5G AND VR

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5G AND VR

1 Consumer Trends

2 5G

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TV & MEDIA CONSUMER TRENDS

ERICSSON

ERICSSON CONSUMER LAB RESEARCH

REPRESENTING
1.1 BILLION
PEOPLE

MORE THAN
40
COUNTRIES

100,000
RESPONDENTS

15
MEGACITIES
STUDIED

GLOBAL KEY INSIGHTS:

TV Media 2017

VR will reignite the campfire experience of TV

- Today's solitary video on demand (VOD) viewing experience is set to become more of a social activity than it is today - this time in VR
- The social and immersive aspects of VR are key reasons why the majority of current and potential VR users believe the technology will be an essential component of TV and video in the future

Smartphone viewing doubles

- Around 70 percent of consumers watch TV and video on a smartphone today – twice as many as in 2012
- Smartphones make up a fifth of total viewing, with approximately six hours per week spent watching TV and video on the device

TV couch potatoes get up and go!

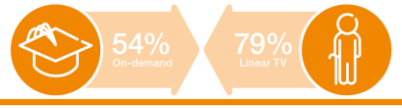
- By 2020, only 1 in 10 consumers will be stuck watching TV only on a traditional screen, a 50 percent decrease compared to 2010
- As couch potatoes disappear and high-usage and high-spending multi-screen viewers increase, both scheduled linear TV and on-demand services stand to benefit!

Content discovery remains a challenge

- As the number of TV and video services increase, so does the average time spent searching for content – it has already seen an increase of 13 percent from last year, reaching almost one hour per day
- Current content discovery capabilities are failing to cope with consumers' usage of multiple video services and devices, which is why 7 out of 10 consumers say a universal search feature would be very useful

On demand soars among teenagers

- 16–19 year olds spend more than half of their time watching on-demand, an increase of more than 100 percent – or almost 10 hours a week – since 2010
- 60–69 year olds, on the other hand, still spend almost 80 percent of their viewing time watching live and scheduled linear TV, which is almost as much as in 2013



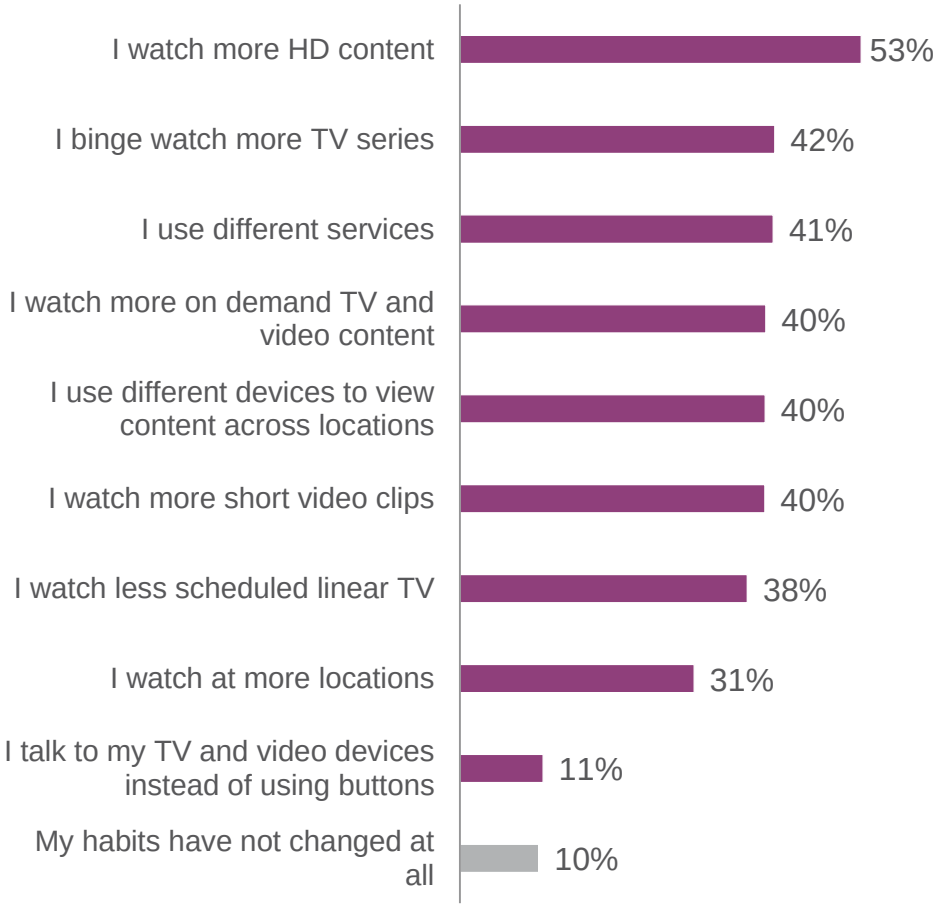
Mobile and on-demand by 2020

- Half of all viewing will be done on a mobile screen, and half of this will be done on the smartphone alone
- About 7 out of 10 consumers will prefer on-demand and catch-up services over scheduled linear TV viewing, and almost half of all viewing will be on demand
- A third of consumers are projected to use VR

Source: Ericsson ConsumerLab TV & Media 2017 Study

5 YEARS CAN MAKE A HUGE DIFFERENCE

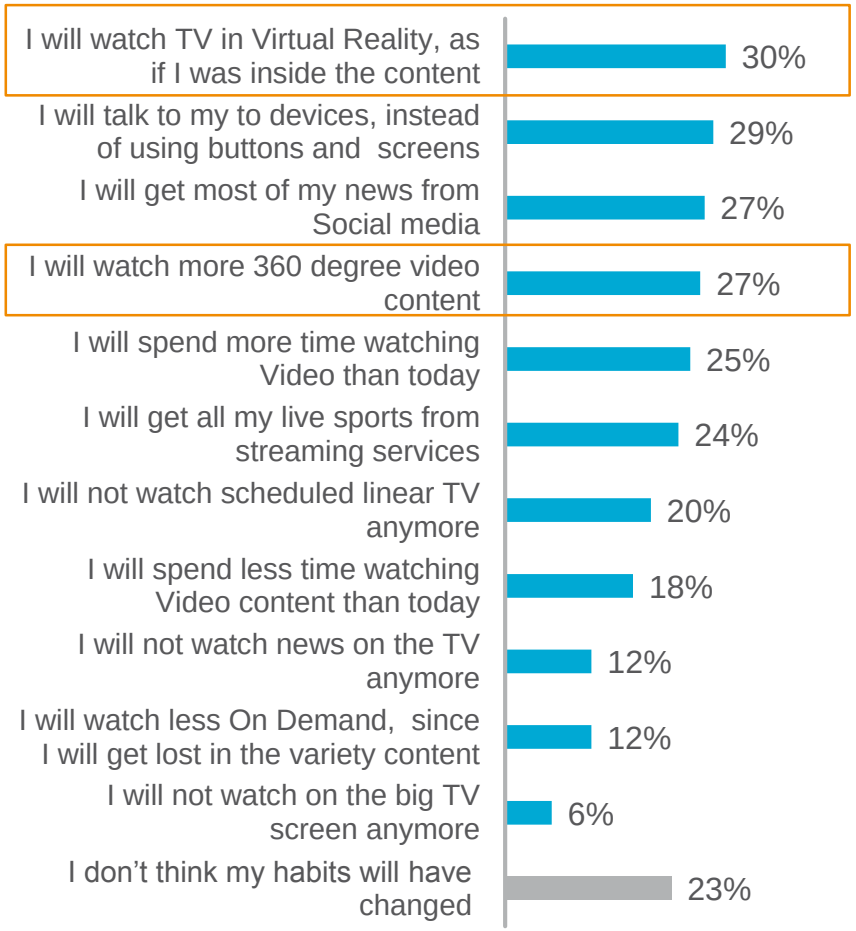
Percentage of consumers that have changed their habits **in the past 5 years**, overall (Self-reported)



What has changed from 5 years ago

What will change in 5 years time

Percentage of consumers that believe they will change their habits **over the next 5 years**, overall (Self-reported)

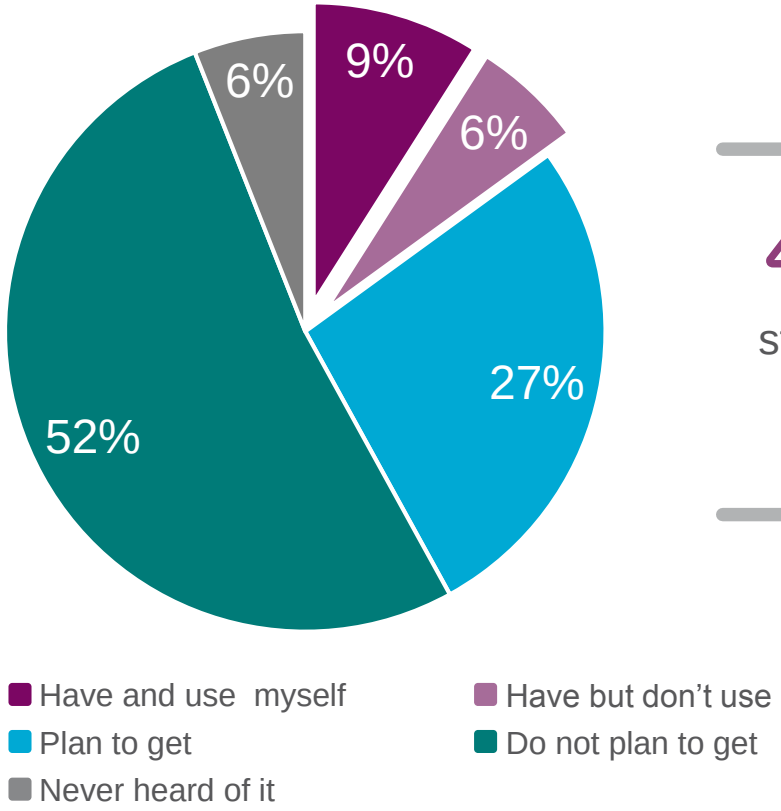


BASE: Population aged 16-69 watching TV/Video at least weekly and having Broadband at home in Brazil, Canada, China, Germany, India, Italy, Russia, South Korea, Spain, Sweden, Taiwan, UK & US

Source: Ericsson ConsumerLab TV & Media 2017 Study

BY 2020, 1 IN 3 CONSUMERS WILL BE VR USERS

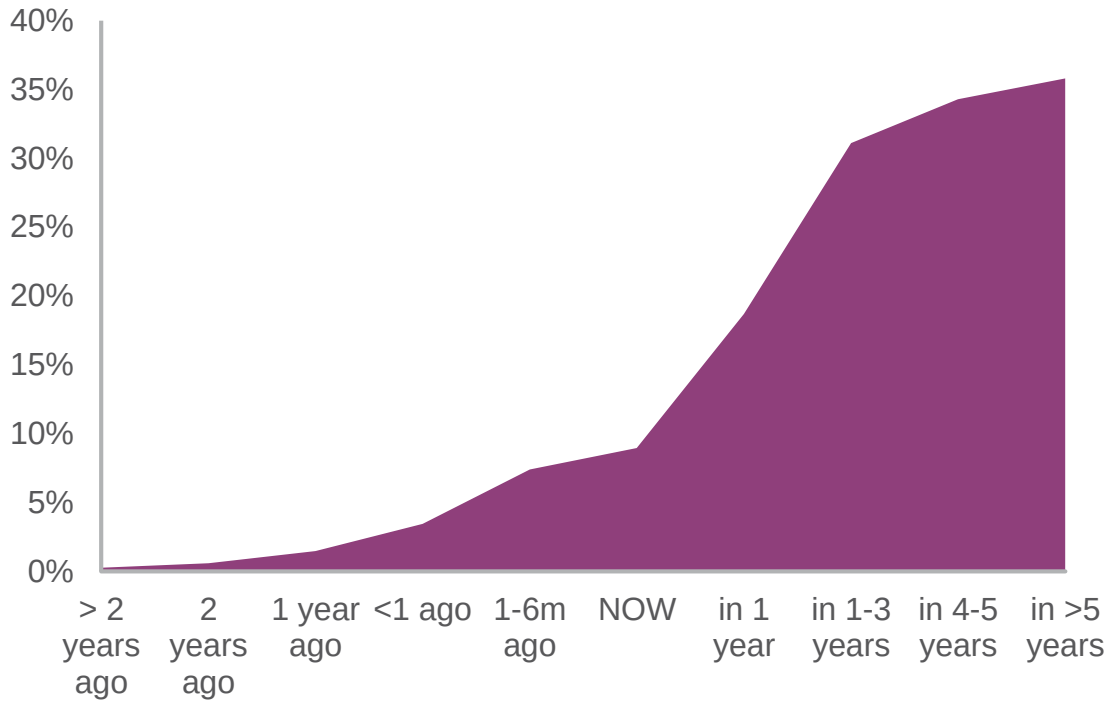
Percentage of consumers owning Virtual Reality headsets, (Self-Reported)



4 IN 5

started using VR less than one year ago

Percentage of consumers that use Virtual Reality, when they started and when they will start (Self-Reported)



BASE: Population aged 16-69 watching TV/Video at least weekly and having Broadband at home in Brazil, Canada, China, Germany, India, Italy, Russia, South Korea, Spain, Sweden, Taiwan, UK & US

Source: Ericsson ConsumerLab TV & Media 2017 Study

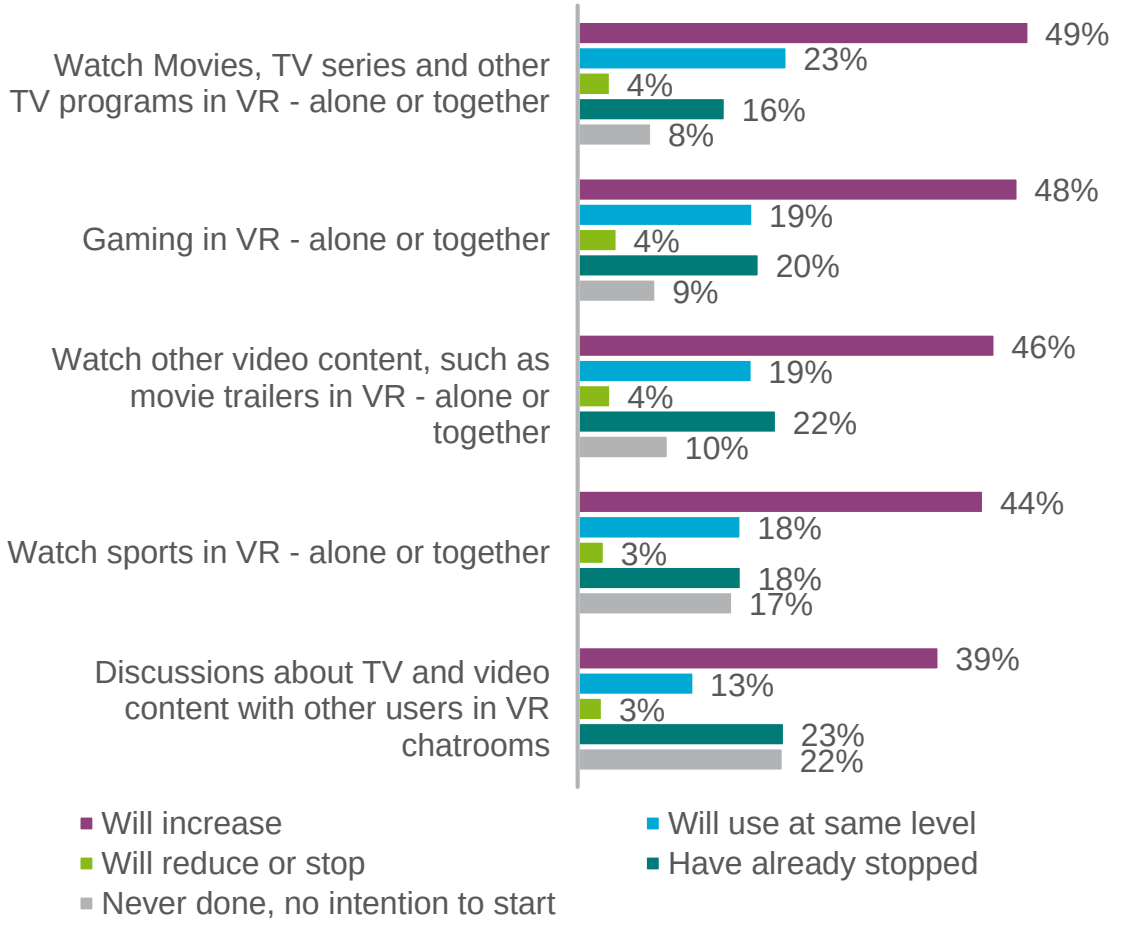
VR IS NOT THE NEW 3D!

<4% Of the VR users believe their usage of gaming and video activities in VR will reduce over the next 5 years.

59% Of the VR users believe their overall usage of VR will increase over the next 5 years

57% Of the VR user believe VR will be a natural part of the TV experience within 5 years. And 48% of the potential users agree with them.

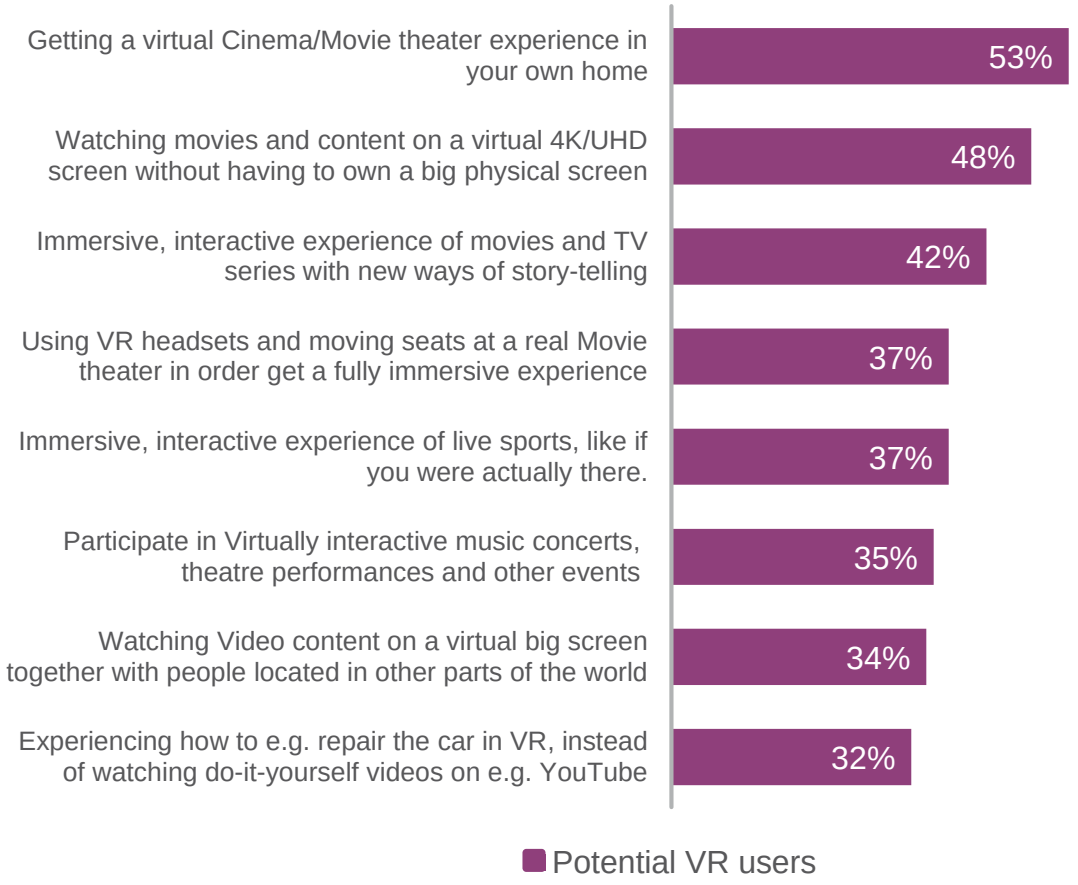
How VR users believe their activities in VR will change over the next 5 years (Self-reported)



BASE: VR users aged 16-69 watching TV/Video at least weekly and having Broadband at home in Brazil, Canada, China, Germany, India, Italy, Russia, South Korea, Spain, Sweden, Taiwan, UK & US
Source: Ericsson ConsumerLab TV & Media 2017 Study

WHAT DO THEY WANT TO DO WITH IT?

Percentage of potential VR users that believe they will regularly do each VR activity in the future (Self-Reported)



46% Of the potential VR users believe VR will be popular for watching TV and video together with remote friends and family

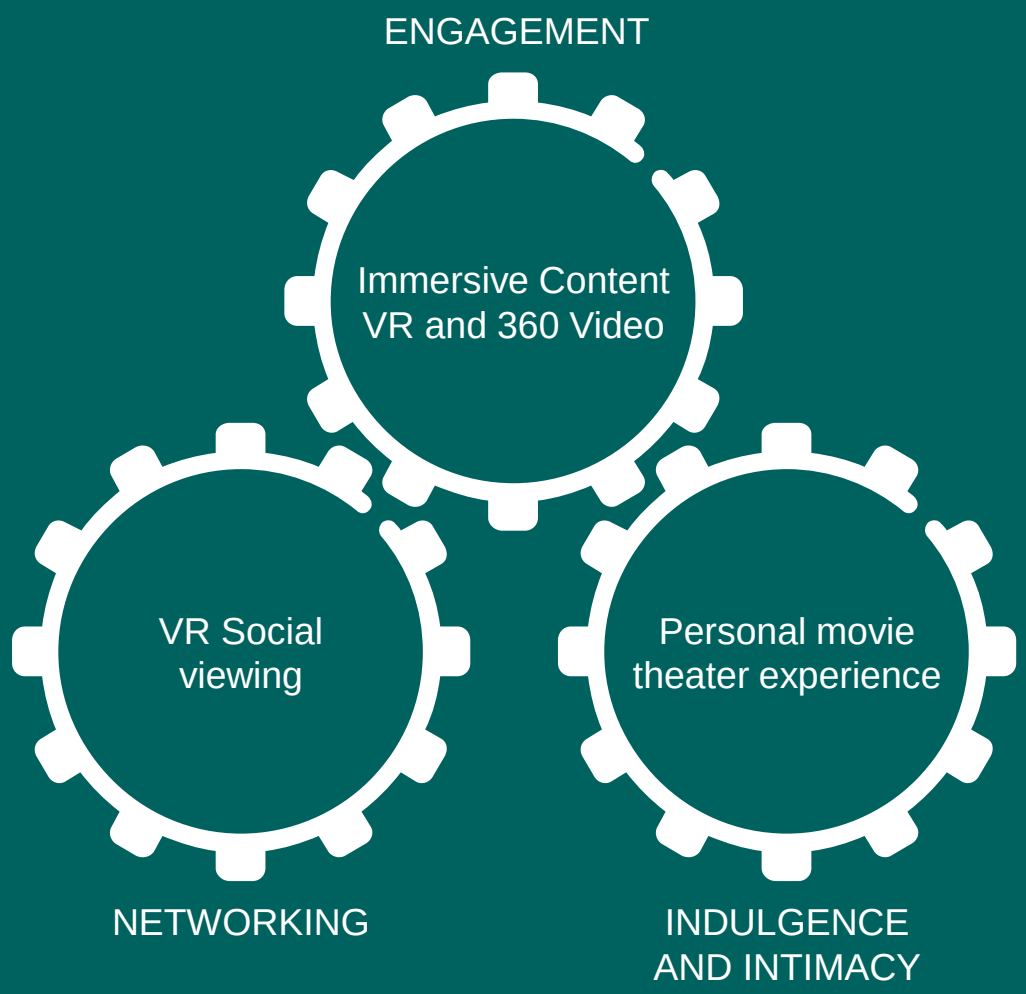
54% Of the potential VR users believe Video viewing will be one of the most popular uses of VR

2 IN 3

VR users are also very interested in getting a virtual movie theater experience in their own home

BASE: Potential VR users aged 16-69 watching TV/Video at least weekly and having Broadband at home in Brazil, Canada, China, Germany, India, Italy, Russia, South Korea, Spain, Sweden, Taiwan, UK & US
Source: Ericsson ConsumerLab TV & Media 2017 Study

DIFFERENT DRIVERS FOR VIDEO IN VR



"I can meet people from all over the world, and watch videos with them on a giant virtual screen. So if you live alone like me, this is a big deal!"
– Chuck

VR users watching Youtube together on the app AltspaceVR

"A big positive of video in VR is privacy, especially if there are people around, since nobody else can see your screen. If I could view it on a flight or while commuting, it would be great."
– Jeremy

Source: Ericsson ConsumerLab TV & Media 2017 Study

GLOBALLY, BY 2020...

~1/4
of all viewing will be done on a smartphone

~1/2
of all viewing will be on-demand

~1/3
of consumers will be VR users

Source: Ericsson ConsumerLab TV & Media 2017 Study

5G
ERICSSON

WIRELESS ACCESS GENERATIONS

The foundation of mobile telephony	Mobile telephony for everyone	The foundation of mobile broadband	The evolution of mobile broadband	Non-limiting access; anywhere, anytime, anyone, anything
1G	**2G**	**3G**	**4G**	**5G**
AMPS TACS NMT	GSM D-AMPS PDC IS-95	WCDMA/HSPA CDMA2000	LTE	
~1980	~1990	~2000	~2010	~2020

5G CHARACTERISTICS

1000X
Mobile Data Volumes

5X
Lower Latency

10X
Battery Life

10-100X
End-user Data Rates

10-100X
Connected Devices

Critical Communications

<5ms e2e delay
99.999% transmission reliability
500Kmph relative velocity

Extreme availability

Intelligent Transport Systems

Massive Communications

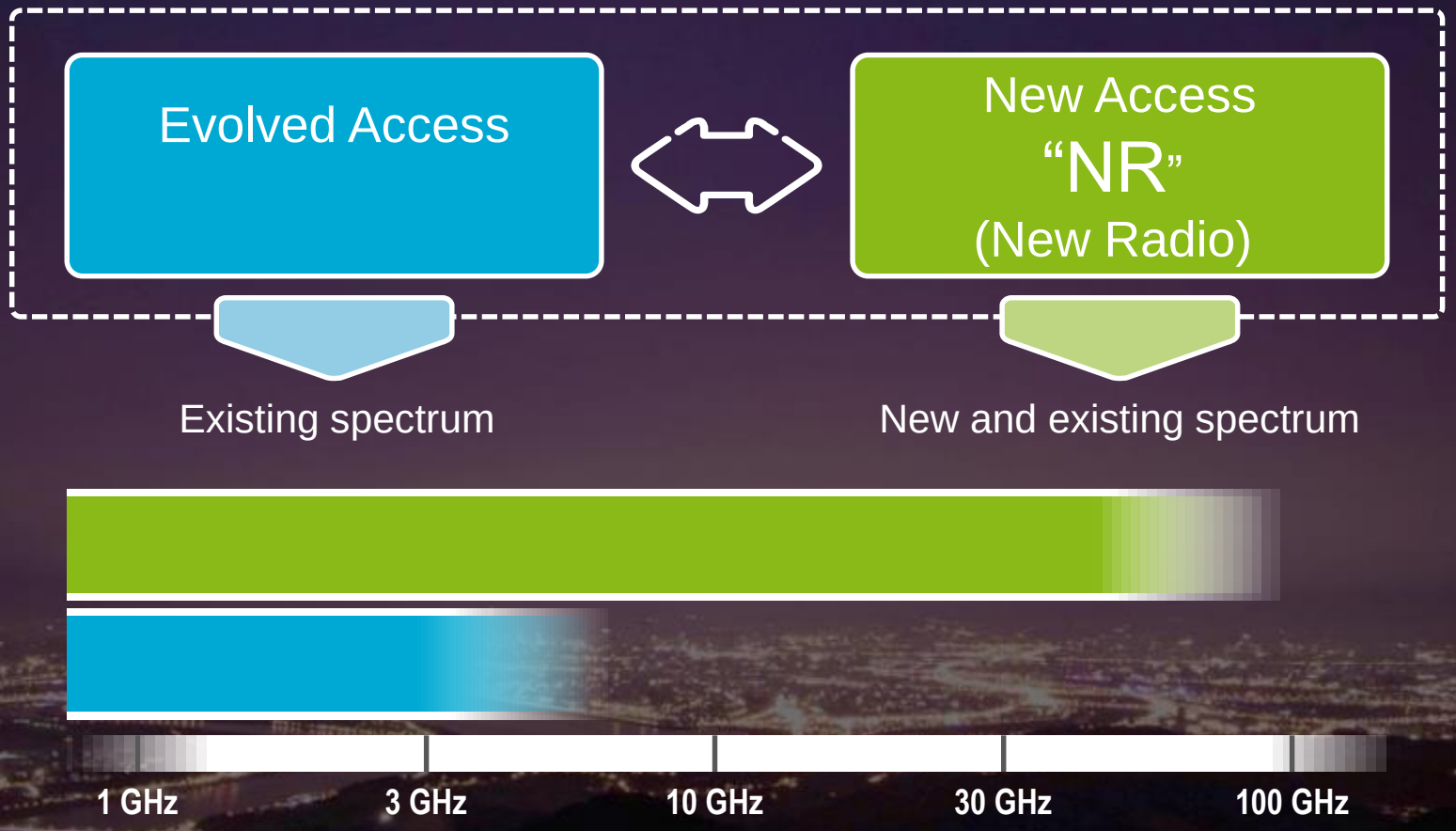
>10yrs battery lifetime
>80% cost reduction
20dB better coverage

Scalability and flexibility

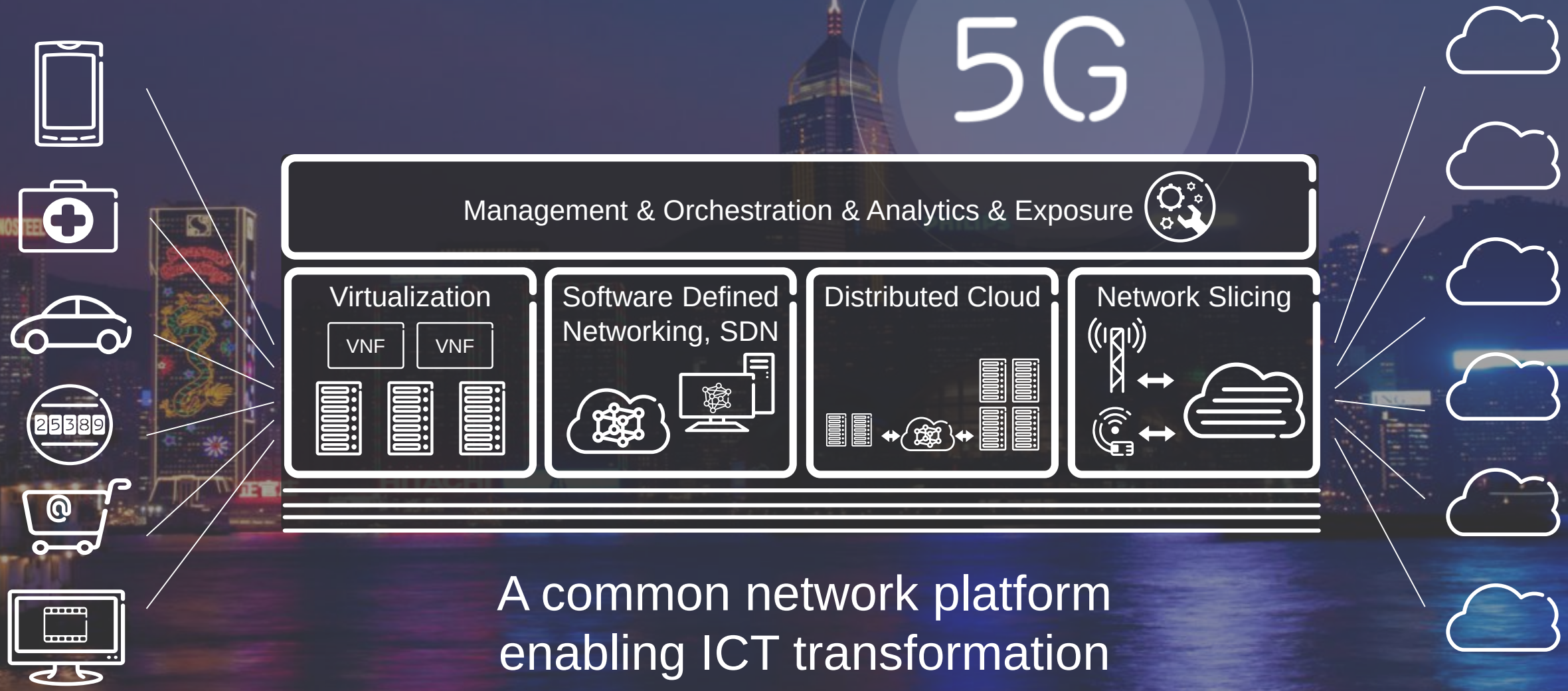
Connected Sensors

Source: METIS

5G RADIO ACCESS



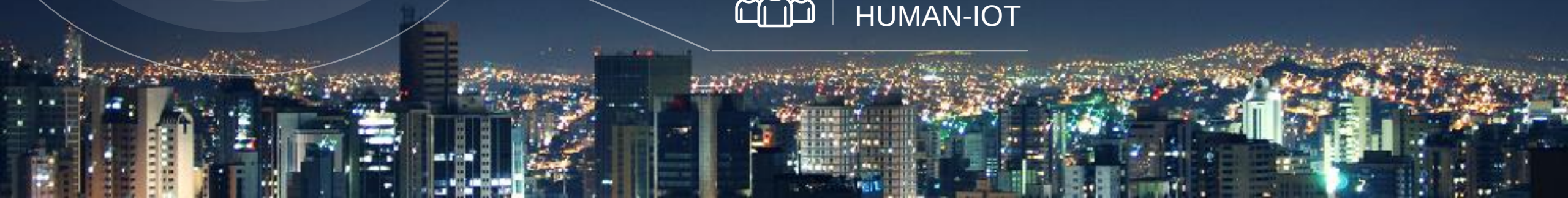
ONE ARCHITECTURE–MULTIPLE INDUSTRIES



A common network platform enabling ICT transformation

5G USE CASES

- SENSORS EVERYWHERE
- BROADBAND AND MEDIA EVERYWHERE
- SMART VEHICLES, TRANSPORT
- INFRASTRUCTURE, MONITOR AND CONTROL
- CRITICAL CONTROL OF REMOTE DEVICES
- INTERACTION HUMAN-IOT



VR IN 5G

5G

RE-DEFINING THE MEDIA LANDSCAPE

5G

1000X
Mobile Data Volumes

5X
Lower Latency

10-100X
Connected Devices

10-100X
End-user Data Rates

>10yr
Battery Life

Broadband and Media Everywhere!

- All media user cases
- In all user settings
- In all parts of the world

5G ESTIMATED PERFORMANCE WHAT 5G WILL ENABLE

THE IMPACT OF 5G

5G

WHAT 5G BRINGS	HOW
Mobile Broadband Expansion	Infrastructure and capacity to meet consumer demand
Capability for Enhanced Viewing	UHD AR/VR
Fixed Wireless Access	Dedicated home solutions with hybrid access
New Opportunities	Content uplink for industrial usage Enterprise solutions Media slices for in-venue solution

THE OPPORTUNITIES

5G

AR/VR

Enhanced Media

Digitization of Industry

VR Communication

ENHANCED MEDIA WITH IMMERSIVE AND SHARED EXPERIENCES

MULTI-TV VR EXPERIENCE

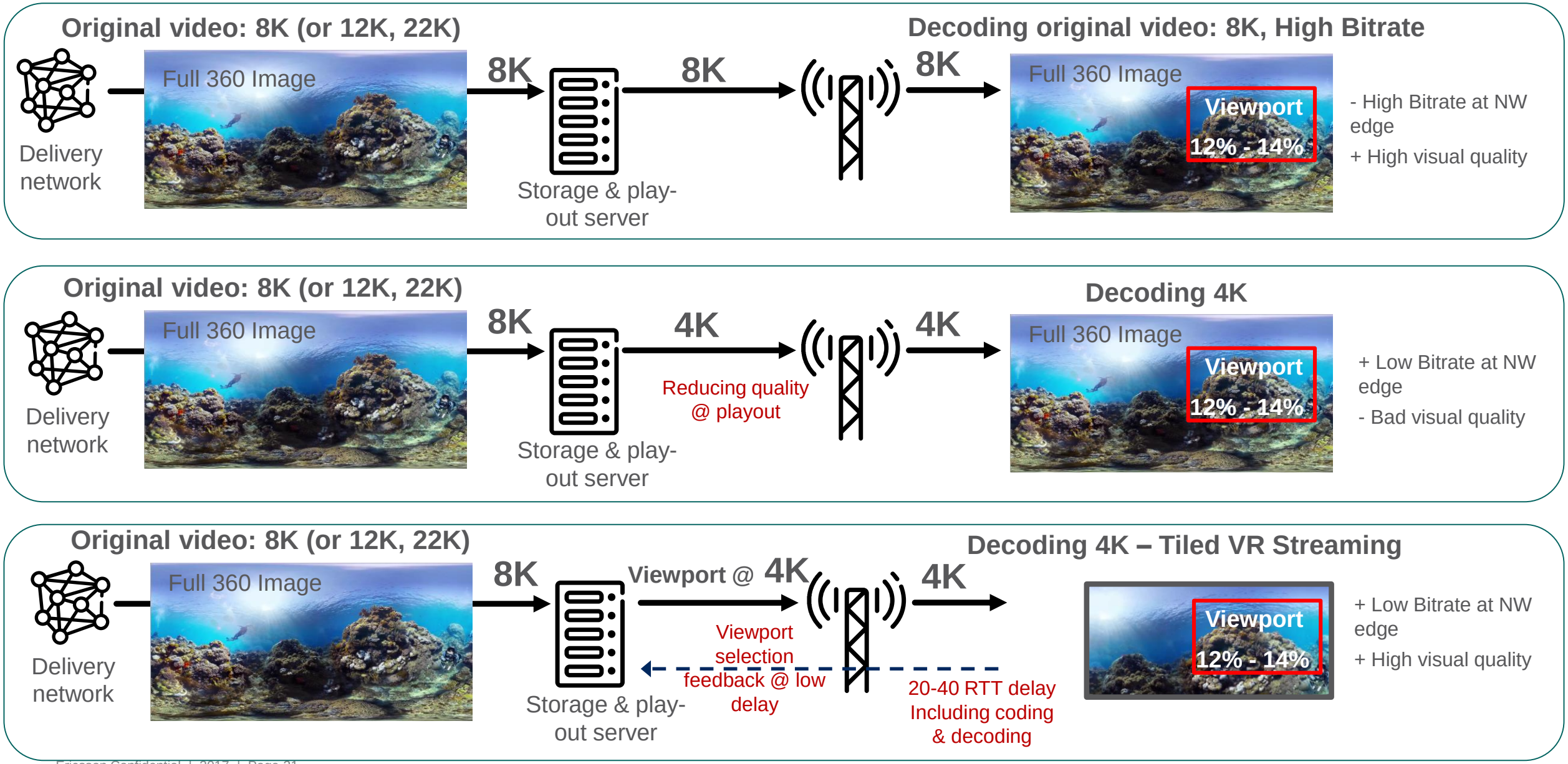
- The use case demonstrated is for a virtual sports bar allowing a user to watch multiple sporting events that are being aired at the same time.
- Each display has the option to enable time shift. The multicast and unicast streams and the TSTV are managed based on the field of vision.
- Bandwidth usage is displayed near real time based on where the televisions are in relation to the user's field of vision.
- VR Device is a Samsung Gear VR.

MULTI-DISPLAY VR RACING EXPERIENCE

- The use case demonstrated is for a virtual garage allowing a user to watch multiple displays from a race. Examples are race broadcast, extended views around the track and in car view.
- Each display has the option to enable time shift. The multicast and unicast streams and the Time-Shifted content are managed based on the field of vision.
- Bandwidth usage is displayed near real time based on where the displays are in relation to the user's field of vision.
- VR Device is an Oculus Rift.

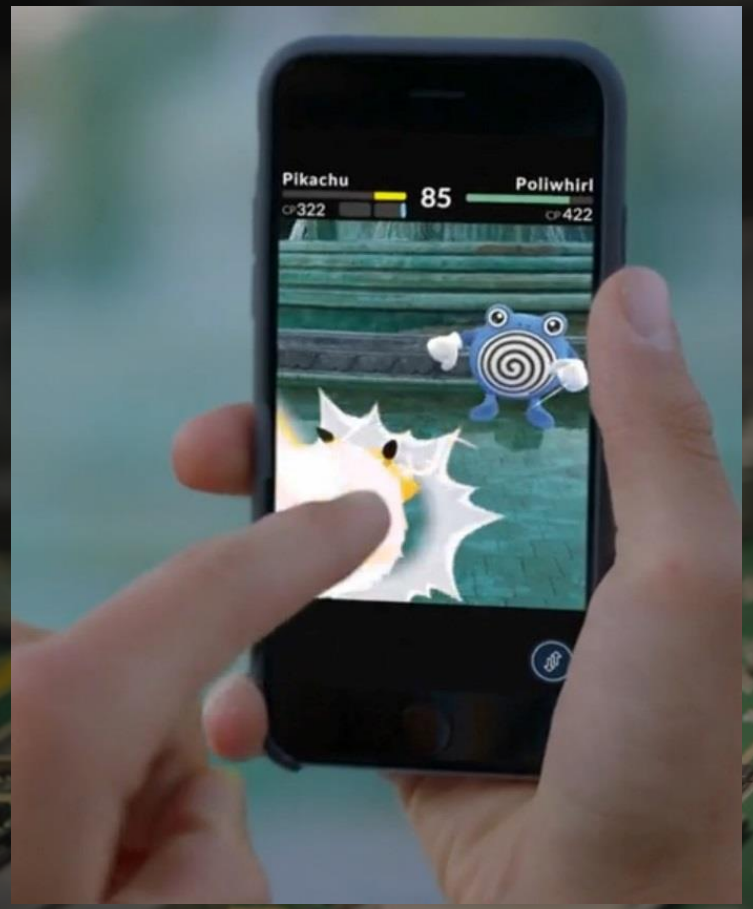
VR360 VIDEO STREAMING SOLUTIONS

TILED VR STREAMING BINGING TOUGH REQUIREMENTS ON DELAY



DIGITIZATION OF INDUSTRY
THE TRIPLE "A" ERA

Augmented Reality

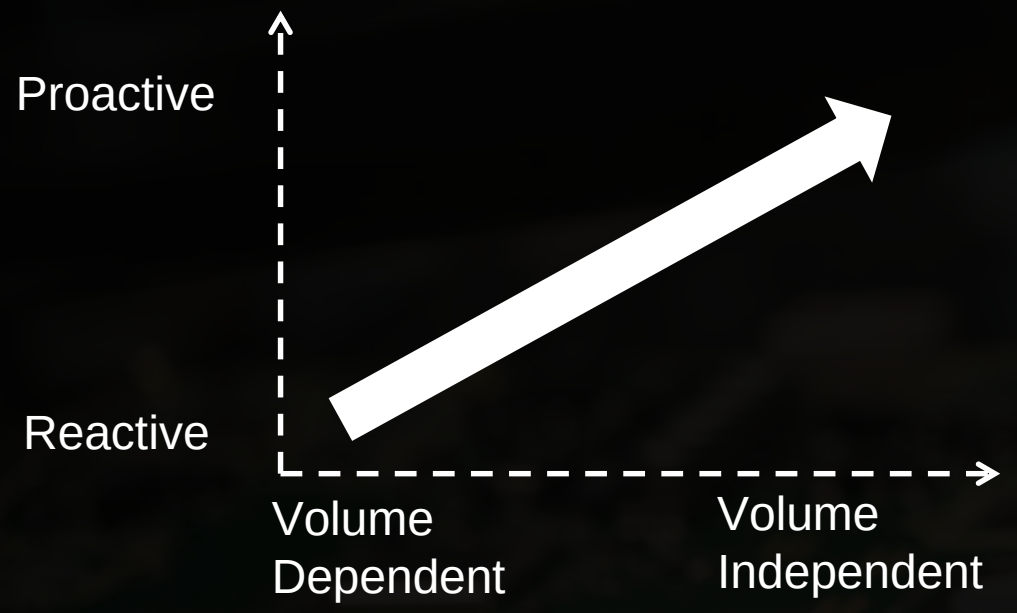


Artificial Intelligence

Autonomous Vehicles

DRIVERS FOR SMARTER MANUFACTURING

Flexibility



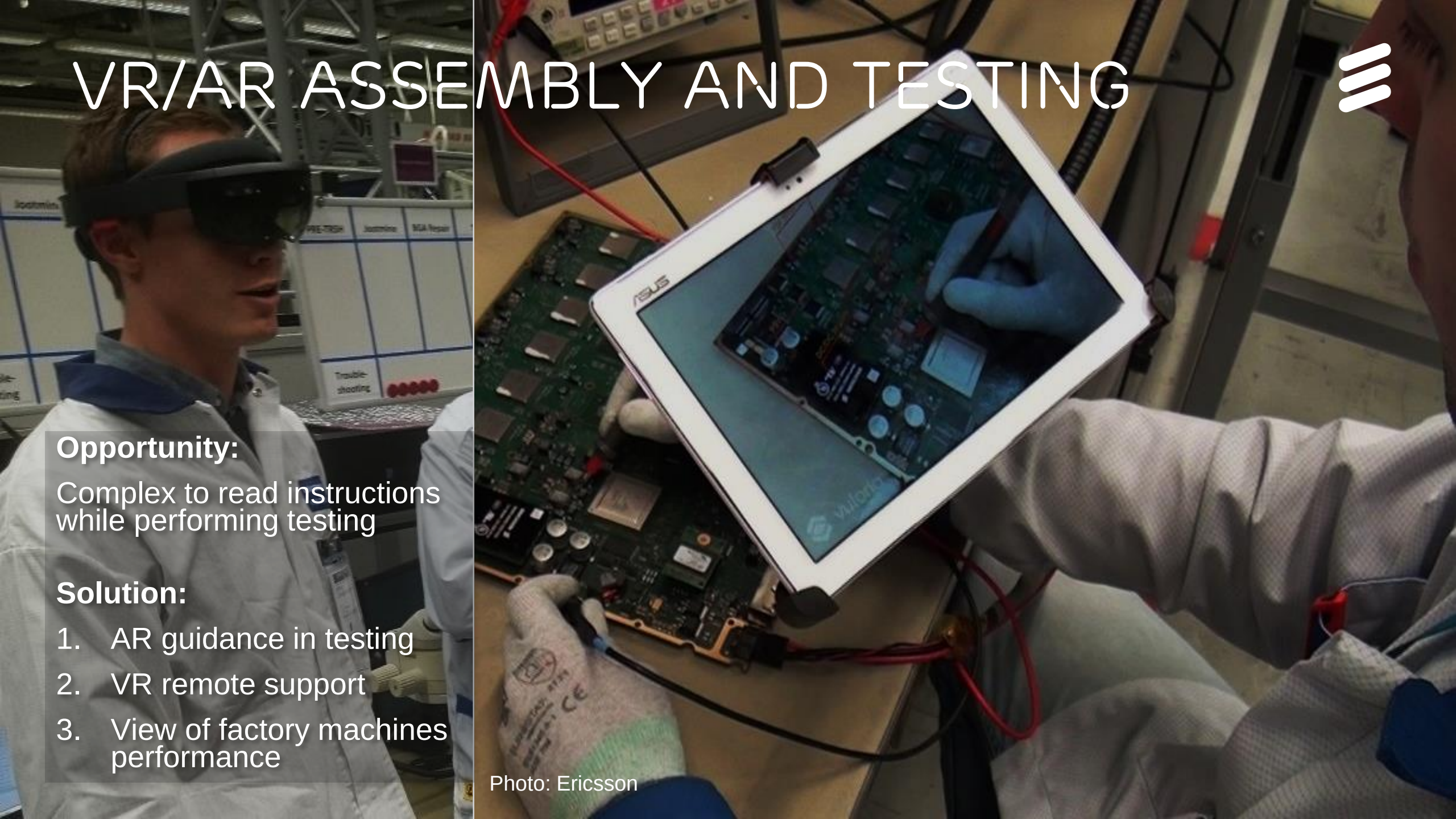
Competitiveness

Enhane safety

Increase efficiency

Attract talent

VR/AR ASSEMBLY AND TESTING



Opportunity:

Complex to read instructions while performing testing

Solution:

1. AR guidance in testing
2. VR remote support
3. View of factory machines performance

Photo: Ericsson

5G AND VR

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1 Consumer Trends

- VR will reignite the campfire experience of TV
- Consumers see great potential to change the media experience

2 5G

- New radio and networks architecture will enable an exponential performance improvement
- 5G will enable converged media and industrial opportunities

3 5G and VR

- Enhanced media experiences
- Industrial efficiency, safety and aided autonomy
- VR communications

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