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Achieving Digital Transformation of Mobile Network Operations

Consolidating network and customer data to improve mobile network operations



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Summary

Catalyst

Mobile network operators (MNOs) have begun their digital transformation journeys. However, they need a more effective approach to transform their mobile network operations and migration to 5G. Up to now, most MNOs have performed network operations in silos, using independent tool kits to perform network planning, network construction, optimization, and maintenance. Insights from existing analytics use cases supporting these operations are stored in disparate sources and aren't easily accessible to other teams in the network operation's organization. This results in inefficient network operations. In order to prepare for future 5G services and continued growth in 4G data usage, MNOs need to transform their network operations.

This whitepaper explores trends associated with the digital transformation of MNOs' mobile network operations and explains the role of a unified digital platform in supporting both network operations and marketing operations. It also explores the important role that big data analytics plays within the unified digital platform and how it enables MNOs to achieve their business objectives.

Omdia view

MNOs are transforming their mobile network operations to improve customer experience and operational efficiencies. To progress with this transformation, they must address the lack of visibility into network lifecycle management and customer service usage. They also need to address the limited automation of operations. These factors currently impede on MNOs' abilities to achieve their digital transformation objectives. As the demand for more data services on the 4G network increases, the resulting traffic is growing, making it more challenging for MNOs to meet customer demands for better experiences and to improve productivity. The evolution of networks to 5G, with its virtualized core and network slicing features and its high-bandwidth and low-latency service requirements, will present further challenges for deriving visibility into the network and other insights. These challenges are due mainly to the increased complexity that 5G will add to the current network infrastructure and network operations.

As MNOs transform their mobile network operations, they need to focus on driving more collaboration between teams and must use data, artificial intelligence (AI), and analytics tools to optimize and automate processes and the network infrastructure. They need to invest in a unified digital platform that creates a consolidated environment for network operations teams to engage with, access, and analyze the same data sets to provide insights that drive better decisions. Taking this approach will see MNOs deliver a better customer experience, be more efficient when performing operations, allocate capex efficiently to derive maximum return on investment (ROI) at reduced costs, and enable marketing teams to optimize their operations.

MNOs must, however, be aware of the potential challenges that lie ahead as they transform network operations, including getting the buy-in of C-level executives (CxOs) and assessing the processes and datasets. They must focus on articulating the value of the transformed organization and tools to the CxOs and how this will facilitate the attainment of business objectives.

Key messages

- Communications service provider (CSP) digital transformation journeys are aimed at improving customer experience and operational efficiencies. Unfortunately, a limited view into network lifecycle management and customer service usage and the minimal automation of operations have hindered the ability of MNOs to transform their network operations.
- The organizational structure, processes, and toolsets of the mobile network operations teams should be transformed to obtain maximum benefits from a digital transformation project. A unified digital platform for network operations is also needed to support the transformation of the organization and processes. This platform should make use of big data analytics and AI-based functionalities to provide comprehensive insights into network, service, and customer activities.
- Use cases to be supported by this platform include 2G/3G to 4G/5G migration, network performance management, service assurance, smart capex planning, and enhanced marketing operations with network insights.
- Benefits that can be achieved using a unified digital platform include improved operational efficiency, enhanced customer experience, reduced costs, and enhanced capex efficiency.
- MNOs must be pragmatic as they transform their mobile network operations, addressing roadblocks on a step-by-step basis, such as obtaining CxO buy-in and restructuring the organization as well as assessing its existing processes and data sets.

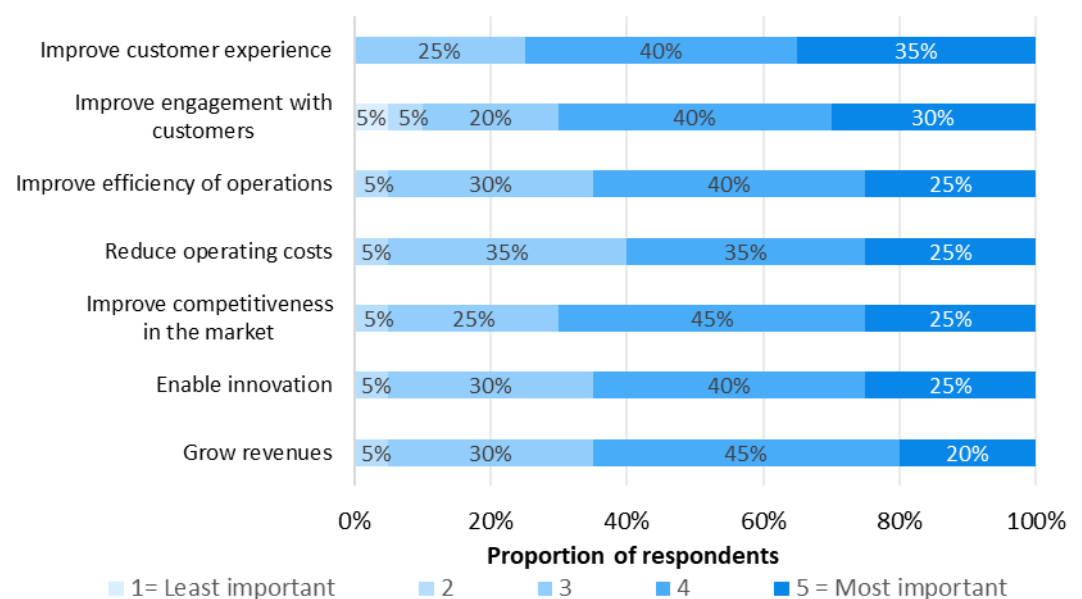
Digital transformation of mobile network operations

Limited visibility and automation of network operations are top challenges to MNOs' digital transformation

MNOs are embarking on digital transformation with the need to improve customer experience, customer engagement, and market competitiveness as the main objectives across the organization (as shown in **Figure 1**). The network infrastructure and network operations teams play a critical role in ensuring that MNOs deliver optimal experiences to their customers. Availability of network capacity when and where required and the optimal functionality of network assets are needed to ensure high-quality services are delivered to customers.

Figure 1: MNOs' top objectives for transforming mobile network operations

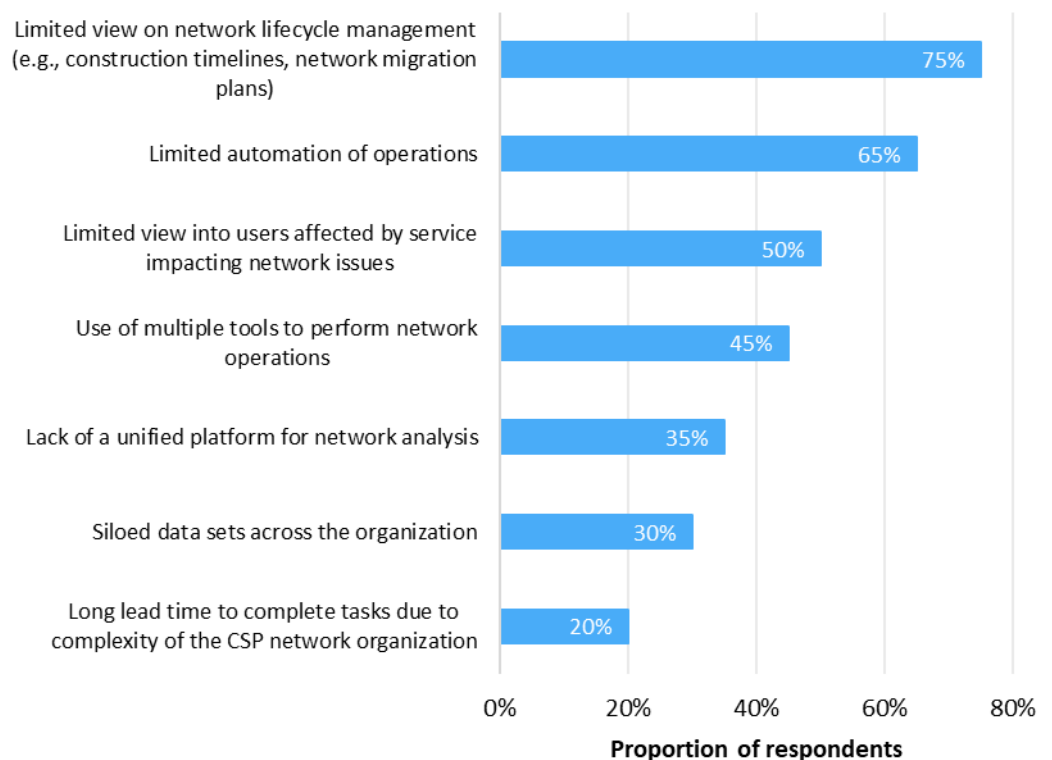
How would you rank the following as your objectives for the digital transformation of your network operations and business functions?



Given the increasing complexity of MNOs' network operations, achieving the digital transformation of these operations has been challenging. In Omdia's 2020 *Telecommunication Mobile Network Operations* survey (hereafter referred to as "Omdia's 2020 survey"), MNOs listed limited visibility into network lifecycle management (75%) and limited automation of operations (65%) as the top two challenges they face when transforming network operations. Half of the respondents surveyed also indicated that the limited view into users affected by service impacting network issues was a key challenge to transforming their network operations (see **Figure 2**).

Figure 2: Top challenges MNOs face as they transform their mobile network operations

How would you describe the key challenges and obstacles that are preventing you from achieving these objectives?



Source: Omdia 2020 Telecommunication Mobile Network Operations survey

A major reason for these challenges is MNOs' siloed approach to running network and customer operations. Network operations such as network planning, optimization, and management often run as independent functions across the access, transport, and core network domains. This structure limits the view of operations performed across teams. The situation is the same with interactions between network and customer operations (for example marketing) teams. These organizations operate in silos with limited view into operations and data. For example, a delayed network rollout in a location could result in poor quality of experience (QoE) delivered to existing customers. Without a view into activities performed by network rollout teams, it's difficult for the network

operations teams to understand why customers are experiencing poor QoE. The marketing teams, on the other hand, need this information to target offers to affected customers in order to improve QoE.

With limited automation, it takes time and effort to execute network operations functions within the different networks. Automation will become especially critical as operators deploy 5G networks with features such as network function virtualization/software-defined network (NFV/SDN) and network slicing. These capabilities will rely on automation to perform their functions. With limited view on customers' use of services, planning and executing network rollouts for 5G will not be effective.

Impact of network operations' challenges on CSPs' overall business objectives

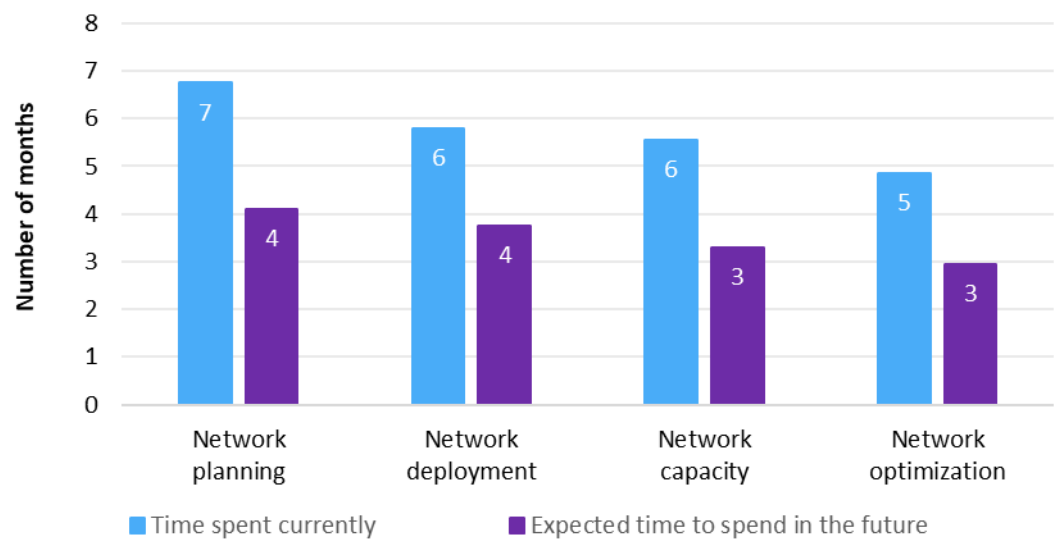
CSPs are experiencing several issues as a result of both the limited view into network lifecycle management and reduced automation of operations. These include the inefficient deployment of network resources due to lengthy network rollout cycles, poor customer experience, difficulty in identifying and addressing the root causes, and the inability to develop strategies for raising ARPU.

Inefficient deployment of network resources due to lengthy network rollout cycles

Omdia's 2020 survey further found that network operations are lengthy processes. As part of their transformation objectives, they plan to reduce time spent performing these operations. **Figure 3** provides a summary of the average number of months it currently takes to complete core network operations functions and the time CSPs plan to spend on these operations in the future.

Figure 3: Average time spent completing key network operations

How long, in terms of months, does it take to perform the following operations and how long do you plan to spend in the future?



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Source: Omdia 2020 Telecommunication Mobile Network Operations survey

The limited view into network lifecycle management makes it difficult to identify the bottlenecks, resulting in long lead times to complete these network functions. These challenges impact on the MNO's time to market for new services and network capabilities, which consequently affects its competitive positioning.

Meeting customer experience targets is challenging

Customer experience can be difficult to manage as it is influenced by several factors, including how quickly MNOs roll out network infrastructure. A combination of QoE factors, including application, service, and network performance, also play a critical role in impacting customer experience. Without a view into application and network performance and its impact on users' consumption of services and experience, MNOs will struggle to meet their customer experience objectives effectively.

Difficulty in finding root causes for poor network quality and customer experience

Customer experience is fundamentally linked to the performance and quality of the network equipment running within the mobile network – from the radio access network (RAN) to the IP transport network (aggregation routers and optical transport network), the mobile core, and the cloud (with the implementation of NFV/SDN within the MNO network). Without comprehensive insight into the end-to-end operations and performance of these network domains, operations teams will find it difficult to identify root causes for poor customer experience. These root causes can stem from cell site congestion or inadequate base station capacity to optical backhaul bottlenecks.

Flat ARPU/revenue

In many CSP markets, MNOs have struggled to grow postpaid and prepaid ARPU despite increases in the data allowance offered to customers. Omdia's World Telecoms Information Service (WTIS) indicates that average ARPU remained relatively flat from 2Q17 to 3Q18 at \$9.20 per month and dropped to \$8.56 until 2Q19.

As customers' use of data services increases, MNOs are forced to offer the same price for more data. Just a few years ago premium data plans were offered at 2–6GB/month; now MNOs are offering about 20–30GB/month (this is just for 4G services). Omdia's *5G Consumer broadband Pricing Report: 4Q19*, reveals that existing 5G offerings are following similar tariff structures to 4G but with much higher starting points for data plans. Data plans offered are in the order of 30–50GB/month as a basic plan. Thus, without new and innovative value-added services (VAS), MNOs cannot expect 5G ARPUs to grow on data volumes alone. Insights into services that customers are consuming can enable MNOs to understand what services they can bundle with 5G offerings to increase ARPU.

Enterprise 5G will present new untapped revenue opportunities to improve ARPU performance but will require service-level agreements (SLAs) much more stringent than those for 4G consumer (best-effort) services. For example, Internet of Things (IoT) use cases for manufacturing and self-driving cars will demand very high latency and speed requirements. Without visibility into network lifecycle management, root cause analysis, and capacity expansion, MNOs will find it difficult to meet SLAs for enterprise services.

Digital transformation imperatives for mobile network operations

Digital transformation encompasses people, processes, and the platform

As MNOs transform their businesses and networks, they must also transform the tools and technologies they use and the structure and processes of the organization. Digital transformation of mobile network operations must be driven by collaboration between network teams in order to consolidate and coordinate their operations, limiting the frictions that occur as a result of the disjointed processes across these teams. Digital technologies such as big data, analytics, AI, and automation will enable MNOs to make these changes. They will provide insight into decisions taken to achieve MNOs' overall transformation objectives of improving customer experience while efficiently maximizing resources and running their networks.

Encourage collaboration between teams

The skills needed to design, plan, operate, and maintain telecom networks can be highly specialized (e.g., transport network engineering and cell site planning). However, they also complement each other as the outcome of one task enables the effective execution of the other. For example, to fulfil the capacity requirements of the transport network, regular updates on cell site rollouts and the capacity growth at the cell and site levels will be required.

The interdependency between network organizations can be extended to other teams within the business. The corporate marketing department, for example, can benefit from collaborative engagement within the network operations teams. With a view into the network planning activities, the marketing organization can ensure that offers targeted at customers monetize the resources being deployed.

Utilize data and analytics to digitize processes

Intelligence and automation enable the digitalization of processes within network operations. With these capabilities, MNOs can run efficient and frictionless operations, deliver better experiences to customers, and respond quickly to market changes.

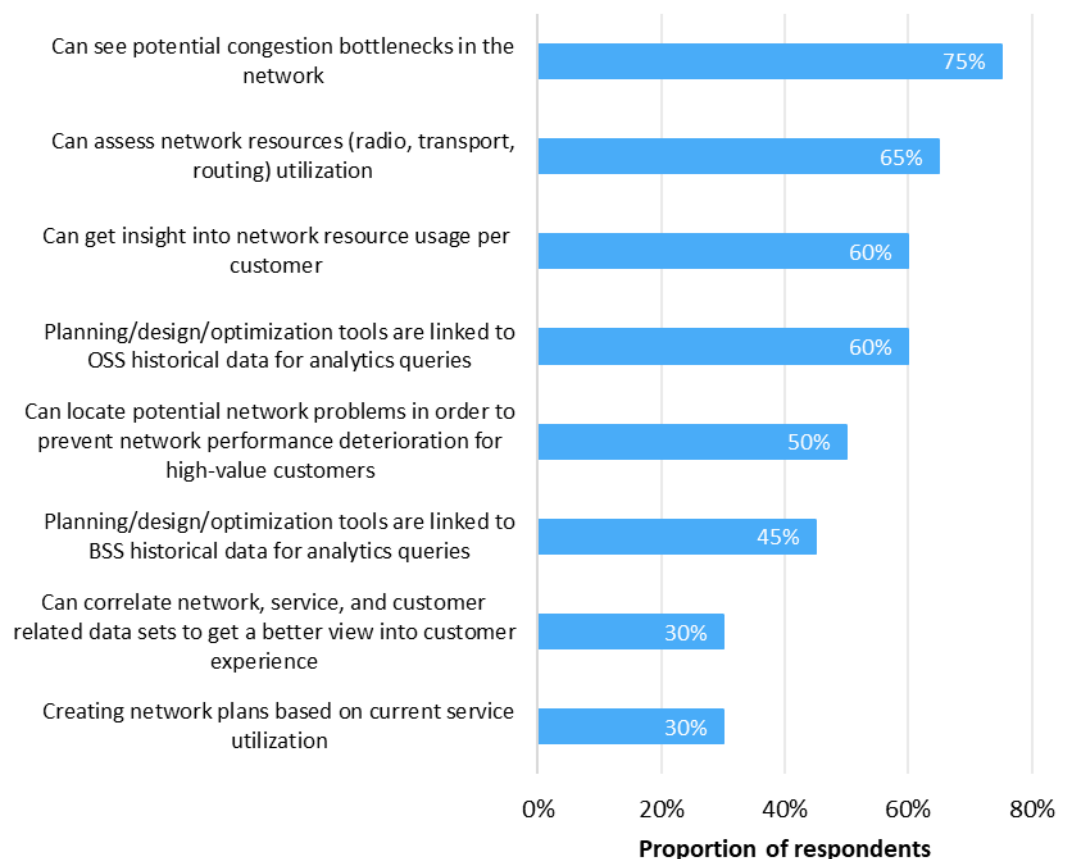
Cross-departmental data will, however, be required to achieve intelligent and automated processes. By combining and analyzing these data assets, MNOs can derive insights that determine the best decisions to take and, where possible, use the insight to automate associated network operations. For example, when a site gets continuously overutilized, it's likely that a network device has failed and may need a quick reset. By correlating the

network performance data and the device performance data of all cells within the site, the failed device can be identified and an automatic reset can be triggered to restore the functionality of the radio.

When machine learning is applied to these data sets, MNOs can achieve their top three network operations functions (as **Figure 4** shows). These include predicting network congestion, gaining insight into network resource utilization, and deriving this view on a per-customer basis. These insights will help MNOs prioritize capital investment and ensure that the customer experience is continuously improved. Furthermore, by assessing network resource utilization on a per-customer usage basis, MNOs can determine customers that would likely be impacted (especially VIP customers) by any faults resulting from the likely occurrence of resource over-utilization. Network analytics and user analytics tools that mine historical and current OSS and BSS data are thus clearly needed to achieve these functionalities.

Figure 4: Top capabilities MNOs plan to achieve through their network operations activities

Which of the following are most important to your network operations?



Build a unified digital platform to consolidate and improve efficiencies of network operations

MNOs require a unified digital platform to enable more collaboration between network teams and to drive intelligent and automated processes. The unified digital platform can serve as an intelligent workspace providing a single view into end-to-end network lifecycle management.

There's clearly a demand for a unified digital platform for network operations in the industry. In Omdia's 2020 survey, MNOs identified network management, network planning and design, and network deployment as the top three network operations in which a unified digital platform would be beneficial. This is because the unified digital platform would help address a key issue that MNOs currently face: the lack of a data model to consistently structure and represent information across all tools and areas of the network operations organization. With a common data model, all network organization teams will utilize common data and insights on a daily basis. For example, all teams would have visibility into the progress of network rollouts.

By extending access to this platform to other teams, such as marketing, those teams can get a view into what is going on within the network in near real time and can use this to make decisions regarding their functions.

Key features of the unified digital platform for mobile network operations

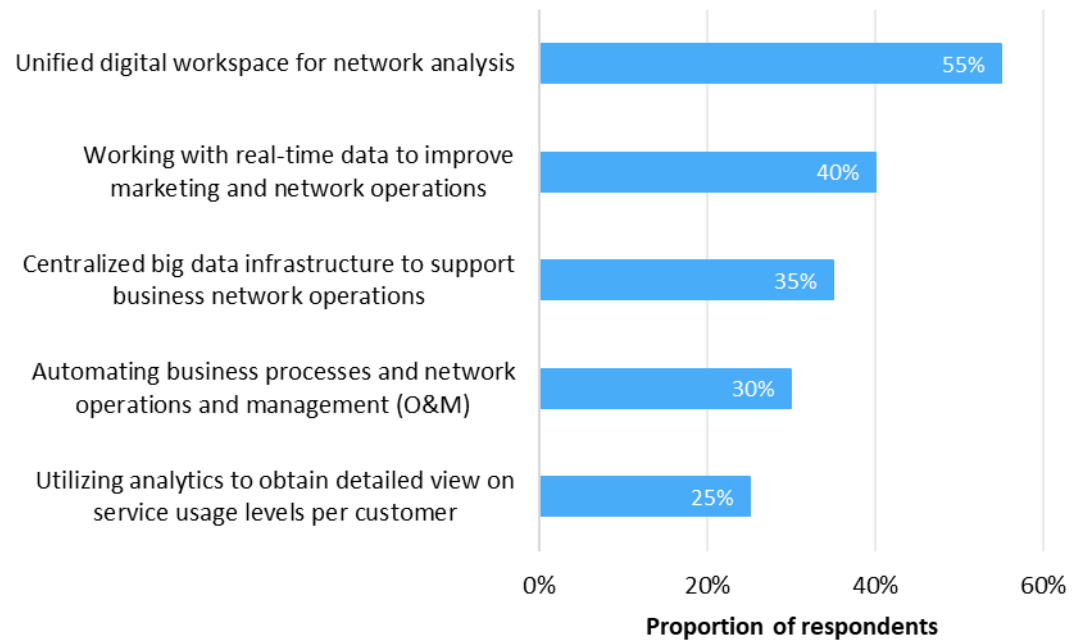
MNOs identified the following as the key capabilities the unified digital platform should possess:

- **Providing centralized big data infrastructure to support network operations:** The platform should consolidate data assets sitting in silos across network organizations. This includes telemetry data as well as data from different operations for all network domains, collected from OSS and BSS.
- **Utilizing big data analytics and AI:** This allows users to obtain and correlate KPIs such as service-usage levels per customer that include data usage, quality of connection, geographic heatmap, customer complaints, and more. The output from the big data analytics can be used to make better network planning and engineering decisions across all network domains.
- **Automating business processes and network operations and management (O&M):** This provides the ability to execute repetitive functions, thereby enabling the network operations to run efficiently.
- **Providing and analyzing data in real time:** This gives real-time insights that allow users to address service-impacting issues in the network or to support traffic forecasting for network planning.

In our research, MNO respondents indicated whether they had deployed these capabilities, with the majority (55%) indicating that they had deployed a unified digital workplace for network analysis. However, less than 40% of respondents have deployed centralized big data platforms or automated business processes or are utilizing analytics to obtain a detailed view of service usage (see **Figure 5**).

Figure 5: MNOs have varying solutions in place today

Please select which of the following you already have in place?



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Source: Omdia 2020 Telecommunication Mobile Network Operations survey

To derive maximum value from the unified digital platform, it needs to include all the capabilities highlighted by MNOs (in **Figure 5**) as well as the following capabilities:

- Be easily accessed by all network operations teams across network domains to encourage collaboration.
- Provide visualization into all network activities and customer experience in real time to all network teams.
- Host multiple software tools that address specific needs of the CSP's network and operations. These include radio planning and simulation tools, traffic forecasting tools, drive testing tools, and optimization tools. Most MNOs that participated in Omdia's 2020 survey indicated that they were deploying these either as separate tools or as a part of software suites.
- Provide interfaces and APIs to integrate the unified digital platform with existing tools used by the network engineering and operations teams. APIs like machine learning (ML) APIs can deliver insights from ML tools running within the platform to predict future outcomes and automate processes supported by these software tools.

Deploying the unified digital platform for network operations

There are two key modes of deployment for the unified digital platform. These deployment methods recognize the MNO preference towards having the network data collection housed on-premises.

- **Mode 1 – on-premises:** the unified digital platform is installed within the MNO's network and all activities including data collection, analysis, and implementation within network operations is performed on-premises.
- **Mode 2 – hybrid cloud:** involves deploying the platform in a combined on-premises and cloud environment. The unified digital platform for network operations (which can be installed by a systems integrator, software solutions provider, or network equipment provider) is installed on-premises within the central data center of the MNO's network. Collection and analysis of network telemetry and network operations data can be done on-premises within the MNO network. The network planning, optimization, and management functions are performed in the cloud to leverage the benefits of a cloud environment and the professional services capabilities of the solution provider.

Use cases of the unified digital platform for network operations

Several use cases can be achieved using the unified digital platform. Use cases that have been difficult to attain due to the fragmentation of existing network systems and operations and the lack of interdepartmental collaboration between network teams can also be achieved. These use cases include migrating users from 2G/3G to 4G/5G networks, effective network management, service assurance, smart capex planning and enhanced marketing operations using network insights.

2G/3G to 4G/5G user migration

MNOs are migrating subscribers from legacy 2G/3G networks to 4G/5G networks in order to meet customer demand for increased data speeds, to free up spectrum to serve the next-generation radio access technologies (RAT), and to reduce operating costs. For most MNOs, this migration exercise isn't performed optimally, leading to degraded service performance which impacts on customer experience. Several factors account for this challenge, including the long lead time to access and analyze the required data sets to support the migration exercise. Required data sets include the following:

- The number of 2G, 3G, 4G, and 5G devices and users and their location.
- The cost to migrate 2G/3G users to 4G/5G. The radius of coverage of a 2G/3G cell site is much larger than that of 4G and 5G cell sites, so more cell sites must be added to ensure full 4G/5G coverage. Deploying more cells means more costs need to be factored in when planning to migrate users from legacy networks to next-generation networks.
- The time to migrate 2G/3G customers to 4G/5G. This involves the estimated time it would take to move 2G/3G to 4G/5G. This time needs to align with the network rollout times.
- Visibility into the way services users consume and their connectivity requirements.

These data sets are currently sourced from different departments within the networks team. With the unified digital platform consolidating data from the network operations teams, MNOs can be more effective in migrating customers to next-generation RATs. They can access and analyze the data required to migrate users from a central location. Historic and current data sets can also be analyzed to understand how customers'

consumption patterns are changing and develop plans to migrate those users to 4G/5G networks to ensure service experience isn't degraded.

Network performance management

As the migration of customers from 2G/3G networks to 4G/5G networks progresses, the next problem that MNOs will likely experience is network congestion. Network congestion occurs when the growth in data usage is too high and the network assets are not optimized or available to cater for the needs of customers. Consequently, customers' perceived QoE worsens. This is particularly challenging for MNOs if their high-value customers are impacted by these issues. Lengthy site-rollout processes or failures in network equipment could impact on the network's ability to meet current capacity and coverage requirements. To restore the performance of the network, the MNO needs to understand what the root cause is and address it quickly.

The unified platform can enable this quick discovery of root causes by analyzing service and network resource usage in real time. The platform can utilize trained AI models (using historic telemetry data) to predict when congestion is likely to occur (in some cases days or months before it occurs). It can utilize AI's correlation capabilities to detect the root cause and raise recommendations to resolve it. Where possible, automated workflows can be triggered to address the problem: either move traffic to a neighboring cell or reset a sleeping cell.

To reduce the occurrence of network congestion, the unified digital platform can continuously analyze telemetry and cell-usage data to find users with low KPIs and determine the reasons for this poor performance. For example, in the event of low network coverage in a cell or site, which results in the handover of users to neighbor cells, the platform can continue to monitor resource utilization of the neighbor cells to ensure that they do not congest and degrade the QoE of services for users. Concurrently, the platform can trigger root cause analysis and resolution to enhance the coverage of low-performing cells.

Service assurance

The unified digital platform can be used to achieve network experience assurance. Service assurance seeks to deliver a consistently high-quality experience to CSP customers by continuously tracking the health and performance of services, detecting faults and root causes, and reducing the mean time to repair (MTTR) of identified faults. These capabilities can be achieved by utilizing integrated tools for service quality management, performance management, and fault management within the unified digital platform. With these combined tools, MNOs can continuously analyze the integrated network and customer data sets and identify cell sites and customers that are experiencing poor QoE (e.g., poor download or upload streaming speeds) for specific services such as video and gaming services.

The ML algorithms running within the platform can enable the correlation of the cell/site-level data, service data, and telemetry data from the network elements to predict the occurrence of service-impacting network issues. These issues can be resolved immediately using automated workflows or raising trouble tickets to replace faulty

network devices or expand network capacity prior to the service failure occurring. This way service performance and customer experience are assured.

4G/5G smart capex planning

MNOs have limited budgets for capex investment and so must consider critically how they invest in capex to yield maximum returns on investment. The smart capex use case can help address this challenge. It involves taking a data-driven approach to making network planning decisions. Instead of creating network plans based on assumed average usage of the network, MNOs can take a more data-driven approach to identify locations for investments at very granular service levels. They can use existing site or cell-level information on users' service consumption patterns, revenue generated, and network resource utilization to generate smarter network plans. An added advantage of taking this data-driven approach is that MNOs can identify profitable areas that need further investment to secure continuous profitability and ROI. MNOs like Proximus in Belgium have indicated how critical the smart capex use case is to them maximizing the returns on network investments.

The unified digital platform can achieve this smart capex solution by collecting, storing and analyzing required data sets and current coverage and capacity KPIs across all existing network technologies (2G, 3G, and 4G). ML models can be used to forecast cell-level traffic and utilize this information to define how to allocate capex, ensuring network capacity and coverage is delivered to the right place at the right time.

The smart capex use case will be particularly relevant to MNOs as they plan to roll out 5G. While wide-scale 5G deployments are only expected to pick up pace from 2021 onwards (based on the release of 3GPP standards releases Rel-16 and Rel-17 providing 5G standalone specification), we are already seeing deployments of the technology. The primary objective is to enhance the capacity and speed requirements of services running on 4G. Given the current mode of 5G deployments, MNOs that participated in our survey indicated that they plan to utilize as much existing 4G infrastructure/spectrum as possible to support 5G rollouts.

Deploying 5G will be even more challenging than the 4G rollout as the technologies will coexist and thus compete for resources. Also, 5G cells, particularly those operating within high-frequency bands, provide less coverage than 4G cells, exposing such cells to high-congestion and QoE issues. Given these conditions and the fact that 5G capex budgets for many MNOs will be constrained due to declining revenue performance, MNOs will need tools that can help decide where the first 5G cell sites should be located to generate maximum ROI.

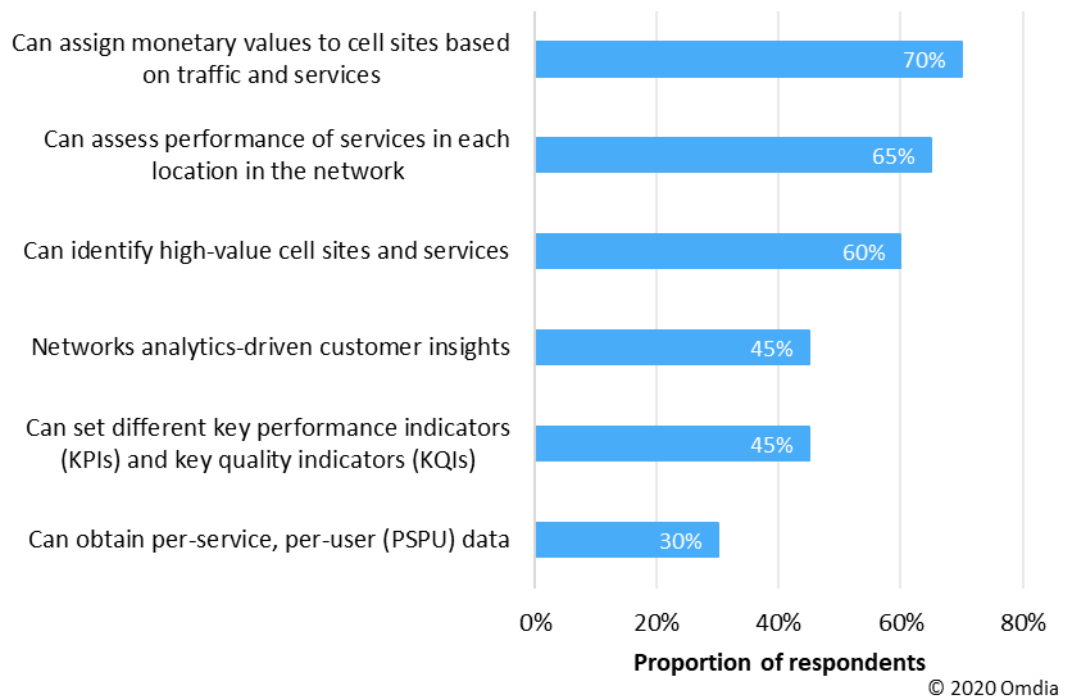
The unified platform can address these needs by utilizing its view of the spread of existing sites and their configuration and utilization along with its ML capabilities to suggest the best network configuration to ensure that 5G deployments meet business objectives. MNOs can use traffic simulation tools (running within the platform or integrated with it) to understand where capacity and bandwidth need to be added in the network. They can also utilize the view of the transport network to investigate the impact of the planned 5G cells on the existing capacity of the aggregation and backhaul networks. Recommendations can be raised to the transport network teams to cater for the added capacity.

Enhancing marketing operations with network insights

Identifying and assessing monetization opportunities for network investment is a key function that a unified digital platform can deliver to MNOs. In Omdia's 2020 survey, MNOs pointed out that the ability to assign a monetary value to a cell site based on the traffic and services it carries, would be a top priority (see **Figure 6**). This insight is particularly relevant to marketing functions as 85% of respondents indicated that insight is very important or extremely important to their operations.

Figure 6: Business outcomes linked to the digitalization strategy

Which of the following outcomes are most important to your business operations?



Source: Omdia 2020 Telecommunication Mobile Network Operations survey

In the early days of 4G LTE, MNO marketing departments focused on the sale of devices (e.g., Apple versus Samsung) that delivered the traditional voice and data services to monetize the networks. But over time the applications/services carried on the network have evolved, with services such as video, gaming, and instant messaging apps becoming prevalent. Rather than focusing on devices, marketing departments see the network's ability to support a broader range of services as a key asset to monetize the network.

Having a unified platform that combines network data and service usage data can help CSPs understand the monetary value of cell sites. The unified digital platform can achieve

this by analyzing usage patterns of services (such as AR/VR and video streaming) on the network, customers using these services, and the revenue derived from these customers. Insights derived can be used to assess the monetary value of the sites and the propensity of customers to buy new services. Furthermore, CSPs can determine which services to target at customers (including 5G services) and likely price plans. Consequently, the unified platform can help CSPs increase ARPU and revenue, which they have struggled to grow in recent years. For example, MNOs in South Korea are developing cloud-based mobile gaming services with a view to offering this as a value-added service (VAS) to upsell 5G to customers identified as using these services. This approach can help to increase 5G-based service revenue.

Key benefits of a unified digital platform

Improve efficiency across network operations teams

The collaborative environment provided by the unified digital platform enables MNOs' network operations teams to improve productivity. They get direct access to, and utilize, the same data sets, thereby reducing time spent in getting information they need to perform their functions. Network teams can utilize the combined insights from customer and network analytics to improve the functions and efficiencies of these operations.

Insights generated from these analytics workflows can be used to drive automated operations. Automation is now considered by most MNOs as the best way to address the shortage of networking skills needed to address the growing complexity of the network. By automating repetitive tasks, network operations and engineering staff can focus on more critical tasks aimed at achieving core business objectives.

Enhance capex efficiency

The unified digital platform enables efficient allocation and use of capex, resulting in maximized ROI and continuous delivery of high QoE particularly for high-value sites. The smart capex use case, for example, will enable the CSP to carry out exhaustive analysis of service and business performance of all proposed site locations. The insights generated will fast-track and optimize decisions made on where to invest resources to meet customer requirements and obtain maximum revenue. Consequently, the unified platform will help MNOs avoid the common phenomenon of overinvesting in areas with low ROI (due to limited traffic activities) and invest more in areas where there's identified demand for network resources.

Reduce costs

Improved efficiencies in operations and allocation of capex will yield cost savings. The singular view of the network assets and operations within the network will reduce the time and costs spent when seeking this information from previously siloed organizations. Automating repetitive functions cuts down on time and costs in terms of man hours spent in executing these tasks. By utilizing the AI and analytics algorithms embedded within the unified platform, MNOs can become more proactive in detecting and resolving network issues and so reduce the cost of retaining unhappy customers impacted by network failures.

Enhance customer experience

The unified digital platform provides a central location for analyzing, visualizing, and optimizing key network metrics that improve customer experience, particularly as people move between locations. Mobile customer experience is tied to the quality of the network in terms of congestion, bandwidth, jitter, and – in the case of 5G services – low latency, which is needed for services such as AR/VR and self-driving use cases. By utilizing the platform's predictive analytics functions, forecasted performance of relevant KPIs can be visualized and assessed in real time. MNOs therefore become proactive in their functions and are better positioned to deliver a high-quality experience to customers.

With the implementation of the 2G/3G to 4G/5G migration use case utilizing the unified digital platform, customers' experience of data services will be improved as they are served by more-efficient network technologies. User migration is accelerated as all teams – network planning, deployment, and maintenance – have a single view of all network activities and can make quicker decisions.

With the delivery of a better customer experience, MNOs will see higher customer retention rates. A Pakistani operator recently saw its 4G user retention rate increase from 79% to 92% as it was able to fast-track the migration of 2G/3G users to 4G quickly (increasing the rate of user migration by 120%). The CSP achieved this result using the unified view of subscriber distribution and service usage on a per-customer basis that the unified digital platform provided.

Recommendations for MNOs

MNOs must be pragmatic as they transform their mobile network operations. There are challenges they must address to successfully transform their mobile network operations and they are summarized in **Figure 7**.

Figure 7: Key challenges MNOs should expect as they transform network organizations and invest in unified digital platforms



Source: Omdia

To address these challenges, MNOs need to do the following:

- **Obtain CxO buy-in from both network and non-network operations teams.** Clearly articulate the business impact associated with the current structure of the network operations organization. Highlight the challenges currently experienced in managing network operations teams as independent functions that run disparate processes and tools. It's also important to highlight the impact of these challenges on customer experience, increase in operational costs, and reduced productivity. Emphasize the benefits – improved customer experience and increased productivity levels – that will be achieved by transforming the organization to being more collaborative and with processes optimized to accelerate time to work.
- **Transform the culture and organization structure.** Adopt agile methodologies that encourage more collaboration between teams. Break down silos across the organization to allow cross-departmental integration of tools and access to a centralized pool of data sets captured by the different network operations teams

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- **Carry out an exhaustive assessment of current processes.** Use this to identify those that are redundant and those that need to be optimized. Carrying out this process will facilitate the implementation of automation within network operations.
 - **Assess all the data sets required to support the optimization of processes and where they are located.** Set up a plan to create consolidated storage of these data sets and establish centralized governance of the data. This centralized data governance defines how the data is to be collected, stored, and accessed and the policies that need to be in place to secure the data.
 - **Invest in developing the unified digital platform.** Ensure that it includes capabilities such as big data collection and storage, analytics, and AI tools to derive insights to provide deeper visibility into operations and guide decisions made across the teams. Your development plan should include having the platform architected as cloud-native to ensure that deployment and upgrade of the solution can be achieved quickly.
 - **Develop a plan to integrate existing network engineering and operations tools using APIs.** This will support the interconnection between tools and the automation of workflows between processes leveraging these tools.

MNOs can perform these activities on their own or decide to work with a partner. It is important that MNOs assess their ability to perform these tasks on their own, including developing the unified platform. Where the MNO lacks the skills in-house to deliver these capabilities, they should seek out a strategic partner that provides a unified digital platform to consolidate and support their mobile network operations. Professional services such as systems integration and process optimization will be particularly important to provide the required support throughout the digital transformation journey.

Appendix

Methodology

This report is based on research undertaken between December 2019 and January 2020. Qualitative and quantitative surveys were conducted with MNOs from Europe, the Americas, Asia-Pacific, the Middle East, and Africa.

Further reading

5G Consumer broadband Pricing Report: 4Q19, Omdia CES005-000057 (February 2020)

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Omdia consulting

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