Market vs WSN
Trieste ICTP 2012

International Awareness Conference on Sustainable Wireless Solutions for Environmental Monitoring

Andrea Marco Borsetti
CEO & Founder VE
andreamb@verdeerba.com

Preamble

WSN is a technology enabler to enhance knowledge about the world around us and make better use of resources (especially when they are scarce)

VerdeErba is a startup company aimed to investigate this opportunity balancing wireless technology adoption with real problem solving.

Using WSN we are trying to extend our sensing capabilities to better understand and later control the environment around us.

Some of the questions we are willing to investigate are :

- Is any reason to really promote WSN WW?
- Why this technology is not yet widely adopted ?
- Is there any barrier to bypass to have a better result ?
- And finally if our vision is correct, what we need to do for succeeding and being part of a next innovation cycle?

Background

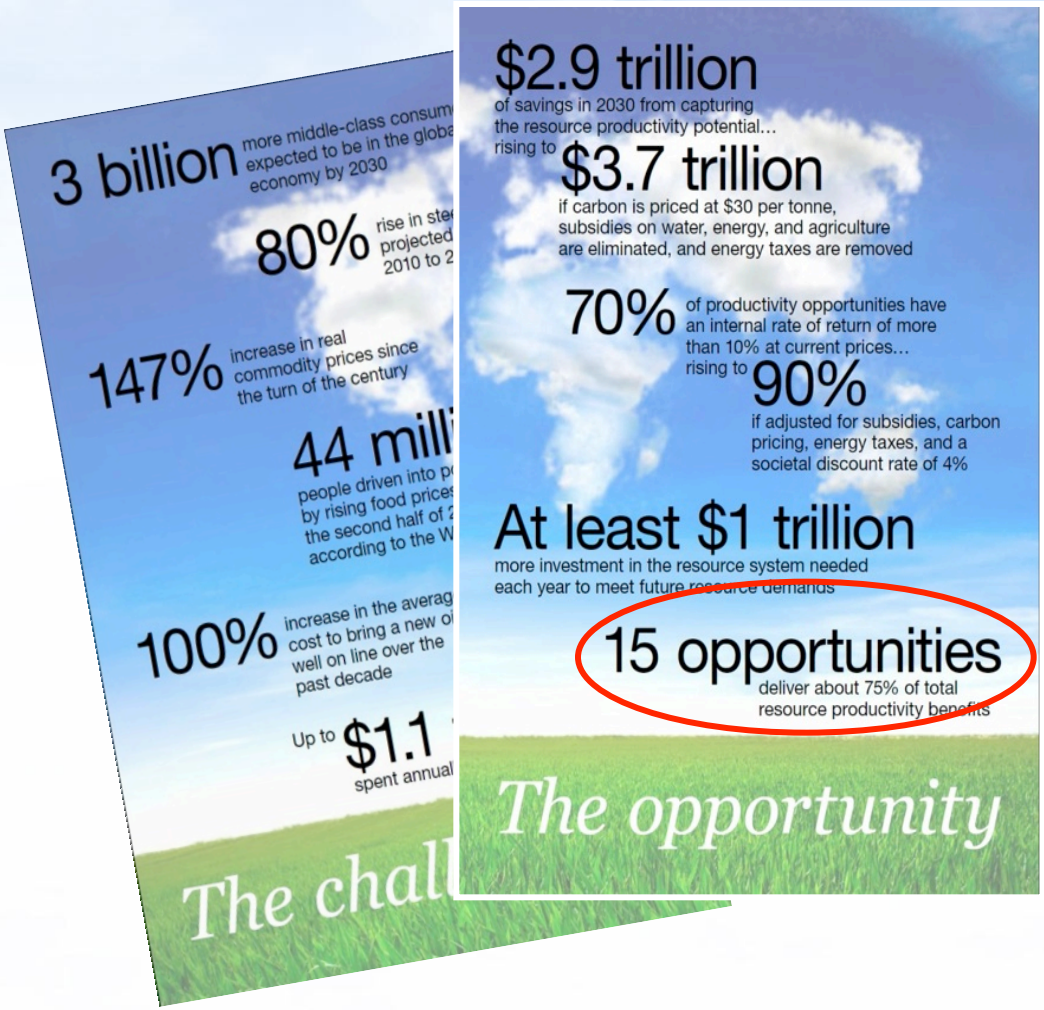
- The physical world itself is becoming a type of information system.
- In what's called the Internet of Things, sensors and actuators embedded in physical objects, from roadways to pacemakers, are linked through wired and wireless networks, often using the same Internet Protocol (IP) that connects the Internet.
- These networks churn out huge volumes of data that flow to computers for analysis.
- When objects can both sense the environment and communicate, they become tools for understanding complexity and responding to it swiftly.
- What's revolutionary in all this is that these physical information systems are now beginning to be deployed, and some of them even work largely without human intervention.

Source: Michael Chui The Internet of Things – McKinsey Quarterly 2010

The vision

Smart Things Better Life

What the future ?



A McKinsey 2011 report idenifies some trends in the global economy of next years:

+ 3 billion middle-class consumer within 2030 (BRIC countries)

Increase in real commodity prices

Possible savings from 2.900 to 3.700 Billion USD capturing the resource productivity potential

From 70% to 90% of these opportunities have an internal rate of return more then 10%

source: MGI - Resource Revolution: Meeting the world's energy, materials, food, and water needs – McKinsey Quarterly November 2011

They found 15 business opportunities able to deliver about 75% of total benefits

15 business opportunities

Some of these opportunities refers to better control of human processes enabled by a smart adoption of WSN

1. Building energy efficiency
2. Increasing yields on large-scale farms
3. Reducing food waste
4. Reducing municipal water leakage
5. Urban densification (leading to major transport efficiency gains)
6. Higher energy efficiency in the iron and steel industry
7. Increasing yields on smallholder farms
8. Increasing transport fuel efficiency
9. Increasing the penetration of electric and hybrid vehicles
10. Reducing land degradation
11. Improving end-use steel efficiency
12. Increasing oil and coal recovery
13. Improving irrigation techniques
14. Shifting road freight to rail and barge
15. Improving power plant efficiency

What about the market ?

- Large market diffusion is still a dream
- Efforts made by institutional Think Tanks, labs and classrooms, seems not being enough to get WSN out from a restricted circle
- All the bricks seems are available but roadblocks still exist
- Today there is a gap between demand and offer.
- Probably this gap is not a consequence of technology limitations but it cames from a poor integration between different technologies

What we found ?

Value chain is quite complex

- HW producers
  - Sensors manufacturer
  - Wireless module manufacturer
  - Technology Integrators
- SW developers
  - Code writers (very low reuse..)
  - Logic & algorithm creators (very few of the ones needed)
- System Integrators
  - Focused on vertical apps narrow vision driven
  - “Spotted” solver even narrowed driven

All this fragmentation is a barrier to a widely large WSN adoption

The Gap

Today Wireless Sensors show
“an evolutionary delay" compared to the internet of things

Offering

- HW solutions available at the chip or board (scarce attention is for the RF component "external" to the chip or board);
- Devices are complex to configure and manage very misleading indications of potential performance (range radio to AXM, throughput up to y kb / s, etc.).
- War of protocols at the level 2 / 3 without any guidance to the final result
- Products for a market-oriented research laboratories, with an almost prototypical
- Skills required to integrate and manage WSN applications in realistic environments are still very high. Performance / reliability achievable are modest

Vs

Demand

- Plug & Play Solutions
- Integration between acquisition capabilities, data transmission, device management, security, reliability, resilience.
- Internet readiness
- Low costs
- "Consumer Approach«
- " large volumes «
- Upgradeable
- Outdoor scenarios
- Value Added Services Availability

A mantra: 8 VE keywords of the ideal solution

Save

Low energy consumption and low environmental impact

Smart

With local computation capability, predefined configuration, easy to use and install

Send

Able to communicate and cooperate over the net with different protocols

Store

Able to store data locally to reduce communication events and add reliability

Sense

«Feel» the environment, collect physical input and transform them in reliable data

Self

Awareness of itself and of the environment
Autoconfiguration
Autodiagnosis

Secure

Able to manage properly the security, critical in some environment

Safe

Able to guarantee a certain level of physical security needed in some outdoor or unprotected.

What we need, how to fill the gap ?

- First – we must build a friendly environment from sensing the data to process them (the physical point of view)
- Second – we must found a way to make data easily understandable to a large platform of applications (the logical point of view)
- Third – we must make available a framework to gluing together physic, logic & algorithm (which is the abstract point of view)
- Finally we must create an easy to use ecosystem facilitating us to improve efficiency all over, to better coexist with our limited and numbered (w) resources.

Conclusion

- We need better and repeatable “applications”
- Often applications do not grow up in lab or classrooms because by role & culture this environment is enabling more the technical side than the overall answer
- Applications must be economical feasible
- Keep in mind “market rules” is a good practice also in in pilots o non-profit projects

Critical factor is still

Deliver the promised value to the end user.

Solving real problems is quite different than win a technology challenge

We must think wsn being more market driven

VE Founder - Andrea Marco Borsetti

23 years of software & telecommunications

Geek and start ups founder

Internet in Italy 1993 – Professional service in Sideco 1995

High Volume Application Server Farm Designer

Sole 24 Ore @ Netscalibur 1999 up 2003

Long term relationship with customers in Enterprise

Early adapter of internet and Http based technology 1991/1992 SII, Microsoft successful Partner from 1996 to 2003 (@SIDECO), strategic open door testimonial and technology evangelist of Data Warehousing

Strategic thinking, creation of new business paradigm in TLC and Digital Divide.

Distribution and vertical market, created dominant position for Alvarion @Tel Aviv and in EU 2003 up 2010

By chance, lecturer at ICTP Trieste since 2005 and Diver since 1986, I know I am mature.. ;)-

Thank you.

Questions?