IoT
Changing the Game?

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Plan

- x slides of theory
- x slides of practical implementation + videos
- X slides of Telia EE doings
What is IoT and what isn’t?
The **Internet of things** (IoT) describes physical objects (or groups of such objects) with sensors, processing ability, software, and other technologies **that connect and exchange data** with other devices and systems over the Internet or other communications networks.
But what exactly is IoT?

• A combination of different practices
• Hardware development
• Software development
• User experience
• Business management
3 Main business layers

Connected Devices Layer (IoT Nodes)
- Hardware capabilities like:
  - gathering sensor data
  - influencing environment
  - connecting directly or indirectly to IoT Interconnectivity Layer

IoT Interconnectivity Layer (Data exchange layer)
- Networking capabilities like:
  - Common data semantics between Application and Devices Layer
  - AAA for and by Data owner
  - Data integrity and privacy protection

IoT Applications (IoT Services)
- Application capabilities like:
  - Value driven (for data owner) use-case realization
  - Big data based analytics
  - Artificial intelligence driven
  - UI Layer for users

Device business

Platform business

Content business

Existing and proposed solutions
Layers to cover to create value

- **End User UI** (Presentation layer)
  - Vendor or Service provider dependent User Experience layer – Vendor/Provider specific

- **Service Core** (Cloud backend systems**)
  - Vendor dependent Service Backend – Software component

- **Wan communication** (from local to cloud)
  - IP over multiple medias: Ethernet, xDSL, Fiber, 2/3/4G, Wifi – Secured usually by tunnelling/
  - Gateway (Local agent*)
    - RGW, Separate CU, HGI, OSGI, OpenVRT, Android, iOS, Windows etc.

- **LAN communication** (wireless and wired)
  - ZigBee, Z-Wave, En-Ocean, WiFi, ULE Dect, Bluetooth etc.

- **IoT Devices** (sensors and actuators)
  - Motion, Temp, Light, Open/Close, Video, Pulse, Reading, Power on/off/dimm etc.

**Proprietary Vertical solutions**
- Existing solutions in place
- New solutions coming to market

**WAN / LPWAN**
- LoRa, SigFox, NB-IoT

**Value**

**Cost**

*Bolt/Wolf “Killer App”*
What are the criteria for choosing right platform provider?

- Cloud;
- Provider hosted;
- Self-hosted
<table>
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- **Weight** values: 15, 20, 30
IoT business case – in a nutshell

• What is the problem - lack of data, crafts, high costs, low income, etc.?
• How large a segment is affected by this problem - who suffers the most? (Icicles)
• Do we have all the existing components - hardware, software layer, platform, communication, integrations with third-party systems?
• How do we enter the market - project-based sales, direct communication, cold contact?
• When do we start bringing in money?
Mythbreaking time

• IoT – something new?
• IoT – to solve all of the problems?
• IoT for the win?
Practical examples
GRID MONITORING

Enabling the grid to run at full capacity and effectively incorporate green energy sources

Monitoring power throughout
Fault detection and location
Enabling green energy to be added
Telia NB-IoT for broad range in remote locations
GRID MONITORING

- Line load
- Status
- Capacity
- Temperature
- Movement
UNLOCKING THE GRID
IOT IN HARD-TO-REACH PLACES

Dimon Systems now helps facility managers to monitor and manage their shutters and doors in real-time. When a malfunction occurs, they are notified directly and can analyse the problem remotely.

A network built for IoT – with wider deeper reach
Less downtime, lower cost and better control

Telia NB-IoT
Case: One Nordic and Ellevio

Next generation of smart metering

One Nordic, one of Sweden's leading suppliers of technical consulting services, maintenance services and contract services in the energy and industrial sector.

Ellevio is one of Sweden’s leading distribution network operators.

Connect to close to 1 million NB-IOT electricity meters

Over 10 year period

Largest NB-IoT implementation

ONE Nordic needed a flexible, future-proof solution that was economically competitive

MD, Smart Metering at One Nordic

NB-IoT technology gives us broader and deeper coverage, which is ideal for rural and deep indoor locations

Program Manager at Ellevio
What does Telia

1. Telia provides hardware and necessary connectivity
   - Fix
   - Mobile
   - LPWAN*
   - Huge network of manufacturers

2. Telia undertakes the simplification of systems
   - Before
   - After

3. New IoT applications enable new business models
   - By combining the customer's current product and Telia’s strengths, we make product innovation

4. We digitize the Client’s business process
   - We find solutions on how to measure the progress of a business in real time.
Telia EE IoT products

- **Remote Metering** – Reading remote readings from different sensors, meters and making data available to the customer
  - Remotely readable meter(Axioma);
  - Communication(Telia M2M);
  - Platform(Cumulocity);

- **Smart City** – Remote reading of measurement parameters from different devices and making them available to the customer
  - Equipment - not limited to a specific type;
  - Communication - there is no obligation to use one specific;
  - Backend - Cumulocity;
  - Frontend - Smart City application;
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• https://andmed.tallinn.ee/et/
• https://tarktartu.telia.ee/et/
• https://www.smartcitysonderborg.dk/da/
• https://green.gaas.ee/et/
COMPETITION?

- Local operators – Elisa, Tele2, Levikom
- SF and HW developers – Google: IoT
- Global solution providers – Google, Amazon, Apple
Why Telia?

- Experience
  - Communication, IT, solutions, organization
- Long-term plan
  - Not a start-up
- Multi-Vendor
  - Complete manufacturer neutrality
- Partners
  - Universities
  - Manufacturers

Top three service supplier selection criteria in EMEA

- 78% References and experience
- 70% Stable financial background
- 65% Multi-vendor service capability
Conclusion

• IoT is nothing new!
• IoT is rather a mindset than an out-of-the-box solution.
• Who has an issue - a problem that is solved?
• Bring the data – data driven decision making!
Thanks!