

Information Systems for Building an ERA in the Field of ICT for Environmental Sustainability

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Agenda

Part 1

- EU project ICT-ENSURE (overview)
- Provision of information on national research programmes

Part 2 (by Martin Schreiber)

- Literature information system

European Research Area (ERA)

Important goal of EU research policy:

- Creation of a European Research Area

Contributions:

- EC is funding various **ERA Support Actions** within the 6th and 7th Framework Programmes
- ICT-ENSURE is such a Support Action



ERA Project ICT-ENSURE

Aim

- Building the European Research Area in the field of **ICT for environmental sustainability**

Consortium

- Graz University of Technology
- International Society for Environmental Protection (ISEP), Vienna
- Forschungszentrum Karlsruhe (Research Centre Karlsruhe)

In Addition: Subcontractors

Funding period

- May 2008 – April 2010



Key objectives of ICT-ENSURE

1. **Establishment of a European expert network** in the field of ICT for environmental sustainability
2. **Support of creation of a single information space** in Europe for the environment (**SISE**)
3. **Provision of information on national research activities** in Europe in the field

1. Establishment of a European Expert Network

- **Basis:** Research network of the expert group “Environmental Informatics” of GI, and its EnviroInfo conferences
- **Extension:**
 - geographically (→ EU 27)
 - thematically (→ environmental sustainability)
- **Regional ICT-ENSURE networking workshops**
 - 2008, July, Barcelona (iEMSs): ICT-ENSURE workshop
 - 2009, January, Paris (UNESCO): Biodiversity, agriculture
 - 2009, March, Prague (Towards eEnvironment): Workshop W2
 - 2009, December, Gothenburg: Climate change adaption
- **Networking workshops on EnviroInfo conferences**
 - EnviroInfo 2008, Lüneburg (ICT-ENSURE workshop)
 - EnviroInfo 2009, Berlin (5 workshops)

2. Support of Creation of SISE

- **Model framework** for the field of ICT for environmental sustainability (cp. contribution of W. Pillmann in this workshop)
- **Overview** of the European research in the field.
Detailed **surveys** of research programmes in selected areas, e.g.
 - Climate change / climate change adaption
 - Energy consumption / efficiency
 - Agriculture, biodiversity
 - Environmental risk management
 - ...
- **Concept for SISE**
 - Concepts for the creation and evolution of the Single Information Space in Europe for the Environment

3. Provision of Information on National Research Activities

Objectives

- Provision of information on **national research programmes** in the field of ICT for environmental sustainability
- Provision of **scientific literature** in the field

Provision of Information on National Research Programmes

Main target groups

- Programme managers, research policy makers, scientists

Similar information is provided by

- CORDIS information system of the European Commission: Information on research programmes funded by the EC
- ERAWATCH website: Research policies; Information on “most important” national research programmes
- CISTRANA IST Research Portal (European initiative for “Coordination of *IST* Research and National Activities”): National ICT programmes

Provision of Information on National Research Programmes (cont.)

Approach (steps)

1. **Web-based information system** on national research programmes is being developed (basis system without data)
 - extensive usability tests
2. **National experts** will **compile** meta information on national research programmes
3. **Acquisition of data** and their maintenance in the information system by the national experts **via the Internet**

Web-based Information System – Main Components

National expert



End user



Authoring component

For acquisition and maintenance of meta data via the Internet

Presentation component

For data retrieval (search functions, navigation facilities)

Management component

For management of the metadata, based on the data model



Most important entity types (and attributes):

■ Research programme

- Programme identification:
Name, country/region, link to home page, ...
- Programme funding / management:
Funding organisation, managing org., funding scheme, start / end date of programme ...
- Thematic description of a programme:
Research area, abstract, related documents, additional links / info ...

■ Research project

- Largely the same attributes

Data Model – Characterisation of Research Area

A **classification schema** of the field of “ICT for environmental sustainability” has been developed:

■ ICT field

- Characterises the ICT methods, tools and techniques used in a research programme
- Classification schema is based on: ICT taxonomy of CISTRANA

■ Sustainability field

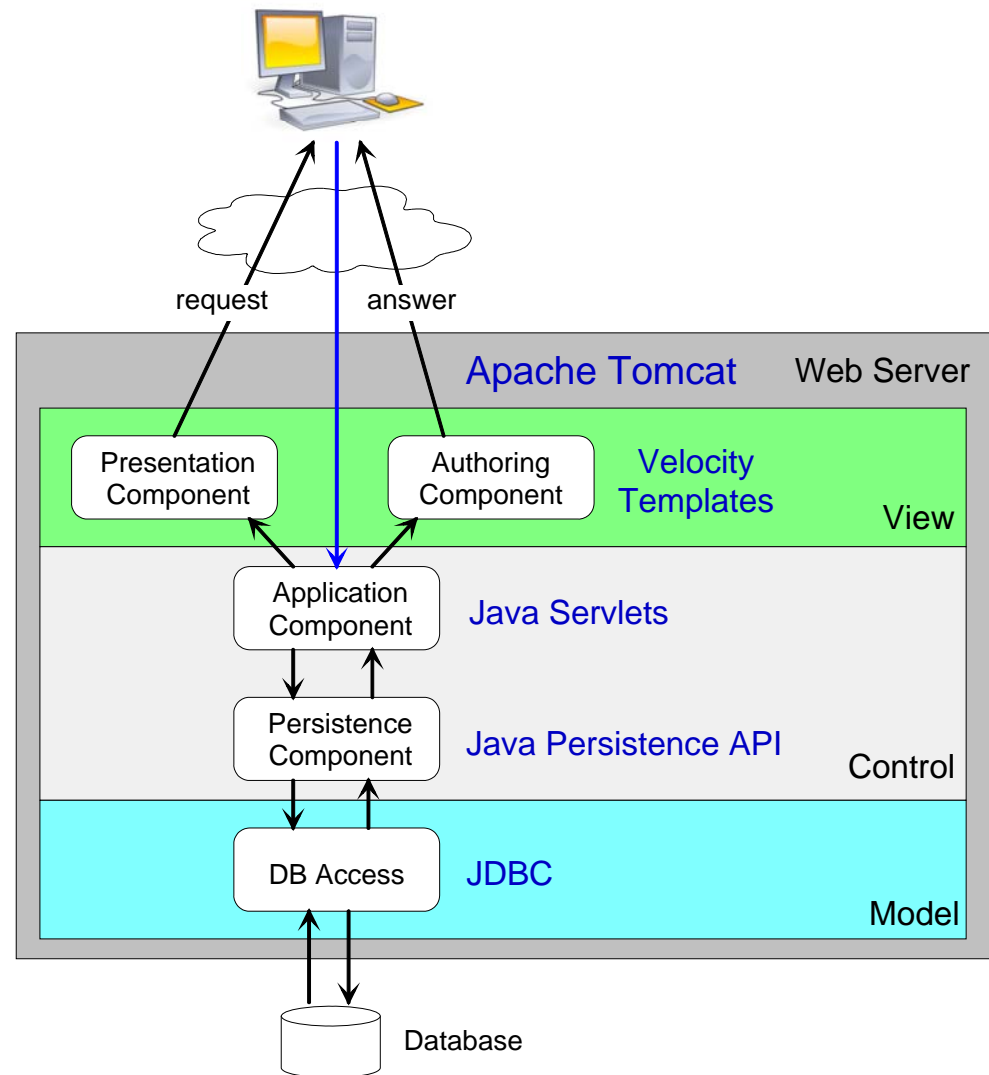
- Characterises the environmental sustainability area
- Classification schema (with 3 levels) is sub-divided according to the sustainability aspects: ecology, economy, society

■ Target field / group

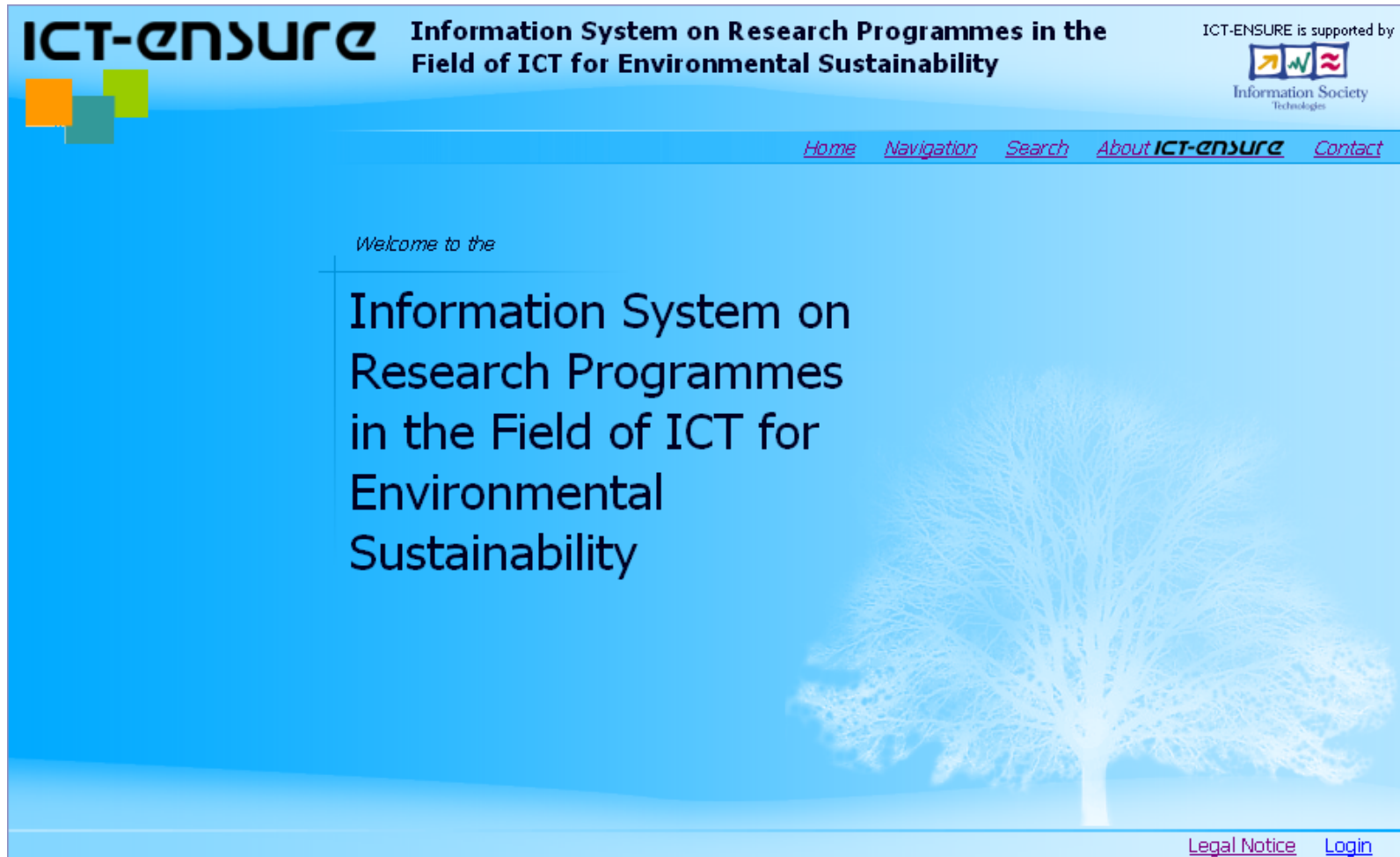
- Characterises the addressees: Policy makers, public administration, economic sector, research ...

System Architecture and Software Used

- Based on MVC Architecture (Model-View-Control)
- Use of free / open source software



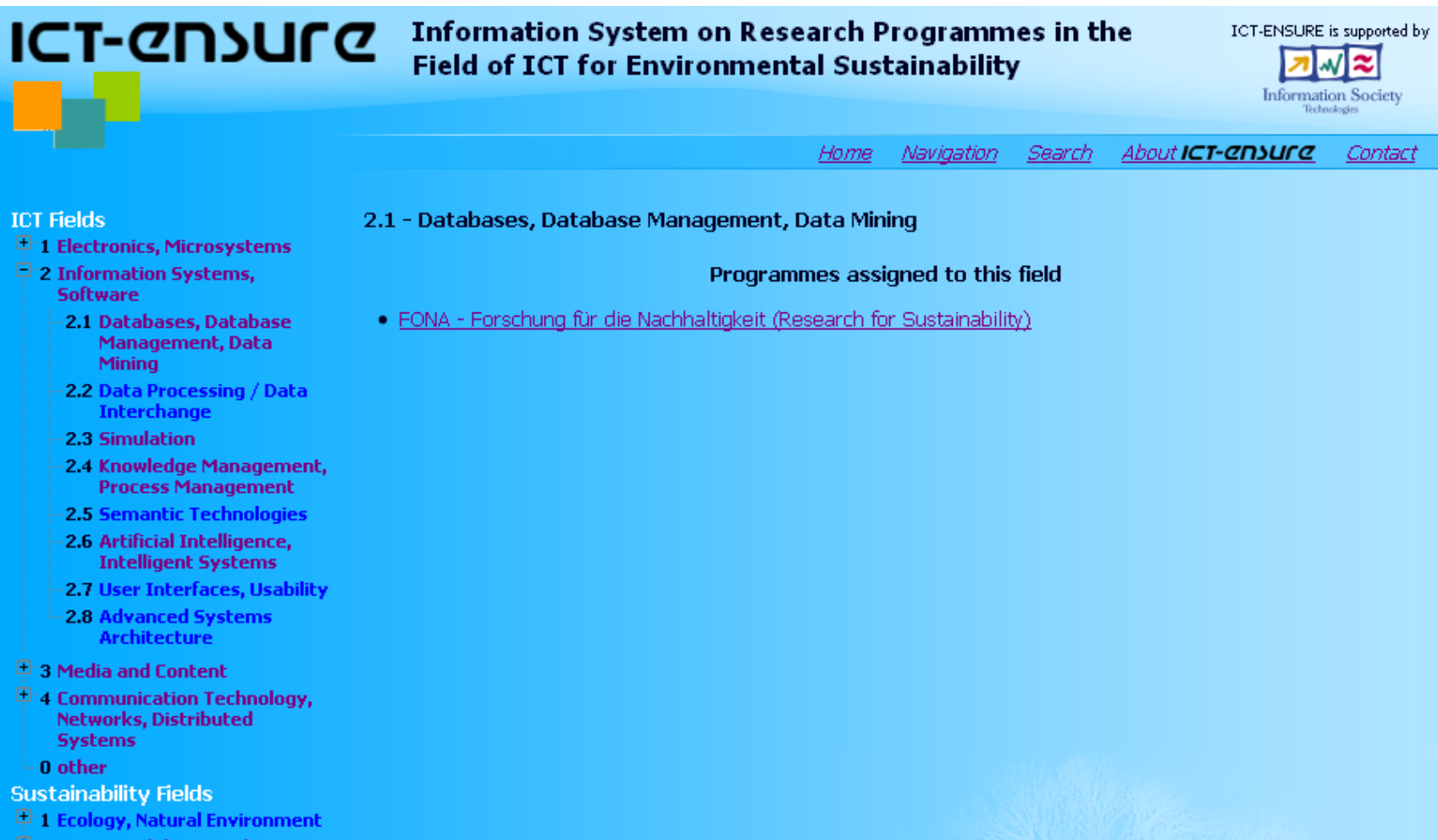
User Interface (Prototype) – Home Page



The screenshot shows the home page of the ICT-ENSURE system. The header features the ICT-ENSURE logo on the left, the title 'Information System on Research Programmes in the Field of ICT for Environmental Sustainability' in the center, and the text 'ICT-ENSURE is supported by' followed by logos for 'Information Society' and 'Technologies' on the right. A navigation bar below the header contains links for 'Home', 'Navigation', 'Search', 'About ICT-ENSURE', and 'Contact'. The main content area has a light blue background with a large, faint tree image on the right. The text 'Welcome to the' is followed by the main title 'Information System on Research Programmes in the Field of ICT for Environmental Sustainability'. At the bottom right, there are links for 'Legal Notice' and 'Login'.



User Interface – Navigation According to Research Fields



ICT-ENSURE Information System on Research Programmes in the Field of ICT for Environmental Sustainability

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Information Society Technologies

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ICT Fields

- + 1 **Electronics, Microsystems**
- + 2 **Information Systems, Software**
 - 2.1 **Databases, Database Management, Data Mining**
 - 2.2 **Data Processing / Data Interchange**
 - 2.3 **Simulation**
 - 2.4 **Knowledge Management, Process Management**
 - 2.5 **Semantic Technologies**
 - 2.6 **Artificial Intelligence, Intelligent Systems**
 - 2.7 **User Interfaces, Usability**
 - 2.8 **Advanced Systems Architecture**
- + 3 **Media and Content**
- + 4 **Communication Technology, Networks, Distributed Systems**
- 0 **other**

Sustainability Fields

- + 1 **Ecology, Natural Environment**

2.1 - Databases, Database Management, Data Mining

Programmes assigned to this field

- [FONA - Forschung für die Nachhaltigkeit \(Research for Sustainability\)](#)

ICT-ensure

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ICT Fields

- + 1 Electronics, Microsystems
 - + 2 Information Systems, Software
 - 2.1 Databases, Database Management, Data Mining
 - 2.2 Data Processing / Data Interchange
 - 2.3 Simulation
 - 2.4 Knowledge Management, Process Management
 - 2.5 Semantic Technologies
 - 2.6 Artificial Intelligence, Intelligent Systems
 - 2.7 User Interfaces, Usability
 - 2.8 Advanced Systems Architecture
 - + 3 Media and Content
 - + 4 Communication Technology, Networks, Distributed Systems
 - 0 other
- #### Sustainability Fields
- + 1 Ecology, Natural Environment
 - + 2 Economy (along Product

FONA - Forschung für die Nachhaltigkeit (Research for Sustainability)



FONA is a supporting programme of the Federal Ministry for Education and Research (BMBF) of the federal republic of Germany. The objective of this programme is the support of projects and programmes which focus on environmental protection by conservation of natural resources.

FONA ist ein Rahmenprogramm des Bundesministeriums für Bildung und Forschung (BMBF) der Bundesrepublik Deutschland. Ziel ist die Förderung von Projekten zum Schutz der Umwelt durch Schonung der Ressourcen.



The guiding principle of sustainable development raises a great deal of specific questions that have to be examined by means of well-directed, action-oriented research. The BMBF has developed a new framework programme for this purpose.

A better understanding of the complex interactions between human interventions and natural processes and the global dimension of environment and development are key features of the guiding principle of sustainable development. The German Federal Government took on this



[Homepage of FONA](#)



[Research for Sustainability \(PDF, english\)](#)
[Forschung für Nachhaltigkeit \(PDF, deutsch\)](#)



[Bundesministerium für Bildung und Forschung](#)



none

User Interface – Result Page, Lower Part

<ul style="list-style-type: none"> 2.2 Data Processing / Data Interchange 2.3 Simulation 2.4 Knowledge Management, Process Management 2.5 Semantic Technologies 2.6 Artificial Intelligence, Intelligent Systems 2.7 User Interfaces, Usability 2.8 Advanced Systems Architecture + 3 Media and Content + 4 Communication Technology, Networks, Distributed Systems 0 other <p>Sustainability Fields</p> <ul style="list-style-type: none"> + 1 Ecology, Natural Environment + 2 Economy (along Product Life-cycle) + 3 Social + 4 Environmental Sustainability (general) 0 other <p>Target Fields</p> <ul style="list-style-type: none"> 1 Policy, Justice 2 Public Administration 3 Business, Economic Sector 4 Research, Science 5 Education, Learning 6 General Public 0 other 	<p>Bundesrepublik Deutschland. Ziel ist die Förderung von Projekten zum Schutz der Umwelt durch Schonung der Ressourcen.</p> <p> The guiding principle of sustainable development raises a great deal of specific questions that have to be examined by means of well-directed, action-oriented research. The BMBF has developed a new framework programme for this purpose.</p> <p>A better understanding of the complex interactions between human interventions and natural processes and the global dimension of environment and development are key features of the guiding principle of sustainable development. The German Federal Government took on this</p> <p> Homepage of FONA</p> <p> Research for Sustainability (PDF, english) Forschung für Nachhaltigkeit (PDF, deutsch)</p> <p> Bundesministerium für Bildung und Forschung ⓘ</p> <p> none</p> <p> International</p> <p> 2.1 - Databases, Database Management, Data Mining 2.4 - Knowledge Management, Process Management 2.6 - Artificial Intelligence, Intelligent Systems</p> <p> 1.2 - Natural Resources 2.3 - Transport, Use 4 - Environmental Sustainability (general)</p> <p>  Deutschland</p> <p> 800 Mio €</p>
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Status and Outlook – Research Programmes Information System

■ Time schedule

- End of April 2009: Prototype of the information system
- September 2009: Product version for experts to enter the meta-data
- April 2010: Complete system publicly available

■ Further information on ICT-ENSURE: www.ict-ensure.eu

Thank you for your attention



**Presentation on
ICT-ENSURE literature information system
by Martin Schreiber**

■ Aim

- To provide scientific literature from the field of ICT for environmental sustainability to the scientific community via the Internet

■ **Developer:** University of Lüneburg (Martin Schreiber)

■ **Background**

- Expert group “Environmental Informatics” of GI, which has organised since more than 20 years:
 - EnviroInfo conferences
 - Workshops of several working groups (env. db etc.)
- > 3.000 papers are available comprising > 30.000 pages

■ Content of the system

- The proceedings of the last 10 EnviroInfo conferences have been prepared by University of Lüneburg:
 - Meta information (title, authors, ...) have been acquired and stored in a meta information system
 - The papers themselves have been prepared in form of PDF files

■ Search and navigation facilities of the system

- Navigation according to the data structure
- Full text search within the meta data and PDF files
- Results of search and navigation can be downloaded by the user (meta data and PDF files)