A.T. KEARNEY

1 + 1 = 1: Network Sharing

Redefining telecom with a structured approach

European mobile network operators face tough times. Although network traffic has been growing steadily for the past few years, prices for mobile phone minutes of use will soon converge with the cost of production, diminishing or even eliminating profits from 2011 onward. In order to survive, operators are considering a measure that might seem counterintuitive: sharing their most valuable asset, the radio access network, with their competitors. The RADAR approach to network sharing can help companies succeed.

The future is uncertain for European mobile network operators (MNOs). In 2011, production costs and revenues are forecast to converge at approximately 8.8 euro cents per minute of use *(see figure 1 on page 2)*. Average profit margins for a mobile network operator, currently about 16 percent, will fall to 0 percent in 2011 and -7 percent by 2012. Our analysis also shows that if operators miss out on just one year of cost reduction between now and then, profits will immediately vanish. In short, incremental cost reductions will no longer be enough to maintain profitability.

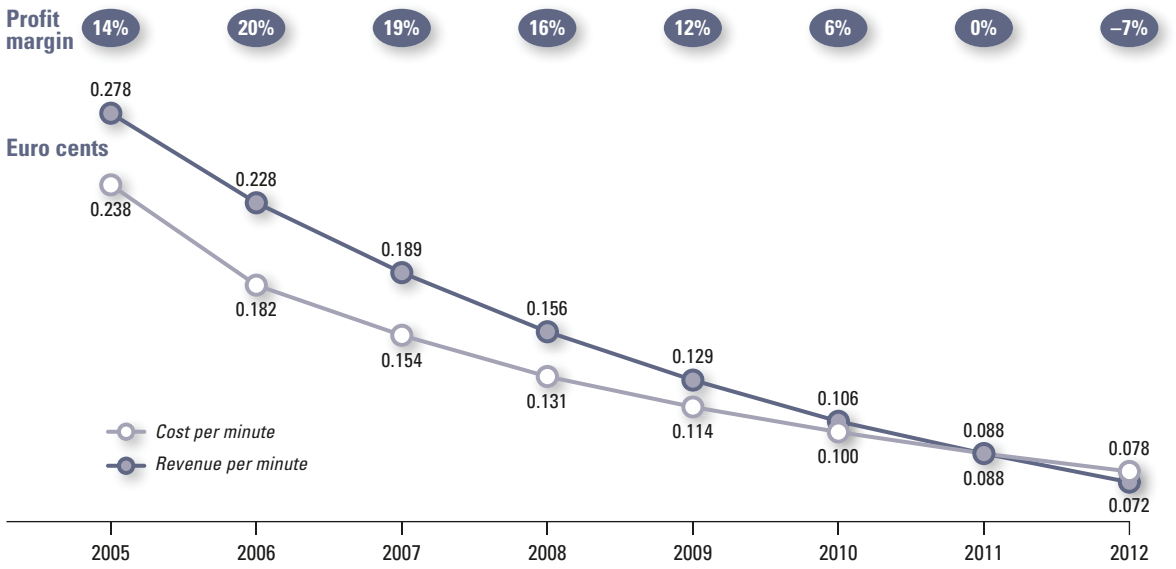
To survive, mobile network operators are considering process improvements, often focusing on the radio access network (RAN), which connects mobile phones to the mobile network operator's core services. There is good reason to consider this area: the RAN typically represents about one-third of total operational expenditures and 80 percent of capital expenditures. For the past five years, this area has been the role model for cost performance, keeping absolute costs flat and reducing cost per customer by more than one-third.

However, most operators have almost reached the limit of cost improvement using classical process efficiency programs. Further progress can be made, especially in the planning, roll-out and operation of the network, but it will require a new approach.

Radio Access Network: Still a Factor?

For years, the RAN was a crucial capability to differentiate operators from the competition. Introducing new technologies faster, and offering better network and indoor coverage, often influenced customers' decisions to choose one network over another and to pay price premiums for such access. In turn, companies made heavy investments to improve network quality, with good

Figure 1
Revenue and cost trend



Sources: European Mobile Operators in Mature Markets, 2005-2007 actuals, 2008-2012 forecast; A.T. Kearney analysis

results: congestion and dropped-call rates decreased to all-time lows.

However, in many countries, the mobile industry has reached a stage of maturity where network coverage and quality have become essentially equal and often the customer has a choice between two comparable networks.

Perhaps more importantly, our analysis finds that most customers only marginally perceive the value of network quality improvements. We found only four countries in Europe with significant differences in network quality among operators *(see figure 2)*. In two of these countries, the average revenue per user for the operator with lower quality was only slightly lower (1 to 3 percent) than the operator with superior quality. In the other two cases, lower network quality was actually associated with a *higher* average revenue per user of up to 16 percent. So in mature markets, quality gaps, where they exist, are no longer affecting profits in a major way.

We can presume, therefore, that the radio access network has lost its status as a crucial capability in mature markets such as Western Europe and North America. In addition, most networks have already reached the limits of cost improvement. So MNOs are seeking new ways to reduce costs associated with their networks.

Is there a way to improve radio access network cost performance? Of course. But how best to do it? Many European MNOs have tried network outsourcing as a solution, with mixed success *(see sidebar: Network Outsourcing Is Not the Answer on page 4)*. We believe a powerful approach is network sharing. Through network sharing, MNOs can remain profitable through 2011 and beyond.

Figure 2
Network quality differences and results

Country 1	
Δ congestion rate:	+321.4%
Δ call setup time:	+65.5%
Δ ARPU:	**–2.7%**

Country 2	
Δ call drop rate:	+73.0%
Δ call setup time:	+50.1%
Δ ARPU:	**+16.3%**

Country 3	
Δ call drop rate:	+50.8%
Δ ARPU:	**+4.9%**

Country 4	
Δ congestion rate:	+209.5%
Δ call drop rate:	+108.1%
Δ ARPU:	**–1.2%**

**ARPU = average revenue per user*

Source: A.T. Kearney

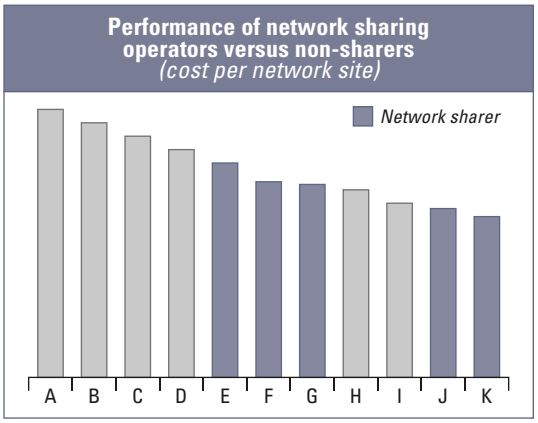
Network Sharing: Bringing Down Costs

Today, around 15 percent of MNOs engage in extensive network sharing. It has proven to be one of the most effective ways of bringing down network costs, on both a relative and an absolute scale. The approach is already common in countries such as Sweden, Spain and the United Kingdom. Companies with shared networks in these countries are more cost efficient than operators that don't or only marginally make use of shared networks.

To find out why these companies are more cost efficient, we analyzed the cost performance of about 100 mobile operators. We found the greatest benefit of network sharing is in the access layer of the mobile network. The access layer includes the base station subsystem (equipment responsible for handling traffic and signaling between a mobile phone and the network) and the infrastructure across the country (towers, masts, shelters and passive infrastructure). MNOs typically spend about 52 percent of their total indirect network costs on the access layer, and about 81 percent of their total network investment.

In this context, extensive network sharing is defined as the sharing of at least the active and passive infrastructure at the site. Figure 3 offers an overview of the cost savings possible in the access layer. Overall, network sharing can deliver savings

Figure 3
Cost reduction potential of network sharing



Costs	Cost advantage of extensive network sharing operators
Processes	
Design and planning	0%
Deployment and rollout	31%
Operations and maintenance	40%
Optimizations	38%
Specific costs	
Site rental costs	69%
Power consumption	47%
Total access layer	**59%**

Source: A.T. Kearney

of 59 percent. The savings result from sharing the following:

Rollout and deployment process. Implementation can be complicated, and thus savings are typically in the 31 percent range. The cost per new site can be distributed over the different parties, but not all costs can be shared, such as the installation of radio capacity elements. Also, a shared site is often more complex in design and more costly to deploy.

Cost of operating the access layer. Companies can save up to 40 percent of the cost of operating the access layer, though the result is highly dependent on the sharing intensity. Whereas

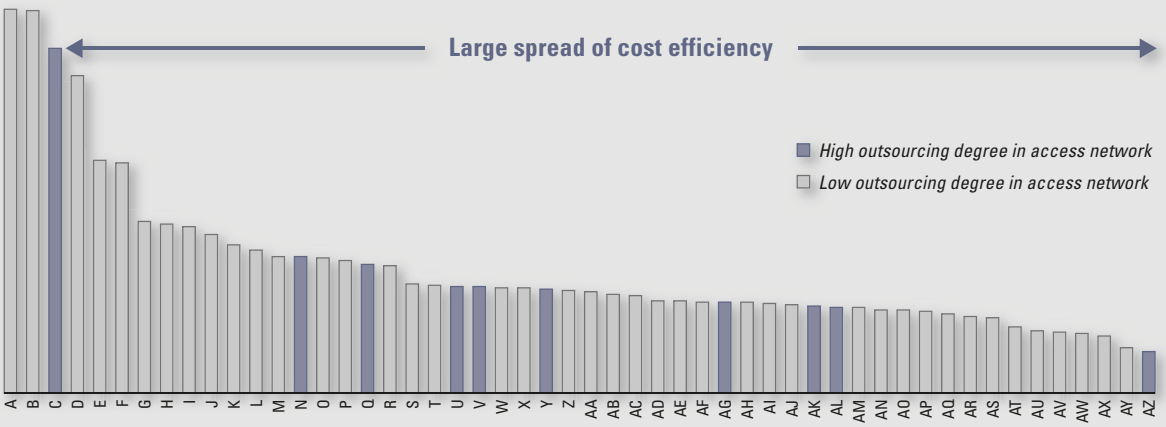
Why Network Outsourcing Is Not the Answer

Many operators are maintaining sole ownership of their RAN, but outsourcing the operations and maintenance. This trend began with late entrants to the MNO field that lacked the expertise to run a mobile access network, and so found it simpler to outsource this function, most often to network equipment providers.

Overall, about 25 percent of all mobile operators outsource their RANs and their core and transmission networks to third-party providers. The goal for new operators is to turn a fixed cost into a variable cost and thereby improve cost performance. For older operators, the goal is often to improve scale. Nokia Siemens Networks, Ericsson and Alcatel-Lucent have all entered this market in response to operator demand, but also to offset declining revenues from their traditional network hardware businesses.

However, our data suggests that outsourcing is at best unproven. We analyzed the operational efficiency of operators that had outsourced their RANs or their operations only to find that they are performing about as well, or as poorly, as their competitors *(see figure)*. The data indicates that capturing cost advantages depends heavily on contractual conditions. In addition, outsourcing is only attractive if the outsourcing partner has process expertise and is large enough to benefit from its size—benefits the operator cannot achieve alone. In short, outsourcing is not a cost management panacea.[1]

Figure: Total access layer cost per network site



Source: A.T. Kearney

[1] *For more information on outsourcing, you may wish to read "Execution Is Everything: The Keys to Offshore Success" at www.atkearney.com.*

sharing the physical site alone does not influence the maintenance cost, the sharing of components such as air conditioning offers savings potential. Yet, only by sharing the passive and active components (actual radio infrastructure) can the full savings potential in maintenance be realized.

Process of optimizing coverage and capacity usage. Sharing the process of optimizing coverage and capacity usage of the RAN provides a similarly sized savings opportunity of 38 percent. As with operations, the sharing intensity has a big impact on the actual realized savings.

Rental costs for the physical site. The largest potential for cost savings is the cost for renting the physical site location (rooftop or tower). Operators have been able to save up to 69 percent of the rental cost by sharing the site location with their competitors. This does not come as a surprise, and shows that operators can benefit from even the loosest form of sharing.

Power costs. MNOs that share power costs—from passive elements such as air conditioning to active elements such as the base transceiver station—can save up to 47 percent.

Although network sharing can provide big savings, it also has important strategic implications to consider. For example, it means sharing capabilities with direct competitors. Such a step is only thinkable if the network has definitely lost its former status as a "crucial capability" for competitive differentiation. Also, what happens if in the future, as new technologies arise, a mature network again becomes a differentiating asset? Will the MNO be at a competitive disadvantage? Despite these and other challenges, the current financial crisis provides convincing arguments to begin sharing investments.

A Network Sharing Approach

Setting up a network sharing agreement is always a complex process. We use a structured approach designed to help MNOs successfully manage and implement network sharing: RADAR—rationale, agreement, dimensions, architecture and regulation *(see figure 4)*. Here is how it works:

Rationale: Why? Although the rationale for network sharing varies among operators, cutting costs is a very good reason. The savings lay mainly in the fixed costs for the site, such as rent, maintenance and power consumption. Another reason is

Figure 4
RADAR approach to network sharing

RADAR

Rationale	Agreement	Dimensions	Architecture	Regulation
WHY?	**WHO?**	**WHAT?**	**HOW?**	**WHEN?**
Strategic goals: • Cost reduction • Coverage extension • Participation in new technology	Reasons for selecting sharing partner(s): • Strategic • Technical • Geographic	Sharing agreement parameters: • Geography • Infrastructure • Technology • Processes	Agreement structure: • Network design • Asset ownership • Legal agreement	Regulatory aspects: • Which parts of infrastructure can be shared • Prerequisites • Effect on competition • Environmental impact

Source: A.T. Kearney

to increase the coverage of the RAN without investing heavily in new equipment. This is especially relevant for market followers and for the rollout of new technologies, for example, the launch of the upcoming fourth-generation network. Network sharing allows latecomers to participate in a new technology that a competitor is already using.

Typical pitfalls to network sharing include a more complex decision-making process due to involving multiple parties and, overall, operators may lose some of their independence and thus flexibility in their network design. Also, strategic advantages of one operator (for example, due to leading technology or high coverage) will also be available to competitors that share the network.

Network sharing has proven to be **one of the most effective ways** of bringing down network costs, **on both a relative and an absolute scale.**

Agreement: Who? Networks can be shared with two or more operators. Typically, the more operators involved, the lower the cost per operated network site. Partnerships may also be for strategic reasons. The right choice of a partner may depend on the potential for differentiation with other partners. When sharing the network with other comparable networks, a mobile operator does not lose much differentiation. However, if sharing with much smaller or less advanced operators, the mobile operator might lose significant competitive advantage—which the smaller partner should have to pay for.

Strategic aspects are important, but technical aspects are absolutely vital. Interoperability of equipment is crucial and operators may want to conduct a technology assessment of potential partners. The geographical distribution of operators' sites is also important, as a large overlap may lead to a high cost for dismantling redundancies.

Dimensions: What? The shared network has four dimensions: geography, infrastructure, technology and process. Each dimension will help determine the structure of the partnership.

Geography determines which locations will be shared. MNOs might share sites in the following ways:

- *Urban:* Sharing in urban areas where the network is completely redundant
- *Rural:* Sharing in low-density rural areas with low utilization
- *Selected urban and rural:* Sharing in a combination of selected urban and rural areas, possibly with national roaming on each other's networks in low-density rural areas
- *Countrywide:* Sharing in all parts of a country

Infrastructure determines the physical components of the network that might be shared:

- Sites such as rooftops and masts might be shared to save rental costs.
- Passive infrastructure such as air conditioning, masts and shelters might be shared to save costs for equipment and power.
- Active infrastructure such as radio equipment and antennas may also be shared.
- Full or combined sharing consists of sharing both active and passive infrastructure.

Technology determines which mobile capa-

bilities are to be shared. This could be second generation (GSM), third generation (UMTS) or fourth generation (LTE technology). MNOs might share some combination of these technologies, or all of them.

Process determines the services to be shared.

- Engineering, planning and design for the network may be shared.
- Deployment and rollout sharing might include the construction of new sites, site acquisition and the deployment of new capacity elements in sites.
- Partners could also share optimization know-how, for example measuring signal strength and illumination, or the optimization of existing infrastructure.
- Maintenance and operations of the existing network sites could be shared.

Architecture: How? The network sharing agreement details the commercial, technical, operational and legal conditions of the partnership. Logistically, the possibilities are:

- *New network:* Both (or more) operators build a new network together, ideally when rolling out a new network generation..
- *All-in-one network:* One operator provides the network while the others abandon their networks.
- *Consolidated network:* Operators merge their networks and deconstruct the redundant sites.

Asset ownership may be handled by outsourcing, where the network is sold to a third party. Or ownership is shared in a joint venture, where all MNOs operate the shared network via a common company. Another option is to form a network company–service company where one operator is the owner of the total network while the other operator(s) pays for the service. One characteristic of this last sharing agreement is national roaming. Assets could also be divided so that each operator holds a part of the network assets.

A good network sharing legal agreement will put all the above details in their final form and spell out how revenues and costs will be distributed.

Regulation: When? Overall, regulation will be decisive for the future of network sharing. The degree to which network sharing is allowed and supported by regulators differs by country.

Strategic aspects are important, but technical aspects are absolutely vital—operators may want to conduct a technology assessment of potential partners.

Operators can prepare for the agreement with a detailed assessment of the current legal situation and possible loopholes. Specific requirements may need to be fulfilled, such as determining which entity has full control over the whole network. Regulators may also be concerned about how the network sharing will affect competition, both among the partners and with other operators. In some cases the regulator decides to allow network sharing for environmental reasons: a shared network uses fewer resources and occupies less land and nature.

The Choice Is Clear

Companies that understand they must work with their competitors in order to thrive in the future will more easily adapt network sharing into their business. With the ever-increasing margin pressure in the telecommunications industry, MNOs sense the need for change Network sharing will provide a competitive edge for operators that understand the advantages of moving forward together.

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