NOKIA CORP
Form 20-F
March 23, 2017

As filed with the Securities and Exchange Commission on March 23, 2017

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 20-F

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE

SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2016

Commission file number 1-13202

Nokia Corporation

(Exact name of Registrant as specified in its charter)

Republic of Finland

(Jurisdiction of incorporation)

Karaportti 3 FI-02610 Espoo, Finland

(Address of principal executive offices)

Riikka Tieaho, Vice President, Corporate Legal, Telephone: +358 (0) 10 44 88 000, Facsimile: +358 (0) 10 44 81 002, Karaportti 3, FI-02610 Espoo, Finland

(Name, Telephone, E-mail and/or Facsimile number and Address of Company Contact Person)

Securities registered pursuant to Section 12(b) of the Securities Exchange Act of 1934 (the Exchange Act):

Title of each class	**Name of each exchange on which registered**
American Depositary Shares	New York Stock Exchange
Shares	New York Stock Exchange[1]

(1) Not for trading, but only in connection with the registration of American Depositary Shares representing these shares, pursuant to the requirements of the Securities and Exchange Commission.

Securities registered pursuant to Section 12(g) of the Exchange Act: **None**

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Exchange Act:

5.375% Notes due 2019 and 6.625% Notes due 2039.

Indicate the number of outstanding shares of each of the registrant s classes of capital or common stock as of the close of the period covered by the annual report. Shares: **5 836 055 012**.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Exchange Act. Yes No

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of large accelerated filer, accelerated filer and smaller reporting company in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer Accelerated filer
Non-accelerated filer (Do not check if a smaller reporting company) Smaller reporting company

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP

International Financial Reporting Standards as issued by the International Accounting Standards Board

Other

If Other has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow. Item 17 Item 18

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in
Rule 12b-2 of the Exchange Act). Yes No

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Cross-reference table

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ITEM	2	OFFER STATISTICS AND EXPECTED TIMETABLE	N/A
ITEM	3	KEY INFORMATION	
	3A	Selected Financial Data	General facts on Nokia Selected financial data
	3B	Capitalization and Indebtedness	N/A
	3C	Reasons for the Offer and Use of Proceeds	N/A
	3D	Risk Factors	Operating and financial review and prospects Risk factors
ITEM	4	INFORMATION ON THE COMPANY	
	4A	History and Development of the Company	Cover page, Overview, Introduction and use of certain terms; General facts on Nokia Our history; Operating and financial review and prospects Liquidity and capital resources; Operating and financial review and prospects Material subsequent events; Financial statements Notes to consolidated financial statements Note 4, Segment information; Financial statements Notes to consolidated financial statements Note 5, Acquisitions
	4B	Business Overview	Business overview; Operating and financial review and prospects Principal industry trends affecting our operations; Financial statements Notes to consolidated financial statements Note 4, Segment information; General facts on Nokia Government regulation
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Forward-looking statements

It should be noted that Nokia and its businesses are exposed to various risks and uncertainties and certain statements herein that are not historical facts are forward-looking statements, including, without limitation, those regarding:

A) our ability to integrate Alcatel Lucent into our operations and achieve the targeted business plans and benefits, including targeted synergies in relation to the Acquisition of Alcatel Lucent;

B) expectations, plans or benefits related to our strategies and growth management;

C) expectations, plans or benefits related to future performance of our businesses;

D) expectations, plans or benefits related to changes in organizational and operational structure;

E) expectations regarding market developments, general economic conditions and structural changes;

F) expectations and targets regarding financial performance, results, operating expenses, taxes, currency exchange rates, hedging, cost savings and competitiveness, as well as results of operations including targeted synergies and those related to market share, prices, net sales, income and margins;

G) timing of the deliveries of our products and services;

H) expectations and targets regarding collaboration and partnering arrangements, joint ventures or the creation of joint ventures, as well as our expected customer reach;

I) outcome of pending and threatened litigation, arbitration, disputes, regulatory proceedings or investigations by authorities;

J)

expectations regarding restructurings, investments, uses of proceeds from transactions, acquisitions and divestments and our ability to achieve the financial and operational targets set in connection with any such restructurings, investments, divestments and acquisitions; and

K) statements preceded by or including believe, expect, anticipate, foresee, sees, target, estimate, design plans, intends, focus, continue, project, should, will or similar expressions.

These statements are based on management s best assumptions and beliefs in light of the information currently available to it. Because they involve risks and uncertainties, actual results may differ materially from the results that we currently expect. Factors, including risks and uncertainties that could cause these differences include, but are not limited to:

1) our ability to execute our strategy, sustain or improve the operational and financial performance of our business and correctly identify and successfully pursue business opportunities or growth;

2) our ability to achieve the anticipated benefits, synergies, cost savings and efficiencies of the Acquisition of Alcatel Lucent, and our ability to implement our organizational and operational structure efficiently;

3) general economic and market conditions and other developments in the economies where we operate;

4) competition and our ability to effectively and profitably compete and invest in new competitive high-quality products, services, upgrades and technologies and bring them to market in a timely manner;

5) our dependence on the development of the industries in which we operate, including the cyclicality and variability of the information technology and telecommunications industries;

6) our global business and exposure to regulatory, political or other developments in various countries or regions, including emerging markets and the associated risks in relation to tax matters and exchange controls, among others;

7) our ability to manage and improve our financial and operating performance, cost savings, competitiveness and synergies after the Acquisition of Alcatel Lucent;

8) our dependence on a limited number of customers and large multi-year agreements;

9) exchange rate fluctuations, as well as hedging activities;

10) Nokia Technologies ability to protect its IPR and to maintain and establish new sources of patent licensing income and IPR-related revenues, particularly in the smartphone market;

11)

our dependence on IPR technologies, including those that we have developed and those that are licensed to us, and the risk of associated IPR-related legal claims, licensing costs and restrictions on use;

12) our exposure to direct and indirect regulation, including economic or trade policies, and the reliability of our governance, internal controls and compliance processes to prevent regulatory penalties in our business or in our joint ventures;

13) our ability to identify and remediate material weaknesses in our internal control over financial reporting;

14) our reliance on third-party solutions for data storage and service distribution, which expose us to risks relating to security, regulation and cybersecurity breaches;

15) inefficiencies, breaches, malfunctions or disruptions of information technology systems;

16) Nokia Technologies ability to generate net sales and profitability through licensing of the Nokia brand, particularly in digital media and digital health, and the development and sales of products and services, as well as other business ventures which may not materialize as planned;

17) our exposure to various legislative frameworks and jurisdictions that regulate fraud and enforce economic trade sanctions and policies, and the possibility of proceedings or investigations that result in fines, penalties or sanctions;

18) adverse developments with respect to customer financing or extended payment terms we provide to customers;

19) the potential complex tax issues, tax disputes and tax obligations we may face in various jurisdictions, including the risk of obligations to pay additional taxes;

20) our actual or anticipated performance, among other factors, which could reduce our ability to utilize deferred tax assets;

21) our ability to retain, motivate, develop and recruit appropriately skilled employees;

22) disruptions to our manufacturing, service creation, delivery, logistics and supply chain processes, and the risks related to our geographically-concentrated production sites;

23) the impact of litigation, arbitration, agreement-related disputes or product liability allegations associated with our business;

24) our ability to optimize our capital structure as planned and re-establish our investment grade credit rating or otherwise improve our credit ratings;

25) our ability to achieve targeted benefits from or successfully implement planned transactions, as well as the liabilities related thereto;

26) our involvement in joint ventures and jointly-managed companies;

27) the carrying amount of our goodwill may not be recoverable;

28) uncertainty related to the amount of dividends and equity return we are able to distribute to shareholders for each financial period;

29) pension costs, employee fund-related costs, and healthcare costs; and

30) risks related to undersea infrastructure, as well as in Nokia s other filings with the U.S. Securities and Exchange Commission. Other unknown or unpredictable factors or underlying assumptions subsequently proven to be incorrect could cause actual results to differ materially from those in the forward-looking statements. We do not undertake any obligation to publicly update or revise forward-looking statements, whether as a result of new information, future events or otherwise, except to the extent legally required.

Introduction and use of certain terms

Nokia Corporation is a public limited liability company incorporated under the laws of the Republic of Finland. In this annual report on Form 20-F, any reference to we, us, the Group, the company or Nokia means Nokia Corporatio its consolidated subsidiaries and generally to Nokia s Continuing operations, except where we separately specify that the term means Nokia Corporation or a particular subsidiary or business segment only or our Discontinued operations. References to our shares , matters relating to our shares or matters of corporate governance refer to the shares and corporate governance of Nokia Corporation.

Nokia Corporation has published its consolidated financial statements in euro for periods beginning on or after January 1, 1999. In this annual report on Form 20-F, references to EUR, euro or are to the common currency of the European Economic and Monetary Union, and references to dollars , U.S. dollars , USD or $ are to the currency of t United States. Solely for the convenience of the reader, this annual report on Form 20-F contains conversions of selected euro amounts into U.S. dollars at specified rates or, if not so specified, at the rate of 1.0552 U.S. dollars per euro, which was the noon buying rate in New York City for cable transfers in euro as certified for customs purposes by the Federal Reserve Bank of New York on December 31, 2016. No representation is made that the amounts have been, could have been or could be converted into U.S. dollars at the rates indicated or at any other rates.

The information contained in, or accessible through, the websites linked throughout this annual report on form 20-F is not incorporated by reference into this document and should not be considered a part of this document.

Nokia Corporation furnishes Citibank, N.A., as Depositary, with its consolidated financial statements and a related audit opinion of our independent auditors annually. These financial statements are prepared on the basis of International Financial Reporting Standards as issued by the International Accounting Standards Board and in conformity with IFRS as adopted by the European Union (IFRS). In accordance with the rules and regulations of the SEC, we do not provide a reconciliation of net income and shareholders equity in our consolidated financial statements to accounting principles generally accepted in the United States, or U.S. GAAP. We also furnish the Depositary with quarterly reports containing unaudited financial information prepared on the basis of IFRS, as well as all notices of shareholders meetings and other reports and communications that are made available generally to our shareholders. The Depositary makes these notices, reports and communications available for inspection by record holders of American Depositary Receipts (ADRs), evidencing American Depositary Shares (ADSs), and distributes to all record holders of ADRs notices of shareholders meetings received by the Depositary.

In addition to the materials delivered to holders of ADRs by the Depositary, holders can access our consolidated financial statements, and other information included in our annual reports and proxy materials, at nokia.com/financials. This annual report on Form 20-F is also available at nokia.com/ financials as well as on Citibank s website at http://citibank.ar.wilink.com (enter Nokia in the Company Name Search). Holders may also request a hard copy of this annual report by calling the toll-free number 1-877-NOKIA-ADR (1-877-665-4223), or by directing a written request to Citibank, N.A., Shareholder Services, PO Box 43077, Providence, RI 02940-3081, United States. With each annual distribution of our proxy materials, we offer our record holders of ADRs the option of receiving all of these documents electronically in the future.

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This is Nokia

We create the technology to connect the world. Powered by the research and innovation of Nokia Bell Labs, we serve communications service providers, governments, large enterprises and consumers with the industry s most complete end-to-end portfolio of products, services and licensing. From the enabling infrastructure for 5G and the Internet of Things (IoT) to emerging applications in Virtual Reality (VR) and digital health, we are shaping the future of technology to transform the human experience.

Since the closing of the Alcatel Lucent acquisition in early January 2016 (the Acquisition of Alcatel Lucent), we have combined global leadership in mobile and fixed network infrastructure with the software, services and advanced technologies to serve customers in more than 100 countries around the world. We are driving the transition to smart, virtual networks and connectivity by creating one single network for all services, converging mobile and fixed broadband, IP routing and optical networks, with the software and services to manage them. Our research scientists and engineers continue to invent new technologies that will increasingly transform the way people and things communicate and connect: 5G, ultra broadband access, IP and Software Defined Networking (SDN), Cloud applications, IoT and security platforms, data analytics, as well as sensors and imaging.

Through our five business groups, we have a global presence with operations in Europe, the Middle East & Africa, Greater China, North America, Asia-Pacific and Latin America. In 2016, we had sales in approximately 130 countries. We also have research and development (R&D) facilities in Europe, North America and Asia, and at the end of 2016, we employed approximately 101 000 people.

We closed 2016 delivering net sales of EUR 23.6 billion. We continued to make significant targeted R&D investments, a bedrock of our success in innovation, with R&D expenditures equaling EUR 4.9 billion in 2016.

Countries of operation
100+

Number of employees at the end of 2016
~101 000

R&D investment in 2016
EUR 4.9bn

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Acquisition of Alcatel Lucent

In April 2015, we announced plans to acquire Alcatel Lucent with an aim to create an innovation leader in next generation technology and services. The all-share transaction was agreed on the basis of 0.55 new Nokia shares for every Alcatel Lucent share, a transaction valued at EUR 15.6 billion on a fully diluted basis.

At the end of 2015, our shareholders voted overwhelmingly to approve the Alcatel Lucent acquisition, and in early January 2016 we announced that we had gained control of Alcatel Lucent through the successful public exchange offer for all outstanding Alcatel Lucent securities by holding nearly 80% of outstanding Alcatel Lucent securities.

During the course of the year, we continued to take steps towards gaining full ownership of Alcatel Lucent through the initial and reopened exchange offers and by purchasing Alcatel Lucent shares and OCEANE convertible bonds in privately negotiated transactions, consequently reaching full ownership of Alcatel Lucent in November 2016.

On October 4, 2016, the French stock market authority (Autorité des marchés financiers, the AMF) announced that a legal action was filed before the Paris Court of Appeal on September 30, 2016 for annulment of the AMF s clearance decision regarding our public buy-out offer, which would be followed by a squeeze-out of all remaining securities of Alcatel Lucent. As a result, the public buy-out offer period was extended and the squeeze-out was postponed. We found the legal challenge to be without merit, as we believed that the offer complied with all applicable laws and regulations.

On October 25, 2016, with the legal challenge still pending, the AMF announced the continuation of the timetable of the public buy-out offer followed by a squeeze-out of all remaining securities of Alcatel Lucent, allowing the public buy-out period to end on October 31, 2016 and the squeeze-out to be implemented on November 2, 2016. On November 2, 2016, we achieved 100% ownership of Alcatel Lucent.

On December 15, 2016, the plaintiffs withdrew the complaint they had filed before the Paris Court of Appeal and, consequently, the public buy-out offer followed by a squeeze-out had therefore become definitive, confirming our ownership of 100% of Alcatel Lucent.

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This is Nokia continued

Organizational structure and reportable segments

January 14, 2016 was Nokia and Alcatel Lucent s first day of combined operations.

After the Acquisition of Alcatel Lucent, we organized our networks-oriented businesses into four business groups: Mobile Networks, Fixed Networks, IP/Optical Networks and Applications & Analytics (together the Networks business); and kept our driver of future innovation and licensing, Nokia Technologies, as a separate fifth business group. For descriptions of our business groups, refer to Business overview Networks business and Business overview Nokia Technologies .

We have three reportable segments: (i) Ultra Broadband Networks comprising Mobile Networks and Fixed Networks, (ii) IP Networks and Applications comprising IP/Optical Networks and Applications & Analytics (all within our Networks business), and (iii) Nokia Technologies.

Following the changes to our organizational structure announced on March 17, 2017, we will continue to report financial information for Ultra Broadband Networks, IP Networks and Applications and Nokia Technologies. Ultra Broadband Networks will be composed of the Mobile Networks, Global Services and Fixed Networks business groups. IP Networks and Applications is composed of the IP/Optical Networks and Applications & Analytics business groups.

Additionally, we report the results of other business activities that are not reportable segments, such as our undersea cables business, Alcatel-Lucent Submarine Networks (ASN), and our antenna systems business, Radio Frequency Systems (RFS), in aggregate. Both ASN and RFS are being managed as separate businesses.

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Key data

Net sales 2016
EUR 23.6bn

Gross margin 2016
35.8%

Dividend per share 2016
EUR 0.17

Net cash as of December 31, 2016
EUR 5.3bn

The following table sets forth summary financial and non-financial information for the years ended December 31, 2016 (including Alcatel Lucent) and December 31, 2015 for our Continuing operations. This data has been derived from our consolidated financial statements, which are included in this annual

For the year ended December 31	2016 EURm	2015 EURm	Change
Net sales	**23 614**	**12 499**	**89%**
Nokia s Networks business	21 800	11 487	90%
Ultra Broadband Networks	15 771	10 159	55%
IP Networks and Applications	6 029	1 328	354%
Nokia Technologies	1 053	1 027	3%
Group Common and Other	1 145		
Gross margin	***35.8%***	***44.3%***	***(850)bps***
Operating (loss)/profit	**(1 100)**	**1 697**	
Nokia s Networks business	1 935	1 349	43%
Ultra Broadband Networks	1 362	1 211	12%
IP Networks and Applications	573	138	315%
Nokia Technologies	579	698	(17)%
Group Common and Other	(342)	(89)	284%
Unallocated items(1)	(3 272)	(261)	
Operating margin	***(4.7)%***	***13.6%***	***(1 830)bps***

report on Form 20-F.

Financial income and expenses, net	(287)	(186)	54%
Income tax benefit/(expense)	457	(346)	
(Loss)/profit	**(912)**	**1 194**	
Earnings per share (EPS), EUR diluted	**(0.13)**	**0.31**	
Average number of employees	**102 687**	**56 690**	**81%**
Net sales by region			
Asia-Pacific	4 206	3 230	30%
Europe	6 393	3 813	68%
Greater China	2 656	1 712	55%
Latin America	1 457	973	50%
Middle East & Africa	1 871	1 177	59%
North America	7 031	1 594	341%
Total	**23 614**	**12 499**	**89%**

(1) Includes costs related to the Acquisition of Alcatel Lucent and related integration, goodwill impairment charges, intangible asset amortization and other purchase price fair value adjustments, restructuring and associated charges and certain other items.

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(1) We also paid a special dividend of EUR 0.10 per share in line with our capital structure optimization program announced on October 29, 2015.
(2) All Nokia Technologies IPR and licensing net sales are allocated to Finland.

Year-on-year change is in parentheses.

Derived from our financial statements which were prepared in accordance with IFRS.

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Letter from our

President and CEO

Net Sales in 2016

EUR 23.6bn

Proposed dividend per share

EUR 0.17

Proposed dividends

EUR 972m

2016 was a year of remarkable change for Nokia.

We started the year primarily as a mobile networks and patent licensing company. Today we are a fundamentally different company, with a complete portfolio that spans mobile, fixed, cable, routing, optical, standalone software, services, digital health, and VR, as well as licensing activities covering patents, brand, technology, and more.

During this transformation, we delivered solid financial performance, made significant progress integrating Alcatel Lucent, launched compelling innovations for our customers, moved forward with the execution of our strategy, and are on track to meet our commitment to reduce costs by EUR 1.2 billion in full year 2018.

Financial highlights

In the context of a challenging market and a major integration effort, we performed well in 2016. Our Networks business delivered an operating margin of 8.9% in 2016, and Nokia Technologies net sales increased by 3% to EUR 1.1 billion in 2016. While overall sales were down compared to sales of both Nokia and Alcatel Lucent in 2015, profitability held up well. Because of this strong performance, our Board of Directors will propose an increased dividend compared to 2015 and compared to our original capital structure optimization plans.

Integration progress

Despite having only closed the Acquisition of Alcatel Lucent in early January 2016 and gained 100% ownership on November 2,

2016, we have completed the majority of our integration projects. While we have agreed product transition plans with all major customers, execution of those programs will take further time. That said, the speed of progress and quality of work have been considerably higher than I have witnessed in past integrations.

Customers

Customers have responded extremely well to the scope of our new end-to-end portfolio. It has increased our credibility with major communication services providers (CSPs), who understand that network performance is based not just on the parts of the networks but on how those parts work together. It has also opened doors for us to new customers in select enterprise segments, who increasingly need the kind of mission-critical networking capability that we provide. In addition, we have successfully agreed product transition plans with all major customers, and implementation is underway in many. This is a remarkable achievement, completed in well under one year.

People

Overall employee engagement scores at Nokia remained high, based on our periodic Cultural Cohesion Tracker. The tracker also pointed to the fact that the Acquisition of Alcatel Lucent created less cultural conflict than might have been expected given the history of acquisitions in our sector. During the year, we also launched a revitalized effort to improve our gender balance within the company. I am confident that we are gaining momentum and within the next two years we will start to see some positive change.

Innovation

We made significant progress in our aspiration to lead in 5G as we began bringing to market innovation from nearly 10 years of research at Nokia Bell Labs. We are preparing the world for 5G with the industry s best evolutionary path from 4G to 4.5G to 4.5G Pro to 4.9G and finally 5G.

We set records for fiber-like speeds over copper with XG-Fast, delivering 8 gigabits per second in a test with Australia s National Broadband Network. Our new optical chip sets enabled us to deliver a transmission speed of 1.2 terabits per second over optical fiber in Africa s first field trial of optical communications technology. In New Zealand, we delivered 200 gigabits per second on a single wavelength over a single fiber.

We introduced our intelligent management platform for all connected things (IMPACT) to help our customers deploy new services for IoT applications. Our Nuage SDN platform gained traction helping businesses move to the Cloud, and we continued our development of Cloud service orchestration and network security.

Nokia Bell Labs moved forward with its Future X projects, shaping the network of the future massively distributed, cognitive, continuously adaptive, learning and optimizing.

Sustainability and corporate responsibility

Reducing our carbon footprint and helping our customers do the same is at the center of our sustainability objectives, as is doing business with integrity. The high standards of our Code of Conduct allow us to build and maintain personal integrity across the company and protect our reputation. We work hard to ensure the technology we provide is not used to infringe human rights and conduct robust on-site assessments of our suppliers, as well as using the EcoVadis scorecards, to ensure they meet our high ethical standards. Our customers also use these very same scorecards to assess our sustainability performance.

In 2016, we made progress in the EcoVadis framework in areas of environment, labor practices, and supply chain management. We were judged Outstanding , the highest gold recognition level, with a score of 85/100 putting us in the top 1% of all suppliers assessed. Our total energy consumption across our facilities decreased by approximately 9% compared to 2015, which reflected a decrease of approximately 16% in our greenhouse

The operational foundation we now have in place, together with our financial strength and our disciplined, results-focused culture, have put us in a much stronger position to capitalize on our bigger portfolio and customer set, to tap the greater number of paths available to us for growth and expansion, and to be the innovation leader that enables our connected lives.

transitioning to 5G in the future. We acquired Gainspeed, giving us a compelling entry into the DOCSIS *(Data Over Cable Service Interface Specification)* world of cable operators. We also made several other acquisitions designed to expand our capabilities in areas such as big data analytics for network and service automation and network security.

Our second priority is to expand network sales to select vertical markets, specifically energy, transportation, public sector, technical extra-large enterprises

us to provide our customers with complete end-to-end orchestration of complex Network Function Virtualization (NFV) and SDN deployments.

Finally, our fourth strategic pillar to create new business and licensing opportunities in the consumer ecosystem gained strong momentum. Our patent licensing business has also progressed, adding more licensees as well as concluding our arbitration and agreeing an expanded licensing deal with Samsung. We also entered into a brand licensing agreement with gas emissions, including our renewable energy usage. The 2016 figures are compared to the combined figures of Nokia and Alcatel Lucent in 2015. In 2016, we retained our listing in the Dow Jones Sustainability Index with a score of 83/100, and were ranked the leader of the CMT Communications Equipment sector.

Cost reductions

With the Acquisition of Alcatel Lucent, we committed to reduce costs by EUR 1.2 billion in full year 2018. We are progressing well towards this goal and, in 2016, we were ahead of plan. I would note that delivering against this commitment has required and will require us to reduce the number of employees as we eliminate overlaps and use best practices from both Nokia and Alcatel Lucent to find new areas of efficiencies. These reductions are never easy and do not reflect the quality of the people who had to leave the company. Throughout the process, which will continue until the end of 2018, we have sought to provide support for those people and to treat them with dignity and respect.

Strategy

Finally, we announced our new strategy and made good progress on execution against four strategic priorities.

Our first strategic priority is to lead in high-performance end-to-end networks with our communication service provider (TXLEs), and webscale players (Webscales) such as Google and Amazon. We saw good momentum in the year in several of these areas, such as building an LTE public safety network in Dubai with our partner Nedaa, IP backbone and network modernization for rail operators such as the S-Bahn in Berlin, and private LTE networks for utilities and mining with major players like Rio Tinto. We see strong future opportunities in all targeted segments.

To tap this opportunity, we are investing where it is needed, including focusing our sales force, and making strategic acquisitions such as Deepfield, a United States-based leader in big data analytics to extend our reach into webscale and large enterprise customers.

Building a strong standalone software business is our third strategic priority, and in 2016 we made good progress, expanding our current business with communication service providers and expanding to enterprises and IoT platforms. We enhanced our IMPACT platform to help our customers deploy new services and lines of business, such as smart parking, smart lighting, and transportation and automotive. Our planned acquisition of Comptel accelerates our plans for a standalone software business. Comptel s service orchestration portfolio, when combined with Nokia s Service Assurance and our Cloudband and Nuage portfolios, enables

HMD Global, which has already launched its first Nokia-branded smartphones. We accelerated our Digital Health business with the acquisition of Withings, and continued to gain momentum in OZO camera sales and in taking steps to see our VR video and audio become embedded in the VR ecosystem. Our primary interest in this area continues to be in developing technology that we can license to other parties and in refreshing our patent portfolio.

These are truly exciting times at Nokia. We came a long way in 2016 and have plenty of opportunities in our future.

Even if our business has changed massively, our culture remains uniquely Nokia. We are driven to win, focused on shareholder value, but always guided by our strong core values and deep commitment to ethics and integrity. We remain true to our vision to expand the human possibilities of the connected world, creating new and extraordinary experiences in people s lives through technology that is grounded in real human needs. To that purpose we are dedicated, ready, and ideally placed to succeed.

Rajeev Suri

President and CEO

customers. We ended the year with a leading position in LTE, service provider IP edge routing, copper access and services.

To maintain these leadership positions, we launched compelling 4.5G Pro and 4.9G solutions, giving operators the ability to continue to meet capacity demands now while

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Our role as a global

technology leader

Our vision is to enable the human

possibilities of the connected world.

We are innovators of the global nervous system, shaping the future of technology to transform the human experience

Innovating this global nervous system is a role that Nokia is uniquely well placed to play. Our business today is not just focused on meeting extraordinary technological demands, but also on how technology is deployed and used. With the potential of Augmented Intelligence, increasing human and machine interaction, and a supercomputer in every pocket, we believe that current trends will have significant implications for society.

We are shaping a new revolution in technology

We are shaping a new revolution in technology, where intelligent networks augment and aid our daily lives through sensing the world around us and providing the data and analytics needed to make choices that help society thrive. We are innovating this global nervous system with effortless, simple and dependable technology for the IoT, ultra-broadband, Cloud, IP interconnectivity, digital health and immersive VR technologies.

We enable innovative and compelling business models, applications and services

With the advent of new technologies such as the IoT, 5G and Cloud, we believe that enabling new business opportunities for our customers is the key to their rapid transition to new digital networks, capitalizing on the inherent operational benefits of this technology, and generating new services.

We assist our customers in identifying compelling cases for new revenue streams, in addition to enabling the rapid onboarding of new applications and services, scalability and operational efficiency.

We optimize performance to maximize value and customer satisfaction

We believe that agility in today s fast and constantly evolving marketplace is no longer just an advantage it is a vital necessity. Agile principles, lean practices and innovative tools are required to successfully survive in the new digital world and enable continuous improvement in quality, value and customer satisfaction.

We enable our customers to move away from an economy-of-scale network operating model to demand-driven operations. We do this by providing the easy programmability and flexible automation needed to support dynamic operations, reduce complexity and improve efficiency.

As a result, our customers can fulfill end user demands when and where they are needed by provisioning services in real time while automatically making optimal use of networks assets.

We create disruptive solutions enabling market differentiation and competitive advantage

We believe that innovation is the foundation of everything we do at Nokia. We force the pace of change by pushing technology boundaries, challenging the status quo and working in open collaboration with customers and partners on the next big idea. It is through these efforts that Nokia expands and enhances its portfolio, introduces disruptive technologies and identifies new market opportunities for its customers.

We are continually evolving the Nokia portfolio: adding and combining functionality, making it more intuitive and simpler to use. Doing this helps our customers evolve their networks. For instance, by taking the first step towards entering the IoT space with our IMPACT solution; or the next step to transition from LTE to 5G using 4.5G Pro and 4.9G; or perhaps the ultimate step to creating immersive experiences with our OZO VR camera.

It is through innovation that we create paths for our customers whatever their starting point to reach the promising new digital world.

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Our values

We foster a culture of high performance and high integrity, guided by our vision, brand and values.

It is through our people and culture that we shape technology to serve human needs. Our pursuit of performance with integrity and sustainability a culture that stems from our Finnish roots is key to why our customers and partners choose to work with us.

Operational excellence is the cultural platform we use to pursue Nokia s core purpose as a company. It means relentlessly pursuing financial performance by delivering on our end-to-end strategy. It informs our quest for innovation, as we use our insatiable curiosity and deep technical knowledge to share the future for our customers. It also drives our pursuit of continuous improvement, not only over earlier performance, but also in our ability to outperform competitors and be a trusted partner for customers, partners and suppliers.

We pursue high performance, always under the guiding principles of our values:

Respect

Acting with uncompromising integrity, we work openly and collaboratively, seeking to earn respect from others.

Challenge

We are never complacent, ask tough questions, and push for higher performance to deliver the right results.

Achievement

We take responsibility, and are accountable for driving quality, setting high standards, and striving for continuous improvement.

Renewal

We constantly refine our skills, learn and embrace new ways of doing things, and adapt to the world around us.

Our commitments

What we do to design and deploy technology in the service of people

We create the most sophisticated technology that is effortless and intuitive to use

We lead the relentless quest for gains in performance and agility, with technology that thinks for itself.

We solve your future needs

We help customers shape their futures based on a clear view of technology opportunities and constraints. We work closely with customers and partners to anticipate their priorities and guide their choices.

We obsess about integrity, quality, and security

We never compromise our values in the drive for business or technical performance. We pursue quality in all our products and processes, and design for security and privacy from the start.

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We are rebalancing for growth, putting

Nokia at the heart of unprecedented

technology demands as innovators

of the global nervous system.

The vision of the Programmable World continues to guide our corporate strategy. We have identified six global megatrends that drive the Programmable World. These megatrends create massive technological requirements, impact our current and potential customers, change the lives of people and impact business operations on a global scale and ultimately provide opportunities for Nokia to diversify into new growth areas.

The megatrends we have identified are:

1. **Network, compute and storage:** Ever present broadband capacity coupled with a distributed Cloud for ubiquitous compute and near infinite storage, allowing limitless connectivity and imperceptible latency

2. **Internet of Things:** In addition to people, trillions of things are connected to the internet, collecting unprecedented amounts of data in a private and business context

3. **Augmented Intelligence:** New tools transform the collected data into actionable insights, fundamentally changing the way decisions are made by businesses, governments and individuals, resulting in time savings, less waste, higher

efficiency and new business models

4. **Human and machine interaction:** A range of new form factors that fundamentally transform the way humans interact with each other and with machines, e.g. voice-based digital assistance, gesture control, smart clothes, implantable chips, robotics and Augmented and Virtual Reality
5. **Social and trust economics:** Ubiquitous connectivity, compute and storage, as well as technologies such as block chain, enabling new business models based on sharing assets and distributed trust, allowing rapid scalability on a global level

6. **Digitization and ecosystems:** Next level of digitization beyond content and information, digitizing atoms with additive printing in an industrial, consumer and medical context, fundamentally transforming production processes

These megatrends are driving massive new technology requirements, and end-to-end networks are a central enabler for all aforementioned megatrends, which create a multitude of opportunities for us. Nokia Bell Labs has developed a vision of a future network architecture that fulfills all of these requirements in a holistic way the Future X network vision. This is our guide not just to how things will change, but also to what we need to do to meet the future needs of our customers and to address these megatrends. The Future X vision encompasses the key domains of future networks: massive scale access, converged edge cloud, smart network fabric, universal adaptive core, programmable network operating systems, augmented cognition systems, digital value platforms and dynamic data security.

Simultaneously, driven by the identified megatrends and the increasing relevance of networks, we are seeing a shift in who is investing in technology. Our primary market, comprised of CSPs, in which we have a leadership position, is expected to remain challenging with a limited estimated growth opportunity over the next five years. However, the megatrends are increasing the demand for large high-performance networks in other key areas, which we define as our select vertical markets. Webscale companies such as Google, Microsoft, and Alibaba are investing in Cloud technology and network infrastructure on an increasing scale. As other vertical markets such as energy, transportation and government digitize their operations, they will need massive mission-critical networks. The same is true for TXLEs technically sophisticated companies, such as banks, that invest heavily in their own network infrastructures to gain a key competitive advantage. Consequently, we have identified attractive growth opportunities in new domains outside our primary market with CSPs, which remains a significant market.

We are addressing both our primary CSP market and the newly identified growth opportunities in our adjacent market with our Rebalancing for Growth strategy. This strategy builds on our core strength of delivering large high-performance networks by methodically expanding our business into targeted, higher-growth and higher-margin vertical markets. Our ambition is to grow the share of our revenue that is derived from outside the CSPs.

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Our strategy continued

Our four pillars

This strategy builds on our business

portfolio and continued drive to design

technology that serves people and

includes the following four key priorities:

Lead in high-performance, end-to-end networks with CSPs

Nokia is a leader in this area today and we will use our main competitive advantage a near 100% end-to-end portfolio that we can deliver on a global scale to maintain our leadership while managing for profitability. Within this first priority, we are focused on:

monetizing additional waves of 4G and establishing leadership in 5G by being first to market with key customers and global technology leadership;
maintaining our leading market share in copper access, accelerating momentum in fiber access, successfully entering the cable market, and developing new smart home solutions;

leveraging our superior products to expand in both edge and core routing, where we have a fully virtualized portfolio that is differentiated by performance, flexibility, and quality;
using our unique capability of offering optical and routing that work together, a capability that is increasingly becoming a customer requirement; and

delivering cost savings by realizing synergies and applying best practices across our entire portfolio to maintain the industry s most profitable networks business.

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Over the next two years, we intend to maintain our leading position with CSPs, while establishing ourselves as a credible and recognized player in our target vertical markets among enterprises. We strive to sustain and rebuild Nokia as a value-adding consumer brand, earning returns through both our own businesses and licensing.

Expand network sales to select vertical markets

We will expand into five select vertical markets with carrier-grade needs: energy, transportation, public sector, TXLEs and Webscales. As the world becomes ever more digital, the kind of massive, high-performance networks once used almost exclusively in telecommunications are now needed by other organizations. Webscale customers will increasingly require high-performance networks to improve customer experiences and to expand their primary business models.

For Webscale companies we have identified two areas for diversification:

- all-IP-led, with a focus on providing more IP routing and optical network infrastructure; and
- mobile access-led, targeted at those Webscales that wish to expand into mobile access connectivity with consumers.

In terms of select vertical markets, we have a three-pronged approach:

- target a limited number of customer segments to ensure focus;

leverage our full end-to-end portfolio to increase penetration with customers; and

accelerate and diversify our go-to-market.

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Our strategy continued

Our four pillars

Build a strong standalone software business

While Nokia has a large software business today, much of that is attached to our hardware products. Our ambition is to move beyond that approach in the medium term and ultimately to create a large global software player that has the margin profile consistent with large software companies. We have three priorities to achieve this ambition:

- generate an uplift to our business by selling software assets we have today because our software is largely network-agnostic. Fixed, cable and enterprise customers are targets for expansion;
- market our current software to select vertical markets. Some of our software assets today are highly relevant for our select vertical markets. For example, Webscales can benefit from Nokia s Operations Support Systems, Service Assurance to enable high-performance IT networks, and inter-data center connections; and
- assess where we are able to expand into enterprise software and IoT platforms, where our experience in providing mission-critical networks and services at scale is a powerful differentiator.

Create new business and licensing opportunities in the consumer ecosystem

In addition to renewing existing patent licenses on favorable terms, our aim is to add new licensees from the mobile industry, and we continue to expand patent licensing into new segments, such as automotive and consumer electronics. Our brand licensing efforts are well underway we see value creation opportunities in the mobile devices industry leveraging our strong brand. Our exclusive brand licensee for mobile phones and tablets, HMD Global, has already launched new Nokia branded feature phones and smartphones.

In addition to our licensing businesses, we intend to return to the consumer market with two select new businesses in Digital Media and Digital Health. Our current focus in the fast-growing area of VR is to expand the range of OZO cameras as part of creating an industry-leading VR ecosystem. Technology licensing and strategic partnerships will form an essential element of this work, in order to accelerate VR content creation and mass adoption.

In Digital Health, we entered the market through our acquisition of Withings, a pioneer in consumer-focused connected health devices. In the future, we see opportunities to scale globally by building on the powerful reach of the Nokia brand, expanding into corporate wellness and assessing opportunities to transition into business-to-business healthcare, in areas such as connected patient care.

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Our leadership

We have a strong and experienced leadership

team that brings together leaders with many

years of experience in telecommunications

and technology, finance, sales and operations,

as well as various other business disciplines.

The diversity of business backgrounds of the Nokia Group Leadership Team (the Group Leadership Team) members has been integral to the transformation of Nokia into an industry and innovation leader in next-generation technology and services in recent years.

The Group Leadership Team is responsible for the operative management of Nokia, including decisions concerning our strategy and the overall business portfolio. The Chair and members of the Group Leadership Team are appointed by the Board. The Group Leadership Team is chaired by the President and Chief Executive Officer (the President and CEO).

(1) As announced on March 17, 2017, Mr. Elhage will continue as a member of the Group Leadership Team until April 1, 2017.

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+ **On March 17, 2017, we announced a change in our organizational structure which also impacted our Group Leadership Team effective from April 1, 2017. Refer to pages 98 to 101 for the updated composition of the Group Leadership Team and full biographies of its members.**

(2) As announced on March 17, 2017, Mr. Rouanne will transition to his new role as president of Mobile Networks effective from April 1, 2017.

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Our businesses

We have two businesses: Nokia s Networks business and Nokia Technologies. Within these two businesses, we had five business groups in 2016: Mobile Networks(1), Fixed Networks, IP/Optical Networks, and Applications & Analytics (all within our Networks business); and Nokia Technologies. This section presents an overview of Nokia s Networks business and Nokia Technologies.

Networks business

Mobile Networks

Fixed Networks

Nokia Technologies

Nokia Technologies

Applications &

Analytics

IP/Optical Networks

(1) Following the changes to our organizational structure announced on March 17, 2017, our current Mobile Networks business group will be separated into two distinct, but closely linked, organizations effective from April 1, 2017: (1) Mobile Networks, which will focus on products and solutions, and (2) Global Services which will focus on services. These changes are not reflected in the presentation of our businesses below, which reflect our organizational structure for the year ended December 31, 2016.

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Networks business

Our Networks business in 2016 was conducted through its four business groups: Mobile Networks, Fixed Networks, IP/Optical Networks, and Applications & Analytics.

Market overview

Through our comprehensive end-to-end portfolio of products and services, we are addressing a market that encompasses mobile and fixed network access infrastructure, IP routing and optical networks as well as software platforms and applications.

We define our primary market as a network and IP infrastructure, software and related services market for CSPs. We estimate that our primary market was EUR 113 billion in 2016. In addition, we have an adjacent market, including a vertical market that includes our Networks businesses expansion areas in both a customer and product dimension. The adjacent market includes customer segments such as Webscales, energy, transport, public sector and TXLEs. In the product dimension, this includes solutions like Nuage Networks, SDN, Analytics, IoT and Security. The adjacent market was estimated at EUR 18 billion in 2016.

Demand for our portfolio is driven by exponentially increasing growth in data traffic as people s lives and enterprises become ever more digitized. This drives the demand for highly reliable networks for massive connectivity.

Competition

The competitors in our primary market are Huawei and Ericsson. We also compete with technology experts in some of our other market segments, such as Juniper and Cisco in the routing segment, and Ciena, Adtran, and Calix in the optical networks and fixed access segments. Both the optical networks and the applications and analytics market segments are still highly fragmented markets.

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Mobile

Networks

Market overview

The primary market for our Mobile Networks business group includes technologies for mobile access, converged core and microwave transport as well as related services. This encompasses access and core technologies ranging from 2G to 5G licensed spectrum for both macro and small cell deployments. The services market includes implementation, care and professional services for mobile networks in addition to managed services for both mobile and fixed networks. The primary market for Mobile Networks was estimated at EUR 64 billion in 2016.

The vertical market for Mobile Networks includes solutions for the public sector, TXLEs and Webscales, and drives expansion into domains such as IoT connectivity, LTE for public safety, private LTE and unlicensed radio access. The vertical market, including verticals, was estimated at EUR 2 billion in 2016.

Business overview and organization

Our aim is to lead with traditional telecommunications operators, as well as expand into select attractive, vertical segments. This is accomplished by delivering a comprehensive end-to-end portfolio of mobile products and services across Radio Networks, Converged Core, Advanced Mobile Networks Solutions and Global Services businesses.

Radio Networks has the task of driving leadership in radio access and specifically has end-to-end responsibility for one of the most important areas for Nokia s future: 5G. We believe that 5G will change the way in which mobile technology is used in virtually every sphere of life. As we move along the path towards making 5G a commercial reality, we aim to extend our leadership in LTE with a smooth evolution path comprising successive generations of 4.5G, 4.5G Pro and 4.9G offerings. Mobile Networks rationalized portfolio, featuring the 5G-ready AirScale radio access, is setting the standard for scalability, openness, energy efficiency and multitechnology support (Single RAN). AirScale is the platform to enable 4.5G Pro/4.9G, Cloud and IoT connectivity.

The further evolution of 4G, and ultimately 5G, requires a continuous transformation of the core network. Mobile Networks Converged Core is designing a radically simplified, robust and scalable core network based on its concept of a Cloud Native Core. Mobile Networks is already executing on this path and distinguishing its offer through its superior Shared Data Layer and AirFrame data center infrastructure solutions, which enable a Telco Cloud architecture that combines the best of both a centralized and a distributed approach. Using truly open interfaces and open source software building blocks, Mobile Networks can provide excellent performance for its customers in and beyond traditional telecommunications operators. Mobile Networks aims for a leading market position in end-to-end IP multimedia subsystem (IMS)/voice over LTE (VoLTE), subscriber data management and other virtualized software infrastructure solutions, putting together the key building blocks which will enable new digital business models.

Advanced Mobile Networks Solutions spearheads Mobile Networks expansion beyond traditional telecommunications operators to vertical markets in public safety; connectivity for IoT and connected automotive; and private LTE networks for, for example, transportation and energy companies. With a leading small cells portfolio and strong positions in unlicensed LTE and fixed wireless access as well as innovative backhaul solutions, including a strong microwave offering Mobile Networks aims to meet the need for increasingly dense networks to supply the capacity demands of our changing world.

Finally, through our Global Services offering, we aim to be the most innovative and complete service provider for the connected world. Our services, solutions and multivendor capabilities help our customers navigate through the evolving technology landscape, network complexity and data growth as well as improve personalized end user experience while supporting them in day-to-day network planning, implementation, operations and maintenance. We differentiate strategically through our service delivery by driving speed, quality and efficiency with the right combination of local expertise and globalized delivery centers, as well as advanced analytics, virtualization and automation using the Nokia AVA platform.

Competition

The mobile networks market is a highly consolidated market and our main competitors are Huawei and Ericsson. Additionally, there are two regional vendors, ZTE and Samsung, that operate with a below 10% market share. As network infrastructure gets virtualized and cloudified, we expect IT companies to emerge, such as HP Enterprise.

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Networks business continued

Fixed

Networks

Market overview

The primary market for our Fixed Network business group includes technologies for fixed access and related services in addition to fixed network transformation services with focus on transformation of legacy fixed switching networks. The primary market for Fixed Networks was estimated at EUR 9 billion in 2016. In this market, we see a shift from copper to fiber technologies. The copper market is currently stable partially due to Nokia-driven innovations that improve the performance of the existing copper networks.

The adjacent market, including verticals, for Fixed Networks includes virtualization solutions for cable access platforms, Digital Home (IoT) and passive optical LAN. The vertical market, including verticals, was estimated at EUR 3 billion in 2016, including related services.

Business overview and organization

The adjacent market, including verticals, for Fixed business group provides copper, fiber and coax access products, solutions and services to deliver more bandwidth to more people, faster and in a cost-efficient way. The portfolio allows for a customized combination of technologies that brings fiber to the most economical point for our customers. It consists of advanced copper-based solutions to boost capacity on existing copper infrastructure, such as VDSL2 Vectoring, Vplus and G.fast.

The Fixed Networks business group is also a leader in fiber-to-the-home solutions, such as Ethernet point-to-point, and all versions of Passive Optical Networks (PON), including EPON and GPON, as well as 10 gigabit next generation fiber technologies (XGS-PON and TWDM-PON). Together with Nokia Bell Labs, we continue innovation and development of even higher-capacity technologies like XG-Fast, which allows 10 Gb/s over copper, and XLG-PON enabling 40 Gb/s symmetrical bandwidth over fiber.

With our acquisition of Gainspeed, a California-based start-up specializing in DAA solutions for the cable industry via its Virtual Converged Cable Access Platform (Virtual CCAP) product line, we have complemented our fiber access technologies for cable multiple-system operators. With this enhanced product portfolio, we provide cable operators with the end-to-end technology capabilities needed to support growing capacity requirements today and into the future. With this acquisition, we are able to offer a turnkey solution for the cable industry that includes products for routing, transport, wireless and analytics.

Additionally, our smart home solution supports digital home devices that enable communication providers to provide enriched customer experiences and diversify their offering.

The Fixed Networks services portfolio is based on our unparalleled expertise and experience and is comprised of deployment, maintenance and professional services such as copper and fiber broadband evolution, public switched telephone network transformation, ultra-broadband network design, deployment and operation, site implementation and outside plant, as well as multivendor maintenance.

Competition

The competitive landscape in fixed access has similar characteristics to the mobile access where the market is dominated by three main vendors, Huawei, Nokia and ZTE and a handful of other vendors with less than 10% market share.

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IP/Optical

Networks

Market overview

The primary market for our IP/Optical Networks business group includes routing and optical technologies and related services sold to CSPs. This market includes technologies such as IP edge and core routing, mobile packet core and Wave Division Multiplex and Optical Multi-Service Network solutions. The primary market for IP/Optical Networks was estimated at EUR 28 billion in 2016.

A significant portion of IP/Optical Networks revenue is derived from its vertical market, which includes customer segments like Webscales, energy, transport, public sector and TXLEs. We have also included technologies like SDN controllers, addressed with our Nuage portfolio, in this market. The vertical market was estimated at EUR 6 billion in 2016.

Business overview and organization

The IP/Optical Networks business group provides the high-performance and massively scalable networks that underpin the digital world s dynamic interconnectivity. IP/Optical Networks portfolio of carrier-grade software, systems and services play across multiple domains, from programmable IP and optical transport networks for the smart fabric to software-defined capabilities for the programmable network operating system and more.

The networks of CSPs are under tremendous pressure from Cloud-based applications, ultra-broadband evolution and the IoT. IP/Optical Networks solutions reduce CSPs time-to-market and risk in launching new services, enabling rapid scaling to meet surging demands in the most optimized configurations. The solutions further assure that network services are delivered with consistent quality, reliability and security and that restorative actions are automatically initiated when any parameter varies beyond set limits. These carrier-grade attributes also benefit and are valued by the needs of vertical markets including internet content providers, public sector and verticals, and TXLEs.

The IP/Optical Networks product portfolio includes:

comprehensive IP and optical Wide Area Networking (WAN) solutions that dynamically, reliably and securely connect people and things from any technology modality to any Cloud at the lowest cost-per-bit;

advanced, Cloud-optimized IP service gateways for residential, business, mobile and IoT services and unique hybrid solutions enabling a converged services future;

carrier SDN solutions for network management that dynamically provision, optimize and assure network services and resources end-to-end, from access to the Cloud, and spanning IP and optical technology layers;

advanced datacenter automation and software-defined WAN solutions that configure network connectivity among Clouds and to any enterprise branch office with the ease and efficiency of Cloud compute using products from our Nuage portfolio;

advanced IP video services offering the utmost user experience streamed efficiently and flawlessly from the Cloud; and

an extensive portfolio of professional services to accelerate the benefits of integrating new technologies to transform networks and leverage the latest innovations in SDN, virtualization, video and programmable all-IP networks.

Competition

The competitive landscape is dominated by Cisco, Juniper, Huawei and Nokia in addition to various specialized players in optics such as Ciena.

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Networks business continued

Applications

& Analytics

Market overview

The Applications & Analytics market is focused on software platforms and applications that help CSPs to optimize their operations, monetize services and improve customer experiences. Applications & Analytics primary businesses include Business Support Systems (BSS), Operational Support Systems (OSS) and Service Delivery Platforms (SDP). The primary market for Applications & Analytics and associated professional services was estimated at EUR 12 billion in 2016.

The adjacent market, including verticals, for Applications & Analytics includes emerging software and services for Self-Organizing Networks (SON), Cloud, Analytics, Security and IoT. From a customer perspective this market also includes Webscales, digital enterprises and IoT verticals. The adjacent market, including verticals, was estimated at EUR 6 billion in 2016.

Business overview and organization

The Applications & Analytics business group is our dedicated software business. We have long-standing positions in its primary markets: our BSS solutions support hundreds of millions of subscribers and manage over 1.5 billion devices each day; we lead in LTE network management; we have thousands of OSS deployments with differentiated capabilities in service assurance, automation, analytics and Cloud; and our Session Border Controller, a SDP that secures network borders and connects an exploding number of devices, stands out for its virtualization capabilities.

These markets are being reshaped by four trends: the transition to the Cloud, the growth of the IoT, the increased need for security and privacy, and the impact of augmented intelligence and machine learning. These trends impact the way networks will operate, how new services and business models will be monetized, how customer expectations will evolve and the speed at which CSPs and TXLEs will need to innovate.

The Applications & Analytics business group is driving an aggressive innovation agenda that includes an Emerging Business unit that is developing software for IoT, security, Cloud, SON, and analytics. These advances are helping our customers:

- modernize BSS systems to rapidly launch and monetize new IoT and Cloud services;
- improve customer experiences with rich analytics and machine learning;
- operate larger networks and more services with fewer staff through virtualization and automation;
- predict issues before they happen with augmented intelligence;
- scale IoT services with a platform that handles data collection, event processing, device management, data contextualization, data analytics, and end-to-end security;
- increase the success of digital transformations with improved processes, collaboration and profitability; and
- secure services and data with confidence.

Growing this business into a standalone software business at scale is a key tenet of our strategy. Please refer to Our strategy for more information on our strategy.

Competition

The Applications & Analytics business group operates in a highly fragmented market in which very few players have a market share above 10%. Our main competitors are Ericsson, Huawei, Amdocs, Oracle, HPE, Cisco and Netcracker.

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Within our

Networks business

Services

Our Services are focused on developing innovative services, solutions and multivendor capabilities around the mobile, fixed and IP networks and beyond. With our full service portfolio we address the current and future needs of our customers, including network operators, public sector, TXLEs and transportation. Customer satisfaction, quality and efficiency are key in service delivery. To achieve that, we leverage a combination of local engagement with the customers, the network of Global Delivery Centers, and Nokia AVA, the next-generation delivery platform. Altogether, our service portfolio and delivery are powered by 38 000 services experts around the globe.

Sales and marketing

The Customer Operations (CO) organization is responsible for sales and account management across the four network-oriented business groups. The CO teams are active in approximately 130 countries to ensure that we are close to our customers, both physically and in terms of understanding the local markets, thus helping us build and maintain our customer relationships. Refer to General facts on Nokia Production of infrastructure equipment and products for more information on our manufacturing facilities globally.

The CO organization is divided into seven markets:

Asia-Pacific and Japan spans a varied geographical scope, ranging from advanced telecommunications markets, such as Japan and the Republic of Korea, to developing markets including Bangladesh, Myanmar and Vietnam. We work with leading operators in the market, including Indosat, KDDI, KT, LG Uplus, NBN Australia, NTT DoCoMo, Singtel, SK Broadband, SK Telecom, Smartfren, SoftBank, Spark, StarHub, Telekom Malaysia, Telkom Indonesia, Telkomsel, VNPT and Vodafone.

We have close technology cooperation with leading operators in Korea and Japan as well as two Service Delivery Hubs located in Japan and Indonesia.

In **Europe**, we are engaged with all the major operators, including Deutsche Telekom, MegaFon, MTS Sistema, Orange, Telefónica, Telia Company and Vodafone Group, serving millions of customers. We have extensive R&D expertise in Europe, and some of our largest Technology Centers, which are developing future mobile broadband technologies, are based in this market. We also have a Global Delivery Center and four regional Service Delivery Hubs in Europe.

In **Greater China**, we are the number one player with headquarters outside China, and we are working with all the operators including China Mobile, China Telecom, China Tower and China Unicom. We have also extended our market presence to the public and enterprise sectors, including railways and public security. In Taiwan, we work with all major operators, including Chunghwa Telecom and Taiwan Mobile. In China, we have six Technology Centers, one regional Service Delivery Hub and more than 80 offices spread over megacities and provinces.

In **India**, we are a strong supplier and service provider to the leading public and private operators, including Bharti Airtel, Vodafone, Reliance Jio, Idea, BSNL, MTNL, Aircel and Uninor. Collectively, our networks for these operators carry over 280 million subscribers across over 230 000 sites, and these figures are growing every day. In addition, we are a key telecom infrastructure supplier to non-operator segments, including large enterprises, utilities companies such as Tata Power and GAIL, Indian defense sector through L&T and BEL, and we are a strategic telecommunication partner for GSM-Railways technology to Indian Railways, including Kolkata Metro Railways and DMRC (Delhi Metro Rail Corporation). We have a Global Delivery Center, a Service Delivery Hub and a Global Technology Center in India.

In **Latin America**, 16% of the population use LTE services, and high-speed fixed broadband is still in its early phase. With the aim of providing broadband services to a population of over 600 million people in the area, we supply ultra-competitive solutions to all major operators, such as América Móvil, AT&T, Oi, Telefónica, Telmex and Tim, as well as local operator groups, such as Avantel, Milicom, Nuevatel and Personal.

In **Middle East and Africa**, we have built a position of considerable strength, working alongside leading operators such as Airtel, du, Etisalat, Maroc Telecom, Mobily, MTN, Ooredoo, Orange, OTA Djezzy, Smile, STC, Telkom, Vodacom and Zain, among our key customers in the market.

In **North America**, we count all the major operators as our key customers. We also deliver advanced IP networking, ultra-broadband access, and Cloud technology solutions to a wide array of customers, including local service providers, cable operators, large enterprises, state and local governments, utilities, and many others. North America is also home to the company s most important and thriving innovation practices from the renowned Nokia Bell Labs headquarters in Murray Hill, New Jersey, to the development labs of Nokia Technologies in Silicon Valley.

In addition, we have a dedicated sales organization focused on driving mission-critical communications sales to organizations outside the telecommunications operator market. This structure is targeted at allowing us to gain speed and efficiency in dealing with customer requirements and cultivating new and existing customer relationships.

The Global Enterprise and Public Sector organization focuses on four segments vertical to the telecommunications operators that require mission-critical communications networks: Public Safety, Transportation, Energy and TXLEs.

This global sales organization is dedicated to serving the needs of customers such as Nedaa in Dubai, which provides telecommunication

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Networks business continued

services to all specialized governmental, semi-governmental and private institutions; the Swiss railway company SBB (Swiss BundesBahn); the Swiss electricity transmission system operator Swissgrid; Smart City initiatives e.g. Bristol is open , which aim at exploring solutions to make cities smarter, safer and more sustainable; and name-brand banks such as BBVA and Santander that are transforming complex legacy environments into leading-edge Clouds that improve their global customer experience.

Research and development

Our Networks business is one of the industry s largest R&D investors in information communication technology and we expect it to drive innovation across telecommunications and vertical industries to meet the needs of a digitally connected world. Product development is continually underway to meet the highly programmable, agile and efficiency requirements of the next generation software-defined networks that will accommodate the IoT, intelligent analytics, and automation used to forge new human possibilities.

Our four networks-focused business groups are responsible for product R&D within the Networks business. The Networks business has a global network of R&D centers, each with individual technology and competence specialties. The main R&D centers are located in Belgium, Canada, China, Finland, France, Germany, Greece, Hungary, India, Italy, Japan, Poland, the Philippines, Portugal, Romania, the United Kingdom and the United States. We believe that the geographical diversity of our R&D network is an important competitive advantage for us. In addition, the ecosystem around each R&D center helps us to connect with experts on a global scale and our R&D network is further complemented by cooperation with universities and other research facilities.

Innovation steering within our Networks business is carried out by the Chief Innovation and Operating Office (CIOO). For R&D activities of our Nokia Technologies business group refer to Nokia Technologies Research and development . Within the CIOO, the Chief Technology Office (CTO) and Nokia Bell Labs organization are responsible for our research agenda and research portfolio along with group services for architecture, compliance, reliability and standards. The CIOO develops disruptive technologies, incubates these technologies into novel prototype systems and solutions and then launches them through our business groups to generate growth and differentiation across our entire portfolio. The CIOO organization also steers innovation externally with customers, partners and governments, and has new solutions tested in collaboration with customers and our business groups.

In response to the six megatrends identified by Nokia as driving the Programmable World (for a more detailed description refer to Our strategy above), Nokia Bell Labs has defined the Future X network architecture a massively distributed, cognitive, continuously adaptive, learning and optimizing network connecting humans, senses, things, systems, infrastructure, and processes. All of our Networks business groups and also Nokia Technologies are committed to this single architecture view and are developing products in their respective domains to build seamless end-to-end solutions in the future:

- Mobile Networks will enable 1 000X higher throughput, 100X lower latency, 10X peak speed, support for multiple spectrum bands and technologies by building application-aware and self-organizing networks that are ultra-secure;
- Fixed Networks will provide massive-scale, ubiquitous access, fiber-like speed over any media, and flexible software-defined access;
- IP/Optical Networks will implement terabit scale capacity, dynamic cloud-optimized smart networks and unlimited network programmability/slicing;
- Applications & Analytics will automate edge/Telco Cloud networks, and enable cognitive network operation and future enterprise interactivity, as well as provide terabit-scale automated IoT/device management contextual security; and
- Nokia Technologies will explore and innovate new digital value platforms, as well as continue to innovate professional and consumer devices and technologies, with focus on digital health and digital media.

Patents and licenses

Intellectual property assets are fundamental to Nokia, which owns a large patent portfolio of more than 26 000 patent families, originating from three distinct organizations (Nokia Technologies, Nokia Solutions and Networks and Alcatel Lucent). The Patent Business in Nokia Technologies is the primary monetization entity for patent assets. Refer to Nokia Technologies Patents and licenses for a description of the patent licensing activities of Nokia Technologies.

Our Networks business, including Nokia Bell Labs, generates valuable patents from their industry leading R&D in fields, such as wireless, IP networking, ultra-broadband access and Cloud technologies and applications.

Our patent portfolio includes high-quality standard-essential patents (SEPs) and patent applications which have been declared to the European Telecommunications Standards Institute and other Standards Developing Organizations as essential to standards including LTE, WCDMA, GSM and other standards. We continue to drive new patent generation.

Our Networks business has patent license agreements in place with a number of third parties as part of its ordinary course of business.

Nokia Bell Labs

Nokia Bell Labs is the world-renowned industrial research and innovation arm of Nokia. Over its 90-year history, Nokia Bell Labs has invented many of the foundational technologies that underpin information and communications networks and all digital devices and systems. This research has resulted in eight Nobel Prizes, two Turing Awards, three Japan Prizes, a plethora of National Medals of Science and Engineering, as well as an Oscar, two Grammys and an Emmy award for technical innovation. Nokia Bell Labs continues to conduct disruptive research focused on solving the challenges of the new digital era, defined by the contextual connection and interaction of everything and everyone.

Nokia Bell Labs searches for the fundamental limits of what is possible, rather than being constrained by the current state of the art. It looks to the future to understand essential human needs and the potential barriers to enabling this new human existence. It then uses its unique diversity of research intellects and disciplines and perspectives to solve the key complex problems by discovering or inventing disruptive innovations that have the power to enable new economic capabilities, new societal behaviors, new business models and new types of services in other words, to drive technological revolutions.

Research at Nokia Bell Labs is focused on key scientific, technological, engineering or mathematical areas which require 10x or more improvement in one or more dimensions. It then combines these areas of research into the Future X network architecture, which brings these disruptive research elements together into industry-redefining solutions. These innovations are

Nokia Bell Labs and Alcatel-Lucent Submarine Networks achieved **65 Tb/s transmission record** for transoceanic cable systems using Bell Labs new Probabilistic Constellation Shaping (PCS) technology, a ground-breaking new modulation technique that maximizes the distance and capacity of high-speed transmission in optical networks.

Nokia Bell Labs, Deutsche Telekom T-Labs and the Technical University of Munich achieved a **1 Tb/s transmission rate** over optical fiber using Bell Labs Probabilistic Constellation Shaping technology to provide greater flexibility and performance enabling optical networks to operate closer to the Shannon limit to meet growing consumer and business data demands.

brought to market through our business groups or through technology and patent licensing. Nokia Bell Labs also engages directly with the market and customers through its consulting service to help define the path to the future network with business model innovation and the optimum techno-economics.

Nokia Bell Labs achieved the world s first **10 Gb/s symmetrical data speeds** over traditional cable access networks using XG-CABLE that is based on unique access technology innovations and applications developed by Nokia Bell Labs.

This model of defining future needs and inventing game-changing solutions to critical problems while advising the market on the path forward has been the constant mission of Nokia Bell Labs.

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Nokia Technologies

Nokia Technologies is an engine

of growth and innovation for Nokia.

Nokia Technologies develops advanced consumer and professional technology products in Digital Health and Digital Media, and licenses our industry-leading innovations as well as the Nokia brand for mobile devices. Nokia Technologies is determined to explore, discover and develop the ways in which technology can transform our lives. Whether taking steps towards a healthier life or sharing experiences like never before, Nokia Technologies makes our vision for a connected future your reality for today. Nokia Technologies mission is to create effortless and impactful technological products and solutions that expand human possibilities.

Market overview

Nokia Technologies is driving innovation and product development in two key growing sectors of consumer technology VR and digital health as well as overseeing the reintroduction of the Nokia brand to handsets through a licensing agreement with HMD Global and the expansion of our patent licensing business based on decades of innovation and R&D leadership in enabling technologies used in virtually all mobile devices used today.

The market for VR products and technologies remains at a very early stage, with estimates of the total market as high as EUR 65 billion by 2020, with significant growth expected over the next five to ten years. We believe the solutions we develop today, the standards we establish and the patents associated with them, will position us as a leading player in this market as adoption grows in products as well as in technology licensing.

The global digital health market is expected to grow exponentially over the next five to seven years, up to EUR 220 billion by 2020. Within that market, we are focused on the segments fueling the most significant growth: 1) connected devices that go beyond trackers and smart watches to include scales and blood pressure monitors; and 2) remote patient monitoring.

Smartphones, feature phones, and tablets had a global estimated market of over EUR 400 billion in 2016, accounting for nearly 40% of the total consumer electronics segment. In the automotive industry, expectations are that around half of the approximately 100 million new cars sold annually around the world will have connectivity in the next five years.

Business overview and organization

Nokia Technologies consists of a portfolio of four growing businesses.

In Digital Media, we are pioneers of the technology enabling VR, an exciting new medium that is transporting people to places, events and experiences like never before.

In Digital Health, we are entering the market through our acquisition of Withings with a portfolio of premium, intuitive products designed to inspire the individual to take control of their own health.

We have established a brand licensing business, and our exclusive brand licensee for mobile phones and tablets, HMD Global, has already launched new Nokia branded feature phones and smartphones.

Nokia Technologies continues to grow its successful patent licensing business, which drives most of its revenue today, giving us the ability to invest in our new businesses in a disciplined, venture capital-like manner.

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Nokia Technologies continued

Sales and marketing

Nokia Technologies has significant ongoing R&D activities and an established patent licensing business. Nokia Technologies manages intellectual property as a technology asset and seeks a return on its investments by making its innovations available to the markets through licensing activities and transactions. Nokia Technologies currently has more than 100 licensees, mainly for our SEPs. Nokia Technologies is actively engaged in sales and marketing in support of the OZO VR camera and related technology solutions that enable fully immersive audio and video experiences.

Nokia Technologies is also engaged in sales and marketing activities to support the Withings portfolio of connected heath products in global markets, which span the regulated and non-regulated segments of the market.

Nokia Technologies introduced the OZO VR camera and related technologies including the OZO Live solution in the United States, European and Asian markets in 2016 and is engaged in marketing these solutions to professional content creators in industries including film and entertainment, music, sport, news, travel and education.

Nokia Technologies sees further opportunities in licensing its proprietary technologies, intellectual property and brand assets into telecommunications and vertical industries.

Research and development

The applied nature of our R&D in Nokia Technologies has resulted in various relevant and valuable inventions in areas that we believe are important for emerging consumer experiences in the Programmable World, such as underlying connectivity and sensing technologies, as well as codecs for VR video and audio and advanced machine learning-based health analytics.

Nokia Technologies has R&D centers in Finland, France, the United Kingdom and the United States.

Patents and licenses

For more than 20 years, we have defined many of the fundamental technologies used in virtually all mobile devices and taken a leadership role in standards setting. As a result, we own a leading share of essential patents for GSM, 3G radio and 4G LTE technologies. These, together with others for Wi-Fi and video standards, form the core of our patent portfolio for monetization purposes. As mentioned above, Nokia Technologies currently has more than 100 licensees, mainly for our SEPs.

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With the acquisition of Nokia Siemens Networks (NSN) in 2013 and the Acquisition of Alcatel Lucent, we have added the results of their sustained innovation, including that of Nokia Bell Labs, creating a larger and more valuable IP portfolio than ever before. The portfolio spans more than 26 000 patent families, built on combined R&D investments of more than EUR 119 billion over the last two decades.

We continue to refresh our portfolio from R&D activities across all of our businesses, filing patent applications on more than 1 300 new inventions in 2016. Continuing our focus on communications standards, we also expect to have a leading position in 5G. In 2016, we were a leading contributor to the development of 5G standards. As part of our active portfolio management approach, we are continuously evaluating our collective assets and taking actions to optimize the size of our overall portfolio while preserving the high quality of our patents.

Competition

While several major technology companies are entering the VR market, it is still nascent, and long-term trends for capture and playback solutions have not yet been identified. We expect opportunities for technology licensing within the VR ecosystem to grow over time.

In Digital Health, we are focused on high growth segments of the total market, including consumer products in both regulated and non-regulated markets, and going beyond fitness trackers to blood pressure monitors, scales and thermometers, as well as remote patient monitoring. In this area, Koninklijke Philips N.V. (Philips) is most notable for its competing products. While Fitbit is primarily focused on fitness trackers, they have also pointed to the broader digital health value proposition as part of their evolution.

Number of new filings in 2016

1300+

R&D investment over the last two decades

~EUR119bn

Number of patent licensees

100+

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Principal industry trends

affecting operations

Business-specific trends

Networks business

We are a leading vendor in the network and IP infrastructure, software, and related services market. We provide a broad range of different products, from the hardware components of networks used by network operators and increasingly by customers in other select verticals, to software solutions supporting the efficient interaction of networks, as well as services to plan, optimize, implement, run and upgrade networks. Our Networks business is conducted through four business groups: Mobile Networks, Fixed Networks, IP/Optical Networks and Applications & Analytics. These business groups provide an end-to-end portfolio of hardware, software and services to enable us to deliver the next generation of leading networks solutions and services to our customers. We aim for all four business groups to be innovation leaders, drawing on our frontline R&D capabilities to deliver leading products and services for our customers, and ultimately ensure the company s long-term value creation. For more information on the Networks business refer to Business overview Networks business above.

Industry trends

The networks industry has witnessed certain prominent trends in recent years, which have also affected our Networks business. First, the increase in the use of data services and the resulting exponential increase in data traffic has resulted in an increased need for high-performance, high-quality and highly reliable networks. The continuing increase in data traffic has, however, not been directly reflected in operators revenue. Consequently, there is an increased need for efficiency for both operators and network infrastructure and services vendors.

Second, we are witnessing more operator consolidation driven by operators needs to provide a wider scope of services, especially through the convergence of disparate network technologies across mobile, fixed, and IP and optical networks. In order to improve networks in terms of coverage, capacity and quality, network operators are continuing their transition to all-IP architectures, with an emphasis on fast access to their networks through copper, fiber, LTE and new digital services delivery. We are also seeing similar trends with cable operators, who are investing in the deployment of high-speed networks. Both the fixed mobile convergence and the transition to all-IP architectures were major rationales behind our Acquisition of Alcatel Lucent and creating our end-to-end portfolio of products and services.

Third, we see an increasing demand for large high-performance networks in some key areas outside the traditional CSPs space, which we define as our select vertical markets. Webscales such as Google, Microsoft and Alibaba are investing in Cloud technology and network infrastructure an increasing scale. In addition, other vertical markets such as energy, transportation, government and TXLEs are investing in their own network infrastructure, to connect data centers and provide seamless IP interconnection and digital services delivery.

Pricing and price erosion

In 2016, we did not witness a dramatic change in the overall pricing environment. The environment remained similar to what we witnessed in the prior year, when competition intensified in the first quarter of 2015 and impacted the net sales and profitability of our Networks business.

Product mix

The profitability of our Networks business is also affected by our product mix, including the share of software in the sales mix. Products and services have varying profitability profiles. For instance, our Ultra Broadband Networks reportable segment offers a combination of hardware, software and services. Hardware, and especially software products, generally have higher gross margins, but also require significant R&D investment, whereas the service offerings are typically labor-intensive, while carrying low R&D investment, and have relatively low gross margins compared to the hardware and software products.

Seasonality and cyclical nature of projects

Our Networks business sales are affected by seasonality in the network operators spending cycles, with generally higher sales in the fourth quarter, as compared to the first quarter of the following year. In addition to normal industry seasonality, there are normal peaks and troughs in the deployment of large infrastructure projects. The timing of these projects depends on new radio spectrum allocation, network upgrade cycles and the availability of new consumer devices and services, which in turn affects our Networks business sales. As an example, during the last couple of years some of the major LTE roll-outs have been largely completed. The next major technology cycle is expected to begin in 2017 when early use-case trials of 5G technology are expected to start, with the initial commercial deployments currently expected to start in 2018. Another example of cyclicality is the IP/Optical Networks market, where network operators often first deploy optical capacity into their networks, which is then followed by investments in routing equipment.

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Continued operational efficiency improvements

In 2016, our Networks business continued to focus on operational improvement across its business groups. In order to continue to make our Networks business more efficient, higher-performing and positioned for long-term success, we aim to further strengthen our productivity, efficiency and competitive cost structure. To help us achieve this, we continue to bring performance excellence methodologies such as Kaizen, Lean and Six Sigma to all areas of the business. Our Networks business will also pursue further efficiency gains from increased automation in delivery of Global Services and in other areas, as well as continued improvements in R&D efficiency and agility.

Cost of components and raw materials

There are several important factors driving the profitability and competitiveness of our Networks business: scale, operational efficiency and pricing, and cost discipline. The costs of our networks products comprise, among others, components, manufacturing, labor and overheads, royalties and licensing fees, depreciation of product machinery, logistics and warranty and other quality costs.

Principal industry trends

affecting operations continued

Nokia Technologies

Nokia Technologies pursues new business opportunities building on our innovations and the Nokia brand. Nokia Technologies develops and licenses cutting-edge innovations that are powering the next revolution in computing and mobility. The Nokia Technologies strategy consists of: 1) patent licensing, focused on licensing standard-essential and other patents in the Nokia portfolio to companies in the mobile devices market and beyond; 2) technology licensing, focused on licensing proprietary technologies to enable our customers to build better products; 3) brand partnerships, to help our customers leverage the value of the Nokia brand in consumer devices; and 4) incubation, focused on developing new products and solutions in the areas of digital media and digital health. All of these activities are supported by Nokia Bell Labs, our world-class R&D team. For more information on the Nokia Technologies business, refer to Business overview Nokia Technologies .

Monetization strategies of IPR

Success in the technology industry requires significant R&D investment, with the resulting patents and other IPR utilized to protect and generate a return on those investments and related inventions. In recent years, we have seen new entrants in the mobile device industry, many of which do not have licenses to our patents. Our aim is to approach these companies by potentially using one or more means of monetization. We believe we are well-positioned to protect, and build on, our existing industry-leading patent portfolio, and consequently to increase our shareholders value.

We see a number of means of monetizing our innovations: on the one hand, we seek to license our patent portfolio, the Nokia brand and new technological innovations to be integrated into other companies products and services. On the other hand, our incubation activities may also, from time to time, lead to concepts that we bring to the market ourselves as products or services like OZO, the extraordinary VR camera designed and built specifically for professional content creators. We also accelerated our expansion into digital health in 2016 with the acquisition of Withings SA, a leading innovator in health and lifestyle product technology with a family of award-winning digital health products and services. Overall, we have sharpened our focus on research and product development in alignment with the strategic growth opportunities we see emerging in the areas of digital health and digital media, including preventive health care and immersive VR.

In patent licensing, the main opportunities we are pursuing are: 1) renewing existing license agreements, and negotiating new license agreements with mobile device manufacturers; and 2) expanding the scope of licensing activities to other industries, in particular those that implement mobile communication technologies. We no longer need patent licenses for our own mobile phone business, enabling the possibility of improving the balance of inbound and outbound patent licensing.

In brand licensing, we will continue to seek further opportunities to bring the Nokia brand into consumer devices, by licensing our brand and other intellectual property, as well as, for example, industrial design. For example, under a strategic agreement covering branding rights and intellectual property licensing, Nokia Technologies granted HMD Global, a newly founded company based in Finland, an exclusive global license to create Nokia-branded mobile phones and tablets for the next ten years.

In technology licensing, the opportunities are more long-term in our view, but we will look at opportunities to license technologies developed by Nokia Technologies and delivered to partners in consumer electronics as solutions or technology packages that can be integrated into their products and services to help enable the Programmable World.

To grow each of the aforementioned business programs, it is necessary to invest in commercial capabilities to support them.

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General trends in IPR licensing

In general, there has been increased focus on IPR protection and licensing, and this trend is expected to continue. As such, new agreements are generally a product of lengthy negotiations and potential litigation or arbitration, and therefore the timing and outcome may be difficult to forecast. Due to the structure of patent license agreements, the payments may be very infrequent, at times may be partly retrospective, and the lengths of license agreements can vary.

Additionally, there are clear regional differences in the ease of protecting and licensing patented innovations. We have seen some licensees actively avoiding making license payments, and some licensors using aggressive methods to collect them; both behaviors have attracted regulatory attention. We expect discussion of the regulation of licensing to continue at both a global and a regional level. Some of those regulatory developments may be adverse to the interests of technology developers and patent owners, including us.

Research, development and patent portfolio development

As the creation of new technology assets and patented innovations is heavily focused on R&D activities with long lead-times to incremental revenues, we may from time to time see investment opportunities that have strategic importance. This generally affects the operating expenses before sales reflect a return on those investments.

Trends affecting our businesses

Exchange rates

We are a company with global operations and net sales derived from various countries, invoiced in various currencies. Therefore, our business and results from operations are exposed to changes in exchange rates between the euro, our reporting currency, and other currencies, such as the U.S. dollar and the Chinese yuan. The magnitude of foreign exchange exposures changes over time as a function of our net sales and costs in different markets, as well as the prevalent currencies used for transactions in those markets. Refer also to General facts on Nokia Selected financial data Exchange rate data below.

To mitigate the impact of changes in exchange rates on our results, we hedge material net foreign exchange exposures (net sales less costs in a currency) typically with up to a 12-month hedging horizon. For the majority of these hedges, hedge accounting is applied to reduce income statement volatility.

In 2016, approximately 25% of Continuing operations net sales and approximately 25% of Continuing operations costs were denominated in euro. In 2016, approximately 50% of Continuing operations net sales were denominated in U.S. dollar and approximately 10% in Chinese yuan.

During 2016, the U.S. dollar appreciated against the euro and this had a positive impact on our net sales expressed in euros. However, the stronger U.S. dollar also contributed to higher cost of sales and operating expenses, as approximately 45% of our total cost base was in U.S. dollars. In total, before hedging, the appreciation of the U.S. dollar had a slightly positive effect on our operating profit in 2016.

During 2016, the Chinese yuan depreciated against the euro and this had a negative impact on our net sales expressed in euros. However, the weaker Chinese yuan also contributed to lower cost of sales and operating expenses, as approximately 10% of Continuing operations total costs were denominated in Chinese yuan. In total, before hedging, the depreciation of the Chinese yuan had a slightly negative effect on our operating profit in 2016.

Significant changes in exchange rates may also impact our competitive position and related price pressures through their impact on our competitors.

For a discussion of the instruments used by us in connection with our hedging activities, refer to Note 36, Risk management of our consolidated financial statements included in this annual report on Form 20-F. Refer also to Operating and financial review and prospects Risk factors .

The average currency mix for net sales and total costs:

	2016		2015	
Currency	**Net sales**	**Total costs**	**Net sales**	**Total costs**
EUR	~25%	~25%	~30%	~30%
USD	~50%	~45%	~35%	~30%
CNY	~10%	~10%	~10%	~10%
Other	~15%	~20%	~25%	~30%
Total	**100%**	**100%**	**100%**	**100%**

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Results of operations

The financial information included in this Operating and financial review and prospects section as of December 31, 2016 and 2015 and for each of the three years ended December 31, 2016, 2015 and 2014 has been derived from our audited consolidated financial statements included in this annual report on Form 20-F. The financial information as of December 31, 2016 and 2015 and for each of the three years ended December 31, 2016, 2015 and 2014 should be read in conjunction with, and is qualified in its entirety by reference to, our audited consolidated financial statements.

In 2016, following the Acquisition of Alcatel Lucent on January 4, 2016 (refer to Note 5, Acquisitions, of our consolidated financial statements included in this annual report on Form 20-F), we revised our financial reporting structure. We have two businesses: Nokia s Networks business and Nokia Technologies, and three reportable segments for financial reporting purposes: Ultra Broadband Networks and IP Networks and Applications (within Nokia s Networks business) and Nokia Technologies. We also present certain segment data for Group Common and Other as well as for Discontinued operations. The comparative financial information presented below has been prepared to reflect the financial results of our Continuing operations as if the new financial reporting structure had been in operation for the full years 2015 and 2014. Certain accounting policy alignments, adjustments and reclassifications have been necessary. Refer to Note 4, Segment information, of our consolidated financial statements included in this annual report on Form 20-F.

Continuing operations

For the year ended December 31, 2016 compared to the year ended December 31, 2015

The following table sets forth selective line items and the percentage of net sales for the years indicated.

	2016		2015		Year-on-year change
For the year ended December 31	EURm	% of net sales	EURm	% of net sales	%
Net sales	**23 614**	**100.0**	**12 499**	**100.0**	**89**
Cost of sales	(15 158)	(64.2)	(6 963)	(55.7)	118
Gross profit	**8 456**	**35.8**	**5 536**	**44.3**	**53**
Research and development expenses	(4 904)	(20.8)	(2 080)	(16.6)	136
Selling, general and administrative expenses	(3 819)	(16.2)	(1 772)	(14.2)	116
Other income and expenses	(833)	(3.5)	13	0.1	
Operating (loss)/profit	**(1 100)**	**(4.7)**	**1 697**	**13.6**	

Share of results of associated companies and joint ventures	18	0.1	29	0.2	(38)
Financial income and expenses	(287)	(1.2)	(186)	(1.5)	(54)
(Loss)/profit before tax	**(1 369)**	**(5.8)**	**1 540**	**12.3**	
Income tax benefit/(expense)	457	1.9	(346)	(2.8)	
(Loss)/profit for the year	**(912)**	**(3.9)**	**1 194**	**9.6**	

Net sales

Continuing operations net sales in 2016 were EUR 23 614 million, an increase of EUR 11 115 million, or 89%, compared to EUR 12 499 million in 2015. The increase in Continuing operations net sales was primarily attributable to growth in Nokia s Networks business and Group Common and Other, primarily related to the Acquisition of Alcatel Lucent and, to a lesser extent, growth in Nokia Technologies.

Nokia s Networks business net sales in 2016 were EUR 21 800 million, an increase of EUR 10 313 million, or 90%, compared to EUR 11 487 million in 2015. Ultra Broadband Networks net sales were EUR 15 771 million in 2016, an increase of EUR 5 612 million, or 55%, compared to EUR 10 159 million in 2015. IP Networks and Applications net sales were EUR 6 029 million in 2016, an increase of EUR 4 701 million compared to EUR 1 328 million in 2015. The increase in Ultra Broadband Networks net sales is comprised of an increase in Mobile Networks net sales of EUR 3 383 million and an increase in Fixed Networks net sales of EUR 2 229 million. The increase in Mobile Networks net sales was primarily attributable to the Acquisition of Alcatel Lucent, which drove higher net sales in both Radio Networks and Services. This was partially offset by revenue declines from several key customers in Asia-Pacific and North America due to previous build-outs and investments, as well as adverse market conditions in Latin America. The increase in Fixed Networks net sales was primarily attributable to the Acquisition of Alcatel Lucent, and increases in Broadband Access, supported by the completion of a large project in Asia-Pacific.

The increase in IP Networks and Applications net sales is comprised of an increase in IP/Optical Networks net sales of EUR 3 987 million and an increase in Applications & Analytics net sales of EUR 714 million, primarily attributable to the Acquisition of Alcatel Lucent. The increase in IP/Optical Networks net sales was attributable to an increase in IP Routing net sales of EUR 2 425 million and an increase in Optical Networks net sales of EUR 1 562 million. The increase in Applications & Analytics net sales was primarily attributable to the Acquisition of Alcatel Lucent, and increases in Services.

Group Common and Other net sales in 2016 were EUR 1 145 million, an increase of EUR 1 145 million, compared to approximately zero in 2015. The increase in Group Common and Other net sales was primarily due to ASN and RFS net sales.

Nokia Technologies net sales in 2016 were EUR 1 053 million, an increase of EUR 26 million, or 3%, compared to EUR 1 027 million in 2015. The increase in Nokia Technologies net sales was primarily attributable to higher IPR licensing income and the inclusion of Withings net sales from June 2016 onwards resulting from the acquisition of Withings, partially offset by the absence of non-recurring adjustments to accrued net sales from existing and new agreements, and lower licensing income from certain existing licensees.

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The following table sets forth distribution of net sales by geographical area for the years indicated.

For the year ended December 31	2016 EURm	2015 EURm	Year-on-year change %
Asia-Pacific	4 206	3 230	30
Europe[(1)]	6 393	3 813	68
Greater China	2 656	1 712	55
Latin America	1 457	973	50
Middle East & Africa	1 871	1 177	59
North America	7 031	1 594	341
Total	**23 614**	**12 499**	**89**

(1) All Nokia Technologies IPR and licensing net sales are allocated to Finland.
Refer to Results of segments Nokia s Networks business for the main changes in regional net sales.

Gross margin

Gross margin for Continuing operations in 2016 was 35.8% compared to 44.3% in 2015. The decrease in gross margin was primarily due to Nokia s Networks business and, to a lesser extent, Nokia Technologies and Group Common and Other.

Nokia s Networks business gross margin in 2016 was 38.5%, compared to 39.0% in 2015. The slight decrease in Nokia s Networks business gross margin was due to decreases in both Ultra Broadband Networks gross margin and IP Networks and Applications gross margin. Ultra Broadband Networks gross margin in 2016 was 36.3%, compared to 37.5% in 2015. The decrease in Ultra Broadband Networks gross margin was primarily attributable to higher central cost of sales in Mobile Networks, partially offset by favorable region and product mix, and the completion of a large Fixed Networks project in the Asia-Pacific region. IP Networks and Applications gross margin in 2016 was 44.1%, compared to 50.9% in 2015. The decrease in IP Networks and Applications gross margin was primarily attributable to changes in the business volume and mix, primarily attributable to the Acquisition of Alcatel Lucent.

Nokia Technologies gross margin in 2016 was 96.0%, compared to 99.3% in 2015. The decrease in Nokia Technologies gross margin in 2016 was primarily attributable to new, lower gross margin business in digital health from Withings, and to a lesser extent, digital media.

Group Common and Other gross margin in 2016 was 16.8%. The Group Common and Other gross margin was attributable to gross margin in ASN and RFS.

In 2016, cost of sales included working capital-related purchase price allocation adjustments of EUR 509 million, which resulted in higher cost of sales and lower gross profit when the inventory was sold; and product portfolio integration-related costs of EUR 274 million.

Operating expenses

Our R&D expenses for Continuing operations in 2016 were EUR 4 904 million, an increase of EUR 2 824 million, or 136%, compared to EUR 2 080 million in 2015. R&D expenses represented 20.8% of our net sales in 2016 compared to 16.6% in 2015. The increase in R&D expenses was primarily attributable to Nokia s Networks business, amortization of acquired intangible assets and depreciation of acquired property, plant and equipment; and, to a lesser extent, product portfolio integration costs, as well as Group Common and Other, all of which primarily related to the Acquisition of Alcatel Lucent, in addition to Nokia Technologies.

Nokia s Networks business R&D expenses were EUR 3 691 million in 2016, an increase of EUR 1 953 million, or 112%, compared to EUR 1 738 million in 2015. The increase in Nokia s Networks business R&D expenses was primarily attributable to an increase in headcount, partially offset by operational and synergy savings. Group Common and Other R&D expenses in 2016 were EUR 282 million, an increase of EUR 198 million, compared to EUR 84 million in 2015. Group Common and Other R&D expenses increased, primarily attributable to Nokia Bell Labs. Nokia Technologies R&D expenses in 2016 were EUR 250 million, an increase of EUR 30 million, or 14%, compared to EUR 220 million in 2015. The increase in R&D expenses in Nokia Technologies was primarily attributable to the inclusion of Bell Labs patent portfolio costs, resulting from the Acquisition of Alcatel Lucent, and higher investments in the areas of digital media and digital health. R&D expenses included amortization and depreciation of acquired intangible assets, and property, plant and equipment of EUR 619 million in 2016 compared to EUR 35 million in 2015, as well as product portfolio integration-related costs of EUR 61 million in 2016.

Our selling, general and administrative expenses for Continuing operations in 2016 were EUR 3 819 million, an increase of EUR 2 047 million, or 116%, compared to EUR 1 772 million in 2015. Selling, general and administrative expenses represented 16.2% of our net sales in 2016 compared to 14.2% in 2015. The increase in selling, general and administrative expenses was primarily attributable to Nokia s Networks business, amortization of acquired intangible assets and depreciation of acquired property, plant and equipment, and transaction and integration-related costs and Group Common and Other, all of which primarily related to the Acquisition of Alcatel Lucent, as well as Nokia Technologies.

Nokia s Networks business selling, general and administrative expenses were EUR 2 720 million in 2016, an increase of EUR 1 300 million, or 92%, compared to EUR 1 420 million in 2015. The increase in Nokia s Networks business selling, general and administrative expenses was primarily attributable to an increase in headcount, partially offset by operational and synergy savings. Group Common and Other selling, general and administrative expenses in 2016 were EUR 231 million, an increase of EUR 134 million compared to EUR 97 million in 2015. Nokia Technologies selling, general and administrative expenses in 2016 were EUR 183 million, an increase of EUR 74 million, or 68%, compared to EUR 109 million in 2015. The increase in Nokia Technologies selling, general and administrative expenses was primarily attributable to the ramp-up of Digital Health and Digital Media, higher business support costs and increased licensing. Selling, general and administrative expenses included amortization and depreciation of acquired intangible assets, and property, plant and equipment of EUR 385 million in 2016 compared to EUR 44 million in 2015, as well as transaction and integration-related costs of EUR 294 million in 2016.

Other income and expenses for Continuing operations in 2016 was a net expense of EUR 833 million, a change of EUR 846 million, compared to a net income of EUR 13 million in 2015. The change was primarily attributable to higher restructuring and associated charges and, to a lesser extent, the absence of realized gains related to certain investments made through venture funds. Other income and expenses included restructuring and associated charges of EUR 759 million in 2016 compared to EUR 121 million in 2015.

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Results of operations continued