WORKSHOP ON ENVIRONMENTAL TELEMATICS

Technical and Institutional Challenges of Data Management

- targeting European local government representatives -

Tuesday, 22 June, 1999

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Jaroslav Solc, Institute of Municipal Informatics of the City of Prague, Czech Republic
- IOZP. Prague Environmental Information System - Effective Tool for City Administration and Public.

Environmental Monitoring and Forecasting on Air and Water Pollution

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- Water Related Data Collection and Management within the Danube River Basin - From Local Authorities to the Danube Convention.

Waste Management and Soil Pollution

Carlos Garcia Suarez, Environment & Transport Planning, ES- SIGRES; Toxic and non-toxic waste management system.

ENSURING SUCCESSFUL DATA MANAGEMENT - BUILDING NEW PARTNERSHIPS AND EXCHANGING EXPERIENCES : SUMMARY (CLOSING PLENARY)

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BACKGROUND

Introduction

A recent CAPE survey revealed more than 70% of European local government environment experts and decisionmakers considered the use of IT/telematic applications a future priority. Some 80% indicated as a priority need, decisionmaking support systems, and as many as 90%, public information and dissemination related applications. However, many recognised the need for the improved availability of information on existing IT solutions. In particular, 80% requested conferences and dissemination events, 81% asked for technical training sessions, and 75% requested on-site technical visits. At the same time, the technical and organisational challenges of improving data collection, storage and dissemination are issues requiring increased attention.

Objectives

The objectives of this workshop on environment telematics, co-organised by the Regional Environmental Center (REC) for Central and Eastern Europe (CEE) and POLIS (Promoting Operational Links with Integrated Services) were thus twofold. First, to facilitate discussion on the challenges (both technical and institutional) and solutions for implementing IT applications. Secondly, to increase awareness to the already available IT systems, and the benefits of experience exchange and partnership building. Two parallel workshop sessions were held enabling opportunity for the exchange of know-how and experiences in the fields of data collection and dissemination. Case-study presentations were offered to facilitate discussion and relate experiences from four key environment areas (waste, monitoring, emergency management, and public access - priority areas according to the above survey), while a final plenary session summarised the main challenges and solutions. An on-site technical visit within Munich concluded the workshop.

Target Audience

Up to 80 environmental experts, senior decisionmakers, and local government representatives participated in the event, thus ensuring broad opportunity for the exchange of dialogue, experiences and know-how. More than 37 delegates represented the CEE region, and some 30 represented CEE and EU local government.

The following pages provides copies of all presentations, as well as the overall conclusions and recommendations of the final plenary session. The Participant Feedback section overviews the interests of participants, their impressions, and recommendations. For reference, the Workshop Agenda and Participants List is included at the end of this section.

WHY TRANSFER TELEMATICS RESULTS?

(OPENING PLENARY)

Session Chair: Nick Hodges, (ENWAP) Leicester City Council, Environment and Development. UK.

Session Speakers:

- Nick Hodges for **Wolfgang Boch**, European Commission, DGXIII Head of Unit, Information Society Applications for Environmental Protection - The Commission Perspective, „Ready-made RTD solutions"
- **João Ribeiro da Costa,** (ENWAP) New University of Lisbon Faculty of Sciences and Technology. Portugal.
- **Maria Kazmukova,** (ENWAP) Senior consultant in air quality City Development Authority Prague. Czech Republic.

Introduction

Why Transfer Telematics Results? Modern IT solutions to environmental problems are ready for the market, but is there value and benefit in their transfer and implementation or is it better to start anew? In either case, there are technical and organisational challenges to overcome.

Speaker Presentations

The objective of this session was to „set the scene". Three 10-15 minute presentations (see powerpoint slides overleaf) offered individual perspectives, advocating respectively: 1) the availability of innovative technologies and their readiness for transfer, 2) the value in technology transfer particularly with regard to the EU accession process, and 3) through one case study, the usefulness of IT in managing information, and supporting the decisionmaking process.

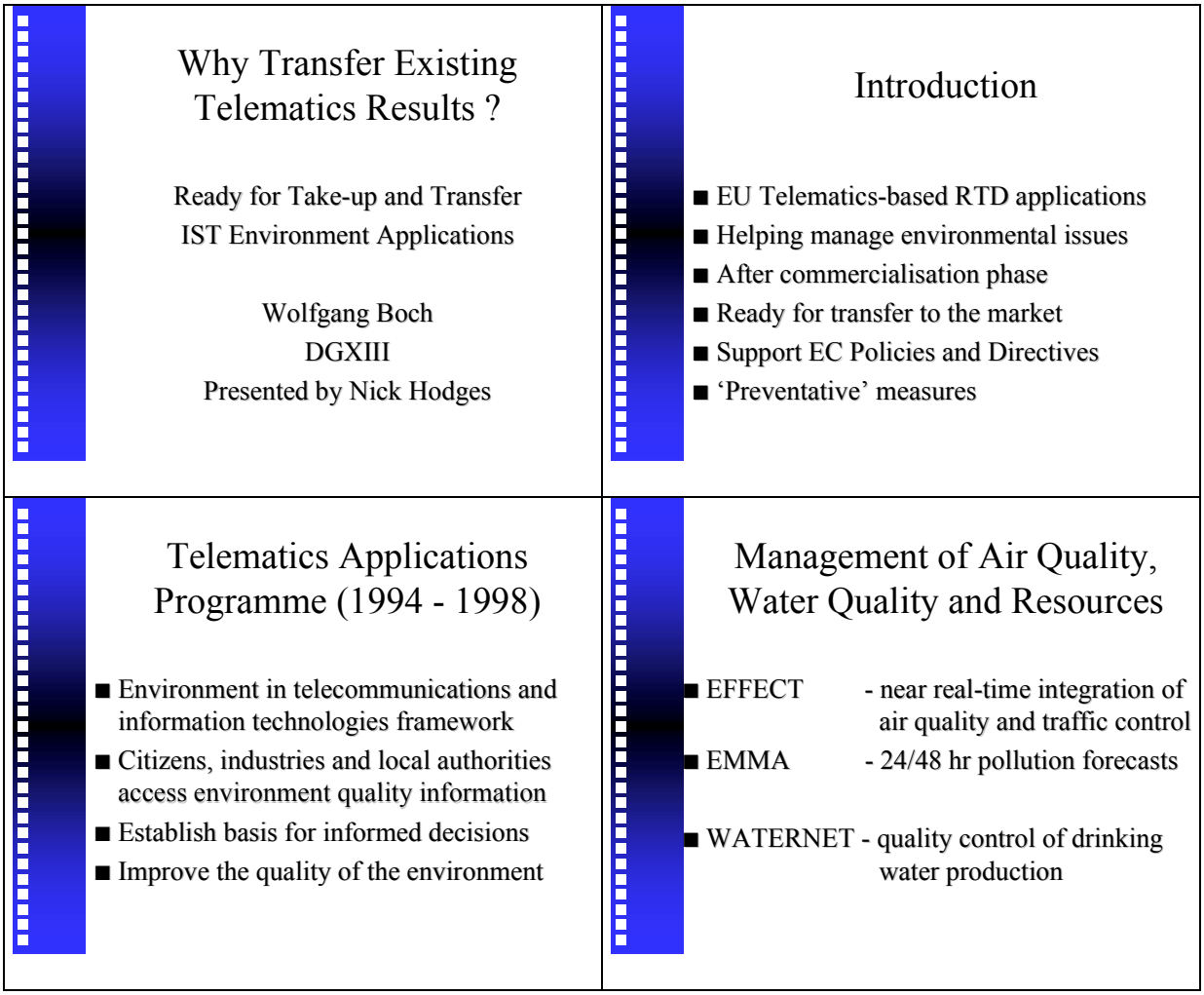
Conclusions

Stressing the importance of IT applications in supporting the decisionmaking process, the Chair concluded modern IT applications are useful tools in supporting environmental management, decisionmaking and public access. He also mentioned they were pertinent to the EU accession process in terms of ensuring data collection and availability consistent with EU Directives, and building on the previous day's discussions, posed the question, can one afford not to invest in IT? With the right amount of support, these applications can easily be transferred if one is aware of the challenges, and available solutions. Discussion through the following sessions on data collection and dissemination - challenges and solutions was therefore encouraged.

Information Society Applications for Environment Protection - The Commission Perspective, „Ready-made RTD Solutions“

Wolfgang Boch, Head of Environment Unit,
European Commission DGXIII, Belgium

The scene was set by describing telematics research has developed a number of applications that have been successfully implemented to help manage environmental issues, consistent with EU environment policy. These applications offer tried and tested, cost-effective solutions that are now ready for transfer to the market. In offering time, cost, and resource savings, ready RTD solutions and their transfer also support sustainable development. Appropriate support actions such as expert groups, partnerships, training and technical workshops, on-site visits, good-practice guides and databases, virtual forums etc. can also help facilitate this transfer.



Prevention and Handling of Catastrophes and Risks

- DEDICS - forest fires
- RADATT - earthquakes
- ENVISYS - marine oil pollution

Access to, and the provision of environmental information

- Internet & Intranet
- ISDN and Fibre-optic
- Multi-media
- Geographical Information Systems
- Numerical modeling & computer simulation
- Multi-lingual systems

Multi-lingual Environmental Thesaurus

- European Environment Agency - Thesaurus
- REMSBOTT - environmental information using Catalogue of Data Sources
- E-MAIL - environmental information to regional authorities and citizens
- TEMSIS - cross-border environmental information exchange

Exploitation and Commercialisation of Results

- Transfer of ready-made RTD solutions
- Saves time, costs and resources
- Supports Sustainable Development and EU accession process
- Avoids duplication of resources
- 1998 - EMMA & E-MAIL available
- 1999 - EFFECT, ECOSIM & WATERNET
- TEMSIS and COSIMA being extended

Transferring Results

- Facilitated through support actions
- ENWAP & CAPE 'Good Practice' Doc's
- http://www.rec.org/telematics
- DETERMINE Conference
- CAPE User Forum
- CAPE Workshops

Telematics Solutions for Sustainable Development

Leicester City Council

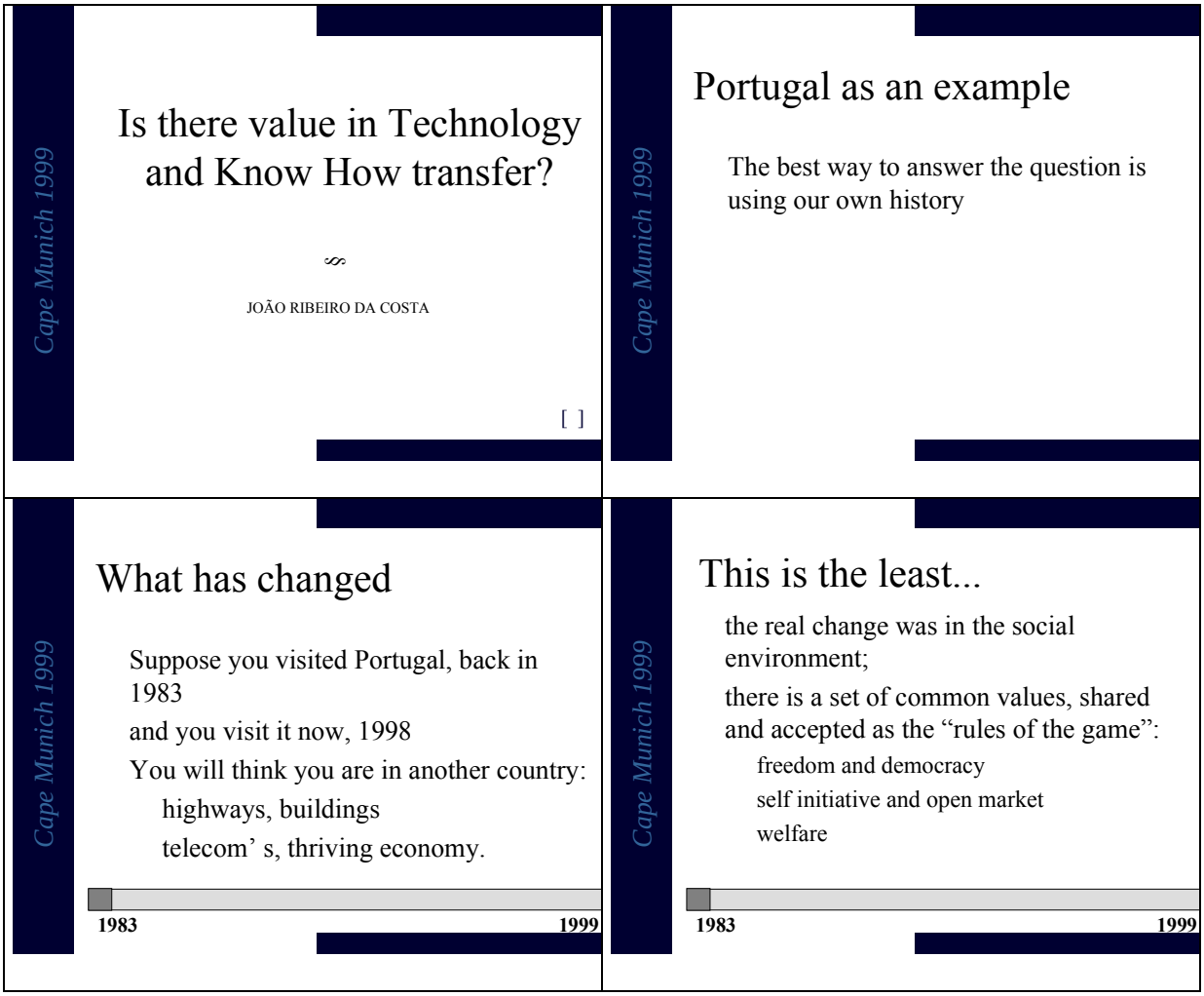
Telematics in the Environment Sector:

The real contribution to sustainable development

Is There Value in Technology and Know How Transfer?: EU Accession from the Portuguese Perspective

João Ribeiro da Costa, New University of Lisbon,
Faculty of Sciences and Technology, Portugal.

Portuguese experiences in terms of the value and benefits of technology and know how transfer were summarised. Portugal joined the EU in 1986 and was on the receiving end of many new RTD applications. But while the implementation of a major new application does introduce considerable institutional and technological challenges, the availability of ready RTD and selected support actions can bring about considerable change for the better. Implementation of RTD and proper support actions/frameworks are fundamental to successful application implementation.



Cape Munich 1999

Illustration examples

AG running DGRAH

NATO PoWaters

Unesco project

1983 1986 1988 1990 1991 1996 1999

Cape Munich 1999

EU membership

Proved to be:

above all, a common goal to a whole country

it managed to gather efforts and make them converge to a well defined point in the horizon of history

the fund issue...

1983 1986 1999

Cape Munich 1999

DGRAH - DGRN

D.Ford & J.L.

1983 1988 1990 1991 1986 1999

Directive transposition

Cr directive

Water Quality Standards (in paper)

Cape Munich 1999

EURO Club

SNIRH WWW

1983 1988 1990 1991 1996 1986 1983 1999

WQ Standards (in practice)

Cape Munich 1999

scale models

Institutions can be viewed as scale models

Democracy

Self initiative

Market driven

Welfare

Transparency

Efficiency

Standards to comply with

Good manag.

To do more with less

1983 1986 1988 1999

Can Technology and Know-how Transfer Offer a Shortcut?

Maria Kazmukova, Senior Consultant in air quality,
City Development Authority Prague. Czech Republic.

The City of Prague's experiences show that IT systems, in particular „IOZP" can assist the decision-making process. Any system's implementation and development, however, can be facilitated by various support measures, which can save both considerable time and resources.

IOZP ENVIRONMENTAL INFORMATION SYSTEM

EFFECTIVE TOOL
FOR CITY ADMINISTRATION
AND PUBLIC

Prague - a capital of the Czech Republic

- 1.2 Mio inhabitants
- an area ca 498 km2
- a complicated topography along the Vltava river and its tributaries
- poor conditions for ventilation
- a medievial street network in the downtown
- transit transportation in the inner city

PRAGUE ENVIROMENTAL INFORMATION SYSTEM

- AIR QUALITY
- WATER QUALITY
- SOIL CONTAMINATION
- NOISE
- SURFACE AND GREENERY

AIR QUALITY MANAGEMENT

information:

- Air pollution measurements
- emmission sources inventory
- air quality modelling

actions:

- Large point sources regulation
- conversion of local house heating
- Traffic demand management measures

AIR QUALITY CENTRAL DATABASE

- Prague Automatic Monitoring System
- Air Quality Information System of the Czech Hydrometeorological Institute
- Mobile local air pollution measurements
- Air pollution sources databases

AIR POLLUTION SOURCES DATABASE

- Large stationary sources and significant technologies point sources
- medium stationary sources and technologies sources
- local heating airborne sources
- mobile - traffic sources

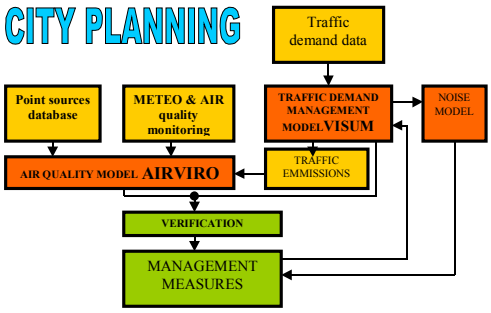
Modelling

- IOZP - Prague
- VISUM - traffic demand modelling
- ATEM -Air Quality Gauss Model
- GIS presentations

SUPPORT TO CITY PLANNERS AT AIR QUALITY ASESSMENT

- STRATEGIC PLAN EVALUATION
- MASTER PLAN PREPARATION
- DISTRICT PLANS EVALUTATION

AIR QUALITY PLANNING



NEW STRATEGY

- REAL-TIME AIR QUALITY MONITORING
- REAL-TIME TRAFFIC DEMAND MONITORING
- AIR QUALITY AND TRAFFIC DEMAND FORECAST
- TRAFFIC DEMAND MANAGEMENT

ENWAP GOOD PRACTICE:

EXPERIENCES FROM THE ENVIRONMENT TELEMATICS PROJECTS

- CONTEXT AND OBJECTIVES
- RESULTS AND IMPACTS
- OBSTACLES ENCOUNTERED
- TRANSFERABILITY
- LESSON LEARNED

READY RTD SOLUTIONS?

ADVANTAGES:

- STATE OF THE ART ENVIRONMENT SOLUTIONS
- TIME SAVINGS
- FINANCIAL RESOURCES SAVINGS IN LONG RUN
- EU+CEEC COOPERATION

DISADVANTAGES:

- TRANSFERABILITY COST
- INITIAL DATA CONVERSION COST
- CHANGE OF STRUCTURE AND RESPOSIBILITIES
- TRAINING

TECHNICAL AND INSTITUTIONAL CHALLENGES OF DATA COLLECTION (PARALLEL SESSION ONE)

Session Chair: Teemu Virtanen, Regional Coordinator Helsinki Metropolitan Area Council. Finland
Session Co-Chair: Zoran Stojic, (ENWAP), Ekonova, Slovenia.

Session Speakers:

- **Stefan Jensen,** Ministry of Environment of Lower Saxony, European Topic Centre on Catalogue of Data Sources (ETC/CDS). Germany.
- **Katerina Cechova,** Olomouc City Council, Czech Republic.
- **Silke Hertz**, COSIMA, Stadt Koln, Germany
- **Maria Kazmukova,** (ENWAP) Senior consultant in air quality, City Development Authority Prague. Czech Republic

Objectives

The objective of this Workshop session was to explore the technical and institutional challenges of **data collection.** These were discussed from both the point of view of a technical environmental expert, and the decisionmaker. A number of solutions or „good practices" were shared and some briefly agreed upon, with the completion of a „Challenges/Solutions" table.

In addition, the workshop also collected background information on those support measures most helpful in ensuring successful data management and technology transfer, ranging from surveys and needs assessments, partnerships and expert groups, training and on-site visits, and good-practice guides and databases. These are also summarised in the final plenary session notes when Session Chairs gave a synthesis of session results.

Speakers

Four speakers representing a TAP or telematics-like project in different environmental fields (waste, public access to information, monitoring, and emergencies) presented information concerning implementation, either within local government or at the local level, in both the CEE and EU. Applications were funded either by the European Commission or in the cases of CEE, through local budgets. Experiences were contributed through brief presentations that encompassed a general overview followed by the technical and organisational needs, the challenges and obstacles faced in their implementation and how these were overcome and through which solutions. In some cases, „good practices" were also recommended that could be easily implemented within local government.

Session results are detailed within the plenary session summary, while the powerpoint presentations of each speaker are given overleaf.

ENVIRONMENTAL INFORMATION TO PUBLIC AND TO EXPERTS

Benefits and Obstacles in Introducing a Regional Data Extracting System

Stefan Jensen, Ministry of Environment of Lower Saxony,
European Topic Centre on Catalogue of Data Sources (ETC/CDS). Germany.

Benefits and obstacles in introducing a regional data extracting system

Stefan Jensen

project leader
ETC/CDS
Niedersächsisches Umweltministerium,
Hannover, Germany

CAPE, Munich, June 22nd 1999

What is meta information?

"data about data"
"catalogue information"
"first point of entry - information"
"locator information"

>>> information to (in the end) get access to data

Who needs to care about it?

Everybody who needs to keep an overview of the own growing amount of data sources.

Everybody who needs information from different sources.

Everybody who needs to identify and omit double work in an institution or network**.**

Where is it used for?

To find out about information sources and their owners

WHO is responsible for WHAT?
WHICH data is located WHERE?
HOW can the data be accessed?
WHAT is the timely and spatial resolution?
HOW can the information be briefly described?

Motivation

Free access to environmental information for the public

Aarhus Convention, Article 3.2:

> Each Party shall endeavour to ensure that officials and authorities assist and provide guidance to the public in seeking **access to environmental information**, in facilitating its participation in environmental decision-making and in seeking access to justice.

Motivation

Organisation of (regionally) available information:

Metainformation helps to structure and publicise the information that an organisation has produced.

It supports the organisation and administration of available information.

Organisational Challenges

Definition of content --> develop data model
(align data model with what is common > GELOS)

Organisation of information exchange process

therefore one must:

Organisational Challenges

Identify players: suppliers of information
recipients of information
mediators of information

Motivate players by inviting them to participate in project committees, e.g.

- steering committee
- quality assurance committee
- advisory board

Technical Challenges

There is a need to develop tools to support the process of collecting and disseminating information.

This must be done such that the players don't loose motivation, i.e. timely, cost effective, the tools must reflect the state of the art technology.

Remember: information technology has a (very) short half-life.

Technical Challenges

Software tools must be flexible enough to adopt (be tailored) to individual needs.

Help desk support must be available.

But:
Tools are just tools, the information is what is important.

Our example: collection and harmonisation

The Directory of Information Resources (DIR):
The underlying metainformation of the European Environment Reference Centre (EERC)

The offer to national and regional initiatives:
European harmonisation based on GELOS:
supply of expertise and tools

Why do we collect ?

"Through the provision of timely, targeted, relevant and reliable information to policy making agents and the public, the EEA aims to help achieve significant and measurable improvement in Europe's environment"

What do we collect? EERC building Blocks!

- A concise directory of EIONET partners
- Records describing legal reporting and monitoring obligations
- Documentation of EEA's products
- Documentation of publicly available data in the data warehouse.
- General national resources

What do we collect ? Nat'l Building Blocks !

- Official National State of the Environment Reports
- Official National Environmental Monitoring Programmes
- National Environmental Resource Libraries
- National meta databases or Reference databases on the Environment

Challenges in the own collection process - less technical than organisational

- Define WHAT information shall be collected
- Prove to providers the added value
- Develop tools to support collection process
- Organise information in database
- Organise the appropriate update cycle and administration

Main challenges in harmonisation

- Streamline information across distributed databases
- Follow up on heterogeneous requests from regional approaches
- Build a variety of approaches into support tools

For more information please visit:

http://etc-cds.eionet.eu.int

or:

http://www.mu.niedersachsen.de

or e-mail

etc/cds@mu.niedersachsen.de

ENVIRONMENTAL MONITORING AND FORECASTING ON AIR AND WATER POLLUTION

Experiences in Air Quality Data Collection, and Cooperation with IOZP, Prague City Environmental Information System

Maria Kazmukova, ENWAP Member and Senior Consultant in Air Quality,
City Development Authority Prague. Czech Republic.

IOZP PRAGUE ENVIRONMENTAL INFORMATION SYSTEM DATA COLLECTION	PRAGUE ENVIROMENTAL INFORMATION SYSTEM • AIR QUALITY • WATER QUALITY • SOIL CONTAMINATION • NOISE • SURFACE AND GREENERY
AIR POLLUTION SOURCES DATABASE • Large stationary sources and significant technologies point sources • medium stationary sources and technologies sources • local heating airborne sources • mobile - traffic sources	IOZP - output • Selected statistical air quality data • GIS information • yearbooks • specialized publications on environment • Atlas of the Environment of Prague • CD ROM - Prague Environment 1 • www sites

SUPPORT
FOR DECISION MAKING
TO CITY ADMINISTRATION

- ON-LINE DATA FROM AUTOMATIC MONITORING STATIONS
- STATISTICAL DATA FROM AIR POLLUTION DATABASES
- OFF-LINE ATEM - AIR QUALITY MODEL+GIS
- OFF-LINE METEO AND AIR QUALITY PREDICTIONS - ESTIMATES OF CHMI

DATA COLLECTION
Institutional obstacles

- Institutions responsible for data collection: Czech Hydrometeorological Institute, Institute of Hygiene, different public and privat organisations involved in mobile monitoring
- Legal responsibilities of data transfer
- communication between officials and administration

DATA COLLECTION
Technical obstacles -

- Availability: different data sources
- compatibility: different methodology of data sampling
- transferability: different types of databases
- calculation of mobile sources emmission
- air quality model availability, financial feasibility

Lesson learned:
Technical obstacles

- Unification and standartization of sampling methodology, if possible
- discussion and negotiation on data transfer possibilities, feasibility of data conversion,
- agreements and guidelines for data transfer
- updating of guidelines for traffic emmissions calculation
- a need for air quality model transfer

Lesson learned:
Institutional obstacles

- Clarification of legislative aspects and resposibilities on state and municipal level
- communication between institutions
- agreements between institutions with legal and financial aspects
- good training practise for all levels of city administration
- communication with public, public awarness raising

IOZP

Prague Environmental Information System

as a tool
for a better decision making

WASTE MANAGEMENT AND SOIL POLLUTION

Experiences With the Use Of a Geographic Information System (GIS) Concerning the Handling of Contaminated Sites"

Silke Hertz, COSIMA Telematics Applications Programme,
Department of Environmental Protection and Food-quality Control, Cologne, Germany

1 ARC PROJEKT

The Department of environmental protection of the City of Cologne works with a GIS-prototype called ArcProjekt. It`s a supporting system which was developped on the base of the GIS platform ArcInfo, a well-known GIS in Europe and USA.

The development of ArcProjekt took place in an European Project named COSIMA which stands for **Co**ntaminated **Si**tes **Ma**nagement.

2 SITE EXAMINATION STRATEGY

ArcProjekt was developed to assist experts in identifying, registering, assessing and remediating sites. This sheet shows the site examination strategy.

Initial Phase

Initial phase means, that the expert gets a first indication that there could be an abandoned industrial site or a landfill. These hints can come from the daily work with historical maps and aerial photographs but also from external side as for example from citizens, who are living a long time in Cologne and know well the former industrial places and abandoned waste disposal sites.

Meaning of ArcProjekt: Information will be transformed in the data base, called UMSYS.

Inital Evaluation

Initial evaluation means a desk study in which all available information concerning the site are combined. Information will be collected mainly in historical topographic maps, aerial photographs, historical address books and in archives. The initial phase ends with the localisation of the site including all details which were needed to decide, whether a risk analysis is necessary or not.

Meaning of ArcProjekt: The geometry of the site will be digitized. If information are available concerning different contamination potentials, it is possible to create subsections.

Orientation / Screening Examination

Screening examination during the orientation phase means drilling and analysis of different parameters to get first information about possible contamination.

Meaning of ArcProjekt: The dates go into the data base UMSYS and will be connected with the geometry of the site in ArcProjekt.

This means, you are able to draw thematic maps including for example distribution of contaminants, maps with the localisation of different drilling points, groundwaterflow etc.

Further, in ArcProjekt you are able to get some short information (called attributes of interest) to any area you digitized and have data in the data base. So it is possible, if the data input concerning the sites in the data base UMSYS is completed, to get short information for the daily work easily.

Detailed examination

Screening examination during the detail phase means drilling and analysis of different parameters to get detailed informations about the vertical and lateral distribution of contaminations.

The detail phase collects all informations necessary to judge the contamination of the site and summarize it in the final report, called assessment. The assessment draws the conclusion, whether a remediation of the site is necessary or not.

Meaning of ArcProjekt: The same as above. The thematic maps support the expert in his decision as they illustrate the analysis results in a clear way and make them transparent. It is more easy for the expert to make a decision if the results are designed in clear thematic maps

Remediation Examination / remediation

The remediation examination is focussed on the evaluation of the different possible methods to find the best and economically siffucient method. The meaning of ArcProjekt in the phase of remdiation examination and remediation is the same as in the orientation and detail phase.

For a full description of the COSIMA application, please see the presentation given by Werner Flacke on the previous day.

EMERGENCY MANAGEMENT AND DISASTER WARNING

Katerina Cechova, Olomouc City Council. Czech Republic

Olomouc Flood Emergency System

Active approach of the city
to the protection of its inhabitants

Kateřina Čechová, Olomouc City Office

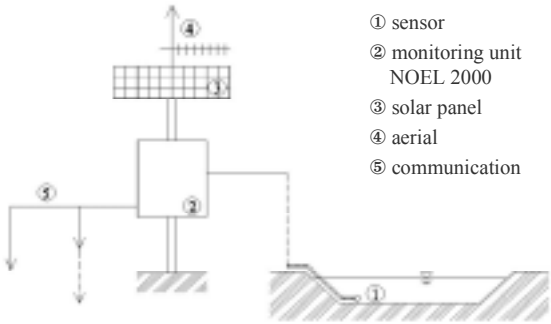
The City of Olomouc

- ➢103 000 inhabitants
- ➢area 11 661 hectares
- ➢in the centre of Moravia
- ➢seat of Palacky University (second oldest in the Czech Republic)
- ➢on the River Morava
- ➢susceptible to flooding
- ➢unsuitable sewage system protection

Present compounds of the system

- ➢water gauges easily accessible by public
- ➢water level monitoring station as an important data source
- ➢warning and information system (sirens) as an effective tool for the protection of inhabitants

Scheme of the monitoring device



Outputs, advantages and improvements

- ➢precise data set
- ➢easy data transfer to other users
- ➢access according to a set regime
- ➢possibility of installing voice transmission
- ➢possibility of connecting more stations
- ➢personal check of situation (water gauges)
- ➢increased public confidence
- ➢fast and intelligible warning covering important areas

Support for decision making

- ➢fresh data from an automatic monitoring station
- ➢comparability with the data from other monitoring stations
- ➢help in predicting further development of flood situation ⇨ timely warning and losses diminution
- ➢long term data collection for statistical and scientific use
- ➢data for future models

Technical obstacles

- ➢electric power input
- ➢phone line connection
- ➢hooligans (sensor type)
- ➢proper location on the stream
- ➢financial feasibility of voice transmission
- ➢changes in stream morphology
- ➢setting of flood levels on the water gauges
- ➢financing and realization of sirens project

Institutional obstacles

- ➢location in Protected Landscape Area (PLA)
- – approval exception of the Ministry of Environment
- ➢approvals for the construction
- – stream administration, owner of weir, PLA administration, local municipality, water management authority
- ➢contract on co-operation and financing
- ➢state subsidy

Lessons learned - Technical obstacles

- ➢advantage of precise data for the creation of flood action plans, all hazards plans, scientific use
- ➢need for close collaboration, knowledge and experience sharing (before installing)
- ➢possibility of future collaboration and data sharing (after installing)
- ➢motivation for technical upgrade of existing stations

Lessons learned - Institutional obstacles

- ➢co-operation between self-government and state government
- ➢importance of scientific and environmental aspects, compromising
- ➢improving communication with public, public awareness, confidence in decision makers' competence
- ➢awareness of city leaders
- ➢need for legislative frame of responsibilities
- ➢sharing of financial costs

TECHNICAL AND INSTITUTIONAL CHALLENGES OF DATA DISSEMINATION (PARALLEL SESSION TWO)

Session Chair: Markus Spring, (TAP) Health and Environmental Information Expert, Munich Department of Environment. Germany.
Session Co-Chair: Dana Svihlova, Institute for Villages, Cities and Regional Development, Faculty of Economics Matej Bel University. Slovak Republic.

Session Speakers:
- **Josef Burgard,** (TAP) TEMSIS, Siemens Telekooperations Zentrum am DFKI. Germany.
- **Ivica Ružić,** (ENWAP) Center for Marine & Environmental Research of the Ruđer Bošković Institute. Croatia.
- **Jaroslav Solc, IOZP,** Institute of Municipal Informatics of the City of Prague, Czech Republic.
- **Carlos Garcia Suarez,** Environment Transport & Planning, ES

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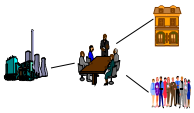
ENVIRONMENTAL INFORMATION TO PUBLIC AND TO EXPERTS

Data Dissemination and Data Exchange for a Public Information System

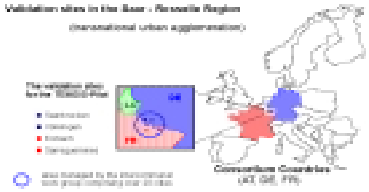
Josef Burgard, TEMSIS, Telematics Application Programme,
Siemens Telekooperations Zentrum am DFKI. Germany

TEMSIS
Data Dissemination and Data Exchange for a Public Information System

Dr. Josef Burgard,
German Research Center for Artificial Intelligence
(DFKI)



Overview

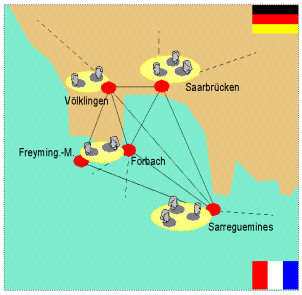


Common industrial past
- coal mining
- steel production

Restructuring

Introduction

A-Kiosk

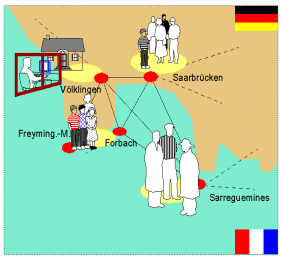


User group
- Communities (planning, environmental)
- Regional authorities as datasuppliers

Objectives
- easy access to well prepared regional environmental data, cooperation between different authorities and experts
- bilingual presentation of environmental data
- cooperative work with local and regional authorities using telecommunication networks.
- preparation of decision making
- environmental impact statements

Objectives

P-kiosk



User group
Citizens

Objectives
- easy access to well prepared regional environmental data, Kiosks for public use in some city halls, access using Internet technology
- additional environmental Information
- Discussion and Information forum for citizens, discussion with responsible authorities.

objectives

A-Kiosk

✔Navigator to select information and services with interfaces
✔Local applications to present and edit environmental information:
- Geographical information: Master plan, water quality map
- time series: Air quality
- Generation of reports from actual air quality data

✔Telecooperation system consisting of:
- Video conferencing
- 'Application sharing', file transfer, etc.

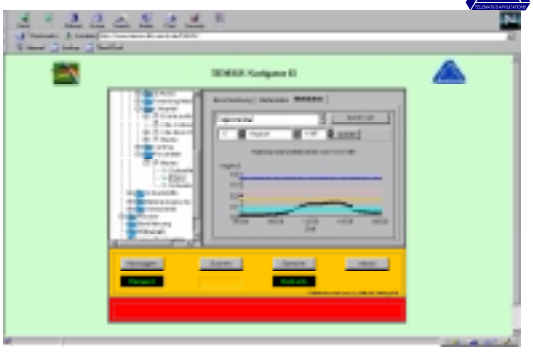
for the co-operation of distributed teams

P-Kiosk

✔Internet based Navigator with interfaces
✔Presentation of environmental information using:
- Local lite -versions of A-Kiosk applications
- Internet applets for time series

✔Electronical communication with :
- E-mail
- Discussion forum
- Online 'chat' sessions

Tools



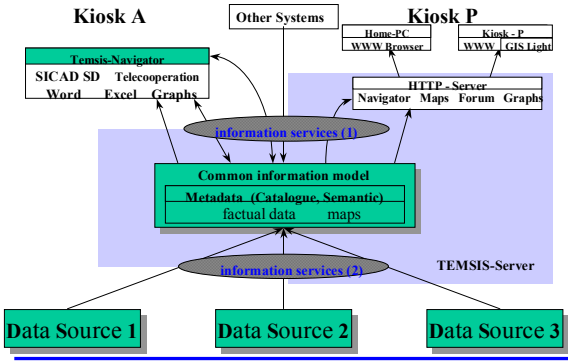
P-Kiosk Dr. Josef Burgard, DFKI

Data sources

The Basis for an environmental Information System
- FNP/P.O.S. local and regional plans
- Air quality
- Water quality
- Socioeconomic Data as general Background

Basic Maps
- **1: 25 000** scale for most plans
- 1:100 000 scale for overview plans
- 1: 5000 scale for detailed plans

Data sources



System architecture

What is the beneficial value of the application?

Data Model for:
- Metainformation, Information:
  - environmental information search
  - retrieval and presentation: standard applications
  - cooperation: standard (ISDN)

Products developments: GIS, telecooperation system

Demonstrator (using new Internet technology, e.g. Java)

Transfer Concept:
- applications developed in TEMSIS are for free
- added value: data preparation, transfer costs (training)

-> direction of further development is Internet

benefit

Technical Challenges

- **Metadata** (Index): combining information search, retrieval, presentation, co-operation functions
  -> own flexible model with basic structures from CDS (environmental information
- **Integrated User Interface** , easy to be handled
  -> Navigator concept with a tree structure (look and feel)
- **Technologies** to be used (company policies, market)
  -> Java, Active X, RMI
  -> fixed specific interfaces to local applications (API)
- Balance between **performance and flexibility**
  -> Distributed data (local and central data)
  -> Web technology was upcoming with new but not consolidated functionality. This was crucial for public dessemination. Consolidation time is necessary (e.g. Java, CGI,..)

benefit

Technical Challenges

- **Bilinguality of the information**
  -> user Interface and data presentation: automatically if multilingual information is created by the users (new information in the meta database)
  -> bilingual (German - French) report generation: automatically
- **Security aspects**
  -> Firewalls: companies doesn't allow interactive access over the Web, but the public users normally have no problems
  -> Intranet solutions (ISDN Router) for Experts have been established
- **Bandwith**: Internet bandwith is increasing
  -> Java applets have to be loaded every time
  -> Functionalities are partly integrated into the Browsers (different functionalities of browsers)
- **Actuality, update rate**
  -> transmission method, costs, validation of the data

benefit

Organisational Challenges

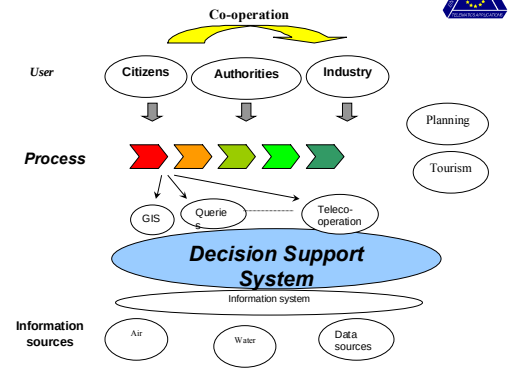
- **Political Support**
  -> Kick-off meeting with all political and social forces of the transnational region (environmental ministry as responsible departments)
- **Legal framework**
  -> contracts between the different suppliers needs a lot of time
  air quality network with ESPOL in France (16 months)
  basic maps (1 year, only with restrictions of presentation)
- **Sustainability** of the changing data after the project life time
  -> support for transfer to the user group (low costs)
  -> automatic update
  -> Users manage information resources themselves (training)
- **comparability**
  -> guidelines, thresholds (EU, national if required)
  -> different measurement methods (not solved for water quality) presentation according the different standards (indicating this)

benefit

Organisational Challenges

- ✧ **Actuality, update rate**
  -> transmission method, costs, validation of the data, actual obligations (responsible organisations has to check before)
  air quality data in Germany:
  not validated data (1/2 day or earlier if required)
  validated data (one day delay).
  The supplier transmit the data in own responsibility
- ✧ **stuff qualifying**:
  -> new complex integrated applications need a training concept
  -> problem is the heterogeneous user group
  experienced, not experienced
  Intensive introduction phase at the beginning (very early in the project)
- ✧ Communication **Costs** of Internet/co-operation
  -> cost awareness of the required costs and the benefit

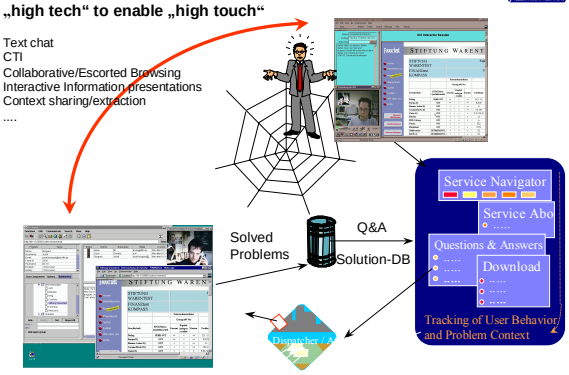
benefit



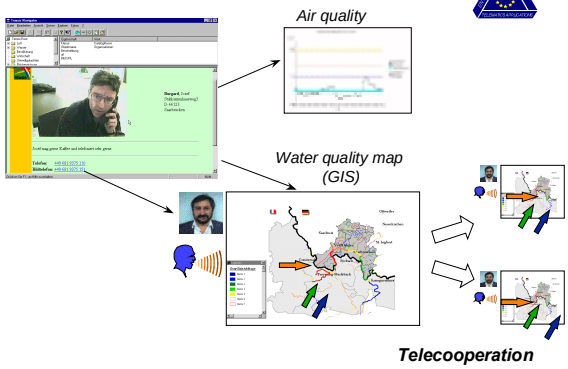
TRENDS - Decision support system

„high tech“ to enable „high touch“

Text chat
CTI
Collaborative/Escorted Browsing
Interactive Information presentations
Context sharing/extraction
....



Collaborative Customer Relationship Management



A-Kiosk

Dr. Josef Burgard, DFKI

IOZIP - Prague Environmental Information System. An Effective Tool for City Administration and Public

Jaroslav Solc, Institute of Municipal Informatics
of the City of Prague, Czech Republic

IOZIP: The Prague Environmental Information System

Data Dissemination for City Authorities, Experts and General Public

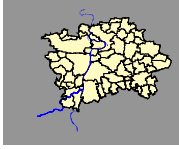
Jaroslav Šolc
Institute of Municipal Informatics of the City of Prague
Czech Republic

Presentation

- Prague
- IMIP
- IOZIP - The Prague Environmental Information System
- Data entry/processing/output basic scheme
- Co-operation, users and output information
- Experience and plans

Prague

BASIC DATA
Population: 1,2 mil.
Area: 496 km^2
Admin. division:
57 municipal parts



CITY AUTHORITIES AND ORGANIZATIONS
(*Environmental Departments)
- Prague City Hall
- District Offices (15 of 57 m.parts)
- City Development Authority (strategic and master plan)
- Institute of Municipal Informatics (IT support)
- ...

ENVIRONMENTAL PROBLEMS:
Air pollution, noise (traffic), waste management, land-use planning, nature preservation, municipal greenery (parks), water supply.....

IMIP

Institute of Municipal Informatics of the City of Prague

- Established by the City Council of Prague as a City funded organization
- Support for municipal authorities (City, district and local offices), municipal organizations, public
- digital maps *(technical map, cadastral map, ortophotomaps, digital terrain model, street lines map etc.)*
- administration and management of selected databases *(territorial identification - addresses, environmental data, statistical data etc.)*
- web server, publications *(www. praha-mesto.cz, magazin Prague, thematic publications - environment, ortophotoatlas etc.)*

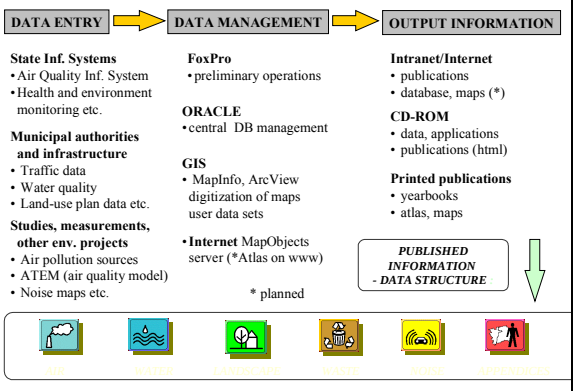
IOZIP

Prague Environmental Information System
CZ: Informační systém o životním prostředí v Praze

- **History:** *First ideas at 1985, part of MIS project. In IMIP since 1993.*
- **Objectives**:
  - *Collection an processing data on quality of Prague environment:(AIR , WATER, LAND, WASTE, NOISE ..)*
  - *Inicialization of regular measurements of environmental factors, thematical studies and projects*
  - *Providing and distribution of information to municipal authorities, experts and general public*

City Information Project - financed from budget

IOZIP - Prague Environmental Information System
basic scheme



Co-operation, Users

- **Data sources**: Czech Hydrometeorological Institute, National Institute of Public Health , Municipal Hygienic Office, Institute of Traffic Engineering, City Development Authority, Prague City Hall ...
- **Processing**: PÚDIS (measurements), Hydrosoft Veleslavín (GIS, Oracle, Web), EnviTypo (publications) ...
- **Users**:
  - City management and authorities (environmental departments)
  - Experts (EIA, env.studies, land-use...) (private comp.)
  - Public (schools, citizens...)

Output information

- **Data and user applications:**
  - Selected data from central database, GIS layers, local applications
- **Publications, maps, CD:**
  - Yearbooks - since 1989cz/1992en, thematic books, maps, atlas, CD
- **Internet:**
  - publications (english) on www.praha-mesto.cz/zivpro/english.htm

+ Experience -

- Support from the City
- Wide thematic range
- Partnerships with other data sources and with user institutions
- Co-operation with private companies
- Concentrated and interpreted information for different user levels (incl. maps statistics ...)
- Use of advanced technology (ORACLE, GIS, Internet)
- Information available for general public (mapshop, Internet)

(Act 123/1998, on the right to environmental information)

- Budget restrictions
- Number of data sources and different formats
- Data recency (year)
- No steady rules for data exchange (even within city)
- Costs, obligatory tenders
- Low level of technical equipment and user qualificacion (↑)
- Complicated system of city administration
- Low public awareness of environmental problems and information possibilities (↑)

Plans

- Wide range of environmental aspects (PSR - OECD, UNEP schemes)
- Standardized sets of information (indicators)
- Use of advanced technologies (Oracle, Internet map server)
- Emphasis on geo-information (GIS), analyses
- Relations to projects focused on environmental modelling (air, noise)
- Data delivery via Intranet/Internet
- User education and implementation of the system as a standard into the city life
- International co-operation (EU cities)

ENVIRONMENTAL MONITORING AND FORECASTING ON AIR AND WATER POLLUTION

Water Related Data Collection and Management within the Danube River Basin From Local Authorities to the Danube Convention.

Ivica Ružić, Center for Marine & Environmental Research
Ruđer Bošković Institute, Croatia; ENWAP Member

A. BRIEF OVERVIEW

Basic Information:

- Water related data collection and maintenance within the Danube River Basin.
- For the assessment of the status of water quality / quantity. To reduce the pollution load into the Danube River Basin and the Black Sea.
- To serve experts and decision-makers. By providing information, performing information management and supporting decision-making.
- Improving and organizing national and international water related monitoring programmes. Improving the quality of information collected in individual countries. Increasing the intercomparability of the data collected. Harmonizing the national sources of information. Improving the information management.

INFORMATION:

WHAT Determinands (status of the environmental quality)
WHERE Monitoring points (countries, river & tributaries and river basins, distance from the mouth, locations in profiles, geographic coordinates, elevation)
WHEN Year, Date, Time (for sampling and analytical measurements)
HOW Methods (for sampling and analytical measurements, detection limits, standards, QA&QC)
MEDIA Samples (water, suspended & bottom sediments, air and biota)
PHYSICAL & CHEMICAL CONDITIONS (temperature, flow, oxygen regime, conductivity, etc.)

MANAGEMENT:

- Collection
- Storage
- Validation
- Exchange & Dissemination
- Processing (statistical treatment, visualisation, quality assurance & control and interpretation)
- Presentation (reports, Yearbooks, National Reviews, mapping, Web Pages and Theme Pages)

DECISION-MAKING:

- Regulations
- Quality Standards & Indexes
- Risk Assessment & Management
- Pollution reduction (effluent treatment and other measures)

B. CHALLENGES, OBSTACLES AND SOLUTIONS

ACCESS TO THE SOURCE OF INFORMATION:

Countries

PHARE	Czech Rep., Slovakia, Hungary, Slovenia, Bosnia & Herzegovina, Bulgaria and Romania
TACIS	Moldavia and Ukraine
SUPPORTING	Germany, Austria, Croatia
NOT INCLUDED	FR Yugoslavia

Chriteria for selecting monitoring points

Financial problems

Support from the EU, individual participating countries and other donors.

Good laboratories and qualified personnel

Equipment procurement, training courses.

Regular TNMN data collection

Collection of data quarterly with three month delay, the use of e-mail facilities for data exchange.

DATA QUALITY

Using standardised methods, interlaboratory comparison, QA & QC practices, harmonizing sampling and analytical methods, training

DATA INVENTORYING AND ORGANISATION

Harmonizing National Information Systems, introducing DEFF and AARDVARK, building interfaces between DEF and NIS, development of Standard Operational Procedures, consulting, training courses

DATA QUALITY AND ORGANISATIONAL IMPROVEMENT

Organising the Network of National Reference Laboratories and National Information Centers, establishment of MLIM ESGs, cooperation between National Managers and Experts, consulting.

DATA DUPLICATION AND ERRORS

Primary and secondary data checking procedure, normalization of entity relationship model, establishment of DEFF database integrity, and effective data coding system

NEEDS FOR FUTURE DEVELOPMENT

Improvement of communication system

Introducing ISDN and PSTN

Application of remote access to data

Development of distant management

Integration of GIS and DEFF

he use of digital vector maps and corresponding integration software for automatic preparation of dynamic Web Pages and Theme Pages

Data security

Building the firewall or point to point connection Intranet.

Water Related Data Collection and Maintenance within the Danube River Basin - From Local Authorities to the Danube Convention

Ivica Ružić, Jadranka Pecar-Ilic,
Center for Marine & Environmental Research, Ruđer Bošković Institute, Zagreb, Croatia

1. INTRODUCTION

This presentation is only a part of the larger project Water Related Transnational Monitoring Network in Croatia (Croatia TNMN) for which GP Form was prepared. However, the content of the presentation is extended so that it includes experiences from most of Danubian countries. This is possible because at present Croatia is the Central Point for collection and maintenance of TNMN data within the Danube River Basin.
To reduce the pollution load within the Danube River Basin Danubian countries in cooperation with EU established the Environmental Programme for Danube River Basin (EPDRB, Sofia 1991), based on the extension of an earlier Bucharest Declaration Programme (1985) from existing National Monitoring Programmes. The Danube River Protection Convention (DRPC) was signed in Sofia 1994 and ratified at the end of 1998. An early step in the implementation of the EPDRB was to coordinate and support monitoring, data collection, assessment, emergency response systems and pre-investment studies. For this purpose the Danube Task Force was established with expertgroups for:

- Monitoring, Laboratory and Information Management (MLIM)
- Accident Emergency Warning System (AEWS) and
- Data Management (DM)

In addition Transnational Monitoring Network (TNMN) was established. Later on Emission working group (EMIS) and a special ad-hoc working group for assisting in transferring activities from the Task Force and the Danube Programme Coordination Unit (PCU) to the International Commission for DRPC Convention were formed.

2. ACTIVITIES OF MLIM

The most complete system for collection, storage, processing and dissemination of data within Danube Convention (DRPC) was developed by Monitoring Laboratory and Information Management sub-group (MLIM). The reason for this is that monitoring data are collected regularly from already existing national monitoring systems. This is not the case with other activities initiated within DRPC Convention. Therefore Data collection, storage, processing and dissemination within MLIM can be very easily adopted for other similar activities within DRPC.

At the end of 1994 within MLIM three special expert sub-groups were organised for:

- Monitoring
- Laboratory Management and
- Information Management

The main objective of the Monitoring working group was to establish TNMN and coordinate the work of National Focal Points for the Danube River Basin. Laboratory Management working group coordinated improvement of laboratory practices increasing interlaboratory comparability of water quality measurements and coordinated the work of National Reference Laboratories. Information Management working

group coordinated collection of water quality and quantity data from individual countries at TNMN stations and coordinated the work of National Information Centers.

Collection of Trans-National Monitoring Network (TNMN) data was initiated in 1996, starting with the data from 1995. After that, TNMN data are collected quarterly with a three months delay in order to enable their standard processing and reporting. Initial Standard Operating Procedure (SOP) was based on the use of flexible diskettes. At the beginning of 1997, experiments with e-mail infrastructure were initiated. Finally, in 1998, data exchange via e-mail entered into a routine procedure approved by MLIM EG.

3. DATA COLLECTION AND MAINTENANCE IN DANUBIAN COUNTRIES

It has been clearly recognized that there are significant differences between Danubian Countries with respect to the collection and maintenance of water related environmental data, particularly in the software and hardware used, quality assurance and quality control measures applied, and organization of water related environmental information management.
In all cases different types of PCs are used with different types of WINDOWS (earlier DOS) operating systems. Sometimes PCs are linked in a local area networks. In other cases they are operating stand-alone. In some countries a start has been made to use UNIX workstations. The quality of equipment used differs from one country to another. In many cases dedicated systems for storage of environmental data are designed to fulfil national needs. In some countries these national systems are installed in regional and local institutions, while in other countries distributed but not integrated systems exist in the same country which have not yet been harmonized even at the national level.
At the beginning, the conditions in Danubian Countries were very different. National information systems (NISs) were not compatible each with other. Therefore WTV Consortium proposed in 1993 to develop a common Data Exchange File Format (DEFF) for harmonizing the existing national TNMN data. Individual Danubian States are responsible for the collection of their national data trough the National Information Centers (NICs) which should act as "centers of excellence" for information management. Countries which did not have their NIS developed could use DEFF not only for processing of their TNMN data but also the complete set of national monitoring data (even those outside Danube River Basin). The countries which have up to now developed their NIS should create interfaces from their NIS to DEFF and from DEFF to NIS. If NICs could become "centers of excellence" one cannot expect any problem in information management of TNMN data. However, for different reasons, some of NICs are not able to play such a demanding role. Even now, in 1999, a few countries still have difficulties in transferring their national data to DEFF.

4. HARMONIZATION OF NATIONAL DATA IN DEFF

Based on DEFF format, corresponding DEFF Database Application was created by WTV Consortium. At the beginning this application was prepared in the simple relational database software PARADOX FOR WINDOWS, Version 5.0, using WINDOWS'95 as the operating system. Later on this application was converted to PARADOX 7.0 and operating system WINDOWS NT. New applications are planned for PARADOX 8.0, WINDOW'98 and 2000. DEFF system is based on several types of entities.

Elementary (Strong) Entities:
1. Country (stored in database file COUNTRY.DB), fixed Table
2. Monitoring points (stored in MONPOINT.FDL form)
3. Sampling methods (stored in SAMPMETH.FDL form), fixed Table
4.Determinads (stored in DETERMIN.FDL form), fixed Table

5. Remarks (stored in REMARK.FDL form), fixed Table
can exist independently in the DEFF Data Model and are uniquely identified by their own identifiers, i.e. they are independent from the other entities.

Weak Entities:
6. Sample (stored in SAMPBULK.FDL form, serving for Sample registration)
7. Analytical Method (stored in ANAMETH.FDL form), fixed Table
are existentially (ED) and identificationally (ID), and sometimes combined ED&ID, dependent on other (often Elementary) entities.

Composite Entities:
8. Locdeter (stored in DETERLOC.FDL form, which could be called as an additional option DETERMINANDS from MONPOINT.FDL form)
9. Analysis (stored in ANABULK form, serving for registration of analyses, which could be called as an additional option ANALYSIS from SAMPBULK.FDL form)
are introduced as a replacement for multiple binary relations of M:M type between individual entities (here M represents the word multiple).

Five fixed Tables could be changed only by responsible manager (CP), and not by any user, based on decisions made at IMESG Meetings. DEFF application includes also some additional forms which serve for maintenance of stored monitoring data (SAMPANAL.FDL), or reporting (DIAOVANA.FDL) and exporting to AARDVARK (DIAAARDV.FDL) simple statistical software package.

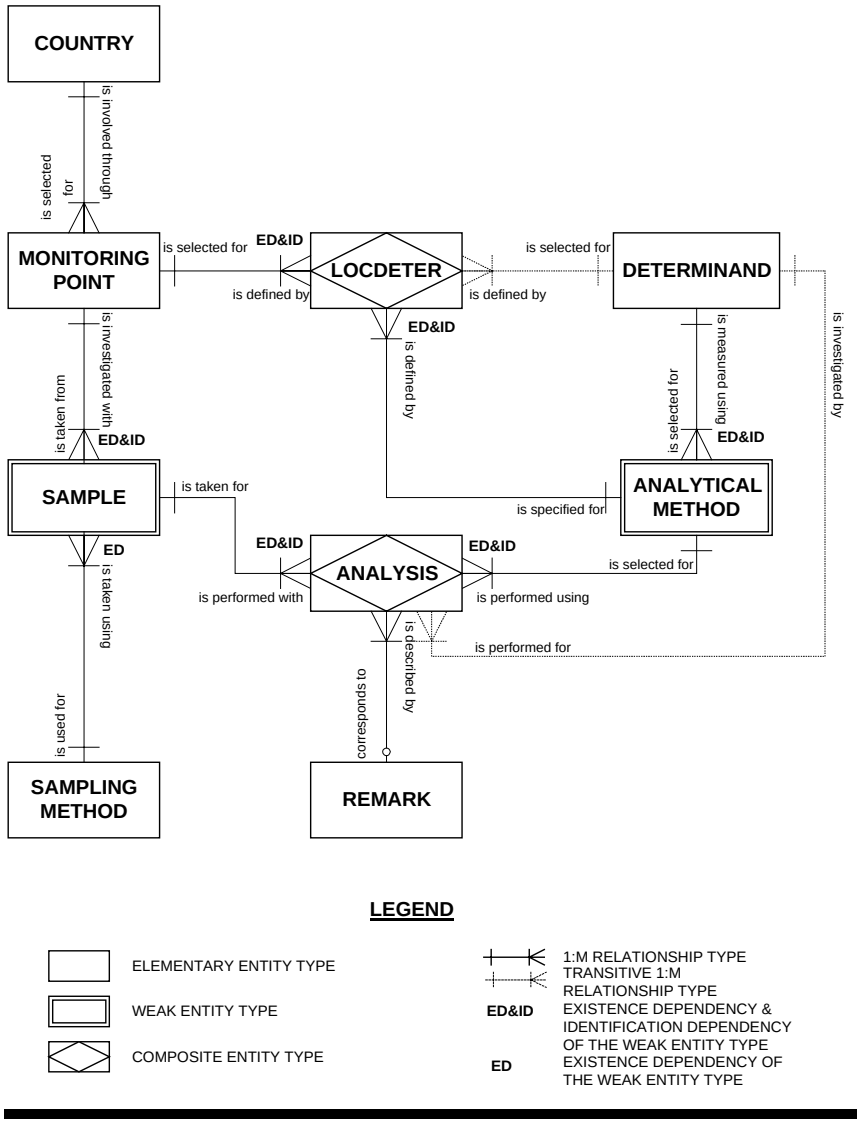


FIG.1. NORMALIZED ENTITY-RELATIONSHIP (E-R) DIAGRAM OF DEFF DATA MODEL

5. PROCESSING OF NATIONAL DATA

The existing national systems are usually not well documented. Many countries produce country reports. Some of these yearly reports are of very high quality, rich in graphic presentations. This situation does not exist in all countries. The use of data for calculation is rare. For many countries the main purpose of data collecting appears to be for the production of Yearbook, like it was the end of the process. Some data were used to calculate the load of pollutants, and the intention to use the data for mass balance calculation can be recognized. However, at present the amount and quality of data does not permit reliable mass balance and load calculations.

TNMN data stored in DEFF system can be exported to a simple software package AARDVARK (Analyse Any Routine Data; Visually Acquire Real Knowledge) developed by Moonsoft (Copyright WRc 1989-1995) in the UK. This software tool offers the following features:

1. Menus for specific requirements for analysing monitoring data
2. Use of colour graphics
3. Automatic significant testing
4. Easy to be used

Some of the common questions that one can answer with AARDVARK are:

- is there a seasonal pattern
- is water quality getting better or worse, and if there was a change, was it gradual or sudden
- is water quality getting more or less variable
- are we doing enough sampling (it is of course not easy to do it very frequently)
- what sort of distribution does the data follow (Normal, Lognormal, other ...)

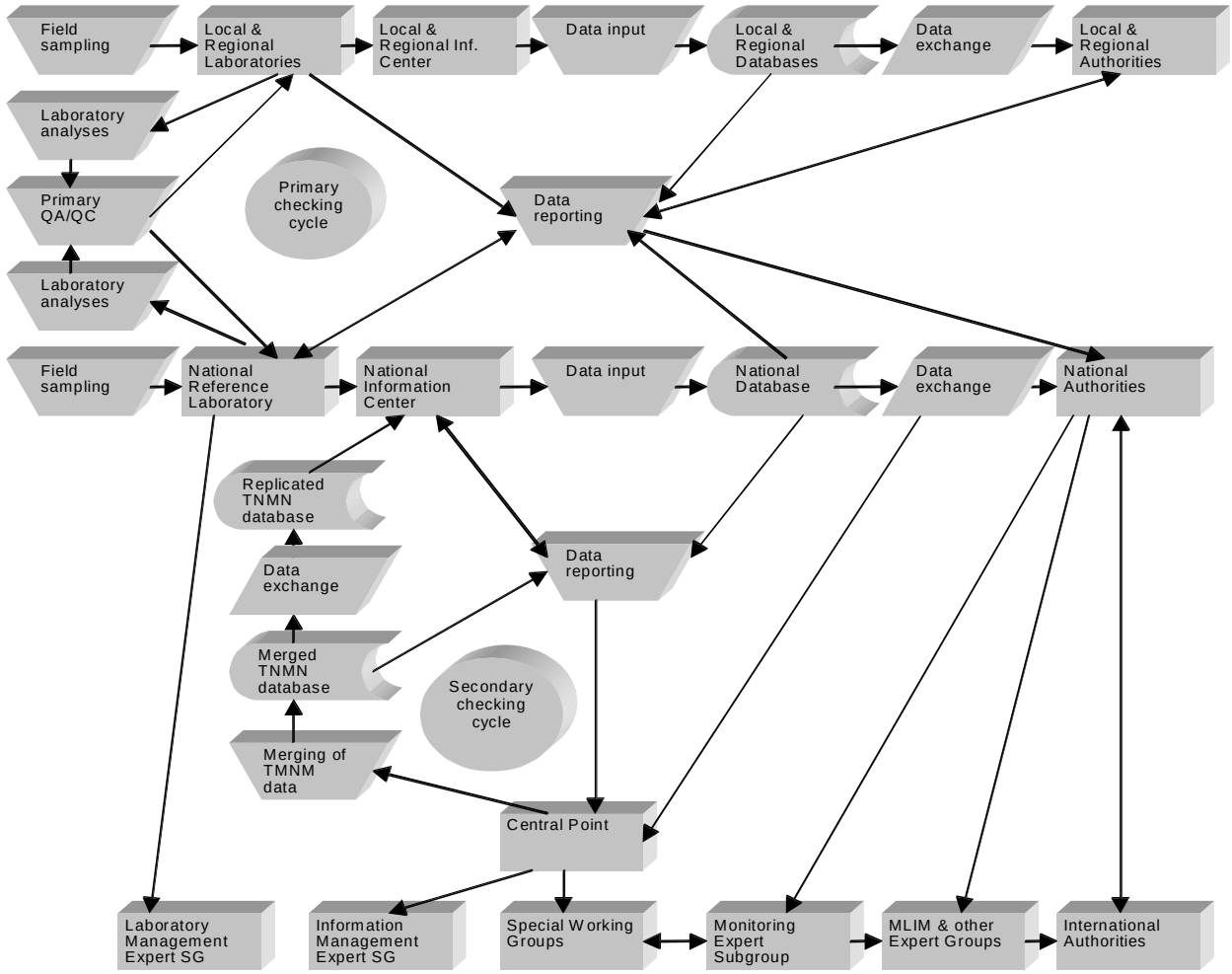
In some of Danubian Countries DEFF and AARDVARK have been used for collection and processing of other than TNMN data. For example Bucharest Declaration data from 1992 to 1997 have been introduced recently into DEFF database. Lists of determinants, monitoring points and analytical methods have been extended in order to enable entering of Bucharest Declaration data into the database. The system of coding of determinants and analytical methods has been updated for the same reasons.

6. ACQUIRING OF TNMN DATA

Within the Transnational Monitoring Network (TNMN) for Danube River Basin water quality data are generated mainly by performing laboratory analyses on samples taken from the field at specified monitoring points. The field sampling and laboratory analyses are performed, depending on the country and type of determinants, mainly by nominated local and/or regional laboratories and in some special cases, as well as in some smaller countries, by National Reference Laboratory (NRL). Within these laboratories primary QA/QC procedures are performed. Local or Regional Laboratories may have their own Information Centers which perform data input in the local or regional databases. From these local or regional databases through data exchange procedure water quality and quantity data can be sent to Local and Regional Authorities. At the same time National Reference Laboratory send their analytical results to National Information Center (NIC), which like the local or regional information centers perform data input of their analytical data into National Database, where from through data exchange procedure these data are sent to National Authorities.

However, if local and regional laboratories do not have their own information centers and databases they send the analytical results through data reporting procedure (based on hardcopy documents) to local and regional authorities and National Reference Laboratory. Local and regional authorities also in the line of their duty send the water quality and quantity data through data reporting procedures to national authority. Data reporting can be also performed directly via local or regional as well as national databases, depending on the operational procedure defined in individual countries. National reference laboratory directly or through national information centers via multiple data reporting send TNMN data to local and regional laboratories or local and regional authorities for primary checking procedure (**Primary Checking Circle**).

Fig. 2: Information flow model for MLIM



NOTES FOR FIG. 2:
Pure quadratic boxes represent institutions involved, trapezoidal boxes represent processes in which these institutions are involved, cylindrical boxes represent databases and parallelograms represent data exchange process, while arrows represent flow of information within the system.

7. MERGING OF NATIONAL TNMN DATA

National reference laboratory (NRL) and national information center (NIC) represent the points of contact between national monitoring network and TNMN organized within the Danube Convention (DRPC). NRLs of individual countries are linked through the National Laboratory Managers (NLM) to the Laboratory Management Expert Sub-Group (LMESG) and its Chairman. LMESG involves only some of the NLMs who are the members of LMESG (National Laboratory Experts, NLE). Duty of the chairman of LMESG is to coordinate the work of LMESG and contact other NLMs who are not members of LMESG. In the same way NICs of individual countries are linked through the National Information Managers (NIM) to the Information Management Expert Sub-Group (IMESG) and its Chairman. IMESG involves only some of the NIMs who are the members of IMESG (National Information Experts, NIE). Duty of the chairman of IMESG is to coordinate the work of IMESG and contact other NIMs who are not members of LMESG.

National information centers collect national monitoring data and generate national data base. They retrieve national data needed for TNMN database, prepare them for the input into the harmonized Data Exchange File Format (DEFF) and send them to the Central Point (CP) which is at present selected between national information centers whose national information expert (member of IMESG) is the Chairman of IMESG. In central point collected national TNMN data are merged into basin wide TNMN database which is maintained as a database separated from the national database. Central point send replicated merged basin-wide TNMN data through data exchange procedure to all NICs of individual countries involved in DRPC convention. In NICs these replicated data are stored separately from their national database. Individual NICs check their national data within merged basin wide TNMN data and inform CP via data reporting on the validity of data stored (**Secondary Checking Circle**).

8. FROM MLIM TO INTERNATIONAL COMMISSION

National authorities nominate their representatives to Monitoring Expert Sub-Group (national monitoring expert, NME), Laboratory Management Expert Sub-Group (national laboratory expert, NLE) and Information Management Expert Sub-group (national information expert, NIE). These expert subgroups act within separate expert sub-group meetings and joint meeting where they prepare proposals for gathering and processing of basin-wide merged TNMN data and development of corresponding information system. National authorities nominate also representatives of Monitoring Laboratory and Information Expert Group (MLIM EG). MLIM EG with chairmen of ESGs and other expert groups (MLIM, EMIS for analysis of emission data and AEWA for accident emergency warning alert). Members of MLIM EG are also representatives of international authorities. MLIM EG discuss and approve proposals on ESGs. On the basis of MESG proposal they nominate Special Working Groups (EWG) for special data processing (preparing yearbooks and other professional documents). For this pupose EWG cooperate with MLIM ESGs.

	MINISTERIAL CONFERENCE	
STEARING GROUP	INTERNATIONAL COMMISSION	PROJECT MANAGEMENT TASK FORCE
CONSORTIA AND COORDINATING INSTITUTIONS	INTERNATIONAL SECRETARIAT	PROJECT MANAGEMENT TEAMS
AEWS	MLIM	EMIS
Ad Hoc Working Groups	Monitoring, Laborato ry & Information Mangement ESGs	Applied Rsesearch Projects

International authorities are International Commission (IC), donor institutions like PHARE, TACIS and UNDP/GEF who are represented in so called Program Coordination Unit (PCU). IC is acting in plenary Meetings as well as in Steering Group (SG) which involves only Heads of Delegations for individual countries. For the assistance of IC in its development work, particularly regarding financial implications, the Project Management Task Force is established (PMTF).

9. APPLICATION OF NEW TECHNOLOGIES

EU 4th Framework Projects for Telematic applications have an important influence on development of comprehensive information system for Danube River Basin (DANUBIS). The results achieved stimulate the application of modern information and communication technologies in environmental management. In this, EU/CEEC User Forum on Telematic Applications for Water and Air Pollution Management (ENWAP User Forum, 1999) supported by EC/DG XIII played a special role. The "Good Practice" exercise performed within ENWAP served as a tool to identify particularly interesting and efficient telematic systems which could be applied in similar sites elsewhere, in order to maximize the benefits of the research among other users.

Efficient cooperation between national experts and effective management of information collected from 12 different countries is a very demanding undertaking. Traditional methods are becoming a limiting factor in the improvement of information management. Distributed and harmonized information systems equipped with high level integration and remote access services, using high speed communication facilities could resove these difficulties. The establishment of such information systems is a process and not only a short-term exercise, and it should be developed in steps, taking always into account the most advanced technologies. Otherwise, the technologies applied would not be able to fulfill efficiently the needs at the moment of their implementation. This requires frequent updating of priorities for every step in the information system development.

Integration of relational database management systems (RDMS) with geographic information systems (GIS) enables automatic presentation of interpreted data through dynamic Web facilities (DHTML) in the form of the so called Theme Pages introduced first time by US NOAA. New technologies are more effective and at the same time more cost-efficient. They are more user-friendly and financially feasible.

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WASTE MANAGEMENT AND SOIL POLLUTION

SIGRES; Toxic and Non-toxic Waste Management System

Carlos Garcia Suarez, Environment & Transport Planning, Spain

Dr. Carlos García-Suárez
Director General (Madrid)

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SIGRES

Toxic and non-toxic waste management system

Workshop on Environmental Telematics

München, June 22nd 1999

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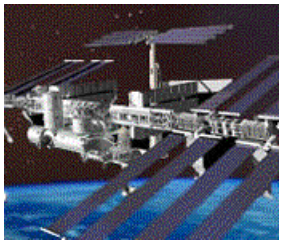
Saturday, June 19th 1999

"El Mundo", 2nd largest newspaper in Spain

- "International Space Station at risk by space waste:

  an old Russian rocket was 7km short of hitting the international space station"

  NASA recognises that the space station was very close to be destroyed and become just history"



- There are some 8700 old space ships orbiting the earth

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Scope

- The Spanish Air Force wanted to develop and implement a telematic system that would help them to:
  - Fulfil the legal obligations regarding reporting and management of hazardous-waste
  - Know the amounts and types of all wastes (including non-hazardous) generated

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Ourselves

- 100% focus environmental consultancy
- large customer base in both the private and public sector
- four offices, including one office in Lisbon (Portugal)
- about 60 people
- the most important environmental consultancy in Spain
- a lot of experience in international projects including EU, South America and North Africa.

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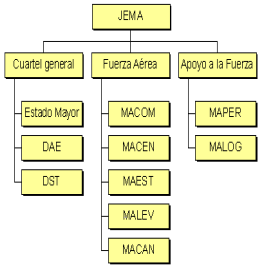
Background

- The Air Force is a fairly large organisations
- It has both a strong geographical component and a functional component
  - It has five major regions
  - Then the general headquarters
  - Support units



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Facilities

- A total of some 70 facilities are scattered throughout the territory
  - CGs (Headquarters)
  - COAs (Air Operations Centre)
  - COSs (Sector Operations Centre)
  - EVAs (Air Surveillance units)
  - + ALA, GRUPO, ESCUADRÓN, ESCUADRILLA
- Some of these facilities are very small with just a few handfull of people
- Medium type facilities with limited maintenance
- Large and complex facilities with industrial type problems

Types of waste

- Hazardous waste
  - Used oils
  - Used solvents
  - Used paints
  - Toxic sludge
  - Batteries
  - many other in minor quantities
- Non hazardous waste
  - Everything produce by groups of people living together
- The system would also account for wastewater
- A total of some 96 different waste have been accounted

Legal and policy framework

- Basic Law on waste 10/1998
- Key regulations on hazardous waste
  - 833/88
  - 952/97
- Instruction by the Ministry of Defense on ISO 14001 and general environmental policy

Legal requirements

- Hazardous waste have to be reported every year on a detailed basis.
  - This has to be done on a regional basis
  - There are 17 regions (more than the 5)
- Hazardous waste can not be store for more than a 6 month period
- Facilities managing more than 10 tons/year of hazardous waste have to fulfil complementary reporting requirements
- Non-hazardous waste do not need to be reported, the only requirement is handle them properly

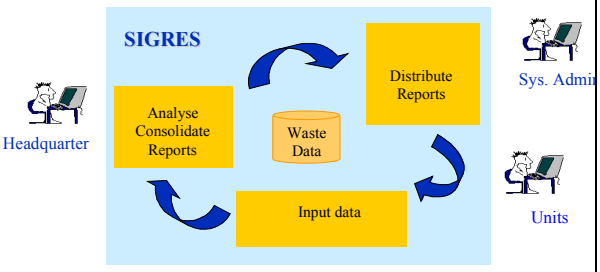
Objective

- To know
  - what waste are being generated in ALL AIR FORCE facilities
  - when the waste have been generated
  - by whom
  - status of the waste
- Provide tools to
  - analyse all this information
  - produce official reports per region (to be directly submitted)

Initial status and programme

- Initially we found that most of the waste bookkeeping was done on a paper based on a local level
- Reports were sent to the headquarters but they really lacked the capacity to analyse the information
- Programme for progress
  - Develop a DBMS accessible through Internet/Intranet that will support all data entering needs and all exploitation needs
  - Input existing historic data
  - Set up facilities so ALL UNITS could send their data in electronic support

View of the system (1st phase)



Upload of information

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- Because of infrastructure limitations and for simplicity the local data is input off-line via a specific application. This produces a file with data for the period at hand.
- Information upload has to be tailored to the large variety of existing infrastructure:
  - E-mail with an attached file
  - Upload a file from a Web page via FTP
  - Send a diskette
  - Still send a paper report

Exploitation of the information

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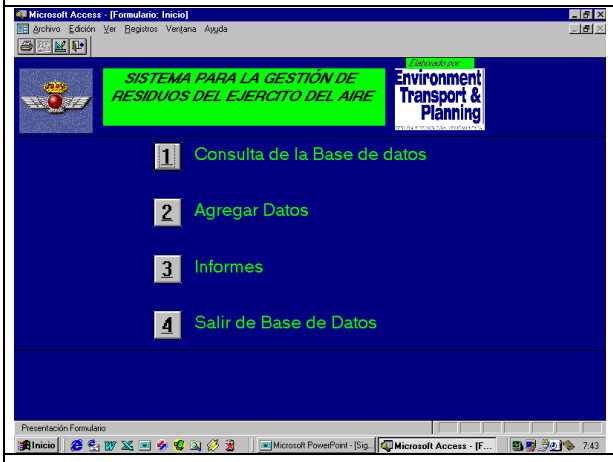
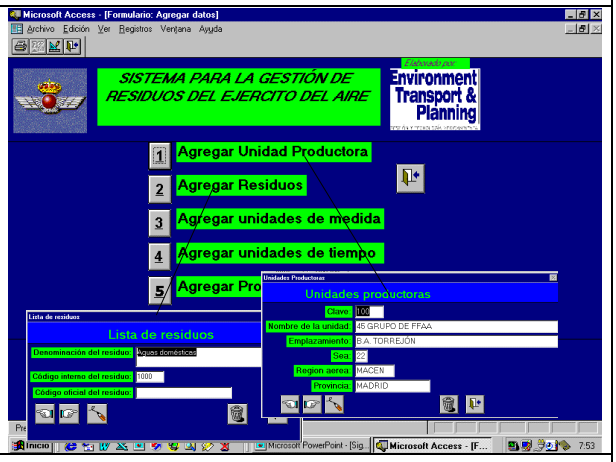
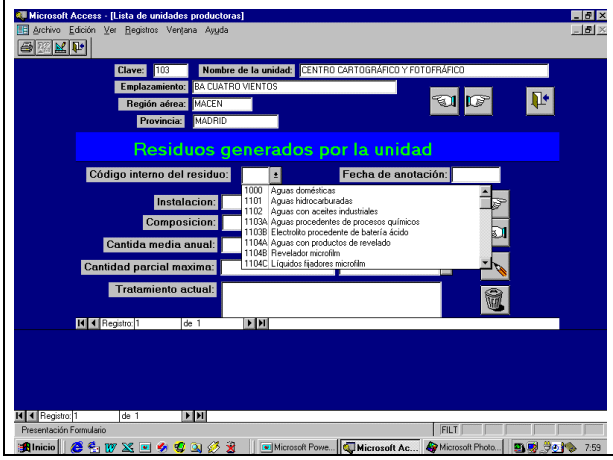
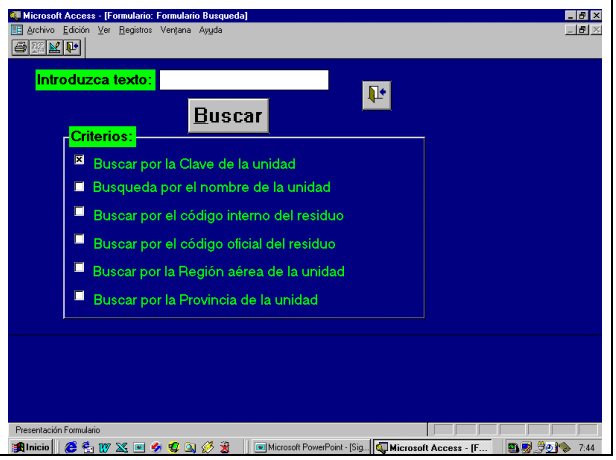
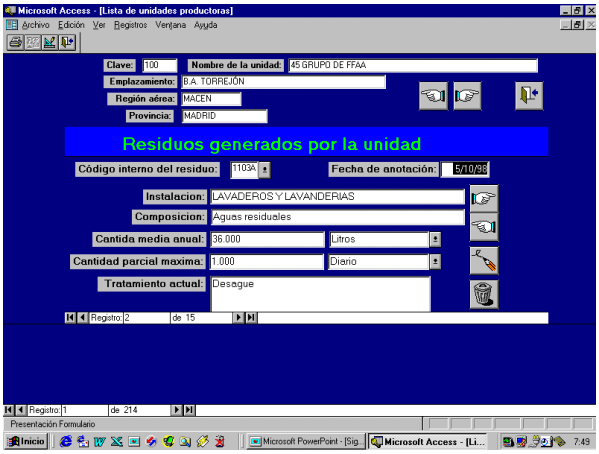
- A set of query facilities were built on
  - E.g.: Give me all the used oils generated anywhere
    - by unit
    - by date
  - E.g.: Give me all the waste generated at “Almeria base”
- Reports
  - Official reports for the 17 regional governments
  - Individual reports for each unit
  - Consolidated reports for the heardquarters



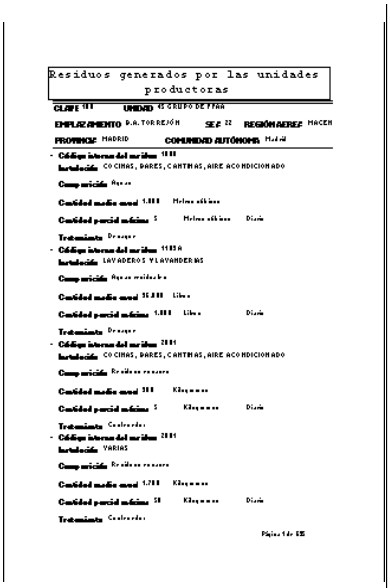


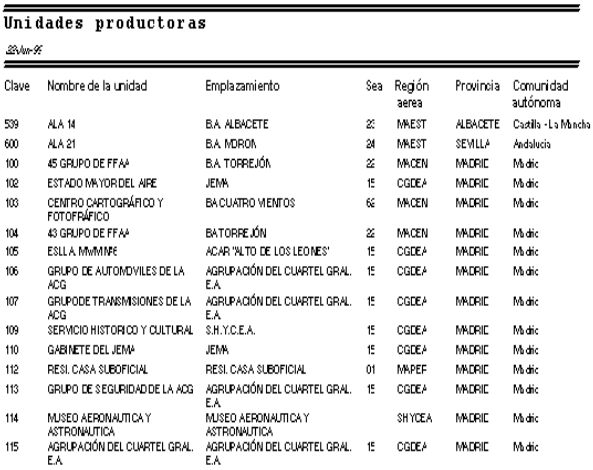






Reports


Residuos generados por las unidades productoras



Unidades productoras

Clave	Nombre de la unidad	Emplazamiento	Sea	Región aerea	Provincia	Comunidad autónoma
539	ALA 14	B.A. ALBACETE	22	MAEST	ALBACETE	Castilla - La Mancha
600	ALA 21	B.A. MORON	24	MAEST	SEVILLA	Andalucía
100	45 GRUPO DE FFAA	B.A. TORREJÓN	22	MACEN	MADRID	Madrid
102	ESTADO MAYOR DEL AIRE	JEMA	15	CGDEA	MADRID	Madrid
103	CENTRO CARTOGRÁFICO Y FOTOFRÁFICO	BA CUATRO VIENTOS	62	MACEN	MADRID	Madrid
104	43 GRUPO DE FFAA	BA TORREJÓN	22	MACEN	MADRID	Madrid
105	ESCUELA MVMNPE	ACAR 'ALTO DE LOS LEONES'	15	CGDEA	MADRID	Madrid
106	GRUPO DE AUTOMOVILES DE LA ACG	AGRUPACIÓN DEL CUARTEL GRAL. E.A	15	CGDEA	MADRID	Madrid
107	GRUPO DE TRANSMISIONES DE LA ACG	AGRUPACIÓN DEL CUARTEL GRAL. E.A	15	CGDEA	MADRID	Madrid
109	SERVICIO HISTORICO Y CULTURAL	S.H.Y.C.E.A.	15	CGDEA	MADRID	Madrid
110	GABINETE DEL JEMA	JEMA	15	CGDEA	MADRID	Madrid
112	RESI. CASA SUBOFICIAL	RESI. CASA SUBOFICIAL	01	MAPEF	MADRID	Madrid
113	GRUPO DE SEGURIDAD DE LA ACG	AGRUPACIÓN DEL CUARTEL GRAL. E.A	15	CGDEA	MADRID	Madrid
114	MUSEO AERONAUTICA Y ASTRONAUTICA	MUSEO AERONAUTICA Y ASTRONAUTICA		SHYCEA	MADRID	Madrid
115	AGRUPACIÓN DEL CUARTEL GRAL. E.A	AGRUPACIÓN DEL CUARTEL GRAL. E.A	15	CGDEA	MADRID	Madrid

Results and next steps

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- Results
  - Makes thing easier for everybody
  - Consistency of information
  - Quick and easy capacity for analysis
- Next steps
  - Provide more information for local management of waste
  - Generate reports for authorities locally
  - Expand to other units of the Arm Forces

ENSURING SUCCESSFUL DATA MANAGEMENT - BUILDING NEW PARTNERSHIPS AND EXCHANGING EXPERIENCES (CLOSING PLENARY)

Session Chair: Nick Hodges, (ENWAP) Leicester City Council, Environment and Development. UK.

Session Speakers:

- **Teemu Virtanen,** *Chair, Data Collection Session*. Regional Coordinator Helsinki Metropolitan Area Council. Finland.
- **Markus Spring,** *Chair, Data Dissemination Session.* (TAP) Health and Environmental Information Expert, Munich Department of Environment. Germany.

Objectives

The session looked to summarise the results of previous parallel sessions, and particularly to further exchange experiences in terms of the available solutions for overcoming data collection and dissemination obstacles. Data management can be improved through summarising „good practice" experiences as well as new partnerships, drawing on lessons learned. Further involvement in the EUs Fifth Framework Programme can also serve to facilitate transfer and the implementation of Information Society Technologies (ISTs). Suggestions for a number of „support actions" to help further realise this process were collected.

Background

Previous parallel sessions explored a variety of technical and institutional challenges to data collection and dissemination. The results of each session and corresponding discussions were briefly presented by the chairs of those sessions and are outlined below. Participant reaction accompanying the presentations is also incorporated, although time was limited for a full discussion. For this written summary, the rapporteur and session chairs have further contributed based on their recollections and experiences.

TECHNICAL ISSUES IN DATA MANAGEMENT

DATA COLLECTION	
Challenges	**Solutions or „Good Practices"**
Inconsistent thematic data collection and storage formats, both electronically and in hardcopy, and its comparability	Definition of a common set of national (and even international) standards for electronic collection, storage, and exchange. For example, data might be stored in very basic format (ascii etc.) so that it can be imported into any database. Specialised software that cannot exchange data with other programs should be avoided. Upcoming international standards like XML or CORBA will perhaps ease the data exchange process. Concerning thematic coverage, local reporting might also be better factored in with European initiatives and standards such as the European Environment Agency's. This would be according to EU limit values and their statistical definitions. And issues like the calibration of measurement gauges, their location and related procedures should be considered within such proposals. Consistent quality management procedures should also be adopted.

	Hardcopy storage often depends on the availability of local fund resources to print up documentation. However, the range of items produced at local level could be universally consistent in a standard reporting and comparable format. Formats might also be streamlined with central institutions responsible for environmental reporting, e.g. the European Environment Agency.
Developing the right tools, functions, and database structures.	Designing the right information system relies on sufficient know-how and expertise, human and financial resources. It also should factor applicable national data standards. Financial resources can be secured through political lobbying. Building the capacity of human resources and experience should also be accorded more importance at the senior level, through financing staff-attendance of targeted workshops and seminars. This might bring both short and long term benefits, rather than the purchase of state-of- the-art products or solutions which are not configured or implemented properly. Selecting an existing, well-functioning application already developed for the market is an alternative approach, as long as the expertise exists to utilise successfully. Project catalogues and guidelines, information and known-how exchange are approaches that can be used to determine which application is best. Furthermore, some participants suggested a national help-desk, „hotline" telephone number, or discussion forum.
Ensuring accuracy of data collected, and its availability	Some participants suggested use of state of the art technology can help to ensure accurate data collection. Rather it could be argued the development of quality procedures is the key issue. A national standard or agreed criteria for measurement can help to ensure accuracy, but this need not dictate the technology relied upon. A full cost-benefit analysis should be performed before any purchasing decisions are made. The availability of data to those responsible for its collection is clearly dependent on any number of issues, including time, financial and human resources, meteorological conditions, use of the right technology etc. According resources for these activities is a political issue dependent on national and local priorities, and bottom-up lobbying.
Poor telecommunications infrastructure	Investment in the IT sector, most likely through its liberalisation can help improve this obstacle, however, rural areas will perhaps remain less well developed through anticipated lower profits.
DATA DISSEMINATION	
Challenges	**Corresponding Solutions or „Good Practices"**
Local Gov. Level	
How best to deal with meta-information (3)	Training and education, skill sharing, capacity building, improving expertise at the local level. Adoption of the European Catalogue of Data Sources can help at the national and international level, and usage of SGML/XML as an approved data format.

Developing an integrated data interface	Use of an Internet browser to visualise, but avoidance of plug-ins and vendor specific enhancements.
Many simple (Internet, email, ftp, diskette etc, cd-rom) and sophisticated technologies are now available on the market to facilitate informational dissemination, but which one best meets user needs?	Potential IST users (decisionmakers and experts) might begin by evaluating needs to be addressed, through what media and which level of technology will meet these expectations. Furthermore, careful judgement of the available in-house technical resources vs. The parameters of a specific technique should be undertaken. Public user needs must also be carefully considered before launching any public dissemination services e.g. information kiosk. These issues are crucial in ensuring long-term acceptance by users, both local and public.
Ensuring internal data security (2)	Selecting the right technology solutions that offer high security is one solution. This depends on obtaining accurate information on the application prior to purchase. Technology directories and guides can help in this respect.
Delivering performance and flexibility	Use of an advanced technology can help, but which one is best for the job? Technology guides and directories or best practice technology inventories of solutions, A clear point of reference, an information desk, helpline or FAQ directory can help.
Issues of National Importance	
Different technical standards (local (2), national, international (3))	Across-the-board use of GIS might be one solution, however, common data standards for exchange and dissemination should be permanently established to improve information transfer and flow. Participants recommended the EU might attach more importance to data standards and hardware/operating systems independence.
Different informational standards at different levels (in terms of dissemination)	
What information should be provided to the public?	Although legislation in the EU and increasingly in the EU Accession countries calls for public access to information, debate continues as to what information should be made publicly accessible. This is an issue to be dealt with at the national and international level. Many argue it is not right to give out raw data that may be subject to misinterpretation. A counter argument would be to offer raw data together with good quality accompanying and explanatory documentation. This can help minimise accompanying risks and thus ensure total transparency in terms of data publication.
Ensuring currency and quality of data (3)	Locally, the establishment of regular data collection and update procedures, complemented by the availability of a sufficient number of skilled staff. Nationally, and internationally, quality standards for currency, quality. Within the Information society today, this is something that should be considered at the international level in order to facilitate comparability, standard access and transboundary exchange. The European Environment Agency of DGXI might set the overall standard and policy for data collection, and management.

Bilingual datasets developed in response to trans-boundary environmental problems and cooperation (2)	Development of sophisticated interfaces or multi-lingual thesauri that offer data in multiple languages, and flexibility of the partners to accommodate this into their activities. Or agreement on one standard language. Chair reaction noted that public information systems should ultimately rely on a multi-lingual approach in order to avoid any potential conflicts.

(Note: Numbers indicate frequency of references made to the issue during the course of the presentations and discussion)

INSTITUTIONAL ISSUES IN DATA MANAGEMENT

DATA COLLECTION	
Challenges	**Solutions or „Good Practices“**
Unclear responsibility and roles as to what data should be collected, how, and how often.	Responsibility can be easily assigned locally for data collection, but this should be consistent with national mechanisms for reporting on the environment. A national or pan-European initiative might be launched defining who is to collect data on the state of the environment, how and how regularly. To be consistent with the subsidiarity principle, data collection should take place at the local level, feeding into a national reporting mechanism and European system, for example that of the European Environment Agency. Communication and cooperation with the key players in-country and on the European scene can help determine these issues.
Unclear access rights. What data can and can't be collected and by whom? Is it public or private?	Local and national policies might also clarify who can access what data when reporting and monitoring the state of the environment. In some cases, local players are hindered from accessing certain kinds of environmental data in spite of legislation defining free access to information. Rules should be enforced once established.
Vague rules on ownership. Should data (raw and processed) be made available for a fee or for free?	Participant reaction from the Dissemination session noted that all work undertaken by administration is funded by the public via taxes, so as public property should be made available without charge. However, parallel discussions during the Data Collection session revealed that because local governments (especially those in CEE) are expected to self-finance their activities, municipal data is one of the few commodities they can sell. This would not apply to „basic data“ (which would require defining), but that with added value and service. One reason for advocating this latter measure is third party use of public data. Value added data, given away for free, has in some instances been sold on without any reference to the supplier/producer. Copyright and ownership rules might help overcome this problem, ensuring proper reference and no profit making. Legislation should therefore define whether data which has been collected and processed becomes the property of the owner, and whether this can be made available for free, or at a cost – if only to cover the time invested in collection and processing.

Securing financing	Besides lobbying for institutional funds and support locally, the role of local players in collecting environmental data need first be clearly defined. Consequent to this, the necessary allocation of funds can be made, at the local level as well as nationally and internationally depending on the reporting mechanisms in use.
Limited expertise, both locally and nationally	Can be improved through data collection/gathering related training courses, seminars and workshops offering opportunity for experience, know-how, and information exchange. Even staff exchange might be facilitated. Participant reaction noted this might be funded by the EU, as opposed to the funding of product development within company-dominated cooperations.
Planning ahead before implementing IT solutions	Defining your content, and processes will streamline any needs analysis, and help ensure a right decision is made in selecting an appropriate IT solution. Identifying key players and further motivating them and ensuring their commitment can be challenging but can be invaluable in dealing with later obstacles which might arise. Business plans can assist in streamlining activities and advisory boards/steering committees can ensure accurate plans are drafted.
DATA DISSEMINATION ***(Solutions for consideration at both local and national level)***	
Challenges	**Solutions or „Good Practices“**
Low political support in addressing environmental problems and understanding of the role technology solutions can play. Once implemented, ensuring sustainability of the application	Better understanding of the benefits of IT and the need to prioritise environmental issues. This can be achieved through awareness raising at the local level, both through external measures such as nationally and EU supported environment workshops, and IT events. Internally, lobbying senior players for time and budget allocations. Low prioritisation is a common obstacle but references can be made to a number of driving forces: the EU accession process driving environmental improvement and consideration, the need for implementation and harmonisation with EU Directives, the growth of the Information Society and the “information revolution,“ the value of IT as a support tool to the decisionmaking process etc.
Poor public environmental awareness	Awareness raising through the dissemination of multi-thematic environmental information through public information systems, the Internet and the media.
Overcoming a poor legal framework	Harmonisation and implementation of legislation at the local (and initially at the national) level consistent with EU law prior to membership. This includes access to information, IPPC (Integrated pollution, prevention and control) and waste directives, environmental impact assessment (EIA), air and water Directives etc. which all call for the collection and dissemination of related information.
Poor staff expertise	Attendance of training courses, workshops, etc. in the relevant fields raising the level of user, and expert education. Funds for this might be provided at the local level, while at the national level, courses offered by those bodies respon-

	sible for the development of the Information Society.
Overcoming high costs of telecommunications and technologies	Implementation of low-cost solutions locally. Ensuring appropriate budgets are set aside locally through lobbying. Soliciting external financial support through regional development and environment funds, national sources, and international sources like VFP, Phare etc. Liberalisation of the telecoms sector (national issue)
Institutional cooperation, locally, regionally, and internationally (transboundary)	At the national level, hosting forums and seminars on environment and IST to raise awareness and bring key players/institutions from the local level together. Partnerships and cooperation can then be nurtured.

Other technical challenges raised before the meeting for discussion included:

Data Collection	**Data Dissemination**
• Access to the source of information. • Data quality (integrity, accuracy, completeness and usefulness). • Data inventorying and organisation. • Packaging: technical versus user requirements • Data quality and organisation improvement • Data duplication • Y2K	• Building an effective index • Implementing local search systems (using freeware available on many Websites). • Search tools and technology • Address/location availability to potential user • Establishing web access. • Firewalls, bandwidth, security issues • 3D compatibility. • Y2K

Following chair presentations, the session chair invited reaction from the floor. Early discussion concentrated on the most pressing issues facing local government (as potential IST users), namely the need to prioritise environmental issues, and solicit funds for financing IST investments.

Frank Price of the ENWAP Expert Group and Sheffield City Council, UK elaborated on problems associated with prioritising environmental issues at the local government level in EU countries, which is often tied to voter support. In spite of European environment policy, related issues within EU states often receive low priority because this can not always be considered a vote winner, while the provision of employment, often to the detriment of the environment can.

In addressing the issue of financing IST activities, Siegfried Rupprecht, an independent Germany-based consultant active in the field of IST encouraged more public-private partnership. Insurance companies for example might be willing to finance flood control devices to prevent costly damages. While software and hardware companies might donate equipment for use in public information systems.

In tackling the issue of high level IST applications and their relevance to the local user and EU policy, Horst Kremers of a Berlin-based research institute proposed a peer mechanism might be institutionalised for independent expert criticism and evaluation of funded applications. In this way, funds would only be invested in the most relevant and most useful applications of benefit to local players. The Session Chair responded by mentioning that all funded projects are already subject to annual project review with contracts terminated in the case of poor performance. Other panelists also noted that as a tool for environmental management, state-of-the-art technology is not always the most appropriate solution. It tends to be expensive to implement and maintain, while grass-roots or freeware solutions

might be more cost effective in some situations and additionally can allow for better employment opportunities for local experts.

Summarising the above solutions and challenges in the form of a Frequently Asked Questions document might become a valuable tool in the future prioritisation of national and pan-European IST environment issues. It could also help answer questions as to how support might be solicited and the right environment applications implemented at the local IST user-level, the rapporteur suggests. The „solutions" proposed could be further discussed and refined at national level by those responsible for IST and environment policy, or as part of an upcoming Information Society Forum meeting. Expert forums or workshops could provide the most suitable vehicle. Based on the outcomes of those discussions, national position papers and policy initiatives concerning the information society could be launched.

A number of other potential actions were also outlined during the course of the discussions which might support the implementation of ISTs. Although time for discussion was limited, the main speaker and floor considerations are captured in the table below by the rapporteur.

ACTIONS	**FLOOR/SPEAKER OPINIONS (added value, usefulness, obstacles, relevance, applicable sectors or env. areas, other issues)**
Technology transfer of "ready-for- market" solutions	**Both sessions indicated a need for transfer and support activities, facilitated through...**
"Support Actions" highlighting existing solutions	
Preliminary surveys, needs/sectoral assessments	The Data Collection seminar revealed a need for the surveying of **technical** issues pertaining to data ownership, responsibility, access, and formats. Such a survey could be undertaken at the national level and be used to identify and streamline IST policies in preparation for EU accession and in terms of improving the quality, and availability of environmental information.
Expert groups/virtual forums, partnerships	Expert forums and networks was considered one way to achieve the exchange of know-how and information when deciding which of a variety of technological solutions is the best. Such forums could be in the form of seminars, virtual electronic forums, or even a national hotline information desk was proposed during the data collection session.
Training and Technical Workshops and on-site technical visits	User and Expert education for IST applications was considered a valuable solution in overcoming the **institutional** obstacle of low level IT expertise at the local government level. Workshops can also serve as valuable opportunities to discuss which technology is the best for a particular job. Improved data management through better **institutional** cooperation might also be facilitated through the hosting of workshops for key players at the local and national level.

Good-practice guides and databases, hardcopy or Internet	Hardcopy information exchange through guides and catalogues was also considered useful in clarifying which „high-level" applications to select when considering implementing an IT solution at the local level. The ENWAP guide is already one example.
Others, including awareness raising events	One means for overcoming the shortage of funds for implementing ISTs at the local level was inferred to be VFP awareness raising events. By encouraging participation, valuable funds that could offset the costs of implementation of an innovative technology could be found.

Clearly, any of these support actions would prove valuable in assisting in the transfer of IT solutions and in facilitating their implementation. Their realisation could be a matter for national governments local government and European Commission consideration, suggests the Rapporteur.

Summarising the discussion and workshop, the Chair recapped that the session had shown a number of proven low-cost IT solutions exist for dealing with and managing environmental problems. In spite of the many challenges discussed, and experiences shared, their implementation is not unattainable. The lessons learned from many of these projects, the rapporteur adds, can be of benefit to potential users in overcoming the above challenges, while the applications themselves, now ready for transfer, could also help serve as a potential short-cut. Good-practice guides are already available, summarising the main characteristics and benefits of these projects.

Reiterating the value of IT applications, the Session Chair cited their importance in the decisionmaking process and in facilitating the EU integration of the EU accession countries. He encouraged local environmental experts to concentrate on lobbying their superiors for the availability of funds and for the prioritisation of environmental issues.

One mechanism that can be tapped into for funding the development and implementation of innovative local level applications is the EUs Fifth Framework Research and Development Programme. Although funding is small (up to 50 percent only), it does provide a vehicle and baseline for implementation. Trans-boundary partnerships are central to the success of any funded project, and events like this provide such an opportunity to establish those relationships. Local players might also think of implementing smaller applications initially, before aiming for more sophisticated and integrated tools, the Chair concluded

PARTICIPANT FEEDBACK & INVOLVEMENT

The Munich event was attended by 89 environment and IST experts. Excepting project staff, EU (European Union) countries constituted 54 percent of participants, while 46 percent were from Central and East European (CEE) countries. All EU Accession Countries were represented except Latvia. 13 EU countries were represented among them, Portugal and Spain, Greece, UK, and Finland. Excepting speakers, 51 participants attended based on professional interest. The table below shows stakeholder representation for both CEE and EU countries.

	CEE	EU	TOTAL (%)
Independent Local Self-Government	15	15	37.5
State Administration	12	6	22.5
Research Institutes and Academia	4	10	17.5
Business	2	12	17.5
NGO	4	-	5
TOTAL	**37**	**43**	**100**

Concerning participant reaction to the event (collected through a questionnaire survey completed by 20 delegates), 77 percent had a „good“ overall impression, while 8 percent felt the event was „very good.“ 61.5 percent claimed to have basic telematic experience, 15.4 percent claimed to have none.

69 percent of participants felt the content of the meeting was „good,“ while 23 percent felt it was „very good.“ Conference services were deemed to be good/very good.

Among delegates' objectives for the event, 61.5 percent found it „important“ or „very important“ to hear about future EU plans in the IST field. Similarly, 70 percent of participants attended the event for the opportunity to meet (potential) project partners, and to forge new links outside of their existing projects. This shows that the „networking“ element of the event was both important and successful (nearly all participants mentioned the event was „useful“). The third key objective (cited by all participants as of primary or secondary importance) was to obtain information on other programmes and topics. The majority of participants found the Munich event „useful“ in this respect also.

Most participants deemed the 2-day event „useful“ from a content perspective, and in particular highlighted the „Environmental Information to Public and Experts,“ and „Monitoring“ sessions most useful. Opportunities for discussion during both the User-Forum and Workshop were considered „useful.“

Participants made also content and logistical recommendations for future events. While some called for more detailed and longer presentations, others more importantly felt speakers failed to keep to the guidelines in delivering a brief, concise (ten minute) summary of their application and the challenges associated with its implementation. Overly long presentations limited the available discussion which prevented a full exchange of experiences. A full day workshop might also have been more appropriate in realising the day's objectives.

Comment was also noted on the large number of technology driven presentations, which for a workshop appeared to make them too formal. Speakers in the future might be encouraged to stand rather than sit, in this way facilitating better floor involvement. The opportunity to comment on the work-

shop and user forum through the questionnaire was welcomed by participants, clearly indicated by the 20 responses received.

Finally, among the themes recommended for consideration in future workshops were: transport related issues, GIS system integration, monitoring, modelling and simulation, public information systems, meta-data handling, regional eco-balance considerations, decision-support and integrated information systems, EIA related applications, and remote data access. Horizontal issues in demand included: good practices in improving environmental management at the local level, overcoming organisational bureaucracy, and how to finance environment IST applications.

Encouraging Participation

The organisers, including both POLIS and REC, encountered a number of obstacles in attracting CEE participation (particularly local government). Among the most frequently cited (gathered during pre-conference telephone conversations), were:

- financial constraints (even when reimbursement was offered, local funds cannot be advanced);
- poor English language skills;
- lack of interest in subject and/or „too technical“ (IST is not a priority issue);
- visa requirements;
- low level of importance attached to environment, and;
- internal bureaucracy to overcome in securing permission to participate.

It is interesting to contrast these responses, with the 81% (119) local governments surveyed during an earlier component of the CAPE project who requested dissemination events and technical workshops in the IST environment field. The same mailing list was used for both activities, however, the questionnaire survey was mailed in the local language. Clearly, limited language skills remains a major obstacle in securing CEE participation, while financial constraints emerged as the second major obstacle.

Any future IST events targeting CEE may therefore look to overcome these issues through a) full translation into local languages and b) through full reimbursement of costs. Alternately, a national event might circumvent both these obstacles.

WORKSHOP AGENDA

9:00 10:00	**PLENARY SESSION: WHY TRANSFER EXISTING TELEMATICS RESULTS?** Modern IT solutions to environmental problems are ready for the market, but is there value and benefit in transfer and their implementation or is it better to start anew? In either case, there are technical and organisational challenges to be overcome. **SESSION CHAIR: Nick Hodges,** (ENWAP) Leicester City Council, Environment and Development. UK. **KEYNOTE SPEAKERS: (15 min each)** • Nick Hodges for **Wolfgang Boch**, European Commission, DGXIII Head of Unit, Information Society Applications for Environment Protection - The Commission Perspective, „Ready-made RTD solutions“ • **João Ribeiro da Costa,** (ENWAP) New University of Lisbon Faculty of Sciences and Technology. Portugal. - Is there value in Technology and Know How Transfer?: EU Accession from the Portuguese perspective. • **Maria Kazmukova,** (ENWAP) Senior consultant in air quality City Development Authority Prague. Czech Republic. - A case in Point: IT/telematics might have assisted the decisionmaking process but its implementation has not been without its obstacles and challenges. Could technology and know-how transfer have offered a shortcut?
10:00 10:15	Coffee Break

10:15

PARALLEL WORKSHOP SESSION 1:

TECHNICAL AND INSTITUTIONAL CHALLENGES OF DATA COLLECTION

Objectives:

The focus of this workshop session is to explore the technical and organisational challenges of data collection. With those challenges in mind, what solutions or "good practices" might be concluded? Would these be common data collection standards, in-house collection or reliance on external bodies, staff training or exchanges?

Workshop success will depend on the contributions of environmental experts and senior decision-makers from local government in relaying experiences during the 45 minute workshop discussion. Consensus will then be sought on those actions best suited to assisting local government in implementing telematics like applications - technology transfer, innovative R&D, partnerships and expert forums, training, good-practice guides etc.

SESSION CHAIR: Teemu Virtanen, Regional Coordinator Helsinki Metropolitan Area Council. Finland.
SESSION CO-CHAIR: Zoran Stojic, (ENWAP), Ekonova, Slovenia.

SPEAKER PRESENTATIONS (10 minutes each)

Environmental Information to Public and to Experts

- **Stefan Jensen,** Ministry of Environment of Lower Saxony, European Topic Centre on Catalogue of Data Sources (ETC/CDS). Germany.

- Benefits and obstacles in introducing a regional data extracting system.

Environmental Monitoring and Forecasting on Air and Water Pollution

- **Maria Kazmukova,** (ENWAP) Senior consultant in air quality, City Development Authority Prague. Czech Republic.

- Experiences in air quality data collection, and cooperation with IOZIP, Prague City Environmental Information System

Waste Management and Soil Pollution

- **Silke Hertz**, COSIMA (TAP) Department of Environmental Protection and Food-quality Control, Koln, Germany.

- Experiences with the use of a geographic information system (GIS) concerning the handling with contaminated sites"

11:00

Emergency Management and Disaster Warning

- **Katerina Cechova,** Olomouc City Council. Czech Republic

- Olomouc Flood Emergency System.

Discussion

Session Rapporteur: Darek Urbaniak, Regional Environmental Center for Central and Eastern Europe

11:45

Coffee Break

12:00

10:15

PARALLEL WORKSHOP SESSION 2:

TECHNICAL AND INSTITUTIONAL CHALLENGES OF DATA DISSEMINATION

Objectives:

The focus of this workshop session is to explore the technical and organisational challenges of data dissemination. With those challenges in mind, what solutions or "good practices" might be concluded? Would these be common access points (email, Internet etc), standard data structure and retrieval measures, public vs. expert access?

Workshop success will depend on the contributions of environmental experts and senior decision-makers from local government in relaying experiences during the 45 minute workshop discussion. Consensus will then be sought on those actions best suited to assisting local government in implementing telematics like applications - technology transfer, innovative R&D, partnerships and expert forums, training, good-practice guides etc.

SESSION CHAIR: Markus Spring, (TAP) Health and Environmental Information Expert, Munich Department of Environment. Germany.
SESSION CO-CHAIR: Dana Svihlova, Institute for Municipal and Regional Development., Faculty of Economics Matej Bel University. Slovak Republic.

SPEAKER PRESENTATIONS (10 minutes each)

Environmental Information to Public and to Experts

- **Josef Burgard,** (TAP) TEMSIS, Siemens Telekooperations Zentrum am DFKI. Germany.

- Data Dissemination and Data Exchange for a Public Information System.

- **Jaroslav Solc ,** Institute of Municipal Informatics of the City of Prague, Czech Republic

- IOZIP. Prague Environmental Information System - Effective Tool for City Administration and Public.

Environmental Monitoring and Forecasting on Air and Water Pollution

- **Ivica Ružić**, (ENWAP) Center for Marine &Environmental Research of the Ruđer Bošković**,** Institute. Croatia.

- Water Related Data Collection and Management within the Danube River Basin - From Local Authorities to the Danube Convention.

11:00

Waste Management and Soil Pollution

- **Carlos Garcia Suarez**, Environmental Transparent Planning, E

- SIGRES; Toxic and non-toxic waste management system.

Discussion

Session Rapporteur: Jerome Simpson, Regional Environmental Center for Central and Eastern Europe

11:45

Coffee Break

12:00

12:00
13:00

PLENARY SESSION TWO: ENSURING SUCCESSFUL DATA MANAGEMENT - BUILDING NEW PARTNERSHIPS AND EXCHANGING EXPERIENCES

Previous session chairs will present results of each parallel session. Clearly a number of technical solutions to challenges already exist, and examples of how organisational obstacles can be overcome are available. How might these best be relied upon to ensure successful data management? Options available include support of European RTD transfer, though partnerships and expert forums, training and on-site technical visits, good-practice guides and databases. Or is new innovative research the easier path to successful data management. The following discussions will conclude which of these options might be most attractive.

SESSION CHAIR: Nick Hodges, (ENWAP) Leicester City Council, Environment and Development. UK.

SPEAKERS:

- **Teemu Virtanen,** *Chair, Data Collection Session*. Regional Coordinator Helsinki Metropolitan Area Council. Finland.
- **Markus Spring,** *Chair, Data Dissemination Session.* (TAP) Health and Environmental Information Expert, Munich Department of Environment. Germany.

Parallel Session Chair Presentations (10 mins each)

- Technical and institutional challenges of data management, and solutions.

General Discussion (10 mins)

Parallel Session Chair Presentations (5 mins each)

- Support measures to ensure successful data management.

General Discussion (10 mins)

Session Rapporteur: Jerome Simpson, Regional Environmental Center for Central and Eastern Europe

13:00
14:00

Lunch

14:00

Excursion and On-site Visit: TUEV, Munich

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