5G – a business enabler and disruptor

Think **Spotify changed the world?** That was just the start. With the advent of 5G, connectivity is set to disrupt value chains and enable new business like never before – whatever your industry.

> "Every stage of the connectivity revolution has created a new – and often unexpected – dimension of innovation... 5G will be no different."

▶ **5G SOLUTIONS WILL HELP** realize the long-term industry vision of unlimited access to information for anyone and anything. By supporting significantly higher traffic volumes and data rates than those available today, 5G will bring new user experiences and enable the introduction of innovative services. Creative deployment scenarios, such as ultra-dense deployments, will become possible. In addition, 5G will support fast-growing areas such as machine-to-machine (M2M) communication that require increased network latency and reliability in order to deliver their full potential.

Unlike previous generations of mobile communication technology such as 3G and 4G, which were based around breakthrough technologies such as WCDMA and LTE, 5G will integrate new and existing radio-access technologies. This combination includes established technologies such as HSPA and LTE – which will continue to evolve while remaining the backbone of operators' radio-access solutions – and complementary new technologies for specific use cases. Massive antennas, expanded spectrum – including higher frequencies – and improved base-station coordination will also form a crucial part of the 5G ecosystem.

A NEW PHASE OF THE REVOLUTION

It's still too early for individual businesses to know exactly what 5G will mean for them. However, seen from a broader perspective, there is no doubt it will disrupt value chains and enable new opportunities on an unprecedented scale for a wide range of industries. We know this because 5G is part of an ongoing, radically transformative global process, rather than an isolated phenomenon. It represents the third phase of the connectivity revolution, and by looking at the impact that the first two phases have already had on business and society, we can draw some general conclusions about what our 5G future will be like, too.

THE STORY SO FAR

The first stage of the connectivity revolution started around 2000 and lasted until 2007. This period was marked by a major shift from offline to online behavior as internet-based services enabled new ways of producing, selling and distributing both physical and virtual items. Fixed broadband was the principal technical enabler, along with e-commerce solutions, user-generated content and Wi-Fi. Some of the companies that first came to prominence in this first stage include Amazon, eBay, Google, Skype and YouTube, while travel, banking and retail are examples of the sectors impacted.

The second stage began in 2007 and has continued up to the present day. In this phase of the connectivity revolution, new mobile devices with high-speed internet connectivity have been the catalyst for disruptive changes in content production and consumption. In particular, mobile and web-based technologies have enabled the growth

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of social-media platforms through which individuals and communities have gained the ability to create and share user-generated content.

The technical enablers of this phase include 3G and 4G, tablets and the cloud; the iPhone, the Kindle, Facebook, Twitter, Netflix and Spotify are some typical products and companies. The sectors impacted include publishing, music, gaming and traditional media.

THE 5G WORLD

What can we expect from the third stage – the 5G phase – of the connectivity revolution? First of all, although the various components that will define this era are beginning to come together, there is still some way to go before the full 5G ecosystem is in place. 5G is therefore a long-term vision that covers the period up to 2020 and beyond.

In this phase, new network capabilities such as dramatically increased reliability, responsiveness and coverage will create new possibilities for connected devices in a broad range of industry segments. The technical enablers are therefore connected devices, high-performing networks and capillary networks. And when it comes to impact-

ed sectors, automotive, healthcare, government, utilities, manufacturing and transport are top of the list – although the impact of unlimited connectivity will ultimately stretch into just about every segment.

To give just one example, the high levels of reliability offered by 5G networks enable new applications relating to the control of critical infrastructure, such as electrical grids, or to essential social functions, such as traffic, e-health and smart-city management. With 5G enabling multi-Gbps data rates, expanded remote video monitoring and surveillance applications become possible. And by supporting latency of a few milliseconds or below, 5G can support industrial safety or control mechanisms, as well a broad range of innovative business and consumer applications. That self-driving, networked car might finally be on the horizon.

Every stage of the connectivity revolution has created a new – and often unexpected – dimension of innovation. The most high-profile example of this phenomenon is probably the smartphone, which initiated an application-development ecosystem on a global scale. 5G will be no

different, and there will be huge opportunities for businesses that can use the new network capabilities as a basis for innovation.

Of course, the parallel processes of business enablement and disruption will not start with 5G only. The journey from fixed broadband to mobile broadband and then to everything connected has brought constant change from day one, and 5G should be seen as the next chapter in an ongoing story. However, by taking connectivity into the heart of business processes in a wide range of industries, 5G accelerates and deepens this transformation significantly.

QUESTIONS FOR BUSINESSES

There's no doubt 5G has huge transformative potential. At the same time, it raises some complex – and urgent – questions for businesses in every sector.

The most important consideration is probably timing. Early adopters of 5G solutions could gain a key advantage over the competition, but being the first mover may not be the best strategy, either. Companies will need flexible strategies that successfully balance business priorities, technology maturity and industry dynamics.

Businesses should also consider the fact that 5G will impact different industries in different ways and on different timescales. So far every stage of the connectivity revolution has created both winners and losers, and the 5G stage will be no different. In hindsight these winners and losers may be obvious, but there is no way to determine in advance which business will fall into which category. The only certainty is that business models and value chains will change, and the businesses that can best adapt to this changed landscape have the highest chances of success.

Traditional telecom companies have to take a trial-and-error approach with partners in other industries. They cannot take it for granted that these partners will adopt a telecom-based approach, as there are strong drivers for industry-specific solutions. It will be necessary to develop joint concepts and pilot projects such as Stockholm Royal Seaport or the Volvo Connected Car – advocating for 5G is key, as this is not a technology that comes with its own built-in market.

All stakeholders in the 5G ecosystem will also need to come to terms with new regulatory challenges. The regulatory environment will have to evolve in order to reflect the increased role of connectivity in business and social processes, and this will place new demands and responsibilities on

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An artist's rendition of the Stockholm Royal Seaport development under construction.

businesses, governments and suppliers. Network reach will no longer correspond to national boundaries, which creates both opportunities and also potential vulnerabilities. In many countries, essential public infrastructure already relies on servers based in another country, and 5G will accelerate this trend. Questions such as who shares responsibility for keeping the system running will become increasingly urgent – resolving these issues and finding ways to operate effectively and responsibly within a changing legal framework will be a key priority for all stakeholders.

CONCLUSION

Connectivity is already enabling and disrupting business on a global scale, and 5G takes this process to the next level. The seamless integration of evolved versions of today's radio-access technologies with new complementary technologies has the potential to become a game-changer for businesses in every industry. Connectivity can be integrated into every business process, and networks offering dramatically improved reliability, responsiveness and coverage can disrupt value chains and enable new business like never before.

Just as with any other revolution, making predictions about 5G is a risky business. The technology – or rather the combination of technologies – is still in its initial stages. However, the time is right for businesses to grasp the issues at stake and begin to explore the possibilities. ●

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▶ **FURTHER READING**

● Ericsson, 5G Radio Access – Research and Vision, white paper, June 2013,
http://www.ericsson.com/news/130625-5g-radio-access-research-and-vision_244129228_c?categoryFilter=white_papers_1270673222_c
● METIS project, "Scenarios, requirements and KPIs for 5G mobile and wireless system", Deliverable D1.1, May 2013,
https://www.metis2020.com/wp-content/uploads/2013/05/METIS_D1.1_v1.pdf