1st Project Periodic, innovation and standardisation report

Deliverable D1.1

MPAT File ID:	1st Project Report.docx
Version:	1.
Deliverable number:	D1.1
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Work Package:	WP 1
Task:	T 1.1
Nature:	R – Report
Dissemination:	PU – Public
Status:	Final
Delivery date:	01.12.2016

Version and controls:

Version	Date	Reason for change	Editor
1	01.12.2016		Christian Fuhrhop
2			
3			
4			

Executive Summary

This report covers the first annual period of the MPAT project from December 2015 to November 2016.

In this time period the project identified a set of typical use cases and scenarios, derived requirements for the MPAT editor from this, developed a consistent design for the UI and implemented a functional MPAT editor and a set of support tools.

Using early versions of the MPAT editor, the project created small showcase applications for the IFA entertainment fair in Berlin and the HD Forum Italia Conference, both in early September and October, respectively.

Based on the experiences from these showcase applications, the MPAT editor was further improved and used to create the first large pilot application for the MPAT project, the HbbTV supporting material for the Band Camp Berlin TV series produced by rbb and broadcast Germany-wide via the public broadcasting channel aimed at children and adolescents, named KiKa.

While it was originally envisaged that the project would primarily provide additional in-page functionality as plug-ins to the HAT system, created in the earlier FI-CONTENT project, two significant changes to the earlier structure were specific to the MPAT project and directly resulting from customer (broadcasters) requirements.

These additions were the concept of different roles in the application creation process, allowing, for example, the creation of a page layout by one user, allowing a subsequent editor only to modify the content within a page, but not the overall appearance of the page. Inclusion of a set of roles, which go beyond what WordPress already offers, is a requirement based on the need to support existing organisational structures in place at broadcasters.

The second significant change was the popularity of the 'Page Flow' concept for providing additional information for documentary programs on the Web. As this is a popular tool for our target group and the presentation mode maps well toward consumption on TVs and TV-like devices, we added a complete new application model to our MPAT editor.

To increase visibility and awareness in broadcasters, creative content creators and other stakeholders, MPAT presented demonstrations and showcases early in the project lifetime on relevant industry fairs and events.

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1 Project context and objectives

The MPAT project is the result of the need for tools to create HbbTV content present in the broadcast industry. Creation of HbbTV content to support individual programmes and TV series is considered expensive and almost exclusively performed for high profile or 'flagship shows'.

On the other hand, broadcasters and content creators usually are making additional content available on the Web, giving a clear indication that it is not the cost of creating supplementary content, which is the critical factor, but the cost of making it available on the TV screen, which is the limiting factor for programme related HbbTV applications.

As a result of this situation, MPAT aims to provide a tool for the easy and cost efficient creation of HbbTV applications.

As stated in the DoW;

„MPAT will create the technical core as well as the business foundation for a new ecosystem focussing on the design and creation of attractive TV multiscreen applications. The main advantage of MPAT is that it is **extensible** in two dimensions: **plug-ins for building additional features and themes for designing the look and functionality of the application**. The entire concept fully builds upon established and ever-developing standards like HTML, CSS, JavaScript, plus HbbTV as an extension for the TV domain."

In its first year, the project has been steadily working towards this goal and achieving most of the objectives stated here.

The DoW also states:

„*The aim of the project is to develop a modular platform to create and edit **multi-screen applications for programme-related interaction for TV, video on-demand and OTT content**. Applications relating to the TV and video content should be usable on any device at any time, allowing a seamless transition **from the live TV experience to on-demand consumption**. So whether the content is viewed in a live linear broadcast environment or as on-demand content, the user experience is always appropriately adapted to the context.*"

In favour of having an early large-scale pilot and providing a solid basic set of functions, support for multi-screen functionality has been limited in the first year and will receive a stronger focus in year two. This has also been a result of analysing typical use cases and scenarios, where multi-screen support is seen as desirable, but not mission-critical for most applications, leading to more activities to features that had a higher relevance for content creators.

2 Results in relation to the Work Programme

LEIT - Content technologies and information management Objectives	MPAT Contributions in Year 1
"The challenge is to strengthen Europe's position as provider of innovative multilingual products and services based on digital content and data, addressing well identified industry and consumer market needs"	MPAT identified the needs of the primary stakeholders (mainly broadcasters and content creators) early in the project through work performed in WP2. Subsequent work provided an early product version aimed at addressing identified industry and consumer needs.
"To provide professionals and citizens with new tools to ... create, access, exploit, and re-use all forms of digital content in any language and with any device."	MPAT provides the means to provide access and re-use content for TV consumption, which previously were generally only exploited on web based presentation. Specifically, MPAT now supports a 'Page Flow' style navigation model, allowing the re-use of content prepared for web consumption in this format, which is increasingly popular with creators of documentaries.

ICT-19 - Specific Challenge	MPAT Contributions in Year 1
"The demand is growing for high-quality content and new user experiences." *"At the same time, thanks to ubiquitous technology adoption, widespread use of mobile devices, broadband internet penetration and increasing computing power the consumption of content anywhere, anytime and on any device is becoming a reality."*	As stated in the previous paragraph, MPAT specifically provides easy access to TV applications for content originally only available on traditional web browsing devices. By doing so, content, especially content enhanced with video, becomes available on TV screens via broadband, increasing availability and accessibility.
"Consequently, developments related to content creation, access, retrieval and interaction offer a number of opportunities and challenges, also for the creative and media industries."	MPAT offers the opportunity to provide TV based applications with significant cost reductions, making the provision of supplementary information for TV programmes, on the same platform that the primary content is consumed

	on, commercially feasible. This has been demonstrated in the project, a couple of months earlier than expected, by providing the tools for creating the 'Band Camp Berlin' HbbTV application.
"In order to keep pace with the trends and remain competitive, those industries need to explore new ways of creating and accessing content."	While MPAT aims to provide the tools for new ways of creating and accessing content in the TV domain, the project also follows industry trends closely. For this, MPAT members are present at most exhibitions and conferences related to TV applications and technologies. In addition, partners have close industry connections and are also active in consortia and standardization bodies. This close attention to the market also enables MPAT to identify emerging trends early and act upon this. The most obvious case of this is the addition of the 'Page Flow' navigation model to MPAT, but there are also other indicators of this, such as the support for 360° videos in MPAT.
"The opportunity to establish new forms of content and user engagement could be transformative to many businesses in creative and media industries."	While the 'Band Camp Berlin' application is the most visible use of MPAT so far, it should be noted that Mediaset also showcased a first version of an ad-replacement application, which has the potential to add new business opportunities for commercial broadcasters the second phase of MPAT.
ICT-19 – Scope	**MPAT Contributions in Year 1**
"The focus is on research, development and exploitation of new or emerging technologies (e.g. 3D and augmented reality technologies) for digital content creation to support the creative and media industries and for unlocking complex information and media and interacting with them."	To provide a lower 'entrance barrier'. MPAT builds on the popular Wordpress tools to enable content creators to build applications without the requirement of learning dolman specific tools from scratch, reducing the complexity of creation. On the research and development side of emerging technologies, MPAT is an 'early adaptor' and supporter of 360° content. As a content format, 360° is mostly unusable as a broadcast format, but immensely suitable for consumption on TVs, provided the content is delivered from a suitable playout platform via IP, thus providing a

ICT-19b – Topics	MPAT Contributions in Year 1
	natural 'playground' for the hybrid use of broadband and broadcast technologies.
"Demonstration of the viability of new technologies and validation of innovative solutions through large scale demonstrations, pilots or testing of use cases so as to guarantee sustainable deployment that facilitate convergence and integration between broadcasting, broadband Internet-based services, audio-visual and social media."	MPAT is currently 'on air with the supplementary, HbbTV based, content for the 'Band Camp Berlin' TV series, providing additional audio and video snippets, 'behind the scenes' texts and photographs for the series. Additional innovative functions are a 360° 'making of the video' presentation and a play-along 'karaoke' feature. As the 'Band Camp Berlin' programme, which was produced by MPAT-partner rbb, is broadcast as part of the KiKa offerings, it can be received by any TV in Germany, providing a first large scale trial of MPAT and the MPAT created application. This early large scale demonstration will also allow the MPAT project to gather technical and social feedback earlier in the project lifetime than initially expected, and thus will have more impact to the subsequent project activities and implementation work.
Partially addressed by MPAT: *This also includes new forms of experiencing environments (immersive, surrounding, multi-sensory and interactive, in any device, always connected)."*	In the original project proposal, the aspect of new forms of experiencing environments was considered as something MPAT would only vaguely be concerned with. Since then, 360° video has become increasingly popular and has also made the transition from a 'special showcase' experience to an affordable end-user technology. While not expected at the time of the proposal, MPAT now supports the display of 360° on HbbTV enabled TVs, adding new experiences for TV viewers.

3 Achievements per Work Package

3.1 WP 1 - Management

In the first year of the project, no significant issues related to project management came up. The project is still followed the plan outlines in the original DoW. No amendments to the DoW have been made or suggested.

Deliverables have been mostly provided on time, with only two significant exceptions:

- "D7.1 - Project website"

  This deliverable should have been delivered in the first month of the project. The actual web site was created in December 2015, but was not made public. We were hoping to acquire the "MPAT.eu' domain name for the project, which did not expire from its previous incarnation until January 2016. In the first project meeting, we decided to wait until the second week of January to go online under the 'MPAT.eu' name instead of going online immediately under the less desirable 'MPAT-project.org' or 'MPAT-project.eu' domains.

- "D2.1 - Initial MPAT Scenarios"

  An initial version of the deliverable was finished on time and delivered to the PO. However, we decided internally that it would be beneficial for a scenario deliverable to not only include a list of scenarios, but also provide a ranking in terms of applicability and coverage of MPAT functionality. As this was deemed better suitable for a face-to-face discussion than for a phone conference and the next full project meeting was in early February, the project decided that the ranking of the scenarios was a relevant addition to the document and that it was better to provide the final version a month after the initial deadline than use the initial version submitted to the PO without the ranking information.

The project conducted four full consortium meetings in its first year:

Kick-Off Meeting, Berlin (hosted by Fraunhofer FOKUS), 16-17 December 2015

2nd Project Meeting, Saariselkä (hosted by Leadin) 7-10 March 2016

3rd Project Meeting, Munich (hosted by IRT) 27-30 June 2016

4th Project Meeting, Paris (hosted by Telecom ParisTech) 14-16 November 2016

In addition to these full meetings, two additional meetings where held:

Co-creation Workshop, Berlin (hosted by Fraunhofer FOKUS), 24-25 May 2016

> The primary reason for the workshop was the availability of more information regarding the upcoming pilot demonstrators and the subsequent work planning and re-prioritizing of requirements and development plans to ensure availability of all features required by the showcases.

Coders Meeting, Lancaster (hosted by University of Lancaster) 24-26 August 2016

> With the upcoming demonstrations at IFA the following week and IBC following a week later, a 'coders only' workshop was held in late August to allow final integration of all MPAT elements (backend, frontend, tools) in time for those events (and the HD Italia event and internal rbb 'Band Camp Berlin' deadlines soon after).

3.2 WP 2 - Scenarios

WP2 was driving the early phase of the project, essentially its first three months, and provided the initial scenarios by which MPAT is driven.

The primary output of WP2 in year 1 of MPAT is deliverable 2.1, the "Initial MPAT Scenarios", based on a collection of broadcaster requirements gathered for the creation of HbbTV 2.0 as well as on requirements provided by MPAT project partners.

Thirty-two potential use cases have been developed and evaluated, leading to a list of detailed requirements extracted from the scenarios and use cases. This list of requirements then shaped the work of the subsequent work packages 3,4 and 5.

3.3 WP 3 - Consistent user experience design

WP 3 produced three deliverables during the first year of the project.

D3.1 covers the plan for evaluating the usability and the suitability of the MPAT tool for building platform-agnostic media presentations. This usability testing will include the experiences from the users of the MPAT tool itself (the content creators) as well as those of the content consumers interacting with MPAT created applications on their devices.

The document covers measurement procedure and ethics as well as measurement metrics. In addition, it outlines the partner roles and responsibilities in the evaluation process.

Deliverable 3.2, the usability findings, presents early feedback from content creators. As the MPAT editor didn't provide sufficient functionality at that time to be used by content creators for this, feedback was solicited, based on a series of wireframe designs and a workflow simulation. The feedback received from focus groups was generally positive, with designs well received in all cases. A number of, often detailed and specific, suggestions were gathered during these sessions and later incorporated into the MPAT tools.

Deliverable 3.3, the UI Design, essentially represents the 'style guide' for MPAT, defining the terms used and describing the interaction methods for the MPAT UI. It is accompanied by a set of graphics and icons that have been used in the MPAT editor and in the created applications.

3.4 WP 4 - System design and quality assurance

While WP 3 was focussed on the usability and user aspects of MPAT, WP 4 covers the technical aspects of application creation and playout.

In year 1, WP4 has produced three deliverables.

D4.1 "System requirements" addresses the suitability of various CMS implementations, based on the requirements derived for MPAT from WP 2 work. Analysing the three most popular CMS solutions (WordPress, Joomla and Drupal), as well as considering writing an MPAT specific system from scratch, the task concludes that the most suitable available CMS to base MPAT on is WordPress, mainly based on its market share, availability, extensibility and strong developer and user community.

D4.3 "System architecture and API documentation" is primarily useful as an internal document, describing the overall MPAT structure and the interfaces between its primary elements – the front end, the plug-ins and the playout backend. This deliverable essentially defines the technical interfaces of the activities covered in tasks 5.1, 5.2 and 5.3 and is enabling the mostly independent work of these tasks.

The third WP 4 deliverable, "D4.5 Developer tools and development guidelines" defines the rules and tools used for code developments, such as development sprints, git usage, jira task handling, bug tracking and code style rules. Similar to 4.3, this is mostly for internal use to ensure that code development in WP 5 is consistent and will not lead to integration conflicts. It will become more relevant as an external document when developers outside the MPAT project partners will provide plug-ins and additional functionality to MPAT later.

3.5 WP 5 - Implementation

As WP 5 is the application work package, all three deliverables at the end of year 1 are of the type 'demonstrator' (backend/frontend/plug-ins). The original project plan assumed that most of the first year would be dedicated to creating the MPAT system, based purely on the original scenarios and requirements defined in the first three months, with usage for the creation of the showcase demonstrator and pilots following in year two.

During the early phases of the project the chance arose to provide a pilot application for the Band Camp Berlin programme, which presented, for a variety of reasons. a nearly perfect opportunity for MPAT.

While produced by rbb, a regional German public broadcaster, the series is shown on Kika, a nationwide broadcast channel, inherently increasing the size of the pilot audience and visibility of project results. In addition, KiKa, though named "Kinder Kanal" (children's channel) also caters for adolescent

viewers (the 'Band Camp Berlin' series features a group of seventeen year old musicians) and thus reaches viewers that have grown up as 'digital natives' and for whom supplementary digital content is not a 'cool new thing' in itself, but seen and evaluated in comparison with other online offerings.

Finally, 'Band Camp Berlin' is a series that allows the provision of supplementary context that goes beyond simple text pages and pictures and can support unusual features such as a play-along 'karaoke' style audios and a 360° 'making of' video.

But, as far as WP 5 was concerned, this required modification of the internal work plan, as 'Band Camp Berlin' went on air in November 2016 (with the application required to be available for internal quality control at rbb and ZDF (the latter being responsible for the technical playout for KiKa content) at the beginning of November. Additionally, a smaller 'teaser application' had to be provided for IFA, making it necessary that the MPAT system would be sufficiently usable for application creation in August and fully supporting the feature set needed by rbb at the end of October.

In addition, the option became available to present a Mediaset showcase application at the HD Forum Italia event in October, requiring the functionality needed for this to be available in September.

Resulting from our intention to support these early pilots, the WP 5 activity plans were re-scheduled, giving priority to 'Page Flow' like navigation, 360° integration and audio hotspots and usability issues in video playback. This mainly influenced the work on plug-ins specified in WP 2, which were not implemented if not needed in the early pilots. Work on these will be shifted to WP 2 for support of the second phase of pilots.

3.6 WP 6 - Pilots

As already outlined in the previous section, MPAT started its pilot activities earlier than originally expected, with the "Band Camp Berlin" HbbTV application going on-air on November 21st and the Mediaset ad-insertion demonstrator at the HD Forum Italia Conference on the 6th of October 2016.

The original assumption in the proposal was that the first year would be spent looking for an pilot opportunity at some time in year two. As TV broadcast planning is driven by the video content (and not by the HbbTV supplementary content), we were aware that we would need to adapt to the broadcast schedule of the primary content, assuming that we would be able to find something for which MPAT was suited between, approximately, December 2016 and June 2017.

Due to this, the work schedule for WP 6 was intentionally kept flexible, since we couldn't predict a precise pilot date by the time of proposal writing. As a result, the moving of the first pilot activities to an earlier date (about a month or two earlier than planned for), did not cause any significant issues for activities in WP 6.

At the end of the first project year (November, 30th, 2016), the "Band Camp Berlin" pilot is still on air, so feedback is still being gathered (this includes feedback on technical issues as well as from viewers about content and usability), so no evaluation has been performed yet. The only WP 6 deliverable in first year, "D6.1 Research questions and measurement methodology" describes the plans and criteria for gathering and evaluating the results of the pilots.

3.7 WP 7 - Exploitation and dissemination

Since MPAT, as a project, is strongly 'product oriented' and aiming at the adoption of the MPAT editor as an application creation tool by content creators in the broadcast industry, most of the dissemination effort was spent on presenting on industry fairs, gatherings and other events.

Broadcast industry events for which MPAT was present in some form included IBC, IFA, Medientage, HD Forum Italia, the HbbTV Symposium and the HbbTV Interop Event.

As the acceptance of tools strongly depends on 'seeing it in action', care has been taken to have, even at early events, a working version of the MPAT editor available at each industry event and show the editing functions on, at least, a small demo application.

Due to the primary targeting of industry events, the scientific output of the project has been just three papers at scientific conferences in the first year, at TVX 2016, the FKTG Conference and the Forum Media Technology & All Around Audio Symposium.

4 Publications and Presentations

Event	Date	Location	Description of activity
NAB conference	April 16 - 21, 2016	Las Vegas	Distributing flyers
27. FKTG	May 09.-11., 2016	Leipzig	Fraunhofer booth & Presentation
TVX conference	June 22 - 24, 2016	Chicago	Short paper, demo
IFA conference	September 2 - 7, 2016	Berlin	ARD booth "digital world" (RBB & IRT) Fraunhofer booth
IBC conference	September 9 - 13, 2016	Amsterdam	IRT booth dedicated to its European funded projects, Fraunhofer booth
Medientage conference	October 26 - 28, 2016	Munich	IRT booth, Fraunhofer booth
Digital2016	6 - 7 June, 2016	Newport	Presentation & talking to experts from the industry
HD Forum Italia conference	October 6th/7th 2016	Vatican city	Demo
EU cluster meeting	March 18th, 2016	Brussels	Presentation/Poster
Interop Workshop	13th/14th April, 2016	Munich	Flyers & talking to experts from the industry
Interop Workshop	November, 23-24, 2016		
TV ID innovation days	May 2016	Rome	Demo & booth
Republica	May, 2-3, 2016	Berlin	Demo & booth

Other publications	Link to publication
Article in FKTG journal	https://www.fkt-online.de/
Article in IRT annual report	https://www.irt.de/de/publikationen/jahresberichte.html
Article on SOIEL	http://www.soiel.it/news/dettaglio/hybrid-broadcast-broadband-tv-impegno-fincons-group/
Article on Data Manager Online	http://www.datamanager.it/2016/06/fincons-partecipa-al-progetto-mpat-lo-sviluppo-nuove-applicazioni-hbbtv/
Article on BtBoresette	http://www.btboresette.com/hbbtv-progetto-mpat-procede-anche-fincons/
Article on Connessioni	http://www.connessioni.biz/website/fincons-group-partecipa-al-progetto-mpat.html

5 Innovation and Standardisation

Taking the HAT editor, which was the result of the earlier FI-CONTENT project, as a base, MPAT has added functionality to make the system more attractive to broadcast users and content creators

Based on use cases and scenarios derived from broadcaster experiences and needs, the primary innovative features of MPAT are:

- Based on WordPress as the underlying CMS
- Role support for broadcaster administrative infrastructure
- Full system including asset manager and application export
- Consistent layout and interface model
- 'Page Flow' navigation
- 360° Support
- Hotspot support

At the moment, MPAT is not directly contributing to standardization, but the project is maintain close ties with the relevant standardization activities through IRT, who is highly active in all aspects of HbbTV standardization and Fraunhofer FOKUS, who is active in W3C, primarily in the areas of WoT (Web of Things) and the Second Screen / Presentation API, where FOKUS provides the Test Facilitator. Fraunhofer FOKUS also follows the 'Web and TV' group, although activities there are currently quite limited.

6 List of Year 1 Deliverables

ID	Title	Lead	Type	Level	Due
D1.1	1st Project Periodic, innovation and standardisation report	Fraunhofer	R	PU	M12 (Nov 2016)
D2.1	Initial MPAT Scenarios	RBB	R	PU	M3 (Feb 2016)
D3.1	Test plan	ULANC	R	PU	M4 (Mar 2016)
D3.2	Usability findings	ULANC	R	PU	M7 (Jun 2016)
D3.3	UI design	LEADIN	R	PU	M10 (Sep 2016)
D4.1	System requirements	IRT	R	PU	M6 (May 2016)
D4.3	System architecture and API documentation	IMT	R	PU	M8 (Jul 2016)
D4.5	Developer tools and development guidelines	FINCONS	R	PU	M4 (Mar 2016)
D5.1	Trial-ready CMS core backend	FINCONS	DEM	PU	M12 (Nov 2016)
D5.2	Trial-ready CMS core frontend	Fraunhofer	DEM	PU	M12 (Nov 2016)
D5.3	Trial-ready Modules/Plug-ins	Fraunhofer	DEM	PU	M12 (Nov 2016)
D6.1	Research questions and measurement methodology	RBB	R	PU	M10 (Sep 2016)
D6.2	Test setup specification backend	RBB	R	PU	M12 (Nov 2016)
D7.1	Project website	IRT	DEC	PU	M1 (Dec 2015)
D7.2	Initial Plan for the Communication of Results	FINCONS	R	PU	M12 (Nov 2016)
D7.3	Initial Plan for the Dissemination and Exploitation of Results	ULANC	R	PU	M12 (Nov 2016)

Glossary

CA	Consortium Agreement
CoA	Coordination Agreement
DoW	Description of Work
EC	European Commission
IPR	Intellectual Property Rights
NDA	Non-disclosure agreement
PO	Project Officer
QA	Quality Assurance
R&D	Research and Development
WP	Work Package

Partner Short Names

Short Name	Name
FRAUNHOFER	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. (DE)
IRT	Institut für Rundfunktechnik GmbH (DE)
RBB	Rundfunk Berlin-Brandenburg (DE)
ULANC	Lancaster University (UK)
MEDIASET	Reti Televisive Italiane S.p.A. (IT)
LEADIN	Leadin Oy (FI)
FINCONS	Fincons SpA (IT)
IMT	Institut Mines-Telecom (FR)