Managing Resources in a Digital World

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Now more than ever, automating processes is critically important. When organizations struggle to fulfill new products and services, the manual planning and management of processes may be to blame. To overcome such challenges and remain relevant in today's digital environment, telco operators need to automate.

The best place to begin is with resource management. Why?
Because by getting resource management right, telco operators unlock key benefits: a holistic view of all assets and network resources; end-to-end visibility across their entire network infrastructure; and access to critical resource information within a fully integrated and automated management tool. As a result, organizations gain the agility to keep pace with competitors, the insight to ensure service quality, and the means to reduce operating costs.

Selecting the right management solution matters. It can help CTOs and network operators keep track of available resources, speed time to market for new services, prevent misconfiguration, reduce recovery time from network outages, and significantly lower overall OPEX. To ensure the cost-efficient and smooth implementation of a new solution, it's important to take common challenges into consideration and strategize a plan to overcome them before beginning the process.

Start by Evaluating Systems and Technologies

The most common resource management challenges an operator may face include fragmentation, working mode, and interface limitations. These are all related to the landscape of systems and technologies in an operator's network, which is typically very disjointed as a result of the number of different devices from different vendors and the fact that each vendor has its own management system. Furthermore, acquisitions are common among operators, which ratchets up an already-complex landscape. In many cases, the merging of IP and transport departments results in a multi-technology network. This reality must be factored into any resource management solution.

Over the years, each operator has developed its own workflows and processes. These are the result of organizational structures, self-developed tools and the legal restrictions at the time of development or implementation. Regardless of how an operator arrived at its present state, it may now find itself in a situation with very specific working modes. This is problematic because any change in the working mode will force changes throughout the entire organization. Adapting the organization from its Present Mode of Operation (PMO) to a new Future Mode of Operation (FMO) will take time, especially as people learn and adapt to the new processes. It also requires the new solution to be flexible enough to support the specific working modes and any subsequent changes down the road.

Another challenge is the northbound interface on network management or any other systems. Even though they are based on standards, these interfaces have limitations, or vendor-specific behaviors and extensions. They may not support the required functionality or there may be different data models within the management systems below. This creates additional challenges to develop a common resource management solution on top, especially in a multi-vendor and multi-technology

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network.

Key Resource Management Principles to Keep in Mind

Since a network is a “living” system, changes are frequent and expected. Data consistency is therefore important—and managing it should be a high priority. The “Closed Loop” principle is integral for high data consistency. By definition, “Closed Loop” means that network configurations created in a planning phase are transferred, step-by-step, into a bill of material and a purchase order, followed by rollout, installation and operation phases. The loop is closed when the resources in operation are compared with the original planned resources, and any data discrepancies have been resolved.

Without data consistency, a planned network extension may be not implemented. For example, slots may already be occupied by undocumented cards or there may be network misconfigurations because of wrong assumptions that were based on incorrect network documentation. These scenarios are painful and expensive—and highly avoidable. The “Closed Loop” principle ensures that the next planning cycle is built on verified and accurate data, and that no surprises await the technician when installing new planned resources.

Another important principle in good resource management is to implement a common central database for all resource-related data. This database ensures that the entire organization maintains the same consistent view of the network and that all of the activities carried out by various people are always based on a shared master data source.

Finally, a unified data model is a very important principle for managing disparate data. This data model needs to be detailed enough to facilitate daily work, yet be flexible enough to support extensions, for instance to manage new objects and attributes of new network layers, or to support new equipment in the network.

Resource Management Requirements

Any new resource management system should support at least the following four basic requirements:

1. Documentation of physical and logical network resources
This is a basic functionality and should be the foundation of any resource management system. Physical resources are the chassis, modules and SFP, as well as the cable, patch panels and splice boxes. Logical resources are network connectivity and network functions, such as firewalls or data filters. Any dependencies between the physical and logical resources need to be modeled, for instance to report the affected services in case of an outage of a physical resource. This is especially true when it comes to cable management. Another requirement for the system is that it must also support the documentation and display of geographical information on a map, such as with GIS functionality.

2. Flexible frameworks to implement interfaces
Since a resource management solution is both the source of data for many external systems as well as a repository for them, flexible interface adapters are critical for northbound integration, as with OSS and BSS systems, and southbound integration to the network for reconciliation of the network data.

3. A library of components
Another feature of a resource inventory solution is a database of predefined components from the different devices to be managed. This includes a graphical representation but also data such as size, power consumption, slots and ports, and so forth. Access to such a library speeds up the addition of new equipment and reduces the effort required for the user to define these components.

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4. Reports and dashboards of all resource data

Having the required resource data in a database is one thing—but making it useful for the operator is another. For example, can the operator easily access the data to identify free resources to be put into service, or those to be replaced? To get the most value from an implemented resource management solution, flexible, user-defined reporting and graphical representation of data on a dashboard is required. This also includes reports for impact analysis—in case of fiber breaks or outages, for example—as well as for workorders generated for new equipment and configurations in the network.

How to Manage Implementation Costs

A productized software solution is the key to managing the cost of a solution. Such a solution eliminates the need to integrate each new customer solution from scratch, also eliminating the cost of programming for software integration and customized features. Each customer of the productized software solution can then decide for itself whether it needs additional customized functionality to support its specific workflows.

While this sounds straightforward and simple, it still requires certain principles to be considered. *Configuration* versus *programming* are the key words. The solution needs general openness through its interfaces as well as in the software design. Most vendors don't make their software generally configurable and open with the configurable interface adapters that would make their solution flexible enough to create a productized software solution. Instead, they let their customers pay for additional programming during solution implementation or via extensions. The productized software solution, with its ability to configure features, is much more fiscally desirable for operators of all sizes than expensive integration and programming.

The benefits of such a solution include reduced cost and faster implementation and extensions, as the functions are already available and data migration is the main topic. Productized features can even help to streamline the data migration process. Lastly, software upgrades for a productized software solution are much cheaper than with a highly customized solution, which drastically reduces the TCO. To ensure quality service, a productized software solution makes the addition of new features from a software upgrade instantly available for all customers.

Avoiding Vendor Lock-In

Beyond the technical capabilities of a particular solution, the next most critical topic is vendor lock-in. With vendor lock-in, a solution and its vendor are mission-critical and cannot easily be replaced. This allows the vendor to dictate the price for any innovation, creating a distinct disadvantage for the operator.

A productized software solution is one of the best ways to mitigate the risk of a vendor lock-in. With configurable software, the operator can independently design and use new features. With a configurable interface adapter, it can even introduce new devices and modules without additional programming.

Finally, with a productized software solution strategy, the cost for the operator is limited to software upgrade and maintenance. Upgrading all customers is in the best interest of the supplier as the maintenance cost for older versions will increase with each new version.

Remaining Successful in a Digital World

Overall, how CTOs respond to these challenges will determine the overall success of an organization's digital transformation and its ability to remain competitive in a digital world. An integrated software solution for network infrastructure management that delivers and maintains an accurate, up-to-date inventory of all physical, logical and virtual network and service resources is vital to achieve a holistic view of all assets and resources.

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The resulting transparency is the hallmark of a modern infrastructure. It enables providers to maximize the use of network resources to make confident decisions about how to plan, build, deploy and manage the business. Additionally, this visibility enables providers to convert emerging opportunities into revenue by making sure they have the information and tools needed to support not only existing networks but also networks of the future as they undergo digital transformation.