



# Quality of Life Environmental Information Services: a SEIS forerunner

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# Rationale

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- Shared Environmental Information Space
  - Environmental Information accounts for a considerable percentage of PSI produced ( $> 50\%$ ), cost in the order of MEuros
    - EI is being produced more and more electronically
  - E-gov, e-accessibility and other initiatives support the development of urban semantics
    - Q.o.L is associated to semantics and EI.
  - The ICT industry (e.g. mobiles) has invested in technologies and is seeking for content and services

# The concept of electronic human-centric services

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Services created to help people in their everyday on the basis of certain assumptions:

- ❑ The average citizen wants specific information tailored to his or her immediate, everyday concerns
- ❑ The average citizen is not a scientist, and maybe not even an environmental “enthusiast”
- ❑ The average citizen does not understand the environmental science, nor does s/he necessarily *want to!*
- ❑ Simplification of the science-based information equals neither banalisation nor invalidation
- ❑ No simplification equals no communication
- ❑ Everyday utility is more relevant than scientific detail

# Intuitive, human centric presentation of E.I.

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# QoL and the environment

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- “The urban surface is a continuous screen, or a series of overlapping screens, onto which representations are projected” (Dewdney, 1998)
- Increased people’s feeling for access to services, facilities and amenities, play an important role in the perception of quality of life (Sénécal, 2002)
  - ↘ Paradigm: urban air quality management and information systems may support decision makers towards environmental management for a sustainable society, and may also “trigger” the creation of new, user-friendly, **human-centric environmental information services that advance the improvement of the general quality of life in the city** (Karatzas, 2003)

# Environmental legislation: access to information

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## □ Dir. 90/313/EEC:

- “Information relating to the environment” = **any** available information in written, visual, aural or database form on the state of water, soil, **air**, fauna, **flora**, land and natural sites, and on activities or measures adversely affecting, or likely so to affect these, and on activities or measures designed to protect these (including administrative measures and environmental management programmes).

- ...repealed by Dir. 30/04/CE



This is how a policy requirement generates a service requirement!

- Environmental information should be disseminated by means of available computer telecommunication and/or electronic technology

# What is needed:

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- ... **Access** to env. information...
- ... **anytime**, ... **anywhere**...
- ... **easily**, in an **understandable** way, yet also **scientifically sound**...
- ... **on time** or even **in advance**...

↪ And the EU legislation supports this !

Take a look at the new air Directive 2008/80

## PUBLIC INFORMATION

1. Member States shall ensure that up-to-date information on ambient concentrations of the pollutants covered by this Directive is routinely made available to the public.
2. Ambient concentrations provided shall be presented as average values according to the appropriate averaging period as laid down in Annex VII and Annexes XI to XIV. The information shall at least indicate any levels exceeding air quality objectives including limit values, target values, alert thresholds, information thresholds or long term objectives of the regulated pollutant. It shall also provide a short assessment in relation to the air quality objectives and appropriate information regarding effects on health, or, where appropriate, vegetation.
3. Information on ambient concentrations of sulphur dioxide, nitrogen dioxide, particulate matter (at least PM<sub>10</sub>), ozone and carbon monoxide shall be updated on at least a daily basis, and, wherever practicable, information shall be updated on an hourly basis. Information on ambient concentrations of lead and benzene, presented as an average value for the last 12 months, shall be updated on a three-monthly basis, and on a monthly basis, wherever practicable.
4. Member States shall ensure that timely information about actual or predicted exceedances of alert thresholds, and any information threshold is provided to the public. Details supplied shall include at least the following information:
  - (a) information on observed exceedance(s):
    - location or area of the exceedance,
    - type of threshold exceeded (information or alert),
    - start time and duration of the exceedance,
    - highest one hour concentration and in addition highest eight hour mean concentration in the case of ozone;
  - (b) forecast for the following afternoon/day(s):
    - geographical area of expected exceedances of information and/or alert threshold,
    - expected changes in pollution (improvement, stabilisation or deterioration), together with the reasons for those changes;
  - (c) information on the type of population concerned, possible health effects and recommended behaviour:
    - information on population groups at risk,
    - description of likely symptoms,
    - recommended precautions to be taken by the population concerned,
    - where to find further information;

## Public information

Member States shall ensure that the public as well as appropriate organisations such as environmental organisations, consumer organisations, organisations representing the interests of vulnerable populations, other relevant health-care bodies and the relevant industrial federations are informed, adequately and in time, of the following:

— ambient air quality in accordance with Annex XVI;

— any postponement decisions pursuant to Article 22(1);

— any exemptions pursuant to Article 22(2);

— air quality plans as provided for in Article 22(1) and Article 23 and programmes referred to in Article 17(2).

Information shall be made available free of charge by means of easily accessible media including the Internet or any other appropriate means of telecommunication, and shall take into account the provisions laid down in Directive 2007/2/EC.

Member States shall make available to the public annual reports for all pollutants covered by this Directive.

The reports shall summarise the levels exceeding limit values, alert values, long-term objectives, information thresholds and alert thresholds, for the relevant averaging periods. That information shall be combined with a summary assessment of the effects of those exceedances. The reports may include, where appropriate, further information and assessments on forest protection as well as information on other pollutants for which monitoring systems are specified in this Directive, such as, *inter alia*, selected regulated ozone precursor substances as listed in Section B of Annex X.

Member States shall inform the public of the competent authority or body designated in relation to the tasks referred to in Article 3.



# State of the art, technical and non-technical barriers towards operationalisation of research results

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## □ Sensor technology

- Usage of cheap sensors in large numbers that “broadcast” within their close vicinity: when a mobile phone approaches, an agent undertakes data transmission, and a J2ME application runs on the basis of this input

## □ Information should be broadcasted on a “easy to be materialize and free to receive” basis

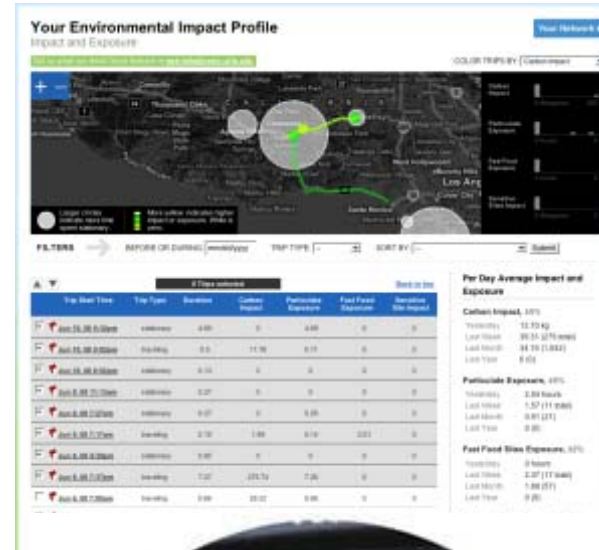
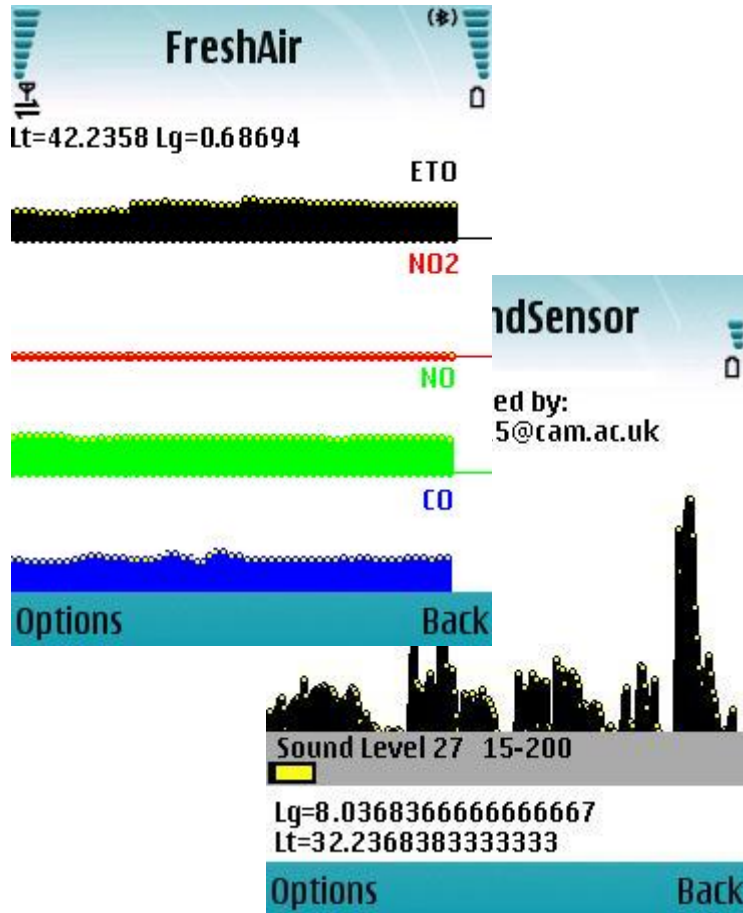
- Air quality related health impact assessment on the basis of “dosage functions”, for both in-door and out-door environments

## □ Citizens now exchange info via SMS (pull-based communication). This should be expanded to EI services

- Old example: web page with police blocks notification in Norway
- Citizen to be able to annotate (electronically) an EI source, with the aid of smart tags, posted via a mobile phone

## □ Thus, turning the citizens from a **passive receiver** of EI services to an **actor**, allowing him/her to formulate the content and the functions of the services to be made available for others (i.w. via web services on the fly)

# Participatory sensing of env. quality



# Service examples

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- ❑ Commuting route within a city: Alternatives may be prioritized on the basis of availability, service robustness, health exposure risks for asthmatic persons, sustainability measure in terms of energy consumption, etc
- ❑ Health status: asthmatic people, sufferers from cardiovascular diseases, children, elderly etc will be able to tailor the way that they will receive health warning and advices, on the basis of geo-referenced information related to hotspots within the urban web, street canyon related air pollution levels, microclimatic conditions, etc.
- ❑ Information presentation and interpretation means: advanced 3-D visualization of the air pollution levels and multimedia means will be combined with simplified, well recognizable health risk alerts, while SMS and other types of simple text massaging may be used as a stand alone way of information communication, or in combination to a graphical way of information presentation and interpretation

# Conclusions

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- ❑ The data will be-is out there!
- ❑ Use your mobile and grab them!
- ❑ Feed them into services!
- ❑ Refine and redefine env, pressures and threads!
- ❑ Participate, interact, formulate!
- ❑ A Shared Environmental Information Space will speed up the application of advanced, Quality of Life (QoL) information services that will allow for personalised, flexible content provision and communication mode (pull-push).
- ❑ The air quality domain may serve as a reference domain for the development of such services. Moreover, technological developments in micro-sensors and related ICT, will allow for the enrichment of information via multiple monitoring data coming from people commuting within a city, monitoring the environment, sharing their observations and suggestions, and thus creating a live and active participation society on the basis of QoL information services. Thus, QoL services may be used as a paradigm for the establishment and use of the SEIS in Europe.

# The chemicalweather COST action

- ES0602 chemicalweather COST action
  - Common AQ modeling information space pilot service available at <http://www.chemicalweather.eu/Domains>
  - Information services for the public

