

The guide to capturing the 5G industry digitalization business potential



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Bringing customers a connected future

Our previous study, The 5G Business Potential, found that operators have the ability to address an additional revenue opportunity of USD 204–619 billion by 2026. Operators can capture this potential by targeting the digital transformation of other industries, such as automotive and manufacturing, using 5G-IoT technology.

Framing the challenge

One of the main challenges for operators is how to address new growth opportunities in an otherwise highly competitive telecoms market that has an expected revenue growth rate of 1.5 percent per annum during the years 2016 to 2026. An example of such a growth opportunity is to address industry digitalization with telecom offerings integrated in B2B2x business opportunities.

Operators need to be highly competitive within industry digitalization. This includes considering how to cost-efficiently deploy a high number of use cases, what roles to take in the ecosystem or value chain, and what the relevant go-to-market models are.

To delve deeper into the 5G business potential, Ericsson has analyzed more than 400 industry digitalization use cases across 10 vertical markets. From these we have identified over 200 use cases where 5G is expected to play a major role.

In order to maximize revenue opportunities and to overcome deployment challenges, we have grouped these use cases into clusters. Through extensive operator engagements and a carefully chosen analytical framework, we have created a comprehensive guide for operators on how to address the challenges. In this study we also highlight how use cases can be evolved to reach the full 5G-IoT and industry digitalization business potential. In addition, we look at various operator initiatives in the market and extract the main lessons learned so far.

This study also takes a closer look at two clusters, selected because of their substantial revenue potential and the fact that they require quite different operator capabilities. We present a case study that identifies successful business models, how partnerships can be put in place and how commercial and technical challenges have been overcome.

Methodology

Ericsson, in partnership with Arthur D. Little, chose to define the operator 5G market opportunities starting from a use case perspective. In order to maximize market opportunities for investments, the use cases have been grouped into clusters. Ten different clustering principles were tested and evaluated before settling on the final version. The chosen method, an application-centric clustering, has the benefit of maximizing operators' revenue potential across several industries when deploying technical capabilities, while also considering go-to-market and business model challenges.



12–36%

is the potential additional revenue gain for operators, depending on their role in the value chain (network developer, service enabler or service creator), from the 5G-enabled industry digitalization market opportunities by 2026.

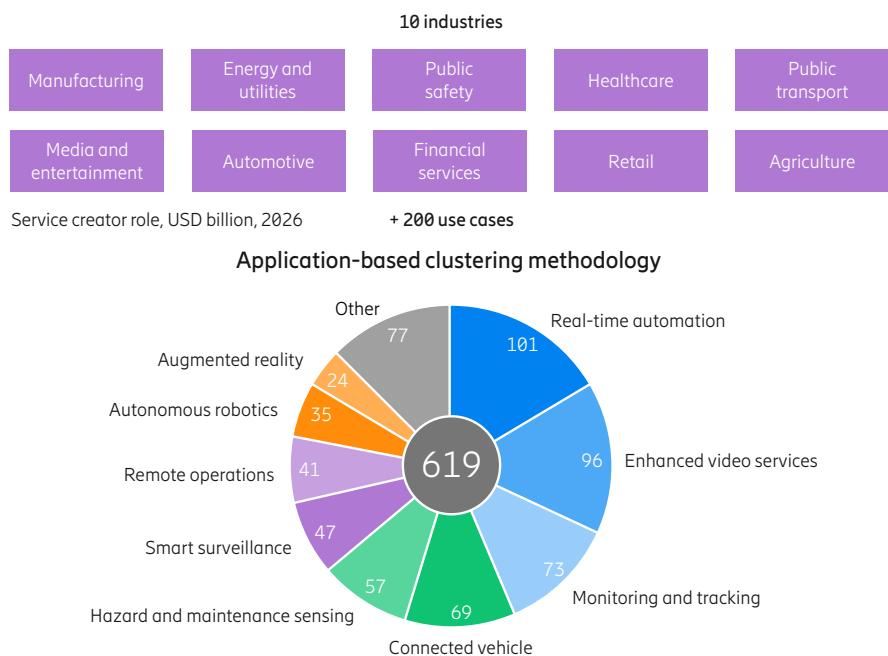
The power of clusters

Ericsson has examined over 200 5G-enabled use cases across 10 industries. Clustering analysis resulted in 9 use case clusters, covering almost 90 percent of the addressable 5G business potential opportunity.

The nine clusters identified provide a more sizable opportunity than individual use cases. More importantly, they enable shared investments and resource allocation across a larger revenue pool. This approach has the additional benefit of increased scalability across industries. At the same time, clustering makes it easier for operators to adapt and evolve use cases based on market response.

As shown in Figure 1, our research has found that the real-time automation cluster is the largest, providing a revenue potential for telecom operators of USD 101 billion by 2026. This is followed by enhanced video services, with a revenue potential of USD 96 billion by the same year.

Figure 1: 5G business potential per cluster

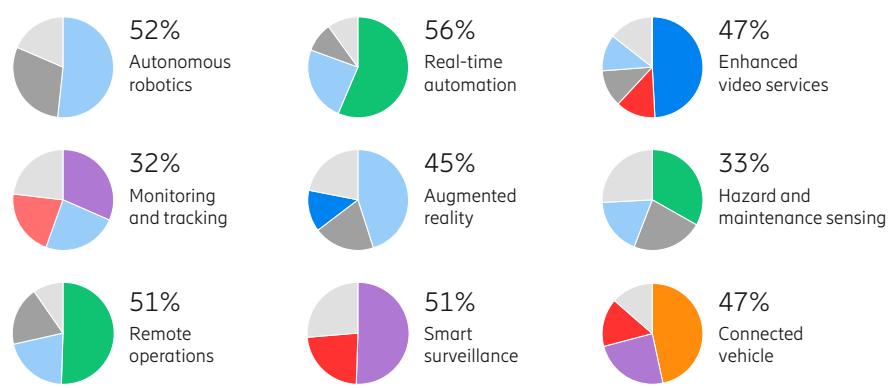


Industry presence per cluster

Before choosing to implement or address a particular cluster, it is vital to again look at it from an industry angle. Figure 2 shows how, based on revenue potential, each use case cluster is made up of industries. All clusters have 3 dominant industries that make up about 75 percent of the total revenue potential, thereby indicating a broader applicability of the cluster approach. We can also see that manufacturing is found in the top three position in seven clusters. Operators need to consider the industry structure of their home markets in terms of the dominating industry sectors, as well as the opportunities from a cluster perspective.

Figure 2: Industry breakdown per cluster

Percentage indicates share of the largest industry per cluster.



Use case evolution



Through the evolution of use cases and clusters, operators can today begin to address the possibilities of 5G-IoT and industry digitalization to ultimately capture their full business potential.

Figure 3 provides examples of how use case clusters can be evolved from an offering that uses currently available technologies into a 5G experience. In a similar fashion, business and monetization models will need to evolve in order to capture the maximum value.

Clusters enable shared investments and resource allocation across a larger revenue pool.

Figure 3: Use case cluster and technology evolution

Example use case cluster	Current	On the road to 5G	5G experience
Monitoring and tracking	Monitoring	Real-time monitoring	End-to-end life cycle management
Autonomous robotics	Procedural robotics	Semi-autonomous robotics	Fully autonomous robotics
Remote operations	Remote operations assistance	Widespread remote operations	Immersive remote operations
Augmented reality (AR)	Smartphone-driven AR	Industry-driven AR	Integrated AR

Example technologies	Multi-standard network	Gigabit LTE (TDD, FDD, LAA)	5G New Radio
	Cat-M1/NB-IoT		Virtualized RAN
	Cloud-optimized network functions	Massive MIMO	Federated network slicing
	Virtualized network function orchestration	Network slicing	Distributed cloud
		Dynamic service orchestration	Real-time machine learning/artificial intelligence
		Predictive analytics	

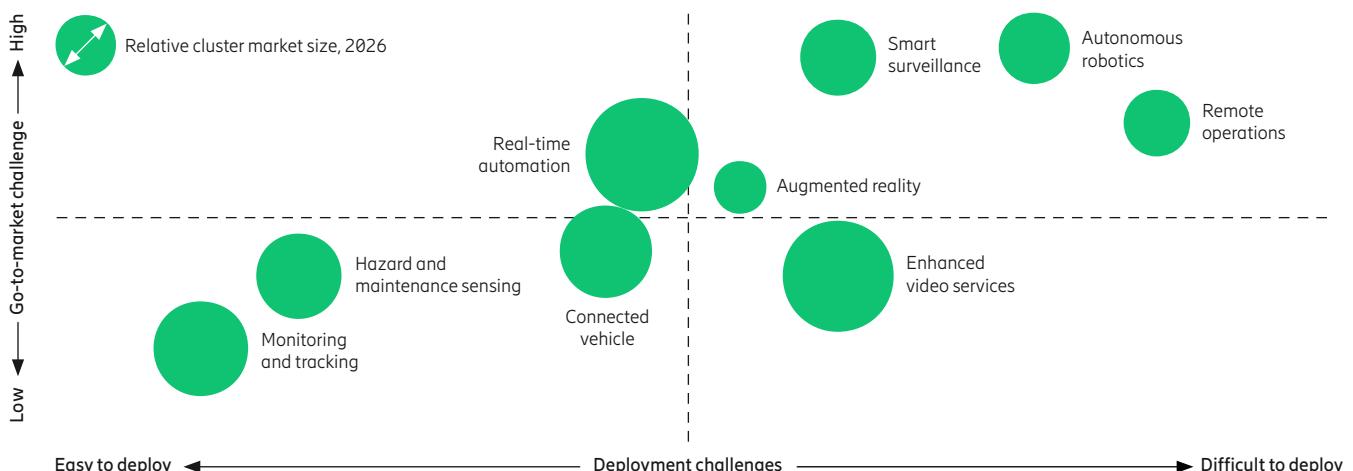
Operator ambitions are key

It will be operators' ambitions and deployment actions that ultimately determine whether these cluster value opportunities are harnessed. Figure 4 shows where clusters are positioned on a scale of their technical and operational deployment difficulty, as well as how challenging they are from a go-to-market perspective, compared to the current typical operator capabilities in these areas.

**USD
101 bn**

in revenue potential for telecom operators by 2026 is achievable in the real-time automation cluster.

Figure 4: Pinpointing clusters' relative growth opportunities



Defining the challenges

All use case clusters come with a set of challenges where operators, based on their current faculties, need to improve and add capabilities. In this study we used two main challenge categories, deployment and go-to-market.

The operator deployment challenges are broken down as follows:

- Throughput and latency: the high throughput and low latency requirements for clusters, combined with quality of service guarantees
- Reliability and availability: the need to avoid packet loss while having 99.999 percent availability
- Local area or wide area: the complexity, measured in deployment efficiency, of providing and enabling functionality such as connectivity, infrastructure and distribution of cloud resources for the cluster

The go-to-market challenges are outlined as follows:

- Ecosystem complexity: the number of partners, and their respective roles, that need to be managed
- Customer stakeholder complexity: the level of complexity of selling applications within a cluster
- Regulations complexity: the level of complexity (not only telecom regulation) of developing and delivering a cluster
- Business model maturity: the business model/s required to derive maximum value from the cluster

Industry digitalization: the guide

With industry digitalization comes fast-growing new revenue pools. High on the executive agenda is how to capture this opportunity.

Figure 5 outlines our view on how to implement a roadmap for the successful introduction of digitalization revenues. Some of the questions we answered in our previous study, The 5G Business Potential; in this study we continue that work and add answers to the following questions:

- What are the most relevant 5G-enabled use case clusters and how do they compare in terms of size and effort needed for deployment?
- What go-to-market challenges need to be overcome and what deployment capabilities need to be built to bring those use case clusters successfully to the market?
- What current examples are there of successful ongoing operator-driven IoT business models and cases on the road to 5G?
- What are the concrete first steps operators can take to boost their existing capabilities in IoT and position themselves as drivers of 5G industry transformation?

Additional learnings from the case studies

In our case studies, we have seen that operators employ a series of strategic and operational activities to address challenges affecting the success of their offerings. Even though these are not yet 5G offerings, these activities will be equally important, or even more so, when evolved towards 5G. Examples of strategic activities include:

- Partnering: depending on lack of strength in the value chain, operators partnering to overcome specific challenges, such as:
- Go-to-market channels: partnering with a player that has sales and/or distribution channels to the chosen target industries
- Complete solution: partnering with a company that offers a large part of the total solution value to the industry being targeted
- Double-sided business models: reducing the risk and ensuring that the business model can be evolved, for example by charging end users of the service and other companies that offer their services on the platform, while also ensuring that these companies can help increase market reach
- Mergers and acquisitions: operators choosing to acquire, or make investments in, companies that play critical roles in the service value chain, such as suppliers of critical end-user hardware and suppliers of important platforms
- Value chain role: having different roles in the value chain (network developer, service enabler, service creator) for different clusters is a requirement for success

Figure 5: The guide to 5G business potential

01: Understand industry pain points and value creation drivers

- What are the most relevant industries in my market?
- What challenges do my prioritized industries face?
- What use case clusters should I focus on?

02: Develop the value proposition

- What is the problem to be solved?
- Is my offering unique and compelling enough?
- How do I measure my customers' gain/pain ratios?

03: Bridge the go-to-market challenges for the cluster

- What ecosystem role should I take?
- What is the best channel model for the targeted segment?
- What business models could I pursue?

04: Invest in deployment capabilities

- What are the key network performance requirements?
- What changes are needed in my network architecture?
- What additional technical enablers do I need to invest in?

05: Experimentation and learnings

- What are the feedback loops?
- How do I adapt and adjust fast?
- What are the milestones for scaling up and for exit?
- What is the time frame for use case evolution towards 5G?

Connected vehicles: transforming industries

The connected vehicle cluster includes applications to provide moving vehicles with a continuous, nationwide connection. One way to target this cluster in the near term is centered around consumers with innovative value chain partners, such as insurance companies.

One key challenge for the cluster is to provide sufficient coverage of high-speed mobile broadband. Additionally, operators will have to develop new sales capabilities to deal with several types of customers, such as original equipment manufacturers, consumers and public transport companies. Example use cases include connected ambulances, high-speed internet on trains, vehicle-to-vehicle networking systems, emergency vehicle notification systems and vulnerable road user discovery.

Drivers and roadblocks

The market drivers for connected vehicles include a growing car sharing market, new safety regulations such as eCall, vehicle electrification and the emergence of new high-tech disruptors in the automotive industry. However, there are also roadblocks to the introduction of connected vehicles. For example, new monetization

models will be required; consumers are used to a one-off payment for a car, while connected cars and features will likely be based on a subscription model.

The industry value of connected vehicles

The global market potential in this cluster is mainly made up by the public safety, public transport and automotive industries, with potential 5G operator-addressable revenue estimated at USD 69 billion in 2026. Figure 6 shows how the connected vehicle cluster could evolve. With the move towards 5G, new opportunities for smart driving will become available, including vehicle-to-vehicle communication systems and high-speed internet access. Once 5G is rolled out it will enhance and broaden the functionality of advanced performance features, such as see-through sensing and advanced entertainment.

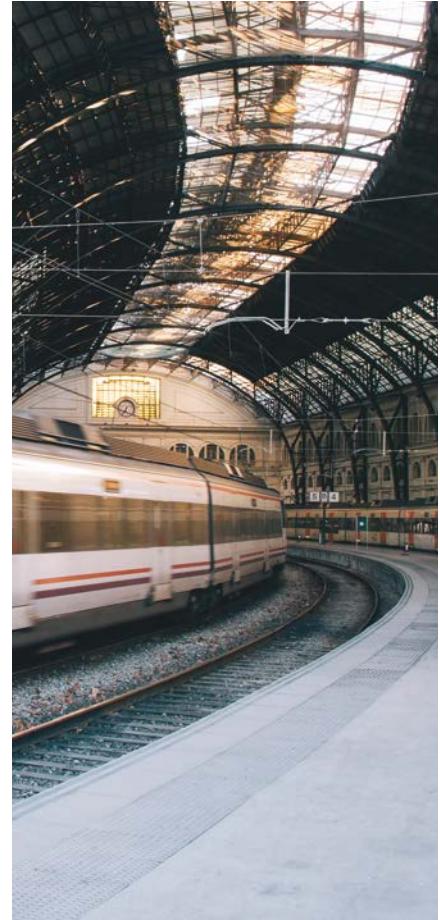
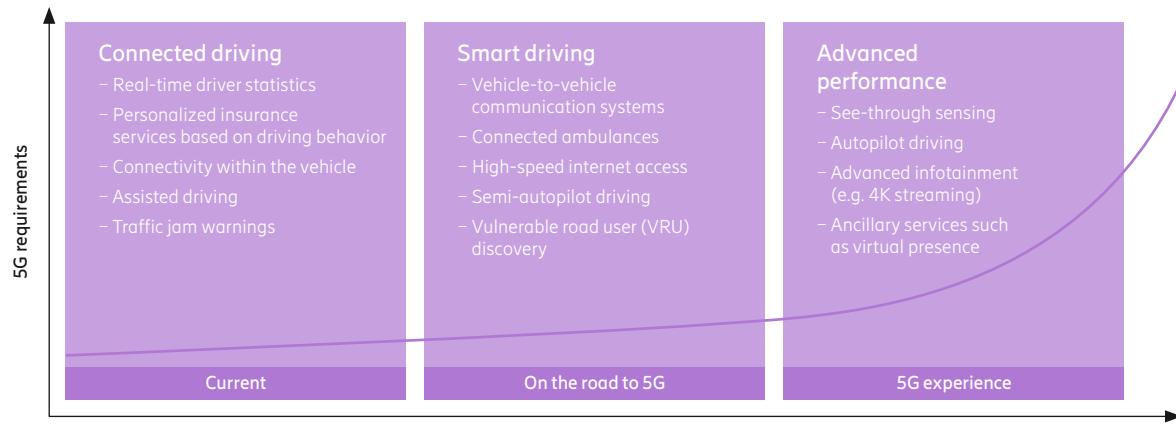


Figure 6: Evolution of the connected vehicle cluster



Source: Ericsson and Arthur D. Little analysis

Time

Cloud-based solutions for connected cars

The automotive industry is addressing the demand for connected vehicles today, with high-tech companies disrupting the traditional industry. Connected cars have been available for a number of years, but mainly as new cars in the premium segment. Now, Swedish telecom operator Telia aims to connect cars already on the streets, opening up a new digital world for otherwise unconnected cars, and complementing inbuilt connectivity with a suite of relevant services.

There are well over 3 million cars in Sweden that employ the on-board diagnostic (OBD) feature, a key enabler for the service. As there is only one port but many service providers, central to Telia's solution is supporting an open ecosystem of partners. Telia demonstrates the opportunity for an operator to expand from data connectivity to offering smart data to an ecosystem of partners – creating innovative service offerings for car owners as well as for insurance and parking services companies.

Telia is one of several operators around the world delivering connected car services today. The company partnered with Springworks AB to offer the product Telia Sense, a host of subscription-based connected car services for customers in Sweden. In this consumer IoT use case example, the main customers

were end users, but Telia also employed a double-sided business model with partners such as insurance companies, car maintenance companies and roadside assistance companies attached to the platform. While the service was initially aimed at the consumer market, Telia has already introduced it to smaller business customers.

In terms of the monetization model for this offering, Telia charges service partners in various ways that support their particular business model, be it a monthly fee based on active users or per event. Meanwhile, car owners pay Telia a monthly subscription fee for a service with a continuously growing set of features ranging from alarms, driving journals and driving statistics to parking assistance and Wi-Fi.

Enhanced car owners' experience has been positive. The ability to constantly evolve the service based on user needs and innovations from ecosystem partners is key.

Folksam, one of the first Telia Sense partners, estimated that if the average speed was decreased by 3km/h up to 40 Swedish lives could be saved per year. Driving well from an insurance perspective means also driving well environmentally, with drivers able to reduce carbon dioxide emissions by an average of 12 percent.¹ In addition, monitoring and providing feedback reduces the accident rate by 56 percent, while revenue is increased by way of a 20 percent reduction in loss ratio for insurance companies.²

Car services enabled by Telia include:

- Wi-Fi hotspots
- Service warning alerts
- Parking information and warnings
- Tire change notifications
- Eco-driving features
- Easy-to-use driving journals
- Roadside assistance
- Insurance services
- Tampering alarms
- Dashboard and car usage data

¹ www.gpbullhound.com/wp-content/uploads/2016/10/Bloomberg-GP-Bullhound-Nordic-Tech-Tour-2016.pdf

² Towers Watson, Usage-based Auto Insurance (UBI), www.casact.org/community/affiliates/sccac/1211/Harbage.pdf

A world of real-time automation

Real-time automation is the largest of the use case clusters defined in our study. It consists of autonomous applications that leverage data from sensors in real time to trigger specific actions. It is often used in mission-critical applications, where latency, availability, reliability and security are of key importance.

Manufacturing, energy and utilities, and healthcare are the main industries represented in this cluster. Example use cases include various industrial automation applications: distributed energy resource management, virtual power plants and precision medicine. Some use cases in the cluster typically require much greater geographical coverage (energy and utilities), whereas others have more local and indoor coverage requirements (manufacturing), providing some insight as to the easier industries to address.

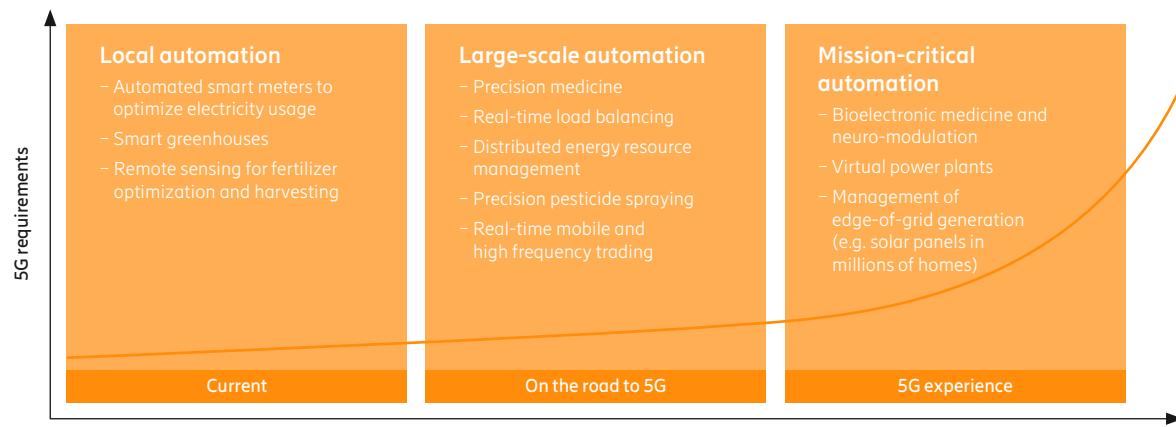
Market drivers and roadblocks

Real-time automation market drivers include manufacturing with IoT: global IoT spending will surpass USD 1 trillion by 2020, with manufacturing being the largest segment.³ Smart agriculture development is also a factor; the smart agriculture market is expected to grow at 11.5 percent annually between 2017 and 2025.⁴ The roadblocks to overcome for real-time automation to become a reality include the quality of data, as automation can only be as effective as the data it receives. In addition, acceptance of and trust in algorithms is a factor; in fields like medicine, patients may not trust automation-based decisions over human judgment.

Reaping real-time automation rewards

The global market potential of real-time automation is significant. The potential 5G operator-addressable industry digitalization revenues total USD 101 billion globally in 2026. Figure 7 shows how use cases within the real-time automation cluster could evolve as 5G technologies come into play and enhance the services, starting with local, fairly simple automation applications and eventually moving towards larger-scale and mission-critical scenarios.

Figure 7: Evolution of the real-time automation cluster



Source: Ericsson and Arthur D. Little analysis

Time

³ IDC, Worldwide Semiannual Internet of Things Spending Guide

⁴ www.researchandmarkets.com/reports/4375555/smart-agriculture-market-to-2025-global



Harnessing 5G industry digitalization

5G is a powerful piece of technology at operators' disposal in capturing the revenue potential opportunities from industry digitalization.

Key findings

- Operators have the potential to address a revenue opportunity of USD 204–619 billion by 2026, in addition to the forecast telecom service revenues of USD 1.7 trillion in 2026.
- Operators can capture potential revenue by targeting industries undergoing digital transformation, such as the manufacturing and automotive industries, with 5G technology.
- To get started today, the challenge for operators is to be competitive with their offerings in industry digitalization. This includes considering how to cost-efficiently deploy a high number of use cases, what roles to take in the ecosystem or value chain, and what the relevant go-to-market models are.
- Through extensive operator engagements and analysis, Ericsson has established nine use case clusters which each address multiple industries. Real-world operator case studies put these clusters into practice.
- The cluster approach is important for sharing risk and reward across use cases and industries. The least challenging clusters to address include monitoring and tracking, hazard and maintenance sensing, and connected vehicle. Other clusters such as real-time automation have large revenue potential but higher entry barriers. The decision on which cluster to target should be based on operators' current capabilities and strategic ambitions.
- Once use case clusters have been selected as targets, Ericsson's architecture and capability framework can be used to capture the full potential of 5G industry digitalization. It highlights which network capabilities to explore in order to prepare for the evolution ahead.
- Legacy business models and operational structures will have to evolve to survive in a 5G-IoT world. Detailed real-life operator IoT initiatives, describing monetization structure and business models, show how they can be evolved to 5G and harness maximum industry digitalization opportunities.

The guide to 5G business potential

To enter a particular cluster, operators will need a tailored go-to-market strategy. Taking a generic example, Ericsson has created a five-step approach:

01. Understand industry pain points and value creation drivers.
02. Develop the value proposition by outlining the problem to be solved, making sure the solution is unique and compelling enough, and measuring customers' gain/pain ratio.
03. Bridge the go-to-market challenges for the cluster and decide which ecosystem role, channel model and business model to pursue.
04. Invest in deployment capabilities such as network performance enablers from Ericsson and secure other technical enablers.
05. Implement the solution and build its roadmap based on the expected evolution of its capabilities. Make sure to use an experimentation and learnings framework to adjust the offering and be ready to scale.

Learn more

For information about the nine use case clusters and eight operator IoT case studies detailed in this study, please contact your Ericsson representative.

Learn more about Ericsson's 5G business potential study, industry survey and network deployment considerations: ericsson.com/5g

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