Final Project Summary Report

Deliverable D1.2

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Executive Summary

This report covers the complete MPAT project from December 2015 to December 2017.

As the report includes the period covered by deliverable D1.1 (the first periodic report), most of the content of that deliverable is contained in this deliverable, extended by the report about the final 13 months of the project.

While there first year was mainly about preparation and implementation, although, with "Band Camp Berlin", the piloting phase of the project started earlier than originally planned for due to the unexpected opportunity for providing a supplementary application for that programme, the application creation and piloting were the central activities in the second part of the project.

Based on the experiences from these showcase applications and pilots, the MPAT editor was further improved. While implementation activities in the first year were more focussed on innovative features (SlideFlow, Hotspots, alternative navigation models, 360° video), the second part of a project spent more effort on usability and convenience for content creators, ensuring that MPAT was easier to use in a daily production environment and did not provide obstacles to the workflow.

As HbbTV is well established in Germany, it was expected that the first pilot applications would be created by the German broadcasting partner in the project, RBB. But HbbTV achieved significant traction in Italy in the second phase of the project, so Italian broadcaster Mediaset created a diverse portfolio of pilot applications in this phase. Due to the suitability of MPAT for this purpose, the first publicly broadcast HbbTV applications in Italy were created with the MPAT editor. Additional pilot applications were created by the University of Lancaster, which utilized MPAT to create more experimental services.

As MPAT has reached a mature state after the end of the first project year, communication was more aimed towards industry events and commercial partners than towards academic dissemination, which had been more prevalent in the initial phases.

A workshop at the premises of IRT, held in December 2017 was successful in attracting potential customers for MPAT, informing potential users and in promoting MPAT as a product. Being able to hold the workshop was the primary reason for extending the MPAT project, originally scheduled to end in November 2017, by a month.

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1 Project context and objectives

The MPAT project was 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 was considered expensive and almost exclusively performed for high profile or 'flagship shows'.

On the other hand, broadcasters and content creators usually made 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. This was a limiting factor for programme related HbbTV applications.

As a result of this situation, MPAT aimed 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. In its second phase, MPAT has then demonstrated its suitability of providing HbbTV applications for established HbbTV markets, such as Germany, emerging HbbTV markets such as Italy and also for some experimental uses in the UK.

An important part of this was the capability of MPAT to support a range of HbbTV versions (mostly 1.5 in Germany, but with a strong base of devices with earlier versions and 2.0.1 in Italy and the UK), providing advanced functionality on more capable devices while degrading gracefully for older versions.

2 Results in relation to the Work Programme

LEIT - Content technologies and information management Objectives	MPAT Contributions in Phase 1	MPAT Contributions in Phase 2
"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.	MPAT worked closely with the content creators employed by the primary stakeholders within the project (broadcasters RBB and Mediaset) in building broadcast applications, based on the needs and requirements in the market place by having a strong focus on 'on-air' applications.
"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.	MPAT now offers three navigation models and allowing combinations of them within an application. It also provides a better integration with existing content sources within a broadcasters' workflow, encouraging re-use and saving time.

ICT-19 - Specific Challenge	MPAT Contributions in Phase 1	MPAT Contributions in Phase 2
"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.	The second phase showed, even more than the first phase, the validity of the assumption of the challenge, namely that demand is growing by the start of HbbTV services in Italy. MPAT was capable of supporting this and was the tool of choice for the first HbbTV applications offered on-air in Italy, demonstrating the suitability of MPAT for addressing that challenge.
"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.	MPAT demonstrated and continues to demonstrate its capability to offer opportunities and address challenges in a wide range of HbbTV applications which go beyond the original scope planned for MPAT, for example by offering HbbTV launcher capability, which was not originally envisaged for as part of the project.
"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	To address this challenge, MPAT not only provided applications in the established broadcast domains and uses, but also explored new and untypical domains (for example with the "Tower" and the "Course overview" applications in Lancaster, but also by including a user interested in providing additional information for in-room hotel televisions in the workshop) to ensure that MPAT is not too closely tied to known scenarios, but also remains aware of alternative and innovative uses.

	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.	Especially with the stronger activities regarding the Mediaset pilots, which were more targeted towards commercial use and exploitation than the RBB applications and included scenarios of HbbTV created advertisements (Fiat 500, Fiat Spider) as well as exploring banner advertisement on other applications, the suitability of MPAT for business driven media industries was extended.

ICT-19 – Scope	MPAT Contributions in Phase 1	MPAT Contributions in Phase 2
"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 natural 'playground' for the hybrid use	While phase 1 was more targeted towards providing access to emerging technologies (306° content, SlideFlow navigation) for content creators, phase 2 was mainly concerned with simplifying the interaction with the tools provided and ensure that users in the creative and media industry did not face insurmountable entrance barriers to accessing and utilizing the tools provided, but providing a better integration and a smooth transition part from their established workflows into the MPAT enhanced workflow.

ICT-19b – Topics	MPAT Contributions in Phase 1	MPAT Contributions in Phase 2
	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.	The viability of MPAT as a technology to enable the creation of broadcast capable applications has been demonstrated by an unexpected large number of applications used in on-air broadcast applications. MPAT pilot applications include supplementing a programme for a technology-affine user group (Band Camp Berlin), a small anniversary supplement that would not have been feasible without MPAT as an editing tool (Brandenburg aktuell 25), a continuing series with twice-weekly regular updates and content changes (Täter Opfer Polizei), new and weather applications, advertisements, a launcher application and various smaller applications have been developed and piloted, demonstration not only the suitability for a wide range of uses, but also the stability, viability, versatility and usefulness of MPAT and MPAT created applications in the targeted domains.

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 be marginally 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.

As the second phase was more concerned with piloting, testing and improving the usability of MPAT in the daily work process of content creators, no new forms of experiencing immersive environments where added on to what was already achieved in phase 1.

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 followed the plan outlined in the original DoW.

In the second phase of the project it became apparent that project partner IRT would, for internal reasons, not be able to provide the planned resources for implementation and piloting to the project. As a result, a project amendment was made, shifting resources from IRT to Fraunhofer and Fincons. In addition, the most convenient date for a project workshop was determined to be in December 2018, originally outside the timeframe of the project. To accommodate for the workshop, the runtime of the project was extended by a month as part of the same amendment, moving the end of the project to 31.12.2018.

The delivery dates of a number of deliverables (D1.2, D5.4, D5.5, D5.6 D6.3, D6.4, D7.4 and D7.6) were moved accordingly.

Deliverables have been mostly provided on time, with only two significant exceptions in the first year. All deliverables in the second phase of the project have been delivered on time.

- "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 six full consortium meetingS:

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 ParisTech) 14-16 November 2016

5th Project Meeting, Milano (hosted by Mediaset) 19-21 June 2017

6th Project Meeting, Lancaster (hosted by Lancaster University)- 25-27 October 2017

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

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).

2nd Co-creation Workshop, Berlin (hosted by Fraunhofer FOKUS), 9-10 February 2017

The purpose of this workshop was to plan for the second phase of pilots, namely the "Täter Opfer Polizei" and "Brandenburg aktuell" pilots at RBB and the "TGCOM", "Meteo.IT", "Sport Mediaset", "Infinity", "Wild", "Fiat Spider" and "Non e'la RAI" applications from Mediaset. The main outcome of the workshop was a list of MPAT features required by the content creators to support the easy creation of the planned applications.

2nd Coders Meeting, Berlin (hosted by Fraunhofer FOKUS), 13-14 February 2017

Following the Co-creation Workshop held in the previous week, this workshop was held to plan and start the implementation work required to support the features requested in the Co-creation Workshop.

In addition to the project internal meetings and workshops, an external workshop for parties interested in MPAT was held on the 5th of December in Munich on the premises of IRT.

Partner activities:

The only partner active in WP 1 was Fraunhofer FOKUS.

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.

WP 2 had only little presence in the second phase of the project, as the WP ended in month 14. The main activity after the end of year 1 was the creation of deliverable 2.2, describing the "Scenarios from consumer perspective" based on the information collected in the first twelve months.

Partner activities:

The primary providers of use cases have been RBB and Mediaset, from their broadcaster experience, IRT from a list of scenarios used in HbbTV development and Fraunhofer FOKUS from their work in providing TV applications in a variety of contexts. The University of Lancaster contributed use cases professionals from the Creative Media Industry in Lancaster. Even though Paris Tech did not formally spend effort in WP2, some use cases, primarily related to synchronization, were provided from them. Work package lead and task lead on Task 2.1 was performed by RBB, Leadin coordinated Task 2.2 and provided the methodology for and subsequent application of the use case ranking and selection.

3.3 WP 3 - Consistent user experience design

WP 3 produced three deliverables during the first year of the project and another three in the second phase, with the final three documents being second version of the initial three documents, enhancing the previous deliverables with updates and experiences from the implementation and initial pilot phase.
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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 3.4 provides an update of this.

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 3.5 provides an update of this.

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. Deliverable 3.6 provides an update of this.

Partner activities:

Task 3.1, UI design, was led by Leadin, with significant input from RBB and Mediaset. The more technical oriented Task 3.2, Usability Testing, was led by the University of Lancaster with technical input and expertise from previous development activities by Fraunhofer FOKUS and IRT. Primary partners in both tasks contributed to the activities of the other tasks. Overall coordination of the work package was provided by the University of Lancaster.

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, in the second phase of the project the WP has produced an additional 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 (Word-Press, 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.

D4.2 "System requirements and existing solutions v2" is an updated version of the earlier (ten months previously) D4.1 deliverable taking into account the implementation and piloting activities and also changes in the marketplace during the project runtime.

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.

D4.4 "System architecture and API v2" is an updated version of the earlier D4.3 deliverable taking into account the changes to the architecture and API resulting from the implementations and pilot activities performed in the first 18 months.

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.

D4.6 "Contributor guidelines" this document provides guidelines to developers outside the MPAT consortium and provides technical information on how to perform changes to the MPAT core and how to provide plug-ins for MPAT without compromising the existing code.

Partner activities:

Task 4.1, State of the art and requirements analysis, was led by IRT, who also coordinated the work package, with primary contributions from Fraunhofer FOKUS, University of Lancaster, Fincons and ParisTech. The software architecture design task 4.2 was led by ParisTech with Fraunhofer FOKUS providing an initial overview input, based on the experience and architecture of the earlier HAT system, which was then modified, based on the MPAT

requirements, with support from IRT and Fincons. Fincons acted as leader for Task 4.3, the software development process management and set up the tools and guidelines for the subsequent software development in WP5, including experience and suggestions from IRT, ParisTech, the University of Lancaster and Fraunhofer FOKUS. The broadcasters, RBB and Mediaset, participated in all activities, essentially in a monitoring and advisory capacity, to ensure that all activities were in line with the established workflow at their sites and that architecture and implementation would not be in conflict with broadcaster rules or guidelines. Lead on delivering the contributer guidelines for MPAT was Fincons with input from all other partners active in this WP.

3.5 WP 5 - Implementation

As WP 5 is the application work package, all deliverables have the type 'demonstrator' (backend/frontend/ plug-ins). All six deliverables (three deliverables comprising the first version of the MPAT tools, the other tree comprising the updated version of the MPAT tools) were delivered on time.

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.

For the second phase of pilots, following the 2nd coder workshop held in February 2017, a strong implementation focus was set on convenience for content creators, improved integration with existing workflows, support for applications with regular changes and updates, localization and testing.

Partner activities:

Work package 5, led by Fraunhofer FOKUS, comprises the MPAT core task (led by Fincons), the MPAT UI task and the plug-ins task (the latter two led by Fraunhofer FOKUS). While there was some specialization among partners – for example for the backend services and the asset converter, Fincons was the primary contributor, while Fraunhofer FOKUS was strongly active in the creation of plug-ins and IRT doing significant work on the UI – all activities in this work package were managed via Jira issues and all implementing partners (Fraunhofer FOKUS, IRT, University of Lancaster, Fincons and ParisTech) were considered a common resource pool to which assignments were distributed in a weekly phone conference, based on availability.

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 a 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 was still on air, it was also back on air as a repeat in July and August 2017.

As expected, the piloting activity increases in the second part of the project and became the main driving force of MPAT.

Following "Band Camp Berlin", a smaller pilot application was created for the "Brandenburg aktuell" programme, a daily regional news magazine. The programmer was celebrating its 25th anniversary in May 2018 and MPAT was used to create an application for offering short video segments about the programme, including the first episode, the first appearance of the anchor persons on the programme and a backstage making-of feature.

A larger pilot activity surrounded "Täter Opfer Polizei" a magazine broadcast twice a week, covering real crimes Berlin and Brandenburg and also providing crime prevention advice. MPAT provided an initial application for the final episode before the summer break and subsequently provided the necessary changes and improvements to make the MPAT editor suitable for the requirements of continuous use. The next pilot phase, which at that time became more regular use than piloting, started after the programme came out of its summer hiatus and has continued until the end of the MPAT project and will continue beyond that.

Due to the initial lack of HbbTV, especially 2.0.1, devices in Italy, pilots in the initial phase of the project had been limited to showcase implementations for industry events and internal feasibility and evaluation demos. Shortly before the HbbTV Symposium in Rome in October 2017, Mediaset announced the rollout of several HbbTV applicatios, all created with MPAT, including TgCom, Sport Mediaset, Meteo.it as on-air services.

Feedback and experiences from the pilots in Germany and Italy, as well as some user testing and experiences from experimental applications, produced by the University of Lancaster are documented in the four deliverables of the WP.

An indication of the success of the MPAT pilot application is the fact that the Band Camp Berlin application did win the award in the category "Best use of HbbTV for broadcast enhancement" at the HbbTV Symposium in Rome..

D6.1 "Research questions and measurement methodology" describes the pilot plans as they were known close to the end of the first project year. As details about later pilots were not yet known, the deliverable is primarily based on the "Band Camp Berlin" and "Fiat 500" pilot applications and some of the research questions are specific to these application. The general methodology and underlying research issues were however applicable to the other pilots as well.

D6.2 "Test setup specification backend" describes the technical infrastructure at the two broadcasters involved. It served as a basis for implementation and integration planning.

D6.3 "Pilot execution report" describes the individual pilot application in detail, describing their purpose, their use, their functionality and appearance.

D6.4 "Test evaluation" takes the data gathered from the pilots and uses it to address the research questions posed in deliverable D6.1. As already evident from the large numbers of applications created with MPAT and piloted in the project, the implementation is well suited for its task of creating HbbTV application easily and efficiently.

Partner activities:

Work package 6 was coordinated as an overall work package by Mediaset, who also led the Pilot conduction task. The main activity in year one however lay in Task 6.1, which was led by RBB and covered the preparation for the trials. As initially planned, only the pilot preparation was assumed to be performed in the first year. Due to the opportunity of having the 'Band Camp Berlin' pilot, some of the activities for the second task has been performed in the first year. Primary partner here was RBB, who created the pilot application with technical support for the

set-up and operation of the pilot by Fraunhofer FOKUS. For the HD Forum Italia showcase by Mediaset, the application content was provided by Mediaset, who also operated the showcase with technical support by Fincons. With increasing piloting activity in Italy, the piloting activity was equally driven by Mediaset and RBB in the second phase of the project, with additional pilots provided by the University of Lancaster. Technical support of the pilot was provided and operational platforms were operated and maintained by the technical partners IRT, Fraunhofer, Fincons and ParisTech. Design support for the pilots was provided by Leadin.

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.

The same pattern continued in the second year of the project, where industry exhibitions and gatherings, like EBU Broadthinking, the Media Web Symposium, IFA, IBC, Medientage München and the HbbTV Symposium were the primary dissemination outlets, as they were also the most likely to lead to subsequent exploitation of the project results. While MPAT also participated in academic events, like the University Open Day, a presentation at the SDA Business School Bocconi and TVX 2017, these were a smaller part of the WP7 activities.

A workshop was held in December 2017 at IRT for potential HbbTV users in Germany. A total of twenty-one participants from broadcast and IT were present and got an overview of MPAT and subsequent hands-on experience, creating their own HbbTV applications.

Partner activities:

Work package 7 was coordinated by Fincons. It consisted of three tasks. The communication task 7.1 was led by IRT, who, together with Fraunhofer FOKUS, operates the MPAT web page and performs regular updates of the news and blog section, featuring short entries from all other project partners. IRT also maintained the deliverable section on the web site and ensured that all public deliverables are available in to the public in a timely fashion. The primary additional medium for external communication, the Twitter account was maintained and fed by IRT and Fraunhofer with contributions from all partners. The dissemination task was led by the University of Lancaster and currently covers mostly presentations at industry events and papers at four scientific conferences. The most active partners on industry events and scientific conferences were Fraunhofer FOKUS, RBB, Mediaset and IRT, but all partners performed dissemination at least at one event. Task 7.3 "Exploitation and Business modelling" was mostly dormant in the first phase of the project and had its activity peak towards the end of the project. Central partner here was Fincons, being most experienced in this domain, with primary input from broadcasting stakeholders Mediaset and RBB and additional contributions from all partners.

4 Publications and Presentations

Event	Date	Location	Description	Responsible partner
2016				
EU cluster meeting	March 18	Brussels	Presentation/Poster	FOKUS
Interop Workshop	April 13 - 14	Munich	Flyers & talking to industry experts	IRT
NAB conference	April 16 - 21	Las Vegas	Distributing flyers	IRT
Republica	May, 2 - 4	Berlin	Demo & booth	FOKUS
27. FKTG	May, 9 -11	Leipzig	FOKUS booth & Presentation	FOKUS
TV ID innovation	May	Rome	Demo & booth	FOKUS
Digital2016	June, 6-7	Newport	Presentation & talking to industry experts	Leadin, ULANC
Innoathens	June, 13	Athens	Presentation/Poster	FOKUS
TVX 2016 conference	June 22 - 24	Chicago	Writing a paper, demo	FOKUS
IFA conference	September 2 - 7	Berlin	ARD booth "digital world" (RBB & IRT)	RBB, IRT, FOKUS
IBC conference	September 9 - 13, 2016	Amsterdam	IRT booth dedicated to its European funded projects	IRT, FOKUS
TV Hackday	September 26-27	Berlin	Demo with hands-on experience	FOKUS
HD Forum Italia conference	October 6-7	Vatican city	Demo	Mediaset, Fincons
Medientage conference	October 26 - 28	Munich	IRT booth available	IRT, FOKUS
Changing the Picture	Novermber, 19	Babelsberg	Presentation	RBB
All Around Audio Symposium	November 23	St.Pölten	Presentation	RBB
2017				
EBU Broadthinking	May 3-4	Geneva	Demo and 1-slider	ParisTech
Media Web Symposium	May 16-17	Berlin	Demo booth & tutorial	FOKUS, IRT
re : publica	May 8-10	Berlin	Interview at RBBTalk lab	FOKUS, RBB
TVX 2017	June 14-16	Hilversum	Paper for Workshop on Interactive Digital Storytelling in Broadcasting	FOKUS, RBB
TVX 2017	June 14-16	Hilversum	Paper in main conference track	ULANC
IFA	September 1-6	Berlin	FOKUS at Deutsche TV Plattform; RBB at ARD Digitale Welt	FOKUS, RBB
IBC	September 14-18	Amsterdam	Fraunhofer booth	FOKUS

University Open Day	September 22	Lancaster	MPAT Info app on display; featured on BBC News	ULANC
HbbTV Symposium	October 17-18	Rome	Joint presentation on main conference track	FOKUS, Mediaset
HDforum	October 17-18	Rome	Mediaset booth	Mediaset
H2020 Media Projects Workshop	October 17	Brussels	Poster presentation	FOKUS
Medientage München	October 24-25	München	Booth	FOKUS, IRT
SDA Business School Bocconi	November 30	Milano	Presentation to students and university staff	Mediaset, Fincons
MPAT workshop	December 5	München	Workshop for German HbbTV users	IRT, FOKUS, RBB, Fincons
Deutsche TV-Plattform, 7. Sitzung AG „Smart Media"	December 19	Frankfurt	Presentation of MPAT and MPAT created applications	RBB

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 FOCUS Zero Uno		zerounoweb.it
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
HBBTV 2 – Status und Ausblick		MPAT was was mentioned within the IRT presentation
EBU working group "Interactive & multimedia services"		Dissemination in the mail reflector
Article in NZZ		https://www.nzz.ch/digital/virtual-reality-rundum-erlebnisse-mit-dem-fernseher-ld.1314904
Article on LINK		Publication on LINK - HBBTV, il nuovo standard
Article on TGCOM		Publication on TGCOM24 Mediaset un passo nel futuro con I progetti di innovazione tecnologica
Article on TGCOM		Publication on TGCOM24 La tv italiana diventa ibrida e interattiva
Article on Platinum magazine contained in Sole24ore		http://www.calameo.com/books/0032723369f662f91ac0a

5 Innovation and Standardisation

Based on the HAT editor, which was the result of the earlier FI-CONTENT project, as a base, during the first year, MPAT has added mainly added functionality and features, while the second phase was mostly spent on making the system more attractive and convenient for 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
- Support of separation of staging and playout instance
- Consistent layout and interface model
- Availability as Open Source
- 360° Support
- Hotspot support
- Three navigation models:
    - Web page
    - SlideFlow
    - Timeline

At the moment, MPAT is not directly contributing to standardization, but the project is maintaining 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.

6 List of Phase 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)

7 List of Phase 2 Deliverables

ID	Title	Lead	Type	Level	Due
D1.2	Final Project Summary Report	Fraunhofer	R	PU	M24 (Nov 2017)
D2.2	Updated MPAT Scenarios	RBB	R	PU	M14 (Jan 2017)
D3.4	Test plan v2	ULANC	R	PU	M15 (Feb 2017)
D3.5	Usability findings v2	ULANC	R	PU	M18 (May 2017)
D3.6	Final UI design	LEADIN	R	PU	M22 (Sep 2017)
D4.2	System requirements and existing solutions v2	IRT	R	PU	M16 (Mar 2017)
D4.4	System architecture and API v2	IMT	R	PU	M19 (Jun 2017)
D4.6	Contributor guidelines	FINCONS	R	PU	M24 (Nov 2017)
D5.4	Final CMS core backend	FINCONS	DEM	PU	M22 (Sep 2017)
D5.5	Final CMS core frontend	Fraunhofer	DEM	PU	M22 (Sep 2017)
D5.6	Final Modules/Plug-ins	Fraunhofer	DEM	PU	M22 (Sep 2017)
D6.3	Pilot execution report	Mediaset	R	PU	M25 (Dec 2017)
D6.4	Test evaluation	Fraunhofer	R	PU	M25 (Dec 2017)
D7.4	Final Plan for the Communication of Results	IRT	R	PU	M25 (Dec 2017)
D7.5	Product license	FINCONS	R	PU	M23 (Oct 2017)
D7.6	Final Plan for the Dissemination and Exploitation of Results	ULANC	R	PU	M25 (Dec 2017)

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)