

Meeting the Challenges of FTTx Deployment

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Introduction

In today's rapidly changing Telecoms marketplace, fixed line service providers face many challenges as they compete for greater market share and look to provide next generation services. The increased demand for higher bandwidth broadband, 'quad-play' services including high speed data voice, video-on-demand and IPTV has focused service providers on the need to invest in cutting edge solutions. To remain competitive, this has been based upon the deployment of Next Generation Networks (NGN), Fibre-To-The-x (home/premises/building/cabinet/curb/node) technology.

The situation necessitates that critical strategic, market analysis, network planning, build and operations support decisions need to be taken to ensure that an adequate return-on-investment is achieved through determining the best, and most cost effective, path for network deployment. To implement this, service providers need to define comprehensive frameworks that can effectively manage the complex hand-offs and interactions in the deployment process, underpinned by strategic investment in the systems, tools and skilled resources, required to effectively deliver an FTTx programme.

FTTx Deployment Challenges

In their core business, fixed line service providers face increasing competition from mobile, cable and internet service providers, which coupled with the convergence of fixed, mobile, data and cable networks, present a number of commercial, technical, organisational and regulatory challenges for FTTx deployment. This includes the following:

- **Strategy** – Defining a cohesive FTTx rollout strategy to ensure that Plan, Build, Operate and Maintain processes are optimised to meet business, regulatory, competitive and time pressures for the provision of new services and 'Homes Passed'.
- **Network Planning & Engineering** – Deploying fibre for Greenfield or Brownfield/Overlay implementations, such as incumbent operators with existing copper network infrastructures, require critical planning and design decisions to be made in terms of selecting the right access technology (e.g. GPON, EPON or P2P), and FTTx architecture (e.g. FTTh/p/b/c/n).
- **Operations Support and Readiness** – The complexities of legacy copper/fibre network inventory data systems and their migration to integrated NGOSS systems, pose a significant challenge to

providing effective physical/logical network inventory management and operations support, pre and post deployment. Service fulfilment and assurance requirements necessitate enhanced OSS capabilities if broadband investments are to deliver business value.

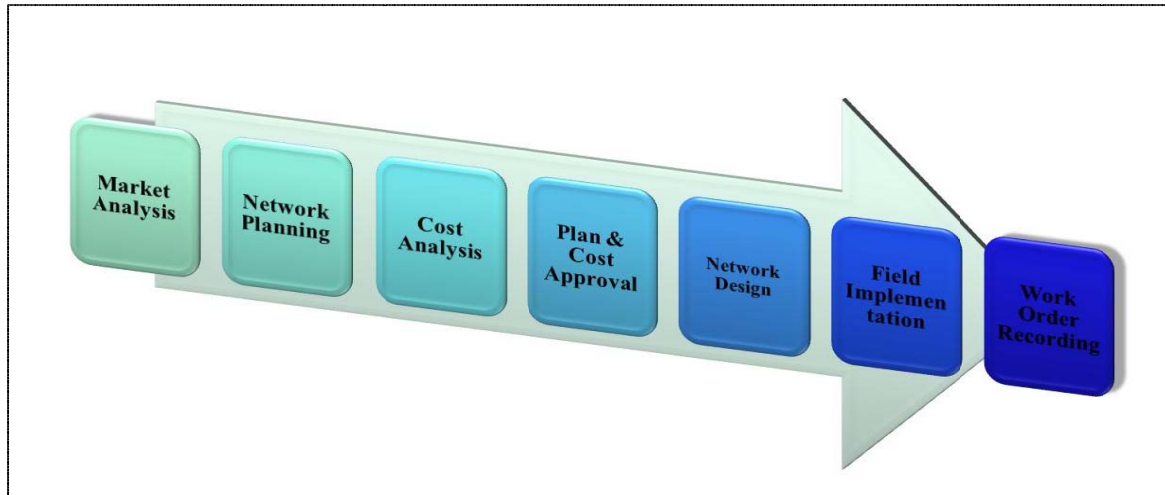
- **Cost Efficiency** – Reducing CAPEX and OPEX is a critical factor for deployment, which requires estimating costs accurately before starting plan and build work; scaling resourcing to increase efficiencies, and optimising costs in network planning, design, implement and operate phases.
- **Skills & Capabilities** - Training and deploying teams effectively to deliver and support FTTx solutions and services due to resources, often trained in legacy copper infrastructure, lacking core skills in fibre network planning, engineering processes and systems.
- **Technology** – Competitive high speed broadband service offerings from mobile, cable and internet service providers using technologies including 3/4G, LTE, Wi-Max, DOCSIS 3.0 and VDSL .
- **Regulatory** – Pressures , including tight timescales on incumbents for the provision of ‘Homes Passed’, from government initiatives for expansion of FTTx based broadband services, local loop access and network interoperability issues and obtaining civil and municipal permissions (way leaves) for laying fibre network infrastructure.

Meeting the Challenges: Plan to Build

To meet the challenges of deploying Next Generation Fibre Networks, service providers can utilise or develop delivery frameworks that leverage a mix of strategic, business, technology and marketing skills to enable the successful deployment of scalable and cost effective FTTx access networks. This approach enables service providers to realise key business objectives, provide customer satisfaction, reduce churn and build average revenue per user (ARPU) through the fast and efficient delivery of next generation services.

An example of such a framework is Infotech Enterprises’ ‘Plan to Build’ seven step FTTx deployment process, that aims to ensure that service providers’ Next Generation Fibre Networks are optimised and deployed to budget and on time. The process delivers the complete end-to-end lifecycle for FTTx implementation from market analysis through to work order recording and maintenance.

The process lifecycle is comprised of the following steps: **Market Analysis, Network Planning, Cost Analysis, Plan & Cost Approval, Network Design, Field Implementation** and **Work Order Recording**. Services or support can be offered in each or all of these areas, based on the service provider requirement:



Plan to Build FTTx Deployment process

- **Market analysis** – By using best practice processes and software tools to produce detailed reports (including customer demographics, topography, property details and competitor analysis), service providers are presented with a clearer understanding of customer demand and market conditions required to implement their FTTx strategy.
- **Network Planning** – Skilled planning and engineering professionals trained in industry recognised processes, tools and systems can be utilised so that service providers ensure the network is planned to meet projected customer demand. This can be carried out by selecting the right elements and equipment required to meet customer and regulatory requirements.
- **Cost Analysis** – Industry standard cost modelling techniques and tools are used to validate FTTx strategies with associated construction and equipment costs, ensuring that deployments are optimised whilst balancing capacity and coverage.
- **Plan & Cost Approval** - Ensures approval by the network planning department for the implementation of specific deployments at regional or exchange level, and compliance with the selected FTTx technology.
- **Network Design** - The management of the information necessary to enable detailed design and construction of the planned network is a critical step in the deployment process. This can be achieved by using leading edge design systems and tools, and supported by skilled and certified resources. This will help to prepare and process design work orders that capture details related to network path, facilities, equipment, and connectivity required to implement the planned network.
- **Field Implementation** - After approval of the costing and design by the network planning department, field engineering implements the construction of the physical network converting work orders to As-built states. Careful management and co-ordination of the process hand-offs between field engineering, operations support teams and invariably, third party contractors, is a key factor for ensuring effective and timely deployment.
- **Work Order Recording** – Triggers payment for the construction stage by supporting accurate recording of the network as it is deployed, thereby eliminating backlog. The integration and automation of systems and tools required to effectively track and manage work orders and As-built records is essential in ensuring that recording and verification activities are efficiently managed and supported during and after deployment.

Network Inventory Management and Operations Support

A critical consideration in supporting the FTTx deployment process is the management of the physical and logical network inventory data, and operations support systems necessary in delivering service fulfilment and assurance. This requires service providers investing in Next Generation OSS (NGOSS) capabilities to ensure that customers and services are effectively managed by consolidating and centralising provisioning, inventory and assurance functionalities. In this context overcoming the challenges in the following areas are critical to successful pre and post deployment support:

- **NGOSS deployment and legacy systems replacement** – The existence of disparate legacy inventory management systems for fibre and copper networks linked to existing services, and the requirements for deploying and integrating NGOSS inventory management systems, pose a significant challenge for service providers in decommissioning these systems and migrating the data from different sources to a consolidated target system. As part of the deployment strategy service providers need to adopt a business and service focused (rather than an engineering-centric) approach to implement an inventory management solution that utilises the right mix of skills and technology, whether these are sourced internally or via a third party.
- **Data Migration and Maintenance** – Defining and implementing an effective strategy for data migration to scalable NGOSS system(s) is critical to managing the customer, logical and physical inventory assets to support service fulfilment. Service providers need to carefully plan migration activities due to the existence of interconnected copper and fibre networks maintained in legacy systems, and the creation of new fibre assets to support new services. Post deployment, implementing robust processes and skilled resources to manage and maintain the deployed data and systems, respectively, is critical to ensuring effective service and operations management for business-as-usual (BAU) activities.

Delivery Models

A key requirement for meeting FTTx deployment targets is the delivery model that service providers ultimately implement. This needs to ensure that the right skills and resources are utilised and deployed, to provide business value and return on investment, whilst minimising costs.

In this context, there are a number of different approaches, including cross training of existing planning; engineering and operations teams in next generation fibre technologies, and alternative outsourcing/offshoring (or hybrid onshore/offshore) models that can be used to ensure cost effectiveness whilst maintaining the quality of delivery on time and to budget. This may involve partnering with third party suppliers or technology services organisations who have the industry experience, skills and delivery capabilities to implement these models.

Choosing the right approach depends on a number of factors including secure access to systems and network data; industrial relations, and competitive, commercial, and skills competency considerations that service providers need to address before committing to a specific model.

Summary

Next Generation Networks, using FTTx technology, present great opportunities for fixed line service providers wanting to leverage the higher speeds and new broadband services that they support.

However, there are significant competitive, regulatory, commercial and technical challenges that need to be overcome to successfully deploy and manage these networks.

To mitigate these challenges it is essential that service providers utilise deployment frameworks supported by experienced resources and industry recognised tools, systems and methods at each stage of the FTTx implementation lifecycle. Furthermore, the importance of implementing a business-centric strategy towards managing physical and logical network inventory data and operations support requirements, through the deployment of NGOSS solutions, is key to delivering efficient, reliable, scalable and cost effective service fulfilment and assurance.

Adopting the right delivery model, which includes potentially selecting the right partners, for implementation is also a critical consideration for ensuring cost efficiencies whilst maintaining the quality and speed of deployment to meet the increasing customer, commercial and regulatory demands of the high speed broadband marketplace.