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5G Messaging Poised to Deliver Ecosystem Innovation



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Summary

In brief

5G has the potential to usher in a new age of telco communications. With 5G messaging, telcos have an opportunity to blend legacy messaging services with innovative business models and refreshed service delivery platforms. Even though messaging apps are popular and have eaten into telcos' SMS traffic and revenues, SMS has remained resilient and must be supported in 5G, both to deliver continuity for consumer and enterprise messaging and for the Internet of Things (IoT). 5G messaging provides telcos the opportunity to bring SMS into the 5G era. Meanwhile, 5G rich messaging is positioned as a more compelling communications channel than SMS for consumers and brands, enabling richer interactions including rich messaging, rich cards and carousels, chatbots, and payments. Finally, IoT traffic and revenues are forecast to grow to 2025 and messaging will continue to play a key role in enabling connectivity between things and between things and people. Realizing the full potential of 5G messaging will require a strong ecosystem with committed partners across the value chain.

Omdia view

Telco messaging may not be as compelling a 5G consumer service as cloud gaming or augmented reality/virtual reality (AR/VR), but SMS will be a key consumer service for some years to come, and telcos will need to support it in 5G. Part of SMS' ongoing appeal to consumers, and perhaps more importantly to enterprises, is its universal availability across devices and networks (now including 5G devices and networks), its reliability, and its relatively low cost as a communications channel. Telcos will also need to continue to support SMS in 5G because application-to-person (A2P) SMS is set to remain a high-value service for telcos, generating \$103 billion in revenues by 2025.

But 5G messaging is not just about SMS – it's also about rich messaging, which is realized in the GSM Association's Rich Communications Service (RCS) Universal Profile (UP) 2.5. Rich messaging does have its challenges – notably, achieving reach and interconnectivity. It has been around since 2008 and still has less than 100 telco deployments, few of which are interconnected. There's no guarantee that 5G will change this, even though some of the world's largest telcos and telco groups that have launched 5G – including Vodafone, Orange, Deutsche Telekom (which includes T-Mobile USA), China Mobile, and AT&T – have also previously launched RCS services. Brands too appreciate that RCS Business Messaging (RBM) allows them to have a richer messaging interaction with their customers, and the ecosystem of SMS aggregators, connectivity service providers, hosting providers, and mobile engagement platforms is also lining up behind it. The GSMA has also mandated that all 5G devices must support rich messaging natively and is positioning it as the 5G messaging service upgrade from SMS.

And then there is the IoT market, where IoT devices currently only support application-originated SMS, meaning that there are limited use cases representing comparatively low market value. 5G for

IoT messaging will continue to enable interactions between machines and consumers and between machines and applications. The IoT market is set to be a key vertical industry for 5G, and while most IoT connectivity will be over data connections, 5G for IoT messaging will play a key role as a communications channel, potentially driving much higher revenue.

Telcos should consider the benefits of developing a coherent strategy for 5G messaging that encapsulates how they roll out telco-based messaging services across their 5G networks and devices and how these services map to the consumer, enterprise, and connected devices markets. But it's not something that telcos can do in isolation, because their decisions will have implications for other players in the value chain and because working with partners can help unlock innovation in the development of new services and business models. Just as an ecosystem has evolved around person-to-person (P2P) and A2P SMS, so too will an ecosystem develop around 5G messaging – likely containing many of the same players but also providing an opportunity for new partners to participate.

Key messages

- **5G messaging offers telcos the opportunity in three key areas to consolidate their messaging services, generate ongoing revenues, and innovate.** These are 5G SMS (for consumers), 5G rich messaging (for consumers and businesses), and 5G for IoT messaging (connected devices/things).
- **The pace of 5G launches and subscriber adoption is quickening.** By end-2020, Omdia forecasts that there will be 236 million 5G subscribers globally, rising to over 3 billion by 2025. By end-2Q20, more than 75 telcos had launched 5G networks. This represents a huge addressable market for 5G messaging.
- **5G messaging complies with all relevant industry standards.** Building a 5G messaging service on hardware and software that meets industry standards provides a solid foundation for the delivery of a reliable, high-quality, future-proof, telco-grade universal messaging service.
- **5G rich messaging has the most potential for telcos to enhance their messaging services for consumers, businesses, and things.** Rich messaging is the upgrade path from SMS to a richer form of messaging service, like that provided by apps such as Weixin, WhatsApp, iMessage, and Facebook Messenger. However, rich messaging is positioned as a universal and interoperable telco service (like SMS), and it will enable fallback to SMS or MMS.
- **One of the more interesting elements of 5G messaging is its use as an upgrade path for A2P SMS.** RCS Messaging-as-a-Platform (Maap) and RCS Business Messaging (RBM or A2P RCS) draw on the Universal Profile 2.4 and 2.5 specifications to enable businesses to offer their customers branded two-way interactions with features such as chatbots, rich media, payments, and authentication/verification services.
- **Telcos can develop revenue streams and business models around 5G messaging.** These include continued support of existing messaging services for consumers over 5G, delivering existing services with a vastly enhanced user experience (such as 5G rich messaging), or the

development of completely new 5G-based messaging services for the consumer, enterprise, and service provider markets.

- **5G messaging devices and networks will enable backwards compatibility while also being future-proof.** 5G SMS will interwork with legacy devices, including feature phones and smartphones as well as new 5G devices. Meanwhile, telcos will reap the benefits of being able to utilize a cloud-based network function virtualization (NFV) architecture for 5G message centers (5GMCs), delivering lower costs, and increasing flexibility and scalability.
- **China Mobile shows what's possible for 5G messaging.** China Mobile has played a key role in advancing 5G messaging in China. In May 2020 the telco was among the first in the world to deploy a 5GMC, which has since amassed over 100 million active users. It has also helped develop 5G rich messaging services for brands, enabling over 300 precommercial and commercial chatbots. In addition, it is building an ecosystem around 5G rich messaging that includes developers, handset manufacturers, and brands.

Recommendations

- **Telcos should play a key role in the building of the 5G messaging ecosystem.** This means working with other service providers, vendors, and application developers to create 5G messaging-based services and develop new business models.
- **Telcos will need to continue to support SMS in their 5G networks.** While messaging apps have achieved significant penetration globally and are almost at saturation point in some countries, SMS remains the only universally available messaging service on mobile devices and therefore retains value for consumers.
- **The messaging ecosystem must focus on A2P SMS and/or 5G rich messaging to drive messaging revenues over 5G networks.** A2P SMS remains an important service for enterprises to engage with consumers. It is attractive to enterprises because it is universally available, cheap, reliable, and the center of an already established ecosystem, which can also be tapped for 5G rich messaging/RCS Business Messaging (RBM).
- **The IoT market for 5G messaging should not be ignored.** Massive IoT (MIoT) looks set to be a significant industry vertical for 5G, with use cases spanning smart cities, consumer electronics, and transport and logistics, among others. Messaging is a key connectivity service for MIoT that telcos should capitalize on where they can.

Introducing 5G messaging

The role of telco messaging in a 5G world

5G, the next generation of global mobile networks, will enable telcos to supersize their wireless data connectivity. It will deliver much faster speeds at much lower latency and at lower per-bit costs compared with 4G. 5G won't be cheap for telcos to deploy – they need to acquire spectrum across multiple bands and build new core networks. But the benefits are potentially substantial in terms of the step change in the quality and the range of bandwidth-intensive, time-lag-sensitive services that telcos will be able to offer consumers and enterprise users. Consumers can expect considerably enhanced experiences in services such as AR/VR, cloud gaming, and high-definition/ultra-high-definition (HD/UHD) content. Meanwhile telcos and enterprises are expected to deploy 5G initially across the smart cities and manufacturing industry verticals, with private networks and network slicing emerging as key use cases.

Much of the focus and excitement around 5G is about the super-sized networks and super-sexy apps and services mentioned above. But telcos deploying 5G networks will still need to support legacy voice and messaging services and ensure backwards compatibility for these services with their 4G, 3G, and even 2G networks (where these still operate).

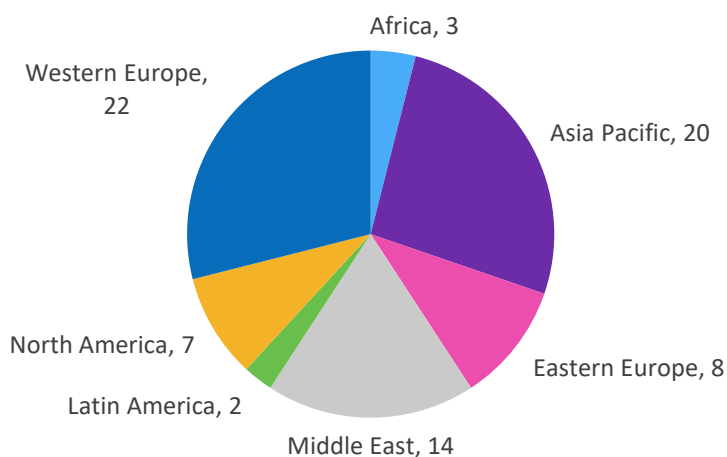
Importantly, 5G provides the opportunity for telcos to consolidate their messaging services, and to innovate, in three key areas: 5G SMS (for consumers), 5G rich messaging (for consumers and businesses), and 5G for IoT messaging (connected devices/things). In much the same way that ecosystems grew around legacy messaging services, especially A2P SMS, so will they grow around 5G messaging.

Telcos are well-positioned to play a key role in the building of 5G messaging ecosystems, working with service providers, vendors, and application developers to create new 5G messaging-based services and develop new business models. In fact, it is incumbent on telcos to do so, since the alternative is to eventually completely cede their P2P and A2P messaging traffic and revenues to messaging apps, which represent the strongest threat to the telco messaging business.

5G network launches gathering pace globally

To put the 5G market in context: by end-2Q20, more than 75 telcos had deployed 5G in 40 countries and in all seven regions (see **Figure 1**), and there were another 20 launches of commercial fixed wireless access (FWA) 5G. Most of the activity is in Asia Pacific and Europe, where telcos in the UK, Switzerland, South Korea, and China – alongside those in the US - have been trailblazers for 5G.

Figure 1: Global 5G launches, by region, 2Q20



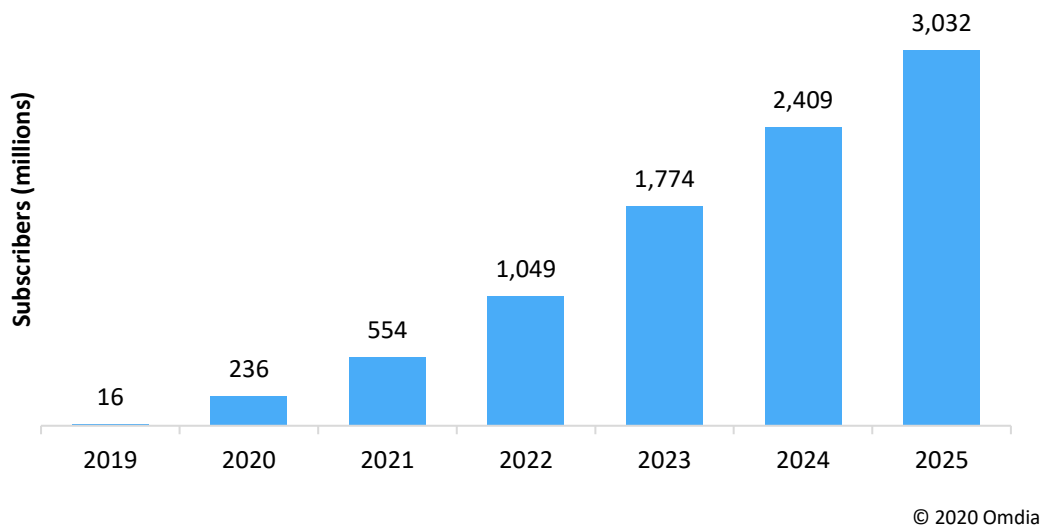
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Source: Omdia

5G mobile subscriptions grow strongly, buoyed by industry engagement

From a standing start in 2019, 5G mobile subscriptions increased dramatically in 2020 (see **Figure 2**). Asia and Oceania are leading the way, primarily due to strong growth in mainland China, where all three telcos launched 5G in November 2019, and where Omdia forecasts 196.2 million 5G mobile subscribers by end-2020 (83.1% of total global subscribers). Support for 5G from telcos, vendors, and the Chinese government has underpinned the growth of a vibrant ecosystem around the technology, delivering the coverage and compelling services required for user adoption.

Figure 2: Global 5G mobile subscriptions, 2019–25



Source: Omdia

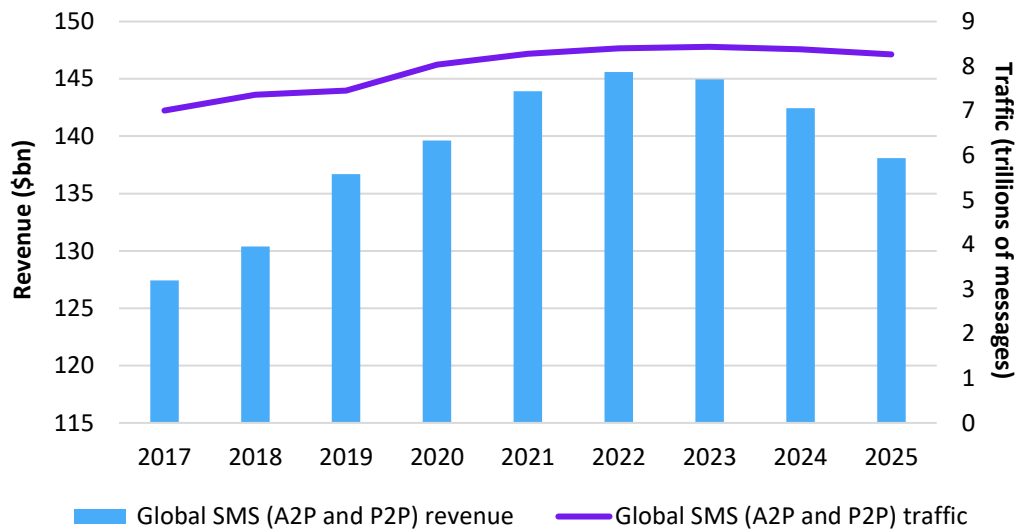
Telco messaging remains resilient against messaging apps

Telcos will need to continue to support SMS in their 5G networks, since it has proved remarkably resilient against messaging apps. While messaging apps have achieved significant penetration globally and are almost at saturation point in some countries, SMS remains the only universally available messaging service on mobile devices. Also, in many countries, telcos have removed the price barrier for SMS, offering plans including unlimited or large bundles of SMS. This encourages consumers to continue using P2P SMS.

A2P SMS remains an important service for enterprises to engage with consumers. It is attractive to enterprises because it is universally available, cheap, and reliable. There is an established ecosystem for A2P SMS, which reduces the barriers to entry for enterprises that have not previously used SMS as a customer engagement channel. Also, communications-platform-as-a-service (CPaaS) providers have made it easier for enterprises to add A2P SMS to their customer engagement platforms by offering programmable APIs for messaging.

Omdia forecasts that total global SMS traffic will reach 8.3 trillion messages by 2025 (see **Figure 3**), buoyed by strong growth in A2P SMS over the forecast period, even as P2P SMS traffic declines gradually after a COVID-19 spike in 2020. A2P SMS traffic will grow from 2.3 trillion messages in 2020, generating \$79 billion in revenues, to 3.2 trillion messages by 2025, generating \$103 billion. Slower than expected take-up of messaging apps as a customer engagement channel and increased telco focus on shutting down gray routes will help contribute to the sustained growth in A2P SMS traffic and revenues. P2P SMS traffic will decline gradually from 5.7 trillion messages in 2020 to just over 5 trillion messages by 2025, reflecting its continued relevance as a telco service for consumers. Global P2P SMS revenues will also decline, from \$60 billion in 2020 to \$35 billion by 2025. It is clear from Omdia’s forecasts that telcos will need to continue to support SMS for the foreseeable future.

Figure 3: Global SMS traffic and revenue, 2017–25



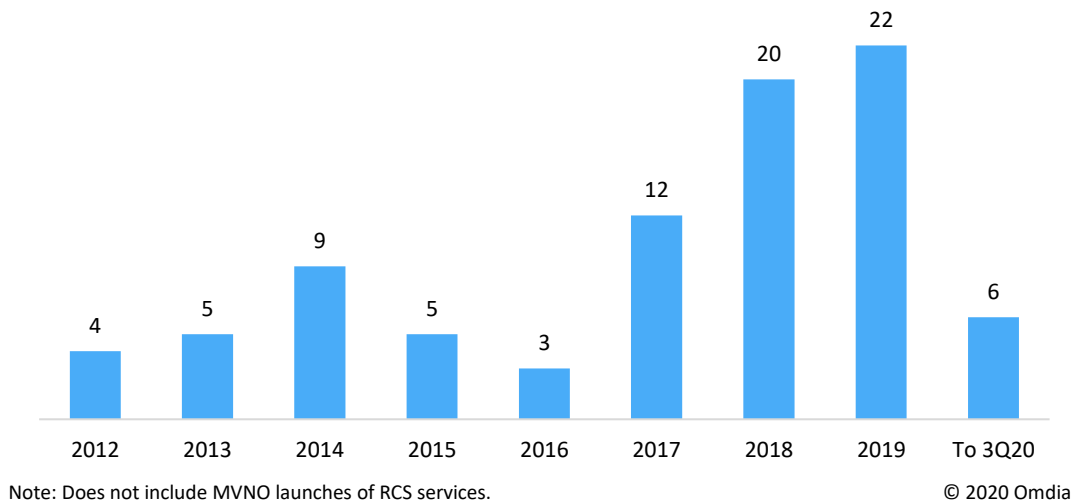
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Source: Omdia

Rich Communications Services provide an upgrade path to SMS

RCS UP 2.4/2.5-based rich messaging is positioned as the upgrade path for SMS. It aims to provide a richer messaging experience for consumers, similar to that provided by messaging apps, but one that is available natively on mobile phones as a universal, or green button, service. The challenge for RCS and its supporters – which include most of the world’s largest telcos and Google – is building reach. As of 3Q20, fewer than 100 telcos globally had launched RCS (see **Figure 4**), and of these, fewer still had deployed A2P RCS or RCS Business Messaging (RBM) which, like A2P SMS, will be where telcos (and the rest of the existing A2P SMS ecosystem) will most likely generate revenue from RCS. Those telcos that have launched A2P RCS include some of the largest mobile operators globally, such as China Mobile and Vodafone, as well as multi-operator deployments within a single country, such as the Japanese telcos NTT DoCoMo, KDDI, and Softbank.

Figure 4: Global telco RCS launches, 2013–3Q20

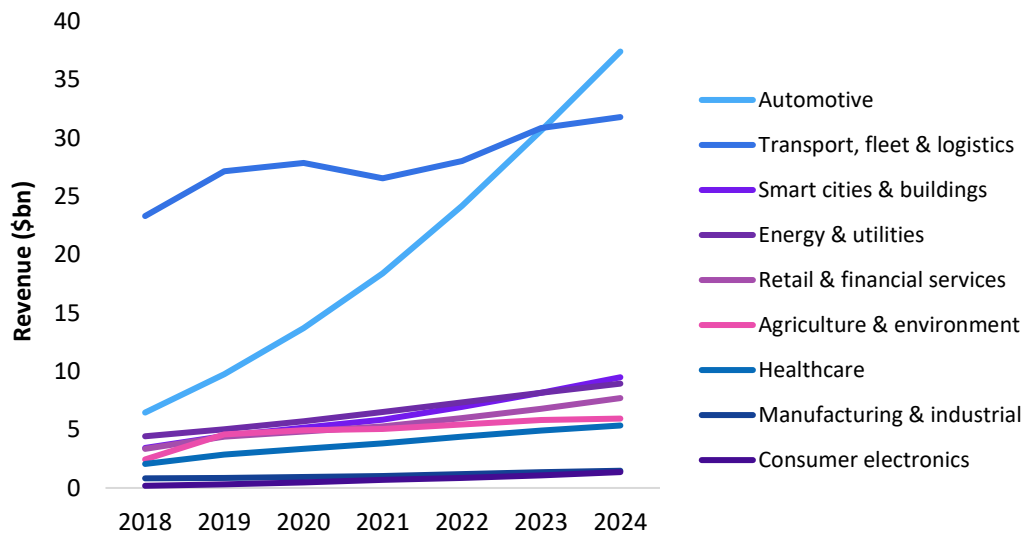


Source: Omdia

The role of SMS in M2M/IoT must be maintained and upgraded in 5G for realization of MIoT messaging

Connected IoT device volumes are expected to double between 2020 and 2024 according to Omdia, growing from 12.7 billion to 25.44 billion, with an almost commensurate increase in total global IoT service revenues, from \$305 billion in 2020, to \$596.8 billion by 2024. Global connectivity revenues – to which SMS would contribute – will increase from \$67 billion in 2020, to \$109.5 billion by 2024, or about 18% of total service revenues (see **Figure 5**). The connected consumer electronics, transport fleet and logistics, and smart cities and buildings vertical industries will account for the highest proportion of IoT connections, devices, and revenues. These are all industries in which MIoT will play a key role as 5G vastly increases network capacity and dramatically reduces network latency, which will in turn drive up the number of IoT devices that can connect to and send data over a telco network.

Figure 5: Global IoT connectivity revenues, 2018–24



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Source: Omdia

Given the significant revenue opportunity that MIIoT represents, telcos must support IoT messaging as part of their 5G messaging strategy, since it is one of the communications technologies that IoT devices will use.

SMS is used in MIIoT for use cases such as sending “wake up” messages to devices or for remotely configuring devices over the air (OTA). It can also be used to enable two-way messaging between things, people, and applications, using 5G rich messaging, chat bots, or SMS.

Standards-based for compliance with telco networks

It is imperative that 5G messaging complies with the relevant industry standards agreed by the standards bodies, the 3G Partnership Project (3GPP) and the GSM Association (GSMA). 5G messaging must be forwards and backwards compatible with telcos’ legacy networks and future networks. The standards on which 5G messaging is based preserve the universality of SMS, which is important since SMS is valued for its global availability across telco networks and end-user devices, ensuring it will remain a core telco service for the foreseeable future. In addition, the 5G messaging standards provide telcos with an upgrade path from SMS to rich messaging and define how messaging is enabled for MIIoT.

5G messaging is enshrined in the following standards and specifications for mobile devices and network equipment:

- 3GPP’s 5G R15, R16, and R17 standards

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- 3GPP's IP Multimedia Subsystem (IMS) – defines the use of SMS over IP using an IMS core, for IMS-based 5G networks
 - 3GPP's TW 23.501 – defines a component called an SMS Function (SMSF), which enables SMS over non-IMS 5G networks (SMS over Non-Access Stratum or SMSoNAS)
 - The GSMA's NG.114 IMS Profile for Voice, Video, and Messaging over 5GS (5G System)
 - The GSMA's NG.111 SMS Evolution
 - The GSMA's RCS Universal Profile Service Definition Document Version 2.5

5G messaging is a step up from plain old SMS

5G messaging comprises three key components:

- 5G SMS
- 5G rich messaging (RCS)
- 5G IoT messaging

5G SMS is unlikely to undergo significant iteration as it is a mature and well-established service. But it is vital that telcos support 5G SMS to ensure continuity of service for both consumers and enterprises. Telcos should focus on enabling backwards compatibility for 5G SMS with their legacy 2G, 3G, or 4G networks.

It is a similar story for 5G IoT messaging, at least initially, as the focus will be on the use of 5G SMS as an industrial communications channel. The key story around 5G IoT messaging is that 5G potentially explodes the number of IoT devices and use cases that will use SMS messaging and applications. Again, telcos need to ensure that their 5G messaging capabilities can scale to meet increased demand. There are standards in development that will enable 5G IoT messaging directly between consumers' smartphones and 5G IoT terminals, but in the interim this will be enabled using 5G rich messaging chatbots.

5G rich messaging has the most potential for telcos to enhance their messaging services for consumers, businesses, and things. RCS is the upgrade path from SMS to a richer form of messaging service, like that provided by apps such as Weixin, WhatsApp, iMessage, and Facebook Messenger. However, unlike the messaging apps, RCS is positioned as a universal and interoperable telco service (like SMS), and it will enable fallback to SMS, which many of the messaging apps don't offer.

The GSMA has mandated that all 5G mobile devices must support RCS Universal Profile 2.5 natively, to ensure that RCS becomes the default messaging service for 5G. This is in contrast with the GSMA's requirements for 4G: it did not mandate that 4G mobile devices support previous versions of the Universal Profile, although most Android device makers, with the exception of Apple, did add native RCS capability to some or all of their devices. Of course, for SMS-like universality and interoperability

to exist, all telco networks must launch RCS services and all device-makers must support it – this is a piece of the puzzle that has yet to be fitted.

The key P2P features of 5G rich messaging, defined by the GSMA's Universal Profile 2.5, are as follows:

- Messaging, including group messaging, SMS fallback, audio messages, and multidevice support
- File transfer for sharing photos and videos
- Calling services, including voice, video and enriched calling (sharing content during a call)
- Live sketch sharing on images or maps
- Post-call capabilities for unanswered calls, such as sending a post-call text or voice message
- Security services, such as user authentication and encryption

But perhaps the more interesting element of 5G messaging is its use as an upgrade path for A2P SMS, via messaging-as-a-platform (MaaP) and RCS Business Messaging (RBM or A2P RCS).

MaaP/RBM also draws on the Universal Profile 2.5 specification to enable businesses to offer their customers branded two-way interactions with features such as chatbots, rich media, payments, and authentication/verification services. MaaP/RBM allows brands to replicate and enhance legacy A2P SMS use cases, to develop new use cases for A2P RCS, and to gather actionable analytics that can be used to improve existing products and services or develop new ones.

MaaP/RBM harnesses the key P2P RCS features and adds the following:

- Chatbots, including features such as a service ID for each unique chatbot, conversations in anonymous mode and public mode, multidevice support, chatbot verification and authorization, chatbot search and discoverability, critical chatbots, payments, rich cards, suggested replies/actions, call initiation, and geolocation
- Rich cards: domain specific or general purpose, including content such as an image or video, title and description, and suggested replies/actions
- Carousels: comprising a series of general-purpose rich cards, which recipients can scroll through (e.g., a catalogue)
- Data analytics

The business case for 5G messaging

A potential killer service for 5G

There is much debate in the 5G ecosystem around which service or services will deliver the revenues that will help telcos to achieve ROI on their 5G deployments. As mentioned previously, 5G represents significant revenue opportunity for telcos across consumer and enterprise. This revenue opportunity comes from the following:

- Continued support of existing services for consumers over 5G (such as voice, messaging, and data)
- Delivering existing types of services (such as messaging, AR/VR, cloud gaming, IoT, or private networks) with a vastly enhanced user experience (higher speed, lower latency), which means that telcos can repackage services and charge more for them
- The development of completely new 5G services that represent purely additional revenue

5G messaging arguably spans all three revenue scenarios and could therefore be a contender for the role of “killer service” for 5G. It retains SMS as a core telco service that is already a proven revenue generator in the consumer, enterprise, and IoT markets. It provides an upgrade path for SMS in the consumer and enterprise markets via 5G rich messaging/RCS, which also offers potent new opportunities for telcos to diversify their business models and create new revenue streams. And it allows for the use of IoT messaging to address an expected significant expansion in the use of MIoT on 5G networks and devices, which, again, will deliver increased connectivity revenues for telcos.

To C, to B, and to T: service scenarios and ecosystem innovation

5G will enable a number of messaging service scenarios, and these can be further broken down by messaging category:

- **5G messaging for the consumer market (2C): P2P SMS and P2P RCS.** These service scenarios comprise the P2P SMS services already available on 2G, 3G, and 4G networks and the P2P RCS services, which are primarily available on 3G and 4G networks. The scenarios enable text-based messaging or rich messaging between mobile subscribers.

- **5G messaging for the enterprise market (2B): A2P SMS and A2P RCS.** These service scenarios comprise the A2P SMS services which, like P2P services, are already available on 2G, 3G, and 4G networks, and A2P RCS services for 3G and 4G networks (delivered via MaaP and RBM). The scenarios enable text-based or rich messaging between businesses and consumers, with the latter including features such as rich cards, carousels, chatbots, and payments.
- **5G messaging for the IoT market (2T).** These service scenarios comprise text- or application-based messaging between IoT terminals, enabling communications between devices or communications between applications and devices. Standards are in development that will enable communications directly between consumer smartphones and IoT terminals. In the meantime, this functionality can be enabled with 5G rich messaging chatbots.

Diversified business and revenue models

As telcos roll out 5G networks, there is an opportunity for them to revise their business models and pricing structures for 5G messaging services and to introduce new ones. Although telcos in many countries already offer consumer price plans that include either unlimited P2P SMS and/or P2P RCS or large bundles of these messages, this practice is not universal. Telcos that aren't already bundling P2P SMS and P2P RCS (where available) into their price plans could use their 5G launch to do so, using it to help justify charging a premium for 5G price plans.

Similarly, in the enterprise messaging market, telcos don't have as much room to move on business models and pricing structures for A2P SMS, since these are long established, and in some countries SMS network termination fees are also regulated. That does not mean no room, however. Gray routes, or the illegitimate termination of A2P SMS traffic onto telco networks using SIM farms and other techniques, can negatively impact telcos' A2P SMS revenues if not detected. Telcos that haven't already deployed SMS firewalls or revenue assurance platforms could also use their launch of 5G networks to add these platforms to protect both their 5G rich messaging revenues and their A2P SMS revenues on legacy networks.

5G rich messaging represents a significant opportunity for telcos to diversify their business models and build new revenue streams from messaging by engaging at a deeper level with enterprises. As a baseline, there will be a connectivity component as part of the 5G rich messaging business model, with the GSMA initially suggesting that A2P RCS/RBM messages could be charged per-event (message) or per-session (conversation), or on a hybrid active user model where telcos would initially charge an access fee per unique MSISDN per bot per month in addition to either per-event or per-session charging. In terms of pricing, it's likely that telcos would charge aggregators and enterprises a premium for bulk RBM messages and sessions, which could be two to three times the cost of an A2P SMS, which they can justify by arguing that RBM campaigns provide a richer, higher-quality experience for consumers that delivers better response rates, higher engagement, and increased revenues to brands than SMS campaigns do.

But 5G rich messaging will allow telcos to have a commercial relationship with enterprises that extends beyond connectivity. Telcos can also use 5G rich messaging to build merchant networks and generate revenues from them in much the same way that messaging apps engage with their merchant networks.

For instance, telcos could create a 5G rich messaging enterprise platform, which would allow them to charge fees or a commission for enabling services such as chatbots, payments, and authentication through the use of templates and programmable APIs. They could negotiate revenue-sharing agreements with merchants, or they could develop a cost per thousand (CPM) model whereby they would receive fees based on the number of “views” that a merchant’s chatbot receives. It would also be possible for them to employ a combination of these new business models across their enterprise customer base, thus maximizing their potential revenues.

Finally, in the IoT market, telcos are likely to see a substantial increase in connectivity revenues from SMS as vertical industries harness the power of their 5G networks to develop and deploy new MIIoT services. As a result, telcos will likely introduce new business models and pricing structures to take into account situations such as ultra-dense device deployments within a defined geographic area or services that need to operate at ultra-low latency at peak times, but which can fall back to a different latency level during off-peak times.

The 5G messaging platform

5G messaging spans multiple terminal types

5G messaging services build on the existing characteristics of the telecommunications industry. Like SMS, 5G messaging services are designed for global interconnectivity and security. Consumers will not need to download an app, and all their relevant personal information will be stored with their telcos.

5G messaging services will be natively available on the following:

- Most 5G NR smartphones, except for 5G rich messaging/RCS on Apple devices
- IoT terminals
- 5G data cards

They will also be backwards compatible with 2G, 3G, and 4G feature phones and smartphones, meaning that a mobile user with a 5G smartphone will be able to send a 5G SMS or a 5G rich message to mobile users on 2G, 3G, and 4G networks, and vice versa. Mobile users on telco networks where 5G rich messaging is not available will receive messages as SMS.

Cloud architecture enables flexibility, scalability, and openness

Over the past few years, providers of SMSCs and MMSCs have moved away from providing messaging infrastructure as expensive, inflexible, and siloed proprietary platforms. Instead, messaging vendors are increasingly offering their platforms via a software-based approach, utilizing NFV, commercial-off-the-shelf (COTS) hardware, and centralized, cloud-based implementations which they can either host for their telco customers or set up on-premises. Doing so allows vendors to offer their telco customers platforms that reduce the total cost of ownership, enhance the flexibility of messaging deployments (allowing the vendor or the telco to more easily add new services or drop less relevant ones), and enable telcos to scale capacity up or down to manage traffic peaks and troughs.

5G message centers (5GMCs) have been developed with these same principles in mind. In addition, some vendors have added a lightweight SIP access module for IMS networks to their 5GMCs. This module enables the convergence of 5G rich messaging/RCS, meaning that vendors can provide unified authentication, message routing, message storage, and message conversion across SMS and RCS.

5G messaging in action: China Mobile

China Mobile leads the way on 5G messaging

China Mobile has played a key role in advancing 5G rich messaging. The telco launched P2P RCS services in 2017 and remains the only operator in China to offer it. At MWC Shanghai in June 2019, the telco announced the launch of its RCS Business Messaging (RBM, or A2P RCS) service and the 5G Messaging Innovation Open Lab (MIOL), aimed at providing an incubation and testing environment for RCS MaaP services. At that time, the telco stated that it had 110 million RCS monthly active users (MAUs). In April 2020, the telco partnered with China Unicom and China Telecom to launch a 5G messaging white paper, signaling the commitment of all three telcos to 5G rich messaging. China Unicom and China Telecom are yet to say when they will launch 5G messaging services, but Omdia understands that they are in the process of launching platforms and deploying a shared A2P capability with a view to establishing interconnection between the three telcos' 5G messaging services in 2021.

China Mobile is the first mobile operator globally to launch a 5GMC. The 5GMC, for which China Mobile used a platform from one of its vendors, ZTE, was deployed in February 2020. Over the next three months it added MaaP (with chatbots), conducted the first "calls" for P2P and A2P messaging (including over MaaP), and trialed MaaP chatbots with a number of enterprises.

China Mobile's 5GMC went into service in May 2020 and since then has amassed over 100 million active users.

China Mobile's 5GMC is compliant with the GSMA's Universal Profile 2.4, which is also supported by seven devices supplied by Samsung, Huawei, ZTE, Xiaomi, Meizu, Vivo, and OPPO. Samsung and Huawei have their own RCS clients, while the ZTE and Xiaomi devices use an SDK from Juphoon and Vivo and Oppo use the Fontdo SDK.

The telco has also built a MaaP ecosystem, two components of which are the 5G Message Application Industry Alliance and a developer competition. The 5G Message Application Industry Alliance consists of 22 businesses and 5G Message Development Partners. Meanwhile its recent developer competition, which was aimed at encouraging developers to create 5G messaging applications, attracted 110 entries from 50 developers.

Chatbots deliver benefits for China Mobile subscribers

MaaP-enabled chatbots are a key feature of China Mobile's 5G messaging deployment and are aimed at providing mobile subscribers with a similar experience to Weixin/WeChat, which offers mini-programs from businesses across many vertical industries within its platform.

Chatbots provide an opportunity for telcos to regain their role in the mobile content and services value chain, a role they have become increasingly separated from in recent years as internet companies and content providers used telco networks for the connectivity to provide their own content and services. With MaaP, telcos can potentially offer their own content and services via chatbots directly to consumers, or they can provide chatbot templates for enterprises. Perhaps more importantly, MaaP chatbots can be a revenue generator for telcos, in that in some use cases telcos can make revenue-sharing agreements with businesses for digital content and services.

Chatbots can also be enabled for 5G IoT messaging for a range of use cases across industries such as smart home and healthcare. 5G IoT messaging chatbots will enable consumers to communicate with and control devices such as smart meters for water and electricity, smart cameras for security services, smart locks for enabling or disabling access permissions using biometrics, and smart appliances such as air conditioners, rice cookers, TVs, and speakers.

Standardization efforts are still underway to enable 5G IoT messaging directly between smartphones and smart devices, so chatbots can be a convenient temporary measure until standards are finalized and supported in devices.

To date, China Mobile's 5GMC enables over 300 precommercial and commercial chatbots for engagement between businesses and consumers in vertical industries including government, finance, education (for online education), healthcare, internet, catering, and e-commerce. In addition, China Mobile offers Smart Push, a set of more than 60 message templates, for use cases such as weather forecasts, banking services, and electricity bills. Businesses can use these templates to create their own chatbots.

There are a number of chatbots already live on China Mobile's 5GMC, including chatbots for typhoon forecasts, public notifications and emergency broadcasts from government departments, and local tourism information.

Appendix

Methodology

This white paper draws on Omdia reports, forecasts, and data trackers, including the *5G Service Provider Tracker: 2Q20*, *5G Mobile and Fixed Subscription Forecast: 2020–25*, *Mobile Messaging Traffic and Revenue Forecast: 2020–25*, *Enhanced Telco Communications Tracker – 3Q20*, and *IoT Forecast: Connections, Devices, and Service Revenues (Total Addressable Market), 2018–24*.

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