

IoT Prediction Report 2022

Digitalization set to
skyrocket fuelled by
5G, sustainability and
the 'new normal'

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telenor IoT



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In recent years, enterprises both large and small have evolved through digital transformation. The speed of change has been remarkable and shows no sign of slowing. Over the next three years, digital transformation will accelerate driven by three forces: the impact of the pandemic, sustainability, and new advancements in digital technology.

- The COVID-19 pandemic has forced companies to fast-track their digital transformation plans and shift to online commerce to sustain revenues and meet shifting customer demands. The sharp increase in efficiency that this has yielded is here to stay, post-COVID is predicted to be an era with returning demand met by increasing productivity.
- Ambitious targets on sustainability have risen high on corporate agendas. Customer demand for more eco-friendly products and the need to comply with new governmental policies and regulations on greenhouse gas emissions are creating a strong urgency to act. Sustainability improvements are often achieved through more efficient use of resources and digital technologies are the key enabler for that change.
- Thanks to massive investments in data centers and infrastructure, high performance computing, storage and networks are now widely available on-demand, making it possible to quickly design, test and deploy new products and services. At the same time, significant advances have been made in technological areas such as 5G, automation, AI, and cloud.
- This will enable companies to innovate by, for example: connecting business to stay close to the digital market, efficient production scale through cloud computing and artificial intelligence for smart green planning of resources and logistics. More specifically, connectivity will continue to catalyse the evolution of business models, encouraging better visibility and control, closer interaction with users, and expanded services.

The combined effect of these three macro trends will open new business opportunities that will transform markets in unprecedented ways. The winners will be the companies that embrace the possibilities early and dare to innovate their business based on an understanding of the customer needs and commercial value.

01

Catalysts
for Change

COVID. Sustainability. Readily available digital technologies. These three forces have laid the foundation for a digitalization leap in the coming three to five years. They combine into a perfect storm to create opportunities for innovation and disruption.

Let's take IoT, one of the pillars of digital transformation, as an example. The possibilities for newly connected devices are expanding tremendously. Consider this: in the next few years, 5G coverage will become widely available around the world, supported by a rapidly growing device ecosystem. Business innovation will grow and many IoT solutions will go from the "monitor and measure" stage to "control and automate". This will open tremendous business opportunities to revamp existing business models and identify new ones, in the process transforming whole industries.

Below we discuss in more detail these three catalysts and why they will drive future change.

The Pandemic as an Accelerator

Almost overnight, the pandemic altered our home, work and social lives and has accelerated the adoption of IoT solutions, AI, and automation. Across industries, businesses are tapping deeper into the benefits of technology – to innovate, engage with customers in new ways and channels and create new services and experiences. Digitalization is now a top priority on corporate agendas in response to remote working, changing customer behaviours and expectations, and the need to increase supply chain resilience¹.

One area undergoing significant transformation is healthcare, where the shortage of medical staff has necessitated the increased adoption of IoT solutions. Connected robots are now used to deliver food and medication to patients, disinfect rooms, or remotely collect their vital signs. The use of remote health monitoring solutions for patients in their own homes will increase even more and free-up hospital space and medical staff.

Looking at the financial impact of the pandemic, data points towards US enterprises coming out of it more profitable than before its start, and with more cash at hand. Cash that can be used for investments to further spur growth². According to The Economist, the pandemic could give way to rapid productivity growth where cloud, big data analytics and IoT are identified as key growth drivers³.

The impact of the pandemic will be long-lasting, and companies will continue to increase their funding for digital investments in the next years to reinvent their organizations, increase speed and efficiency and improve customer experience. We foresee that enterprises will move much more rapidly and boldly from pilot projects to large-scale initiatives.

¹ Telenor Connexion (2021). IoT will make supply chains more cost-efficient, flexible and resilient. Retrieved from <https://www.telenorconnexion.com/iot-insights/iot-predictions-2021/>

² Wall Street Journal (2022). U.S. Companies Are Thriving Despite the Pandemic—or Because of It. Retrieved from <https://www.wsj.com/articles/u-s-companies-are-thriving-despite-the-pandemic-or-because-of-it-11641033005>

³ The Economist (2020). The pandemic could give way to an era of rapid productivity growth. Retrieved from <https://www.economist.com/finance-and-economics/2020/12/08/the-pandemic-could-give-way-to-an-era-of-rapid-productivity-growth>

01

Catalysts for Change



Sustainability: Better for Profit and Planet

Sustainability is a driving force for innovation and has risen high on the agenda for consumers, businesses, and society. Customers want greater transparency about how the products they purchase are manufactured, and their environmental impact. There is increased demand and willingness to pay for products that are more sustainably and ethically produced. And governments are implementing stricter legislation across industries related to emissions and the use of natural resources.

In response to these changing dynamics, companies are setting ambitious targets to reduce their carbon footprint. There is an opportunity to both increase energy efficiency and create more sustainable products and services that open new revenue streams. Enterprises now understand that what is good for the environment can be good for business too.

An Accenture global research study⁴ found that new value exists at the intersection of digital technologies and sustainability. The companies that leverage both – referred to as Twin Transformers – are two and a half times more likely to be among tomorrow's strongest performing businesses.

Let's take energy efficiency as one example. It is key to reducing carbon footprint. At the same time there is a strong business incentive as energy prices have been soaring across Europe and Asia due to a combination of economic and environmental factors. Technologies like AI, in combination with IoT solutions, will be adopted more and more to make better predictions about power supply and demand, and reduce waste, not just in the overall energy grid, but also in factories and offices.

Another example of how the use of new technology can have a significant impact is the case of 5G. According to Ericsson, implementing 5G technology across high-emitting sectors such as power, transport, manufacturing, and buildings could result in emission savings equivalent to removing 35 million cars on European roads (or every seventh car on European roads)⁵.

We expect that in the next few years, companies will increasingly search for new sources of value at the intersection of digital technologies and sustainability.

Advanced Technologies now Ubiquitously Available

Adopting IoT solutions is part of digital transformation and is an area that will get a significant boost thanks to technological development and the enormous investments made in rolling out new infrastructure, which means that connectivity is now readily available everywhere.

In recent years, two network technologies have been introduced: NB-IoT and LTE-M. Both were created to support the needs of IoT applications that are low cost, use less data, have long battery lives (up to 10 years or more), and often operate in locations that are hard to reach such as in remote areas or underground. This will open up for new applications in agriculture, utilities, logistics and other industries. In addition, as 2G and 3G networks are being phased out globally, NB-IoT and LTE-M are the obvious replacements. LTE-M, in particular, is a good alternative for moving devices, like

cars as one example, and can support voice technology.

Another major shift is the arrival of 5G networks which are being commercially deployed across the world. A major benefit of 5G⁶: The network can be programmed to the needs of various IoT scenarios, from connected cars to remote surgery. The adoption of these new connectivity technologies represents more than just a shift that brings improved technical parameters for speed, latency⁷, or battery life. It will be a catalyst for innovation: redefining uses, enabling new applications and revenue streams. Like the shift from using connectivity for telematics to using it for self-driving cars.

For companies planning to roll out their connected products globally, ensuring connectivity in each individual country can be a challenge. Roaming has

been the main option, but in some geographies, regulators do not allow "permanent roaming" where a device is connected for more than 90 days to the host network. With the introduction and increasing adoption of eSIM solutions that allow to choose a local connectivity provider, companies are getting more options about how to deploy connected products globally and optimize the cost.

New technologies will allow companies to put more focus on the commercial side: How to improve offerings, the business model, and go-to-market strategies across geographies.

⁴ Accenture (2021). The European double up: A twin strategy that will strengthen competitiveness. Retrieved from https://www.accenture.com/_acnmedia/PDF-144/Accenture-The-European-Double-Up.pdf#zoom=50

⁵ Ericsson (2021). 5G connectivity is fundamental to Europe achieving climate targets, new analysis reveals. Retrieved from <https://www.ericsson.com/en/press-releases/2021/10/5g-connectivity-is-fundamental-to-europe-achieving-climate-targets-new-analysis-reveals>

⁶ Telenor Connexion (2022). 5G and IoT: What can 5G do for IoT Business? Retrieved from <https://www.telenorconnexion.com/iot-insights/5g-and-iot/>

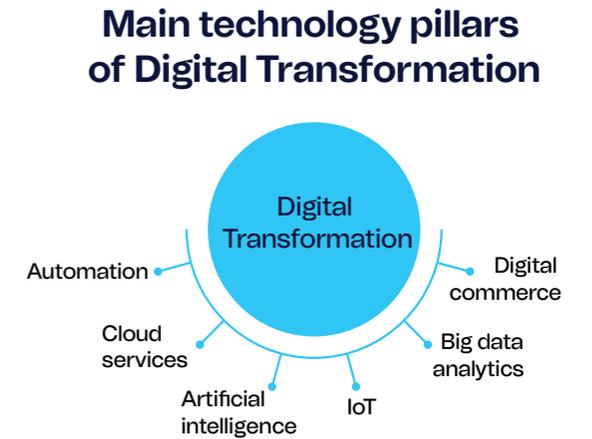
⁷ Latency is the time it takes for data to be transferred from its original source to its destination

02

Transformation through Innovation

Companies are poised to reinvent themselves through advanced digital technologies in order to drive new levels of services and customer experiences, business models and efficiencies – all in a more sustainable way. To this end, there is a variety of digital technologies that can be utilized. At the top of the list: automation, cloud, AI, IoT solutions, big data analytics and digital commerce. These are often combined and work together.

In this section, we will focus specifically on IoT-driven innovation and how it can help companies reinvent their business models and innovate their offerings. To showcase this, we have selected a few cases and examples.



Reinventing Business Models and Applications

ANTICIMEX: REINVENTING PEST CONTROL

Pest control leader, Anticimex, has been around for nearly 100 years and is an excellent example of a company that is embracing digital technologies to stand at the forefront of a transformation of the whole industry towards more efficient and sustainable solutions.

Pest control has traditionally relied on traps filled with toxins to exterminate pests. This approach depends on continuous manual checking of the traps and is less effective in eradicating infestations. But that is all changing thanks to IoT.

Through the use of custom made IoT devices for pest control and pest surveillance, Anticimex can monitor and analyze pest control activity for early detection of potential issues, react fast and find the root cause to the infestation. Ultimately Anticimex mitigate the risk of further problems, reduce cost and the use of pesticides. By developing a solution that both analyzes activity data and captures, they have significantly increased customer value. Another great benefit is that environmentally damaging deployments of toxins can be minimized or entirely avoided.

AUTOMOTIVE: DRIVING INNOVATION

The automotive industry is arguably leading the connectivity charge: from the early days of telematics, to today where they cater to varying types of connectivity to suit the needs of different

end users. Not only does the automotive sector benefit, but other sectors such as insurance, parking and entertainment are increasingly tapping into the possibilities presented by connected vehicles. (See callout: "Safety Insured.") Even retailers will be able to offer additional value-add by providing in-car delivery of goods.

Today, autonomous vehicles rely mainly on onboard sensors and processing to govern advanced driver-assisted systems (ADAS) capabilities. With 5G connectivity, the sophistication of autonomous vehicles will advance to things like vehicle-to-vehicle communication and edge data processing⁸. With the low latency in 5G, information can be sent almost instantly, and actions carried out to add additional preventative safety measures, like prompts for braking can be delivered in real-time⁹.

IoT promises to not only transform the experience of autonomous vehicles, it is poised to upend the concept of ownership. With a growing part of the world's population expected to live in urban areas¹⁰, the need for ownership of vehicles is expected to decline even further. This is where models such as car sharing come into play. These models are heavily reliant on cellular IoT connectivity to access and track vehicles, and measure usage, among other issues. The payoff is two-fold: People without the necessary means get access to cars, and sustainability is boosted through the optimization of resources and reduced carbon footprint.

Safety Insured

Usage-based insurance encourages compliance with posted speeds which correlates with lower accidents. Both the insurance company and the customer are rewarded: The former in terms of possibly lower insurance pay-outs, and the latter in terms of better insurance rates.

02

Transformation
through
Innovation

Solar Panels: Peer-to-Peer Energy Trading

In the utilities sector, customers require a robust, fast, and secure two-way communication to the meters that works in urban environments as well as in more remote areas. New solutions¹¹ using LTE-M technology now allow for more frequent readings of once per minute compared to once per day as in legacy solutions, together with higher bandwidth for more transport of data and latency reduced to milliseconds. That facilitates better balancing of energy production with demand and enables better analysis and optimization of the grid. In addition, IoT opens opportunities to involve the end-user to access and make use of all the data created. Take for example electricity generated through solar panels. This is enabled by a mix of factors: grid connections and smart meters, participants partaking in the energy trading, a software layer, and last, but not least, connectivity¹². Solar panel owners are now able to engage in peer-to-peer energy trading, making money out of their excess electricity, while contributing to a more sustainable society by providing green energy. It's a market that's expected to grow in the future.

Future Innovation

More demanding customers. New technology. Innovative enterprises. All are giving rise to new applications. Some of which are a reality today, others are on the near horizon:

Drones: Commercial delivery by drone will not only enable a more convenient way of receiving goods, but there will also be environmental benefits. Drones have a lighter carbon footprint than a delivery truck. And especially in a post-pandemic world, contactless deliveries are here to stay. In the future, drone technology holds promise for handling last-mile delivery. Beyond delivery, they will be deployed increasingly in remote areas, or in difficult terrain, carrying out inspections in industries from forestry to mining. There are other drone-based uses that will emerge in industries like agriculture, where they can facilitate and automate crop fertilization.

Healthcare: The remote monitoring of patients, a reality today, will be further enhanced by 5G. The end result: better patient service. With the increased capacity for the number of connected devices on 5G networks, more innovation is on the way. Things like connected ambulances that can communicate data and video in real-time with the receiving hospital, engaging healthcare professionals before the patient arrives and supporting paramedics during transport. Boosting the efficiency and efficacy of patient care all in all.

Supply Chain and Logistics: The name of the game in supply chain management is transparent transportation. And thanks to IoT, logistics is moving from expected delivery dates to tracking last-mile delivery in real-time. More transparency is coming in the future beyond the whereabouts of a package. IoT will drive visibility into whether a package has been tampered with, or if certain temperature thresholds have been exceeded. All critical insights into the overall delivery experience.

⁸ Compute and storage for applications with networking near the end user.

⁹ Ericsson. 5 Things to know about 5G if you work in the auto industry. Retrieved from <https://www.ericsson.com/en/5g/5-things-to-know-about-5g-if-you-work-in-the-auto-industry>

¹⁰ United Nations (2018). 68% of the world population projected to live in urban areas by 2050. Retrieved from <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>

¹¹ Telenor Connexion. Case study: Ningbo Sanxing Smart Electric: Connecting around 1 million smart meters in the Nordics. Retrieved from <https://www.telenorconnexion.com/iot-case/ningbo-sanxing-smart-meters/>

¹² International Renewable Energy Agency (2020). Peer-to-peer electricity trading – Innovation landscape brief. Retrieved from https://irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jul/IRENA_Peer-to-peer_trading_2020.pdf



03

Getting Ahead of the Curve

A perfect storm has been brewing: The pandemic pushed corporate entities to accelerate their digital journeys. At the same time, massive tech infrastructure investments have created a fast lane onto the digital highway encouraging more investment in ever-innovative solutions underpinned by 5G. And both underscored the urgency of regulation and innovation in sustainability.

Now that technology makes it possible to build virtually any solution, including IoT, there are no excuses for lagging behind the curve. This also means that the next horizon of innovation will rest

not in the IT department, but with commercial teams, where new ways of doing business are conceived.

There will be roadblocks along the way. Companies need to address a shortage of digital competence. There is a need for suppliers that can not only fill the gaps, but can provide an end-to-end service, for example IoT managed connectivity or system integration in order to fit all the pieces of the digital puzzle together into a complete solution; a partner that possesses a holistic understanding of industry, strategy and domain.

The companies that start now will get ahead of the curve, gaining competitive advantage by shaping industry innovations instead of running to catch up to them. Those slow to act are taking a big risk long-term.



Telenor Connexion

Telenor IoT is the portfolio of IoT solutions from Telenor Group, one of the world's major mobile operators. With more than 20 years' experience of providing global IoT connectivity, cloud services and expert support to companies of all sizes, Telenor is one of the world's most advanced IoT solution providers. Telenor IoT manages international IoT deployments for global customers in some 200 countries and today operates more than 17 million connected devices to enterprises such as Volvo, Scania, Hitachi, Verisure Securitas Direct and Husqvarna. The IoT solutions are offered to national customers in the Nordics through the local Telenor operations in each country, and on a global level through Telenor Connexion, Telenor's specialized unit that provides IoT solutions for large, international enterprises who need a customized offer with advanced support.

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