



# The journey toward successful 5G monetization starts today

Monetize 5G use cases and business models from  
day one

White Paper

## Contents

<i>Introduction</i> .....	<b>3</b>
<i>5G use cases and emerging business models</i> .....	<b>3</b>
<i>Cloud gaming with 5G</i> .....	<b>4</b>
<i>Industrial automation with 5G</i> .....	<b>5</b>
<i>Transformation implications of 5G</i> .....	<b>6</b>
<i>BSS considerations of new business models</i> .....	<b>6</b>
<i>Network-facing considerations</i> .....	<b>6</b>
<i>Monetization considerations of 5G</i> .....	<b>7</b>
<i>Key characteristics of 5G revenue management platforms</i> .....	<b>7</b>
<i>Transform existing monetization system or replace?</i> .....	<b>9</b>
<i>Conclusion</i> .....	<b>10</b>

## Introduction

With the commercial launch of 5G, service providers are looking forward to bringing a bevy of new services into the marketplace. The industry generally divides these services into three major families:

- Extreme mobile broadband services, which use 5G's high data rates to enable services such as high-quality video, user-generated content, and fully immersive virtual reality (VR) and augmented reality (AR) applications
- Massive machine communication services, which use 5G's ability to support a very large number of devices in a small area to deliver services such as smart cities, home automation, and sensor monitoring and management
- Critical machine communication services, which use 5G's ultra-low-latency and high-reliability characteristics to deliver services such as connected cars, industrial automation, and remote medical procedures

One common theme across all of these families is that 5G will expand the definition of a service well beyond traditional connectivity. 5G services will build on connectivity with capabilities such as guaranteed latency and bandwidth, network slices, and edge computing resources to support much more complex use cases and business models.

## 5G use cases and emerging business models

With 5G, service providers will need to adopt new business models as they extend their capabilities with new types of product offerings. Many 5G use cases will require expertise beyond the traditional strengths of service providers. To address these use cases, service providers will need to develop (or acquire) new expertise or greatly expand their use of partners. Partners can play an important role in B2B2X scenarios, selling end solutions that incorporate offerings from the service provider and potentially several other partners. Many other models exist, including cases where the service provider takes the lead and sells solutions that include components from partners.

These approaches are not entirely new to service providers. After all, service providers have supported mobile virtual network operators (MVNOs) and sold in a simple bundled model with partners for many years. For example, Amazon offers cellular connectivity with Kindle subscriptions, rental car companies offer LTE hotspots with their vehicles, and security companies offer smart alarm systems and video feeds that utilize connectivity.

In each of these bundles, the service provider provides connectivity as a component of a more complete solution that others offer to the marketplace. Its role is generally invisible to the end user.

The growing popularity of Internet of Things (IoT) offers has led to an increase in the range of services that could be offered through a partnering arrangement. Each of these services has its own requirements and potential business models.

Enabled by 5G, IoT use cases are expected to explode, and to cover an increasingly wide range of verticals with specific requirements that introduce new types of complexities. Service providers will need to be able to offer IoT services on a bigger scale, simplify productization of partner offers and roll these offers out much faster. They will also need to make these offers much more dynamic and granular than they are today to address the specific needs of each of the verticals.

There is still lack of clarity about what the killer apps are for 5G. Service providers around the world are addressing the issue by developing 5G use cases in collaboration with their ecosystem partners. The sections below describe sample 5G use cases for cloud gaming and industrial automation and outline the capabilities that service providers need to offer these services.

## Cloud gaming with 5G

The gaming industry is going through a major shift. A new generation of games moves the processing power for capabilities such as rendering graphics from the home into the cloud, making specialized gaming consoles and PCs obsolete. The player subscribes to the cloud gaming service and has a separate internet access subscription with a service provider. This approach already works well for many single-player and simple multi-player games.

The limitations of this approach center on network speed and latency, which can impact the game's ability to respond to the player's actions. Bandwidth needs have increased from full HD streams to 4K and 8K. They will evolve further to support AR/VR streams. Latency is a huge concern to serious gamers. A difference of a few milliseconds in reaction time can make or break the game.

The emergence of cloud gaming at a time when 5G is ready can be compared to the emergence of content streaming services when 4G was introduced. There is, however, a major difference between the two. With content streaming, it was relatively easy to compensate for connectivity limitations by using intelligent buffering and caching. This is not possible with cloud gaming. LTE networks cannot offer the characteristics required for high-end games.

With 5G, service providers can benefit from the cloud gaming opportunity in different ways. For example, they could sell a gaming connectivity add-on to consumers in a typical

B2C approach. But, given the importance of the connectivity in this use case, they could also partner with a cloud gaming vendor and let the vendor sell a single subscription that blends gaming and connectivity.

The service provider's monetization system will need to be able to offer the gaming ecosystem the ability to bundle these capabilities into personalized offerings for players. The system will also need to be able to support various billing models, such as subscription billing, and compensation models across the ecosystem, such as revenue share.



## Industrial automation with 5G

The manufacturing sector is in the middle of its own transformation, known as Industry 4.0. The 5G network is seen as having tremendous potential to help with this manufacturing initiative. According to David Van Dorselaer, General Manager of Manufacturing and Transportation for AT&T, it will “supercharge this transformation [and] bring faster speeds, lower latency, large bandwidth and edge computing capabilities.”

One use case occurs when the manufacturer begins to deploy next-generation robotics technology onto the shop floor. To reduce the cost of deployment, the manufacturer would deploy the Robotic Motion Control and Automation (RMCA) system in the cloud,

ideally running it in an edge server to reduce lag and latency. The industrial automation company would provide robotic devices, RMCA software, and integration services. It would procure connectivity and edge server compute resources from the service provider to form a complete solution. The solution could also have one or more dedicated network slices to improve security and guarantee reliability. All this would be delivered as a service to the manufacturing company.

For this solution, the service provider's monetization system needs to offer the industrial automation company the ability to monitor usage and price on a very granular level. Pricing metrics will need to go beyond traditional approaches such as number of devices, time, or usage-based billing. Pricing could also be based on more advanced attributes such as latency, reliability, or edge compute characteristics.

## Transformation implications of 5G

Many service providers are looking to gain a more significant position in the value chain by offering an assortment of digital, content, and integration services, either alone or with partners. In this new role, they will be evolving their approach from standalone, self-contained offerings to a new elastic, programmable, and secure platform to facilitate partner interactions.

Service providers will need to address new considerations regarding their monetization functions, especially partner management, to achieve this evolution and succeed with their 5G rollouts.

## BSS considerations of new business models

Service providers need to consider whether their current business support systems (BSSs) can support these new use cases and business models. Many existing BSSs are limited in their ability to support the flexible ordering, provisioning and monetization capabilities required for these new business models. For example, depending on the arrangement with the partner, the service provider may have to offer a digital business platform to third parties. Or, it may need to offer a "white label" call center and billing capability and perform these tasks on behalf of the partner.

## Network-facing considerations

5G introduces a new services-based architecture and new interfaces for the critical monetization functions closest to the network — in other words, the Policy (PCF) and

Charging (CHF) functions. More importantly, these functions need to support key 5G concepts such as network slicing and mobile edge computing.

## Monetization considerations of 5G

With the advent of 5G, the very nature of the services being billed is changing dramatically:

- 5G services are expected to be more complex than 4G services, with more components making up each service. A greater volume of service usage is also expected across all three 5G service families. As a result, the volume of transactions to be handled by the revenue management system is expected to be orders of magnitude greater than what is currently handled by legacy systems.
- Many of the enterprise services defined thus far suggest that the service provider requirements for cost per charging transaction will be substantially lower due to the low margins on each service.
- Many 5G services will be delivered in conjunction with partners and many services will require service providers to extend beyond their normal connectivity provider role. Both of these scenarios will place significant new requirements on the revenue management system.
- Unlike previous “Gs,” no single service is the driving force behind 5G. As described in the preceding section, 5G will feature a plethora of new services, each of which will place different requirements on the monetization platform.

## Key characteristics of 5G monetization platforms

- 1. Rapid definition and deployment of products and pricing models:** As 5G network deployments expand, service providers need to be able to create and modify new services as quickly as webscale companies do today. They will also likely need to build these services using innovative new pricing models. To support rapid service creation, the service provider product managers need a product lifecycle workbench with capabilities that include financial modeling, analytics, prototyping, A/B testing, and deployment tools.
- 2. Complex value chain support:** Many of the anticipated 5G use cases, especially in the B2B2B segment, will be delivered in conjunction with a set of partners through a complex value chain. For example, contributors to an AR retail solution are likely to include a device manufacturer, an application provider, a connectivity provider, and a systems integrator. With a portfolio of such services, service providers will need to establish and manage an ecosystem that includes a broad range of partners that can contribute to multiple services and provide vertical industry expertise for enterprise customers. The platform capabilities required include partner onboarding, customer order management, partner provisioning, ecosystem management, analytics, and multi-partner settlements.

- 3. Flexible, real-time charging algorithms:** Under 5G, services will increasingly move away from traditional billing parameters and instead charge based on a wide range of possible parameters. For example, services might be charged based on latency, device type (e.g. embedded in a household appliance), location (e.g. other users' usage within an area, also known surge pricing), or image quality (e.g. 8K, 4K or 1080p video). As a result, the charging component of the 5G monetization platform will need to be able to flexibly support complex charging algorithms based on service provider-customizable parameters, and do it all in real time.
- 4. Customizable SLA definition and enforcement:** With the advent of 5G, service providers are anticipating that their ability to define and deliver on complex service-level agreements (SLAs) for their enterprise customers will allow them to differentiate from other non-telco service providers. Enterprises, especially with network slicing, are going to be expecting much more sophisticated SLAs driven by components delivered by multiple partners in the value chain. Having the ability to track, enforce, analyze, and report on these SLAs in real time will be key to the success of all stakeholders.
- 5. AI/ML-driven insights and predictions:** The new monetization platform must provide a rich set of artificial intelligence (AI) and machine learning (ML) capabilities for a wide range of users, including:

  - Internal stakeholders, who need customer demographics, segmentation and targeting, service usage, partner contributions, financial results, and SLA management
  - Partners, who need service usage reporting, anonymized customer data, value chain partner settlements, and SLA commitments and results
  - End customers, who need personalized offers, current and historical usage and spend, and, for enterprise customers, detailed per-user breakdowns
- 6. Cloud native:** As service providers adopt cloud technologies and approaches in search of improved efficiency, faster time to market, and greater agility, the new 5G monetization platform must be fully cloud native. A platform that embraces a microservices-based architecture using containers will provide the required deployment flexibility and scale. Business-centric functions need to be supported in public cloud deployments to ensure a rapid rollout. It is expected that network-centric functions will be deployed in the private cloud.
- 7. Dynamic scalability:** Given the diverse range of 5G use cases, the monetization platform needs to be able to automatically respond in real time by expanding and shrinking processing capacity to ensure service continuity. The service provider can't plan these capacity adjustments in advance. It must respond in real time.
- 8. Telco-grade reliability:** Components of the monetization platform are business critical, so they will need to deliver telco-grade, or five-nines, reliability. Achieving this reliability requires a careful design of all aspects of the components, including support for a number of redundancy models.

- 9. Continuous development and DevOps:** Service providers have traditionally upgraded their BSSs only occasionally because of the lengthy time between software update availability, the critical nature of these systems, and the complexity of the upgrade process. A drastic change is required in a digital world. New software releases need to become available in smaller, faster deliverables. By embracing DevOps principles, software vendors and service providers will benefit from much faster and simpler upgrade processes. This approach will require vendors and service providers to change their normal internal business processes. It will also require unprecedented collaboration across company boundaries.

## Transform existing monetization system or replace?

As service providers plan their 5G rollouts, they need to make a key decision about whether to attempt to transform their existing monetization systems or move directly to solutions designed for a digital world. For example, a recent report by Analysys Mason states:

The enterprise-focused business cases that 5G is expected to accelerate the adoption of (such as mobile edge computing, network slicing and so on) require modern, scalable, real-time charging systems. In the long term, it will be beneficial for service providers to deploy all new stacks to support these use cases rather than investing in enhancing legacy billing and charging systems.<sup>1</sup>

The 5G opportunity for service providers is likely to be more heavily concentrated on enterprise services than on consumer services. Historically, enterprise and consumer services have had separate monetization systems, with the consumer system focusing on simple, high-volume, real-time charging and the enterprise system, with the more complex services, tending to be offline and post-paid. Service providers have often deployed multiple, siloed instances in support of different services.

Service providers will need to make extensive modifications to existing legacy systems to support 5G service requirements. These transformations are likely to be costly, slow and prone to failure.

A simpler and more effective approach would be to bypass existing bottlenecks by replacing them with modern systems designed in anticipation of the new needs of digital service providers.

---

<sup>1</sup> [“Effective monetization of 5G: the deficiency of existing charging systems will drive service provider spending”](#). John Abraham, Analysys Mason, March 2018. Page 3.

## Conclusion

It took 50 years to connect 50 million subscribers with telephone services. The same number of internet users was reached in 7 years. Pokémon Go required only 19 days to reach 50 million players. Is this an exceptional scenario? No, this is a new paradigm. This is what digitalization means.

Service providers need to be prepared for a new kind of business speed, business scale and business innovation with data, where end customers expect to be served with a premium digital experience. In the era of digitalization, this phenomenon touches consumer and enterprise services and sets a new pace for digital service launches. To keep up, service providers need to build a digital, AI-driven, and open ecosystem where enterprises can instantly join and leverage to innovate with digital services for their customers.

5G creates huge potential and opportunities for service providers to leverage enterprise innovation and onboard their digital service offerings to support solutions for domains such as gaming, robotics in the manufacturing industries, connected health services, and smart cities.

Some markets are closer to introducing 5G services than others. Service providers need to act today to ensure that their business solutions are ready. With the introduction of 3G and 4G, many service providers worried about the network technology first and network operations second. Consequently, they often overlooked the importance of updating their BSS environment to monetize the new technology. This had a significant impact on the customer experience and resulted in loss of revenue for years to come.

By starting to plan and to roll out a 5G-ready monetization solution today, service providers will be able to reap benefits such as higher average revenue per account (ARPA) immediately for their more traditional B2C and B2B offerings, as well as for some of the emerging 4G-based IoT use cases. They will also be ready to launch and monetize 5G-enabled business models and use cases from day one.



Nokia is a registered trademark of Nokia Corporation. Other product and company names mentioned herein may be trademarks or trade names of their respective owners.

Nokia Oyj  
Karaportti 3  
FI-02610 Espoo  
Finland  
Tel. +358 (0) 10 44 88 000

Product code XXXX

© Nokia 2019