



Perspective

The BSS building blocks of the future

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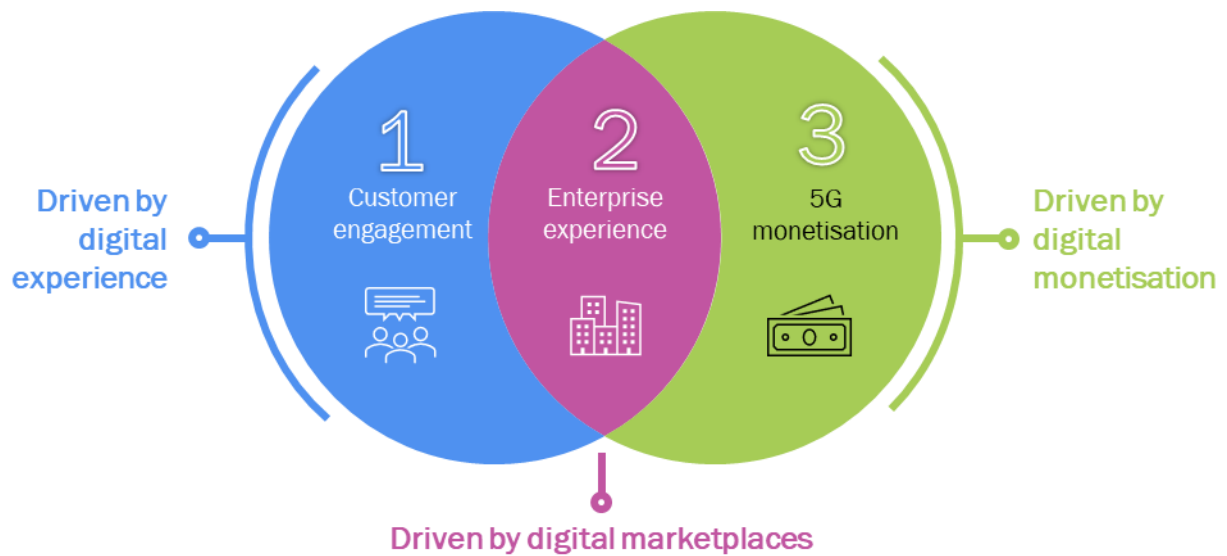
1. Executive summary

The ongoing roll-out of 5G and the continued emphasis on digital transformation are driving broad changes within the telecoms industry as communications service providers (CSPs) evolve into digital service providers (DSPs). CSPs have a large number of opportunities within their reach; these have been enabled by both the introduction of 5G and the broader 'digital society' wave that is reshaping economic flows and disrupting traditional supplier/distributor value chains. At the same time, CSPs are also facing greater competition and flat or declining margins. CSPs are responding to these trends by increasing their focus on developing capabilities that will allow them to swiftly embrace, and effectively monetise, emerging opportunities.

The main objective of CSPs, from an architecture design perspective, is to establish an agile, flexible and cost-effective foundation for the future. This is vital for mission-critical, customer-facing functions, especially in the light of rapidly evolving business and operating models. CSPs want to ensure that their investments are futureproof, the architecture is simple and systems operate efficiently at scale. In this regard, CSPs anticipate that the development of an automation friendly, independent, yet interconnected BSS framework will help to lower the cost of operations, improve the time to market and enable participation in a broader value chain. The automation of the customer engagement segment will be driven by an organisation-wide focus on digitising customer engagement channels. 5G monetisation will be driven by the need to cost-effectively commercialise emerging business models and ensure support for new HTTP/2-based interfaces, which are specific to 5G standalone deployments. The driver for the development of digital marketplaces is the ongoing emphasis on the application of 5G-enabled use cases, especially in the enterprise segment, which provides CSPs an opportunity to expand their presence further up the value chain, beyond the realms of connectivity.

CSPs will embrace a software-oriented operations framework in the long term as 5G standalone becomes more commonplace. This will require agile, configurable and scalable BSS that can swiftly respond to market changes and new opportunities. BSS are formed of multiple components (customer engagement, monetisation platforms and digital marketplaces), each of which has its own cycle of technology maturity and adoption curve (Figure 1.1). In the long term, CSPs will need to address BSS requirements both holistically and on a component level to ensure that the key capabilities and requirement specifications are satisfied.

Figure 1.1: The primary building blocks of BSS



Source: Analysys Mason, 2022

In this report, we discuss the drivers of BSS transformation and the relevance of the three building blocks of BSS that will help CSPs to be well-positioned for future opportunities.

2. Recommendations

- **CSPs should overhaul their consumer and enterprise engagement strategies so that they are digital-centric and mobile-first.** Digital customer experience will be a defining factor in how well CSPs are able to engage with their customers and capitalise on new revenue opportunities. Customer behaviour and preferences have been shifting towards self-service and control for some time and strongly favour digital channels. CSPs should prioritise the creation of a standardised and flexible end-to-end framework that can be dynamically configured, scaled and expanded.
- **CSPs should prioritise the adoption of new 3GPP-mandated capabilities to track and monetise 5G-enabled applications.** Telecoms monetisation platforms are undergoing a dramatic change, driven primarily by the change in how network events are tracked and charged. The adoption of web-friendly, HTTP/2-based interfaces as part of 5G will provide CSPs greater opportunities to monetise new services, well beyond those linked to connectivity. CSPs need to comply with the new charging standards associated with 5G standalone deployments in order to ensure effective monetisation.
- **CSPs should accelerate their adoption of modern marketplace capabilities, which can drive the creation and growth of ecosystems centred around partner offerings.** Partner ecosystems and multi-dimensional value chains will play a vital role in helping CSPs to unlock the enterprise opportunity. CSPs will need to engage with an expansive network of partners in order to establish their role within the enterprise value chain beyond connectivity, while bringing together a platform that can support the end-to-end process of onboarding to delivery.

3. CSPs' ability to respond to market changes is limited by legacy infrastructure

The roll-out of 5G offers CSPs a window of opportunity to expand their influence and offerings. However, they face inherent challenges that they must overcome if they are to stay relevant in the future. Agility is the key word here; CSPs should embrace new business models and respond to market changes more quickly than nimble digital companies if they wish to remain competitive and generate the expected returns on their ongoing 5G investments. CSPs' progress is limited by both external and internal factors.

- External factor: changes to customer behaviour and the market environment.** Customers' preferences and expectations have changed dramatically over the past decade, primarily due to growth in the availability of internet access and the increase in the use of smartphones and other connected devices. Digital companies such as Amazon and Netflix were driving a significant change in how customers interact with service providers even before the COVID-19 pandemic, by making the experience intuitive, highly personalised and always on. The leading digital-only companies have adopted a digital-only approach to engagement, and this has led to a large-scale transformation of how customers perceive and interact with digital channels. Digital-native companies took this path from the outset because they could not afford to use the traditional model of serving customers across multiple channels involving several touchpoints. Digitising all customer interactions was the only way for digital-native companies to achieve scale at a low cost without compromising the customer experience. Indeed, many end users now prefer to be in control of their interactions with their service providers and expect a completely digital experience, without the need to make direct contact.

This shift in customer preferences has been amplified by the COVID-19 pandemic and has forced CSPs to move towards digital channels. Simple websites that offer static information for customers are being superseded by dynamic and personalised experiences on mobile apps. CSPs are increasingly experimenting with AI-based automated attendants, and early results suggest that such endeavours lead to improved engagement and reduced support costs. However, CSPs continue to lag behind digital natives by a considerable margin in their digital engagement capabilities, especially when enterprise self-service functions are also considered.

- Internal factor: legacy architecture framework.** CSPs' operations efficiency and future readiness is primarily dependent on their software architecture and system design, as is the case for most large organisations. Legacy system frameworks are still commonly used by leading CSPs worldwide, but they remain one of the biggest bottlenecks to systemic transformation and CSPs' ambitions to establish themselves within the new value chain.

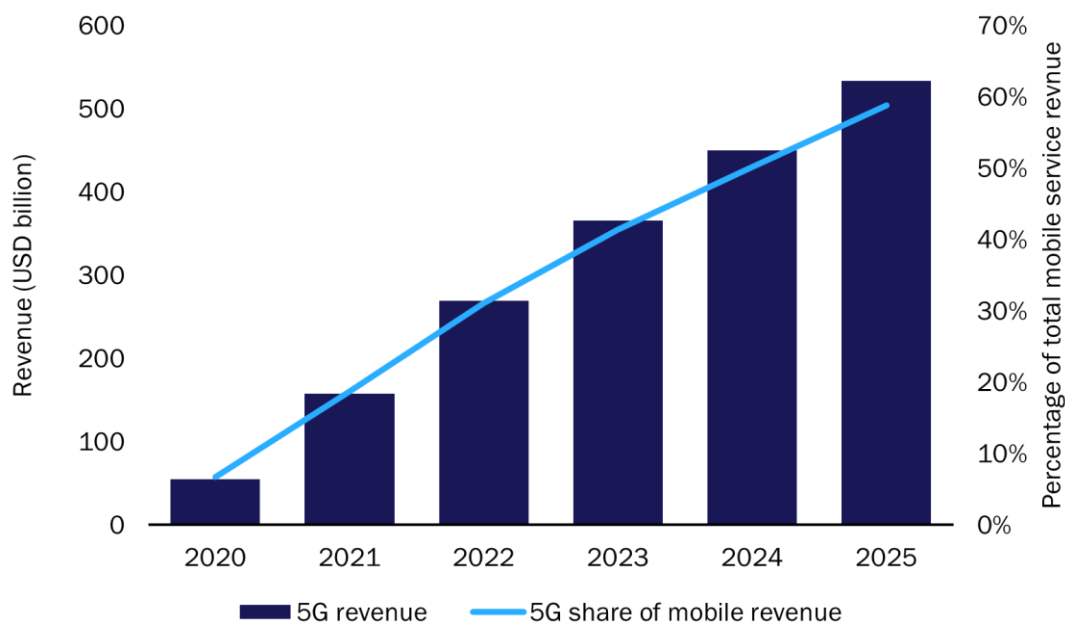
Most CSPs' incumbent systems are disparate and disjointed, which makes it very challenging to update or launch new products in a timely manner. Moreover, these environments are predominantly multi-vendor, with software stuck on older versions because updates would require extensive testing across the interconnected set of systems. Another inefficiency is the absence of a single point of responsibility; CSPs often rely on professional service providers to maintain and support their legacy systems. The lack of interconnection standards also leads to the creation of multiple proprietary interfaces that will need further changes and support when the next iteration of new features is introduced. Incomplete customer information is yet another shortcoming; relevant customer information is often missing because of poor information management practices. Not only do legacy frameworks slow CSPs down, but they also result in high operations costs that significantly exceed those of digital natives that are of a similar or larger scale. This

has implications for how CSPs are perceived and valued by consumers and large and small enterprises, especially when compared with digital-only companies.

4. 5G roll-outs will enforce a paradigm shift in telecoms operations

5G is the most prominent driver of ongoing telecoms investments and is a key influencer of how CSPs should evolve their architecture and operations frameworks to be better prepared for emerging opportunities. The number of 5G connections is forecast to grow rapidly; 5G will account for over 35% of mobile connections and 60% of mobile service revenue worldwide in 2025 (Figure 4.1).

Figure 4.1: 5G service revenue and the 5G share of the total mobile service revenue, worldwide, 2020–2025



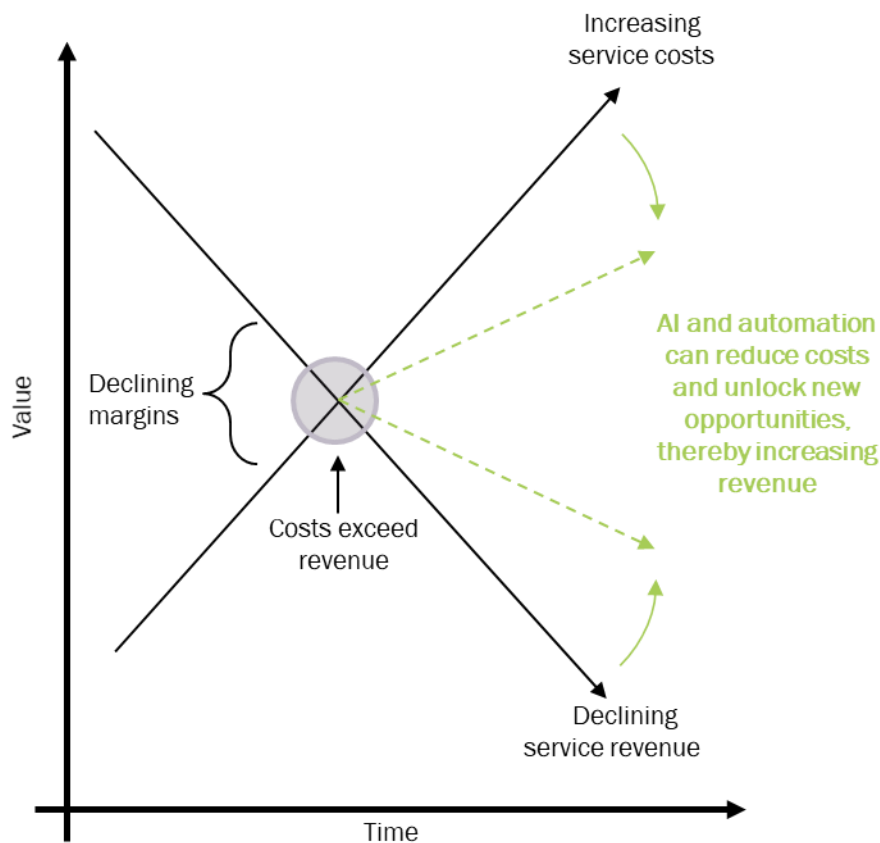
Source: Analysys Mason, 2022

The lack of clarity regarding which use cases will take off is a key issue affecting CSPs that are trying to determine how to approach the transformation of their systems. CSPs have traditionally adopted a use-case-centric approach (for example, they positioned 4G as an enabler of high-quality streaming video) when upgrading their systems or deploying new ones. When taking this approach, CSPs first identify the use case that needs to be supported and then prepare to support it using a mix of existing systems and new systems (deployed as either an adjunct or a new stack). The lack of clarity regarding 5G use cases means that this approach is untenable, and CSPs will instead need to emphasise agile architecture and configurable frameworks in order to support as yet undefined use cases.

The range of use cases that 5G enables is not restricted to a limited number of applications for an already captive audience, unlike with previous network generations. Instead, 5G will enhance a CSP's ability to be a

partner, provider and enabler of a broad spectrum of use cases for both small and large enterprises. CSPs will require a cost-effective and efficient way of addressing the new opportunities, especially those related to small and medium-sized enterprises (SMEs) and very large enterprises where it is not practical to assign separate resources to pursue new partnerships. In the medium-to-long term, AI- and ML-based automation capabilities will be needed to address a larger number of use cases and customers in an efficient and cost-effective manner. As can be seen in Figure 4.2, automation can help CSPs to reduce cost increases due to complexity and open up new revenue opportunities that reduce the impact of declines in traditional revenue streams. AI and automation can accelerate both service development and the execution of operational processes, thereby allowing CSPs to respond more quickly to changes in a rapidly evolving market.

Figure 4.2: The role of automation in improving margins



Source: Analysys Mason, 2022

CSPs will need to accelerate their adoption of next-generation BSS frameworks in order to move towards becoming software-centric entities and achieving AI-based autonomous operations (even for limited application types).

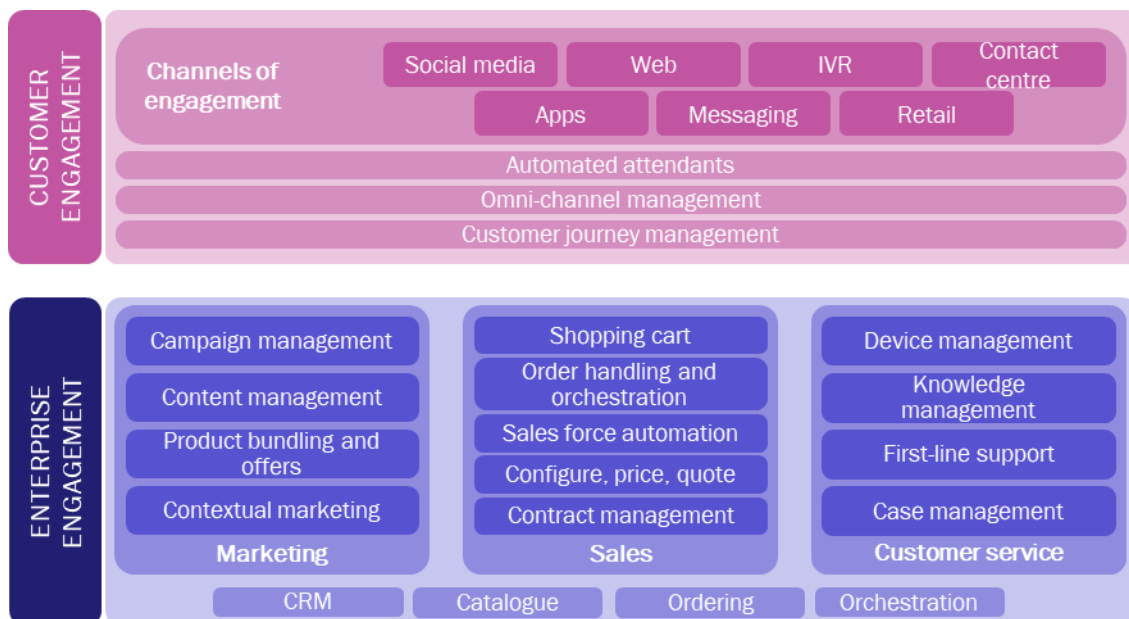
5. There are three primary building blocks of next-generation BSS

The widespread adoption of 5G will accelerate the introduction and adoption of a software-centric operations framework. The software-centric operating framework of the future will require agile, configurable and scalable BSS that can swiftly respond to market changes and new opportunities. BSS are formed of multiple components with their own cycles of technology maturity and adoption curves. The three fundamental building blocks for BSS of the future are customer engagement, monetisation platforms and digital marketplaces. In the long term, CSPs will need to address BSS requirements both holistically and on a component level to ensure that the key capabilities and requirement specifications are satisfied.

- Digital customer engagement.** Transformative digital experience goes beyond intuitive designs and seamless customer journeys. It requires an inside-out transformation of systemic capabilities that enables CSPs to autonomously support interactions over digital channels without having to rely on human intervention. For consumers, this involves having access to digital channels that are self-sufficient and having the ability to have control over their interactions. Building a digital channel that is self-sufficient is challenging because such a channel must support processes that were designed for in-person engagements (such as handset returns to the store). Automation is even more complex to enable for enterprises because it requires synchronisation between multiple cross-domain systems including product catalogue, order management and orchestration.

The framework shown in Figure 5.1 outlines which capabilities are considered to be essential and must co-exist with legacy capabilities that are still in use. In the long term, it is important that any digital customer engagement solution is able to continuously expand its capabilities without affecting ongoing operations.

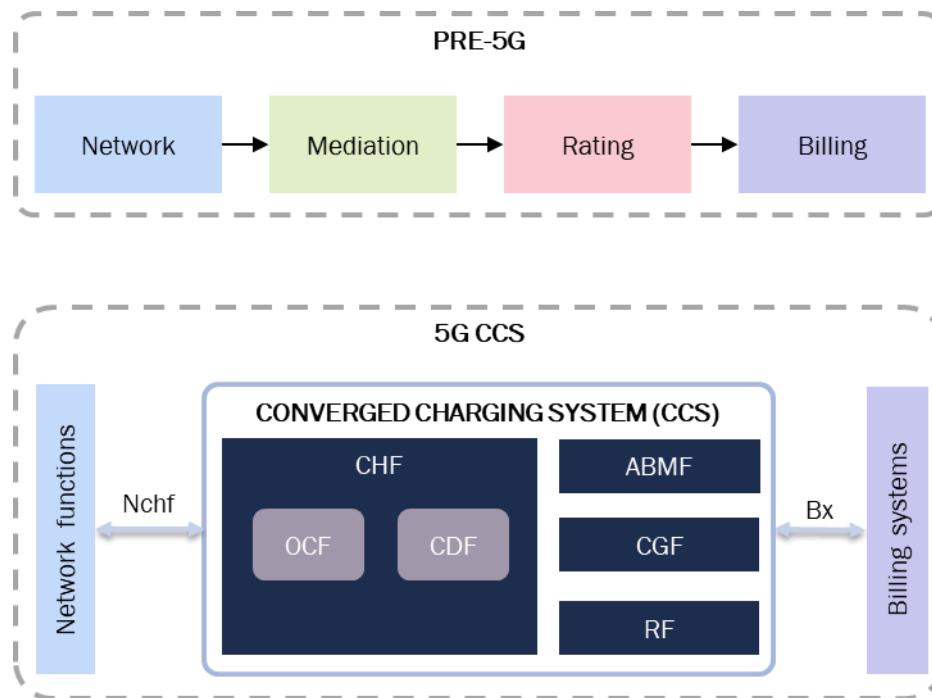
Figure 5.1: Digital customer engagement framework overview



Source: Analysys Mason, 2022

- Digital monetisation.** The introduction of web-friendly, HTTP/2-based interactions to replace the traditional diameter interfaces is the key factor that is drawing CSPs' immediate attention to the transformation of their monetisation platforms. This is a very significant change because it affects how events on the CSP network are tracked and charged (figure 5). CSPs will eventually need to invest in a new converged charging system (CCS) to support the monetisation of 5G applications. A 5G CCS also permits CSPs to monetise a number of previously inaccessible network control and data insights. The architecture of a CCS and its adjacent systems is such that it can enable CSPs to offer a broad set of value-added services over and above traditional connectivity services, that can be configured on-demand (such as application-specific network slices or real-time geolocation information). This will bring CSPs closer to the digital native model of 'monetising anything'.

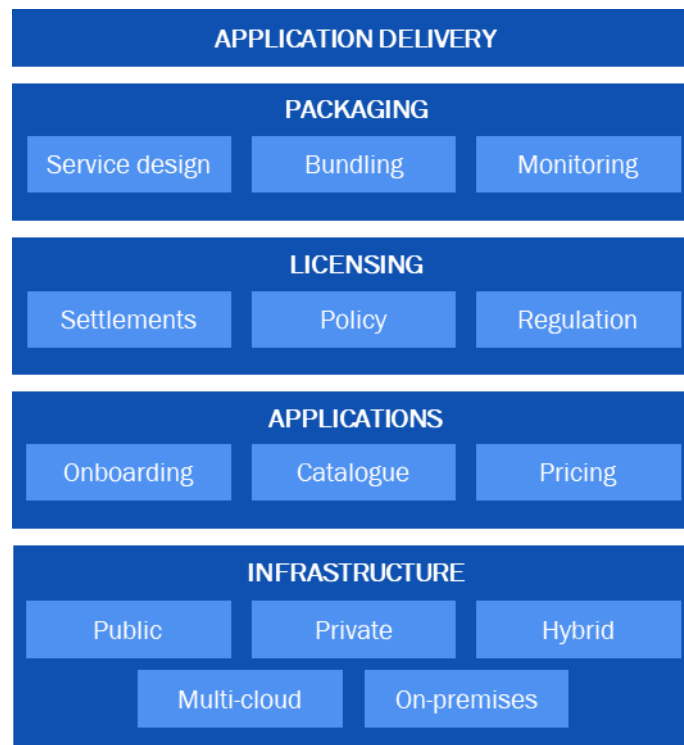
Figure 5.2: High-level comparison of the billing and charging event flow in the pre-5G era with that using 5G CCS



Source: Analysys Mason, 2022

- Digital marketplaces.** Partner ecosystems and multi-dimensional value chains will play a key role in helping CSPs to unlock the enterprise opportunity. Automation will be crucial for CSPs to effectively address this opportunity, primarily because of the SME segment and the complex requirements of large enterprises, where it is not practical to have separate resources. CSPs will need to engage with an expansive network of partners in order to become key players in the enterprise value chain beyond connectivity, while also bringing together a platform that can support the end-to-end process of onboarding to delivery (Figure 5.3).

Figure 5.3: Overview of the digital marketplace framework



Source: Analysys Mason, 2022

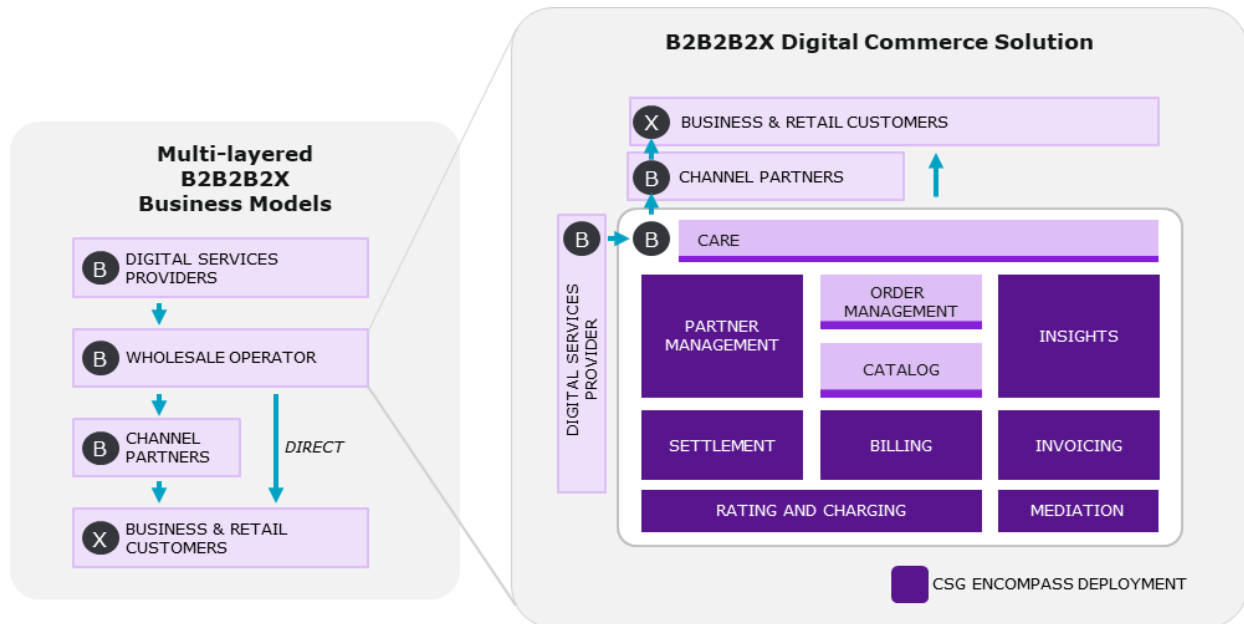
Some CSPs have experimented with short-term solutions for marketplaces by using some of their existing functions for billing and charging. However, these are unlikely to be sufficient in the long term, especially once the SME segment begins to scale. Bundling partner services such as application software or security services alongside connectivity can be an attractive proposition, particularly for SMEs, because these enterprises are unlikely to take on the overhead of having multiple suppliers. CSPs who have a dedicated marketplace platform can also benefit from the early-mover advantage of onboarding partners, which can become an important differentiator over time.

6. Case study: a European wholesale operator has deployed a multi-layered ecosystem to boost revenue and value chain coverage

A wholesale operator based in Europe wanted to expand its operations from selling connectivity-based services directly to businesses to providing a suite of offerings including business applications and digital content to its customers' customers (B2B and B2B2C). It also wanted to expand its sales channels in order to sell digital services through a network of dealers and value-added resellers, who can then sell the operator's services to other resellers. This necessitated the deployment of a new end-to-end BSS platform that could provide capabilities such as partner management, configure, price, quote (CPQ), order orchestration, monetisation,

settlements and policy management. The operator was also keen to use a solution that was compliant with TM Forum Open APIs and could be deployed in the cloud and delivered using a SaaS model. The operator selected CSG as their solution partner for this transformation programme (Figure 6.1).

Figure 6.1: Overview of the CSG Encompass platform deployment framework



Source: CSG, 2022

After deploying the solution, the operator created a multi-layered ecosystem that could support specific B2B2X business models (B2B2B and B2B2B2C). The operator is now able to provide multi-tenancy, real-time credit control, rating and charging for partners and retail end users. The new system is also able to support multi-dimensional charging models where one transaction can be rated multiple times in parallel (for instance, for calculating the end-user charge and any commission or royalty payable to agents or content providers).

The operator has also been able to streamline the management of both its own and its partners' offerings by automating the management and monetisation of a digital ecosystem. Today, the operator manages over 1 million business and direct retail customers across its four key vertical markets, and processes over 90 million retail billing events every month. The operator can also support B2B2X models across the entire commerce cycle from rating to charging to settlement, as well as complex partner relationships and agreements. The deployment of the new platform has helped to lower the relative cost of operations and has enabled the operator to improve revenue and become a key part of multiple value chains that offer opportunities for upselling and cross-selling in the future.

7. Conclusion

CSPs are well-positioned to become a key part of the emerging digital value chain ecosystem due to 5G roll-outs and digital transformation initiatives. The widespread deployment of 5G standalone will accelerate the adoption of a software-centric operations framework, which will require an agile digital BSS platform. The evolution of the three primary components of BSS (customer engagement, monetisation platforms and digital

marketplaces) will be driven by separate but associated factors: an emphasis on digital-first design, a new framework for monetising 5G and the need to support multi-dimensional B2B2X value chains, respectively. Each of these three components will have its own adoption curve and maturity cycle, but CSPs will need to balance the key capabilities of the individual components and the overall BSS architecture in order to achieve their ambitions of improved customer and enterprise engagement and effective monetisation of new opportunities.

8. About the author



John Abraham (Principal Analyst) leads our digital transformation research, including three research programmes: *Customer Engagement*, *Monetisation Platforms* and *Digital Experience*. His areas of focus include customer journeys and experience, the impact of 5G on BSS systems, telecoms enterprise opportunities, cost transformation, ecosystems and value chains, and micro-services-based architecture models. John has over a decade of experience in the telecoms industry. At Analysys Mason, he has worked on a range of telecoms projects for operators in Africa, Europe, India and the Middle East. Before joining Analysys Mason, he worked for Subex, a BSS vendor, and before that for Dell in India. John holds a bachelor's degree in computer science from Anna University (India) and an MBA from Bradford University School of Management (UK).

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