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Nokia

1. SYNOPSIS

Headquartered in Finland, Nokia is a major supplier of digital technologies including mobile phones, cellular and fixed telecommunications networks, wireless data solutions, multimedia terminals and computer monitors. Its shares are listed in Helsinki, New York, London, Stockholm, Frankfurt and Paris. Starting as a timber and rubber company, the company bought a majority stake in Finnish Cable Works in 1922, which produced cables for power, telegraph and telephone networks. In 1960, it entered the electronics industry and began development of radiotelephones. In 1967 all operations were merged into the Nokia Group.

2. COMPANY INFORMATION

Exhibit 1 – Nokia Group at a glance

CEO	Mr Jorma Ollila
Established	1865
Revenue 2002	€30.0 billion
R&D 2002	10.2% of sales
Shareholdings & partnerships	Hewlett Packard and Cisco
Headquarters	Finland
Branches	45 countries worldwide; sales in over 130 countries
No. of Employees Dec 2002	51,700 worldwide (-4%)

(Source: Paul Budde Communication, based on company data)

Headquartered in Finland, Nokia is a leader in digital technologies including mobile phones, cellular and fixed telecommunications networks, wireless data solutions, multimedia terminals and computer monitors. Nokia's shares are listed in Helsinki, New York, London, Stockholm, Frankfurt and Paris.

From origins in timber and rubber, in 1922 the company bought a majority stake in Finnish Cable Works, which produced cables for power, telegraph and telephone networks. In 1960, it entered the electronics industry and began development of radiotelephones. In 1967 all operations were merged into the Nokia Group.

In 1979, the Radiophone Dept merged with another company that eventually became Nokia Mobile Phones in 1989. In 1992, Nokia decided to concentrate on telecommunications, and began divesting itself of its other operations.

Exhibit 2 – Acquisitions

Name	Date	Activities
Ipsilon Networks Inc	December 1997	Development of open Internet Protocol (IP) routing platforms
Matra GSM R&D unit	June 1998	GSM development
User Interface Design	August 1998	An international consultancy with niche competence in the areas of computer science, graphical design and advanced value-adding software applications for user-friendly solutions
NE-Products Oy	September 1998	Develops and manufactures wireless payphones and other telecommunications related electronics
Vienna Systems Corp	December 1998	Internet Protocol (IP) telephony company
Diamond Lane Communications	February 1999	Developed the multi-service digital subscriber line access multiplexer
InTalk Corp	February 1999	Development of wireless LAN access point products
R&D units from TeamWARE Group	May 1999	Pioneering work in the field of wireless information management applications

Aircom International	June 1999	Provides radio engineering services and designs and develops network planning, information management and performance monitoring software
Rooftop Communications Corp	September 1999	Develops multipoint-to-multipoint radio systems that enable wireless broadband access to the Internet
Telekol Group	October 1999	Develops intelligent corporate communications solutions
Business from TeamWARE Group	December 1999	Security software
Network Alchemy	February 2000	Provider of IP Clustering solutions
DiscoveryCom	August 2000	Provides solutions that enable communications service providers to rapidly install and maintain Broadband DSL services for fast Internet access.
Ramp Networks	December 2000	Provider of purpose built Internet security appliances
Amber Networks	July 2001	Networking infrastructure company

(Source: Paul Budde Communication, based on company data)

Table 1 – Location of Nokia operations

Production		Nokia Ventures	Research and Development
Nokia Networks	Mobile phones		
Brazil	Brazil	China	Australia
China	China		Canada
Finland	Finland		China
Great Britain	Germany		Denmark
Malaysia	Hungary		Finland
	Mexico		Germany
	South Korea		Great Britain
	USA		Hungary
			Italy
			Japan
			Malaysia
			South Korea
			Spain
			Sweden
			USA

(Source: Paul Budde Communication, based on company data)

Table 2 – Major subsidiaries – Dec 2002

Company	Country	% owned
Nokia Inc	USA	100%
Nokia GmbH	Germany	100%
Nokia UK Limited	England & Wales	100%
Nokia TMC Limited	South Korea	100%
Beijing Capitel Nokia Mobile Telecommunications Ltd	China	50%
Nokia Finance International B.V	The Netherlands	100%
Nokia Komárom Kft	Hungary	100%
Nokia do Brazil Tecnologia Ltda	Brazil	100%
Nokia Italia Spa	Italy	100%
Nokia France S.A.	France	100%
Dongguan Nokia Mobile Phones Company Ltd	China	70%
Beijing Nokia Hang Xing Telecommunications Systems Co. Ltd	China	69%

(Source: Paul Budde Communication, based on company data)

2.1 YEAR 2002 RESULTS

During 2002 the company experienced intense competition and a continued weakened global economy. Net sales were down 4% to €30.0 billion, reflecting continuing difficult operating conditions in the network infrastructure business. Operating profit increased by 42% to €4.8 billion.

During 2002, operating profit was negatively impacted by a net charge of €265 million in relation to the obligations of MobilCom and by goodwill impairments of €182 million primarily in the Nokia Networks business. The goodwill impairments relate to Nokia Networks' IP Mobility Networks business as well as to Nokia Internet Communications within Nokia Ventures Organisation. Net profit for the year was up 54% to €3.38 billion.

Cash equivalents at the end of the year were €9.35 billion.

Table 3 – Revenue for years ending December – 1994-2002

Year	(€ billion)
1994	5.1
1995	6.2
1996	6.6
1997	8.8
1998	13.3
1999	19.8
2000	30.4
2001	31.2
2002	30.0

(Source: Paul Budde Communication, based on company data)

Table 4 – Revenue by segment – 2002

Segment	Proportion	Annual change
Networks	22%	0%
Mobile phones	77%	-13%
Ventures	1%	-22%

(Source: Paul Budde Communication, based on company data)

Table 5 – Revenue by region – 2002

Segment	Proportion	Annual change
Europe	54%	+6%
Asia Pacific	24%	-11%
Americas	22%	-15%

(Source: Paul Budde Communication, based on company data)

2.2 YEAR 2001 INDUSTRY DOWNTURN

During the first half of 2001, Nokia continued to perform strongly in the global mobile communications market. It showed a 22% revenue and 8% net profit improvement over the same quarter the previous year. However, the company reported that the general economic slowdown in the US was showing signs of extending to other regions and to the wireless telecommunications industry as a whole.

In April 2001, Nokia arranged a US\$1.75 billion multi-currency revolving credit line.

In June 2001, Nokia estimated that the global mobile phone market would show only very modest growth during 2001. However, it believed that it would increase its market share and its mobile phone

business would continue to grow significantly during 2001, and that its network business would achieve an annual growth rate at least on par with overall market growth.

Nokia expects the weaker market conditions to reduce its sales growth to below 10% for the second quarter, but to retain a strongly positive cash flow.

Nokia plans to continue its actions in all areas of the business to meet the changing market conditions. These actions include operational changes to further enhance customer focus in Nokia Networks, a refocus of production at Nokia Mobile Phones factories in Texas (US) and Bochum (Germany), and the re-alignment of Nokia Internet Communications. It cut 1,000 jobs in its Networks unit. The cost of these actions will negatively affect the operating profit in the second quarter 2001 by approximately €190 million.

In addition to these cost cutting measures, the company plans to accelerate ongoing development programs that will generate improved efficiencies and costs.

Also in June, Nokia restructured its mobile phone production processes in Bochum, Germany. The Bochum unit will increasingly focus on the final assembly of mobile phones, while part of the current board assembly will be shifted to other Nokia facilities and to contract manufacturers. At the same time, it entered into a letter of intent to outsource all Nokia Original Accessory distribution and logistics services for the US and Latin America to Brightpoint.

In July 2001 Nokia announced that, contrary to the moves by other suppliers, it was considering increasing its level of vendor financing to 3G mobile operators. By May 2001, its existing level of vendor financing was reported as about €3.6 billion for 3G and €2 billion for 2G projects. The cash rich company obviously feels that this will give it an advantage over its struggling rivals in its planned move to increase market share.

The company has also maintained R&D expenditure, with the % of sales actually increasing in 2002 to 10.2%.

2.3 NOKIA BUSINESS GROUPS

2.3.1 Nokia Networks

This group offers systems and infrastructure for both analogue and digital networks. Its dedicated network products include switching, transmission, network management, and intelligent network solutions. These products are designed for wireless, fixed, and convergent environments.

Nokia Networks had seven production facilities at the end of 2002: four in Finland and three in China. Over 60% of Nokia Networks' production is outsourced, as well as some support activities.

2.3.2 Nokia Mobile Phones

This is the world's largest manufacturer of cellular phones, with markets in more than 130 countries around the world. It offers a full range of mobile phones for all major digital and analogue technologies and customer segments worldwide. In Europe, most of the market is digital with increasing amounts of data traffic in the networks. In the Americas, an accelerating shift from analogue to digital is occurring, while Asia Pacific is witnessing growth in several mobile digital telecommunication standards.

During 2002, Nokia Mobile Phones reorganised to provide more market focus. From May 2002, nine new business units were formed:

- Mobile Phones
- Mobile Entry Products
- Imaging

- Entertainment and Media
- Business Applications
- Time Division Multiple Access (TDMA)
- Code-Division Multiple Access (CDMA)
- Mobile Enhancements
- Mobile Services

Nokia Mobile Phones operates 10 manufacturing plants in nine countries. The US plant primarily supplies the American markets, as do the manufacturing plants in Mexico and Brazil. Three major European plants, located in Finland, Germany and Hungary, principally supply the European market and non-European countries that have adopted the GSM standard. A manufacturing plant in the UK serves Nokia's UK subsidiary, Vertu. Two plants in China and one in South Korea that primarily supply the Asian markets.

Nokia uses outsourcing to complement its manufacturing activities. During 2002, outsourcing covered an estimated 15-20% of the manufacturing volume of mobile phones.

2.3.3 Nokia Ventures Organisation

This explores new business areas facilitating future growth and boosting Nokia's product and long term business development. To date, Nokia Ventures includes:

- Nokia Internet Communications – offers Enterprises and Managed Internet Service Providers strategic IP oriented products and solutions.
- Nokia Home Communications – develops digital home platforms and communications solutions based on IP technologies for the home environment.
- Nokia Mobile Display Appliances – focuses on the development of entirely new display devices enabling Internet-based, visually rich communications in the mobile environment.
- Nokia Ventures Fund – focuses on new start-up businesses and technologies, which are not in the natural scope of our current business units and has a global investment scope.

Nokia Ventures has outsourced the production of multimedia terminals and Internet security products to third party contract manufacturers with factories in China, Malaysia, Mexico and Romania. It also participates in a joint venture to manufacture multimedia terminals in China.

2.3.4 Nokia Research Centre

The corporate research unit, its goal is to enhance the Group's technological competitiveness. The centre covers the full range of activities from exploration of new technologies and product/system concepts to their exploitation in actual product development in the business units. It actively participates in various international R&D projects in cooperation with universities, research institutes and other telecommunications companies. Nokia Research Centre's technology areas are wireless and wireline telecommunications, audio-visual signal processing, software technology and electronics. Its main focuses include GSM enhancement and third generation mobile technology, broadband communications and multimedia.

In February 2003, Nokia announced plans to rationalise its R&D activities. The broadband access activities in Santa Rosa, California will be transferred to its broadband site in Espoo, Finland. It will also close its small base station R&D site in Kista, Sweden, and reduce the number of employees in its UK R&D site. The level of R&D effort will also be reviewed in the light of reduced business activity.

The planned actions mean reductions in the number of employees by approximately 550 positions in the US, the UK, Sweden and Finland.

3. MAJOR SERVICES/PRODUCTS

3.1 NETWORK PRODUCTS

- Access.
- Cellular Transmission.
- Mobility Core.
- Modems.
- Network and Service Management.
- Nokia Solutions.
- Service and Connectivity Nodes.
- Services.
- Switching.
- TETRA Terminals.

3.2 CORPORATE SOLUTIONS

- Mobile business.
- Network protection.
- VPN Solutions.
- New Technologies:
 - Mobile Commerce;
 - SyncML;
 - GPRS;
 - Bluetooth;
 - 3G;
 - IPv6;
 - MMS.

3.3 MOBILE PHONES

- Phones.
- Accessories.
- Access plans.

3.4 HOME PRODUCTS

- Home entertainment.
- Home networking.
- Games.

4. RESEARCH AND DEVELOPMENT

The corporate research centre interacts closely with the R&D units of all Nokia business groups. The centre covers the full range of activities from exploration of new technologies and product/system concepts to their exploitation in actual product development.

In 1999, Nokia strengthened its R&D operations in Finland by establishing a unit in Pori, Finland. The unit concentrates on developing software to mobile phones for Nokia Mobile Phones and to network management tools for Nokia Telecommunications.

5. NOKIA ASIA PACIFIC

Nokia established its first Asia/Pacific office in Singapore in about 1980. Asia's economic growth has provided a good platform for expanding cooperation, and in 2000 about one quarter of Nokia net sales came from Asia/Pacific. Nokia currently has sales, customer service, production, and research and development operations in 25 countries in the region. Nokia's customers include telecom operators and public utilities as well as consumers.

In the Asia/Pacific region, Nokia focuses on digital GSM-based solutions. GSM was originally developed as the pan-European mobile communications standard, but it has subsequently been widely adopted also in the Asia/Pacific region. GSM1800(PCN) networks are used in Malaysia and Thailand, and the number of networks is growing.

Nokia Mobile Phones operates 3 factories in the region - in Masan, Korea, and Beijing and Dongguan in China. It also has R&D centres and activities in Japan and China. Examples of the many activities Nokia Networks operates in the region includes technology and training centres in Australia, Japan and Thailand, and six joint ventures in China.

For details of Nokia's Australian operations, see chapter 6 below.

Nokia business units in the Asia/Pacific region are Nokia Telecommunications and Nokia Mobile Phones and most recently Nokia Multimedia Network Terminals:

- **Nokia Telecommunications (Asia/Pacific)** - has more than 27 installed GSM/DCS networks with numerous installations in China, India, Thailand, Malaysia, Indonesia, Singapore and the Philippines.
- **Nokia Mobile Phones (Asia/Pacific)** - offers a wide range of products and accessories for all major cellular standards. Nokia Mobile phones is represented by 14 offices. It operates 3 factories in the region - in Masan, Korea; Beijing and Dongguan in China - and has R&D centres and activities in Australia, Hong Kong and China. Examples of the many activities Nokia Networks operates in the region includes technology and training centres in Thailand, and a regional Sales Support Centre in Singapore. Nokia Networks also has six joint ventures in China.
- **Nokia Multimedia Network Terminals (Asia/Pacific)** - in December 1997, Nokia Multimedia Network Terminals announced the details of its operations in Asia and introduced digital satellite/cable receivers for the Asian market. Hong Kong has been selected as the location for an Asia Pacific regional headquarters. The regional office will support sales offices in Beijing, Sydney, Bangkok and New Delhi. Further offices across the region are planned during 1998.

Table 6 – Revenue for years ending December – 1997-2001

Year	(billion)
1997	US\$2.2
1998	US\$3.3
1999	€4.3
2000	€7.0
2001	€7.9
2002	€7.2

(Source: Paul Budde Communication, based on company data)

Singapore continues to be the regional hub for Nokia, and a base from which more than 700 staff provide solutions and support for the surrounding markets and other Nokia offices in the region.

5.1 PRODUCTS AND SERVICES

- Mobile phones and accessories.
- Broadband IP Access Solutions:
 - ⇒ DSL modems - DSL/WLAN;
 - ⇒ Nokia MW1642;
 - ⇒ DSLAM (ETSI and US) - Digital Subscriber line access multiplexer;

- ⇒ Loopmaster - a modular, high-density platform designed specifically for the central office.
- Network solutions:
 - ⇒ Small office solutions;
 - ⇒ Security solutions;
 - ⇒ VPN solutions;
 - ⇒ SSL solutions;
 - ⇒ Industry solutions;
 - ⇒ Training.
- Services to operators:
 - ⇒ Mobile Internet and messaging;
 - ⇒ 3rd Generation;
 - ⇒ Mobile networks;
 - ⇒ Broadband access;
 - ⇒ Convergence;
 - ⇒ Professional mobile radio;
 - ⇒ Professional services;
 - ⇒ Network developer tools.

6. NOKIA AUSTRALIA

Nokia Telecommunications (NTC) was established in Melbourne in 1985 to fulfil a contract with Telecom Australia (now Telstra) for digital radio transmission equipment. NTC began its expansion in Australia in early 1992 when it was awarded its first trunked mobile contract in association with Telstra.

In Australia, Nokia Telecommunications and Nokia Mobile Phones have offices in North Sydney NSW, Heidelberg VIC and Balcatta WA.

In 1992, NTC signed a Strategic Partnership Agreement with Optus. This was extended until the end of 1998.

Nokia signed a Partnership for Development plan with the Australian Government in November 1992 for an export commitment of AU\$116 million and Research and Development expenditure of AU\$27 million.

In January 1998, Telstra and Nokia signed an agreement to trial Nokia's TETRA digital trunked mobile system. Nokia and Telstra will jointly install and commission the system and Telstra will provide the subsequent operation and management. This agreement marks the first step towards introducing digital trunked mobile radio communications to the Australian market. The six-month trial will commence in Sydney in early 1998.

The Centre for Telecommunications Information Networking, in Adelaide, reached agreement with Nokia and Optus for a joint two year research to analyse the deployment of improved data transmission capabilities in mobile communications. This research will create technical and economical models for deployment of packet radio capabilities in a GSM network.

In August 2000, Vodafone New Zealand and Nokia agreed to implement the Nokia General Packet Radio Service (GPRS) core network solution into Vodafone's commercial mobile network.

In September 2000, Nokia agreed to supply Cable & Wireless Optus' GPRS core network. The Nokia GPRS core network solution will be integrated into Cable & Wireless Optus' existing GSM 900 and 1800 network allowing the rollout of packet-based mobile Internet services to Cable & Wireless Optus subscribers across Australia.

In April 2001, Nokia reached agreement with C&W Optus for the sole supply of a 3G mobile network in Australia. The agreement covered the supply of 3G RAN (Radio Access Network), for both

WCDMA and EDGE, as well as the complete 3G Circuit and Packet Core Network. In addition, Nokia becomes a mobile Internet applications partner of Optus Mobile.

During 2002, Nokia contracted to supply MMS solutions to both Telstra and Optus.

6.1 PARTNERSHIP WITH ECORP

In February 2000, Nokia Australia announced a partnership with ecorp to deliver broad wireless access to its key online assets.

Users of Nokia's 7110 mobile WAP phones will now have access to a number of different content channels currently available on the Nine MSN Web site. As well as the delivery of real time information services, customers will be able to connect with Ticketek and participate in US online auction house eBay via their mobile phones.

6.2 R&D IN AUSTRALIA

Nokia Telecommunications, in cooperation with the Centre for Information Technology Research at Wollongong University, performs R&D activities. This agreement was developed in 1992. In 1993, the R&D Centre of Excellence was established in Victoria.

In May 1998, agreement was reached between CTIN, Nokia and Optus for a joint two-year research to analyse the deployment of improved data transmission capabilities in mobile communications at the Centre for Telecommunications Information Networking in Adelaide. This research will create technical and economical models for deployment of packet radio capabilities in a GSM network.

6.3 EXPORT FROM AUSTRALIA

Nokia Australia exports to New Zealand, Italy, Finland and Hong Kong. Export products include cellular systems products and services.

7. OTHER DEVELOPMENTS

7.1 YEAR 2002

May

- Nokia acquired 10% of Redback Networks, and signed a strategic agreement to cooperate on technology development and product solutions.

October

- Nokia opened a branch office in Hangzhou and commenced operations of its Hangzhou R&D centre.

7.2 YEAR 2003

March

- Nokia announced plans to merge its four joint ventures in China, and to begin production of CDMA handsets in that country.

For information relating to:

- worldwide activities in the telecommunications industry, see [Global Overviews](#).

- the global telecommunications industry, see [Technologies, Terminology and Glossary](#).
- telecommunication companies in Europe, see [Companies in Europe](#).
- activities in Europe, see [Europe](#).
- equipment supply companies, see [Equipment suppliers](#).

8. CONTACT DETAILS

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