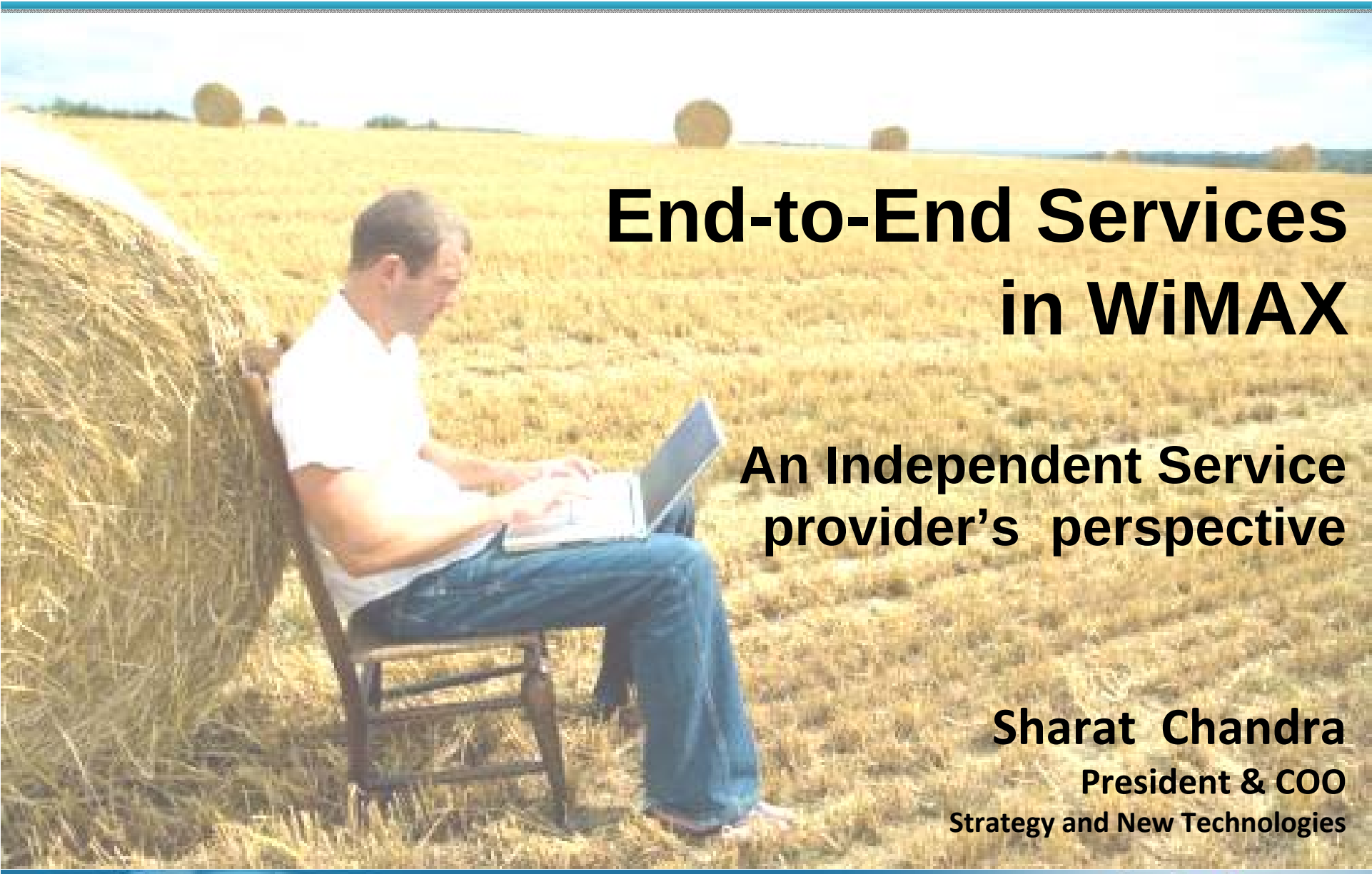


End-to-End Services in WiMAX

An Independent Service provider's perspective

Sharat Chandra
President & COO
Strategy and New Technologies

Networking the World

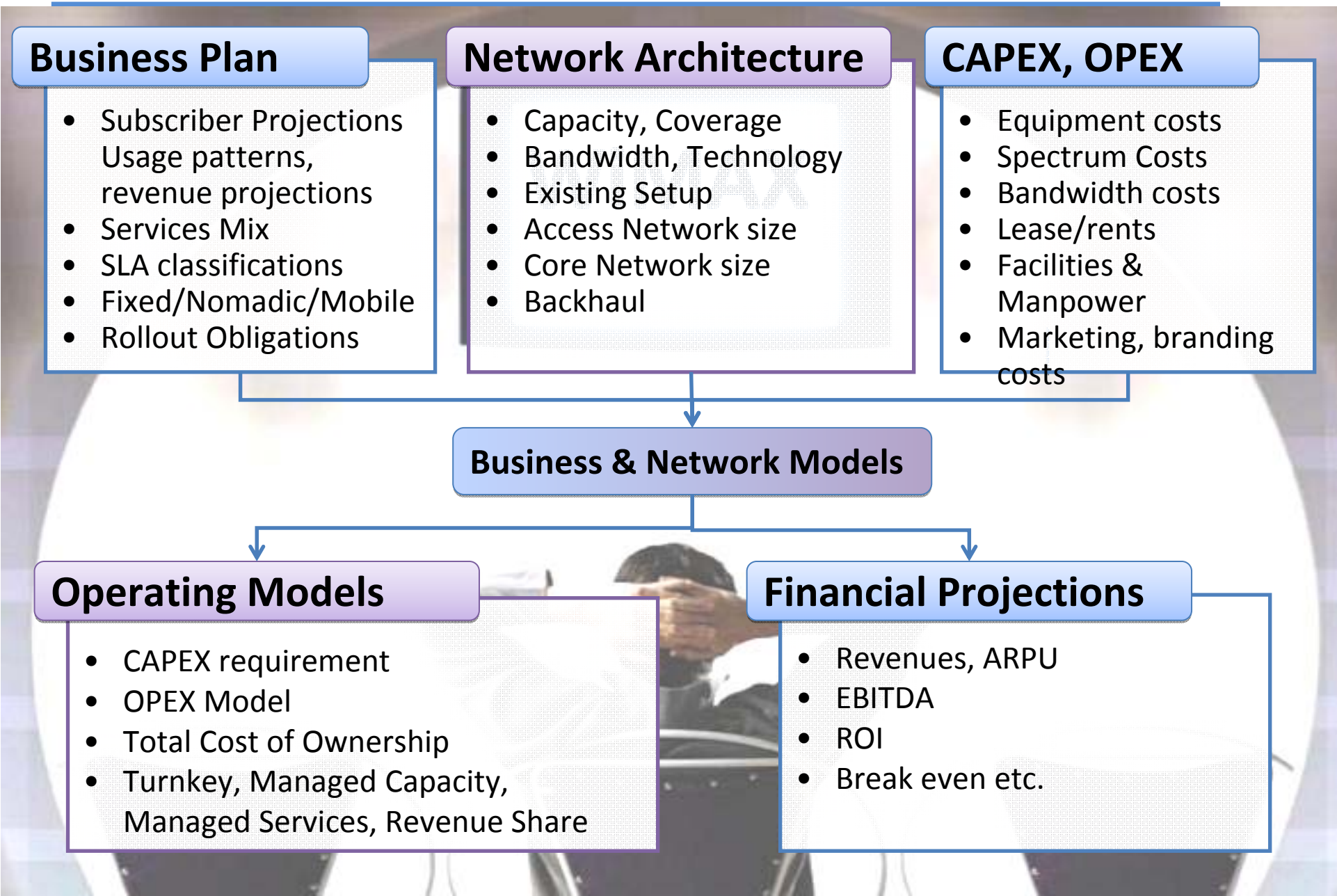
GTL
GLOBAL Group Enterprise

Agenda

- WiMAX Operator Needs
- Technology Perspective
- Operating Models
- Managed Services Approach
- Strengths and Capabilities
- Summary

WiMAX Operator Needs

Before License Acquisition



Business Plan

- Subscriber Projections Usage patterns, revenue projections
- Services Mix
- SLA classifications
- Fixed/Nomadic/Mobile
- Rollout Obligations

Network Architecture

- Capacity, Coverage
- Bandwidth, Technology
- Existing Setup
- Access Network size
- Core Network size
- Backhaul

CAPEX, OPEX

- Equipment costs
- Spectrum Costs
- Bandwidth costs
- Lease/rents
- Facilities & Manpower
- Marketing, branding costs

Business & Network Models

Operating Models

- CAPEX requirement
- OPEX Model
- Total Cost of Ownership
- Turnkey, Managed Capacity, Managed Services, Revenue Share

Financial Projections

- Revenues, ARPU
- EBITDA
- ROI
- Break even etc.

… and After acquiring License

Rollout Preparation

- Access Network Planning
- Rollout Plan as per business model outputs
- Marketing, branding, customer services, facilities planning
- Feasibility Studies, Benchmarking of technology/equipments

Partner Selection & Engagement

- Partner Engagement Model
- Partner evaluations
- Contract Framing
- Agreement on KPIs/SLAs, QoS
- Interface Levels with partner, Communication Formats
- Organizational Transfer, if any

Service Delivery

- Network Engineering
- Network Deployment (Access & Core)
- Integration
- Operations & Maintenance

……During Operations

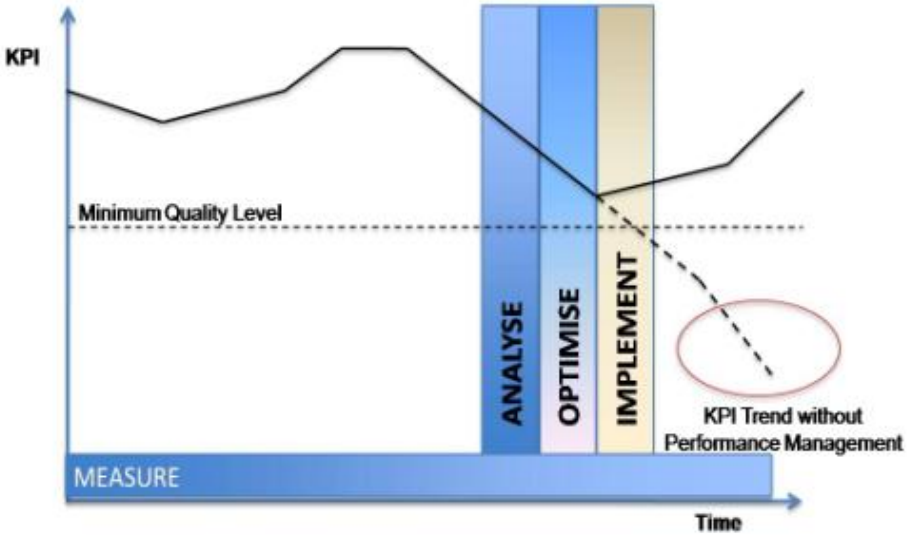
With high demand for quality of data and voice, tracking of network performance is imperative

Managing QoS & traffic takes precedence over rollout, to maximise QoE & minimize churn

Complex all-IP networks demand continuous monitoring & management of KPI, SLA & QoS

Performance Management becomes key to customer satisfaction

KPI vigil, periodic analysis, optimisation & implementation of preventive measures ensure network health



Technology Perspective

WiMAX – Enabler for new business models & services

- Commercially available NOW
- Existing Ecosystem
- An All-IP Solution
- Open Standard for Service Innovation
- Last Mile as well as Backhaul
- Fixed, Nomadic, Mobile

SERVICE ENABLER

INTERNET

MOBILITY

VOICE

VPN

VIDEO

BUSINESS CONNECTIVITY

GAMING

TELE-MEDICINE

IP TV

E-EDUCATION

BACKHAUL

E-GOVERNANCE

Operator Opportunities in WiMAX

- Attractive to new entrants
- Alternative to existing legacy fixed networks
- Great potential for rural and remote areas
- Straight forward implementation
- IP Based multi-purpose platforms
- Significantly faster than HSDPA -WiMAX Forum
- OFDMA for higher bandwidth efficiency
- The Mobility promise
- Equipment available in 2.3-2.7, 3.4-6 & 5.8 GHz -WiMAX Forum

WiMAX growth in India - Hurdles

Spectrum & Regulatory Issues

- Huge opportunity loses due to spectrum delays
- Impact of spectrum costs on choice of operating models

Disruptive Costs Points

- Subscription costs comparable to existing wired broadband
- Driven by sub-$10/month ARPU for mass market deployment
- Sub-$100 - $150 CPEs required

Overlay of WiMAX over existing 2G-3G networks

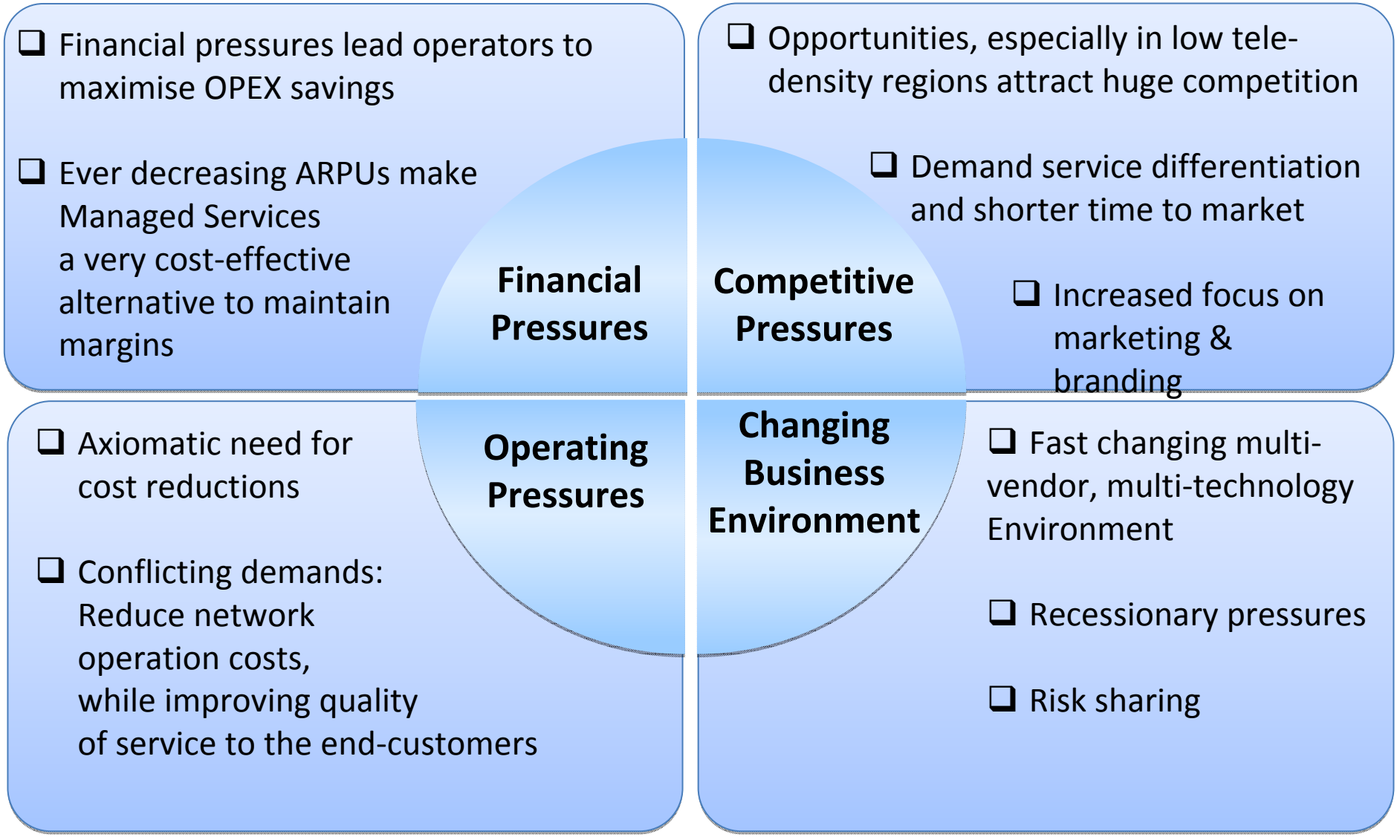
- Integration complexities
- Cost segregations

Availability of ultra-low cost devices

- Computer penetration hampered by the lack of sub-$300 full featured computers

Operating Models

Drivers for alternative operating models



Managed Capacity Model

Main goal: Reduce initial CAPEX requirements of the operator by sharing business risks

MC provider shares CAPEX risk with operator to offer a ‘pay for capacity’ model

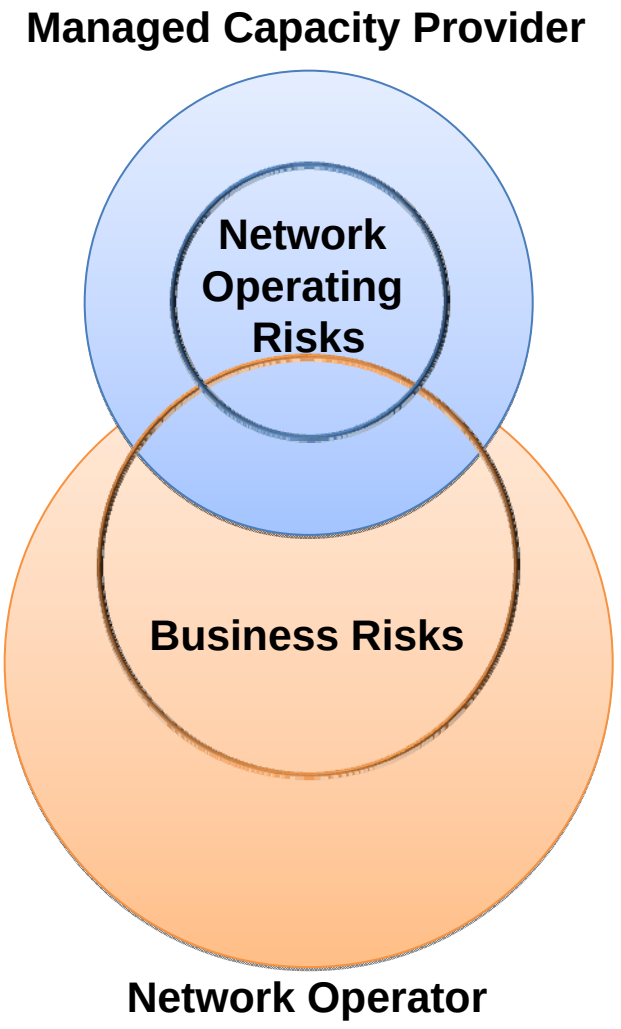
Combines advantages of not only sharing operating risks but also sharing of business risks

Operator states the coverage, capacity requirements & rollout priorities

While MC provider does sizing & roll out to deliver capacity to meet targets

MC provider is paid as per capacity and services used by the subscribers

Payout to MC provider gets tied to success of business rather than just efficient running of network

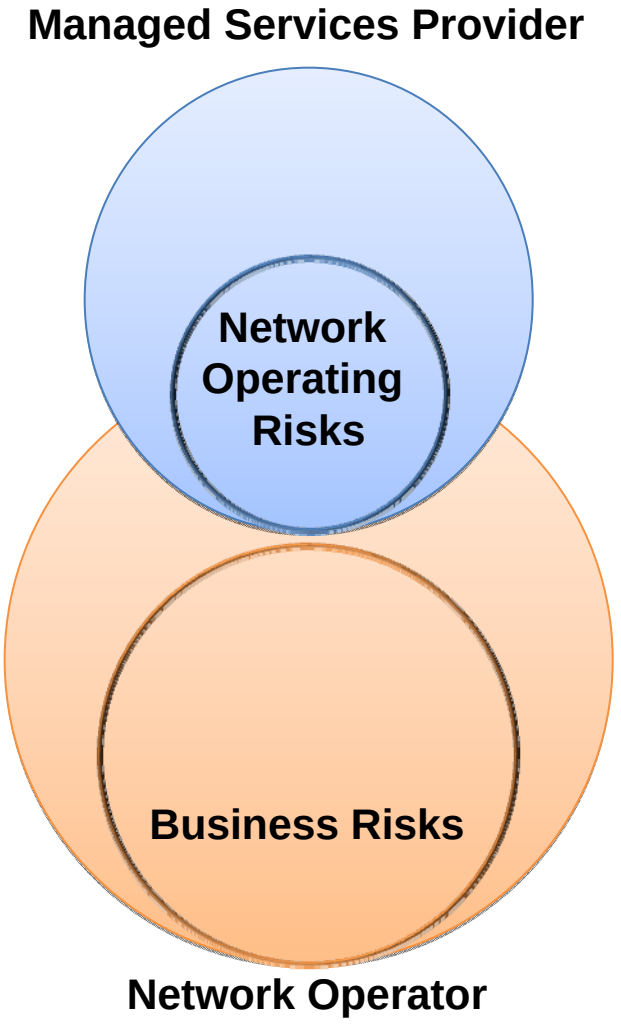


Managed Capacity (Contd.)

Merits	Demerits
Lower Initial CAPEX	Diligent partner selection
Low Total Cost of Ownership	Cost of finance gets included in OPEX payout
Payment based on risk/reward	Complex Measurement Mechanism
Suitably adjust to changing market and subscriber expectations	Heavy reliance on partner skills
Align OPEX with capacity delivered	Data security and privacy

Managed Services Model

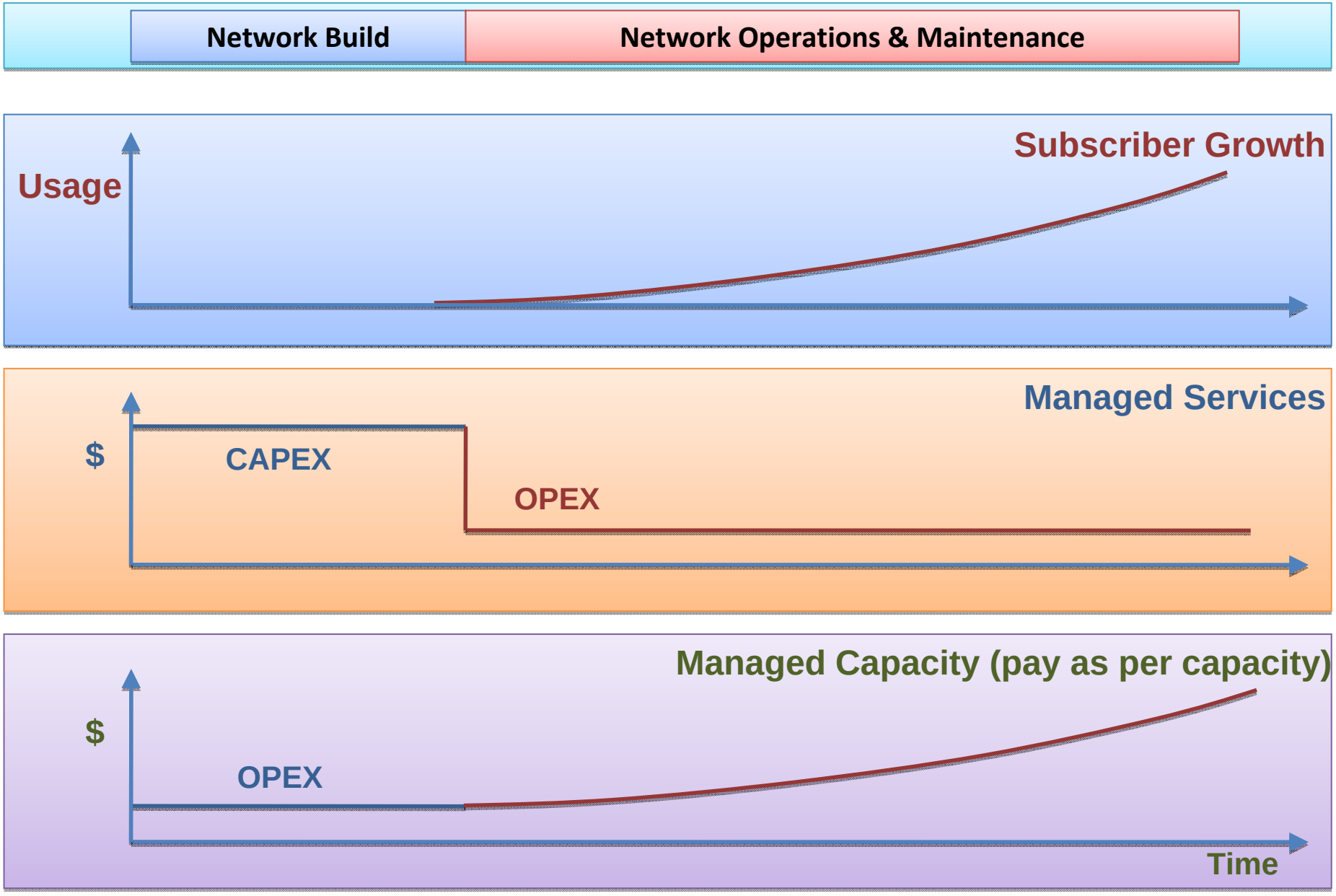
- Main goal: OPEX reduction, free resources & focus on core business
- OEM along with a services partner provide Managed Services to the operator
- Operator concentrates on marketing & growing the business
- While MS provider builds &manages the network
- Operator benefits from significant reduction in OPEX as expertise of MS provider are utilized
- Reduces total cost of ownership as MS provider uses its organization or does a resource transfer
- Payout to MS provider depends on network performance KPI and SLA



Managed Services (Contd.)

Merits	Demerits
Operator can focus on core business	OPEX not associated with network usage
Optimisation on infrastructure facilities requirements	Discomfort from lack of ownership of network
Low Total Cost of Ownership	Data Security & Privacy
Payment tightly linked to KPI / SLA of network	Meticulous negotiations & agreements
Avoids management of multiple vendors	Heavy reliance on partner skills

Managed Capacity & Managed Services Payout Model



Mitigation of risks for effective launch of service

Selection of right operating model

- Turnkey, Managed Services, Managed Capacity, Franchisee based revenue share

Long standing, committed partnerships

- Reliable partner for supply and services capable of scaling up/down as per business needs
- Willing to share risks

Robust service platform to adapt to market requirement

- Scalable platform to easily integrate new technologies and services
- Create synergies with existing infrastructure

Low TCO by sharing of infrastructure, resources etc

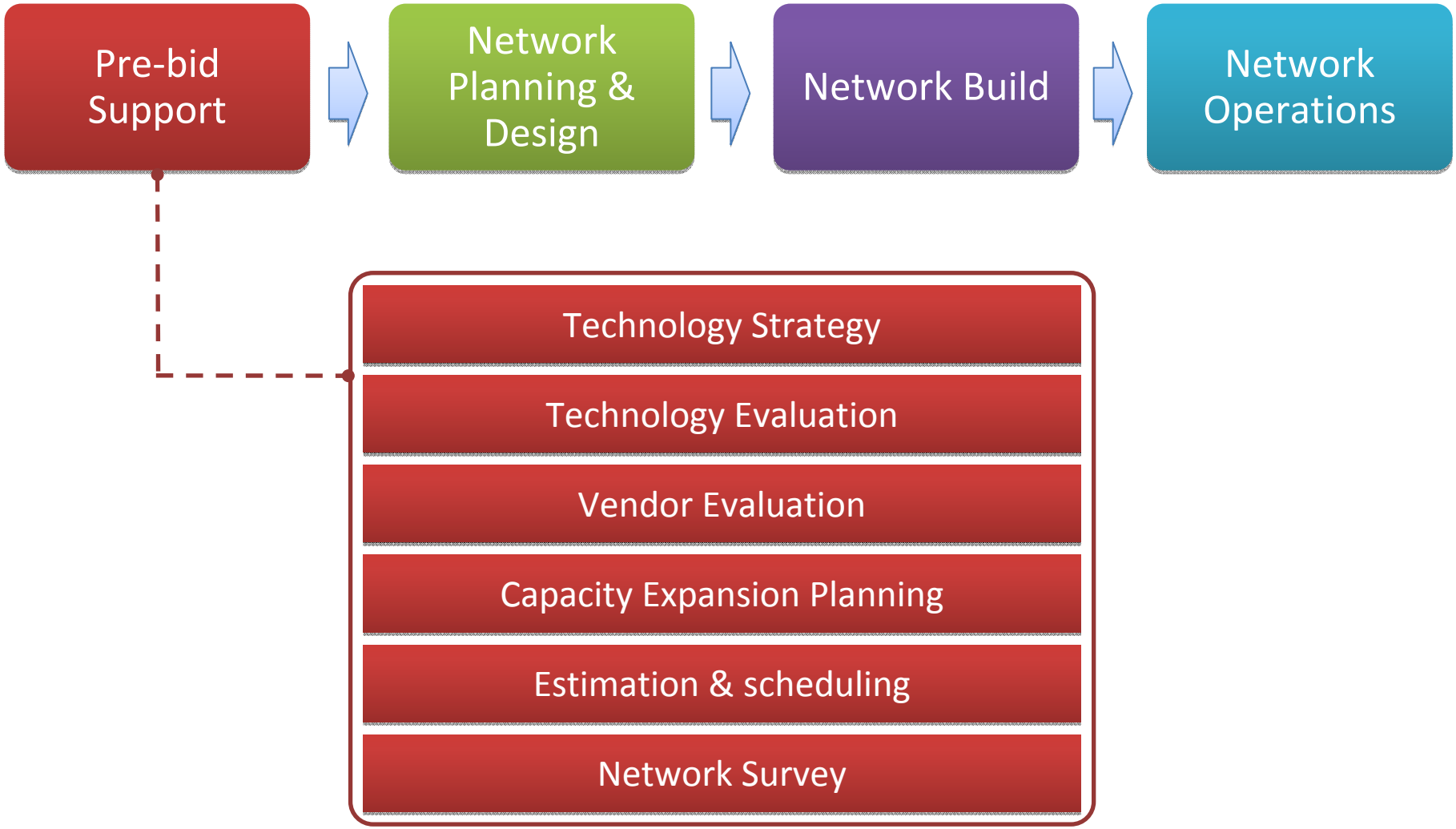
- Mitigate duplication risks
- Maximise efficiencies

GTL's approach to Managed Services

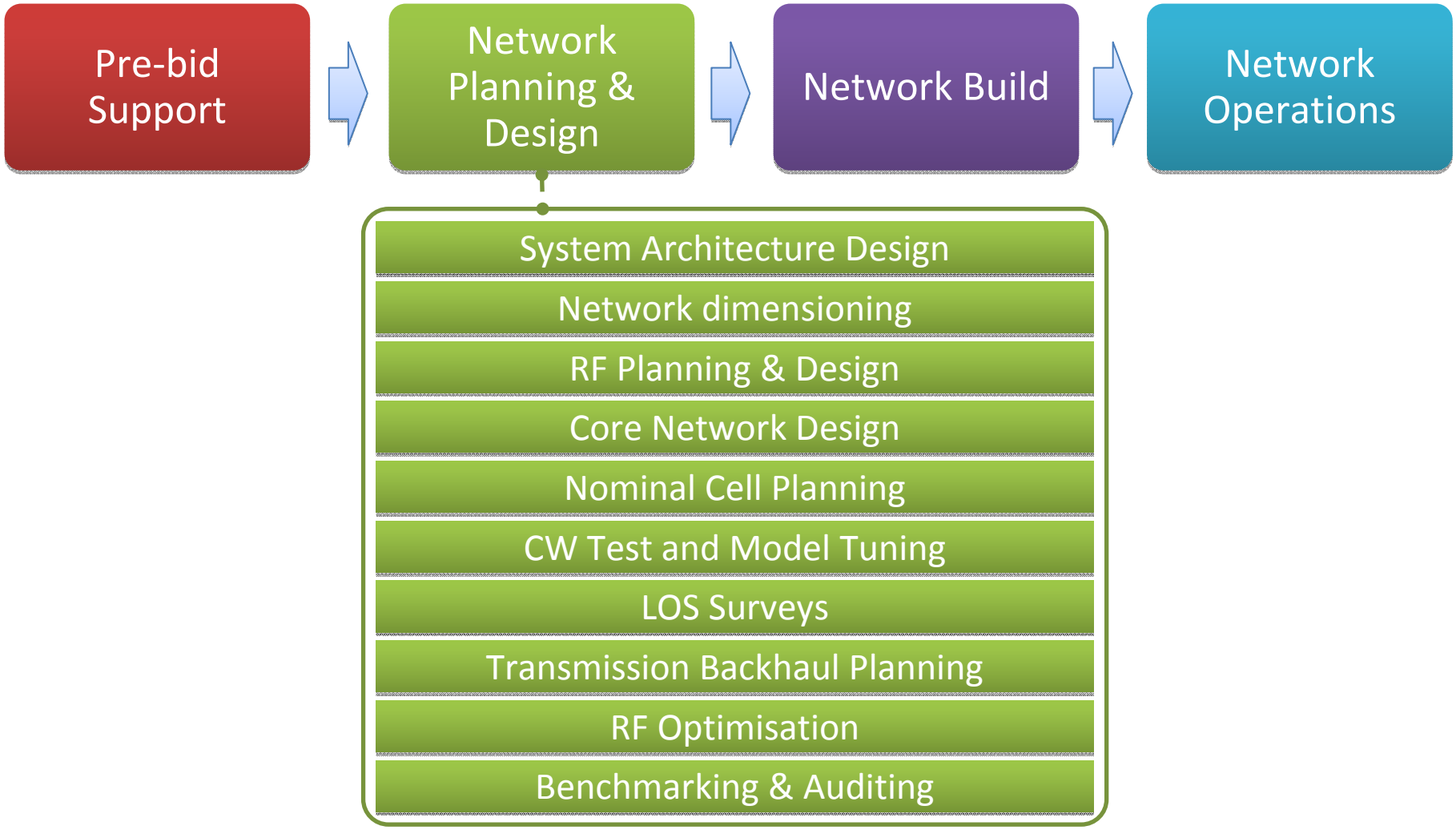
GTL's Managed Services Approach

- Core, Non-core?
- Managed Services objectives, goals, scope
- KPI / SLA /QoS definitions
- Measurement Mechanisms
- Organisational interfacing
- Network Operations as per KPI / SLA
- Exit Transition

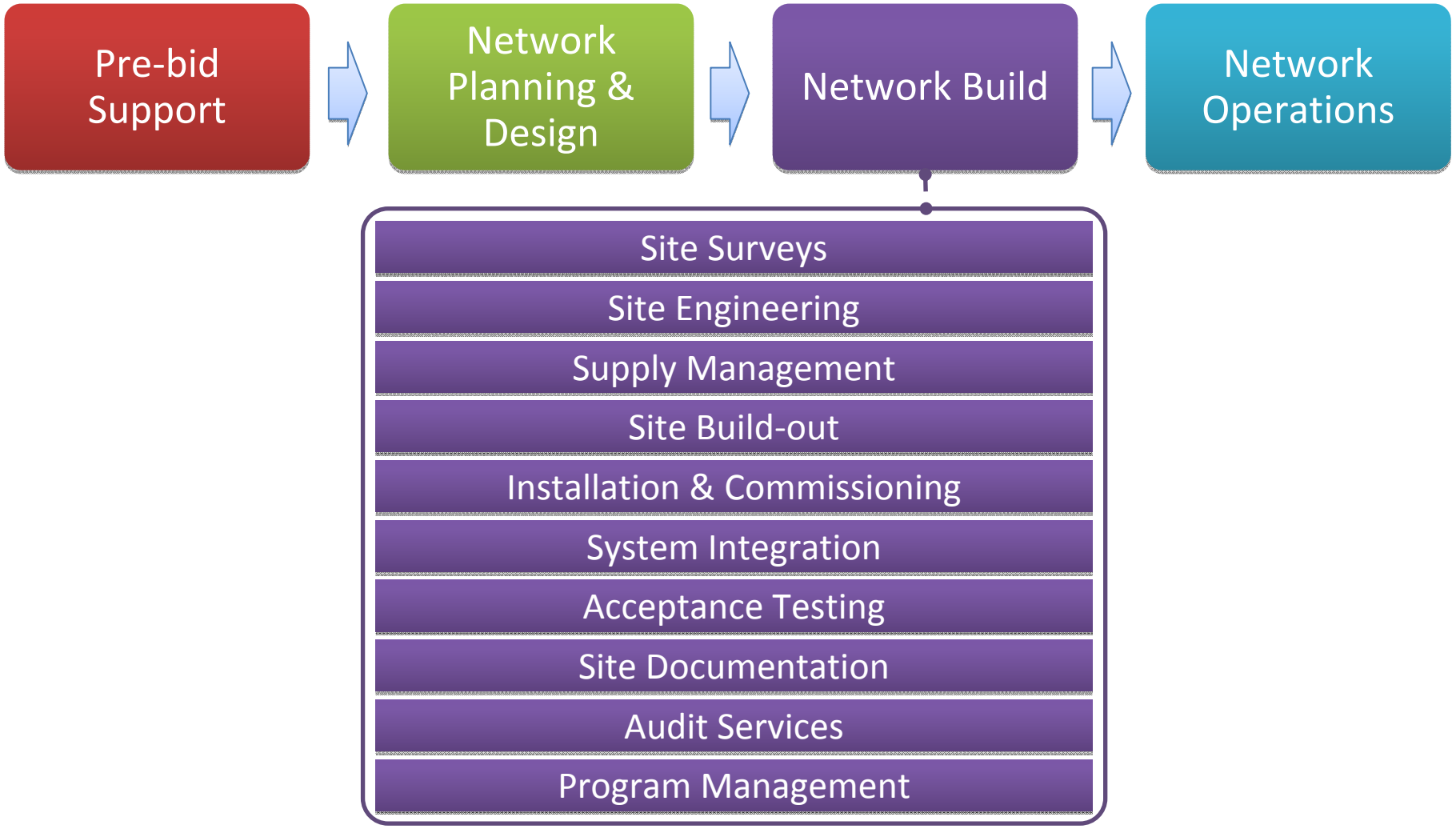
Managed Services Capabilities



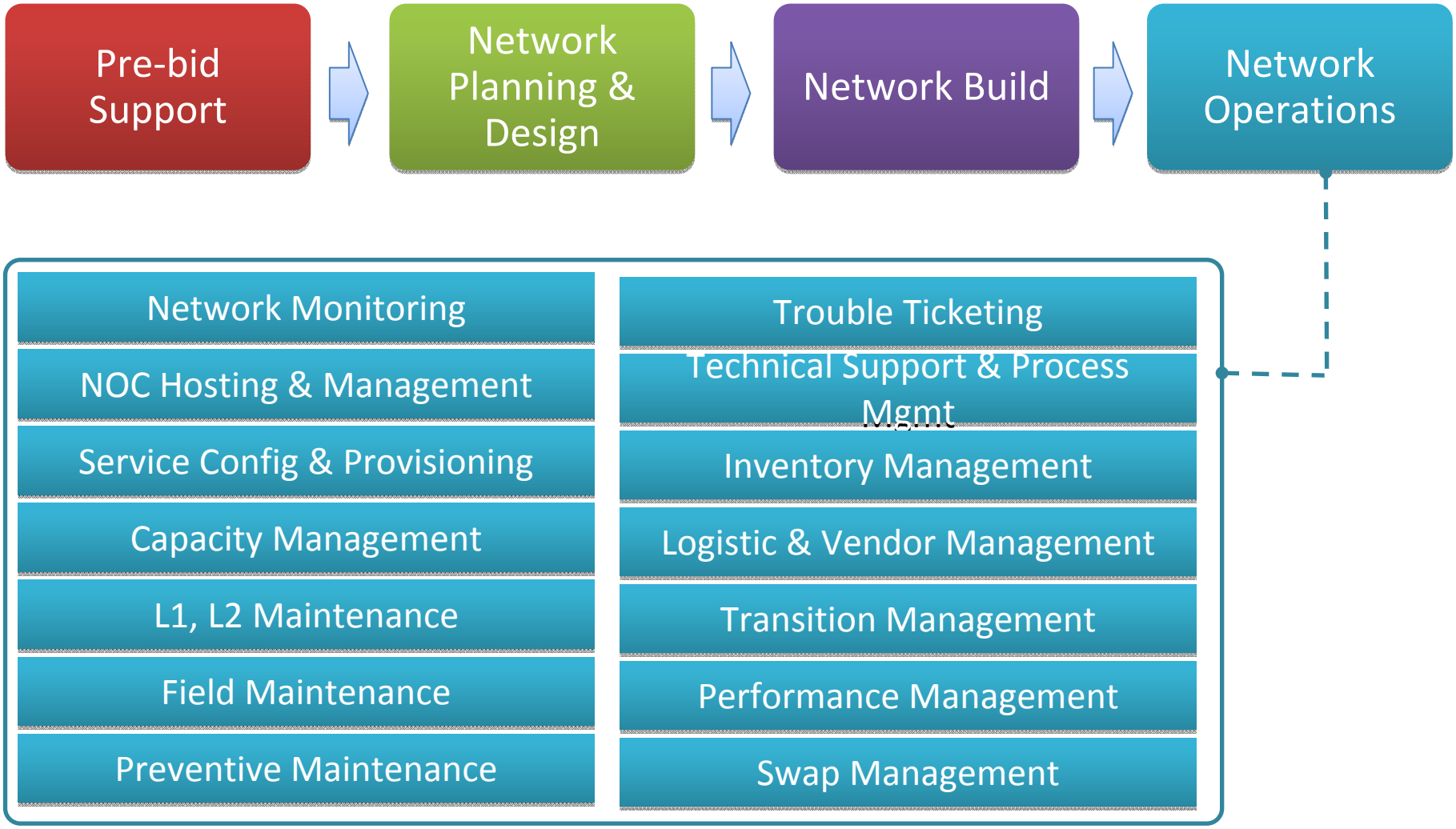
Managed Services Capabilities



Managed Services Capabilities



Managed Services Capabilities



GTL's Managed Services Experience

Managed Services for one of India's largest telecom operators

GTL is currently engaged with one of India's largest operator to provide Managed Services for their WiMAX network. The solution includes KPI/SLA based network planning, design, build and operations with NOC hosting and management

Network Planning	**Service Assurance & TAC Support**
Network Implementation & Integration	**Infrastructure and Installation items**
Network Operations	**Network Operations Centre (NOC)**
Feasibility	**Test Equipment**
Service Delivery	**Online Portal**

GTL Strengths

More than two decades of experience in providing network services

Vendor and technology agnostic independent Telecom service provider

Service offerings encompass entire network life cycle from Network Planning and Design, Build, Optimization, Operations & Maintenance

Valuable mix of onsite and off shore technical services, be it RF related work, Program management or even NOC management

Pan India presence along with experience in more than 40 countries

Images Courtesy: Punchstock, Getty Images