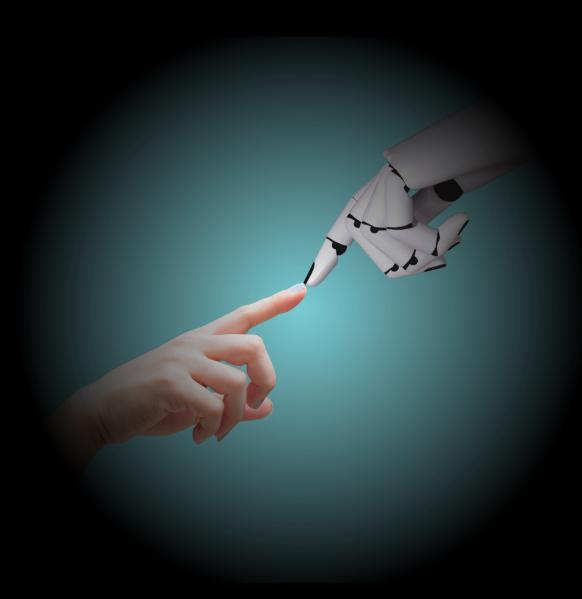
# ME & THE MACHINE

ENTER A NEW REALITY IN OUR UNREAL TIMES







"Consumers are ready for immersive experiences that can transcend the ills of the internet age and let them create their own reality—one in which personal growth and discovery trump consumption."

- Jon Penn, CEO, National Research Group





## WHY YOU NEED TO WATCH THIS SPACE

1

At the dawn of the '20s, 5G is accelerating the exponential evolution of key technologies. The tech titans are already heavily investing in concepts formerly relegated to the world of science fiction, from smart glasses to 3D maps of the world and persistent holograms. This original research takes a heat check on consumer readiness, unearthing cautious optimism expressed by more than half of consumers for immersive technology's positive impact on society.

2

As machines continue to get smarter, consumers resist a life on automatic. **The most** promising 5G-powered use cases are interactive learning/skill development—learning by doing rather than seeing—as well as new communication solutions beyond send and receive, from removing language barriers to hands-free screens-on-the-go, enabling real-time collaboration, anywhere, anytime.

3

Deep diving into the huge promise and potential peril of 5G and immersive technology, this research uncovers white space for future use cases that empower consumers to transcend the lonely reality of our 4G society to a more hopeful, socially connected world where learning and self-discovery take center stage.

Produced with consulted partners, Verizon and RLab

## FROM STATIC INFO TO ENHANCED REAL TIME EXPERIENCES

## 4G HERALDED THE BEGINNING OF THE GOLDEN, MOBILE AGE OF CONTENT

4G is synonymous with peak content—watching stories on our phones, sharing videos on social media, and only being a click away from an affirmative, instantaneous "like." Yet in the middle of a 4G loneliness epidemic—where one out of two Americans identifies as "lonely"\*—are consumers optimistic or anxious about a 5G future?

### CONNECTIVITY IS NOT JUST ABOUT THE NETWORK

It's about me and my network, and all the things in my network, growing closer and smarter, and delivering much more seamless experiences.

New advancements in XR (Extended Reality)—any form of "mediated reality" be it AR, VR or other 3D formats—present significant opportunities for enhanced real-time experiences, and the advent of 5G technologies will unlock a multitude of new use cases.

Imagine the opportunities when you combine the promise of 5G—low latency, speed and continuous connectivity—with the potential of spatial computing to free computers from the single, inflexible interface of the screen, into the wider world.



 $\hbox{$\star$ Cigna study on the Impact of Loneliness in the U.S. and Potential Root Causes, March 2018.}$ 

"Look at 4G. I don't think people bought 4G phones to watch their HBO shows on their phones but now they're doing that routinely."

So was it a driving use case? I don't know. Was it a lasting use case? It's here to stay, and it's changed behaviors worldwide."

Tony Parisi, Global Head AR/VR Ad Innovation, Unity Technologies

## THE INDUSTRY IS STILL AT ITS INFANCY

Before we look to the future, let's take pause at where the market sits today.

Martina Welkhoff, Founding Partner, The WXR Fund, positions the question of how immersive technologies will break through as a design question: how to leverage increasingly sophisticated tools for more intuitive interaction. Martina shares that to "augment" in the truest sense is to "complement" consumers' lived experience, restoring more power and agency to the consumer, even if that might go against commercial interests in some instances. When the technology does the trick best, it empowers users, making them feel more capable to accomplish what they care about.

#### Virtual Reality (VR)

ealistic and immersive simulation of a 3D environment, created using interactive software and hardware, and experienced or controlled by movement of the body.

#### Augmented Reality (AR)

An enhanced image or environment as viewed on a screen or other display, produced by overlaying computer-generated images, sounds or other data on a real-world environment.

There is untapped opportunity for experiences to move beyond the novelty of current gaming and social experiences, to offer more nuanced enhancements to our day-to-day lives.

**93**%

are aware of VR

**49**% have used VR

Usage for VR and AR skews male, under 35

**44**% have used AR

**74**% are aware of AR

The primary way non-users engage with the tech is at a friend/family member's house

non-owners have tried VR tech higher among teens



Social is the second highest use of AR amona users 36% use AR for social



## TOMORROW'S TECH IS BORN OUT OF TODAY'S STORYTELLING

#### What will an immersive technology infused society really look like? And where are we today?

This quarter alone, we saw Facebook announce Live Maps to create multi-layer representations of the world using crowdsourced data, enabling future use cases like getting notifications projected into thin air, identifying objects with labels, or even projecting a holographic avatar to hang out with real people. We're also in the midst of a

quickening race to bring computing to your face, with whispers of Apple Mixed Reality devices in the wind, and Amazon recently releasing a new class of wearables, including their smart glasses, Echo Frames, which embed Alexa into the frames.

But the 20's aren't just about glasses. There's an entire lineup of innovative hardware, from Microsoft's foldable mini dual screen tablet to 5G phones, bound to disrupt our media experiences: What was once the stuff of science fiction is moving to the mainstream.

"If we thought that the search index and then the social graph were both impactful on the world, just wait for the mirrorworld—that impact is going to be much larger."

- Matt Miesnieks, CEO, 6D.AI

## ME & THE MACHINE: A NEW ERA OF SELF-DISCOVERY

With consulted partners, Verizon and RLab, researchers and strategists at National Research Group set out to realize three key objectives:



#### Understand unmet consumer needs, drivers and barriers

What do consumers want from immersive technology experiences that they're not getting elsewhere?



#### Uncover white space for next-generation experiences

At the confluence of content, commerce and connected community, what might next-generation experiences, powered by 5G, look like?



#### Deep dive into the promise and potential peril of 5G & immersive tech

What role can/should technology play in society, and how can we more effectively communicate the value of high-speed innovation?

#### To look to the future, we architected a robust research approach:

- **Consumer immersions** among leading-edge consumers in 5G cities at ArtCenter, LA and RLab, NY, where we tested concepts across mobile, Augmented Reality audio sunglasses, Mixed Reality & Virtual Reality headsets
- A quantitative survey among a nationally representative sample of 1500 consumers, including teens (ages 13-54) to gauge attitudes, usage and perceptions
- In-depth interviews with industry luminaries, from award-winning creators to innovative executives, to anchor and round out future-cast projections

## **5G CAN SPARK THE MARKET**

Despite the relatively slow uptake of the consumer market, VR & AR present significant opportunities for business and society, to the tune of a \$1.5 trillion boost to the global economy by 2030. Key business applications include product and service development, healthcare, development and training, process improvements, retail and consumer.\*

5G can address many of the key holdbacks consumers express about immersive technology, across Product, Accessibility and Content:

#### PRANIICT

The number one driver for AR/VR usage is more affordable

**products:** hardware such as low-cost headsets (46%), and software, such as free apps (44%).

Affordable hardware (such as a low-cost headset)

Affordable software (such as free apps)

44%

Faster loading time for content 22%

Streamlined hardware

(such as lightweight, non-invasive glasses)

5G can enable us to offload computing to the cloud, opening up new possibilities for lightweight, high-performance solutions

#### **KEY DRIVERS FOR ADOPTION OF IMMERSIVE TECHNOLOGY**

Consumers selected relevant drivers for adoption of immersive technology, with % indicating frequency of selection

**57**%

#### **ACCESSIBILITY**

1/3 of non-users say they need better understanding of how to use the tech

Better understanding of how to use the technology 31%

Accessible content over the internet 21%

More places to try XR

Broader distribution/availability 18%

5G will broaden distribution/availability of content online and offline, and allow for higher flexibility of use cases in live, outdoor environments. **54**%

#### CONTENT

Nearly 40% of users say they would be compelled by higher quality graphics or resolution

Higher quality graphics or resolution

More real or truly immersive content 26%

More choice for content related to my interests

If my favorite brands were offering unique experiences

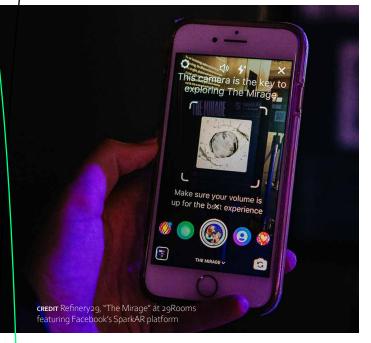
Persistent connectivity can enable XR to deliver a high-quality experience without interruption, and the localized nature of the technology can ensure the right experience reaches the right person at the right place and time.

"5G can be a great equalizer in certain ways, overcoming current barriers such as hardware costs that restrict who can create new software and products."

- Adaora Udoji, Director, Corporate Innovation & Venture Programs, RLab

## IDENTIFYING WHITE SPACE FOR XR IN A 5G FUTURE

What do consumers perceive to be the benefits of XR, and how are these distinct from their expectations for technology at large?



#### Consumers expect technology to be connective in nature:

it should make me accessible to others and connect me to brands/artists/celebrities/characters I care about. Secondary benefits of technology include it's ability to give me control over how I lead my life, from improving my ability to collaborate with others to allowing me to express myself more authentically.

XR offers consumers something unique from technology: the possibility of deeper personal growth. For 4 in 5 consumers, the top benefits of XR foster self-discovery: XR distinctively stimulates my mind or makes me think, gives me a sense of adventure and discovery, and transports me to a different world.

5G reflects a turning point where more real-time, socially connected experiences will become possible. There is **white space for XR to bridge the desire for self-discovery with the desire for community** that consumers are seeking from their tech consumption more broadly.

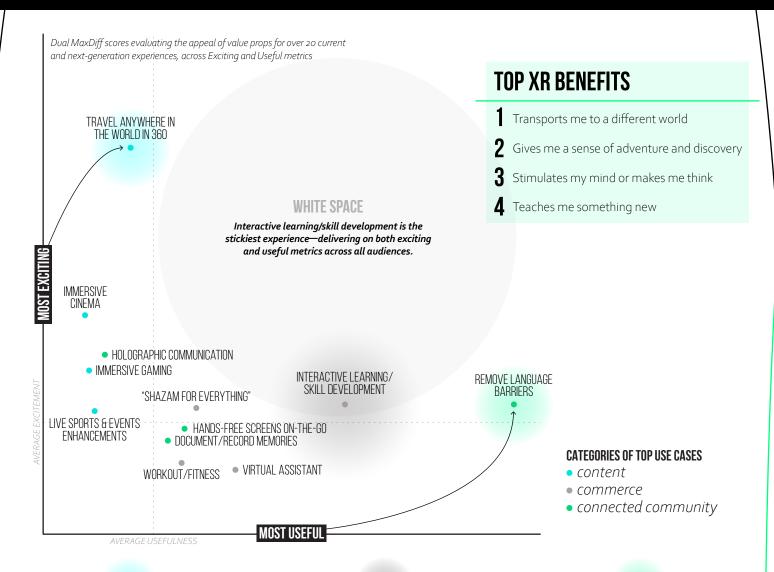


Out of a comprehensive set of over twenty current and next-generation XR experiences, we conducted a Dual MaxDiff, a core analytic approach that allows us to more precisely evaluate the appeal of value props by simulating trade-offs. Using the results, we can plot each use case on two different dimensions to understand not only what strategies are exciting, but also which are seen as useful. The stickiest experiences can effectively deliver on both exciting and useful metrics.

#### We grouped use cases into three key pillars: Content, Commerce and Connected Community.

Content experiences bring our passions to life, from immersive gaming to live sports and events enhancements. Commerce experiences empower our day-to-day, from virtual assistant to interactive learning/skill development. Connected Community experiences deepen our ability to communicate and collaborate without limits—from removing language barriers to hands-free screens on-the-go, enhancing how we relate to one another.

While Content use cases perform best for "exciting" and Commerce use cases perform best for "useful," Connected Community offers the best of both worlds, delivering the highest index score of the three pillars.



#### CONSUMERS WANT CONTENT TO TRANSPORT

Within **Content**, the stickiest use case is the ability to *travel anywhere in the world in 360*. This is approximately 3.5x more exciting than the average use case, and is also perceived to be the most useful of the set. When we talk to consumers, they tell us that traveling anywhere in the world would allow them to both transcend their current reality in an immediate yet meaningful way, while also delivering a cost and time efficient way to learn more before committing to the real thing.

Other top performing use cases include immersive gaming, immersive cinema, and live sports and events enhancements. Demand for enhanced entertainment experiences outweighs demand for social media enhancements which underperforms for the category.

#### COMMERCE IS ABOUT LEARNING SELF-IMPROVEMENT AND PRODUCTIVITY

Within **Commerce**, the stickiest use case is *interactive learning/skill development*, which is approximately 2.7x more useful than the average, and is also perceived to be the most exciting of the set. Presenting a positive outlook for learning/training, the promise of this experience is *learning by "doing" rather than "seeing."* Similarly, the next top performing Commerce experiences enhance learning and productivity: *virtual assistant* and "*shazam for everything"* or being able to point your camera at anything in the world for more information.

Consumers resist overtly commercial use cases, such as interactive out-of-home advertising, 3D wayfinding and premium shopping experiences which underperform for the category.

#### A CONNECTED COMMUNITY IS BUILT ON DEEP COMMUNICATION AND COLLABORATION

When we look to **Connected Community**, the stickiest use case is to remove language barriers approximately 4.2x more useful than the average, and perceived as exciting, too. Further, consumers await more multidimensional communication and collaboration solutions beyond send and receive. In fact, all five of the most useful 5G experiences improve these areas of our lives, from removing language barriers to hands-free screens-on-the-go and holographic communication, enabling real-time collaboration anywhere, anytime. Just think...



## HOW CURRENT AND NEXT GENERATION USE CASES STACK UP

**MOST EXCITING** MOST USEFUL CONTENT COMMERCE CONNECTED COMMUNITY Current and next-generation use cases ranked by Most Exciting and Most Useful metrics, with those over-indexing as top-performers per category reflected by circles 3.5x the average demand Travel anywhere in the world in 360 10 preview/tour universities, hotels, cultural exhibitions or far away destinations without needing to travelImmersive cinema watch a favorite show in 36o-degrees; enjoy surround sound and other sensory feedback to make scenes feel even more realistic 23 Immersive gaming 21 roam your neighborhood and other locations to look for AR creature s, competing with friends to collect unique finds Live sports and events enhancements 22 get added information such as real-time player ats and comparisons; use AR to navigate stadium experiences or easily geo-locate your friends Premium content experiences step inside augmented scenes from your favorite shows; go to the scene of a journalism article as if you were there, talk to characters from your favoriteTV shows or movies 20 Future of the stream experience content from all angles such as watching a game from players' eyes, or getting up close and personal 11 with favorite creators/vloggers; enjoy 3D replay content for real-time debate/chat with friends anywhere 14 Social media enhancements 20 express yourself creatively through unique filters or lenses; you can transform selfies or use "landmarks" to make buildings around you come to life 17 Interactive learning/skill development 2.7x the average demand touch, get hands-on and interact with 3D subject matter spatially, learn by "doing" rather than "seeing", cultivate new skills with augmented tutorials guiding you every step of the way "Shazam for everything" point your camera at anything in the world to get more information, including price comparisons or reviews for items, or help identifying anything in your environment Premium shopping experiences preview products to see how they will complement your space, look or style, experiment before committing 12 to the real thing; get feedback about products in-store, such as availability in your size or preferred colors Workout/fitness 17 get real-time analytics, coaching and guidance on your workout without the distraction of a phone or smart watch Virtual assistant 18 manage all your needs at home and on-the-go through lifelike interaction with a virtual assistant, from scheduling to shopping and more **3D wayfinding** smart displays can help you navigate what you need with ease, from seeing rearview traffic when bicycling to finding the closest exit in an emergency 19 Interactive out-of-home advertising 23 16 scan a poster to get more info or enjoy billboards that are responsive to real-time data such as people or cars passing by, weather conditions and more Holographic communication n real-time, beaming into locations anywhere in the world 13 Remove language barriers 4.2x the average demand instant translation allows you to communicate with anyone, anywhere for immediate understanding Hands-free screens on the go 10 work from anywhere with multiple virtual screens, enabling real-time collaboration; watch anything, anywhere at the size you want Document/record memories 13  $capture\ photos/videos\ of\ your\ experiences\ in\ 36o,\ share\ with\ friends\ to\ see\ from\ your\ perspective\ at\ any\ given\ time$ Social VR 14 meet friends in a VR social hub where you can play games, create your own worlds, and interact with other users via a digital avatar Location based entertainment 15 18 step into a site dedicated to immersive experiences, discovery and play, from an XR art museum to a high-tech arcade or theme park Meditation/wellness meditate in a virtual world of your choice, de-stressing through a guided, shared meditation in an immersive VR environment 16 9 3D collaboration tools 21 extend your computer or phone by using the space around you, filling a room full of ideas, seamlessly extending content into XR 12

AR messaging and tagging capture and share interactive, 3D messages with friends; place AR objects for friends to discover in the real world, creating your own narrative layered on top of the world around you

19

22

## AS MACHINES CONTINUE TO GET SMARTER, CONSUMERS RESIST A LIFE ON AUTOMATIC

Consumers are ripe for new experiences that enable personal growth, learning and discovery.

Our research reveals the number one most sticky (both exciting and useful) consumer experience is interactive learning/skill development—learning through "doing" rather than "seeing."

Studies suggest that the unique properties of immersive technology improve memory recall and enable us to better apply what we have learned.\* Engaging with AR/VR can also build empathy—broadening users' understanding of situations, people and the world around them.

Start-ups such as Friends with Holograms are leveraging the unique capabilities of VR/AR technology to create soft skills training experiences—from understanding workplace exclusion to a recent initiative helping social workers practice interviewing a family in crisis, recognized as a finalist for a SXSW Innovation Award for its impactfulness. In areas such as healthcare, virtual education can speed up how medical students understand basic concepts and get experience practicing complex procedures in a risk-free environment.

Rising demand for experiential learning reflects the centrality of learning to next generation consumer's lives. With more access to information than previous generations, Gen Z-ers tend to embrace hands-on social learning environments and increasingly see learning as an essential part of life that extends well beyond the classroom. Recent research reveals that Gen Z-ers rank You Tube second only to teachers as a learning aid, seamlessly connecting academic success to personal growth, using the same tools.\*\*









Across our ethnographies, multiple consumers reference a desire for virtual learning tutorials to help them gain skills such as cooking, where technique matters and hands-free is a clear advantage. And talking to experts such as Chris Edwards, CEO, The Third Floor, iterative, nonlinear virtual production workflows pioneered for Hollywood are trickling down to the creator level—enabling audiences to participate in content like never before, from seeing through their favorite vlogger's eyes to using next-gen interfaces such as voice and gesture to navigate content layers with added ease and deeper engagement.

Will the virtual vlogger become the new teacher?

Further, in an age of "fake news," consumers are ironically turning to XR solutions to search for reality in unreal times.

Use cases such as the NY Times's 360-degree investigative journalism excited consumers in our ethnographies, allowing them to personally go to the site of an event. The antidote to the soundbite, immersive technology can present consumers with deeper context and help prevent the warping of truth.

A powerful communications medium, XR can empower storytellers to amplify big messages at scale. Coming 2020, Verizon Media, RYOT Media and TIME Magazine will release a new location-based entertainment experience that brings Martin Luther King's march on Washington to life, leveraging new advancements in Al, motion and facial capture to immerse audiences in lifelike representations of our shared history.

Collaboration will reach new heights—we'll be able to work in the backseat of the car from multiple virtual display screens with avatars or AR/VR holograms of other remote colleagues: integrating creativity and flexibility into every experience. The most cutting-edge brands will anticipate these changing behaviors, pioneering new ways to engage consumers by allowing them to express who they are, and how to most effectively relate to one another in any given moment in time.

Made possible by 5G, pervasive XR experiences can unlock more fulfilling interactions and an enriched understanding of the world around us.

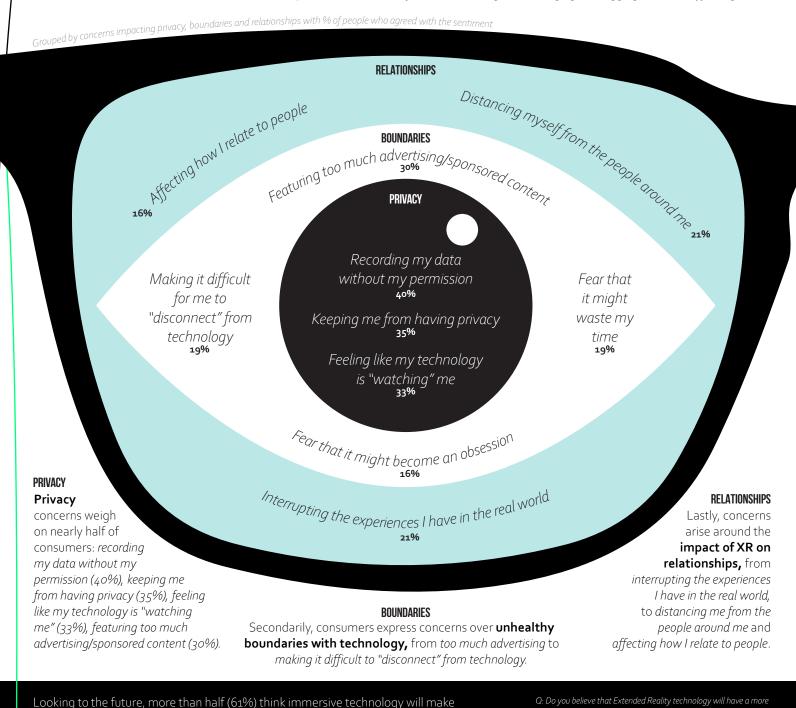
"XR can revolutionize areas such as e-sports and concerts by unlocking access for millions of fans to shared live cultural moments, and also education, where 'learning through doing' can become increasingly democratized."

- Marcie Jastrow, SVP, Immersive Media, Technicolor

## SUPPORTING SELF-DISCOVERY AND GROWTH WITHOUT IMPEDING ON PRIVACY, BOUNDARIES AND RELATIONSHIPS

Beyond designing more affordable solutions, creators and developers must overcome deeper societal concerns.

As with many nascent technologies, the top barrier to XR adoption is cost or being expensive/a waste of money (55%), suggesting a deeper need for education around its value proposition. However, this is immediately followed by an expansive set of deeper societal concerns. These concerns are echoed in perceptions of use cases, too: consumers tell us they are least excited about use cases that layer content on top of the world around them, with the weakest rankings for interactive out-of-home advertising, AR messaging and tagging and 3D wayfinding.



a positive impact on society, led by more than 7 in 10 teens and users of AR/VR. LESS OPTIMISTIC MORE OPTIMISTIC PERCEIVED POSITIVE IMPACT OF XR ON SOCIETY M TEENS NON-USERS & NON-GAMERS **FEMALES** MALES TEENS 62% **72**%

negative or more positive impact on society in the next decade?

"Soon we'll be dealing with an entity, not just a tool. XR is the tip of the arrow for bringing deeper connections with technology to the mainstream."

- M. Pell, Author & Envisioneer/Design Lead, The Microsoft Garage

## **OVERCOMING THE ILLS OF THE INFORMATION AGE**

A mindset shift towards human-centered design can enable a 5G era to overcome certain ills of the Internet era. The convergence of XR and 5G will further enhance our ability to effectively convey ideas visually, spatially and quickly—delivering on the benefits of learning and self-discovery that consumers are so hungry for.

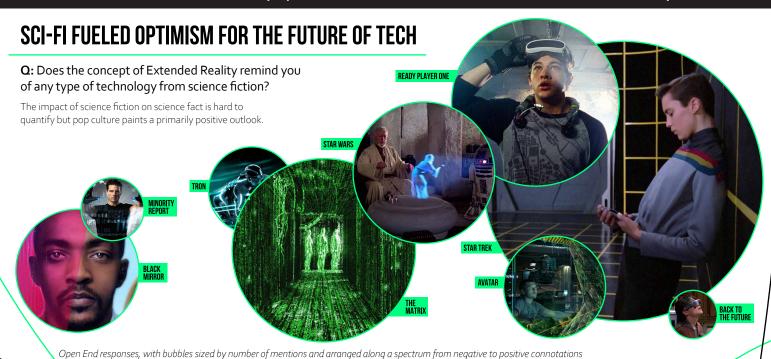
M. Pell, Author, Envisioneer and Design Lead, The Microsoft Garage, suggests that down the line, legacy media like images and video will be embedded into spatial interfaces that present information in more compelling and clear 3D formats.

Do you like to be read the news, but shown a recipe? Do you want to be able to access spreadsheets on-the-go on easy-to-read, virtual screens or watch your favorite sports game at your lunch break on a remote screen, zooming in and out as desired?

M. Pell tells us this will all be possible in the not-so-distant future, as auto-tools become increasingly capable of self-generating multiple formats on the fly. Further, he prognosticates that what content gets served up in a specific moment will be tailored to your unique needs on that occasion, and how best you process information, in any particular context.

Our research points to strong demand for experiences that enable us to become better versions of ourselves, underpinned by powerful new learning, communication and collaboration solutions.

Are consumers ultimately optimistic or anxious for an immersive tech infused society?



It's up to us to create a more positive future unlike anything we can imagine today.

### **METHODOLOGY**

Produced with Verizon and RLab as consulted partners, in October 2019, NRG conducted in-depth expert interviews with over twenty industry luminaries, consumer immersions at RLab, Brooklyn, New York, and ArtCenter, Pasadena, CA, and a quantitative survey among 1500 consumers in the US ages 13-54.

#### **INDUSTRY LUMINARIES**

We might not have all the answers, but what we do know about consumer-led innovation is tantalizing.



Adaora Udoji
Director, Corporate Innovation
& Entrepreneurship, RLab



Amy LaMeyer
Founding Partner,
The WXR Fund



**Chris Edwards** *CEO, The Third Floor* 



**Ciro Donalek** CTO and Co-Founder, Virtualitics



Cortney Harding Founder & CEO, Friends with Holograms



**Debra Davis** Managing Partner, We Are Phase2



Jenny Rodenhouse Director, Immersion Lab, ArtCenter



**Leila Amirsadeghi** Award-winning marketer and co-creator of The Unreal Garden



**M. Pell** Author & Envisioneer/Design Lead, The Microsoft Garage



**Marcie Jastrow** Senior VP - Immersive Media, Technicolor



Martina Welkhoff
Founding Partner,
The WXR Fund



Matt Miesnieks
CEO, 6D.AI



**Matt Neiderhauser** *Co-Founder, Sensorium* 



Nancy Baker Cahill Immersive Tech Artist



**Ori Inbar** Co-Founder, Augmented World Expo and Super Ventures



**Raul Carvajal**Producer, Games for Change



Stephanie Riggs Creative Director - Experiential, Refinery 29; Author & Lecturer, Yale Blended Reality Lab



Tony Parisi Global Head of AR/VR Ad Innovation, Unity Technologies

## **ARE YOU READY TO INNOVATE?**

Beyond our finger on the pulse of 5G and the immersive media ecosystem, we have a robust innovation practice where we evaluate new products and experiences on their breakthrough potential. Leveraging the art and science of testing concepts, we test features, benefits and messages to uncover the unique DNA of a big idea.

To learn more about this study or how we can help your business innovate, get in touch.



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National Research Group is a leading global insights and strategy firm at the intersection of entertainment and technology. Rooted in four decades of industry expertise, the world's leading marketers turn to us for insights into growth and strategy for any content, anywhere, on any device. Working at the confluence of content, culture and technology, NRG provides insights to bold storytellers everywhere.



Watch this Space is a think tank at National Research Group (NRG) charting emerging global trends changing how we interact with the world around us. Combining robust research design with innovation expertise, Watch this Space creates new industry knowledge on the future of content and technology, capturing unmet opportunities and evolving consumer expectations.