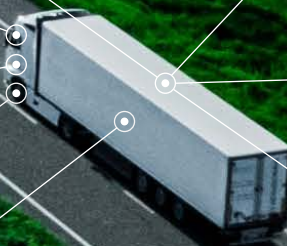
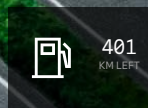
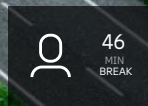




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How enterprises create new business value through digitalization

**Asset monitoring, remote control and
connected offerings are paving the
way for enterprise agility and resilience**



Executive summary

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The strive towards increased business value creation is nothing new, however the ways to achieve it are continuously evolving!

Today, digitalization is revolutionizing the business value creation process. It has become a quintessential driving force for organizational relevance. Integrated across operations, it creates agility, advances operations and boosts resilience.

In this, the fourth edition in the Ericsson IndustryLab report series – Future of Enterprises, the focus is to cover the present, near-future, and more long-term evolution of enterprise digitalization.

This research aims to support enterprise decision-makers and communications service providers by outlining the opportunities, challenges involved, and the role of enabling technologies on the road to enhanced business value creation today as well as in the future.

To achieve this, the research investigates current enterprise digitalization, both generally and more specifically in the form of use cases that are relevant across a wide range of industry segments, by surveying decision-makers and employees across 15 markets around the world to answer questions such as:

- What business values do the enterprise decision makers and employees attach to digitalization in general, as well as to each of the use cases?
- What are the current and projected levels of use case utilizations, and how do these differ across various industry segments?
- What role do cellular (5G and beyond), cloud, AI, digital twins and immersive technologies play as enterprises continue their digitalization journey, and how is this expected to evolve going forward?

This research also covers other important digitalization questions such as:

- Which are the key challenges hindering enterprise digitalization initiatives that need to be addressed?
- What sustainability implications from a triple bottom line (that is, environmental, social and economical) are associated with the use cases?

To truly cover this rather extensive topic, this research has been divided into three different deliverables.

This is the first deliverable, which contains a global, cross-industry analysis of the business value creation opportunities, currently as well as in the future, particularly those linked to remote control, asset monitoring, and connected offerings. The study's global, quantitative insights are enriched through qualitative interviews with industry and academic experts. Also featured is a case study featuring Motor City Wash Works, a customer of Cradlepoint, part of Ericsson, utilizing cellular and cloud technology to drive value creation, particularly agility and resilience, in their customer offering.

In the second deliverable, the business value creation opportunities linked to human-centric use cases will be studied in a similar fashion.

The third and final deliverable will, in part, serve as a summary, drawing on reflections from deliverables 1 and 2. More importantly, it will provide a longer-term, foresight perspective, by outlining the future vision of enterprise digitalization and business value creation.

An introduction to the evolution of enterprise digitalization

Today, digitalization is revolutionizing enterprise value creation. Integrated across operations, digitalization improves agility, advances operations and boosts resilience.

Enterprises are faced with some daunting challenges in keeping pace with the changing needs of their customers in a rapidly evolving digital and business landscape, such as the ability to quickly adapt to rapidly changing conditions, increasing demands for efficiency or just generally becoming better at working in an environment that cannot fully be controlled.

To truly cover this rather extensive research topic, this report has been divided into three different deliverables:

This first deliverable contains a global, cross-industry analysis of current as well as future value creation opportunities, particularly those linked to remote control, asset monitoring and connected offerings. These quantitative and qualitative insights are complemented by insights from a case study where Motor City Wash Works, a customer of Cradlepoint, which is part of Ericsson, is using cellular and cloud

technology to drive value creation, not the least agility and resilience, in their customer offering.

In the second deliverable, the value creation opportunities linked to more human-centric use cases will be studied in a similar fashion.

The third and final deliverable will to some extent act as a summary of the first two deliverables, but even more so, it will take a longer term, foresight perspective, by outlining the future vision of enterprise digitalization and business value creation.

Key findings



Untapped digitalization potential

There is significant untapped digitalization potential in asset monitoring, remote control and connected offerings, with 8 in 10 decision-makers stating that the main value drivers are boosting agility and resilience.

- Around half of the decision-makers¹ say they currently only have a limited-to-moderate utilization level of asset monitoring and remote control.



IoT growth enablers

Cellular technology is considered to be a key enabler for growth of IoT use cases by 7 in 10 decision-makers.

- However, cellular connectivity's ability to drive fast scaling is underestimated or not fully understood.



Challenges to growth

Challenges including regulation, solution capabilities and cellular coverage are putting market growth at risk, according to more than 6 in 10 decision-makers.

- Additionally, scalars seem to underestimate this challenge.



Infrastructure is leading the way

The infrastructure segment is leading asset monitoring with the deployment of Extended Reality (XR), low-power sensors, AI and digital twins, averaging a 28 percent higher expected mid-term utilization than the laggard segments.

- The segment is also expected to keep its leading position in the long term.



Augmenting human capabilities

The importance of social sustainability is ever increasing. Roughly 7 in 10 decision-makers expect their companies to enhance their IoT use cases with human-focused tools such as XR, haptic devices and AI-enhanced functions in the next 3–5 years.

- In the automation era, AI, XR and haptic devices are set to augment human

Case study insights

Embedding cellular connectivity into Motor City Wash Works' automatic car wash tunnel systems significantly reduces time-to-market (TTM)

and facilitates customer agility with "plug-and-play" solutions. Enterprise routers with embedded SIM cards and cellular subscriptions allow

a plug-and-play setup of Wireless WAN connectivity. This can reduce the setup time of a new car wash tunnel by several weeks.

¹ Questions related to specific use cases have only been answered by decision-makers who classified the respective use cases as a top-two priority for their companies.

Massive value and major investments are already here

The derived values and versatility of the studied use cases can be extended across many industry segments.

The quantitative insight from this research demonstrates the potential for leveraging synergies between the IoT use cases (asset monitoring, remote control and connected offerings): 56 percent of the 4,500 decision-makers consider all three IoT use cases to be relevant and important to their business, while 13 percent say only one of the use cases is relevant.

Industry segmentation puts findings into perspective

To understand how these IoT use cases play out across different enterprises, this study adopts an industry segmentation based on two key criteria.

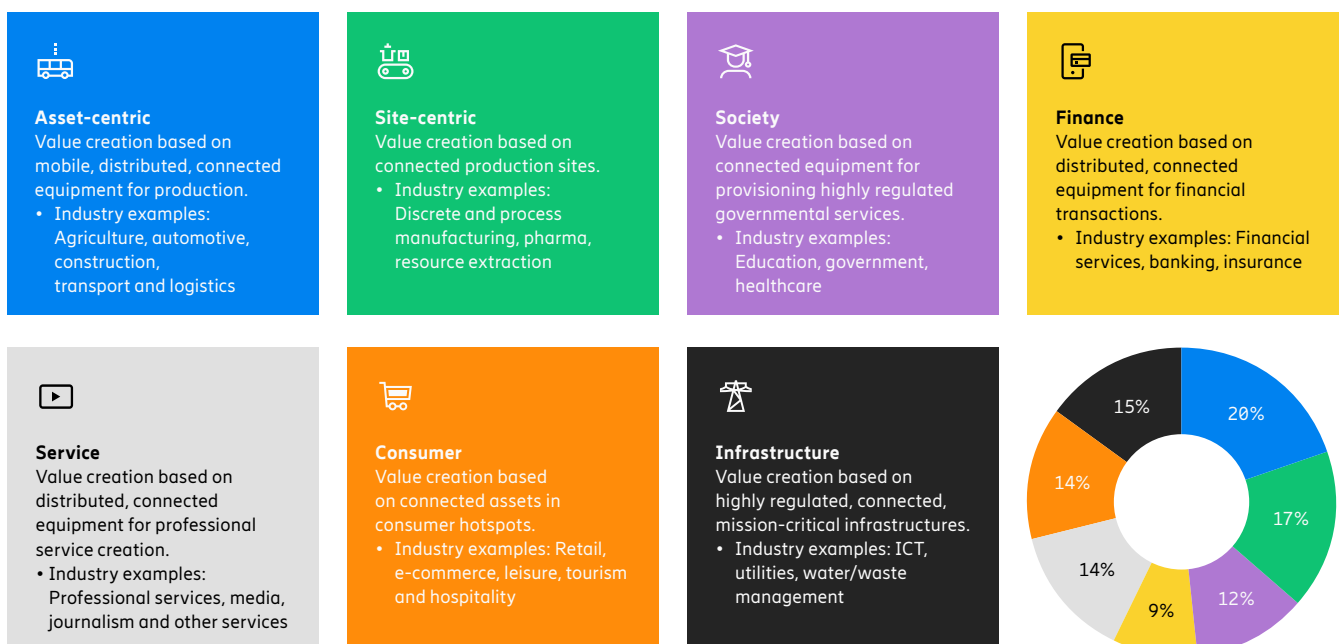
1. Connectivity characteristics refer to the nature of the connectivity needs, and are shaped by how value is created, both internally and for the customers. For example, a company with only one large site will have different connectivity needs than a highly distributed company.
2. Industry-shaping characteristics refer to factors that significantly shape or influence industries, such as regulation, type of production or offered services.

Using these two criteria, each studied enterprise can be allocated to one of the segments – see Figure 1.

Financial motives are not the primary drivers for IoT use case implementations

There are good reasons behind the apparent interest in these IoT use cases, with decision-makers agreeing that they lead to an array of values in almost all aspects of agility, resilience and advanced operations. Capex and opex reductions are not at the top of the list of drivers behind the implementation of these use cases as some might expect. According to the decision-makers, the top-two values associated with asset monitoring, remote control and connected offerings were instead “customer satisfaction” (83 percent) and “improving innovation” (82 percent). This highlights the intentions of businesses to boost their agility and resilience with the help of IoT use cases.

Figure 1: The seven industry segments used in this report



Share of companies belonging to each segment [self-reported]

The untapped potential of use cases for enterprises

Despite acknowledging the benefits derived from digitalization initiatives, on average, decision-makers in this study claim their companies are only halfway towards reaching their ideal digitalization level. Furthermore, around 50 percent of decision-makers state that their companies currently have a limited-to-moderate level of asset monitoring and remote control utilization, despite recognizing these use cases as a digitalization priority. This showcases a significant incongruence between the perceived strategic importance and current utilization levels in companies. The explanation for this is two-fold.

More than 50 percent of decision-makers stated a significant current willingness to invest in asset monitoring and remote control, regardless of current deployment levels. This number goes even as high as 80 percent for high utilizers and indicates that these companies are willing to invest even further to enhance existing solutions.

On the other hand, the deployment of IoT use cases is still costly. More than half of decision-makers report that their companies currently plan to dedicate more than 10 percent of their total IS/IT budget on average across these use cases. This represents a significant level of investment. Unsurprisingly, 65 percent of decision-makers consider high costs to be one of the challenges in implementing use cases.

Additionally, as shown in Figure 2, over 67 percent of the decision-makers are dissatisfied with existing commercial solutions, and consider integrability with other systems and regulation to be primary challenges. In the case of remote control, 70 percent of decision-makers consider the offered solutions to be unsatisfactory. These challenges all slow down the digitalization journey of companies.

Consumer-related challenges and the value of resilience

Consumer enterprises (such as companies in retail, leisure or hospitality) have a below-average utilization level in asset monitoring across all industries.

This segment seems to have the greatest challenges when it comes to the deployment and utilization of the use cases. Between 70 and 82 percent of this segment's decision-makers classify cellular coverage, security, regulation and solution capabilities as key challenges – significantly above the average across all industries. The challenges associated with security and regulation in this segment may be the result of customer data privacy concerns and restrictions. For example, the GDPR implications of tracking customer data in connected offering cases or using surveillance cameras in asset monitoring. At the same time, across all industries, consumer companies are the ones who see the highest resilience value potential in connected offerings.

There is significant untapped digitalization potential in asset monitoring, remote control and connected offerings, with 8 in 10 decision-makers stating the main value drivers are boosting agility and resilience.

80%

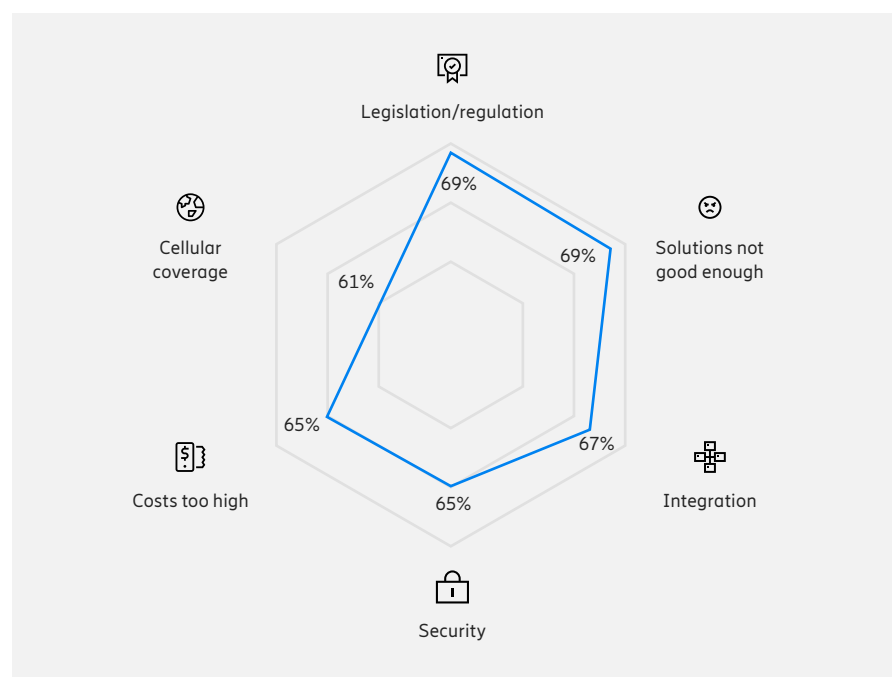
Remote control: A use case champion in site-centric industries

Among the industries covered in this study, site-centric companies are those who believe that remote control brings the highest agility and advanced operational values to their business. More than 8 out of 10 decision-makers in this segment attribute improved customer and employee satisfaction, as well as enabling scalability and a faster TTM, to the remote control use case.

Remote control is also pivotal for the Motor City case featured in the previous chapter. Car wash tunnels are equipped with a number of different robotic systems. Providing the best possible customer experience and time-optimized operational efficiency requires careful fine-tuning of all technical components, which is typically done by specialists. With data at their fingertips, remote control allows these specialists to conduct configurations from anywhere.

Remote-control applications can also be utilized to ensure safety in potentially dangerous on-site operations. For example, as depicted in Ericsson's Port of Tyne report, 5G-enabled remote control could perform tasks in dangerous environments, such as offloading containers from ships, thereby improving safety and efficiency.² Furthermore, being able to simultaneously remote control several on-site operations can improve customer satisfaction while facilitating scalability and a faster TTM.

Figure 2: Percentage of decision-makers stating each factor is a key challenge for their company when implementing IoT-centric use cases



² Ericsson, [Driving greater maritime safety and efficiency at Port of Tyne](#)

Cellular connectivity enabling scalability for growth

The study further revealed that business scalability is another important motive behind use case implementations. Business scalability can be facilitated through the interconnected nature of IoT use cases that transcends the need for physical proximity to devices or operations. For asset monitoring and remote control, decision-makers consider cloud solutions and cellular connectivity to be the top-two technology enablers for IoT use cases. Both solutions are proven for scaling businesses. As also illustrated in the Motor City's case study chapter, embedded cellular connectivity, in combination with the flexible storage and processing capacities provided by cloud solutions, can help companies to smoothly scale their businesses.

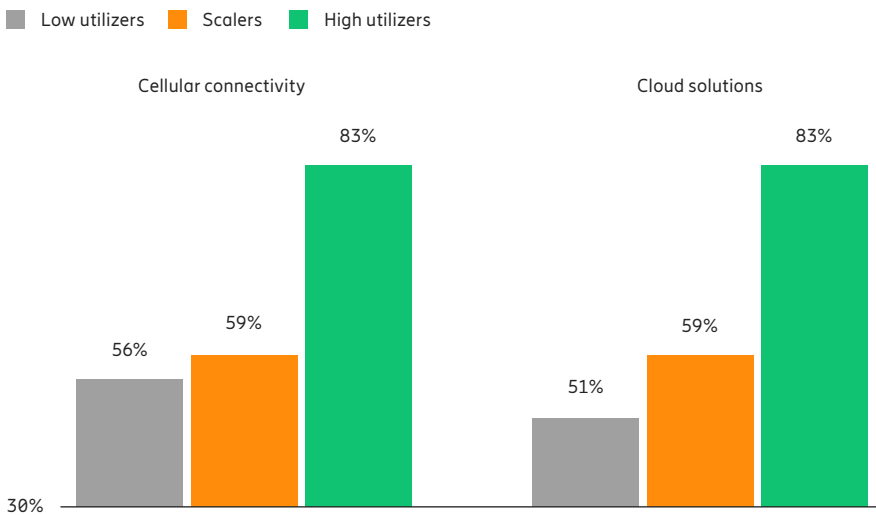
However, scalars might underestimate the role and importance of cellular connectivity and cloud solutions. As shown in Figure 3, around 8 in 10 decision-makers from high utilizers – but only about 6 in 10 decision-makers from scalars – consider these technologies to be key enablers in asset monitoring. A similar pattern is also evident in remote control and connected offering use cases. The difference in response rates between these two groups indicates a potential lack of awareness among scalars on the technologies required to realize their digitalization strategies. 8 in 10 scalars expect fast deployment and great indoor/outdoor coverage to be the key cellular connectivity benefits needed for enabling remote control and asset monitoring as full-scale solutions in the next 7–10 years.

Cellular technology is considered to be a key enabler for growth of IoT uses cases by 7 in 10 decision-makers

70%

At the same time, IS/IT decision-makers indicated that scalability, as one of the connectivity attributes – defined as “a means to accommodate growing data speed and expanding business needs” – is not deemed as important as other connectivity attributes, such as speed and performance, or dedicated resources. This suggests that the role of scalability is not fully known and is underestimated by decision-makers.

Figure 3: Percentage of decision-makers considering cellular and cloud solutions to be key technology enablers for asset monitoring, grouped based on enterprise use case utilization levels

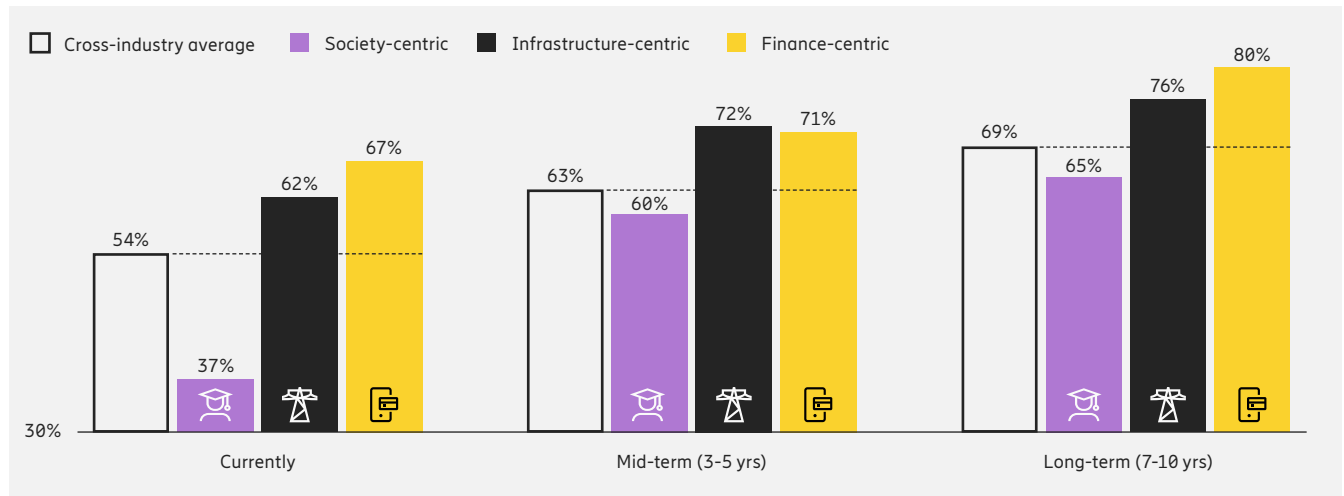


Recommendation
When designing/constructing their value propositions, communications service providers need to better incorporate the scalability-related attributes of cellular connectivity in their offering packages.

Infrastructure companies and the need for ubiquitous connectivity
Infrastructure companies (such as energy or transport network operators) have largely distributed, mission-critical assets to manage. Hence, they can benefit greatly from IoT use cases for remote operation or supporting field personnel. About 80 percent of decision-makers in this industry associate high resilience and agility values with the utilization of IoT use cases. At the same time, these decision-makers are also the largest group struggling with challenges. Notably, almost 7 in 10 decision-makers from infrastructure companies consider cellular coverage to be a key challenge. One reason for this could be the dependency on ubiquitous connectivity, whether it is deployed in rural or urban areas.



Figure 4: Percentage of decision-makers in companies that utilize asset monitoring extensively or fully today and expect to do so in the future [self-reported]



Finance and infrastructure industries are leading asset monitoring

Most industries find IoT use cases of high strategic relevance. However, finance and infrastructure industries stand out, particularly in asset monitoring utilization. As shown in Figure 4, current and expected levels of asset monitoring utilization in the finance and infrastructure segments are considerably above the cross-industry average. These two industries also stand out when it comes to driving resilience value through asset monitoring.

Asset monitoring is particularly prevalent in the finance industry. According to 67 percent of surveyed finance industry decision-makers, asset monitoring is used extensively by their companies. This is 13 percentage points higher than the cross-industry average. With payment terminals and cash machines, the finance industry has an extensive number of connected critical devices in the field. Failures of these devices have a direct impact on revenue generation, which can explain the high level of asset monitoring in this industry.

There is also evidence to support the growing usage of emerging digital tools such as AI-enhanced assets, digital twins, XR, haptic devices and low-power sensors within different industries. Infrastructure industries excel in their current utilization of these emerging digital tools, particularly XR, which stands at 8 percentage points above the cross-industry average.

"The broadband line that connects to the card terminal died and I couldn't take card payments for two weeks. It's frustrating as I could have potentially lost GBP 21,000 in sales, equating to GBP 10,000 in profit."

Store owner, <49 employees, London, UK

Society companies are lagging in asset monitoring

Society companies currently show a significantly below-average utilization of asset monitoring despite the perceived key challenges in implementation being below the cross-industry average. Figure 6 shows that only 37 percent of all decision-makers from this segment state that asset monitoring is extensively or fully used in their companies. This is 14 percentage points below the average across all industries.

Society companies and organizations show the lowest digital maturity of all segments investigated in this study. Less than 50 percent of all decision-makers from this segment claim that their companies apply a high degree of automation. Compared to other industries, substantially fewer decision-makers in the society segment see key values in asset monitoring, except for employee satisfaction. This indicates that this segment is primarily focusing on enabling employees to provide remote support rather than on automation.

Asset monitoring and remote control: Boosting crisis resilience

According to the Future of Enterprise 3³ report, enterprises anticipate a more disruptive future, with natural disasters, energy crises and cyber attacks as the most likely and severe events.

Infrastructure enterprises are among the most vulnerable industries in crises due to the mission-critical and distributed nature of their operational assets. Work safety, particularly for technical staff, is crucial for these companies during crises and is identified as a top-three benefit from utilization of asset monitoring and remote control in this study. Both use cases have the potential to enhance resilience during times of crisis.

Paving the way to the future

Before continuing with a more future oriented view of business digitalization, the next chapter will illustrate, with a hands-on-approach, how the company Motor City Wash works is utilizing cloud and 5G cellular solutions to ensure these IoT use cases bring additional business value, both to themselves and to their customers!

³ Ericsson, Future of Enterprises #3 - Time to rethink resilience

Applying a micro-factory automation approach - Insights from a case study

The car wash industry, with over USD 30 billion in global value and a projected compound annual growth rate (CAGR) of 3 percent, predominantly comprises small and medium businesses.⁴

Market growth is driven by consumers increasingly favoring car wash services over washing their own cars. Simultaneously, the professional car wash industry has made significant progress in minimizing its environmental impact, including endorsing efficient water utilization, water recycling and the utilization of environmentally friendly detergents.

Car washes can be built as systems leveraging conveyor technology to transport vehicles through fully automated car wash tunnels. Alternatively, they can be centered around stationary vehicles, either as self-service solutions or as "in-bay automatic" systems.

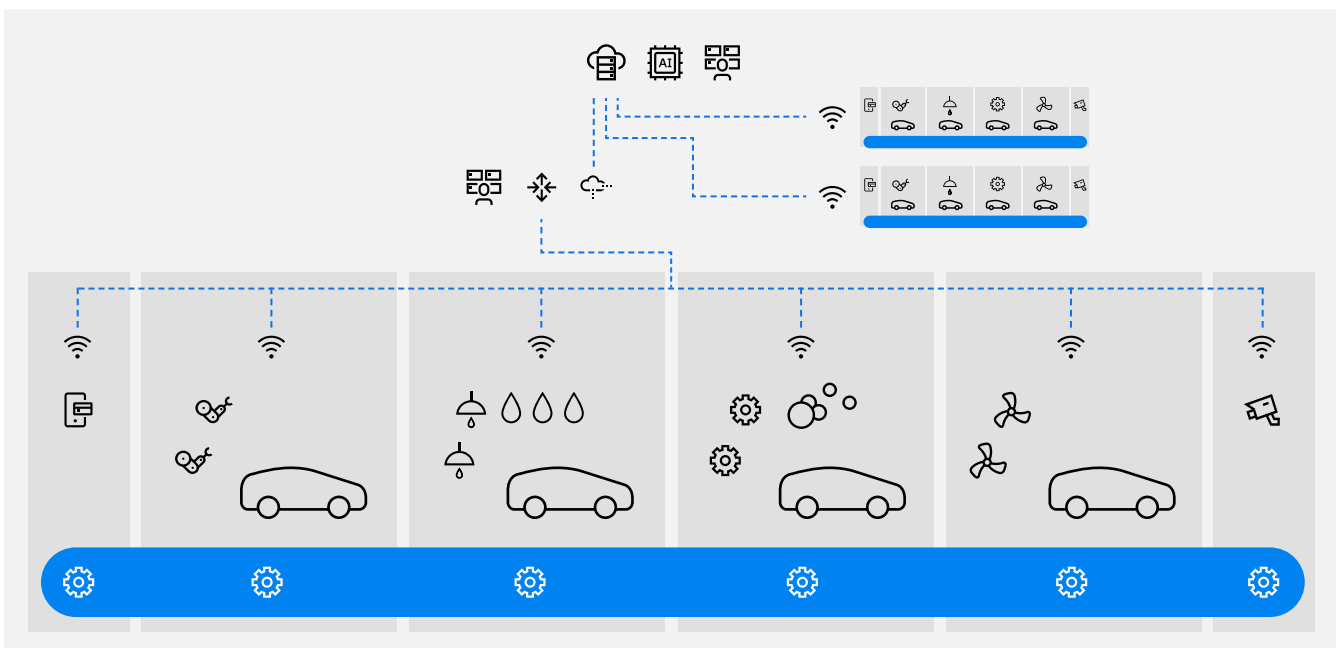
In-bay automatic systems hold the majority of the market share as they require less space, have a lower cost of ownership and do not require dedicated personnel. Car wash tunnels, however, enable a higher throughput. Recent advancements in car wash tunnel solutions facilitate further automation as well as easier installation and better scalability. This will contribute to further growth of the car wash tunnel segment, as will be explained further in this case study.

The car wash market is characterized by high price pressure and limited customer loyalty. Consumers typically choose the cheapest and nearest facilities, expecting minimal waiting time and a perfect service. Therefore, a superior customer experience must be provided based on smooth service flows, on-site entertainment and intuitive self-service for ordering and payment.

From a service delivery perspective, an automated car wash tunnel needs to be seen as a micro-factory equipped with highly sophisticated robotic systems, including conveyors, foamers, wheel brushes, drying systems and other electro-mechanical equipment that is constantly exposed to water, mud, abrasive chemicals and dirt. Mechanical failure can have severe consequences including lost revenue, damaged cars or even accidents involving customers. Furthermore, all equipment needs to be orchestrated and maintained to guarantee service availability and customer satisfaction.

As a result of all this, as can be seen in Figure 5, ICT networks have become critical for the car wash industry, and ensuring the quick installation of these complex car wash tunnels with minimal TTM is essential.

Figure 5: Car wash tunnels – applying a micro-factory automation approach



⁴ Global Car Wash Service Market Size is Estimated to Reach USD 40.24 Billion By 2031, Growing at a CAGR Of 3.63%: Straits Research

Digitalizing the car wash industry – Motor City Wash Works

Motor City Wash Works (Motor City hereafter) has been providing reliable conveyor car wash equipment to car wash service providers since the early 2000s. Today, Motor City is recognized as a major global manufacturer of automated car wash systems.

Data-driven operations of car wash tunnels are key to addressing the aforementioned industry challenges. As a result, Motor City offers an IoT- and cloud-based management platform (CruzControl), enhancing operational efficiency through improved data visibility, analytics and automation.

This offering generates several key benefits, including:

- reducing equipment downtime for planned or unplanned repair and maintenance
- eliminating lost revenue due to inadequate management of supplies
- reducing the risk of accidents involving human casualties and incidents with environmental impact
- improving scalable operations of larger numbers of sites
- improving cyber security (including the protection of payment transactions)
- improving the handling of false customer damage claims
- reducing long site installation times due to complex car wash and ICT systems

Motor City's digitalized solutions

With CruzControl, Motor City provides a portfolio of digital solutions based on on-site ICT infrastructure and AI-enabled cloud services. Local ICT infrastructure comprises a pre-packed IT system with embedded connectivity and an industrial controller for car wash equipment. Cloud-based services include comprehensive site surveillance, predictive maintenance capabilities and tools for online configuration, remote support, analytics and documentation.

"Through our Cradlepoint connection, [we can] pretty much control every facet of the car wash tunnel. You don't always want to send out specialized labor to complete those [fine tuning] tasks because that can be really costly."

**Rob Peraino, Sales Manager,
Motor City Express Networks**

Motor City collects data from industrial automation devices including sensors, drives and programmable logic controllers (PLCs), transmitting data about motor vibrations, brush movements and chemical levels. Critical information from each car wash site is transmitted to the data center and subsequently presented to each car wash management team through user-friendly online dashboards, enabling informed actions.

Embedding cellular connectivity into Motor City Wash Works' automatic car wash tunnel systems significantly reduces TTM and facilitates customer agility with "plug-and-play" solutions.

"When our little data rack enclosure arrives on site, all they have to do is plug it into a power outlet. It immediately grabs its cellular connectivity, and you have day one internet connectivity wherever you are."

**Rob Peraino, Sales Manager,
Motor City Express Networks**

A key component of the on-site connectivity solution is the Cradlepoint enterprise router with embedded 4G/5G dual-SIM to establish a secure VPN tunnel that includes a fallback option to a second cellular network, as well as an interface for fixed-line connectivity. In areas that are well served with 5G connectivity, embedded SIMs also drive a cellular-first approach. The Cradlepoint router also provides an edge cloud capability – in this case, it is used to host APIs for third-party equipment integration (such as point of sale, or POS, terminals) as well as APIs for asset monitoring software.

The integration of PoS terminals for secure digital sales is an important capability of the solution. Payment transactions need to be protected, and integration between PoS devices and the controller of the car wash tunnel ensures that only car wash service packages that are currently functional and available can be sold, which is key to avoiding customer dissatisfaction.

This pre-packed plug-and-play ICT solution empowers Motor City Wash Works' customers with reliable edge connectivity, enabling real-time monitoring, remote troubleshooting and data-driven insights. Pre-packaging local ICT infrastructure allows a plug-and-play installation, thereby reducing complexity and installation time, potentially by several weeks.



Asset monitoring, remote control and connected offerings create enterprise value

The enterprise value created by Motor City’s offerings, which is powered through cellular and cloud solutions as technology enablers, is based on several fundamental IoT use cases including asset monitoring, remote control and connected offerings.

Asset monitoring collects asset performance and environmental data, enabling predictive maintenance and management of supplies. Equally relevant is site surveillance, customer car documentation and number plate recognition. These capabilities reduce system downtime, minimize the risk of accidents, ensure service availability and quality, and help to manage customer damage claims, thereby contributing to agility and resilience.

Remote control allows car wash operators to send control signals to the washing tunnel machines. Several hundred control signals are needed to configure equipment and orchestrate the different machines. Furthermore, regular fine-tuning of the equipment and the wash flow can be carried out with remote assistance. This renders a significant reduction in operational costs and system downtime, contributing to advanced operations.

Connected offerings enhance the user experience in business process management by provisioning advanced user interfaces and bundling underlying IoT use cases such as asset monitoring and remote control. Motor City’s cloud-based management platform offers elevated customer experience to the independent car wash owners who purchase turnkey car wash solutions and contributes to more advanced operations and agility in enterprises.

While Motor City is applying the use cases above in the context of digitalized car wash solutions, they are relevant for many industry segments. The following chapters delve deeper into these use cases in their industry-agnostic form.

Evolving the use cases through advanced digital tools and components

Digital tools and components such as artificial intelligence/machine learning (AI/ML), XR and digital twins are expected to extensively enhance IoT use case capabilities in the mid- and long-term. All three are also anticipated to become relevant for Motor City.

Figure 6 depicts the interplay between IoT use cases, technology enablers and digital tools, serving as a point of reference in the upcoming chapters when discussing the quantitative and cross-industry insights.

Artificial intelligence

Motor City is planning to leverage AI/ML technology to further evolve the asset monitoring use case. Analyzing the data collected from Motor City’s CruzControl can enable the creation of customized equipment performance or failure prognosis as well as inventory forecasts. Proactive communication of such prognoses and actionable insights through advanced applications will allow operators of car wash tunnels to cut off any potential service disruption, further reducing downtime, shrinking overhead costs and enabling just-in-time inventory management.

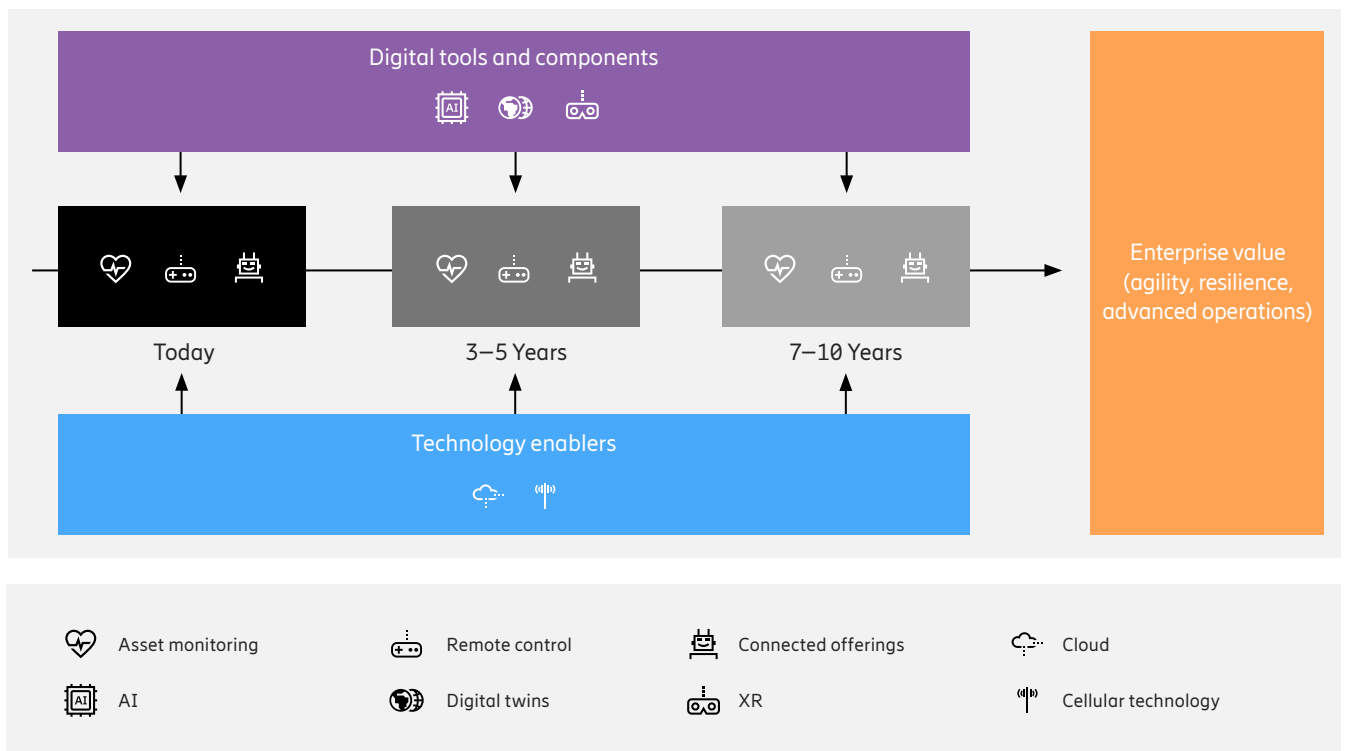
Extended reality (XR)

XR has the potential to create an impressive customer sales experience. Customers could see their future car wash tunnel in XR and digitally configure it to their needs. Motor City is already exploring this technology as a means for further digital sales enablement.

Digital twins

Motor City is working on a stepwise introduction of a real-time digital representation of their customers’ wash equipment (digital twins). Computer Aided Design (CAD) data is combined with real-time life cycle and performance data collected from customer equipment with remote-control capabilities. This will allow technical service personnel to remotely inspect machines, diagnose failures and take necessary measures to fix problems without being dependent on local staff.

Figure 6: The interplay between IoT uses cases, technology enablers and digital tools in driving enterprise value creation



Unlocking full market potential with the evolution of IoT use cases

The number of wide-area IoT connections is expected to double from 3.3 billion in 2023 to 6.6 billion in 2029,⁵ and the IoT market is in the middle of its evolution. Untapped digitalization potential and willingness to invest means growth expectations are high.

To unlock the full market potential, key challenges need to be addressed. Furthermore, enterprises across the different industries are in different stages and have different deployment strategies, causing market fragmentation.

Approximately 50 percent of all enterprises who consider remote control and asset monitoring to be important have not yet fully utilized these use cases. Unlocking the full potential of the IoT market, therefore, lies with this majority group of enterprises' scaled-up investments. These enterprises comprise low utilizers and scalars. In the case of remote control, approximately 4 in 10 are scalars. For asset monitoring, this number is almost 5 in 10. Almost all scalars expect extensive or full utilization of use cases within the next 10 years.

Since a prerequisite for a successful use case deployment is properly addressing key challenges, rather than underestimating them, it is important for companies on a growth trajectory to learn from peers that are experienced in utilization of IoT solutions. Solution providers and communications service providers could play an important role in facilitating this knowledge sharing, thereby contributing to IoT market growth and mitigating the risks of failure.

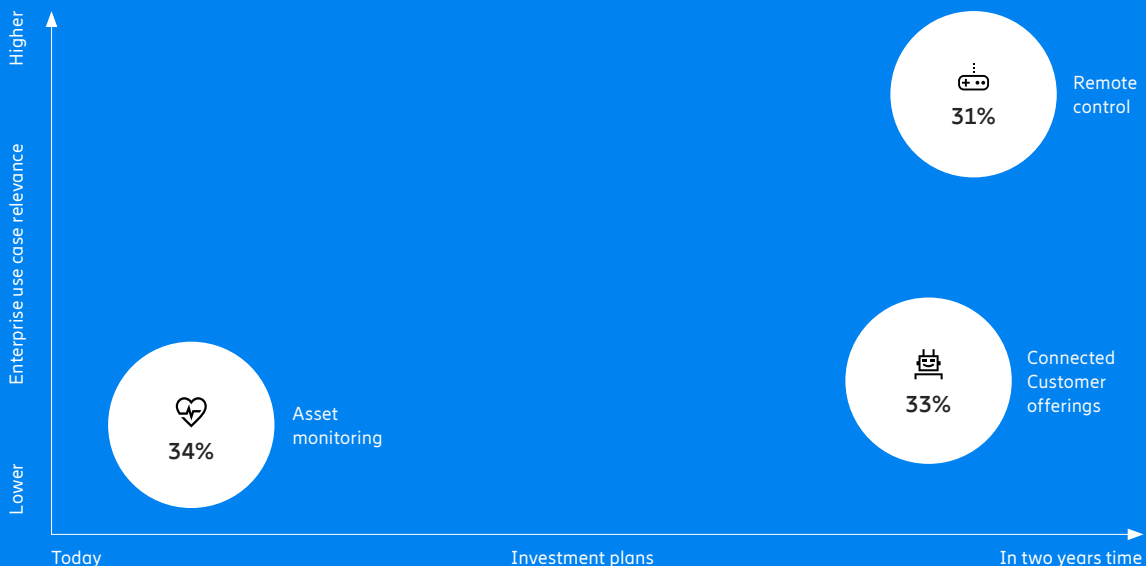
The other group of aforementioned enterprises are low utilizers of remote control and asset monitoring, despite the perceived importance of these use cases or their operation. Notably, more than 70 percent of the decision-makers from such companies identify operational efficiency, customer satisfaction and capex/opex reductions as key benefits in utilizing these use cases.

This indicates their awareness of the potential values associated with their utilization. It can, therefore, be expected that further momentum created by scalars will trigger the need for low utilizers to protect their competitive edge with increased IoT investments.

As seen in Figure 7, remote control is the IoT use case with the highest share of decision-makers stating its importance, but with investment plans more geared towards the future. On the other hand, asset monitoring currently has the highest average share of IS/IT investment budgets. Connected offerings has a sizeable current investment level, and investments are more geared towards the mid-term.

However, enterprises are also facing significant deployment challenges. To fully unlock the investment potential, these challenges need to be understood and addressed.

Figure 7: Relative position of each IoT use case based on current importance to decision-makers (y-axis), current average investment level (percentage of IS/IT budget) and average timing of current and future investments (x-axis) [self-reported]



⁵ Ericsson Mobility Report November 2023

Challenges decision-makers must not underestimate

While IoT is a mature technology, its deployment is still not a simple process. Recent studies have shown that half of IoT projects have failed to deliver according to expectations, most of them in the early stages. One of the risks threatening IoT projects in successfully reaching their desired outcome is scalars underestimating key challenges, particularly regulation, existing solution capabilities, integrability and, notably, cellular coverage.

Challenges including regulation, solution capabilities and cellular coverage are putting market growth at risk, according to more than 6 in 10 decision-makers.

60%

Recommendation
 To reduce the regulatory hurdles, vendors need to design IoT solutions that can be easily adapted to local regulatory requirements, and communications service providers need to ensure that connectivity services fulfill these requirements as well.

1. Legislation and regulation: While regulatory boundaries are important aspects, regulation also creates complexity, increasing effort and cost for enterprises. Therefore, it is unsurprising that 75 percent of decision-makers from high utilizers of remote control or asset monitoring (meaning they have a comprehensive experience), state that regulation represents a key challenge for their companies. However, less than 60 percent of decision-makers from scalars share this view, indicating these companies might be underestimating regulatory challenges (see Figure 8).

2. Capabilities of existing solutions: A significant majority of enterprises with comprehensive experience using asset monitoring claim that these solutions are not good enough. Far fewer scalars see this as a key challenge, which could indicate a potential underestimation of these challenges (see Figure 8).

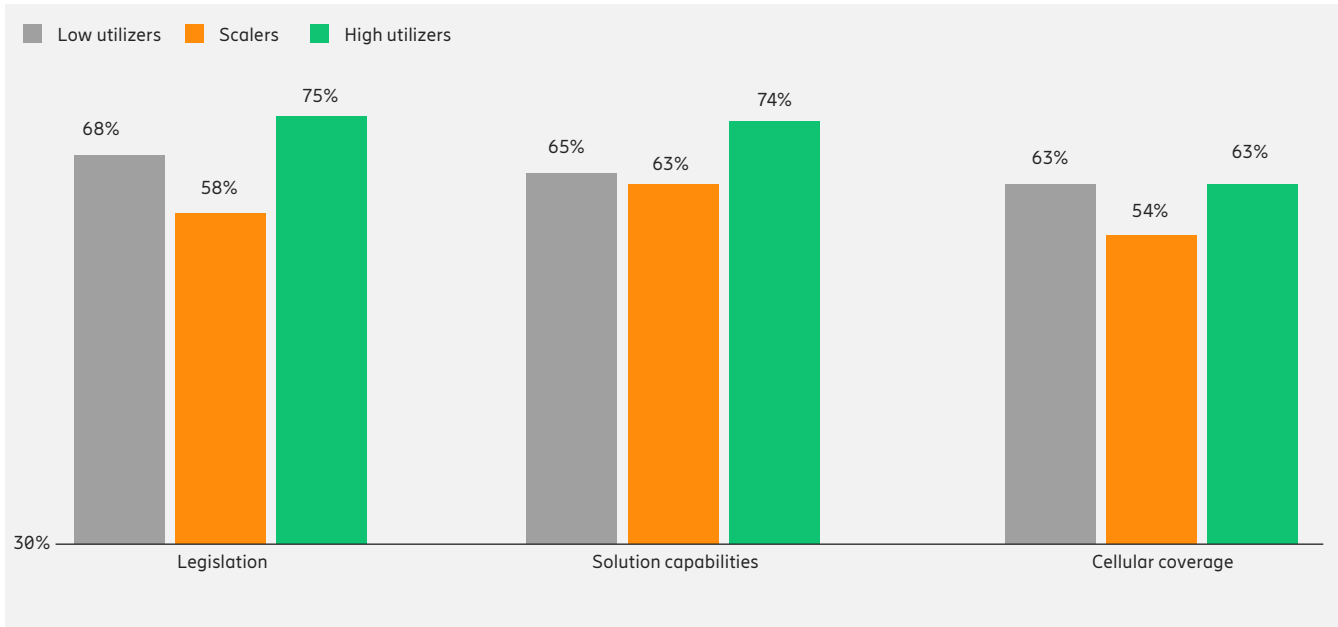
One reason for low solution satisfaction is the lack of solution localization capabilities. Localization capabilities need to be an integrated part of the respective solution architectures.

3. System integration: Most IoT solutions require integration with a range of different devices, with operational data available to several back-end systems including enterprise resource planning, customer relationship management and more. Furthermore, there is an increasing need to share data in a trusted manner with ecosystem partners, as well as to incorporate emerging technologies such as XR and digital twins. On average, 67 percent of cross-industry decision-makers identify different aspects of system integration as a key challenge.

4. Seamless cellular coverage: Cellular coverage still represents a significant challenge that seems to be underestimated by scalars. For asset monitoring, 63 percent of all high utilizers identify cellular coverage as a key challenge. However, only 54 percent of all scalars share this view. This indicates a risk that these companies underestimate challenges related to cellular coverage.

Infrastructure companies are particularly affected by lack of cellular coverage in rural areas. From a communications service provider perspective, investments in cellular network infrastructure often prove a difficult business case in rural areas. However, cellular network slices dedicated to the operations of critical infrastructures of societal interest, for example, energy or transport, would allow a separation of commercial and societal usage and could be one way to address this challenge by unlocking public funding.

Figure 8: Percentage of decision-makers considering each factor as a key challenges for asset monitoring, grouped based on enterprise use case utilization levels



The impact of emerging digital tools on IoT use cases

Decision-makers across all industries expect emerging digital tools to become an integral part of IoT use cases. These emerging digital tools include AI platforms, digital twins, XR devices, haptic tools and low-power sensors.

These five digital tools have the largest growth expectation and most of the utilization growth is anticipated in the next 3–5 years, slowing down in the long term (7–10 years). At least 35 percent of all decision-makers claim to already be using one or more of these emerging digital tools in their companies. This means that the window of opportunity for digital tool suppliers has already opened and can be expected to start closing in five years.

AI and digital twins are currently the most established emerging digital tools for the use cases studied. As depicted in Figure 9, almost half of decision-makers state that AI and digital twins are being utilized by their companies in this context, with almost three-quarters expecting AI utilization within 3–5 years. This may include the usage of “digital shadows,” which are also real-time digital representations of physical objects, but typically only represent the current status and don’t allow for running simulations. Digital shadows are nevertheless a first step towards digital twins.

For XR, expected mid-term usage levels are somewhat lower, but still significant. Approximately 2 in 3 decision-makers expect their companies to use such devices in the next 3–5 years.

The utilization of these emerging tools is expected to complement currently used tools across use cases. For example, computer applications and dashboards are expected to be utilized in parallel with emerging XR tools to enhance IoT use cases within the next 10 years. In asset monitoring, digital twins will complement, not replace, existing solutions, and AI-enabled computer vision technology can complement digital twins, applying digital shadows to non-connected objects or even humans operating in the context of digital twins.

The emerging digital tools can further drive business process automation, fundamentally changing current job roles related to IoT use cases. However, despite the strong automation trend, human workers will still have a role to play in asset monitoring and remote control. Human capabilities will be enhanced by adding XR to their work environment. Field technicians will continue to inspect technical systems and AR will allow them to see vital information via an AR interface. This will improve efficiency, while valorizing job roles significantly.

“...in manufacturing, we have services like digital twins where we can duplicate and digitize the factory floor [...] We can literally apply rules and controls on the digital side that will apply to the production and vice versa, so that you can do things like preventive maintenance, workflow optimizations, yield optimization, quality control and so forth.”

Robert Wenier,
Global Head of Cloud and Infrastructure, AstraZeneca

Figure 9: Percentage of decision-makers stating that their companies utilize the following digital tools and components to extend the capabilities of IoT use cases today and intend to do so in the future [self-reported]

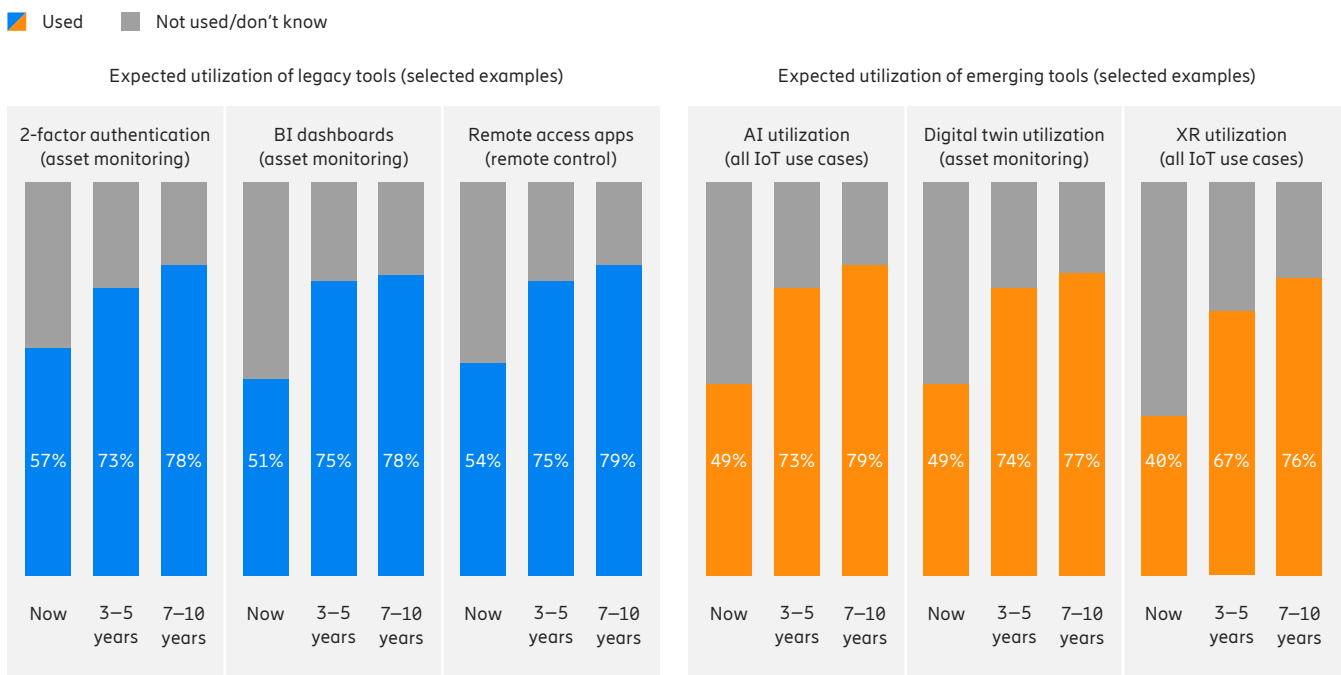
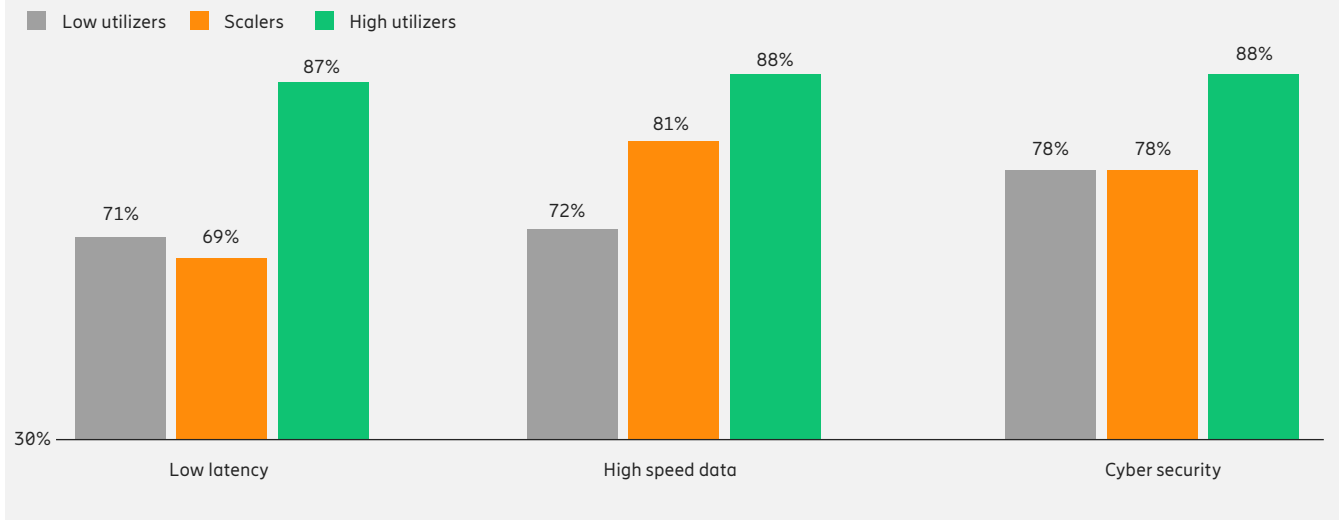


Figure 10: Percentage of decision-makers considering each factor to be a key benefit of cellular connectivity for asset monitoring, grouped based on enterprise use case utilization levels



Finance and infrastructure industries remain asset monitoring champions

As described in the previous chapter, enterprises in the finance and infrastructure segments currently have the highest utilization level of asset monitoring and are expected to keep this leading position over the next 10 years.

Emerging digital tools stand to benefit from cellular connectivity

Almost three-quarters of decision-makers from the infrastructure and finance industries see cellular connectivity as a key enabler for asset monitoring. Cellular connectivity can provide a broad range of benefits to digital tools, including low latencies, high data speeds and cyber security. Beyond asset monitoring, these benefits are also pivotal for XR and haptic devices to function well and secure in the context of remote control.

Recommendation

Communications service providers need to better emphasize the benefits of cellular connectivity for emerging tools such as XR and haptic devices when addressing less experienced enterprises.

The infrastructure segment is leading asset monitoring, through the deployment of XR, low-power sensors, AI and digital twins, averaging a 28 percent higher expected mid-term utilization than the laggard segments.

28%

As shown in Figure 10, almost 90 percent of all decision-makers from high utilizers see low latency, high data speeds and cyber security as key benefits of using cellular connectivity for asset monitoring. However, a significantly smaller number of decision-makers from scalars share this view, particularly related to low latency and cyber security. Even larger differences exist for remote control.

These discrepancies indicate that the benefits of cellular connectivity might be underestimated by decision-makers across all industries, including the infrastructure and finance segments. From an enterprise perspective, this implies the risk that either sub-optimal connectivity solutions are chosen for the roll-out of asset management solutions, or cellular connectivity solutions may not be optimally designed. From a communications service provider perspective, this means that some enterprise connectivity needs might not be solved using cellular technology, or that cellular services might be difficult to monetize optimally.

Infrastructure companies are leading the deployment of the emerging digital tools for asset monitoring. Of decision-makers from infrastructure companies, 73 percent expect their companies to use XR for asset monitoring in the next 3–5 years, and 84 percent expect to use digital twins. Longer term, infrastructure companies will also lead the deployment of low-power sensors.

The finance industry is expected to become a top-two user of digital twins. Almost 80 percent of decision-makers expect their enterprises to use digital twins for asset monitoring in the next 3-5 years. This industry is also expected to become a top-two user of XR, AI-enabled predictive maintenance and low-power sensors in the next 7–10 years.



Increased importance of social sustainability in business

In the era of automation, AI, XR and haptic devices are set to augment human capabilities.

Sustainability must be considered by enterprises to combat the ever-increasing climate and socio-economic challenges. Understanding digitalization and the role of ICT from a “triple bottom line” sustainability perspective (such as the three performance dimensions: social, environmental and economic) is thus very important.

Around 7 in 10 decision-makers expect their companies to enhance their IoT use cases with human-focused tools such as XR, haptic devices and AI-enhanced functions.

70%

From this research, it is clear that decision-maker and employee perceptions differ when it comes to sustainability. Decision-makers claim that a safer work environment for employees, related to social sustainability in business, is the number one sustainability driving

force when it comes to asset monitoring. The same is also true for connected offerings, whereas for remote control, employee skills and competence development is the top sustainability benefit (see Figure 11).

This apparent focus on social sustainability amongst decision-makers could be linked to several different factors, such as regulations and the need to be compliant with work environment legislations.

On the other hand, when it comes to the employee point of view, the environmental aspects are rated higher for asset monitoring, with an environmentally positive brand and a reduction in waste being the two top factors. For remote control, employees rated reduced energy consumption as the top sustainability benefit. Employees only rate social sustainability highest when it comes to connected offerings, in the form of increased employee wellbeing, which could be linked to the benefits they perceive they get by using these connected offering solutions.

Digital tools such as AI-enhanced functions and XR will allow for faster response times in case of incidents, creating safer work environments, which can boost employee satisfaction.

It can be argued that the social aspect of sustainability will be driven by technological innovations. In fact, roughly 7 in 10 decision-makers expect their companies to use these employee-centric digital tools in the next 3–5 years.

Considering that IoT use cases are inherently remote, it would not have been unreasonable to expect to see higher levels of perceived environmental sustainability benefits, particularly when it comes to benefits associated with reduced travel and transport. However, the environmental aspects appear to be secondary to the social benefits (decreased commuting and traveling was the lowest ranked sustainability driver in five out of the six cases).

To conclude, the aim of this chapter was to discuss the potential enhanced social benefits attributed to digital transformations. These highlighted social sustainability benefits should not be seen as a sign that companies are neglecting the environmental benefits, only that they assign higher value to the social benefits.

To what extent this is also true for more human-centric use cases, is something to be covered in the upcoming, second deliverable of this study. Stay tuned!

Figure 11: The highest and lowest rated sustainability benefits across the three IoT-centric use cases [self-reported]

		Decision-makers			Employees		
		Asset monitoring	Remote control	Connected offering	Asset monitoring	Remote control	Connected offering
Social	Employee skills and competence development		▲				
	Increased employee health, safety and wellbeing	▲		▲			▲
Environmental	Environmental positive brand				▲		
	Decreased waste				▲		
	Reduced energy consumption				▼	▲	
	Decreased transportation/travel/commuting	▼	▼	▼		▼	▼

▲ Top value ▼ Bottom value


Conclusions

This report has shed light on digitalization opportunities for enterprises striving to enhance their capacity to generate value, whether to create agility, advance operations, or boost resilience.

The focus has been to cover the present, near-future and long-term evolution of


enterprise digitalization, with the purpose to support enterprise decision-makers and communications service providers by outlining the opportunities, challenges, and the role of enabling technologies involved on the road to the future.

This was facilitated through a global quantitative and qualitative study covering three IoT use cases – asset monitoring, remote control, and connected offerings – along with a real-life case study demonstrating their value for enterprises.

 **Untapped digitalization potential**

There is significant untapped digitalization potential in asset monitoring, remote control and connected offerings, with 8 in 10 decision-makers stating that the main value drivers are boosting agility and resilience.

- Around half of the decision-makers say they currently only have a limited-to-moderate utilization level of asset monitoring and remote control.

 **IoT growth enablers**


Cellular technology is considered to be a key enabler for growth of IoT use cases by 7 in 10 decision-makers.

- However, cellular connectivity's ability to drive fast scaling is underestimated or not fully understood.

 **Challenges to growth**


Challenges including regulation, solution capabilities and cellular coverage are putting market growth at risk, according to more than 6 in 10 decision-makers.

- Additionally, scalars seem to underestimate this challenge.

 **Infrastructure is leading the way**

The infrastructure segment is leading asset monitoring with the deployment of Extended Reality (XR), low-power sensors, AI and digital twins, averaging a 28 percent higher expected mid-term utilization than the laggard segments.

- The segment is also expected to keep its leading position in the long term.

 **Augmenting human capabilities**

The importance of social sustainability is ever increasing. Roughly 7 in 10 decision-makers expect their companies to enhance their IoT use cases with human-focused tools such as XR, haptic devices and AI-enhanced functions in the next 3–5 years.

- In the automation era, AI, XR and haptic devices are set to augment human

Case study insights

Embedding cellular connectivity into Motor City Wash Works' automatic car wash tunnel systems significantly reduces TTM

and facilitates customer agility with "plug-and-play" solutions. Enterprise routers with embedded SIM cards and cellular subscriptions allow

a plug-and-play setup of Wireless WAN connectivity. This can reduce the setup time of a new car wash tunnel by several weeks.

This study clearly shows that decision-makers and employees place significant value on all three studied IoT use cases, both in the present, and in the mid- (3–5 year) and long-term (7–10 years) perspectives.

This presents significant opportunities for communications service providers and enterprises across all industry segments, provided that the identified challenges are not underestimated by enterprises currently scaling up their digitalization

efforts and are treated and handled with due respect. Cellular connectivity, be it 5G or beyond, along with cloud solutions, are key enablers for the evolution and utilization of these use cases to progress as expected.

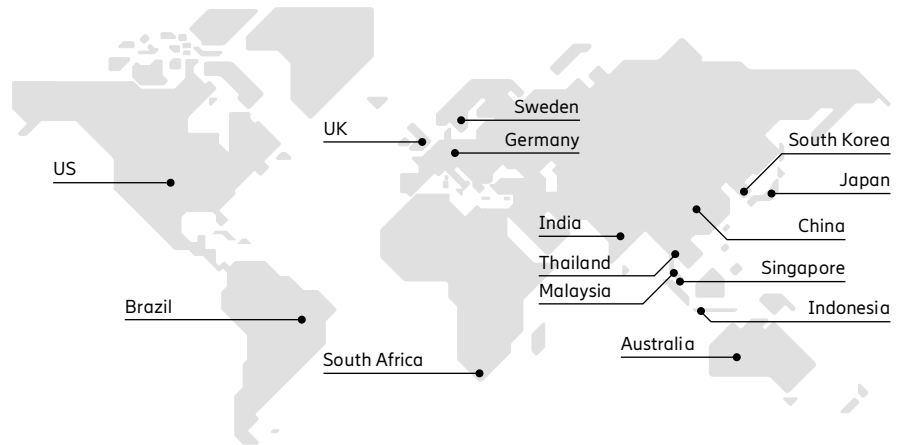
About Consumer & IndustryLab

Ericsson Consumer & IndustryLab explores the future of technology for consumers, enterprises and a sustainable society. We deliver world-class market research, actionable insights and design concepts to drive innovation and sustainable business development. We provide a scientific fact-based analysis regarding environmental, social and economic impacts and the opportunities of ICT.

Our knowledge is gained from global consumer, enterprise and sustainability research programs, including collaborations with leading customers, industry partners, universities and research institutions. Our research programs cover in-depth studies and over 100,000 interviews with consumers, working people and decision-makers each year, in 30 countries – statistically representing the views of 1.1 billion people.

Our reports can be found at:
www.ericsson.com/industrylab

Markets included in the study



Methodology

Quantitative data was collected through an online survey with 9,000 respondents aged 18 and older in Australia, Brazil, China, Germany, India, Indonesia, Japan, Malaysia, Singapore, South Africa, South Korea, Sweden, Thailand, the UK and the US. The seven industry segments covered in this study comprise asset-, site-, infrastructure-, finance-, consumer-, society- and service-centric companies. These segments may be referred to throughout the report as, for example, “finance companies”. Of the respondents, 4,500 were decision-makers in companies with 50 or more employees. The remaining 4,500 respondents were employees. The early-adopter profile of many of these respondents makes them important when it comes to exploring the future evolution of enterprises. The online survey was conducted between July 27 and September 8, 2023.

Qualitative insights were gathered through 32 telepresence interviews with decision-makers, subject matter experts and academic researchers in the US and Europe. These interviews were conducted between January 12 and December 6, 2023.

In this study, a decision-maker is a person with the final say-so or significant influence on strategic ICT and/or business development decisions and are considered to represent the company they work for. Questions related to specific use cases have been answered by a random selection of decision-makers and employees, that have classified that particular use case as a top-two priority for their companies (decision-makers) or for their own work roles (employees).

Terminology:

- **Case study** – A description of a real-life company having implemented one or several use cases, often outlining both what they wanted to solve, and what the outcome of the implementation was.
- **Digital tools and components** – Applications, features or capabilities used to enhance a use case beyond its most basic functionality.
- **Digital twin** – Real-time digital replicas of physical objects or processes, often used for simulations.
- **Low utilizers** – A company on a comparably low current level of utilizing the studied use case across its operation, and with no expectation to change significantly in the future.

- **High utilizers** – A company on a comparably high current level of utilizing the studied use case across its operation, and with no expectation to change significantly in the future.
- **Scalers** – A company currently on a comparably low level of utilizing the studied use case across its operation, but with an expectation to significantly increase its utilization in the future.
- **Technology enabler** – A high-level set of technologies that act as the prerequisite, foundation or facilitator of digital use cases. For example, cloud computing or cellular technology.
- **Use case** – A set of actions performed by an actor (user or machine) when interacting with a product or system to achieve a specific task. A use case can be expanded by adding different digital tools and components. This report focuses on three use cases: asset monitoring, remote control and connected offerings.

About the authors



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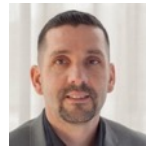
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