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EVOLVING OPERATOR ROLES

How the Internet of Things can create innovative solutions that support society

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WHAT IS THE INTERNET OF THINGS?

A definition

The Internet of Things (IoT) is the design and implementation of internet-based systems and solutions that interact with the physical environment. It stems from Machine-to-Machine (M2M) applications and technologies, and will continue to rely on M2M solutions to bridge the gap between digital and physical spaces.

With the IoT, devices will be able to share data by connecting to the internet, rather than communicating with a specific application on a Wide or Local Area Network. In fact, the IoT will enable communication between any imaginable aspect of the environment – from nature and buildings, to vehicles and appliances.

The IoT can bring efficiencies and new business value to various industries and also tie industries, people, and parts of society together. This is where the IoT becomes a focus area for governments and institutions that are looking for ways to create well-functioning societies. For example, sustainability targets and rising energy demands are putting pressure on infrastructure, transport and energy industries, and IoT solutions are already in place in the form of smart metering and eCall, which have been used in Europe and the US.

User expectations

The digital services marketplace is increasingly connecting industries and facilitating cross-industry applications, services, business models, loyalty programs and advertising.

Many actors in the ecosystem will benefit from this connected marketplace. For example, companies will gain access to new revenue streams, developers will have one interface for APIs, and customers will be able to use one marketplace where they can buy apps and contact customer care.

Telecom operators will also have a chance to expand their part in the value chain by evolving from a network and connectivity provider to a communication service provider (CSP). Telecom operators need to develop a good understanding of what the IoT will mean to them. They need to become ecosystematic, i.e. commit to open-ended innovation and collaborate with external partners to create a new range of services.

These scenarios are realized by the increasing convergence of IT and telecoms.

Driving factors

In this emerging marketplace, M2M communication is taking off, driven by declining costs, innovation in sensor battery power, improved coverage, more capable radio technologies, regulatory mandates, and a growing range of successful applications and business models.

Powerful mobile devices, data-network-connected computers, sensors, big data and analytics, and cloud-provided services are all examples of what comprise ICT tools.

Underpinning the digital transformation

CSPs are increasingly looking to IoT models for their digital services offerings and innovation.

In a recent survey performed by the TM Forum (January 2014), the following digital services were of interest to CSPs: home/business facility monitoring, device remote control, telematics, and general M2M services.[1]

More importantly, the IoT enables B2B2X business and operational models to become key cornerstones of the digital ecosystem.

This creates new challenges, meaning CSPs need to:

- Enable a complex ecosystem
- Secure the ecosystem and manage policies
- Comply with strict data handling and privacy laws
- Find ways to analyze data and monetize information exchanges
- Monitor, diagnose and control devices and applications

A strong Service Enablement platform integrated within a state-of-the-art Service Innovation Framework is required in order to:

- Connect ecosystems with developers, customers and marketplaces in the Networked Society
- Leverage investments already made with the Network, Operation and Business Support Solutions
- Orchestrate the underlying business and operational flows in an agile, consistent and efficient manner

Service Enablement provides functionality across different systems, thereby lowering the costs for implementing solutions and making it easier to build new applications.

A strong focus will be on the ability to exploit all the assets and capabilities available in the network, service and business layers. For this reason, there is an increasing need to make those assets available through programmable interfaces which can be used by the ecosystem to quickly and cost-effectively create new applications and services.

Only by empowering this modularity will CSPs be able to support millions of applications, while at the same time taking advantage of mainstream technologies and enablers.

Main players in the IoT ecosystem

	Communication service providers	Systems integrators	Technology platform vendors	Device manufacturers	Over-the-top players
Differentiators	> CSPs actively engage with suppliers to ensure the right combinations of people, processes and technology > They roll out global M2M solutions	> They deliver integrated, end-to-end M2M propositions > They support the full transformation lifecycle	> They provide best-in-class M2M platforms > They can establish and participate in vendor groups to promote interoperability across industries	> Can take a pivotal role in innovation > They enrich the functionality of devices	> Have expertise to deliver scalable solutions > Have potential to be a big driver of growth
Challenges	> Understand different industries and build versatile solutions > High bandwidth and international roaming charges are a major barrier	> Require commercial models for taking a key role in risk sharing > Need multi-skilled teams	> Need open interfaces > Must engage as a partner in the ecosystem	> Are under pressure to drive down costs of terminals	> Yet to establish influence in the ecosystem

[1] Transforming to a Digital Business – 2014 TM Forum

HOW DOES THE IOT SUPPORT SOCIETY?

The evolution of the Networked Society means that services now require a dynamic utilization of connectivity.

When business assets connect and start to communicate with each other and with information systems, they enable innovative services. These help businesses to extend their offerings, tap into new revenue streams and stay profitable in a fiercely competitive marketplace.

IoT opportunities can be separated into two main areas:

- **Empowering businesses and people:** IoT solutions will create value across businesses, governments and people. It is about connecting society, and catering for new customer needs.
- **Transforming industries:** The IoT can impact value chains, transform processes, improve resource efficiency and enable new types of services and applications, thereby altering business models and creating new marketplaces.

In this paper we describe a few examples of how the IoT transformation can deliver benefits in a couple of industry segments by enabling either disruptive use cases or empowering more efficient, effective ways of executing relevant business processes.

Travel and transportation

Transformation scenario: Carpool collaboration

A flexible and affordable self-service ride sharing app could enable people to search and book vehicles based on a simple per-minute, per-hour or per-day tariff scheme. It would support communities in achieving reduced emissions targets and air quality improvements.

Empowerment scenario: Intelligent road infrastructure

The IoT could be used to create centralized platforms that control and manage roads, enabling improved user safety and security, as well as more efficient maintenance. Local authorities could use these platforms to provide people with real-time information about traffic conditions. The platforms would also facilitate quick responses to adverse weather or road incidents in accordance with pre-programed action plans.

Healthcare and wellness

Transformation scenario: Personalized wellness

In this instance, apps and sensors can be used to continuously monitor characteristics such as diet, blood pressure, etc. The data is sent to an online personal wellness program that is accessible by the customer and their physician. It provides an overview of the individual's health status, offers personalized recommendations for exercise and diet, and is used alongside social media channels for customers to share experiences and accomplishments.

Empowerment scenario: Digital hospital

Here, the IoT can be used to digitize healthcare records, and enable the remote control of medical and telemedicine services. ICT can be used to reliably deploy, transport and integrate medical data and images 24/7.

Tools for success

In order for service providers to successfully deliver IoT services and make the most of the opportunities they present, several capabilities must be realized.

These capabilities need to:

- Take a horizontal approach to business transformation
- Enable a digital services ecosystem
- Ensure best-in-class performance and customer experience
- Provide a fully industry-agnostic platform that serves multiple industries with common functionality

Analytics and data management
Analyzing data will help service providers to discover meaningful patterns and trends in the usage of IoT applications, which can then be passed on to enterprises to create new services. This data management creates value from information and develops insights to monetize IoT-based transactions.

Ericsson's process for dealing with this challenge is called Insights in Motion and consists of three elements:

- Quality-of-Insights (QOI): Identify important information and source relevant data
- Time-to-Insights (TTI): Minimize the time between data retrieval, analysis and exposure of useful insights
- Return-on-Insights (ROI): Connect insights with value propositions to ensure that they drive business advantages

Optimization and KPI measurement
This addresses the need for the service provider to enhance the customer experience and optimize Total Cost of Ownership (TCO) by maximizing efficiency and effectiveness of devices, networks and applications.

Security and policy enforcement
CSPs need to enforce policies associated with security and corporate compliance in order to reduce misuse, fraud and cyber-attacks on an IoT solution.

Regulatory requirements and data management
This will ensure that the service provider's IoT ecosystem complies with data transmission and storage policies.

API exposure and management
CSPs need to be able to share key assets with partners, for the creation of innovative services that open new streams.

Monetization
Generating revenue enables CSPs to establish marketplaces, set up new business models and form revenue-sharing settlements with their ecosystem partners.

Business assurance
Tracking and monitoring IoT business processes, functions, applications and devices will help to streamline them, thereby minimizing service downtime.

Ecosystem enablement
This is achieved by focusing on the tools, methodologies and APIs needed for creating and managing partnerships in a B2B2X environment at an industrial scale.

Application creation and user interaction
The IoT supports application developers in delivering superior, uniform user experiences through the use of graphical tools and a sophisticated multi-screen management solution.

Device management
This will ensure that a device delivers the right service throughout its lifecycle. Device management offers a cost-efficient tool for remote operation of connected devices, providing efficient installation, service provisioning, maintenance, upgrades and customer care.

WHY IS THE IOT IMPORTANT?

Today, there are a number of market characteristics that facilitate the IoT opportunity for CSPs.

- The decreasing costs of devices and components which make new applications affordable
- There is an abundance of mobile broadband connectivity technologies, enabling the effective use of the IoT in many disparate scenarios
- Policy makers are beginning to focus on ICT as an enabler for many aspects of society, including the environment, sustainability, safety and healthcare, and are looking into application of standards
- In many organizations there is a shared opinion about the key role of the IoT. In 2013, the Economist Intelligence Unit conducted a survey that showed over three-quarters of companies were exploring or using IoT services or applications
- Over a 10-year forecast period, the IoT CAGR is expected to reach 30 percent. It is estimated that there will be 50 billion connected devices by 2020 – one-fifth of these will support IoT applications

The role of CSPs

Depending on their history, market preconditions and ambitions, CSPs will be able to take on different roles.

The Network Developer

A basic role where operators provide connectivity to companies and their customers.

Their main capabilities include:

- Utilizing network infrastructure and performance
- Providing new M2M services
- Using multiple business models

The Service Enabler

This CSP markets platforms, software or infrastructure.

Their main capabilities include:

- Integrating new business platforms
- Supporting enterprises and processes
- Focusing on customer experience

The Service Creator

This CSP takes on the full package of connectivity and services. They strive to create new innovations and find new revenue streams by utilizing the cloud solutions, mobile web, platforms, and software at their disposal.

Their main capabilities include:

- Providing innovative end-to-end services
- Building new ICT-based ecosystems
- Cooperating with partners to support new value chains

HOW TO SEIZE THE IOT OPPORTUNITY

To make the most of the IoT, CSPs need to remember several key steps:

Transition from network developer to become a real value-added player

This requires the ability to move on from selling SIM cards and connectivity plans. CSPs need to establish value-based relationships where revenue depends on the business generated for customers. CSPs should pursue large-scale partnerships in order to provide true end-to-end solutions with greater value. Mergers and acquisitions are also options that could be considered.

Enter new industries

CSPs can generate new revenue to compensate for Average Revenue Per Connection (ARPC) erosion. This can be achieved by exploiting established channels and sales forces in order to manage the relationship with enterprise customers, as well as the existing footprint in the M2M market. Forming certain partnerships will also provide industry knowledge that CSPs might lack.

Exploit big data and advanced analytics

These will provide actionable and ecosystematic intelligence to businesses and retail users. CSPs need to implement IoT solutions that can be used across different applications and devices.

Be ready to support many diversified IoT applications

The IoT will lead to a progressive balance between mission-critical enterprise applications and consumer applications based on personal sensors, e.g. wearable devices.

Build the capacity required

In the past, basic M2M devices didn't need much capacity to exchange messages. The IoT will require much larger bandwidth and higher QoS, e.g. for applications based on HD video. This may impact international roaming agreements, which are designed to ensure that consumers have a consistent experience and service level even when crossing borders.

A systematic IoT Network Impact Analysis is needed to qualify requirements and develop traffic models in terms of user data, signaling, network coverage, roaming, etc.

Pay close attention to security and privacy issues

In a landscape made of complex ecosystems revolving around the same value chain, the ability to securely manage data and privacy at all levels is of paramount importance.

In order to capture a valuable stake in the IoT value chain, CSPs will need to stick to some guiding principles:

- Industrialize and be ready to scale both the device and customer lifecycles
- Adapt step-by-step according to the needs of the applications, identifying common solution components along the way
- Commercialize the service and build a working business model, based on a carefully defined go-to-market strategy
- Use the cloud as a delivery machine for the XaaS model

Ericsson is the driving force behind the Networked Society – a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, businesses and societies to fulfill their potential and create a more sustainable future.

Our services, software and infrastructure – especially in mobility, broadband and the cloud – are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities.

With more than 110,000 professionals and customers in 180 countries, we combine global scale with technology and services leadership. We support networks that connect more than 2.5 billion subscribers. Forty percent of the world's mobile traffic is carried over Ericsson networks. And our investments in research and development ensure that our solutions – and our customers – stay in front.

Founded in 1876, Ericsson has its headquarters in Stockholm, Sweden. Net sales in 2013 were SEK 227.4 billion (USD 34.9 billion). Ericsson is listed on NASDAQ OMX stock exchange in Stockholm and the NASDAQ in New York.

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