

Augmenting the Augmentors

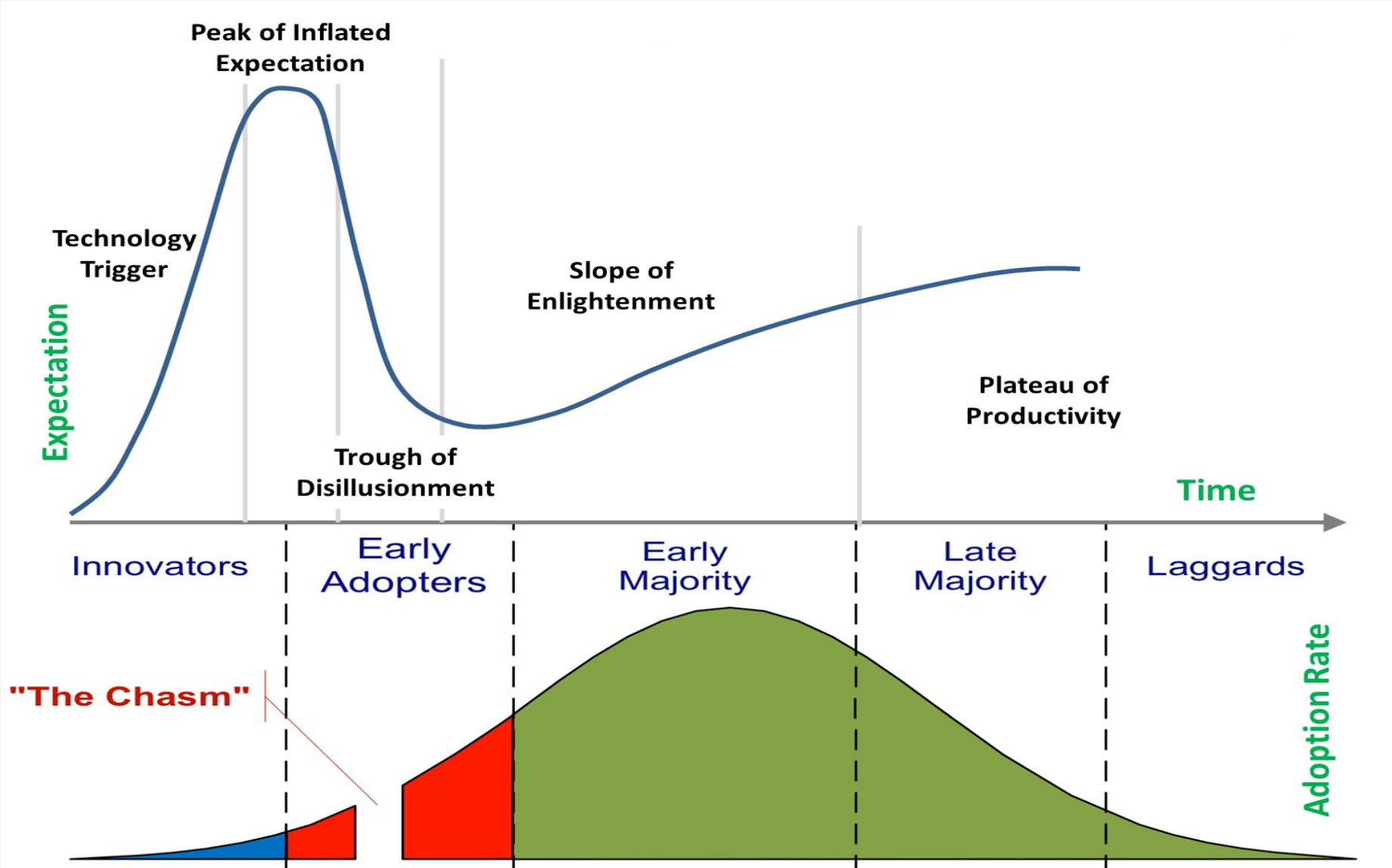
How the Great Western Metaverse will be built

Jeremy Silver
Chief Executive Officer
@JeremyS1

Digital Catapult

The UK authority on advanced
digital technology innovation
and adoption

Hype cycle and technology adoption cycle



Global immersive technologies economy

VR/AR market value

\$209bn in 2021

*Greenlight Insights via techjury.net

Jobs enhanced by VR/AR

>23m by 2030

*Statista.com / PwC

Business VR/AR spending

\$18.8bn (2020), up 78.5% from 2019

*IDC

UK
uniquely
combines
technology
with
culture



Significant UK public investment

UKRI Funded programmes

- **Audience of the Future** - **£39.3m** investment including £16m for six Future Demonstrators
- **Creative Clusters** - **£80m** for nine clusters

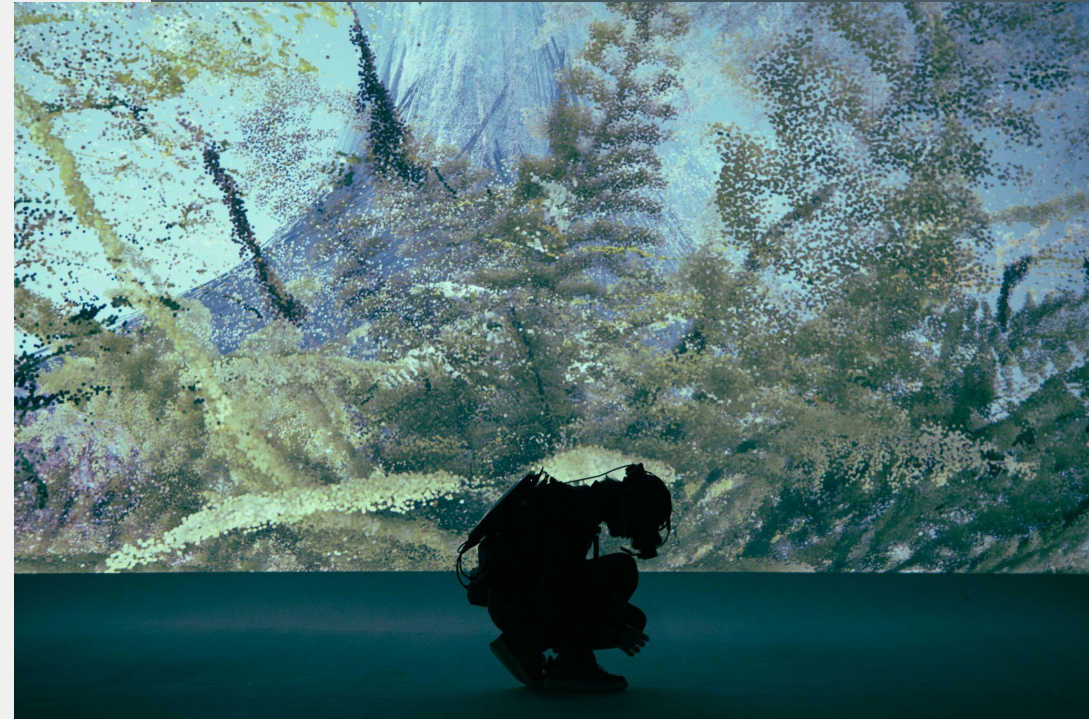
Digital Catapult programmes

CreativeXR (with Arts Council England)

- **£1.2m+** in funding to 60 startups
- Private investment of **£2.7m+** secured over first two years
- **New for 2021** - three CreativeXR companies receive further £189k prototype development funding

Augmentor - early stage acceleration

- **26** companies over three years
- Raised **£7.5m** in private investment and **£4.3m** in grants



Marshmallow Laser Feast, Natan Sinigaglia,
Mileece l'Anson: *We Live in an Ocean of Air*

THE VR FUND 2019 VR INDUSTRY LANDSCAPE



	LOCATION BASED	SPORTS/LIVE EVENTS	SOCIAL	GAMES	ENTERTAINMENT	ENTERPRISE	HEALTHCARE	EDUCATION
APPLICATIONS/CONTENT								

	DISTRIBUTION (APPS/MEDIA)	3D TOOLS (ENGINES/AUDIO)	REALITY CAPTURE (360 VIDEO/NEXT GEN)
TOOLS/PLATFORM			

	HMD (TETHERED/MOBILE)	INPUT (HAND/EYE/WEARABLE/OMNI TREADMILLS/HAPTICS)
INFRASTRUCTURE		

THE VR FUND 2019 AR INDUSTRY LANDSCAPE

APPLICATIONS

GAMES/ENTERTAINMENT	CONSUMER	SOCIAL	ENTERPRISE	HEALTHCARE	EDUCATION
Microsoft, magic leap, LEGO, ASOBO, Disney, Funomena, SCHELL GAMES, HADO, FATHER.IO, Directive, LIMBIC, FLARB, ludia, VITO, CORTOPIA	Microsoft, Apple, IKEA, LOWE'S, MODSY, houzz, HUTCH, WILLIAMS SONOMA, Tasmanic, L'OREAL, wayfair, amazon, PERFECT, stream, YAHOO!, rooomy, lynde, LAAN LABS, finfy, PHAR, morpholio, American Airlines, eyeacandy	Apple, Snapchat, facebook, Google, Microsoft, SAMSUNG, SEERSLAB, Snapchat, Flirtar, GENIES, octi, facemoji, Activision, brud	Microsoft, UPASKILL, ZEBRA, IBM, RE'FLEKT, shopify, DASSAULT SYSTEMES, SCOPE, vuforia, XMREALITY, CN2, Spatial, AUGMENT, Trimble, CivicAR, make[REAL], Camera IQ, PPRENTICE, JOINPAD, AUGMATE, POLARITY, TNQ INGAGE, HOVER, Sketchfab, enduvo, ario, iStaging, mira, revieve, cgtrader, verlebros, object theory, holoone, ATHEER, hyperindustry, TechSee	Microsoft, AUGMEDIX, Augmedics, 3D4MEDICAL, BRAINLAB, evena, SCOPIS, echopixel, BEYEONIC, Proprio, ARIS.MD	Microsoft, Google, Apple, Lifelike, EvoBooks, NeoBear, CURISCOPE, SPACE, metaverse, Smithsonian CHANNEL, 3D BEAR, WWF

TOOLS/PLATFORM

DISTRIBUTION	SDK	3D TOOLS (ENGINES/AUDIO)	3D REALITY CAPTURE
Microsoft, magic leap, Google, Apple, nreal, Lenovo	Microsoft, Apple, vuforia, Wikitude, blippar, Google, DAQRI, kudan, occipital, AR-media SDK, BOSCH, SONY, Rokid, SAMSUNG XR, Bose AR, Total Immersion, augumenta, HISCENE, 8TH WALL, ARTOOLKIT, EasyAR, magic leap, UBIQUITY6, mapbox, DeepAR, mood, SEERSLAB, 6 D. AI, twentybn, banuba, NAVVis, jido, WAXRAY, LOMAI, hypsense, SCAPE	unity, UNREAL ENGINE, BRE'FLEKT, ONE, facebook, skylight, amazon, vuforia, Zappar, TORCH, AMD, NVIDIA, RealSpace3D, DOLBY ATMOS, Google, facebook, DYSONICS, Mach 1™, AR	PHOTOGRAMMETRY: Microsoft, Agisoft, occipital, FUSION, INDOOR REALITY, itSeez3D, matterport, Artec 3D, Standard Cyborg VOLUMETRIC CAPTURE/LIGHTFIELD: Microsoft, Google, SONY, otoy, scatter, intel, 8P, Fraunhofer, 4D VIEWS, DGene, HYPE VR, Adobe, SAMSUNG XR, CIVISION, JAUNT, VOLU, METASTAGE, IMMERSE, CANON, AUTODESK, VIVIDQ, ARCTURUS

INFRASTRUCTURE

DEVICES (MR HMD/AR HMD/HANDHELD MR)	COMPONENTS (DISPLAY/3D CAMERAS/INPUT/COMPUTER VISION)
Microsoft HoloLens, magic leap, Lenovo, VARIO, Canon, occipital, LEAP, BAE SYSTEMS, INFINITY, mira, facebook, Apple, SHADOW CREATOR, KURA, DreamWorld, HISCENE, DIGILENS, IMMY, Rokid, t5, nreal, uSens Inc, ARIZON, NEDGLASS, REALMAX	magic leap, LUMUS, KOPIN, Emacula, DIGILENS, mojo, AVEGANT, KURA, WaveOptics, RAONTECH, TruLifeOptics, UNIVET, VUEREAL, dispelx, EyeWay, LetinAR, intel, REALSENSE, Microsoft, mantis vision, pmd, SONY, FLIR, INUITIVE, occipital, STEREO LABS, FOTONIC, AIRY.3D, ORBBEC, FINISAR

Poll question 1:

Given the interdependency of hardware and software in the development of VR/AR - how hard should the UK use public investment to pursue a strategy of content, format and production skills first?

Not at all

A little

Push hard

Go for it big time

Magic Leap - Hype n Burn

- Beat Apple and Facebook to market with AR kit
- Raised >\$2.3bn from major investors
- Over promising / under delivering / low demand
- \$2,000+ price point
- Sold 6,000 units in 6 months vs. projections of 1m
- \$6.4bn valuation in 2019
- \$450m valuation by mid-2020
- 93% decline in six months
- Now pivoting from consumer to enterprise (medical devices)



Report: Magic Leap One Sales Are Horrible, New Version 'Years Away'

Core hardware technologies - major players

Epic Games

\$28bn valuation
Amongst world's 10 most valuable startups
\$1.8bn Fortnite revenue (2019)
250 million players



Microsoft Hololens 2

5G, AR Cloud built in
Focus on enterprise
Cost \$3,500 each



Unity

\$40.24bn valuation (2021)
1.5 million monthly creators >2 billion monthly users (2020)
15,000 new projects daily
Run on 1.5bn devices



Niantic

\$4bn valuation
>\$1bn Pokemon GO revenue (2020)
>600m unique users



HTC Vive



~13% share of headset market
Innovative VR accessories for enterprise market
Est. 1.3m units sold since launch vs. 4.7m PSVR

Oculus



2012 Kickstarter raised \$2.4m
Acquired by Facebook in 2014 for \$2bn
Headsets sell for \$299-\$399
Approx. 1.5m sold since launch

NReal



Focus on consumer AR/MR
Raised \$85m to date (Feb 2021)
Partnered with Vodafone in EU - mixing AR & 5G
Av. user time = 49 mins per day

Pandemic impact

- Seven year accelerated digital adoption
- From ecommerce to business tools like Zoom
- Consumers now 3x more likely to go online first

- Less dramatic VR uptake
 - Oculus headsets sales up 350%
 - Estimated 1.2 million Oculus Quests sold worldwide in 2020
 - Supplies hit by Covid-19 electronics shortage

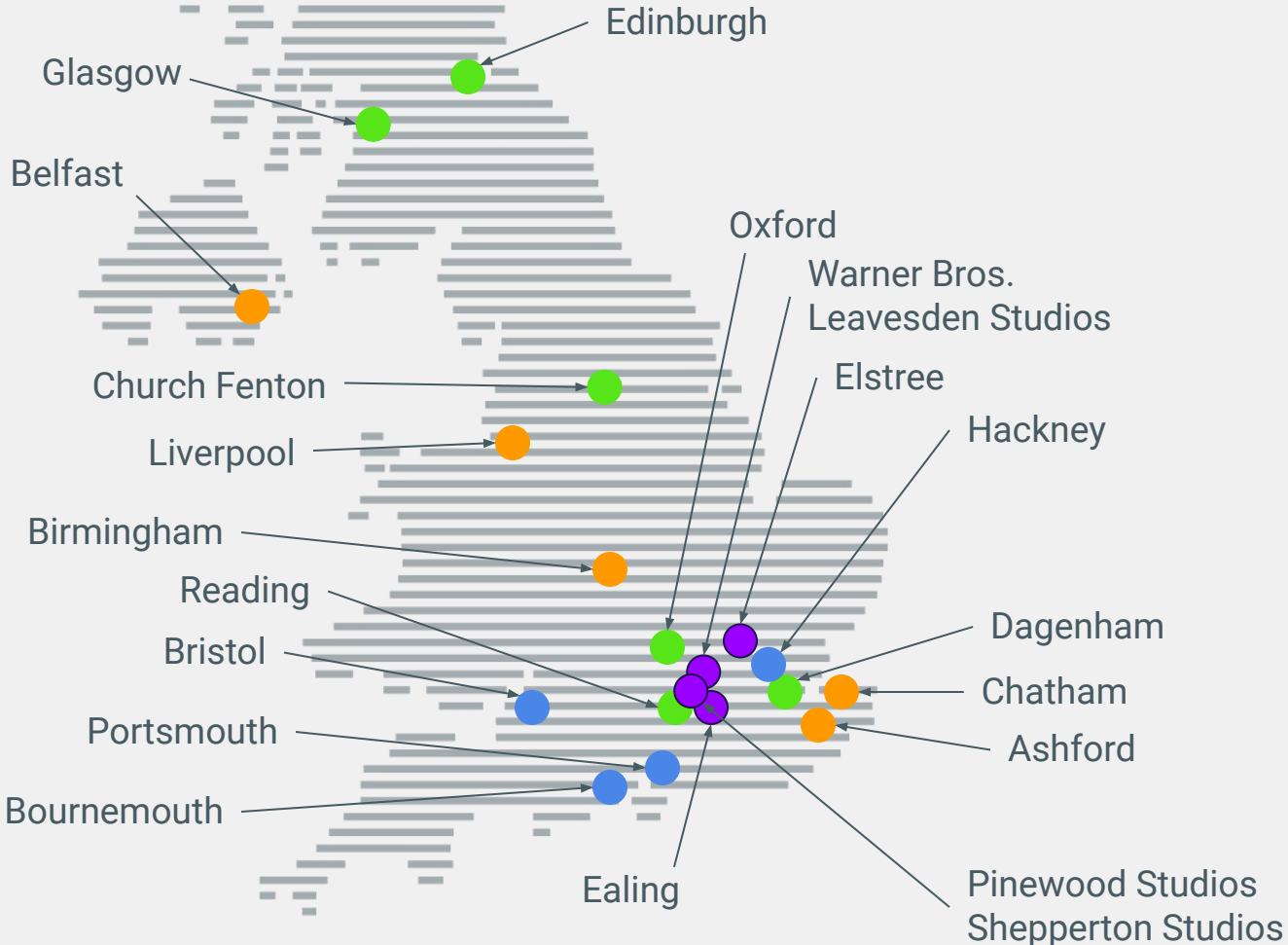
- Household penetration still 1.2%
- Predicted to rise to 3% by 2025

- But massive uptake in streaming platform content -



Future landscape of UK studio production facilities

£2bn forecast investment in new UK studio builds over next five years



KEY
Academic and Council
Commercial Funded
Commercial Planned
Film studios

Hollywood plans £700m film and TV studios in Hertfordshire

🕒 11 hours ago | 💬 [Comments](#)



Subject to planning permission, the site in Broxbourne turned into a film, TV and digital production centre

Plans for a £700m "world-class" film and TV studios facility in the UK have been announced by a Hollywood studio.

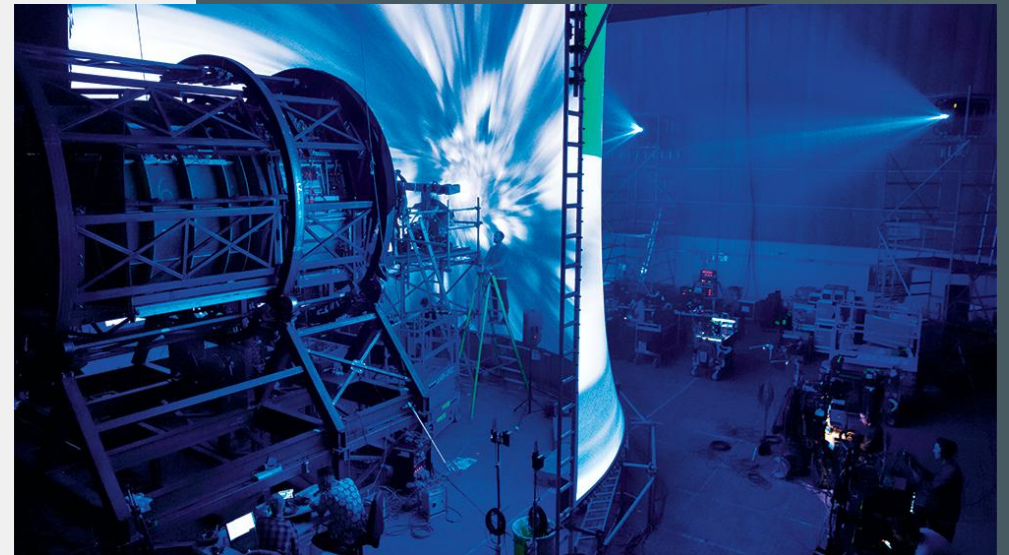
The owners of Sunset Studios in Los Angeles and an investment firm have bought a 91-acre site in Hertfordshire for £120m.

Virtual Production



Core technologies - the major players

- Epic Games - Unreal Engine
- Unity - game engine
- ARRI - lighting, screens
- Red Digital Camera
- Dell Media Group
- Disguise - live to virtual production
- Microsoft Azure
- AWS Media Services



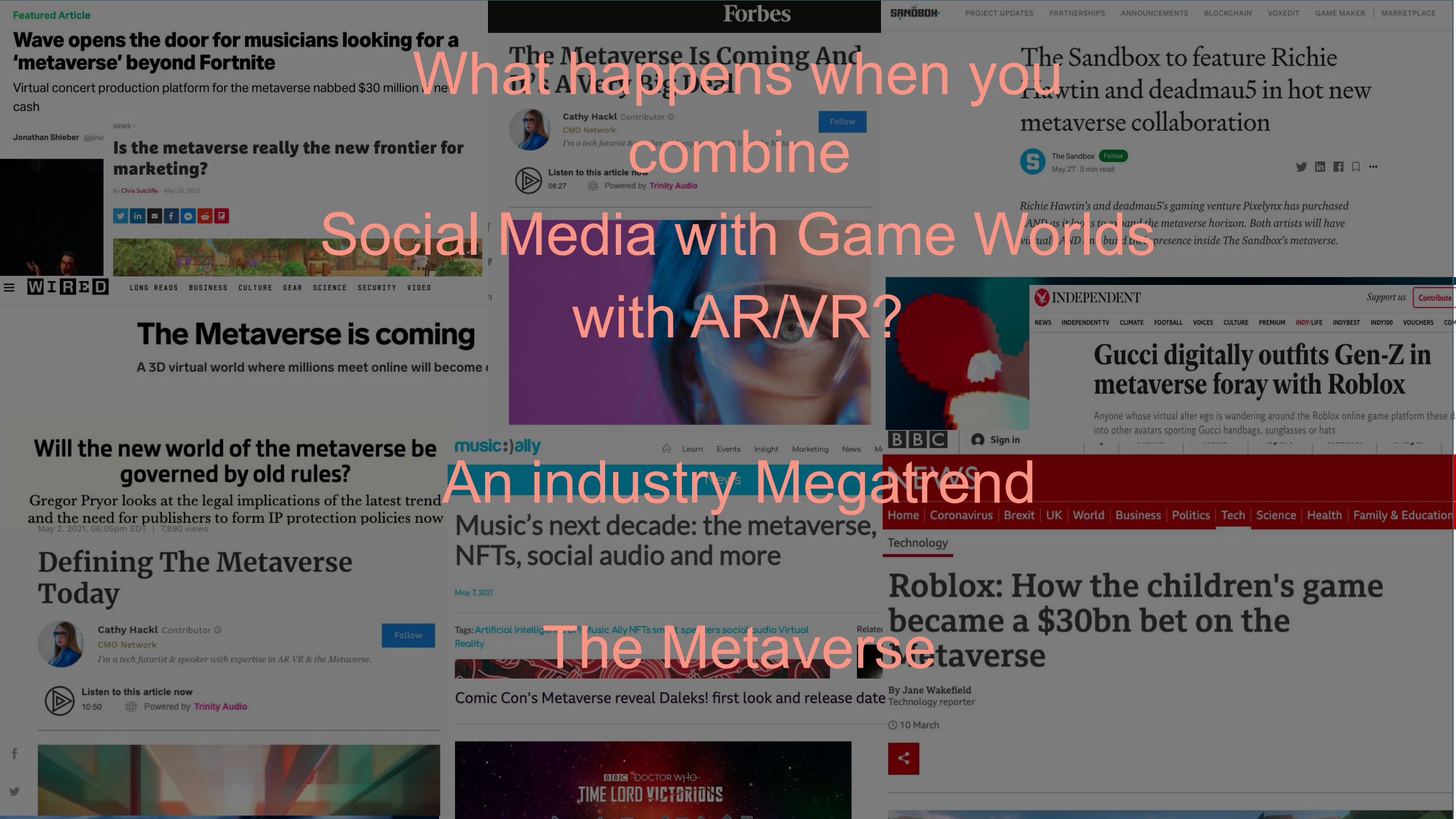
Poll question 2

Will virtual production entirely disrupt media production?

Never

Partially in 5-10 years

Completely in 5-10 years



What happens when you combine Social Media with Game Worlds with AR/VR?

An industry Megatrend

The Metaverse

Featured Article

Wave opens the door for musicians looking for a 'metaverse' beyond Fortnite

Virtual concert production platform for the metaverse nabbed \$30 million in new cash

Jonathan Shieber @jshie

Is the metaverse really the new frontier for marketing?

By Chris Sutcliffe - May 26, 2021

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Forbes

The Metaverse Is Coming And It's A Very Big Deal

Cathy Hackl Contributor @ CMO Network

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SANDBOX PROJECT UPDATES PARTNERSHIPS ANNOUNCEMENTS BLOCKCHAIN VOXEDIT GAME MAKER MARKETPLACE

The Sandbox to feature Richie Hawtin and deadmau5 in hot new metaverse collaboration

The Sandbox **Fellow** May 27 - 5 min read

Richie Hawtin's and deadmau5's gaming venture Pixelynx has purchased AND as it looks to expand the metaverse horizon. Both artists will have virtual AND avatars build their presence inside The Sandbox's metaverse.

The Metaverse is coming

A 3D virtual world where millions meet online will become a



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Gucci digitally outfits Gen-Z in metaverse foray with Roblox

Anyone whose virtual alter ego is wandering around the Roblox online game platform these days can now be seen in other avatars sporting Gucci handbags, sunglasses or hats

BBC Sign in

Will the new world of the metaverse be governed by old rules?

Gregor Pryor looks at the legal implications of the latest trend and the need for publishers to form IP protection policies now

May 2, 2021, 06:05pm EDT | 7,890 views

music:)ally Learn Events Insight Marketing News

Music's next decade: the metaverse, NFTs, social audio and more

May 7, 2021

Tags: Artificial Intelligence Music Ally NFTs smart speakers social audio Virtual Reality

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Technology

Defining The Metaverse Today

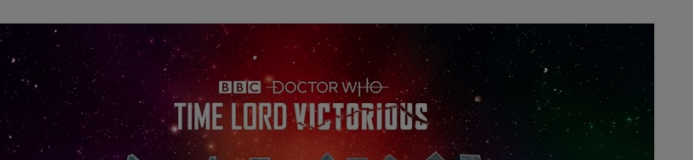
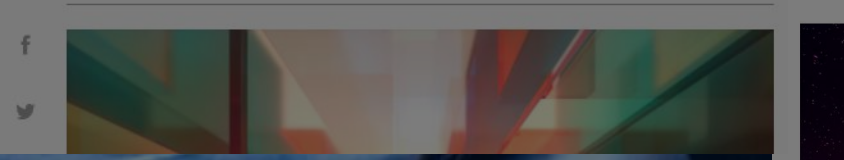
Cathy Hackl Contributor @ CMO Network

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Roblox: How the children's game became a \$30bn bet on the metaverse

By Jane Wakefield Technology reporter

10 March



What is a Metaverse?

An artificial parallel universe

Media experiences becoming richer and richer

Gaining larger and larger audiences.

Remember

Second Life

World of Warcraft,

Pokemon Go!

....Now ... FortniteRoblox

combining social, gaming and music to attract millions

Travis Scott gig - less a game more a music promotion

Traditional industry - Digital Twins

Investing in the Metaverse

- 12 m attend Fortnite Travis Scott gig
- Amazon introduce AR hair salon - see your look before your do
- Google hiring AR wayfinder designers
- US army \$49m HoloLense trial
- Microsoft - LinkedIn, Minecraft, HoloLense
- Zuckerberg describes future of FB as an open Metaverse company
- Sony participates in £1bn Epic fundraiser
- Gartner says by 2035, the digital human economy will become a \$125-billion market



Metaverse Market Map

Experience

Discovery

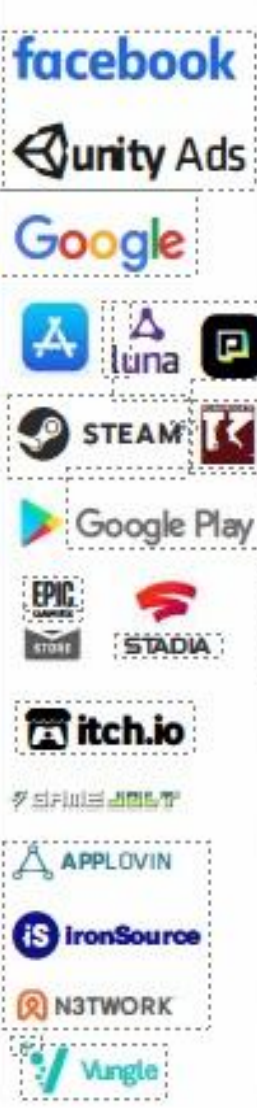
Creator Economy

Spatial Computing

Decentralize

Human Interface

Infrastructure



What kind of metaverse future?

Individual Corporate metaverse

- No interoperability
- No transferability
- Free market approach
- Walled gardens on steroids

“Open” platform

- Niantec, Facebook, Fortnite, Roblox
- Invite multiple players
- Create business dependencies
- 30% tariffs vs in app purchases vs adverts

Open interoperable Metaverse

- Open accessible market
- Level playing field
- Data sharing
- Low barriers to entry



Thank you

digicatapult.org.uk

@digicatapult

The UK immersive economy

Global market value for VR and AR
Global number of companies active
Global number of jobs if we can

£1.8bn

Contributed to UK GDP in 2019

*PwC: Economic Impact of VR & AR "Seeing is believing" 2019

1,250

UK specialist companies in 2019

*Digital Catapult and Immerse UK: "The Immersive Economy in 2019"

£62.5bn

Estimated market value by 2030


*Digital Catapult and Immerse UK: "The Immersive Economy in 2019"


400k


UK immersive jobs by 2030


*Digital Catapult and Immerse UK: "The Immersive Economy in 2019"


Defining the Metaverse


“The Metaverse crosses the physical/digital divide between actual and virtual realities” 


“The next iteration of the internet. And as dystopian it may sound, this is the next iteration of life” 

Full interactive reality layered across every segment of our lives. It is the connective tissue between humanity that we have always literally lucid dreamed of but until recently haven't had the infrastructure to make it real. 


“We are already in the MetaVerse, it's just mostly 1D (clubhouse), 2D (Zoom), 2.5D (Fortnite) - 3D (VR/AR) is just in the development stages.” 

The Metaverse is the next significant 3rd space as not home (1st), not work or study (2nd) but where you will spend your leisure time. 

“If one company owns the metaverse, they'll be more powerful than a god on earth” 

“The Nth Floor” where we bring our people together in ways never before possible in the physical world.” 

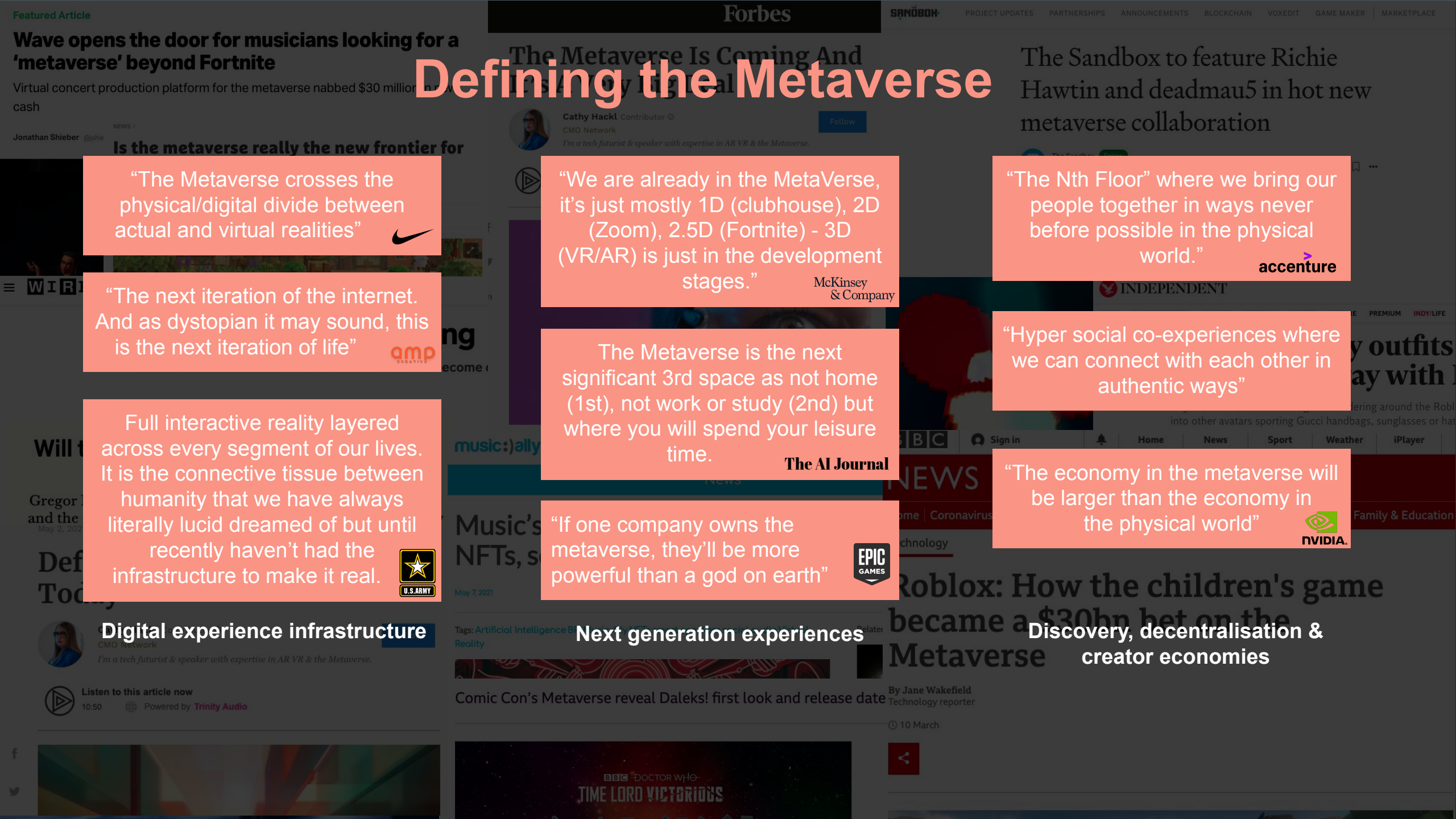
“Hyper social co-experiences where we can connect with each other in authentic ways”

“The economy in the metaverse will be larger than the economy in the physical world” 

Digital experience infrastructure

Next generation experiences

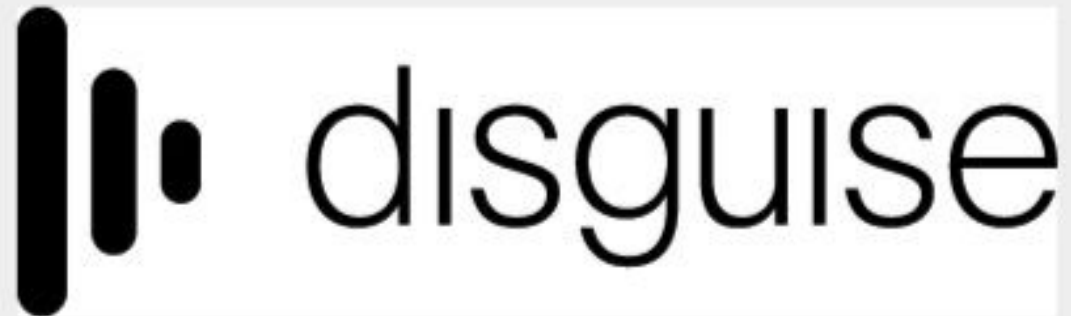
Discovery, decentralisation & creator economies



Core technologies - major players



FORTNITE



GLOBAL AUGMENTED REALITY (AR) AND VIRTUAL REALITY (VR) MARKET 2021-2025



Market growth will **ACCELERATE**
at a **CAGR** of almost

46%

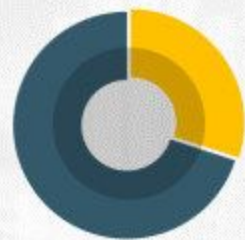


Incremental growth (\$B)

162.71



The market is **FRAGMENTED**
with several players occupying the
market



Growth Contributed by
APAC

34%



Growth for **2021**

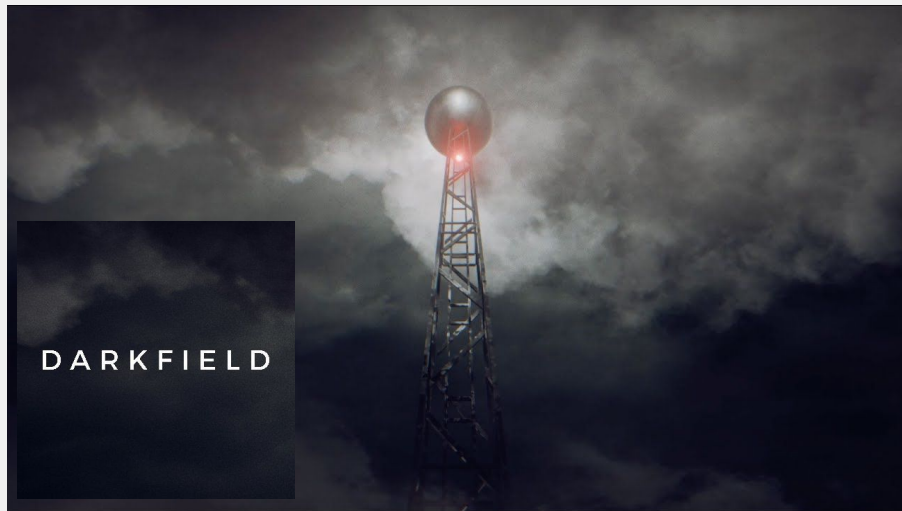
25.13%

Global Augmented Reality economy

- Mobile AR 2.0
- The US Army's \$479M contract with Microsoft HoloLens late 2018 - enterprise value of AR
- HMD (head mounted display) AR in transition
- Increased interest in volumetric capture content, works for both AR and VR, partially driven by 5G networks capabilities
- Consumer entertainment AR content growing

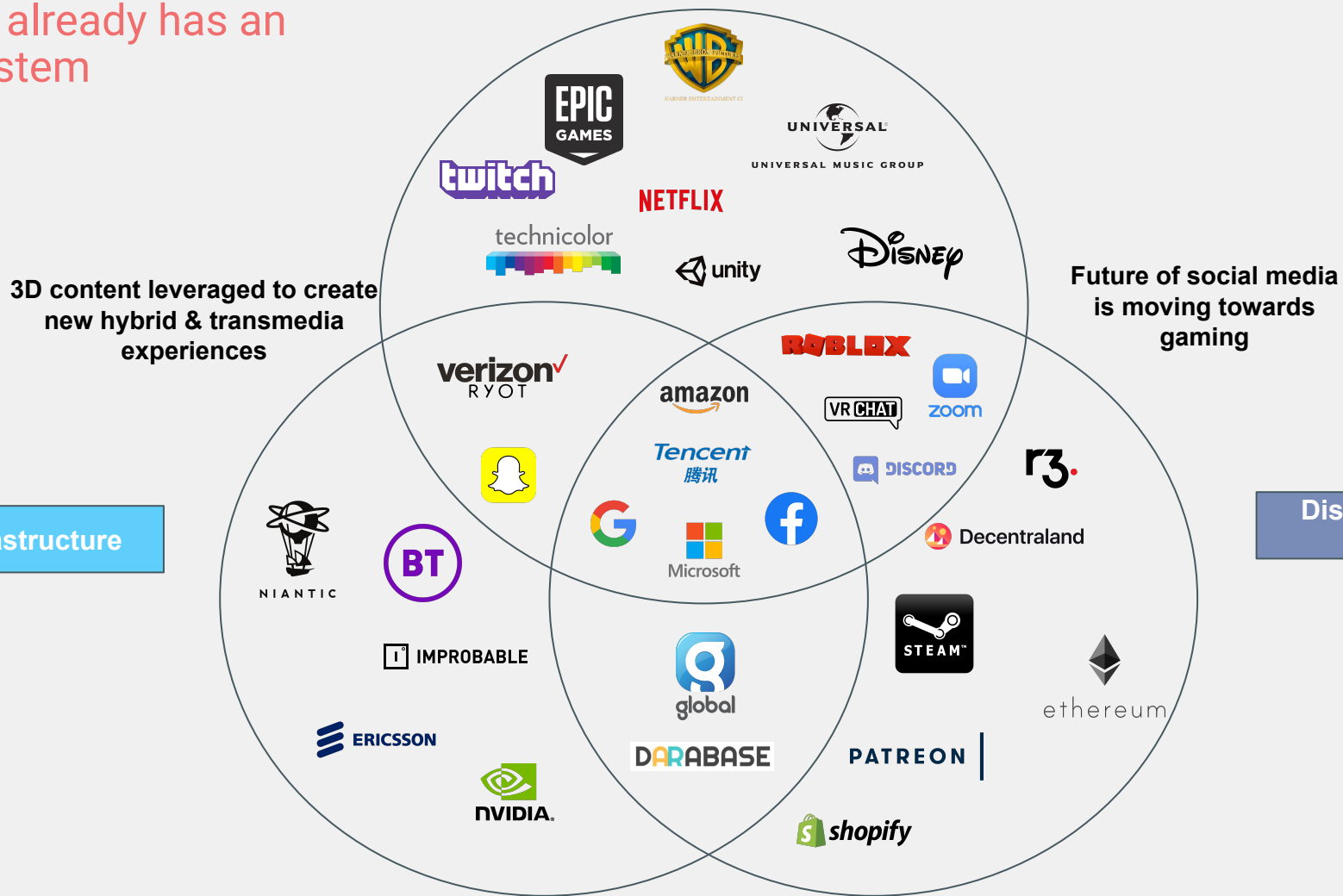


Super creative UK



Next generation media production

The metaverse already has an evolving ecosystem



3D content leveraged to create new hybrid & transmedia experiences

Future of social media is moving towards gaming

Digital experience infrastructure

Discovery, decentralisation & creator economies

Digital overlays on the real world provide new services, transforming commerce and advertising

Defining the Metaverse

Digital experience infrastructure

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Next generation experiences

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Discovery, decentralisation & creator economies

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Augmented vs Virtual Reality - Implementation vs Experimentation

