VR Interest Group >>> VR Industry Forum

28th October 2016

SMFoLD Conference: SMPTE

David Price

VR Interest Group

- Members of the Interest Group share:
  - ❑ A common background in the TV and Media space
  - ❑ A desire to avoid market fragmentation through cross industry collaboration
  - ❑ A desire to accelerate the widespread consumption of immersive VR content
  - ❑ A desire to foster and advocate standards based solutions liaising with SDOs : MPEG, SMPTE, 3GPP, DVB
  - ❑ A desire to include future big VR platforms : Facebook, Google, ….
  - ❑ A desire to liaise with already established VR Forums : VR Society, ITA3D
  - ❑ A common desire to avoid …….

…going from this….

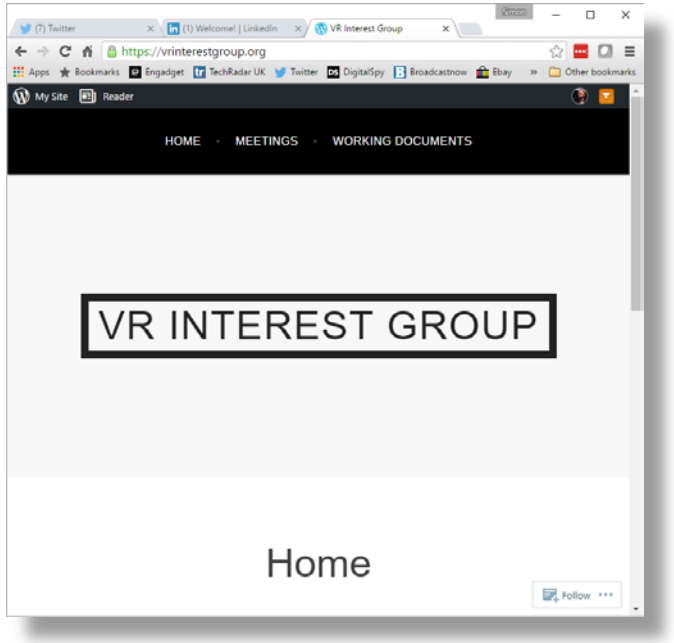
…to this….

For iPhone there are already

- 28 VR headsets
- 13 Cardboard headsets

VR Interest Group - Status

- Email reflector (VR360@dtg.org.uk) over 176 individuals from 74 organisations
- Website with meeting information, previous minutes and working documents (https://vrinterestgroup.org)
- Scope document in Google Docs
- Meetings at CES, NAB and IBC
- Bi-weekly conference calls



VR Industry Forum

- A derivative from the VR Interest Group
- 27 Founding Organizations have agreed to move forward to establish an Industry Forum (studios, operators, technology vendors, academia…)
- Inaugural Founders Conference Call this week
- VR Industry Forum Bylaws and IPR Policy have been drafted
- Preliminary plan is to launch at CES 2017
- VR Interest Group may continue as a reflector but as:
  - a review body for WG output
  - A distribution for studies and white papers

Why move from VRIG to VRIF

- We all believe that VR will thrive, but that we can **accelerate the adoption** by removing hurdles.
- Our goal is to **bootstrap an industry** that will allow all of us, and consumers, to benefit.
- Having a formal organization will provide a **context** to make this happen **more efficiently**

A Formal Organization

- Provides a structure to conduct **technical** and **communication activities**
- Makes it easier companies and other organizations to **participate** and **allocate resources**
- Provides a context for **dealing with IP**
- Provides context that respects **competition law**
- Allows us to **fund relevant ac**tivities
  - Host meetings, interop activities, professional communication and advocacy, liaisons, with a professional infrastructure to support the work
- Allows us to command industry-wide **recognition** and **credibility**

VR work areas

Work Packages		Guidelines on….	Potential SDO related	Note
0	General	Overall structure of guidelines including scope and intent	Initial work in establishing the Lexicon	
1	Story Telling	How to write VR content Directing the viewer Freedom of viewing choice Standards based structure to story branching	DPP have done some work in this area	Need buy in from studios to include this section. Allowing viewer selectable scene position has a dramatic effect on content production, capture and encode. Could be part of VR Society
2	Production	how to produce content: camera, 2D/3D , file formats, frame rates, interfaces, storage, archive	SMPTE Virtual Reality Society (part of AIS)	
3	Merged Graphics	Video and graphics merging using various techniques like overlay, 3D mapping,…..		VR experiences will include interactive elements rendered in real time and there is a need to harmonize dealing with those across platforms. Need to have a broader scope than pure video with standard graphics
4	Content Mapping	Stitching and geometry mapping eye/iris tracking	Could be part of MPEG (OMAF, Video), JVET, and/or 3GPP, IETF	Fove, Eye Tribe, SensoMotoric, Tobii and others all working on proprietary iris tracking solutions
5	Compression	Tiling, windowing, codec	MPEG (OMAF, Video, LightField exploration), JCT, VC, JVET, SCTE, ETSI	Efficient use of bits for the highest user experience, especially for “magic window” or iris tracking content
6	Storage	File format encapsulation and metadata signaling	MPEG (File Formats, OMAF)	Metadata signalling (e.g., VR content indication, info needed for decoding, rendering and their optimizations), storage format
7	Distribution	Broadcast, unicast, LTE Broadcast, CDN caching, low delay by design	DVB, CableLabs, MPEG (DASH), DASH, IF, SCTE, ETSI	Metadata signaling (e.g., VR content indication, info needed for content selection, transmission, adaptation, consumption), distribution format

VR work areas

Work Packages		Guidelines on….	Potential SDO related	Note
8	**Decoder and Display**	Rendering techniques: external (PC, game station) vs internal (built in Mobile) Resolution/frame rate for display device		
9	**API**	API for all devices interactions especially between HMD, hand/foot sensors and external signaling such as walls and objects		Facebook, Google (Daydream) , Apple (to come) , Unity
10	**UI / navigation**	Rendering, navigation	W3C	
11	**Motion sickness Vertigo, Audience ratings**	Impact on the human balance, sensing vestibular system from experiencing VR where motion is seen but not sensed	BBFC have some work MPAA (potentially)	Studios already considering a rating system to provide user warnings
12	**Spatial audio**	Spatial audio capture: microphone arrays, workflows, file formats for storage and transmission, encoding. Spatial audio rendering: proper head tracking and sound field rotation, sound source localization, latency constraints, ambisonics, audio objects and metadata to control them.	MPEG (Audio), 3GPP IETF, ETSI	
13	**Security**	Encryption including CENC support; Support for transformations in secure media path in players and devices; Verification of source and integrity of content	W3C (CENC, EME etc.), EBU, SCTE	Need to ensure any transformations, packaging etc. for VR and AR is supported in HW and SW for secure content, both server side an on the devices.
14	**Taxonomy**	Creation of a lexicon and glossary for use by the other WGs and industry at large	DECE	Starting with the DECE glossary
15	**Requirements of Service Providers**	Specific needs of broadcasters and OTT service providers for commercial success	EBU, NAB, ABU, ACT, NABA	

WG 1: Comprehensive Lexicon

- Fantastic starting point provided by DECE!
- 6 weekly calls to date
- Moving to editing work
- First draft released to VRIG Members for review
- 240 terms in a spreadsheet (v9)
- Getting as reasonably exhaustive as possible
- Will have to be maintained, periodically iterated/versioned over time

Lexicon Organization

- **Term:** Word or phrase
- **Category:** Classification of the term
- **Acronym:** Abbrevated form of the term
- **Definition:** Meaning and use of the term
- **Core:** Applicability of the term to standards work.
- **Workflow:** Categorization of the phase(s) of ecosystem workflow the term is most relevant to.
- **SDO Ref:** Relevant standards-developing organizations or industry bodies

WG 1: Lexicon Categories

- Artifact
- Audio
- Camera
- Display
- Interaction
- Metric
- Organization
- Person
- Physiology
- Product
- Sensor
- Software
- Technology
- Other

WG 1: Lexicon Workflow

- **Capture** Includes sensors, real-time stitching
- **Produce** Includes data conversion, post-production, stitching, point clouds, 3D mapping, planar projection, and QC
- **Encode** Includes transcoding, multiplexing, DRM license generation, encryption
- **Distribute** Includes storage, CDN, streaming, download, broadcast
- **Decode** Includes DRM license verification and decryption
- **Render** display Includes HMD, light-field display
- **Interact** Includes user input, latency
- **Experience** Includes physiology, user acceptance

VR Interest Group >>> VR Industry Forum