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Enabling Experience-Driven Monetization for 5G

How 5G converged charging enables experience-differentiated services

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Summary

Introduction

Although the telecoms industry has passed the benchmark of more than 130 commercial deployments of 5G globally, communications service providers (CSPs) continue to struggle to identify viable monetization strategies for the network. After years of declining revenue, profits, and market share, the arrival of 5G is much more than a new network generation; it is also an inflection point for the telecoms industry. CSPs can continue to implement the same monetization strategies that allowed the industry to be disrupted by internet content providers (ICPs) such as Facebook and Apple, or they can implement new strategies and invest in new IT capability that will allow them to reap the fruits of their investments.

The specifications outlined in 3GPP Release 15 dictate that, at a minimum, CSPs should upgrade charging and policy control systems for compatibility with new service-based 5G core networks. Converging IT and business priorities—such as the need to improve business agility, implement new business models, deliver digital-first services, and personalize the customer experience—further complicate CSP investment priorities for 5G. However, by investing in 5G converged charging systems that are service agnostic, cloud native, and engineered for high performance, CSPs can ensure they have the tools needed to support an array of use cases, business models, and monetization strategies for 5G.

Key messages

- Nearly 97% of CSPs believe upgrading to 5G-compatible charging and policy control systems is an important IT project for 2021, and nearly 60% of those that have already deployed 5G find “identifying a viable business case” to be the top challenge they face.
- Such 5G converged charging systems will enable CSPs to implement unique pricing plans for experience-differentiated services that make use of network services such as low latency, throughput, mobility, energy efficiency, data security, massive connectivity, reachability, and guaranteed quality of service (QoS).
- Network monetization and the enabling of new services and business models demand that CSPs invest in 5G charging systems that are convergent, service agnostic, and cloud native.

Monetization strategies for 5G remain unclear

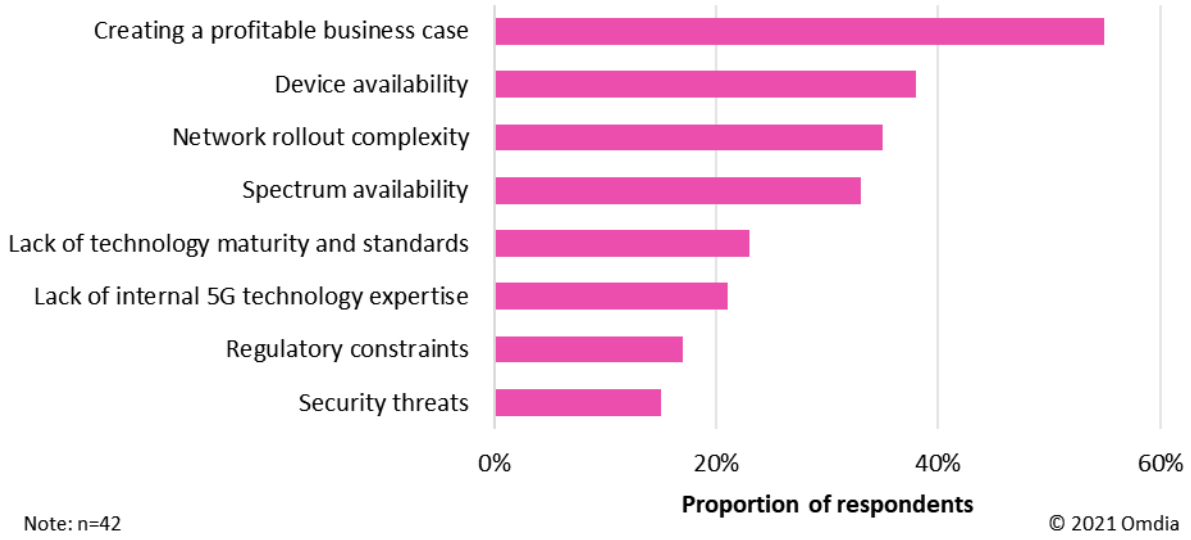
CSPs need to implement new monetization strategies for 5G

Historically, CSPs have not done a great job of monetizing the network. Most network monetization strategies govern the network as a utility, where consumers are offered unlimited data plans for a fee or are charged based on the amount of data consumed. This approach has commoditized the network, laid the foundation for the telecoms industry to be disrupted by digital players that innovate on top of it, and nearly reduced CSPs to “dumb pipes.”

In 2020, for example, Omdia’s World Cellular Information Series, which tracks mobile metrics from CSPs around the world, showed that mobile data services accounted for an average of 73% of CSP mobile revenue. This reflects a trend that had been emerging in the industry for years, the growing irrelevance of traditional telecoms services (such as voice and SMS) as consumer adoption of digital alternatives surge. This trend is also reflected in CSPs’ financial results. Over the last decade, CSP revenue and profits have steadily declined, while ICP revenue has grown at a double-digit pace.

Now, several years into commercial launches of 5G, it is time for CSPs to reconsider the fruitless monetization strategies of yesteryear. As **Figure 1** shows, Omdia’s 5G World 2020 Global Insights survey found that of those CSPs that have already deployed 5G, nearly 60% are most challenged by creating a viable business case.

Figure 1: Key challenges for 5G-deployed CSPs



Source: Omdia 5G World 2020 Global Insights survey

Early pricing plans for 5G highlight the trouble that CSPs are facing in identifying monetization strategies. Plans range from 5G at no additional cost to unlimited data or buckets of 5G data at a nominal fee. Not only is this strategy unlikely to yield different results from those we have seen in previous network generations, but the potential for incremental revenue generation is likely to be limited. Omdia's 2020 Digital Consumer Insights survey found that, on average, consumers are willing to pay no more than a 10% premium for 5G, which limits the total ROI CSPs can generate. After the fallout of the utility-like monetization strategy in previous network generations, doing more of the same but with faster speeds in 5G is unlikely to change the outcome.

The introduction of a new network generation is typically cause for a new IT upgrade cycle, and the same is expected for 5G. Specifications outlined in 3GPP Release 15 require, at a minimum, that CSPs upgrade their charging and policy-control systems for compatibility with the 5G network. With the telecoms industry reaching an inflection point, CSPs should take stock and envision the future role they want to play in the industry. Omdia's 2021 ICT Enterprise Insights survey revealed that 97% of CSPs believe investing in 5G-compatible policy control and converged charging systems is an important IT priority for 2021. As CSPs invest in essential upgrades of their monetization systems, they must ensure they are investing in future-proof IT that delivers the agility and IT capability needed to support any monetization strategy. To avoid a continued decline in profits as witnessed with 4G, CSPs must prioritize 5G monetization and act now.

Communicating the value of 5G is crucial for monetization

Aside from the lack of a clear monetization strategy for 5G, CSPs have also been greatly hindered by their ineffectiveness in communicating the value of the network to the market. Omdia's 2020 Digital

Consumer Insights survey found that 75% of consumers primarily associate 5G with faster speeds, and only 30% associate it with better applications and services.

While the value of 5G is better understood within the enterprise segment, there seems to be a disconnect between enterprises and CSPs on where the opportunity lies. Omdia's 5G World 2020 Global Insights survey found that 60% of CSPs expect large and multinational enterprises to generate the most 5G-related revenue. By contrast, large and multinational enterprises indicate that they most trust network equipment vendors to execute their 5G strategy, as **Figure 2** shows. Interestingly, small and medium-sized enterprises (SMEs) put the most trust in CSPs to execute their 5G strategy. However, only a little more than 30% of CSPs expect SMEs to generate the most 5G-related revenue.

Figure 2: SMEs trust CSPs with their 5G strategy, but large enterprises prefer network equipment vendors

Source: Omdia 5G World 2020 Global Insights survey

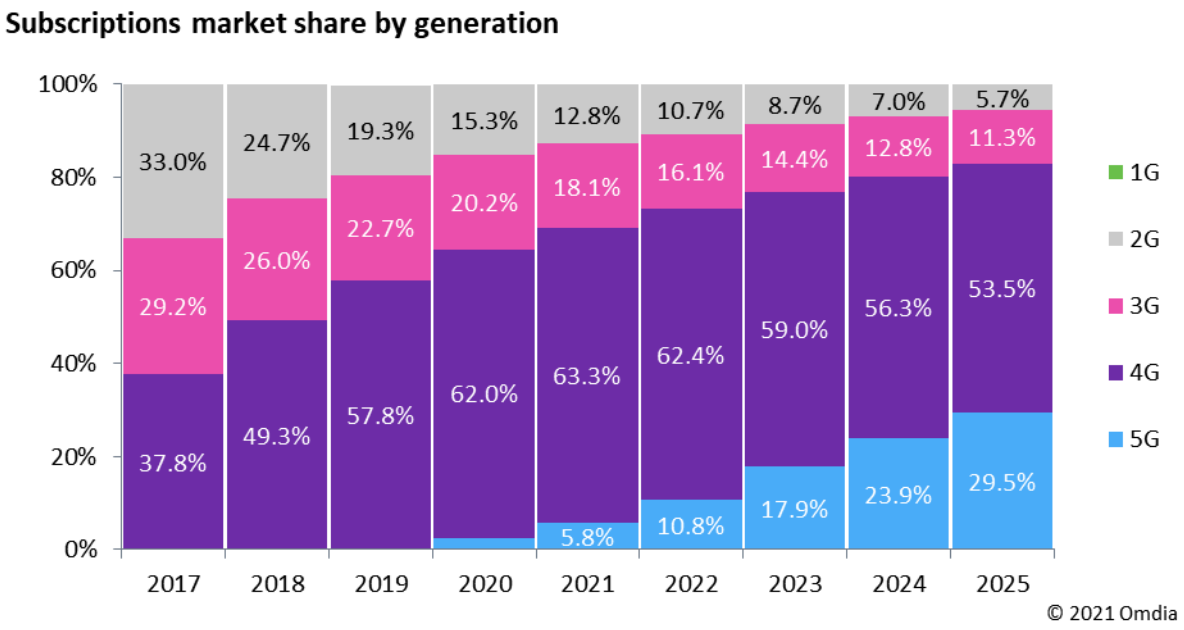
The disconnect between CSPs' perception of where the value lies in 5G and the market's view represents a fundamental flaw in how the industry has approached network monetization. If CSPs choose to only, or primarily, provide connectivity to their customers, their perceived value in the market is diminished. Large enterprises, for example, may see more value in cutting out the intermediary (i.e., the CSP) and working directly with the network equipment providers to deploy a private 5G network. However, by implementing a monetization strategy that goes beyond connectivity, whether through the delivery of cloud services or of any other value-added services, CSPs can create value among their subscribers and target customers.

CSPs are tasked with clearly demonstrating to the market the value of 5G and demonstrating the value of the CSPs' services and ability to meet the needs of their subscribers. Once this is achieved, it enables CSPs to sell services and products at a profitable price point and allows them to differentiate themselves in the market based on service execution and the experience delivered rather than on price and bits and bytes (e.g., MB and GB).

Monetization strategies must factor in 5G coexistence with legacy networks

Although CSPs are rolling out 5G and turning their focus toward 5G monetization strategies, they must continue to protect and monetize their existing investments. In many markets across the world, LTE has only been commercially available for a couple of years. For example, as late as 2019, CSPs in Ukraine were still deploying LTE. In other markets, CSPs are expanding their coverage of LTE in rural areas where the adoption and monetization of LTE services remains low. Globally, the adoption of 5G services will be contingent on the adoption of 5G-compatible devices and on network coverage. For CSPs this means there will be several years of coexistence of the 5G network and services alongside legacy networks, which must also be factored into their monetization strategies.

Figure 3: 5G subscriptions projected to reach only 29% of market share by 2025



Source: Omdia Mobile Connections Forecast, 2020–25

As **Figure 3** illustrates, Omdia's *Mobile Connections Forecast, 2020–25* projects 5G subscriptions to account for around 30% of network market share by 2025, while 4G subscriptions will still account for just over half. When developing monetization strategies for 5G, CSPs will need to plan for the coexistence of 5G services alongside the legacy 3G and 4G networks and incorporate a subscriber migration strategy into their monetization plans. Monetization strategies must also strike a balance between monetizing legacy networks and delivering added value or incentives for subscribers to

take up 5G services. For example, in South Korea, the first nation in the world to deploy 5G commercially, CSPs in the market saw 5G subscriptions grow rapidly. However, because of a poor customer experience on the 5G network, including poor device experiences and poor connectivity, local CSPs saw more than 6% of their subscribers downgrade from 5G plans back to LTE. This highlights how essential it is for CSPs to deliver value and an enticing proposition to encourage subscribers to take up 5G services and stay on the network.

Monetization strategies must become customer centric

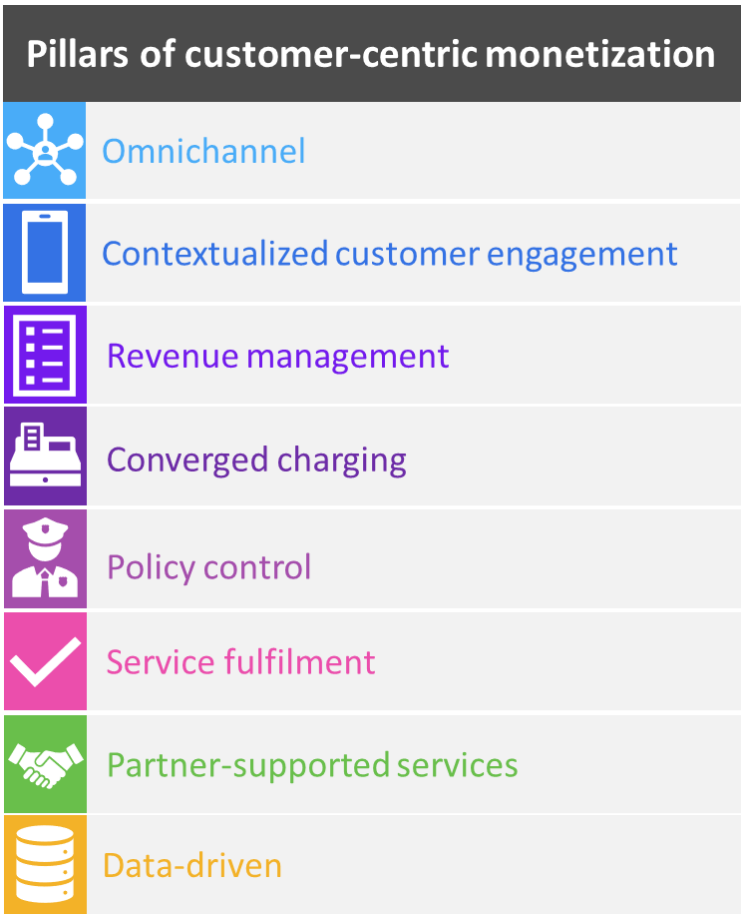
To be successful in the era of 5G, CSPs will need to embrace customer-centric monetization strategies. The proliferation and success of ICPs in the telecoms industry has had a monumental impact on consumer expectations of service. ICPs such as Amazon, Apple, and Netflix have mastered the art of personalized customer experiences that remain consistent across channels. Consumers now expect an ICP-like experience from their service provider. They want digital-first services delivered in their channels of choice. They demand a personalized experience that is consistent across channels and adapts as their preferences evolve over time. Most significantly, because of the numerous low-cost options on the market today, consumers no longer feel a sense of brand loyalty and are willing to churn to the provider that best meets their individual needs.

Adapting to these new expectations is a tall, though surmountable, order for CSPs as they begin to formulate their monetization strategies for 5G. By making use of the unique attributes of the 5G network, such as low latency, device density, and increased speed, to deliver services and experiences that best meet their customers' needs, CSPs can implement a customer-centric monetization strategy that encourages the uptake and monetization of 5G services while also supporting the continued monetization of legacy networks.

Putting monetization into perspective

Omdia defines *monetization* as a collection of processes that occur across the CSP ecosystem to enable the delivery of products, services, and offerings tailored to individual customer preferences. Making this distinction is important, because in the past, monetization has been equated with revenue management. What separates the two, however, is that while revenue management focuses on revenue collection, monetization focuses on generating revenue as a result of meeting the specific needs and preferences of the target user. Consequently, monetization should inherently be customer centric.

Figure 4: Omdia's eight pillars of customer-centric monetization



Source: Omdia

Enabling a customer-centric monetization strategy involves many components and attributes. Omdia has identified eight elements or "pillars" that CSPs need to implement to deliver a customer-centric monetization strategy, as **Figure 4** illustrates:

- **Omnichannel.** Well-executed monetization strategies thrive across channels, be they traditional or new, physical, or digital. They require CSPs to remove operational and IT silos, enabling them to deliver a consistent experience across channels and the customer lifecycle, including by ensuring consistency in the services and pricing offered in each channel.

- **Contextualized customer engagements.** CSPs must understand their customers, when to engage with them, and in which channels to engage. By leveraging real-time and historical data to understand the context for engagements with customers, CSPs can take the appropriate actions

at the right time to deliver a more pleasant customer experience that leads to customer loyalty and more opportunities for upselling and cross-selling.

- **Revenue management.** Billing is one of the top drivers of traffic to the contact center, and a customer's billing experience can have a significant impact on their overall experience, loyalty, and receptiveness to purchasing or subscribing to new services. The billing experience should be simple and should support service convergence (e.g., prepaid and postpaid, B2B and B2C) and multiple billing models (e.g., subscription).

- **Converged charging.** This is a vital component in managing and enabling customers to set usage thresholds and alerts to avoid bill shock, improving the billing and customer experience. It also plays a critical role in enabling CSPs to offer creative pricing schemas for services and create new monetization opportunities. Real-time converged charging also plays an important role in providing context to customer usage and engagement, which can further inform customer engagement.

- **Policy control.** Working in tandem with charging systems, policy control enables differentiated services such as zero-rated services, location-based charging, dynamic bandwidth-based offers, time-bound pricing, and discounts. It enables CSPs to manage QoS and manage network traffic via offloading (to different networks or alternative connections such as Wi-Fi), which is also important to managing the customer experience and creating new monetization opportunities. In 5G, policy control will also introduce the opportunity for CSPs to monetize the experience delivered based on a guaranteed quality of experience (QoE).

- **Service fulfillment.** Without the ability to provision and fulfill services for customers, CSPs will be unable to generate revenue, so service fulfillment is a key component of monetization.

- **Partner-supported services.** CSPs need to be able to create services that meet the unique needs and preferences of different customer niches. By co-innovating and co-selling with partners, CSPs can expand their market reach and monetization opportunities.

- **Data driven.** A fundamental capability of monetization and the customer experience is the ability for CSPs to leverage data from internal sources such as data from charging systems and external sources (e.g., location) so that they can understand the needs of their customers and deliver the services and experiences that they prefer.

5G converged charging will enable experience-differentiated services

The evolution of charging in 5G

Although real-time charging has always played a part in delivering a customer-centric monetization strategy, its importance will grow as its role in 5G changes. Release 15 of 3GPP introduces significant changes for charging systems in the 5G network. Foremost, functionality such as mediation, which in previous network generations was spread across multiple systems, becomes consolidated in a converged charging system (CCS). The CCS sits between the 5G network and billing system and now manages several processes including rating, mediation, and account balance management. Most significant, however, is the introduction of the charging function (CHF), which places the charging functionality closer to the network. Residing within the CCS, the CHF interacts with the charging gateway function (CGF), which sends the event detail downstream to the billing and settlement systems. Unlike in previous network generations, charging for 5G services will no longer require a separate mediation system.

Release 15 also outlines a fundamental change in both how the network is architected and, because of the CCS and its proximity to the network, how it is monetized. At a fundamental level, the release introduces the concept of a service-based architecture (SBA) for 5G. It is a concept that defines the 5G network as comprising network functions that operate as independent services. Subsequently, through the use of well-defined APIs, network functions can provide services to or consume the services of other network functions. The concept introduces a framework for a more modular network to support the move toward network virtualization and the independent scaling of network functions.

CSPs can leverage new and enhanced capabilities to enable new monetization strategies for 5G

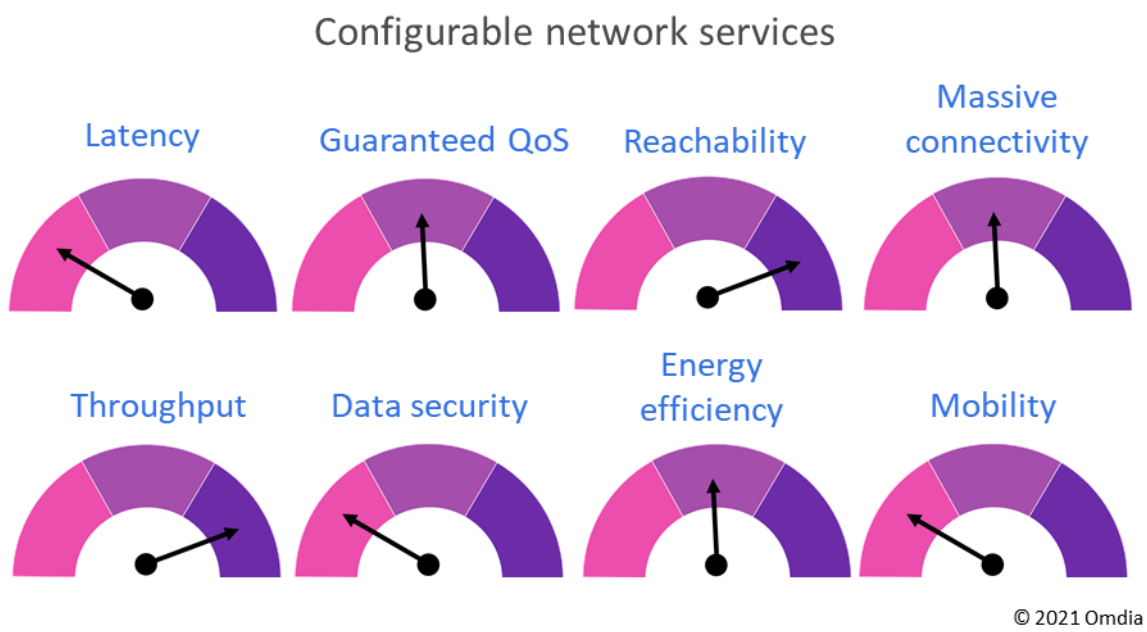
Today, consumers who connect to the network are charged the same based on the amount of data consumed, regardless of their activity. This is problematic for several reasons. Foremost, users connecting to the network have different requirements and expectations of the quality of experience or service that they receive. A consumer or enterprise connecting to the network to check email or browse the internet, for example, has a higher tolerance for latency and poorer QoS. Conversely, subscribers connecting to the network to play an online video game or to use a critical health-monitoring device are likely to have higher expectations and demands on the QoE and QoS or

to have strict service level agreements that must be met. As a result, a more effective monetization strategy for CSPs is to focus pricing and service offerings based on the QoE that can be guaranteed. New and enhanced capabilities within the 5G network will make such a monetization strategy feasible.

In addition to changes with converged charging, the 5G network features new and enhanced capabilities, which can be leveraged to implement new monetization strategies for 5G. Policy control, for example, plays an increased role in the 5G core network and is now called the policy control function (PCF). The network also solidifies the architecture and functional requirements needed to implement network slicing, a process in which network resources are provisioned for a specific location, entity, application, or use case. The concept of allocating network resources or network slicing is not new; however, 5G will introduce new possibilities for CSPs to create experience-differentiated services to support a customer-centric monetization strategy.

Dictated by the conditions set by the PCF, the 5G network now enables CSPs to configure new network services. The services, which can be configured within a network slice, enable CSPs to allocate resources to deliver a certain QoE for end users. As **Figure 5** shows, the configurable network services available include latency, guaranteed QoS, reachability, massive connectivity, throughput, data security, energy efficiency, and mobility.

Figure 5: 5G CCS and policy control enable new network experiences for end users



Source: Omdia

Configuring network slices with different degrees of network services will make experience-differentiated services possible. With CSPs expected to provision hundreds of network slices, they

can create network slices with a guaranteed QoE configured for different types of customers, use cases, or applications. For example, a CSP may offer a virtual reality (VR) service to consumers, which is configured in a network slice with low latency and guaranteed QoS. An autonomous driving use case may include low latency, mobility, and reachability configured in another network slice. These different QoEs can also be monetized by using well-defined APIs to enable the network data analytics function (NWDAF) to relay information (i.e., conditions) about the network slice load to the CHF. In some instances, the CHF may also be deployed in slice or across multiple slices. The CCS then charges for these services based on pricing schemas set by the CSP before sending the information downstream to the billing system to complete the revenue management process.

The value in providing experience-based services is threefold. The end user is guaranteed a certain experience and QoS that is consistent with their needs and expectations for the service consumed, creating more value for them. The CSP can allocate network resources more efficiently by determining which applications or services need to consume resources, for example, latency. Finally, because the CSP can guarantee the experience, this can be reflected in the pricing schemas it sets, leading to a more robust monetization of the network.

Partners can create further demand for experience-differentiated services

Successful monetization of the network will be dependent on the industry moving away from utility-like business models and instead treating the network as a platform on which to develop services. This approach is also conducive to partnerships for the co-innovation and development of services.

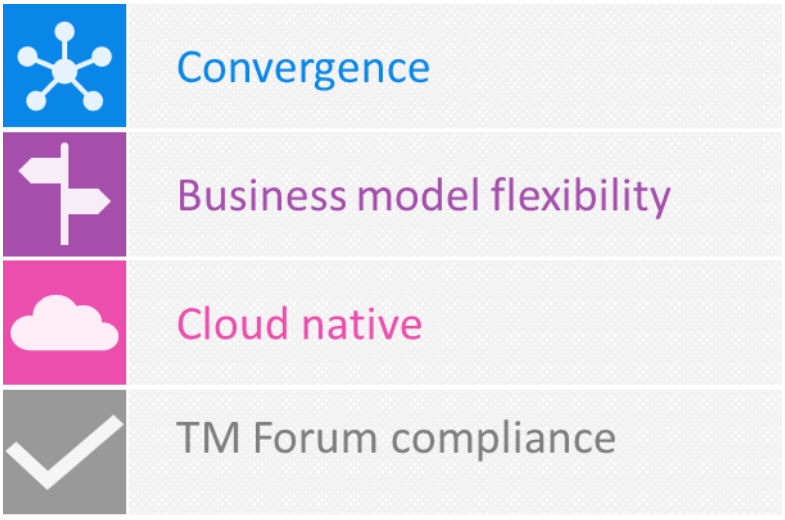
Partners can be a powerful asset for CSPs in the delivery of experience-differentiated services and the subsequent monetization of 5G. By treating the network as a service development platform rather than a utility, CSPs can change the tenor of their relationships with digital players and innovators in the market. A partner-supported development model, in which partners innovate and codevelop services on top of the network, enables CSPs to expand their market reach, diversify revenue streams by branching out into the industries in which their partners operate, and extend their reach in the 5G service chain. Additionally, exposing network capabilities to partners using open APIs encourages partners to develop services or applications that consume more-valuable network services. For example, an Internet of Things (IoT) developer may require specific mobility or data security for its product to ensure the QoE for its end users. This is more valuable for the CSP than basic connectivity. Other capabilities such as mobile edge computing can also be combined with network-embedded services such as low latency to enhance the customer experience and provide additional opportunities for service creation and monetization.

Investment priorities for 5G converged charging

The core competencies of a 5G-ready charging system

Charging systems are at the heart of every monetization strategy, so CSPs must ensure the systems are up to the task of supporting the various business models, use cases, and strategies that will be implemented. Omdia's 2021 ICT Enterprise Insights survey found that 47% of CSPs plan to increase spend on converged charging systems, and 14% plan to increase IT spend by 6% or more. As CSPs invest in charging systems to monetize 5G, they must prioritize systems with the core competencies illustrated in **Figure 6**.

Figure 6: Core competencies of a 5G-ready charging system



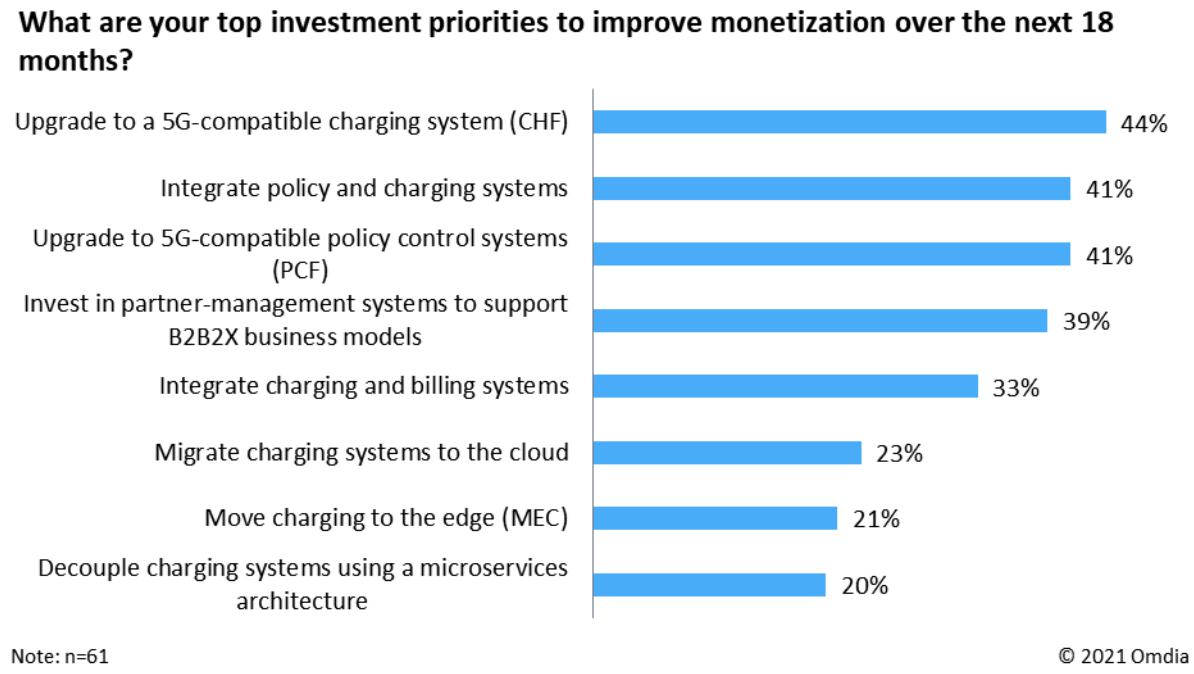
Source: Omdia

Convergence

Converged charging systems have been an industry standard for many years as the lines between prepaid and postpaid services have been blurred and demand for blended (prepaid and postpaid) has grown. Likewise, the blending of models such as B2B, B2C, and now B2B2X has led to the need

for charging systems to support convergence across lines of business. As CSPs explore new service types and business models such as subscriptions, there will be even greater demand for charging systems that can support convergence across any type of service, business model, or account structure.

Figure 7: CSP investment priorities to improve monetization



Source: Omdia 2021 OSS/BSS Evolution survey

Figure 7 shows that according to Omdia's 2021 OSS/BSS Evolution survey, 44% of CSPs plan to upgrade to a 5G-compatible charging system this year to improve monetization. While 5G may serve as the catalyst for investment for many CSPs, monetizing legacy networks by modernizing charging systems must continue to be a priority as well. Rather than investing in separate charging systems, however, CSPs should ensure that they invest in 5G charging systems that are convergent, not only across lines of business but also across network generations. At a minimum, charging systems should be convergent across 4G and 5G. CSPs still maintaining subscribers on legacy 2G or 3G networks must ensure their 5G charging systems are convergent across these networks as well. Network-convergent charging systems will play a critical role in monetizing legacy networks and will also enable CSPs to create a pathway for subscriber migration from legacy networks to 5G.

Business model flexibility

Perhaps the biggest question associated with 5G is what the killer use case will be. Without a clear answer to the question, CSPs must be prepared to try out many new services and business models and adapt to the market quickly. To ensure that CSPs can generate revenue from their newly implemented services, they must invest in charging systems that can support flexible business

models including B2B, B2C, and B2B2X in a single system. Furthermore, as new service requirements emerge, and innovations on the 5G network create new business models, the charging systems in which CSPs invest today must be flexible enough to evolve to meet the unknown demands of tomorrow.

Charging systems should be able to rate and charge for any condition or event that can be measured to enable business models such as experience-differentiated services. What is more, ratable attributes within a charging system must expand beyond network conditions to consider external conditions that may need to be rated for services created by partners, whether that be device type or car make and model. Charging systems will also need to support partner-monetization strategies for CSPs such as partner pricing based on location or the type of traffic, bandwidth usage, or volume generated by a partner. This will enable CSPs to forge deeper relationships with their partners, encourage them to create more valuable services, and expand the adoption of 5G services by incentivizing partners with custom pricing.

Cloud native

The service-based architecture introduced in 3GPP Release 15 is significant for many reasons. Not only does the architecture progress the industry toward network modularity, it also lays the groundwork for a fully virtualized network. With 5G charging moving closer to the network than ever before and the industry moving toward network virtualization, it is of the utmost importance that CSPs invest in 5G charging systems that are cloud native. The cloud-native architecture will be a necessary component in ensuring that charging systems can evolve alongside the network as it is virtualized.

A cloud-native architecture will also be necessary to ensure the scalability of converged charging in the 5G network. Partner-enabled services and massive IoT are expected to generate significant amounts of traffic. Cloud-native architectures running in the cloud will enable CSPs to cope with the unpredictable fluctuations in network traffic without damaging the integrity of the charging process or the end-user experience.

Finally, a cloud-native architecture is important to delivering truly real-time charging, which will be important to delivering latency-sensitive use cases such as autonomous driving and VR. Distributed charging or charging-at-the-edge scenarios that rely on mobile edge computing will require that charging systems be architected using microservices that can be distributed across multiple locations to support more complex use cases such as industrial IoT.

TM Forum compliance

Converged charging systems must be compliant with TM Forum Open APIs and Open Digital Architectures (ODA). TM Forum's ODA echoes many of the principles outlined in the 3GPP's introduction of the service-based architecture. The ethos behind TM Forum ODA is that the applications from the systems of record (BSS/OSS) to the engagement layer follow similar modular development principles as defined in the SBA and supported by cloud-native development principles. As the need for modularity and scalability of charging systems grow, and as the industry continues to make progress in network virtualization, TM Forum ODA compliance will become a must-have for CSPs. Moreover, Omdia's 2022 OSS/BSS Evolution survey found that 18% of CSPs use compliance with TM Forum ODA as a vendor selection criterion when procuring IT systems.

Likewise, compliance with TM Forum's Open APIs must be prioritized as CSPs invest in converged charging systems. The same Omdia survey found that 22% of CSPs use compliance with TM Forum's Open API framework as a vendor selection criterion. As CSPs begin to expose parts of the network and other aspects of the business to partners to encourage innovation and the codevelopment of services, there will be demand for IT systems that embrace common API frameworks such as TM Forum's.

Conclusion

CSPs do not need to have all the answers today about how they plan to monetize 5G. They do, however, need to act now by investing in converged charging systems that can support any monetization strategy and business models that may be implemented in the future. By investing in 5G charging systems that are convergent, support flexible business models, and are cloud native and TM Forum compliant, CSPs can ensure that they have the tools and IT agility needed to deliver experience-differentiated 5G services and implement a customer-centric monetization strategy. Moreover, they will have the tools in place to ensure a return on their network investments, meet the needs of their subscribers, retain their relevance in the market, embrace partnerships, and continue to generate value from their existing network assets while also creating a path for subscriber migration from legacy networks onto 5G.

Appendix

Methodology

The information included in this report is based on primary research gathered through interviews, discussions, and inquiries with CSPs and IT vendors. It also includes survey insights from Omdia's 2020 ICT Enterprise Insights survey, OSS/BSS Evolution survey, 5G World 2020 Global Insights survey, and 2020 Digital Consumer Insights survey.

Secondary research from publicly announced contracts, partnerships, and previously published research including Omdia's *Communications Provider Revenue and Capex Tracker* and *World Cellular Information Service* were also used in the development of this report.

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Oracle helps companies see data in new ways, discover insights, and unlock endless possibilities. Oracle's Converged Charging System (CCS) meets 3GPP requirements to combine online and offline charging into a single, REST API–supported architecture and supports the coexistence of 2G, 3G, 4G, and 5G networks. Built on Oracle Coherence's in-memory data grid, Oracle's cloud-native CCS provides a real-time approach to transaction processing by colocating data and processing capabilities. The solution has been proven in rigorous performance testing on Oracle Cloud Infrastructure to scale to very high subscriber volumes with low-millisecond latency, near-linear scalability, and efficient resource utilization, all with real-world prepaid and postpaid charging scenarios. Aligned with TM Forum Open APIs, Oracle's CCS is fully integrated with a complete revenue management portfolio as well as 5G policy control to deliver a superior customer experience with less risk and cost.

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