GTL

WiMAX
Out of Box Approach to Technology Seeding

Sharat Chandra,
President & COO - Strategy & New Technologies

Safe harbor

Agenda

Subscriber Expectations

Operator Needs & Expectations

Market Challenges

Business Drivers

Imperatives for New Technology

WiMax Academy & Lab

Ecosystem Balance

In Conclusion

Subscriber Expectations

ENTERPRISE CUSTOMER

- Guaranteed bandwidth
- Analog T1, E1 extensions
- Burstable bandwidth
- Bandwidth on demand

METRO MOBILITY CUSTOMER

- Mobility within a large area (>100 Km)
- Cost effective ease of use
- Should work with any IP network

STATIONARY CUSTOMER

- Protection against Bandwidth hogs
- Safeguard against theft of service and Denial of Service attacks

Operator Needs & Expectations

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MOBILE OPERATORS

- Expand personal broadband services to areas where 3G may not be available
- Reduce cost/bit/Hz over the access network

FIXED NETWORK OPERATORS

- Enhance Fixed broadband offerings with Personal Broadband services
- Improved economics for "Hot Zone" services
- Fixed mobile convergence

Standards Compliance

Capacity Optimization

Infrastructure Cost Efficiency

Modem Cost Efficiency

Spectral Efficiency

Proper Transport Mechanisms
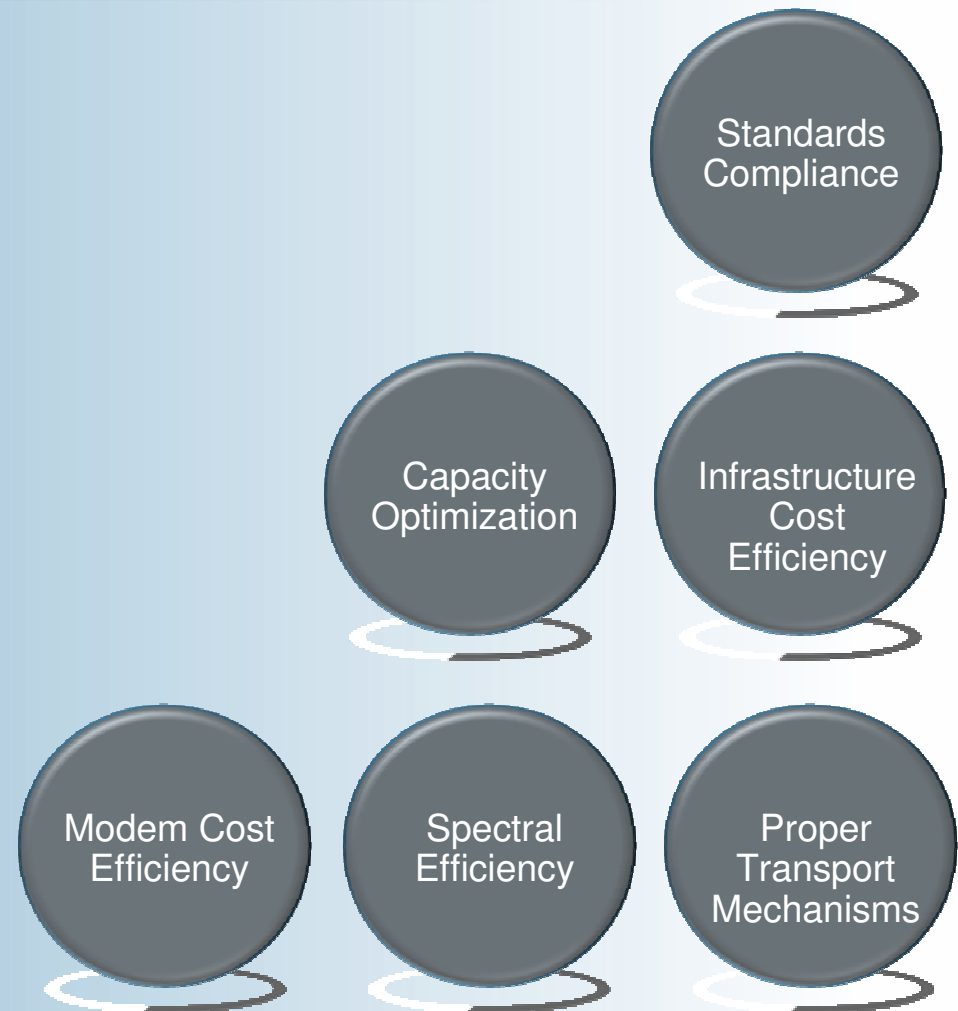
Focus on Marketing and meeting subscriber needs

India Market Challenges

Disruptive Cost Points required

– Driven by sub-$10/month ARPU for mass market deployment
– Sub-$100 - $150 CPEs required

Performance breakthroughs needed

– Near Line of Sight for ease of installation
– Long reach of WiMAX for Rural applications to leverage existing/ proposed cellular/ USO infrastructure

Availability of ultra-low cost PCs

– PC penetration hampered by the lack of sub-$300 full featured PCs

Market confusion – standards war

– "d" vs "e" vs ".20"

WiMAX Business Drivers in Indian Market

Low broadband penetration in the rural/sub urban areas

Demand for internet connectivity from SOHO is growing rapidly

❖ Can't be met effectively by the existing wireline technologies

Cost effective service availability to subscribers

Need for high Bandwidth

Low Tariffs

Enabling The Eco-system

Any new technology goes through an evolution curve; demanding regular upgrades and smooth inter-operability across platforms

Infrastructure vendors, CPE Manufacturers and Application Developers need a neutral platform to ensure testing and smooth integration

Live Networks are never a playground for testing as it could have devastating effects on performance

Skills, Tools and Processes for Testing are difficult to assimilate and not cost effective to maintain by each network operator

Going forward post deployment, O&M processes need to be streamlined and customized to suit each Operator needs

Imperatives for Outsourcing

Cost of testing should be limited to usage and not creation and upkeep

Network size & complexity is rapidly increasing with new multi – vendor, technology & version networks- becoming increasingly common

Finding & retaining qualified *testing engineers* who manage complex test profiles; a huge challenge

Process creation should be the *Outcome* of testing and not just a Test report of what passed and what did not

Increasing competition necessitates service differentiation - Leading to *Applications customized to suit Operator specific needs* - Pretesting a requisite

Applications Development Roadmap

Emerging youth market requires mobile broadband for:
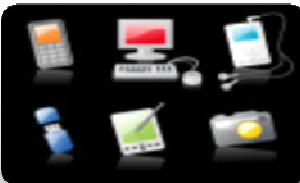- Education, Entertainment, Gaming, Video and Daily Communication

Parents want location based services to monitor children's activity

SMEs require "broadband on the go" solutions that provide:
- competitive advantage
- more time for customers

Adoption of e-governance, tele-education, tele-medicine by government and business

Major need to have high level of QoS

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$ 1.7 bn	Balance sheet size
$ 601 mn	Revenue
$ 2 bn	Market Cap*
21 Years	Years of service
35	Countries around the globe
45	Cellular Networks
36000	Cell Sites
24 MN	Served Subscribers
12,675	Dedicated Employees

Networking
the world...

GTL's Network Services
Geared to serve all your networking Lifecycle needs...

Network Services – Key Verticals

Network Planning & Design

Professional Services

Network Deployment

Application Management

Network Operations & Maintenance

Infrastructure Management
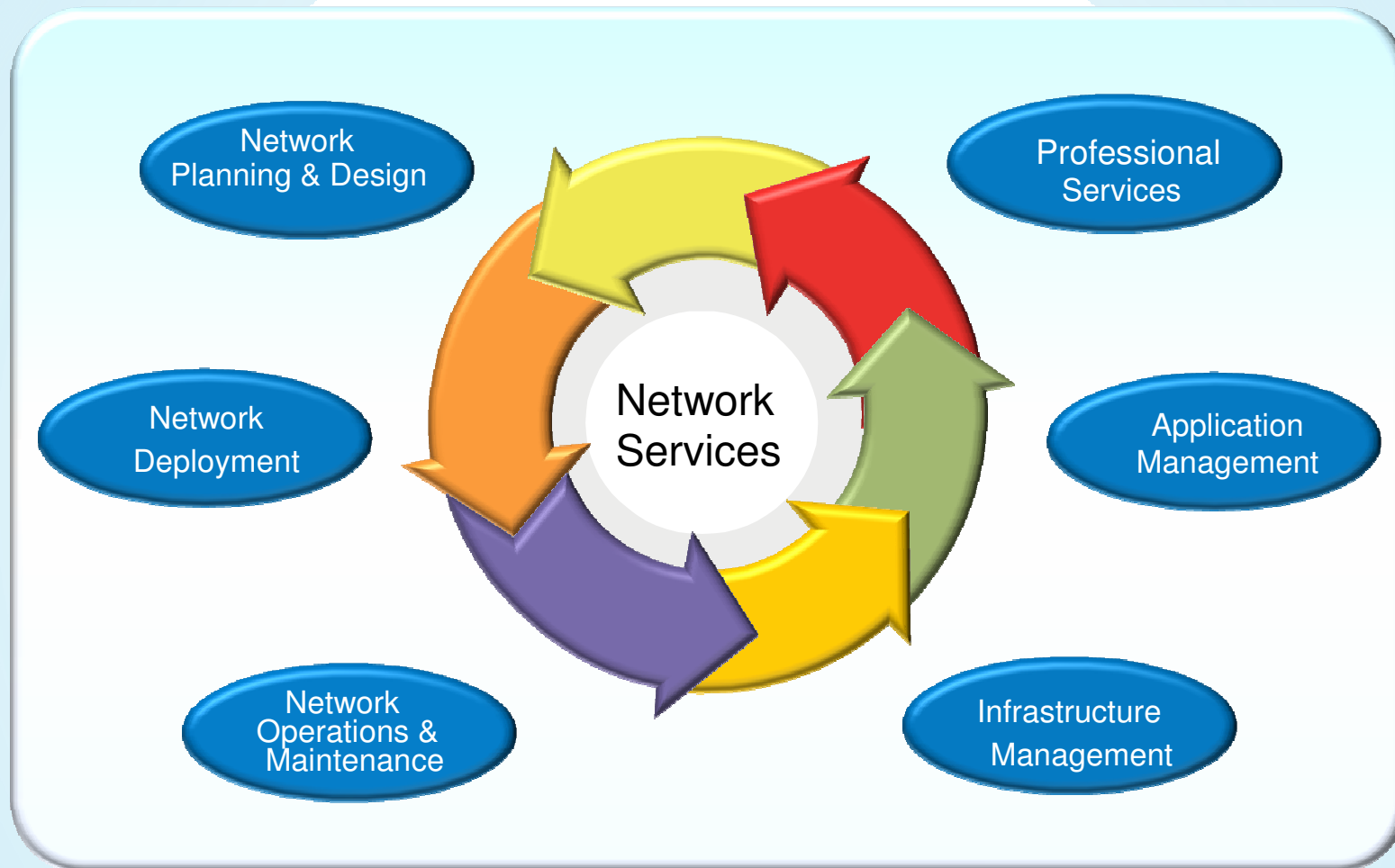
Network Services

Services aligned with Life cycle for OEMs and Carriers

WiMAX Centre of Excellence

Engineering Services

Optimal, scalable, secure end to end engineering solution

Implementation Services

Control Costs, Accelerate Revenue

Managed Network Operations

High network availability through proven processes; methodologies

Academy & Test Lab

World class training, testing & certification facility

Mission

To be the best-in-class, professionally managed Services organization delivering Cost - competitive

End to End Systems Integration Services including Managed Services support for

Wireless Broadband operators globally

GL🌐BAL Group Enterprise

WiMAX Academy

World-class training facility that would include theory and practical training from expert trainers

Features:

- Highly accomplished **Subject Matter Expert** instructors

- Flexible – content, scheduling, processes

- Foundation courses and technology overview for the non-technical staff

- Core, Access Network and Antenna Technology training for engineers and technical managers

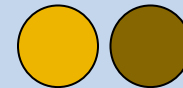- Discussion Forum

- Library / Data Bank
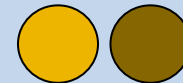
WiMAX Training Modules (ILT)

WiMAX Essentials 🟡

Exploring WiMAX 🟠🟤

Mobile WiMAX Access Network Signalling 🟤

Advanced Antenna Technologies for WiMAX 🟠🟤

WiMAX Access Network Planning & Design 🟤
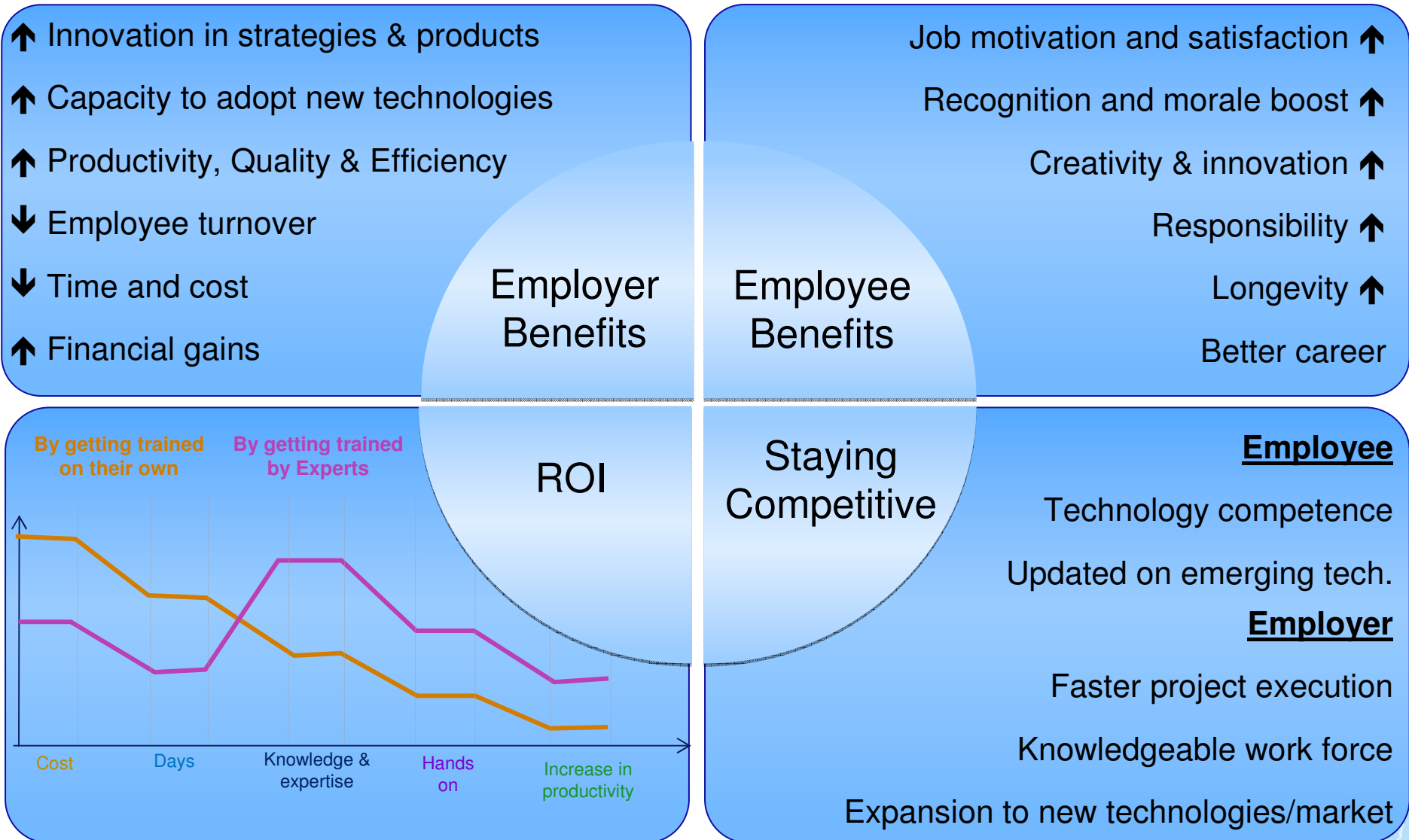
Mobile WiMAX Core Networks 🟤

🟡 Management & Sales

🟠 WiMAX Network Engineer

🟤 Sr. WiMAX Network Engr

Academy - Value Proposition

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Employer Benefits
↑ Innovation in strategies & products

↑ Capacity to adopt new technologies

↑ Productivity, Quality & Efficiency

↓ Employee turnover

↓ Time and cost

↑ Financial gains

Employee Benefits
Job motivation and satisfaction ↑

Recognition and morale boost ↑

Creativity & innovation ↑

Responsibility ↑

Longevity ↑

Better career

ROI

By getting trained on their own   By getting trained by Experts

Cost   Days   Knowledge & expertise   Hands on   Increase in productivity

Staying Competitive

Employee

Technology competence

Updated on emerging tech.

Employer

Faster project execution

Knowledgeable work force

Expansion to new technologies/market

WiMAX Lab

A first of its kind initiative by an Independent Service Provider

Features:

- Equipped with **WiMAX equipments of various OEMs** under one roof.

- To provide an environment for Service Providers to test different WiMAX equipment

- Multiple CPE, proof of concepts, software upgrade compatibility, firmware changes and hardware upgrades before rollout.

- Highly skilled Resources, processes and Tools for conducting interops and application testing in the Lab
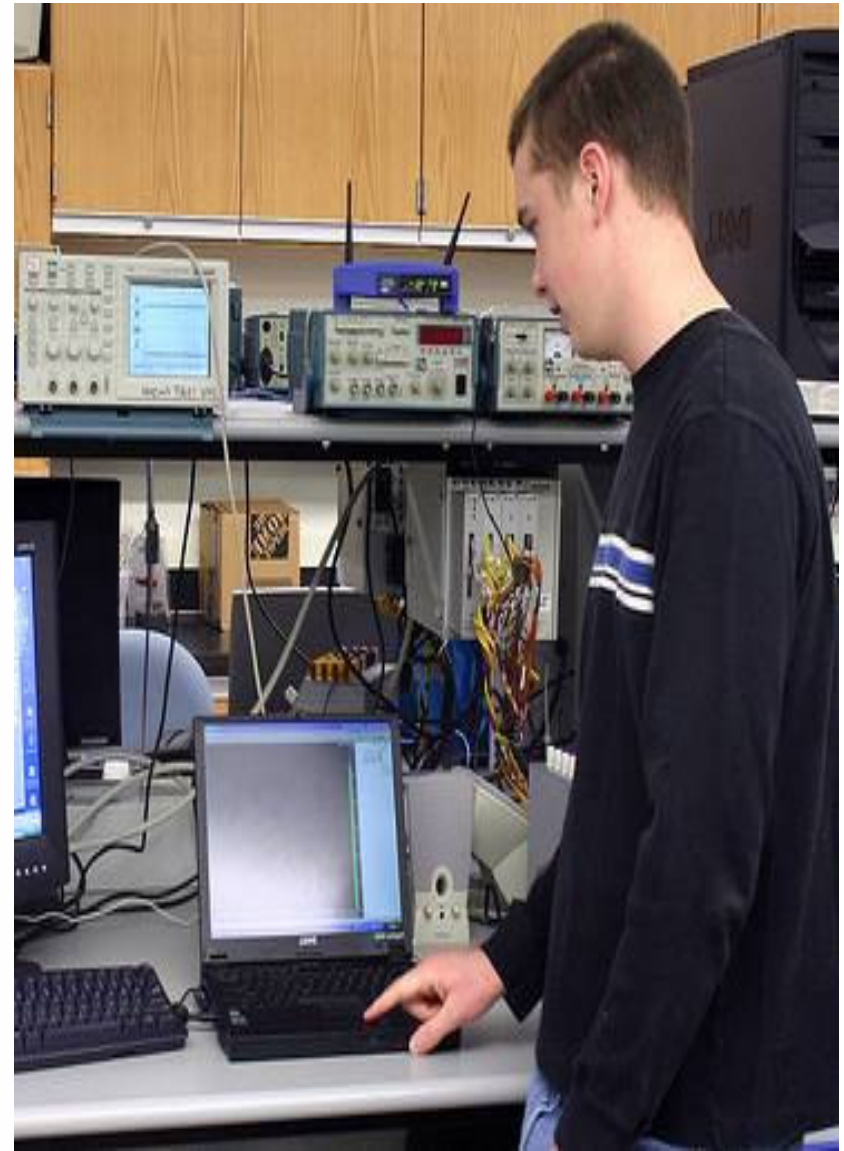
Ecosystem Balance
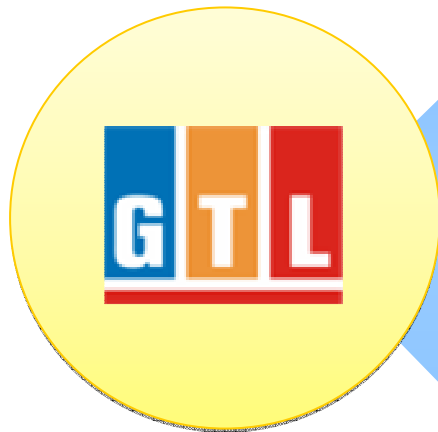
- Invest in the Lab facility creation

- Maintain the Lab and have trained resources for upkeep of the equipments

- Conduct tests and POC

- Maintain tools & test equipments required for carrying out the testing

- Build Processes and standardize test cases and methodologies for O&M subsequent to GO Live!

# Ecosystem Balance

Operator

- Equipment and software facilitation

- Test Case or specific feature set or functionality validation mandates

- Facilitate Level 2 support from OEM during testing, if required

CPE Manufacturer

- Equipment and software facilitation

- Test Case or specific feature setor functionality testing or mandate to GTL

- Product specific tools that do not fall within the scope of generic tool kit maintained by GTL

Application Developer
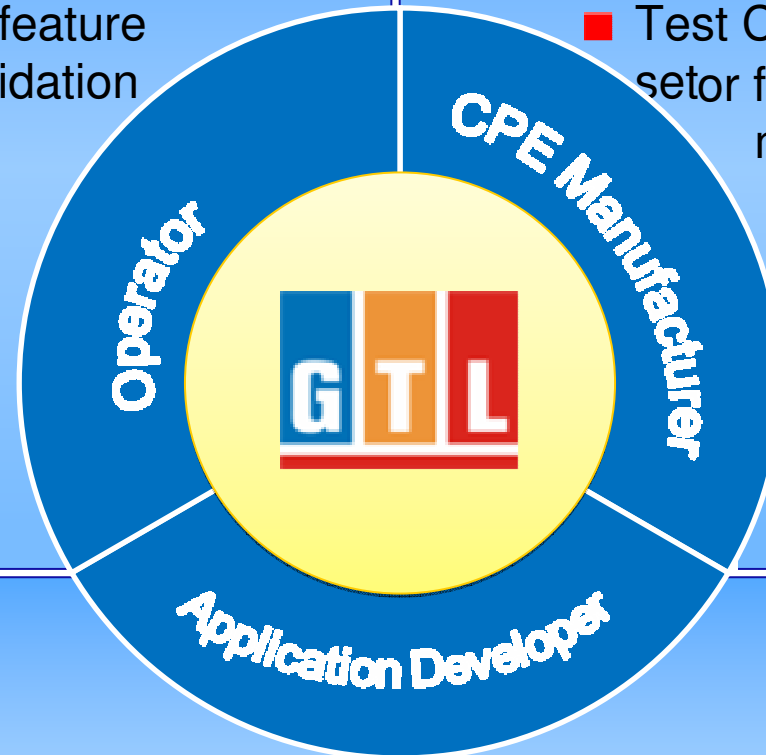
- Multi-Platform interoperability testing
- Test Case or specific feature set or functionality testing or mandate to GTL
- Product specific tools that do not fall within the scope of generic tool kit maintained by GTL

In Conclusion

1   Any evolving technology brings opportunities and complexities; deserves a holistic services approach for success

2   WiMAX CoE a professionally Managed Services Organization delivering Cost-competitive End to End Systems Integration Services including Managed Services support for Wireless Broadband operators

3   WiMAX Academy & Lab: A World class training and testing facility to enable interoperability testing, knowledge transfer and Application development support

- Enables Vendor Agnostic Unbiased Test capability
- No burden to "Create and Upkeep"
- WiMax Business Enabler- All parties gain
- Non-Intrusive to Network Operations

Thank You