CAPSIL

International Support of a Common Awareness and Knowledge Platform for Studying and Enabling Independent Living

CAPSIL Project Periodic Report Two
Grant Agreement: 215639
July 2008 – December 2008

Lead Author: Michael McGrath
Secondary Author(s): Benny Lo, Rachel King

Project Objectives for Period

2.12	Body Sensor Network Roadmap	2	R	PU	Month 9

Please provide an overview of the project objectives related to your work package for the reporting period in question, as included in Annex I of the Grant Agreement. These objectives are required so that this report is a stand-alone document.

The following are the objectives for the Body Sensor Network Work Package

The following are the objectives for the Body Sensor Network Roadmap

- Perform a baseline analysis of sensor networks focusing on the following topic areas:
  - Computational Capabilities
  - Radio Performance
  - Battery Life and Power Optimisation
  - Data Formats
  - Usability and Durability
  - Electrical Compliance
  - Contextual Collection of Data
  - Data Processing and Presentation
  - Sensor Data and Patient Outcome
  - Sensor Reliability

- Perform analysis of key research challenges for body sensor networks and document them into a roadmap document.
- Present roadmap in appropriate forums and collect feedback from content experts

Work Progress and Achievements during the Period

July

- Preparation for CAPSIL workshop in Tokyo
- Michael McGrath, Terry Dishongh attended the CAPSIL Workshop meeting in Tokyo Japan.
- Prof Guang Zhong Yang attended the CAPSIL Workshop meeting in Tokyo Japan
  - Discussion with partners of CAPSIL and WBSN roadmap with partners

Oct

- Initial baseline analysis for WBSN initiated.

November

- Work Package Coordination Meeting with Imperial College.
- November 28th – 29th Attendance at the CAPSIL meeting, Lyon
    - Discussion of CAPSIL and WBSN roadmap with partners
- Continued baseline analysis for WBSN roadmap

Wireless Technology	Blue Tooth	IrDA	IEEE 802.15.3a Ultrawideband (UWB)	IEEE 802.11a	IEEE 802.11b (Wi-Fi)	IEEE 802.11g	IEEE 802.15.4 (ZigBee)
Data rate (Mb/s)	1-2	4	100-500	54	11	54	250 kbps and 20 kbps
Output power (mw)	100	100 mw/sr	1	40-800	200	65	30
Range (meters)	100	1-2	10	20	100	50	30
Frequency band	2.4 GHz	Infrared	3.1-10.6 GHz	5 GHz	2.4 GHz	2.4GHz	2.4 GHz and 868/915 MHz
Comments	7 active nodes	Very Short-range	Low power, short-range applications	Wireless LANs with high data rate	Wireless LANs with low data rate	Wireless LANs With lower power	Low duty-cycle applications

Figure 1. Shows a comparison of the different radio technologies and their ranges/data rates.

December

- The initial baseline analysis identified the following key areas:
    - Current Wireless Systems
    - Computational Capabilities
    - Radio Performance
    - Battery Life
        - Low duty cycle
        - Clock gating.
        - Adaptive routing algorithms
        - Dynamic Voltage Scaling
        - Power Scavenging Methods
        - Vibration Energy generation.
        - Use of alternative energy sources such as solar and thermal energy
        - On-node processing
        - Analog signal processing
    - Data Formats
        - ISO/IEEE 11073
        - IEEE P1451
        - Continua Alliance

        - The IHE Initiative
        - Health Level 7
    - Interoperability
    - Usability and Durability
    - Compliance
    - Contextual Collection of Data
    - Data Processing and Presentation
    - Relationship Between Sensor Data and Patient Outcome
    - Clinical Benefits
    - Size
    - Reliability

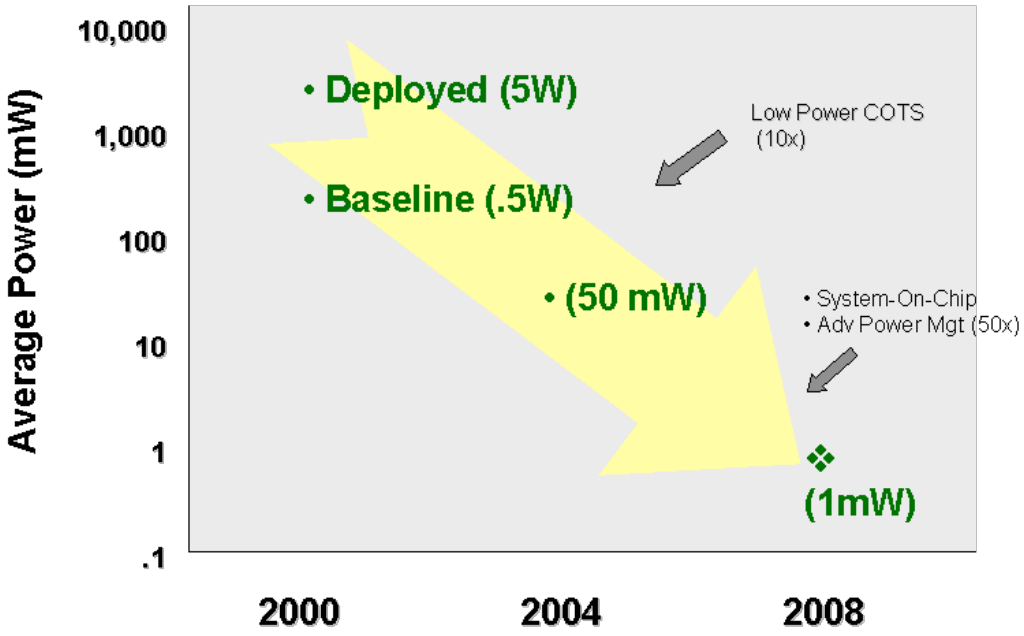

Figure 2. Average power is shown as a function of time. *Source: ISI & DARPA PAC/C Program*

- Based on the initial baseline analysis a number of key themes emerged. The key research challenges that emerged where as follows:
    - Autonomic Networks
    - Power and Battery Optimisation
    - Context Aware Sensing
    - Data Security
    - Privacy
    - Non Contact Sensing
    - Biocompatibility
    - Data Patterning
- Initial BSN roadmap documenting both the baseline analysis and the key research challenges was created and circulated to partners for review and feedback.

Please provide a concise overview of the progress of the work in line with the structure of Annex I of the Grant Agreement. For each work package -- except project management, which will be reported in section 3.5-- please provide the following information. A summary of progress towards objectives and details for each task;

Highlight clearly significant results

- Baseline analysis conducted for WBSN roadmap.
- Initial WBSN roadmap created and distributed for review.

If applicable, explain the reasons for deviations from Annex I and their impact on other tasks as well as on available resources and planning;

- No deviations taken

If applicable, explain the reasons for failing to achieve critical objectives and/or not being on schedule and explain the impact on other tasks as well as on available resources and planning (the explanations should be coherent with the declaration by the project coordinator) ;

A statement on the use of resources, in particular highlighting and explaining deviations between actual and planned person-months per work package and per beneficiary in Annex 1 (Description of Work)

If applicable, propose corrective actions.

- N/A

Deliverables

A table is provided for this section on the next page.

Please list all the deliverables associated with your work package due in this reporting period, as indicated in Annex I of the Grant Agreement.

Deliverables

D2.1: Body Sensor Network Roadmap (R, M21)

Milestones

M2.1: Workshop #1 – Outline of Roadmap and structure of Wiki entries (M3)
M2.2: Workshop #2 – Initial BSN Roadmap document presented and prototype BSN WiKi entries (M9)
M2.3: Workshop #3 – First draft of BSN roadmap document and initial BSN WiKi entries (M15)
M2.4: Workshop #4 - Final draft of BSN roadmap document and BSN WiKi entries (M21)