

# Virtual reality and augmented reality

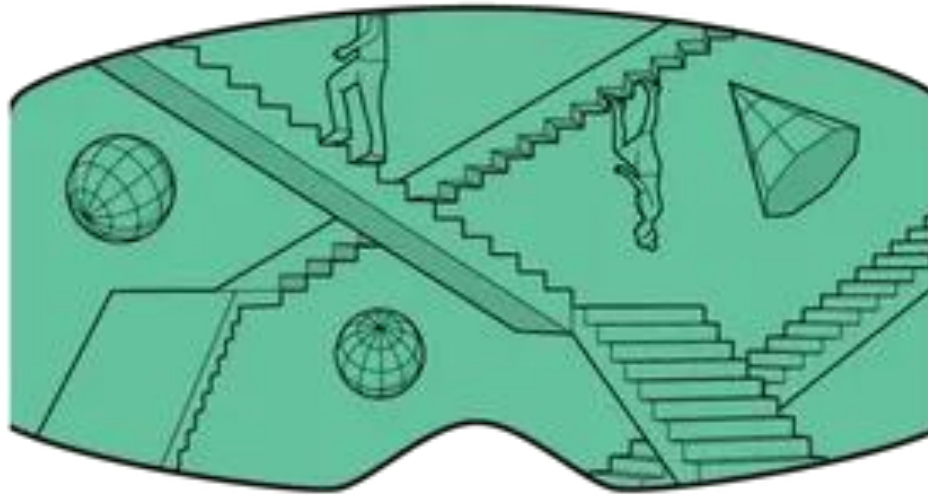
## Trust in a new way of working

Jeremy Dalton  
April 2019



# VR and AR comprise the main immersive technologies

**Virtual Reality**



**Augmented Reality**



1

“VR

is a

new

technology”





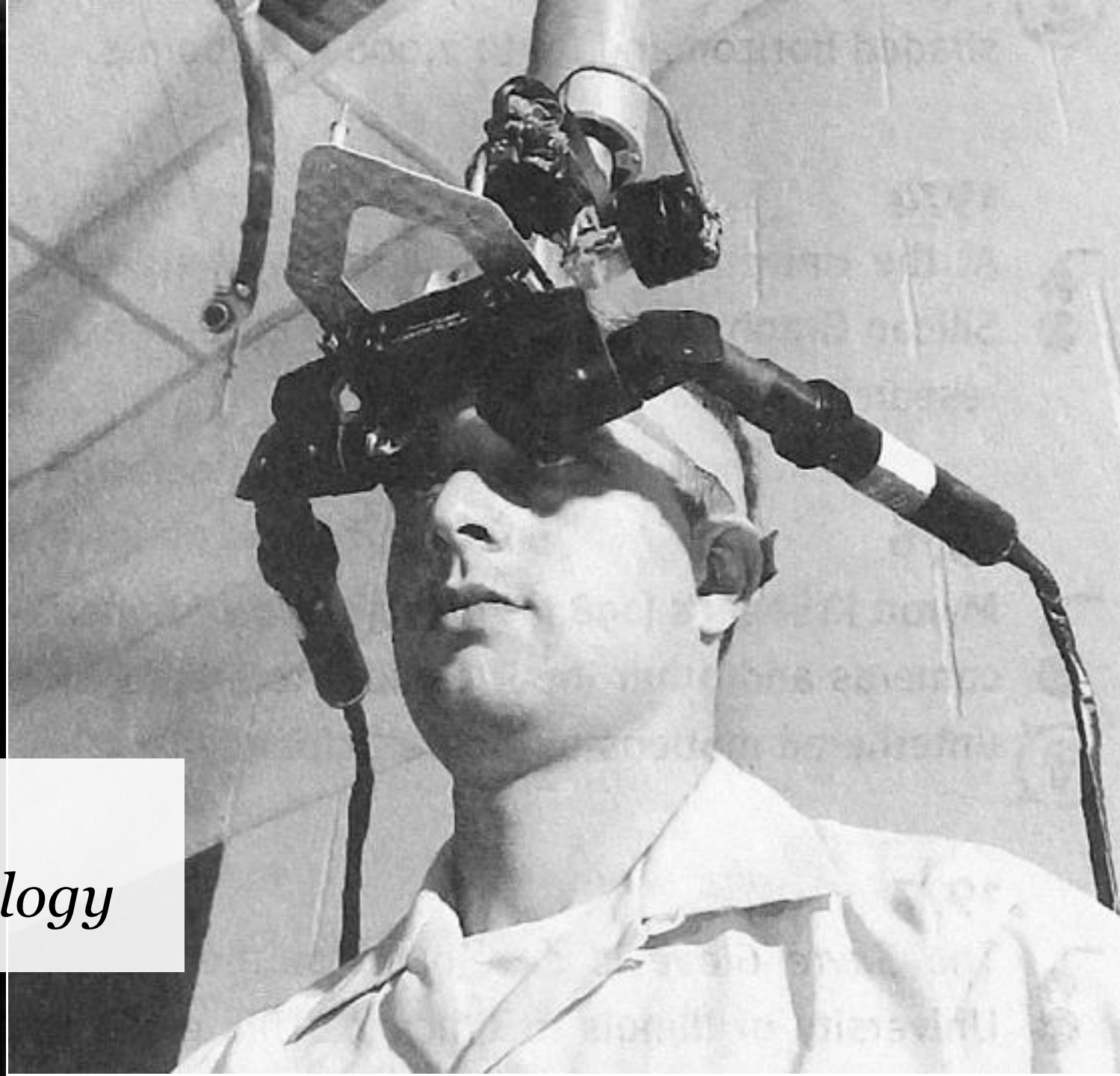
1800s  
*Panoramas*





1960s

*Adventures with technology*





1990s  
*The height of VR misery*





## Oculus Rift: Step Into the Game

Long Beach, CA

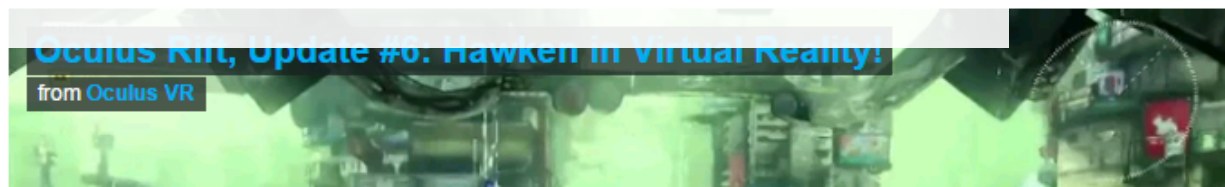
Gaming Hardware

Project We Love

**\$2,437,429**

pledged of \$250,000 goal

2012  
If you missed our Kickstarter, you can pre-order an Oculus Rift developer kit now at <http://oculusvr.com/preorder/>!  
*Oculus Rift Kickstarter*



### Pledge \$10 or more

SPECIAL THANKS: Help us take gaming to the next level! You'll receive a sincere thank you from the Oculus team and we'll keep you up to date on all of our progress developing the consumer Rift and building out the developer SDK!

ESTIMATED DELIVERY  
Oct 2012

1,009 backers

### Pledge \$15 or more

OCULUS POSTER: A limited-edition poster for the Oculus Rift, only available via Kickstarter. See the project description for a preview! (Please add \$15 for international shipping)

ESTIMATED DELIVERY  
Nov 2012

209 backers

### Pledge \$25 or more

OCULUS T-SHIRT: A limited edition t-shirt for the Oculus Rift, only available via Kickstarter. See the project description for a preview! You'll also receive a sincere thank

Image © Kickstarter

# facebook

2014

*Facebook buys Oculus for \$3 billion*



Image © Brian Solis



8 of the top 10 tech companies in the world have invested time and money in VR/AR

**And others are experimenting too!**



2

“VR

only has

entertainment

applications”

# Industry growth for VR/AR is expected to be strong

85%

enterprise driven by 2021

\$209b

industry by 2021

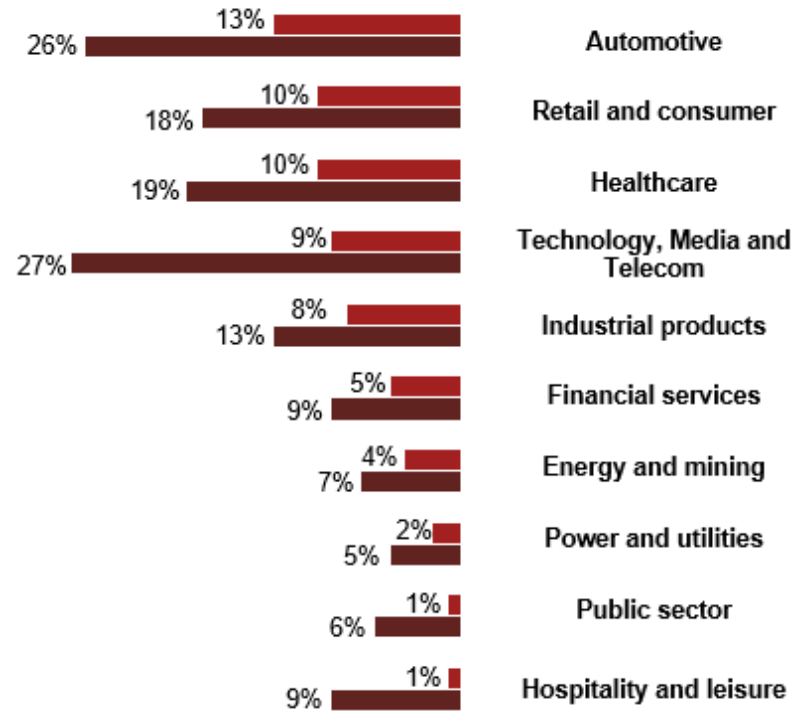
175m

headsets by 2021

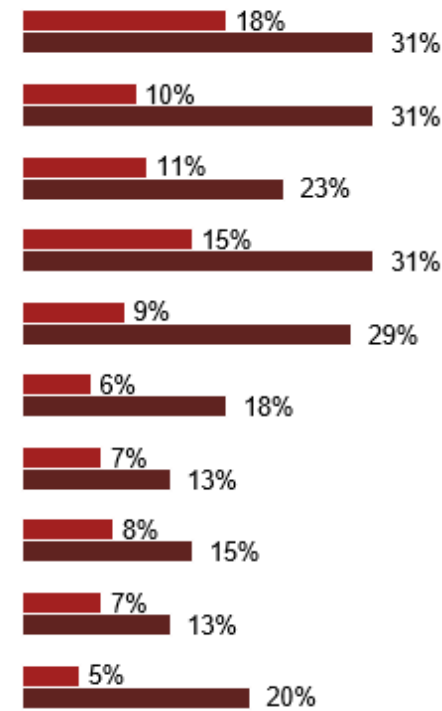


# VR/AR investment is increasing across all sectors

*Virtual reality investment by industry*



*Augmented reality investment*



■ Today ■ In 3 years

Source: PwC, 2017 Global Digital IQ Survey.

Bases: Automotive: 72, Energy and mining: 135, Financial services: 332, Healthcare: 237, Hospitality and leisure: 75, Industrial product: 375, Power and utilities: 131, Public sector: 156, Retail and consumer: 217, Technology, Media and Telecommunications: 433.

# VR/AR adds value to business in a number of areas



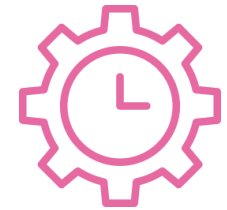
**Reduce  
cost**



**Grow  
revenue**



**Remove  
complexity**



**Operate  
efficiently**



T06  
010.2

3x

T07  
022.1

		1
	1	
		1

# Logistics optimisation

DHL



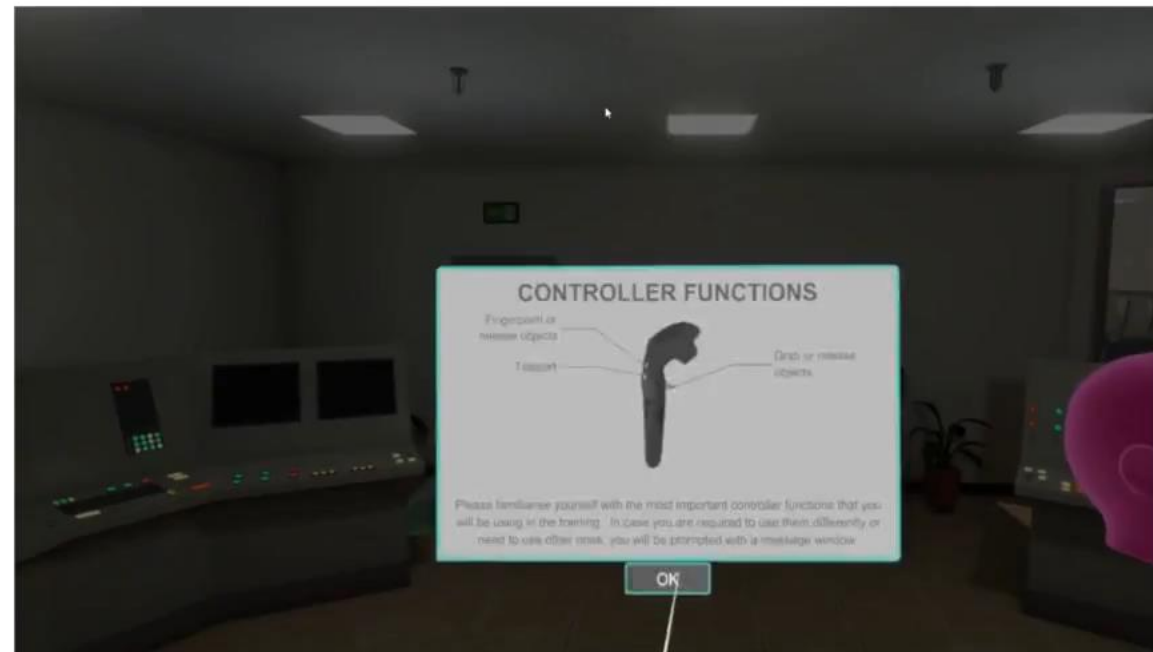


Imagine hands-free working

A woman in a flight attendant uniform, consisting of a white long-sleeved shirt, a dark cardigan, and a dark skirt, is standing in a hallway. She is holding a VR headset over her head with both hands. The background is a plain, light-colored wall with a light switch visible on the left and a doorway on the right.

# Cabin crew training

American Airlines







A man wearing a VR headset and headphones is using a handheld controller to interact with a 3D model of a car chassis. The model is semi-transparent, revealing internal components like the engine and suspension. The man is in a room with large windows looking out onto a landscape. The text "Vehicle design" and "McLaren" is overlaid on the image.

# Vehicle design

McLaren



A 3D rendered street scene. On the left, there is a green hedge and a wooden fence. A road with white dashed lines runs into the distance. On the right side of the road, there is a row of green trees. In the distance, a white van and a white truck are visible on the road.

# Legal visualisations

UK court of law

Image © Teeside University



3

“VR

is

not

scalable”

# 100 users in 2 hours

## Shifting leadership mindset

We worked closely with a client to create a realistic narrative of the cultural state of the company and developed this into a virtual reality experience which we delivered to 100 of its leaders with the objective of driving a case for change.



# 300 users in 15 minutes (coming soon!)

## Immersing you in a cyber attack

An interactive experience that puts you in the shoes of an executive board member during a cyber attack on your company.

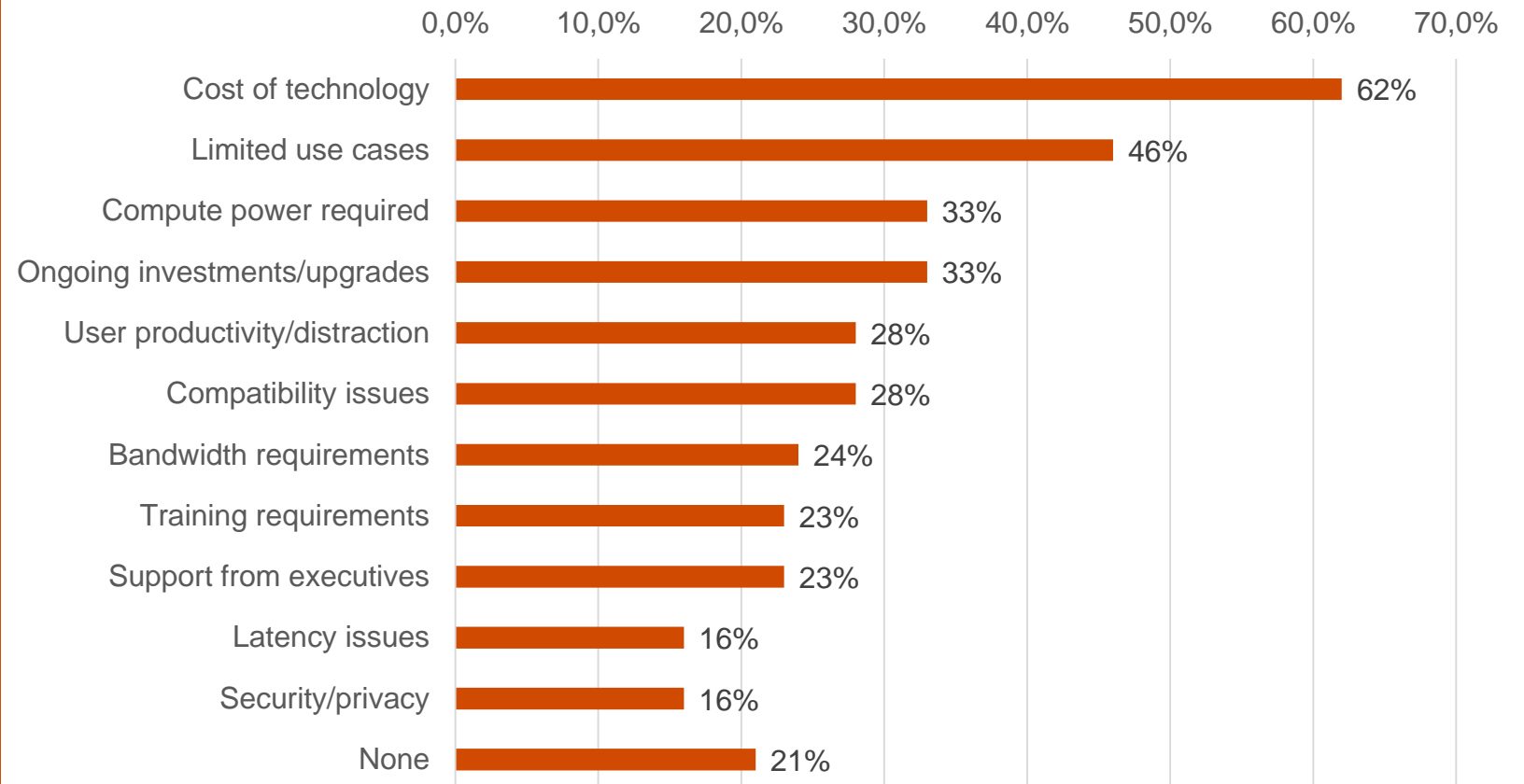
Make your decisions and understand the ramifications on your organisation both locally and globally.



# Concerns about virtual reality technology in organisations worldwide

16%

of IT professionals surveyed cited  
“security/privacy” as a concern about  
virtual reality technology



Source: Spiceworks, 2016



# There are a number of potentially invasive datasets that could be recorded in virtual reality



**Eye  
tracking**



**Physical  
information**



**Behavioural  
information**



**Neural  
patterns**



# Further reading on VR/AR challenges in business

Link to report: <https://pwc.to/2vg859r>

## Privacy & cyber security

- Augmented reality privacy concerns in public environments
- VR/AR and GDPR
- Risk profiles of VR/AR applications

## Legal

- Does an avatar wearing branded clothes in a VR world require owners' consent?
- A group of individuals conduct an experiment in a virtual laboratory, creating a new product – who does the patent belong to?

# Growing your VR/AR company in the UK

A business and legal handbook



4

PwC is

just an

accountancy

company”



# Thank you

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