conducted at six locations and results will be analyzed for upcoming developments.

**ACKNOWLEDGMENTS**

This work is supported by the Collaborative Project FICONTENT 2 (www.medialf.org) funded by the European Commission through the 7th Framework Programme (FP7-603662, Future Internet Public Private Partnership FI-PPP).

**REFERENCES**