

5G: Follow the Money

Exploring investor trends
to inform network decisions



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“A lot of companies like Uber and Netflix have made billions of dollars from 4G data services. Carriers didn’t really get a slice of the cake.”

– WWT research of service providers by Deep Blue Thinking, August 2020

History repeating?

5G might have become a reality, but how to make money from this new technology is still underexplored. And there’s prevailing concern that, when it comes to the spoils from implementing the technology, history will repeat itself: the lion’s share of new revenue will go to the companies using 5G’s capabilities to build innovative new products, rather than providers of the bandwidth.

Justifiably so, many network operators fear being consigned to the status of the ‘dumb pipe’ that carries the data of technology companies’ innovative services.

This fear is creating inertia. The upshot is that, for now, we are all still waiting for 5G’s big bang moment – an app or service that so clearly illustrates the value of 5G that a wave of new apps and services follow. Until we get it, 5G is essentially 4G with an uptick in speed, and neither consumers nor businesses will be willing to pay extra for more of the same.

A revolutionary change is needed. Key to that change will be the creation of truly transformative applications.

These applications will leverage 5G’s potential not as a means to transport data, but as a pervasive, liquid, ‘network as a platform’ that can provide computing, storage, analytics, AI and more, wherever and whenever they are required. That’s where 5G will show what it can really do.





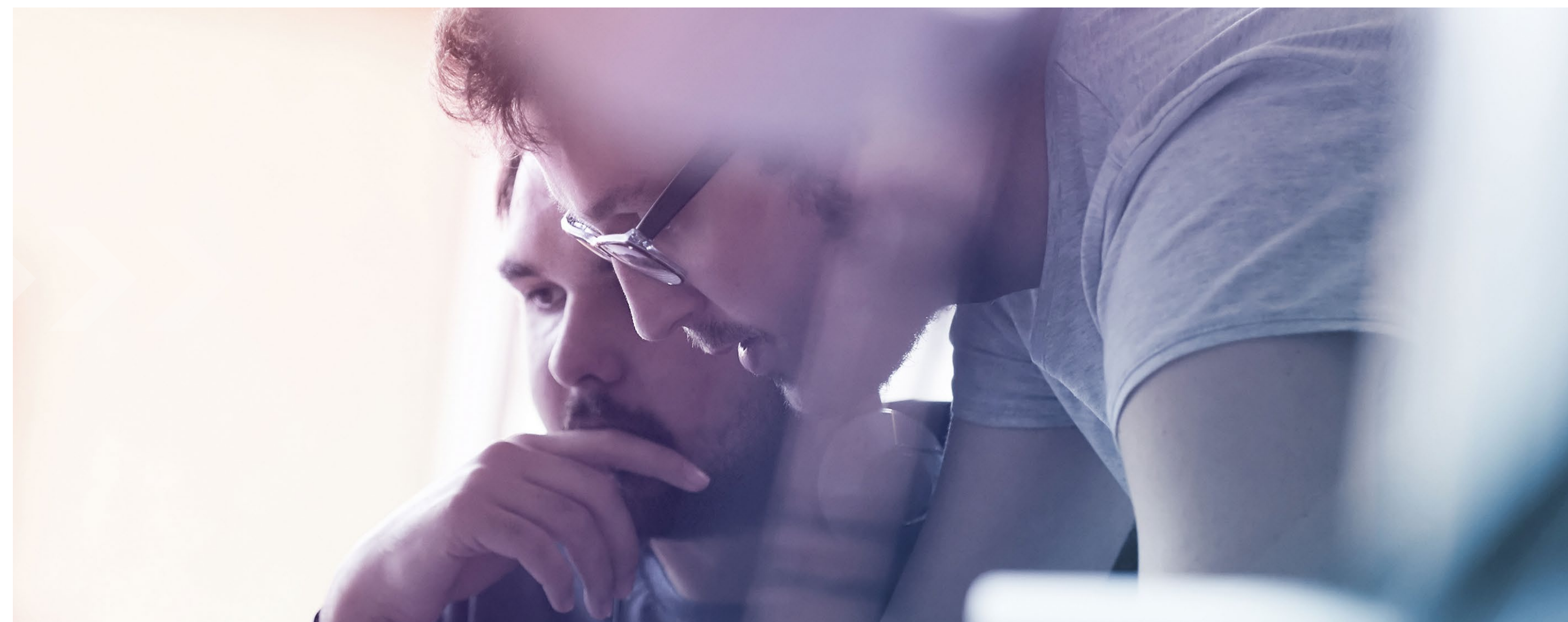
The 5G gamble

If we look back at 4G, it's clear that a lot of money has been made from applications that were impossible before the technology emerged. 4G made the likes of Instagram, Netflix and Uber the all-conquering services they are today, not to mention empowering high-speed access to business applications on the go, nor live video calls using FaceTime, Teams and WhatsApp.

When it comes to 5G, the technical side of implementing a network tailored to accelerating next-generation applications is challenging, but not insurmountable. What makes it all the more complicated is the varying needs of these applications, as building a network that is optimized to every one of them is impractical. A network purpose-built for drone deliveries is not the same as one made for mass consumption of the metaverse.

We have something of a chicken and egg situation. Service providers are understandably hesitant to make big investments that enable specific applications before the applications come to fruition and the opportunities are laid plain.

With 5G, it's not yet clear where to place the bets.



***“5G is currently very much a ‘one-size-fits-all’ proposition – with these early deployments all sessions are basically the same. The real promise of 5G is in the potential to reconfigure the network in real-time – to slice the network. A group of smart electric meters in people’s homes might need to connect once every half hour and send a small packet of data; that is very different to a use case like VR, which requires lots of bandwidth, and very low latency.*”**

Slicing lets you define the attributes and quality of your service differently and serve each use case appropriately. This is the big investment operators should be looking at over the next 18 months if they are to make the dreams of 5G a reality.”

– Ian Bartlett, Senior Technical Sales Specialist, Intel





Following the money

So we went to the smartest guys in the room, and the people with perhaps the greatest interest in making 5G applications pay: technology investors.

Investors have a track record of success in the 4G era. Think Sequoia with WhatsApp, Creandum with Spotify, First Round Capital and Lowercase Capital with Uber, just for starters.

Of course, as with any tableau as wide and varied as 4G, the heroic failures outnumber the successes. But on balance investors make or break their fortunes on their ability not just to know what's going to fly, but when it needs to be in the public realm in order to do so.

In Bill Gross' words: "Execution definitely matters a lot. The idea matters a lot. But timing might matter even more."¹

We spoke to 100 investors in the United States and United Kingdom to find out which sectors and technologies they anticipate will be transforming first in the 5G era. We wanted to know where they themselves are placing their bets, and, therefore, where the greatest revenue opportunities are likely to lie.

In other words, to find out where the 5G opportunity is, we followed the money. This report outlines the findings of this research, and our analysis of the results.

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Methodology

WWT worked with Walnut Unlimited to conduct 100 interviews with VCs and investors across the UK (35) and US (65) between August and September 2021.

We asked each of them a series of 16 quantitative and three qualitative questions.

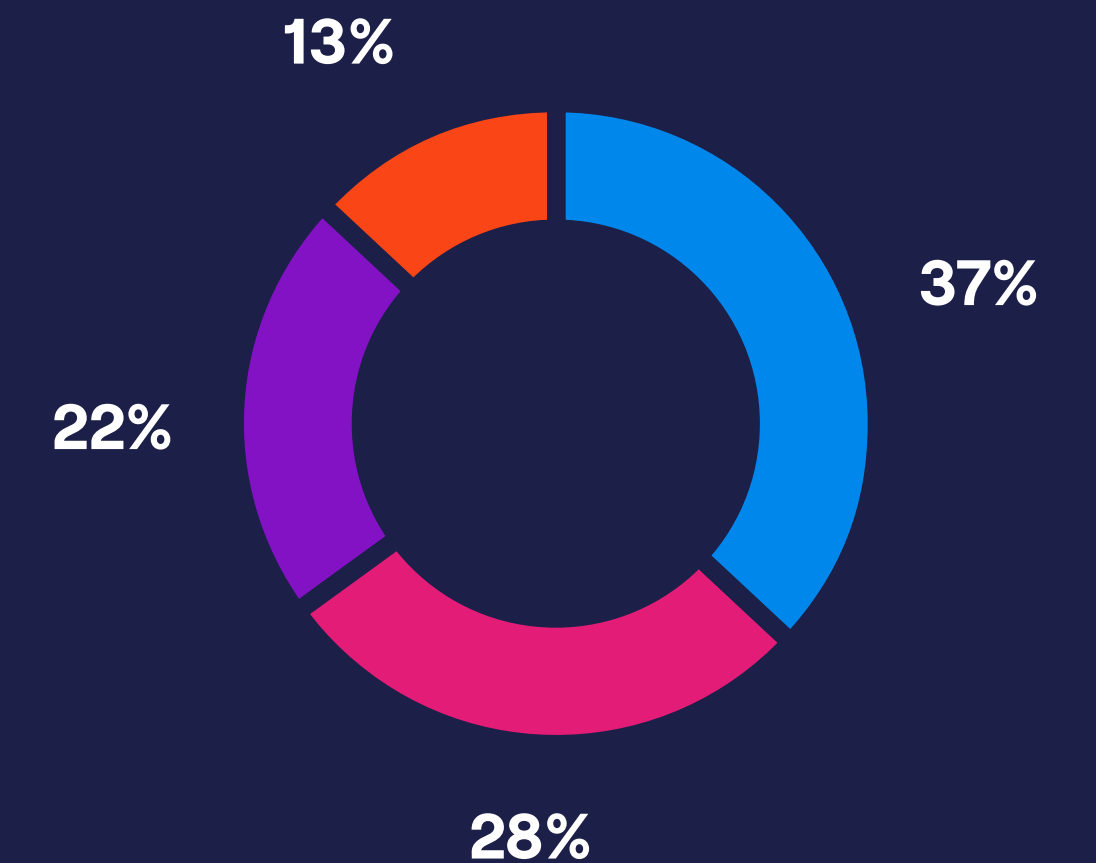
All of the respondents worked in finance, with the following breakdown:

- **37% investment banking**
- **28% hedge funds**
- **22% private equity**
- **13% venture capital**

Respondents were selected on the basis of their focus on studying specific sectors to inform investment decisions. All specialized or took an active interest in telecoms and/or IT.

More than half of the respondents manage assets of more than \$2 billion, while two in five manage assets of more than \$5 billion.

Investor profile:
the organizations our
respondents work for





“
It will be a
new industrial
revolution...”
”

- Segment of investor response when asked
“What sector is most likely to be disrupted
as a result of 5G technology?”

Follow the Money: The topline figures

The statement to the left is from one of the comments we received from the qualitative portion of our research. Indeed, one of our overarching findings is that **there is a great deal of enthusiasm – and expectation – for the prospects of 5G** among investment houses and venture capital.

Investors are backing the technology, and they’re backing it strongly. In fact, **92% of companies we spoke to are invested, or planning to invest**, in companies dependent on 5G technology.

According to our estimates, the funds these 100 respondents represent are **investing \$59bn in 5G this year**, and they expect this investment to grow to **\$94bn within 5 years.**²

The graph on the next page shows the growth of 5G investment that our respondents have made to the present day, as well as investments they anticipate being made in five years’ time.

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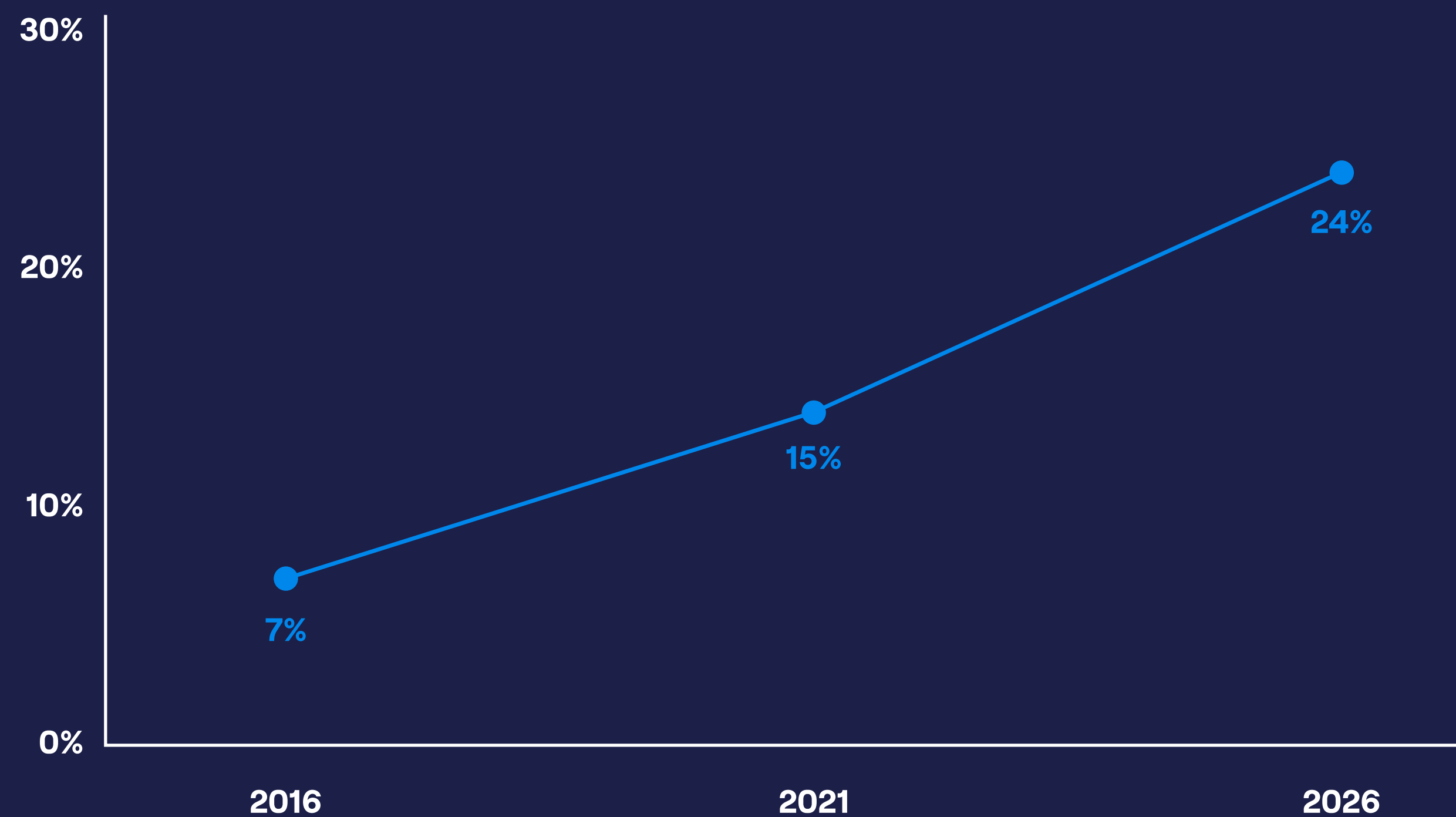
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Approximately what proportion of your organization's portfolio was invested five years ago, and what proportion will be invested in 5G-enabled companies in five years' time?

Proportion of portfolio invested in 5G-enabled companies



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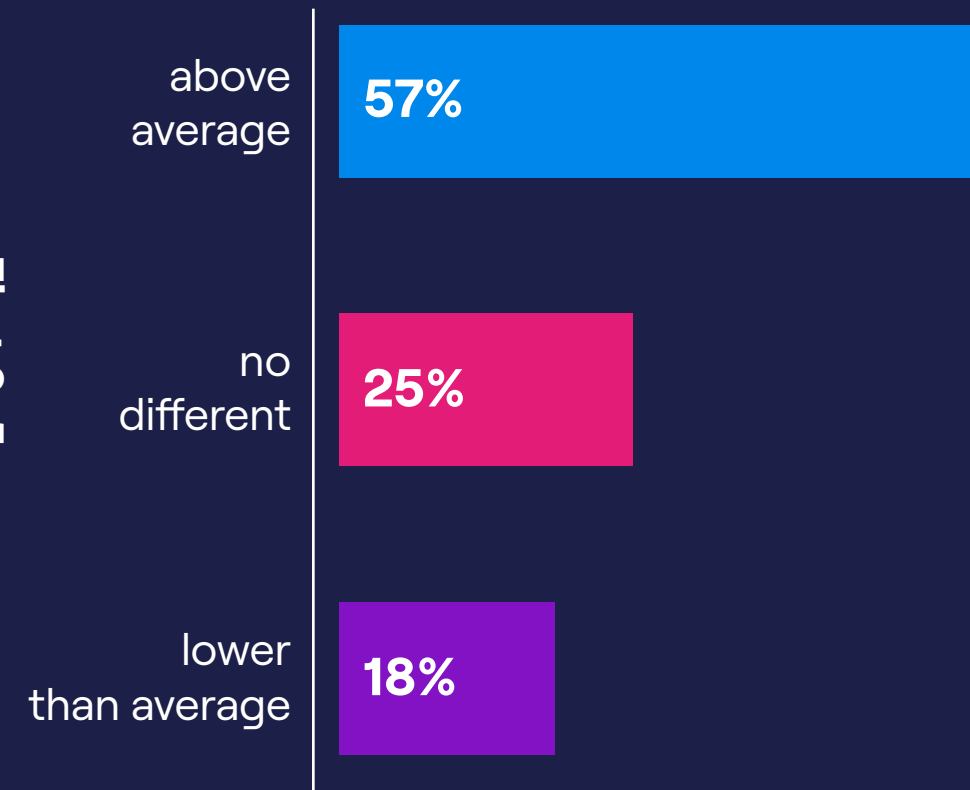
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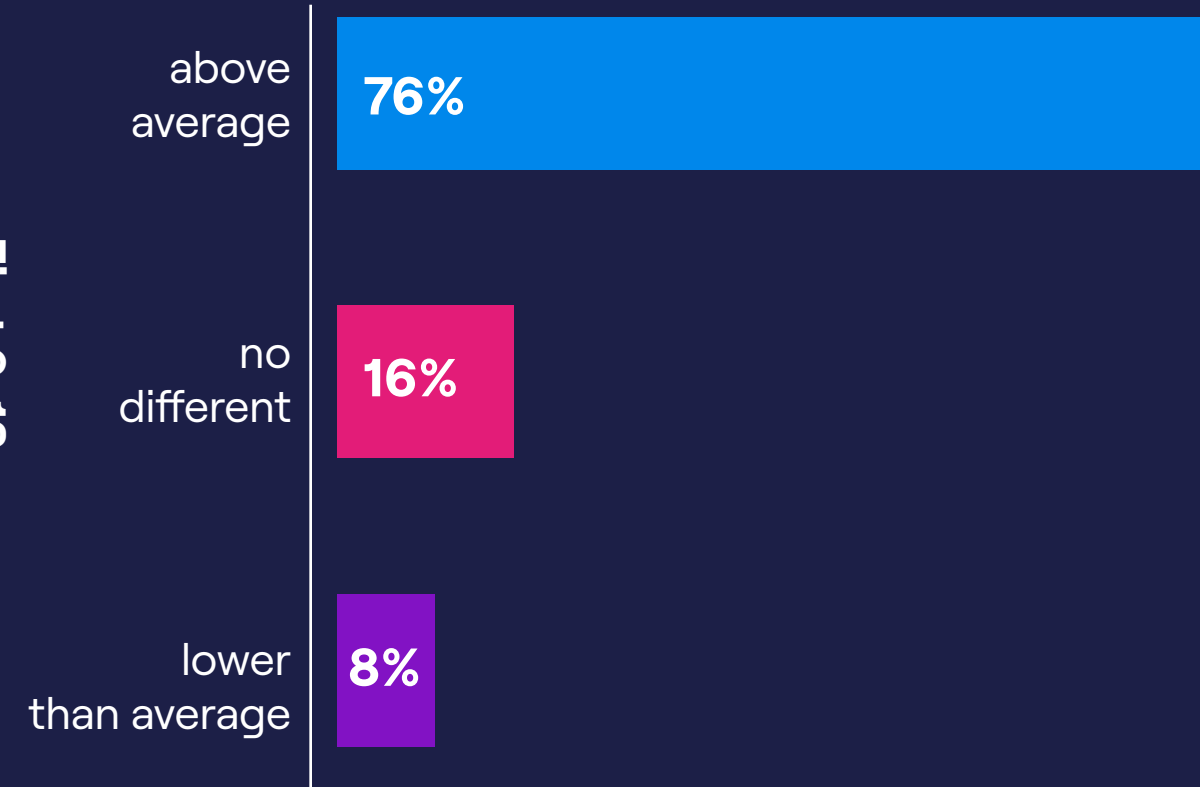


Expectation of return on 5G investments

First 3-5 years



First 6-10 years



Compared to the average of other areas you are investing in; how would you describe the return on investment from 5G-enabled companies and technology?

It's clear that investors are anticipating strong returns on their investments. 5G-reliant companies are expected to provide above average returns by 57% of respondents, with only 18% predicting a lower than average return. And the returns are expected to grow as the technology matures, with 76% predicting an above average return in the next 6-10 years.

In short, investor expectations in the 5G market are strong. The overall picture from our research is that 5G is considered a worthy investment over the next decade.

Another important finding is that **investment is split across B2C and B2B almost equally** (47% and 53% respectively). For operators looking to seize the opportunity in 5G, there should be no worry of cutting off revenues by specializing – there are strong opportunities in both consumer and business services.

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The operator opportunity

The topline figures paint a picture of 5G being a lucrative area for investment. But what do investors think of the network operators' prospects?

When asked 'Can you name any 5G-enabled companies that are expected to make it big in the next 12 months?', 41 of our 100 respondents answered by naming an operator – second only to suppliers of components and hardware.

This suggests investment houses are bullish about network operators' ability to make the most of 5G. Check out the full data from this question on the next page.



“Service providers at the forefront of the 5G transformation opportunities will be the key enablers for technologies that weren’t deemed feasible until now. The need for technologies such as connected everything, augmented reality, digital twins and artificial intelligence at the empowered edge is creating new markets and revenue stream opportunities.

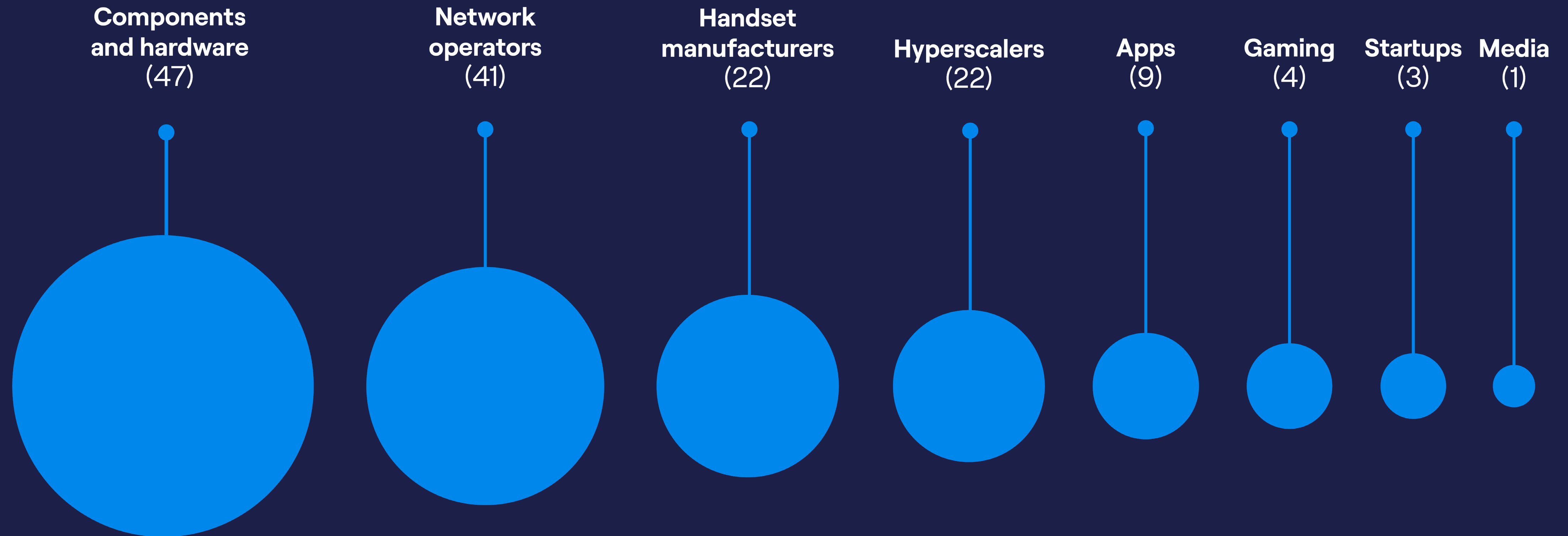
Service providers will also be able to provide agile and flexible service offerings that can keep up with the evolving needs of their customers. 5G’s ability to slice the network effectively enables service providers to create tailor made service levels and experiences, addressing unique use cases.”

– Arash Ghazanfari, CTO UK Presales, Dell





Can you name any 5G-enabled companies that are expected to make it big in the next 12 months?





Sector and technology analysis

So – there is money in 5G, and investors expect operators to be able to capitalize on it.

But as previously mentioned, there are many ways to skin this particular cat. Building a network that caters to every possible future use case of 5G is not practical; instead, insight is required that can guide operators' best next steps.

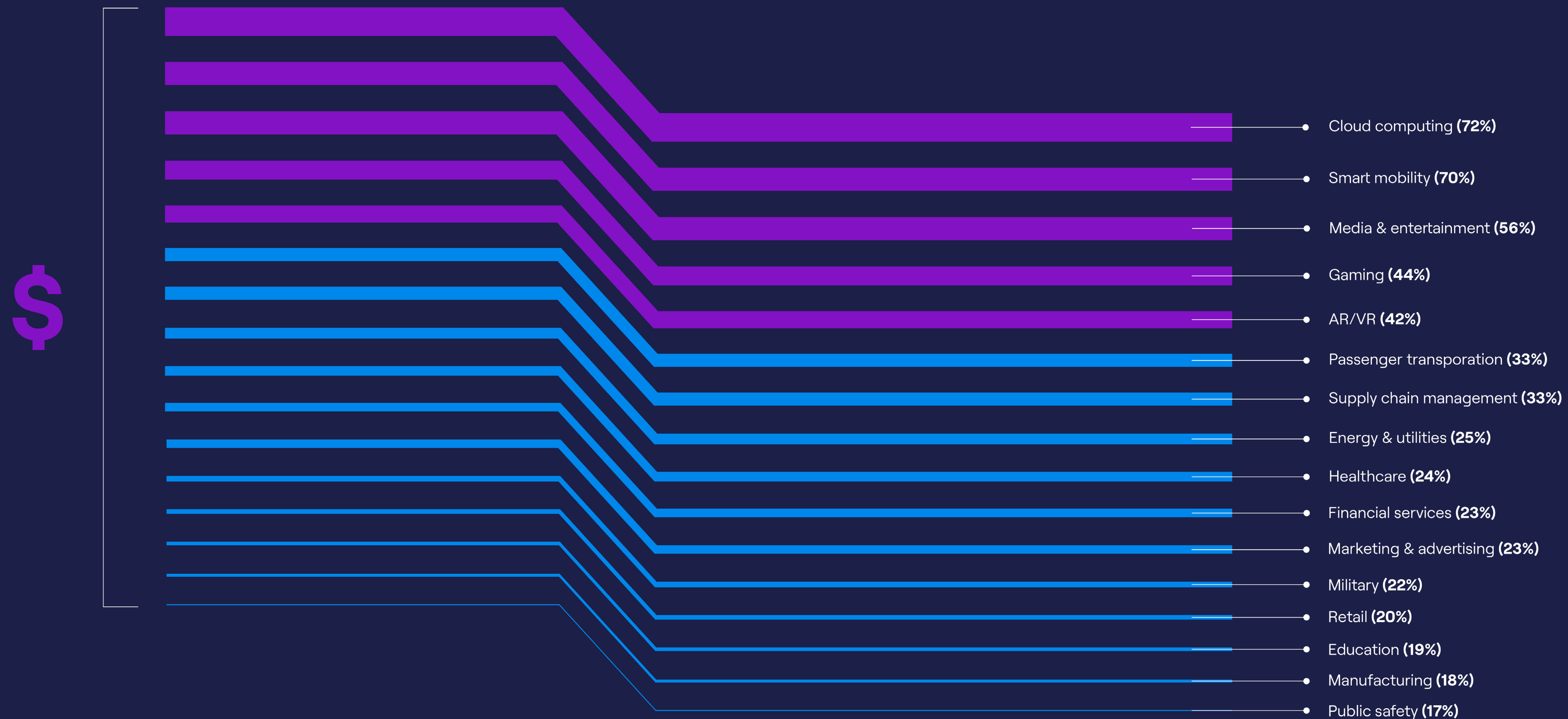
That's why we asked our 100 respondents the following question.

[Click here](#)





Thinking about the investor community in general, which sectors, if any, do you think are seeing above average investment in 5G-powered technology currently?



Goods transportation (15%), Oil & gas (15%), Engineering (13%), Tourism (11%), Insurance (9%), Real estate (8%), Agriculture (8%), Restaurants (7%), Construction (6%), Another sector, please specify (6%), Mining & quarrying (2%), No, none in particular (1%)

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“It’s hardly surprising these sectors are seeing the greatest investment. Our ability to generate and consume data will be amplified with 5G. This will certainly impact how we experience the world and will manifest in a much more pronounced manner in the world of entertainment and gaming paving the way for much richer and more immersive digital experiences.

While it will undoubtedly lead to huge change in consumer technology, gaming and client solutions, 5G’s impact will be more far-reaching and profound. It will pave the way for the next generation of the agile and digitally-enabled workforce. We have already developed use cases around smart cities, machine vision, AI powered robotics, the use of digital twins in the energy sector and Advanced Driver-Assistance Systems, to name a few. And there will be much more to come.”

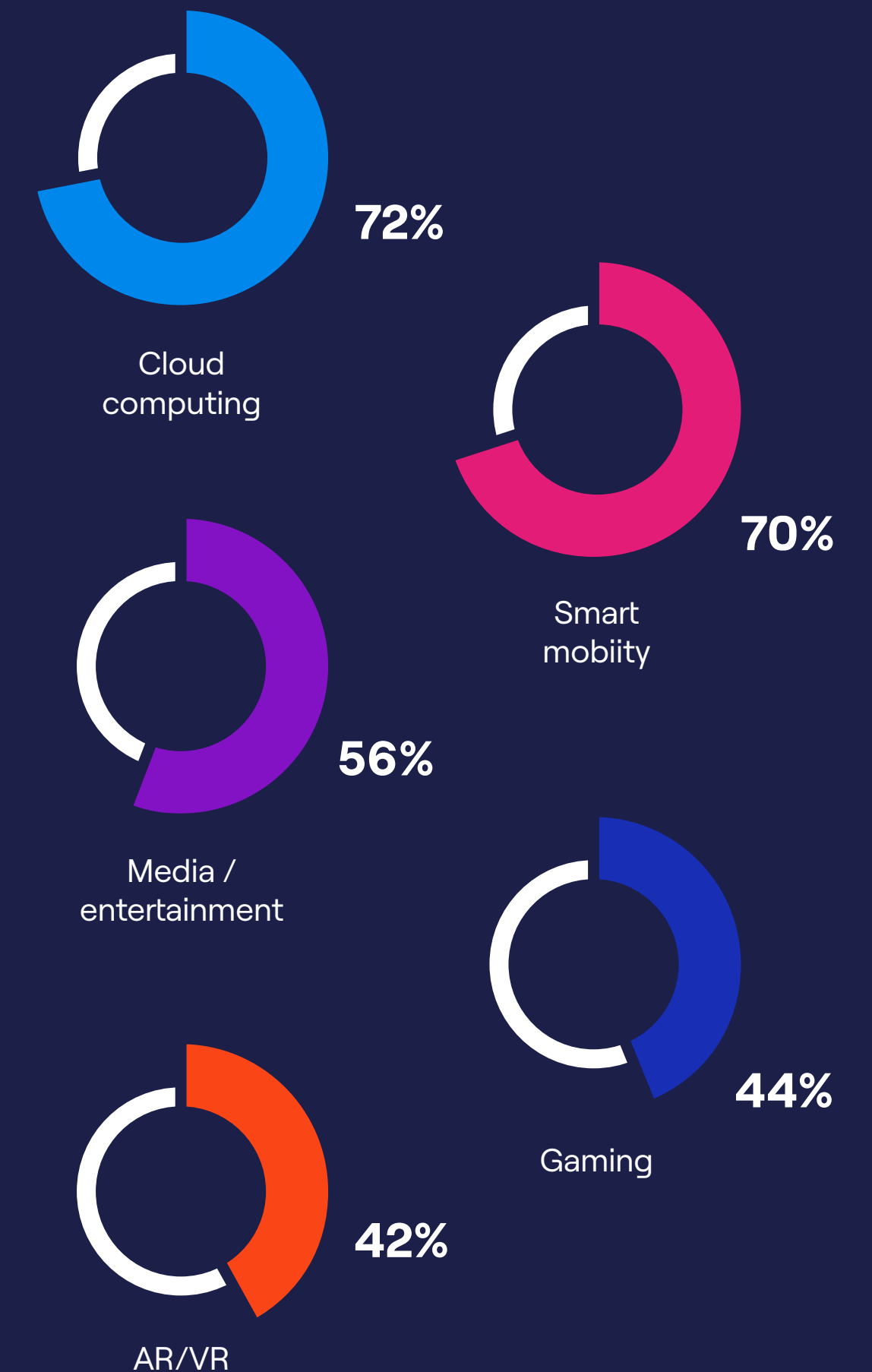
– Arash Ghazanfari, CTO UK Presales, Dell

As you’d expect, investors are seeing money flowing into numerous areas, from education to engineering and real estate to retail. But our numbers suggest that the biggest winners are clear. **The top five sectors and technology areas that investors see opportunity in are:**

- **Cloud computing – 72%**
- **Smart mobility – 70%**
- **Media / entertainment – 56%**
- **Gaming – 44%**
- **AR/VR – 42%**

On the following pages, we will examine these sectors and technology areas in more depth. We’ll look at the reasons for investors’ excitement, as well as investor commentary on the sector – and what operators can do to capitalize on the opportunity.

The Top 5: sectors and technologies where investors are seeing the greatest investment





Top 5 Sectors and Technologies for investment: Analysis

Q: Thinking about the future and the investment community in general, which sectors are most attractive from an investment perspective as a result of the expected opportunity 5G technology will create? Please rank the top three sectors.

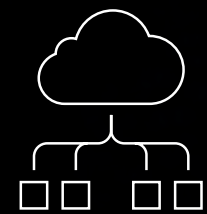
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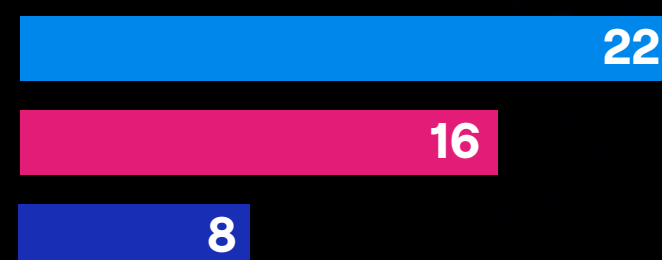
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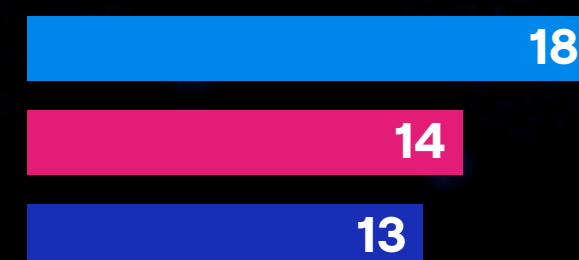
Cloud computing



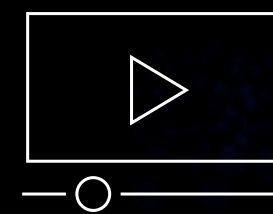
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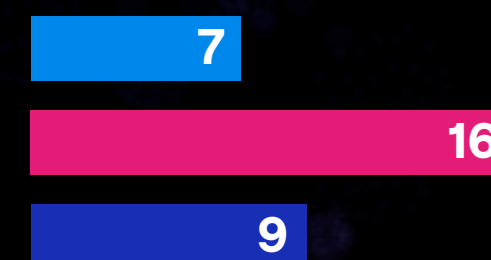
Smart mobility



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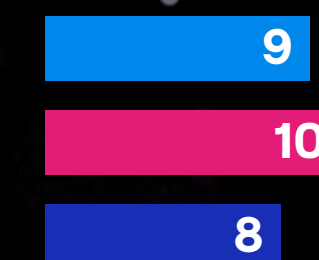
Media / entertainment



[Read more](#)



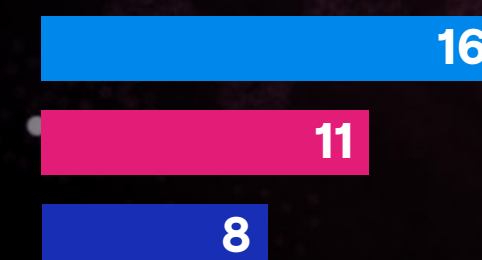
Gaming



[Read more](#)



AR/VR



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1. Cloud computing

Q: Which sectors are most attractive from an investment perspective as a result of the expected opportunity 5G technology will create? Please rank the top three sectors.

A: Of 100 respondents, 46 felt that cloud was one of the most attractive investment opportunities from a 5G perspective. 22 picked cloud computing as their first choice, 16 as their second and eight as their third.

Why Cloud computing?

Cloud has been a reality for almost 20 years, and recent events have accelerated its adoption further. Gartner reports that 82% of enterprises plan to support remote working some of the time after offices reopen,³ and a CIO report claims that 32% of IT decision makers will spend more on cloud-based enterprise applications this year than they have in the past.⁴

But looking at it a level above individual applications, cloud computing is a foundational technology for any form of digital transformation. And with the enhanced connectivity of 5G, the flexibility and scalability of cloud computing platforms will be available to underpin a greater volume of innovative services than ever. It's therefore something of an outlier in our list of investment opportunities, as the rest of the entries will rely to some degree on cloud platforms. Media, for example, relies on cloud-based content delivery networks. Smart mobility will require vast data storage supported by hyperscale cloud, and processing at the edge of the network. So it's no wonder that cloud computing is the area that most investors think presents the biggest growth potential for 5G, as like 5G itself, transformative applications rely on cloud computing to exist in the first place.

Building a 5G network geared to cloud

There is no single way to build a network for cloud computing. Instead, specific use cases will determine how the network should deliver cloud services. For example, if an enterprise wanted to launch or optimize a cloud application for 5G, network operators would first need to know if that application was for consumers or businesses. In the case of consumer applications, the most important thing may be the user experience delivered.

For B2B applications, this focus may be security, or delivering a consistent quality of service, regardless of what device is being used for access. That's not to say experience can be neglected, however; with the consumerization of enterprise, employee experience is becoming increasingly important, particularly as organizations move towards hybrid working.

Rather than looking to optimize for cloud, operators should pay mind to the fact that cloud is an essential part of their platform. Many have already recognized this, and have struck up partnerships with hyperscalers to position themselves to capitalize on future opportunities. As such, bringing the cloud to the edge of the network via the implementation of Edge computing will deliver benefits regardless of the specific use cases it ultimately delivers.





Investor view



Q: What sector is most likely to be disrupted as a result of 5G technology?

“ Cloud computing. It will reduce the need for storage hardware, creating thin clients, which outsources the burden of storing and even computing intensive tasks to companies providing cloud computing services. **5G will be the facilitator for fast access to the cloud service providers.** ”

“ We will see an increased use of cloud computing as more and more companies streamline processes and jump into the online space. ”

“ Cloud computing, with wireless interfacing, could become as normal and familiar as desktop PCs and internal storage. **If 5G can unlock that potential, working digitally could evolve much faster.** ”





2. Smart Mobility

Q: Which sectors are most attractive from an investment perspective as a result of the expected opportunity 5G technology will create? Please rank the top three sectors.

A: Of 100 respondents, 45 felt that smart mobility was one of the most attractive investment opportunities from a 5G perspective. Eighteen picked it as their first choice, 14 as their second and 13 as their third.

Transport-related technologies received a further nine votes as one of the most attractive investment opportunities, and passenger transport another nine still. Mobility of all forms therefore has a strong claim to being the hottest investment area within 5G.

Why Smart Mobility?

Smart mobility covers a plethora of applications and use cases.

As well as the ride-sharing apps, there are the micro-mobility services we're seeing popping up in cities around the globe – the Vois, Limes and Birds of this world that emerged following the advent of 4G – all of which rely on connectivity to provide diagnostics and a consistent location-based service to their users. Micro-mobility is a market set to be worth \$200-\$300bn in the US alone by 2030.⁵

There are the continued enhancements to today's vehicles. Most private cars have significant onboard computing power that processes information regarding vehicle location, driver behavior, telematics, the surrounding environment and the vehicle's passengers. Modern cars are also mobile IoT devices that can sense their surroundings and communicate with cloud platforms for over-the-air upgrades, enablement of new features via software and streamed entertainment. As they increase in sophistication, so will the demands on the connectivity that empower them.

As they increase in sophistication, so will the demands on the connectivity that empower them.

There are the elements of smart mobility enabled by smart city infrastructure; the vehicle-to-infrastructure (V2I) communication that will deliver better traffic management, superior safety (via road conditions, traction monitoring and more) and improved sustainability. And there will be further moves towards autonomous vehicles that combine onboard processing and AI with vehicle-to-vehicle (V2V) and V2I communication to deliver truly driverless private and commercial vehicles, and coordinated traffic.

And all that's not to mention the very real possibility of eVTOL taking to the skies, forever changing the way a lucky few get around.⁶





Building a 5G network geared toward mobility

To become an enabler of smart mobility, the network must be resilient and secure with low-latency to facilitate use cases such as trajectory sharing, real-time local updates and coordinated driving.

With the car acting as a self-sufficient Edge node, doing most of the data processing itself to ensure occupants are safe and sound, it's the data security element that 5G will have to deliver, rather than the driving safety of the car.

A key issue will be the protection of the data flows being created by the car, both for the sake of the manufacturer's IP and for the privacy of the driver. Data sovereignty will be key, as will the anonymity of data manipulation, modelling and storage processes.

The other pressing issue will be the sheer volume of data these vehicles create – up to 4TB per day. Being able to feed this data back into organizations at scale in a safe and secure manner should be a critical consideration for the future network. There may be opportunity in offering organizations solutions for the storage of it, too.

Beyond the network, providers of smart mobility will grapple with new regulatory challenges as autonomous driving technology gathers pace. It will be critical for network operators to stay abreast of new legislation and ensure their technology meets emerging standards.





Investor view



Q: What sector is most likely to be disrupted as a result of 5G technology?

“
Definitely transportation and automotive. **5G will bring innovation to everything ranging from public transportation to private mobility.** The fast and reliable dataflows it provides can support self-driving cars, smart cities, and fully connected streets and vehicles. 5G technology can support all of this by allowing traffic lights to receive real-time data about the traffic patterns from cameras, sensors, and drones distributed throughout the smart city. As a result, traffic lights will be more responsive to actual traffic, keeping it flowing and reducing unnecessary stops at red lights.”

“
5G will greatly disrupt the automotive industry. Mobile upload and download speeds will increase significantly, reducing latency and preserving energy. This will play a critical role in time-sensitive applications such as autonomous driving and IOT in cars.”

“
Transportation has already seen major changes within the last few decades. However, **the implementation of 5G is set to revolutionize the industry.** Vehicle-to-vehicle or vehicle-to-infrastructure communication, advanced driver-assist systems and self-driving technology are just a few of the proposed plans that the transport industry is expected to adopt with the execution of 5G.”





Investor view



Q: What sector is most likely to be disrupted as a result of 5G technology?

“
Autonomous driving and logistics will be the future. **Vehicles will be able to obtain and process critical information in almost real time.**”

“
The transportation and smart mobility sector is the one most likely to be disrupted. Smart mobility is still in its infancy; and **5G will enable the sector to take a huge leap forward** by allowing vehicle-to-vehicle and vehicle-to-infrastructure communication.”

“
Transportation will benefit from the improvements 5G brings the most, by allowing for autonomous driving to become the prevalent form of transportation. **The knock-on impact on everyday life cannot be overstated** with insurers, car manufacturers, utilities all seeing significant disruption.”

“
Autonomous driving. This requires immense processing power and AI, which in turn relies on huge quantities of databases. This only works with a fast and reliable telecoms infrastructure which 5G is expected to provide.”





3. Media / Entertainment

Q: Which sectors are most attractive from an investment perspective as a result of the expected opportunity 5G technology will create? Please rank the top three sectors.

A: Of 100 respondents, 32 felt that media and entertainment was one of the most attractive investment opportunities from a 5G perspective. Seven picked it as their first choice, 16 as their second and nine as their third.

Why Media & Entertainment?

Looking back over the past 10 years of media and entertainment gives a sense of the scale of change we can expect over the next 10. Mobile video accounted for 78% of the world's mobile data traffic in 2020 versus 50% in 2011,⁷ its growth accelerated as social platforms became increasingly reliant on moving images and on-demand became the de facto mode of viewing. There is every reason to expect 5G to drive the same level of change – in video, certainly, but in emerging areas, too.

According to the '5G Economics of Entertainment' report commissioned by Intel,⁸ media and entertainment experiences enabled by 5G will generate up to \$1.3 trillion in revenue by 2028. Quality video and audio are now an expectation on today's high-end phones. The next step will likely be a new entertainment content and technology nexus where new experiences continue to proliferate. What could this new world look like? Shared entertainment experiences will

flourish. Concerts, movie premieres, sporting events and other crowd-based activities will take place across time zones for global audiences. AR and VR will be accelerated – more on that in the AR/VR section – and learning could be transformed with virtual and mixed reality classrooms.

New and in some cases unimaginable applications could be brought to life with 5G. The metaverse could touch various aspects of our lives, both at home and on-the-go. From 3D holographic displays to supercharged location-based advertising, immersive new media could impact upon various aspects of our day to day. The upshot of this change is that, according to Intel, monthly traffic per 5G subscriber could rocket from 11.7GB in 2019 to 84.8GB in 2028.

Building a network geared to Media & Entertainment

To enable next-generation media experiences, the network must offer low latency, high resilience and super-high bandwidth for increased throughput and capacity. Initially, the demands of applications will be similar to those of 4G, so 5G's primary value will come from its increased efficiency.

As the amount of data utilized for media increases, the content will need to be brought closer to the user. Content delivery networks augmented with Edge computing will help avoid congestion and unnecessary lags. The establishment of 5G service will go a long way in making it possible to serve more mobile users at the same time in a given area.





Investor view



Q: What sector is most likely to be disrupted as a result of 5G technology?

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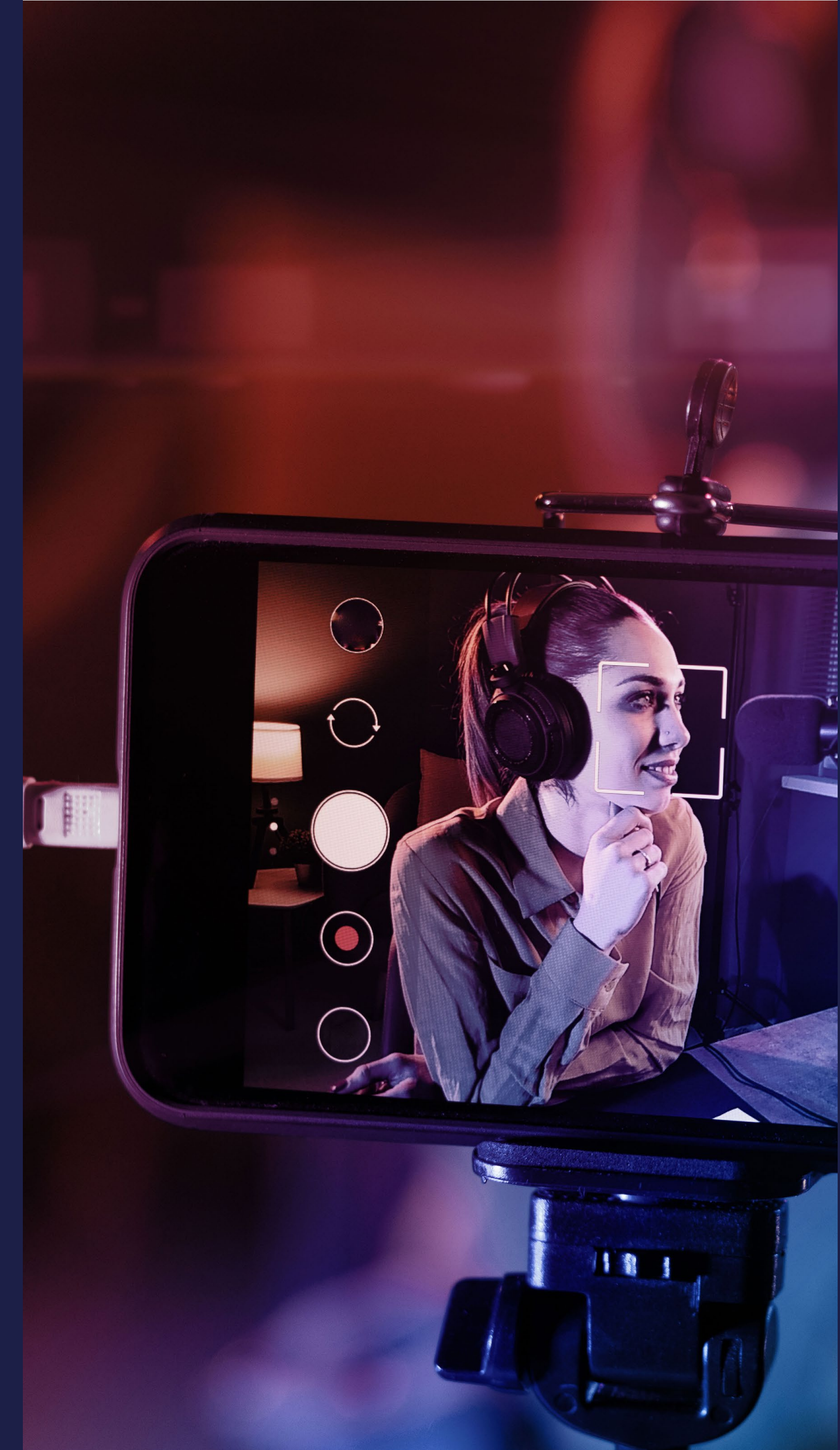
The media and entertainment industry has already seen progressive changes in regards to technology such as virtual reality and augmented reality. **5G will enhance the viewer's experience** when using such platforms due to better video quality and download and streaming speed time.”

“

Media and Communications since it is most able to leverage high-bandwidth connectivity.”

“

I would say a sector that is known for taking risks and can fail fast, something like a media or gaming company. Any company that contributes to a lot of research and development and rewards high risk.”





4. Gaming

Q: Which sectors are most attractive from an investment perspective as a result of the expected opportunity 5G technology will create? Please rank the top three sectors.

A: Of 100 respondents, 27 felt that gaming was one of the most attractive investment opportunities from a 5G perspective. Nine picked it as their first choice, 10 as their second and eight as their third.

Why Gaming?

The video games industry was worth \$173.7bn in 2020, and is projected to grow to \$314.4bn in 2026.⁹ As of June 2020, average time spent on video gaming increased by double digits in all global regions, with LATAM gamers increasing their time spent by 52%, and APAC by 42%.¹⁰

And the single biggest games console on the planet is the smartphone.

Over the past decade, game streaming services have also become a reality. Google's Stadia, Nvidia's GeForce Now, Amazon's Luna and more are already available for use at home and on mobile, providing a gaming experience that far exceeds the capabilities of the device that is running them (or at least the workloads that these devices are processing). The higher speeds of 5G mean that gamers can expect even better streaming and more immersive experiences

via VR and AR. Indeed, in May 2020 Archiact struck up a deal with Migu (a subsidiary of China mobile) to provide VR games via Migu's cloud gaming platform.¹¹

5G's improved latency is likely to have just as great an impact on the gaming experience, providing action that's more instantaneous than ever, with no lag between the user's input and the on-screen response – essential for mobile *Metro Exodus*.

With 5G enabling better gaming without the need for new consumer hardware, it will be a prime opportunity for upsell by operators in the near future – 'ultimate game packages' that promise better gaming, delivered via improved network performance and sharing of workloads.

Building a network geared towards gaming

A high-bandwidth, low latency network could provide a huge boost in game quality – particularly for multiplayer games, which require a sub-10ms end-to-end response time akin to that of a console. And when VR and AR gaming become more prevalent, the need for speed will become more acute. Offloading some of the processing from handheld devices will be key to enabling these better experiences. The continued implementation of a pervasive 5G platform equipped with edge compute will facilitate the sharing of workloads without significant outlay from the consumer – provided they already have a device equipped with 5G. That could be an enticing proposition. without significant outlay from the consumer – provided they already have a device equipped with 5G. That could be an enticing proposition.





Investor view

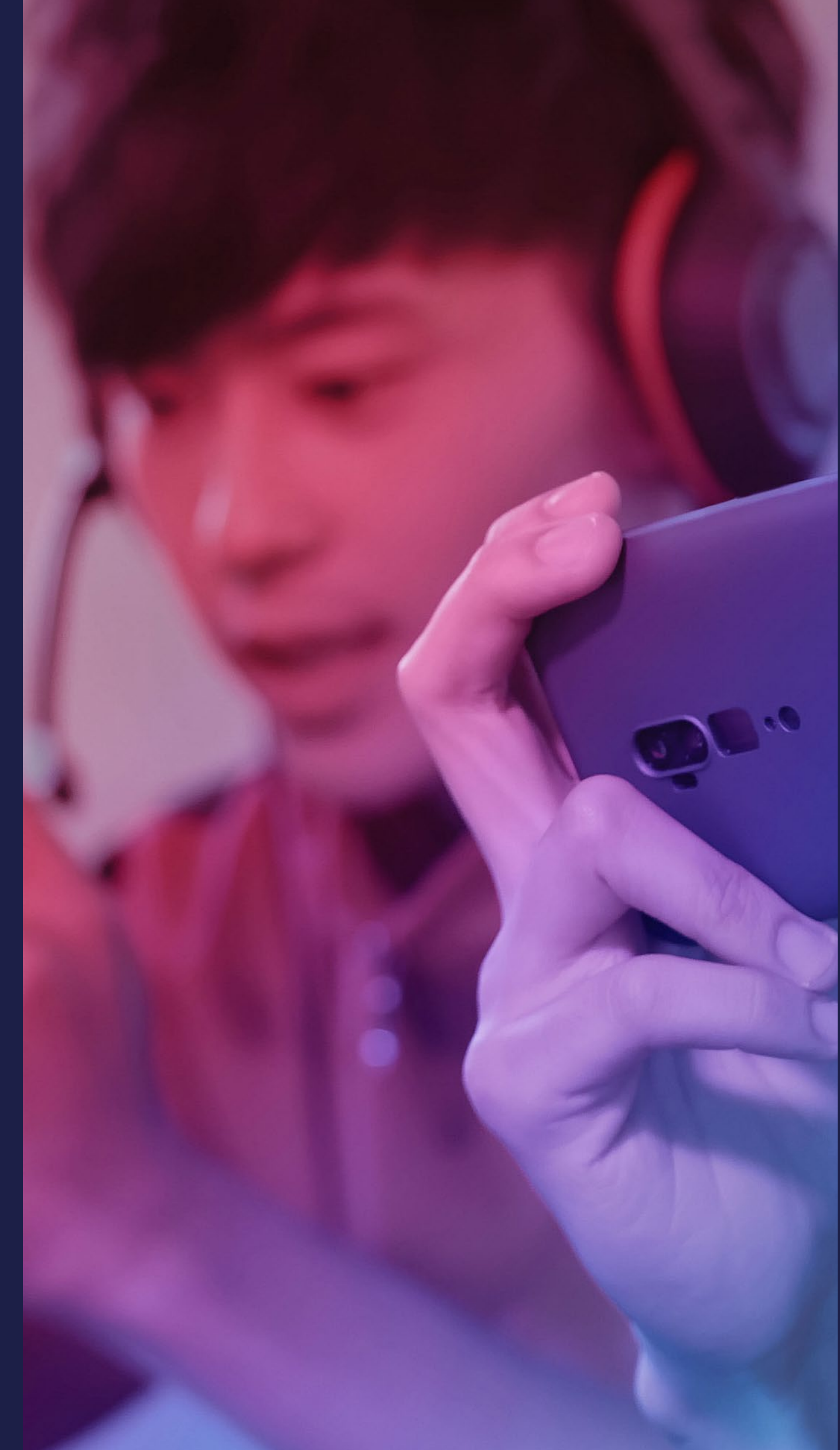


Q: What sector is most likely to be disrupted as a result of 5G technology?

“
The whole gaming space will heavily shift to VR driven by 5G tech. **”**

“
More than a disruption, I see a step-change evolution in a number of sectors that is going to force current models of consumption to evolve into something new, in particular mobile gaming. **”**

“
*Gaming consoles could face a further **extinction risk** as 5G mobiles become more powerful, and able to host complex MMO games.* **”**





5. AR/VR

Q: Which sectors are most attractive from an investment perspective as a result of the expected opportunity 5G technology will create? Please rank the top three sectors.

A: Of 100 respondents, 35 felt that AR/VR was one of the most attractive investment opportunities from a 5G perspective. Sixteen picked it as their first choice, 11 as their second and eight as their third.

Why AR/VR?

AR, VR and mixed reality experiences of various kinds look set to impact upon almost every aspect of everyday life.

Facebook recently rebranded as Meta and announced a 10,000-job hiring spree over the next five years to start realizing its ambition to build a metaverse. These virtual environments and worlds, accessed through VR headsets and AR experiences, constitute a new platform that Mark Zuckerberg thinks “will be the successor of the mobile internet,”¹³. Meanwhile, *Pokémon Go* maker Niantic has released its own mobile platform for the AR metaverse called Lightship, designed to enable other developers to build ‘planet-scale AR apps’¹⁴.

But even if we look at the sector at a more granular scale, the value is abundantly clear. In 2020, 32% of consumers used AR for shopping¹⁵, and the AR market for the retail industry alone is expected to reach a value of over \$200bn by 2027¹⁶.

As smart glasses from the likes of Magic Leap, Spectacles, Niantic/Qualcomm and (reportedly) Apple start to emerge, the growth in revenue and use cases looks set to accelerate. AR already has applications across gaming, marketing, in-car infotainment and more. In industrial environments, AR is already being used for assisted maintenance and repair of equipment; in healthcare, it can do much the same for patients.

The business case for VR is also compelling, with forecasted CAGR of 44.8% between today and 2028.¹⁷ In a world where face-to-face meetings have become increasingly rare, technologies such as Facebook Horizon Workrooms allow team members to put on headsets and join each other in a virtual environment, or view design prototypes without leaving their home office desks. Meanwhile, in industry, VR is being used to train up engineers on new equipment before it’s delivered to their workplaces.

And while VR gaming has failed to gain significant traction just yet, there is continued investment from the likes of Sony and HTC. Combined with the ever greater hardware power of mobile devices and workload-sharing via cloud, the missing piece of the puzzle is infrastructure capable of delivering VR workloads and content at scale.

Building a network geared towards AR/VR

For AR/VR adoption at scale, networks will need to provide the ultra-low latency and high bandwidth of mmWave, as well as workload-sharing via Edge. For many industrial and enterprise customers, private 5G solutions such as network slicing may be required to ensure that the applications receive the necessary resources to function consistently and securely.





Investor view



Q: What sector is most likely to be disrupted as a result of 5G technology?

“
AR/VR will become realistic enough to make people feel fully immersed. **This will change the way we get information** – TVs, mobile phones, other devices will be disrupted.”

“
AR/VR due to investment opportunities around the metaverse. 5G is required to build out the platform and connect users regardless of geographic location.”

“
AR/VR and gaming because companies in those sectors will be able to take advantage of the tech to create significantly better products.”

“
I believe that **5G technology will be a huge boon for the VR sector**, as the tech will become more prevalent and due to price elasticity and advancement of the products, making them more affordable to the average person.”





More sectors to watch

Q: Thinking about the future and the investment community in general, which sectors are most attractive from an investment perspective as a result of the expected opportunity 5G technology will create? Please rank the top three sectors.

Beyond the stand-out sectors and technologies detailed in the previous section, our research uncovered others that investors consider ripe for disruption. Among the most popular are **Supply Chains (33%)** and **Healthcare (24%)**.

First



Second



Third



Healthcare

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Supply chain

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Healthcare

Why Healthcare?

Healthcare's rapid evolution has been accelerated by the pandemic. With telemedicine and test and trace efforts now commonplace, reliable connectivity has become essential, particularly for those unable to travel or with poor broadband coverage at home. Better remote diagnostics and analysis based on connected health sensors such as smartwatches are a logical next step; beyond that, remote surgery, potentially automated or combined with AR, looks set for widespread adoption. Moreover, with the cost-effectiveness of telehealth, and connectivity's ability to bridge the healthcare gap for remote communities, the opportunity is great – especially given that healthcare spending accounts for over 18% of GDP in the US¹⁸ and over 8% in the UK¹⁹.

Building a network geared towards Healthcare

Network security and resilience and data privacy are vital in healthcare to foster patient confidence and keep sensitive data safe. Pervasiveness is also key to ensuring consistent coverage, whether in dense city environments, remote communities or anywhere in between. More data-intensive applications such as telesurgery will demand low latency and high bandwidth, alongside flawless reliability.





Investor view



Q: What sector is most likely to be disrupted as a result of 5G technology?

“ 5G will allow for more tools to be widely used in healthcare. **Medical devices that rely on 5G connections will also benefit from reduced costs and improved efficiency.** Technology, particularly for wireless communication, is already embedded in the operations of the healthcare industry. In the United States, healthcare spending is expected to be 18.9% of GDP in 2020. ”

“ Remote patient monitoring dramatically improves with 5G. If a patient has a chronic health condition, a mix of IoT and 5G can help providers monitor a patient’s condition in real-time outside of a healthcare facility. If something appears abnormal, the provider can contact the patient and recommend the proper course of action, which can improve health outcomes. ”

“ **Healthcare is an industry that is expected to experience a dramatic shift with the growth of 5G** and the disruptions caused by the COVID-19 pandemic. Remote surgery is one of the biggest areas that will see growth, as 5G promises to remove the previous issues of lag time. Also, the practice of telemedicine is growing massively as a result of the pandemic. 5G will enable health professionals to connect with patients in rural areas who may not have the ability to travel. ”

“ **Healthcare is primed for disruption** given the massive inefficiencies and lack of investment in technology & data. ”

“ Healthcare: remote support in disaster areas for surgeries. This requires low latency and high speed. ”





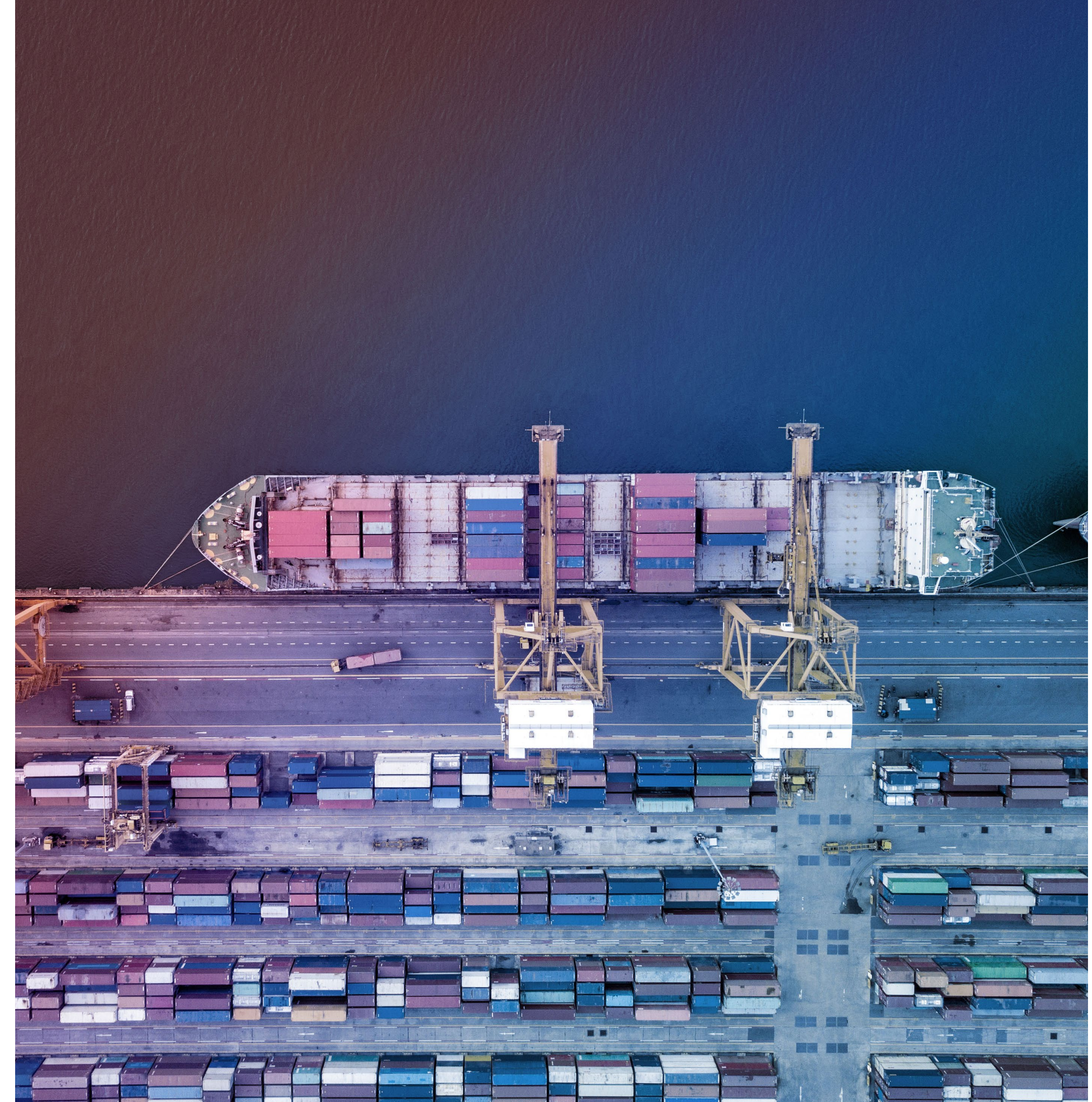
Supply Chain

Why the Supply Chain?

With consumers demanding increasingly personalized products and services delivered quickly, cheaply and transparently, traditional supply chains that evolve solely based on economies of scale are becoming less relevant. Agile, hyper-connected and increasingly automated versions are emerging in their place. Enhanced connectivity is key to ensuring the coordination of every element in the chain. Among other benefits, connectivity enables real-time tracking and the end-to-end visibility of a physical item's whereabouts and status, delivery route optimization and the safe functioning of robotic lifting and loading equipment.

Building a network geared towards the Supply Chain

The supply chain has varying demands at every link, but connecting a high volume of devices to a low latency network will be a consistent need, as will data processing capability to assist with the automation of tasks. 5G network equipment will also need to be more energy-efficient than its predecessors to allow certain connected devices to operate for months without human intervention. Solutions such as network slicing will also allow service providers to create both high-density and long-distance mobile private networks that offer secure and efficient communications with IoT devices.





Investor view



Q: What sector is most likely to be disrupted as a result of 5G technology?

“ 5G will continue to drive innovation in the supply chain vertical for a number of reasons. It will enable the reliable real-time tracking of physical assets as they travel through areas with poor connectivity – a necessity for the proliferation of end-to-end visibility within the supply chain. ”

“ Manufacturing and supply chain management will see direct impact from the roll-out of 5G by **enabling the shift to Industry 4.0**. Providing a better understanding of the shop floor, better visibility of goods in transit. ”

“ This should impact industrial and manufacturing sub-sectors by reducing menial tasks by having more data and insights at one’s disposal, which would benefit companies in supply chain management, machinery, and logistics. ”

“ Manufacturing and supply chain management, **enabled by billions of additional connected devices**. ”

“ **We believe that it also has the propensity to largely re-shape and drive further automation in the supply chain sector.** ”

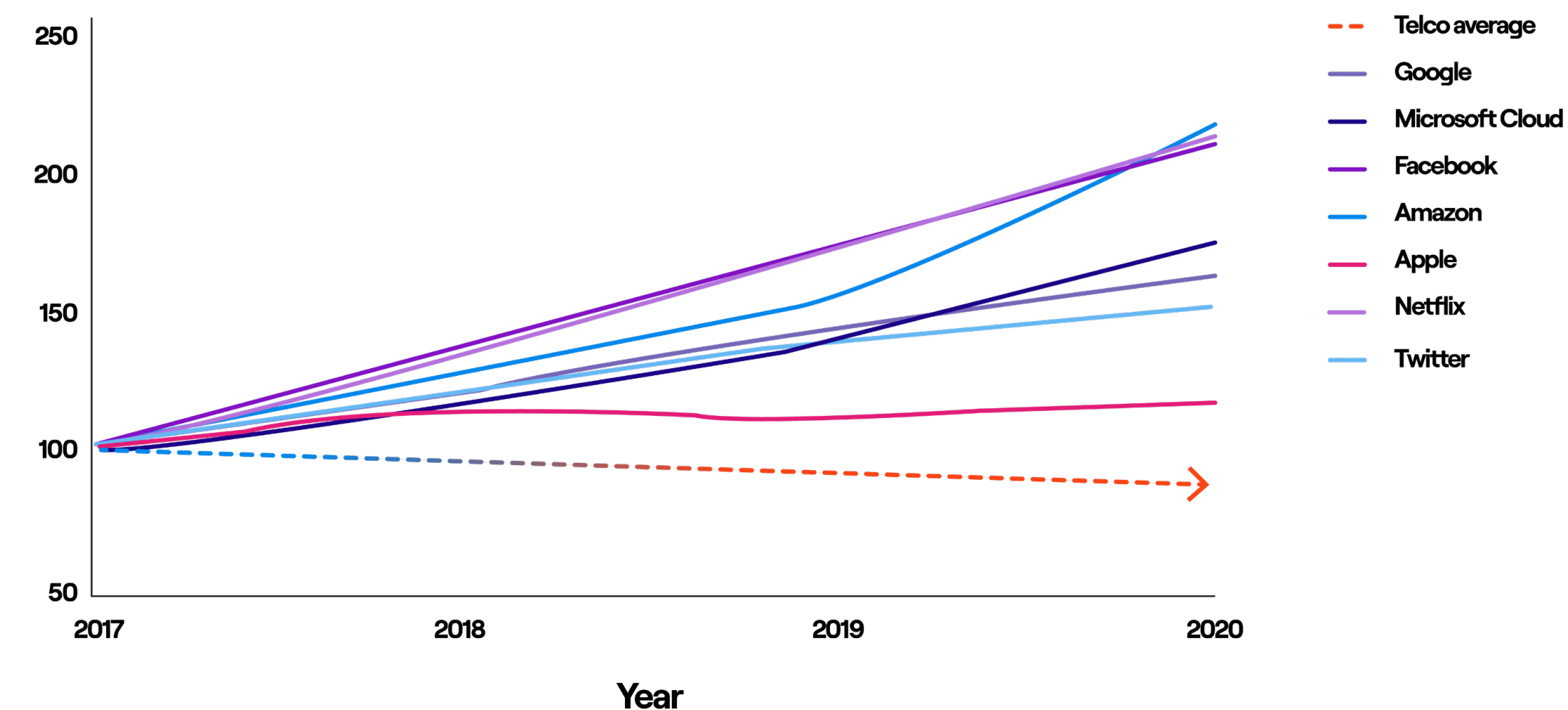


Conclusion: Learning from the past

5G is hot and it's getting hotter – that's the investor's view. Our respondents see massive opportunity in various applications that use the technology, the businesses that provide them, and those that facilitate their delivery.

However, to revisit the contention from the introduction of this report: we are at a stage where 5G has launched, but there has been no big bang, either for its consumers or its providers. Now, network operators are in danger of finding themselves in a similar situation to the one they did midway through the 4G era. Laden with high network costs and mired in a race to the bottom to capture subscribers, infrastructure became commoditized, without the opportunity to generate new revenues from value-add technologies. While technology companies that used operators' infrastructure thrived, the revenues of operators themselves dwindled.

Percentage growth over 2017 revenues





How do we avoid this happening again? How do we act quickly to capitalize on the trends that investors are so confident about?

With 4G, a key problem for operators was an inability to extract meaningful value from the innovative new services that were using their infrastructure.

Becoming the 5G Application Enabler

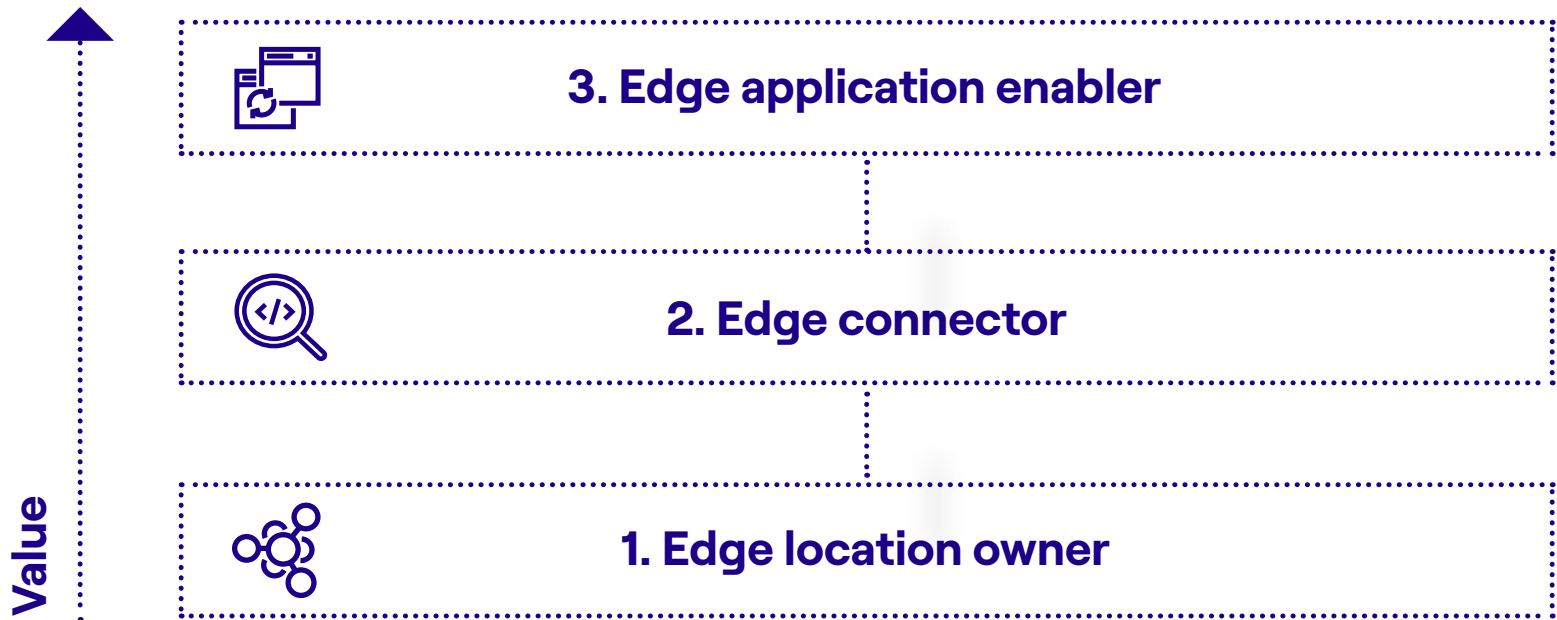
But it's not just Facebook, Amazon Web Services and Uber who will conjure revenue from 5G-dependent services. What operators need to do is take a slice of the revenue from the services that businesses like this create.

You'll have heard of the dangers of operators acting as 'dumb pipes' for smart services and endpoints. But if operators build their networks with the provision of new applications in mind, they won't just help make them possible; they can make them work better.

Partnering with a hyperscaler is by itself unlikely to dramatically enhance operators' revenue streams with the spoils of 5G. Even with a partnership in place, it will remain essential that they bring unique, service-enhancing value to the table.

Roles of service providers

From our 2020 report, The Edge Disconnect



In our 2020 report, The Edge Disconnect, we found that of the three main roles operators could play in the Edge computing ecosystem, by far the greatest share of revenue sits with the role of 'Edge Application Enabler' (59% of the total \$80bn opportunity).





The past has shown that providing connectivity by itself is not enough to capitalize on the opportunity new technology infrastructure presents. It's by being germane to the application experience that operators become gatekeepers to better services and reap the rewards from their investments.

By continuing to build a 5G platform, operators can change their relationship with the customers using their networks, making their technology platforms indispensable to innovators and app developers. They become 5G *Application Enablers*, creating environments where innovation can thrive.

No longer a dumb pipe, but the best intelligent pipe on the market for the specific applications they empower. This moves their business from a provider of 5G connectivity to a catalyst to unlock the potential of 5G.

Don't place your bets; hedge them

Our research tells us that the five areas where investors expect the greatest returns on 5G investments first are cloud computing, smart mobility, media & entertainment, gaming and AR/VR. The expectation of our respondents was that each would show significant returns in the short term, and an even greater return in six to ten years' time. Each of these applications rely on 5G's foundational technologies to thrive. They need high-bandwidth, high-speed, secure infrastructure with significant processing capability at the edge of the network.



Service providers have a responsibility not only to build a platform for continuous innovation, they need to encourage it and lead by example. They need to proactively engage with the ecosystem and the market, particularly with developers and the industry to accelerate the realisation of industry-specific, 5G-powered use cases.

They need to drive tighter integration opportunities for application developers and emerging start-ups to drive verticalized industry solutions and amplify the benefits of 5G by creating and delivering differentiated services in collaboration with the enterprise.

– Arash Ghazanfari CTO UK Presales, Dell

In other words, they are heavily reliant on 5G networks' ability to 'split the chip' (as Nokia's Leslie Shannon puts it²⁰); sharing workloads between devices and the network to deliver experiences are innovations that are currently out of reach.

The key to unlocking the opportunity these areas present will be to continue to invest in core technologies that are to a degree application-agnostic – Edge being one of them.

For network operators, then, the next stage of successful investment in 5G is not about placing bets on individual use cases; it is about hedging them by ensuring their network is ready to deliver on the requirements common to many.





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