

# 2-IMMERSE: MotoGP multiscreen experience with HbbTV 2 retail devices

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## ABSTRACT

This demonstration showcases the 2-IMMERSE platform – a system built on open standards that enables broadcasters, and other content providers, to deliver novel multi-screen entertainment services. These services are based on the concept of object-based media. Our implementation is currently being tested and validated with Hybrid Broadcast Broadband TV (HbbTV) version 2 prototype and retail devices, that are now entering the market, to ensure the 2-IMMERSE platform can be used in an HbbTV ecosystem. In cooperation with Samsung the demonstration will show the 2-IMMERSE MotoGP experience (Silverstone GP 2017) on an HbbTV 2 implementation on a recent consumer device.

## Author Keywords

Multi-screen; companion apps; object-based broadcasting; TV production; HbbTV; cloud services; entertainment.

## ACM Classification Keywords

H.5.1 Multimedia Information Systems

## INTRODUCTION

2-IMMERSE is a collaborative research and development project, funded by the European Commission within the Horizon 2020 framework [1]. This team of leaders in the broadcasting industry and academia is developing an innovative approach to the object-based production and delivery of multi-screen entertainment. The object-based approach is a paradigm according to which media objects, e.g. audio tracks, video or infographics, are rendered at the receiver, as opposed to traditional broadcasting where media is composed and rendered before transmission. This means an experience is a collection of related objects made of various media feeds/clips, images, interactive graphics etc. which can be assembled at the point of consumption in a responsive manner based on factors like available screens, device capabilities and/or user preferences. The project is developing a modularized and extensible platform including production tools to facilitate the creation of novel immersive experiences.

Four service trials had been envisaged, each varying in type of content and place of consumption, in order to drive

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requirements and make the platform as robust, scalable and flexible as possible. One of the trials, Theatre-at-Home, was showcased at TVX in 2017 [6]. Since then, a new trial, MotoGP-at-Home, has been successfully completed. Evaluation of these trials help improve the platform for the next trials, Theatre-in-Schools and Football, with a particular focus on live production and delivery. An additional field study in a Fanzone is planned to evaluate the concept in public spaces as well. In the final year of the project, the results can be fed back into the platform.



**Figure 1: Demonstration at IBC 2017 by IRT showcasing synchronising audio on a companion with the TV picture by means of HbbTV 2**

The 2-IMMERSE platform is built on emerging standards like HbbTV 2 [5] including companion screen features like the Digital Video Broadcasting (DVB) specification “Companion Screens and Streams” (DVB-CSS) for synchronisation of content on companion-screen devices like tablets or smartphones [4], the DVB profile for “Dynamic Adaptive Streaming over the Hypertext Transfer Protocol” (DVB-DASH) for bandwidth-adaptive streaming [3], and the specification authored by the Moving Pictures Expert Group (MPEG) for “Server and network assisted DASH” (SAND) [7], which handles bandwidth management in the 2-Immerse multi-device environment. In a parallel task within the project, cooperation with manufacturers helped to develop some of the first HbbTV 2 prototype services and devices. We plan to conduct interoperability tests and demonstrate that 2-IMMERSE applications can be performed on TVs entering the market now.

## HBBTV 2 AS A TARGET PLATFORM

Our demonstration showcases an HbbTV 2 standard-compliant implementation of the MotoGP scenario. HbbTV enables broadcasters to link Web applications to their linear TV services. Applications can be interactive and can be realised as TV picture overlays. Applications can present live

and on-demand IP streams. Also, HbbTV provides different means to synchronise applications to the IP and broadcast video.

HbbTV 2 adds interaction with companion screens and advanced media synchronisation capabilities allowing rendering of broadcast services with broadband streams synchronised on the TV or across devices having access to the same local network. The companion screen features facilitate the discovery of devices and local app-to-app communication. The following features of HbbTV 2 are employed in the demonstration

- Device discovery using the “Device Discovery and Launch” (DIAL) protocol
- App-to-app communication
- Media Synchronisation between TV and companion application using DVB CSS
- Canvas2D for interactive graphics, e.g. leader board

The demonstration will be using an HbbTV 2 device provided by Samsung as the main screen. The device implements a second video decoder, which is specified as an optional part of the HbbTV standard. This will enable at least one additional video stream in a picture-in-picture (PIP) view.

### THE MOTOGP SCENARIO

The MotoGP service scenario envisions a user at home watching a motorcycle race on a TV screen while using a companion screen to consume additional footage and control the experience. The experience consists of multiple stages. In the pre-race stage, the user gets up to speed with recent events that happened so far in the season, for example watching interviews. During this stage the user mainly accesses and watches on-demand video clips. An overview of the available content is given via a menu on the companion screen. The content can be launched on either the personal companion or the shared TV screen, depending on how many persons are in the room and whether they are interested in the same driver.

During the actual race the service changes into a linear consumption mode with the main editorial feed shown on the large screen. Any race graphics like a leader board, which are usually rendered into the broadcast video signal, are customizable. For instance, the leader board is scaled differently depending on the screen size. On a larger screen, for example, it will consume relatively less screen real estate. In addition, the user can customize the amount of information presented in the leader board.

Additional video feeds, e.g. from cameras mounted on the bikes, can be selected for presentation on the companion screen or potentially on the shared TV screen, if the device has sufficient decoding capabilities, which is automatically detected by the 2-IMMERSE platform. In the trials an Intel NUC PC device was used. This device supported presentation of one 360° video and also had sufficient capabilities for up to four PIP views.

A video of the MotoGP trial can be found on the 2-IMMERSE YouTube channel [2]. Further information regarding the service description of the MotoGP scenario is available for download as D4.4 on the 2-IMMERSE website [1].



Figure 2: Concept illustration of MotoGP at Home scenario.

### CONCLUSION

This demo brings the concepts developed in the 2-IMMERSE project for object-based media and multiscreen experiences to open standards-based retail devices. This is a great step towards broadcasters to pick this up and to start realizing such services for their viewers.

### ACKNOWLEDGEMENTS

The research leading to these results has received funding from the European Union’s H2020-ICT-2015 programme under grant agreement n° 687655 (2-IMMERSE)

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