

VR Industry Trend

Dillon Seo, VoleR Creative



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IEEE P3333.3
HMD Based 3D Content Motion Sickness Reducing Technology
Dillon Seo, dillon@volercreative.com

VR Industry Trend

Date: 2017-04-23

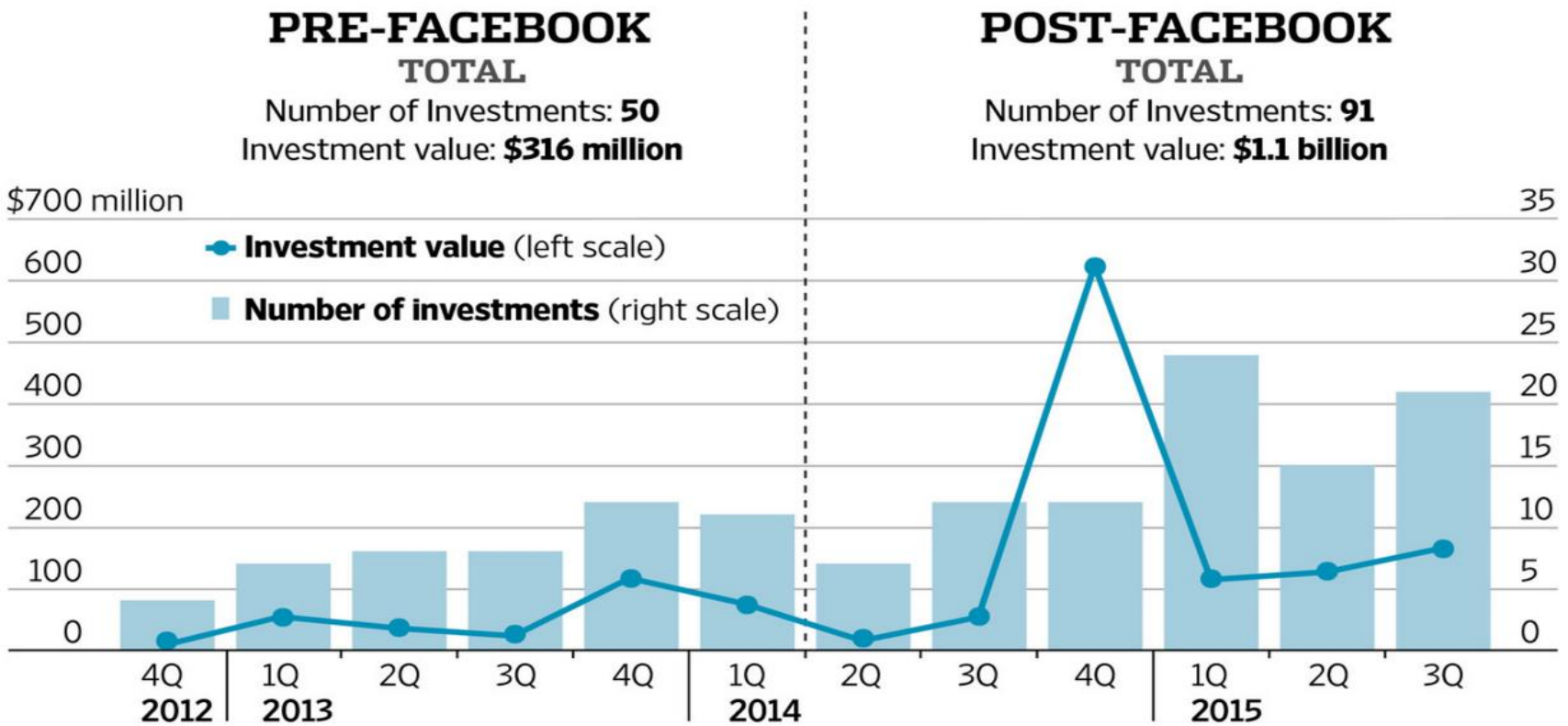
Author(s):

Name	Affiliation	Phone [optional]	Email [optional]
Dillon Seo	VoleR Creative	+82 10 3135 3194	dillon@volercreative.com

Revisit of VR Industry

Betting on New Worlds

Venture funding for virtual reality and augmented reality (before and after Facebook's purchase of Oculus)



Source: CB Insights

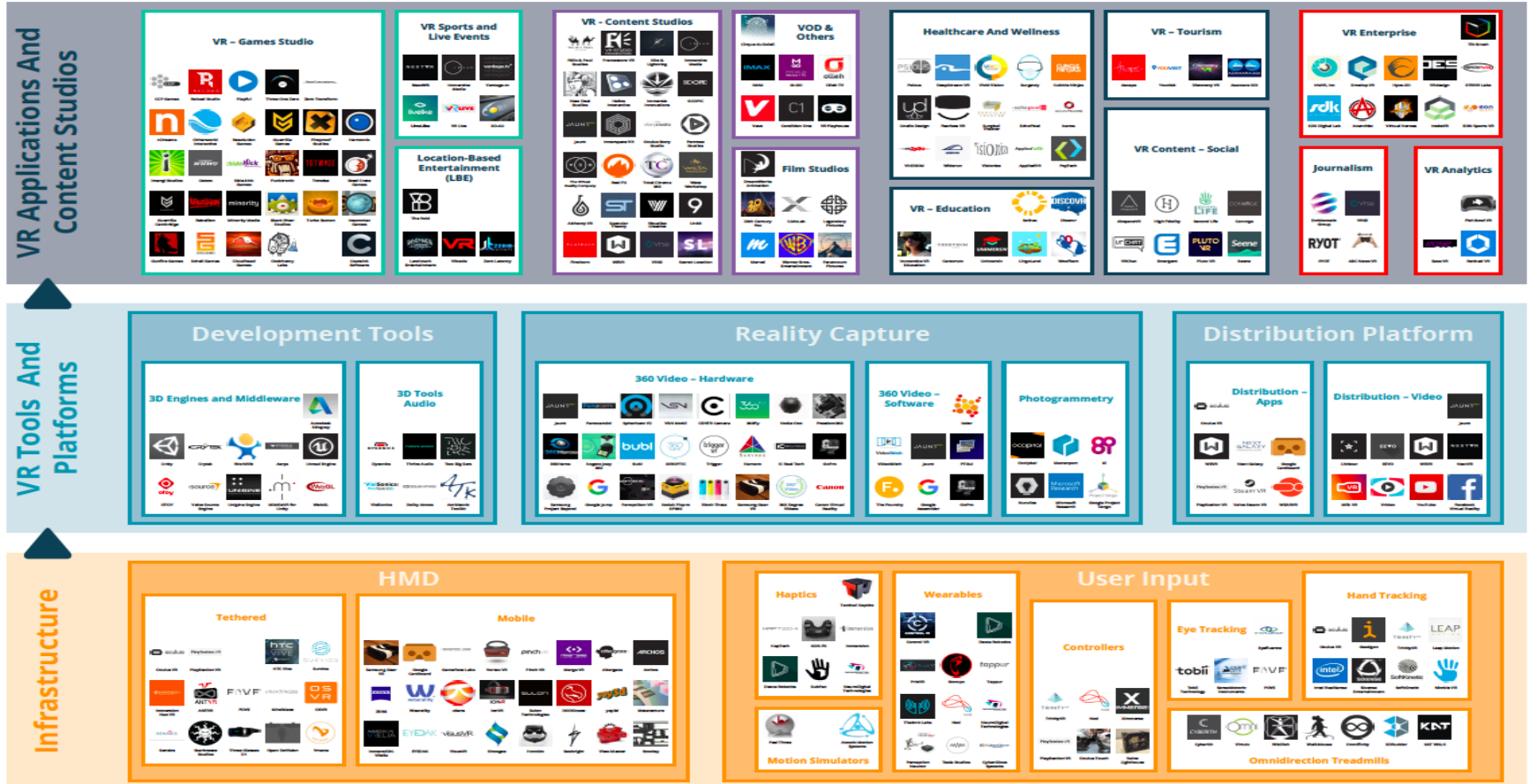
THE WALL STREET JOURNAL.

VR Industry in 2015

DESIGNED BY
TIPATAT CHENNAVASIN

Virtual Reality Landscape

POWERED BY
VB | Profiles



VERSION 2.0

VR Industry in 2016

THE VR FUND 2016 VR INDUSTRY LANDSCAPE AUG v1.8

APPLICATIONS/CONTENT



TOOLS/PLATFORM



INFRASTRUCTURE

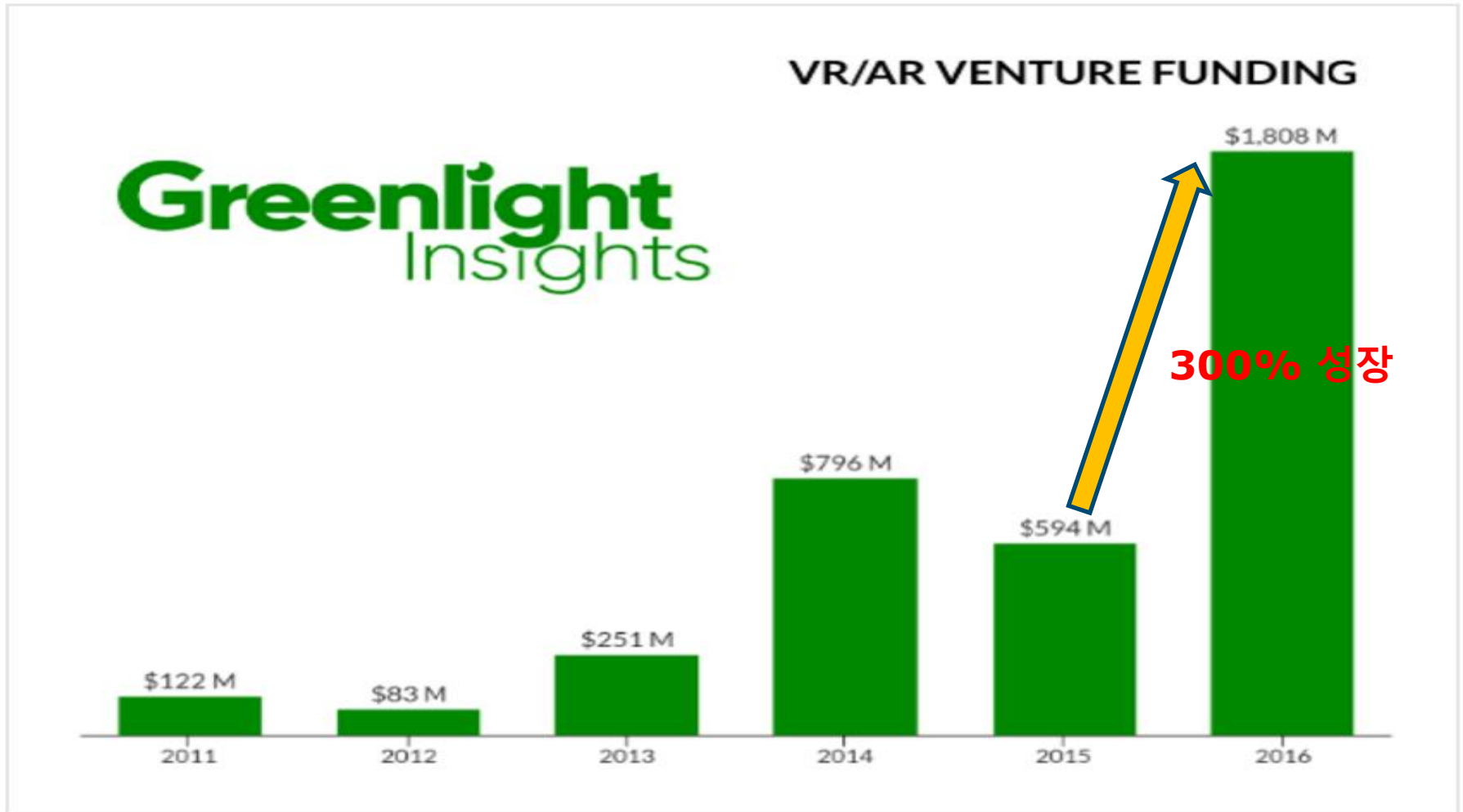


BY TIPATAT@THEVRFUND.COM

VR Investment Scene in 2016

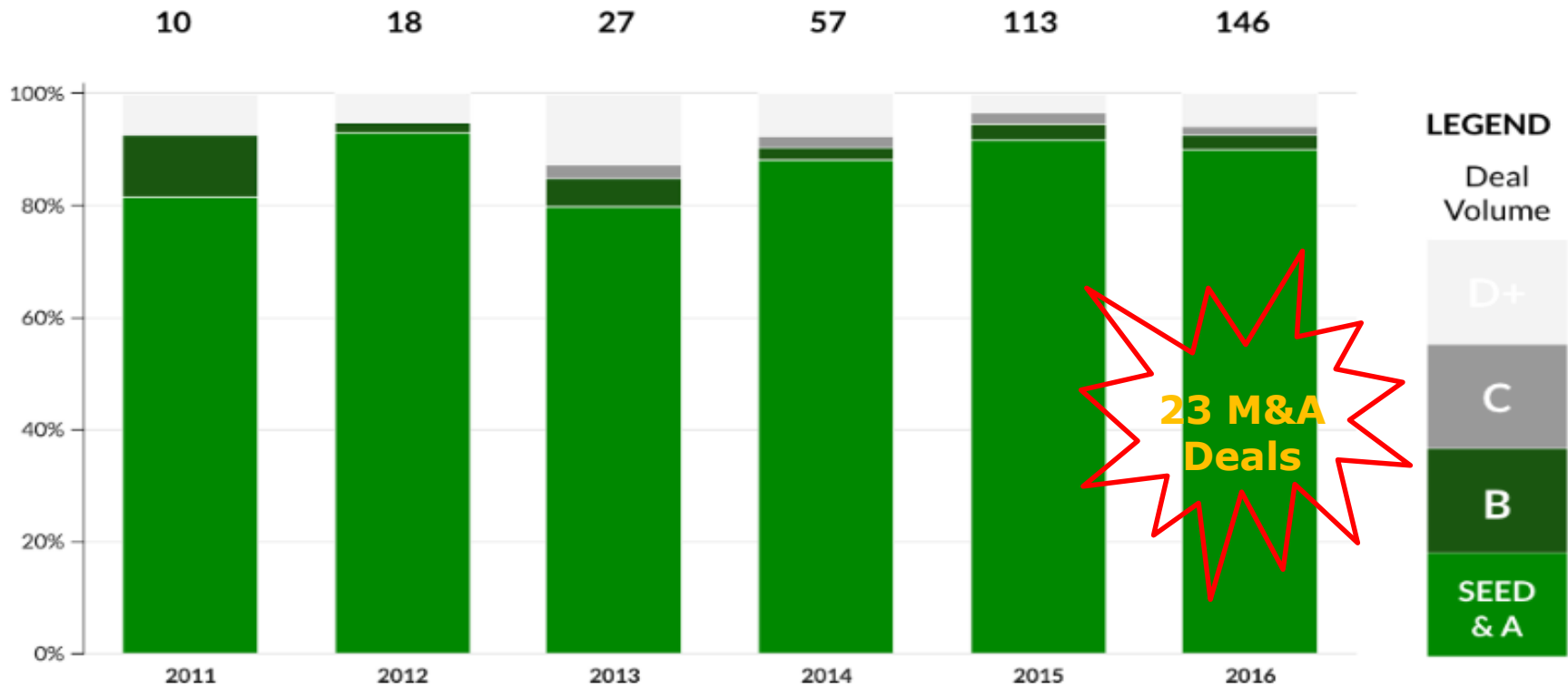
VR/AR Funding: 2016 Year in Review

Clifton Dawson / January 25, 2017 / Analysis, Funding Database



VR Investment Type in 2016

DEAL DISTRIBUTION 2011-2016









Source: Greenlight Insights Funding Database
Note: data through December 31, 2016

VR Investment Breakdown in 2016

TOP 6 DEALS & CATEGORIES
VIRTUAL REALITY 2016



 <p>\$201M</p> <p>HEAD MOUNTED DISPLAYS A computer display you wear on your head.</p>	 <p>\$113M</p> <p>LIVE EVENTS Technology used to stream live events to consumer HMDs.</p>	 <p>\$94M</p> <p>ENTERTAINMENT Non-gaming, non-live entertainment, including movies and UGC.</p>
 <p>\$78M</p> <p>GAMES A three-dimensional environment where player can interact with that environment during a game.</p>	 <p>\$59M</p> <p>LOCATION-BASED VR Technology or application in which the gameplay evolves and progresses via a player's location.</p>	 <p>\$24M</p> <p>SOCIAL Public or private communication or media sharing between one or more users.</p>

Source: Greenlight Insights Funding Database

Note: data through December 31, 2016

Icons: Nikita Golubev; Freepik; Simpleicon; and Madebyoliver

Some Largest VR Deals in 2016

LARGEST VENTURE ROUNDS VIRTUAL REALITY 2016



Building machine interfaces combining VR, computer graphics, and neuroscience.

\$100M

Series B



Creators of Idealens, a standalone VR headset out of China.

\$100M

Series A



Captures and delivers live and on-demand VR experiences.

\$80M

Series B



SURVIOS

Video game studio and creators of award-winning VR game Raw Data.

\$50M

Series C



Starbreeze is a video game studio and maker of StarVR headset.

\$40M

Series Undisclosed



VR animation company that creates story and character driven cinematic experiences.

\$25M

Series B

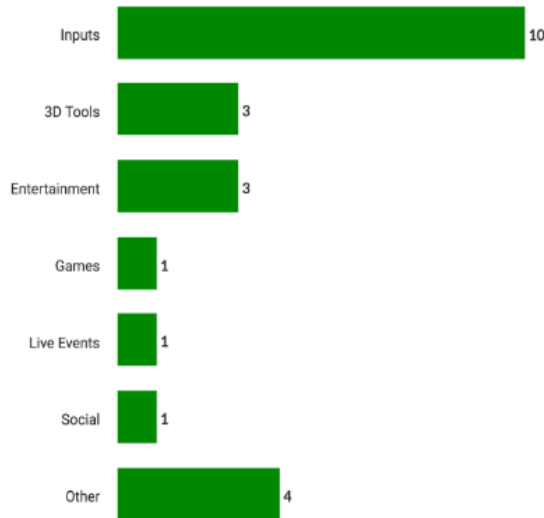
Source: Greenlight Insights Funding Database
Note: data through December 31, 2016

VR M&A Deals in 2016



NOTABLE ACQUISITIONS 2016

BY PRODUCT CATEGORY



DISCLOSED

Target	Acquirer	Amount
ePawn	Starbreeze	\$1.7M
Nozon	Starbreeze	\$7.8M
Cimagine Media	Snap, Inc.	\$30.0M
Pebbles Interactive	Facebook	\$60.0M

UNDISCLOSED

Target	Acquirer
Hammer and Tusk	Axiom Zen
Two Big Ears	Facebook
Secret Location	Entertainment One
BioLucid	Sharecare
Voke	Intel
Facio Metrics	Facebook
Eyefluence	Google
Fake Love	The New York Times
Melon	Daqri

Source: Greenlight Insights tracking and analysis based on news reports

Note: M&A transactions totals and lists are not meant to be comprehensive; deals through December 31, 2016

Summary for VR Investment in 2016

- Venture funding for VR/AR companies in 2016 raised \$1.8B, surpassing 2015. This represents a compound annual growth (CAGR) from 2011-2016 of 71.38%. There were 475 deals, most of which were for early stage companies. The median deal size was \$1M.
- **Major themes** Investment in HMDs still remains the highest of any category, partially due to the capital-intensive nature of producing hardware products. In terms of growth from 2015, there has been a noticeable level of investor interest in content producer as the industry realizes that for VR/AR products to really take off, consumers will soon demand need to have a significant amount of use for the hardware. As the industry faces growing need to offer compelling content, specialty studios and input technologies will play a key role in enabling engagement with the HMDs.
- **Exits activity** In 2016, there was a spike in M&A transactions relative to 2015. Yet the 2016 exit market was a mixed bag with only 23 tracked and disclosed deals valued at \$100M. Public markets are not yet a viable exit with no new market capitalization created through VR/AR company IPOs.

Global VR Association



The image shows a promotional graphic for the Global VR Association. The background is a dark blue space scene with a starry sky and a galaxy. On the left is a large teal logo consisting of a square with a smaller square inside, offset to the top-left. To the right of the logo, the text "GLOBAL VIRTUAL REALITY ASSOCIATION" is written in white, with "GLOBAL" on the first line, "VIRTUAL REALITY" on the second line, and "ASSOCIATION" on the third line. Below this, a paragraph of text reads: "GVRA's mission is to promote responsible development and adoption of VR globally with best practices, dialogue across stakeholders, and research. GVRA will be a resource for industry, consumers, and policymakers interested in VR." In the top right corner, there is a white box containing several logos: the GVRA logo, the Oculus logo (with "from facebook" below it), the PlayStation logo, the VIVE logo, the Google VR logo, the SAMSUNG logo, and the STARVR logo (a black rectangle with a white star and the letters "STARVR" below it).

VR Industry Outlook for 2017

- Investment in Content will increase by the Platform Holders
 - Facebook – \$250M USD investment for VR Game Content
 - HTC – Content investment through Vive X & VRVCA
 - Sony – First party VR titles & content sourcing
- Business Models for VR Content
 - More location based VR entertainment centers will open
 - VR adoption for Asian Cyber Cafes
 - Household VR market will continue to grow
- Consolidation of VR Hardware
 - Many Chinese VR HMD manufactures went bankrupt
 - Hardware companies with most number of content will win the war
- Evolution of VR Hardware
 - Wireless VR HMD & Price Drop
 - Various VR input devices will appear to maximize the VR UX

Why VR?

Industrial Perspective – Diminishing Return



Display



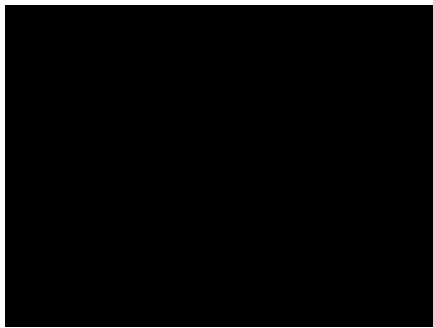
Chips



Telecom

Why VR

Consumer Perspective – Cost & Efficiency



Anywhere



Anything



Whatever



Time



Space

VR is still at its infancy

- More improvements
 - Hardware Performance (Resolution, CPU/GPU, Sensor, Network)
 - UX (I/O Device, Motion Sickness)
 - Diversified UX (Game, Entertainment, Education, Tour, etc)
 - Better ergonomics (Comfortable, Reduced Size)
 - Price drop for better consumer adoption
- What is the difference between VR and Stereoscopic 3D TV
 - Reducing cost and Increasing efficiency through the control of Time and Space