Future Technologies:
The Inside Scoop From Silicon Valley
Rich Green

Connected Home Conference 2016
Sydney, Australia

(c) Copyright 2016 Richard C. Green All Rights Reserved

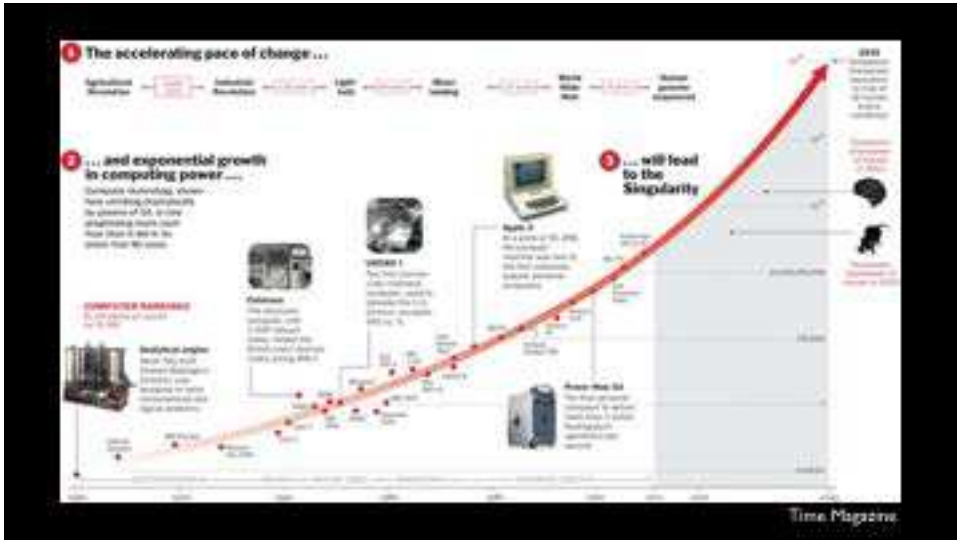
CEDIA

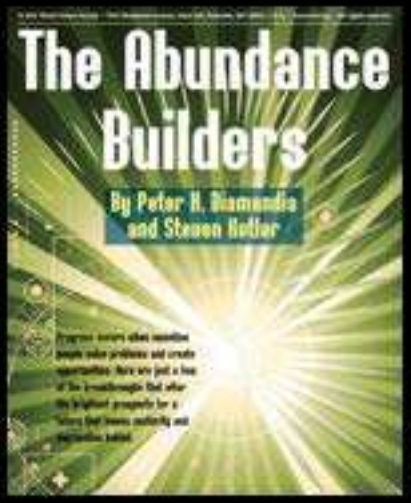
"You can't connect the dots looking forward.
You can only connect them looking backward."
Steve Jobs

Rich's Thesis: "Social Presence"

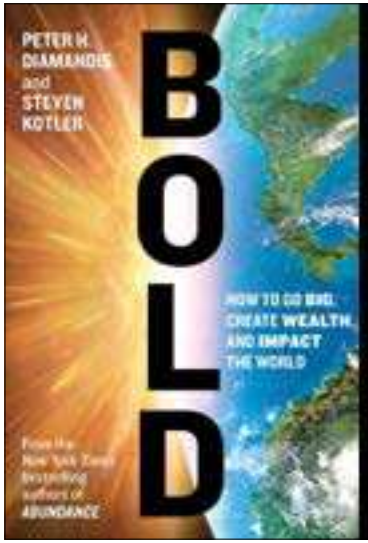
Market Opportunity and Profit

Accelerating Returns





"When the world around us becomes plugged in and effectively self- aware, it will drive efficiencies like never before. It's a big step toward a world of abundance." Vint Cerf



To Become a Billionaire, Help a Billion People.

"Thinking at Scale"

"In the 2030s we are going to send nano-robots into the brain (via capillaries) that will provide full immersion virtual reality from within the nervous system and will connect our neocortex to the cloud. Just like how we can wirelessly expand the power of our smartphones 10,000-fold in the cloud today, we'll be able to expand our neocortex in the cloud."

Ray Kurzweil

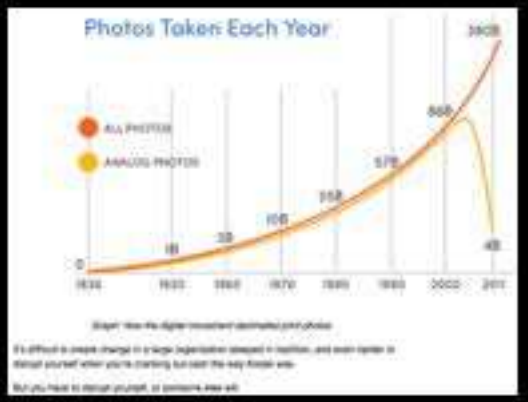
Brain-to-Brain Communications
Google on the Brain
Scalable Intelligence (on demand)
Living in the Virtual World
Extended Immune System
Downloadable Expertise
Expanded and Searchable Memories
A Higher Order of Existence

Reality Check

- Macromyopia: We tend to over-estimate short term change and under-estimate long term change

"The history of every dead and dying 'growth' industry shows a self-deceiving cycle of bountiful expansion and undetected decay."

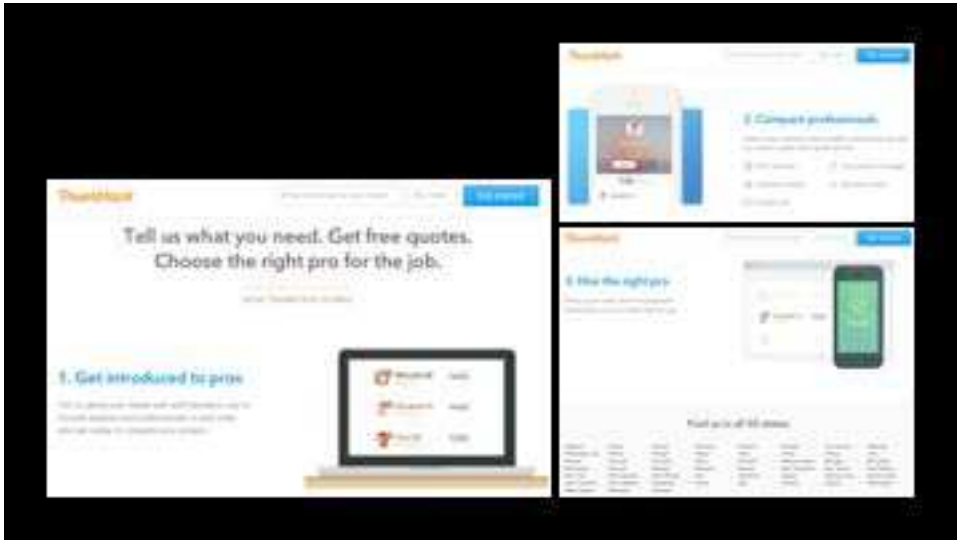
Theodore Levitt, Marketing Myopia, 1960



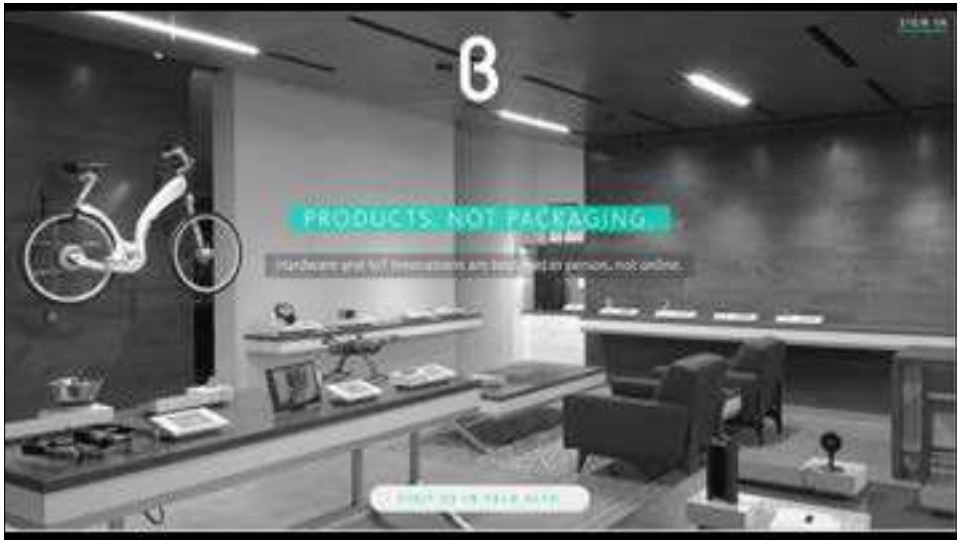
Cloud to Consumer =

Disintermediation

Cloud Media
Cloud Communications
Cloud Controls
"Three Screens and a Cloud"



Enjoy!



" People are expensive--Things are cheap."
Ramez Naam

Hire talent, pay well, nurture with purpose. What's the end game? Why are we doing this work?

It's All About Services

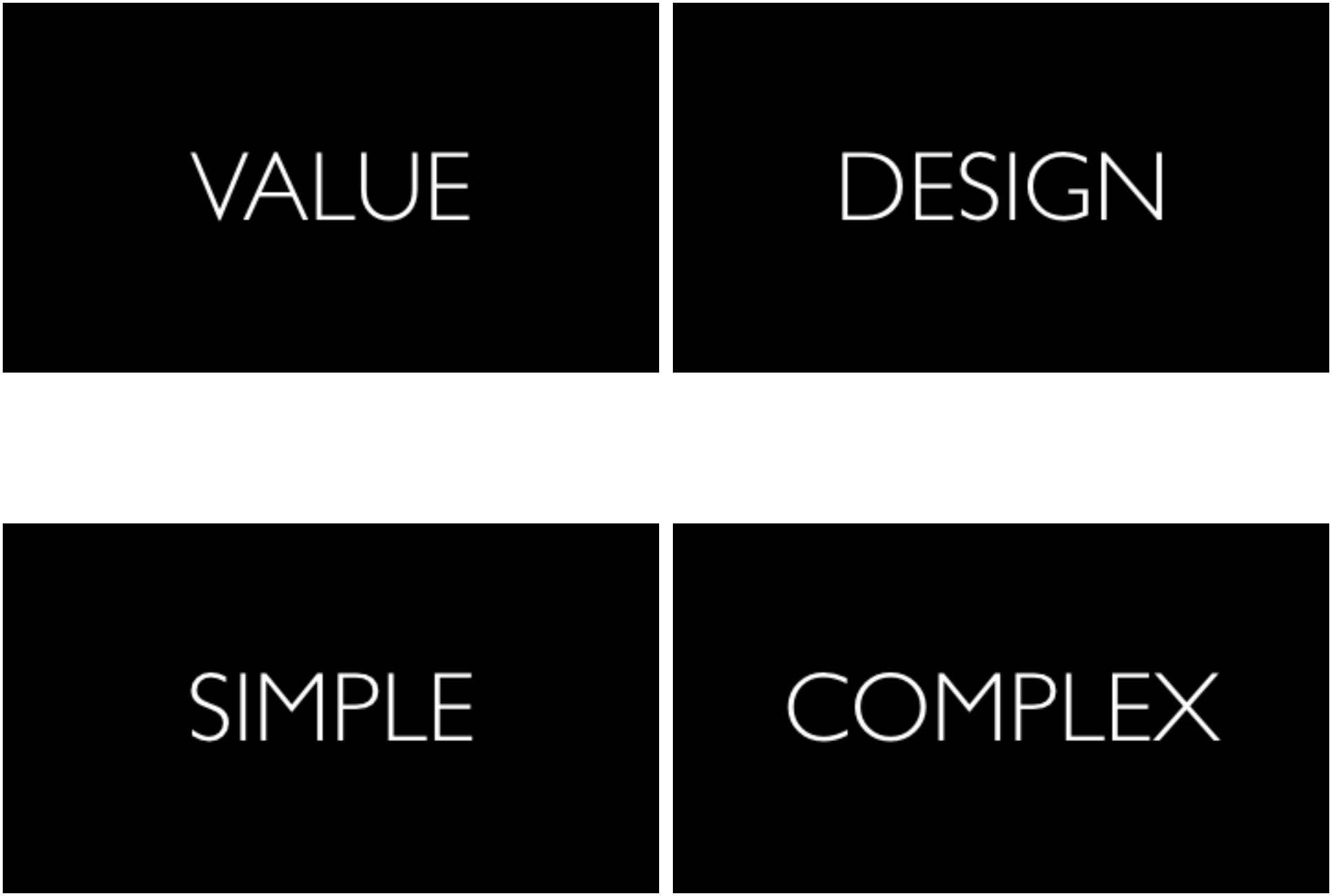
Software Will Overtake Hardware
Be the Digital Concierge

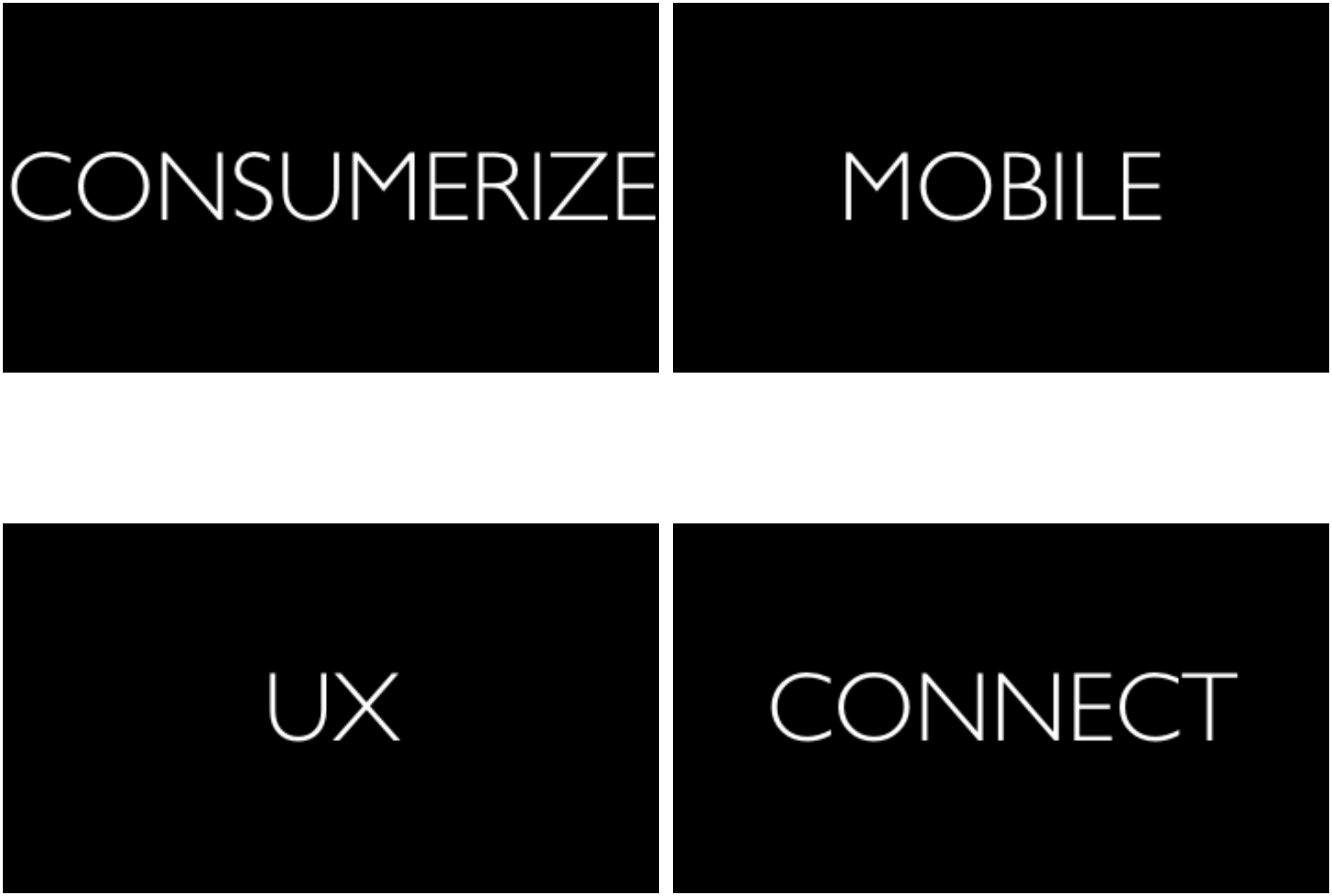
Dash/Map
Status Dashboard
Jones Residence
Beaver Creek Lodge
Future Tech #4734
Aria Penthouse
Big Sky Ranch
Cunningham Court
Jiji Board Room

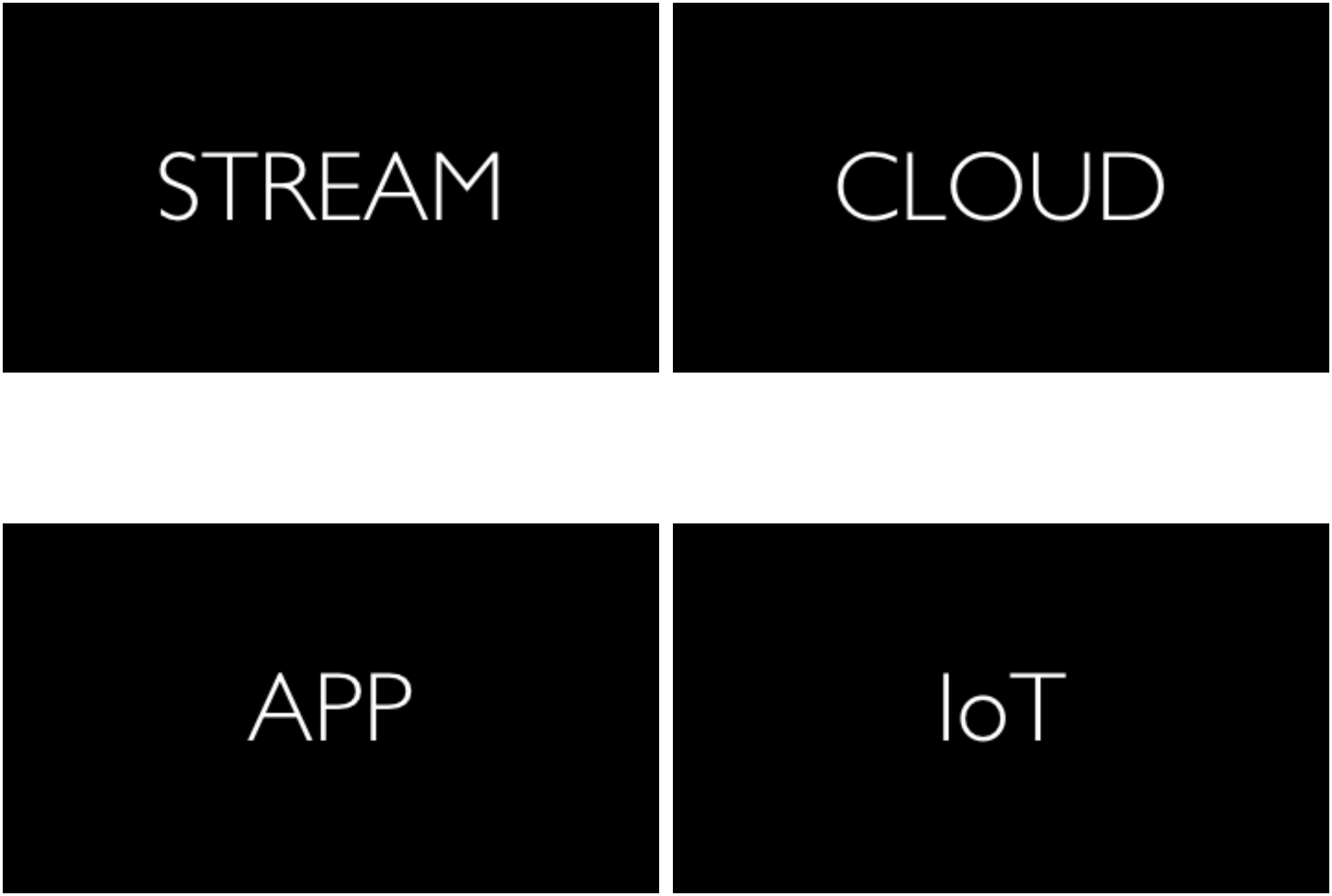
Dashboard
$ 78,436
$ 82,762
112
12
7
6

Krika

PROFIT


VALUE
DESIGN
SIMPLE
COMPLEX


CONSUMERIZE
MOBILE
UX
CONNECT

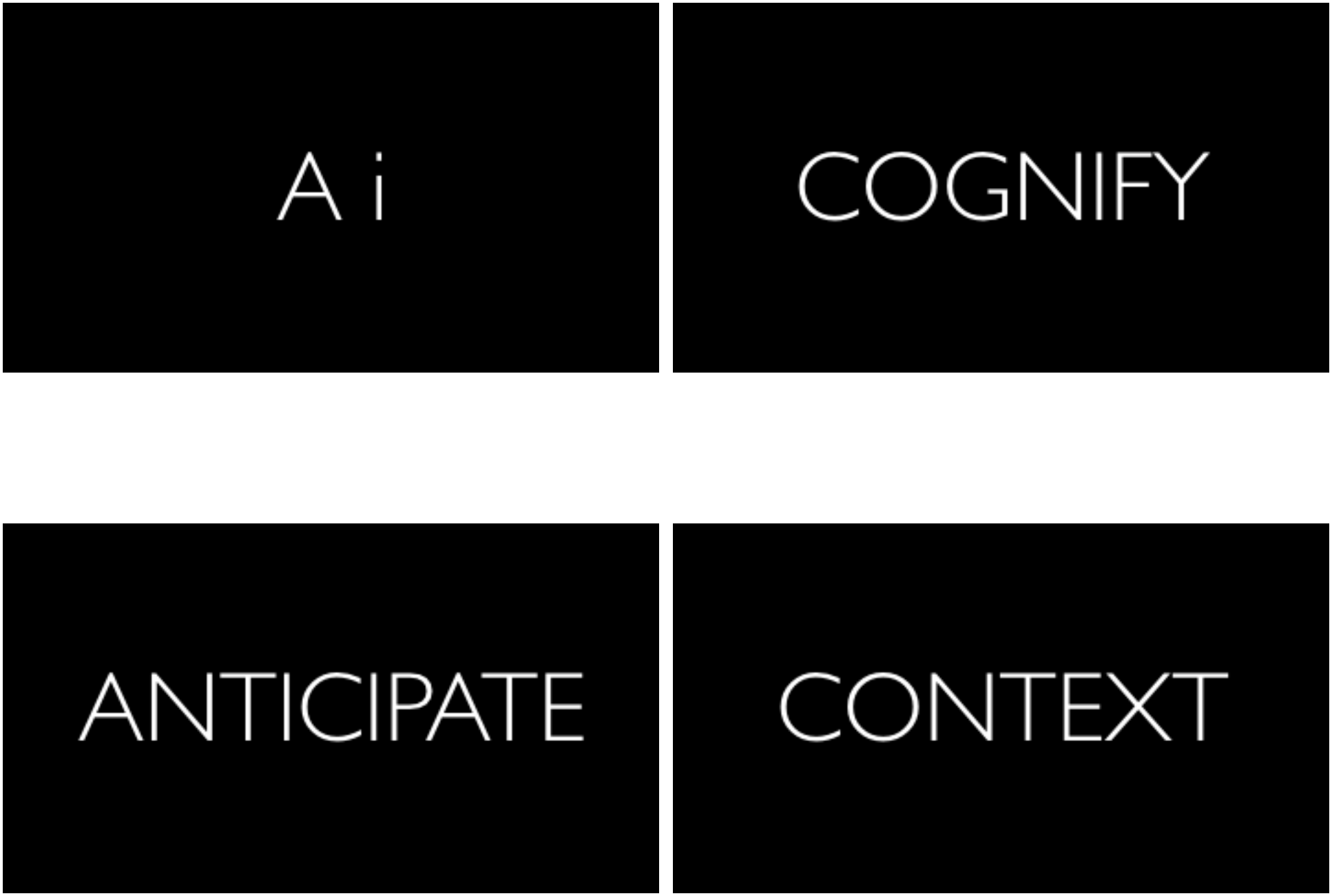

STREAM
CLOUD
APP
IoT

API

PLATFORM

ECOSYSTEM

DATA

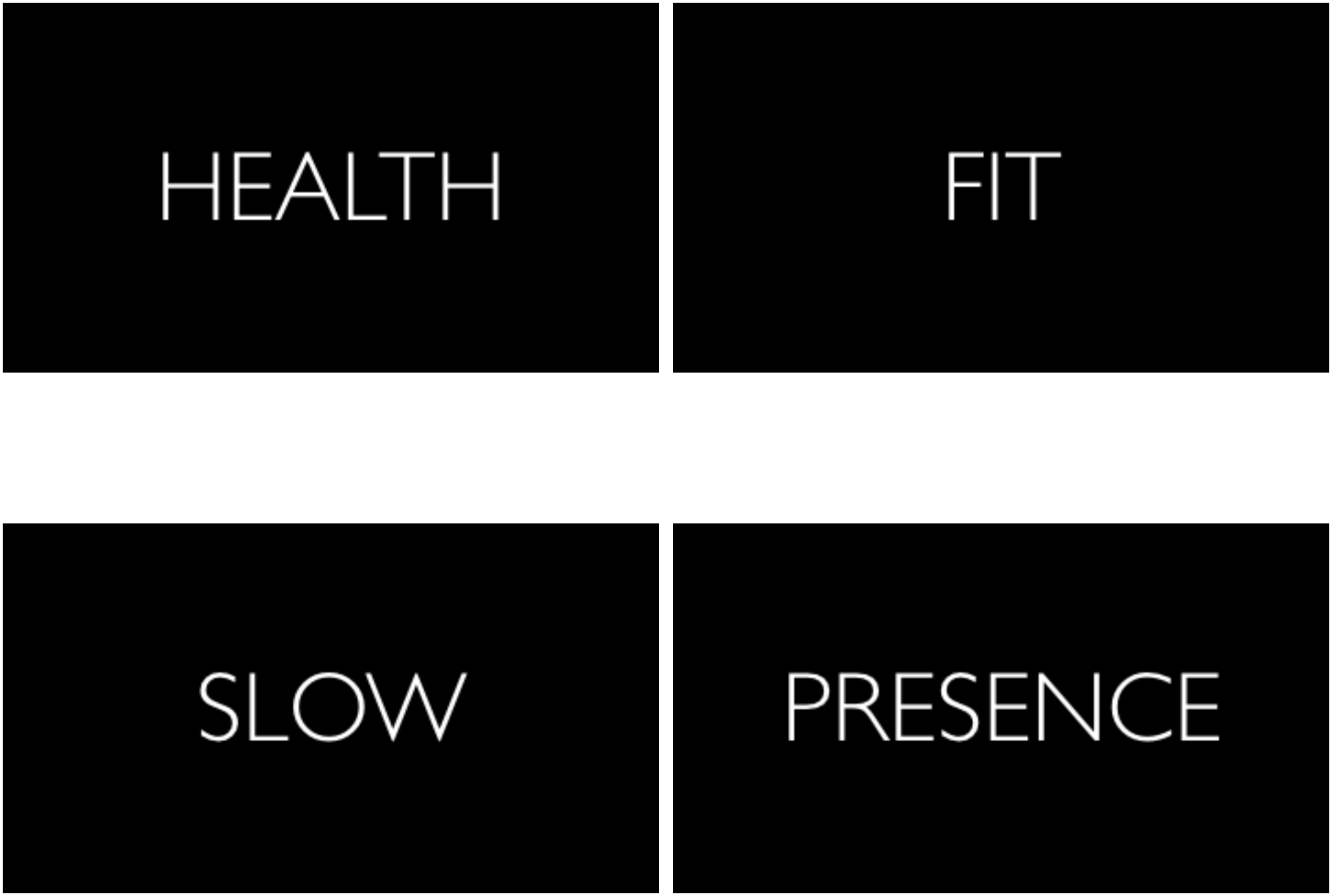

A i
COGNIFY
ANTICIPATE
CONTEXT

AR

VR

MR

NUI


HEALTH
FIT
SLOW
PRESENCE

CLARITY

GRACE

Why Did Google Pay $400M for DeepMind?

BIG DATA

"Tracked, but catered to."

"Trust is the new currency."

"Fitbit will measure sex,
and know who you are with."

Google Wink

M2M

Self Aware - Contextual - Adaptive

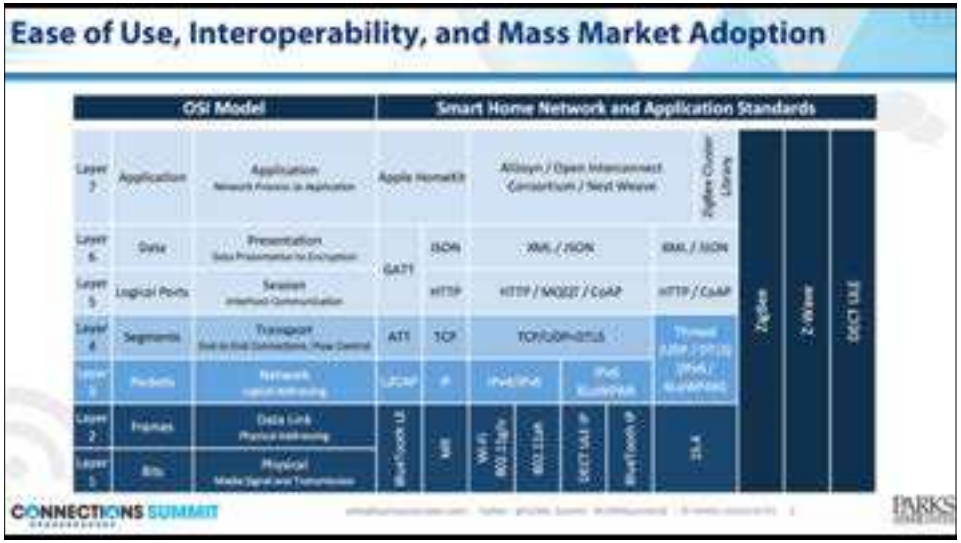
A i

Purchase Price: $3.2B
Customer Acquisition Cost: $320,000 per Household

DEEP LEARNING

IoT

Defining The Internet of Things
1. Things
2. Connected to
3. The Internet



Wireless Network "Generations"

Generation	Technology Standard	Capabilities	Maximum data rate	Latency	Year introduced
1G	AMPS	Analog voice	<10 Kbps		1979 (Japan) 1983 (US)
2G	GSM, CDMA	Digital voice	64 Kbps		1991 (Finland)
2.5G	GPRS, EDGE	Digital voice + data	144 Kbps	600 ms	2001
3G	WCDMA, EvDO	Circuit switched data	2 Mbps	200 ms	2002 (S. Korea, US)
3.5G	HSDPA	Packet switched data	20 Mbps	170 ms	2008
4G	LTE	Wireless broadband	680 Mbps	<100 ms	2009 (Sweden)
5G	IMT-2020	Flexibility to address multiple use cases	> 1 Gbps	< 1 ms*	2020

* This is envisioned RAN latency, not e2e

The Next Generation Mobile Networks Alliance defines the following requirements for 5G networks:

- Data rates of tens of megabits per second should be supported for *tens of thousands of users*
- 1 gigabit per second to be offered simultaneously to many workers on the same office floor
- Several hundreds of thousands of simultaneous connections to be supported for massive sensor deployments
- Spectral efficiency should be significantly enhanced compared to 4G
- Coverage should be improved
- Signalling efficiency should be enhanced
- Latency should be reduced significantly compared to LTE.[1]

The Next Generation Mobile Networks Alliance feels that 5G should be rolled out by 2020

DIY

Bekey OrangeBox
Bluetooth Door Access

KICKSTARTER

"The future belongs to new entrants.
They change the rules." Steve Jurvetson

Try to guess the dominant technologies and companies of the year 2020 and you may quickly fall into the traps of entrenchment and tradition. There are plenty of reasons to be conservative and continue with the tried-and-true. However, in today's technology landscape the "new entrants" who disrupt traditional business models with grass-roots innovation may leave you behind.

API

SAMSUNG

SmartThings

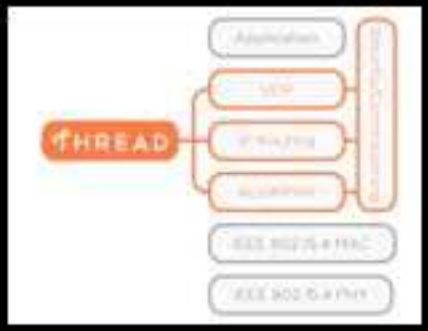
$200,000,000
1000 Devices
8000 Apps
5000 Developers

AllJoyn

Qualcomm

ALLSEEN ALLIANCE

Linux Foundation



ConnectSense
- ConnectSense Smart Outlet GC-CS-SO

Ecobee
- ecobee3 Smarter WiFi Thermostat with Remote Sensor EB-STATe3-02

Elgato
- Elgato Eve Door & Window 1ED10990100-G
- Elgato Eve Energy 1EE10830100
- Elgato Eve Weather 1EW10990100-G
- Elgato Eve Room 1ER10990100-G

iDevices
- iDevices Switch Connected Plug IDEV0001

iHome
- iHome Control Smart Plug iSP5

Insteon
- Insteon Hub Pro 2245-222

Lutron
- Lutron Smart Bridge L-BDG2-WH
- Lutron Smart Bridge Pro L-BDGPRO2-WH
- Lutron Smart Lighting Kit for Wall and Ceiling Lights P-BDG-PKG2P

Phillips
- Hue Bridge 458489
- Hue White and Color Ambiance Starter Kit 456210

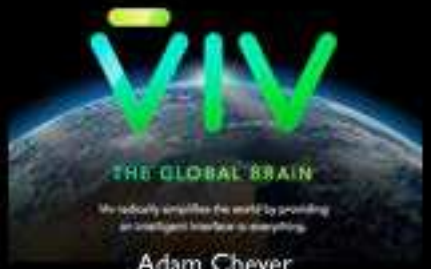
Schlage
- Schlage Sense Smart Deadbolt with Century Trim

Works with Apple HomeKit

ECOSYSTEM

Amazon
Apple
Facebook
Google
Microsoft

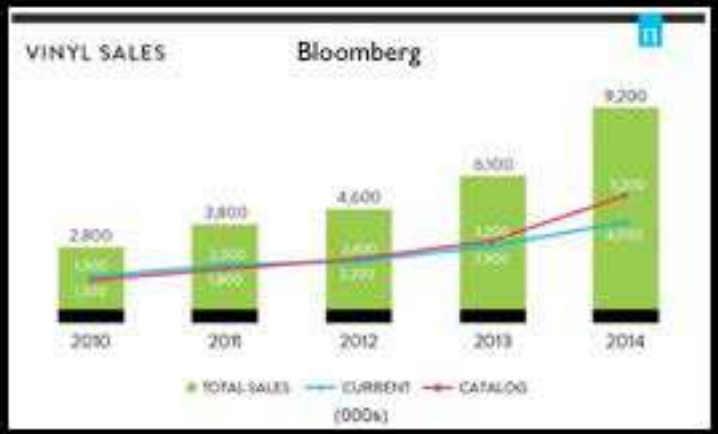
One of the biggest announcements from CES 2016 came from Ford, which will be integrating Amazon's Alexa directly into its cars.

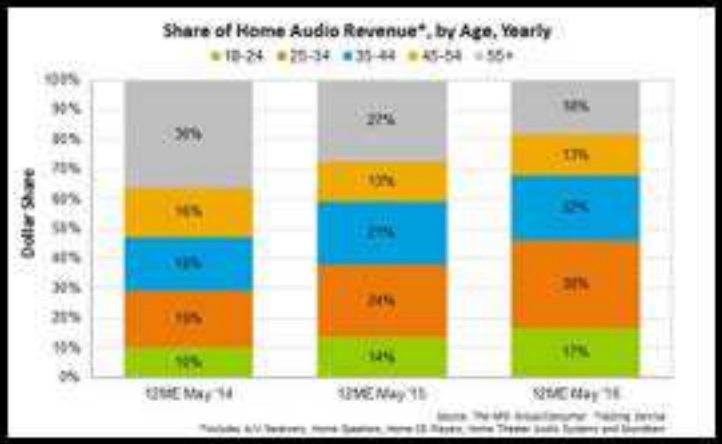


Adam Cheyer

Their goal is to build a new generation of AI that can process massive troves of data to predict and fulfill our desires. Viv strives to be the first consumer-friendly assistant that truly achieves that promise.

It wants to be not only blindingly smart and infinitely flexible but omnipresent."





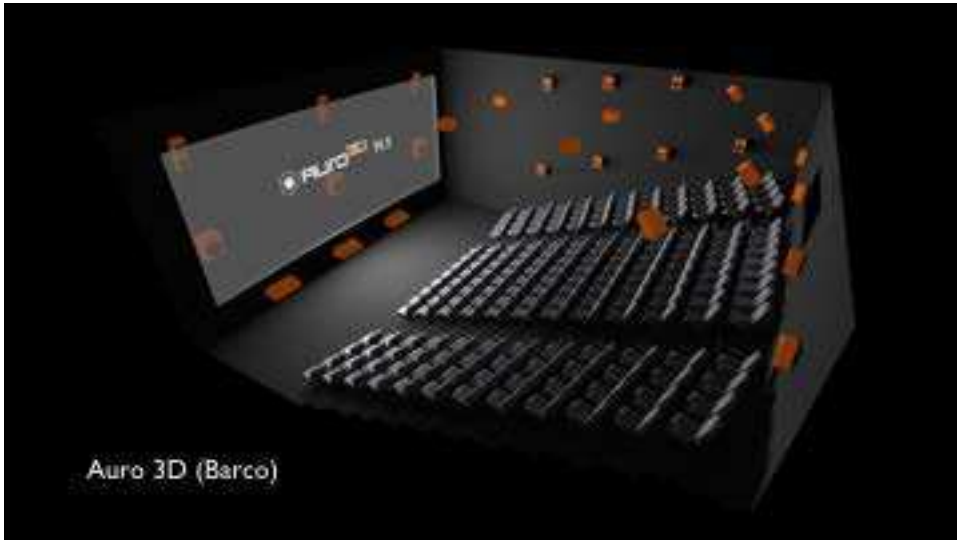
Sennheiser Orpheus
$55,000

Hi-Res
AUDIO

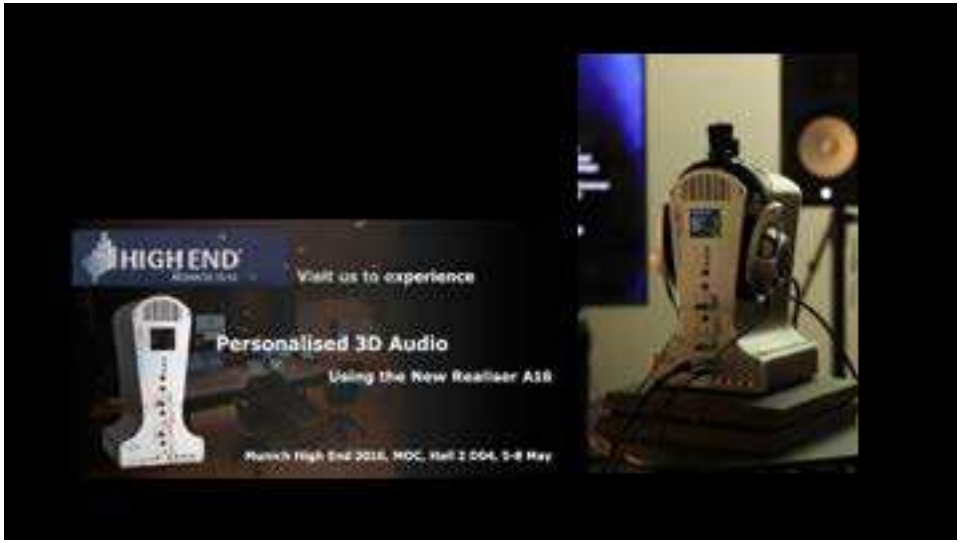
TIDAL
HIGH FIDELITY MUSIC STREAMING
qobuz
DEEZER

TIDAL
MQA

Dolby Atmos


Auro 3D (Barco)

TRINNOV
DOLBY ATMOS
dts X
Auro 3D
dts X


HIGH END
Visit us to experience
Personalised 3D Audio
Using the New Realiser A16

nVidia Shield
4K Streamer
HDMI 2.0a
HDCP 2.2

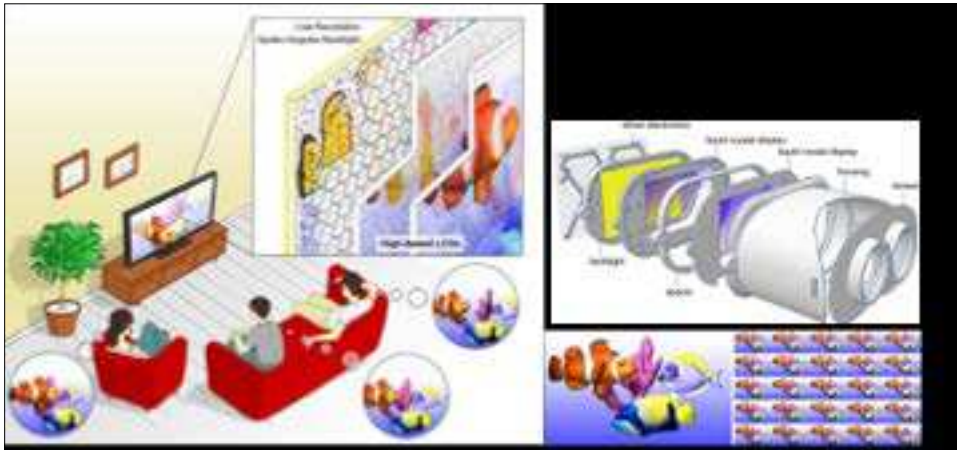
Dish Hopper 3

Samsung SmartThings

HDR

Matt Hirsch and Gordon Wetzstein, MIT, Stanford

High Speed LCD Tensor Displays



http://displayblocks.org/diycompressivedisplays/tensordisplays/

Barco Escape

Star Trek Beyond

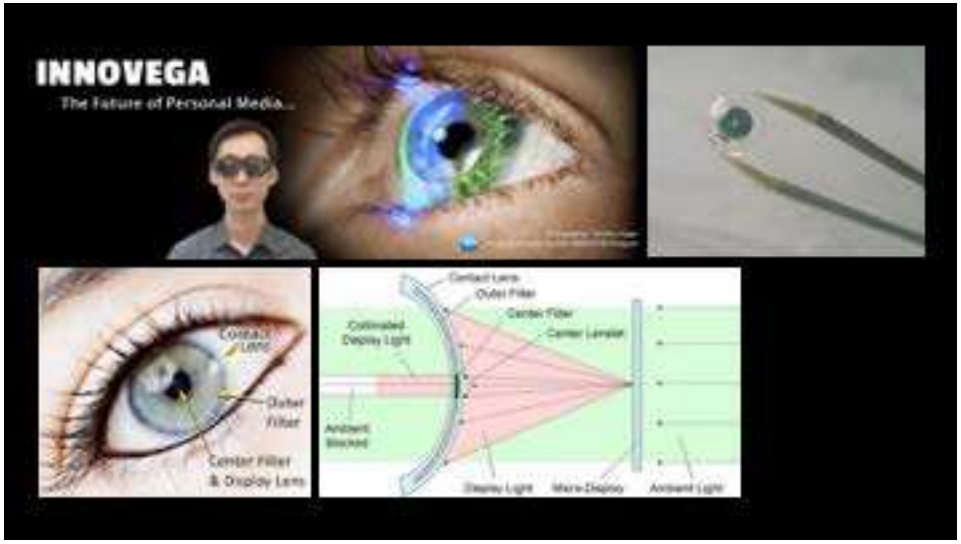
BARCO

visibly yours

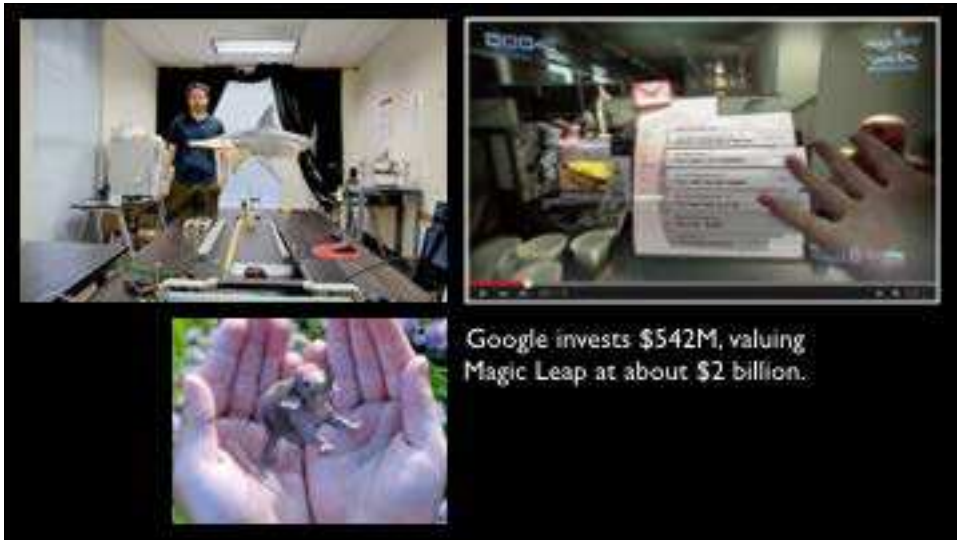
Fox MazeRunner and Ruin

AR

Google Translate
(Word Lens)


INNOVEGA
The Future of Personal Media...
Contact Lens
Outlet Filter
Center Filter & Display Lens
Contact Lens
Outlet Filter
Center Filter
Center Lenslet
Collimated Display Light
Ambient Blocked
Display Light
Micro-Display
Ambient Light

Mini Augmented Vision

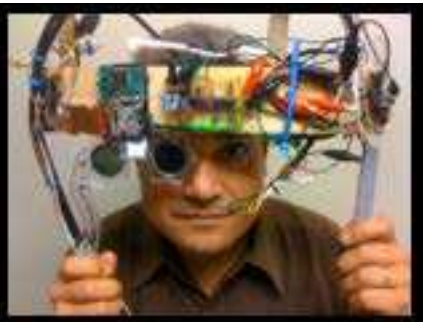

Google invests $542M, valuing Magic Leap at about $2 billion.

"Imagine you are walking in China and all the billboards are in English and at the restaurants, as the people are talking to you, there are live subtitles. You don't even realize you are in a computer."

Rony Abovitz
CEO, Founder, Magic Leap

Microsoft Hololens

VR



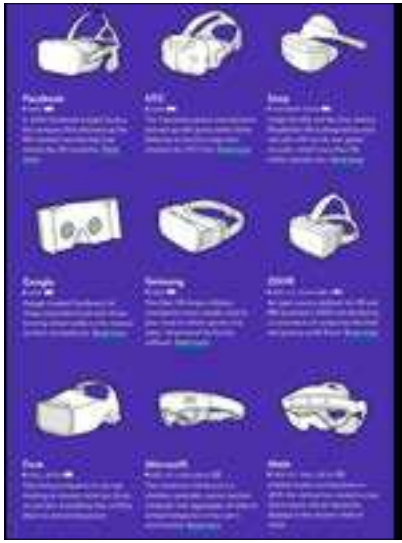
"I believe we're in the virtual world now more than the real world already, it's just that our interface sucks. We're in that barbaric place where the interfaces to the machines don't consider the human side."

Mark Bolas
USC Institute of Creative Technologies

"...virtual reality is the natural extension of every major technology we use today.

The technology is powerful. It's like uranium. It can heat homes and destroy nations.

Jeremy Bailenson
Stanford University Virtual Human Interaction Lab



Not immediately, but within 15 years, the bulk of our work and play time will touch the virtual to some degree. Systems for delivering these shared virtual experiences will become the largest enterprises we have ever made.

Yet something certainly has just happened. A threshold has been crossed. After a long gestation, VR is good enough to improve quickly. It's real.

http://www.wired.com/2016/04/magic-leap-vr/

Kevin Kelley

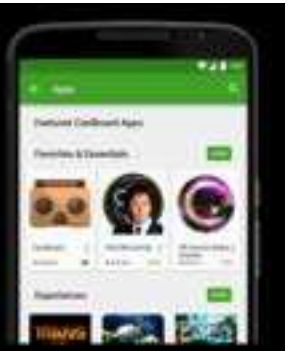
"We're going to get to the point where virtual reality is indistinguishable from reality itself…it's the final platform." Palmer Luckey

$2,001,985,000

RR

Palmer Luckey refers to things outside of Virtual Reality as Real Reality, what the rest of us call Life.

"When we get to this world, a lot of things we think about as physical objects will just be $1 apps in an AR app store."



Dawn of the VR Room

16' x 12' Empty Room

"Sell your dining room table, eat over your sink. If you have a pool table, get rid of that. Get a Murphy bed. People are going to find a space."

Jeep Barnet, Vive

70 Laser Position Sensors for Head Tracking at 0.1 Degree Accuracy

1200x1080 90Hz Each Eye

Content Partners: Valve Stream VR, HBO, Lionsgate, Google

CONTENT

Google Go Pro Camera Array

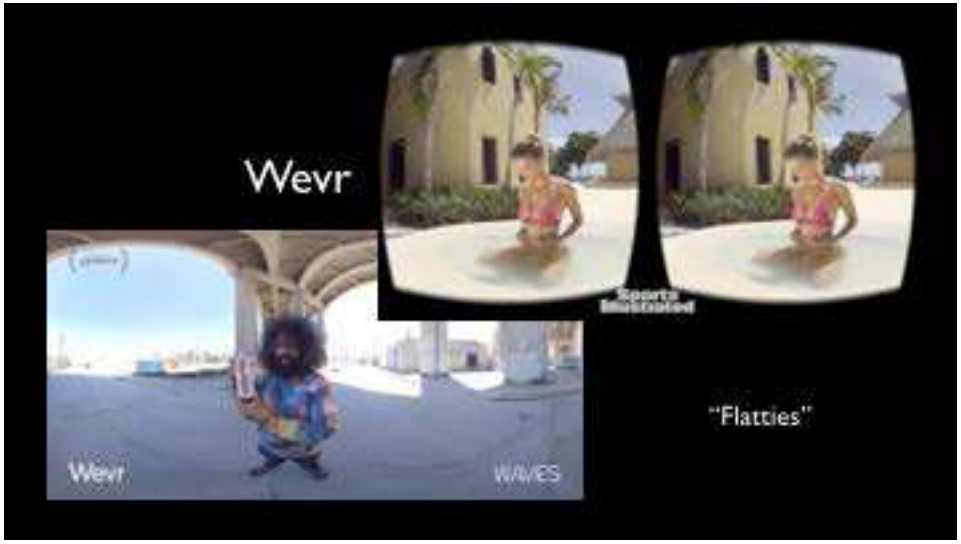
NextVR 6K 80Hz
Stereoscopic Light Field

New Deal Studios: The Mission

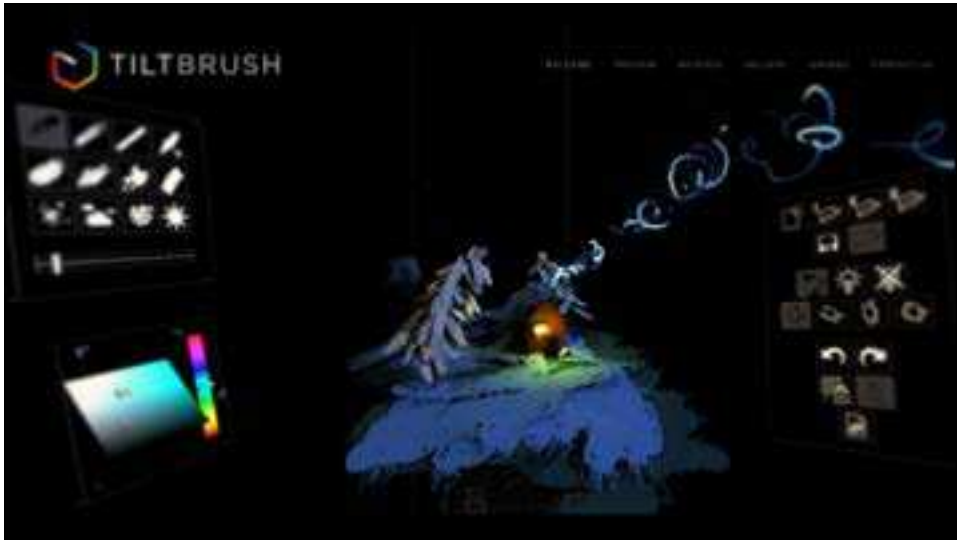
Framestore: 360 Degree Immersion Interstellar Experience (Christopher Nolan)
Built in Unreal 4 on Oculus Rift DK2

Oculus

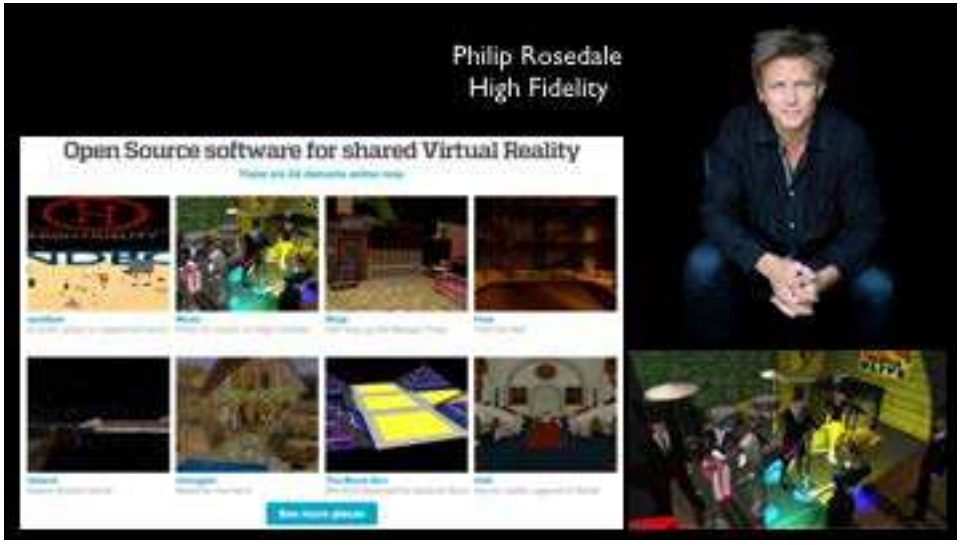
storystudio



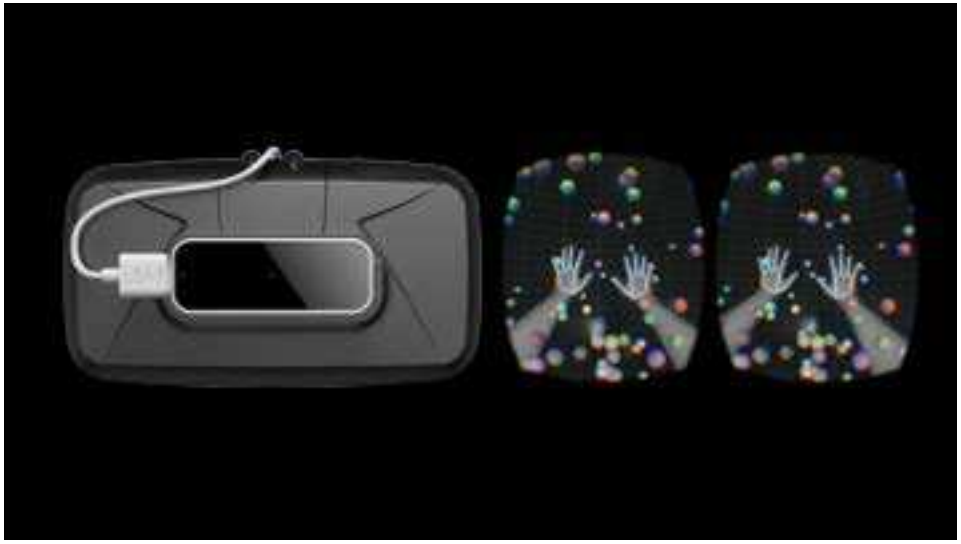
A tool for teachers and other educators. A standard Expeditions kit has 30 phones and Cardboard viewers plus a tablet for the teacher, who acts as the tour guide. All of the devices are perfectly synchronized. There are already hundreds of places they can go: the Great Barrier Reef; Verona, Italy; and yes, Mars.

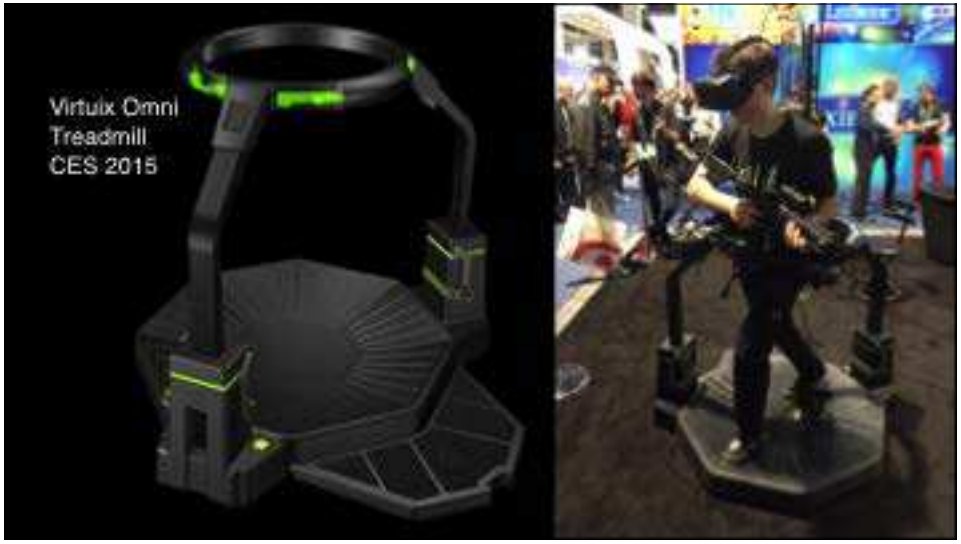


Philip Rosedale
High Fidelity

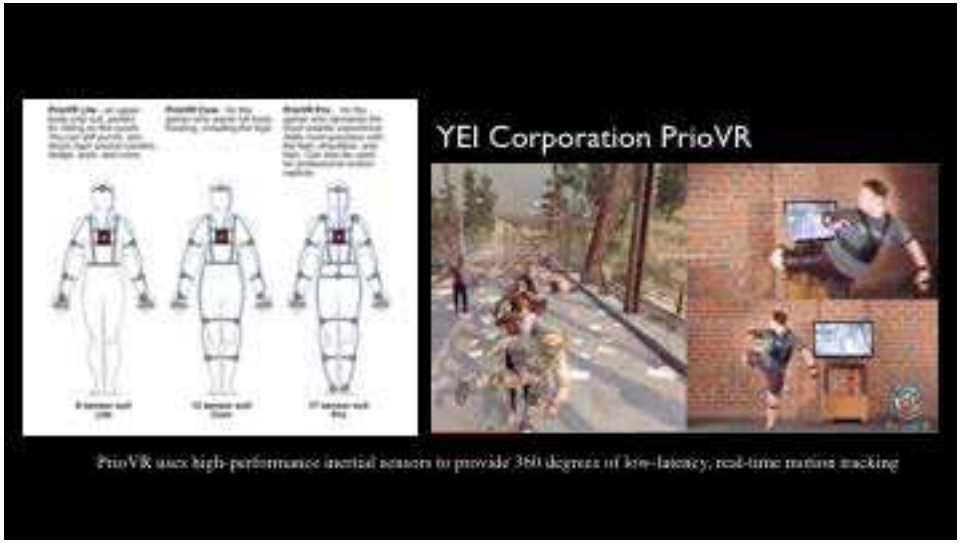


MR

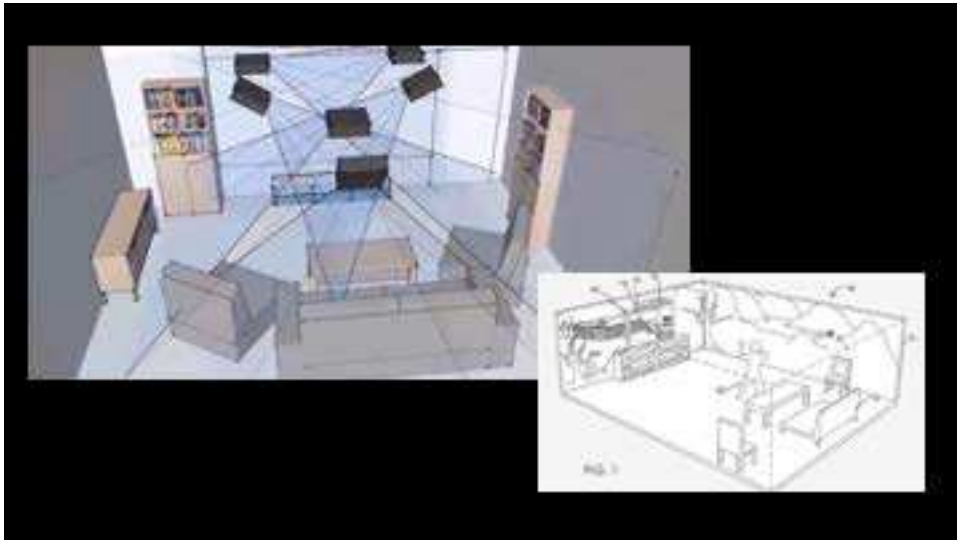


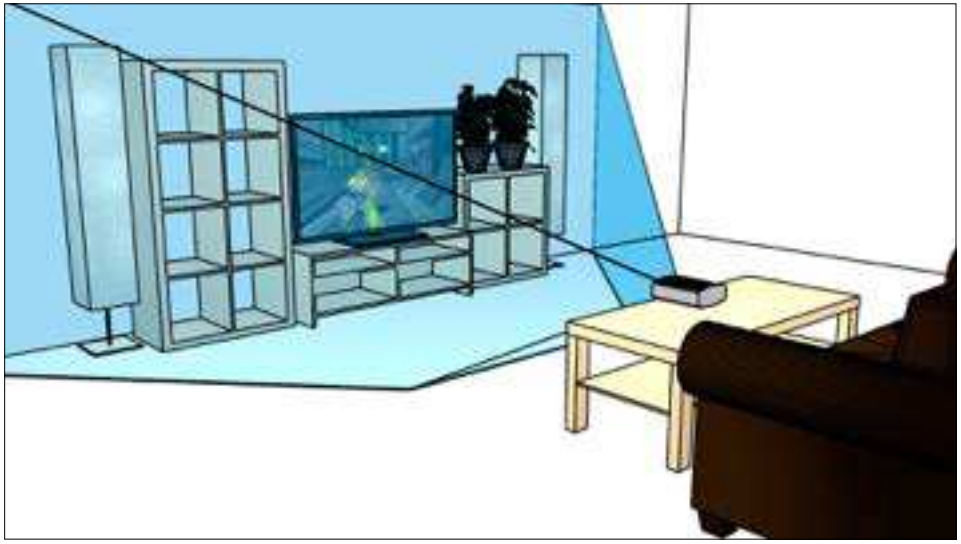

Virtuix Omni
Treadmill
CES 2015

STEM System
Wireless Motion Tracking System
SIXSENSE


YEI Corporation PrioVR
PrioVR uses high-performance inertial sensors to provide 360 degrees of low-latency, real-time motion tracking

uses projectors and depth cameras to cover
an entire room including the people and the furniture inside
with pixels that can be used for both input and output.





Microsoft Illumiroom
Kinect
Projector

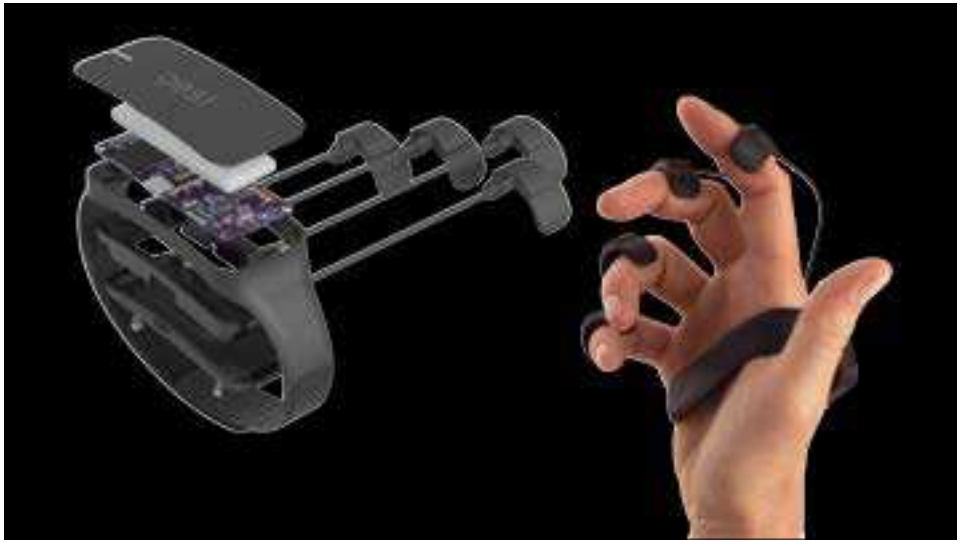
NUI

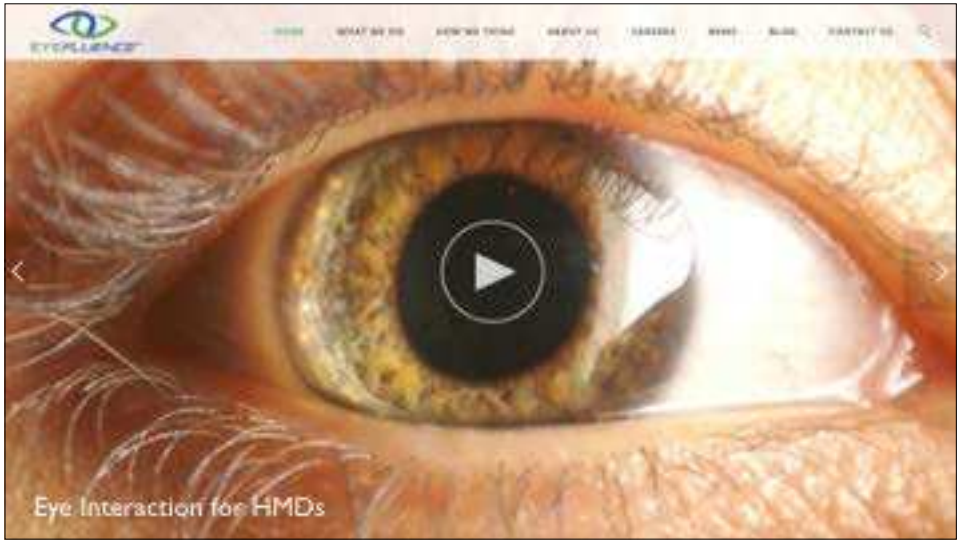
"The best technology is invisible; you don't know it's there."

Jose Pinero, Microsoft X-Box Live

THE MAGIC
OF MYO

Aria




Eye Interaction for HMDs

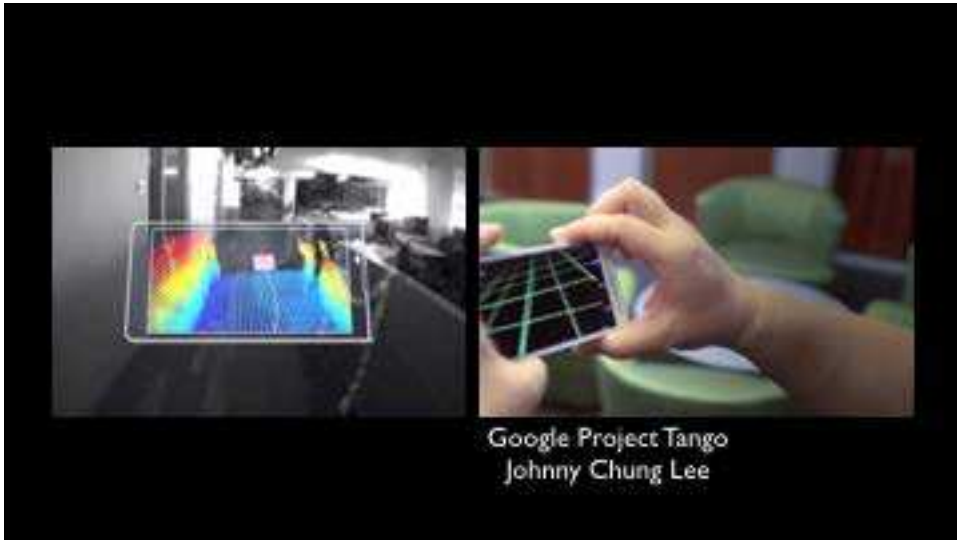
TECH SPECS.
MAKE EYE CONTACT
AIM WITH YOUR EYES

BCI

Emotiv

3D Printed EEG Headset

PERCEPTUAL COMPUTING



Dyson 360 Eye

Baxter

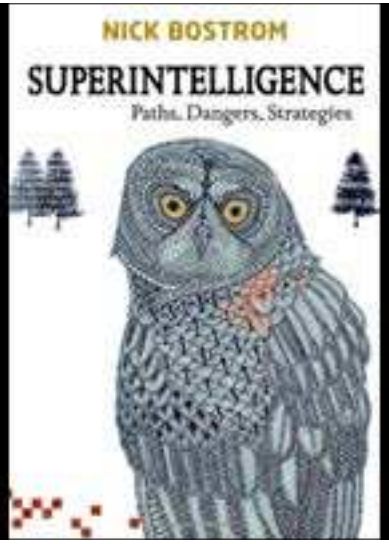
Rise of the
Social Robot

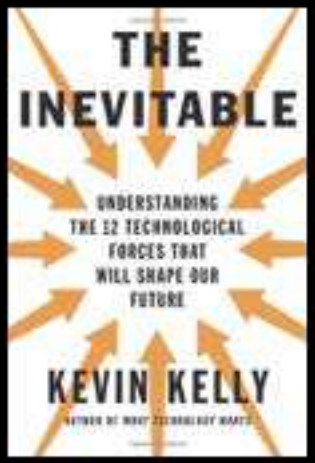
SLOW

Caroline Weaver, NYC

BWM
Bike Washing Machine

Pavlok





12 forces of accelerating actions (inevitable metatrends):
Becoming, Cognifying, Flowing, Screening, Accessing, Sharing, Filtering, Remixing, Interacting, Tracking, Questioning, Beginning

SIMPLE

Out of clutter, find simplicity.
Albert Einstein

"...any third-rate engineer or researcher can increase complexity;
but it takes a certain flair of real insight to make things simple again."

E.F. Schumacher, Small is Beautiful

To attain knowledge, add things every day.
To attain wisdom, subtract things every day.

Lao Tzu

August
Door Lock

"The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it".

Mark Wiser, Xerox PARC
1991 Scientific American

The Age of

invisible design

Wired Magazine, Scott Dadich, 8.13.13

"Design doesn't just make things beautiful, it makes them work...at best, it is invisible."

Wired Magazine, Scott Dadich, 8.13.13

1. Good design is innovative.
2. Good design makes a product useful.
3. Good design is aesthetic.
4. Good design makes a product understandable.
5. Good design is unobtrusive.
6. Good design is honest.
7. Good design is thorough down to the last detail.
8. Good design is environmentally friendly.
9. Good design is long-lasting.
10. Good design is as little design as possible.

Dieter Rams
10 Principles of Design

HANDS

Bret Victor
The Future of Interaction Design (blog)

DESIGN

Left-Handed Acheulian Bifacial Hand Ax
Africa
1.4M Years Old

How to prepare your business for 2020:

Brand yourself-earn loyalty
Build a Design Center-test and use new technologies
Sell great ideas-charge by the minute -"Lifestyle Engineering"
Focus on people-hire and keep talent
- Women
- Software Engineers and Network Specialists
- User Interface Designers
- Smart Kids (they know what's going on)

Practice respectful design for human beings
Enhance your truck roll capability (Digital Truck Roll!)
Never compromise on customer service
Never, ever lose a customer to new technology

CEDIA

Future Technologies:
The Inside Scoop From Silicon Valley

Rich Green

Connected Home Conference 2016
Sydney, Australia

(c) Copyright 2016 Richard C. Green. All Rights Reserved

CEDIA