DIVERSIFYING CELLULAR FOR MASSIVE IOT

David Hammarwall, LTE Product Manager
MARKET OUTLOOK

PREDICTED IOT CONNECTED DEVICES IN 2021

15 BILLION

M2M (TODAY)

IOT (YEAR 2016 +)

Source: Ericsson Mobility Report
USE CASE DIVERSITY

TRANSPORT & LOGISTICS
- Fleet Management
- Goods tracking

AGRICULTURE
- Climate-Agriculture monitoring
- Livestock tracking

ENVIRONMENT
- Flood monitoring & alert
- Environmental monitoring (Water, air, noise, etc)

INDUSTRIAL
- Process monitoring & Control
- Maintenance monitoring

SMART BUILDINGS
- Smoke detectors
- Alarm systems
- Home automation

SMART CITIES
- Smart parking
- Smart bicycles
- Waste management
- City lighting

UTILITIES
- Smart metering
- Smart grid management

CONSUMERS
- Wearables
- Kids/Elderly tracker
- Medical monitoring

TRANSPORT & LOGISTICS: Goods tracking
SMART CITIES: Smart bicycles
INDUSTRIAL: Process monitoring & Control
SMART BUILDINGS: Home automation
CELLULAR IS THE FOUNDATION
FULL RANGE OF SOLUTIONS
Addressing diversity of use cases

<table>
<thead>
<tr>
<th>EC-GSM</th>
<th>Global cellular IoT for all GSM markets</th>
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<tbody>
<tr>
<td>LTE-M</td>
<td>Wide range of Massive IoT applications</td>
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<tr>
<td>NB-IoT</td>
<td>Ultra low-bitrate Massive IoT applications</td>
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ERICSSON LAUNCHING SW 17A FOR MASSIVE IOT

- **90%** MODULE COST REDUCTION
- **10+** YEARS BATTERY LIFE
- **7X** BETTER COVERAGE
- **1M+** DEVICE CONNECTIONS

NB-IoT devices support

Extended Long DRX (LTE-M & NB-IoT)

Extended Coverage (NB-IoT)

Support massive number of connections per cell site
CELLULAR PERFORMANCE DIVERSIFICATION

- **150 MBPS**
  - Cat-1 (LTE-M)
- **300 MBPS**
  - Power Saving Mode (GSM, LTE-M, NB-IoT)
- **450 MBPS**
  - Cat-0 (LTE-M)
- **600 MBPS**
  - Extended DRX (GSM, LTE-M, NB-IoT)
- **1 GBPS**
  - Extended Coverage (GSM & NB-IoT)

- **600 MBPS**
  - Cat-M (LTE-M)
- **1 GBPS**
  - Narrowband-IoT (NB-IoT)

- Reduced Device Cost
- Improved Coverage
- Improved Battery Life
First launched EC-GSM offering and now first launching LTE-M & NB-IoT
DIVERSIFYING CELLULAR FOR MASSIVE IOT

ONE NETWORK, MULTIPLE INDUSTRIES
USER AND IOT DATA ANALYTICS

Marcelo Malizia, UDM Marketing Manager
CONNECTED DEVICES IN 2021

28 BILLION

13 BILLION
MOBILE PHONES, PC'S, LAPTOPS, TABLETS

15 BILLION
INDUSTRY and CONSUMER M2M / IoT DEVICES

Source: Ericsson Mobility Report, Nov 2015
LEVERAGE ON THE DATA ASSET

Leverage existing subscriber data asset

~10B* User

~5.5B* Consumer IoT

~12.5B* Industry IoT

Cellular and non-Cellular communication

Identification Authentication Services Security

LAUNCHING ERICSSON USER AND IOT DATA ANALYTICS

User and IoT subscriber database
Other data sources

Contributing to:
- Operational efficiency
- User experience
- Vertical opportunities

Unlock data

UDC embedded analytics
Analyze
Extract insights
Create Value

Extract insights
Create Value

USER AND IOT DATA ANALYTICS SOLUTION CHARACTERISTICS

Data management embedded analytics

- View
- Report
- Analyze
- Expose

Real-time
- Massive data analysis
- Database performance
- Protecting users privacy

› FAST to deploy
› FLEXIBLE to customize
› QUICK to scale
› SIMPLE to integrate

Consolidate - Analyze - Expose
Data consolidation
Service access for users and IoT devices

Data monetization
Real-time analytics on data

Data security
Controlled access and exposure of data

Empowering the Internet of Things value chain
NEW VALUES FROM INSIGHTS
Analytics use cases

**Operational efficiency**
- Internal efficiency on IOT and User data management
- IOT Cross DB consistency
- Plan-to-provision
- Roaming analytics

**User experience**
- Personal management of connected devices
- Connected bicycle
- Smart alarm
- Connected house

**Vertical opportunities**
- Monetize insights towards the industry
- Roaming analytics
- KPI monitoring
- Connected smart billboard
Ericsson and Swisscom working together to improve network and operational efficiency based on subscriber data analytics.

**CHALLENGE**

› How to secure network performance while extracting insights from subscriber database in real time.

› Be prepared for the unknown. Different stakeholders requesting different answers - and they need fast answers

**SOLUTION**

Ericsson User Data Consolidation (UDC)

Empowered with embedded Data Analytics functionality

**GOALS TO SWISSCOM**

› Efficiency and speed

› Answer to stakeholders needs quickly

› Securely pave the way towards Big Data

In collaboration with:
Plan-to-Provision IoT Operational efficiency

Managing mass IoT devices more efficiently
Be able to add, remove and change device configurations centrally

Examples
› Optimize services quality settings on device basis
› De-provision inactive devices (upon certain conditions)
› Move massive number of devices to new access types or service (e.g. 3G to 4G and later 5G)

Operator
› Be ready for massive roll-out of IoT devices with different characteristics
› Agile management of devices (e.g. active, deactivate, reconfigure)
› Optimize provisioning data for each device type
› Export only relevant data and attributes (no “noise” data)

Ericsson Centralized Database
360° view of data

Efficiency Customer Vertical

Analyze
Exposure
Bulk provision
CONNECTED BICYCLE
User experience and Vertical opportunities

Empowering Operators to provide more value in the IoT chain

External databases

Location data

User and device data

Ericsson Centralized Database

User and IoT data analytics

Analyze

Expose

Consumer

› Device monitoring (e.g. find my bike)
› Control from distance (e.g. lock/unlock)

Vertical - Insurance company

› Target offerings to owners of high-end bikes (e.g. racing bikes or mountains bikes)
› Potential fraud/theft detection and control (e.g. bike moving in a different location than its owner, notify owner, lock, locate)

Vertical - Community bicycles

› Bike rental history (who rented it, when)
› Planning and maintenance (insights and reporting on bike service usage and bikes’ connectivity)
› Locate available bikes (service to consumers)

Efficiency

Customer

Vertical
IOT ROAMING ANALYTICS
Operational efficiency and Vertical opportunities

- Providing better device tracking capabilities
- Improving revenues
- Ensuring QoS when roaming

Vertical – Containers’ company

- Track where the containers are
- Track where they have been and if they deviated from the planned route

Operator

- Track roamers location
- Optimize roaming partnerships
- Evaluate how changes in regulation will affect roaming revenue

Global insights

Ericsson Centralized Database

- Resources
- Roaming optimization

Vertical – Containers’ company

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Global insights
ERICSSON OFFERS:

- Experience, credibility and market presence
- Analytics with simplicity
- Device agnostic solution