

Breaking up the handset value chain

Handset vendors are in for some tough decisions, it is becoming harder to compete through uniqueness as the value chain for handsets breaks up. They should instead learn from the PC industry. And if they want to be solution providers to operators, why not offer mobile devices from other firms?



LARGE FIRMS SUCH AS MOTOROLA, Ericsson, Nokia and Siemens pushed the frontiers of mobile-handset performance during the late 1980s and into the 1990s, and the industry was considered a classic case of vertical integration. These vertical integrators not only controlled the design, production and marketing of mobile phones, but also the mobile communications infrastructure business. This was a period in which uniqueness and control of the knowledge generated by innovation was a key lever for competitive advantage.

But the ability of handset vendors to maintain their competitive advantage progressively diminished during the 1990s. Although there were still relatively few large firms in the industry, it became increasingly difficult to maintain competitive advantage simply through product uniqueness. Rather, the basis for competitive advantage shifted towards the ability to control the complementary assets necessary to exploit the knowledge generated by industry innovation. The key complementary assets at this time included volume manufacturing capabilities, sales and service expertise, brand building, management of distribution channels and customer relationships.

The ability to meet the stringent device requirements of mobile-network operators has been a key complementary asset in the industry for at least the past five years. While many companies have entered the mobile handset device market since the late 1990s, few have been able to develop the organizational capabilities needed to interface effectively with operators across the full spectrum of activities required to integrate a handset with increasingly sophisticated service offerings: new service and product development and testing, sourcing, logistics, segment and channel management, and servicing. Given the organizational resources required to deliver across this spectrum of operator activities, it is perhaps not surprising that more than 80 percent of handset industry volumes are still dominated by just five players.

As mobile network operators place increasing emphasis on serving low-income customers in developing markets, complementary assets are going to remain a significant driver of competitive advantage. While the ability to bring a “unique” low-cost handset to market will provide a lever for sales in developing markets, the ability to build brand equity, construct and use effective supply chains, and build and maintain strong relationships with mobile-network operators will also be crucial.

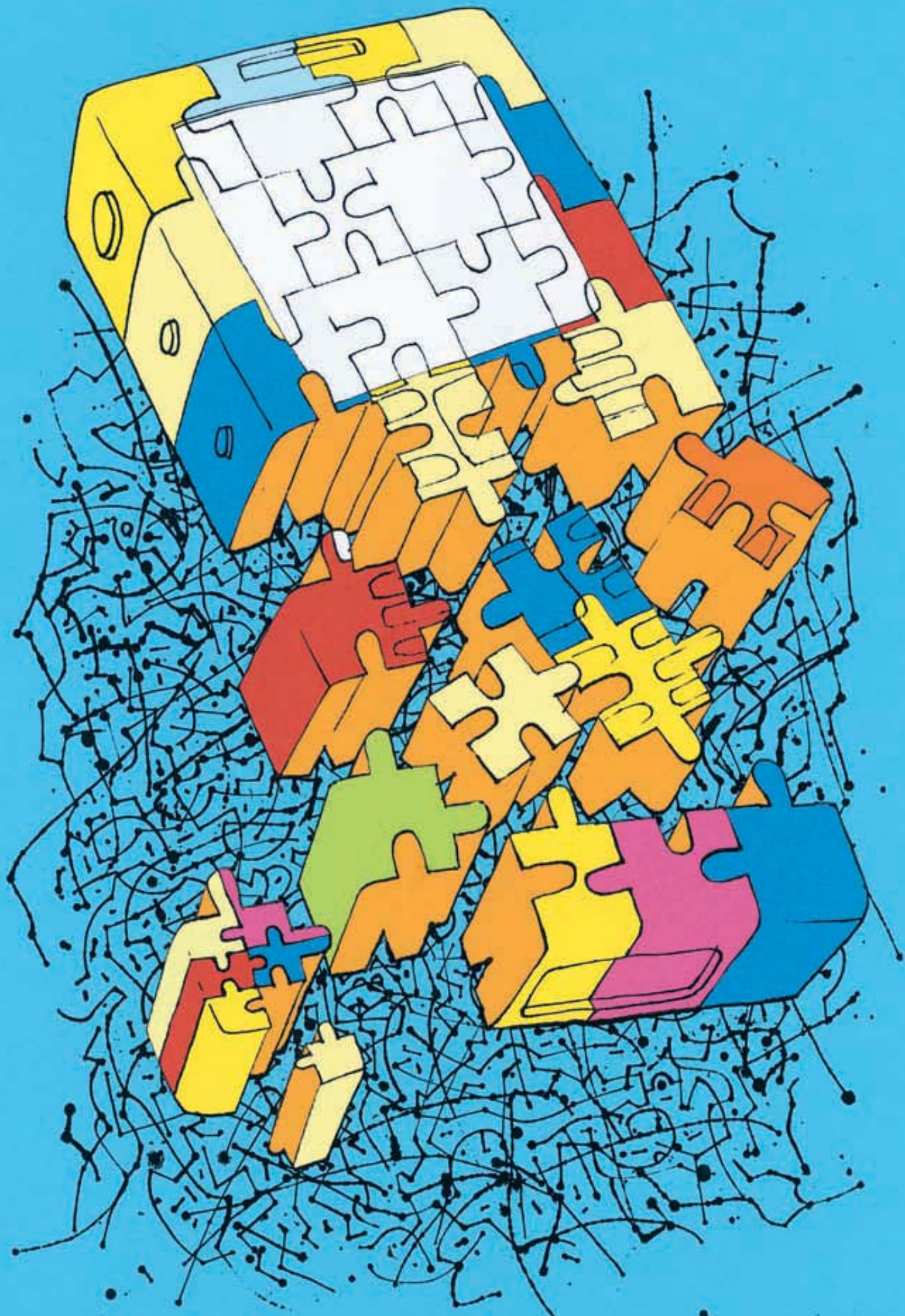
It is interesting to note that Nokia has not made significant efforts to bring an ultra-low-cost handset to market, but retains a market-leading position in much of the developing world through a strong emphasis on building the complementary assets necessary to bolster its product approach. In 2006, Nokia grew handset volumes in India by 100 percent. With revenues of EUR 2.71 billion, the company bypassed long-established firms such as Hindustan Unilever to become the largest multinational in the country. Nokia's market share in the Indian GSM handset market (in terms of units sold) exceeded 70 percent at the end of the year.

From complementary assets to managing power

We are now witnessing yet another major shift in the mobile handset industry. As was the case in the PC industry in the 1980s and 1990s, the mobile handset industry is today “unbundling” – that is, increasingly specialized firms are entering the market with components and software that are assembled by branded manufacturers and original device manufacturers (ODMs) into finished devices.

While this evolution has been under way for the greater part of a decade, it has gathered pace in the past two to three years. There seem to be several motivating factors at the heart of this process: evolving technological standardization; gains from specialization driven by differences in the evolving knowledge bases across the industry; and gains from trade emerging from the different cap-





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abilities of specific firms. Powerful buyers – mobile network operators – are also exerting an important influence on the break-up of the mobile-handset value chain by demanding that manufacturers integrate certain standards-based technologies, software, operating systems and applications.

While this trend towards specialization across the handset-industry value chain has been under way for some years, the structure of this specialization has begun to differ across different tiers of the market, especially if we look into mobile platform-related activities in the value chain. The industry has witnessed the emergence of three distinct structures:

- 1. The semiconductor paradigm**
- 2. The telecom paradigm**
- 3. The computing paradigm**

A set of basic capabilities is required to enter the mobile-platform industry. But to be successful within each of the above paradigms, handset vendors need to combine these capabilities with paradigm-specific capabilities. No independent mobile-platform provider is today fully successful across the entire market, largely due to the almost incompatible requirements of, for example, cost leadership in the lower segments and a need for differentiation through cutting-edge technology in the higher segments. This does not exclude the possibility of building synergies between the different paradigms, but doing so will require handset vendors to optimize their organizational capabilities for the specific market. The drive towards specialization has created a set of rules required for success in each specific paradigm.

The semiconductor paradigm

The semiconductor paradigm is strongly influenced by the key capabilities often possessed by traditional semiconductor companies such as Texas Instruments and Infineon. They compete primarily through cost leadership when addressing the entry segments with their own mobile platforms, and they have historically been less successful when trying to compete with more advanced solutions.

The prime focus within this paradigm is on hardware, and continuous cost reduction is achieved through process shrinking (Moore's Law-driven innovation), component reduction, vertical integration in the value chain for mobile handsets and horizontal synergies (economies of scale). The focus of cellular software is limited and thus not a differentiating capability.

The products provided within the semiconductor paradigm address the lower segments of the mobile-handset industry (average sales price less than USD 125). These segments have stable software protocol stacks and limited feature growth since cost awareness is central to the end-user design. This is currently dominated by GSM and GPRS-enabled products, and we expect EDGE to enter this market in 2008; WCDMA will take a few more years until the standard matures to the level of GSM/GPRS today.

The semiconductor paradigm has evolved over the past couple of years as a result of maturing standards and technologies. The

value has shifted towards the key capabilities of traditional semiconductor companies, giving them cost advantages over traditional players because there is less opportunity for differentiation.

The telecom paradigm

The telecom paradigm is dominated by the traditional handset development industry, which has been driven by continuous feature growth for both new access technologies and multimedia functionality. The semiconductor paradigm emerged as access technologies matured enough to be managed by non-traditional handset vendors, whereas the telecom paradigm has been, and still is, dominated by traditional telecom players such as Nokia, Ericsson, Qualcomm and Motorola. It is also, by far, the largest market both in terms of volumes and value.

Key to success within the telecom paradigm is the ability to manage new radio-access technologies, system design, integration of multimedia functionality and peripherals, operator relations and interoperability testing. Innovation is driven by intellectual property rights (IPR), with a continuous flow of new and more complex requirements balanced by the total cost of ownership needed to meet end-user device requirements.

The mobile platforms included in the product offerings are advanced system designs with tightly coupled software and application-specific hardware, using an optimized footprint to balance

point

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mobile handset's specific requirements for industrial design and low power consumption. Other parts of the product offering in the telecom paradigm include physical handset reference designs, development boards, development and test tools, as well as different types of services such as training and support.

The computing paradigm

The third paradigm, the computing paradigm, illustrates the ongoing convergence with the PC industry. Traditional PC-oriented services, such as internet browsing, e-mailing, content creation and content consumption, are being converged into the mobile handset in mainly two categories of services: business and multimedia. The key differences between using these services in a traditional mobile handset and in the more advanced smartphones, ultra-mobile PCs and other devices developed for the computing paradigm are that the devices typically integrate simplified text design (touch screen or QWERTY keypad), strong CPU power, large screens and the ability to use third-party

Product value chain – mobile phones



applications. The ways of working between the players involved in the industry value chain are similar to the PC industry, with a horizontal value chain and several players involved in one product design.

Software design and OS are important in the computing paradigm: it can be seen as the PC industry going mobile, where cellular functionality has been reduced to one of many plug-in features. Simply put, one could say the computing paradigm has copied the PC industry's evolution with a strong focus on operating systems and a Megahertz race on the CPU.

Implications for vendors

Given these developments across the three paradigms, any firm wishing to compete as a mobile-device manufacturer in the future will need to develop strong system-integration capabilities. But like the PC industry, as the mobile handset industry moves towards greater specialization, the entry barriers to new players will fall. Variable rather than fixed costs will become more significant, and core R&D capability will not be a requirement for competitive advantage. But to select the right partners and integrate supplier input effectively, successful firms must still have technical know-how that overlaps with suppliers.

The cost structure of non-integrated design or assembly firms tends to be dominated by variable rather than fixed costs. Because high fixed costs are what give rise to steep economies of scale, assemblers of modular products are able to compete on relatively flat scale curves: small competitors will be able to enjoy similar costs to larger ones. There will be a rush of new entrants from

China, Taiwan and other countries that have perfected low-cost manufacturing of modular products such as consumer electronics and PCs.

As entry barriers fall, profitability is likely to flow away from handset manufacturers to manufacturers of key performance-enhancing components and modules (both hardware and software). Likewise, the OS, software applications and microprocessor subsystems are likely to be critical in determining the performance of future mobile devices, so the battle to control these elements will be intense. Other component manufacturers, such as manufacturers of peripherals and components that eventually overshoot the performance requirements of the mass PC market, are unlikely to reap substantial profits in the longer term as industry standards are established and technologies mature.

One of the biggest decisions for handset vendors will be whether to compete across all three paradigms. As computer companies such as IBM discovered in the 1980s and 1990s, in an industry with a high degree of multidimensional complexity, it can become difficult to be competitive across increasingly diverging product categories. IBM's range included PCs, mini-computers and mainframes until the mid-1990s, but this positioning became increasingly untenable as the capabilities required to compete across all these segments diverged. IBM shifted its strategy from being based on end products towards an approach in which it focused on distinct horizontal layers of the value chain, such as semiconductors, microprocessors and disk drives, and a solutions approach in which it delivers integrated systems from a range of previously competing vendors.



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Today, about 55 percent of IBM's revenues come from services, with less than 25 percent coming from hardware. The company recently sold its PC manufacturing business to the Lenovo Group, China's largest PC company. IBM provides an interesting case for the mobile-handset vendors of today: if vendors are solutions providers to mobile-network operators, might it not be possible for companies such as Nokia or Motorola actually to offer the mobile devices of other firms? It is interesting that the emergence of vendors such as Taiwan's HTC was partially the result of the established vendors being unwilling to deliver mobile-network operators a full spectrum of devices, including Microsoft OS smartphones.

What will happen if you don't?

Whatever the approach chosen by handset vendors in managing the respective value-chain paradigms, it will become increasingly difficult to compete primarily on product functionality in the mobile-handset industry as different vendors gain access to the same or similar components and modules. First-mover advantage is likely to be short-lived for competitors coming to market with higher performing digital-camera modules, higher memory capacity or LCD screens, as competitors are also likely to be able to source these components within a relatively short period of time.

Mobile-handset vendors should learn from the PC industry and make sure that their future strategies are not made simply on the basis of cost optimization or speed to market. While such logic might appear to make compelling sense in the short term, experience suggests that it can result in a firm outsourcing those elements of added value in which most of the industry's profits will be made in the future – and retaining activities in which it is difficult to maintain long-term advantages over competitors. Witness IBM's outsourcing of the PC operating system to Microsoft and chipset to Intel in the 1980s. Value-chain design should be recognized as a strategic activity that will determine the fate of a mobile-device

manufacturer, and of future profits and power distribution in the industry.

As was the case in the PC industry, "complementary assets," or resources that can raise the value of a firm's technological innovations, will remain important as a means of strengthening a firm's ability to generate profits. This will be true both for developed and developing markets. As the basis for competitive advantage shifts from product differentiation towards complementary assets, we may also witness the emergence of a new breed of competitors who offer a portfolio of handsets from different suppliers – just as has been done in the IT services industry.

'New kid on the block'

Apple entered the mobile-handset arena in 2007 with the launch of its iPhone. From a phone-design point of view, Apple has entered the industry through the computer paradigm, with a customized CPU, a modular design and a cellular modem. Apple has not joined the traditional feature-driven race with the established players, but rather has focused on the end-user experience and optimized the feature list accordingly.

The most unique part of the iPhone approach is that Apple brings a complete, working, end-to-end ecosystem: iTunes, providing desirable content to the user, covering everything from music and podcasts to TV shows and full-length movies. Still, the iPhone is just one phone, and Apple will need to manage operator relations in each individual market, apply different regional cellular standards and meet local regulations.

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