

# Interactive Storytelling & Audio Apps for HbbTV

Nicolas Patz  
Rundfunk Berlin-Brandenburg  
rbb Innovation Projects  
14482 Potsdam, Germany  
Nicolas.Patz@rbb-online.de

Christian Fuhrhop  
Fraunhofer FOKUS  
10589, Berlin, Germany  
Christian.Fuhrhop  
@fokus.fraunhofer.de

Angela Brennecke  
Rundfunk Berlin-Brandenburg  
rbb Innovation Projects  
14482 Potsdam, Germany  
Angela.Brennecke@rbb-online.de

## Abstract

The **Multiplatform Application Toolkit (MPAT)** is an open source authoring system for creating interactive HTML-based applications to be published on HbbTV or other web platforms. The primary user group of the system are journalists who can supplement their stories with interactive HbbTV applications. Central aspect of the project is to explore different use cases for interactive HbbTV applications to better understand the technical requirements as well as the consumers' adoption of such applications. A first pilot demo addresses a younger audience with a music related programme: To motivate the audience to interact with TV programmes, the project consortium developed an interactive audio application that allows TV viewers to play along to music videos on the TV screen. MPAT is based on WordPress and supports easy integration of different audio-visual media formats like, for example, mp3, mp4, or even 360° video, among others.

## 1 Introduction

Historically, presenting additional information on TVs required authoring concepts that were difficult to align with authoring for the web. Input on TVs is performed via key navigation, while computers and tablets use pointers. TV presentations switched between full-page screens, while web application scroll. Recently, however, the gap between the two worlds has narrowed. Web content that is aimed at usage on tablets or smartphones increasingly adopts visual metaphors that are based on switching of full page presentations, where the pages provide automatic content presentation and little in-page navigation.

Utilizing tools aimed at creating such presentations provides an easy way for content creators accustomed to creating web content for mobile devices to also provide content for TV presentation, while using the same skill set.

### 1.1. MPAT – The Multiplatform Application Toolkit

MPAT is a WordPress<sup>1</sup> based authoring system to create applications for SmartTV. As such, MPAT natively supports HbbTV (Hybrid Broadcast Broadband TV), the most common standard in Europe to provide supplementary content for broadcast programmes. Since it is based on WordPress, MPAT allows content creators to use the same tools they are familiar with to create web pages and thus reduces the entrance barrier to building TV applications.

WordPress is particularly popular among web site creators as there is a large number of supported templates (free and commercial) and plug-ins that bring various functions to choose from, so that content creators can focus on the content creation and do not have to dive into the specifics of web site creation. MPAT follows this approach and supports plug-ins for voting, displaying social messages, image galleries, ad insertion and 360° video. The toolkit is an enhanced version of the HAT editor developed in the EC-funded project FI-CONTENT.

### 1.2. Journalistic Content Development

Looking for attractive application formats, rbb Innovation Projects, a research unit at one of MPAT's two broadcasting partners, Rundfunk Berlin-Brandenburg (rbb), teamed up with rbb's editorial department for "Family Programmes" which is, among others, responsible for TV programmes for young people (12-19 years old). Their plans to produce a documentary series about a band of young musicians on their way to success in music business included a concept for a so-called "scrolly-telling" web

---

*Copyright © by the paper's authors. Copying permitted only for private and academic purposes.*

---

<sup>1</sup> <https://wordpress.org/>

documentary, built with the Open Source software Pageflow.<sup>2</sup> The format allows the presentation of narrative content in sequential order, using attractive full screen visuals, while at the same time allowing ‘side pages’ for providing additional information and depth.

Soon the partners in the MPAT consortium decided that this was a format that would work well on TV screens and partners agreed to adapt the concept. For technical and organizational reasons, early versions will not enable importing fully developed Pageflow web documentaries. One major reason for this decision was that MPAT intends to provide features and functionality that are not yet enabled in Pageflow.

## **2 Related Work**

Availability of tools suited to create TV applications for general broadcast users is limited. While developer suites exist for manufacturer specific platforms, such as Samsung TOAST, a TV Web Application developer tool for Samsung Smart TV and WebOS systems, so far most applications for HbbTV have been written by coders. The few tools aimed at app creation by content creators (such as the TV App Engine, Inio.TV or the initial version of HAT) use their own workflows and interfaces and present a significant entrance barrier for developers accustomed to web design tools.

HbbTV applications that enable interaction with audio/music content in front of the TV screen could not be found to date.

## **3 Application Concepts for Storytelling & Audio Interaction**

### **3.1 SlideFlow Concept**

MPAT will enable various navigation models, from applications which appear like traditional websites, with a menu bar to navigate between a number of interlinked pages, to a time-based interaction model where action points or related information can be attached to relevant points on the timeline of a broadcast or on demand-video. In addition to these, SlideFlow will enable programme makers to publish complementary presentations of content related to a

programme, be it a series, a documentary or a regular TV show for which editors occasionally want to publish extra presentations on event highlights.

A SlideFlow presentation is a sequence of fullscreen images or videos with text overlays, which can be supplemented with image galleries, and/or interactive options like voting, social media feeds or embedded audio.

The first public pilot for this new navigation model was published on 21 November 2016 on the German national TV programme KIKA, the national children’s channel of Germany’s public broadcasters ARD and ZDF. For eight weeks, anyone receiving the channel via satellite or cable on an HbbTV-enabled SmartTV device will be able to experience the first SlideFlow application on HbbTV. The application will be compatible with HbbTV devices of all generations, i.e. HbbTV 1.0, 1.5 and 2.0.

### **3.2 Karaoke Concept**

The audio interaction feature of the MPAT system enables programme makers to invite their users to really interact with their content. In the case presented here, people in front of this HbbTV application can not only listen to the official music video of the featured teenage musicians, they will be invited to pick up their instruments and play along their catchy song.

To guide the user intuitively, the SlideFlow page shows objects or persons which are connected with related audios, in our case the instruments the user can play alongside the music video (see Figure 1). With the help of the arrow keys on the Remote Control for the TV set, the user navigates to the desired instrument. A highlighted play icon indicates that the audio file can now be played by pressing the OK button of the Remote Control.

### **3.3 Application**

As rbb is a public broadcaster, it can not derive direct income from placing advertisements in either the programme itself or the supplementary material. Additionally, as the show is aimed at a young audience, regulations would limit the advertisement possibilities, even for a commercial broadcaster.

As a result, the main incentive for providing supplementary material is not monetary, but in emotionally binding the viewer to the show, making

---

<sup>2</sup> <http://pageflow.io/en>

them watch subsequent episodes and invite their friends to do the same. Especially for a younger audience, HbbTV will have to provide innovative and, wherever possible, highly interactive features so as to motivate them to stay in front of the TV screen rather than changing to more interactive devices like smartphones or gaming consoles.

Viewers who can play or sing along with the band and invest effort there are more likely to stay with the programme than viewers who just read the texts and look at photographs. Additionally, a ‘play-along’ page has (literally) a replay-value, in other words viewers are much more likely to return to the page multiple times.

Technically, the play-along feature is provided with a set of five ‘Music Minus One’-style audio mixes of the song “I won’t break down”. For this, all instruments and the vocalist were recorded separately and the song was remixed with one of the tracks (drums, base, guitar, keyboard, vocals) missing.

Five hotspots, selectable via keyboard navigation (arrow keys), are put near the canvas on which the official music video will be playing while the user plays along.



Figure 1: Screenshot Band Camp Berlin, Play-along video screen

Technically, it would also be possible to navigate to individual pages for each of the five versions.

To support the user who, by definition, cannot know this newly released piece of music, the lyrics or the score for the selected instruments will be shown on screen, in ‘karaoke-style’ form. Despite the extra effort

required for providing scores and lyrics, the editorial department decided, it was well worth it, especially because this will be the first play along application on HbbTV.

## 4 Implementation / Technical Discussion

While WordPress provides its own web server functionality, in most broadcast environments it is not desirable to serve content directly from the editing suite. The reasons for this are technical, legal and organizational. In many cases any content provided by the broadcaster needs to be approved and may not be modified afterwards.

To support this working model, MPAT supports technical separation of editing and production layout.

Editing is done on a local or hosted WordPress instance that allows access to templates, APIs, plug-ins, content and a local layout.

Content editors use this system to create and test the application – in this specific case the Band Camp SlideFlow application.

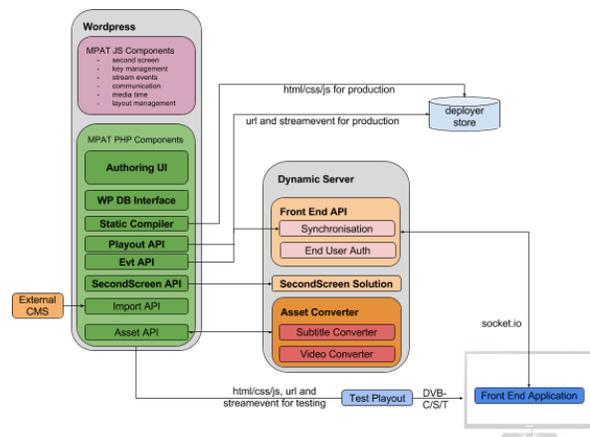


Figure 2: WordPress based editing environment

Once the application is finished and approved, the pages comprising the application, including any static content are exported as static web pages in Docker format and moved by a dedicated deployer tool to the playout-environment of the broadcaster.

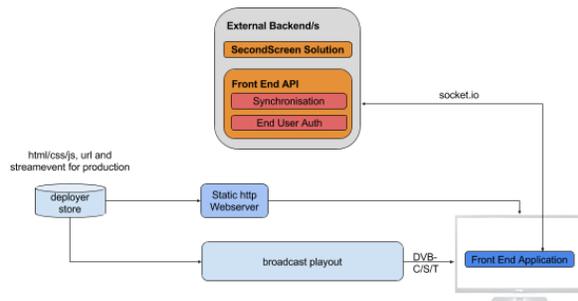


Figure 2: MPAT ployout

The partners in the project are Fraunhofer FOKUS (DE), Institut fuer Rundfunktechnik (DE), Rundfunk Berlin-Brandenburg, rbb (DE), Mediaset (IT), Fincons (IT), Leadin (FI), University of Lancaster (UK), ParisTech (FR)

While pages on the ployout server can still reference live content when needed and approved – for example, a weather app would still access current weather data and a Twitter app would still need to access the current live feed – any content that does not need to be changeable will no longer be modifyable by the content editor. In the case of the Band Camp Berlin application, all content is static after review and approval.

## 5 Conclusion

The Band Camp Berlin application is the first broadcast application created with MPAT that uses the SlideFlow concept. It uses all media types currently supported (video, audio, 360° video, images and text) and is as such well suitable as a showcase application. As MPAT is designed to be extendable by plug-ins, future work will provide additional functionalities to improve and enhance upcoming applications authored with the tool.

## 6 Acknowledgments

This work is supported by the Multi-Platform Application Toolkit ([www.mpat.eu](http://www.mpat.eu)) Collaborative Project, funded by the European Commission through the Horizon 2020 Programme (H2020-ICT-2015, call ICT-19-2015) under grant agreement n° 687921. These contents are the sole responsibility of the MPAT Partnership and can under no circumstances be regarded as reflecting the position of the EU or the Programme’s management structures.