

# **D3.3.1 – Demonstrator design and evaluation report – year 01**

## **MOS2S**

### **Media Orchestration from Screen to Screen**

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**FINAL VERSION**

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## Project key data

### ACRONYM and full-length title

<b>15022</b>	<b>MOS2S</b>
Program Call	ITEA 3 Call 2
Full-length Title	Media Orchestration - Sensor to Screen
Roadmap Challenge	Urbanisation

### Description

Novel and ubiquitous consumer-priced audiovisual sensors and data in particular, represent an important aspect of the Smart City environment, enabling a variety of applications for citizen information, participation, entertainment, experience, safety and security. Every user becomes a potential source of information, either directly or through social media buzz and its discovery. Audiovisual media provide citizens with Smart City data readily accessible to human senses. With the MOS2S project (Media Orchestration from Sensor to Screen), an international consortium of partners will develop and test audiovisual Smart City technologies and solutions in the context of citizen needs, and embed these solutions within the Smart City Playground.

### Project duration & size

Size	Effort: 133.67 PY	Costs: 13.9 M€
Time frame	Start: 2016-10-01	End: 2019-09-30 (36 months)

### Coordinator

<b>Netherlands</b>	<b>TNO</b>
Type	Research Institute
Contact Person	Gjalt Loots
Email Address	gjalt.loots@tno.nl

## Consortium

Belgium	Nokia, iMinds, Kiswe Mobile, VRT*
Korea, Republic of	ETRI*, Mooovr
Netherlands	Amsterdam ArenA*, Bosch Security Systems B.V., Game On, Inmotio Object Tracking BV, Koninklijke KPN NV, TNO
Turkey	Bor Software inc. *, DİA Yazılım San. ve Tic. A.Ş., KoçSistem,

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## Project acronyms

3DoF	3 degrees of freedom
BE	Belgium
CPA	Conformance Points A
CPB	Conformance Points B
DVB	Digital Video Broadcasting
IM	Instant Messaging
IT	Italy
KR	Republic of Korea
MOS2S	Media Orchestration Sensor To Screen
NL	(The) Netherlands
OB	Outside Broadcasting
PTZ	Pan-Tilt-Zoom
TR	Turkey
UHD	Ultra-High Definition
VR	Virtual Reality

## 1. Introduction

### 1.1. Purpose of this Document

Within MOS2S WP3, yearly demonstrators are prepared and held to validate and showcase the project progress. The purpose of these demonstrators is twofold, first to raise project awareness of media within the industry, and second to test drive the technology and getting industry expert input for the further development of the technology and exploitation. This document reports on the first public demonstration, at the International Broadcast Convention (IBC) in September 2017.

### 1.2. Scope of this Document

This document is related to Task 3.3.1: Year 1 demonstrator - demonstration of first project results at IBC2017, Amsterdam. In the MOS2S project proposal this task is described as first mock-up demonstrations, primarily based on or derived from existing platforms and enabling technologies, that will be showcased with a focus on live events in the Amsterdam ArenA. A live event, e.g. sports game or concert, will be selected as context for the demonstration. First feedback from stakeholders will be retrieved, and a limited validation of technologies will be performed, to steer the next phase of development.

### 1.3. Status of this Document

This is the final version of D3.3.1.

## 2. Demonstrator at IBC2017

After an initial pitch to the IBC Technical Programme Committee (see Annex I), we were delighted to get the opportunity to demonstrate MOS2S on the Future Zone at the IBC 2017 in September. At IBC2017, we showcase cutting-edge technology that enriches the live event fan experience, in the stadium, at the cycling race track and at home. Our demonstrations use high-end footage from official games of the Dutch national football team, as well as from Belgium's professional cycling race: the Tour of Flanders. Many of the record attendance of 57,669 across the six day IBC event were taken through the story of MOS2S.

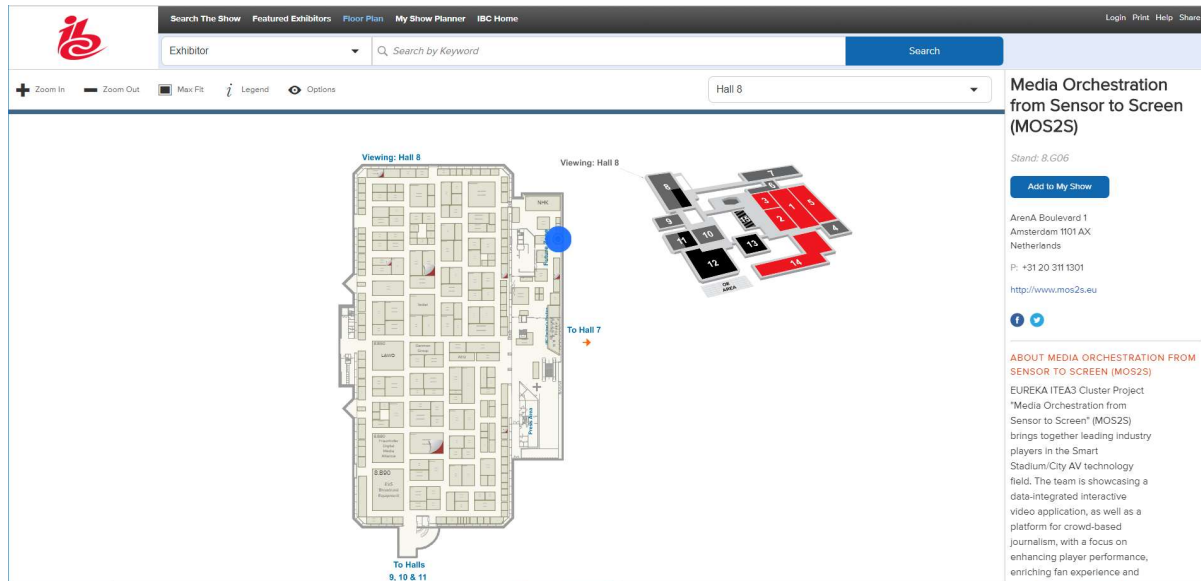
### 2.1. Preparations

End of 2016 we have approached the IBC to inform them about the MOS2S project and possibilities to showcase our first year demonstrator on the Future Zone of the IBC2017. They responded very enthusiastic and offered us a booth on the Future Zone. Careful preparations of our IBC booth took place in the months before September 2017, starting from April 2017. We were allocated booth 8.G06 in the Future Zone of the IBC. This location was nicely placed on route to the NHK that featured their 8K UHD OLED sheet-type display (G01) and right after the Experience the Smart AV 'Time Tunnel' (G09), which allowed us to easily attract the interest of passing visitors.



Figure 1: Future Zone: Hall 8 Booth G.06.





**Figure 2: Future Zone: Map Your Show.**

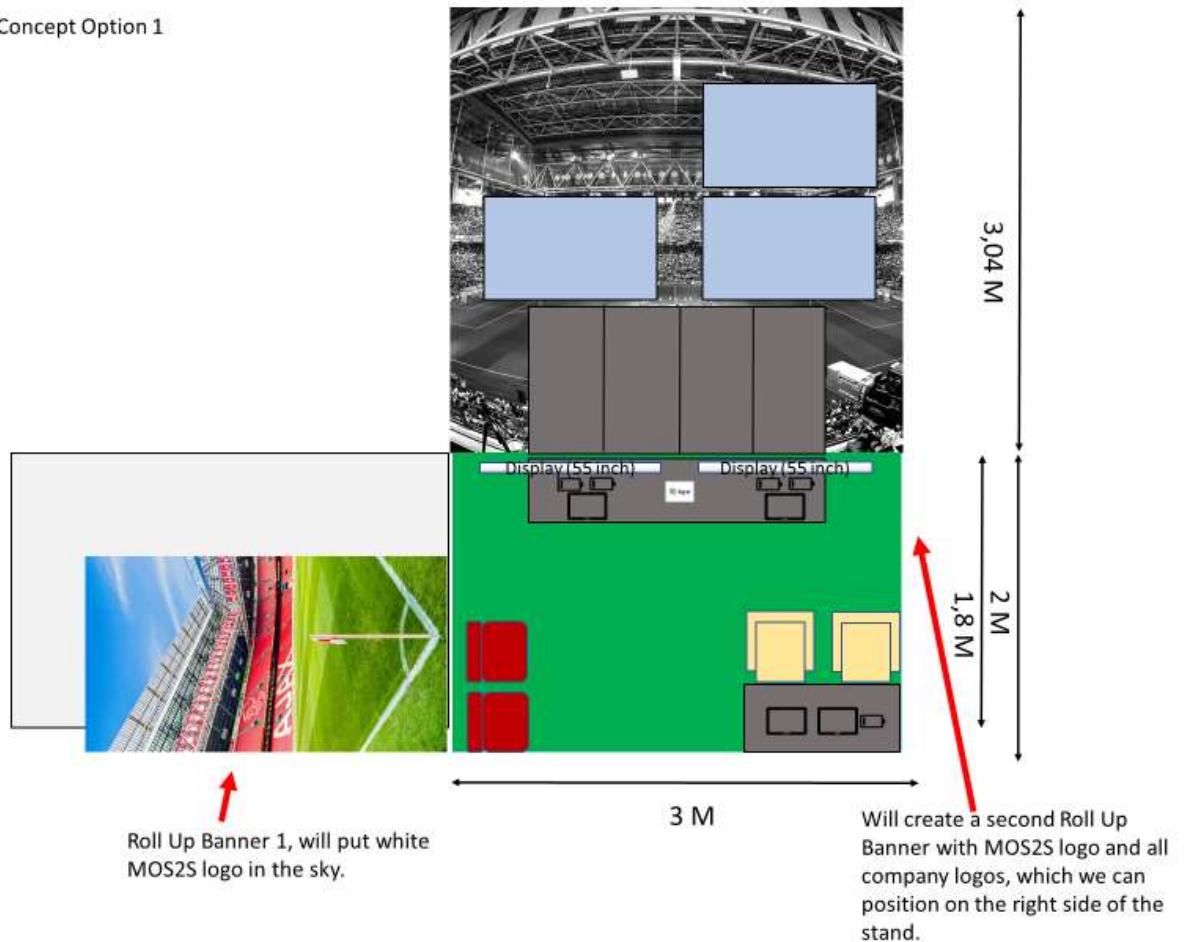
During our Consortium meeting in Antwerp half of April the MOS2S team discussed the first booth concept. The main outcome of this meeting was that the demonstrator and booth design should highlight the innovative technology of MOS2S each country consortium had been working on in the first year. At the same time we wanted to show our joint vision and goals and a glimpse into the ambitions for the MOS2S project in the upcoming 2 years. To give each country the possibility to showcase their subproject and/or expertise the booth was divided into 4 showcases:

1. Lively Experience by Belgium Consortium
2. 180VR by Korean Consortium
3. Professional Analyst by Dutch Consortium
4. Coach on the couch by Dutch Consortium

These showcases were built around sports events namely an official match of the Dutch national football team and Belgium's professional cycling race: the Tour of Flanders.

We explored different look and feel options for the booth, but based on aesthetics and practical reasons, such as image rights and image quality, we decided to go for the booth design as shown in Figure 3. The booth design includes, wall images, furniture, 3 HD Screens, Power Ducts and even VIP Stadium Seats and Artificial Grass to create the real sport event / stadium environment look and feel. For more concept booth designs and sketches please see Annex II.

### New Concept Option 1



**Figure 3: Booth Design IBC2017.**

Beside the booth design we also developed and designed a:

### MOS2S flyer;



**Figure 4: Flyer Design IBC2017.**

<https://www.mos2s.eu/wp-content/uploads/2017/09/flyer.pdf>

## Two Roll up Banners

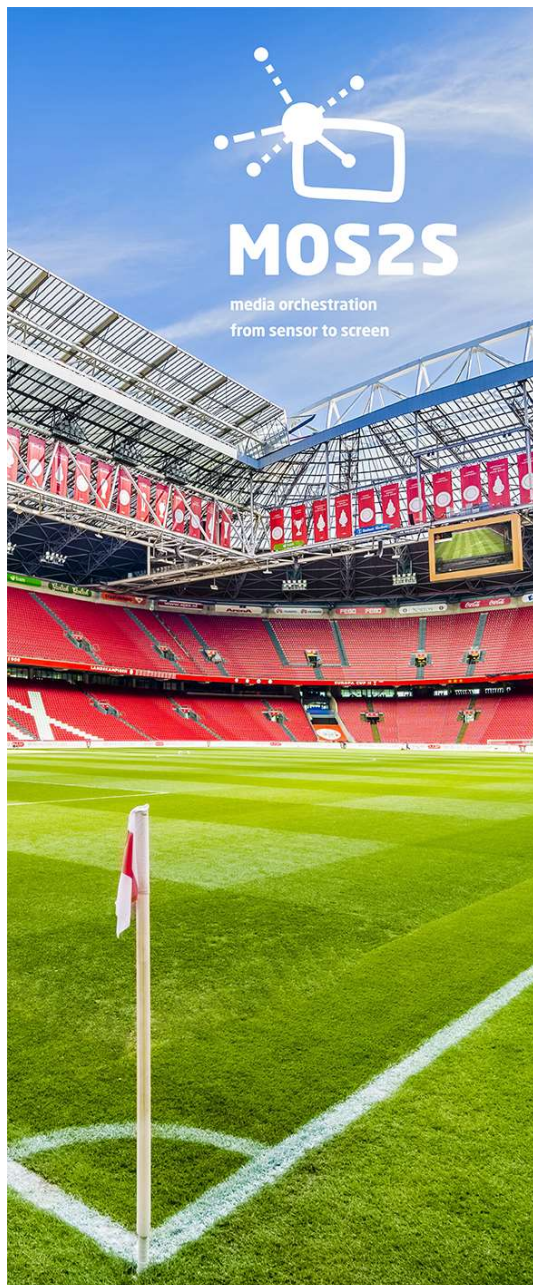


Figure 5: two roll-up banner designs.

**Project Website:** <https://www.mos2s.eu/>

## 2.2. Exhibition

The IBC has been very well visited and the flow of visitors to the future zone and our booth was above expectations. Our steady flow of visitors were treated to a showcase of what MOS2S is really about, with 3 demonstrations explaining the major features of the project. The demonstrations made use of (1) the football game content that was recorded during the first MOS2S test shoot and (2) content captured during the Tour of Flanders.

The 3 showcases demonstrated on the Future Zone were:

### **1. Coach on the couch by Dutch Consortium**

We demonstrate a data-integrated interactive video system and mobile application, featuring navigable 360/ultrahigh definition (UHD) video and real-time player and game statistics. We combine tracking data and ultrahigh definition video images in real time in an in-stadium smartphone app that lets fans get more information about the players and match by using augmented reality layers. For example, fans can determine their team's game tactics, follow a specific player, and more. At the same time, the technology provides an innovative TV experience for the viewer at home. The tracking and UHD video data streams can be shown via an app on an IPTV set-top box. This allows home viewers to watch the live sport or music event and also access extra information on their television set, or on streaming apps on second screens, such as smartphones and tablets. Tracking persons or objects in combination with UHD video can be useful to event management. For example, technology that allows us to follow medical and security personnel during live events will help give the event management team better operational control in complex situations.

The demonstration consisted of 2 Samsung HD LED screens, showcasing a TV-style application, running on the KPN set-top box; and a companion screen application mirrored from an Apple iPad Pro.

### **2. Lively experience by Belgium Consortium**

Coverage of the professional Tour of Flanders is enriched with live content contributed by the crowd watching the race. Curated by a professional editor, these highlights will provide an immersive and multi-perspective race experience. An interactive application enables users to submit content (text, images, audio and video) as well as consume content shared by a broadcaster (e.g. radio, sports or news station). From a broadcaster's perspective, news editors can easily segment and collect user content by a specific topic or location. In effect, end users become reporters in the field. The app's editorial dashboard makes it easy to reach users for updates and polls. Besides content contribution, the app enables news editors to search and analyze social media. By adapting their current workflow into a set of tools, editors will be able to efficiently collect information, tailored to their news stories. We demonstrate how novel editorial tools and end-user apps can be used to augment traditional professional race coverage with crowd-contributed highlights, curated by a professional (news) editor to provide viewers with an enriching immersive and multiperspective race experience.

The demonstration consisted of 1 Samsung HD LED screen, showcasing a companion screen application mirrored from an Apple iPad Pro; in addition, a movie reel was displayed at regular intervals.

### **3. 180VR by Korean Consortium**

Recently, 360VR displayed on head-mounted sets has presented great opportunities for viewers to experience wide field-of-view videos. Many service providers are experimenting with 360VR, trying to bring the remarkably real impressions of Smart Venue into the home environment. An important aim of developing such immersive technology is to show the feasibility of an 8K-grade 360VR broadcasting service to viewers at home.

The demonstration consisted of 1 Samsung S8 with GearVR HMD, showcasing the use of UWV content in a VR application.

The 3 demonstrations were very stable and we did not experience any problem during the 5 exhibition days.

### **Staff Planning Booth**

To be able to showcase all passing visitors our demonstrators we made sure that our booth was constantly staffed with 5 persons during 14-18 September. For this we prepared a Staff Planning which you can see in Annex IV. In our planning we made sure that each and every country and responsible party of the demonstrators were present.



## Project logo and more

For the project and demonstrator VRT has developed a MOS2S Logo, style guide and bumper.

## Tours

We also were requested to participate in 3 guided IBC tours which attracted several professionals in the field of media and broadcasting:

Tour Scheme:

- Monday Afternoon, Business-in-Media by Josbert van Rooijen (Ericsson), time 14.35
- Monday Afternoon, Government & Media-tour by Freek van 't Ooster, time 14.50
- Tuesday Morning, VIP Tour Immovator by Freek van 't Ooster, rond 11.20

## 2.3. Press and coverage

To get some more (media) attention for our MOS2S project we have developed a press release ahead of the IBC2017 for booth Dutch as English orientated Media. Please see Annex III. Besides that MOS2S was featured in IBC Preview Issue our Press Release was published on:

### **Media**

[https://issuu.com/newbayeurope/docs/ibc\\_2017\\_preview\\_digital](https://issuu.com/newbayeurope/docs/ibc_2017_preview_digital)

<https://www.avinteractive.com/news/broadcast/amsterdam-arena-introduces-new-technology-ibc-11-09-2017/>

<http://www.broadcastprome.com/news/international-news/augmented-reality-and-more-at-amsterdam-arena-during-ibc-2017/>

<http://www.culturedworld.com/amsterdam-arena-introduces-new-technology-during-ibc-2017/>

<https://amsterdamsmartcity.com/posts/amsterdam-arena-introduces-new-technology-during-ibc-2017/>

<http://www.amsterdamarena.nl/article-tonen-op-pagina/-amsterdam-arena-presenteert-nieuwe-technologie-tijdens-ibc2017-.htm>

<https://www.tno.nl/en/about-tno/events/2017/tno-showcases-media-technology-at-international-broadcast-convention/>

<http://innovatie.vrt.be/home/2017/9/14/2-europese-projecten-van-vrt-innovatie-op-ibc-2017>

<http://amsterdaminnovationarena.com/amsterdam-arena-introduces-new-technology-during-ibc-2017/>

**Social Media**

<https://www.linkedin.com/feed/update/urn:li:activity:6315469267399688192>

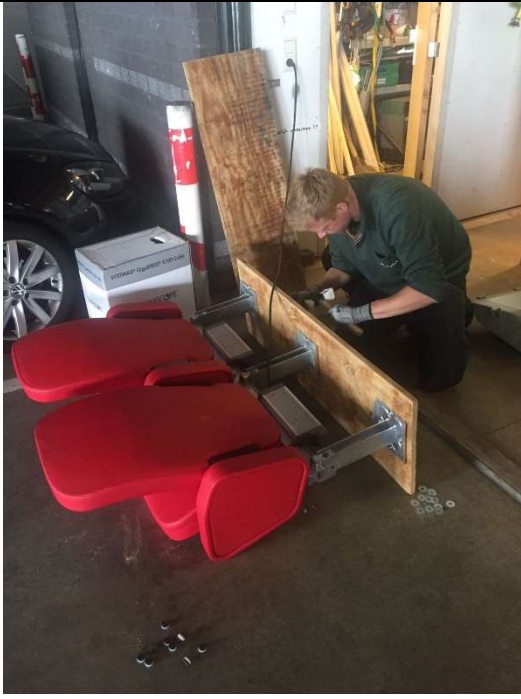



<https://twitter.com/InnovationArena/status/909388762001657857>

<https://twitter.com/Inmotio/status/910133019641548800>

<https://www.facebook.com/InnovationArenaAmsterdam/photos/pcb.862526897249228/862524933916091/?type=3&theater>

<https://www.facebook.com/VRTInnovatie/posts/1693191174025818>

### 3. A visual tour

	
Booth Attributes preparation in ArenaA	Booth Attributes from parking to booth
	
Booth as delivered by RAI / IBC	VLAN specially created by and for KPN Set-Top Box





Demo Installation &amp; Preparation 1



Demo Installation &amp; Preparation 2



Finally the HD Screens are there

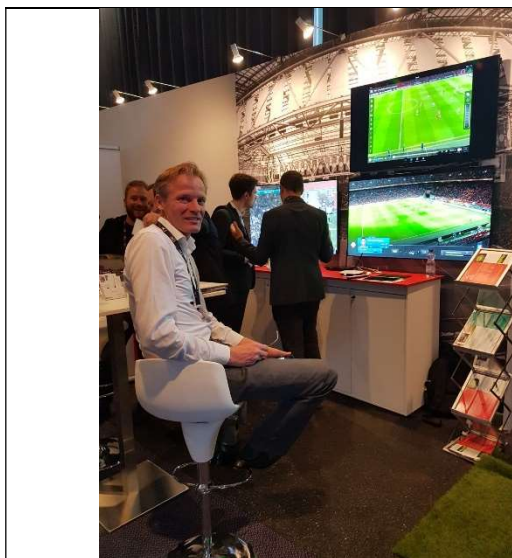


Cable Management



Ready for Exhibition Day 1!





Impression 1



Impression 2



Lots and lots of interest for MOS2S



Guided Tours 1



Guided Tours 2

## 4. Reflections and Outlook

The first public demonstration of MOS2S innovation and technology was very successful. We have managed to show individual demonstrations of all parts of the MOS2S system. Also, we have shown integration of components, such as the data interface from the Inmotio EPTS system to the KPN TV application, and the integration of the TNO tiled streaming library into the GameOn companion screen application.

The MOS2S booth was located at a clearly visible and accessible location and attracted a lot of visitors. During the exhibition, many project partners were present and were able to demonstrate all aspects of MOS2S to the audience. We received many compliments and congratulatory remarks from visitors who felt we had achieved a lot in the first year that the project has been going so far. We attracted visitors from many diverse areas, such as broadcasters, camera and production companies, technology vendors and operators and sport federations. We collected many business cards and have handed out many flyers, from interested parties that wanted to stay in touch and updated about the project progress. We have also received invitations for upcoming events in 2017 and 2018 such as the Media Fast Forward and ISE event.

This first demonstrator has given us good insights and feedback for further project developments such as:

1. The stability of the demonstrations and technology generates a lot of confidence amongst potential customers.
2. Shown technology is relevant and has great potential in terms of exploitation.
3. Overall consortium and each country should further formalize how and under which conditions the technology can be exploited in short and long term.
4. Coherence of different demonstrators and technology must be (more) clear at “glance”.

As described in our Project Outline we plan to demonstrate the project advancements during future (test) events. On the MOS2S website, a list of upcoming events is updated: [www.mos2s.eu/events](http://www.mos2s.eu/events)



## 5. Annexes

### 5.1. Annex I: IBC2017 demo proposal

The following material was sent to the IBC Technical Programme Committee to qualify for a booth at the IBC Future Zone.



#### IBC2017 Demo Proposal



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Omar Niamut / December 2016

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#### Summary



- With MOS2S, an international and industry-led consortium of partners such as the Amsterdam Arena, Bosch, ETRI, KPN, Samsung and VRT, will develop and test audiovisual Smart Stadium technologies.
- We aim to showcase cutting-edge technology to enrich the live event fan experience, in the stadium and at home. In particular, we can showcase a data-integrated interactive video system and application, featuring navigable 360/UHD video with real-time player and game statistics.
- In our demonstrations, we use footage from high-profile sports events, such as an official game of the Dutch national football team and the Ronde van Vlaanderen cycling match.

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Omar Niamut / December 2016

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#### Demo Setup



- Our proposed demo setup consists of the following
  - A large videowall showcasing recent ultra-wide-view panoramic footage from high-profile sports events, as well as aggregated amateur footage captured before, during and after the events
  - Coach-on-the-coach; an interactive amateur sports coaching application for in-venue and TV companion use
  - Crowdsourced event reporting; a live event reporting tool using editor-controlled live mobile streaming
- These demonstrators represent the efforts of the MOS2S partners in building new and innovative technologies and concepts around live events; the proof-of-concepts are not available as products

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#### Demo Test Capture Impression



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#### About MOS2S



- The project partners focus on **media orchestration** technologies, currently being standardized within MPEG, that allow for orchestrating devices, data and media streams, and resources into a rich and coherent media experience on various end-user devices, including virtual environments. Applications include crowd journalism (citizen information and participation), live events (citizen experience and entertainment) and event security (citizen safety and security).
- MOS2S projects partners originate from Belgium, Korea, The Netherlands and Turkey, and include Amsterdam ArenA, Bosch, ETRI, KPN, TNO, Samsung and VRT.

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Omar Niamut / December 2016

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### Contact partner



- As a leading EU research & development institute, TNO is a regular participant at IBC, with Technical Paper presentations, and demonstrations both at the Future Zone and industry partner booths. We are leading multiple standardization efforts in DVB, ETSI, HbbTV, IETF and MPEG.
- Omar Niamut (TNO) / MOS2S technical manager
- [Omar.niamut@tno.nl](mailto:Omar.niamut@tno.nl) / +31651916242
- <http://www.ibt.org/speaker-library/omar-aziz-niamut>

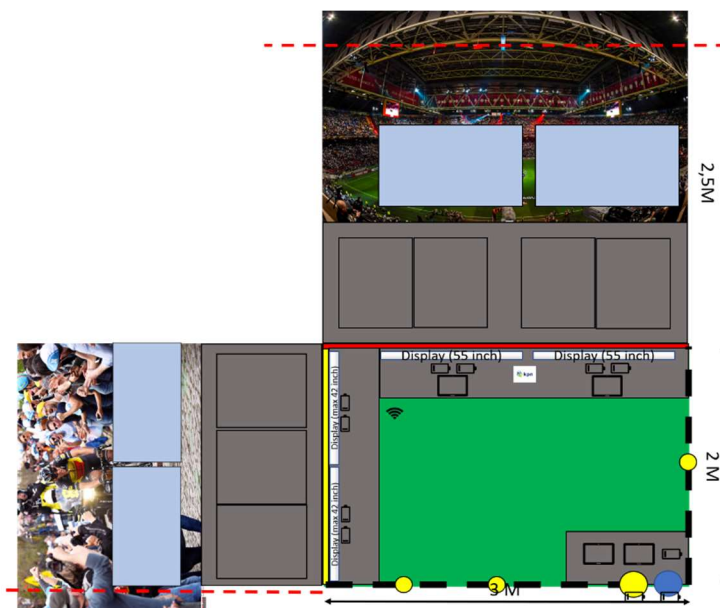
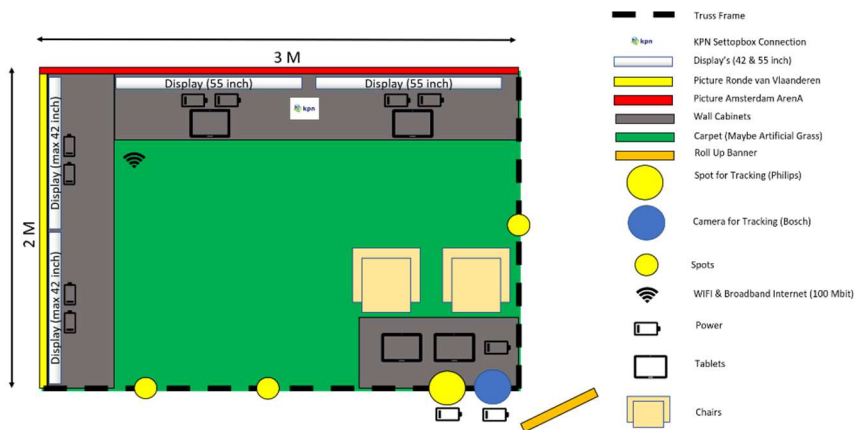


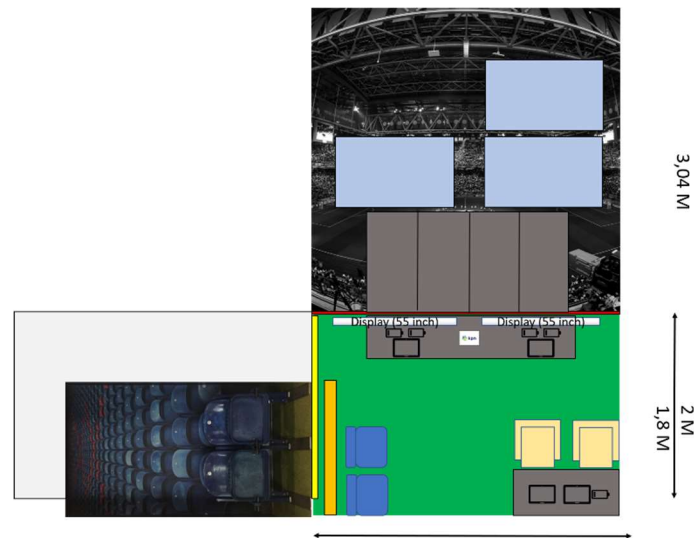
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## 5.2. Annex II: Booth Design

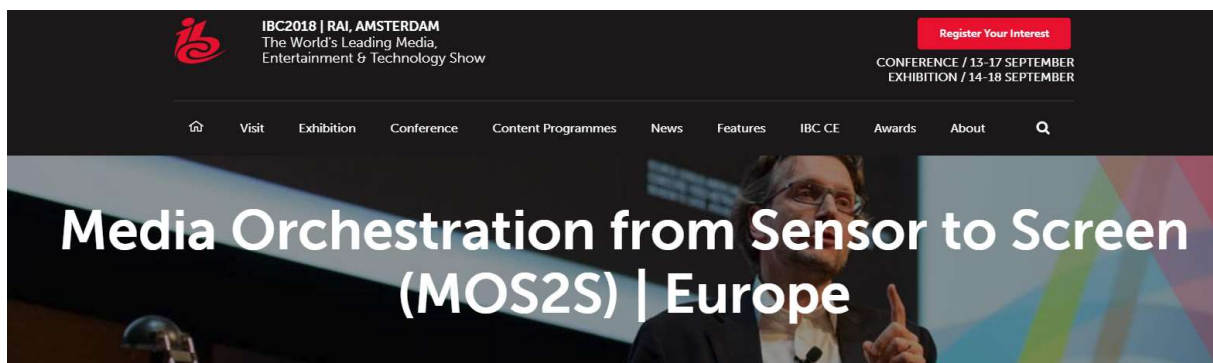
The figures below were used to design the MOS2S booth at the IBC2-017 Future Zone.





### 5.3. Annex III: Website and Press Release

The MOS2S booth was announced on the IBC2017 website (see figure below).



## Media Orchestration from Sensor to Screen (MOS2S) | Europe

Year: 2017

Stand: 8.G06

EUREKA ITEA3 Cluster Project "Media Orchestration – from Sensor to Screen" (MOS2S) brings together leading industry players in the Smart Stadium/City AV technology field. The team is showcasing a data-integrated interactive video application, as well as a platform for crowd-based journalism, with a focus on enhancing player performance, enriching fan experience and enabling end-user participation and interaction.

The Amsterdam Arena, as year 1 demonstration lead, issued a press release on their website, with the following text:

## AMSTERDAM ARENA INTRODUCES NEW TECHNOLOGY DURING IBC 2017

FAN EXPERIENCE

The Amsterdam ArenA is present at the RAI from September 14th until September 19th, at the International Broadcasting Convention (IBC), the world's largest exhibition in the field of media and entertainment. Here the stadium together with partners demonstrates new technology, which provides additional experience for TV viewers and stadium visitors during live events, such as football matches and concerts. The stadium participates in ITEA3, a European research program that stimulates the development of new software services. Under the name of 'Media Orchestration from Sensor to Screen (MOS2S)' the ArenA works together with Dutch companies as Bosch, Game On, Inmotio Object Tracking, KPN and TNO. Together they develop applications that make it possible for tv viewers and stadium visitors to receive additional information live during soccer games; both on the tv screen at home and on the smartphone or tablet. Through *augmented reality* an interactive layer is put down on the footage, which gives the opportunity to ask for additional information, for example about the condition of the soccer players or the tactics. With that, viewers and visitors can do their own analyses.

#### **Ultra-smart cameras**

Another part of the MOS2S project focuses on innovative, ultra-smart camera applications, which can be used in the stadium. This technology offers completely new possibilities, like for example zooming in on certain players with the tablet or 'follow' certain players like the defenders. This new camera application is being developed by a number of South Korean partners, including ETRI, Mooovr and Samsung.

#### **The public participates**

The third line of the research program focuses on *crowd journalism*; messages, photos and videos of attendees are combined on social media live with TV images. Here a number of Belgian MOS2S partners is involved, including the Flemish broadcast VRT, Kiswe and Nokia Bell Labs.

#### **Drop by at exhibition stand 8.G06**

During the IBC, from 14 until 19 September 2017, the Amsterdam ArenA and her MOS2S-partners demonstrate this technology in the European research program in the Future Zone of the RAI, hall 8, stand G06. Visitors are welcome to come by.

If you want more information, you can contact the Amsterdam ArenA





#### 5.4. Annex IV: Booth staff planning

The following overview was create to plan the staffing of the MOS2S booth at the IBC2017 Future Zone.

<b>IBC Exhibition 15-19 September</b>						
Morning session is 9:00 - 13:00						
Afternoon session is 13:00 - 18:00						
	Build Up	Exhibition				
	Thu	Fri	Sat	Sun	Mon	Tue
	14	15	16	17	18	19
<b>NED</b>						
<b>ArenA</b>						
Reinout	1				1	
<b>GameOn</b>						
Cyril	1	1	1			
Wadia						
Max?				1	1	1
<b>KPN</b>						
Dolf						1
Rolf	1	1				
<b>TNO</b>						
Gjalt	0,5				1	1
Omar	0,5	0,5		0,5		
Aschwin	0,5	0,5	1			
Johan					1	1
Paul						
<b>BEL</b>						
<b>VRT</b>						
Luk	1	1		1		
Karim	1		1		1	1
Tatjana		1				1
Nikki					1	
Rik			1	1		
<b>KISWE</b>						
Jorre		1	0,5			
Tom			0,5	1		
<b>KOR</b>						
<b>ETRI</b>						
Seong Yong Lim	1	1	1	1	1	0,5
Hyo Jun Shin		1		1		
<b>Total</b>	<b>7,5</b>	<b>8</b>	<b>6</b>	<b>6,5</b>	<b>7</b>	<b>6,5</b>