MIMOSA

Ambient functionality in MIMOSA from technology to services

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FP6/2002/IST/1-507045

MIMOSA IDENTITY CARD

MIcrosystem platform for MObile Services & Applications

- Integrated Project FP6/2002/IST/1507045
- Starting date: January 1st 2004
- Ending date: June 30st 2006
- Duration: 30 months
- Total Budget: 23 M€
- Community Financial contribution: 10 M€

MIMOSA GOAL

Make Ambient Intelligence a reality by developing a mobile-phone centric open technology platform

MIMOSA VISION

In MIMOSA vision, **personal mobile devices act as the principal gateway to ambient intelligence**.

The **technology platform for AmI** consists of the present telecommunication technology platform augmented with the following new key building blocks:

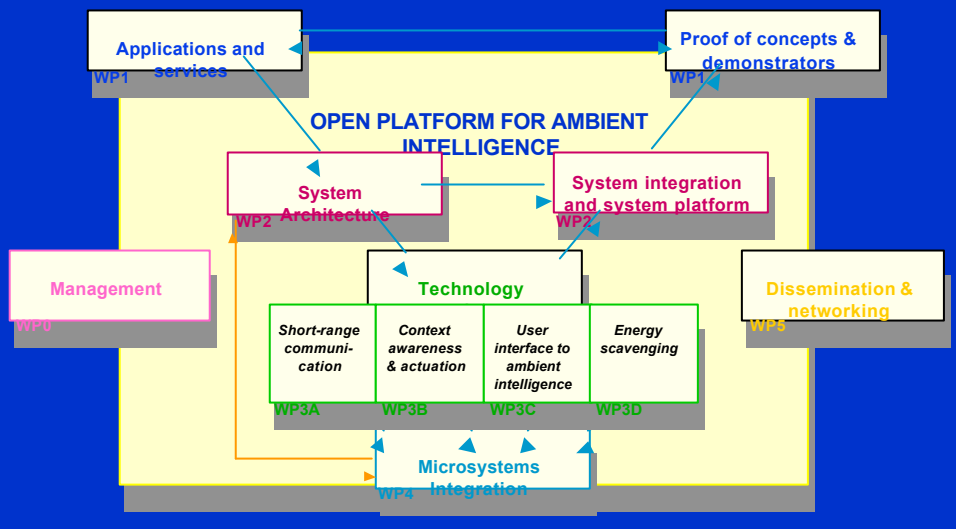
- wireless sensors exploiting the RFID technology
- highly integrated readers/writers for RFID tags and sensors
- low-power MEMS-based RF components and modules
- low-power short-range radios
- advanced integration technology
- novel MEMS sensors for context sensitivity and intuitive user interfaces.

In MIMOSA vision, the **user feels and really is in control of Ambient Intelligence**. Ambient intelligence applications help people in their everyday life: the applications are useful, usable, reliable, and ethical issues have been taken into account in the design.

MIMOSA CONSORTIUM

16 Partners in 8 countries

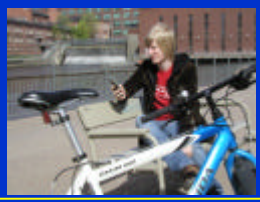
MIMOSA WORK PACKAGES



WP1 - APPLICATIONS AND SERVICES

WP1 will ensure that the development of the MIMOSA core technology is based on **user needs** and that the resulting technical solutions will be

- Easy to use, useful and acceptable from the **end user** point of view
- Applicable in different application fields from the **application developers** point of view



WP1 - MIMOSA APPLICATION FIELDS

Usage scenarios describe what MIMOSA technologies could provide to the end user and how the technology will look and feel in different everyday situations

Housing

Sports

Public deliverable available

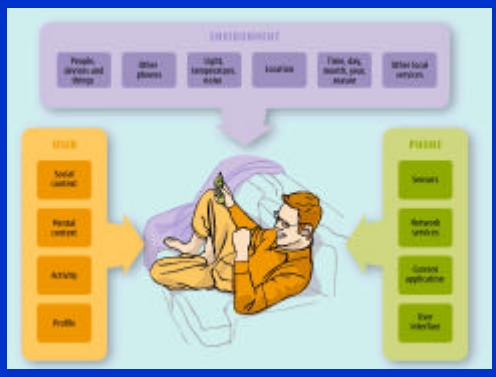
« MIMOSA initial usage scenarios »

Fitness

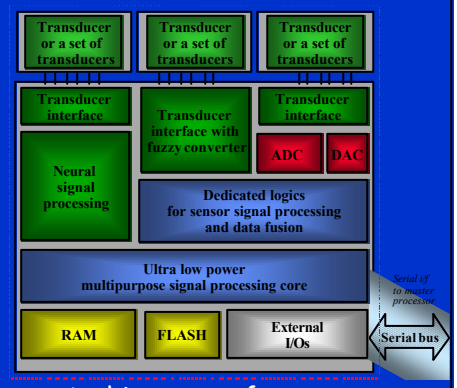
Healthcare

WP2 - SYSTEM ARCHITECTURE

WP2 focuses in creating **specific architectural descriptions** of local connectivity, intelligent sensors, context information processing and novel user interfaces



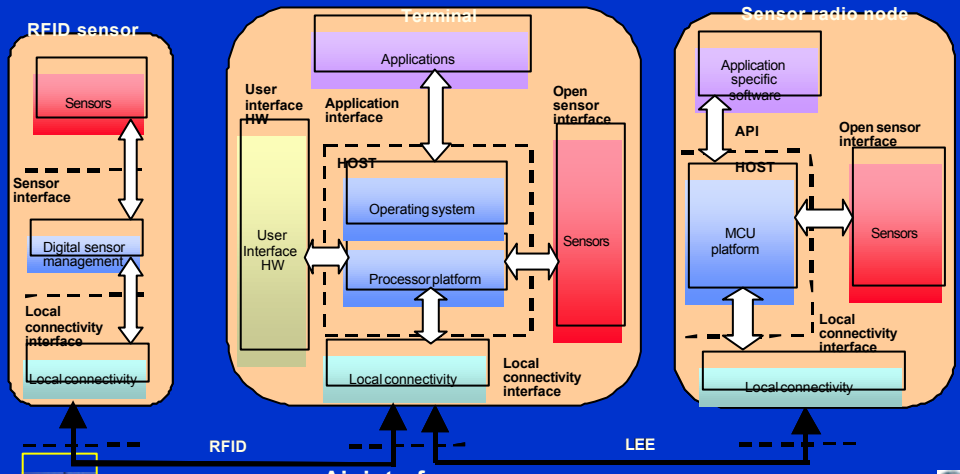
Architectures for context information processing



Architectures for intelligent sensors

WP2 - SYSTEM ARCHITECTURE

Overall architectural specification (OMAS) for **mobile-device centric open technology platform** to Ambient Intelligence



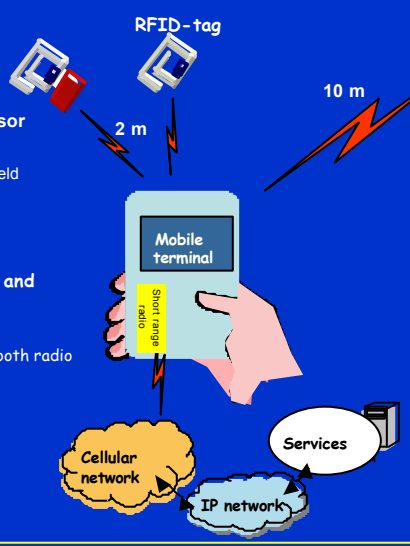
WP3A SHORT-RANGE COMMUNICATION

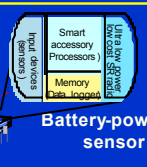
Task 1:
Wireless remote-powered sensor

- 2.4 GHz RFID-technology
- passive: remotely powered by RF-field

Task 2:
Reader/writer for wireless remote-powered sensors and RFID-tags

- 2.4 GHz RFID-technology
- maximized integration with Bluetooth radio





Battery-powered sensor

Task 4:
Low-power battery-powered sensor node radio

- 2.4 GHz low-power sensor node radio
- high-Q passives, MEMS, advanced CMOS (130nm SOI)

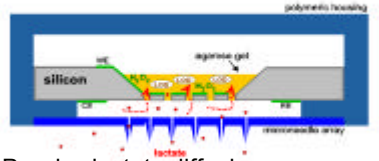
Task 3:
Ultra low-power wake-up radio

- novel 2.4 GHz wake-up service for Bluetooth master radio
- increase battery lifetime
- high-Q MEMS-passives (BAW reonator)

W3B: CONTEXT AWARENESS & ACTUATION

POLYMER MICRONEEDLE & LACTATE SENSOR

Smart lactate sensor plaster



Passive lactate diffusion

Interface for short-range wireless communication

MIMOSA innovation:
continuous monitoring lactate sensor with painless micro-needle transdermal fluid transfer

First Si-master of sharp microneedles

W3B: CONTEXT AWARENESS & ACTUATION

3D-GYROSCOPE AND 3D-MAGNETOMETER

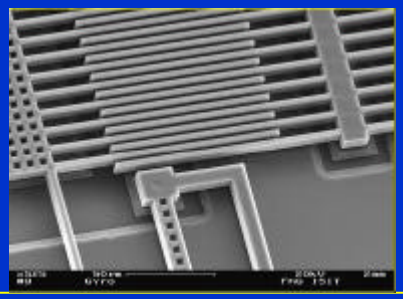
Autonomous tracking of position, motion, orientation, tilt of:
user or parts of the user's body
mobile terminal, smart pens, etc.

9D-motion tracking unit:
(low-power, low-cost)

→

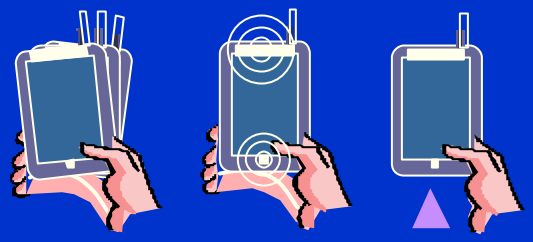
Applications:
Sports/ fitness
Inertial user interface

W_x W_y W_z	**Angular rate**
a_x a_y a_z	**Acceleration/ Tilt**
B_x B_y B_z	**Magnetic field**



WP3C – USER INTERFACES TO AmI

- Objectives
  - Propose and investigate transducer systems technology that can be employed as **user-friendly interfaces to the intelligent environment** via the personal trusted device
- Interface types
  - Inertial user interface
  - Acoustical user interface
  - Optical user interface

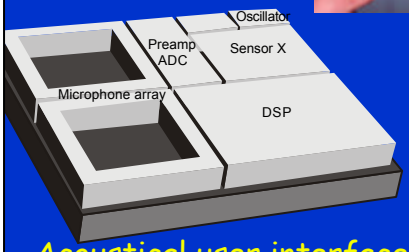


Inertial UI Acoustical UI Optical UI

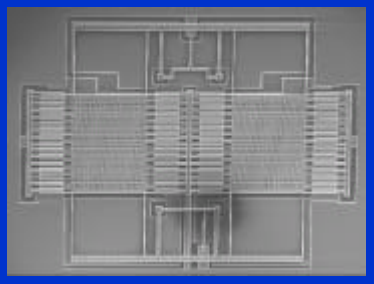
WP3C – USER INTERFACES TO AmI

Micro-mirror

Optical user interface
Laser scaning microprojector



Acoustical user interface
Silicon microphone array



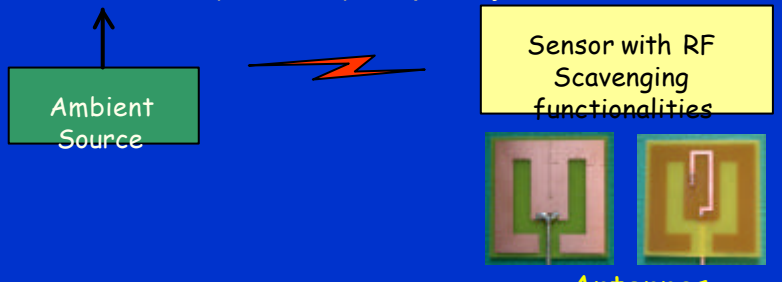
Inertial interface
3-axis gyroscope

WP3D – ENERGY SCAVENGING

- Developing energy harvesting components for powering sensor nodes:
  - Energy is gathered for powering the sensor between two data acquisitions
  - Energy scavenging solutions are various: RF, PV Cells, Thermocouples…

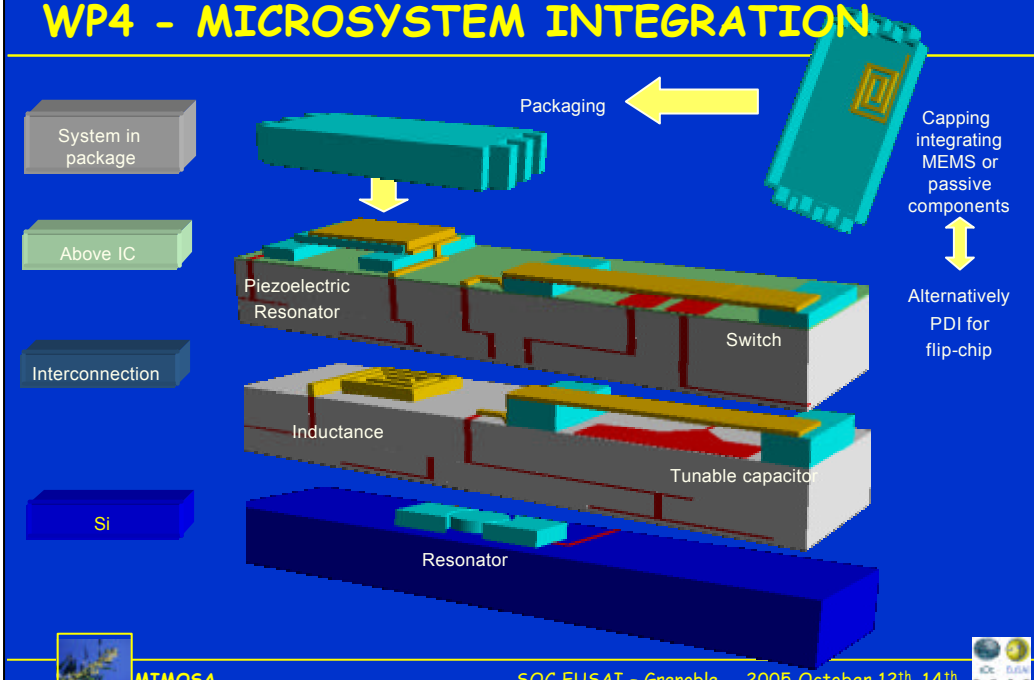
⇒ Investigation on **Electromagnetic Energy Scavenging**

⇒ Focus on GSM (900MHz) frequency band



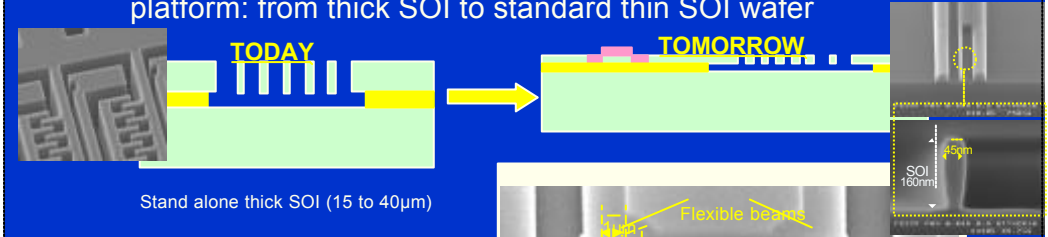
Antennas

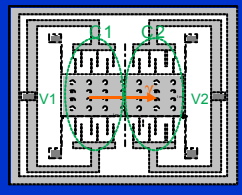
WP4 - MICROSYSTEM INTEGRATION



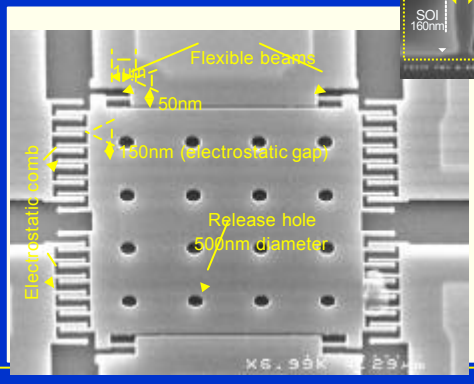
WP4 - SOI PLATFORM FOR EMBEDDED MEMS

- Feasibility of embedded resonator with standard CMOS-SOI platform: from thick SOI to standard thin SOI wafer





Planar accelerometer



WP5 - MIMOSA DISSEMINATION

More information available on the MIMOSA public website:
http://www.mimosa-fp6.com

MIMOSA contacts:

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Acknowledgements

- European Commission for the funding of the project MIMOSA IST-2002-507045
- All the partners of the MIMOSA project for their fruitful collaboration & discussions

Thank you for your attention

Questions?