Report on Dissemination and Standardisation Activities Y3

Deliverable D7.2.3

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1 Executive Summary

This document is a report on dissemination and standardisation activities carried out by the project partners during the final year of the project.

Following the dissemination and standardization activities of the second year, the effort in the final project year has been further intensified based on the availability of further project results. Witness of the work performed in the third year are ten public deliverables, eighteen papers and articles which have been released in international publications, thirteen presentations, posters and demos at international symposiums or conferences. Deliverables and presentations (if permitted) are available from the project web-site at http://icosole.eu/.

2 Introduction

2.1 Purpose of this Document

This document summarises the dissemination and standardisation activities of the project from month 25 to month 36.

2.2 Scope of this Document

The document lists the dissemination activities and provides pointers to further documentation (e.g. publications, slides, etc.)

2.3 Status of this Document

This is the final version of D7.2.3.

2.4 Related Documents

Before reading this document it is recommended to be familiar with the following documents:

- D7.2.2 Report on Dissemination and Standardisation Activities Y2
- Latest information on the project can be found on its website http://www.icosole.eu.

3 Dissemination Tools and Mechanisms

3.1 Dissemination Mechanisms

The project uses the following mechanisms for disseminating project results.

- **Papers at scientific conferences:** During Year 3, ICoSOLE results have been presented at 13 international and regional scientific conferences (e.g. ACM Multimedia International Conference on Multimedia Modelling, ACM International Conference on Interactive Experiences for Television and Online Video).
- **Demonstrations:** During Year 3, project partners have participated in various demonstration events. Highlights have been demonstrations performed at NAB 2016, IBC 2016 and ACM International Conference on Interactive Experiences for Television and Online Video.
- **Targeted media and publicity activities:** The broadcasters in the group, the BBC and VRT, both can self-publicise using their web-sites. Larger conferences, such as IBC, also attract the media, so provide the potential for project-related demonstrations to be reported.
- **Information activities within ICoSOLE partner organisations:** During Year 3, ICoSOLE partners continued to keep their senior managers about ICoSOLE, its progress and its benefits. This acts as a catalyst for disseminating ICoSOLE results. It also helps to keep ICoSOLE business, dissemination and exploitation focussed.
- **ICoSOLE public Website:** The public ICoSOLE Website ensures that all interested parties are informed about the project and its progress, and can access the publicly available results of the ICoSOLE project. The address of the public ICoSOLE Website is http://icosole.eu/ .
- **Social Media:** In this respect Twitter was used in continuation of the activities in the second year.
- **Individual partners' homepages:** Project partners will provide information about ICoSOLE on their homepages (with a focus on their share of the work, of course) and will link to the project's homepage for further information (which will also increase the search engine ranking of the ICoSOLE homepage).
- **Liaison with other projects:** SceneNet, Cognitus, Selvie, Orpheus.

4 Dissemination Activities

4.1 Public Website

The ICoSOLE website http://icosole.eu/ has continuously been used as the primary source of information for the public. It provides extensive information about the project ICoSOLE such as the idea behind this project, work plans, list of milestones and technical sections.

It also provides information about the consortium, contact details linked to partner's website, each partner's description and their rolls within this project.

The scientific *publications and presentations*, and the public deliverables generated from the project are presented at this website and are updated regularly.

The *News* section presents the partners and the public on upcoming presentations, conferences, events, developments and released technologies associated to ICoSOLE. The news section also offers visitors the possibility to comment on the news to increase the exchange of information in relation to the research articles and news. This interactive section of the website provides us very useful information about the opinion of the website's visitors and their potential interest on the project researching area.

The section *Contact Us!* allows every visitor to contact the project coordinator Georg Thallinger directly.

A Twitter widget on the ICoSOLE website aims to broaden the audience for the project.

Figure 1: The ICoSOLE Website (as of October 5, 2016)

Figure 1 shows a screen shot of the ICoSOLE website which contains the following main sections:

- Overview
- News
- Consortium
- Work Plan
- Technical Section
- Publications
- Contact us!

4.2 Social Media

The @ICoSOLE Twitter feed is available at https://www.twitter.com/ICoSOLE and tweeted 244 times and has 169 followers as of Oct. 5, 2016. All partners have access to the twitter account.

Figure 2: Excerpt from the ICoSOLE Twitter channel

4.3 Public Documents

Public documents are available through the ICoSOLE website:

- Public deliverables: http://icosole.eu/public-deliverables/ .
- Publications and presentations: http://icosole.eu/scientific-publications-presentations/

4.4 Scientific and Technical Publications and Presentations (3rd Project Year)

Also the third project year turned out to be a successful period with respect to ICoSOLE dissemination activities. In total 29 publications (papers, posters, demonstrations, etc.) have been performed addressing scientific conferences, academic workshops, professional journals or trade fairs. The following table lists the events in chronological order.

#	Category	Status	Partner(s) responsible/involved	Author(s)	Conference, Journal, Event	Date of publication / event	Location of event	Title
1.	Presentation	Held	TAW	Heinrich Fink	Gstreamer conference 2015	7.-9.10.2015	Dublin	Going Live with ToolsOnAir's GStreamer-based broadcast mixing architecture
2.	Newsletter	Delivered	BIT	Christian Timmerer, Daniel Weinberger, Martin Smole, Reinhard Grandl, Christopher Müller, Stefan Lederer	IEE COMSOC MMTC E-Letter	November 2015		Cloud-based Transcoding and Adaptive Video Streaming-as-a-Service
3.	Paper	Published	JRS	Stefanie Wechtitsch, Hannes Fassold, Marcus Thaler, Krzysztof Kozlowski, Werner Bailer	22nd International Conference on Multimedia Modelling	4.-6.01.2016	Miami, FL, USA	Quality Analysis on Mobile Devices for Real-time Feedback
4.	Paper	Published	JRS	Werner Bailer, Wolfgang Weiss and Stefanie Wechtitsch	22nd International Conference on Multimedia Modelling	4.-6.01.2016	Miami, FL, USA	Selecting User Generated Content for Use in Media Productions
5.	Presentation	Held	BIT	Christian Timmerer	Streaming Forum London 2016	23.02.2016	London	Live Transcoding and Streaming-as-a-service with Low Delay and High QoE
6.	Paper	Published	iMinds	Maarten Wijnants, Kris Van Erum, Peter Quax, Wim Lamotte	Lecture Notes in Business Information Processing (LNBIP)	March 2016		Augmented ODV: Web-Driven Annotation and Interactivity Enhancement of 360 Degree Video in Both 2D and 3D

#	Category	Status	Partner(s) responsible/involved	Author(s)	Conference, Journal, Event	Date of publication / event	Location of event	Title
7.	Presentation	Held	JRS	Hannes Fassold	GPU Technology Conference 2016	4.-7.04.2016	San Jose, California, USA	GPU-Accelerated Computer Vision for Multimedia, Post Production and Surveillance
8.	Presentation	Held	BIT	Stefan Lederer	EBU BroadThinking 2016	07.04.2016	Geneva	Latest development in player technology
9.	Presentation	Held	BIT	Christian Timmerer, Daniel Weinberger, Martin Smole, Reinhard Grandl, Christopher Mueller, and Stefan Lederer	NAB 2016	16.-21.04.2016	Las Vegas, NV, USA	Live Transcoding and Streaming-as-a-Service with Low Delay and High QoE
10.	Paper	Published	BIT	Christian Timmerer, Daniel Weinberger, Martin Smole, Reinhard Grandl, Christopher Müller, Stefan Lederer	MMSys'16	10.05.2016	Klagenfurt	Transcoding and Streaming-as-a-Service for improved Video Quality on the Web
11.	Paper	Published	JRS	Claudiu Cobârzan, Klaus Schoeffmann, Werner Bailer, Wolfgang Hürst, Adam Blazek, Jakub Lokoc, Stefanos Vrochidis, Kai Uwe Barthel and Luca Rossetto	Springer Multimedia Tools and Applications (MTAP) journal	June 216		Interactive Video Search Tools: A Detailed Analysis of the Video Browser Showdown 2015
12.	Tutorial	Held	BIT	Christian Timmerer	QoMEX Tutorial	06.06.2016	Lisbon	Adaptive Media Streaming: The Role of Standards
13.	Presentation	Held	BIT	Christian Timmerer	QoMEX Panel	06.06.2016	Lisbon	QoE: From Academia to Industry, where are we?
14.	Presentation	Held	JRS	Werner Bailer	EBU Metadata Developer Network	07.06.2016	Geneva, CH	Content and Metadata Workflow for UGC in Live Production

#	Category	Status	Partner(s) responsible/involved	Author(s)	Conference, Journal, Event	Date of publication / event	Location of event	Title
					Workshop			
15.	Paper	Delivered	VRT	Rik Bauwens	TVX 2016	22.06.2016	Chicago	Interactive Content Contribution
16.	Paper	Published	JRS, BIT	Stefanie Wechtitsch, Marcus Thaler, Albert Hofmann, Andras Horti, Werner Bailer, Wolfram Hofmeister, Jameson Steiner, Reinhard Grandl	4th Workshop on Interactive Content Consumption	22.-24.06.2016	Chicago, IL, USA	Automatic Selection of Live User Generated Content
17.	Paper	Published	JRS, BIT	Marcus Thaler, Andras Horti, Albert Hofmann, Stefanie Wechtitsch, Werner Bailer, Wolfram Hofmeister, Jameson Steiner, Reinhard Grandl	4th Workshop on Interactive Content Consumption	22.-24.06.2016	Chicago, IL, USA	Live UGC Stream Selection Using Quality Metadata
18.	Paper	Published	JRS, BIT	Marcus Thaler, Andras Horti, Albert Hofmann, Werner Bailer, Wolfram Hofmeister, Jameson Steiner, Reinhard Grandl	4th Workshop on Interactive Content Consumption	22.-24.06.2016	Chicago, IL, USA	Real-time Metadata Extraction from UGC Video
19.	Paper	Published	JRS, iMinds, VRT	Britta Meixner, Werner Bailer, Maarten Wijnants, Rene Kaiser, Joscha Jäger, Rik Bauwens and Frank Bentley	ACM International Conference on Interactive Experiences for TV and Online Video (TVX)	22.-24.06.2016	Chicago, IL, USA	4th International Workshop on Interactive Content Consumption at ACM TVX'16
20.	Paper	Published	JRS	Hannes Fassold	IEEE International	30.06.-02.07.2016	Budapest, HU	Computer Vision on the GPU - Tools, Algorithms and

#	Category	Status	Partner(s) responsible/involved	Author(s)	Conference, Journal, Event	Date of publication / event	Location of event	Title
					Conference on Intelligent Engineering Systems			Frameworks
21.	Tutorial	Held	BIT	Christian Timmerer	ICME Tutorial	11.07.2016	Seatle	Quality of Experience in Multimedia Systems and Services: A Journey Towards the Quality of Life
22.	Paper	Published	BBC	Chris Pike	AES International Conference on Headphone Technology	24.-26.08.2016	Aalborg, DK	Descriptive analysis of binaural rendering with virtual loudspeakers using a rate-all-that-apply approach
23.	Paper	Published	iMinds	Maarten Wijnants, Gustavo Rovelo, Peter Quax, Wim Lamotte	Springer Multimedia Tools and Applications (MTAP) journal, Special Issue on "INTERACTIVE MEDIA: TECHNOLOGY AND EXPERIENCE"	19.09.2016		WanderCouch - A Smart TV approach towards experiencing music festivals live from the living room
24.	Presentation	Held	TAW	Georg Lippitsch, Vivia Nikolaidou	GStreamer Conference 2016	10.-11.10.2016	Berlin, Germany	GStreamer in the broadcast world: A general overview, SMPTE timecodes in Gstreamer
25.	Paper	Published	iMinds	Maarten Wijnants, Gustavo Rovelo, Peter Quax, Wim Lamotte	ACM Multimedia	15.-19.10.2016	Amsterdam, NL	A Pragmatically Designed Adaptive and Web-compliant Object-based Video Streaming Methodology - Implementation and Subjective Evaluation

These publications have been accepted and will be published after the projects runtime.

#	Category	Status	Partner(s) responsible/involved	Author(s)	Conference, Journal, Event	Date of publication / event	Location of event	Title
1.	Paper	Accepted	JRS	Martin Höffernig, Werner Bailer	TRECVID Workshop	14.-16.11.2016	Gaithersburg, MD, USA	JRS at TRECVID Instance Search Task 2016
2.	Paper	Accepted	JRS, BIT, TaW	Werner Bailer, Marcus Thaler, Andras Horti, Reinhard Grandl, Wolfram Hofmeister, Jameson Steiner, Heinrich Fink	13th European Conference on Visual Media Production	12.-13.12.2016	London, UK	Content and Metadata Workflow for User Generated Content in Live Production
3.	Paper	Accepted	JRS	Werner Bailer, Stefanie Wechtitsch and Marcus Thaler	23rd International Conference on Multimedia Modeling	4.-06.01.2017	Reykjavik, IS	Compressing Visual Descriptors of Image Sequences

4.5 Other dissemination activities

4.5.1 Field Trial at Committee of the Region Open Days (VRT)

The Open Days, organised by the European Regions and Cities, was held October 12-15 2015. The event mainly focuses on European journalism and is set in several venues around Brussels. This was an opportunity for ICoSOLE because of this spread-out nature of the event, as well as the other approach a news event brings, as opposed to a festival. Both VRT and JRS were present, and tested out a second iteration of the Wall of Moments. This time, the focus was more on the editorial side: assessment of incoming content and publishing it to the Walls, which placed across the event.

4.5.2 Demonstration at ICT Event in Lisbon

The ICoSOLE project participated in the ICT event in Lisbon in October 2015 with a booth in the exhibition area featuring several demonstrations resulting from the project. The featured demonstrations were:

- Wall of Moments: people were able to test out the Moments prototype developed for the European Open Days field trial that ran shortly before; we also displayed the Wall with content originating from the Open Days, to illustrate findings we learned from that event
- Live streaming of UGC
- The WanderCouch Smart TV application

4.5.3 Field Trial at Austrian Science Night

The small field trial at the Austrian Science Night (“Lange Nacht der Forschung”) in April 2016 was a good opportunity to present the Wall of Moments to thousands of visitors to the five stations of the event that hosted an instance of the wall.

4.5.4 Field Trial at MNM Start 2 DJ

MNM Start 2 DJ is an annual event, organised by the MNM radio station (part of VRT). The event is a DJ contest during which a lot of social interaction is going on (mainly Instagram and Twitter). The Focus prototype, developed by VRT in cooperation with Studio Brussels (another radio station owned by VRT), turned out to be a perfect match to handle this interaction. We used the app to detect what was happening around the topic on social media and used the Wall app to display curated results on screens, installed at the event site.

4.5.5 Field Trial at Edinburgh Festival

ICoSOLE's presence at the Edinburgh Festival in August 2016 took advantage of the BBC's own venue, based in the George Heriot school, called the Blue Tent. Each day two or three shows were hosted there, many of them existing BBC Radio shows. Several other projects internal to the BBC or with the BBC being partner performed trials at the event. Thus many BBC employees from different areas of the company as well as of partners visited the backstage are and could see the ICoSOLE technology being demoed and tested.

4.5.6 Field Trial at Leffingeleuren

The presence of ICoSOLE at the Leffingeleuren festival in September 2016 was quite prominent, including the Wall of Moments booth and another installation of the Wall in a bar area. Beyond the test users, many visitors saw the Wall and were informed about the project and the technology being developed. Next to the Wall of Moments booth, the projector manufacturer Barco performed a trial of 360° video projection, with was fed by a camera installed by iMinds and sharing the network installed for the ICoSOLE trial. This increased the visibility of ICoSOLE at the event. At the same time, a multi-panoramic video production system from iMinds was set up, with 4 cameras on-stage, and driven live from IBC in Amsterdam at the TaW booth.

4.5.7 Publication of test data

In addition to the data made available in the first project year, selected content from the field trials at Dranouter and Leffingeleuren was made available for research purposes. The data is hosted by VRT at the ICoSOLE content exchange platform[1]. Interested parties can register for an account in order to access the data.

Further, a Belgian national innovation project called SELVIE has been focussing on combining UGC with professional content during live events such as concerts. The demonstration activities have delivered several 100s of UGC videos. The SELVIE consortium has decided to share these content items with ICoSOLE. They will be made available on the test data platform.

The DASH audio and video files (both professional and UGC) captured from the Edinburgh Festival have been placed on a server that's accessible to the partners. The material captured from the BBC Blue Tent is allowed for use by the project for research purposes.

4.5.8 Demonstration at Media Fast Forward

On December 3rd, 2015, VRT Innovation presented the innovation results of 2015. ICoSOLE was one of the chosen topics and a presentation was given. This presentation covered the overall project, as well as the Wall of Moments. The demo setup of the Open Days was also installed, and event visitors were able to try out the prototype app.

4.5.9 Demonstration at NAB 2016

In April 2016 the project was present at the NAB show in Las Vegas with a booth in the "International Research Park". ICoSOLE presented the following demos:

- System for multi-panoramic recording: demonstrating live recording at the show as well as showing navigation in recorded panoramic content.
- Audiovisual capture app for user contributions: providing real-time streaming of content and sensor data to production system and providing quality feedback
- Wall of Moments: visualization of professional and user-generated content of an event, with options to show on large screens and mobile devices, using MPEG DASH. At the show the wall was be fed by means of the AV capture app.
- Smart TV Application: allowing a user to explore professional and user-generated content from the field trial at Dranouter festival.

4.5.10 Demonstration at IBC 2016

In parallel to ICoSOLE's final field trial at Leffingeleuren Festival (Belgium) the project's results were demonstrated IBC in Amsterdam in September 2016. ICoSOLE results were shown at the booths of TAW, BIT and Axon (partner of iMinds' spin-off AZilPix).

AZilPix (a spin-off from iMinds) had a very prominent spot on the booth of their partner Axon to show their Studio.One multipanoramic camera system.

[1] https://icosole.lab.vrt.be/

TAW dedicated one side of their booth to ICoSOLE, and demonstrated live control and editing of the multipanoramic camera system installed at Leffingeleuren festival.

The output of the mixing engine was sent to the Bitmovin encoder in the cloud, and shown on Bitmovin's booth.

4.5.11 Demonstration at TVX

In June 2016, the project was present at TVX in Chicago, with a demo of the Wall of Moments as trialled on the Austrian Science Night. The Moments app was shown to capture content and interact with the editorial team, the Trademark app was demoed showing the selection process as well as the interaction part and the Wall displayed the selected content in a vibrant way on the screen. A poster (Figure 3) and paper accompanied this demo.

4.5.12 Demonstration at Digitale Doebeurs

We demoed the Wall of Moments at the annual event 'Digitale Doebeurs' in Ghent, Belgium on October 8th 2016. People were invited to install the Moments app and share their experience, or to post their content on Twitter and Instagram. All those different sources were bundled using the Trademark and Focus app, and displayed using the Wall app on a screen at the VRT booth. A total of four demo apps (Moments, Focus, Trademark and Wall) were showcased.

4.5.13 Participation in benchmarking activities

In 2016, JRS participated in the TRECVID instance search task with the visual matching technology developed in WP4. The task was this year focused on finding specific people at specific locations. As the JRS approach does not include face recognition, the overall scores were low. However, JRS focused on the analysis of the filtering the location, for which the technology is suitable.

Figure 3: Wall of Moments poster as used for TVX 2016

4.5.14 Concertation activities

ICoSOLE contributed to the 2nd Audio Visual Gestalt Workshop organised by the **SceneNet** project in October 2015 with a presentation about the Dranouter field trial and the lessons learned.

A collaboration with the H2020 **Cognitus** project has been started. The BBC is partner in both projects, and thus meetings with Cognitus members took place during the two project meetings hosted by BBC in 2016. In addition, VRT attended the Cognitus consortium meeting in Paris in July 2016 to present the Wall of Moments and the backend technology. Both projects have collaborated on content collection during the trials at Edinburgh festival and the user generated content set has been shared with Cognitus.

Furthermore, VRT has organised several meetings to foster collaboration and knowledge exchange with the **SELVIE** project, a regional project funded by the Flemish government within the MIX-ICON programme. SELVIE ran from November 1st 2014 until April 30th 2016. This convenient timeframe allowed SELVIE to kick-start with lessons learned and content from ICoSOLE as well as feed the results of SELVIE back into the ICoSOLE project. Concretely, VRT has organised 3 meetings with the SELVIE coordination team and participated in the SELVIE closing event on March 23rd 2016 in Kontich.

The H2020 funded **Orpheus** project (http://orpheus-audio.eu) started on the 1st December 2015, and lasts for 30 months. The project is dedicated to improving the management of audio content to create new user experiences. The ten consortium partners will develop, implement and validate a new end-to-end object-based media chain for audio content. The BBC are the common partner between ICoSOLE and Orpheus, with object-based audio being the continuing theme across the two projects. The development of audio metadata (using the ADM), immersive and interactive playout and the use of IP Studio from ICoSOLE will continue to the used in Orpheus.

4.5.15 Individual partners' activities

iMinds

The WanderCouch Smart TV application has been showcased at an internal networking event for iMinds researchers and staff called SuperMinds in October 2015 (https://www.iminds.be/en/events/20151020_event_superminds). Nearly 500 iMinds colleagues attended the event and were given the opportunity to experiment with the WanderCouch application for remotely experiencing music festivals.

The WanderCouch Smart TV application has been demonstrated as part of a Hasselt University "info day" on March 5th, 2016. The goal of the info days is to rouse prospective students' interest in the education opportunities offered by Hasselt University (i.c., in the field of computer science). The info day was attended by an audience of approximately 100 people, consisting of prospective students and their companions (typically their parents).

The WanderCouch Smart TV application has been showcased to secondary school students in the context of the UHasselt@school initiative, which enables secondary schools to visit research institutes affiliated with Hasselt University. In academic year 2015-2016, two schools participated in the UHasselt@school initiative, amounting to an audience of approximately 40 secondary school students and their accompanying teacher(s).

The WanderCouch Smart TV application was featured as part of EDM's participation in Flanders' annual "open business day" (http://www.openbedrijvendag.be/) on October 2nd, 2016. During the open business day, businesses seated in Flanders of divergent sizes and types (ranging from research institutes over SMEs to large multi-national companies) open their doors to inform the general public about the products and services they offer. A total of 251 people visited EDM and were given (among other things) a demonstration of the WanderCouch approach.

The Multi-depth Layered Video (MLV) streaming technique has been given as an example for an advanced multimedia streaming use case within the context of a streaming-specific lecture for a course on multimedia technology at Hasselt University. The multimedia technology course is part of the Computer Science master curriculum at Hasselt University.

The Multi-depth Layered Video (MLV) streaming technique and the multi-panoramic video production system will be demonstrated at the 2016 edition of the SuperMinds event on October 27th. In light of the upcoming iMinds/IMEC merger (which came into force as of October 1st, 2016), the 2016 SuperMinds edition will be attended not only by iMinds researchers and staff, but also by IMEC researchers.

In additional to events reported elsewhere in this document, iMinds multi-panoramic video production system was demonstrated to the public at

- VRT sandbox (October 20, 2015)
- VRT Media Fast Forward (December 3, 2015)
- the 3D Stereo Media conference in Liege Belgium (December 17, 2015), next to a presentation on immersive video capture by Philippe Bekaert.
- at the United Demo Day (January 14, 2016) in Hilversum NL
- the iMinds HIVIZ lab opening event (March 15, 2016) in Brussels
- the iMinds conference (April 28, 2016). At this event the system has also been used for video-streaming of the actual conference presentations themselves.

It will be demoed on upcoming events including:

- VRT sandbox creative circle (November 10, 2016)
- SATIS fair in Paris (November 15-17, 2016).

Moreover, 13 private demonstrations have been organised to interested parties, including production companies, regional radio and TV stations, representatives in surveillance and security, event organisers, music artists, camera manufacturers, but also to Philips medical for medical training purposes.

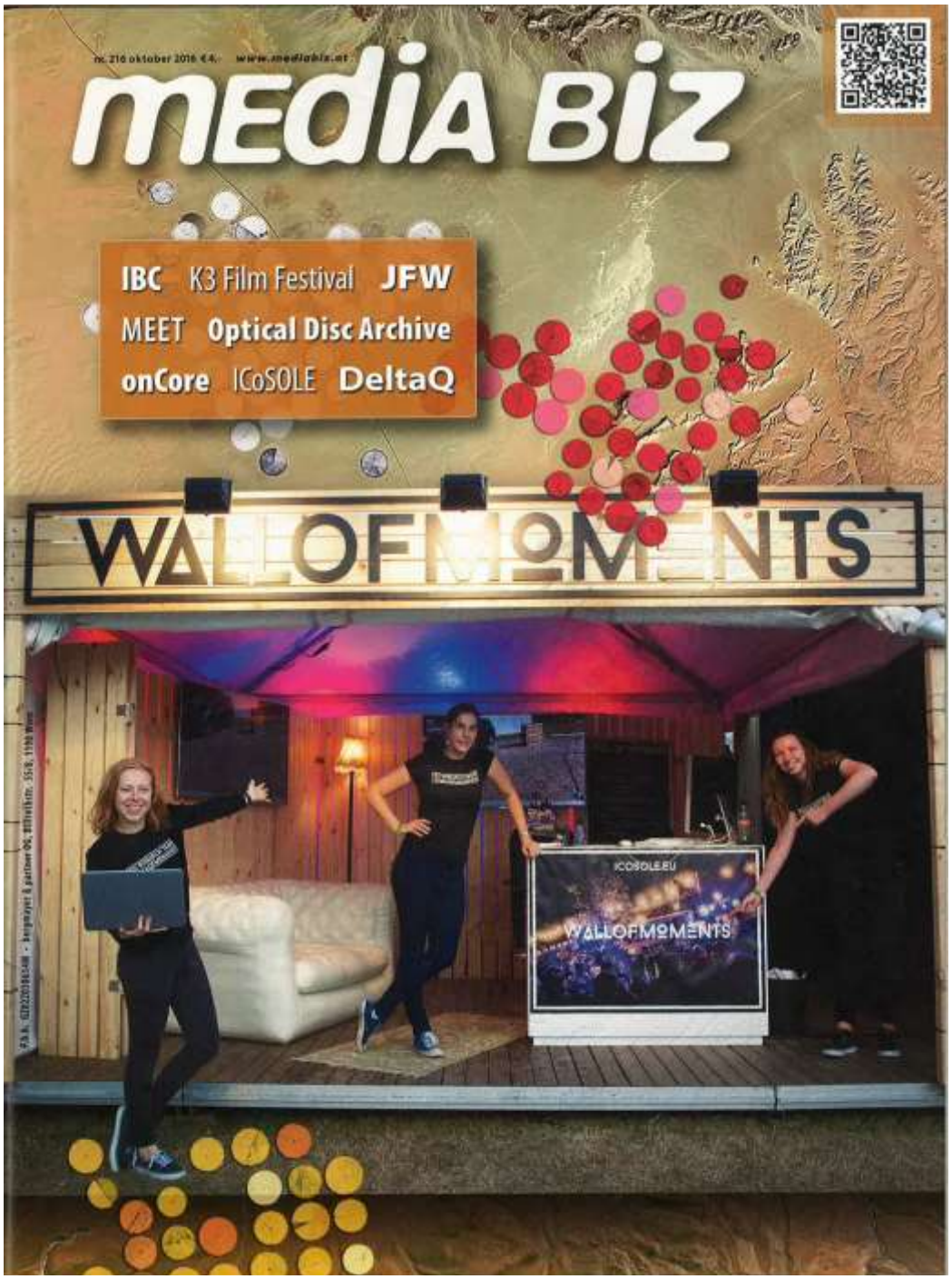
Finally, a web site is being constructed for the spin-off company AZilPix which will commercialize the multi-panoramic system under the name of Studio.One. The site will be published at www.azilpix.com.

AZilPix' Studio.One web site under construction is a state of the art HTML5 web site based on the bootstrap framework, presenting the main features of the system, a video on how it works, a list of applications with photographs and (soon) links to produced videos (when permission is granted), the specifications of the system and of course contact information.

4.5.16 Coverage in Media

An article featuring Philipp Bekaert's work on 360° video has been published by the Flamish newspaper "De Staandard" on April 21, 2016[2] (in Flamish). This was followed by a web-article also including videos[3].

"media biz" an Austrian monthly publication for the media industry published the article "Gleichzeitig dabei sein"[4] (roughly "Be there at the same time") on ICoSOLE in its October 2016 issue. The front page featured an image taken at the field trials at Leffingeleuren.



[2] http://www.standaard.be/cnt/dmf20160420_02248976
[3] http://www.standaard.be/cnt/dmf20160421_02249751
[4] http://www.mediabiz.at/magazin/stories/story4.htm

5 Standardisation Activities

5.1 BBC

The BBC's areas of standardisation relating to the project in the third year have been audio metadata and a baseline renderer for object-based audio, both of which are continuation of the work in the second year.

5.1.1 Audio Definition Model

The Audio Definition Model (ADM) was first established in EBU Tech 3364 (https://tech.ebu.ch/docs/tech/tech3364.pdf) and as part of the EBU Core schema (EBU Tech 3293 v1.5, https://tech.ebu.ch/docs/tech/tech3293.pdf). In the second year of the project it became an ITU standard: ITU-R Recommendation BS.2076, which contains additional features over the current EBU Tech 3364 version. As well as BS.2076, and Recommendation BS.2088 (the BW64 WAV-based file format that can carry ADM metadata), two more ITU documents were generated. These were Report BS.2388, which is a usage guideline document for the ADM and BW64; and Recommendation BS.2094, which defines a set of common definitions for the ADM. There is also on-going work on developing a serialised version of the ADM, which will allow it to be used in streaming applications. The work in ICoSOLE on streaming object-based audio has been key in this area.

The ITU work was carried out in ITU-R Working Party 6B Rapporteur Group 13 which Dave Marston from BBC is co-chair of.

Other standardisation bodies that the ADM is being discussed in, is SMPTE, MPEG, DVB and the AES. All these bodies are becoming aware of object-based audio and the needs for metadata related to that, so the BBC has been monitoring activities in these groups.

5.1.2 Baseline Renderer

The BBC continued to be involved in ITU-R Working Party 6C (Rapporteur group 33) with the work on developing a baseline renderer. There are four candidate renderers from four different vendors (including one from the BBC), and the group is aiming to end up with a single renderer that is either using the most suitable one of the four, or a combination of the best components of each. Part of the decision process is to decide the requirements and test methodology for each of these requirements.

The renderer is only for loudspeaker (or more specifically channel-based) output, not binaural output. There has been agreement that the ADM parameters will the basis for the metadata. A point-source renderer has been largely agreed upon, though some of the testing methods are still under discussion.

5.2 JRS – MPEG Compact Descriptors for Video Analysis (CDVA)

In August 2015, MPEG issues a call for proposals for defining compact descriptors for video analysis tasks. JRS has been involved in these efforts from the beginning, and Werner Bailer from JRS is co-chairing the Ad-hoc group on this topic. The deadline for the submission of candidate technologies was in February 2016, and JRS responded to the call with a technology based on work in the ICoSOLE project. The proposals are currently evaluated and improved in a series of core experiments.

The following input documents on CDVA have been submitted during the reporting period.

- *114th MPEG meeting (February 2016), San Diego, CA, USA*
  - m37794, JRS Response to Call for Proposals for Technologies Compact Descriptors for Video Analysis (CDVA) - Search and Retrieval, Werner Bailer, Stefanie Wechtitsch
- *115th MPEG meeting (May 2016), Geneva, Switzerland*
  - m38519, JRS Response to CDVA Core Experiment 1, Werner Bailer
- *116th MPEG meeting (October 2016), Chengdu, Sichuan, China*
  - m39172, JRS Response to CDVA Core Experiment 1, Werner Bailer
  - m39173, JRS Response to CDVA Core Experiment 3, Werner Bailer

Based on the work done on Core Experiment 1 during winter 2015/2016 a patent application has been filed: “DATA STRUCTURE FOR DESCRIBING AN IMAGE SEQUENCE IMAGE, AND METHODS FOR EXTRACTING AND MATCHING THESE DATA STRUCTURES” on April 28th, 2016.

5.3 BIT – MPEG DASH

- *115th MPEG Meeting, May/June 2016, Geneva, Switzerland*
  - m38771: VR and 360° videos for MPEG-DASH was presented resulting in many outputs related to MPEG-DASH, CMAF, OMAF, and MPEG-VR.

5.4 JRS – EBU/AMWA FIMS and EBU MIM/SCAIE

FIMS (Framework for Interoperable Media Services) is an international consortium of more than 90 companies. The goal of FIMS is to define web service interfaces (SOAP and REST). Interfaces for content capture, transform and transfer have already been specified. Reference implementations exist in both SOAP and REST. More information on FIMS and its members can be found at http://www.fims.tv.

JRS continued their contribution to the FIMS activities, especially of the FIMS working groups on automatic metadata extraction (AME), a semantic data model (SEM) and a conformance testing framework (TEST).

Work in FIMS AME has continued, and a draft model has been developed. Like in the completed activity on automatic quality assessment (QA), FIMS AME refers to external definitions of analysis services. The EBU SCAIE (chaired by Mike Matton from VRT) group is working on those definitions, using an infrastructure provided by VRT.

6 Conclusions

The ICoSOLE partners have kept the high level of effort related to dissemination and standardization activities reached in year two, and even intensified it in some areas.

Public communication has been continued through ICoSOLE's website and Twitter account, and a continuously high number of page visits and followers could be recognized. The contributions of partners to international conferences and publications have been at the same level as before. This has included demonstrations of technologies used in the project and the presence of the ICoSOLE consortium at the NAB and IBC trade shows, among others. Partners have also published related activities on their own websites.

ICoSOLE maintained its engagement in several key standardisation activities covering the areas of audio, video and media streaming. In audio, immersive and object-based audio and related metadata is being standardised through the EBU, MPEG and ITU. For video, video analysis standardisation is being carried out in MPEG (CDVA). For streaming, the work on DASH continues in MPEG.

Again, the ICoSOLE project has continued in the testing and data gathering of the technology behind these standards. In the field trials provided a large set of audio and video data along with associated metadata. Whenever possible due to the legal situation, data collected in the trials is shared with the research community.

7 Glossary

Terms mostly used within the ICoSOLE project, sorted alphabetically

ACM	Association for Computing Machinery
ADM	Audio Definition Model
CDVA	Compact Descriptors for Video Analysis
DASH	Dynamic Adaptive Streaming over HTTP
EBU	European Broadcast Union
FIMS	Framework for Interoperable Media Services
HOA	Higher Order Ambisonics
HTTP	Hypertext Transfer Protocol
ITU	International Telecommunications Union
MPEG	Motion Pictures Expert Group
NAB	National Association of Broadcasters
REST	Representational State Transfer
SOAP	Simple Object Access Protocol
UGC	User Generated Content

Partner Acronyms

BBC	Britisch Broadcasting Corporation, UK
BIT	Bitmovin Softwareentwicklung OG, AT
iMinds	iMinds vzw, BE
JRS	JOANNEUM RESEARCH Forschungsgesellschaft mbH, AT
TaW	Tools at Work Hard + Soft Vertriebsges.m.b.H, AT
VRT	De Vlaamse Radio en Televisieomroeporganisatie NV, BE

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