Report on Dissemination and Standardisation Activities Y2

Deliverable D7.2.2

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1	2015-08-19	Document created
2	2015-09-11	Comprises all input on up-dates from partners, sent out to consortium for intermediate check
3	2015-09-18	Additional input from BIT inserted; version sent out for review
4	2015-10-05	Added information about IBC, internal review done, Update of the list of publications
5	2015-10-14	Final version

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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 second year of the project.

Following the dissemination and standardization activities of the first year, the effort in the second project year was more focused on the presentation of technology advancements as well as on activities carried out jointly between partners or within the consortium. Witness of the work performed in the second year are eight public deliverables, 18 papers and articles which have been released in international publications, seven presentations, posters and demos at international symposiums or conferences and last but not least the first field trial carried out at the occasion of the Dranouter folk festival in Belgium. Deliverables and presentations (if permitted) are available from the project web-site at http://icosole.eu/.

Furthermore, the envisaged plans for dissemination and standardisation of the third project year are described in a separate chapter.

2 Introduction

2.1 Purpose of this Document

This document summarises the dissemination and standardisation activities of the project from month 13 to month 24. Since this document is the extension of activities carried out in the first year (see also: D7.2.1 Report on Dissemination and Standardisation Activities Y1) it relies on the structure and layout of the previous deliverable with an up-date on the second project year.

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 D7.2.2.

2.4 Related Documents

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

- ICoSOLE Description of work (as a reference for planning data)
- D6.3 First Demonstration and Field Trial
- D7.2.1 Report on Dissemination and Standardisation Activities Y1
- 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 2, ICoSOLE results have been presented at 14 international and regional scientific conferences (e.g. ACM MMSys, ACM TVX, WAC, DAGA, GPU Tech Conference, etc.).

- **Demonstrations:** During Year 2, project partners have participated in various demonstration events. Highlights have been demonstrations performed at IBC 2015, MediaEval, BBC's "Sound: Now and Next", 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 2, 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.

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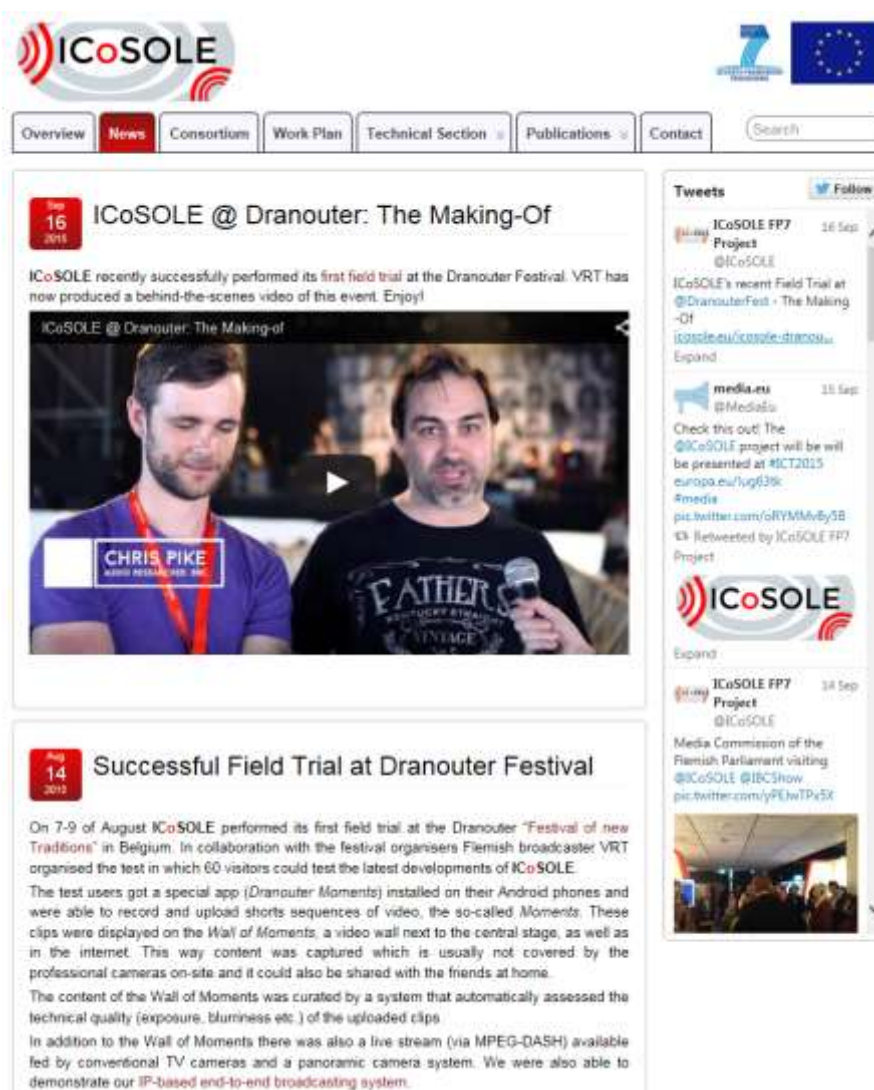
It also provides information about the consortium, contact details linked to partner's website, each partner's description and their rolls within this project.

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. It has explicitly used in regard of the Dranouter Field Trial.

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 September 18th, 2015)

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 156 times and has 138 followers as of Oct. 6. 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 (2nd Project Year)

Also the second project year turned out to be a successful period with respect to ICoSOLE dissemination activities. In total 25 publications (papers, posters, demonstrations, etc.) have been performed addressing scientific conferences, professional journals or academic workshops. 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	Paper	Published	JRS	Pawel Nowak, Marcus Thaler, Harald Stiegler, Werner Bailer	MediaEval Workshop	16-17.10.2014	Barcelona, ES	JRS at Event Synchronization Task
2	Paper	Published	JRS	Werner Bailer, Harald Stiegler	MediaEval Workshop	16-17.10.2014	Barcelona, ES	JRS at Search and Hyperlinking of Television Content Task
3	Presentation	Published	VRT	Mike Matton and Rik Bauwens	Media Fast Forward	04.12.2014	Brussels, Belgium	The Wall of Moments, een festivalbeleving bij je thuis
4	Paper	Published	BBC	Matt Paradis, Frank Melchior, Rebecca Gregory-Clarke	WAC 2015	26.01.2015	Paris, FR	VenueExplorer Object-based Interactive Audio for Live Events
5	Paper	Published	BBC	Peter Taylour, Chris Pike, Frank Melchior	WAC 2015	26.01.2015	Paris, FR	Delivering Object-Based 3D Audio using The Web Audio API and The Audio Definition Model

6	Paper	Published	JRS	Hannes Fassold, Jakub Rosner	Real Time Image and Video Processing	10.02.2015	San Francisco, US	A real-time GPU implementation of the SIFT algorithm for large-scale video analysis tasks
7	Paper	Published	DTO	Jan-Mark Batke	DAGA - 41th Annual Conference on Acoustics	16-19.03.2015	Nuremberg, DE	Virtual acoustic scenes through smartphone acquisition
8	Presentation	Published	TAW	Heinrich Fink	GPU Tech Conf 2015	17-20.03.2015	San Jose, California, USA	Practical Real-Time Video Rendering with Modern OpenGL and Gstreamer
9	Paper	Published	JRS, BBC, BIT, VRT	Werner Bailer, Chris Pike, Rik Bauwens, Reinhard Grandl, Mike Matton and Marcus Thaler	ACM Multimedia Systems Conference	18-20.03.2015	Portland, OR, USA	Multi-sensor Concert Recording Dataset Including Professional and User-generated Content
10	Paper	Published	JRS	Hannes Fassold, Stefanie Wechtitsch, Marcus Thaler, Krzysztof Kozlowski and Werner Bailer	Proceedings of the 7th ACM International Workshop on Mobile Video	18-20.03.2015	Portland, OR, USA	Real-time Video Quality Analysis on Mobile Devices
11	Paper	Published	iMinds	Maarten Wijnants, Kris Van Erum, Peter Quax, Wim Lamotte	11th International Conference on Web Information Systems and Technologies (WEBIST2015)	20-22.05.2015	Lisbon, Portugal	Web-Mediated Augmentation and Interactivity Enhancement of Omni-Directional Video in Both 2D and 3D

12	Demo	Published	BIT	Christian Timmerer	7th International Workshop on Quality of Multimedia Experience (QoMEX 15)	26-29.05.2015	Costa Navarino, Messinia, Greece	Glass-DASH, live streaming from Google Glass
13	Paper	Published	JRS, BIT	Marcus Thaler, Werner Bailer and Reinhard Grandl	ACM International Conference on Interactive Experiences for Television and Online Video	3-5.06.2015	Brussels, BE	Integrated Video and Sensor Capture App Providing Immediate Quality Feedback
14	Paper	Published	VRT	Rik Bauwens, Tine Deboosere and Luk Overmeire	ACM International Conference on Interactive Experiences for Television and Online Video	3-5.06.2015	Brussels, BE	The Wall of Moments: an immersive event experience
15	Demo	Published	VRT	Rik Bauwens, Mike Matton, Tine Deboosere and Luk Overmeire	ACM International Conference on Interactive Experiences for Television and Online Video	3-5.06.2015	Brussels, BE	The Wall of Moments
16	Paper	Published	JRS	Marcus Thaler, Werner Bailer and Georg Thallinger	3rd International Workshop on Interactive Content Consumption	3-5.06.2015	Brussels, BE	Spatiotemporal Video Synchronisation by Visual Matching

17	Demo	Published	iMinds	Maarten Wijnants, Gustavo Rovelo Ruiz, Donald Degraen, Peter Quax, Kris Luyten, Wim Lamotte	3rd International Workshop on Interactive Content Consumption (WSICC2015)	03.06.2015	Brussels, Belgium	Web-Powered Virtual Site Exploration Based on Augmented 360 Degree Video via Gesture-Based Interaction
18	Paper	Published	JRS	Hannes Fassold, Harald Stiegler, Jakub Rosner, Marcus Thaler and Werner Bailer	13th International Workshop on Content-Based Multimedia Indexing	10-12.06.2015	Prague, CZ	A GPU-Accelerated Two Stage Visual Matching Pipeline for Image and Video Retrieval
19	Paper	Published	iMinds	Maarten Wijnants, Peter Quax, Gustavo Rovelo Ruiz, Wim Lamotte, Johan Claes, Jean-Francois Macq	10th IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB2015)	17-19.06.2015	Ghent, Belgium	An Optimized Adaptive Streaming Framework for Interactive Immersive Video Experiences
20	Poster	Published	JRS	Georg Thallinger	EC Concertation Meeting	25.06.2015	Brussels, BE	Immersive coverage of spatially outspread live events
21	Paper	Published	BIT	Christian Timmerer, Daniel Weinberger, Martin Smole, Reinhard Grandl, Christopher Mueller, Stefan Lederer	IEEE International Conference on Multimedia & Expo Workshops (ICMEW)	29.06.2015-03.07.2015	Turin	Live Transcoding and Streaming-as-a-Service with MPEG-DASH

22	Paper	Published	BIT	Christopher Mueller, Stefan Lederer, Reinhard Grandl, Christian Timmerer	IEEE International Conference on Multimedia & Expo Workshops (ICMEW)	29.06.2015-03.07.2015	Turin	Oscillation Compensating Dynamic Adaptive Streaming over HTTP
23	Poster	Published	DTO	Jürgen Schmidt, Mario Sieck, Uwe Riemann	IBC 2015	11-15.09.2015	Amsterdam	A dynamic production tool for live and offline production combining professional and user generated content
24	Paper	Published	VRT	Rik Bauwens, Tine Deboosere, Mike Matton and Luk Overmeire	IBC 2015	11-15.09.2015	Amsterdam	The Wall of Moments: an Immersive Event Experience at Home
25	Paper	Published	JRS	Hannes Fassold, Harald Stiegler, Felix Lee and Werner Bailer	Working Notes Proceedings of the MediaEval 2015 Workshop	14-15.09.2015	Wurzen, DE	JRS at Synchronization of Multi-user Event Media Task

These publications have been accepted and will be published in the next reporting period.

#	Category	Status	Partner(s) responsible/involved	Author(s)	Conference, Journal, Event	Date of publication / event	Location of event	Title
1	Paper	Accepted	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

| 2 | Paper | Accepted | 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 |
| 3 | Paper | Accepted | iMinds | Maarten Wijnants, Kris Van Erum, Peter Quax, Wim Lamotte | Lecture Notes in Business Information Processing (LNBIP) | | | Augmented ODV: Web-Driven Annotation and Interactivity Enhancement of 360 Degree Video in Both 2D and 3D |

1) P. Nowak, M. Thaler, H. Stiegler, W. Bailer, "JRS at Event Synchronization Task", MediaEval 2014, October 2014. Workshop: http://www.multimediaeval.org/mediaeval2014/

2) W. Bailer, H. Stiegler, "JRS at Search and Hyperlinking of Television Content Task", MediaEval 2014, October 2014. Workshop: http://www.multimediaeval.org/mediaeval2014/

3) M. Matton, R. Bauwens, "The Wall of Moments, een festivalbeleving bij je thuis", Media Fast Forward, December 2014.

4) M. Paradis, F. Melchior, R. Gregory-Clarke, "VenueExplorer Object-based Interactive Audio for Live Events", WAC 2015, Paris, France, January 2015.

5) P. Taylour, C. Pike, F. Melchior, "Delivering Object-Based 3D Audio using The Web Audio API and The Audio Definition Model", WAC 2015, Paris, France, January 2015.

6) H. Fassold, J. Rosner, "A real-time GPU implementation of the SIFT algorithm for large-scale video analysis tasks", Real Time Image and Video Processing, San Francisco, USA, February 2015. Abstract: http://proceedings.spiedigitallibrary.org/proceeding.aspx?articleid=2191034

7) J.-M. Batke, "Virtual acoustic scenes through smartphone acquisition", DAGA - 41th Annual Conference on Acoustics, Nuremberg, Germany, March 2015.

8) H. Fink, "Practical Real-Time Video Rendering with Modern OpenGL and Gstreamer", GPU Technology Conference 2015, San Jose, USA, March 2015, Abstract: https://registration.gputechconf.com/form/session-listing&doSearch=true&additional_parameter_selector=none&queryInput=toolsonair&topic_selector=none&type_selector=none

9) W. Bailer, C. Pike, R. Bauwens, R. Grandl, M. Matton, M. Thaler, "Multi-sensor Concert Recording Dataset Including Professional and User-generated Content", ACM Multimedia Systems Conference, Portland, USA, March 2015. Abstract: http://dl.acm.org/citation.cfm?id=2713191

10) H. Fassold, S. Wechtitsch, M. Thaler, K. Kozlowski, W. Bailer, „Real-time Video Quality Analysis on Mobile Devices", 7th ACM International Workshop on Mobile Video, Portland, USA, March 2015. Abstract: http://dl.acm.org/citation.cfm?id=2727041

11) M. Wijnants, K. Van Erum, P. Quax, W. Lamotte, "Web-Mediated Augmentation and Interactivity Enhancement of Omni-Directional Video in Both 2D and 3D", 11th International Conference on Web Information Systems and Technologies (WEBIST2015), Lisbon, Portugal, May 2015. Full-text: http://www.researchgate.net/publication/277175160_Web-mediated_Augmentation_and_Interactivity_Enhancement_of_Omni-directional_Video_in_Both_2D_and_3D

12) C. Timmerer, „Glass-DASH, live streaming from Google Glass", 7th International Workshop on Quality of Multimedia Experience (QoMEX 15), Costa Navarino, Messinia, Greece, May 2015.

13) M. Thaler, W. Bailer, R. Grandl, "Integrated Video and Sensor Capture App Providing Immediate Quality Feedback", ACM International Conference on Interactive Experiences for Television and Online Video, Brussels, Belgium, June 2015. Abstract: http://figshare.com/articles/DEMO_101_Integrated_Video_and_Sensor_Capture_App_Providing_Immediate_Quality_Feedback/1423368

14) R. Bauwens, T. Deboosere, L. Overmeire, "The Wall of Moments: an immersive event experience", ACM International Conference on Interactive Experiences for Television and Online Video, Brussels, Belgium, June 2015. http://www.google.at/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CBsQFjAAahUKEwiJ4qT9trDIAhVIwBQKHfAhDNo&url=http%3A%2F%2Ffiles.figshare.com%2F2079105%2FIN_101.pdf&usg=AFQjCNExucL08yaZZxAXCAxELYHfMGBhCA

15) R. Bauwens, M. Matton, T. Deboosere, L. Overmeire, "The Wall of Moments", ACM International Conference on Interactive Experiences for Television and Online Video, Brussels, Belgium, June 2015. http://www.google.at/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0CDoQFjAEahUKEwiazYzht7DIAhXBtxQKHa9aCwI&url=http%3A%2F%2Ffiles.figshare.com%2F2079115%2FDEMO_102.pdf&usg=AFQjCNHUWNlkkoilBBYWONpxyuQEBEpizQ&bvm=bv.104615367,d.d24

16) M. Thaler, W. Bailer and G. Thallinger, "Spatiotemporal Video Synchronisation by Visual Matching", 3rd International Workshop on Interactive Content Consumption at ACM TVX2015, Brussels, Belgium, June 2015.

17) M. Wijnants, G. Rovelo Ruiz, D. Degraen, P. Quax, K. Luyten, W. Lamotte, "Web-Powered Virtual Site Exploration Based on Augmented 360 Degree Video via Gesture-Based Interaction", Brussels, Belgium, June 2015. Full Paper:
http://research.edm.uhasselt.be/~mwijnants/pdf/wijnantsWSICC2015.pdf

18) H. Fassold, H. Stiegler, J. Rosner, M. Thaler, W. Bailer, „A GPU-Accelerated Two Stage Visual Matching Pipeline for Image and Video Retrieval", 13th International Workshop on Content-Based Multimedia Indexing, Prague, Czech republic, June 2015. Abstract:
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7153620&filter%3DAND(p_IS_Number%3A7153597)

19) M. Wijnants, P. Quax, G. Rovelo Ruiz, W. Lamotte, J. Claes, J.-F. Macq, "An Optimized Adaptive Streaming Framework for Interactive Immersive Video Experiences", Ghent, Belgium, June 2015. Abstract:
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7177259&punumber%3D7161213%26filter%3DAND(p_IS_Number%3A7177182)%26pageNumber%3D4

20) G. Thallinger, „Immersive coverage of spatially outspread live events", EC Concertation Meeting, Brussels, Belgium, June 2015. Abstract:
https://ec.europa.eu/digital-agenda/events/cf/ict2015/item-display.cfm?id=15182

21) C. Timmerer, D. Weinberger, M. Smole, R. Grandl, C. Mueller, S. Lederer, „Live Transcoding and Streaming-as-a-Service with MPEG-DASH", IEEE International Conference on Multimedia & Expo Workshops (ICMEW), Turin, Italy, June-July 2015. Abstract:
http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=7169746&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxpls%2Fabs_all.jsp%3Farnumber%3D7169746

22) C. Mueller, S. Lederer, R. Grandl, C. Timmerer, „Oscillation Compensating Dynamic Adaptive Streaming over HTTP", IEEE International Conference on Multimedia & Expo Workshops (ICMEW), Turin, Italy, June-July 2015. Abstract:
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7177435&punumber%3D7160935%26filter%3DAND(p_IS_Number%3A7177375)%26pageNumber%3D3

23) J. Schmidt, M. Sieck, U. Riemann, „A dynamic production tool for live and offline production combining professional and user generated content", IBC 2015, Amsterdam, Netherland, September 2015.

24) R. Bauwens, T. Deboosere, M. Matton, L. Overmeire, "The Wall of Moments: an Immersive Event Experience at Home", IBC 2015, Amsterdam, Netherland, September 2015. Full-Text: http://www.ibc.org/files/rik_bauwens_the_wall_of_moments_an_immersive_event_experience_at_home.pdf

25) H. Fassold, H. Stiegler, F. Lee, W. Bailer, „JRS at Synchronization of Multi-user Event Media Task", Working Notes Proceedings of the MediaEval 2015 Workshop, Wurzen, Germany, September 2015. Full-Text: http://www.researchgate.net/publication/281650779_JRS_at_Synchronization_of_Multi-user_Event_Media_Task

These publications have been accepted and will be published in the next reporting period.

1)   S. Wechtitsch, H. Fassold, M. Thaler, K. Kozlowski, W. Bailer, „Quality Analysis on Mobile Devices for Real-time Feedback", 22nd International Conference on Multimedia Modelling, Miami, USA, January 2016. Event: http://www.eecs.ucf.edu/mmm2016/

2)   W. Bailer, W. Weiss, S. Wechtitsch, „Selecting User Generated Content for Use in Media Productions", 22nd International Conference on Multimedia Modelling, Miami, USA, January 2016. Event: http://www.eecs.ucf.edu/mmm2016/

3)   M. Wijnants, K. Van Erum, P. Quax, W. Lamotte, „Augmented ODV: Web-Driven Annotation and Interactivity Enhancement of 360 Degree Video in Both 2D and 3D", Lecture Notes in Business Information Processing (LNBIP).

4.5 Other dissemination activities

4.5.1 Field Trial at Dranouter

One major dissemination event was clearly the first ICoSOLE field trial performed on 7-9 of August at the Dranouter "Festival of new Traditions" in Belgium. In collaboration with the festival organisers Flemish broadcaster VRT organised the test in which 60 visitors could test the latest developments of ICoSOLE.

The test users got a special app (*Dranouter Moments*) installed on their Android phones and were able to record and upload shorts sequences of video, the so-called *Moments*. These clips were displayed on the *Wall of Moments*, a video wall next to the central stage, as well as in the internet. This way content was captured which is usually not covered by the professional cameras on-site and it could also be shared with the friends at home.

In addition to the Wall of Moments there was also a live stream (via MPEG-DASH) available fed by conventional TV cameras and a panoramic camera system.

A more comprehensive description of the first field trial can be found in deliverable D6.3 First Demonstration and Field Trial.

4.5.2 Publication of test data

Selected content from the Marconi Moments test shoot has been 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.

4.5.3 Demonstration at IBC

In September 2015 the project was present at the International Broadcasting Convention (IBC) with a booth in the "Future Zone". ICoSOLE presented the following demos, for more details on the demonstrations please refer to deliverable D6.3.

- Capture system
- Capture app
- Set composer
- Mixing engine
- Wall of Moments
- DASHing
- Smart TV App

For its innovative demonstrations the ICoSOLE project received a "What caught my eye" Award from the show's organisers.

4.5.4 Participation in benchmarking activities

VRT has co-organised the MediaEval task on Synchronization of Multi-user Event Media Task, which is strongly related to scenarios addressed in ICoSOLE. The aim is to synchronise photo and video collections taken by different users (called galleries) that cover the same large event (e.g., Olympic Games) and partly overlap when users attended the same sub-events.

As time stamps are not always reliable (due to wrong settings of the camera) the alignment is done by visual matching and identifying synchronisation points between galleries of different users. In 2015, the task has been extended to include video. Data from the Salford test shoot has been provided as part of the content set for the task. JRS has participated in this task.

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

4.5.5 Concertation activities

JRS has continued collaboration with the SceneNet project (FET, http://scenenet.uni-bremen.de/) which is also addressing the use of user generated contact captured on mobile devices. SceneNet will organise a second edition of the "Audio-Visual Gestalt Workshop" in Oct. 2015, and a presentation about the progress of ICoSOLE will be part of the program.

4.5.6 Individual partners' homepages

BIT updated and revised the section about the ICoSOLE project, which can be accessed via https://www.bitmovin.com/2152-2/. BIT further posted updates and development results in their blog.

The BBC published several articles on their R&D pages related to immersive and object-based audio. These included a blog post on the Dranouter field trial: http://www.bbc.co.uk/rd/blog/2015/08/dranouter-field-trial, and the Sound Now & Next conference: http://www.bbc.co.uk/rd/blog/2015/06/sound-now-next-watch-talks-online.

VRT hosted a page dedicated to the project on their website (http://innovatie.vrt.be/project/icosole).

4.5.7 Conference Organisation

On the 19th & 20th May the BBC hosted a conference called Sound Now & Next at Broadcasting House in London. The event brought together programme makers, researchers, engineers and broadcasters to discuss, share and experience the latest audio developments. There were several presentations and keynote speeches covering topics such as recording techniques in the Antarctic, organising Olympic sound capture and live electronic music composition. There were also several demonstrations of audio technology from commercial companies and academia.

From the ICoSOLE project the BBC demonstrated live object-based audio and rendering over IP with a link to Salford, and VRT demonstrated the Wall of Moments (for further information see http://icosole.eu/demo-bbcs-sound-now-and-next/).

5 Standardisation Activities

5.1 BBC

The BBC's areas of standardisation relating to the project in the second year have been audio metadata and a baseline renderer for object-based audio.

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). Since then it has also become an ITU standard: ITU-R BS.2076, which contains additional features over the current EBU Tech 3364 version (which will be updated in the near future to match the ITU version). The ITU work was carried out in ITU-R Working Party 6B Rapporteur Group 13 which Dave Marston from BBC is co-chair of. In addition to the ADM, a WAV-based file format called BW64 has been made a New Recommendation through ITU-R WP6B. BW64 allows the ADM metadata to be carried in the audio files. A Draft New Recommendation on commonly used ADM definitions has also been written. There has also been an ITU-R Report generated which give guidelines on how best to use BW64 and the ADM.

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 become involved in these groups to ensure their standardisation processes head in a coherent direction.

The BBC also contributed two documents to ITU-R Working Party 6C (Rapporteur group 33) on a baseline renderer:

- A structure for the internal rendering process/application of panning gains and appropriate interpolation and block-wise processing. The algorithms were not described but how the panning gains might be applied to the audio signal and what the internal structure of the renderer might look like;
- A Preliminary Draft New Recommendation for the baseline renderer. This was presented as a proposal for a working document to allow additional detail in the future. It included the initial requirements, structure and in addition a mapping of the different parameters from ITU-R BS.2076 to the blocks of the renderer

The SOFA file format (Spatially Oriented Format for Acoustics), used to encode HRTF for binaural rendering became a published AES standard (http://www.aes.org/publications/standards/search.cfm?docID=99).

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

In August 2013, MPEG has started an activity on defining compact descriptors for video analysis tasks, complementing the existing work on compact descriptors for visual search (CDVS), which focuses on similarity matching of still images. 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.

In August 2015, the call for proposals was issued and the evaluation data set has been released. The deadline for the submission of candidate technologies is in February 2015.

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

- *110th MPEG meeting (October 2014)*
  - m34906, Temporal and Spatial Alignment Ground Truth for ICoSOLE Concert Recording Data set, Marcus Thaler, Elisabeth Höldrich, Werner Bailer (JRS)
  - m34907, Comments on CDVA Requirements and Evaluation Scenarios for Search Applications, Werner Bailer (JRS)
- *112th MPEG meeting (June 2015)*
  - m36439, Annotated datasets and distractor videos for CDVA, Werner Bailer, Stefanie Wechtitsch, Marcus Thaler (JRS)

5.3 BIT – MPEG DASH

- 109th Meeting, July 2014, Sapporo, Japan
  - o m34438: Input contributions highlights existing/related work on DASH/2.0, i.e., Dynamic Adaptive Streaming over HTTP/2.0. HTTP/2.0 – currently under development within IETF httpbis – is developed based on SPDY.
- 110th Meeting, October 2014, Strasbourg, France
  - o m35188: This input contribution describes a dataset and provides a brief overview about the player support with which we have tested the dataset.
- 111th Meeting, February 2015, Geneva, Switzerland
  - o m35935: BIT proposed a solution targeting live services using the live profile which includes a live edge hint within the MPD that allows DASH client effectively determining the live edge.
  - o m35937: BIT suggests a new attribute referred to as name with string data type that can be optionally included at the level of the Period, AdaptationSet, and Representation.
  - o m35938: BIT proposed a new attribute, in context of Ad insertion, referred to as skippable that can be optionally included at the level of the Period.
- 112th Meeting, June 2015, Warsaw, Poland
  - o m36517: This input contribution is an updated proposal of m35935 (Live edge hinting for MPEG-DASH) from the previous MPEG meeting where we proposed a solution targeting live services using the live profile which includes a live edge hint within the MPD that allows DASH client effectively determining the live edge.
  - o m36519: This input contribution is an updated proposal of m35937 (Descriptive information for adaptation set and representation) which provides descriptive information" (pure text with no semantic meaning) to be used by application, to show it to user/ to display.

5.4 DTO – MPEG –H

Work on MPEG-H Audio started in 2012, when requirements for a new standard for delivery of next generation audio content were collected. The requirements include amongst others: shall enable high-quality applications, accurate sound localization shall be supported and the sense of sound envelopment shall be very high, shall provide rendering to arbitrarily placed loudspeakers or to setups with a different number of loudspeakers as the reference setup and shall provide binaural rendering.

Following evaluation of the results of a technology Call for Proposals in mid-2013, proposals from Fraunhofer IIS and Technicolor were selected for combination into a reference model to serve as the basis for further improvement. In the evaluation process a huge number of subjective listening tests were conducted at the envisioned target bitrates from 256 kbit/s up to 1.2 Mbit/s. Already the so called first reference models provided mostly excellent quality at the tested bitrates.

In a subsequent joint development process, the channel- and object- based proposal from Fraunhofer was integrated with Higher Order Ambisonics (HOA) – the scene-based proposal from Technicolor. This integration work has been finished in spring 2014. At the same time a second technology Call for Proposals targeting at even lower bitrates has been evaluated. It was highly encouraged that the new technology proposals are based on the MPEG-H Audio standard under development at that time. The evaluation process showed that a few additional tools expand the bitrates of operation down to 96 kbit/s for 22.2 multichannel content or HOA content still providing good audio quality. A second joint development process followed the so called "phase 2" evaluation.

Meanwhile the first joint development process ended in autumn 2014 with the completion of the Draft International Standard (DIS) text. In this process also additional requirements, such as loudness management, dynamic range control (DRC), bitrate adaptation, and dialog enhancement, were adopted to optimize the MPEG-H Audio codec for broadcast and streaming applications.

At the MPEG meeting in February 2015 the standard "ISO/IEC 23008-3 Information technology -- High efficiency coding and media delivery in heterogeneous environments -- Part 3: 3D audio" was finalized and has now (09/2015) the status of an "International Standard under publication".

Meanwhile the second joint development process continued and reached the status Preliminary Draft Amendment (PDAM) to the MPEG-H 3D Audio standard. It is envisioned that the final amendment text will directly be merged into second edition of the MPEG-H 3D Audio standard in mid-2016.

5.5 JRS – EBU/AMWA FIMS

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. SMPTE is supporting the FIMS initiative and the FIMS v1.07 specification has been accepted for publishing as Registered Disclosure Document by SMPTE. The specification of the interface for managing repositories has been announced at IBC 2013. 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 group on definition of a service interface for quality analysis (QA) and automatic metadata extraction AME). FIMS QA has a developed an interface specification and a schema for the service interfaces and the request (QA profile) and response (QA report) side metadata, which has been released at IBC 2015.

Work in FIMS AME has started, and a draft model is currently being developed. Like for QA, FIMS AME will refer to definitions of analysis services. The EBU SCAIE (chaired by Mike Matton from VRT) group will work on those definitions, using the same infrastructure on ebu.io that is used for EBU QC.

6 Planned Activities (Year 3)

6.1 Dissemination

In the third project year the ICoSOLE partners will focus on joint dissemination activities. Potential demonstrations at ACM MMSys and at NAB are currently under discussion. At the time of writing of this deliverable the consortium didn't yet take a final decision on one or the other option. It is expected that first indications could be given at the occasion of the second project review.

More specific dissemination activities per partner related to conferences, events and journals are listed in the chapters following hereafter.

6.1.1 JRS

JRS plans to publish on efficient matching of compact video descriptors and visual quality analysis. Targets to be considered are the IEEE International Conference on Image Processing (ICIP), the ACM International Conference on Multimedia Retrieval (ICMR), the Workshop on Content-Based Multimedia Indexing (CBMI), the ACM Multimedia Systems conference and ACM Multimedia and attached workshops. In collaboration with other partners, JRS aims to again submit contributions to the ACM International Conference on Interactive Experiences for Television and Online Video (TVX).

6.1.2 DTO

With regard to audio processing research, DTO intends to present preliminary results for audio scene creation using user generated content (UGC). Conferences to be addressed are the 42nd annual conference of the German acoustical society (DAGA 2016) in Aachen on March 14th to 17th and the 140th Audio Engineering Society Convention in Paris on June 4th to 7th. Moreover likewise other ICoSOLE project partners, IBC 2016 will also be considered as high profile event to demonstrate project results.

6.1.3 VRT

ACM TVX 2016: Tvx 2016 is an ACM international conference on interactive experience for television and online video taking place in from the 22nd till the 24th of June. We are planning to submit the further work on the Wall of Moment and review of user generated content in collaboration with other partners.

IBC 2016: IBC (International Broadcasting Convention) is an annual event for professionals engaged in the creation, management and delivery of entertainment and news content worldwide. VRT plans to present the results of the ICoSOLE project together with other partners in the consortium.

6.1.4 iMinds

iMinds potentially targets a technical submission for ACM MMSys, IEEE ICME or ACM TVX 2016 – which would describe the multi-depth layered video methodology developed as part of task T5.1 "Content preparation and distribution". iMinds also plans to develop an MPEG-DASH-compatible tiled streaming solution in the third project year. Ideally, this effort will lead to another technical scientific publication; potential dissemination avenues include ACM Multimedia 2016 and Springer's Multimedia Tools and Applications (MTAP) journal.

The iMinds playout client for remotely experiencing music festivals on a Smart TV (developed as part of task T5.3 "Playout clients") will be subjected to a user study to gauge users' (subjective) impressions of the application, for example with regard to immersion and remote presence. The goal is to valorise the findings from this user study by means of a scientific publication; ACM CHI 2016 seems like a promising venue for publishing this kind of research.

6.1.5 BIT

BIT has planned to present the results of ICoSOLE collectively with other partners of the consortium at international conferences and conventions.

BIT will continue to publish and promote interesting developments steps, as well as updates and summaries from events, like test shoots, within their social community and on their website/blog.

6.1.6   BBC

The BBC R&D site (http://www.bbc.co.uk/rd) will continue to be a location for blog posts relating to any interesting developments in the project.

6.1.7   TaW

TAW is going to present the ICoSOLE field trial and the ICoSOLE live playout engine architecture at the GStreamer conference 2015 (http://gstreamer.freedesktop.org/conference/2015/index.html). This will include specific topics about PTP synchronisation and the integration with VRTs and BBCs work in ICoSOLE.

Furthermore, a submission to the NVIDIA GTC 2016 is planned, presenting the progress of GPU-focused developments in GStreamer as being for the ICoSOLE live playout engine (i.e. using hardware encoders, etc).

6.2 Standardisation

6.2.1   BBC

Over the next 12 months the BBC plans to continue the standardisation processes within the ITU (ITU-R WP6C and WP6C) of the baseline renderer and related audio file and streaming formats. EBU Tech 3364 and 3285 will be updated with to be compatible with their ITU-R equivalents.

There will also be effort to develop the baseline renderer taking into account other standardisation bodies' work, in particular SMPTE, MPEG and DVB.

Work will continue in W3C to getting the Web Audio API to a standard that is capable of handling immersive and interactive audio.

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

JRS plans to further contribute to standardisation of CDVA, focusing on the instance search use cases, which are most relevant for ICoSOLE. It will be decided, whether technology will be submitted in response to the call. In any case, JRS plans to contribute to the assessment of candidate technologies.

6.2.3   DTO – MPEG-H

DTO will be further involved in the MPEG-H Audio standardization process. One important part is the finalization of the amendment including the tools improving the very low bitrate quality (formerly known as "phase 2").

Another important topic, especially for application standards potentially adopting MPEG-H 3D Audio, will be the definition of profiles and levels. A profile and corresponding level define the actually mandated tools from the MPEG-H Audio standard and their complexity (e.g. a level may restrict the number of output loudspeakers or the number of input channels). This means certain tools may be excluded from usage in a profile, e.g. due to complexity reasons or because in a specific application the usage of a certain tool is not necessary. In other words a profile tailors the standard for specific applications.

Activities over the next year include: Participation in upcoming international ISO meetings, preparing the Amendment text, preparing text for a second edition of the MPEG-H 3D Audio standard and related reference software as well as providing conformance bit streams.

6.2.4   JRS – EBU/AMWA FIMS

JRS will continue to contribute to the specification of services for automatic metadata extraction, as well as to the specification of service types and parameters in the EBU MIM/SCAIE group.

6.2.5   BIT – MPEG-DASH

BIT plans to further contribute to the standardisation of MPEG-DASH, specifically

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7 Conclusions

It could be well derived from the deliverable that ICoSOLE partners have intensified their effort related to dissemination and standardization activities.

Public communication has been continued through ICoSOLE's website and Twitter account, and an increased number of page visits and followers could be recognized. The contributions of partners to international conferences and publications have been increased as well. This has included demonstrations of technologies used in the project, such as object-based audio at BBC's Sound: Now and Next event, .JRS and VRT's presentations on ACM conferences, and the joint demonstration of the ICoSOLE system at IBC, just in order to mention a few of it. 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. The related advancements with respect to the first year have been highlighted.

Also in the second year, the ICoSOLE project has helped in the testing and data gathering of the technology behind these standards. For example, the Dranouter field trial provided a large set of audio and video data along with associated metadata. The new and proposed standards could be applied to this data and test it more thoroughly. And last but not least, the performing artist, who accepted being recorded by the ICoSOLE technology, will benefit from these acquisitions, which will be made available for them for their own marketing purposes.

In conclusion it can be confirmed that all originally set objectives have been met.

8 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
DTO	Deutsche Thomson OHG (Technicolor), DE
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