

Digital Workflows in the Cloud

Connecting the Customer to the Network

Author: Patrick Kelly, Founder and Principal Analyst



Published by Appledore Research LLC • 44 Summer Street Dover, NH. 03820

Tel: +1 603 969 2125 • Email: info@appledorerg.com • www.appledorerresearch.com

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Publish date: June 15, 2021

Cover image: Patrick Kelly

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EXECUTIVE SUMMARY

“Workflow automation and its ability to unify process flows across the service lifecycle and technology domains will play a critical role to drive workforce efficiencies.”

Distributed cloud networks are transforming the workflow process and the operational support systems used to deliver advanced services in the telecommunication network. Workflow automation and its ability to unify process flows across the service lifecycle and technology domains will play a critical role to drive workforce efficiencies. ServiceNow is a leading supplier in helping CSPs transform their workforce and evolve the tools and systems to support cloud services.

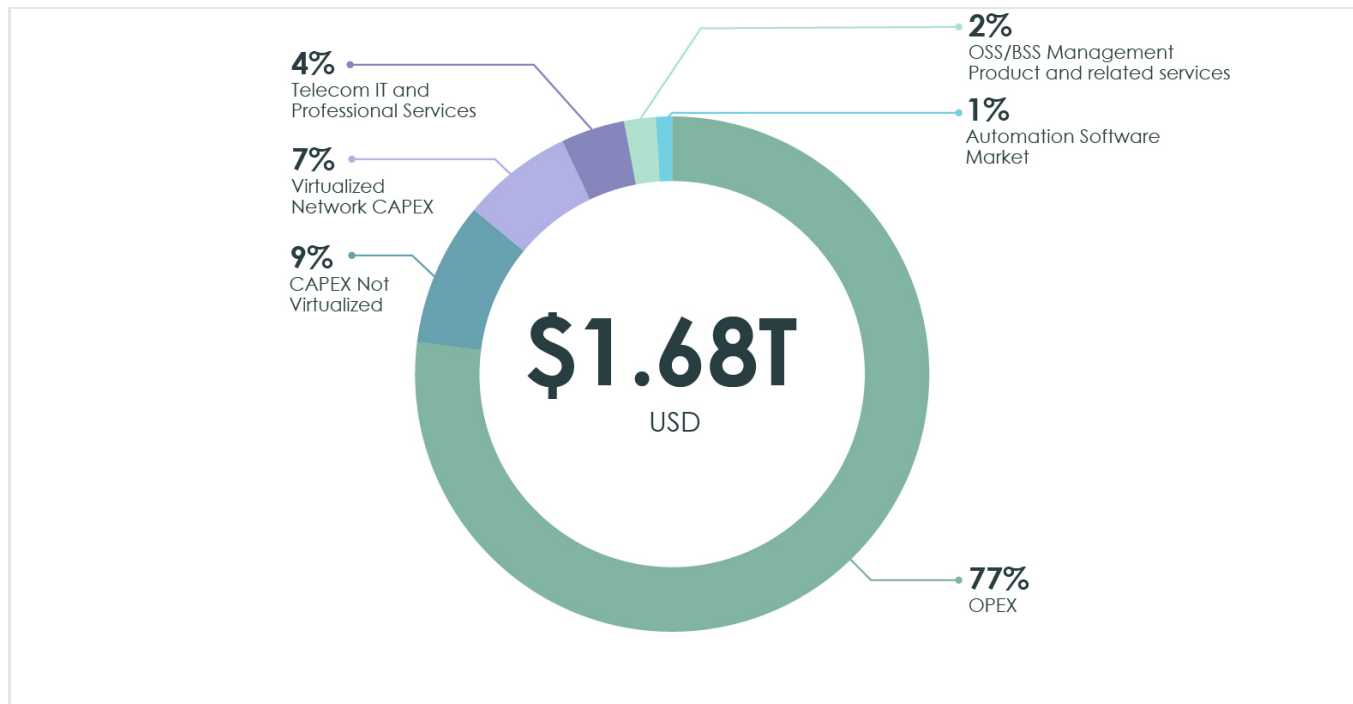
Our research shows that telecommunication providers are rapidly moving to support cloud-based services to meet the demands of enterprise and consumers who want on-demand applications in a secure, highly available network.

ServiceNow is managing complex workflow transactions that span technology domains and unify the contact points in the customer journey from order to service assurance. The telecommunication industry is at a crossroad. Executives must decide how to deliver digital services in a highly complex dynamic cloud network in an industry that carries high operational cost.

MARKET OPPORTUNITY

Appledore Research forecast that global telecommunications market spending will reach USD 1.68 Trillion in 2025. Seventy seven percent (77%) of cost to deliver these services is locked into the operating expense. Most operators focus on capital expenses (16%) as an economic lever to support existing and introduce new network services. It is our belief that if operators assessed their total cost in delivering services and isolated key aspects of labor used in the operations of the network, then profit margins could be expanded. The OPEX lever is a game changer to deliver earnings acceleration and yield substantial improvements in improving the customer experience. The automation software market is a crucial piece in moving the OPEX lever.

Figure 1: Global Telecommunication Operational and Capital Expenditure 2025



Source: Appledore Research

TELECOMMUNICATION INVESTMENT PRIORITIES

Enterprise businesses are migrating more of their workloads to the cloud. In the communication sector, more cloud service delivery models continue to proliferate as enterprises take advantage of IaaS, PaaS, and SaaS solutions to satisfy more complex application requirements.

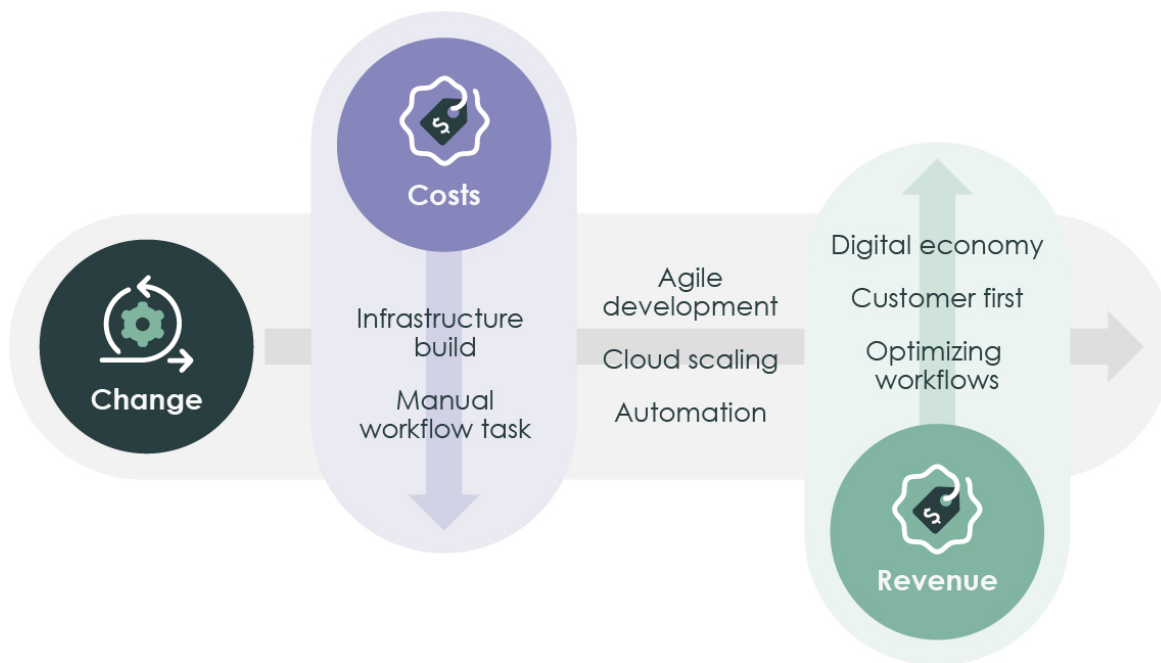
These services must be delivered cheaper, faster, and in a much more agile IT development environment to satisfy the demands of enterprises and consumers. Newer modern software will be deployed that can manage more dynamic workloads across a distributed infrastructure. The digital supply chain of services requires a new way of managing the workflow processes and at the same time delivering a first-class customer experience.

The ability to deliver higher bandwidth services at a lower cost per bit is achieved thru virtualization of the infrastructure and the ability to scale out dynamically as workloads ebb and flood the network.

Automation of the software-controlled network will drive the reallocation of investments to lower cost and drive more revenue generating services. The importance of streamlining the workflow across multiple sales and distribution channels that span many technology domains is a driving force in this sea change.

Our thesis on the autonomous network signals a force multiplier in OPEX reduction and efficiency gains. Some immediate benefits include on-demand service activation, improvements in workforce problem resolution, and massive reductions of manually intensive task.

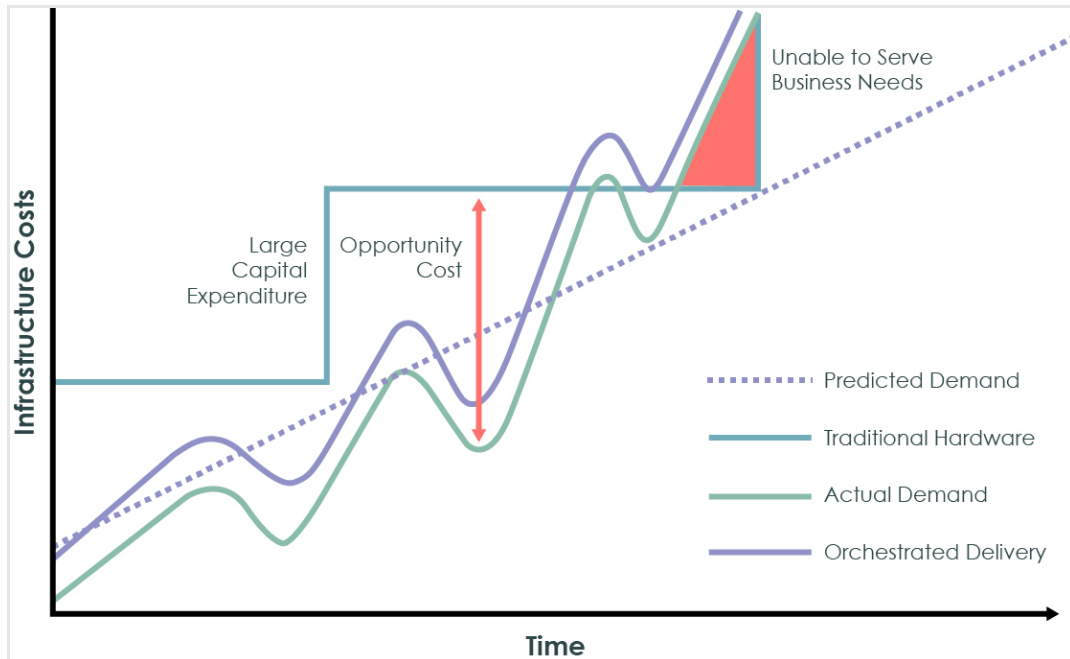
Figure 2: Telecom Drivers for Change



Source: Appledore Research

Services will shift from mostly offline to real time on-demand. Network functions will become distributed with more workloads running at the edge of the network. This will result in increased complexity to manage the network and many CSPs will find that not enough experts in house can be hired to manage the service lifecycle. The lack of available skilled technicians will drive investments in workflow automation to meet customer demand and satisfy the scale requirements of a distributed network. Consumption of applications and services will follow a just in time model (figure 3). We are already taking note of lambda services living for seconds as traffic burst occur during peak short cycle timeframes.

Figure 3: Consumption Model Just in Time

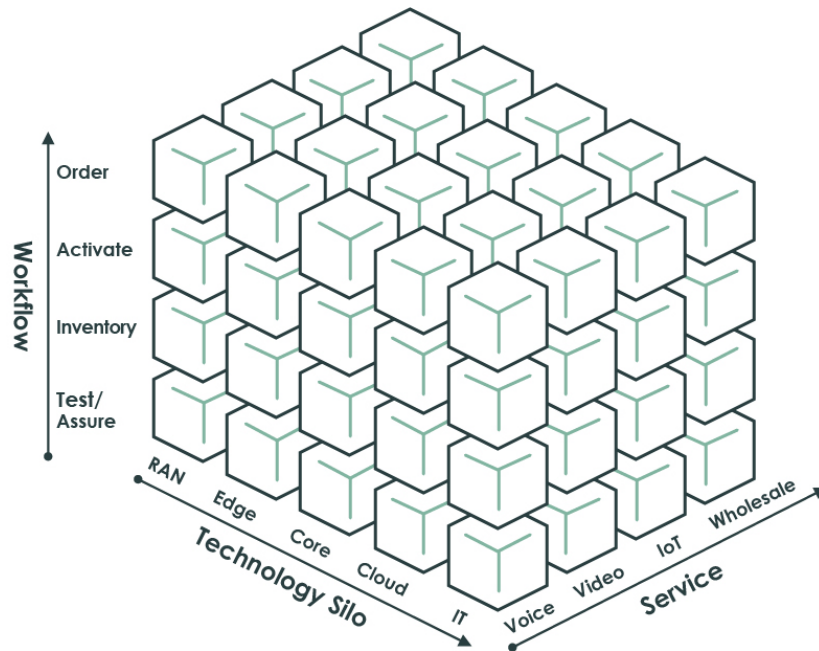


Source: Appledore Research

CHALLENGE IN THE DIGITAL WORKFLOW

Today, most CSPs have hundreds of systems that span across technologies, services, and business units and each supporting its own workflow processes. Figure 4 is a simplified illustration of the problem that identifies 80 separate workflow processes. We could expand this view to hundreds of services, dozens of workflows, and further subsegment the technology domains to be more inclusive of IP, ethernet, optical wavelengths, and more yielding thousands of workflow tasks.

Figure 4: Workflows and Services across Technology Domains



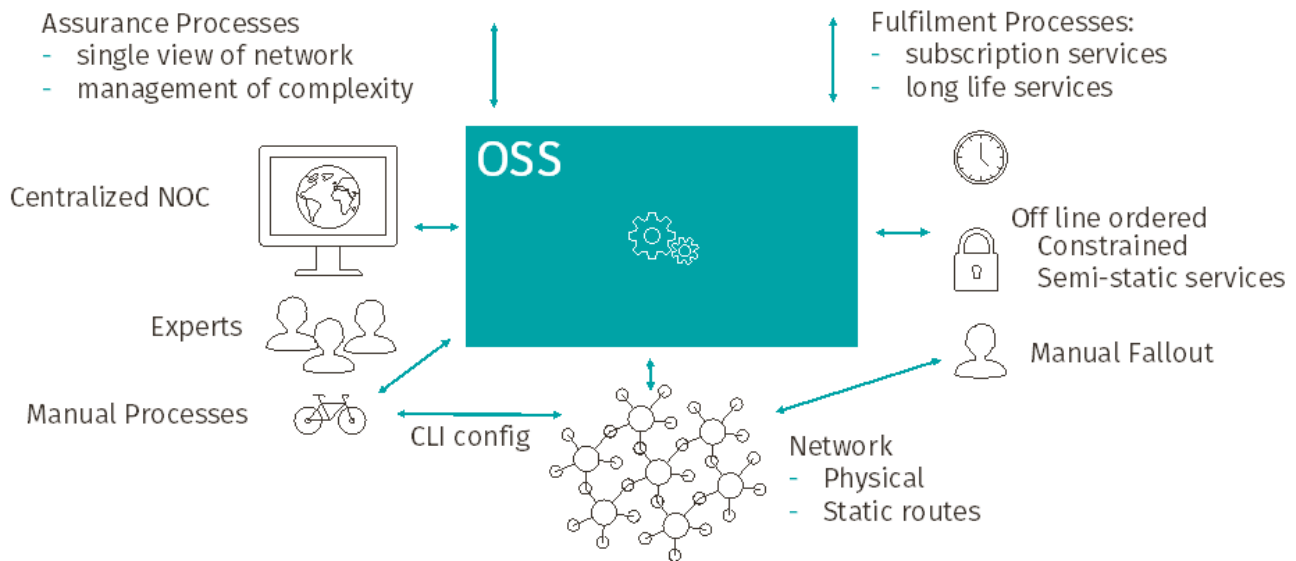
Source: Appledore Research

To illustrate you can think of each workflow as a block in the cube. Testing and assuring a voice service in the RAN requires a set of tools and a process, of which further requires a prescribed set of workflows. The activity is largely independent of other workflow tasks and is performed in isolation. The systems all rely on datasets and interfaces that are not shared with other systems in the value chain, making the customer experience and service availability difficult and costly to administer. Each technology domain is an island of data that has a specific workflow in turning up and managing the lifecycle of the service. As the network architecture becomes distributed and on-demand services flourish, the ability to manage the end-to-end service lifecycle will require unifying the service chain.

A difficult and persistent problem nagging many CSPs is the ability to manage the customer experience in each stage of the customer lifecycle. The diversity of management tools combined with disjointed operational task often results in order fallout and the inability to identify service impacting events. To achieve success in understanding the customer experience, management platforms must provide a contextual view of different workflows in the service chain. Operational efficiency in the service chain requires linkages or APIs to lower-level systems that perform specific functions in the service lifecycle. In the service assurance domain, the metric that matters is average handling time for network incidents. Southbound APIs to testing, performance, and fault management subsystems that expose service impacts in near real time improve net promoter score and customer retention. In the order to fulfillment phase, metrics on order fallout and tracing back to the inventory, order catalog, and activation systems supporting this activity yield improvements to cash and avoiding unnecessary dispatches.

To understand the state of most CSPs' management domain, one only need to look at the structure of the organizations and how processes are performed to satisfy each customer. CSPs had a proven workflow methodology which functioned in the old world. It was operated by craft technicians performing manual processes and deep knowledge of the network. Figure 5 depicts the workflows and tools used in this old world. The cloud model wreaks havoc on these very same workflows inhibiting the true benefits of the cloud; agility, speed, reuse, and low cost on-demand services. In short, the brittle OSS systems and workflows of the past are not sustainable in a distributed cloud network.

Figure 5: OSS Becomes Brittle in Cloud Networks



Source: Appledore Research

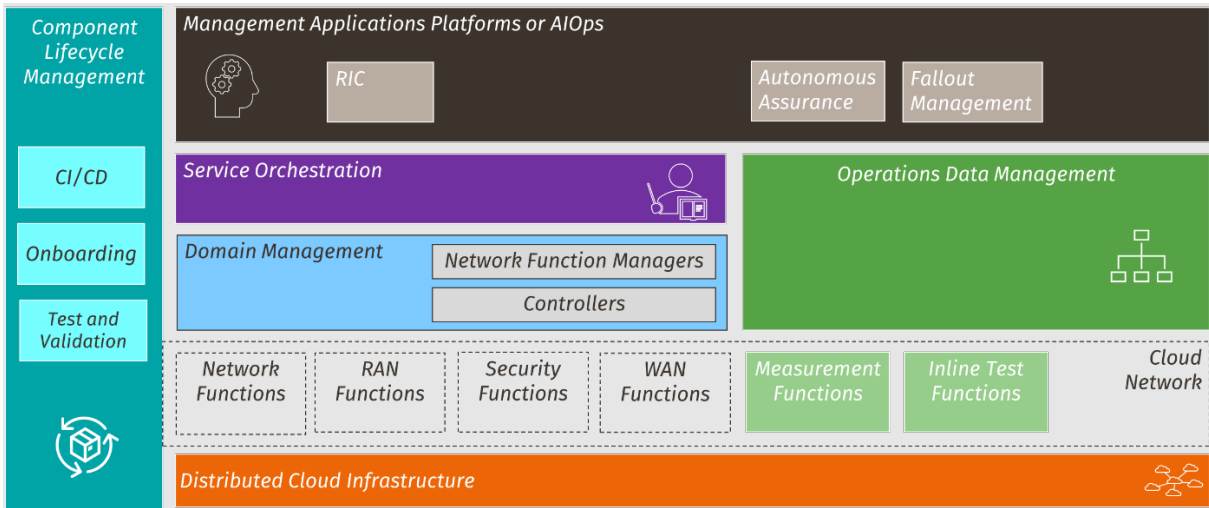
OSS systems become brittle in the cloud network because:

- Assurance and fulfilment systems are still separate, restricting closed loop automation.
- Each system has its own database, catalogs, inventory, and topology duplicating what could be common and shared. This creates an integration tax.
- The NOC is a collection of tools stitched together with expert's knowledge. When the expert walks, so does the knowledge base.
- Fulfilment processes are mostly offline activities based on static technical models. This inhibits the underlying network to dynamically manage service intent.

SOFTWARE AUTOMATION MARKET TAXONOMY

Appledore Research has developed a framework for how we envision the evolution of operational systems to support the dynamic real time services of the future (figure 6).

Figure 6: Infrastructure Software Automation Market Taxonomy



Source: Appledore Research

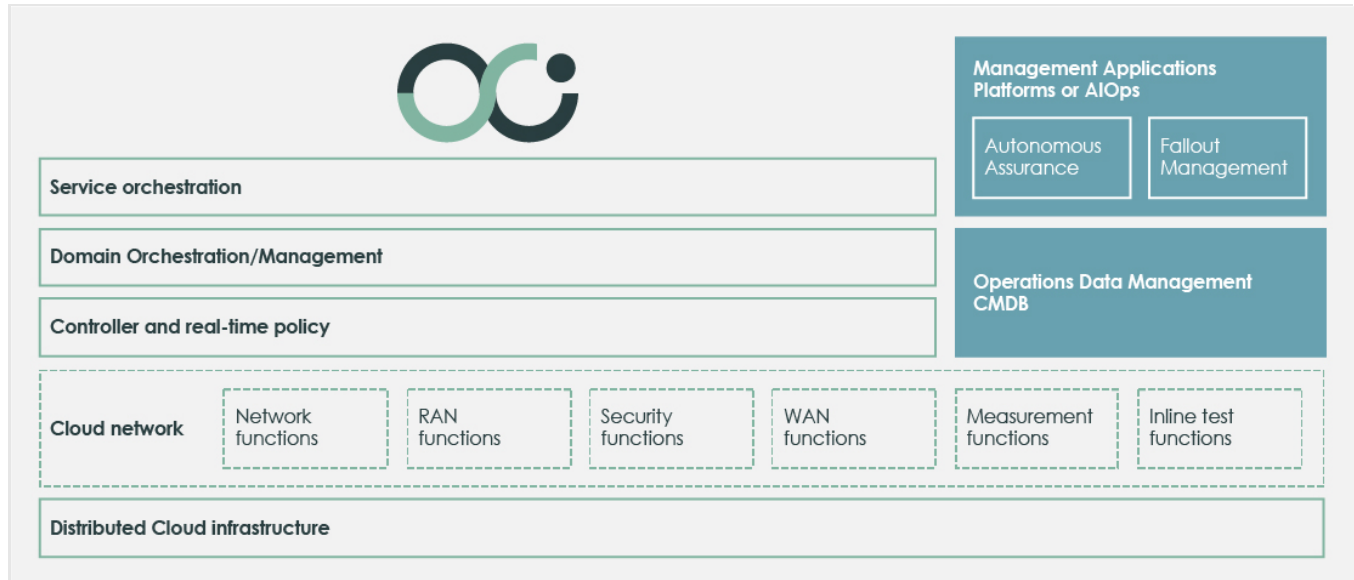
This view encapsulates the thinking of network functions supported in the cloud network. It embraces a more IT centric view where software releases will be delivered as micro-services within the distributed cloud infrastructure. Each higher order layer will abstract the complexity of the network into a management domain that subsumes the OSS and BSS systems. We are already seeing this play out in the SD-WAN market and in the radio access network (RAN). Controllers have knowledge of the topology and visibility of network traffic patterns which enable the domain managers to orchestrate low level network fabric configurations to support the services requested. The higher-level management systems are application and customer aware. At the AIOps layer, no-code applications can define business objectives which are pushed down into the lower levels to drive intent, optimize scarce resources, and deliver tiers of service to match the requirements of the application or service. These systems enable system operators to manage the customer lifecycle more efficiently. We will address some of the use cases and customer deployments in the next section.

ServiceNow operates in the AIOps and Operations Data Management layers. The glue in the data management layer is their service aware CMDB, which unifies the data model from potentially hundreds of systems in the operational domain. This includes inventory, product catalogs, physical and logical inventory, topology links, test agents, performance tools, and fault management systems.

ServiceNow can collate a diverse set of network and application data, and then abstract away the complexity to provide customer care agents with relevant actionable reporting on service performance and fault impacting events. The power of ServiceNow is to unify service points in the value chain and link it to

back to customer incidents and order flow across a diverse supply chain with dozens of internal systems and 3rd party platforms.

Figure 7: ServiceNow Position in the Software Automation Market



Source: Appledore Research

APIS AND PUBLIC EXPOSURE OF CAPABILITIES

Cloud adoption is largely driven by the mashing up and iterative development of services and products. The loose coupling of services across the service lifecycle enables more rapid development of products. To further unleash innovation, published APIs targeted at application developers, suppliers, and other wholesale partners must become common practice. ServiceNow is taking this approach in building out its ecosystem of partners.

The uses cases provided below provide the proof points in how ServiceNow is delivering key benefits to some of its telecommunication customers. The ability to manage complex digital workflows in large Tier 1 operations and provide a unified view of the customer experience enables customer care agents to deliver proactive customer resolution.

USE CASES

Vodafone 360-degree view of the customer

Background	Vodafone Group is a multinational telecommunications company providing services in 70 countries through its operating companies and partner networks and serving more than 300 million customers.
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Problem	Customer care was using many systems operating independently and customer data was in each systems data silo. Care agents had a segmented view of the customer journey and had to piece together data to understand the end-to-end workflow.
Solution	Now Platform and ServiceNow Customer Service Management has provided customer agents with a simple, intuitive, and streamlined system, allowing clearer insight into a customer's journey.
Business Outcome	45% productivity improvement and 25 basis point increase in customer satisfaction.

BT automating workflows in the cloud

Background	BT Group is a British communications service provider (CSP) headquartered in London. It serves customers in 180 countries, providing fixed-line, broadband, and mobile services, as well as subscription television and IT services to B2B and B2C customers. For its multinational business customers, BT provides managed services, security, and network and IT infrastructure services.
Problem	The digital product teams wanted to respond to market needs faster for digital services. The goal was to become a digital-native managed service provider, offering solutions to deliver a superior customer experience, commercial flexibility, and security.
Solution	It took a greenfield approach, partnering with ServiceNow to accelerate its digital transformation and create a simplified, automated, and more programmable network and cloud infrastructure. ServiceNow Network Performance Management and Telecommunications Service Management act as the primary cloud engine, while BT and ServiceNow work together to co-innovate and deliver more valuable propositions to the customer, faster than ever. A key element is the market's first native telco customer integration app, called 'eBonding for Telecommunications'.
Business Outcome	Automation of 10,000 transactions with partners and supply chain.

Tata Communications full life cycle service management

Background	Tata Communications generates USD 2.9 billion in annual revenue with 77% generated outside India. The business is the world's largest wholesale voice carrier. The business also operates the world's largest wholly owned submarine fiber network. The Tata Communications services portfolio includes high-speed connections and global MPLS virtual private networks, telepresence services, DDoS mitigation and detection service, content delivery networks, and cloud offerings.
Problem	The primary driver was the ability to proactively engage with customers on service impacting events. Tata wanted to give customers the same event and remediation visibility that the Tata Communications business and technical teams had access. Ultimately, the team wanted to mitigate the impact of incidents to the point of delivering near-100% availability to customers.
Solution	Deploy ServiceNow Customer Service Management to deliver the first stage of a project to drive automation. The deployment was completed in 90 days with a small team using minimal customization.
Business Outcome	Correlate events and services in real time. Resolution of problems has been reduced and customers receive near real time status of service impacting events.

About the Author



Patrick has more than 25 years of experience in product management, business development, and technology consulting. He has advised executives and developed actionable business plans to help hundreds of technology companies profit in high growth software segments of the market. He is the leading authority and has published research in the areas of cloud economics, virtualization of the network, NFV, SDN, machine learning, orchestration, analytics, service management, and customer experience management.

Patrick founded Appledore Research Group in 2014 to focus on the business impact of cloud and virtualization in the telecommunication market. Prior to Appledore, he was Research Director at Analysys Mason, co-founder of OSS Observer (acquired by Analysys Mason in 2008), Director of Product Management for Aprisma (acquired by CA) and held many technical roles in the field supporting both enterprise and service provider customers.

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As you would expect, key focus areas for Appledore's comprehensive research work include Cloud Management, Network Function Virtualization (NFV), Software Defined Networking (SDN), 5G, AI and analytics technologies, service innovation and best operational practice. As a result, our client base spans the complete spectrum of the global telecom industry.

So, we work closely with communication service providers, network providers, software and IT vendors, system integrators, investors, and enterprise users. Unbiased and impartial in our views, we are regarded by our clients as a trusted partner. One that is quick to react to disruption in telecom market dynamics and deliver you the most considered and relevant response.

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Insight and analysis for telecom transformation.

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 Appledore Research

www.appledorererearch.com

info@appledorerg.com

+1 603 969 2125

44 Summer Street Dover, NH. 03820, USA

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