

Transforming Fiber Backhaul Rollout: The Need for Optical Fiber Lifecycle Management Systems

Abstract

Fiber has become the backhaul medium of choice in the 5G era, offering a faster internet speed with the use of wavelength division multiplexing (WDM). While the cost of fiber has fallen in recent years, a wide coverage of area in fiber backhaul network still makes it a costly undertaking.

For communications service providers (CSPs) the dilemma is to choose between greenfield or brownfield approach, integrating legacy infrastructure, and managing capex. The complexities in rolling out a fiber network include consensus among stakeholders--telecom operators, network asset owners, the design and field survey teams, construction teams, power companies, and external regulatory and compliance bodies.

This paper discusses the urgent need of an integrated Optical Fiber Lifecycle Management system to aid CSPs to scale their operations with speed and certainty.

The Network Conundrum

EY, in a September 2019 Global Telecommunications study¹, found that about 36.3% of CSPs automation initiatives are focused on network management. For these CSPs, the share of IT capex for digital infrastructure and associated software is expected to grow from 30% to 86% by 2025. In fact, in a recent Light Reading article², Ericsson argued that the COVID-19 crisis could ultimately reward operators that have invested in the quality of their networks. In their study, they found that service providers with the highest network quality enjoyed on an average 30% higher average revenue per user (ARPU). Also, the average churn was lower by a fourth when compared to service providers with the lowest network quality.

In our own experience, CSPs tend to use disparate tools and manual processes to organize the various stages of network planning, design, rollout and ongoing management. At best, some CSPs draw on a number of separate lifecycle management modules. This approach affects construction time and cost, and overall time-to-market for new services. A poorly designed network requires frequent rework, contributes to longer routes for network deployment and is a cause for inflated budgets.

A Simple Resolution

An effective way of addressing these challenges is the use of a comprehensive management system that covers the entire fiber rollout and connects all the stakeholders through a centralized portal.

An integrated optical fiber network lifecycle management system provides a software-based automated process stretching from the planning phase all the way to the network going live.

The software helps project leaders orchestrate workflows across the multiple stakeholders involved in the rollout, considering their varying interdependencies as the project progresses.

While workflows for network rollout are typically set up by design teams and followed through by the construction team, the automation of process enables the end-to-end management of service without any manual intervention. This enables the functional teams to focus on their core priorities rather than having to take on the wider role of project management as well.

More importantly, the software-centric approach can significantly reduce the capex, overall cost per home passed and time and risk for the project owner. It also enhances customer experience.

Need for an Integrated E2E Platform

Customer expectations for an end-to-end automated and cognitive solution has been on the rise. A high level of automation and integration between the different project players and the processes implicitly helps CSPs to accelerate the deployment of their network besides eliminating errors and delays.

Moreover, design accuracy is improved significantly compared to traditional approaches as a result of automating processes such as fiber routing and network mapping using algorithms. Intelligent automation can help CSPs to identify gaps and layout new network routes to supplement their existing infrastructure.

The system must also automatically generate, collect and validate field data, create single-line drawings, construction plans, the bill of materials (BOM) and the bill of quantities (BOQ).

We believe that the possible potential improvement with automation for any major telco can be as much as:

- 30% reduction in cycle time³
- Over 99% Right First Time design³
- 30% cost reduction³
- 95% constructible design, i.e., zero deviation during construction³

By tying stakeholders together more tightly, giving them a dashboard view of the project and automating large parts of the deployment, a fiber rollout as a service can help project managers to manage the costs and resource wastage more proactively by addressing BOM and BOQ slippages quickly.

Similarly, the enhanced visibility and real-time updates on the status of the deployment (as-built) means that issues can be detected and addressed earlier in the lifecycle. Afterwards, joint field walkouts with all the relevant stakeholders can be held to review node locations and network route for example, to pre-empt construction-related delays.

Overall, the standardized, integrated approach therefore also supports quality assurance.

The Fiber Rollout Workflow

Fiber rollout as a service can be a digitally enabled end-to-end orchestration engine for network planning and designing across multiple technologies (GPON-FTTC/FTTN/FTTP), which brings in the power of automation to achieve scalability, speed and

certainty for network rollout. It can act as a single source of truth for all the stakeholders, providing:

- An integrated workbench for automating plan and design activities
- A comprehensive defect management tool
- A field force application to capture data digitally with hand held devices
- A real-time SW-centric workforce alignment and tracking tool
- A network enablement, installation and fault repair tool
- A document repository with a version control system
- A workflow manager to handle automation across multiple stakeholders

Conclusion

As we recover from the pandemic, an implicit need is to scrutinize CAPEX investments. Rolling out any kind of network is costly and risky and ultimately time to market is critical for the CSP's return on investment. This is more challenging for fiber networks due to the higher cost and practical challenges involved.

Based on our learnings across the globe, we recommend an integrated solution that enables network operators to roll out fiber network better, faster and cheaper. At the heart of the proposed framework is enabling automation and integration of all stakeholders into a coordinated workflow for a higher level of visibility and customer-centricity. Stakeholders can get a 360-degree view of the project, enabling them to manage each stage more quickly and effectively.

We believe that technology will be a key enabler for business orchestration as real-time insight and automation will be a requisite for CSPs in the post COVID-19 world. The future will be about building resilience, adaptability, and leading with purpose-centricity.

References

- [1] EY, *Global telecommunications study 2019, September 2019, 3rd February 2020*, [https://www.ey.com/Publication/vwLUAssets/ey-accelerating-the-intelligent-enterprise/\\$FILE/ey-accelerating-the-intelligent-enterprise.pdf](https://www.ey.com/Publication/vwLUAssets/ey-accelerating-the-intelligent-enterprise/$FILE/ey-accelerating-the-intelligent-enterprise.pdf)
- [2] Light Reading, *Behind the numbers: How COVID-19 could change the US telecom industry, 30 March 2020, accessed 24 April 2020*, <https://www.lightreading.com/services/behind-the-numbers-how-covid-19-could-change-the-us-telecom-industry/d/d-id/758555>
- [3] *Measured against TCS project using the traditional approach*

About The Authors

Aqil Ahmed,

*Sr. Business Consultant,
Head - Network Plan and
Design - Network Solutions Group*

Aqil Ahmed is responsible for Network Plan and Design in the Communications, Media and Information Services business group at TCS. He has over 23 years of experience, having worked with telecom operators globally on Optical Fiber Transmission roll out programs.

Ritika Chaudhry,
Functional Consultant

Ritika is a functional consultant with NSG, in the Communications, Media and Information Services business group at TCS with over 11 years of cross-functional and global experience. She specializes in delivering plan and design projects of network rollout, developing client relationships and managing complex telecom projects.

Gaurav Garg,
Sr. Telecom Solution Consultant

Gaurav is a senior consultant in the Communications, Media and Information Services business group at TCS with over 18 years of experience in the telecom domain. He has deep insights across the value chain of a telco, from multi technology physical network to network operations and activations.

Contact

Visit the [Communications, Media & Technology](http://www.tcs.com) page on www.tcs.com

Email: global.cmi@tcs.com

Blog: [Next Gen CMI](#)

Subscribe to TCS White Papers

TCS.com RSS: http://www.tcs.com/rss_feeds/Pages/feed.aspx?f=w

Feedburner: <http://feeds2.feedburner.com/tcswhitepapers>

About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled, infrastructure, engineering and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

For more information, visit us at www.tcs.com

All content / information present here is the exclusive property of Tata Consultancy Services Limited (TCS). The content / information contained here is correct at the time of publishing. No material from here may be copied, modified, reproduced, republished, uploaded, transmitted, posted or distributed in any form without prior written permission from TCS. Unauthorized use of the content / information appearing here may violate copyright, trademark and other applicable laws, and could result in criminal or civil penalties. Copyright © 2020 Tata Consultancy Services Limited