
Multi-Platform Application Toolkit

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Abstract

This paper presents the current status of the Multi-Platform Application Toolkit, an extensible platform for the simple creation of interactive multi-media applications for connected TVs.

Developing applications from scratch requires considerable resources and for this reason they are often simply too costly for single formats or shows to contemplate. The situation is exacerbated when multiple target platforms are considered, such as HbbTV and Open Web. MPAT addresses this using an approach based on WordPress, aiming to make application development affordable and sustainable while creating a new eco-system for content creators, theme and plug-in developers. With MPAT, media companies can semi-automatically author their set of customised applications that are then populated with content by the editorial staff or by linking MPAT to existing content management solutions.

Author Keywords

CMS; HbbTV; Multi-Platform; TV program-related content; Social Media; Multi-screen

ACM Classification Keywords

H5.2 Graphical user interfaces, Screen design, User interface management systems

Introduction

To date, over 20 countries have launched HbbTV services while others announced future support, making it the de facto standard in the European connected TV market. HbbTV plays a major role in media convergence. However, development of applications is still not sufficiently convenient due to market fragmentation, both in devices and revisions of the standard. The lack of widely adopted solutions increases time and cost of delivery.

MPAT aims to fill the gap between quality and need for cost-effectiveness of broadcasters and creative agencies. Built on top of the most widely used content management system, our toolkit utilizes the WordPress interface to create web applications with HbbTV specific features quickly while maintaining a high quality.

While the latest released version of the HbbTV specification directly supports second screen discovery and timed text markup language, content providers should not need to be aware of these technical details and should be able to sue these features, regardless of which equipment an individual customer uses. The underlying toolkit will provide an abstraction layer from the underlying hardware, whether this involves different HbbTV versions or other, web based, connected TV platforms. MPAT will provide a wide set of components and strict rules for third-party plugins to ensure backward compatibility.

By the end of the development, MPAT will also provide tools to automate the management of media assets and deployment of applications to speed up delivery processes.

Related Work

There is a wealth of Document Engineering techniques for web application authoring, but the reality is that web sites are often designed with commercial authoring tools. Recently, many frameworks have emerged to ease the burden of web application creation, and blogging frameworks like WordPress have been of increasing importance for the creation of simple web sites.

In the web domain, content creators, especially those creating small websites, are most likely to use WordPress. It has the largest market share by a wide margin. The main advantages for the content creator are the availability of tried and tested, but customizable, templates of professional quality and a wide range of plug-ins for specific, often used functions. In most cases a WordPress user does not need to pay specific attention to making their web pages responsive, as it can be assumed that the template will be designed to cover device adaptation.

The Multi-Platform Application Toolkit has its predecessor in the HbbTV Application Toolkit (HAT) editor created in the FI-CONTENT 2 project. HAT [1] embodied the same underlying concepts of providing a simple to use tool for content creators and developers of programme-accompanying content. Unlike MPAT, the system provided its own proprietary web interface and was specifically aimed at the creation of primary screen HbbTV 1.0 applications. HAT was limited by a small set of GUI templates that could be filled with text, images, audio and video content via a responsive HTML5 user interface for desktop and mobile devices alike. A REST-API to the content model of the HAT editor allowed its integration into the existing production environment of

content creators and thus supports the alignment of HbbTV apps to established workflows [0].

An alternative approach to allow the creation of programme-accompanying content is the TV Application Layer (TAL) created by the BBC, which provides a set of JavaScript libraries, which abstract the device capabilities (Connected TVs, set-top boxes, games consoles, Blu-ray players) from the application and acts as a compatibility layer. TAL does not address how the applications themselves are created [2].

Toolkit Created Applications

So far, three applications built with HAT were on air in 2014 and 2015 at the German broadcasters Rundfunk Berlin-Brandenburg (RBB), KiKa and einsfestival.

Over the weekend of 8-9 November 2014, Rundfunk Berlin-Brandenburg broadcast a 25-hour long programme to mark the 25th anniversary of the fall of the Berlin Wall. Using the HbbTV Application Toolkit (HAT) technology developed by Fraunhofer FOKUS and IRT, the broadcaster incorporated a live social media feed in the programme. HbbTV-Viewers equipped with HbbTV-enabled TV sets could access this additional content via the 'Fall of the Wall' application in order to interact with on-screen messaging and photos. Users were able to contribute content via social networks and/or RBB website, and RBB editors acted as moderators of the resulting blog



Figure 1: "Mauerfall" application in editor view

The second HAT generated application was the "Verknallt & Abgedreht" app during the 2nd February and 13rd February 2015. The show was broadcast over 20 episodes. While the show was live on air, the app was displaying a live feed, generated by HAT. The application was available over DVB-T and DVB-S and had more than 16.500 app interactions made by users.



Figure 2: HbbTV Application Toolkit generated app - Sandmännchen

The third, and still on air, application generated by the HbbTV Application Toolkit is the "Sandmännchen" app. The "Sandmännchen" is a popular German children daily TV show on RBB, KiKa and MDR. The daily "Sandmännchen" is a short, self-contained video of about 10 minutes. The application is displayed the daily episode and four older episodes in a carousel. The application utilizes the same API as the mobile application of the "Sandmännchen".

Concept

The goal of the Multi-Platform Application Toolkit (MPAT) is to open up the emerging possibilities of hybrid TV to content producers, by providing an easy-to-use authoring tool for the creation of interactive TV related multimedia applications. The project is on the one hand focusing on delivering essential tools to create basic applications while on the other hand the system can be expanded with 3rd party plugins to enlarge the functional possibilities and also templates to enhance the visual and navigational experience.

MPAT offers a system that enables the creation of TV multi-screen applications, supporting different standards (like HbbTV or the Open Web Platform) on multiple platforms (tablets, smartphone and connected TVs). Its approach aims to make application development affordable and sustainable while creating a new eco-system for content creators, theme and plug-in developers similar to WordPress in the web domain. With MPAT, media companies can semi-automatically author their set of customized applications that are then populated with content by the editorial staff or by linking MPAT to existing content management solutions.

Applications relating to the TV and video content should allow a seamless transition from the live TV experience to on-demand consumption. The accompanying user experience should always adapt to the context.

The core system consists of a content database and a content generator with elemental modules necessary for the author to build basic applications. For more complex scenarios it can be expanded with additional plug-ins, themes and templates gathered in an open marketplace.

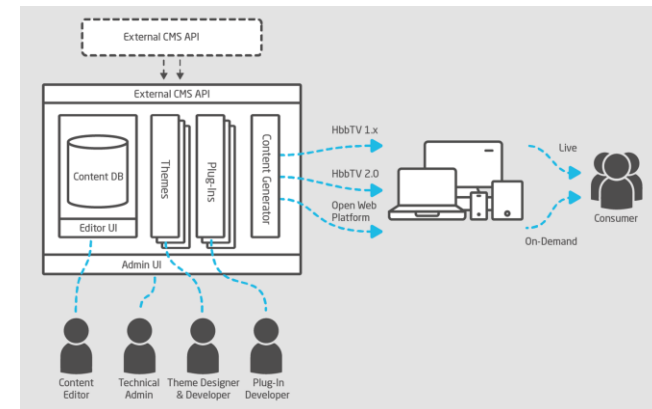


Figure 3: MPAT Core Functionality and some Roles

An important part of MPAT is the support of different roles to match the existing work flow used by broadcasters or other content producers. In many cases, the current work flows have strictly defined responsibilities of the participating individuals. A designer is only responsible for the look of the application, but may not add or change content. An editor may add content, but not change the basic layout of a page.

WordPress allows the creation and definition of roles, which MPAT will build upon.

Architecture

The MPAT system architecture is presented in Figure 4. There are three primary parts in this architecture:

1. the WordPress subsystem, which is detailed below;
2. the backend software is responsible for responding to dynamic requests from TVs and second screens;
3. the content server is responsible for serving media in all forms to TV and second screens;

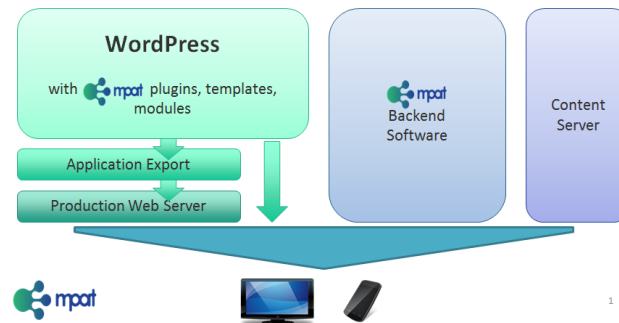


Figure 4: MPAT system overview

As our broadcasting partners often have web servers already in place in their production environment, they have expressed the requirement that WordPress should not be mandatory for the provision of the created application to the end users. As a result, we have added an export of WordPress content to web applications that can be served by an existing web server.

The MPAT system is extensible. The MPAT project will provide a core of open source and free WordPress modules, templates and widgets. A set of APIs will be available to extend the MPAT core with your own plugins, as well as with commercial plugins from any vendor.

It will also be possible to integrate external tools into the MPAT system, such as tools like media editors and encoders are already used by broadcasters; online social media integration services, such as Scribble; new tools like timed metadata editors, allowing the preparation and use in the MPAT applications of points of interests in the broadcast stream to provide, for example, follow-up URLs or of interactive advertisements.

Use Cases

MPAT is a solution to build rich content centric social experiences. Finding the right balance between content producer needs, enabling technologies and consumer value is critical for media companies. MPAT does cover social process between content producers, broadcasters and audience. Multiple roles are included building the actual experience.

During the MPAT project some of the possible use cases will be implemented and piloted in more detail. The design phase is heavily driven by user centric approach and use cases will be built based on user insight gained from previous studies and workshops with focus user groups.

A number of unique use cases were proposed by the project partners themselves. These were collected through a number of mechanisms, including

engagement with internal project teams responsible for content creation and presentation, and interviews with external organizations that have no experience with creating applications for television as a medium. Previous research activities within partner organizations were also brought to discussion and for some use cases there was already existing business rationale.

Priority between the use cases was achieved through a ranking mechanism, with each project partner declaring the set of use cases that they deemed to be most important. Given that the project consortium is diverse, with broadcasters, universities and research organizations all represented, the resulting outcome was relatively generalized. In fact, those use cases chosen for inclusion in the project had almost unanimous agreement between partners, and provide a representative sample going forward. Essentially focusing on actual consumer experience did results in a joint framework where finding priorities between business needs, technical possibilities and consumer value was possible.

Moving Forward and Future Work

Progress continues on developing the MPAT toolkit, with development effort now placed in implementing the functionality described previously. Furthermore, graphical user interface designs are also been created. These will be used in further focus groups to ascertain feedback early in the project development lifecycle. Consequently, changes will be made in response to any potential usability concerns or improvements deemed important through the conduction of this testing.

Conclusions

The Multi-Platform Application Toolkit as a connected TV platform provides many technical possibilities. Its goal is to create baseline for content development and distribution. Finding the focus and common vision between diverse partners involved in the project is essential for productive work. Focusing more on the users has been effective way of finding common language to agree between different perspectives related to complicated eco-system.

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