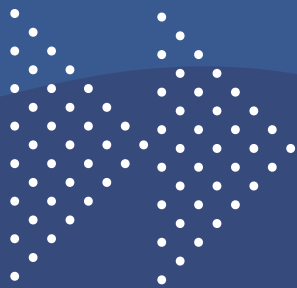# 7th HbbTV SYMPOSIUM
and AWARDS 2018
GROWING VALUE THROUGH HbbTV

**14th - 15th
November 2018**

**ESMT
Berlin**

HYBRID TV - BETTER TV

HYBRID BROADCAST BROADBAND TV (OR "HbbTV") IS A GLOBAL INITIATIVE AIMED AT HARMONIZING THE BROADCAST AND BROADBAND DELIVERY OF ENTERTAINMENT SERVICES TO CONSUMERS THROUGH CONNECTED TVs, SET-TOP BOXES AND MULTISCREEN DEVICES.

HbbTV specifications are developed by industry leaders to improve the video user experience for consumers by enabling innovative, interactive services over broadcast and broadband networks. The specifications use elements of existing specifications from other standards including OIPF, CEA, DVB, MPEG-DASH and W3C.

Members of the HbbTV Association define and promote the specifications and standards by working together, sharing knowledge, technical expertise and market experience with other members, and contributing to a variety of working groups.
The resulting standards provide a rich set of business opportunities and enhancements for participants of the content distribution value chain – from content owner to consumer.

These include:
- Enrich Broadcast Services
- Maximum Reach for Interactive Services
- Simple Access to Enriched Services
- Enable Targeted Ads on TVs
- Enable Enhanced Digital Switchover
- Create Branded TV Viewing Experiences with Operator Applications (OpApps)
- Reduce Operators' Costs and Accelerate Go-to-Market Deployment

DEUTSCHE TV-PLATTFORM:
HBBTV AND MUCH, MUCH MORE

Deutsche TV Platform (DTVP) was founded more than 25 years ago to introduce and develop digital media technologies based on open standards. Consequently, DTVP was also involved in the introduction of HbbTV. When the HbbTV initiative started at the end of 2008, three of the four participating companies were members of the DTVP: IRT, Philips, SES Astra. Since then, HbbTV has played an important role in the work of DTVP. For example, DTVP did achieve the activation of HbbTV by default on TV sets in Germany; currently, HbbTV 2.0 is the subject of a dedicated DTVP task force within the Working Group Smart Media.

HbbTV is a perfect blueprint for the way DTVP works by promoting the exchange of information and opinions between market participants, stakeholders and social groups, coordinating their various interests. In addition, DTVP informs the public about technological developments and the introduction of new standards. In order to achieve these goals, the German TV Platform sets up dedicated Working Groups (currently: WG Mobile Media, WG Smart Media, WG Ultra HD). In addition to classic media technology, DTVP is increasingly focusing on the convergence of consumer electronics, information technology as well as mobile communication.

To date, DTVP is the only institution for media topics in Germany with such a broad interdisciplinary membership base. Currently, the association has more than 50 members: private and public broadcasters, streaming providers, manufacturers, infrastructure operators, service and technology providers, research institutes and universities, federal and state authorities as well as other companies, associations and institutions involved in digital media.

1,2,3! A Tangible TV Companion based on HbbTV 2.0.x for a Children's Quiz Show developed by IRT. It was one of the highlights at the IFA 2018 booth of Deutsche TV Platform and is nominated for the HbbTV Awards 2018, category „best multiscreen HbbTV service".

To participate in this exciting work, join HbbTV Association by visiting our website www.hbbtv.org

10:00 | Registration, Coffee, Networking & Exhibits
2nd Floor Colonnade and Foyer 2
Coffee break sponsored by CBC Broadcasting Center

11:00 | Welcome and Symposium Introduction
Vincent Grivet, Chairman HbbTV Association

11:15 | Keynote: The "Deutsche" Television Market: Where is our TV-market heading?
Andre Prahl Chairman of the Board of Deutsche TV-Plattform (DTVP)

11:45 | Keynote: Global TV Market Review
Paul Gray, Director Research and Analysis, Technology, Media & Telecom, IHS Markit

12:15 | Panel: Growing Value Through HbbTV: Key success stories
Moderator: **Carine Léa Chardon**, Managing Director, Deutsche TV-Plattform
Xavier Redon, Product Manager, Cellnex: Spanish market update
Simon Hunt, Director of Business Development and Strategy, Digital UK: UK market update
Liz Ross, CEO Freeview Australia: Australia market update

13:00 | Lunch, Networking and Exhibits
2nd Floor Colonnade and Foyer 2

14:00 | Keynote: HbbTV Services and Media Landscape Evolution
Albhy Galuten, Vice President, Media Technology Strategy, Sony Interactive Entertainment

14:30 | Panel: Growing Advertising Value: The business and the technology
Moderator: **Matthew Huntington,** Independent Industry Consultant
Florian Löw, Senior Product Manager, El Cartel Media GmbH: Dynamic ad substitution via HbbTV 1.5
Robert Curwen, Head of Broadcast, Go to Market Partnerships EMEA, Google: Harnessing the potential of Addressable TV
Dr. Andrea Dürager, Product Leader TV Research, ServusTV – a brand of Red Bull Media House GmbH: New ways in audience measurement
Angelo Pettazzi, Senior Strategic Marketing Manager, Mediaset Group and Co-Chair of DVB CM-TA: How DVB and HbbTV are working together on targeted/addressable advertising

15:25 | Panel: Growing Value: Reacting to market changes
Moderator: **Dr. Jörn Krieger**, Freelance Journalist
Oliver Botti, Head of International Business Development and Innovation, Fincons Group: Connected TV as a key enabler towards a new generation TV model
Andy Carr, Director of CE, Freesat: Building a business with HbbTV
Yiannis D. Vougiouklakis, New Media General Director, ERT

16:00 | Afternoon Coffee, Networking and Exhibits
2nd Floor Colonnade and Foyer 2
Coffee break sponsored by CBC Broadcasting Center

16:30 | Panel: Growing Consumer Interest: Improving user experiences
Moderator: **Jack Lacy,** SVP Standards and Community Initiatives, Intertrust Technologies
Fabian Birgfeld, CEO and Co-founder, W12 Studios: How to leverage HbbTV to create an excellent user experience
Nicolas Moulin-Fournier, SVP New Video Services, Eutelsat: Leveraging the HbbTV standard to enhance the free-to-air TV experience
Carlos Antonio Navarrete Puentes, Project Leader of the HbbTV Project Colombia, Universidad de los Andes: Growing contents' experience through HbbTV

17:15 | Panel: Growing Applications: Tools and Techniques for Developing Quality HbbTV Services
Moderator: **Dr.-Ing. Peter Neumann**, Specialist, Platform Solutions, CBC Cologne
Dr. Bob Campbell, Director of Engineering, Eurofins Digital Testing: HbbTV's tools for improving interoperability
Mirko Nedeljkovic, Chief Strategy Officer, Suitest: Automated Freeview Play self-certification for device manufacturers
Pasquale Marinaro, Technical Manager, Kineton: Rapid application development through templates and frameworks

18:00 | Close of Day 1

19:00 | HbbTV Awards Reception and Ceremony,
Foyer 1

Awards Reception supported by
Hellenic Republic, Ministry of Digital Policy, Telecommunications and Media

09:00 | Coffee, Registration, Networking and Exhibits
2nd Floor Colonnade and Foyer 2

09:30 | Keynote: Growing the TV Business with HbbTV: The Chairman's "state of the nation" speech
Vincent Grivet, Chairman HbbTV Association

9:50 | Keynote: Growing the TV Business with HbbTV: The latest on our specifications and activities
Jon Piesing, Vice-Chair HbbTV Association

10:20 | Panel: Growing the TV Business with HbbTV: What's is needed in the future?
Moderator: **Robert Briel**, Owner and Co-founder, Broadband TV News
Dr. Marcus Dimpfel, Head of Strategy and Business Development at Mediengruppe RTL Deutschland
Stuart Savage, Director EU Innovation R&D, LG Electronics
Ian Medland, Associate Director, Testing, DTG
Peter MacAvock, Chairman of the Steering Board at DVB Project
Pascal-Hippolyte Besson, CEO, DOTSCREEN

11:00 | Morning Coffee, Networking and Exhibits
2nd Floor Collonade and Foyer 2
Coffee break sponsored by Eutelsat

11:30 | Roundtable: How can HbbTV help broadcasters better compete within the global marketplace?
Moderator: **Dr Jörn Krieger**, Freelance Journalist
Arturo Larrainzar, Strategy Director, Atresmedia
Thomas Follin, Deputy Managing Director in charge of new media channels, M6
Stefanie Luedecke, Managing Director ProSiebenSat.1 Digital GmbH
Simon Hunt, Director of Business Development and Strategy, Digital UK

12:15 | Panel: Growing Through Innovation: What is cooking in the HbbTV labs?

Moderator: **Klaus Merkel,** Senior Engineer, Institut für Rundfunktechnik
Martin Prins, Product Owner, Media Distillery: How AI can help to improve the HbbTV user experience
Louay Bassbouss, Senior Project Manager Future Applications and Media, Fraunhofer FOKUS: 360° Video playout for HbbTV
Francesc Mas Peinado, Engineering Research & Innovation, CCMA: Big data and HbbTV

13:00 | Lunch, Networking and Exhibits
2nd Floor Colonnade and Foyer 2

14:00 | Panel: Beyond HbbTV: A review of other markets and specifications
Moderator: **Raj Patel,** Co-founder and CEO Yotta Media Labs
Jeong-Deok Kim, Director Research and Planning Department, KBS and IBB Chair at Future Broadcast and Media Standards Forum Korea: Terrestrial UHD broadcast and interactive service in Korea
Masaru Takechi, Internet Service Systems Res. Div, NHK and Co-Chairman, IRG-IBB at ITU: Harmonization between HbbTV 2 and Hybridcast (Japanese hybrid TV system)

14:30 | Panel: Growing Viewers' Choice: The value of HbbTV for operators
Moderator: **Teun Veen,** Senior Consultant, TNO
Alberto Sigismondi, CEO tivù: tivùon HbbTV Operator Application, the world's first OpApp
Patrice Silvant, VP Sales & Partnership in EMEA, Seraphic: Take control of UX with an open standard
Dr. Jens Johann, Senior Manager Standardisation Media and Broadband Services, Deutsche Telekom: Using OpApps for IPTV operators
Erik Gazzoni, Product Director, SmarDTV: HbbTV OpApp and CAMs
Frode Hernes, SVP Product Management, Vewd: Fulfilling the promise of HbbTV Operator Apps

15:40 | Symposium Closing Remarks
Vincent Grivet, Chairman of HbbTV Association

16:00 | End of Conference

7TH HBBTV SYMPOSIUM EXHIBITION AREA
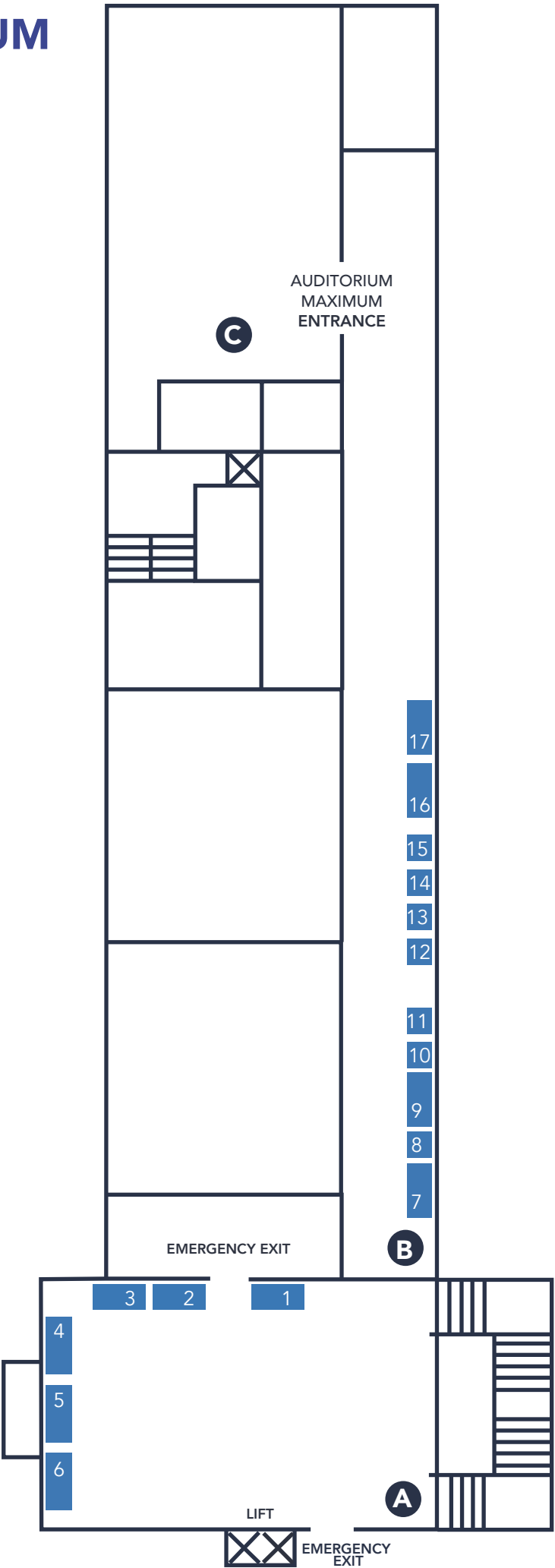
A **EXHIBITION AREA**
FOYER 2
2nd Floor

1. ERT
2. Fincons Group
3. Google Germany
4. Kineton
5. TIVU
6. Seraphic Information Technology

B **EXHIBITION AREA**
COLONNADE
2nd Floor

7. Institut fuer Rundfunktechnik
8. RTI
9. Red Bull GmbH
10. Das Fraunhofer-Institut
11. AdScribe
12. Dolby
13. Sofia Digital
14. Dotscreen
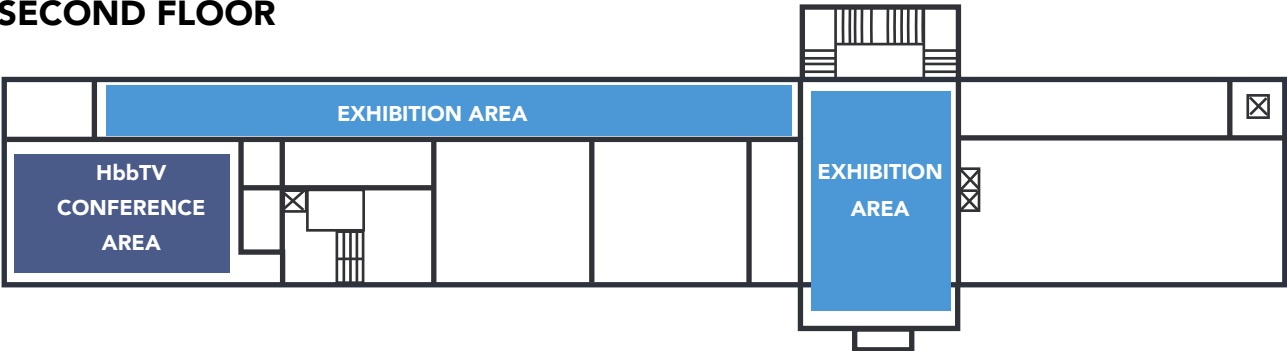15. Media Distillery
16. HbbTV
17. Deutsche Plattform

C **CONFERENCE ROOM**
AUDITORIUM MAXIMUM
2nd Floor

7th HbbTV Symposium Conference
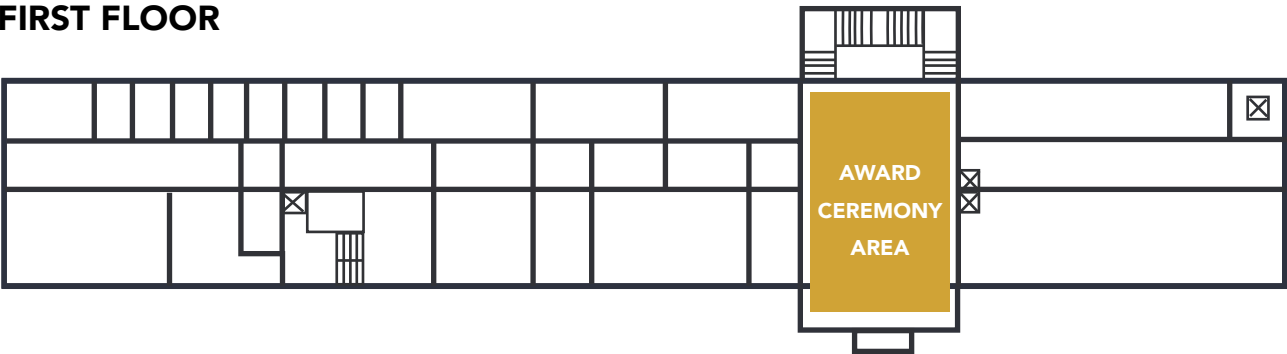
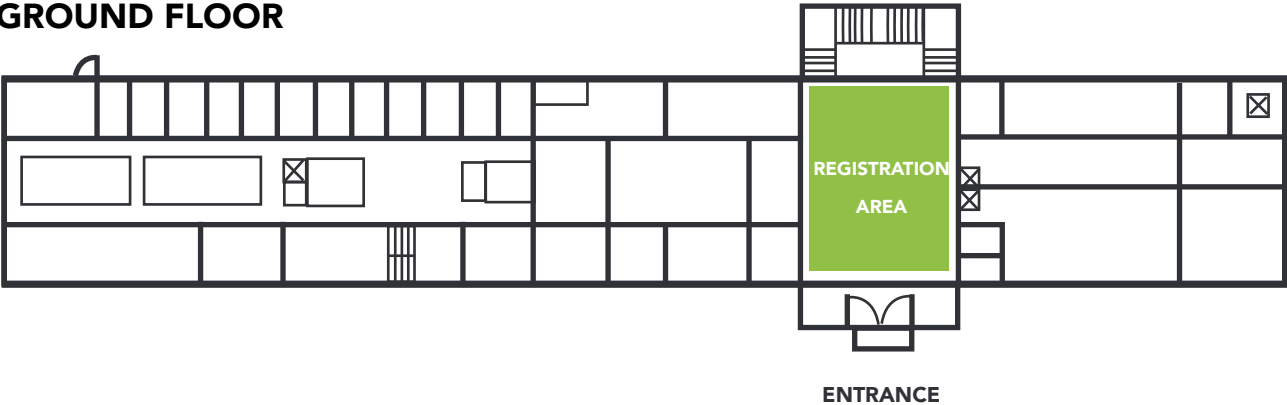AUDITORIUM MAXIMUM ENTRANCE

EMERGENCY EXIT

LIFT

EMERGENCY EXIT

ESMT PLANIMETRY

SECOND FLOOR

EXHIBITION AREA

HbbTV CONFERENCE AREA

EXHIBITION AREA

FIRST FLOOR

AWARD CEREMONY AREA

GROUND FLOOR

REGISTRATION AREA

ENTRANCE

On December 4th 2017 ERT launched its Hybrid Services Platform, ERT Hybrid. ERT hybrid is freely available to Smart TV sets HbbTV-ready, at the touch of one button. ERT Hybrid platform includes the following services:

 • Catch-up video, containing almost the entire television program of ERT as aired during the past eight days

 • Exclusive broadcasts of sporting events on our Internet channel Ertplay

 • Access to on demand video service, in which the user can enjoy television material broadcasted by ERT
 by selecting through thematic categories (through special search, youtube- like category) such as:

   • Archive videos

   • Sports including Super league Greece football matches

   • News videos

• Possibility of listening to all 27 ERT radio stations, with useful information

• ERT channels program for the next hours and days, enriched with graphics, video and text material

• Interactive platform about the weather, in which the user will be able to choose the area of interest within Greece and the world

• Subtitles selection

• Multicamera viewing in a specific sport events

•Shortly all services available from ERT satellite channel

And all of this free and interactive. All directly to TV sets, for a seamless, improved TV experience.

In the website hybrid.ert.gr anyone can have the necessary informational bout ERT Hybrid, devices and applications as well as support on any technical matter, via online communication with the public.

According to our recent statistics (14.07.2017 - 14.10.2018), ERT Hybrid Channel visits are on a considerable increase (16.646.154 Visits from 260.000 smart id's).

During the world championship, the Greek channel ERT, in cooperation with   Fraunhofer FOKUS, has integrated 360° video technology into its FIFA World Cup HbbTV offering. As a result, during the world championship, viewers could watch more than 170 video clips in 360° format on their TVs, using their regular TV remote controls.

Supplementary 360° content was offered for all games during the FIFA World Cup. This led to ERT HbbTV Awards 2018 candidacy.
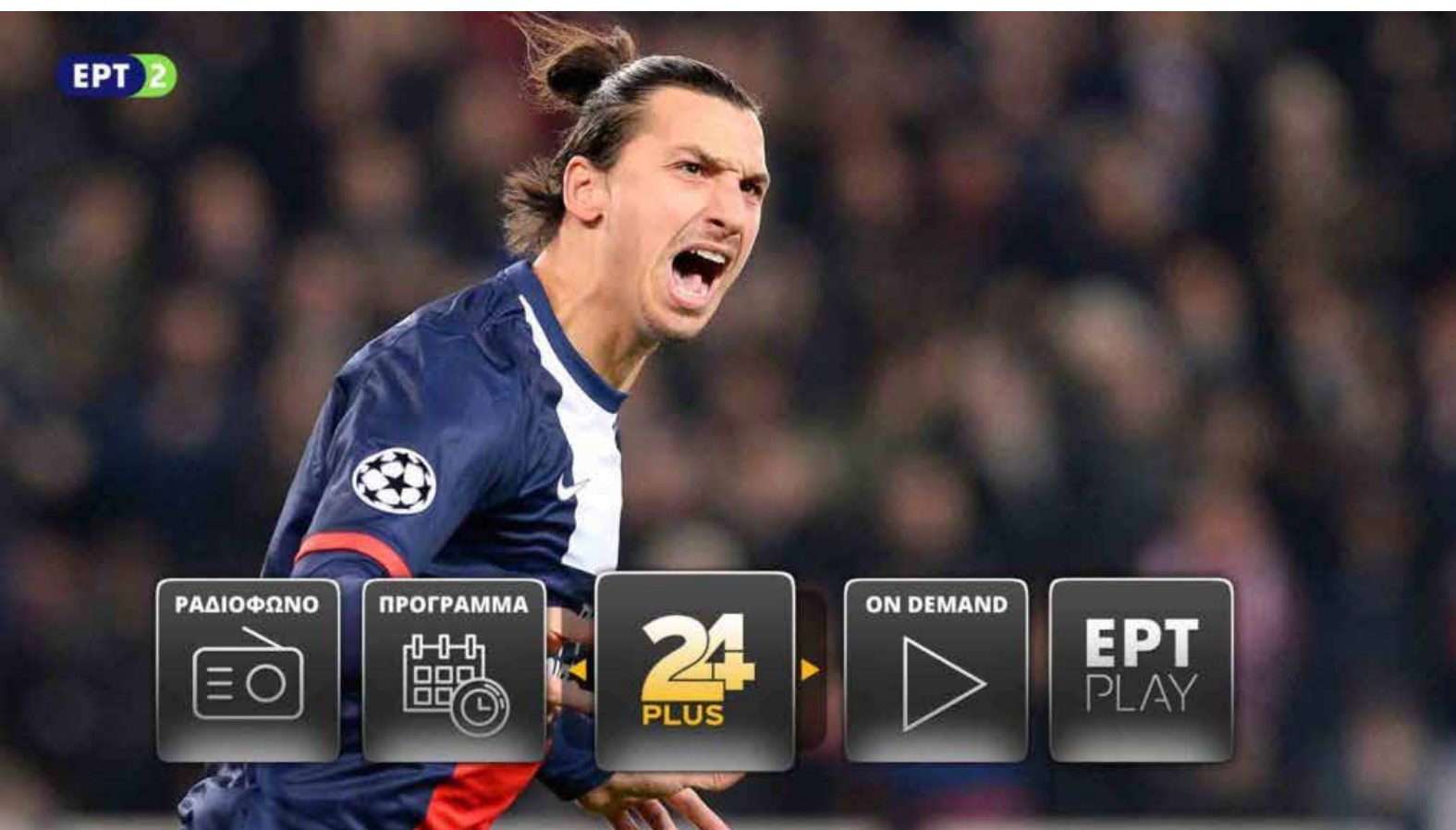
HOW NEW TECHNOLOGIES CAN HELP BROADCASTERS COMPETE AND INNOVATE

To compete with the FAANG (Facebook, Amazon, Apple, Netflix, Google)entering the TV space, broadcasters need to invest in a "New Gen TV" that changes the playing field to one in their favour, by combining their traditional "brand-driven" offering with new "data-driven" models, leveraging the online data and tools provided by the FAANG themselves.

This "New Gen TV" will be built upon media specific technologies, such as HbbTV, and technologies that are already driving digital transformation in many other industries, such as AI, Conversational UX, VR/AR, Blockchain. Combined, these enable a new technical foundation for the future of Media, based on unbundling and personalization in both content and pricing, new user experiences and content formats, and advertising models such as interactive, addressable, programmatic and media embedded merchandising.

Adapting to change by leveraging new technologies is a real opportunity for broadcasters to stay competitive. Integration remains a complex domain requiring technology specialists capable of assessing the relevance and effectiveness of new technologies, as well as the capability to deploy, configure, and optimise them.

Fincons Group is a well-established system integrator with offices in Italy, Switzerland, the UK and the US offering business consulting structured to match the different phases of transformation projects.

With a history of international collaborations in Research & Innovation initiatives, Fincons' experience with HbbTV dates back to 2011, when – together with industry and research leaders of the German market – built pilot applications anticipating today's trends. This allowed to promptly put innovation at work when Fincons and Mediaset launched Mediaset Play, a new service that combines linear and OTT on HbbTv. Thanks to this innovative service, during the 2018 FIFA World Cup users enjoyed real-time highlights on their Connected TV whilst also experiencing interactive advertising during the T-Roc linear advert, by being able to navigate Volkswagen's mini-site and even booking a test drive to the local dealer.

As well as solid technical capabilities, Fincons has deep business domain knowledge gained through many Media projects within traditional broadcast and IP sides of the business. Fincons has been involved in the design and implementation of several OTT solutions, for example all three generations of OTT built for the SKY Group: SkyGo, Sky Online and NowTV in Italy, Germany and Spain. In fact, this year Fincons was named as Sky Deutschland's preferred OTT supplier.

Surviving the constant and rapid changes in the media industry is possible, and broadcasters can find in the adoption of new technologies – tailored to their own needs - the right ally to come out even stronger.

Oliver Botti – Fincons Group Head of International Business, Development and Innovation

REIMAGINE THE COMMERCIAL BREAK
Google Ad Manager brings the power of digital to the magic of TV.
Ensure your audiences get the best of both worlds with relevant and seamless ads across every screen.

CREATE A TV-LIKE EXPERIENCE | EVERYWHERE
Use Dynamic Ad Insertion to effortlessly deliver ads across your live, linear, and on-demand video streams without buffering or quality degradation wherever people are watching.

MAKE AD BREAKS SMARTER
Maximize your revenue with ads that are optimized in real-time for every viewer in each ad break; while maintaining full control and brand safety protections.

MANAGE ALL YOUR SALES PROGRAMMATICALLY
Reach more advertisers and get the true value of your inventory in your own programmatic marketplace.
And use Programmatic Guaranteed to simplify your cross-screen reservations business.

## POWER BETTER EXPERIENCES WITH SMARTER INSIGHTS
Personalize ad experiences and effectively measure the impact your advertisers are having on your audiences.
It's easier than ever with Google Ad Manager.

Kineton is an engineering company that provides services and products, assist clients in the creation and development of their products and solutions in some of the major technological domains, such as Media, ICT and Automotive. It has relationships with some of the major Italian universities, and maintained a meaningful connection to the academic world. Kineton is in the center of the ever-changing media and telco worlds. Our network of laboratories, techie engineers, and up-to-date technology and methodologies keep us at the forefront of these sectors.

Our partners are fully supported throughout every step of the product lifecycle, from the requirements analysis through to the architecture analysis, software development, testing, delivery, and maintenance.

The KbbTV platform consists of a series of products designed to simplify the development and management of the HbbTV applications. The core of KbbTV is a modular framework, a software layer composed of a set of UI widgets, making it faster and easier to develop and manage the structure and life-cycle of a HbbTV application, starting from scratch. Through the application, all the data audience and all the interactions of the end user are traced and saved in an intelligent audience service with a view to understand its behaviour and to make user clusters based on geolocalization or preferences.

Thanks to the KbbTV platform, the editorial team can manage magazine, participation and advertising applications. Once the template is created, the platform allows the editorial team to manage contents, using the Platform Content Management System.

Through CMS it is possible to import the contents from the legacy system or upload new contents into the previously created sections. Also, the editorial team can choose to insert preroll, midroll, postroll videos and advertising banners for each users cluster. It is possible to create different surveys that have various templates, that can be scheduled, in order to improve the users' engagement and collect the users' feedback. Also, regarding advertising, it possible to create applications, dedicated to an adv campaign, quickly. These applications can contain videos, images and call to action related to video channel contents. Using KbbTV create a campaign is very easy!
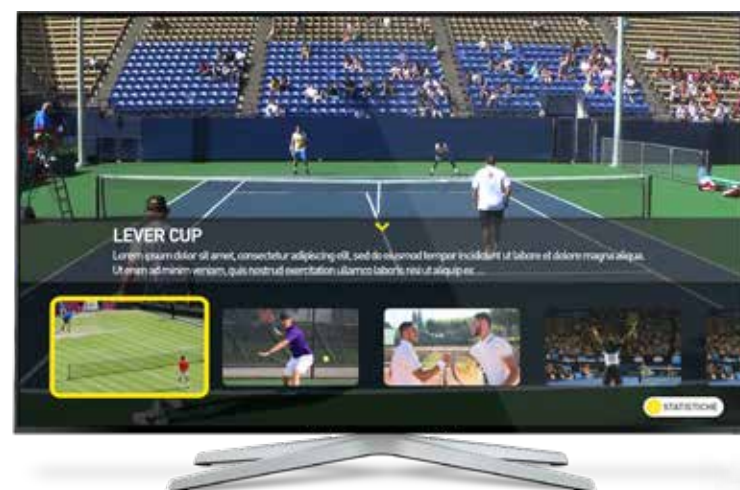
OUR PRODUCT

Together with our partner Fraunhofer FOKUS we created our Red Tech RTA HbbTV Tracking Solution. It gives even small broadcasters, marketers and content producers the ability to gain deep knowledge of their programs and of the viewing habits of their audience as well as the basis to optimize strategic programming & advertising.

THE TECHNIQUE

The Red Tech RTA HbbTV Tracking solution offers a tracking framework based on the HbbTV standard to measure TV usage of all connected HbbTV devices in real-time. The tracking framework integrates easily into existing HbbTV apps or can be introduced as new HbbTV app being launched via the channel application information table (AIT). Our solution is cloud-based, flexible and highly scalable.

THE BENEFIT

All tracking data is available in real-time and accessible via the web based HbbTV Research Toolkit that offers customizable visualizations for live and historical data, report templates, automatized reports, interfaces for editors and non-research specialists to easily review the performance of their program as well as an extensive research environment for professional researchers. Additionally, a HbbTV-based overlay app can be used to monitor the live performance of the channel within the linear TV program.

Our solution meets the demands to be objective, reliable and valid based on several tests we have run.

HbbTV TRACKING BY RED TECH MEANS

- internationally applicable
- easy to integrate with new and existing HbbTV services
- anonymization of devices (in line with data policies & privacy)
- cost-effective
- precise figures (based on a large number of devices)
- validated figures (line with official TV measurements/"currencies", but no representative measurement)
- research data of all connected SmartTVs (usage, technical equipping and geotargeting)
- integration of program data (EPG / Run Downs)
- customizable target groups
- picturing of audience flow & user lifecycles
- also applicable for Online-Streaming

SERAPHIC TAKES YOU HYBRID WITH HbbTV

TV is evolving into a more immersive, personalized and interactive medium almost always delivered over a mix of broadcast and broadband networks.

SERAPHIC strongly support the positive hybrid technology effects on the TV/STB industry. As the market leader of hybrid TV technologies, SERAPHIC co-work with upstream and downstream partners and contributes to the growing hybrid trend. SERA PHIC delivers device software and web-based solutions to Broadcasters, Operators and TV/STB manufactures. Its product offering includes TV Browser for HTML5, HbbTV, OpApp, Freeview Play, YouTube TV, TV Portal and Open Browser as well as Web UI solution.

SERAPHIC has established strong connections with clients and partners from all over the world. As a leading HbbTV 2 solution provider and active HbbTV Association member, SERAPHIC is contributing to standard specifications and test assertions elaboration since the early stage of HbbTV. SERAPHIC is the earliest Chromium/Blink based HbbTV 2 developers and as deployed a great deal of market-proven HbbTV 2 solution.

SERAPHIC's full commitment to Open International Standards positioned itself as the pioneer of commercial deployment of OpApp compliant devices. Sraf OpApp is the market-proven, platform-independent leading HbbTV solution, enabling TV operators, device manufacturers, OEMs/ODMs, and SoC vendors to quickly launch HbbTV 2 and OpApp solutions at affordable cost. It leverages the mature Sraf HbbTV architecture and deployment experience so that customers can develop OpApp enabled STB and Smart TV in a very short time.

SERAPHIC partnered with Tivusat and Skyworth Digital to launch the world's first OpApp based commercial service. It's recent cases include comprehensive cooperation with Europe's leading home appliances manufacturer Arçelik and strategic partnership with consumer electronics giant Skyworth on OpApp projects.

SERAPHIC is honored to participate in the 7th HbbTV Symposium and Awards 2018. Xinwen Xue, VP of Product Management and Patrice Silvant, VP Sales & Partnership EMEA will present SERAPHIC's views at the 'Growing Viewer's Choice: The Value of HbbTV for Operators' panel.

Speaking about:

"Take Control of UX with an Open Standard"
Time: 14:40-15:50, November 15th
Speaker: Patrice Silvant

During the event, we'll be demoing SERAPHIC's latest hybrid solutions including OpApp, Mobi HbbTV+, HbbTV on Android, etc. at SERAPHIC's booth. You're also available to see how SERAPHIC's OpApp solution is deployed at our partners Tivusat and Sofia Digital's stands. Looking forward to meeting you there!
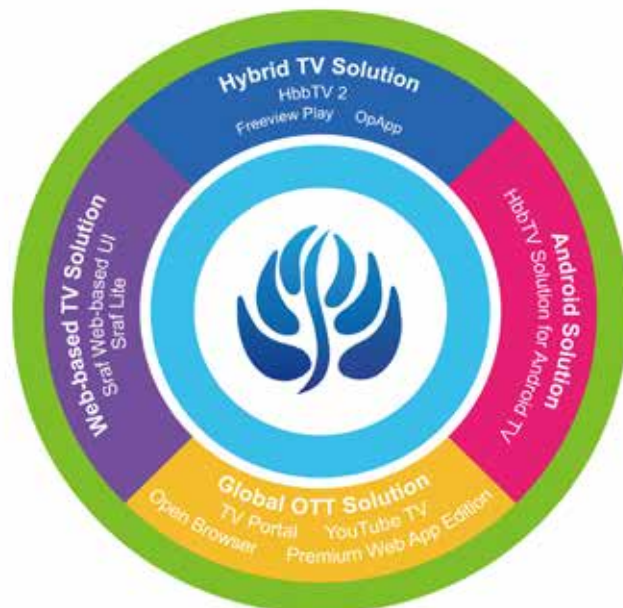
TIVÙ PRESENTS TIVÙON, THE FIRST 2.0.1 HBBTV APP EVER DEPLOYED, NOW 'ALWAYS ON' WITH THE OPAPP!

Tivùon is a hybrid universe that binds the OTT and Italian broadcast worlds together.

Tivùon is the horizontal Super-EPG providing access to FTA catch-up contents combined with a complete forward and backward EPG with detailed info, a service program guide with the whole on-demand offer of the Italian TV networks, a magazine - part editorial, part automated - with the best picks of what to watch from live TV and on demand and a fast search function. All displayed together in a unique, FREE, simple and graceful application. Tivù has become the world's first operator to deploy an HbbTV Operator App (OpApp). Tivùon, tivù's OpApp, supports all of the features expected of a vertical network operator's application for the Italian horizontal TV echosystem. This Operator Application dramatically enhances the usability of interactive services and the viewer experience steps up to the next level; narrowing the gap with pay TV's user experience but without any subscription fee for the viewer.

The market launch will initially start with two models of tivùsat set-top-boxes, available from November in Italy and will follow on TV-sets. Tivù has been working, since its foundation, with the main TV and STB manufacturers operating in the Italian market for its multiplatform services. Now, thanks to the OpApp, tivù has a unique opportunity to get to the highest level of customer satisfaction and user experience, for this reason tivù aims to integrate OpApps into the next generation devices starting from 2019. Tivùon OpApp is fully based on HbbTV specs, enhances the TV experience through a better performance and enriches the ecosystem of HbbTV technology offe-rings allowing advanced features (PVR, Audience measurement, targeted advertising).

Tivù, in collaboration with the Free TV Alliance, has supported since the very beginning the development and adoption of the HbbTV Operator Application specification. Tivù and the Free TV Alliance are fully committed to the future of operator applications and to the creation of a common standard for Free-To-View satellite TV services and technologies across Europe for the benefit of viewers, manufacturers and broadcasters.

ABOUT TIVÙ

Tivù, is a company jointly owned by Rai, Mediaset, Telecom Italia, Associazione TV Locali and Aeranti Corallo.

Tivù, co-founder in 2014 of the Free TV Alliance, has been founded in 2008 to promote the digital terrestrial television in Italy and to launch and manage tivùsat, the first Italian free-to-air digital satellite platform covering all the Italian territory.

Tivùsat, offering digital TV and radio services, gives free access to more than 100 television and 45 radio channels including 40 HD channels and a large selection of OTT interactive services.

Tivù has launched in 2016 tivùon, an open horizontal app providing access to free-to-air catch-up content with a backward EPG across the 3 most important Italian broadcasters (Rai, Mediaset and La7), a complete forward EPG with detailed +7 days info and a service program guide with the whole FTA on-demand offer of the Italian TV networks, all together on the screen.
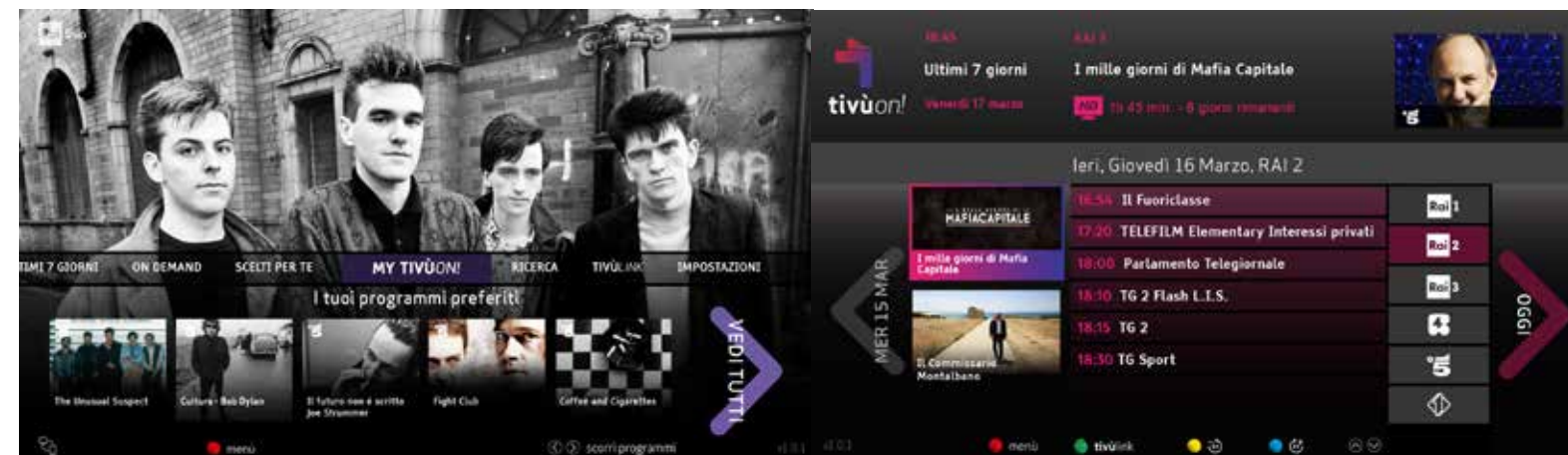
ADSCRIBE, A SUBSIDIARY OF ZENTERIO BASED IN LONDON AND DUBLIN WILL BE SHOWCASING THEIR APP CREATION, ADVERTISING AND ANALYTICS PRODUCTS AT THE 2018 HBBTV SYMPOSIUM IN BERLIN.

AdScribe Engage is an end-to-end advertising platform that gives TV operators and broadcasters the tools to create and operate an interactive advertising & content promotion business. A core part of the platform is the best-in-class application authoring tool that works across most TV platforms, including full HbbTV compliance. Unlike most template-based approaches, our drag-and-drop, browser-based authoring environment gives complete creative freedom while guaranteeing compliance with the taplat-

form standards. This creative freedom is a key requirement for brands and agencies when deploying interactive campaigns. It also ensures that campaigns and apps can be developed, tested and brought to market in the short timeframes common in the advertising industry.

AdScribe Audience is an end-to-end cloud-based Software-as-a-Service tool for TV audience measurement and analysis. Audience collects and processes TV viewing events to make the data available for detailed analysis through an intuitive UI. To meet industry and international regulations the data collection process is fully secure, anonymized, and contains no personally identifiable information.

ADSCRIBE

DOLBY AUDIO™

Dolby provide a complete technology package to the industry for Dolby AC-4. It's easy to implement and designed to solve real-world problems.

In December 2017, the HDFI in Italy published the "Ultra HD Book 1.0 – Unified Volume" specification, including Dolby AC-4 as its NGA solution. Since then, it has been a busy year in the deployment of Dolby AC-4. It is now widely available around the world.

• The NorDig standards body, confirmed that Dolby AC-4 has been officially added as the only next generation audio codec for the forthcoming NorDig specification v3.1. The specification will require all HEVC enabled receivers to support NGA Dolby AC-4. This covers cable, satellite, terrestrial networks as well as both free and pay platforms that distribute content from NorDig broadcasters in Sweden, Norway, Finland, Denmark, Iceland and Ireland.

• Over the Summer, a major French tennis tournament was streamed to mobile devices with immersive audio through Dolby AC-4.

• HbbTV included support for AC-4 next generation audio in version 2.0.2 of the HbbTV Specification, published in February 2018.

• HbbTV included support for AC-4 next generation audio in version 2.0.2 of the HbbTV Specification, published in February 2018.

• RTVE broadcast the Change of the Royal Guard live from the Royal Palace in Dolby AC-4 and Dolby Vision.

• European Broadcasting Union groundbreaking high frame rate UHD broadcast trial featured immersive and personalized audio experiences with Dolby AC-4.

For more information, visit dolbyac4.com.
Come to our booth to discover how AC-4 enables next generation audio in today's TV.

ULTRA-SHARPENING THE SENSES

Berlin is a great place to sharpen your senses. Sharpen your taste with Currywurst and Döner, two of the most famous inventions from the capital. A real feast for the eyes are the super sharp UHD televisions, which are shown at the IFA every year. And so it fits wonderfully into the sharp picture that the eighth HbbTV Symposium is taking place in Berlin this year. Here and there, UHD can already be enjoyed non-linearly via HbbTV, making you hungry for more. For the main course, we recommend UHD via satellite. That always succeeds, linear delight is the best basis for a hybrid menu. "Crisp?" "Extra crisp!" HD television has reached its viewers, now UHD is rapidly gaining fans. More and more TV buyers are consciously choosing

UHD, soon there will be ten million sets in Germany's TV households. HD+ and Astra will satisfy your hunger for razor-sharp content. RTL UHD, Travelxp 4k and our own channel UHD1 are available on the HD+ menu card. Recently, UHD1 has also started broadcasting information supplementing the programme – the menu for UHD gourmets, so to speak. That way, everybody immediately knows what's on UHD1. The information is also available via the award-winning HD+ Guide app, and will soon be via other EPGs and apps as well. In this way, we sharpen consumers' perceptiveness and whet their appetite for UHD.

INSTITUT FÜR RUNDFUNKTECHNIK

IRT is one of the main founders of the HbbTV initiative and makes major contributions to the development of the HbbTV standard. IRT promotes the market role-out of the standard through prototyping and interoperability testing of new technical HbbTV features and through transfer of knowledge to the TV industry by means of consulting services and seminars.

At the HbbTV Symposium 2018, IRT demonstrates the latest HbbTV 2 prototype services expanding broadcast experience by both UHD Streaming and Multiscreen Applications including Media Synchronisation with synchronised playback of AV content on the TV screen and mobile devices. A demo implemented in cooperation

with Zattoo and TARA Systems shows the usage of the "HbbTV Application Discovery over Broadband" specification to apply HbbTV in OTT platforms.

Also Targeted Advertising replacing broadcast content by targeted IP ad clip is demonstrated. Furthermore, we show results of the EU funded research project 2-IMMERSE which provides a platform for personalized multiscreen services with synchronized and animated on-screen graphics. Finally, we demonstrate that HbbTV 2 allows incorporating tangible interfaces into interactive TV experiences on the basis of a board game accompanying a children's quiz show.

RTI | RETI TELEVISIVE ITALIANE

Reti Televisive Italiane (RTI) – part of the Mediaset Group – is the Italian broadcasting company managing the three largest Italy's free TV commercial networks and an extensive portfolio of free and pay TV thematic channels, available on DTT, SAT, IPTV and OTT, offering a broad range of content including original entertainment, TV series, movies, news and sport. Over the last two years, RTI has also expanded its operations to the radio segment, and it now operates three of the largest national radio stations (see *www.mediaset.it*). Since 2003, RTI was committed to experiment and exploit interactive services deploying successful examples of OTT SVOD and catch up TV services available on any device, including TV screens. In 2015 RTI became a member of the HbbTV Association and com-

mitted itself to migrate and exploit the HbbTV technology fulfilling the Italian broadcasters "Statement of Direction Towards HbbTV 2.0" agreed in 2014. Today HbbTV is the RTI preferred interactive technology for present and future interactive services. HbbTV services are available on RTI channels since 2017 and are showcased at our booth; the HbbTV service showcase is featuring advert enhancement and L-shaped addressable advert together with "Mediaset Play", a service available alongside all RTI channels, offering viewers restart feature, live clipping, an extensive catch up library and direct access to both broadcast and OTT linear channels and to audio video application (i.e. "Infinity" VOD and tivùon!).

A demonstration of Digital Advertising Substitution (DAS) – based on HbbTV 2.0.1 compliant TV set – is showcased at our booth; save time to have a look at it!

SOFIA DIGITAL | POWERING SMART SCREENS

Sofia Digital is TV application specialist coming from Finland bringing new value-adding services and applications to different TV terminals with unique competence is in hybrid TV and open standard interactive platforms, DVB broadcasting, EPGs, TV-metadata management, etc. Sofia Digital HbbTV services and products are used all over the World for example in Finland, Germany, Spain, Hungary, Estonia, Turkey, Malaysia and Singapore.

Sofia Backstage® Platform is available for powering smart TV apps, interactive TV services including management of any DVB, EPG and HbbTV services as well as TV and VOD metadata integration. Special competence covers also TV Start-Over services using MPEG-DASH standard and HbbTV Authoring tool.

As an active member of the HbbTV Association since 2012 and the vendor of the HbbTV MPEG DASH DRM Reference Application the company is able to provide the support our customers with best possible level of interoperability for HbbTV and MPEG-DASH.

At HbbTV Symposium 2018 in Berlin Sofia Digital is showing the latest developments of HbbTV, including especially the HbbTV Operator Applications running in real-life devices. Sofia Digital has a long history working with operators all around the world and provided operators with solutions before HbbTV had specified the operator applications, which are now a natural continuance in our portfolio.

CBC IS A COMPANY OF MEDIENGRUPPE RTL DEUTSCHLAND

Since its foundation in Cologne in 1994, CBC has developed into one of the leading TV production, IT and broadcast companies in Germany. At the locations in Cologne, Munich and Berlin, numerous well-known TV channels and TV producers trust the know-how of the more than 800 employees, the state-of-the-art technology and the wide range of services.

The diversified portfolio with a clear customer- and solution-oriented requirement from broadcasting, studio production, outdoor production, postproduction, teleport, online services, system consulting and system integration enables flexible adaptation to individual customer and project needs. CBC is responsible for RTL, VOX, NITRO, RTL plus, RTL II, n-tv, RTL Crime, RTL Living, RTL Passion, NOW US and GEO Television. In addition, CBC is responsible for the production and broadcast of the international coverage of the Bundesliga on behalf of DFL.

FRAUNHOFER FOKUS

Fraunhofer FOKUS, based in Berlin, Germany, develops solutions for the communication infrastructure of the future. The research institute explores how communication networks will contribute to a more secure and convenient living. Thus, the institute addresses important challenges in the society and the smart cities of the future, including access to information, economic and sustainable use of resources, smart mobility and a modern governmental administration. In its projects, Fraunhofer FOKUS establishes useful ties between industry, governmental administration, users and the people.

Besides technical infrastructures, Fraunhofer FOKUS creates manifold practical concepts, applications and prototypes. In particular, Fraunhofer FOKUS is specialized in developing multi-domain networks and interoperable, user-centric solutions. The FOKUS Business Unit Future Applications and Media (FAME) hosts all the technical know-how needed for the realization of interactive media applications: services that can be converged on multiple media platforms, and personalizable services that enable interaction with a broad array of end devices. The experts at FAME make consistent use of Web-based technologies. Moreover, they also play active roles in standardization committees (including ETSI, HbbTV, DASH-IF and W3C), support customers in the development of interoperable solutions, evaluate them and engineer showcases for visualization of their possible functionalities.

DOTSCREEN

DOTSCREEN is one of the most experienced European HBBTV application developer that has created and released numerous HBBTV apps. For several years, we have been developing and maintaining HBBTV projects for Freenet TV (Media Broadcast) in Germany, Fransat, TF1 and France Télévisions in France, SVT in Sweden, ERT in Greece, France24 worldwide to name a few. At the Berlin symposium, we will officially release our first version of HBBTV OpApp (including voice control features).

US, DOTSCREEN is a leading specialized multi-screen application & UI agency.
The company has completed hundreds of video applications for smart TV (HBBTV, Tizen, Orsay, Web OS...), OTT boxes (Roku, Apple TV, Adroid TV), set-top boxes, game consoles (Xbox, PlayStation), smartphones and tablets (iOS, Android), smart watches, smart speakers and smart fridges. Our customers include prominent pay TV operators (Vodafone, Orange, Freenet TV, Telefonica, Tele2, Virgin Media, TDC…) and TV/VOD companies (HBO, Fox, Turner, Disney, ESPN, Beinsports, TF1, CBS, Mediaset, France Télévisions, OCS…). Our apps have been integrated with numerous back-ends & OVPs (Comcast, IBM, Neulion, Kaltura, Arkena, Conax, Nagra…).

Astra Germany GmbH is a wholly-owned subsidiary of SES, the global leading operator in the sector of satellite technology maintaining a fleet of more than fifty satellites. Astra Germany is responsible for the commercialization and the distribution of the SES services in Germany, Austria and Switzerland. From its orbital position 19,2 Ost, Astra transfers around 300 German-speaking programs of which more than 100 programs in HD quality. By now, 71 per cent of all German households using satellite technology watch high-definition television. In Germany, Astra is the leading receiving path: More than 17 million TV households receive their programs via satellite.

For more information, please visit www.astra.de.

Deliver consistent quality content to customers, anytime, anywhere, on any screen with Eutelsat CIRRUS, a fully integrated, user-friendly, content delivery platform. Designed to overcome the challenges inherent in building a content distribution business, Eutelsat CIRRUS is the reliable, high quality and cost-effective answer for broadcasters to get their content into more homes. The fully supported, state-of-the-art, turnkey content delivery solution can deliver video and channels simply anywhere, helping broadcasters meet increasing customer expectations for a flexible, seamless content experience across multiple screens, with analytics to better monetize content.

Find out more at: www.eutelsat.com/cirrus

MEDIA DISTILLERY

Media Distillery provides unique AI technology to understand what's inside video. Our Deep Content UnderstandingTM platform provides next-generation metadata in real-time and at an unparalleled scale. Metadata that was previously only visible to humans. We are committed to turning our technology into valuable products that our customers love. There are many features that can further improve the user experience of TV platforms: better content discoverability, binge watch capabilities and the ability to watch snack-sized video clips instead of entire programs. These are features that consumers know from OTT video services like Netflix and YouTube, and which they might expect from broadcasters and TV operators as well. To address this, some broadcasters and TV operators try to offer better experiences by manually annotating content to improve their discoverability, detect start times or intro/outro credits, and by manually "cutting" linear content into short-form video clips. However, these are often neither feasible nor scalable solutions. Media Distillery provides Artificial Intelligence can help to automatically extract meaning out of linear broadcast content in order to create additional value:
• detect accurate start/stop times of broadcast programs;
• detect what's actually inside a video besides the description given in the EPG, such as person detection, topic detection and object detection;
• allow for binge viewing by skipping intro or outro credits;
• create contextual advertising;
• create snack-sized video clips out of broadcast programs.
We are committed our mission: to help people discover relevant video content faster with an ultimate user experience.

NAGRA KUDELSKI

NAGRA is the digital TV division of the Kudelski Group and the world's leading independent provider of content protection and user experience solutions for pay-TV providers and content owners. Our comprehensive technology portfolio is designed to address today's ever-evolving pay-TV and OTT market and includes: the NAGRA Security Services Platform, the Conax Contego content security platform, Anti-Piracy Services featuring our NexGuard forensic watermarking, the OpenTV Signature Edition always-evolved OTT video ecosystem, the Conax GO Live OTT solution, direct-to-TV solutions including TVkey, a broad cloud TV offering, the DVnor media asset management and NAGRA Insight AI-based pay-TV analytics platform.

marlin

Marlin is a globally deployed open standard DRM platform for IPTV, OTT and OTA services and devices that may or may not have broadband connectivity. Marlin protects a wide range of premium content from around the world and includes an enhanced content protection compliance and robustness framework for protection of ultra-HD content. Marlin was founded in 2005 by Intertrust Technologies, Panasonic Corporation, Royal Philips, Samsung Electronics, and Sony Corporation. Marlin specifications are available through Marlin Developer Community *(www.marlin-community.com)*. The Marlin Trust Management Organization *(www.marlin-trust. com)* serves as the licensing and trust authority for commercial deployments based on the specifications.

VERANCE

Verance digital watermarking sets the industry standard for TV, movies and music. ATSC selected Verance technology as the basis for a watermarking standard that enables discovery, life-cycle management and frame-accurate synchronization of hybrid applications for terminals that receive broadcast services via HDMI or redistribution paths that do not carry application signaling information. HbbTV is currently adapting the ATSC solution for its ecosystem. Verance's Aspect solutions enable broadcasters and OEMs to easily deploy the watermarking standard and expand the reach of their interactive applications. Fox, NBC, and dozens more broadcasters have deployed Aspect in the US and HbbTV-ready solutions are available for international trials now.

SPEAKERS BIOGRAPHY

Louay Bassbouss, *Senior Project Manager Future Applications and Media, Fraunhofer Institute for Open Communications Systems*

Louay Bassbouss is a scientist and senior project manager R&D in the business unit Future Applications and Media (FAME) of the Fraunhofer Institute for Open Communications Systems (FOKUS).

He works on Future Web Applications, Multiscreen Technologies & Standards, and 360° Video Technologies.Louay has actively participated in various standardization activities at W3C, particularly in the Second Screen Working Group. He is the test facilitator of the W3C Presentation API.

Panel: 15th November | 12:15

Pascal-Hippolyte Besson, *CEO, DOTSCREEN*

Pascal-Hippolyte Besson, CEO of DOTSCREEN, is a digital TV veteran with more than 20 years in this industry. Prior to co-founding DOTSCREEN in 2011, he created, designed and developed with his team more than 300 applications on STBs (games, VOD, EPG, native UI etc.) for prominent digital networks around the world such as Dish Network (USA), Bell (Canada), Sky (UK), Multichoice (South Africa and Greece), Digiturk (Turkey), Austar (Australia), SkyNZ (New Zealand), Etisalat (U.A.E) and more. DOTSCREEN is one of the leading European, truly "multi-screen" agencies that creates, designs and develops custom applications on any Internet-connected mass-market device such as smartTVs, OTT boxes (including Roku, AndroidTV and AppleTV), set-top boxes, game consoles (PlayStation and Xbox), HbbTV devices, smartphones, tablets, connected car-radios, smartwatches and smart-speakers.

Its customers are ESPN, HBO, CBS News, BeIN Sports, Turner, Fox, Disney, Orange, Telefonica, Vodafone and more. Regarding HbbTV, DOTSCREEN has been involved since its launch and has deployed many applications and portals for France Television, TF1 (France), France24, Fransat, Freenet (Germany), SVT (Sweden) and more. Pascal-Hippolyte holds an Engineer diploma in computer sciences (Université de Paris-Sud Orsay) with a specialization in User Interface. He also holds a MBA from Essec-Mannheim (DE).

Roundtable: 15th November | 10:20

Fabian Birgfeld, *CEO and Co-founder, W12 Studios*

Fabian Birgfeld is the CEO and co-founder of the digital design agency W12 Studios with offices in London. With over 20 years of experience he has designed, developed and launched next generation digital experiences for companies such as Bertelsmann, Intel, Citibank, and the BBC, among others, prior to founding W12. He was awarded the D&AD yellow pencil and the TV of Tomorrow's Individual Leadership Prize. He is also an IntelCapital mentor. He holds a BA in Economics from Harvard University and a graduate degree in Architecture from Princeton University.

Panel: 14th November | 16:30

Olivier Botti, *Head of International Business Development and Innovation, Fincons Group.*

As Head of International Business Development and Innovation, Olivier is in charge of developing international markets as also portfolio innovation through R&D initiatives. In the Media sector specifically, he is involved in multiscreen video distribution, multimodal UX design, Interactive TV, Addressable TV Advertising, IoT, VR/AR, Big Data and Advanced Analytics, applied to OTT and to Audience Segmentation and UX Personalization. He is also UK Territory Manager.

Panel: 14th November | 15:25

Robert Briel, *Owner and Co-founder, Broadband TV News.*

Robert Briel has been an international media journalist for many years, contributing to both Dutch and international trade publications. He is co-founder, co-owner and editor and publisher of Broadband TV News.

Robert was for many years editor-in-chief and creative director of Veronica TV Magazine, Holland's biggest selling weekly. From December 1999 until January 2002 Robert was head of international press & PR at the UPC media group and responsible for the international and external contacts for the various thematic channels from UPC across Europe. As a senior consultant at RGB Media he worked for Canal+, Bookmark, Sky Radio, CineNova the movie channel, the Dutch DVB-T broadcaster Digitenne, BBC Worldwide, SES-Astra, Philips, the NOS communications department and other blue chip media companies. Robert is also the author of a number of books on music, travel and the media.

Roundtable: 15th November | 10:20

Dr. Bob Campbell, *Director of Engineering, Eurofins Digital Testing.*

Dr Bob Campbell is chair of HbbTV's Improving Interoperability Task Force (IITF) and Director of Engineering at Eurofins Digital Testing, a leading digital media and device testing specialist. The IITF seeks to address interoperability issues raised by industry in implementing HbbTV, wherever possible, within the HbbTV Association's remit and scope. As a result of feedback it gathered, two new tools are now available for the HbbTV ecosystem which will be the subject of this presentation. At Eurofins, Bob is responsible for the team that delivers Eurofins Digital Testing Products including the

CI+ Test Tool, Ligada HbbTV test harness and HbbTV test suites used around the world. Bob is also responsible for Eurofins participation in a wide range of standards bodies and he is their representative at the HbbTV Association Steering Group, CTA WAVE, ATSC and a number of other organisations. Prior to joining Eurofins, Bob worked in a variety of industries including at IBM and Siemens Rail and holds a PhD from Bristol University.

Panel: 14th November | 17:15

Andy Carr, *Director of CE, Freesat Andy oversees all the CE and relationships that Freesat has.*

Entrepreneurial by nature, Andy's leadership harnesses the technology investments inside Freesat setting the product strategy to create economies of scale for our global CE partners. Central to Andy's capability and personality is his ability to build strong relationships with silicon companies, product companies, software partners, infrastructure providers and content owners. Early in Andy's career, he was part of the first story for establishing digital television in Sony, as standards and industry emerged into existence. Starting and growing his own Set Top Box company TVonics in 2004 and winner of the IET Start up award in 2007. Andy's professional network brings more than twenty years of experience in the television and media industry.

Panel: 14th November | 15:25

Carine Léa Chardon, *Managing Director, Deutsche TV Plattform (DTVP)*

Carine Léa Chardon completed her legal training in Germany and France with a focus on media law and media management. She joined the Kirch Group in 2001 as a media policy officer, was then responsible as Contract Manager at EM.TV AG for the licensing contracts for TV and merchandising, including for the 2010 FIFA World Cup. From September 2004 on, she held the position of Senior Counsel Regulatory Affairs at Premiere AG (now Sky Deutschland AG) – among other things, she worked on the development of Premiere's media policy network at the European Union and in Austria. Since July 2008, Carine Chardon has been Head of Media Policy / Media Law at ZVEI – Zentralverband Elektrotechnik- und Elektronikindustrie e.V. (German Electrical and Electronic Manufacturers' Association). In this function, she represents the interests of the members of the consumer electronics industry vis-à-vis legislative bodies and supervisory authorities at national and European level. She also heads the Consumer Electronics Team and represents the Managing Director of the ZVEI Consumer Electronics Association.In addition, Carine Chardon has been the managing director of t he German TV Platform since August 2008. The association is committed to the overall interests of digital broadcasting companies,

in particular the introduction of new technologies based on industry standards, such as interactive television with the HbbTV or Ultra HD standard.

Panel: 14th November | 12:15

Robert Curwen, *Head of Broadcast, Go to Market Partnerships EMEA, Google*

Robert joined Google in 2013, and as Head of Broadcast, GTM Partnerships, is responsible for developing the Google Ad Manager product & sales strategy for broadcasters in EMEA.

Panel: 14th November | 14:30

Dr. Marcus Dimpfel, *Head of Strategy and Business Development, Mediengruppe RTL Deutschland*

Dr. Marcus Dimpfel is responsible forstrategy development and implementation of both core and diversification business. His scope of tasks includes e.g. distribution strategy and signal protection,

portfolio management and venture capital as well as exploitation of new business opportunities and inhouse consulting. Previously, Dr Marcus Dimpfel was in charge of business development for RTL interactive and he was engaged as Senior Director for the Corporate Controlling and Strategy division of Bertelsmann AG in Gütersloh. He received the doctor degree at the mcm institute, St. Gallen (Switzerland).

Roundtable: 15th November | 10:20

Dr. Andrea Dürager, *Projectleader TV-Research, ServusTV – a brand of Red Bull Media House GmbH*

Andrea Duerager is a media research specialist within the Red Bull company, especially focused on TV research regarding ServusTV Austria and Germany. Her main responsibilities lie on the evaluation of the programme performance, the realization of quantitative and qualitative studies, and the enhancement of the HbbTV tracking measurement, that has been developed and refined by Red Bull in cooperation with Fraunhofer since 2016. In the past she worked for the University of Salzburg as a researcher and lecturer within the Department of Communication Studies and is still teaching basics of statistics and empirical quantitative work. She holds a Doctor in Philosophy, Master degrees in Communication Studies and Pedagogics and an MIM (Master in Management).

Panel: 14th November | 14:30

Thomas Follin, *Deputy Managing Director in charge of new media channels, M6.*

Thomas Follin, 41, is Deputy Chief Executive Officer of M6 web, he oversees distribution activities and digital innovation. In this capacity, he develops the distribution of M6 Group TV channels and services across all networks and platforms. He has been at the head of the 6play activity for the past 10 years, driving the active digital innovation initiatives. In 2002, Thomas joined M6 web in the strategic development group, to take charge of the channel and VOD businesses. Thomas Follin holds a Master's Degree in Telecoms and New Media from Paris-Dauphine University.

Roundtable: 15th November | 11:30

Albhy Galuten, *Vice President, Media Technology Strategy, Sony Interactive Entertainment*
Producer, Musician & Songwriter 1970 –1992.

Grammy Award-winning record producer, song writer and composer, musician, orchestrator and conductor. Produced 18 number 1 singles with singles and albums selling over 100 million copies. Awarded twoGrammy Awards, multiple gold and platinum records, a Drama-Logue award and a BMI award. The inventor of the Drum Loop for Stayin' Alive from Saturday Night Fever. Technology Executive 1993 – Present. Began his technology career in 1993 at Ion where he invented and developed the Enhanced CD. Then started Elabs Technology group at Universal Music Group as Senior Vice President. Currently VP of Technology Strategy for Sony Interactive Entertainment.
6 Patents Issued, 8 more Pending.

Panel: 14th November | 14:00

Erik Gazzoni, *Product Director, SmarDTV.*

Erik Gazzoni is currently in charge of Product Management for SmarDTV Global. As such he's looking after the DVB-CIPlus roadmap to define next generation Conditional Access Module Product Line.
Before he was Head of Cable and IPTV products where he led the Product definition for two-way networks. Prior to SmarDTV, Erik was Director of Marketing Digital TV for SCM Microsystems Inc., Fremont CA. where he managed several Digital TV projects (first WW USB/1394 PC DTV receiver, CableCARDs for both US and Korean markets).

He has been involved in various Standardization/Engineering committees and Working groups like Society of Cable Telecommunications Engineers (SCTE Digital Video Subcommittee) and OpenCable to DVB-CI/CIplus initiatives. He received his Master of Computer Sciences and Electronics from one of the top of French Higher School of Engineering (Ecole Centrale).

Panel: 15th November | 14:30

Paul Gray, *Director Research and Analysis, Technology, Media & Telecom, IHS Markit*

Gray joined IHS in November 2014, when IHS acquired DisplaySearch, a leader in primary research and forecasting on the global display market. At DisplaySearch, he served as director of European research. In addition to TVs, he has also researched wearable devices, digital broadcasting and semiconductor technology. He conducted in-depth analysis and forecasting of wearable devices, connected TV and 4K Ultra HD. Mr. Gray has more than 20 years of experience in market intelligence, marketing and product management. His work includes forecasting, product strategy, investment and R&D decisions. He has also been involved in consulting and conferences, and has been cited as an expert by (amongst others) the BBC, Nikkei, Los Angeles Times, Le Monde, Financial Times and The Korea Herald.

Prior to DisplaySearch, Mr. Gray worked at NXP Semiconductors as both a market intelligence manager and semiconductor product manager. Before NXP, he held positions of increasing responsibility at Philips Display Components (later LG.Philips Displays), including director and international account manager in both Asia and Europe. He began his career as a production shift leader in a CRT factory. Mr. Gray has a Bachelor of Science in Electrical Engineering and a management diploma in Industrial Studies from Loughborough University, United Kingdom

Keynote: 14th November | 11:45

Vincent Grivet, *Chairman, HbbTV Association*

Vincent Grivet, is a graduate from Ecole Polytechnique (Paris France) and Paris Tech Telecom. He worked for eighteen years for the international activities of the Orange Group, including a time as Chief Executive Officer of Wanadoo, Orange's internet services unit in Belgium. In 2006, he was a co-founder of Maxtel, an entrepreneurial Wireless Broadband start-up which obtained significant spectrum rights in a competitive bid. He currently works for the TDF Group, where he is in charge of Broadcast Development and Innovation.

Keynote: 15th November | 09:30

Frode Hernes, *SVP Product Management, Vewd*

Frode Hernes is SVP, Product Management at Vewd, where he leads product development of Vewd's core products, including our award-winning HbbTV products. He has more than 35 years of experience with office- and consumer software delivered to B2B customers. Since 2010, he has spearheaded Opera/Vewd products for the TV industry, from the first pioneering HbbTV 1.0 solutions, and the latest HbbTV 2.0.1 solution with advanced Media Synchronization, to the latest introduction of the complete turn-key smart TV solution, Vewd OS. Frode has a broad knowledge of the HbbTV ecosystem, technology and markets and has been a member of the HbbTV Steering Board since 2012.

Panel: 15th November | 14:30
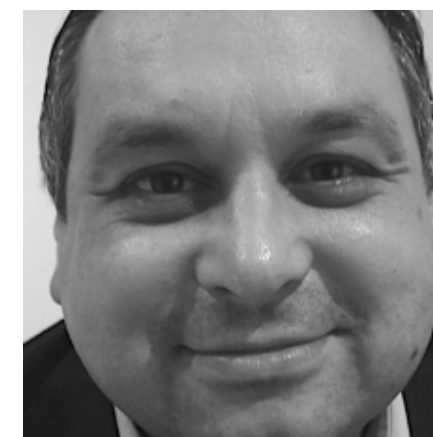
Simon Hunt, *Director of Business Development and Strategy, Digital UK*

Simon Hunt is responsible for strategic and business-related activities at Digital UK, particularly with regard to commercial and product development of Freeview Play. He also leads on analysis and planning for other areas of Digital UK's operations, including regulatory and policy issues relating to the future of the DTT platform, working in conjunction with Freeview. Hunt previously held positions at Virgin Media, Talk Talk and Sling TV in the US, where as Vice President of Products he worked with partners including Apple, Google, Microsoft, Samsung and Disney. Most recently he was Chief Strategy and Marketing Officer at Digital Media Distribution, a consultancy specialising in VoD.

Panel: 14th November | 12:15

Matthew Huntington, *Independent Industry Consultant, DigitalRefugee Consultants.*

Matthew has over 20 years of experience in developing solutions, services and products for digital and interactive television, starting with video-on-demand trials in the early nineties. His most recent role was as CTO of Freesat, where he led the definition, development and live operations of Freesat products and services. Matthew strove to position Freesat as an innovation hub for free-to-view television, in the UK and across the globe.

A popular satellite, cable and technology speaker, Matthew has the ability to clearly articulate the essence of complex technical issues to general and business audiences. He has written and spoken extensively on interactive television technology. Matthew holds a first class honors degree in Computer Software Technology from the University of Bath. He has a number of pending and issued patents and has served on the boards of several industry groups. He currently resides in London, with his wife, Abigail, and daughter, Amelia.

Panel: 14th November | 14:30

Dr. Jens Johann, *Senior Manager Standardisation Media and Broadband Services, Deutsche Telekom.*

Jens Johann has been involved in the development of digital TV since its planning in the early 90's and he is currently acting as Senior Manager in the area of multimedia and broadband services at Deutsche Telekom. In this position he manages standardization activities for Deutsche Telekom Group in close collaboration with research and product development. For more than 25 years he represents his company's interests in several standardization bodies and fora as ITU, ETSI, DVB, DECT, i3Forum and also in HbbTV. Jens holds a diploma and a PhD from Technical University of Darmstadt, both in communications engineering.

Panel: 15th November | 14:30

Jeong-Deok Kim, *Director Research and Planning Department, IBB Chair at Future Broadcast and Media Standards Forum Korea, KBS.*

Jeong-Deok Kim obtained the B.S. and M.S. degree in Electronic and Electrical Engineering from POSTECH, Korea, in 1994 and 1996 respectively. In 1996, he joined the R&D Institute of KBS. He is now a director in the Research and Planning Department and IBB Chair at Future Broadcast and Media Standards Forum in Korea. He has devoted himself to developing new broadcasting services across multiple TV platform and he is also interested in AI, data analysis and VR/AR.

Panel: 15th November | 14:00

Dr. Jörn Krieger, *Freelance Journalist, Newsinfo*

Jörn Krieger has been working as a freelance journalist, specialised in digital media, broadcast technology, convergence and new markets, since 1992.

His articles are published by German and international industry publications such as Broadband TV News, InfoDigital, Digitalmagazin, Cable!vision Europe and Medien Bulletin. Jörn also takes up University lectureships, conducts workshops and seminars and hosts panel discussions at industry events such as Deutsche TV-Plattform Symposium, ANGA COM, Medientage München and IFA Berlin.

Panel: 14th November | 15:25

Jack Lacy, *SVP Standards and Community Initiatives, Intertrust Technologies*

Jack Lacy is Senior Vice President, Standards and Community Initiatives at Intertrust. He is also Secretary and Treasurer of the Marlin Developer Community and the Marlin Trust Management Organization, the two operative branches of the Marlin Open DRM Standard. Mr. Lacy has been at Intertrust since 1999 and has served in several executive roles in research and development and standardization. In addition Mr. Lacy has held lead positions at various standards including MPEG, SDMI, and the Coral Consortium. Prior to joining Intertrust, Mr. Lacy spent 18 years as a research scientist at Bell Laboratories, Bell Labs and AT&T Labs working in a variety of areas related to networking and computer security, including systems for sending voice over IP networks,

cryptography, and secure systems architecture. He is a co-inventor of Cryptolib, a widely distributed cryptographic library, and Policymaker, an AT&T developed approach to specifying and interpreting security policies, credentials, and relationships. Mr. Lacy holds graduate degrees in Physics and Computer Science from the University of Wisconsin and NYU respectively.

Panel: 14th November | 16:30

Arturo Larrainzar, *Strategy Director, Atres Media*

Arturo Larraínzar was born in Madrid in 1982. He has a degree in Business Administration and Management from Colegio Universitario de Estudios Financieros (CUNEF). Additionally, he complemented his training with a Master's Degree in Audiovisual Company Management from the EAE Business School, and a Master's Degree in Economic Research from the UNED. He commenced his professional career at Deloitte, where he carried out audit and consulting projects in the Media and Telecommunications sector. In 2008, he joined the Antena 3 Group as a market executive and in 2010, he was appointed Market Analysis and Business Development Director at Atresmedia Publicidad. In March 2014, he was appointed Strategy Director of the Atresmedia Group, a post which he occupies at present.

Roundtable: 15th November | 11:30

Florian Löw, *Senior Product Manager, El Cartel Media GmbH*

Florian is working for the RTL II saleshouse EL CARTEL MEDIA in Munich since 2014 – he is Senior Productmanager in the Media Solutions department, creating customer individual ideas and concepts for special ads in TV and crossdigital. Besides the website RTL2.de, the VOD service TVNOW and several mobile apps for different RTL II tv shows, HbbTV and especially Addressable TV is one of the focus topics in his daily business.He also is project lead of the EL CARTEL MEDIA AD LAB, where the sales house is developing new advertising forms for TV an digital.

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Stefanie Lüdecke, *Managing Director ProSiebenSat.1 Digital GmbH, ProSiebenSat.1*

Stefanie Lüdecke is Member of the Executive Board of ProSiebenSat.1 Digital. Her area of responsibility covers the red button services and HbbTV activities.

For this reason, she is responsible for the direct digital distribution of the video inventory of ProSiebenSat.1. Stefanie has longtime experiences in the entertainment and digital industry. At last she managed Shopkick in Germany and Europe. Further stations were leading positions at zanox (Axel Springer), TUI Germany and SPIEGEL.

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Peter MacAvock, *Chairman of the Steering Board, DVB Project*

Peter MacAvock is Head of Delivery, Platforms and Services, EBU Technology and Development and DVB Chairman. At EBU, he heads the team responsible for innovation projects relating to delivery technologies, spectrum management and software platforms. Amongst other things, he is responsible for spectrum matters and high level projects related to Hybrid Radio and Television including HbbTV, DVB, RadioDNS and others. In July 2016, he was elected Chairman of the DVB Project, and retains a role as co-chair of the HbbTV Reuqirements Group. He is an Irish national living and working in Switzerland.

Roundtable: 15th November | 10:20

Pasquale Marinaro, *Technical Manager, Kineton*

I am Pasquale Marinaro, born in Benevento on 31/07/1986. I graduated with a master's degree in Computer Science in 2012. My first job was at Intelligentia, a university spin-off in Benevento in 2010, during my master's degree. At Intelligentia, I developed a platform for business process management and a platform to optimize the management of cash in ATM, using AI techniques. In 2012 I started to develop interactive applications on SAT STB for a Sky Italy. In June 2014, I started working for MediaMotive, as a software architect, continuing to work in the media environment, in particular on SKY IP STB for a product that was launched in 2015, in Italy. In the 2 nd semester of 2015 I started working as a software architect and project manager to design anddevelop interactive applications for the new Sky STB: Sky Q. This product was launched in Italy in 2017. Afterwards, I moved to a new company called Kineton, a company set up by the top management of MediaMotive, acting as technical manager concerning the media world, in particular, on HbbTV ecosystem.

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Ian Medland, *Associate Director, Testing, DTG*

In his role as Associate Director, Ian leads the DTG Testing operation, including test material development and testing services, overseeing technical architecture and project design and management, ensuring quality delivery to specification, deadline and budget. Ian joined DTGTL from interactive TV specialists Strategy and Technology (S&T) where he spent over a decade in a variety of roles, culminating in Head of Development – Client Systems, leading a group of engineers based in the UK and Hong Kong developing interactive middleware (MHEG) for digital television receivers.Ian chairs a number of industry groups within the DTG, including the Technical Oversight Group which oversees all technical activities within the DTG.
Ian started his career as a Test Software Engineer at aviation firm Smiths Industries before spending three years at Pioneer's Digital Design Centre creating test and verification software for a variety of MPEG-1, MPEG-2 video, VSB, and QAM silicon designs.

Roundtable: 15th November | 10:20

Klaus Merkel, *Senior Engineer, Institut für Rundfunktechnik*

Klaus graduated from the Technical University Munich in telecommunications engineering in 1992 and then joined the IRT as scientific engineer. Since 1995 he is engaged in various working groups in the definition and market introduction of open and interoperable platforms for digital interactive television. With various standardisation activities being an important part of this work, he was deeply involved in the launching phase of the HbbTV initiative in 2009. He coordinates IRT's activities related to HbbTV and is still active in contributing to the further development of the HbbTV standard. Beyond standardisation, many of his activities are related to the practical application of HbbTV in operational market environments. This includes support for both public and commercial broadcasters in all questions related to the practical use of HbbTV, specifically in the context of new service types or new HbbTV features.

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Nicolas Moulin-Fournier, *SVP New Video Services, Eutelsat*

Nicolas Moulin-Fournier is SVP New Video Services at Eutelsat. He is in charge of the Eutelsat CIRRUS service, an end-to-end video distribution solution over satellite and OTT. Nicolas joined Eutelsat in 2011. Prior to this, he had 12 years of experience in the space industry, strategy consulting and software industry.

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Carlos Antonio Navarrete Puentes, *Project Leader of the HbbTV Project Colombia, Universidad de los Andes*

Carlos Antonio Navarrete-Puentes is a Colombian lecturer, researcher and tech entrepreneur with a Master degree in Software Engineering from the Universidad de los Andes in Bogotá (Colombia). He has worked in human-computer interaction and new media content production for Digital TV and since 2011. His experience as a software development lecturer and his interests in entrepreneurship, education, culture, music and technology, has allowed Mr. Navarrete-Puentes to lead projects that ease and promote content creation addressing the design of new viewers' experiences, in which he has developed, applied and tested in @ mhp and HbbTV standards. He is currently leading a project of a HbbTV based full interactive TV show with the participation of Universidad de los Andes, the Colombian IT Ministry, Colombian National TV Authority (ANTV), Señal Colombia important Colombian audiovisual producers.

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Mirko Nedeljković, *Chief Executive Officer, Suitest*

Mirko Nedeljković is CEO at Suitest, a spinoff of mineus, and has been working in the interactive television industry for more than 19 years. Suitest is the first and only object-based solution for automated end-to-end and user interface testing of TV apps across all living room devices including HbbTV/FreviewPlay, Tizen, webOS, Android TV, Apple TV, Xbox, Roku and many others. At Suitest Mirko is defining the product strategy and developing partnerships with broadcasters, manufactures and organisations. Prior to founding mineus and Suitest, Mirko worked at razorfish in Hamburg and New York as producer, client partner and head of broadband/future TV. Mirko has been working on cross platform software projects for broadcasters, cable network operators and content providers. At mineus he has been overseeing implementations of HbbTV/teletext CMSs, HbbTV apps for e.g. ProsiebenSAT.1 Germany /Austria, swisstxt (SRG SSR), a comprehensive advertising SDK for HbbTV and various SmartTV platforms and numerous second screen apps.

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Dr.-Ing. Peter Neumann, *Specialist, Platform Solutions, CBC Cologne Broadcasting Center GmbH*

Peter Neumann studied Electrical Engineering and received the Dipl.-Ing. degree (2009) as well as the Dr.-Ing. degree (2017) from Technische Universitaet Braunschweig (Germany). In 2010 he started his career as a researcher at the Institute for Communications Technology of Technische Universitaet Braunschweig, where his research interest was on system theory and technology for heterogeneous broadcast/broadband networks enabling cost-effective and spectrum-efficient content delivery (Dynamic Broadcast). In 2016 he joined the Platform Solutions department of CBC Cologne Broadcasting Center GmbH. Since then he has been working in the field of program distribution with a focus on hybrid broadcast/broadband TV (HbbTV) and addressable TV (ATV)

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Raj Patel, *Co-Founder and CEO, Yotta Media Labs*

After working with Freesat as Chief Solutions Architect, Raj Patel founded Yotta Media Labs with Gary Knowles (ex NDS and OpenTV). Raj has worked in the media industry over the last 18 years, primarily focusing on Interactive Services on TV across multiple platforms and successfully launched the 2nd generation Freesat platform & service called "freetime". Recently, he has contributed, his efforts to the HbbTV Operator Application Specification and now assisting over the pond in implementing ATSC 3.0 next generation TV.

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Francesc Mas Peinado, *Engineering Research & Innovation, CCMA*

Francesc Mas is Engineer Consultant & Project Manager at Corporació Catalana de Mitjans Audiovisuals (CCMA S.A.), Spain. He graduated in 2001 as Telecommunications Engineer, and upgrade his skills with a Master in Digital TV in 2002 and an Executive Master of Business Administration in 2007. He's specialized in TV & Radio News IP contribution, multi-platform delivery and broadcast & broadband TV services (DTT, OTT, Hybrid TV). Francesc Mas collaborated in TV-Ring European project focused on innovative multi-camera TV services and Hbb4All European project about TV accessibility for impaired people. He also took part in the project for the deployment of Digital TV and HbbTV in Colombia. Nowadays Francesc Mas is participating in two European projects, both focused on accessibility, with the target to foster wider availability of accessible media offerings including also the new immersive 360° contents.

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Angelo Pettazzi, *Senior Strategic Marekting Manager, Mediaset Group and Co-Chair of DVB CM-TA, DVB*

Angelo has worked for the Mediaset Group since 1981. He is involved in the Strategic Marketing of "Reti Televisive Italiane", the Mediaset Group Italian broadcasting division. Angelo was born in Milan in 1954. He graduated in 1991 in physics – specializing in computer science – at Milan "Università degli studi". He joined the broadcasting operations of Videotime, a Company of the Mediaset Group, in 1981 as a technician. In 1997 he was involved in R&D Department of RTI as a researcher and then in 2001 in the Strategic Marketing of RTI as a technology manager. In 2003 he was appointed Head of the "Digital Terrestrial Content Factory" where he helped in designing and deploy interactive TV services based on the DVB-MHP standard technology; the "Content Factory" was, from 2003 to 2008, the Italian avant-garde of interactive television. Since 2013 he has involved in RTI Strategic Marketing where, among other, he is in charge to oversee DVB and HbbTV standard definition activities from the business point of view. He is member of the "HD Forum Italia" technical committee and member of the "HbbTV Association" steering group. Since January 2018 he is chairing the "HbbTV Marketing and Education Working Group".

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Jon Piesing, *Vice-Chair, HbbTV Association*

Jon Piesing is the vice-chair of HbbTV. He played a major role facilitating the convergence of the original French and German initiatives which together become HbbTV. He is a member of the Steering Board of the DVB project and the Steering Committee of the CTA Web Application Video Ecosystem (WAVE) project. Jon has been a leading figure in the development of specifications for integration of TV and interactivity for more than ten years. This has included being the chairman of groups in DVB, the Open IPTV Forum and the UK DTG.
Jon is now Director, Standardisation for TP Vision (who manufacture Philips TVs for Europe and a number of other territories). He has previously held senior positions related to standardisation in several different units of Philips.

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Martin Prins, *Product Owner, Media Distillery*

Martin Prins is Product Owner at Media Distillery, an Amsterdam based startup specialized in using AI to understand what's inside video. With an R&D-background in streaming and broadcast media, Martin is currently responsible for Media Distillery's Deep Understanding Platform, which helps broadcasters, operators and media organisations leverage AI to improve the user experiences of (broadcast) video services. Martin has over 10 years of experience in creating innovations for the broadcast and media industry.

Andre Prahl, *Chairman , DTVP*

Andre Prahl is Head of Program Distribution of Cologne Broadcasting Center GmbH and Mediengruppe RTL Deutschland GmbH. He is responsible for the technical distribution of all TV channels of Mediengruppe RTL Deutschland GmbH.

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Prior to joining Media Distillery, Martin worked as Senior Media Consultant at TNO, a leading Research Institute in the Netherlands. In this role he helped broadcasters and operators with media innovations such as OTT content delivery, HbbTV, Ultra-HD and Addressable TV. Martin was involved in HbbTV, as spec editor of HbbTV Application Discovery over Broadband, and was also actively involved in DVB's standardisation activity for Targeted Advertising.

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Xavier Redon, *Product Manager, Cellnex Telecom*

Product Manager at Cellnex Telecom, Treasurer and SG member at HbbTV Association and Associate Professor at Universitat Autònoma de Barcelona, Xavi Redon has been involved in Terrestrial Television evolution in Spain since 1996 moving forward projects like UHD DTT transmissions, TDT Híbrida certification, TDT SAT, ASO or the Spanish DTT network.

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Liz Ross, *CEO, Freeview Australia*

Liz Ross has been CEO at Freeview Australia since 2011and during her tenure has overseen the successful development of award-winning television services. These include the highly successful launch in 2017 of Freeview FV, the world-first collaboration between FTA networks on a mobile-first app, allowing Australian viewers to watch live streaming and catch-up content from all free-to-air networks on the go. Liz was also responsible for launching the Freeview Plus service on the HbbTV platform in 2014 and upgrading the service for launch in 2017. Freeview Plus was the first service in the world to aggregate all free-to-air on-demand services into one application and is compatible with all HbbTV receivers. Liz has extensive experience as a media professional across both owners and agencies in senior roles, including Media Director at Carat and Media Marketing and Insights Director at News Corporation, Australia.

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Stuart Savage, *Director EU Innovation R&D, LG Electronics*

Stuart has been involved in the world of TV middleware since the 1990s and helped deliver the first interactive Red Button service at Sky in 1999. Since then he has worked with a variety of TV middlewares and systems including OpenTV, Liberate, TwoWay TV, MHEG and now HbbTV. Stuart chairs HbbTV's Supplier Evaluation Working Group and has been a Steering Group member since 2014. He is currently Director of R&D for LG Electronics in Europe.

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Yiannis D. Vougiouklakis, New Media General Director, ERT

Managed a team of 80+ employees staff engineers journalists, electronics, production and post production staff, etc. with a budget over of 1.5 million euros. The company today boasts several technology projects that have been implemented to enable multimedia to enjoy multimedia content through a variety of devices and applications such as mobile phones, tablets, pc's, laptops, SmarTV, etc. The pinnacle of technological developments is the deployment of hybrid TV (HbbTV) services by ERT for the first time in Greece but also in the Balkans. Hybrid TV and the interactive services it offers are now available to citizens by ERT free, interactive. We currently offer for free at least seven apps like: 24 Plus, On Demand, App for the 27 live radio stations, EPG, ERTPlay's (thematic channels), Whether app, App for the Football League. Latest we lunch services such as subtitles selection and multicam viewing of sport events. The ERT is devoted to making public service media. In a continues process my division supports and strengthen public service media, provide first-class media services and offer our customers innovative solutions.

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Alberto Sigismondi, *CEO, Tivù*

Alberto Sigismondi is an expert in digital television, he works for Mediaset as Director of Digital Platforms Development. In 2008 he has been appointed CEO of Tivù S.r.l., the JV between RAI, Mediaset, Telecom Italia Media. He has been working in television since 1978, with different roles including Strategic Marketing Director. He is 59, lives in Milan, married with two children.

Graduated in Philosophy, he taught Media Studies at University of Milan. He has chaired the Free TV Alliance recently created among the main european free to air satellite broadcasters.

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Patrice Silvant, *VP Sales & Partnership EMEA, Seraphic*

Patrice Silvant acts as the strategic role of VP Sales & Partnership in EMEA. Patrice comes to SERAPHIC with more than 20 years' experience in technology, sales development and innovative projects in DTV industry, with roles spanning from software development to technology licensing. Patrice initially joined the inception of digital TV at Technicolor and the world first internet connected TV: the Thomson-TAK project. Patrice then partnered with the key DTV technology companies worldwide to source the best technologies as Director of Software Sourcing at Technicolor, and then joined DivX and Opera TV business team before joining SERAPHIC.

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Masaru Takechi, *Co Chairman, IRG-IBB at ITU, NHK*

Masaru received B.E and M.E degree from Tohoku University in Sendai, Japan in electrical engineering in 1987 and 1990 respectively. He joined NHK in 1990, and since then, he started his research work in various technical area at its Science and Technology Research Laboratories. His research takes an important role for the development of digital broadcasting systems in Japan from its early age, in particular, the protocols and receiver architecture for multimedia services. He is also active for standardization. He made many important contributions for interactive TV standards including BML and ARIB-J and led standardization of Hybridcast for 2K and UHDTV, and ARIB-TTML. He also led global standardization in this area as the Sub Working Group chair and the Rapporteur at ITU-R and ITU-T. Currently he is seconded to NHK Engineering System Inc. for the development of technique toward harmonization of applications between Hybridcast and HbbTV 2.

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Teun van der Veen, *Senior Consultant, TNO*

Teun van der Veen is Senior Consultant in the Networks department in TNO. In this position he leads the Media Networking team and is responsible for R&D projects in the Dutch and European telecom markets. Teun chairs a number of informal European operator work groups on broadband and IPTV.
He leads the TNO-initiative on HbbTV Operator Applications and works with operators and manufacturers towards deployment in 2018 and beyond. He is supporting HbbTV in its marketing activities, for instance by driving the publication of the recent whitepaper on the OpApps standard. Teun has coordinated a consortium of HbbTV members to create and review test assertions for this standard.
He founded TNO's Ultra-fast Broadband seminar, a world-leading event on technical developments in broadband that celebrated its 10th edition in 2018, illustrating the fact that Teun has always enjoyed connecting people and knowledge.
Before joining TNO in 2003, he was lead photonic chip designer at C2V, Alcatel Optronics and Kymata Netherlands.
Teun holds an MSc degree in Applied Physics from the University of Twente in The Netherlands.

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