Achieving the human possibilities of connected life

Public

A long history of successful change

2015

2014

Mobile
devices

here

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Connecting People

NOKIA

1865

Siemens Com

Motorola Solutions

Alcatel-Lucent

Withings
Nakina Systems
Gainspeed

    Public
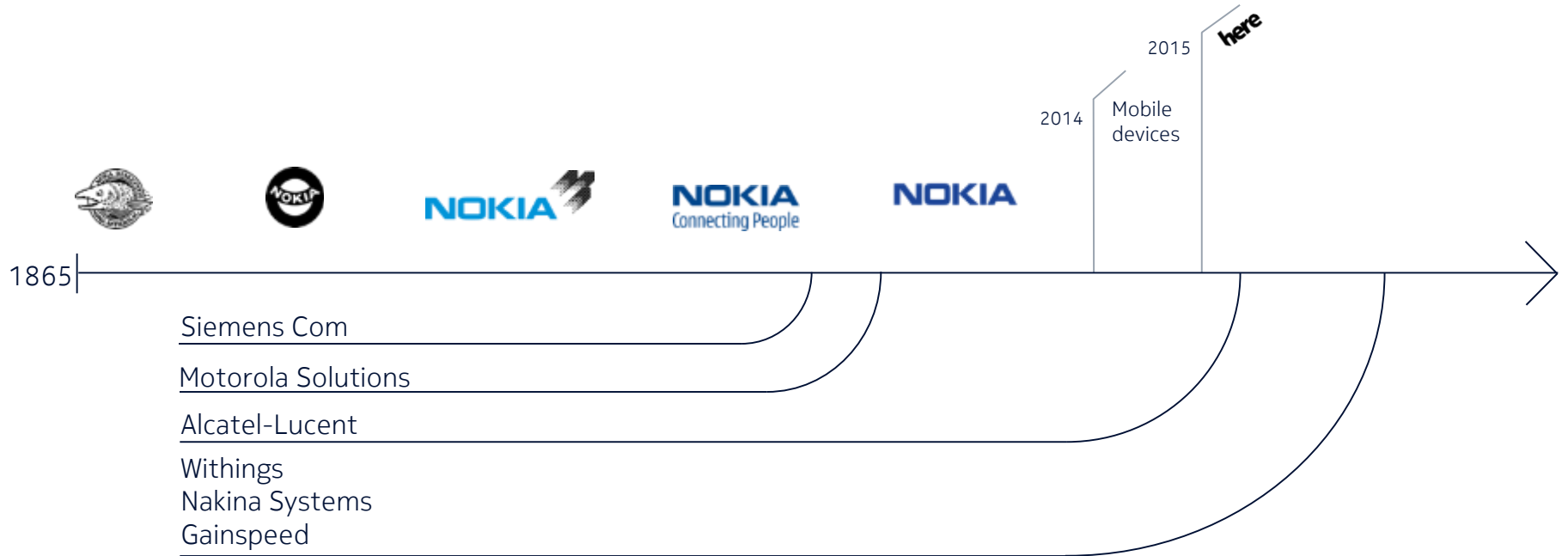
NOKIA

Nokia has been at the forefront of every fundamental change in how we communicate and connect

Telephony begins

Bell Telephone Laboratories formed in 1925

Analog revolution

Long distance voice communication

- Copper networks
- Circuit switches
- Amplifiers

Digital revolution

Voice, data, and video communication

- Laser
- Satellite communications
- UNIX
- DWDM
- 100Gbps optical transport
- 400G routers

Mobile revolution

Wireless communication

- First ever calls on GSM and LTE
- First car phone
- Commercialization of Small Cells
- MIMO

IoT - The Programm-able World

Intelligent and seamless connectivity through the Cloud

- 5G
- G.Fast: 1Gbps over copper
- Optical super channels
- Terabit IP routing
- Datacenter infrastructure and applications
- Smart sensors for the Internet of Things

Public

NOKIA

The Internet of Things represents a major disruption of the Telco & IT industry

Internet
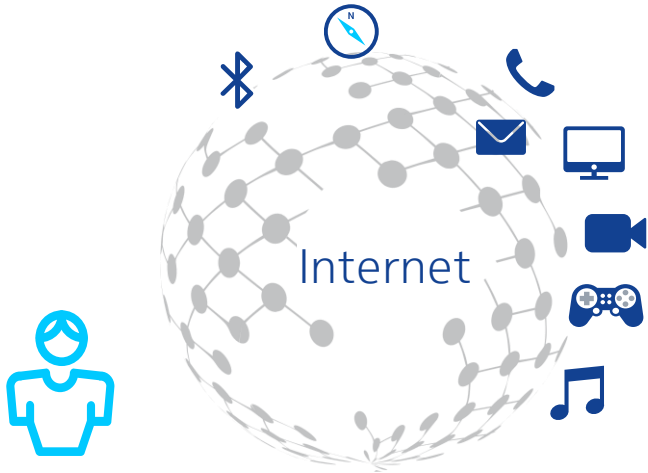
- < 5 Billion connected people
- Data meaningful in context
- From product...

Today

- 50 Billion connected "things"
- Data disassociated from any source
- ...to everything delivered as a Service

2025

    Public

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The purpose of the "The Programmable World" – Achieving the human possibility of connected life

Get back 2hrs/day…
No more rush hour

Towards **zero road fatalities, >** half a million lives saved

Zero loss water distribution

Healthier people with connected wearables, telemedicine

Never lost - always find an address – always on time

Less transport costs and fuel consumption

50% higher industry productivity by connected cyber physical systems

Safer in connected homes

Individual   Society   Economy

"Carrier Grade" mission critical IoT solutions – Trust, Scale, Safety, Reliability, and Social Value applied to the Programmable World

Public Safety **1**

Digital Health **2**

Connected Mobility **3**

Industries, Utilities **4**

Smart Cities **5**

Nokia's expertise best supports verticals that require "telco grade" reliability with low-latency, real time communication, end-to-end security and scalability

Internet of Things revolutionize the world

50+
Billion mobile connected devices by 2025*

127
Billion USD spent on unmanned aerial vehicle applications in 2020**

*Nokia sources ** PvC report, Bloomberg technology news, May 2016

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Unmanned Aerial Vehicles (UAV)

- Intelligent monitoring and surveillance

- Search and rescue

- Study and exploration

- Transport and delivery

- Mobile Network

    Confidential

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Nokia leading the way

Using UAVs to carry base stations to rural areas to establish mobile coverage (EE, UK)

UAE Drones for Good Award event 2016 in Dubai

CTIA Everything Industrial & Enterprise: Mobile Enterprise Innovation Award

Smart city project

M1 – a mobile network operator in Singapore

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UAV Traffic Management for safe, smart use of airspace

Automated UAV mission enabled by LTE connected Drones (UTM)

- Real time Drone registration
- Dynamic Fly zones (Go / NO GO areas)
- Collision avoidance
- 3D navigation
- Big data analytics

UAV ID

1 23 456 0

1. Manufacturers equip UAVs with unique ID

2. Owners register devices in the UAV Traffic Management database

UTM

3. With centralized monitoring and control, UTM manages UAV traffic over mobile network

NOKIA UAV TRAFFIC CONTROL CENTER

NOKIA

Nokia UTM brings traffic control to Twente (NL)

Research into mobile networks UAV connectivity

Build and and trial UAV Traffic Management to:

- Automate UAV flights
- Introduce ad-hoc no-fly zones
- Operate non-line of sight flights

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Nokia is expanding the human possibilities of the connected society – on the ground and in the air.

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UAV Traffic Control Center

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