



**VR/AR**

**Dream to Reality**

**Sergio Salvador, Head of New Business Development**  
**Global VR/AR Summit 2016 - Shanghai 2016**

A walk through VR history

2015... To Infinity & Beyond



**1960**  
Morton Heilig creates "Sensorama" a multi-sensory simulator



**1968**  
"The Sword of Damocles" created by Ivan Sutherland first AR HMD system



**1982**  
Thomas Furness develops Visually Coupled Airborne Systems Simulator



**1987**  
"Virtual Reality" coined by Jaron Lanier of VPL Research Inc.



**1992**  
Brett Leonard's 'The Lawnmower Man'



**1993**  
Sega announce Sega VR prototype for Mega Drive console



**2007**  
Google introduces Street View



**2014**  
Facebook buy Oculus VR for US\$2 billion from Palmer Luckey



**1516**  
"Sala delle Prospettive" created by Baldassare Tommaso Peruzzi Villa Farnesina in Rome



**1978**  
Andy Lipman's team at MIT create the Aspen Movie Map



**1982**  
Steven Lisberger's TRON is released



**1984**  
William Gibson publishes 'Neuromancer'



**1985**  
Data Glove for commercial use developed by VPL Research Inc.



**1988**  
Star Trek: The Next Generation introduces "the holodeck"



**1995**  
CAVE Automatic Virtual Environment



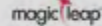
**1999**  
The Wachowski Brothers' 'The Matrix' is released

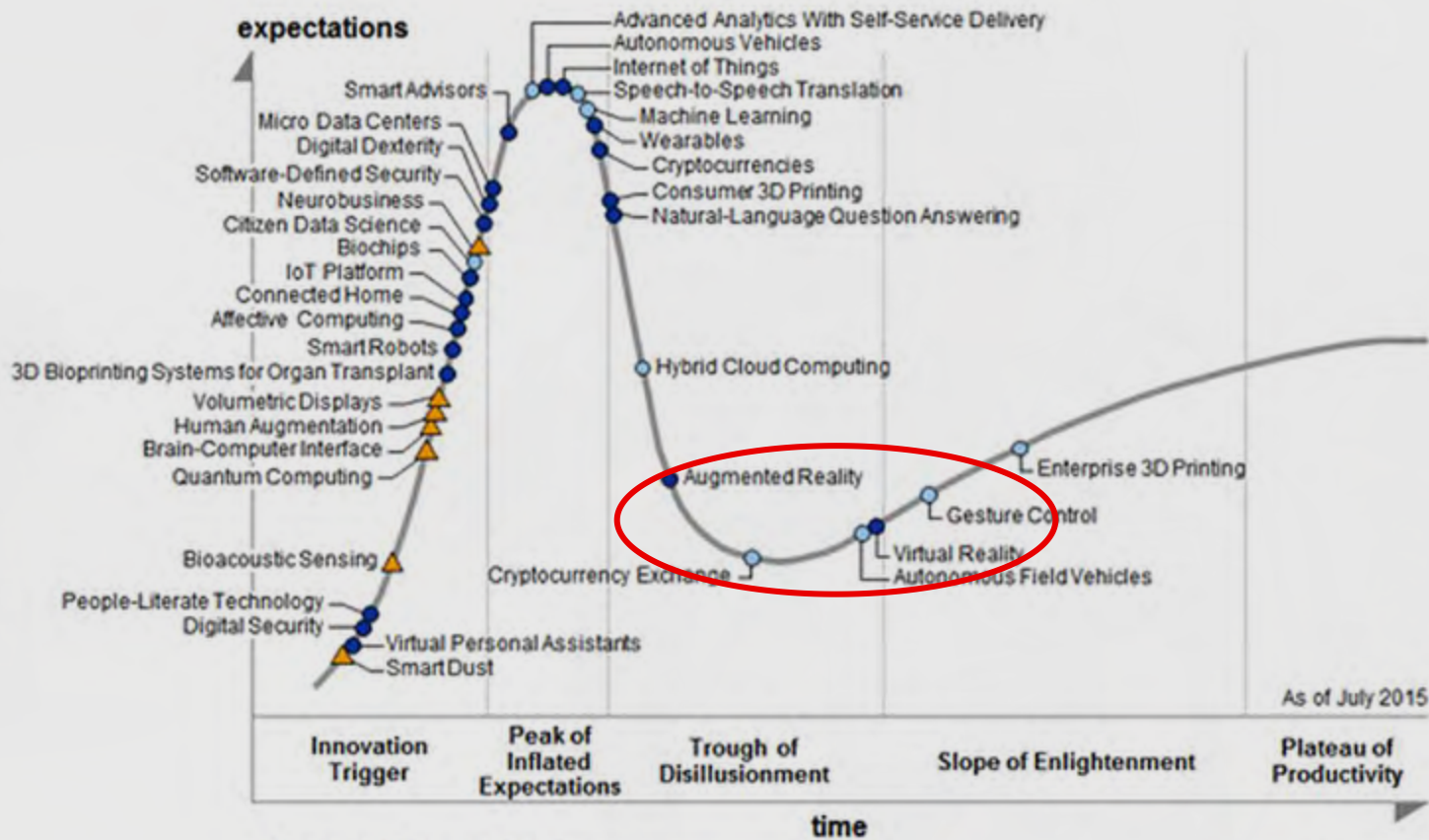
**2003**  
Linden Labs releases Second Life



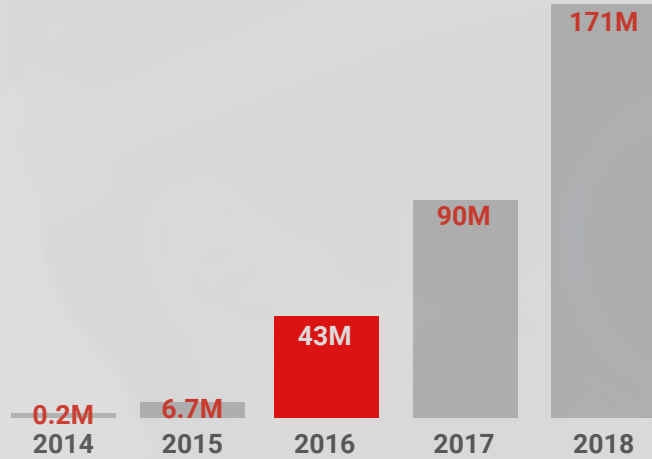
**2013**  
Nintendo files patent for VR 3D technology

**2014**  
Google invest US\$500 million into Magic Leap





Source: Gartner (2015-2016)



4X

growth in global searches  
for virtual reality on Google  
over the last year

## Number of active virtual reality users worldwide

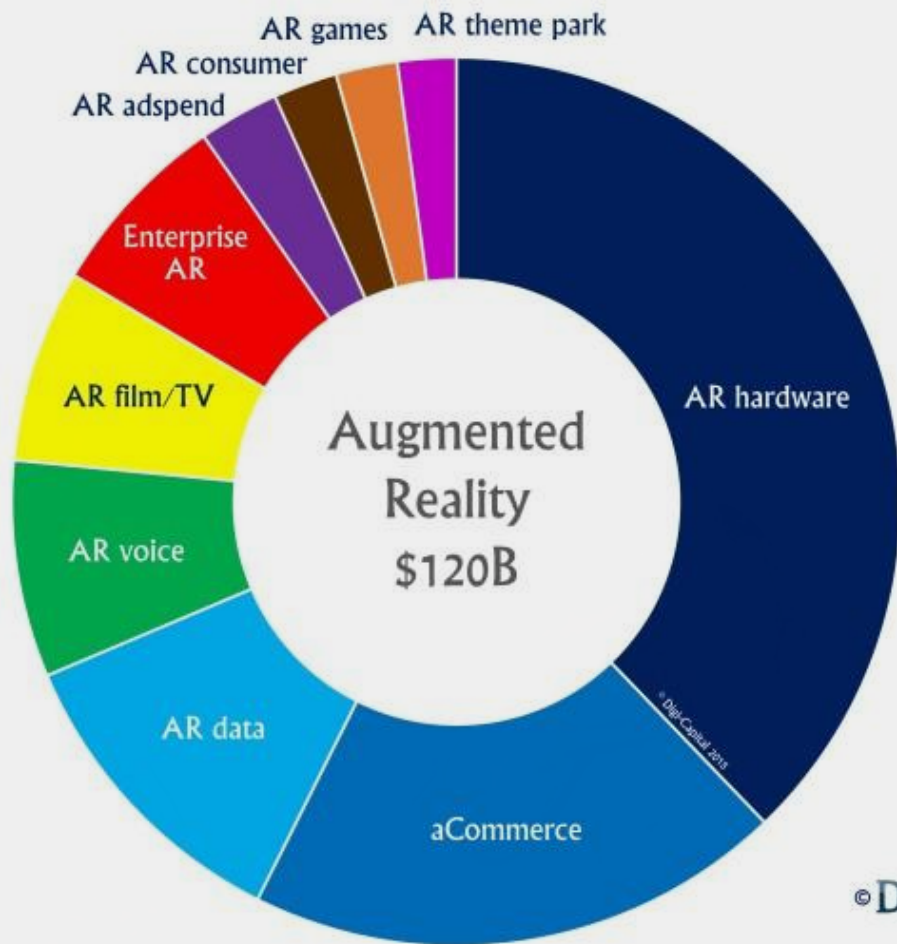
Source: eMarketer (Jan 2016)

Virtual Reality and Beyond: The Current State and Future Potential of Immersive Digital Marketing Experiences

# AR vs. VR Yearly Global Financing History

2012 - HI 2016









# 25 Virtual Reality Use Cases And their leading innovators



Venture  
Radar

Cinema

JAUNT

Meditation



Sports Training

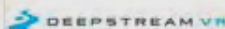


Recruitment

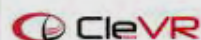


Wade & Wendy

Pain Relief



Mental Health



Travel



Architecture



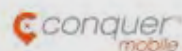
Education



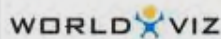
**“People Will Spend the Majority of  
Waking Time in Virtual Reality by 2020”**

- Zack Kanter

Surgery Training



Automotive Design



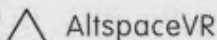
Sports Spectating



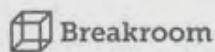
Pilgrimage



Social Networking



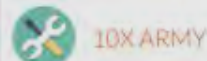
Workspaces



Industrial Training



Marketing



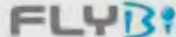
Courtroom



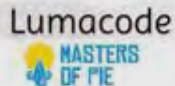
Journalism



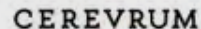
Flying



Data Visualisation



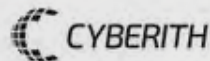
Cognitive Training



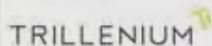
Manufacturing



Gaming



Shopping



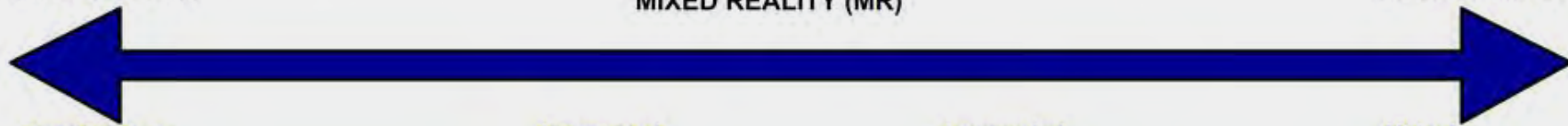
	LOCATION BASED	SPORTS/LIVE EVENTS	SOCIAL	GAMES	ENTERTAINMENT	ENTERPRISE	HEALTHCARE	EDUCATION
APPLICATIONS/CONTENT								
	DISTRIBUTION (APPS/VIDEO)			3D TOOLS (ENGINES/AUDIO)		REALITY CAPTURE (360 VIDEO/NEXT GEN)		
INFRASTRUCTURE	HMD (TETHERED/MOBILE)			INPUT (HAND/EYE/WEARABLE/OMNI/TREADMILLS/HAPTICS)				



# REAL ENVIRONMENT

# MIXED REALITY (MR)

# VIRTUAL ENVIRONMENT



## Tangible User Interfaces (TUI)

A TUI uses real physical objects to both represent and interact with computer-generated information (Ishii & Ullmer, 2001).

## Augmented Reality (AR)

AR 'adds' computer-generated information to the real world (Azuma, et al. 2001).

## Augmented Virtuality (AV)

AV 'adds' real information to a computer-generated environment (Regenbrecht, et al. 2004).

## Virtual Reality (VR)

VR refers to completely computer-generated environments (Ni, Schmidt, Stadt, Livingston, Ball, & May, 2006; Burdea & Coffet 2003)

Projection Augmented models (PA model) are a type of Spatial AR display, and are closely related to TUIs

### Spatial AR

Spatial AR displays project computer-generated information directly into a user's environment (Bimber & Raskar, 2005).

### 'See-through' AR (either optical or video)

A user wears a head-mounted display, through which they can see the real world with computer-generated information superimposed on top (Cakmakci, Ha & Rolland, 2005; Billinghamurst, Grasset & Looser, 2005).

### Semi-immersive VR

A semi-immersive VR display fills a limited area of a user's field-of-view.

### Immersive VR

Immersive VR, which uses either a head-mounted-display or a projection-based system, completely fills the user's field-of-view.



Using physical objects to create a virtual model (Ichida, Itoh, & Kitamura, 2004). As a user adds a physical 'ActiveCube' to the construction, the equivalent virtual model is automatically updated.

The 'Bubble Cosmos' - 'Emerging Technology' at SIGGRAPH'06. The paths of the smoke-filled bubbles are tracked, and an image is projected into them as they rise.

See-through AR: the butterfly is computer-generated, and everything else is real (Fischer, Bartz & Straßer, 2006; Kölsch, Bane, Höllerer, & Turk, 2006).

Semi-immersive VR using the Barco Baron workbench (Drettakis, Roussou, Tsingos, Reche & Gallo, 2004).

Projection-based immersive VR. The users are fully immersed in the 'CAVE' (FakeSpace, 2006; Cruz-Neira, Sandin & DeFanti, 1993).

Oculus Rift



HTC Vive



Samsung Gear VR



Project Morpheus



Google Cardboard



Virtual Boy





*VR game*



*Tilt Brush for HTC Vive*

# Examples in sports, news, education



*Sports*

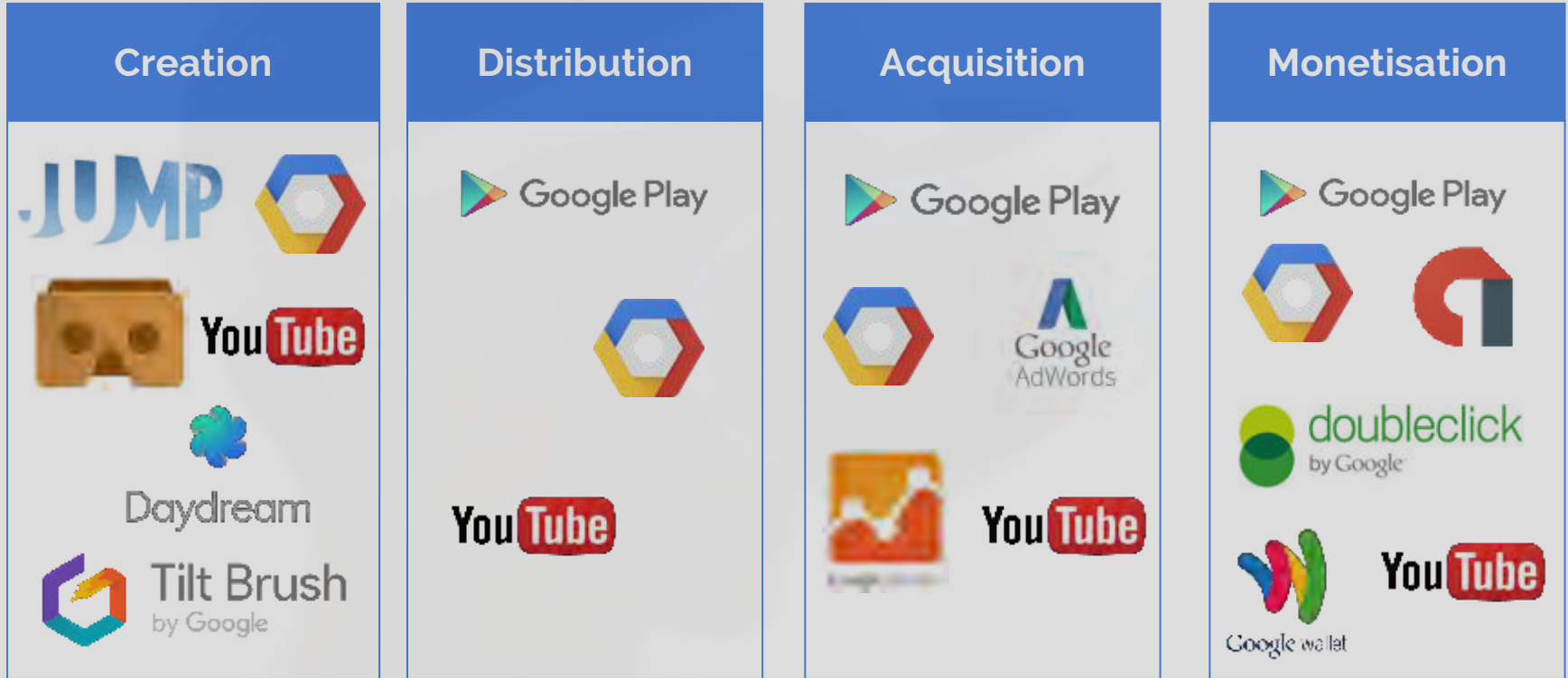


*News*



# Google can help you build your VR/AR Business

Proprietary + Confidential



# Partnerships examples in APAC

Proprietary + Confidential

ANZ



Media

VR View

ANZ



eCommerce

AdWords  
Cardboard  
YouTube

KR



News

AdWords  
Cardboard  
YouTube

JP

集英社

Media

Tilt Brush



LANA WILSON  
JOHANNESBURG, CA

PROTOTYPE  
DESIGNED BY [unclear]









**Thank you**