

Nokia Technologies



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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.

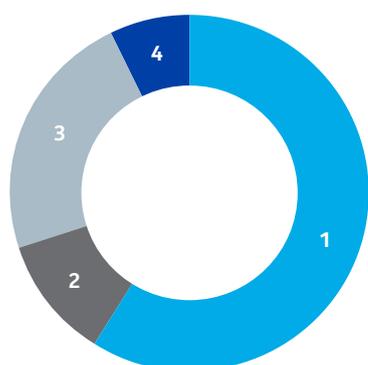
In Digital Media, we are pioneers of the technology enabling VR, an exciting new medium that is transporting people to places, events and experiences like never before.

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.

Breakdown of patent filings in 2016 by technology



1 Connectivity	825 (59%)
2 Fixed & optical networks	158 (11%)
3 Services, applications & multimedia	317 (23%)
4 Product user interface and hardware	91 (7%)

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 health 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.

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

1 300+

R&D investment over the last two decades

~EUR 119bn

Number of patent licensees

100+