Nokia Corporation
Innovation and Efficiency
in a High-Growth Global Firm

Why have we been a successful company? If you want a very simple answer, it is getting the balance right between innovation and execution. In a technology business, you need a tremendous amount of innovation, but with these volumes and growth, you need to execute or it will kill you. So it is balance. I think we have done that better than anybody else.

—Jorma Ollila, Chairman and CEO, Nokia Corporation

In late April 2000, the first signs of spring were just arriving in Espoo, Finland, the city adjacent to Helsinki that was the headquarters of Nokia Corporation. Nokia’s executive team—chairman and CEO Jorma Ollila, corporate president and head of Nokia Ventures Organization Pekka Alan-Pietilä, CFO Olli-Pekka Kallasvuo, president of Nokia Networks Sari Baldauf, and president of Nokia Mobile Phones Matti Alahuhta—were enjoying a quick, light lunch together in the company’s employee canteen, located in a soaring seven-story atrium in the strikingly distinctive headquarters building. (See Exhibit 1 for Nokia’s Board and Executive Committee and Exhibit 2 for an organization chart.) Other employees stopped by the table frequently. Some had substantive business to transact, but many just wanted to comment on the current issue of Fortune (May 1, 2000), which featured a lead story on Nokia and a cover photo of Ollila.

The Fortune story was a source of excitement and obvious pride, even among the reserved Finns. It recounted how an obscure, near-bankrupt conglomerate from the geographic fringe of Europe had, in eight short years, become the global leader in mobile telephony, delivering almost 30 percent annual compound growth in revenues over the period while shedding the businesses that had accounted for almost 90 percent of its 1988 sales. By that early spring day in 2000, Nokia Corporation had the highest margins in the mobile phone industry, a negative debt-equity ratio, the most valuable non-U.S. brand in the world, Europe’s highest market capitalization, and a presence in 140 countries. (See Exhibits 3–6 for the evolution of Nokia’s product mix, revenues, employment, market value and stock price and Exhibit 7 for current financial statements.)
While very positive in tone, the story had tried for some balance by pointing to challenges that Nokia faced in managing its growth, maintaining its unique culture, and dealing with the great technological uncertainties that were inherent in the convergence of mobile telephony and the Internet. The members of the leadership team were confident, but they knew the challenges identified by *Fortune* were only some of the pressing ones their company faced.

**NOKIA TO 1992: THE MAKING OF AN INDUSTRIAL CONGLOMERATE**

The Nokia story began in 1865, when engineer Fredrik Idestam opened the Nokia wood-pulp mill in southern Finland. A new town grew up around the mill and took its name. In 1898 the Finnish Rubber Works opened in the town and later began using the Nokia brand for its galoshes, tires, and other rubber products. The seeds of Nokia’s telecommunications business were sown in the Finnish Cable Works, established in 1912. After decades of manufacturing cables for telephone networks, it seemed a logical step in 1960 for the Cable Works to establish a department dedicated to telecommunications-oriented electronics. Seven years later these three companies merged to form the Nokia Group. At that time electronics generated just 3 percent of the Group’s sales.

In the 1960s and 1970s there were two major areas of technological development in telecommunications: digitalization and wireless. Nokia’s fledgling telecommunications business was an early entrant and successful innovator in both. New technology allowed analog sound signals to be converted into digital form for transmission, substantially increasing the capacity of telephone cables. In 1969, Nokia was the first company to introduce digital transmission equipment that conformed to international standards. Subsequent Nokia research allowed the company to deliver Europe’s first fully digital telephone switch in 1982. Developments in wireless technology during the same period allowed far more phones than before to be connected to public radio networks. The Nordic countries decided early on to join forces and develop a common network. Opening in 1981, the Nordic Mobile Telephone (NMT) system was the world’s first multinational cellular network. In part because it allowed easy international roaming, it was a great success. Nokia’s mobile phone division, founded in 1979, made one of the very first phones for the network. Over the next decade the Nordic standard was adopted by many other countries, while the Nordic countries became the world’s leaders in mobile phone use. In this context, Nokia began to build a strong position and capabilities in mobile handsets, while Ericsson, its Swedish rival, established a lasting leadership in network equipment for mobile telephony.

Despite these developments, the vast majority of Nokia’s interests still lay in rubber, cable, and other basic products (87 percent of sales in 1980). By the early 1980s, CEO Kari Kairamo realized that there was little growth to be had from these old industries and that the greatest potential lay in new technologies. Kairamo also recognized that the company needed to become more international. In 1980, Finland—with a population of just 4.8 million—accounted for almost half of Nokia’s sales. Kairamo’s strategy was to invest aggressively for growth, building on the Group’s newly developing knowledge in computers, consumer electronics, and telecommunications.
In the mid 1980s, the Nokia Group made numerous large acquisitions, primarily in electronics. The Group’s purchases included the largest television manufacturer in Scandinavia, a Swedish electronics and computer firm, and consumer electronics firms from Germany and France. In the process it became Europe’s largest manufacturer of television sets. The basic industry businesses were also allowed to make some acquisitions to maintain their morale.

In just two years, from 1986 to 1988, headcount and sales in the electronics division tripled. Over half of Nokia’s total personnel were now employed in electronics. However, the Group was stretched thin, both financially and in terms of management resources. The fast-growing mobile phone business, unaccustomed to high volume production, began losing money. The television and computer businesses also struggled. Profits in the electronics division tumbled from $71 million to just $14 million and overall Group income stagnated. Looking back, Ollila admitted that key cultural attributes were allowed to deteriorate during the expansion:

These are things you have to nurture every year, every month, every week, otherwise they just get watered down and you just start having parties and thinking that everything will go well—“This is a big company, I can make a loss for a few more years, somebody else will cover that, they always did”—which was the case. So this sort of phlegmatism or complacency sneaked in.

Following Kairamo’s death in 1988, his replacement, Simo Vuorilehto, looked to regain focus and cost control. Nokia stopped making acquisitions and began to divest some businesses, including flooring, paper, and rubber goods. But just as the restructuring began, Finland was hit by the worst recession in its history. The Soviet Union, Finland’s most important trading partner, collapsed, and most of Europe experienced a severe slowdown. In 1991 and 1992, Nokia lost over $200 million. The Group’s key shareholders, the major Finnish banks (which were facing crises of their own), just wanted to cash in and get out. The mobile phone business was actually offered to Ericsson, but the company turned it down.

Ollila became Nokia’s president and CEO in January 1992 at age forty-one. An economist by training, he had joined Nokia from Citibank in 1985 and become CFO a year later. From 1990 he had headed the mobile phone business and by all accounts had saved it from disaster, leading a turn-around through his very personal involvement on the factory floor. Ollila now hoped to do the same for the entire Nokia Group, but many observers were skeptical:

There were lots of people who thought that this is just going to be “a piece of cake,” cut into pieces and then sold, and that’s it! I was given eighteen months, basically, to survive.

Strategic Intent

While Ollila had no intention of selling off the entire Group, Nokia could not continue to produce everything from power generators to tires. The company needed an explicit strategic intent to focus managerial attention, unify the different businesses, and attract investors. Ollila recalled the process:

We took twenty-five key people and went into the bush somewhere. We basically talked about three things. What to do with the portfolio? How to get the operational things right? What sort of company to create in terms of the values?

The resolution came in May 1992:

Matti Alahuhta asked me, “What do you think? What are you going to do with Nokia?” I said, “How about if we start building a telecom company?” So that was the first time.

It was a big gamble. Telecommunications accounted for only about one third of Nokia’s sales in 1992. Moreover, the mobile phone business had only just started making money again. And while the industry was certainly growing fast, it was not obvious that it would be enough. Ala-Pietilä recalled:

We were criticized to some extent during the early years of the 1990s that now we were over-focusing: “In telecom you have only one leg.” Our response was “No! Telecom will be a huge industry—several legs.” You needed the guts to say, “Ok, focusing on telecom will be enough as a growth path.”

In August Ollila explicitly defined Nokia’s strategic intent. Late one night, he scribbled four words onto a transparency—“focused, global, telecom-oriented, value-added”—that summarized his vision of what Nokia ought to become by the year 2000. For the next five years these provided the basis for deciding which businesses Nokia ought to keep and grow and which it should divest. Sari Baldauf believed having a clear strategic intent also boosted morale:

There was a very strong vision and will—where we want to take the company. And I think that somehow we succeeded in reflecting or sprinkling that throughout the organization, which gave people a lot of energy and enthusiasm.

At first the definition of telecom was broad and a little vague. Some difficult portfolio decisions still remained. It was unclear whether or not telecommunication cables should be included, or military radios. However, by the fall of 1993 Ollila felt strongly that Nokia should keep just two businesses: telecommunications, which would provide equipment and systems for both cellular and fixed networks, and mobile phones. The two divisions would be unified by the vision that “voice will go wireless.”
In 1994, the board gave Ollila the authority to divest everything else over three years. The power business went immediately; tires, cables, and television followed in the next couple of years. According to Ala-Pietilä, this was not just a matter of getting rid of weak businesses:

We spun out businesses that had been profitable ones. They had been the profit engines, where we had good market share, where we were global! Like cable machinery parts—we were number one there. But it wasn’t telecom.

Leadership

Having worked out what Nokia ought to look like, Ollila’s first priority was to put together the right management team to lead it. Ambitious thirty and forty year olds from the technology businesses replaced managers rooted in the old cable business. Pekka Ala-Pietilä moved up to head Nokia Mobile Phones (NMP). An economist by training who had joined the firm in 1984 as an applications consultant, he had been in charge of strategic planning and then marketing in NMP when Ollila headed the unit. Matti Alahuhta, an engineer who had joined in 1975 and had later earned a doctorate, was made president of Nokia Telecommunications (Telecom). Twelve-year veteran Olli-Pekka Kallasvuo, a lawyer who had been Ollila’s number two in finance, was named chief financial officer. The fifth key member was former business researcher Sari Baldauf, who had joined the company in 1983. She was in charge of Cellular Systems, the fast-growing mobile infrastructure business within Telecom.

Before 1992, the new team had been dispersed in different parts of the organization, but its members had shared the experience of things going wrong. They now shared a determination to put the company back on track. Baldauf recalled:

We went through a big economic crisis all together as a nation and we went through one as a company and so there was a kind of spirit, “Hey!—We will rebuild this company, we will rebuild the economy, and then we will conquer the world!”

The group quickly became a close-knit team, communicating daily and making all important decisions jointly. They were seen by the rest of the company as an inseparable unit, remarkably free of any “politics” or similar “nonsense,” a norm that came to pervade the company.

Growth Strategy

Nokia’s strategic intent required rapid growth in the new core businesses of mobile phones and telecommunications networks. The target for the mobile phone business in particular was a 25 percent global market share, compared to a 1992 share of 12 percent. For both businesses this would require a major push to develop new products and become more international. In the networks business that growth was to be achieved by focusing on the then-new digital GSM standard and by seizing on the opportunities created by deregulation in telecom. On the mobile phone side, Nokia bet on the power of branding and consumer-friendly design.
Through the 1980s, all mobile telephony was based on analog technology. At the end of the decade the European telephone companies decided to develop a common standard for digital mobile telecommunications. This standard, established by the quasi-governmental European Telecommunications Standards Institute (ETSI), was known as the Global System for Mobile Telecommunications (GSM). From the very beginning, Nokia was one of the main developers of GSM technology on both the network and phone sides.

Telecom’s decision to focus exclusively on the digital GSM standard was, according to Sari Baldauf, driven by the company’s position at that time. Nokia did not yet have a track record as a supplier of complete network systems, so it was important to be the first with the new products. Given the division’s limited R&D resources, the only way to do that was to focus all their efforts on just one digital standard. The gamble paid off. In 1991, Nokia delivered the first operational network to the digital GSM standard, nine months ahead of its competitors. All of Europe and much of Asia eventually adopted the digital GSM standard (although, significantly, not Japan or America, although GSM eventually made some limited inroads in the United States), and Nokia became one of the leading suppliers.

Equally important were opportunities provided by deregulation in European telecom markets. State-owned telecommunications authorities (PTTs) had monopolized most European markets in the past. (An exception was Finland, which had a large number of independent service providers and some of the highest telephone penetration and usage rates in the world.) The PTTs’ practice of sourcing close to home from national champions meant that Telecom was virtually confined to customers in the Nordic region and the USSR. Deregulation and privatization changed that. Baldauf reflected:

Had we been competing against the Siemens and Alcatels of this world in their own national markets, trying to sell to their PTTs, we would not have had a chance, because it used to be 70 percent politics.

Following liberalization, Telecom targeted new service operators such as Orange in the United Kingdom, Germany’s E-plus, and cable TV operators offering telecom services. Nokia recognized that the new entrants would want turnkey solutions on common platforms and it developed the capability to supply these. The company also focused on understanding the end-user market and helping operators differentiate themselves from the competition by adding new network features. At the same time, Nokia was successful in selling networks to emerging markets such as China and India. Traditional telecom suppliers were slower to respond to changing market needs and began losing market share.

Helped by the fact that mobile phone use in Nordic countries was far ahead of the rest of world, Ollila realized early on that mobiles would become mass-market consumer goods. Pushed by Anssi Vanjoki, then in charge of sales in NMP, the company set about creating a global consumer brand. In the early 1990s, Nokia phones were selling under multiple different brands, including Mobira, Radio Shack, and various operators’ labels. In 1991, the company decided to use Nokia as the single brand for all its phones and to create a unified image through design, technology, and marketing.
Efforts initially focused on a new phone, the Nokia 2100, that was being developed in versions for each major digital standard: GSM; TDMA, which looked likely to prevail in the United States; and Japan’s PDS. Although the insides and software would differ based on the different standards, Nokia could develop shared platforms across the standards and the external look, feel, and image would be the same for each standard. At the time, this was a revolutionary approach to the mobile phone business.

The project team realized that a mobile phone is a personal technology and must suit its user in terms of function and aesthetics. Even when Nokia did not pioneer technology, it always prided itself in giving consumers what they wanted. This philosophy was summed up in Nokia’s 1995 Annual Report: “In the rapidly changing markets technological prowess is important, but understanding the market needs is key.”

The smooth, rounded look that became the hallmark of Nokia’s phones was created for the Nokia 2100 by Los Angeles designer Frank Nuovo, who later joined the firm full-time as head of design. The phones also needed a user-friendly interface adaptable for Japanese text. The resulting big screen with a scrolling text menu was a breakthrough that became the industry standard. Nokia’s phones were also the first with such simple consumer-friendly features as switchable covers, changeable ringing tones, and signal and battery indicators.

The Nokia 2100 was released in 1994. The goal was to sell four hundred thousand phones. Actual sales reached 20 million.

Organization

In 1997, the Nokia Group consisted of five basic units. The two core business groups, NMP and Telecom, were by far the largest and formed the central pillars of the organization. These divisions were very strong and operated quite independently, both from the corporate center and, thanks to the well-defined GSM standard, one another. The two other product units were comparatively small. Multimedia Network Terminals made set-top boxes, while Industrial Electronics, which would be sold off three years later, made high-end computer monitors. Nokia Research Center, the corporate research labs, formed the fifth basic unit.

Within NMP and Telecom, the balance between global and regional organization was driven by the very different needs of the two businesses. NMP was a high-volume consumer business (although it did sell many of its handsets through service providers) and it tended to accentuate the largest market segments. It was structured as a matrix with a strong global dimension realized through single divisions for product creation, operations, and sourcing. The product-creation division consisted of the platforms business unit, which developed the basic technologies, as well as business units that turned the basic technologies into products. There were also three regional organizations, Europe/Africa, Americas, and Asia-Pacific, which were responsible for manufacturing, sales and marketing, and customer support. Factory heads and logistics managers reported to both their product business unit and their region.

Telecom was increasingly a software and systems business that depended on maintaining close relationships with big customers in different countries and providing tailored solutions.
Consequently, the telecommunications division was much more decentralized and locally oriented than the mobile phones division.

Both divisions were also organized around processes. Process-based organization had been introduced in NMP in 1991, when Ala-Pietilä was head of strategic planning. Having found the existing functional organization to be too rigid, he defined three processes: concurrent engineering, global logistics, and customer satisfaction. The concurrent engineering process transformed product development by involving manufacturing, sourcing, and marketing people from the start, dramatically reducing time-to-market. The global logistics process coordinated sourcing, manufacturing, and distribution worldwide. Finally, the customer satisfaction process brought together product planning, marketing and sales, and follow-up services. Targets were set for each process, performance was measured and everybody in the process was rewarded accordingly. It took a few years to work out the details fully, but by 1997 both business groups were fully committed to a process-based way of working.

Additionally, each of three “strategic” markets had a single senior executive overseeing Nokia’s business operations: Kallasvuo for the United States, Baldauf for China, and Alahuhta for Japan.

However, the most distinctive characteristics of Nokia’s organization did not show up on any organization chart. When asked to describe the company’s organization, Nokia’s managers talked about flexibility, freedom, and the importance of networks, rather than describing its formal architecture. Indeed, CFO Olli Pekka Kallasvuo quipped that the organization chart was drawn “only in pencil, because it changes all the time.”

When Nokia needed to “mix and match” ideas, talent, and knowledge from different areas, it would simply create new organizational elements. For example, cross-business task forces were formed to address specific issues, such as developing new technical standards. In product development, a small project team sometimes evolved into an entirely separate business unit. This was the case with NMP’s Communicator, a combined phone and electronic organizer, which began as a program within Product Creation, developed into a joint project with the regions, then, after being introduced to the market in 1996, was finally spun off into a new Digital Convergence unit formed in 1999. Ala-Pietilä explained the importance of a flexible structure in a fast moving industry:

We say “Strategy = Structure = Implementation.” That means you can have great ideas, but the only way you can get those things implemented is if you change your structure—rapidly, swiftly. But you don’t make complete changes, because then recovering from those changes will take time, so that means making small changes.

The flexibility of Nokia’s structure went hand in hand with decentralized decision-making. For example, Pertti Lounamaa, vice president of the Wireless Software Solutions unit, noted that most new offerings started “with a couple of engineers innovating something and then propagating it through the organization.” Generally, strategy was not imposed from the top down at Nokia, but instead was the combined result of decisions made throughout the organization. Kallasvuo explained the logic:
In the paper business, say, you make one or two decisions annually that are extremely important. The CEO says, “We will invest in this activity,” and the rest is implementation. You don’t even have to know in the organization why we are making the investment. But we don’t make one or two decisions a year. We make thousands of small decisions a year by hundreds of people. We need to ensure that these decisions take place in harmony or are aligned with each other, but we cannot make them. And I really strongly believe that decisions in the organization need to be made where the expertise is greatest.

Several managers summed up the philosophy in almost the identical words: “If you have a good idea at Nokia, it will be hard to find someone who will stop you.” Markus Kajanto, the corporate manager of Strategy Development, explained that this decentralization was supported by “adaptive short term planning,” which gave department managers the freedom to find extra money for promising ideas, even within the six-month planning and budgeting cycle. In addition, a flexible open staffing system, based on Nokia’s intranet, permitted growing projects to attract interested individuals without intervention from above. All openings were posted on the intranet, and the bosses of individuals who chose to move were not allowed to block their transfers. At the same time, managers were forbidden from internal headhunting and could not offer higher salaries to transfers unless the move involved a promotion.

Nokia’s approach to becoming more international was characteristic of its entrepreneurial style. Initially, NMP and Telecom each went global on its own, without any corporate structure, offices, or support functions. Ollila explained the thinking behind this strategy:

We asked our people in mobile phones and telecom to continue to go global on a divisional basis, because we knew that the portfolio would change. And we felt that in order to be successful they needed the speed. So they wouldn’t spend time haggling about how to share costs, what sort of building to build, and then which side of the building do the mobile phone people take and which floor do the network people take. None of that nonsense! You just go! And that was a tremendous boost because then the best instincts and energies of the Nokia people could be used.

When it came to getting things done, informal networks were considered to be more important than formal authority or bureaucratic processes. Kallasvuo discussed the role of networking versus formal processes at Nokia:

I don’t think anyone can be successful at Nokia without being able to network. And I think this is one of the ways of ensuring horizontal communications. I very often find that without being able to find strong support for what I feel, I really don’t have that much authority or power. So it doesn’t come from your position, but from what you are and do.

Let me give one example. Yesterday I spoke to a person who joined us about six months ago, and he said, “It is a totally different situation from anything I have
experienced. Lots of people have asked ‘What do you do?’ but not once have I got the question: ‘To whom do you report?’ Not once!” I think that made my day.

Value-Based Leadership

In such an entrepreneurial organization, what ensured that individual decisions were kept in alignment with each other? According to Ala-Pietilä, there were two important “anchors”: vision and culture. Talking to Nokia’s managers, one was struck by the degree of agreement on the strength and nature of the Group’s culture. All stressed that the “Nokia Way” had been a critical factor in the successes of the 1990s.

Ollila articulated Nokia’s fundamental values in late 1992. The four values—customer satisfaction, respect for the individual, achievement, and continuous learning—provided the cornerstone of the Nokia Way. According to Baldauf, “the value base makes it possible to communicate fast and transparently globally and if that is missing, I wouldn’t say that there is any chance for success.”

Nokia’s culture was not formed from thin air in 1992. It was rooted in the Finnish national character—frugal, honest, very direct, serious, with little tolerance for “fooling around”—mixed with a good dose of engineering culture—“can do,” pragmatic, and hands-on. The shared experience of hard times in the preceding few years also played its part. Though discipline in the Group had been allowed to lapse, Ollila still felt he had had something significant to work with:

The basis of the values was there. It wasn’t very well articulated and it wasn’t methodically cultivated, but the decentralized way of operating and the informality and the sort of ‘can-do’ mentality, the drive—giving people rope—anybody who has an idea, you know, this is the company to work for. It still is, it always was.

Of the four official values, the two that perhaps seemed to resonate most through the organization and have a unique meaning for its members were “respect for the individual” and “achievement.”

We call it “respect for individual,” but it is very close to words like “trust.” And the other important element is that the company is pretty “un-political.” You can trust your colleagues, you can trust your peers and you can trust the people around you, which has made it possible to take pretty big risks at times. Because if you don’t have that, and if there’s an enormous fear of maybe not succeeding, of failure and what will happen thereafter, then you don’t have the guts and you don’t have the innovation and boldness to try out new things. (Sari Baldauf)

People have an attitude of 120 percent target setting. You go outside your comfort zone and then you initially have to deal with this nagging feeling of uncertainty. But you have enough support from yourself, and your colleagues, and from your bosses, that we can do this. And once you achieve it, it is not absorbing energy any more, it is creating energy. Because then you are happy to
set a 120 percent goal another time, and then it’s a positive spiral. (Pekka Ala-Pietilä)

There was also a typically Nordic egalitarian and communitarian side to the Nokia culture, which emphasized joint achievements and rewards. As Baldauf put it, “It’s not ‘What I get and what I do,’ but ‘What we get done together as a team.’” There was little sense of personal ownership of projects. This allowed information and skills to be shared freely and staffing and organization to evolve with relatively little resistance.

Ala-Pietilä accentuated another feature of the culture that he called “intellectual and emotional honesty.” People were expected not just to abjure politicking for what they wanted, but also to be open in expressing disagreement.

**Attracting and Motivating People**

The years from 1992 to 1997 were a period of large-scale recruitment for Nokia. While the total workforce only grew from 26,000 to 37,000, the aggregate figures hid the reductions from the divested units and the very rapid growth in the two core businesses. Both NMP and Telecom more than tripled their headcount during this time, from 4,900 to 17,100 in the case of Telecom and from 3,150 to 13,400 in the case of NMP. The new recruits reduced the average age of Nokia’s employees to just thirty-two.

Nokia had been very successful in attracting and retaining high quality people. The company did not pay large salaries. In fact, Sari Baldauf claimed that for many years they were “happily badly underpaid.” Phil O’Neil, general manager of quality in Europe/Africa for NMP, argued that, instead, Nokia competed for talent by offering an attractive work environment:

> I’m not sure how well it is understood outside Finland, but here people have this belief that if you work in Nokia you will get a lot more responsibility and a lot more freedom than elsewhere. You won’t get the remuneration that you might get elsewhere, but in terms of the challenge you will get, it’s much better, much more exciting.

> You can spot the people who are saying, “Well, what motivates me is money,” and they don’t join, or they don’t stay. The people who tend to come are people who are motivated more by being able to be creative and challenge themselves and stretch themselves and feel they’ve achieved something.

Nokia took a similar approach to motivating its employees, believing that intrinsic motivation, rather than monetary rewards, was central. Bonuses, with a maximum of 20 percent of base, were low compared to the industry norms and usually were based more on team achievements than individual performance.

People working at Nokia were also motivated by working for their team and by working for Finland. The fast growth that Nokia enjoyed was itself a very good motivator. Growth brought new challenges and therefore more room for personal development. It also brought greater
rewards in terms of job satisfaction. One drawback of Nokia’s non-hierarchical organization was the limited scope for handing out promotions, but as long as there was growth, jobs became bigger naturally.

In 1995, however, Nokia introduced option grants for senior managers. It later extended these option grants to the middle-manager levels and planned to take them further down the organization. This was a necessary step if Nokia was to stay in line with the U.S. job market and to compete at all with start-ups elsewhere. In 1997, the company introduced a bonus plan that paid everybody in the organization (apart from those with options) 5 percent of base salary if earnings per share grew by more than 35 percent.

Ownership

During this period Nokia needed a significant injection of new capital in order to fund its growth strategy and to buy out unwilling Finnish shareholders. For the first time, the company set its sights on the U.S. stock market. In hindsight, Kallasvuo pointed out:

There is no way on earth this country [Finland] could own Nokia. Even if every penny of every investor in Finland was put into Nokia stock, the Finnish could hold perhaps 25 percent of the company. So we had to go to the biggest capital market in the world and really become a U.S. company in that respect.

Nokia did a private placement with U.S. institutions in 1993 and listed on the New York Stock Exchange in the following year. The shift in ownership that followed was dramatic. In 1991, Finnish shareholders owned 90 percent of Nokia, but after the U.S. listing this fell rapidly to 40 percent. By the end of the decade, Finnish ownership stood at just 13 percent, compared to the 55 percent held by 350,000 U.S. investors. Nokia had become one of the first companies in the world not to have a major home-market capitalization.

As a result Nokia had to become very like a U.S. company in terms of investor relations, finance, and accounting procedures. There was a Nokia vice president for investor relations in Dallas from 1994 onwards. On the other hand, the board, which consisted of Ollila and eight outside directors, remained almost entirely Finnish through 1998, when two foreigners—one American and one Dutch—replaced retiring Finns.

Looking back, Ollila felt that the early NYSE listing had brought far more than just access to capital. Nokia had benefited from increased transparency and active investor relations activity, and it had adopted shareholder-value-based thinking. Ollila believed this fundamental change in mindset was crucial to the extraordinary growth the company’s market value was to experience: 2,300 percent by spring 2000.

Research and Development

Nokia did the vast majority of its research and development in-house: fully a third of employees worked in R&D in some fifty research labs around the world. The Research Center had overall responsibility, but less than one tenth of the engineers engaged in R&D actually worked for the
Center, with the rest working in the business divisions. Generally speaking, business group research teams focused more on product development than basic research, and on incremental rather than fundamental innovations.

Most research and development was very closely linked to the operating businesses. R&D projects were called “business programs” and were run as concurrent engineering processes, with engineers working closely with people from marketing, manufacturing, and other functions right from the start. As Baldauf explained, it was considered very important that the projects were in touch with the realities of business:

I think it is very important that they also understand the business implications, so they are not only working in some lab somewhere, but they really see the product coming up and they can be proud of it. They know the volumes, they know how well it’s succeeded in the marketplace and they take pride in that... and they know what the expectations are and what the consequences are if they miss the date.

The majority of the Research Center’s funding came via the business divisions, forcing researchers to justify what they were doing by getting buy-in from the users of the technology. At the same time, corporate research funds ensured that the Center was not exclusively focused on current business goals. This close relationship between the Research Center and the businesses was an important conduit for information and ideas. Ten percent of Research Center staff moved to other parts of the company each year, which also improved the lines of communication.

**Learning Logistics Lessons**

During Ollila’s first three years as CEO, Nokia enjoyed spectacular growth. Revenues grew by around 30 percent a year while 1992’s losses turned into profits of $135 million and $575 million in 1993 and 1994, respectively. Then, in December of 1995, Nokia warned that problems in the mobile phone business meant final quarter earnings would be down on the previous year. The stock price plunged by 20 percent in one day and eventually half the company’s market capitalization evaporated. Nokia resumed its growth path in the second half of 1996, but this was a serious stumble.

The problems were caused by weaknesses in logistics, exacerbated by falling phone prices. In 1995, after doubling output in each of the preceding three years, NMP was feeling the strain. New people were being recruited frantically, but the division was struggling to get the right products out, at the right time and in the right volumes in the face of explosively growing demand. In such an environment, with inexperienced personnel still trying to find their feet, strict cost and quality control was not a priority. Purchasing managers bought parts at high prices, often on the spot market, and did not always ensure suppliers could meet demand.

At the end of the year, delayed chip deliveries halted some assembly lines and inventories of other components were building up. Parts prices were falling at almost 25 percent per year, but Nokia could not take advantage of the drop. At the same time, the U.S. mobile phone market
went into its first slowdown and prices fell as companies sold excess inventory at distress prices. Nokia’s forecasts were slow to pick up the U.S. slowdown. Moreover, the forecasts overestimated the rate of conversion from analog to digital, so Nokia found itself stuck with the wrong products. Group margins fell from nearly 14 percent in 1995 to 6 percent in the first quarter of 1996.

In early 1996, Nokia executed a quick turnaround. “Commando teams” were formed to speed up turnover and slash inventories. Component prices were renegotiated and chip suppliers were told to cut delivery times from twelve to eight weeks. At the same time, the division overhauled its management information systems. New software allowed purchasing managers to track excess parts and reroute them, and forecasting methods were revamped. However, despite the seriousness of the situation, not one member of the division was sacked, and Ala-Pietilä remained in charge. Ollila explained:

> It’s not firing and hiring that gets results in that sort of environment, which is a learning environment. You have to accumulate the know-how you need to do the implementation as well as the innovation.

The management team learned a lot from their mistakes. Ollila actually claimed that “the ’95/’96 problems were necessary because they were a wake-up call. We learned so much and after that sort of a hit you can take anything!” In particular, they learned that their management systems needed to stay ahead of the growth, which meant that every four or five years they would have to do major architectural changes. In 1995 they were too late, but from then on they excelled in the logistics of high volume production. Ala-Pietilä summed up:

> We couldn’t cope with the growth and master it any more, so the growth was mastering us. And therefore we made a big change in our logistics, and we did it well. A lot of innovation was built in and we came out with flying colors. And now we believe that in logistics we are absolutely on top of the world—very, very, very good!

### 1997–2000: CREATING THE MOBILE INFORMATION SOCIETY

#### 1997: Claiming Leadership

By 1997 Ollila and his team had every reason to be satisfied with their achievements. The restructuring was complete and that year’s Annual Report could proudly announce Nokia’s first year as a “100 percent dedicated telecommunications company.” NMP now had a global market share of 21 percent, putting it in the number two position behind Motorola. Even better, in digital mobile phones, the fastest growing segment, Nokia was the market leader. On the networks side, Nokia was one of two leaders in the dominant GSM standard, with a 30 percent GSM market share. Moreover, the growth in market share had not come at the expense of profits: at 16.1 percent, Nokia’s margins led the industry.

Having achieved the aims for the year 2000 set out by Ollila in 1992, Nokia needed something new to strive for. The 1997 strategic intent redefined the company’s goal: “Nokia strives for
leadership in the most attractive global telecom segments through: speed in anticipating and fulfilling evolving customer needs; quality in products and processes; openness with people and to new ideas and solutions.” The key word here was “leadership.” Ollila explained:

We never said before that we want to be a leader. In Nokia Mobile Phones for the first time in '97, we dared to say, “We want to beat Motorola.” That was a big statement! I mean, they were the obvious, clear number one, not quite like Coke or IBM in early 80s, but almost. It was such a given that they were the number one and we were the number two. So to say internally in a management meeting that our goal is to beat Motorola in the next couple of years! Huge applause, relief and emotion! But we doubted: “Can we say it? How will people react?”

In fact, Nokia overtook Motorola just twelve months later, in June 1998.

**Challenges**

Despite this success, Nokia’s management team began to wonder how they could possibly maintain 30 percent growth rates when sales were already approaching $10 billion. As mobile phone penetration rates passed the 40 percent mark in some European countries, the specter of market maturity and slower growth loomed on the horizon. Outside the Nokia stronghold of Europe, lower penetration offered the prospect of greater market growth, but it was unclear how much of that Nokia could capture. In the United States, for example, CDMA had emerged as the dominant standard. Nokia was unwilling to license the technology and had developed its own CDMA phone. However, Nokia’s phone scored poorly in tests and achieved only a 9 percent market share. At the same time, some analysts warned that phones would become a low-margin, commodity good. From 1991 to 1996, the average wholesale price of low-end phones had fallen from $518 to $136 and manufacturers were under ever increasing pressure to keep costs down.

Nokia’s immediate answer to the growth challenge was to form Nokia Ventures Organization (NVO) in June 1998. In a general shuffling of the top management positions, Ollila became chairman of the board and CEO and Ala-Pietilä left NMP to head NVO and was also named the Group’s president, with special responsibility for growth. At the same time, Nokia’s managers responded to the growing scale and complexity of the company’s operations and the need for efficiency by increasing “fact based management.” Over the next couple of years, a pattern emerged in the new opportunities that presented themselves, and a new vision evolved. The vision was formalized in late 1999 when Nokia announced its intent to create the “Mobile Information Society.” It was hoped that the new vision would drive the next phase of the company’s growth.

**Nokia Ventures Organization**

When the leadership team reflected on Nokia’s innovation record in the 1990s, it was clear that its engineers had excelled at the technological innovations needed to improve existing product categories. They had also had some success in using existing technologies to create entirely new product categories, such as Nokia’s Communicator. However, the team worried that Nokia might be missing opportunities that lay beyond both existing technologies and markets.
Increasingly, new initiatives were appearing that did not fit the existing organizational structure of Nokia. These initiatives fell between the businesses, or across the businesses, and so nobody had natural ownership of them.

NVO was established as a way to fill these gaps. It was set up as a self-standing business group headed by Ala-Pietilä. NVO contained both internal business-venturing activities and an external venture capital fund. According to the 1998 Annual Report, its target was “to foster growth opportunities beyond the scope of the existing business groups” (see Exhibit 8). The organization was overseen by the Nokia Ventures Board, which consisted of about fifteen experts from the two main business groups, NVO, the Research Center, and the corporate business development unit.

The internal venturing part of NVO was intended to provide a temporary home for new business ideas that had potential but did not fall naturally into the current remit of the businesses and needed space to develop. Its role was as a “catalyst” or “incubator,” rather than as another permanent business group.

Having made the decision to create an internal venturing organization, the team “had to put something in there.” In order to be included, projects needed to have the potential to generate at least half a billion dollars within four to five years. Three ventures were initially placed inside NVO: one from NMP that was applying wireless technology to health services for diabetics; Wireless Software Solutions, which started life in the Research Center and was developing Wireless Application Protocol (WAP) technology; and Wireless Business Communications, which planned to offer wireless network systems to corporate customers. These ventures were all at the piloting stage when NVO was formed and were expected to bring products to market in the following year.

In addition to these ongoing activities, an internal “venturing unit” was formed to investigate new ideas, no matter where in Nokia they arose, and turn the most promising into internal start-ups. Ala-Pietilä and the NVO business development group did not attempt to predict where individual business opportunities would lie, but over time they did establish “focus areas” for venturing activity. These were areas where Nokia could bring unique insights into technologies or markets. Thus, by 2000, NVO had several initiatives related to “the home,” which was expected to be a big business area for Nokia in the future. By developing clusters of ventures, NVO hoped to create synergies and also to avoid the “materiality” problem large companies often face, that no single new idea seems big enough to warrant attention.

Ventures that started life in NVO could take a number of paths as they developed. It was expected that some would be sold, while others would be put back into the existing businesses, or made into a whole new business. The key was small fast changes to ensure that the organizational structure was always ideal. For example, the health services unit was spun off within a couple of years. In contrast, the WAP project merged with part of Nokia Networks (“Net”—the new name for Nokia Telecommunications) to form Nokia Internet Communications (NIC), which stayed within NVO for the time being. By 2000, NIC had nine hundred people and was operating quite independently. At that time, NVO as a whole only employed about one hundred additional people. It was generally felt that NIC had outgrown its home at NVO and was likely to become a separate business before long.
Ala-Pietilä felt strongly that NVO should not separate the operating businesses from innovation. The venturing process that was developed by NVO was also applied to ventures within the business groups, creating a Nokia-wide network of internal ventures. Each month a group of people from Networks, NMP, and NVO would meet to maintain an inventory of internal ventures and to look for the best homes for ideas. While ideas and people might migrate from the business units to NVO, if ideas that arose in NVO could be integrated with the businesses, then NVO had to be able to let them go. As Markus Lindquist, director of business development, Communications Networking in NVO, put it, “NVO does not exist for itself; it exists for Nokia. That means in particular that if we start to do things, we don’t regard them as being our own. It’s up to someone else to take them farther. Our customer is Nokia.” Teams of engineers were regularly transferred from the businesses or Research Center to NVO in order to pursue a venture idea for a limited time. When they returned, it was hoped that they would take their new knowledge and ideas with them. Indeed, when the teams were formed, an important concern was to find people with enough credibility in the larger company that their point of view would be taken seriously outside NVO.

The external business venturing activities of NVO were done through Nokia Ventures Fund (NVF), a $100 million venture capital fund based in Silicon Valley. Nokia Corporation was the sole limited partner of NVF, which typically made investments of between one and five million dollars in early-stage, high-growth IT companies, although it was free to invest in other sorts of businesses. The Silicon Valley operations involved five NVF partners who were all former Nokia people and mostly U.S. citizens. These partners acted very much like any other venture capitalists, helping to set up the management of ventures and taking a personal stake as well as a board seat. However, the NVO partners felt that, by calling on the resources of Nokia, they could provide greater technological expertise than typical venture capitalists, as well as the considerable credibility that came with the Nokia name.

According to Nokia’s Annual Report, the purpose of NVF was “to gain exposure to learnings about new markets, business models and technologies beyond the reach of Nokia’s current business unit strategies.” In the words of Ala-Pietilä, the fund acted “as an arm, having the longest reach to the future, but still under the Mobile Information Society vision.” While the primary objective was to learn, NVF was also to get financial returns on its investments, for which there were strict targets. While Nokia did not rule out buying full control of the ventures, it was expected that the vast majority would be sold or taken to IPO. Examples of investments made by NVF included EVoice, an IP telephony company providing messaging solutions via the Internet; Pogo.com, a service targeting family Internet game players; and Confinity, which developed cryptography for hand-held devices.

NVF would regularly bring the best people from other parts of Nokia to meet entrepreneurs and would support on-going communication, but there was no formal process or any requirement to participate. NVF also acted as a “radar screen” for investment/acquisition opportunities that had a direct connection to the existing businesses. Businesses were given just three weeks to say whether or not they would invest in opportunities that were passed on to them, and they were then held accountable for their responses.
Those involved with NVF were well aware that most corporate venture funds had difficulties being accepted by the venturing community. However, they felt that NVF was different because Nokia allowed it to operate quickly and independently. Only three people were needed to make an investment decision: a fund partner, Ala-Pietilä, and Kallasvuo, and they could do it in an hour if necessary. Kallasvuo explained:

[In other corporate venture funds] you always need a blessing from a division somewhere. We don’t have that link. If these guys wanted to invest in a railway they could. They haven’t, simply because the good opportunities to make money have been in businesses which are very close to us, but we don’t have that strategic link.

Reorganization at the Top

In 1998, Nokia changed its basic corporate governance model. It had previously followed the Scandinavian model, with a president who ran the company and a non-executive chairman of the board. The board, however, decided to move to a U.S.-style model under which Ollila would hold the combined roles of chairman and CEO. This was possible under Finnish law as long as the company also named a president, who was legally required to be responsible for certain matters. Ala-Pietilä was appointed to this position.

In his new role as president, Ala-Pietilä took particular responsibility for corporate renewal and growth beyond the existing business trajectory. Ala-Pietilä described the arrangement as a “kind of matrix” in which division heads were in charge of growth and renewal of their own businesses, as well as current performance, but he had responsibility for the new growth dimension beyond existing businesses. His charter also included the Research Center and managing Nokia-wide strategic alliances, as well as NVO. Kallasvuo explained Ala-Pietilä’s role:

We have a person who has the respect of everyone in the organization, looking cross-divisionally and cross-functionally at every growth opportunity that needs to be taken. And if it means taking a piece from here and from there and putting them together, we do it.

These appointments were accompanied by a wider reshuffling. Ala-Pietilä was replaced as head of NMP by Matti Alahuhta. His position as head of Nokia Networks was taken by Sari Baldauf. Kallasvuo, who had been in charge of the Americas region for the preceding couple of years, returned to Finland and resumed his role as CFO. The rotation had the knock-on effect of stimulating rotation in the lower levels of the organization.

Fact-Based Management

By the late 1990s, Ollila felt it was time to shift the balance between “value-based leadership” and “fact-based management.” In the entrepreneurial growth phase of 1992–1996, value-based leadership was crucial and chaos had to be tolerated. However, with the portfolio now in place, Nokia needed to ensure quality, cost efficiency and global learning by increasing the role of fact-
based management. This meant tough targets, clear accountability, and well-managed business processes. According to Kallasvuo, it was a “fact of life” that Nokia had to introduce some more elements of control as it grew:

We are paying more attention to simple achievement, accountability, reacting more to a situation where targets are not being reached. [...] When you grow you easily get free riders and that’s what we need to fight. [...] I think we are in good control of the situation.

In 1998, Nokia created common platforms for information management, finance and control, and human resource management. For the first time there was a single server “doing the numbers” centrally every month. This was a major change for an organization that had previously been very decentralized. In each country in which Nokia had operations there was now a Nokia HR organization, Nokia finance and control, and so on. Inevitably, the head office had to grow to accommodate the changes, though it was still relatively small: 300 people in 1999, compared to 150 five years before.

The very high growth rates that Nokia faced posed particular challenges for the planning and control process. The strategic planning cycle was changed from once a year to twice a year because planners could not see far enough into the future. Targets were increasingly set for smaller projects and shorter time frames. Kallasvuo described the implications of the fast-changing environment:

We are now very clear that we don’t make an annual budget anymore. We simply base our reporting on continuous planning and we change our targets very quickly. Yes, we have got an estimate for 12 months ahead, but the planning cycle is much shorter. We don’t know whether the market is here or here, but we have to be able to make money in all scenarios. In that type of situation, why would you put your targets there? The market might not be there! But you might put a quality measure or overall performance measure there, which you need to fill anyhow regardless of the traditional measures of, let’s say, sales growth.

Both financial and operating performance measures were used and tracked at high levels. Non-financial measures were also used. Bonuses then were based on measured performance. Ari Virtanen, a vice president in Networks who had previously run a large (one thousand-person) GSM-focused business unit and then transferred to a fifty-person start-up unit aimed at packet technology, explained that the weighting on performance measures varied across businesses, although the framework used was applied uniformly:

Business measures and challenges are different when you are executing on an existing business and when you are building something new. In my previous business, the most important measure was operating profit. In my current one, operating profit is important, of course, but clearly market share is the most important measure. And the key processes are different.
New Vision: The Mobile Information Society

The vision of the future that had driven Nokia had become the present reality. Voice was indeed going wireless, mobile phones were a mass-market good, and digital technology dominated. It was time for Nokia to develop a new, forward-looking view of the world. The problem with the 1997 strategic intent was that it did not inspire. As Ollila said, “it didn’t enthuse anybody.”

In late 1998, as Ollila’s team sat down for a regular strategy panel meeting, a new vision fell into place. In Ollila’s words:

Mobility and Internet have been the “big things” over the last four or five years and now the next big thing is to bring those together. We want to be the company that brings the Internet to everybody’s pocket.

This was a very different strategic approach for Nokia. For the first time the company wanted to be the market maker, the first to say that the mobile Internet was going to be big. In the past Nokia had worked to well-established standards such as GSM, and then developed the products quicker and better than anyone else. Now the standards would be set more in the market. There was a lot of uncertainty, but Nokia’s successes of the last few years had boosted the team’s confidence.

The new strategic intent was made explicit in mid-1999. It read: “Nokia takes a leading brand-recognized role in creating the Mobile Information Society by combining mobility and the Internet, and by stimulating the creation of new services.”

The use of the word “mobile” rather than “wireless” represented a critical mindset change. Nokia’s vision was to create a seamless network of both wireless and wireline connections so that unified services were available anywhere they were needed. As Markus Kajanto explained,

With the Internet, value-added services and content are becoming increasingly important. Of course, as Jorma explained [the day before, in a presentation to analysts], we are not going to provide the services or content ourselves, but we want to facilitate their development by providing the right equipment and systems solutions that let others provide them.

Nokia approached the Mobile Information Society from two directions, bringing together activities and developments throughout the organization (see Exhibit 9). On the one side were the wide-area-coverage wireless technologies, starting with GSM and progressing via “generation 2.5” GPRS to the third generation (3G) technologies that were due to be introduced in Europe in 2002. On the other side there were local wireless connections that could link with broadband fixed networks. The local area technologies in which Nokia was active included Wireless LAN and Bluetooth, which allowed computers and other devices to communicate with each other over short distances using high-bandwidth wireless technology.
The first major step in bringing everything together was WAP. WAP had started at Nokia with a small group of engineers trying to extend the short messaging service in GSM to allow business cards to be traded electronically and had grown into a method to access the Internet over mobile phones. In 2000, that meant four or five lines of text on a screen. However, the expectation was that GPRS and then the 3G technologies would improve transmission speed and bandwidth to the point where mobile phones would become completely multi-functional communication devices able to receive video, music, and complex data of all kinds. Working on the packet-switched model of the Internet rather than the circuit-switched model that had dominated voice-oriented telephony, 3G systems would be “always-on,” offering immediate access to data.

THE SITUATION IN SPRING 2000

Market position

NMP entered 2000 as the clear market leader, having sold 78.5 million units the year before. In the first quarter of the year, the division had a 28 percent market share, leaving Motorola and Ericsson trailing with shares of 16 percent and 11.5 percent, respectively. Furthermore, the division enjoyed operating margins in 1999 of over 23 percent, compared to Motorola’s 7–8 percent and Ericsson’s 5–6 percent. Nokia’s predictions were that it would continue to gain market share, with sales growth of over 35 percent in 2000 and 25–30 percent in the years after that. In 1999, Nokia Networks claimed 13 percent of announced wireless infrastructure contracts by value, putting it in fourth place compared to the 26 percent share of market leader Ericsson. However, Nokia had been dominant in the market for GPRS, where it had sold to over fifty operators. Outside GSM-dominated Europe, Nokia’s overall position in both businesses was weaker. In the United States, NMP was still stuck behind Motorola and Networks captured a mere 2 percent of the wireless equipment market. In Japan, Nokia’s share of mobile phone sales was just 3 percent. (See Exhibit 10 for market share data and Exhibit 11 for actual versus forecast growth in mobile phone volumes.)

Demand predictions for the industry remained strong. For example, it was predicted that by 2001 there would be more mobile phones than people in Finland. Penetration rates were not as extreme elsewhere, but in the large European markets they averaged 60 percent, and 2000 was expected to be the first year in which replacement purchases would exceed sales to first-time buyers. At the same time, in many countries the mobile phone was supplanting the fixed wire system, especially where the latter had not been well managed (e.g., Italy) or adequately developed (e.g., China). The data-centric third generation phones were already causing excitement. The Western European nations had begun allocating spectrum for this service, and in the United Kingdom the auction for 3G licenses had generated £23 billion in revenues for the government, which had anticipated that only £3 billion would be bid. The bidding had gone even higher in Germany, and it was clear that big network equipment contracts would soon be let as the winners sought to recoup their huge up-front investments as quickly as possible. On the other hand, some observers were concerned about the effects of the immense outlays on the service providers’ financial situation. There were suggestions that equipment suppliers would be pressured to finance the operators’ investments in developing 3G networks, a practice Nokia had traditionally avoided.
Strategic Challenges

In the new situation with the emerging mobile Internet, Nokia and its competitors had to work together to establish standards. Yet even when standards had been agreed, they could effectively be altered if enough big players diverged from them. Nokia sought constantly to take the lead in developing the standards and keeping them open, so that anyone could access them. Nokia firmly believed that customers preferred open standards because they did not want to risk being locked into an incompatible system with a single producer. Thus open standards were perceived as the best way to grow the market for mobile Internet services. Yet there were frequent attempts from other companies to create proprietary features and standards that they alone would control. American firms seemed especially active in this regard.

One of Nokia’s biggest cooperative ventures was the WAP Forum. The Forum was founded by Nokia, Ericsson, Motorola, and Phone.com, a small U.S. company that had independently created a WAP micro-browser at the same time as Nokia. By 2000 there were over two hundred members, including Microsoft and all the major network operators. However, finding a basis for cooperation was not always easy. Nokia was unhappy that Phone.com was planning to charge about $1 for each handset that used its technology. (Phone.com later dropped the idea.) Microsoft initially refused to join, because WAP was only for cell phones and it preferred a standard that could link the Internet to many different devices. The WAP Forum members eventually agreed that WAP would be made compatible with technology specified by an Internet standard-setting body. The Forum was also hit by troublesome intellectual property claims by WAP Forum member Geoworks.

Nokia, Ericsson, and Motorola also worked together on other projects. The three teamed up with Psion, the U.K. manufacturer of personal digital assistants, and Japanese consumer electronics company Matsushita in the Symbian joint venture, which sought to develop operating systems for mobile phones. They also cooperated on the development of Bluetooth technology, along with IBM, Microsoft, and Intel.

Nokia had staked a great deal on the success of WAP, but the initial rollout was somewhat disappointing. In 1999, Nokia was the first company to bring out a WAP-enabled phone, but there were software problems and some phones had to be recalled. Other criticisms included claims that WAP phones were slow and unreliable, with too-small screens and cramped keyboards. There were also security concerns. It was recognized that GPRS and 3G would bring great improvements, but there was growing concern whether WAP would live up to its much-hyped promise. As Markus Kajanto noted, “The challenge is not to over-promise the customer. If you do, there may be a backlash.”

WAP’s major competing standard was i-mode, developed by the Japanese cellular operator NTT DoCoMo. In the middle of 2000, i-mode had over ten million users in Japan, about five times the total number of WAP users, and was growing very fast. The difficulties with WAP were leading some European operators to consider running i-mode, at least in tandem with WAP. The Japanese system seemed more reliable, it was much more visually appealing and it offered users specific applications tailored to the mobile format.
While WAP was expected to prevail because of its place in the mainstream evolution towards a single Internet standard, the lesson from i-mode was that WAP would not take off until it developed some compelling applications. As well as establishing the standard, Nokia had to build alliances with businesses that would create content and services for use over the mobile Internet. In 1999 and 2000, Nokia announced several alliances with Internet companies (AOL), e-commerce companies (Amazon), telecom operators (France Telecom) and several European banks to pilot services using Nokia’s WAP phones. In addition, many NVF investments were developing applications for the wireless Internet.

However, with an open platform, it was not clear how much direct benefit Nokia would get from these alliances. Any service that was developed would have to be available on any manufacturer’s phone. When it came to differentiating itself from Motorola, Ericsson, and the rest, Nokia had to go back to the basics of speed, cost, design, and quality.

Nokia’s track record in the phone market put it in a strong position, but there were also reasons for concern. First, Asian manufacturers such as Samsung and Matsushita were betting that the shift to third-generation networks would give them a boost over the firms that had dominated GSM phones, including Nokia. Second, the convergence of the mobile telephony and computer industries opened the way to new business models and was bringing with it new, powerful competitors. For example, Nokia was now competing against the companies in the personal digital assistant sector, such as Palm and Psion. Software companies such as Microsoft and Oracle were also positioning themselves to benefit. By 2000, Microsoft had signed deals with Ericsson, Samsung, and numerous others whereby Microsoft browsers and operating systems would be integrated into handsets and Microsoft would get a license fee for every one sold. In addition, Motorola had teamed up with Oracle, but Nokia was holding out. Sari Baldauf commented:

> We don’t have a strong partnering culture. We have a very strong “let’s do it ourselves” culture. And when the world is converging very rapidly, that is definitely something that you need to change your mindset about.

More generally, there were discussions throughout the industry about its future form. Would it disintegrate vertically, as the computer business had, with companies specializing in a particular horizontal slice, or would the need for integration across stages in the value chain keep the vertical model intact?

**Internal Challenges**

Given its projected growth rate of 25–35 percent, Nokia was looking at the prospect of becoming a one hundred thousand-person company within three years. However, Ollila was absolutely determined to avoid that situation. He firmly believed that if Nokia grew too large, then it would fall into the group of “5 percent growth companies.” In part, Ollila felt that the answer lay in increasing the amount of production that was outsourced. At that time, Nokia outsourced all phone accessories, most of the components for phones, and 61 percent of infrastructure production, but only 12 percent of phones themselves. These were basically older models, where there was little opportunity to make process improvements. More fundamentally, Ollila believed
that Nokia had to have the “courage and cleverness” to continually redefine its core activities and question which businesses it should be in.

A disproportionate amount of the growth in headcount was taking place outside Europe and this trend was expected to continue. In 1992, a mere 7 percent of employees were based in the Americas and the Asia-Pacific regions. By 1999, this had increased to 32 percent, and over half were outside Finland. In total, Nokia employed people in fifty countries.

Nokia obviously needed to have at least some local presence for sales and customer service functions. However, the search for talent meant that research and development was also becoming increasingly dispersed, with sites in fourteen countries. There were thirty nationalities working in the Research Center alone. Finnish engineers had served Nokia very well, and Finland was still the main research site, but it was simply impossible by this time for the country to produce enough engineers to meet Nokia’s needs. For the moment, most operations still had at least one Finn in a leadership role, and the senior levels of the company were solidly Finnish, but key jobs were increasingly going to non-Finns.

In this situation, maintaining the company culture was a challenge. Nokia’s management accepted that there could not be a single “Nokia Way” in Finland, the United States and China, but they also believed in the importance of a common core. In the beginning, new operations were mostly staffed by expatriates. According to Kallasvuo, Nokia often sent in “the best examples of the so-called ‘Nokia Way’ to be the pioneers. Because you need a strong injection of ‘how we feel’ and ‘what we think.’” Later they would be withdrawn and responsibility lodged with local talent.

Ollila reflected on the issues arising from the fact that 60 percent of employees had joined Nokia within the last four years:

The majority of that 60 percent are non-Finns—so there is a lot of cultural work, a lot of road shows, a lot of management practices to be transmitted through the organization. So, a lot of work! I think the basic spirit is still there, but it’s harder to keep up. A new guy in Dallas who joins cannot expect to meet me or any of the core management team members within a short period of time. So I think we have to be much smarter, much more methodical in the way we communicate and transmit the values. It’s much harder, it’s a real challenge, the biggest challenge we have today.

As Nokia became more international, it was also being forced to rethink its approach to attracting and motivating talent. Apart from Finland, the United States—especially Silicon Valley—was Nokia’s most important labor market. In that market it was impossible to avoid the pressure to compete through ever increasing salaries and financial incentives and to deal with a norm of high turnover. Sari Baldauf considered the challenges:

It always used to be “we.” Now it is much more “I.” If you look at societal trends, and if you look at the motivational structure of especially our younger workforce, it’s “what I want to do” and “what I want to get done.” Now the thing
is to find a balance so that it is the individual and company in partnership creating something, implementing a vision, that is giving the individual a kick and bringing good business results for the company. And that’s the challenge for us.

At the same time, Nokia was not just growing in size and diversity; it was also growing in complexity. The new vision required Nokia to simultaneously develop multiple different businesses and technologies. Just the first few pages of Nokia’s 1999 Annual Report featured a mind-boggling array of activities, from WAP phones and servers through DSL, EDGE, and WCDMA, to Bluetooth, the EPOC operating system, Wireless LAN, and more. Bringing at least some of these to market successfully would require much more interaction between NMP and Networks than had been needed with earlier projects, like GSM, where there were well-established standards. Within the mobile phone business, there was a proliferation of products as Nokia created different categories tailored to different lifestyles, from a basic terminal for voice and text to a full personal digital assistant and communications device. On top of this, Ollila’s team had to manage a growing network of alliances and a slew of new acquisitions, mostly in the United States.

Fifteen years earlier NMP and Telecom had had four thousand people. The company now had over fifty-five thousand employees. Yet Fortune could still describe it as “one of the least hierarchical big companies on earth, a place where it is often profoundly unclear who’s in charge.” According to Kallasvuo, this was the essence of the “Nokia Way”—that it still had “a small company soul in a big corporate body”—but maintaining that way of working was the biggest challenge of all.
Exhibit 1
Nokia Corporation Board of Directors, March 2000

Jorma Ollila, 49
Chairman and CEO
Chairman, Nokia Group Executive Committee
Member since 1992

Paul J. Collins, 66
Vice Chairman
Vice Chairman, Citigroup Inc.
Director, Citicorp and Citibank N.A.
Member since 1998

Georg Ehrnrooth, 60
President and CEO, Metra Corporation
Member since 2000

Dr. Bengt Holmström, 50
Paul A. Samuelson Professor of Economics, MIT
Member since 1999

Jouko K. Leskinen, 56
President and CEO, Sampo Group
Member since 1994

Robert F. W. van Oordt, 63
CEO, Rodamco Continental Europe N.V.
Member since 1998

Vesa Vainio, 57
Vice Chairman of the Board, MeritaNordbanken Plc
President and Member of the Board, Merita Plc
Vice Chairman of the Board, Nordbanken Holding AB
Member since 1993

Iiro Viinanen, 55
President and CEO, Pohjola Group Insurance Corp.
Member since 1996
Exhibit 1 (continued)
Nokia Group Executive Committee, February 2000

Jorma Ollila, 49  Chairman and CEO, Nokia Corporation
Group Executive Board member since 1986
Joined Nokia 1985

Pekka Ala-Pietilä, 43  President, Nokia Corporation
Member since 1993
Joined Nokia 1984

Dr. Matti Alahuhta, 47  President, Nokia Mobile Phones
Member since 1993
Joined Nokia 1975–1982 and 1984

Sari Baldauf, 44  President, Nokia Networks
Member since 1994
Joined Nokia 1983

Mikko Heikkonen, 50  Executive Vice President and General Manager,
Customer Operations, Nokia Networks
Member since 1998
Joined Nokia 1975

Olli-Pekka Kallasvuo, 46  Executive Vice President and CFO, Nokia Corporation
Member since 1990
Joined Nokia 1980

Dr. Yrjo Neuvo, 56  Executive Vice President, CTO, Nokia Mobile Phones
Member since 1993
Joined Nokia 1993

Veli Sundbäck, 53  Executive Vice President of Corporate Relations and Trade Policy,
Nokia Corporation
Member since 1996
Joined Nokia 1996

Anssi Vanjoki, 43  Executive Vice President, Europe & Africa, Nokia Mobile Phones
Member since 1998
Joined Nokia 1991

Source: Nokia Annual Report
Exhibit 2
Nokia’s Organization

Nokia Corporation
Jorma Ollila
CEO & Chairman of the Group Executive Board

Business groups

Nokia Networks
Sari Baldauf
President
Systems and infrastructure for both analogue and digital networks:
- Switching
- Transmission
- Network management
- Intelligent network solutions

Nokia Mobile Phones
Matti Alahuhta
President
Mobile phones and accessories for analogue and digital standards

Nokia Communications Product
Pekka Ala-Pietila
President
Terminals for reception of digital broadcasting and multimedia applications

Nokia Multimedia
Terminals
Nokia Industrial Electronics
High-end, large Computer and Workstation monitors

Research Center and Ventures Organization
Pekka Ala-Pietila
Corporate President

Nokia Venture Center
Juhani Kuusi
SVP

Nokia Research
Center
Pekka Ala-Pietila
President
- Exploration of new technologies
- Product development
- Co-operation with other research institutions
- Co-operation with global standardization bodies

Nokia Ventures Organization
Pekka Ala-Pietila
President
- IP-oriented products and solutions
- IP technologies for the Home environment
- Display devices in the Mobile environment
- Start-up businesses and technology
- Venturing Unit

Source: Nokia
Exhibit 3
Nokia’s Business Mix

Floors 1%
Chemicals 2%
Machinery 4%
Electrical
Wholesale 4%
Mobile Telephones 5%
Telecommunications 5%
Rubber 6%
Information Systems 23%
Cables 9%
Paper 10%
Consumer Electronics 31%

Mobile Phones 60%
Infrastructure 33%
Other 7%

Source: Nokia
Exhibit 4
Nokia Revenues 1989–1999

Source: Compiled from Bloomberg and Annual Reports

Exhibit 5
Nokia’s Employment, 1989–1999

Source: Compiled from Bloomberg Annual Reports
Exhibit 6

Source: Nokia

Nokia’s Stock Price, 1996 – May 1, 2000

Source: Nokia
### Exhibit 7
Nokia’s Income Statement

#### PROFIT AND LOSS ACCOUNT

<table>
<thead>
<tr>
<th>Financial year ended December 31</th>
<th>1999 EURm</th>
<th>1998 EURm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>19,772</td>
<td>13,326</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>-12,227</td>
<td>-8,299</td>
</tr>
<tr>
<td>Research and development expenses</td>
<td>-1,755</td>
<td>-1,150</td>
</tr>
<tr>
<td>Selling, general and administrative expenses</td>
<td>-1,811</td>
<td>-1,368</td>
</tr>
<tr>
<td>Amortization of goodwill</td>
<td>-71</td>
<td>-20</td>
</tr>
<tr>
<td><strong>Operating profit</strong></td>
<td>3,908</td>
<td>2,489</td>
</tr>
<tr>
<td>Share of results of associated companies</td>
<td>-5</td>
<td>6</td>
</tr>
<tr>
<td>Financial income and expenses</td>
<td>-58</td>
<td>-39</td>
</tr>
<tr>
<td><strong>Profit before tax and minority interests</strong></td>
<td>3,845</td>
<td>2,456</td>
</tr>
<tr>
<td>Tax</td>
<td>-1,189</td>
<td>737</td>
</tr>
<tr>
<td>Minority interests</td>
<td>-79</td>
<td>-39</td>
</tr>
<tr>
<td><strong>Profit from continuing operations</strong></td>
<td>2,577</td>
<td>1,680</td>
</tr>
<tr>
<td>Cumulative prior year net effect of change in accounting policies</td>
<td>-</td>
<td>70</td>
</tr>
<tr>
<td><strong>Net profit</strong></td>
<td>2,577</td>
<td>1,750</td>
</tr>
</tbody>
</table>

#### Earnings per share

<table>
<thead>
<tr>
<th></th>
<th>1999 EUR</th>
<th>1998 EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>2.24</td>
<td>1.48</td>
</tr>
<tr>
<td>Diluted</td>
<td>2.17</td>
<td>1.43</td>
</tr>
<tr>
<td>Net Profit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>2.24</td>
<td>1.54</td>
</tr>
<tr>
<td>Diluted</td>
<td>2.17</td>
<td>1.49</td>
</tr>
</tbody>
</table>

#### Average number of shares (1,000 shares)

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>1998</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>1,148,440</td>
<td>1,138,341</td>
</tr>
<tr>
<td>Diluted</td>
<td>1,185,796</td>
<td>1,173,301</td>
</tr>
</tbody>
</table>
### Nokia 2000 Balance Sheet

#### December 31

<table>
<thead>
<tr>
<th></th>
<th>1999 EURm</th>
<th>1998 EURm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASSETS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed assets and other non-current assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tangible assets</td>
<td>838</td>
<td>484</td>
</tr>
<tr>
<td>Property, plant and equipment</td>
<td>2,031</td>
<td>1,331</td>
</tr>
<tr>
<td>Investments in associated companies</td>
<td>76</td>
<td>90</td>
</tr>
<tr>
<td>Investments in other companies</td>
<td>68</td>
<td>75</td>
</tr>
<tr>
<td>Deferred tax assets</td>
<td>257</td>
<td>196</td>
</tr>
<tr>
<td>Other assets</td>
<td>217</td>
<td>44</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>3,487</td>
<td>2,220</td>
</tr>
<tr>
<td><strong>Current assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventories</td>
<td>1,772</td>
<td>1,292</td>
</tr>
<tr>
<td>Receivables</td>
<td>4,861</td>
<td>3,631</td>
</tr>
<tr>
<td>Short-term investments</td>
<td>3,136</td>
<td>2,165</td>
</tr>
<tr>
<td>Bank and cash</td>
<td>1,023</td>
<td>726</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>10,792</td>
<td>7,814</td>
</tr>
</tbody>
</table>

**Total assets**

|                | 14,279    | 10,034    |
Exhibit 7 (continued)
Nokia 2000 Balance Sheet

<table>
<thead>
<tr>
<th>December 31</th>
<th>1999 EURm</th>
<th>1998 EURm</th>
</tr>
</thead>
</table>

**SHAREHOLDERS’ EQUITY AND LIABILITIES**

<table>
<thead>
<tr>
<th>Description</th>
<th>1999</th>
<th>1998</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shareholders’ equity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share capital</td>
<td>279</td>
<td>255</td>
</tr>
<tr>
<td>Share issue premium</td>
<td>1,079</td>
<td>909</td>
</tr>
<tr>
<td>Treasury shares</td>
<td>-24</td>
<td>-110</td>
</tr>
<tr>
<td>Translation differences</td>
<td>243</td>
<td>182</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>5,801</td>
<td>3,873</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7,378</td>
<td>5,109</td>
</tr>
<tr>
<td>Minority interests</td>
<td>122</td>
<td>63</td>
</tr>
</tbody>
</table>

**Long-term liabilities**

<table>
<thead>
<tr>
<th>Description</th>
<th>1999</th>
<th>1998</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term interest-bearing liabilities</td>
<td>269</td>
<td>257</td>
</tr>
<tr>
<td>Deferred tax liabilities</td>
<td>80</td>
<td>88</td>
</tr>
<tr>
<td>Other long-term liabilities</td>
<td>58</td>
<td>64</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>407</td>
<td>409</td>
</tr>
</tbody>
</table>

**Current liabilities**

<table>
<thead>
<tr>
<th>Description</th>
<th>1999</th>
<th>1998</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term borrowings</td>
<td>792</td>
<td>699</td>
</tr>
<tr>
<td>Current portion of long-term debt</td>
<td>1</td>
<td>61</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>2,202</td>
<td>1,357</td>
</tr>
<tr>
<td>Accrued expenses</td>
<td>3,377</td>
<td>2,336</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6,372</td>
<td>4,453</td>
</tr>
</tbody>
</table>

**Total shareholders’ equity and liabilities**

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>1998</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14,279</td>
<td>10,034</td>
</tr>
</tbody>
</table>

Source: Nokia 1999 Annual Report
Exhibit 8
NVO and New Business Development at Nokia

Source: Nokia Ventures Organization
Exhibit 9
Convergence to Mobile Information Society

Emerging Mobile Information Society
Seamless services

Mobile Information Society

Wireless, secure, high speed access
Fast Internet & Intranet
Shared databases & applications
Messaging, internet, always on
Mobile multimedia
Mobile telephony
Global IP Mobility
Unified end-to-end applications

Nokia’s technology: Global IP Mobility

Global IP Mobility

IP Transport Network

Source: Nokia
## Exhibit 10
### Market Share Information

### TOTAL WORLDWIDE MOBILE TERMINAL SALES BY MANUFACTURER IN 1999

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Sales 1,000 units</th>
<th>Market share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nokia</td>
<td>26,900,000</td>
<td>26.9%</td>
</tr>
<tr>
<td>Motorola</td>
<td>16,000,000</td>
<td>16.0%</td>
</tr>
<tr>
<td>Ericsson</td>
<td>10,500,000</td>
<td>10.5%</td>
</tr>
<tr>
<td>Samsung</td>
<td>4,315,000</td>
<td>4.3%</td>
</tr>
<tr>
<td>Panasonic</td>
<td>3,350,000</td>
<td>3.3%</td>
</tr>
<tr>
<td>Siemens</td>
<td>2,650,000</td>
<td>2.6%</td>
</tr>
<tr>
<td>Alcatel</td>
<td>2,120,000</td>
<td>2.1%</td>
</tr>
<tr>
<td>NEC</td>
<td>1,350,000</td>
<td>1.3%</td>
</tr>
<tr>
<td>Mitsubishi (Trium)</td>
<td>928,000</td>
<td>0.9%</td>
</tr>
<tr>
<td>Philips</td>
<td>848,000</td>
<td>0.8%</td>
</tr>
<tr>
<td>QUALCOMM</td>
<td>317,000</td>
<td>0.3%</td>
</tr>
<tr>
<td>SAGEM</td>
<td>200,000</td>
<td>0.2%</td>
</tr>
<tr>
<td>Toshiba</td>
<td>187,000</td>
<td>0.2%</td>
</tr>
<tr>
<td>Others</td>
<td>10,000,000</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

Source: McKinsey

### TOTAL WORLDWIDE WIRELESS INFRASTRUCTURE SALES BY MANUFACTURER IN 1999*

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Sales US$m</th>
<th>Market share %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ericsson</td>
<td>14,000</td>
<td>28.4%</td>
</tr>
<tr>
<td>Motorola</td>
<td>12,000</td>
<td>12.8%</td>
</tr>
<tr>
<td>Lucent</td>
<td>11,000</td>
<td>11.1%</td>
</tr>
<tr>
<td>Nokia</td>
<td>9,500</td>
<td>9.5%</td>
</tr>
<tr>
<td>Nortel</td>
<td>9,000</td>
<td>9.0%</td>
</tr>
<tr>
<td>NEC</td>
<td>7,000</td>
<td>7.0%</td>
</tr>
<tr>
<td>Siemens</td>
<td>5,600</td>
<td>5.6%</td>
</tr>
<tr>
<td>Alcatel</td>
<td>2,800</td>
<td>2.8%</td>
</tr>
<tr>
<td>Fujitsu</td>
<td>2,100</td>
<td>2.1%</td>
</tr>
<tr>
<td>Others</td>
<td>5,100</td>
<td>10.7%</td>
</tr>
</tbody>
</table>

*Estimates as of November 1999
Source: McKinsey
Exhibit 11
Predicted vs. Actual Mobile Phone Market Volumes

Source: Nokia