



# The operational agility to capitalize on the 5G opportunity

Optimize 5G operations to deliver the extraordinary

**NOKIA**





# Contents

- Agility and profitability go hand-in-hand
- Eliminate the bottlenecks to business growth
- What it will take to become more operationally agile
- Extending agility across the entire value chain
- Solutions to optimize 5G operational 5G agility
- Your partner in 5G operations



• Agility and profitability go hand-in-hand

• Eliminate the bottlenecks to business growth

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• Extending agility across the entire value chain

• Solutions to optimize 5G operational 5G agility

• Your partner in 5G operations

## Agility and profitability go hand-in-hand

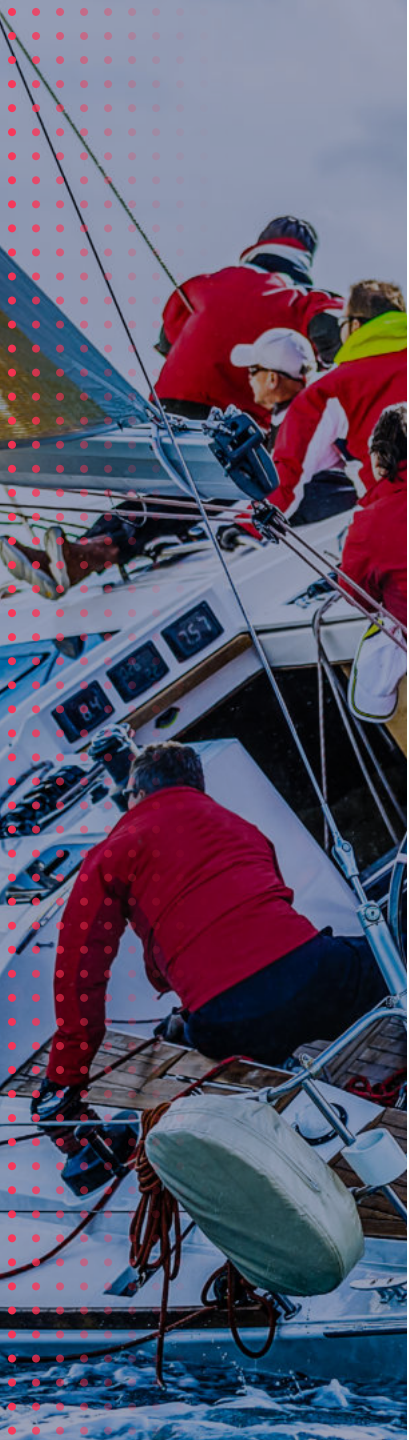
The potential value of the new services, business models and markets made possible by 5G could be as high as \$2 trillion.<sup>1</sup> Capturing a share of that will demand extremely high levels of agility: the capability to quickly respond to the unexpected and unplanned, or to adapt existing solutions for new purposes. But that's something the operations of today's communications service providers (CSPs) simply aren't built to deliver.

As it stands now, introducing new features, creating and customizing network slices for B2B2X partners, and integrating connectivity with a broad range of services and applications is complex, time-consuming and expensive. But it doesn't

have to be. What if CSPs could do all that in a couple of clicks? How many more business opportunities would be open to them?

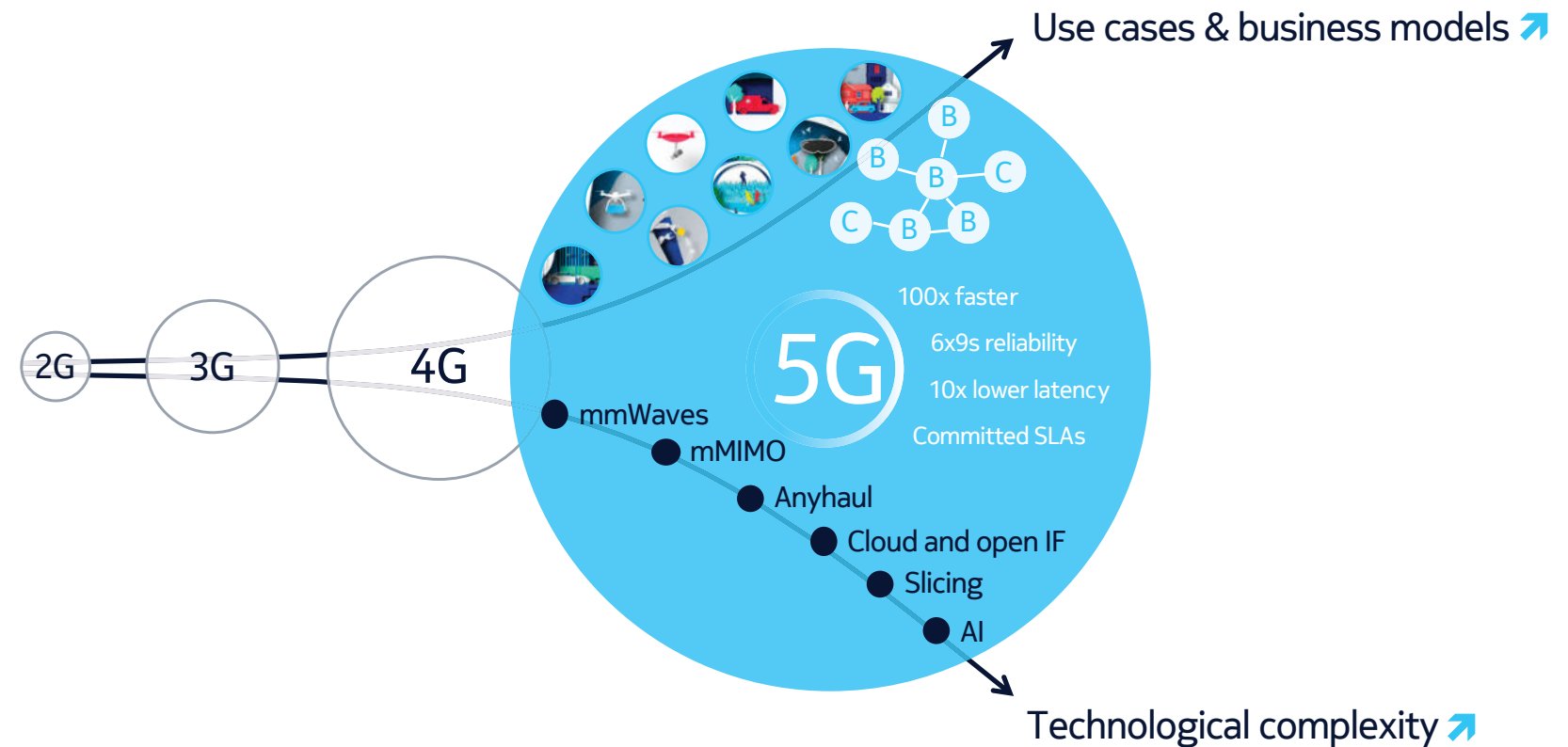
That kind of agility isn't acquired overnight. It can't be achieved by adding more headcount, either. Being able to launch and pilot new services faster requires a fundamental shift in every aspect of operations.

<sup>1</sup> Bell Lab Consulting, based on a 2018 McKinsey Global Institute study.



- Agility and profitability go hand-in-hand
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To deliver the extraordinary — and do it faster — CSPs must become more agile in their network and service operations.



**5G brings an explosion of new use cases and business models — and a corresponding increase in technological and operational complexity**



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## Eliminate the bottlenecks to business growth

**5G services will be diverse and complex. If CSPs are to create, customize, deliver and assure those services on demand and on potentially massive scales — on top of the legacy services ecosystem they're already supporting — operational agility is essential.**

A lack of operational agility could end up being CSPs' most significant barrier to growth. That fact is clear when one thinks through the implications of virtually any 5G use case. Consider a large port with multiple industrial control systems managed by various private and public agencies. Dedicated 5G slices will be needed for all of those systems: construction, maintenance, traffic steering, environmental monitoring, logistics, crane operations and more. Not only will each system require its own slice, but so will each organization operating at the port. Without agility, responding to that multiplicity of needs would be practically impossible.

The same is true for a use case such as connected vehicles. There might be a slice dedicated to real-time map displays, another to streaming video for onboard infotainment, another still for automated driving features. Slices will also be needed for roadside video surveillance and to facilitate video communications between emergency teams responding to serious accidents. Agile operations that can respond to the evolving service needs of the connected vehicle as an ecosystem will allow CSPs to capitalize on a broader range of opportunities as they emerge.

• Agility and profitability go hand-in-hand

• Eliminate the bottlenecks to business growth

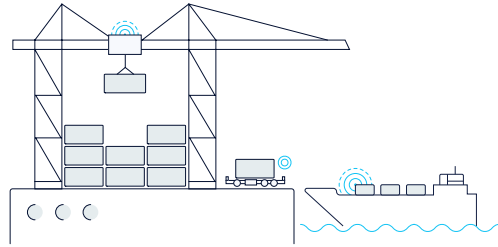
• What it will take to become more operationally agile

• Extending agility across the entire value chain

• Solutions to optimize 5G operational 5G agility

• Your partner in 5G operations

## 5G smart sea port



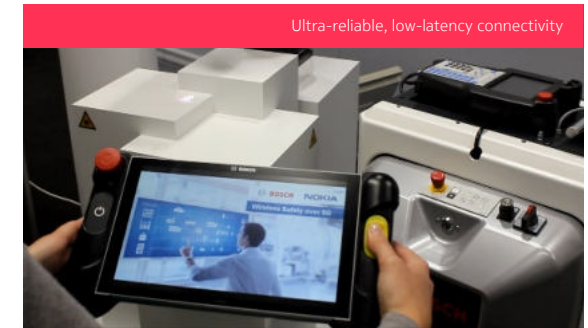
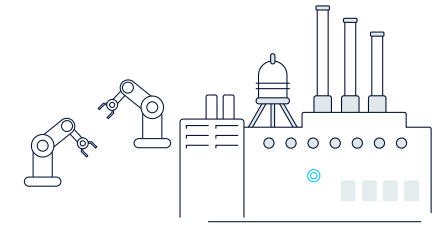
Traffic lights management, data processing from mobile sensors and virtual reality

## 5G V2X connectivity



Different automotive and public safety slices running over the same network

## 5G industrial automation



Coupling advanced interactive robots with wireless perimeter intrusion detection

**Nokia has conducted real-world 5G trials with the Hamburg Port Authority, BMW and more — early examples of the impact 5G will have across dozens of different industries**

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- Eliminate the bottlenecks to business growth

- What it will take to become more operationally agile

- Extending agility across the entire value chain

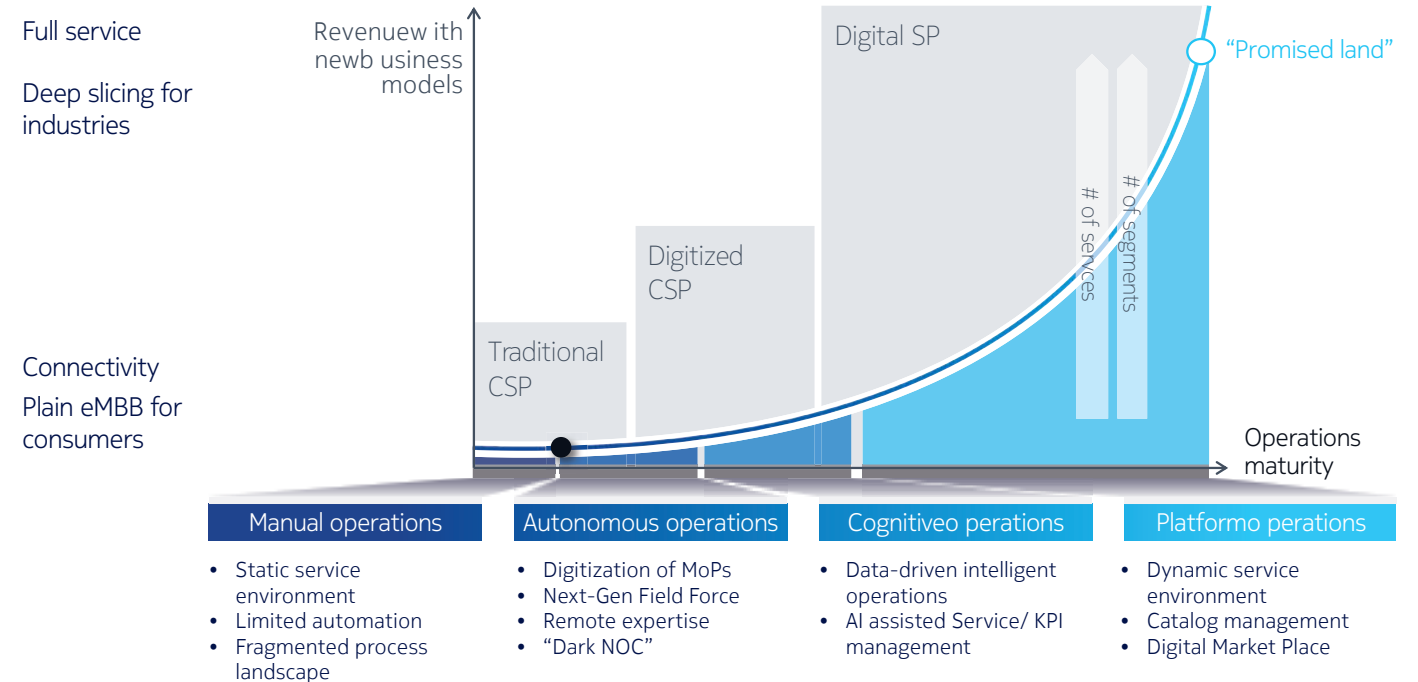
- Solutions to optimize 5G operational 5G agility

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## Reaching the 5G “promised land”

Agility is a product of becoming **operationally mature**: streamlining and automating operational processes. That maturity will allow CSPs to reach the 5G “promised land” where they can offer more high-revenue services to more customers across more industries and use cases. Up to 72 percent of 5G revenue growth depends on a CSP’s ability to transform their operational and business support systems.<sup>2</sup>

There are four main stages of operational agility, starting with today’s manual operations and bulk connectivity services and progressing all the way to full-service platform operations where new services can be spun up and deployed at very high speed. Each stage of development is an opportunity for CSPs to “level up” their revenue potential. Yet 84 percent of today’s CSPs receive the lowest score for 5G maturity, lacking the automation and embedded intelligence that characterize the latter stages of operational agility.<sup>3</sup>



The four stages of operational agility.

<sup>2</sup>TM Forum, 2018. 5G monetization: Operational imperatives.

<sup>3</sup>Nokia, 2019. Best practices for 5G transformation: Key findings from the Nokia 5G Maturity Index.

- Agility and profitability go hand-in-hand

- Eliminate the bottlenecks to business growth

- **What it will take to become more operationally agile**

- Extending agility across the entire value chain

- Solutions to optimize 5G operational 5G agility

- Your partner in 5G operations

# What it will take to become more operationally agile

CSPs looking to achieve higher levels of operational agility will need to dramatically transform **people**, **processes** and **tools** across all aspects of their operations.

## A holistic approach to transformation

Often, CSPs' tools are standalone, with limited integration. Processes are typically restricted to specific network domains or service areas. And people's expertise, while deep, can also be narrow and specialized.

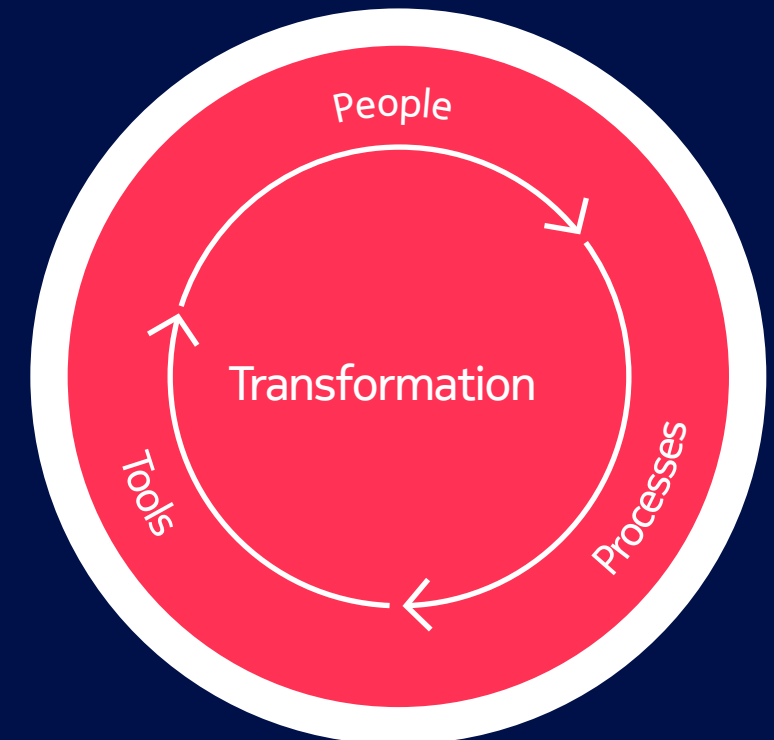
This abundance of isolated tools and processes calls for frequent human intervention, with data needing to be moved manually between systems and repetitive tasks consuming huge amounts of time.

As they progress along the path of operational maturity, CSPs will gradually reorient their operations to support end-to-end, fully automated service lifecycles. When the creation, testing, orchestration, delivery, assurance and analysis of services are automated and enabled by closed-loop **processes**, CSPs can focus more of their attention on the business layer than

the operational layer. They can also pursue unplanned or unexpected new business opportunities, even on short notice.

Similarly, automated **tools** free CSP operations teams to focus on broad strategic needs rather than repetitive manual or specialized technical tasks. That leaves the **people** able to work on cross-domain operational planning and problem-solving, bringing in new software functionality or building new partnerships across the value chain.

CSPs may also consider partnering with a managed network and service management provider to handle operational tasks and bridge gaps that exist within their in-house teams.



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- Eliminate the bottlenecks to business growth

- What it will take to become more operationally agile

- Extending agility across the entire value chain

- Solutions to optimize 5G operational 5G agility

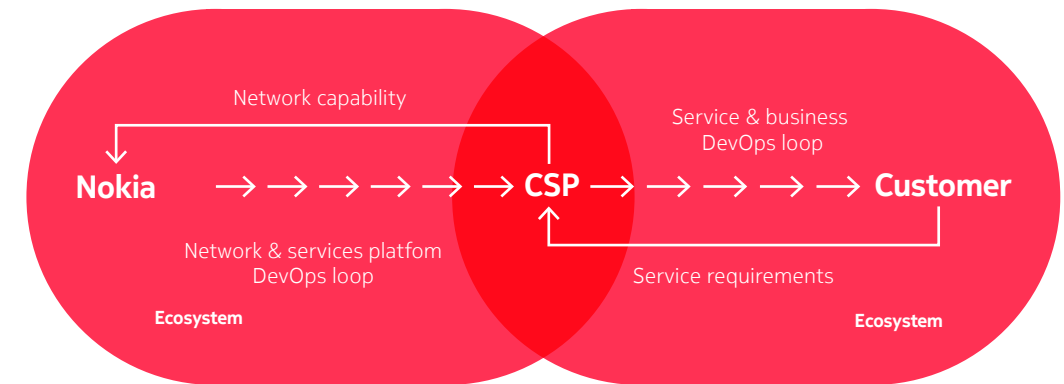
- Your partner in 5G operations

## Extending agility across the entire value chain

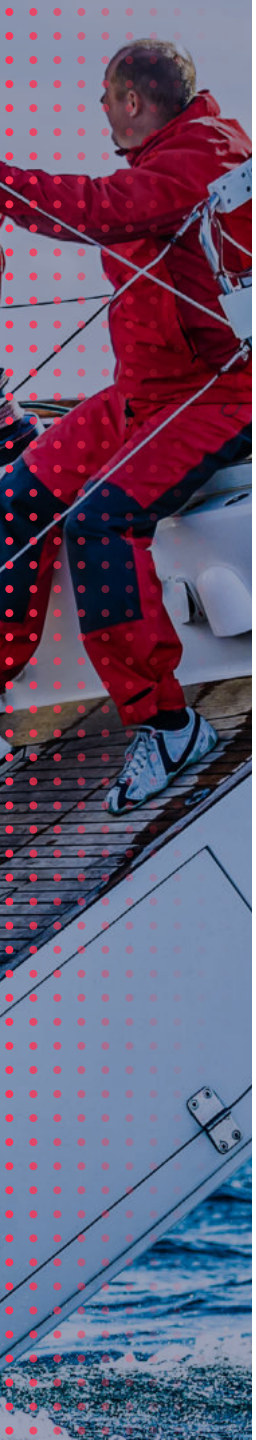
**Network services in the 5G era will take on “webscale” characteristics: on demand, delivered quickly and modified (or decommissioned) just as fast. That requires agility that is truly end to end — permeating every aspect of CSPs’ operational processes and extending to their relationships with both **technology suppliers** and **customers**.**

When CSPs need new network solutions to seize 4G opportunities today, the change and development process with network technology suppliers can take months. The 5G marketplace won’t have that patience, meaning the relationships between CSPs and their suppliers have to become as dynamic as the services themselves. The days of “once-a-year” software releases are over. Everything will be driven by dynamically changing business intents — what the new service or solution needs to do for the end customer. It’s about connecting the network to the business.

At the same time, CSPs, can’t be locked into a single supplier: they’ll need to build a partner ecosystem that will allow them to work with whatever supplier is capable of meeting their immediate demands in the least amount of time.



**5G requires agility in all directions**



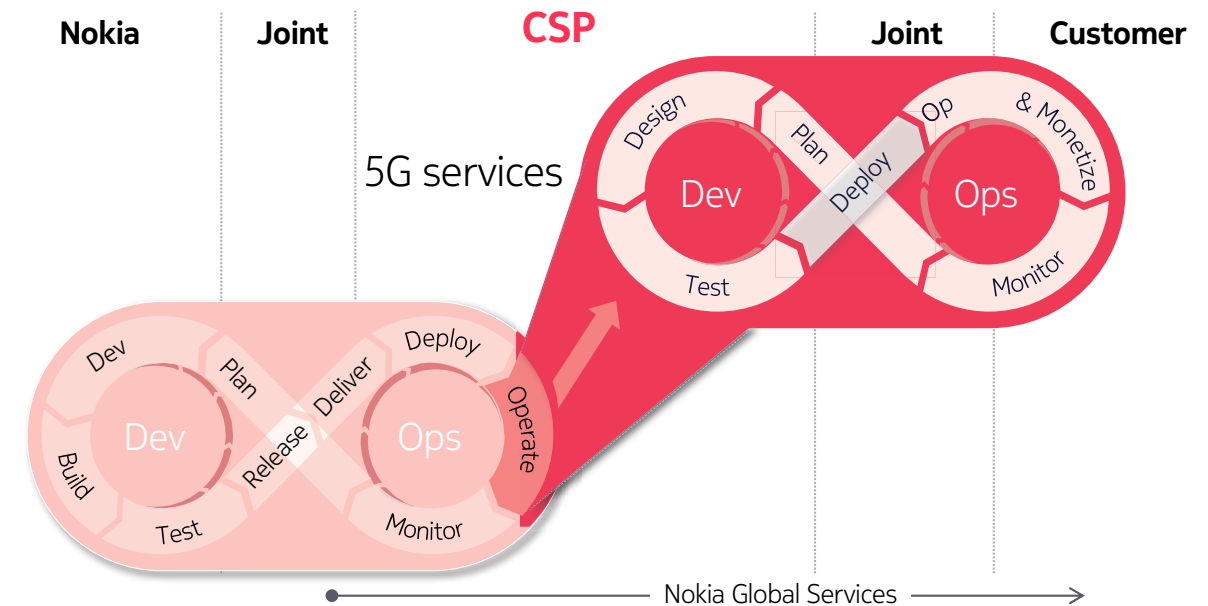
- Agility and profitability go hand-in-hand
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- What it will take to become more operationally agile
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## The DevOps way of doing things

DevOps combines software development with network and service operations in a process of continuous improvement, resulting in faster development cycles and services better attuned to customer needs. Applications and code are updated and released on demand, with products and services always “live” and responsive to changing needs.

By leveraging agile relationships with suppliers and customers, CSPs can develop and pilot new 5G services incrementally, continuously and cost-effectively. Embedding a DevOps approach to design, testing, deployment, assurance, monetization and more will improve knowledge sharing and empower teams and stakeholders — with everyone in the value chain playing their part in delivering extraordinary 5G services.

Network and service platform



**The DevOps mindset is about continuous, iterative improvement — in both the services provided to customers and the operations platform behind those services**



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- Eliminate the bottlenecks to business growth

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- Extending agility across the entire value chain

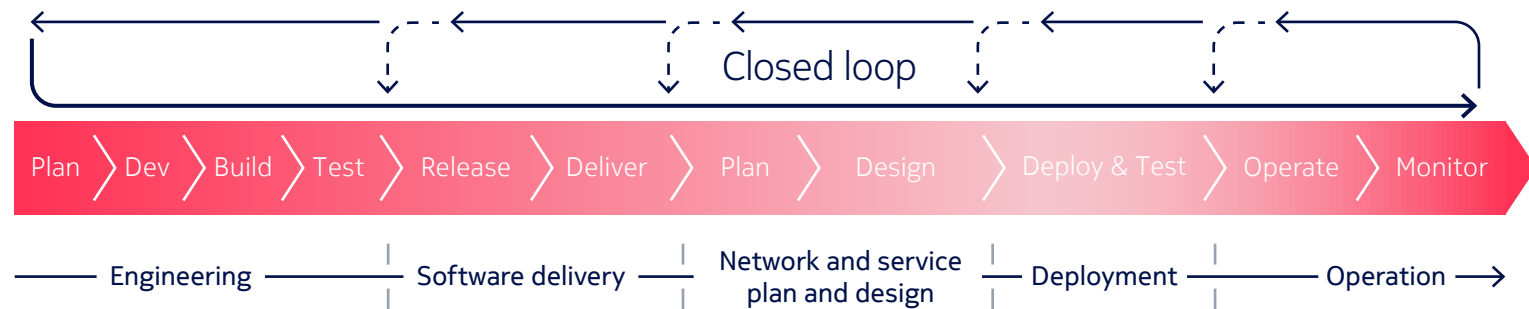
- Solutions to optimize 5G operational 5G agility

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## Agile, closed-loop operations that are driven by data

The various layers of CSP operations need to be powered by data-driven, interconnected, closed loops in the 5G era. This makes network and service data available to all processes and functions, including engineering, software delivery, network and service planning and design, deployment and operations. Artificial intelligence and machine learning can extract meaningful information from all the input and feedback gathered, and then make and act on predictions and recommendations

in response to — or anticipation of — shifting operational conditions. The results of those actions also automatically fed back into the loop for further iteration and refinement, resulting in more streamlined, simplified and efficient operations.



**Closed-loop processes across every stage and every layer enables the agile, flexible DevOps approach to operations.**



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Eliminate the bottlenecks to business growth

What it will take to become more operationally agile

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# Solutions to optimize 5G operational 5G agility

Nokia provides the operations, management and orchestration software to help CSPs realize greater agility in-house as well as a comprehensive managed services offering to accelerate service deployment while minimizing total cost of ownership.

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Your partner in 5G operations

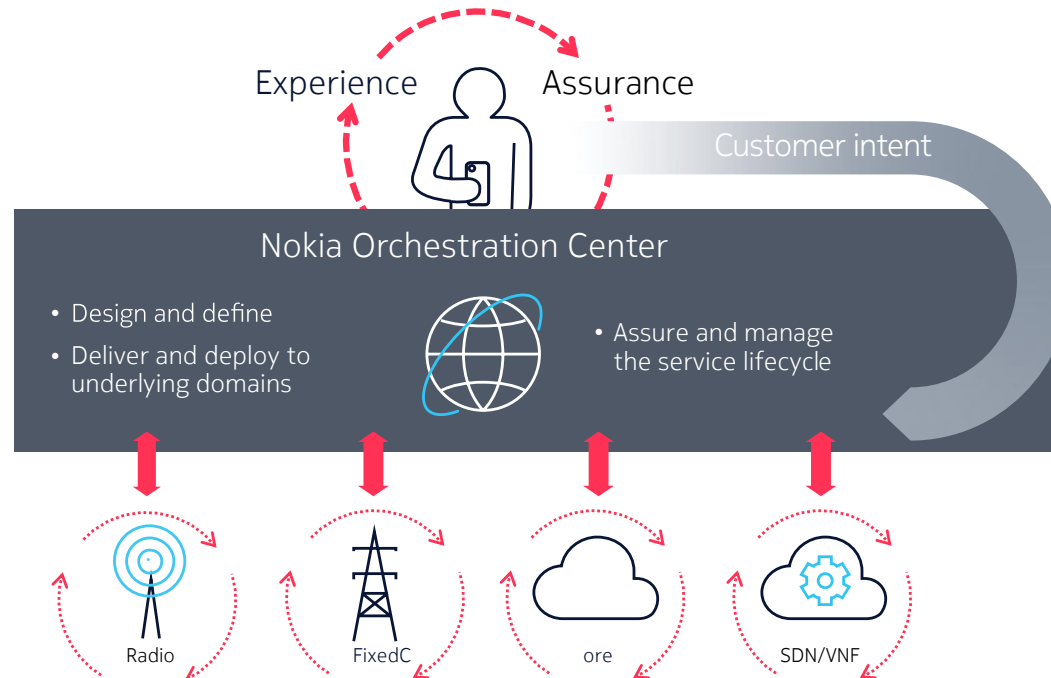
# Nokia FlowOne

Learn more

Enable complex, multi-domain hybrid service operations with a unified, automation-native, end-to-end service lifecycle orchestration platform for mobile and fixed services.

automated service operations. With a unified resource and service inventory (including a library of more than 800 interfaces), system integration is faster and operations are simpler overall.

Nokia FlowOne provides a single tool for cross-domain service design and delivery with native support for closed-loop,



67%

faster corporate IP service delivery for a European CSP

3x

more effective network utilization for a Middle Eastern CSP

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- **Solutions to optimize 5G operational 5G agility**

- Your partner in 5G operations

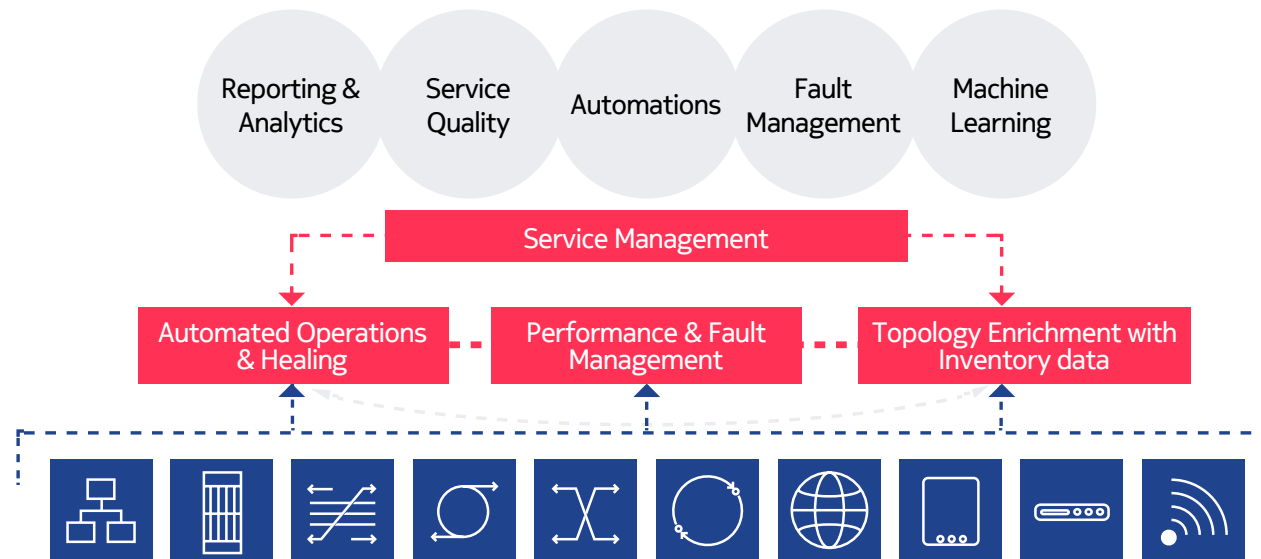
## Nokia Assurance Center

[Learn more](#)

Improve operational agility and reduce operating costs with our multi-vendor, multi-domain and multi-technology service assurance suite that combines quality management with automated operations.

ensure performance benchmarks are being met. That means the introduction of new technologies does not cause the deployment of new services to be delayed.

The Nokia Assurance Center facilitates faster time to operations by automating the onboarding and testing needed to



# 30%

faster rollouts of new network technologies

# 30%

of tickets are solved by closed-loop processes

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Your partner in 5G operations

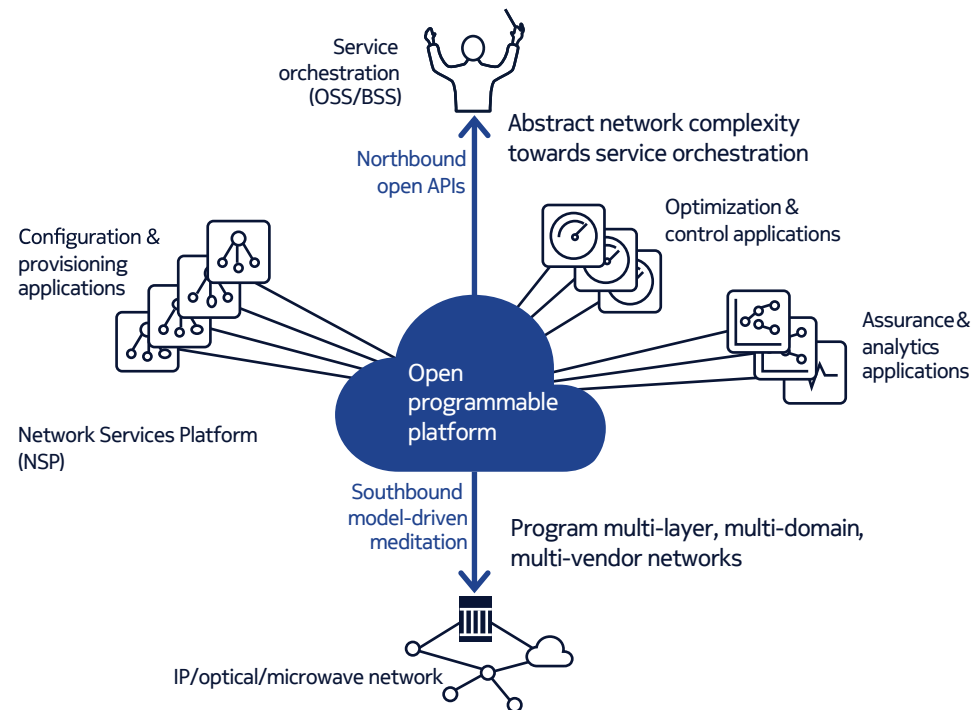
## Nokia Network Services Platform

[Learn more](#)

Automate, optimize and assure IP, optical and microwave transport services with our unified, multi-layer, multi-tenant solution.

The modular and programmable Nokia Network Services Platform includes a complete suite of ready-to-use applications to help network operations teams cover all

use cases related to network management and control. This flexibility makes it easy to quickly respond and adapt to changing customer demands. Plus, open interfaces allow for the simplified integration and deployment into existing operating systems, accelerating service rollouts.



56%

faster time to value

24%

more revenue-generating traffic on existing network

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- **Solutions to optimize 5G operational 5G agility**

- Your partner in 5G operations

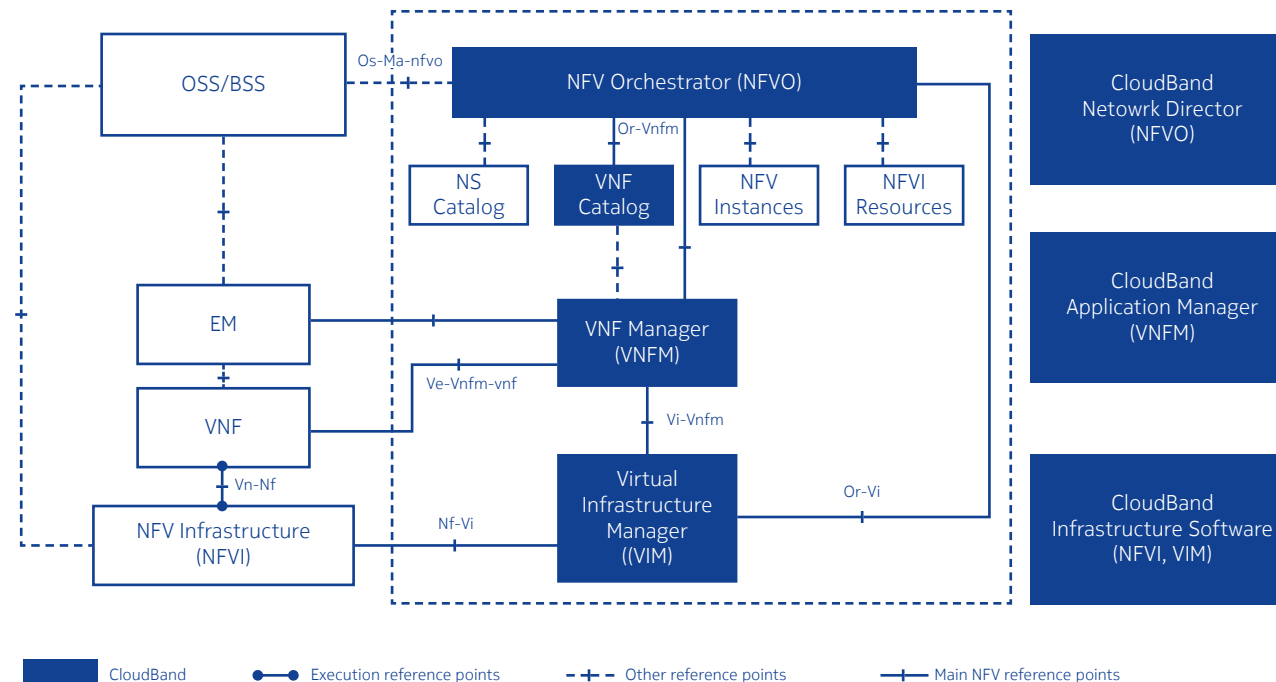
# Nokia CloudBand

[Learn more](#)

Get complete control of the cloud with a fully automated lifecycle management system for network services and virtual network functions (VNFs).

new cloud services — and transition to leaner, more agile operations by automating infrastructure and application management processes across the entire lifecycle.

Our CloudBand portfolio makes it simple to host, orchestrate and manage VNFs. Unlock new revenue streams and speed up time to revenue by rapidly launching and scaling



40+

supported third-party virtual network functions

150

CloudBand customers around the world

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- Your partner in 5G operations

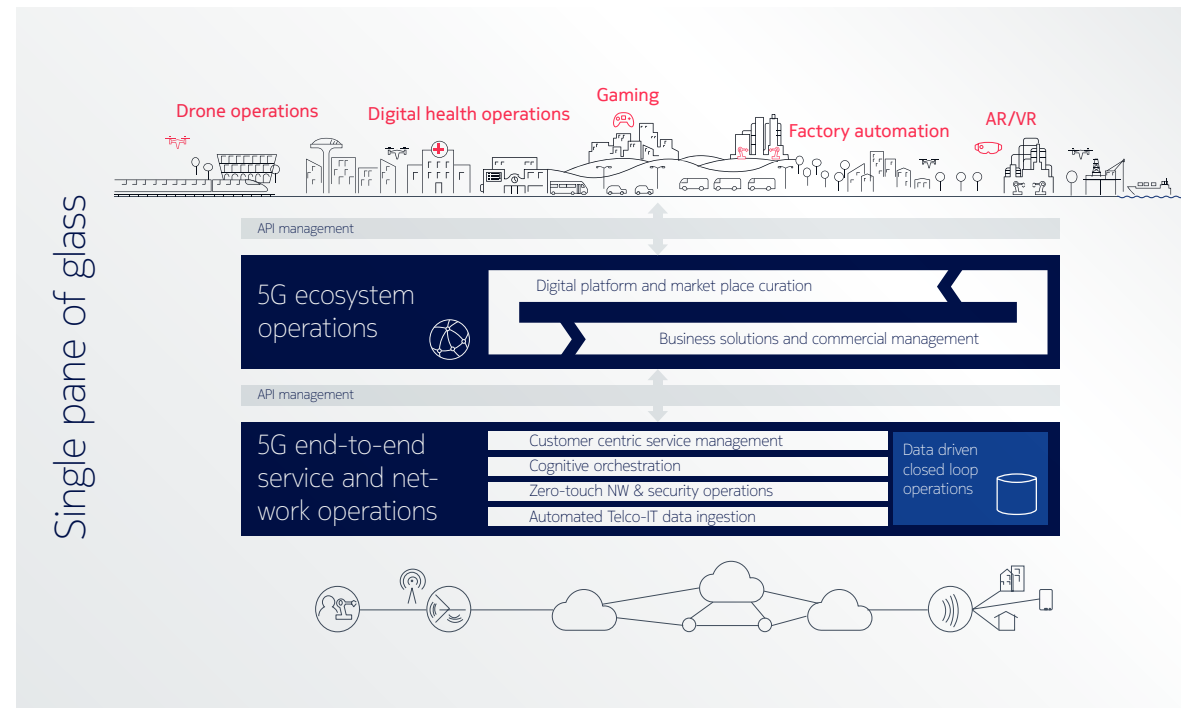
# Nokia Managed Network and Service Operations

[Learn more](#)

Boost revenues while accelerating time to value with a complete set of managed services for 5G service creation, delivery and monetization.

Our managed services portfolio provides an entire ecosystem of 5G services delivered through a single, unified platform. CSPs

benefit from faster slice creation and service onboarding, including quicker integration and testing (through the use of common APIs) as well as speedier fulfilment by using templates and automated solution fulfilment orchestration.



4-6x

faster time to value

3-4x

more enterprise revenues

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## Your partner in 5G operations

5G

Future X architecture  
and vision

**NOKIA** Bell Labs

#1

in AI and network analytics

analysys  
mason

Ovum

120+

managed services  
deployments across 64  
countries

E2E

capabilities across radio,  
core, transport devices and  
management


Reduce solution design and  
deployment time by up to

75%

with Nokia automation  
software

9,000+

managed services  
employees around the  
world



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## Your partner in 5G operations

Acquiring the operational agility to keep pace with complex and diverse 5G use cases requires new approaches to people, processes and tools. With a range of business models and solutions for 5G service creation and delivery, we can help you get there.

Nokia has the network expertise, software solutions and global services to help CSPs plan for and carry out their 5G evolution. We are the only vendor with a globally deployed, end-to-end portfolio that delivers the agility needed by today's CSPs, drawing on our network heritage and Bell Labs innovations to address every stage of the network and service operations lifecycle.

**For even more insights into what it will take to deliver the extraordinary in the 5G era**

[Visit our 5G Operations microsite](#)

[Discover our Agility use case](#)



## About Nokia

We create the technology to connect the world. Powered by the research and innovation of Nokia Bell Labs, we serve communications service providers, governments, large enterprises and consumers, with the industry's most complete, end-to-end portfolio of products, services and licensing. From the enabling infrastructure for 5G and the Internet of Things, to emerging applications in virtual reality and digital health, we are shaping the future of technology to transform the human experience.

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