The Impact of 5G on Next-Generation Telecom Order Management

Abstract

With 5G, we now need a step change in the capabilities of Communications Service Providers (CSPs) to provide new services and business models. This will require evolution of the core order management capability of CSPs as 5G business models necessitate complex, multi-component, cross-vertical, real-time, and on-demand services.

This paper provides an overview of the Telecom Order Management System (TOMS) capabilities required for CSPs in the 5G era. We have assessed the disruption that 5G would bring to the telco order management ecosystem and have explored the definitive demand to upgrade.

Imperatives of Next-Gen Telecom Order Management

To prepare for 5G, CSPs are focusing on building their network infrastructure to enable 5G core connectivity services such as enhanced mobile broadband (eMBB), ultra-reliable low-latency communications (uRLLC), and massive machine-type communications (mMTC). Furthermore, as the backhaul infrastructure is getting ready, CSPs are also strategizing and evaluating the products and services that 5G would enable, ranging from use cases in the manufacturing industry to smart city and autonomous driving to new-age medical services. As these areas evolve, CSPs would need new business models based on whether they want to be a smart connectivity provider, smart product and digital services player, an aggregator/ marketplace for digital services or an ecosystem platform driver[1].
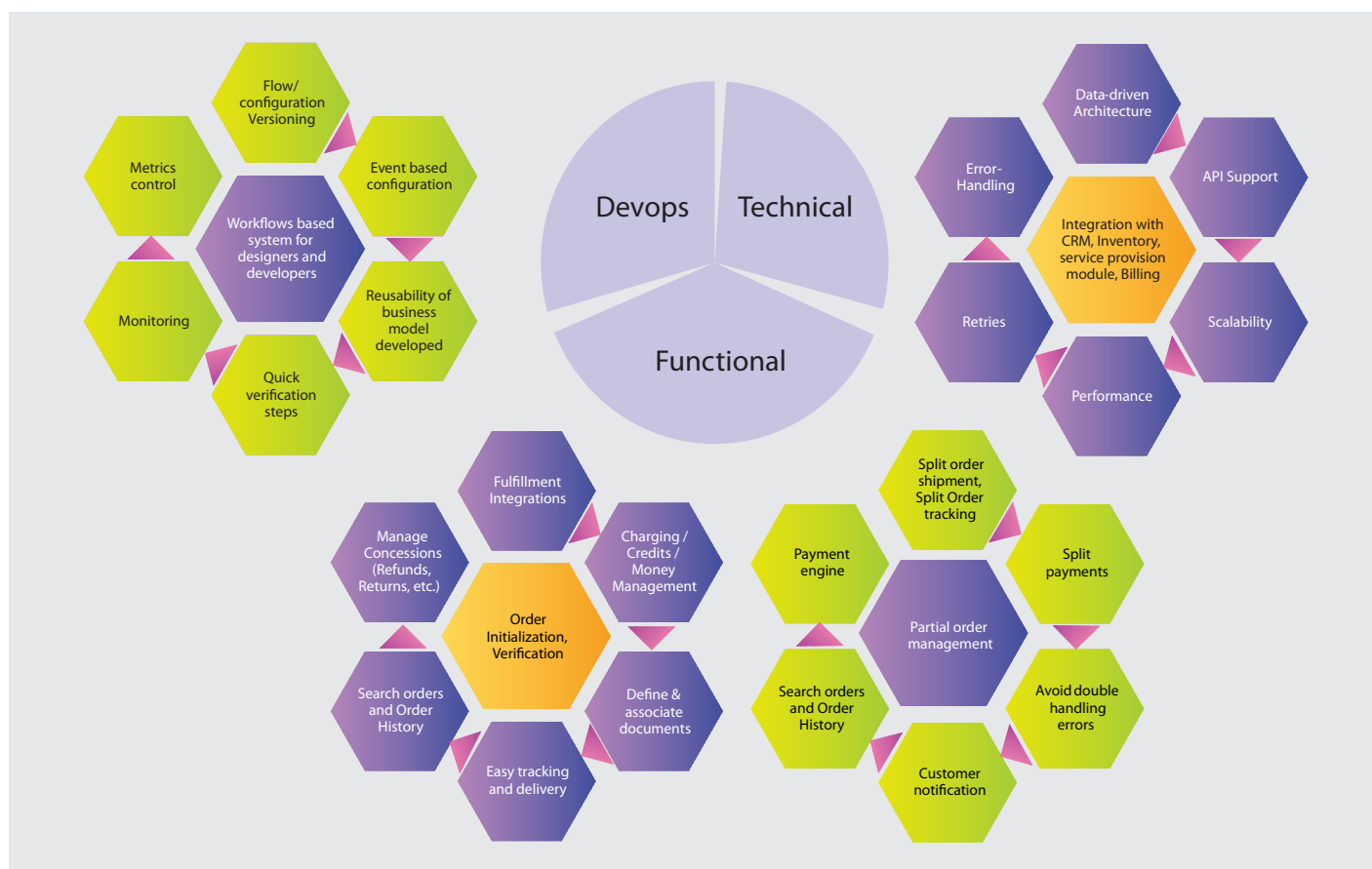
In all these cases, the success of 5G use cases will need multiple stakeholders' participation. Moreover, CSPs' role will be crucial to bring all the parties together and provide a value-added service to the customer.

CSPs need to ensure that their telco ordering systems are aligned with the dynamic nature of today's businesses. Orders of the future will not always be requested by humans, but will be directly triggered from edge devices, intelligent applications and sensors, AI based consumer devices and smart IOT infrastructures. CSPs should be capable of managing the dynamic nature of the ordering and fulfillment process.

5G also brings in the need for dynamic creation of network slices. TOMS need to have a high degree of automation to handle such kind of dynamic activation and enablement of zero-touch provision. For instance, service assurance systems must be able to talk to the ordering system for contextual telco networking needs. This is called closed-loop automation[2] and is expected to set the precedent for a new-age paradigm in the 5G provisioning world.

Edge is a new paradigm in the 5G world and TOMS should be capable of fulfilling orders and deploying solutions at edge.

1. Tata Consultancy Services, Making The Smart Call (May 2019), Accessed Jan 20, 2020
   https://www.tcs.com/content/dam/tcs/pdf/Industries/communication-media-and-technology/Abstract/TCS-HBR-Telco-WP.pdf

2. TMForum, Building the future telco, (May 2018), Accessed Oct 12, 2019,
   https://inform.tmforum.org/insights/2018/05/building-future-telco-simplify-automate-innovate/

Today's TOMS Capabilities

The 5G impact

To be a step ahead of the next revolutionary trend, CSPs need to build their TOMS to cater to the four technology pillars of Business 4.0—cloud, automation, agile, and intelligence.

5G's two top feature, high speed and low latency, will play a critical role in shaping the future.

It is critical now to understand how information needs to be presented to the customer, and the speed at which services need to be provisioned. 5G will enhance customer experience and enable CSPs to gain operational efficiencies.

Among many things, mass deployment of IoT in stores, enhanced inventory visibility, and virtual reality, underpinned by the new generation of wireless connectivity is expected to deliver a tremendous boost to omnichannel capabilities[3]. Selling and buying experiences will be enriched with artificial intelligence, robotics, voice activation, and automation.

3. National Retail Federation, How will 5G make a difference today – and in the future (April 2019), Accessed Oct 12, 2019, https://stores.org/2019/04/01/how-will-5g-make-a-difference-today-and-in-the-future/

Through 5G, CSPs have a better opportunity to leverage data, bring it to consumers at the point of sale and leverage applications like mixed reality that are creative and new.

Salient capabilities of Next-Gen Telecom OMS to support 5G

✓ CSPs would need an upgraded TOMS with **next-gen operational support systems (OSS)**, which are specialized in deploying network resource management (NRM) systems that render 95% to 100% inventory accuracy and help attain the goal of zero-touch provisioning.

✓ A **rock-solid inventory with service fulfillment systems** that can configure any part of that inventory at a moment's notice to deliver services would be required—today's services and futuristic ones.

✓ The increase in IoT devices will lead to more futuristic products and an increase in over-the-top (OTT) providers. TOMS need to handle these efficiently and **scale up performance or capacity.** Once the order is provisioned, OSS must be fast and reliable to respond back quickly to achieve closed-loop assurance.

✓ 5G will open the era of IoT where provisioning needs to be done for orders that are initiated by non-human entities. For example, when an IoT device is registered, certain services would need to be activated or provisioned in the network automatically. This is quite different from today's world of order placement where it is a salesperson or an individual who is placing an order. Though the provisioning steps might be the same, it requires a **foolproof automated OSS** to ensure smooth operations.

✓ Data produced by the TOMS would be used for **analytics** to get insights into degree of responsiveness, payment patterns, input channel preference, customer satisfaction index, etc. With these insights, organizations can improve forecasting, inventory planning, and just-in-time procurement.

✓ Transformation in business processes would require a relook at order orchestration to enable **real-time and on-demand service management capabilities** across channels. This will impact the way business processes are configured within TOMS. Processes will be configured dynamically or changed on the fly.

✓ Services of the coming generation will be defined by scripts that represent an abstract view of how resources are committed toward the creation of the service. Through **script-based provision**, these abstract resources can be mapped to real resources—similar to virtualization or cloud computing.

✓ Seamless integration with catalog-as-a-service to enable third-party integration and OTT service provisions in a quick and dynamic way. Enterprise Product Catalog (EPC) would be at the center of the ecosystem and a federated catalog-centric architecture will drive distributed order management.

✓ Other new technologies that will also have an impact on building TOMS for 5G are:

    o AI/ML – Artificial Intelligence and Machine Learning help in embedded analytics and real-time prediction to lower fallouts and frauds, better forecasting and auto fixing errors, decrease costs through better end-to-end process management and automation

    o Blockchain – Information passed during TOMS processes can be managed using blockchain technology. In the 5G world, multi-partner integration and orchestration is a necessity. Blockchain-based security and identity management, and partner collaboration are areas where blockchain technology can come of service.

Capabilities	Benefits
Real-time order fulfillment	Capability to deploy 5G services, such as dynamic network slicing in real-time and dynamic activation of 5G slices.
Enterprise Product Catalog driven order management	Catalog-driven order management processes create an ecosystem, where products can be defined centrally and federated to both northbound channels and southbound TOMS, and billing/charging system without the need to duplicate product information.
Dynamic service orchestration	Dynamic orchestration and pre-integrated solution that enables CSPs to launch out-of-the-box business use cases with both physical and virtual network functions.
Support new technologies like blockchain	E-sim provisioning and fulfillment, digital identities and supply chain integration.
Network slicing and Real-time multi-domain orchestration	Ability to include multiple vertical slices into the telecommunication network.
On-demand scaling	Auto-scale cloud instances to take extra load
AI capability	AI-based end-to-end service management and closed-loop assurance.
Edge capability	Dynamically deploy and manage resources at edge.

A snapshot view of TOMS capabilities and benefits that CSPs can avail in the 5G era

Conclusion

While it is true that many service providers are launching 5G services in cities across the globe, the focus has been primarily on providing superfast broadband. Most CSPs are still evaluating other best possible use cases which can provide them better monetization across URLLC or MMTC e.g. applications across mobile gaming, manufacturing, smart cities or remote healthcare and other verticals. In all cases CSPs will have a major stake to build that platform ecosystem with partners and enable seamless on-demand fulfillment and process management built around its core order management system. As more partners emerge to provide specialized services, CSPs must upgrade their existing system to enable a catalog driven order management system which enables co-creation and co-opetition in the ecosystem. They need to build capabilities to provide real time order orchestration and fulfillment with multiple partners. CSPS also need to embed AI/ML capabilities to their TOMS to enable real-time, dynamic service capabilities based on customer needs and network events which allow for provisioning of services at edge. The time is ripe for CSPs to assess their current TOMS readiness and transform to meet the demands of 5G services, customer needs and future network capabilities.

About The Authors

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Tridib Banik is an Enterprise Architect at the Communications, Media and Information Services business unit of Tata Consultancy Services. He has over 18 years of IT experience, most of it in the telecom industry. His experience spans across diverse areas such as business architecture, digital architecture, technology consulting, IT project delivery across BSS, OSS. He is an AWS certified practitioner and also SAFe certified (Scaled Agile Framework).

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