D2.7 FUTURE APPLICATIONS REPORT

SECOND YEAR (MARCH 2010 TO FEBRUARY 2011)
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Revision History

Version	Revision	Date	Description	Author
1	1	2011-02-24	First draft version.	Nuno Cunha
1	-	2011-02-28	Second draft after partner comments	Nuno Cunha
1	2	2011-02-28	For Approval	Nuno Cunha
1	3	2011-10-03	Approved version according to the results of the Interim (M24) Technical Review Report, ref: ARTEMIS-ED-21-09 of 2011-07-19	Gareth May-Clement

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1. Documents

This section presents the list of applicable and reference documents as well as the documentation hierarchy this document is part of.

1.1   Applicable Documents

This section presents the list of the documents that are applicable to the present document. A document is considered applicable if it contains provisions that through reference in this document incorporate additional provisions to this document.

[AD-1]   "D1.5 Periodic Report", FP7-JU-EMMON-2010-DL-WP1-104-D1.5, Approved 2010-12-07.

[AD-2]   "D2.2 Exploitation and Standardisation Plan", FP7-JU-EMMON-2009-DL-WP2-002-D2.2, Version 2, Approved, 2010-06-04.

[AD-3]   EMMON APCA – ARTEMIS Project Consortium Agreement, Critical Software, SA, Nuno Cunha, CSW-EMMON-2009-AGR-04799, Version 1, 2009-07-31.

1.2   Reference Documents

This section presents the list of reference documents. A document is considered a reference document if it is referred but not applicable to this document.

The following documents are referenced within this document:

[RD-1]   EMMON public website; http://artemis-emmon.eu/ 2009-03-01

[RD-2]   Technical Annex, EMMON Project, ARTEMIS Joint Undertaking Call for proposals ARTEMIS-2008-1, Grant agreement no. 100036.

2. Purpose

This FAR (Future Applications Report) document provides a succinct overview of possible future applications and visions that can be aimed at using results from the EMMON Project.

These future applications and visions were a result of discussions targeted at a future world full of Internet Connected Objects (ICOs) where visions of IoT (Internet of Things) will materialise, with Wireless Sensor Networks (WSN's) being one of the building blocks.

Therefore, the realisation of any referred application and vision is clearly beyond the present technical feasibility. The timeframe for their implementation is, at least, 5 years in the future and in some cases much further than this.

The purpose of this document is to accumulate EMMON consortium "out-of-the-box" innovative views on such possible future applications and visions. As well as considering published third party future applications and visions.

3. Future Applications and Visions

3.1   Instant Security and Public Health Monitoring

Future personal and environmental WSN devices will be able to scan toxic and harmful components, e.g. explosives, pollution and virus/microbes. The network will allow us to be able to track their presence, proximity to people and their dispersal within urban areas, as well as their progress and path of dissemination in the society.

3.2   Context Aware Fee Collection

Future vehicle Internet Connected Objects with location and environment sensing capabilities will be able to monitor and charge environmental fees based on the amount of pollutants and energy consumed by the vehicle, depending on the region crossed during a given travel.

Fee collection will depend on the location, travel performed, potentially taking into account the parking space (and time) occupied by the vehicle.

3.3   Remote Regions Monitoring

Emerging Energy harvesting nodes will be able to survive in wild remote areas for a long time and in areas where a permanent link is difficult to install. There would be constant monitoring and collation of the WSN collected data. This could be performed by a swarm of UxV (several kinds of Unmanned Vehicles: air, ground, polar or maritime).

3.4   IoT becomes Social and Entertaining

The future possible interconnection of IoT personal and mobile objects with social networks and virtual worlds like the ones that are currently popular now (e.g. Farmville connected to real farms).

3.5   Personal Life Memory Recorders

Future widespread implementation of ICOs will allow the existence of several mechanisms to collect gigabytes of data related to each one's personal life. A full digital diary will be enabled by recording all information about one's life, creating a personal memory life multimedia searchable database.

3.6   Health ICOs to Monitor & Treatments

Future ICO's will monitor constantly personal health and provide automatic connection with medical facilities and personnel that can evaluate and make real-time decisions on personal health issues. Treatment will be performed also by ICOs that act as health actuators, providing intravenous stimulation and/or drugs.

The prevalence of lifestyle related disease (e.g. obesity, diabetes) as well as increasing longevity and ageing will make such ICOs devices necessary to provide in loco monitoring and treatment e.g. for keeping sugar levels stable.

3.7 Extended Environmental Consciousness

Future IoT will enable personal extended consciousness, by allowing each person's brain to be directly connected to a wide network of monitoring and networking things that can provide a cybernetic external view of the world.

4. Third Party Future Applications and Visions

This section is devoted to provide an index to future applications and visions identified by third parties not related to the EMMON consortium.

The purpose is not to repeat and copy all the information found but instead to collect references to relevant studies, within the same frame of mind and context.

4.1 Vision and Challenges for Realising the Internet of Things (IoT)

This document, published by the members of the Cluster of European Research Projects on the Internet of Things (CERPIoT) in March 2010 provides a list of Internet of Things Application Domains.

The document can be retrieved from ec.europa.eu/information_society/events/shanghai2010/pdf/cerp_iot_clusterbook_2009.pdf

The application domains referred are the following:

- Aerospace and aviation (systems status monitoring, green operations);

- Automotive (systems status monitoring, V2V and V2I communication);

- Telecommunications;

- Intelligent Buildings (automatic energy metering/ home automation/ wireless monitoring);

- Medical Technology, Healthcare, (personal area networks, monitoring of parameters, positioning, real time location systems) Independent Living (wellness, mobility, monitoring of an aging population);

- Pharmaceutical;

- Retail, Logistics, Supply Chain Management;

- Manufacturing, Product Lifecycle Management (from cradle to grave);

- Processing industries - Oil and Gas;

- Safety, Security and Privacy;

- Environment Monitoring;

- People and Goods Transportation;

- Food traceability;

- Agriculture and Breeding;

- Media, entertainment and Ticketing;

- Insurance;

- Recycling.

4.2 6 Ways to Better Living: Inside an Internet of Things Home

Online article at:
http://www.readwriteweb.com/archives/6_ways_to_live_better_inside_an_internet_of_things_homes.php

Quotation: *"What if we took the leading sensor-based products currently being developed or already on the market, put them all under one roof, and added a typical American family? Would they just be the techiest family on the block, or would it have a significant impact on their lives?*

Here are six ways this Internet of Things family can see their lives change. They exercise more, save energy and water, budget better, know where their kids are at any moment, and they'll always have the right lighting for activities in the house"

- Bank Account-based Motivation;
- Health and Fitness;
- Water Conservation;
- Energy Use Scoreboard;
- Alert Services;
- Lighting Optimization.