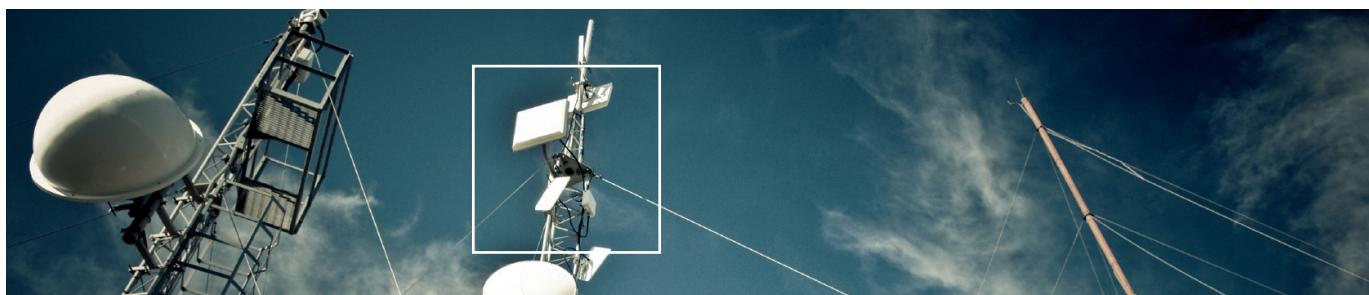


The Future for Telecoms Suppliers – Technology Bets and Survival of the Fittest

Arthur D. Little's 2008 Telecoms Infrastructure Supplier Outlook



Traditional telecom infrastructure suppliers are coming under severe pressure both from evolving operator demands and from new heavyweight competitors in the form of IT players and emerging Asian suppliers. This double pressure means that selling fixed and mobile network equipment in both developed and emerging markets with sustainable margins is becoming ever more challenging for incumbent manufacturers.

Arthur D. Little has reviewed the performance of the leading companies in the sector and conducted a global survey of CTOs to gain their perspective on developments and challenges ahead. Arthur D. Little's analysis of these findings in the market suggests that consolidation will continue; the number of suppliers capable of full-service portfolio coverage will decline; and that suppliers will need to take positions in new technologies.

1. Increasing pressure on established equipment suppliers

Four of the major long established players in the telecoms infrastructure supply sector are Ericsson, Nokia Siemens Networks (NSN), Alcatel-Lucent, and Motorola. They mostly have strong bases in the leading global operators' networks.

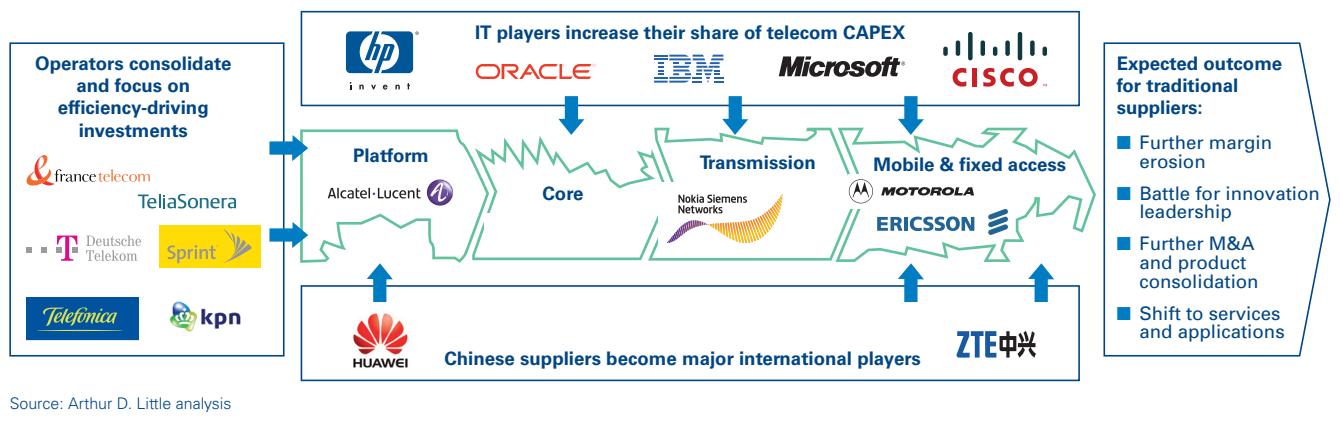
After having seen double digit annual growth rates in recent years, these industry players are now having to adjust to a new environment of profit warnings and declining confidence leading to reductions in market capitalization in virtually all established suppliers, except Nokia (driven by its handset business). As a result, the total market value of the top five global manufacturers dropped by almost 20% between March 2007 and early 2008 – even before the turbulent stock market events in Fall 2008.

The competitive pressures underlying the weakening confidence in traditional players are illustrated in figure 1.

The first of those pressures arises from continued consolidation amongst telecom operators, with the number of fixed and mobile providers in European countries expected to fall from seven to four per country (Arthur D. Little/Exane BNP Paribas 2008). Operators are also consolidating across national borders and establishing regional and even multi-continental operations (e.g. Telefonica in Europe and Latin America, Vodafone in Europe and various emerging markets, MTN in Africa and the Middle East). Both types of consolidation give operators increased purchasing volumes and so stronger negotiating positions with equipment suppliers.

"After having seen double digit annual growth rates in recent years, these industry players are now having to adjust to a new environment of profit warnings and declining confidence leading to reductions in market capitalization in virtually all established suppliers."

Figure 1. Competitive squeeze on Traditional Telecoms Equipment Suppliers



The second pressure is coming from the emergence of Asian companies which are increasingly building a presence in developed as well as developing markets. These new players are characterized by their attractive cost base, improving quality, and an expanding portfolio of products and services. As a result, they are growing fast. The combined global market share of Huawei and ZTE in mobile and fixed services increased from 7% to 20% between 2004 and 2007 and that growth looks set to continue with Huawei forecasting 40% revenue growth in 2008 – 78% of which will come from outside China.

The third source of pressure is coming from IT players entering the infrastructure equipment market. This is being driven by a shift towards an Internet Protocol (IP) approach which has the potential to bring significant changes to the sector and provide new growth opportunities for IT providers.

The combination of these pressures means that traditional European and North America-based infrastructure suppliers have been facing declining margins, pressure on prices and shrinking market valuations over the recent years. That may lead to mergers of manufacturers and a narrowing in product portfolio range, as well as further moves to separate handset and infrastructure businesses. In contrast, Chinese suppliers are still pursuing a strategy that targets an extremely broad portfolio of products and a growing range of services.

Innovation is clearly going to be a key factor in this market and there will be a battle for leadership between emerging and established players. The picture will be further complicated as IT players look for innovative products outside their core IP expertise, with Cisco's acquisition of the WiMax specialist Navini being one example of this approach.

Another strategy likely to be pursued by manufacturers is to develop services and applications to complement their equipment business. Suppliers hope this approach can help differentiate their products and secure new revenue streams.

However, such developments are highly complex and have volatile margins and, given that these products are not the core business of equipment suppliers, they will need to secure partnerships with established software architects to provide the expertise they need. This could then bring further risks and complexity to their business models.

Network operators face their own challenges in this increasingly complex market. A key priority for them will be to secure suppliers who are financially stable and do not put their own investment in production facilities at risk. Equally, they will be looking for suppliers who have the technological strengths to keep up with the pace of change in the market and demand and can offer technology platforms and offerings that will gain critical scale and as a result build advantages in costs, both in capex and opex.

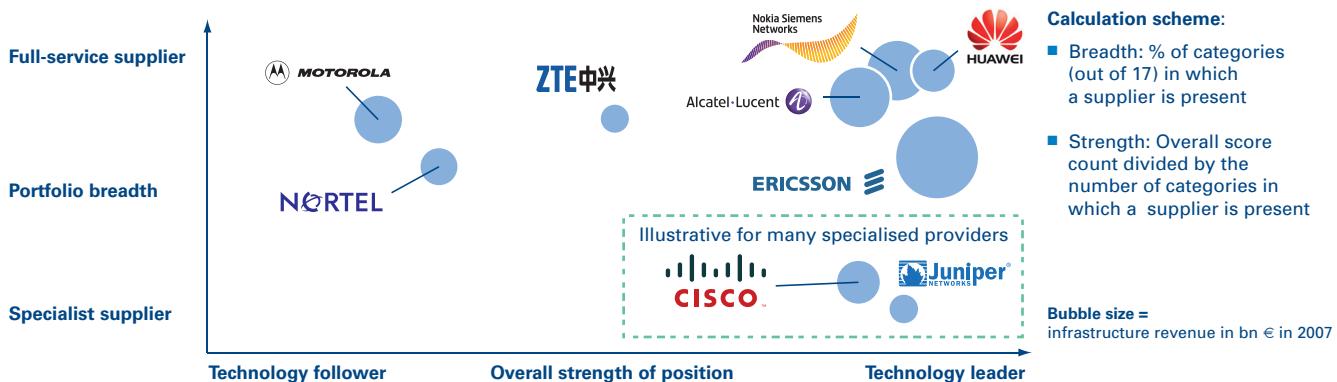
2. How well placed are Telecom equipment suppliers to meet future technological demands?

To provide a perspective on the particular issues around technological developments Arthur D. Little has conducted a survey among CTOs and industry experts (see page 5 "Arthur D. Little's 2008 Telecoms Infrastructure Supplier Outlook").

This first global telecom equipment supplier survey was conducted in May-July 2008 and 20 technology areas were rated for 10 suppliers (which invoiced 59% of global telecoms infrastructure CAPEX in 2007).

The survey showed that the four largest players Ericsson, Alcatel-Lucent, Nokia Siemens Networks and Huawei are seen as broadest and strongest in terms of their product and technology positioning (see figures 2 and 3). However, there are a number of, specialized players who are not necessarily seen as technology leaders, but have particular strengths in specific product categories (see figure 2).

Figure 2. Arthur D. Little Infrastructure Equipment Supplier Positioning Map



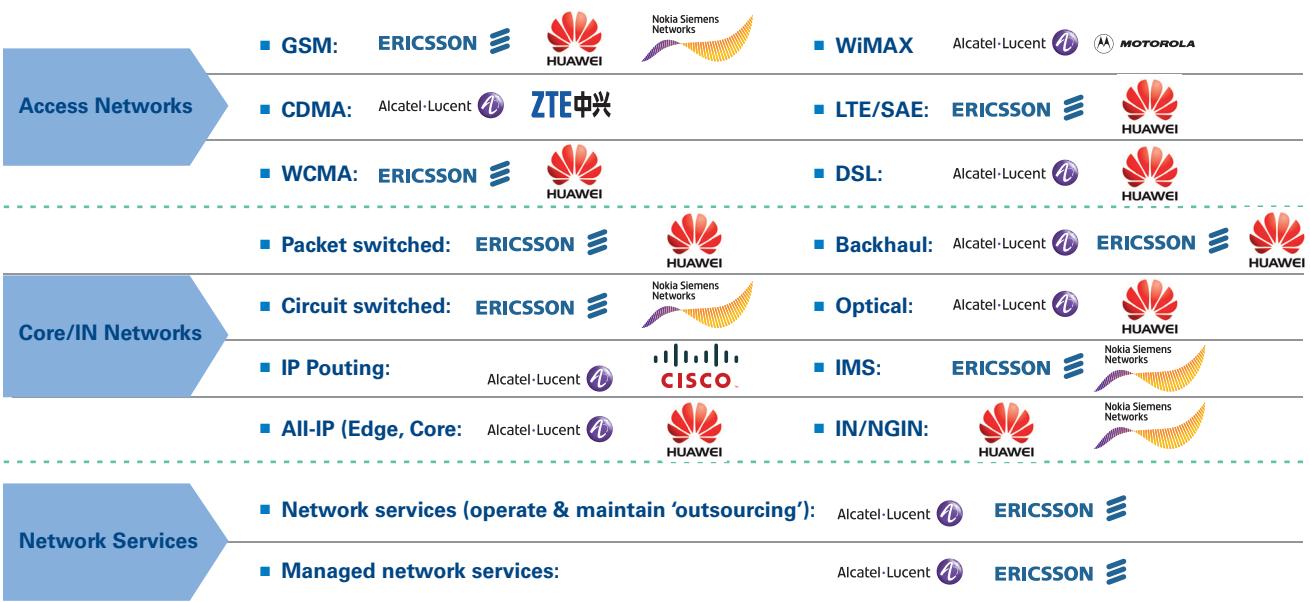
Source: Arthur D. Little survey, May-July 2008. Further details are available in the full report

Services and products were reviewed in three main areas: Access network infrastructure, Core & Transmission network infrastructure, and Services. Our main findings are that

- CTOs identified clear leaders in the surveyed technology areas – e.g. Alcatel-Lucent and Motorola in WiMax or Ericsson and Huawei in LTE, and Cisco in core IP routing.
- Despite clear leader positions, as shown in figure 3, operators typically still have a choice of 3-5 alternative credible suppliers (additional suppliers, which were not seen as leaders but rather as “at par” or “laggards” in terms of their overall technology position in the surveyed areas are not shown in Figure 3 but are presented in further detail in the full Arthur D. Little report).

- Not all suppliers are supporting all technologies, technology bets are increasing – e.g. Ericsson is not in WiMax and CDMA2000 but is in WCDMA and aggressively pursuing the development of OFDM-based LTE. Nortel has abandoned its earlier commitment to WiMax development, having earlier sold its UMTS/WCDMA business to Alcatel-Lucent, and will resell Alvarion’s WiMax products, concentrating its R&D on LTE (4G).
- According to our survey participants, Nortel and Motorola have lost ground mainly due to missing the 3G (WCDMA) wave and investing heavily in WiMax (remains a niche market) with little market impact. They are now reshuffling their resources towards LTE.

Figure 3. Arthur D. Little Survey Results: Technology Leadership among Infrastructure Equipment Suppliers



Source: Arthur D. Little survey, May-July 2008. Further details are available in the full report

Leaders listed in alphabetical order without indication of ranking

- CDMA2000 seems to be led by Chinese suppliers, particularly for emerging markets – only four main suppliers remain in the infrastructure game for CDMA: ZTE, Alcatel-Lucent, Huawei, and Nortel.
- Overall, CTOs think that Ericsson seems to be very well on track for the next few years, having invested heavily in GSM/ HSPA while laying the groundwork for LTE in the longer term.
- Huawei is perceived as a strong technology player in Access infrastructure and may have the broadest and strongest position overall, with the exception of (local) services.

Further, various smaller players as well as ICT companies with some telco infrastructure equipment are identified by the respondents as being relevant in only a few or even just one technology area.

In addition to their perceptions about technology we asked executives how they see the Intellectual Property Rights (IPR) base of the equipment suppliers surveyed. A good IPR base was seen for all of the companies. Particularly strong bases were attributed to Ericsson, NSN, Huawei and Cisco, while the strongest IPR creation was attributed to Ericsson, NSN, Motorola, Huawei and Cisco. We have tested these perceptions against the publicly available information on patents and patent creation and Alcatel-Lucent, Ericsson and Motorola have the strongest base of patents among the traditional equipment manufacturers. Huawei, Nortel and ZTE have a rather small base of patents but Huawei in particular is catching up, having created and registered 14,000 patents in the last three years. Clearly the quantity of patents a company may have filed provides only one part of the picture and their quality is also important, although outside the scope of this report.

3. Implications and key questions for the future

The competitive pressures faced by traditional suppliers are also opening up potential new opportunities. These include maintaining and even operating networks on behalf of operators. For example, Alcatel-Lucent entered into a network roll-out/maintenance joint venture with a mobile service company in India – leading to significant risk sharing and a quite different business model compared with conventional infrastructure sales.

The market for these services, which require significant amounts of systems integration work in multi-vendor environments, is growing. However, the operating margins of such propositions are only in the low to mid-teens and tighter than those for equipment. But these services do offer scope for equipment suppliers to help retain existing accounts, and win new customers, and, given their lower working capital requirements and typical payment terms, help with cash flows as well.

Another response to market conditions, is the investment by infrastructure vendors in software research and development. These service extensions offer high profit margins, often two to three times the margins of hardware sales. This is leading to partnerships with software specialists, for example, Nortel with Microsoft. There is, of course, a risk that these partners may also quickly become competitors with software specialists and ICT players increasingly building on their niche markets and entering traditional telecoms territories.

It is clear that the software and solution business is becoming essential for network infrastructure suppliers as it becomes more important to integrate proper and effective equipment with applications rather than simply install the most advanced network. This presents challenges because software and solutions are very different types of business in terms of value chain, business model, and even their organizational culture. To succeed in this arena, suppliers will need to ensure they focus on developing solutions that respond to customers' needs rather than trying to impose technology-driven innovative products originating in laboratories.

Challenges Ahead

The key challenge for suppliers will be to make a sophisticated assessment of both their commercial and technological positions and how they can meet the demands of a rapidly evolving market. The key questions for them are:

- Which market evolution scenarios are likely and what is their impact on a supplier's competitive position and strategy?
- Which should be our technical focus given our finite resources and current competitive position (e.g. internal development versus partnerships versus buying expertise)?
- Where do we see portfolio consolidation potential?
- How can we improve our customers' confidence and perception of our capabilities?
- How can we become efficient in designing the next generation technology by partnerships with other suppliers?

In particular, companies engaged in or contemplating a major acquisition will have to pay attention to the post-merger integration issues that will have the highest impact on their technology position and minimise both external and internal disruptions.

The key challenge for operators will be the need to monitor the volatile and changing supplier market continuously. This may include introducing supplier audits and/or a short-list of preferred partners.

The key questions for them will be:

- Which market evolution scenarios are likely and what is their impact on infrastructure procurement and cost?
- How vulnerable is our position/existing investment to disruptions in the supplier landscape?
- What is a healthy supplier mix in access, core, transmission, and services?

Conclusion

Arthur D. Little's findings from this in depth survey of leading infrastructure suppliers highlight that they are facing significant competitive pressures. The "squeeze" stems from the growth of Asian players entering new developed markets and from the entry of IT as the transformation to IP-based networking continues. That is leading to a more diverse and volatile market with intense jockeying for position along a changing telecommunications infrastructure and services value chain. We also expect that we have not yet seen the last consolidation wave, that we may see an evolution where fewer and fewer suppliers can do everything.

In terms of technology, suppliers are placing bets on particular technologies and face real challenges keeping pace with the technological developments demanded by the markets. These developments are also creating new opportunities for alliances and for new services. This means the market will continue to evolve dynamically and in ways hard to predict with a high degree of accuracy. As a result, both suppliers and operators need to monitor developments closely while being prepared to challenge their own currently accepted wisdom.

It will be vital for them to maintain strategic flexibility, while not being distracted from maximising the immediate and short term opportunities, which will provide the resources needed to build for the long term.

Please let us know should you be interested in a full overview of the Arthur D. Little Supplier Assessment Study, which we can provide to you at your convenience.

"Arthur D. Little's 2008 Telecoms Infrastructure Supplier Outlook"

Arthur D. Little conducted the first global telecom equipment supplier survey in May-July 2008 to capture industry perspectives on technology positions of leading manufacturers. 20 technology areas were rated for 10 suppliers, which accounted for 59% of global telecoms infrastructure CAPEX in 2007. Following a pre-study with selected industry experts both from the technology and procurement side, the global survey was distributed to 100+ CTOs from fixed and mobile operators and management level industry experts (e.g., leading industry associations) – predominantly clients of the discussed suppliers. Responses were qualitatively weighted by Arthur D. Little according to specific experts' experience in relevant technology areas and operator size to reflect validity and importance of opinion in the final survey results. The survey will be updated on an annual basis to reflect supplier evolution and performance improvements.

"What about the Asian Cost Advantage?"

Asian suppliers have much lower R&D costs and so they can employ up to 15 times more researchers per million Euros than western companies. The cost of manufacturing is much lower and the Chinese players receive government support in the form of preferential government loans, tax breaks and land.

Will this cost advantage be durable? There are some signs the advantage is eroding. This is partly due to 8% inflation, the 20% Yuan-USD appreciation since 2005, as well as reductions in government support. Asian suppliers also face increasing costs in service provision and distribution in developed markets. Equally, western players have started shifting some manufacturing and R&D to low cost countries and should realise post merger integration synergies. Therefore we expect cost bases to converge over 3-5 years.

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Arthur D. Little

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