VR Industry Forum

Open Meeting
January 5, 2017
Press Release

28 major companies collaborate to promote the adoption and end-to-end interoperability of VR across key media and entertainment sectors.

LAS VEGAS, Nevada — January 5th 2017 — At CES in Las Vegas today, 28 companies announced the Virtual Reality Industry Forum, Inc. (“VRIF”), a not-for-profit company with its purpose stated as, “To further the widespread availability of high-quality audiovisual VR experiences, for the benefit of consumers.” The Founding Members of VRIF are Akamai Technologies, ARRIS International plc, b<>com, Baylor University, CableLabs, Cinova Media, Dolby, DTG, DTS, EBU, Ericsson, Fraunhofer, Harmonic, Huawei, Intel, Irdeto, Ittiam, MovieLabs, NABPILOT, Orah, Qualcomm Technologies, Technicolor, TNO, Sky, Sony Pictures, Vantrix, Verizon and Viaccess-Orca

• Media Alert initiated January 4th
• Analysts invited to Open Meeting
• Proactive PR planning follow up to maintain momentum

From Bylaws: "such press release shall not name the identities of any other Member unless prior written consent from such other Member is granted”. Amazing to get 28 approvals done in this holiday period.
Purposes Stated in the Bylaws

“To further the widespread availability of high quality audiovisual VR experiences, for the benefit of consumers”

• A broad range of participants from sectors including the movie, television, broadcast, mobile, and interactive gaming ecosystems, comprising content creators, content distributors, consumer electronics manufacturers, professional equipment manufacturers and technology companies....The Corporation is not a standards development organization, but will rely on, and liaise with, standards development organizations for the development of standards in support of VR services and devices.
Status Report

• Incorporation Status
  – Incorporated in Delaware as of January 3, 2017
  – Federal tax ID #81-4848697
  – Bank account opened
  – Non-profit status filing, in process
Membership

- Current Membership update and how to join
Founding Members

You can be on this list, too!

– Akamai
– ARRIS
– b<>com
– Baylor University
– CableLabs
– Cinova
– Dolby Laboratories
– DTG
– DTS
– EBU
– Ericsson
– Fraunhofer
– Harmonic
– Huawei
– Intel
– Irdeto
– Ittiam
– MovieLabs
– NAB PILOT
– Orah
– Qualcomm Technologies
– Sky
– Sony Pictures
– Technicolor
– TNO
– Vantrix
– Verizon
– Viaccess-Orca
Initial Board and Officers

- President
  - David Price
- Secretary
  - Rob Koenen
- Treasurer
  - Paul Higgs
Initial Working Groups

- Requirements WG
- Guidelines WG
- End-to-end Interoperability WG
- Communications WG
- Liaison WG
## VR SDOs Landscape

<table>
<thead>
<tr>
<th>Organization</th>
<th>Type</th>
<th>Scope</th>
<th>Description</th>
<th>Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPEG</td>
<td>SDO</td>
<td>A, B</td>
<td>Mechanisms to carry VR</td>
<td>OMAF (17), MPEG-I (18)</td>
</tr>
<tr>
<td>DVB</td>
<td>SDO</td>
<td>B, C</td>
<td>Set of tools out of MPEG-I for unicast &amp; broadcast applications</td>
<td>CM just starting (‘18)</td>
</tr>
<tr>
<td>3GPP</td>
<td>SDO</td>
<td>B, C</td>
<td>VR for Mobile</td>
<td>Ongoing activity, schedule ?</td>
</tr>
<tr>
<td>SMPTE</td>
<td>SDO</td>
<td>A, B</td>
<td>Production spec for VR content</td>
<td>Just starting</td>
</tr>
<tr>
<td>W3C</td>
<td>SDO</td>
<td>C, D</td>
<td>Web VR initiative</td>
<td>Ongoing activity, schedule ?</td>
</tr>
<tr>
<td>IETF</td>
<td>SDO</td>
<td>C, D</td>
<td>Mechanism to carry VR over Internet</td>
<td>?</td>
</tr>
<tr>
<td>ITU</td>
<td>SDO</td>
<td>A, B</td>
<td>Production spec for VR content</td>
<td>Just starting</td>
</tr>
<tr>
<td>ULTRA VIOLET</td>
<td>Spec group</td>
<td>B, C</td>
<td>VR for Storage Media or Streaming</td>
<td>Just starting</td>
</tr>
<tr>
<td>CableLabs</td>
<td>Spec group</td>
<td>B, C</td>
<td>VR for Cable delivery</td>
<td>Started in ‘15</td>
</tr>
</tbody>
</table>
## VR Groups Landscape

<table>
<thead>
<tr>
<th>Organization</th>
<th>Type</th>
<th>Scope</th>
<th>Description</th>
<th>Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="VR Society" /></td>
<td>Industry group</td>
<td>A, B</td>
<td>Story telling guidelines</td>
<td>Started several years ago</td>
</tr>
<tr>
<td><img src="image" alt="The Invasive Technology Alliance" /></td>
<td>Industry group</td>
<td>B, C, D</td>
<td>Games &amp; Video Guidelines</td>
<td>Started several years ago</td>
</tr>
<tr>
<td><img src="image" alt="VRAR Association" /></td>
<td>Industry group</td>
<td>NA</td>
<td>VR Networking group</td>
<td>Started several years ago</td>
</tr>
<tr>
<td><img src="image" alt="GVRA" /></td>
<td>Industry group</td>
<td>B, C, D</td>
<td>Unified standard for HMD</td>
<td>Just started</td>
</tr>
<tr>
<td><img src="image" alt="Khronos Group" /></td>
<td>Industry group</td>
<td>D</td>
<td>Unified standard for HMD peripherals</td>
<td>Just started</td>
</tr>
<tr>
<td><img src="image" alt="Streaming Video Alliance" /></td>
<td>Industry group</td>
<td>B, C</td>
<td>VR Streaming</td>
<td>Just started</td>
</tr>
<tr>
<td><img src="image" alt="DASH Industry Forum" /></td>
<td>Industry group</td>
<td>B, C</td>
<td>VR Streaming</td>
<td>Just started</td>
</tr>
</tbody>
</table>
External Presence

- Logo selected

- Website created [www.vr-if.org](http://www.vr-if.org)
Want to join?

• Please contact us at:

  info@vr-if.org
  +1-510-492-4055
  www.vr-if.org
Paul Jensen - MovieLabs

VRIF LEXICON
(CURRENT STATUS)
VRIF Lexicon – What?

**Definition of LEXICON**

*plural lexica* /lɛksɪə/ *or lexicons*

1. a book containing an alphabetical arrangement of the words in a language and their definitions: **DICTIONARY**
   
2. a: the vocabulary of a language, an individual speaker or group of speakers, or a subject
   b: the total stock of morphemes in a language

3. **REPERTOIRE, INVENTORY**
Why?

• Encourage common usage of terms, avoid confusion when the same term is used to mean different things.

• Provide a taxonomy for terms along different axes such as category, or which parts of VR workflow they are pertinent to.

• Provide an efficient means of disseminating neologisms.

• Quick reference to give readers a sense of an unfamiliar term encountered while browsing VR literature.
How?

• Initial terms extracted from a large corpus of VR-related material, including academic publications, online articles, and vendor marketing material.

• Look at the usage of terms within the corpus and elsewhere.

• Eliminate outliers and create consensus definition based on most common usages
  – NO cutting & pasting of existing definitions!

• Curated crowdsourcing for future contributions, and ongoing maintenance.
  – Meanings tend to evolve over time
History & Recent Progress

- **Mar-Jun 2016**: initial development by DECE & MovieLabs.

- **Aug 2016**: work moved to Lexicon and Taxonomy for VR sub-group, with a core group of ~10 participants meeting weekly, plus contributions from a larger group.

- **Aug-Oct 2016**: Added new terms, pruned others, refined categories, defined a Workflow taxonomy, re-hosted to Google Docs.

- **Nov-Dec 2016**: prepare for initial publication.
  - Currently 155 terms defined

- **Jan 2017**: Initial public review, and plan for revision process to keep current.
Lexicon Taxonomy

• Organized around Terms & Definitions, augmented by five additional metadata fields:
  
  – **Category**: Classification of Terms. This makes it possible to select subsets of the list applicable to different needs.
  
  – **Acronym** (optional): Abbreviated form of the term (including initialisms).
  
  – **Core** (optional): Applicability of the term to standards work. *Primary* indicates most applicable; *Secondary* indicates additionally applicable.
  
  – **Workflow**: Categorization of the phase(s) of VR ecosystem workflow the term is most relevant to.
  
  – **SDO Reference**: Relevant standards-developing organizations or industry bodies.
Example

<table>
<thead>
<tr>
<th>Term</th>
<th>Category</th>
<th>Acronym</th>
<th>Commercial</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room-scale system</td>
<td>Technology</td>
<td></td>
<td></td>
<td>A VR system allowing people to walk around within a limited area. Also known as &quot;walk-around&quot; VR, such a system must be capable of tracking not only the orientation of the headset but also the location (six coordinates versus three).</td>
</tr>
</tbody>
</table>
Term Category

- A first-order, color-coded, bucketing of terms into a relevant body or knowledge:
  - **Concept:** High-level notion or abstract idea.
  - **Audio:** Technology or device specifically related to audio.
  - **Camera:** Video or audio capture device, or associated optical or aural system.
  - **Display:** Technology or device that presents video (and audio) to a user.
  - **Interaction:** System or technique enabling a user to interact and control a simulated environment.
  - **Metric:** A system, unit, or frame of reference for measurement.
  - **Physiology:** A human factor or human response.
  - **Sensor:** A device for tracking motion or position. (Excludes devices for capturing video, audio, or morphology.)
  - **Software:** Computer application or software library.
  - **Technology:** General technical knowledge or its application.
  - **Video:** Technology or device specifically related to video.
Term Workflow

• Bucket terms according to their position in an idealized VR workflow:
  – **Capture**: Includes sensors, real-time stitching.
  – **Produce**: Includes data conversion, post-production, offline stitching, point clouds, 3D mapping, planar projection, and QC.
  – **Encode**: Includes transcoding, multiplexing, DRM license generation, encryption.
  – **Distribute**: Includes storage, CDNs, streaming, downloading, broadcast.
  – **Decode**: Includes DRM authentication and decryptions.
  – **Render**: Real-time generation of audiovisual content from internal data formats.
  – **Display**: Present audiovisual and other sensory data to devices such as HMDs and headphones, and (future) light field displays.
  – **Interact**: Control and affect the virtual environment using methods such as body motion, speaking, and manipulating input devices.
  – **Experience**: the gestalt of the individual sensory inputs that approximate a virtual environment. Includes physiology, user acceptance, haptics, and other human factors.
Open Session
Close and Refreshments

www.vr-if.org