A Dozen Trends in Telecommunications

Perspective Paper
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This perspective paper summarizes Booz Allen Hamilton’s understanding of the growth opportunities in the telecommunications market. The authors emphasize that they have intentionally focused only on the key trends to provide managers with a catalyst for their decision-making process.

I. Trends in the Telecommunications Market

Exhibit 1
Booz Allen sees the following 12 key trends in the areas of market, technology, and competition.

<table>
<thead>
<tr>
<th>Area</th>
<th>Core Statements on Trends</th>
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<tbody>
<tr>
<td>Market</td>
<td>• Investment (CAPEX) will remain restrained, with the main expenditures in the mobile communications and fixed network broadband areas.</td>
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<tr>
<td></td>
<td>• China will dominate market development.</td>
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<td>• The fixed network is already being crowded out by mobile communications, particularly in the voice segment.</td>
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<td></td>
<td>• New business models based on improved customer segmentation will continue to emerge (e.g., low-cost carriers).</td>
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<tr>
<td></td>
<td>• Operators will consolidate further, particularly in mobile communications, and we expect this trend to continue also at the national and regional levels of mature markets.</td>
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<td></td>
<td>• Fixed network growth will be driven by broadband rollout and entry into TV.</td>
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<tr>
<td>Technology</td>
<td>• European mobile markets will be characterized by broadband overcapacities—little demand for 4G is foreseeable in the short term.</td>
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<td>• Customer requirements and technological developments are changing the mix in the manufacturing business.</td>
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<td></td>
<td>• Multiple-access opportunities are prevailing and increasing the complexity in the market. Ubiquitous IP will lead to the availability of applications regardless of the underlying network technology.</td>
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<tr>
<td>Competition</td>
<td>• Manufacturers from the Far East will continue to gain rapid traction globally.</td>
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<td></td>
<td>• Mergers and Acquisition activities among manufacturers will increase.</td>
</tr>
<tr>
<td></td>
<td>• New competitors from the IT environment are entering the market in the areas of applications and platforms.</td>
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</table>

Source: Booz Allen Hamilton
1. Selective CAPEX Growth
Investment (CAPEX) will remain restrained, with the main expenditures in the areas of mobile communications and fixed network broadband. Spending will be driven primarily by expansion plans in threshold countries and Third World countries, as well as by capacity increases in 2G and the global 3G rollout. In the fixed network area, investments will be driven primarily by upgrades and broadband equipment expansion, mainly DSL now, followed by VDSL. Incumbents and established alternate carriers are saddled with legacy network infrastructures, and need to enable these with functionality for new offerings, as well as create a less complex and optimized structure.

Three key developments are driving the CAPEX for Next Generation Networks (NGN) in the fixed network: Broadband/Triple Play expansion (both platforms and network), Next Generation OSS/BSS, and migration of voice networks to VoIP.

While this migration to VoIP has already progressed extensively in Asia (for example, in Korea and Japan), and operators are delivering multimedia networks down to the end user, a similar development for Europe is expected only in the next five years. Due to the operators’ cautious, step-by-step migration, major investment is not expected.

2. The China Factor
China will dominate in terms of market growth, creating significant opportunities. The country offers a large sales market for telecommunications products and services. First signs of a maturing market, such as slightly sinking growth rates in the mobile communications sector, do not change this forecast: As many as 500 million mobile phone users are projected for 2008, and growth rates in value-added services also promise attractive business opportunities.

The poor development of the telecommunications infrastructure (few and unreliable phone lines) on the one hand, and China’s rapid economic growth (which for the first time provides large segments of the population with the means to buy a cellular phone) on the other hand, clearly point to the importance of the mobile communications market as a growth driver.

3. Mobile Versus Fixed
The trend of consumers using a mobile rather than a fixed network continues to gather steam. This development, known as Fixed Mobile Substitution (FMS), demonstrates that the fixed network is already being crowded out by mobile communications, particularly in the voice segment. In Finland, for example, 35 percent of households no longer have a fixed connection.

It’s still too early to predict whether this trend will continue given the focus on Fixed Mobile Convergence (FMC), where mobile handsets can be designed for use on both mobile and fixed networks—which is expected to grow substantially.

This mobile versus fixed trend will lead to different consequences or value propositions. On the one hand, FMS offers mobility, flexibility, easy understanding, and an all-in-one product. FMC, on the other hand, offers a one-stop-shopping approach and the use of either fixed network or mobile communications, depending on the given conditions.

In any case, we expect a number of FMC products around home entertainment and in business providing users with more flexibility (e.g., use of mobile terminals over the fixed network to provide connectivity in an office or home).

4. The Pressure Mounts
New business models are emerging, and low-cost carriers are a prime example. These new providers will be able to go to market at significantly lower cost than full-service providers, increasing the pressure on the latter.

A successful example of this market change is MetroPCS, in the San Francisco Bay area. Its cost advantages began with a focus on simple products, such as plain pre-paid voice service at a flat rate, often with a clear geographical concentration (no national roaming), based on the lowest priced network technology/approach. MetroPCS now has simple and economically priced terminals that are sold via e-sales channels and are easily topped up at third-party retail locations.

5. Consolidation Activity
We expect operators to consolidate further, particularly
in mobile communications. This trend will be seen primarily at the national or regional levels in mature markets. The emergence of additional global players, whether in the mobile or fixed network sectors, is rather unlikely or will be limited to only a few companies. Consolidation will also further constrain CAPEX spending.

6. Even Broader-Band
Growth in the fixed network will be driven by continuing broadband rollout and the entry of traditional telecom players into the TV business (Triple Play). Fixed network operators will try to compensate for decreasing sales in their businesses, caused by the decline of prices and mobile radio substitution, with strong growth in broadband (DSL). Most operators in Europe have recorded double-digit growth in DSL connections.

Operators can achieve real sales growth in saturated markets, however, only by entering the TV business. In particular, incumbents—not least as a strategy to counter the cable network operators—have planned an aggressive entry into TV. Field tests conducted to date, however, have shown that ADSL+ does not suffice for this. Therefore we expect an aggressive rollout of VDSL as the prerequisite for successful implementation of a Triple Play strategy.

7. 4G Question Mark
European mobile markets will be characterized by broadband overcapacities, so little demand for 4G is foreseeable in the short term, given that the expectations associated with 3G in Europe have yet to be met. The market is accepting UMTS only very reluctantly.

Even based on the most optimistic growth estimates, the European mobile communications market looks saturated in terms of bandwidth for the next five to ten years. This is partly due to the fact that many of the 3G rollout plans are tied to operator GSM licenses that will run through 2012 to 2015.

Moreover, a fundamental insecurity prevails among operators regarding technological development: Few providers, if any, are currently thinking about next-generation technologies. The excessive bandwidth offering and the cautious interest in new technologies dampen hopes for the next wave of investment programs in mobile communications.

8. Going Soft
Customer requirements and technological developments are changing the mix in the manufacturing business. The hardware/software mix in the supplier market is shifting with the trend to software-based NGNs, the stronger focus on applications and solutions areas, and the increasing movement of software into traditional hardware areas.

The increasing willingness of operators to relinquish parts of their value-added services to third parties means an increased growth in the servicing business. Thus the current hardware/software/services mix in the business will tend toward a more equitable subdivision of thirds.

Due to the differing margins in these areas, impact on the overall margin is also to be expected. The extent of this would, however, strongly depend on the market positioning of the individual suppliers.

In many areas, hardware will become a commodity and thus experience a strong downward pressure on prices. Mobile radio power packs, for instance, are already purchased via e-auctions. Here, too, technological developments will spur a further drop in prices, as can already be seen in the DSL and PBX areas.

Booz Allen surveys support the view that the positive demand in the servicing business will lead to moderate growth in traditional segments like the integration business, as well as to strong growth in the outsourcing area, particularly in the mobile and enterprise business.

9. IP Everywhere
Multiple-access opportunities are prevailing and increasing market complexity. Ubiquitous IP has led to the availability of applications regardless of the underlying network technology.

The variety of access technologies (UMTS, WiMAX, FlashOFDM, VDSL) will increase further. The specific situation in individual countries, be it fixed network penetration or the proportion of cable and fixed-network operators, will result in the most diverse combinations. This increasing diversity will generally increase the complexity for operators.

Additionally, ubiquitous IP as a standard on top of the infrastructure enables applications to be decoupled from network technology per se. Due to the resulting
customer potential, large application developers like Microsoft will increasingly enter the market.

10. Made in Asia
Manufacturers from the Far East—particularly those from China (such as Huawei)—are gaining rapid traction globally. Such companies are already in the third phase of their business evolution and can take advantage of not just low-cost production capacities but also a high degree of technological innovation and their intellectual property.

Thus Huawei is already number two in DSL, with Alcatel in the number one position. Although Asian manufacturers will dominate in the mass segments, in the medium term they will not be able to rapidly gain access to sales channels organically, nor will they be able to offer service coverage comparable to that of the incumbent manufacturers.

The terminal equipment business will be delivering a mass market product with technology niches for micro-customer segments in the medium term, so brand value, customer access through indirect channels, and high innovation cycles will be discriminators for success.

11. Strength in Numbers
M&A activities among telecom equipment vendors will increase. Up to now, a lack of financial power and strong overlaps have hindered consolidation in the equipment vendor market. The first signs of consolidation, however, can already be observed, such as the joint ventures of SonyEricsson, and Alcatel with TCL; acquisitions such as Avaya/Tenovis; and increasing cooperation between European and Asian manufacturers.

We expect these activities to increase, particularly in the terminal equipment environment and in enterprise equipment. M&A activities can be envisioned in the fixed and in the mobile network equipment markets, particularly related to scale requirements, both in production and in sales or service.

12. Competition Defined
New competitors from the IT sector have entered the market in the areas of applications and platforms. Particularly in the area of value-added services, manufacturers of traditional telecommunications platforms are experiencing stronger competition from the IT industry.

With a more standardized infrastructure and open platforms, these IT players will be able to offer cost and time-to-market advantages. It is still a stretch for the IT industry to meet the stability and quality standards of telecom companies, but it’s achievable.

While traditional manufacturers aim to secure future cash flows from the integration and maintenance business through sales of proprietary systems, the IT industry has countered with standard concepts such as ATCA or the Microsoft suite of .net solutions, along with a vast pool of application developers.

As such, the differentiating factors that traditional manufacturers used to have (such as specialized knowledge of telecommunications protocols and frequency management) is being eroded by IT giants like IBM, HP and Accenture in the fields of consulting, application development, and servers and applications.

The traditional telecommunications infrastructure business, therefore, will be subject to great pressure moving forward, in a manner similar to that already experienced by proprietary players in the IT industry.

Many other trends are recognizable but, in our view, they take a backseat to the issues discussed here, or can be subsumed by the above-mentioned trends.

II. Market Opportunities and Implications for Vendors
The growth opportunities derived from these 12 key trends can be viewed in context of four submarkets:

1. Mobile Network Infrastructure
The growth in this submarket will still be driven by 3G rollout in the short to medium term. After this, a significant drop of CAPEX can be expected due to broadband overcapacity in mature markets. Subsequently, growth will be achievable predominantly in threshold countries, where expansion of the infrastructure has not progressed very far.

Concurrently, growth niches are developing in the area of new access technologies like WiMAX. In addition, growth will be achievable in the software and service areas. Already an increased demand, for instance, for consulting services and managed operations services (up to network outsourcing) can be observed.
Due to the projected broadband overcapacities in Europe, vendors must take a strong position mainly in threshold countries like China, India, or Russia to sustain medium- to long-term growth. In Europe, vendors can generate growth particularly in the areas of platforms, software, and services, when these markets are approached strongly.

In addition, the market approach should be more strongly differentiated among the large global mobile network operators, national operators, and low-cost carriers. Each of these segments has specific needs, and serving these needs better than the competition yields competitive advantages.

2. Fixed Network Infrastructure

In the short to medium term, growth in fixed network infrastructure will be possible mainly as a result of DSL rollout. We expect the next investment wave to be the rollout of VDSL as the prerequisite for a successful Triple Play offering. Additional growth opportunities exist—analog to mobile infrastructure—in software and services.

Due to the limited growth opportunities for operators in the fixed network business, vendors will be able to grow only if a strong position can be established in the growth segments. The transition to NGNs will give vendors growth opportunities. However, this will require focus and patience, as on the one hand, migration paths of the carriers provide for only a stepwise transition and, on the other hand, this market segment is also fiercely contested in the vendor space.

Vendors can achieve significant growth with attractive profitability when their position in growth segments such as DSL and VDSL is strong, or when the realignment toward software and services can be accelerated.

3. Terminal Equipment—Wireless and Wireline

Growth opportunities exist in the terminal equipment market, particularly in China and other threshold countries, as well as in a smaller segment of convergent terminal devices (WLAN/3G and the home entertainment area).

This terminal equipment business will increasingly follow the business model of entertainment electronics, and the market will show a reinforced subdivision into various segments (e.g., low-cost models for threshold countries, high-functionality models for business customers, multimedia devices for residential customers). We expect the trend toward customization to continue in the medium term, and this will also be required from non-operators like supermarkets. This trend strongly increases the complexity in sales/marketing and in development. At the same time, a “commoditization” will begin as soon as a saturation of technological innovation has been reached in the terminal equipment area. We expect this to occur following the introduction of mobile TV applications. While the entry barriers in this market are being constantly lowered (no major technological leaps, access to design and production capacities of ODMs or EMS), the competition from Asia will increase. The integrated traditional manufacturers (Siemens, Nokia, Ericsson/SonyEricsson/EMP, Motorola, Qualcomm) have a short- to medium-term advantage in securing an end-to-end integration of terminal device, service platform, and network for the operators. This advantage will, however, likely erode with increasing standardization, but it can currently be actively leveraged for market positioning.

Vendors will have to decide whether to pursue a pure play niche (e.g., high end), a low-end (low cost), or a broad portfolio strategy, and will be able to achieve a sufficient margin only by leveraging scale effects—the margins in this industry will on average align with the lower margins of the entertainment electronics industry. In the medium term, a strong innovation capability, complemented by a persuasive marketing and sales performance in the channels and vis-à-vis the consumer, will continue to be required.

4. Enterprise Equipment

Growth opportunities in the enterprise equipment market are very limited because PBX functionality and terminal devices are integrated in LANs increasingly on the basis of IP, thus creating a strong decrease in the traditional PBX hardware business. As a consequence, the top line faces deterioration due to clearly lower prices “per port.” LAN-based solutions will also trigger declining sales in the maintenance business, as the share of maintenance in overall data equipment sales is lower than in the case of voice equipment. Finally, the intensity of the competition will increase, as traditional vendors are increasingly competing with players in the LAN market and with Asian suppliers, who are gaining ground in this market.
Growth opportunities lie mainly in up- and cross-selling services to the existing customer base, for instance, in systems integration (e.g., voice-data integration, applications) and IT services, as well as in the managed services business.

III. Prospects for the Telecommunications Equipment Industry

The aforementioned trends and implications demonstrate that the global telecommunications equipment industry continues to undergo a paradigm shift and essential changes are required of players to survive. All vendors are encountering the change imperatives listed below:

- High cost pressure will remain in the medium term, so scale advantages must be exploited; and a selective relocation (make/buy or locations) must take place in the value creation of the production area.
- Shifting the differentiating value creation from a traditional hardware/box business to a software/solution and servicing business requires a fundamentally new alignment of competencies.
- The stronger differentiation of the network operator landscape—e.g., global mobile operators versus national mobile operators versus full-range incumbents versus low-cost carriers—requires a differentiated go-to-market approach and the alignment of the product/service portfolio.
- Competitive pressures and the changed customer behavior require a strong positioning of the brand, the occupation of the sales channels, and an active caretaking of the “installed base.”
- With this background, the subject of innovation is much more to be understood as “Customer-Pull” than as “Technology-Push”; consequently, R&D activities must be aligned much more to the market and to the specific needs of the customer segments.
- Market developments and pressure to consolidate will lead to increased M&A activities and alliances, both within the telecom equipment industry and with players from the IT industry. This will increase the pressure on all players. The limited options mean early movers can gain the advantage.
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