

Sustainable, human-centric, environmental information services, towards sustainable cities

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The sustainability issue

One penny for one more definition....

Achieving personal and societal well being while not just optimising available resources at all scales in an environmental friendly and humanitarian way, but also focusing on resolving personalised citizen's needs.



Urban development



- ❑ From ancient times urban structures provided access to services and goods. Citizens' well being was judged according to the access to these goods.
- ❑ Contemporary cities have not yet become "digital", i.e. supporting dynamic information flow to and from the citizens concerning the environment they live in, on the basis of their interests and profile.

IT: lever or burden?

- ❑ IT is considered to be the "holy graal" of contemporary sustainable development, as it helps replacing material with services, and is supposed to provide access to the latter for more people
- ❑ Nevertheless, the digital divide is more than a nuisance:

"If the information revolution is left to its own devices, it will increase the gap between the rich and poor people"
(M. Dertouzos)

In addition

- ❑ IT usage seems to be linked to "consuming reflections" rather than to the adoption of a new paradigm of sustainability.



What do we mean by “human centric services”

Services created to help people in their everyday life that

- ❑ Do not require special skills to be used
- ❑ Allow access to old and disabled people
- ❑ Are engineered so as to promote a society for citizens and not for solitudarians

Bringing things together: EI

Citizen participation in env. management and decision making is the key towards the improvement of the quality of life.

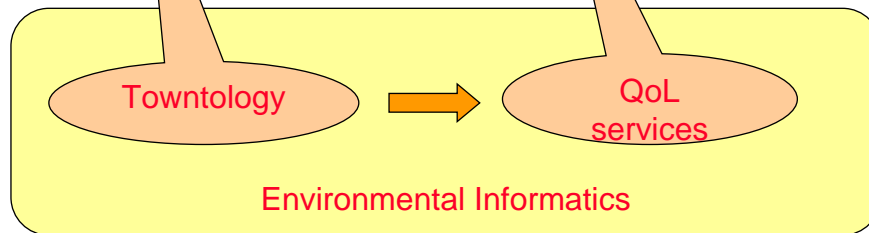
The former participation may be advanced only if citizens feel that they can actively take part, and not just be passive receivers of information or decisions.

Moreover, information received is not currently filtered on the basis of personalized needs (profiling), that may multiply the interest of the public to environmental issues.

The way to go: **Environmental Informatics**

Bringing things together: EI

- Building H.C. services results in the creation of the **virtual city** and **intelligent regions**: replacing material flow with services, that are widely available, thus smoothing the societal divide by reverse engineering of the digital divide



A definition of EI (1/2)

- Information and telecommunication technologies were introduced to support solving Environmental Engineering/Management problems....
- So, is **EI** the combination of software engineering and environmental engineering methods ???



A definition of EI (2/2)

- *EI should be considered as the combination of software and environmental engineering methods and tools for the creation of a new "knowledge-paradigm" towards supporting environmental well-being at an international, national, regional, community or personal level.*
- Citizen centred, environmental information services that will support societal sustainability while promoting personal well being.

From the urban web to the semantic web

The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation.



The consumer and producer *agents* can reach a shared understanding by exchanging *ontologies*, which provide the vocabulary needed for *discussion*. Agents can even "*bootstrap*" new reasoning capabilities when they discover new ontologies. Semantics also makes it easier to take advantage of a service that only partially matches a request.

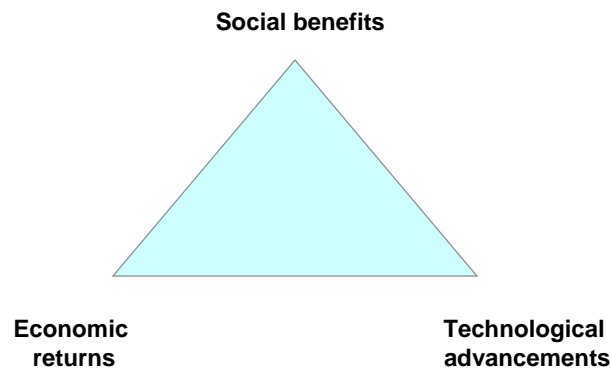
What about sustainable cities?

- ❑ Services are related to citizens, but citizens are related to cities.
- ❑ A new (or maybe old) city concept is of need...

“People come to the city to find safety and happiness, to lead the good life” Aristotle

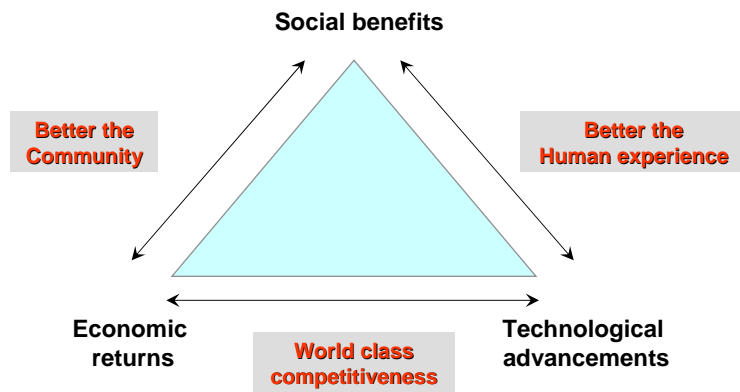
- ❑ Quality of life semantics extracted from urban semantics
 - An urban ontology may be used as the road map for the definition of quality of life semantics, and its use for QoL, human-centered, electronic information services

A Conceptual S-City model



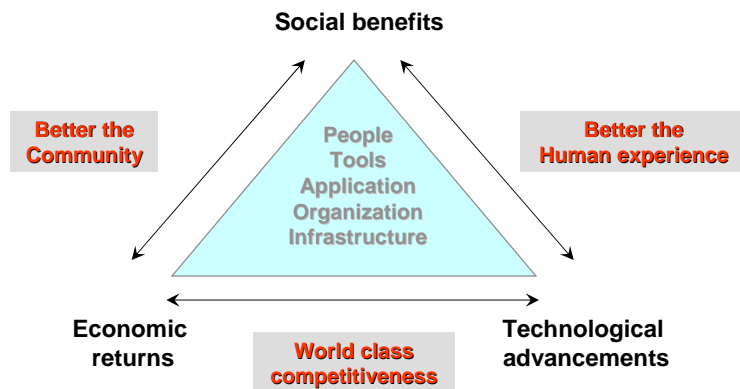
Source: "A conceptual model to analyze sustainability" Nathan Nifco, INFERTEC

Conceptual model



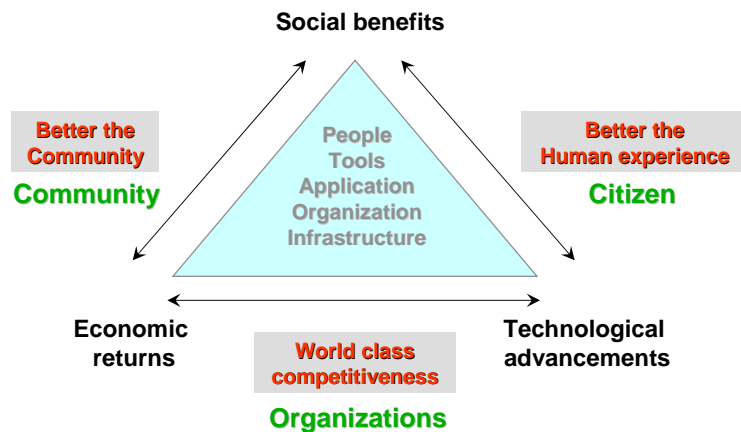
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Conceptual model



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The concept of electronic human-centric environmental services

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The former participation may be advanced only if citizens feel that they can actively take part, and not just be passive receivers of information or decisions.

Moreover, information received is not currently filtered on the basis of personalized needs (profiling), that may multiply the interest of the public to environmental issues.

Information is provided in an intuitive way, being easily understood, avoiding complex graphics and meaningless numbers.

Euphoria vs. pragmatism

- ↪ *The Human-centric approach is nothing else but a repeat of “ancient wisdom”, ref. to Ancient Greece (Plato’s Politiae, the cave metaphore...)*
- ↪ *Visions create euphoria, but reality calls for pragmatism.*
- ↪ *So, what to do... ???*

What to do...

- ❑ Develop services having the consumers in mind and not just selling statistics!
- ❑ Strengthen societies with customized, intelligent information services
- ❑ Provide service portals that will link everyday life and behavior to commonly understandable quality of life indicators
- ❑ Be pragmatic and put things to work: visions without application dimension can create “information smog”!!!
- ❑ **So.... A real world example**

The APNEE & APNEE-TU projects



Every morning...heading to work..



Every morning...heading to work..



- ❑ ... a crowded city
- ❑ ... traffic
- ❑ ... manage to drop my daughter at the kindergarten
- ❑ ... and purchase the anti-allergic spray I need..

At the same time

- ❑ ... air pollution levels are increasing or/and
- ❑ ... a pollen episode is possible by lunch time

But

- ❑ ... I don't know anything about it!

I would like to have ...

- ❑ ... access to information ...
- ❑ ... anytime, anywhere ...
- ❑ ... in a easily understandable way ...
- ❑ ... timely or even in advance

↪ EC legislation

Directive 90/313/EEC on the freedom of access to information on the environment their national legislation body/system, dir. 92/72/EEC (on air pollution by ozone), article 5, dir. 99/30/EC

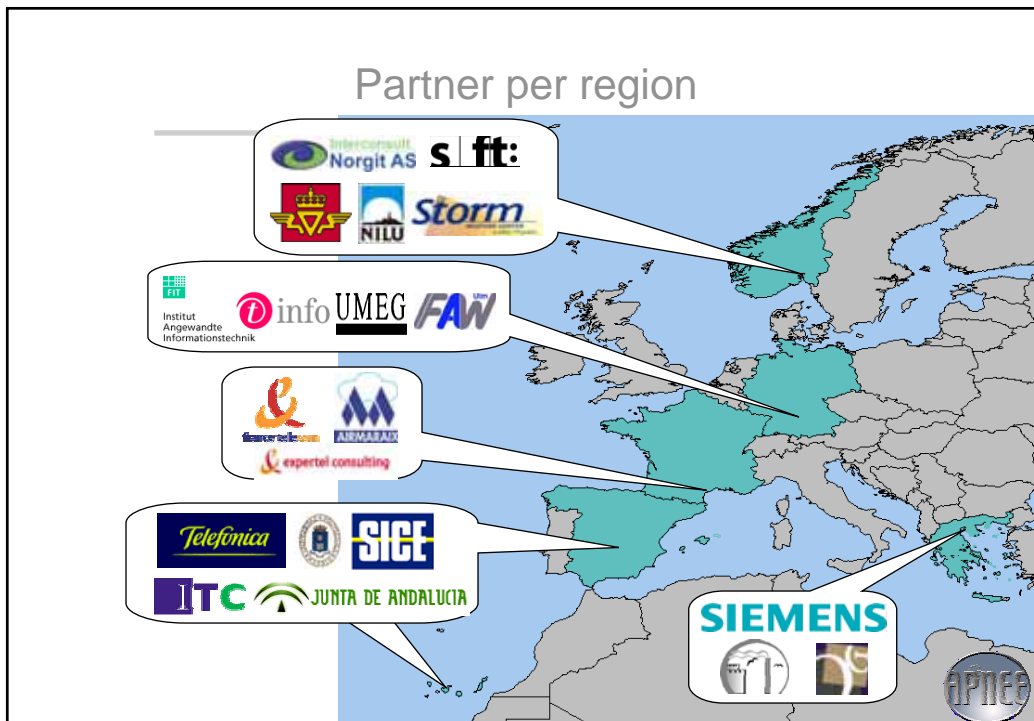
- ↪ *To provide the public with the appropriate AQ information.*
- ↪ *Information provided should include "a short assessment in relation to limit values and alert thresholds and appropriate information regarding effects on health".*
- ↪ *That when the alert thresholds are exceeded, member states shall undertake to ensure that the necessary steps are taken to inform the public.*
- ↪ *Use of internet and new technologies.*

Project APNEE(-TU)

- Coordinates
- APNEE - APNEE-TU [to you]
 - Air Pollution Network for early warning and on-line information exchange in Europe - Take Up
 - RTD (research and technological development projects)
 - Accompanying measures specific to technology take-up measures (trials)
 - Key action 1 Systems and services for the citizen: Environment
 - IST-1999-11517 - IST-2001-34154
- Time
 - APNEE 1/2000 - 12/2001
 - APNEE-TU 4/2002 - 3/2004



Partner per region



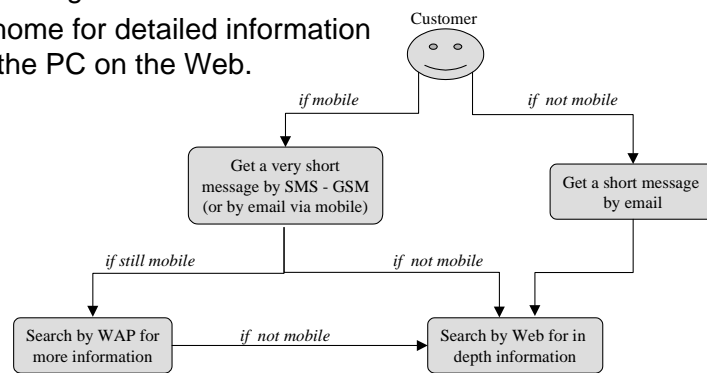
So, I am driving towards the office.....

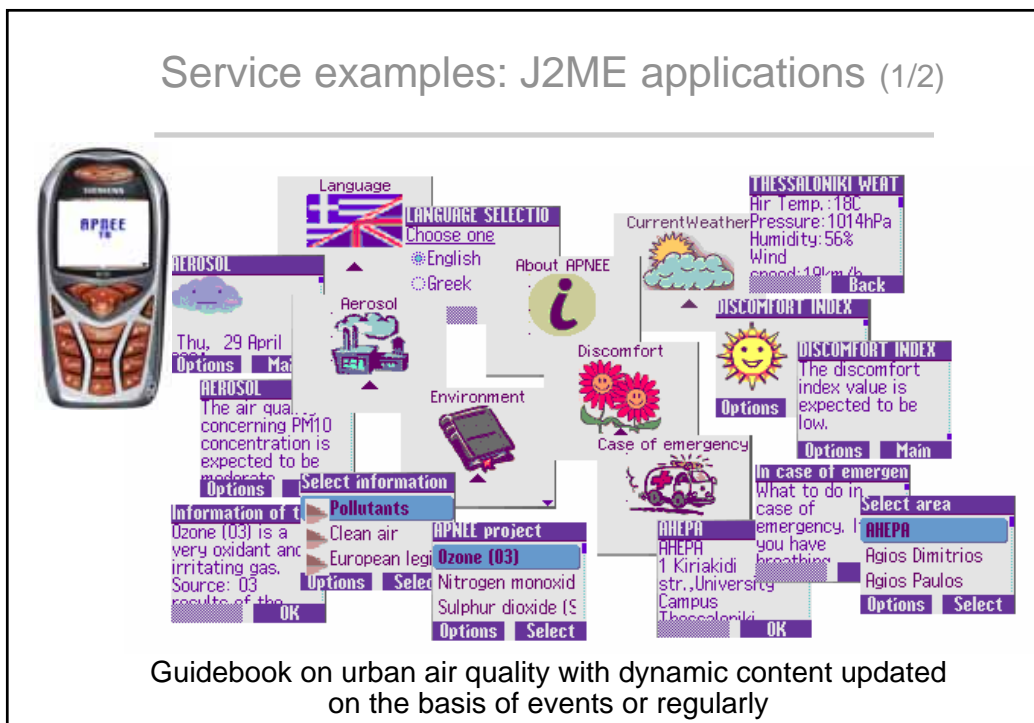
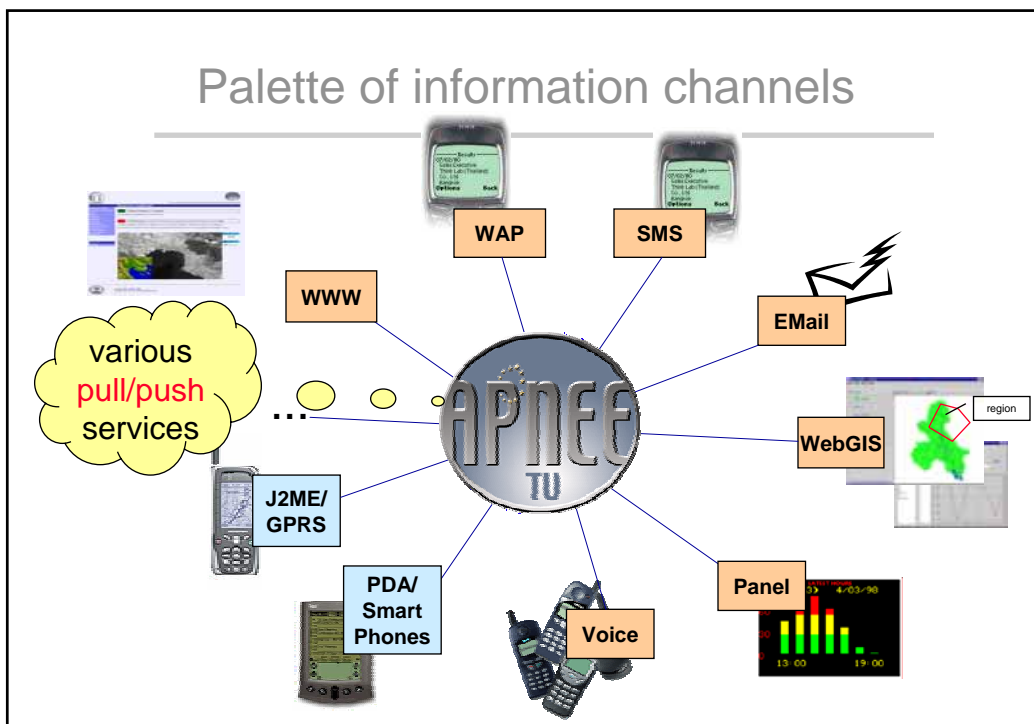
And I am an APNEE-TU information services user...
(the survival kit for the urban environment)



Complimentary Dissemination






1. get a short information by GSM **SMS**
(early warning – push technology),
2. look for further information on the **WAP/J2ME** (via **GPRS** or **UMTS**)
while being mobile
3. look at home for detailed information
with the PC on the Web.





Service examples: J2ME applications (2/2)



- Low 
- Medium 
- Medium-high 
- High 
- Very high 

A mobile phone screen saver/logo updated every 20 min, showing discomfort index info for Thessaloniki, Greece

PDA application



The information services are made available for PDA's via flexible, adaptable Velocity templates, and a technology that tailors content presentation on the basis of automatic browser detection

Some APNEE use cases

- ☑ Population groups **sensitive** to air quality levels
- ☑ Parents of **children** affected by respiratory problems, allergies and other related health problems
- ☑ People with **respiratory** problems
- ☑ **Elderly** people
- ☑ Performers of strenuous **physical exercise** or continuous labor in open spaces
- ☑ Frequent intra-urban **commuters**
- ☑ Information for **farmers** (**agricultural** activities)
- ☑ **Tourists** information

Some conclusions towards the future

- ☐ Quality of life may be used as the basis of advanced, human – centered information services
- ☐ City authorities should be prepared to migrate from static to real-time interactive environmental administration systems.
- ☐ **A new service-oriented relationship between city authorities and the public based on applied use of ICT innovations is emerging**
- ☐ APNEE/APNEE-TU are the way to go for personalized electronic information services for the urban environment
 - and major part of the core of the system is being made available as Open Source, i.e. **for free!!!**

Thank you!