M2M Platform and Vertical Applications: the experience of Telecom Italia

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WHY Machine To Machine for a TelCO (M2M)?

Vertical applications

Many billions scenario and capillary network

Revenues from value added services

Revenues from connections and quantities
Reference Architecture

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M2M Network platform (in the cloud)

Open API

M2M Service MNGT (CRM, Billing)

OSS/BSS

Fixed & Mobile Networks

GW

Gateway

Gateway

Femto

WSN No SIM

Actuators No SIM

SIM based Devices

Applications layer

App Store

M2M Service Layer

Networks Layer

Devices and distributed application Layer

G. Rocca, R. Gavazzi, G. Larini, M. Annoni, M. Lupano, E. Scarrone, P. Veltri

TELECOM ITALIA - UNCLASSIFIED
The M2M framework of Telecom Italia

The M2M Telecom Italia services are:

- **Connectivity** both fixed and wireless for devices;
- **Cloud Hosting** for apps (IaaS);
- **M2M management** services;
- **Vertical apps** for specific markets (for ex. Smart grid, e-Health, ITS)

Telecom Italia wants to avoid the bit pipe provider syndrome
The standard capability expected

- All the capability that are common to every M2M vertical application:
  - Interface with Devices;
  - Interface with Applications;
  - Legacy adapters;
  - Devices and Apps Self Discovery and Identity management (access controls);
  - Connectivity management (session, mobility);
  - Content Management (QoS);
  - Security, privacy and trust;
  - Service (apps and devices) Management (auto provisioning, auto configuration, self healing, SW and FW upgrade, ...)
The Telecom Italia M2M Platform

Location-Based Services
• Geospatial Coordinates
• Map Localization
• Location Reporting & History

Cost Control
• Single SIM Traffic Thresholds
• APN Filtering

Application Development
• API Partner Set Availability
• Apps Module Management

Asset Management
• Integrated Asset Visualization
• M2M SIM Attribute Management
• SIM-IMEI Coupling

Advanced Self Provisioning
• Online Order Management
• Multiple Addresses Management
• On-Demand SIM Activation

Managed Connectivity
• Connectivity Data Collection, Storage & Processing
• APN Shared
• Connectivity Module Management

Mobile Access Networks

Current Capability Focus (giugno 2011)
• SIM & Device Overall Connectivity Management
• E2E Vertical Application Integration (e.g. Energy Management & Automotive)
Application use case: E-health MyDoctor@Home Architecture

**Administrator**
Users and devices management, service settings

**Main Doctor**
He writes report of exams, he sets configuration data, he manages drugs therapy. Videoassistance.

**General Doctor**
Data and report visualization

**Nurse**
Data visualization, Patient assistance in performing measures using assisted gateway, Agenda of patients visits

**Patient**
Visualizations of his measures, of his data, of his configuration, of report of exams

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**MyDoctor@Home Gateway**

**MyDoctor@Home Platform**

**Centralization of data management (SaaS)**

**Management of different users**

**Different medical devices**

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Application use case: E-health
Patient’s gateway

Examples of Gateways

Examples of devices
Application use case: E-health Nuvola IT Home Doctor: Awards and deployments

Final Event European Health Optimum project held in Verona on 3-4 June, 2009 organized by the consortium Arsenal. First prize in the poster session.

28-May - ICMT Award 2010

Turin Molinette.
Regional Agency for Health Services (ARESS) of Piedmont has decided, in October 2010, to adopt MyDoctor@Home service in different hospitals of the Region. Initially it was involved in the Hospital Molinette in Turin (where the trial had been conducted) with a target of 416 patients managed by different departments of the hospital. The use of the service will gradually be extended to other Hospital as will be set with the aim of involving over three years about 5000 patients.

Trial MyDoctor@Home at Rio de Janeiro
Application use case: ITS (1/3)

Innovation and Standardization as key market enabler

- **R&D Projects**
  - eCoMove
  - GST
  - CVIS
  - HeERO
  - eMotion
  - Safetunnel
  - Open Gate
  - GAL-PMI

- **Standard ecosystem**
  - ETSI TC M2M
  - 3GPP
  - ISO TC 204
  - ETSI TC ITS
  - IEEE 802.11p & 1609
  - CEN TC 278

- **Trials & Pilots**

- **Operational Deployment**

- **Commercial Services**
  - Intelligent Transportation Systems (ITS) Services
    - Safety, Information, PAYD, Insurance, OEM Services
    - Freight, Logistics & Fleet Services
    - Local Admin. Governance, Eco-Sustainable Mobility
Application use case: ITS (2/3)

- ETSI TC ITS: harmonization of architectures
Application use case: ITS (3/3)

- Synergy among ETSI TC ITS and ETSI TC M2M Architectures

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TELECOM ITALIA - UNCLASSIFIED
Application use case: Smart Energy (1/2)

**TI GREEN**

- **Electrical consumption monitoring:** for production, lighting, air conditioning.
- **Alert in case of anomalies or exceeding threshold**

Geographical classification

Consumption type classification

Time based analysis consumption vs. type of contract
Application use case: Smart Energy (2/2)
Reference Architecture

- **Application Layer**
  - Diagnostica e Allarmi
  - Configurazione e Calibrazione
  - Reporting Management Modules
  - 3rd Party Applications
  - Asset Management
  - Authentication
  - Creazione report (cliente/geografia/tempo)
  - Gestione utenti e privilegi (security)
  - Analisi di risparmio
  - Confronto offerte/contratti
  - Analisi di costo su previsioni
  - Analisi scenari di mercato
  - Settlement
  - Interfaccia borsa elettronica
  - Forecasting
  - Order Management
  - Controllo fatturazione

- **Presentation Layer**
  - Blog/Forum
  - Wiki
  - Widgets
  - Maps
  - RSS feed
  - Report
  - 3rd Party API

- **Sensor Adaptor Layer**
  - ZigBee CUSTOM adaptor
  - TI ZigBee adaptor
  - EnergyTeam sensor adaptor

- **Data Layer**
  - ETL
  - Files / Liste esterne CRM
  - DataBase
  - Data Warehous eDataMart s
  - Business Intelligence su dati da sensori/attuatori

- **Self Management (Configuration, Provisioning, Maintenance)**

- **Custom and flexible reporting**

- **External Data analysis**

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Conclusions: The approach of Telecom Italia vs Standards and Vertical Applications

- The Use Cases presented were developed by TI before the existence of a consolidated standard for M2M;
- Now TI has plan to develop a M2M platform and it has already launched a SIM management platform as the first important module toward the M2M horizontal platform;
- Once the platform will be available this vertical use cases will evolve becoming vertical applications running on top of the platform;