Operator views at the uO5G Final Results Seminar

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Elisa key figures

€1.8 billion (1.6) revenue 2017

4,700 (4,300) Elisa employees

€240 million (226) capital expenditure investments 2017

4,7 million (4.7) mobile subscriptions, Finland and Estonia 2017

690,000 (590,000) fixed broadband subscriptions 2017

#1 Finland #2 Estonia market position
Finns use the most mobile data in the world
More mobile data in Finland than in Germany

Population:
- Germany = 82 millions
- Finland = 5.5 millions
- 15x difference
Mobile data in Finland is very cheap to use
Elisa is a world leader in cost management

Indexed: 2010 = 100

Mobile data usage

OPEX
CAPEX
Elisa 4G network coverage 2014-2018

January 2014
Elisa 4G network

June 2018
Elisa 4G network

4G population coverage today: 99.7%
5G benefits

- **Ultra fast mobile broadband**: > 10 Gbit/s peak data rates
- **100 Mbit/s everywhere**
- **Massive Internet of Things (IoT)**
  - 10-100 X more devices
  - 10 X better coverage
  - Low cost IoT devices
  - 10 year battery time in IoT
- **Critical and very low latency communication**
  - 1 ms radio network latency
  - Very reliable

Programmable, scalable, automated, sliced and secure network
Options for private LTE network

1. Ensuring mobile capacity at customer site via public network
   • Ensuring capacity in normal conditions

2. Local private radio
   • Ensuring capacity in extremely high peak hours

3. Local gateway at enterprise
   • Ensuring capacity and low latency

4. Total private network deployed on enterprise site
   • Ensuring capacity, low latency, reliability and security
Only 10% of IoT value chain is in connectivity
Elisa’s experiences as a (micro-)operator

- Very high quality networks in Finland with good coverage
- Networks been always built if corporate customers have requested
- Operator’s core business is to build, operate, optimize and develop local connectivity at optimized costs with a lot of synergies with the macro network
- Network operation includes interference management, interconnection, roaming, 5G-4G-3G-2G interoperability, traffic loading between frequencies, network maintenance, optimization and development, cost management (capex and opex)
- uO is a very interesting field and could be a lot more than a pure connectivity; focusing on platforms and end user services
- Elisa is very interested in uO in Finland and in other countries where Elisa has new business opportunities such as Smart Factory, Video Conference and Network Optimization services
Elisa International Digital Services

**AUTOMATE**
Providing automation solutions to telcos for zero-touch network processes

**SMART FACTORY**
Solution for manufacturers to enable better decisions, reduce downtime and improve quality

**VIDERA**
Innovative managed services and solution provider for large enterprise video conferencing
Elisa Automate: Providing automation solutions to telcos for zero-touch network processes

- **Virtual NOC**: Network operations centre
- **ELISA SON**: Self-organising networks

**Planning**
- Planning

**Rollout**
- Network inventory management

**Fulfillment**
- Configuration management

**Assurance**
- Fault management
- Monitoring
- Performance management

**Optimization**
- Customer experience management

- Zero people working in NOC, 80% reduction in network faults
- 4 million checks and 5000 change of nw parameters daily
Elisa Smart Factory: Elisa’s experience in telecom automation applied to manufacturing

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IIoT CREATES A NEW LAYER OF DIGITAL TECHNOLOGY

L5 ELISA SMART FACTORY

CONNECT DATA
Integrate data
Understand data
Define models & KPIs

VISUALISE DATA
Real-time, role-based dashboards
3D/2D views of equipment and processes

ACT ON DATA
Real-time alerts
Automation through analysing data
AI and machine learning enable better and faster decisions

Reduce downtime
Improve product quality
Efficiency & safety

* ISA-95
Very large growth market for Industrial IoT

Source: Gartner 2017; IoT professional services spending, Elisa analysis

Global manufacturing software in Industrial IoT market

€13bn
YoY growth +18%
Elisa Videra: Customers of video conferencing service in 90 countries

"The partnership we’ve forged with Elisa Videra enables us to both benefit from our collective strengths and bring something truly unique to market."

Vodafone Principle Collaboration Manager
uO much more than connectivity; focus on platforms and end user services?
THANK YOU!
Possible 5G use cases

- Ultra fast mobile broadband
- Virtual and augmented reality (VR&AR)
- Remote health care
- Advanced remote control
- Massive Internet of Things
- Smart factories and cities
- Advanced robotics
- Intelligent logistics and traffic