



Managed Services Simplify Taking New Technologies to Market

How Managed Services enables WiMAX Operators to focus on core business objectives

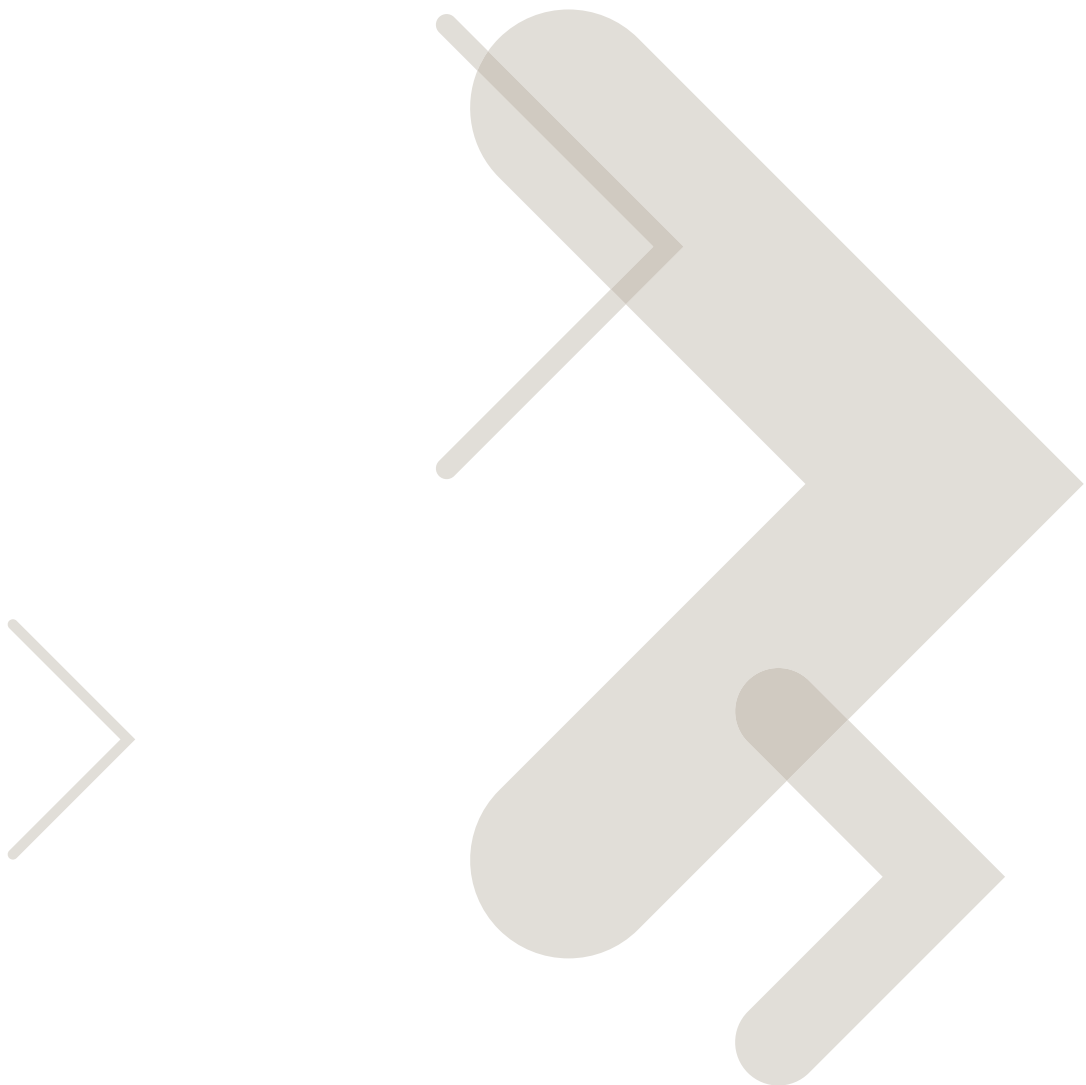


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To attract and retain profitable customers, service providers and enterprises exploring the business viability of WiMAX have some difficult business and technical decisions to make. They also have some tough questions to ask of themselves and of prospective WiMAX suppliers, including “How effectively and efficiently can we meet growing demands?”

Motorola is Bringing WiMAX to the World

Motorola's extensive WiMAX capabilities are being proven day-after-day in networks and trials all around the world, including WiMAX FOR 100 MILLION USERS.

The world's first 802.16e deployment uses Motorola's WiMAX technology to provide nationwide high-speed coverage to Pakistan. Wateen Telecom chose Motorola to plan, design and deploy a wireless broadband voice and data network to serve 22 cities and 100 million users throughout the country. Since there were limited internal resources available for operating and managing the new technologies, the company teamed with Motorola to do more than provide, design and deploy the network. Wateen also engaged Motorola to help manage operations in a number of locations, increasing operating efficiencies by leveraging world-class technology expertise not available internally.

“This managed services agreement allows Wateen to leverage Motorola's standards-compliant infrastructure, skilled staff, clear operational processes and demonstrated ability to manage a network of this complexity and diverse emerging technologies.”

**HH Sheikh Nahayan,
Wateen Telecom**

Purpose of Paper

This paper examines real business-driven questions around taking new technologies, such as WiMAX, to market. It provides information and insights on a range of relevant issues, including:

- What factors should be considered when developing a sustainable WiMAX business case?
- Understanding what types of Managed Services solutions and models are available today and how they can impact the business value chain
- How to best evaluate and select a committed partner who has the required services expertise to take on management of a WiMAX network

There is no denying that five-year WiMAX projections are impressive. For example, Maravedis, a leading telecom market research and analysis firm specializing in next generation networks, predicts that by the end of 2012, there will be 87 million wireless broadband access users. If today's subscriber patterns remain the same, approximately 42 percent of subscribers in 2012 will be business customers and 58 percent will be residential. Maravedis also predicts that of the 87 million wireless broadband access users in 2012, more than 67 million will be WiMAX subscribers. Furthermore, of the subscribers added in the year 2012 itself, more than 90 percent are predicted to use WiMAX networks.

Driven by Demand

What is driving this dramatic acceptance of wireless broadband in general and of WiMAX in particular? We believe the main driver is the “always connected” life style of end users, with demand coming from virtually all user segments. Especially important today are enterprise users. Their importance can be shown with one quick statistic. Today's estimated global WiMAX ARPU (average revenue per residential user) is \$40.76. For enterprise users, ARPU is more than triple that figure at \$145.54.

In the near term, the industry is poised to greatly expand upon trends already taking hold.

- Increased use of wireless broadband by young users, who are rapidly turning into “heavy” fee-paying subscribers. This demographic group, includes the teen, ‘tween’ and Gen Y subscribers, who want a lot more than high-speed connectivity. They crave bandwidth-intensive applications like streaming video, downloadable music and online gaming. They also make prodigious use of applications such as instant messaging, social networking and blogging. And they want mobility that lets them access their applications wherever they happen to be: inside, outside or on the move. And of course, like virtually everyone today, they also want—and need—the highest levels of security.
- Wireless broadband and mobility are an increasingly prominent part of enterprise users' lifestyle, both in and out of the workplace. Wireless networks have moved from an occasional convenience to the network of choice – both on the road and in the office. WiMAX brings new deployment models for operators and helps enterprises more securely extend the reach of their wireless networks, supporting more real-time information and business critical applications as they seek to increase productivity and convenience for their work force.

WiMAX is not just a technology for today's business models; it is a technology for the foreseeable future. WiMAX readily answers to the compounding costs of fixed copper, fiber, and Hybrid Fixed Coaxial (HFC) as well as the infrastructure complexity and higher costs of traditional wireless access technologies. WiMAX offers a truly universal delivery platform that migrates away from hardware and firmware embedded applications and onto upgradeable and evolvable, content rich software delivered applications.

Rewards: Not Without Their Challenges

Even with the inherent technological and cost advantages of WiMAX as a network infrastructure choice, operators know that investments are significant when launching any new business. Compounded with that fact that they may well be entering into an already competitive market, they realize they can't risk not getting their strategy right and execute on it ‘out of the gate’.

WiMAX operators face many of the same challenges as other wireless broadband, cellular, cable and DSL operators. Established operators, as well as new entrants are having to focus on time to market, reducing costs, and maximizing revenues amidst price pressures and improving quality rather than simply being focused on signing up as many subscribers as possible.

Many, especially Greenfield operators, are faced with increased risk as they set about building their business operations but must also take on the role of technical operations as well. Many are not yet staffed with in-house personnel who are familiar or capable of deploying and managing new technologies in a cost effective manner. Quite often as new licenses become available within a region, there is a surge of demand in the market for skilled resources, applying pressure for timely acquisition of these resources and resulting in higher acquisition and retention costs.

WiMAX operators need to ensure network availability and true carrier-grade service levels while managing new security issues. They are faced with different demands and usage patterns between residential consumer, SOHO and enterprise users as well as between fixed and mobile users. For example, WiMAX operators need to deal with the effects that broadband-centric applications such as Peer-to-Peer (P2P) have on network capacity and performance. The importance of proper network planning, optimization and management is crucial in order to balance this type of traffic while at the same time ensuring quality of service (QoS) for voice traffic and in-demand applications such as mobile e-mail, mobile music, mobile TV and gaming.

All these and other issues can be defocusing for operators and distract from their core business of building their brand, rolling out services, minimizing churn and developing service offerings to not simply meet demands, but delight their customers and differentiate themselves from competitors.

Exploring Requirements and Capabilities

As operators work to design a viable business case, there are many questions that must be addressed. How “large” should the network be? What cash reserves are needed to fund the business while the business is growing? How many subscribers are needed to make the business profitable and sustainable? How do I differentiate as a service provider? What is the optimum infrastructure? What are the applications and services needed to stimulate and drive user demand? How to best protect shareholder investment and value? How to recruit and train the staff required to oversee the network deployment and ongoing operation? Which vendors have the best combination of technical capability and real-world WiMAX experience, who can offer the most practical and insightful answers to these questions? Which vendor should I partner with?

As operators accept the WiMAX business case and start to consider prospective WiMAX vendors, the questions may change but are equally important. Here, the focus shifts now to the organization’s technical and business WiMAX capabilities, along with their experience in designing and deploying WiMAX networks that are either operational or in trials. Questions should also probe the organization on its professional services capabilities and willingness to invest resources in designing, deploying and managing a high-performance network that delivers both subscriber and business value. Questions that come to the forefront include:

1. What is the company’s experience in deploying and operating wireless broadband and/or WiMAX networks?
2. What level of complex systems integration—IP and RF—expertise and program management does the vendor have?
3. Does the vendor have experienced in-house design, planning and engineering capabilities?
4. Does the vendor have any clear differentiators relative to efficiency of WiMAX network design, such as semi-deterministic models, antenna tuning and other advanced tools?
5. Can the company offer an end-to-end system: infrastructure, hardware, applications and devices?
6. What levels of security can be provided?
7. What are the firm’s network and service layer management capabilities?
8. What kinds of training services can the vendor provide?
9. What kinds of tailored support and maintenance programs are offered?
10. Can the organization provide a full complement of Managed Services?

Answering WiMAX Operator Challenges: Managed Services

For some time, operators have been familiar with the benefits and rationale for Managed Services and outsourcing related to key business operations such as IT, customer contact centers and billing centers, to name just a few. More recent trends see a broad range of telecom operators embracing Managed Services for network operations in order to drive more efficiency into their business and shift their core competency focus from managing their networks and ever evolving technology and onto customer-centric activities. Managed Services models are being used by telecom operators as a key strategy for providing business agility and ability to compete with larger or entrenched competitors in order to capture market share.

WiMAX for an Entire Kingdom

Mena Telecom recently announced that it has begun working with Motorola to plan, deploy and manage an 802.16e-based mobile WiMAX and IP Multimedia Subsystem (IMS) network across the Kingdom of Bahrain. Mena Telecom will leverage Motorola's mobile WiMAX leadership to provide wireless high-speed connectivity, advanced voice and nomadic broadband data services to business and residential customers nationwide.

This will be an end-to-end network operating in the 3.5 GHz frequency band, and will consist of WiMAX infrastructure, IMS core, Customer Premises Equipment (CPE), voice and data applications and operational and business support systems. Motorola will also take responsibility for Customer Relationship Management (CRM) systems, as well as the technical operations of the project and management of the total WiMAX/IMS network.

"We selected Motorola because it is a leading major with assets in all of the critical product and service line areas – and the necessary global span and market presence needed to deliver a practical, fully integrated end-to-end WiMAX solution."

**Abdulhakeem Al Khayyat,
Chairman, Mena Telecom**

Telecommunications equipment vendors have recognized this need and are increasingly looking to leverage their competencies in their technology, as well as their products and services offerings. Certain vendors are applying their service capabilities in more value-added offerings and Managed Services that are finding roles in more areas of an operator's business value chain.

While operators embrace the exceptional coverage, performance and mobility of WiMAX, many are not yet staffed to manage the technology in a cost effective manner. Others are more comfortable concentrating their efforts on marketing their business to subscribers than managing technology assets. Therein lays the need for operational Managed Services that the right WiMAX vendor can provide.

Free Resources to Focus on Core Business

Many operators and enterprises prefer to focus on business issues such as their growing market share, building their brand, increasing revenues by developing, integrating and selling value-added applications and planning for future growth. Operators such as these might consider contracting with their WiMAX vendor to manage key elements of the network, or perhaps even the entire network.

Reduced Total Cost of Ownership

Examination of the various types of Managed Services engagements over the past few years shows that they can be highly efficient business models that have been proven to provide measurable cost savings of approximately 10-30% resulting from lower start-up costs, fewer salaries, improved efficiencies and an overall reduction in operating expenses. Managed network services agreements also help operators by providing fixed operating costs that are predictable for the length of the engagement and aligned with revenue streams.

Operational expenditure (OPEX) reduction is clearly a common goal that comes to mind when looking to Managed Services. The operator can realize reduced headcount related expenditures by leveraging the Managed Services provider's resource economies of scale and access to efficient processes and expertise. The savings will vary depending on the Managed Services model employed. Out-tasking small portions of an operator's network processes would be expected to yield less of a savings versus a fully outsourced network that sees operator staff being transferred to the Managed Services provider. For Greenfield WiMAX operators, OPEX savings can primarily come from:

- being able to forgo the recruitment and training of a staff to run portions or the entire network and
- leveraging the operational and cost management experiences of vendors that have already successfully deployed and run WiMAX networks

OPEX savings are not limited to headcount but also across the entire network and operations scope. The Managed Services provider may also be tasked to drive more efficiency into site acquisition and preparation costs, optimize performance of the network, provide creative transmission/backhaul solutions and automate end-user provisioning, to name but a few examples.

Capital expenditures (CAPEX) also stand to be impacted. Operators can reduce or completely forgo significant investments in facilities for network operations/call centers, warehousing, distribution and maintenance by leveraging these resources of the Managed Services provider. The right Managed Services provider's scope of capabilities offers the operator flexibility to manage to their optimal mix of CAPEX and OPEX. Network optimization on the part of the Managed Services provider can also move out capital investments for network expansion or better prioritize where and when those investments are made.

Managed to Key Performance Levels

Under Managed Services engagements, vendor and operator typically agree on various Key Performance Indicators (KPIs) as part of a comprehensive Service Level Agreement (SLA) – a written document that defines the nature and quality of service (QoS) that is to be delivered. KPIs are set to ensure required levels of efficiency, productivity and overall quality of the network and therefore end user experiences. The Managed Services provider's personnel manage the network day-in and day-out, bringing the specialized WiMAX knowledge and expertise, often from a global knowledge base, required to keep the system functioning to the highest levels of cost-effectiveness and performance.

Sharing Risk with an Accountable Partner

Managed Services engagements can also serve as an excellent strategy for minimizing risk, for example, by sharing set-up and operating costs, or by ensuring the successful introduction of new applications and technologies to the network. Sole accountability is key for operators as the right WiMAX vendor will be capable of managing deployment, systems integration and operation of the entire end-to-end solution, which often entails managing many other third party deliverables. Perhaps most important of all, is the peace of mind an operator has when a new technology network is being professionally managed according to pre-determined Service Level Agreements (SLAs) and Key Performance Indicators (KPIs) to deliver the high performance levels so critical to business growth and profitability.

Access to Leading Expertise, Methodologies and Tools

WiMAX is a hybrid network that employs the power of both IP and RF technologies. Having expertise in just one of these areas is not enough to ensure high-levels of WiMAX quality and performance that end-users will expect. Operators, whether established or Greenfield, can greatly benefit from the Managed Services of a vendor that understands both IP and RF technologies.

When an operator leverages the technical WiMAX knowledge and expertise of their experienced network managers, realized benefits can be widespread. In most cases, network managers can access and utilize proven global best practice processes and custom network management tools.

Avoid Staffing Challenges

Managed Services can remove a barrier to market entry which is the recruitment, training and retention of scarce technical personnel. Aside from the previously mentioned reduced headcount OPEX savings, through Managed Services, operators can defer or avoid all together the challenge of staffing, retaining and upskilling an organization to keep pace with ever changing shifts in technology.

The Managed Services provider may be called upon to perform the recruitment function on behalf of the operator. In the case of outsourced personnel, the operator stands to benefit from their employees receiving on-the-job training as they work with the WiMAX vendor's knowledgeable staff.

Managed Services Model Definitions

Managed Services is a method of delivering any service where the operator hands off management and operational responsibility to the Managed Services provider. This includes services such as Design and Planning, Integration and Deployment, Network Operations, Applications Management or any other service/function previously performed by the operator or performed as discrete, one-off services by the vendor.

A Managed Service is typically governed by a multi-year contractual SLA and measured using KPIs. This assures operators that they are receiving the levels of service expected.

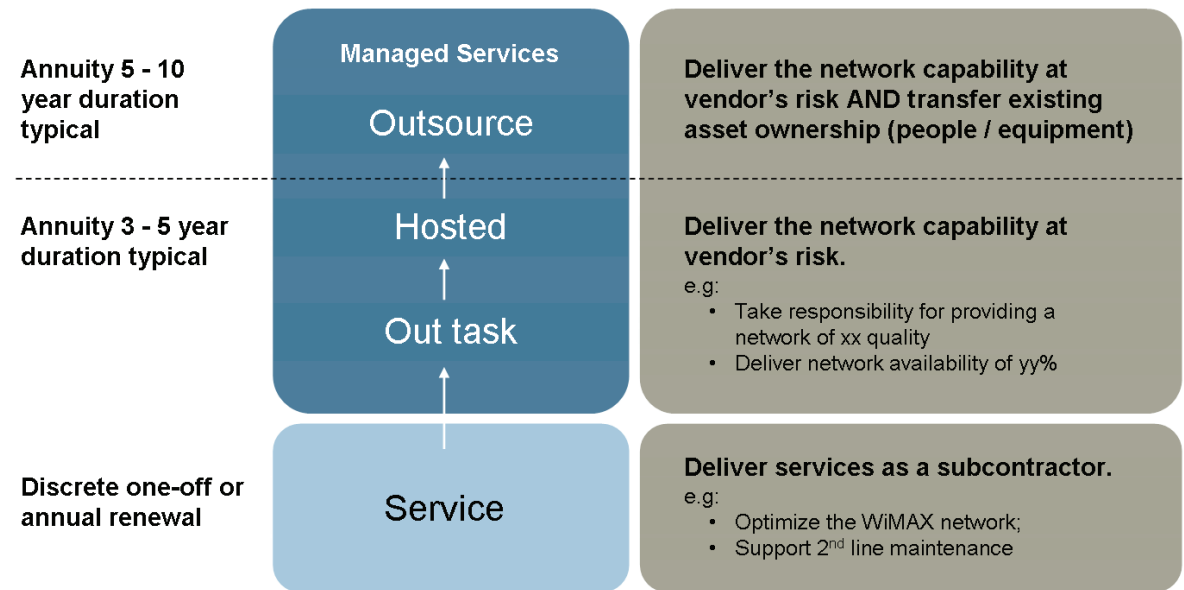


Figure 1: Managed Services Models

Typically types of Managed Services include:

- **Out-tasking** – The WiMAX equipment vendor has the responsibility and assumes the risk for delivering a managed service using their existing staff, tools and expertise.

Out-tasking is typically a limited scope engagement that focuses on a key portion of the operation for delivery of a previously one-off service as a multi-year, ongoing solution.

Common examples of out-tasked Managed Services of particular consideration for WiMAX operators include:

- Operations and Maintenance of the WiMAX network
- Managed Security services
- Performance Management through Managed Optimization services

- **Outsourcing** – The WiMAX equipment vendor delivers the Managed Service and the operator’s existing staff and/or assets are transferred to the vendor.

Outsourcing deals are typically lengthy engagements entered into to achieve long-term strategic objectives. Implied by definition of this model, outsourcing usually involves established operators whose previous strategy was internal staffing for self-sufficiency but is now looking for a committed partner to help drive efficiencies with this comprehensive end-to-end Managed Services model. Not all situations require outsourcing and many times the solution rests in out-tasking a number of functions. The right Managed Services partner will work to find the best solution that best addresses the business and operational needs.

- **Build Operate Manage/Transfer (BOM/T)** – The WiMAX equipment vendor will build, operate and manage the technical operation of your network.

This model in particular is attractive to Greenfield WiMAX operators as they can take full advantage of focusing on their core business strategy from day one as the vendor deploys and manages their network for them. They may even rely on the vendor’s Managed Services to recruit and train staff for an eventual transfer of all or portions of the network operations back under the operator.

- **Hosting** – The WiMAX equipment vendor delivers a capability, application service, content or other features to the operator without selling the platform that provides that capability.

Hosting can be a risk-reduced and effective way to rapidly monetize the WiMAX network by rolling out new applications and experiences into the mix and drive revenue.

Requirements and Capabilities in the Managed Services Scope

Managed Services is not a one-size-fits-all engagement. The Managed Services models described are custom designed from a vendor’s services portfolio of solutions that speak to the unique needs of individual operators.

Managed Services providers are increasingly taking on more functions within the operator’s business value chain, from the traditional network focused processes through to Business, Billing and Operational Support System provision.

Operators will want to select a vendor with competencies in a wide range of services offerings from which to build their customized Managed Services solution and allow for an expansive partnership. An example of this scope is shown in Figure 2 which depicts Motorola’s Managed Services process map.

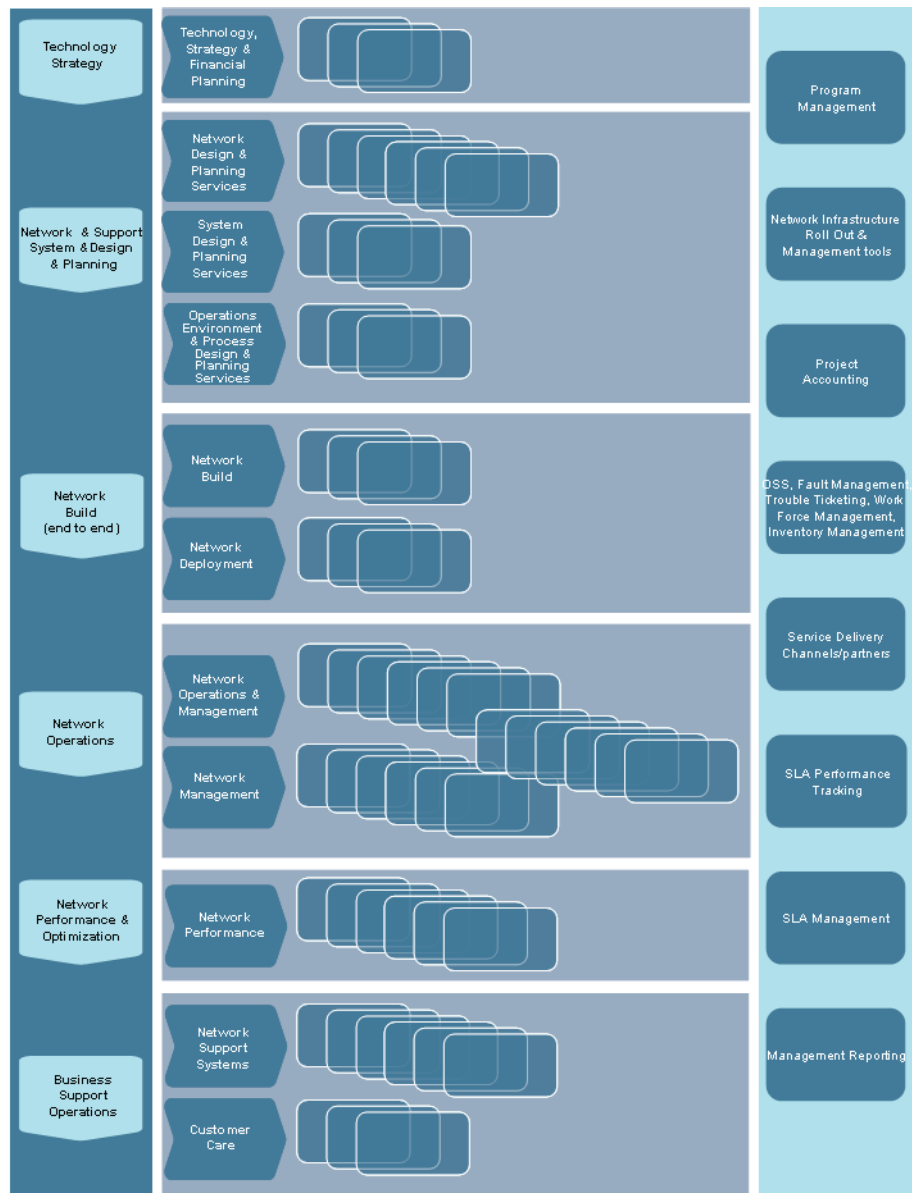


Figure 2: Motorola’s Managed Services Map

The main services categories and competencies expected to draw from are:

- **Technology Strategy** – the initial engagement of the WiMAX planning process should include business and technical consulting. These services can include:
 - Strategy Creation and Multi-Year Planning
 - Market Analysis
 - Corporate Finance and Financial Planning
 - Business Case Creation, Planning and Analysis
 - Research Development and Technology Solution Planning

- **Network and Support Systems Design and Planning** – includes the design and planning of the network and its integral elements as well as the support and management systems and centers. Key considerations for WiMAX operators are:

- Traffic Engineering
- RF Planning
- Base Station/Access Point Design and Planning
- IP Core Design and Planning
- Transmission Network (Backhaul and Access) Design and Planning
- Network Management System (NMS), Operations Support System (OSS) & Business Support System (BSS) Design and Planning
- Value-added Services such as Security Process and Design
- Design and Process Planning of Centers for Network Operations (NOC), Security Operations (SOC), Dispatch and Data

- **Network Build (end-to-end)** - Proven field experience is certainly one of the most significant differentiators of potential suppliers for successful network deployment. Operators should contract with an organization that has extensive experience in deploying wireless voice and data networks, including multiple WiMAX networks. Key network build and deployment services include:

- Site Surveys
- Turnkey services such as Site Acquisition, Permitting, Preparation and Construction
- Materials and Ancillary Procurement
- Network Install, Commissioning and Integration
- Data Build and Initial Software Load
- Materials Planning, Logistics Management and Order Management
- Asset Management, Warehousing and Distribution
- Program Management

- **Network Operations** – WiMAX operators should also look to a vendor that can leverage global security and operations center resources utilizing network management solutions that can monitor both network and services layers to root out existing or potential problems. Combining this with proactive and timely reactive maintenance capabilities provides the needed “holistic” approach to network operations. Key Network Management, Operations and Maintenance services can include:

- Network Operations Center
- Network Monitoring
- CPE Operations and Maintenance
- Hardware and Software Upgrade Deployment and Management
- 1st, 2nd, 3rd and 4th Line Maintenance
- Preventative Maintenance
- Security - Intrusion Monitoring and Patch Management
- Disaster Preparation and Recovery
- Emergency Event Configuration and Management
- Facilities Leasing, Management and Maintenance
- Asset Management, Warehousing and Distribution
- Data Management/Mining

- **Network Performance and Optimization** - In this technologically sophisticated marketplace, network performance is a moving target. Technology advances and new data-rich applications are emerging at a rapid pace. These enhancements call for constant evaluation of network capabilities and technology to keep the network performing at its highest level in response to end user demand.

- Performance and Optimization for Radio Access Network, IP Core and Transmission Networks (Backhaul and Access)
- Frequency Planning
- Service Quality Analysis

- **Business Support and Operations – main categories of Support Systems and Customer Care Services can include the following:**

- IT Help Desk
- VAS Systems
- Billing Systems
- Subscriber Provisioning
- Service Provisioning and Configuration
- Software Deployment
- Access Control Management
- Revenue Assurance and Fraud Management
- Customer Care Desk

In addition to these services capabilities, operators will want to understand a vendor's competencies as far as the integrated Managed Services methodologies, tools and processes in areas such as:

- Project Management
- Project Accounting
- Network Infrastructure Design, Planning and Management Tools
- OSS, Fault Management, Trouble Ticketing, Workforce Management and Inventory Management
- Service Delivery Channels and Partners
- Process and Procedures Documentation
- Governance Processes
- SLA Management and Performance Tracking
- Management Reporting

A Successful Approach to Managed Services

The real value of Managed Services can only happen when taking the Managed Services model and its customized scope of services deliverables and combining that with skilled, experienced people and best in class tools, methodologies and processes. Further discussion of some of these key methodologies and processes follows.

Phased Engagement Approach

Sound Managed Services practice follows a structured engagement process to make sure that the right solution is identified, all parties are aware of methodologies employed and expectations are set by being involved in the service scope and process definition. Figure 3 below illustrates the example of Motorola's proven approach.

Discovery: A consulting approach, working with operators to identify business requirements and analyze opportunities for Managed Services within their network operations.

Right from the beginning of this phase, trust in the relationship between the operator and Managed Services provider is important in order to accurately tailor a specific solution focused on the operator's unique needs. Increasingly, the trend is for Managed Service contracts to include risk and reward elements, often a key consideration for emerging markets. To ensure that these are fair for both parties, it may be necessary for operators to share their detailed business plans and revenue projections. Including such data as subscriber growth projections and operating expenditures. This intelligence will also ensure that not only is the commercial agreement equitable but the project itself will be designed from the ground up with the operational data needed to deliver on its objectives. While there may be concerns about divulging such commercially sensitive information, reputable Managed Services providers are accustomed to guaranteeing the protection of information as integrity is the basis of their reputation as Managed Services providers.

An experienced Managed Services provider can leverage global resources and knowledge from managing mobile networks of many customers in order to provide benchmarking, best practice data and input to the high level business case. The resulting recommendation could be any degree of the available Managed Service scope.

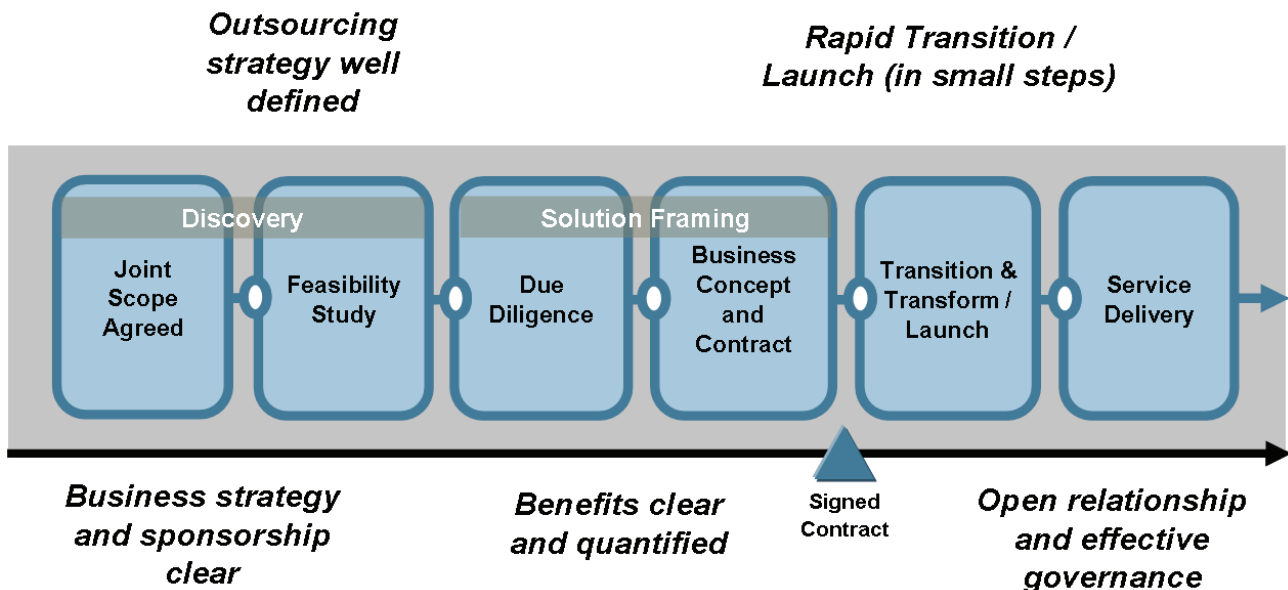


Figure 3: Motorola's Managed Services Engagement Approach

Solution Framing: Involves preparation through a contract of Managed Services business and operational solution. Here, both parties dedicate more time and effort to develop the detailed business case and establish the principles of the agreement, with pre-negotiation occurring at a senior level. Key in this phase is that both parties have full understanding of capabilities and risks to be managed to meet the Service Level Agreement. In the case of outsourcing, heavy emphasis needs to be dedicated to the planning for any eventual transfer of employees. The outcome of this phase is a signed contract.

Transition and Transfer: Taking over the management and operational responsibilities. A dedicated team is required for this process in order to provide continuity and expertise to the transition, providing an overall program management template and working with operators to assess which steps are applicable for a particular conversion.

The overall program should consider all aspects of the transition related to business and technical factors and in the case of outsourcing engagements, substantial weight is placed on human resource factors (Figure 4). Heavy emphasis should be placed on communications plans, targeting employees, the project team and governance teams. This assists in the common understanding of issues, pace of the transition and enhances resolution for issues as they arise.

Service Delivery: Running the operation per agreed scope, typically over a period of 3 to 7 years, against the contracted SLA and KPIs. This is where the right WiMAX vendor's services capability proves its mettle, relying on skilled, highly trained people, proven multi-expertise, leading edge tools and best practices and processes.

Compiling Tasks and Processes

Operators today have already committed to following industry quality standards that their end customers expect. Therefore, a Managed Service provider's offering has to abide by these same industry standards in order to even be considered as a candidate.

Motorola's Managed Services process map is based on eTOM (enhanced Telecom Operations Map), the most widely used and accepted standard for business processes in the telecommunications industry that describes the full scope of business processes required by an operator and defines key elements and how they interact.

eTOM is a common companion of and can be mapped to ITIL (IT Infrastructure Library) – a best practices guide developed and adopted by companies' IT Service Management. As customers increasingly rely on IT for management of various elements of their networks, ITIL represents a best practice in this area and it is therefore natural that ITIL terminology will be increasingly utilized.

These frameworks are part of the larger context of Total Quality Management. While TL9000 and ISO 9000 are probably the best-known of these process improvement standards, they are far more generic than either eTOM or ITIL.

A Managed Services provider should be able to deliver documented policies and procedures with details of the business processes and operational framework between vendor, customer and subcontractors. This framework in its initial form should be expected to contain the methodology, processes, tools references, best practice examples and reference literature required to deliver on each of the enabling processes. During the initial phases of the Managed Services engagement process, this policy and procedures manual is used to communicate and establish the methodology with which they will approach and execute the scope of works for the Managed Service. It is expected that this framework will be modified to accommodate the specific client processes and interaction points that are required for contract execution.

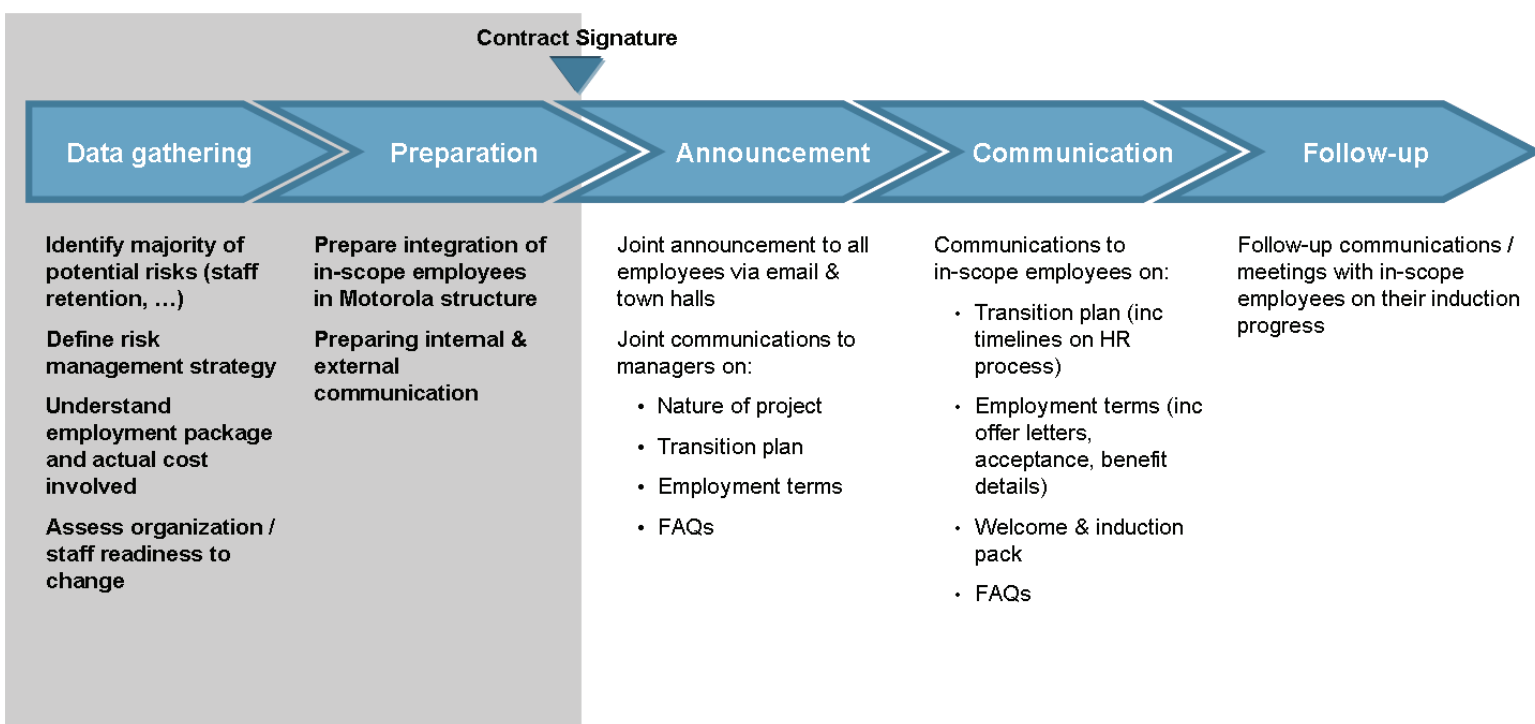


Figure 4: Preparing The Human Resources Landscape

Governance Model

Another key factor in the execution of a Managed Services engagement is the implementation of a clear governance model (Figure 5) to drive the right business behaviors. A clearly documented governance structure will:

- Ensure both parties are working together towards a common objective
- Give customer visibility to Managed Service provider performance
- Decide and prioritize new strategies/ requirements
- Clearly establish responsibilities and accountability
- Provide formal methodology for escalation

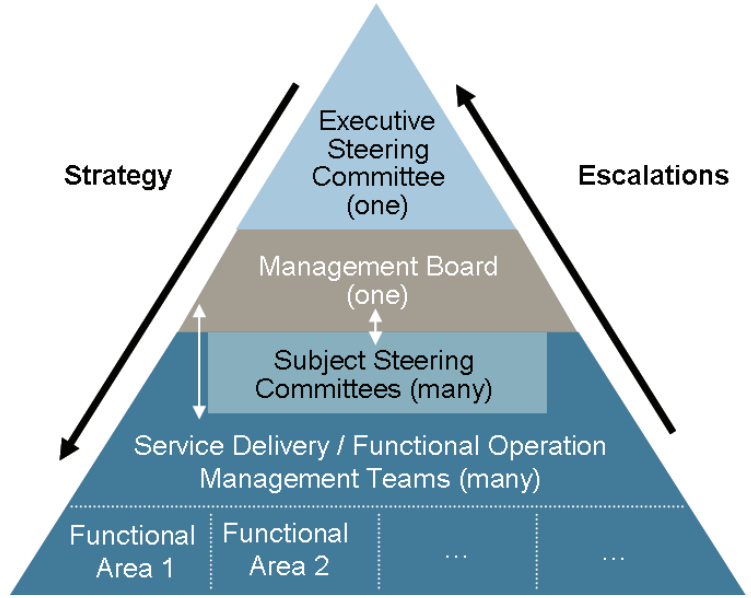


Figure 5: Governance Model

The governance model agreed upon should be clearly documented in the Master Services Agreement and framework implemented during the Transition phase.

During the Transition phase, meetings should be held on a regular scheduled basis between the operator and Managed Services provider. The ongoing periodicity of the meetings can be amended/finalized during the Transition phase. The Operator and Managed Services provider jointly determine the functional organization of these meetings and the content of the meetings is aligned with the scope and requirements of the contract.

Through the term of the Managed Services engagement, there inevitably will arise the need to change some aspect of the scope of service delivered, effecting the terms of the contract. Changes can be introduced more easily if the governance structure is clear and properly integrated (Figure 6).

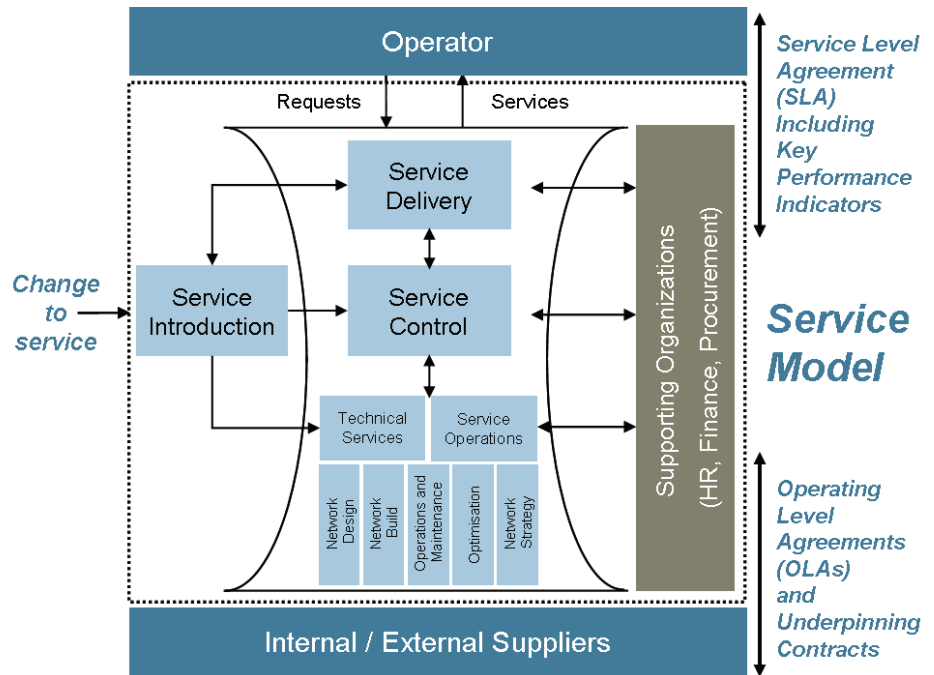


Figure 6: Successfully Accepting Change To Service

Conclusion

WiMAX service providers, both existing and those planning for an initial deployment, should strongly consider the focusing benefits of Managed Services. The most benefit can be gained by selecting a WiMAX vendor that can function as the single point of accountability, having proven global and multi-vendor expertise capable of providing a true end-to-end solution, including WiMAX network infrastructure, user devices and a comprehensive services portfolio – all delivered by a proven WiMAX Managed Services capability.

Some key factors for success in a Managed Services engagement:

- Operators should set clear objectives with respect to what they are trying to achieve through Managed Services
- Develop a trusting partnership between operator and vendor
- Build a win/win Service Level Agreement
- Partner with a company that can leverage its global scale and experience
- Define the scorecard to measure performance
- Put in place a “can do” joint start-up management team
- Manage the relationship between operator and vendor with an effective governance model



About Motorola

WiMAX is all about reducing the cost of bandwidth delivered over the air. Motorola is an acknowledged industry leader in the global WiMAX community, and in providing successful multi-wireless broadband environments worldwide.

Motorola offers advanced solutions in virtually all critical WiMAX product and service line areas, including our flat IP-based distributed architecture and one of the industry's broadest and deepest product portfolios. Our wi4 WiMAX solutions include carrier class products for networks needing exceptionally high availability, redundancy, QoS and extended coverage.

Motorola is also an industry leader in providing a robust suite of integrated network services including design, planning, installation, optimization, management and support services. We have customers in more than 80 countries, whom we support with an extensive service network of more than 8,500 professionals and full-service Centers of Excellence located around the world. We also offer 75+ years of wireless industry leadership, extensive R&D resources, deep experience in all customer segments and complete, end-to-end solutions in WiMAX and all major access technologies. Our experts are always available to help operators optimize network efficiency and availability, as well as provide world-class technical and field support.

Motorola's managed services enhance WiMAX network operations by providing out-tasking and outsourcing options to meet individual and customized business requirements. Motorola offers innovative build, operate and manage network services where key performance indicators (KPIs) and service level agreements (SLAs) are jointly defined with our clients predominantly on a multi-year agreement.

For more information on Motorola's industry-leading wireless broadband and WiMAX capabilities, visit www.motorola.com/wimax or contact your Motorola representative.



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