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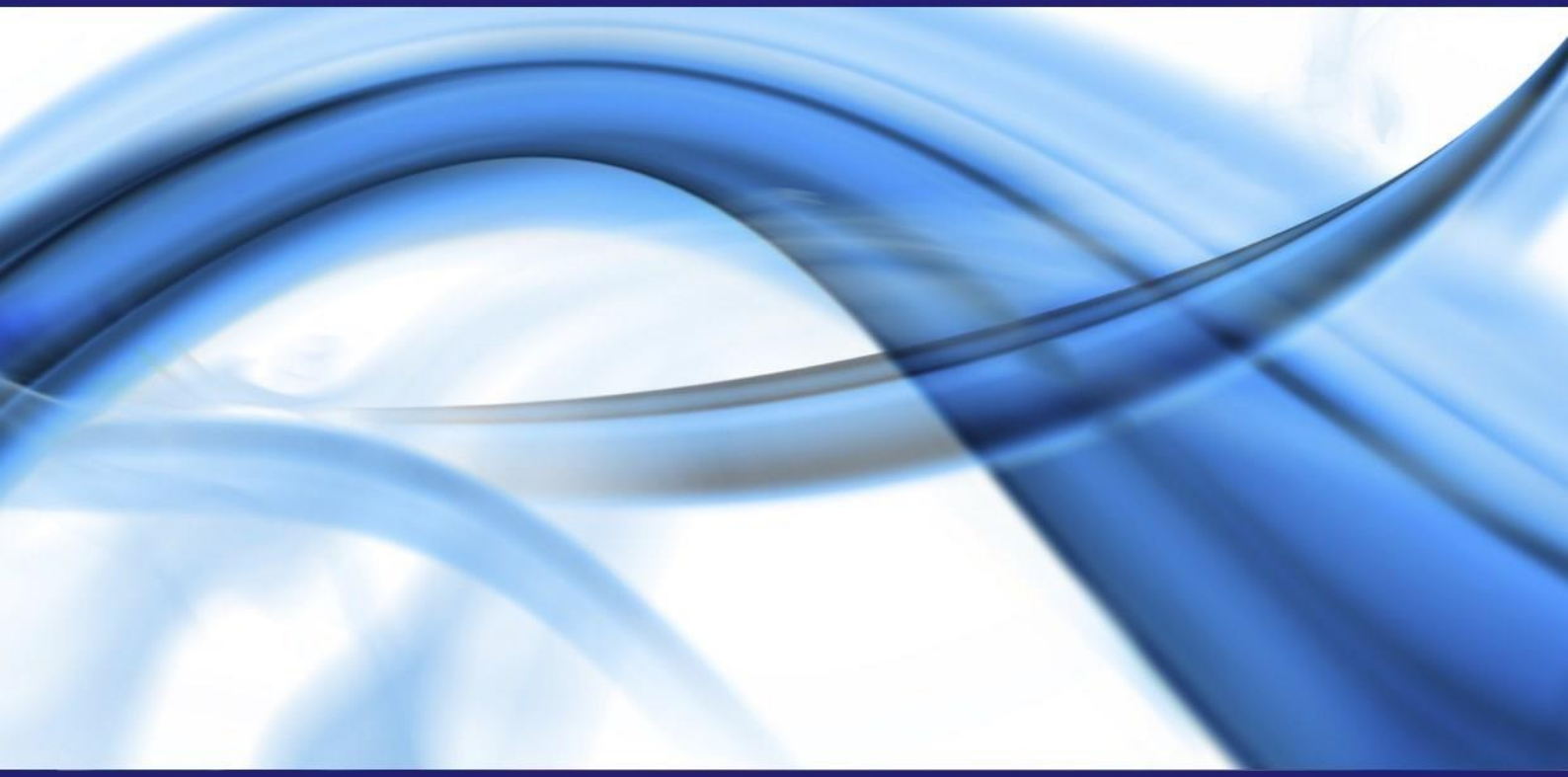

Report

How a service operations centre can enable the transition to a customer-centric organisation

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* Analysys Mason does not endorse any of the vendor's products or services discussed in this whitepaper

1. Executive summary

The mobile communications services industry is undergoing profound change and is facing unprecedented challenges, from the perspectives of both the external business environment and internal operations. Innovation in radio technology has led to high-speed, low-latency networking technology such as LTE. The resulting exponential take-up of data services is enabling communication service providers (CSPs) to make the transition to data-oriented revenue models, as well as accelerating the proliferation of over-the-top (OTT) application service providers.

Network capabilities and good overall network performance are undoubtedly extremely important preconditions for success among CSPs. However, CSPs will find it impossible to compete purely on the basis of these attributes, because it is increasingly obvious that the service-enabling mobile networks are going to become a commodity, with many operators pursuing network-sharing engagements for better capex efficiency. In this context, there is an urgent need for CSPs to change the way they compete for new customers and revenue, and attempt to retain existing customers. The traditional network operations centre (NOC) tools and processes are highly network focused, and so lack service, customer and business context. In an environment where service consumption is changing rapidly and network complexity is increasing, as well as the prospect of network virtualisation, such a network-focused operational approach will be unsustainable. Instead, CSPs must embrace a new approach in which service quality and customer experience are at the heart of their business strategy and operational processes.

A service operations centre (SOC) provides the capability to monitor services in an end-to-end context, enabling CSPs to take actions based on their impact on services and the customer experience. An SOC plays the role of an intermediary between the customer-facing departments such as customer care and marketing and network-focused and back-end teams such as network operations and network engineering, planning and optimisation. An SOC breaks down organisational barriers and fosters inter-departmental collaboration, transforming the CSP into a highly agile and responsive organisation. It enables CSPs to focus important resources, care processes and network improvement initiatives on high-value customers such as VIPs and enterprises. Using advanced analytics capabilities, CSPs can devise targeted marketing campaigns based on ‘personas’ – behaviour-based customer segments. By mapping the different end-to-end customer journeys such as order-to-cash or trouble-to-resolution processes, CSPs can identify high-impact customer touchpoints that contribute to a negative customer experience and churn, and address them accordingly. The SOC is arguably the most important step in a CSP’s transition towards a customer-centric organisation, and should be at the heart of a CSP’s customer experience management (CEM) strategy.

In order to move to a customer- and service-centric operations model, a CSP needs to undertake a business-led operations transformation, aimed at moving its operations from a NOC-based, people-intensive, process-centric model that is focused on cost reduction, towards a truly service-oriented SOC-based operations model that can generate additional revenue. This is a transformation that will involve fundamental changes in organisation, processes and people, as well as technology, and will need to be executed through a continuous improvement process. The SOC may be deployed as part of an optimised NOC, or as a separate entity, but in either case the SOC must be established at a higher level in the organisational hierarchy, so that it is able to proactively trigger the necessary operations and network optimisations through in-depth integration and automation.

2. Key trends shaping the mobile services industry

Technological advances in the mobile device ecosystem have introduced powerful and multi-functional smartphones to the market. It is no accident that the rise and the success of OTT application service providers has coincided with the worldwide proliferation of smartphones, which has led to a dramatic change in consumer behaviour and significantly raised users' expectations of operators.

2.1 Changing consumer behaviour

Smartphone sales have already reached 1 billion units worldwide, and take-up will accelerate significantly with the emergence of cheaper smartphones in the emerging markets.

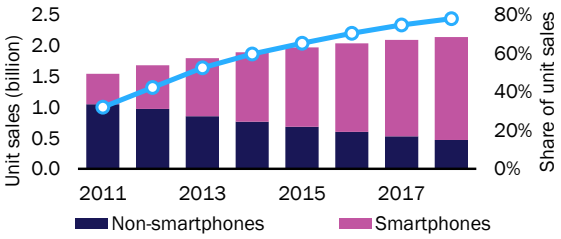

Figure 2.1: Mobile handset unit sales, worldwide, 2011–2018 [Source: Analysys Mason, 2015]

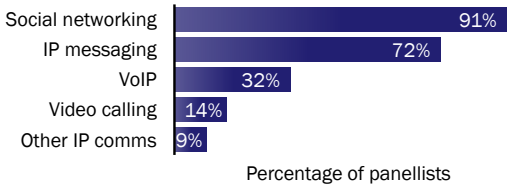

Figure 2.2: Penetration of social networking and comms apps (excluding email) (n = 1596) [Source: Analysys Mason, Nielsen, 2015]

For many smartphone users, the device is synonymous with OTT applications such as Facebook, WhatsApp, Skype, Viber and YouTube – that is, they buy smartphones primarily in order to use these applications. Consumers are no longer satisfied with a 'one-size-fits-all' approach from operators; they now demand high levels of service personalisation and control over how, where and in which role they consume the services, as well as expecting a high quality of service (QoS).

2.2 Advent of the digital economy and stretching of service boundaries

Faced with competition from OTT providers and a rapid decline in revenue from traditional services such as SMS and voice, mobile operators have adopted a business model based on data services, including fixed-price application-based bundles (e.g. Facebook or YouTube). However, because the rate of increase in data revenue cannot fully offset the decline in traditional revenue and the rapid reduction in price per bit, mobile CSPs are further diversifying and transforming into digital communication service providers. This strategic shift will have a profound impact on the way CSPs conceive, design and deploy next-generation services.

By way of example, consider service boundaries – when an operator only offered basic communication services such as voice and SMS, the service boundaries were confined to the operator's traditional network.

However, since the advent of mobile broadband technologies, smartphones and the boom in data services, the boundaries have extended to the operator's own value-added services ecosystem, including service delivery and content management platforms, and non-telco OTT application providers (see Figure 2.3).

Now, with the emergence of business models based on the digital economy, such as machine-to-machine (M2M)/Internet of Things (IoT) and cloud, the service boundaries will further stretch out into operators' cloud infrastructure.

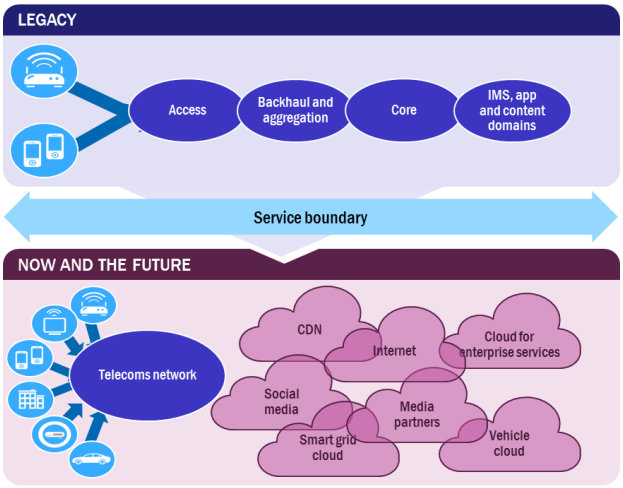

Figure 2.3: Stretching service boundaries

[Source: Analysys Mason, 2015]

2.3 Increasing network and service complexity

The stretching of service boundaries will introduce further service complexity, on top of the significant increase associated with the evolution to IP networking technology. Evolution from the legacy circuit-switched (CS) to all-IP packet-switched (PS) networks is well underway (e.g. with the shift from 2G to 3G and 4G-LTE). Although this evolution has improved the economics of the operator business both in terms of spectral efficiency and cost of service delivery, it has also introduced significant levels of network and service complexity. Because of the inherent nature of IP services, there are now many more network elements in the service path, and therefore more potential points of failure.

Voice over LTE (VoLTE) is a prime example of how new IP-based services are introducing significant network complexities. While VoLTE promises significant business benefits such as increased spectral efficiency, increased efficiency in the voice domain and higher voice quality, the service itself is not straightforward to implement. The all-IP nature of the voice service and the need to hand over calls from legacy 2G/3G to LTE, in addition to the established QoS expectations of a voice service, will make it challenging for CSPs to ensure that customers receive a superior quality of experience.

3. SOCs enable CSPs to transform the customer experience

3.1 NOC tools and processes are necessary but insufficient in the new world order

The NOC continues to be the operational 'nerve centre' for CSPs, housing some of their most important operations support system (OSS) assurance tools and processes for monitoring and troubleshooting network issues. For many services such as voice or SMS, 'service' has been synonymous with the network (i.e. a service issue would quite often be tracked back to a network issue); as a result, network management has typically been equated to service management. In such cases, ensuring adequate network performance has been sufficient to assure the service. In line with this premise, CSPs have understandably made significant investments in their NOCs over the years, and hired highly skilled network engineers to run their network

operations. Consequently, the development and application of tools (e.g. to handle fault and event management, and performance management) have also predominantly focused on providing the necessary capability for network monitoring.

Furthermore, CSPs have traditionally deployed separate instances of the assurance systems to cater for different domains (i.e. RAN, backhaul and core), because (a) each domain was considered to need its own specialist expertise, and (b) the vendors offered solutions which mirrored these domains, and so in most cases these were separate products. The result is quite evident in the way CSPs regarded their organisational structures – as separate 'operational silos', with domain-specific operational key performance indicators (KPIs). While this was a highly effective approach for legacy services, the same cannot be said for IP-based data services. The lack of a pre-determined path for IP traffic demands an end-to-end approach to service management. However, when CSPs' operational teams lack an end-to-end view of the true 'service' performance of new IP services this results in a 'service blind spot'.

The 'service blind spot' has created tremendous pressure points both in relation to customer care and the NOC, because issue resolution takes too long, is highly reactive, and ultimately results in poor customer experience. Clearly, this is an unsustainable position, which CSPs must address both from an operational perspective and a revenue-generation and monetisation standpoint: by improving their understanding of the customer experience, CSPs can more effectively cater to their needs, create opportunities to up-sell/cross-sell new services, and increase ARPU.

In the new hyper-competitive telecoms industry, the battle for competitive differentiation will be fought on the basis of superior customer experience. To win this battle, a CSP must transform from a traditional network-centric organisation to one which is service- and customer-focused, and it must start by evolving the traditional 'network' operations to 'service' operations.

3.2 An SOC can address the issue of 'service blind spot'

Conceptually different from an NOC, an SOC views operations from a customer- and service-centric perspective. It comprises the relevant technology and processes to monitor QoS, providing near-real-time insight on service impact so any remedial action can be swift and purposeful. Service quality management (SQM) forms the technology backbone of the SOC, which monitors and reports on the QoS-based key quality indicators (KQIs) by applying predefined service models to network KPIs and other contextual data. By configuring thresholds for these KQIs, operations personnel can proactively identify service-quality degradations and take necessary action before there is any impact on customer experience. Example use cases include: video pixellation and stalling or service inaccessibility for OTT applications such as WhatsApp or Facebook, call handover failures for VoLTE, and slow response times when browsing.

Advanced SQM capabilities integrate root-cause analysis and alarm correlation, and provide drill-down capabilities to accurately pinpoint the network resources that are causing the service-quality degradation. Enriching SQM with contextual information such as device type or location data can expand the addressable use cases to device-based performance reporting or location-based trend reporting. Dedicated SQM applications for customer care can empower care teams to deal with customer enquiries more effectively, because they will have better insight into individual customers' quality of experience for each service type, which can be used to resolve queries more quickly, resolve them first time or prioritise actions more efficiently.

The emergence of big data and innovative analytics technologies such as machine learning enable CSPs to empower their SOC to provide near-real-time actionable insight. CSPs have always had access to network

and customer data, but the high costs of storage and computing resources traditionally made it prohibitively expensive to store or process the data in a timely manner. As a result, CSPs were very selective in what was recorded and processed, and the use cases were predominantly marketing-led (e.g. related to segmentation or product innovation). However, advances in analytics technology, the declining cost of computing power and storage mean that many CSPs now believe the time is ripe for harnessing network and customer data to create real-time actionable insight. By implementing big data analytics as part of an SOC implementation, CSPs can develop targeted use cases, such as: creating granular customer segmentation; providing persona-based differentiated offers; and introducing real-time marketing campaigns.

The application of advanced methods such as predictive analytics and machine-learning techniques will make it possible to anticipate network and service-quality degradations with a reasonable level of accuracy, enabling operators to take pre-emptive action.

3.3 An SOC breaks down organisational barriers and fosters inter-departmental collaboration

The other most important role of an SOC is to act as an intermediary between different CSP departments (see Figure 3.1). In effect, an SOC is an important enabler for CSPs that wish to differentiate themselves based on customer experience and potentially the most important building block of a CSP's overall CEM strategy. It provides the necessary business processes that are specifically designed with services and customers in mind, and it aligns with customer-facing departments such as customer care and marketing. Because an SOC provides a deeper understanding of customer behaviour, both in terms of the applications they access and their overall quality of experience, the CSP's marketing department can make well-informed and near-real-time decisions based on highly granular customer segmentation data, in order to launch campaigns that are more relevant and targeted.

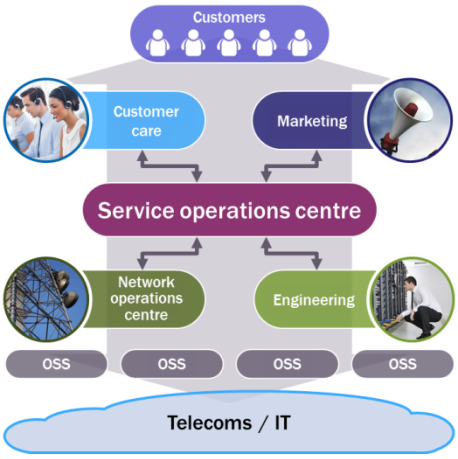

Figure 3.1: An SOC as an intermediary between different departments [Source: Analysys Mason, 2015]

In the new digital economy, organisations will need to be highly agile and responsive, both when resolving customer issues and when bringing new services to the market. An SOC, backed by a strong governance structure, can break down 'organisational silos' and encourage close collaboration among network and customer-facing departments, enabling the CSP to become a more-agile organisation.

However, CSPs must be mindful that simply extending or repurposing NOC processes in the SOC will not achieve the desired results: they either need to retrain existing personnel to take on new roles in the SOC or hire experienced service managers.

4. CEM considerations for CSPs

4.1 An SOC needs to be at the heart of CSPs' CEM strategy

A typical customer–CSP engagement lifecycle can be categorised into five stages (see Figure 4.1), during which there are touchpoints of various types. For example, a consumer may walk into the CSP's retail store to enquire about a new device, or call the customer-care department to add a new service or to complain about the network quality of service (such as coverage issues or frequent call drops). If the consumer has a poor experience during any of these touchpoints, this may cause them to churn away from the CSP.

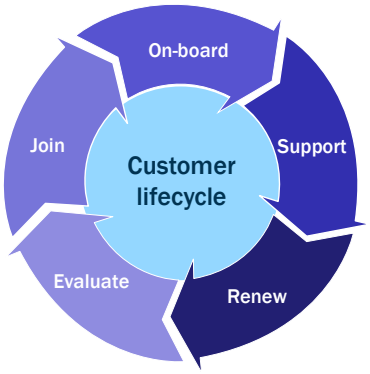

Figure 4.1: Lifecycle for customer experience management [Source: Analysys Mason, 2015]

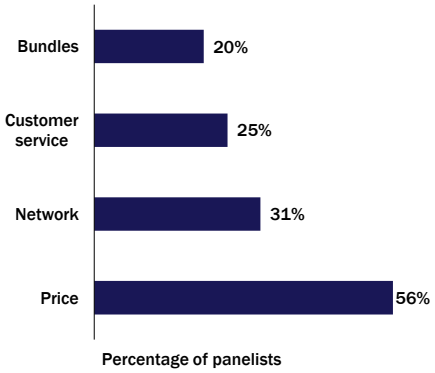

Figure 4.2: Main reasons for churn cited by respondents who said they intended to churn in the next six months, Europe and the USA [Source: Analysys Mason, 2015]

Other than price, low quality of service and poor customer service are the two main reasons why customers churn (see Figure 4.2). Broadly speaking, the Support stage – along with Join and On-board – has the greatest influence on the customer experience and net promoter score (NPS), and will determine whether a customer stays or churns.

In the transformation of a CSP into a customer-focused organisation, there is an important need for systems and processes that can measure and enhance the customer experience, especially during these three stages. An SOC is a key enabler of this CEM journey, providing the most important operational underpinnings and governance mechanisms.

4.2 CSPs must address the issue of early churners

Within the customer experience lifecycle, the Join and On-board stages (i.e. order-to-cash phase) are when subscribers form their first impressions of the CSP. Consider a scenario where a prospective customer visits a CSP's high-street retail store to sign up for a service. Everything that happens during their stay at the store contributes to the customer's experience, including: the length of time spent queuing to talk to an agent, the process for entering customer information into the CRM, capturing billing details, selecting the service bundles and activating the service. Multiple BSS and OSS systems are responsible for the ordering, account creation, activation and billing of the service. If the process is not speedy, seamless and error free, the CSP's average cost of acquiring a customer will rise, as there will be a high risk of the customer cancelling the service within the 'cooling-off' period due to a negative customer experience.

Furthermore, in the first year after a CSP acquires a customer, between 12% and 20% of the revenue it earns from that customer is spent on acquisition costs (e.g. marketing, selling, on-boarding and equipment

subsidies). Given this high level of initial costs, it is extremely important for a CSP to measure and manage its operational activities against customers' perceptions of how well the CSP is performing.

To reduce the issue of early churners, CSPs must therefore be able to understand the customer experience at each touchpoint in the order-to-cash journey. Figure 4.3 illustrates how a poorly conceived order-to-cash journey can lead to a high cost of customer acquisition and increase the risk of churn. To avoid this, CSPs must alleviate delays occurring due to long activation cycle time, either resulting from repeated failures due to inaccurate data input, or from poor system performance. Data quality issues should be minimised by employing robust validation techniques and watertight system interfaces, while software system performance can be monitored and improved by embedding application performance monitoring (APM) software in mission-critical IT systems.

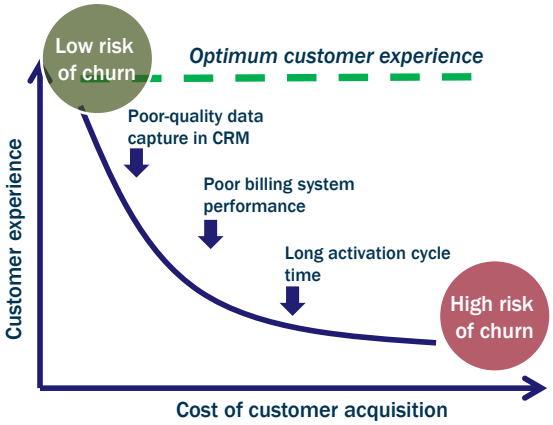

Figure 4.3: Relationship between customer experience, cost and churn in the order-to-cash phase [Analysys Mason, 2015]

By mapping out the customer journeys during the Join and On-board stages and correlating the APM data with network SQM data, CSPs can identify bottlenecks in the processes and gain full visibility of the customer experience, so that they can take decisive action to alleviate the issue of early churners.

4.3 The end-to-end customer experience needs to be measured

The Support stage of the customer lifecycle is the longest stage that often involves repeated customer interactions (e.g. on issues related to technical support and billing enquiries). This 'long tail' in the customer relationship relies on the use of software systems to handle inbound calls, troubleshoot devices, configure applications, isolate network problems, dispatch technicians and reconcile billing issues. Often, there are gaps in the CSP's understanding of an issue raised by a customer, because these software systems span many technology domains and departments.

It is challenging to assess customer experience, since it is formed from many different interactions between a customer and their CSP. Outside-in KPIs such as NPS and voice of customer (VoC) score provide a good indication of customer perceptions and their propensity to churn. A CSP can solicit detailed feedback from the participating customers, and use analytics to extrapolate the subjective insights to the broader customer base in order to derive specific actions. An inside-out KPI such as customer experience index (CEI) is calculated on the basis of different customer journeys and interactions that customers have with the CSP. One approach that may be worth considering in order to derive the CEI would be to apply some sort of weighting to each touchpoint in the overall churn formula. The formula might then look something like that shown in Figure 4.4 (at a high level), although the weighting percentages would vary based on the service type and the demographic of the customer.

A CSP can assign a weighted value to price, QoS and so on, based on its understanding of the customer base, and then capture information on why a customer decided to cancel a service or end a relationship. The CSP can then apply this information to future churn and focus on the areas that contribute to the highest percentages of churn.

QoS must be evaluated against the technology and the services consumed by a user. This area provides the best opportunity for a CSP to raise its NPS and CEI, improve customer satisfaction and reduce churn, because surveys show that it accounts for a high degree of churn (see Figure 4.2). One probable solution to this issue is to have a system that enables a CSP to correlate high-value subscribers with access points on the radio network.

By looking at the clustering of high-value subscribers and their frequent access points, a CSP can make strategic decisions on which parts of the RAN should be upgraded to improve accessibility and avoid congestion. This simple technique can reduce churn in the subscriber base and thus increase profit margins.

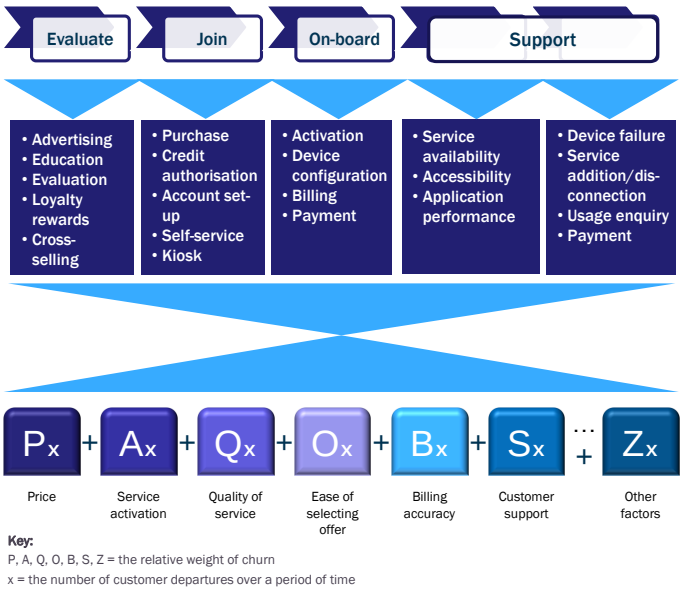

Figure 4.4: Example of how to measure end-to-end customer experience [Source: Analysys Mason, 2015]

4.4 Customer lifetime value must guide CSPs' CEM strategy

By better segmenting the customer base based on customer lifetime value (CLTV),[1] CSPs can devise targeted strategies for those segments that have a high CLTV. In the retail domain, a small percentage of subscribers typically consume a disproportionately large amount of data. For example, when Analysys Mason carried out an assessment for a CSP in South-East Asia, we found that around 5% of subscribers with the heaviest data usage were responsible for 30% of total network data consumption, but contributed only 6.5% of revenue and a mere 1% of overall margins.[2] By studying data consumption patterns and identifying customers who contribute the highest ARPU and profit margins, CSPs can formulate personalised initiatives to prevent them from churning.

Enterprise customers of all sizes are a significant source of revenue for CSPs, but may demand a higher reliability and consistent QoS, given the critical nature of their service usage. A single account may consist of tens, hundreds or even thousands of service users, so CSPs can incur massive revenue losses if an enterprise customer churns. In terms of CLTV, enterprise accounts rank the highest, and it is imperative that CSPs take special care to maintain and nurture these relationships.

Another segment which contributes a significant share of CSP revenue is roaming customers. By monitoring even simple failure scenarios (such as network-attach failures for inbound roamers), CSPs can obtain valuable insights which will help them tackle the problem and inform their strategy when negotiating roaming agreements.

1 Customer lifetime value (CLTV) is defined as the present value of a customer's net cashflow over their tenure with the CSP.

2 Refer to Analysys Mason's article on *Pricing for data profitability: usage-based segmentation can identify profit drains*; see http://www.analysysmason.com/About-Us/News/Newsletter/Data-profitability-heat-maps-Oct2014

CSPs should develop initiatives specifically for high-CLTV customers. Such initiatives could include:

- tailoring journeys and touchpoints for customers with high CLTV to provide a consistently superior experience
- monitoring the quality of experience in real time and taking proactive action to avoid or alleviate the service impact
- assessing the geo-location of network congestion hotspots where high-ARPU customers are concentrated (such as central business districts or conference venues)
- monitoring the quality of experience of VIPs such as senior corporate executives and business managers, and other important individuals (such as social media influencers or heads of the family with responsibility for bill payment)
- liaising with customer care to set up dedicated care processes for enterprise customers to deal with incoming complaints and enable the care personnel to proactively inform customers of any scheduled maintenance activities or anticipated service-quality degradations
- liaising with the marketing department to proactively recommend changes to the service bundle based on usage and up-sell/cross-sell services to highly satisfied customers.

4.5 Persona-based differentiation can enhance customer experience and increase CLTV

A ‘persona’ is a characterisation that represents a particular type of customer who buys from the CSP or uses its products or services. Marketing organisations have been using the concept of personas for key buying groups for many years, across numerous industries. Personas are constructed based on the customer’s interactions with CSPs’ systems as recorded in their own databases, as well as from external analytics databases that are able to extract this information from the interactions customers have on social media and feedback they provide during customer satisfaction surveys.

Big-data solutions are enabling CSPs to build cost-effective ‘data lakes’ and ‘data streams’, which can be used for in-depth analysis of both offline and real-time use cases. CSPs can use this varied data to build models and create many subscriber personas based on their service consumption, service preferences and buying patterns. Using these insights, CSPs can derive broad categorisations of the customer base based on their expectations of the CSP and the degree of influence they exercise in making their own and others’ purchasing decisions (see Figure 4.5). For example, the same customer may be a business person during office hours, but a family-focused person during the evenings and so their expectations of the CSP may vary.

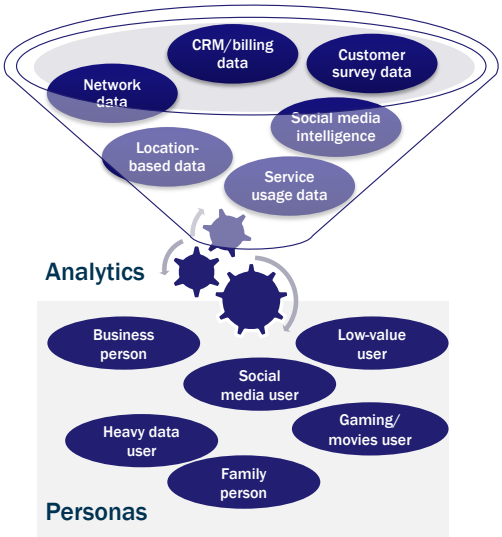

Figure 4.5: Deriving personas

[Source: Analysys Mason, 2015]

Other examples could include an individual who is a heavy data user at weekends but only a limited data user on weekdays, or an extensive social media user who demands always-on connectivity and so has significant influence in the social sphere. These persona models can be distributed to marketing applications as required, to enable better decision making, support targeted messaging, design products and services, and deliver a more-personalised experience and support.

Ultimately, CLTV should drive CSPs' decision making on how to treat different customer segments and personas. If a CSP is to classify its customers, it must have substantial knowledge of them, their services and projections of their future purchases. This kind of information can be obtained using data analytics and the operator's records, supplemented with information disclosed from social media. If CSPs can link the personas to the CLTV and NPS, they can prepare optimally personalised offers that generate maximum revenue and improve NPS.

4.6 Customer experience can be a differentiator for CSPs to move up the M2M value chain

IoT/M2M services such as smart-home automation, connected cars, smart cities, m-health and mobile payment services are upcoming opportunities in the new digital economy that will affect CSPs' revenues, systems and operational processes. M2M cellular connectivity revenue was USD6 billion worldwide in 2014, and CSPs are aiming to increase this by penetrating further up the IoT/M2M value chain with complete services and applications (as outlined in Figure 4.6).

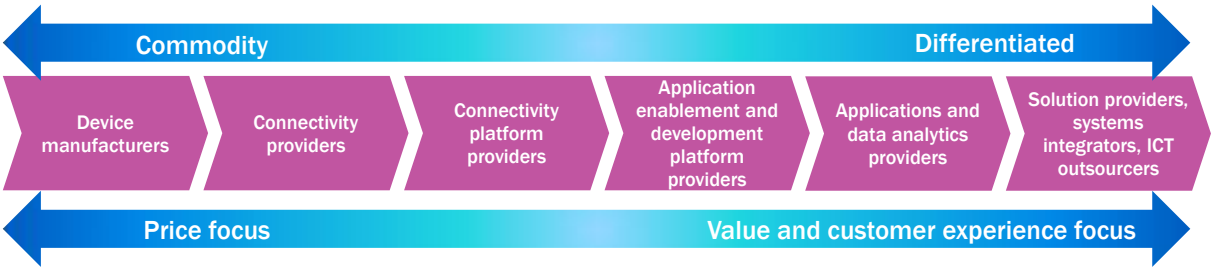

Figure 4.6: M2M value chain [Source: Analysys Mason, 2015]

CSPs' strength in providing connectivity services should put them in a good position to compete in the M2M segment. However, the revenue potential from the connectivity services segment is weak compared to other segments in the M2M value chain (such as connectivity platform services or application enablement and development platform services). Nevertheless, some of the strengths that CSPs have are extremely hard to replicate – for example, few other organisations have an existing customer base of millions and the mechanisms to bill and support them.

As the M2M industry matures and prices for connectivity services decline, it is critical that CSPs differentiate themselves through other aspects of their service offering. They can learn from their experience in the enterprise segment (where they already carefully measure various customer satisfaction metrics), and apply similar CEM techniques to the M2M segment. In order to do this, however, they need to be able to integrate the systems and processes from their M2M divisions into their overall enterprise CEM processes.

Unlike the traditional retail and enterprise segment, the M2M segment is not prone to high churn, because the length and restrictions of contracts makes it very cumbersome to change service providers. However, as more CSPs enter the M2M market offering more holistic services, superior customer experience will become a key differentiating factor. CSPs can develop their services by upselling and cross-selling telecoms services bundled with M2M solutions. An example of such an M2M solution is the retail 'store-in-a-box' solution, which incorporates traditional services like voice and data connectivity and digital signage.

In order to deliver a superior customer experience when providing this kind of bundled service to enterprises (similar to what they do for customers who buy traditional telecoms services), CSPs need to be able to combine or connect their M2M systems and processes to their existing software systems. This exercise is essential for CSPs which want to move up the M2M value chain and successfully provide differentiated services.

5. Transformation of CSPs' service operations

5.1 CSPs need a transformational approach to move to customer- and service-centric operations

An SOC represents a fundamental shift in a CSP's operational methodology. With an SOC, all tactical and strategic activities (including network operations, planning, engineering and optimisation) need to be triggered by a service driver or by an event that happens at the service level. This means that deployment of an SOC requires modifications in organisation, process and people, in addition to systems architecture and technology changes (see Figure 5.1).

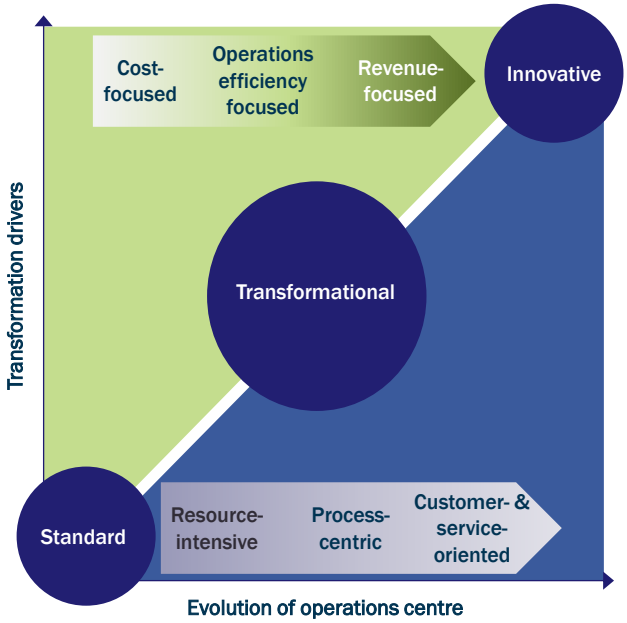

Figure 5.1: Transformation of service operations

[Source: Analysys Mason, 2015]

As a CSP's networks, services and business models become more and more complex, the underlying tenets for operations should also change: it is not possible or necessary to solve all problems economically all of the time; the highest priorities need to be identified and dealt with first. In particular, problems which affect the highest-value customers and their services need to be addressed as a matter of urgency. This also means that cost reduction cannot be the sole driver for OSS rationalisation and transformation.

Therefore, customer- and service-centric operations often require transformational or innovative approaches, aimed at managing existing services in efficient new ways based on CLTV, and there will need to be a continuous improvement process so that these operations can evolve to manage new high-value services that will be deployed in the future. These transformations will move the CSP from an organisation with people-intensive and process-centric operations focused on cost reduction, towards a truly service-oriented operation that can generate additional revenue.

In order to handle new service types and new business and operations models, a CSP needs to undertake a business-led operations transformation around the SOC. A successful implementation will need to incorporate a number of principles :

- The development of key business objectives that drive operational excellence or customer experience improvements, or provide new high-value services.
- The adoption of an organisation-wide approach to transformation, with executive sponsorship and 360-degree stakeholder management, to ensure alignment of business objectives, acceptance of changes and retraining of employees.
- The use of a blueprint that addresses organisation, processes and change-management systems, in addition to the software systems like SQM, network data collection systems, analytics, visualisation and process automation systems.

- The identification of a transformation partner that offers a broad portfolio of professional services, with new pricing models and benefit- and risk-sharing contracts, delivered by multi-skilled, dynamic project teams.
- The use of a phased approach to match the CSP's SOC maturity level, along with a process-led strategy that sets quantifiable and measurable business goals and a continuous improvement plan.
- The use of outsourcing instead of in-house transformation is an option, if the CSP can put strict service-level agreements/organisational-level agreements (SLAs/OLAs) in place.

5.2 SOC deployments and functionality should be linked to the business objectives

A CSP should implement its SOC in phases (see Figure 5.2), matched to its service deployments, business objectives and level of organisational maturity. At every stage, the transformation should involve the overall organisational structure, processes, people and systems. Adequate and optimal processes are an essential feature of service- and customer-centric operations. Before embarking on an SOC implementation, it is therefore essential to optimise the existing NOC.

In a *Level-1* SOC implementation, systems like SQM are deployed, to provide near-real-time service-level visibility. More information is available to enable faster root-cause analysis, because the service-to-network correlation is established through service models and KQIs. Network performance and usage, service quality and service availability are maximised. However, to a certain extent service management is still reactive, because customer-level visibility is lacking and the NOC is still the central trigger point for maintenance activities.

In a *Level-2* maturity SOC, process changes shift the focus of operations from a network-oriented reactive model to a service-oriented proactive model. The service can be visualised in the broader context of all customer-related touchpoints, rather than being confined to the network context alone. The CSP can use and share analytics data through inter-department interfaces and processes. Customer care, network operations and planning departments can access geo-located customer and network analytics data to prioritise tasks based on their service and customer impact. The CSP can analyse service-inventory and service-quality degradation information to proactively increase capacity in the network before it affects the customer experience. This stage calls for a mindset change, and subsequent organisational, process and governance changes, as the central trigger point for maintenance activities shifts to the SOC (which is equipped with customer-level visibility and context).

Most CSPs are either at Level 1 or Level 2 of this transformation journey; the move to *Level 3* will take some time because this requires a significant change in a CSP's approach to operations. A CSP which aspires to deploy SOCs at a higher maturity level needs to enable full service lifecycle management, which is entirely dependent on customer and network analytics databases. This will enable the CSP to launch high-value data and digital economy services quickly and automatically, providing just-in-time capacity in the network and operations to meet the needs of high-value users. Innovative CSPs have the capability to establish a proactive, customer-focused Level 3 SOC, but to do this they need to turn the processes around completely, to start from the customer. CEM systems and tools will need to be deployed to map the outside-in customer experience onto internal operational KPIs, to enable proactive service- and network-level changes through in-depth integration and automation.

Standard →	Transformational →	Innovative
Level 1 Network-oriented view of service SOC is a peer of the NOC or at a lower level	**Level 2** Network-oriented view of service, along with customer context SOC is a peer of the NOC or at a higher level	**Level 3** Customer-oriented view of service SOC at a higher level than NOC
Business objectives		
• Reduce costs by increasing the efficiency of the networks • Maximise resource utilisation of the networks • Maintain uniform service levels for all customers	• Reduce churn by maximising customer service experience • Provide differentiated, personalised services based on customer preferences and personas • Maintain service levels based on specific services for specific customer segments	• Increase revenue by providing high-value data services • Maintain high-capacity, rapidly growing networks for high-value users • Maintain service levels for specific customers based on their lifetime value
Operational efficiencies		
Automated service management in an SOC provides better-quality networks and services at a lower total cost of ownership	Geo-located customer and network analytics data (available in the SOC) enables personalised service optimisation and support	SOC will proactively enable automated optimisation of network and operations, to build service capacity at the right place and launch new services faster for targeted users, providing assurance on demand
Process characteristics		
• Semi-automated processes • All processes start with a service event	• Proactive, semi-automated processes • All processes start with a service event, linked to the customer context	• Proactive, automated processes • All processes start with a customer requirement

Figure 5.2: Three maturity levels in the SOC transformation journey [Source: Analysys Mason, 2015]

5.3 SOC implementations and deployment models are dependent on the organisation of a CSP's operations

A CSP could choose from several SOC implementation models based on its existing operations organisation, its blueprint for the SOC evolution and its deployment geographies. The SOC may be a peer to the NOC or it could be within a NOC (or vice versa). However, the CSP needs to establish the hierarchy of the NOC and SOC within its organisation. The CSP also needs to establish processes for how the SOC will interact with various other departments, like customer service, planning, engineering and field operations.

First and foremost, a CSP should perform an OSS rationalisation and enhancement exercise in its NOC, to reduce the number of systems and suppliers. Process improvements and automation will also need to be improved, and organisation restructuring and workforce retraining can be carried out to enable more work to be achieved with the same staff. Process improvements alone can reduce NOC opex by around 15%.

NOC optimisation and centralisation (through consolidation of facilities) are important in enabling a clean and successful SOC implementation. The appropriate level of NOC consolidation will depend on regulatory and business factors; fully centralised NOCs may be possible in some countries, but regional NOCs may still be needed for some geographies. In the case of a CSP that forms part of a group it may be possible to consolidate NOCs across multiple countries.

Suppliers and systems integrators offer build, operate, manage and transfer (BOMT) and outsourced operations (managed services on site) to help operators transform from an NOC to an SOC, or establish an SOC in addition to an NOC. In these cases, the chosen supplier could also implement an OSS rationalisation and NOC optimisation exercise before deploying the SOC. In many cases, CSPs' NOC and SOC transformations have delivered substantial benefits: for example, they provided an opex reduction of up to 20% for an European operator, a more than 10% improvement in customer satisfaction score (CSAT) for a North Asian operator, and an improvement in network quality index of up to a 30% for a large operator in India.

Suppliers offer standardised processes and often implement their own reference architectures. The use of a supplier's global NOC (GNOC) for offshoring is also a possibility, as this would give a CSP access to state-of-the-art facilities and expert personnel for its NOC operations. Furthermore, some suppliers have built advanced SOC functionality into their GNOCs and are able to offer SOC as a hosted managed service to CSPs. However, this may be a difficult option for a CSP to accept, as it would involve significant real-time interaction between the SOC and several departments within the CSP's organisation.

For a CSP, the SOC itself is increasingly becoming a differentiator, and so it may wish to retain control over the SOC. However, some CSPs, particularly in emerging markets, may not have the expert personnel needed to transform their NOC and operate an SOC: these CSPs may therefore favour suppliers and systems integrators which offer transformation services. Suppliers which are able to offer innovative pricing models and benefit- and risk-sharing schemes could also be preferred by large CSPs, if they are able to provide multi-faceted project teams and a scalable, reusable project delivery model.

6. Vendor solution overview – Huawei

Figure 6.1 demonstrates Huawei's SmartCare SOC solution, which forms part of Huawei's SmartCare CEM solution family.

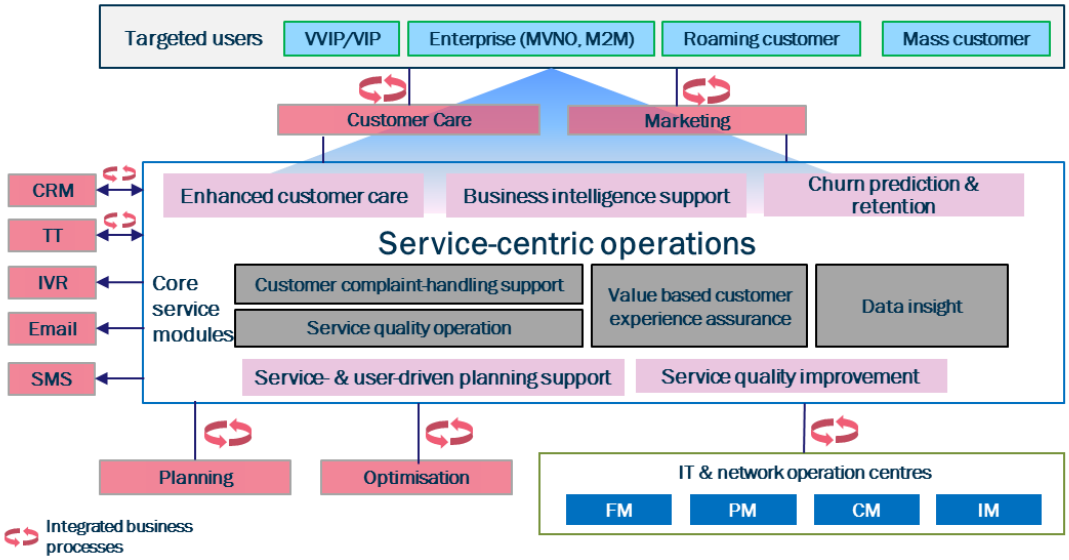

Figure 6.1: Huawei's user-centric service operations solution [Source: Huawei, 2015]

At its centre are the solution's four core modules, whose capabilities are outlined in Figure 6.2. The core modules enable key business processes such as enhanced customer care, business intelligence support, churn prevention and retention, service- and user-driven planning support and service quality improvement. In collaboration with the IT data management and network operations, the underlying big-data platform provides the data collection, adaptation and pre-processing which enables the CSP to define service models, manage alarms, and maintain fault trees.

Module	Capabilities
Customer complaint-handling support	• Automatic diagnosis of customer complaints • Multi-data source demarcation, and maintenance of fault tree for complaint handling
Service quality operation	• Dashboards for service operations management visualisation • Value- and area-based assurance for web browsing, streaming, VoLTE and OTT applications
Value based customer experience assurance	• Customer-segment-based assurance (e.g. VIP, high-ARPU, persona-based assurance)
Data insight	• Cell-level insight on traffic imbalance trends • Identification of worst-performing cells, based on service quality • Insight on weak coverage (dimensioned based on value user, service and device) • Insight based on value user, service and hotspot area • Insight OTT active users and hotspot cells • Identification of high-value social network users

Figure 6.2: Core module capabilities of Huawei's SOC solution [Source: Huawei, 2015]

Additionally, analytics-driven insights are mapped to actions via the most appropriate channels for different personas so the operations can close the loop between customer complaint and corrective action and/or communication. Altogether, Huawei's SOC solution provides the key elements required to support' multiple CSP organisations, including customer care, network planning and optimisation, and marketing:

- *Customer care* – enable improved first-call resolution and average call handling times through faster complaint demarcation between network, device and external source.

- *Network planning and optimisation* – perform tasks based on their impact on service quality, and supporting processes such as service quality optimisation, service quality complaint handling, and service- and application-based coverage and capacity planning.

- *Marketing* – support monetisation use cases by creating highly targeted offers based on granular customer segmentation, enable collaboration with OTT application service providers and MVNOs, and promote user migration to LTE by identifying customer prospects currently using 2G and 3G services.

In addition to these tools and processes, Huawei also provides professional services to enable CSPs to establish the SOC, and make the transition to a service- and customer-centric organisation (as outlined in Figure 6.3).

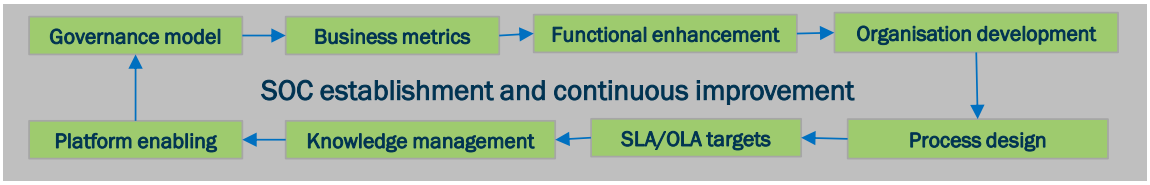

Figure 6.3: Huawei's process model for transition to SOC [Source: Huawei, 2015]

The four key service pillars for establishing the SOC are:

- *Metric design:* includes SLA/OLA design, alarm design, KQI monitoring and customisation

- *Process design:* complies with the eTOM business process framework, and necessary customisations will be proposed to suit each CSP organisation

- *Organisation and governance design:*
  - organisation design to include position and profile of the SOC, definition of the service layer, centralisation and assignment of ownership of SOC functions
  - governance design for regular communication between internal teams and the SOC to ensure alignment between business objectives, strategy and direction

- *Platform design:*
  - SQM platform setup, including site survey, deployment design, installation and commissioning
  - SQM platform integration with other OSS and IT systems (such as fault management, performance management, configuration management, third-party probes, email system and Short Message Service Centre (SMSC).

After the SOC has been established, Huawei's professional services group can run the operations of the SOC and eventually transfer the ownership back to the CSP, as part of the knowledge transfer and handover phase.

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