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LBS as a tool for developing tourism in marginal regions

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and

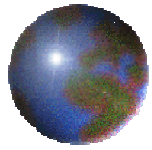
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Mauri Myllyaho, Markku Oivo & Jouni Similä

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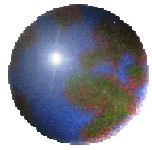
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Mobile Environmental Information
Systems and Services

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LBS – Location-Based Services

Definition:

Location-based services (LBS) are services that exploit knowledge about where an information device user is located

Mobile phones, PDAs

Applications: mapping, yellow pages, routing, tracking, advertising, data collecting, safety

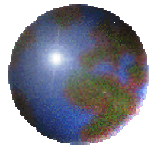


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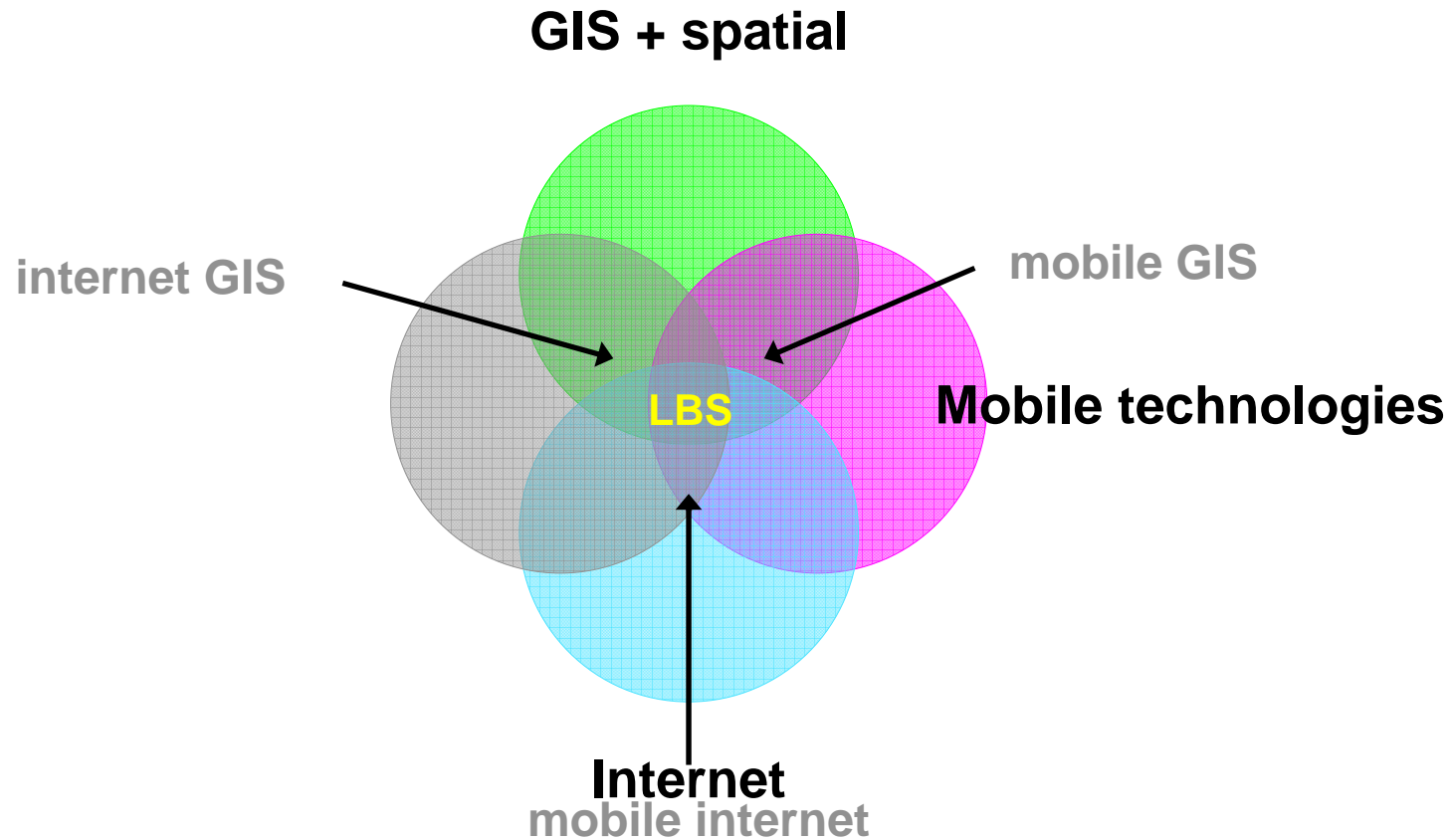
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LBS at Intersection of Technologies

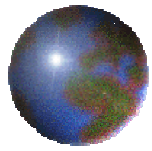


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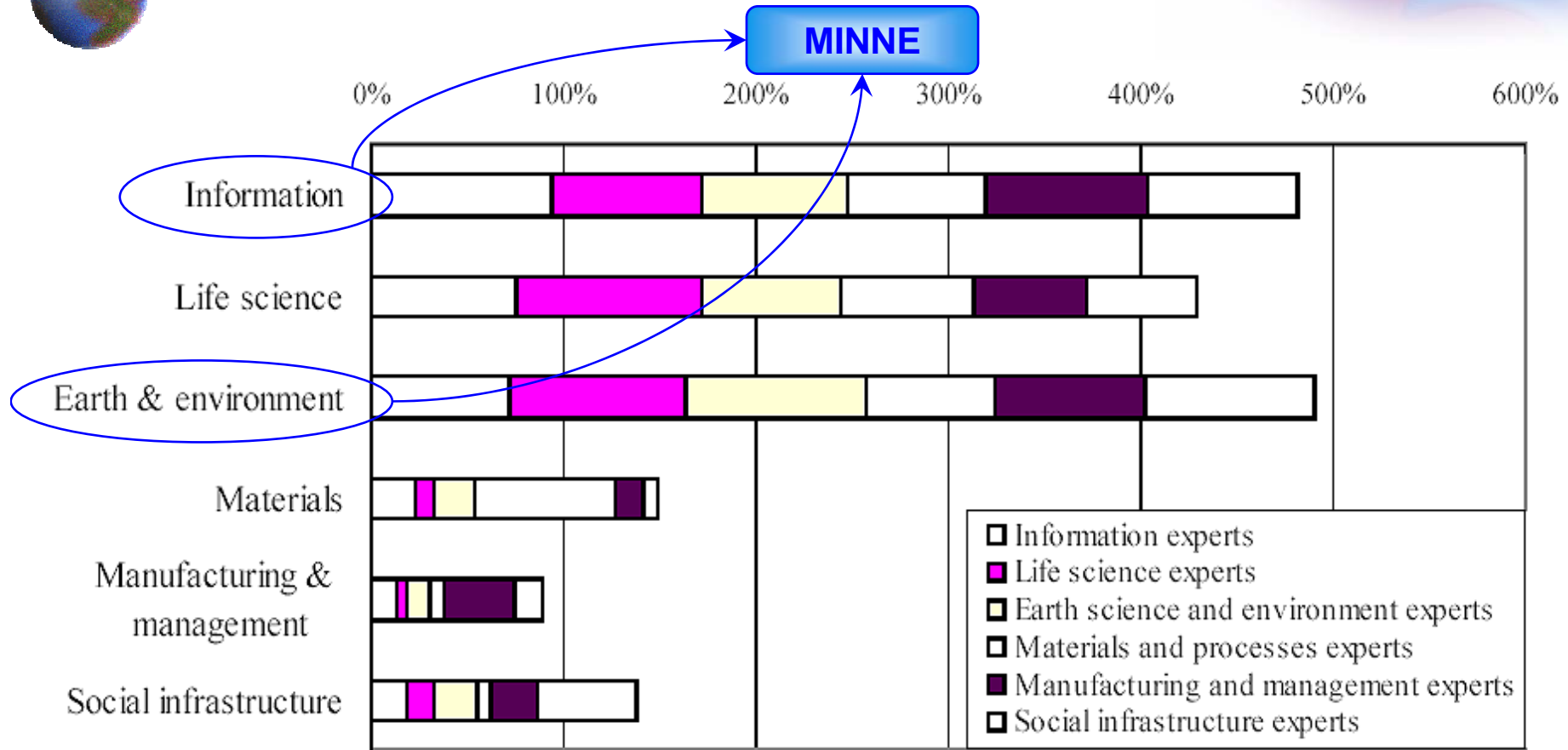
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Context: Important fields until 2010

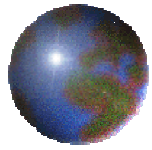


NISTEP REPORT No.71" [10] information related technologies, and science and environment related technologies are rated as the most important areas of research and development of the future (<http://www.nistep.go.jp>)

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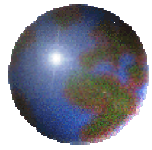


Video: Four general goals

- 1) Guiding from place A to place B
- 2) To get information in place B, or anywhere
- 3) To develop a realtime, dynamic environmental information measurement system
- 4) To promote the use of the data organizations have

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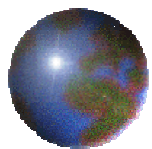
A new term:

Mobile Geography

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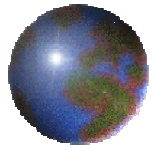
Ubiquitous computing
= in French ubiquité informatique

UbiGIS

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MINNE Objectives

Explore new applications in mobile environmental information systems and services (MEIS)

1. Methods and systems for gathering environmental information
2. Location based user guidance methods and systems

Explore technologies and processes for interdisciplinary MEIS development

1. Mobile technologies including mobile Internet
2. Processes for combining the effort and interests of experts in different fields
3. New business models

Proof of concept

Facilitate effective development

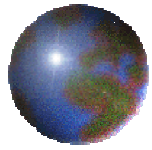
Build MEIS prototypes to demonstrate the technology and applications
• Exploratory and experimental approach

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Research Themes

Environmental systems

- Collection and use of environmental information

Services for the citizen and organizations

- Nature, hiking, skiing, [tourism](#), forestry

Location-based services (LBS) and ambient awareness

- Focus on LBS in environmental *applications*, we do not build location technology
- Mobile devices that sense the environment

Access, sharing and distribution of mobile information

- User communities, distributed mobile databases, geomarking

Future: “sensing the user”

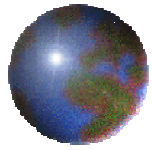


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Background – Mobile Technology

Mobile technology is maturing and spreading

- Positioning, smartphones, mobile multimedia etc.
- Mobile services (LBS etc.) are existing, but not yet widely adopted

Large amounts of existing location relevant data, in different forms, that would be of interest to mobile people and business

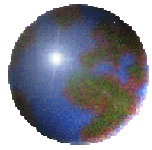
Mobile channel can be used for delivering content, but also for collecting information

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Interdisciplinary research

Participating organizations

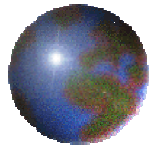
- Department of **Information Processing Science** (coordinator; mobile applications, software engineering)
- Department of **Biology** (environmental science, ecology)
- Department of **Geography** (geoinformatics, GIS, LBS)
- Research Unit for Educational Technology (mobile learning, testing)

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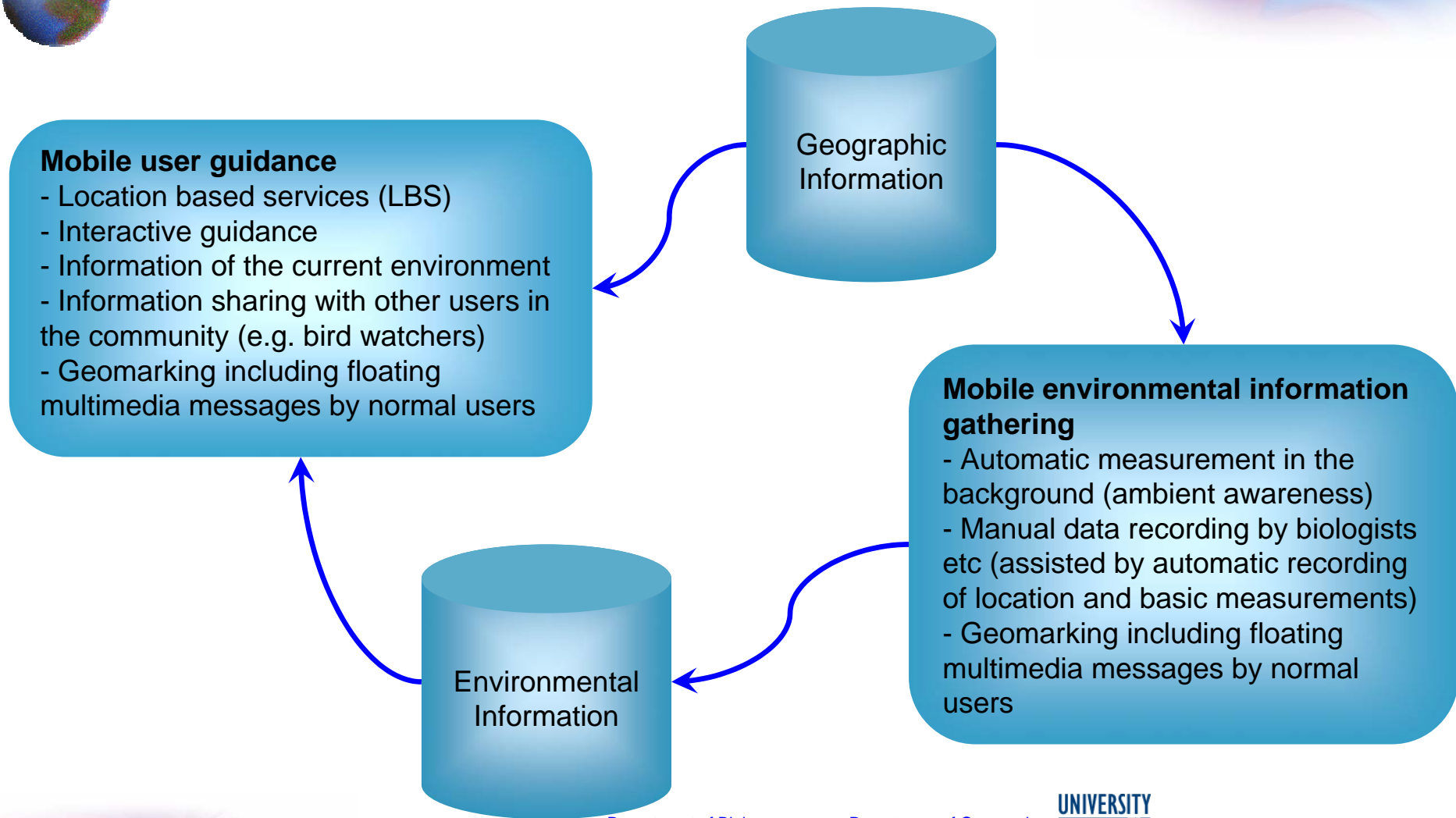


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1/5 Intelligent Environmental Services



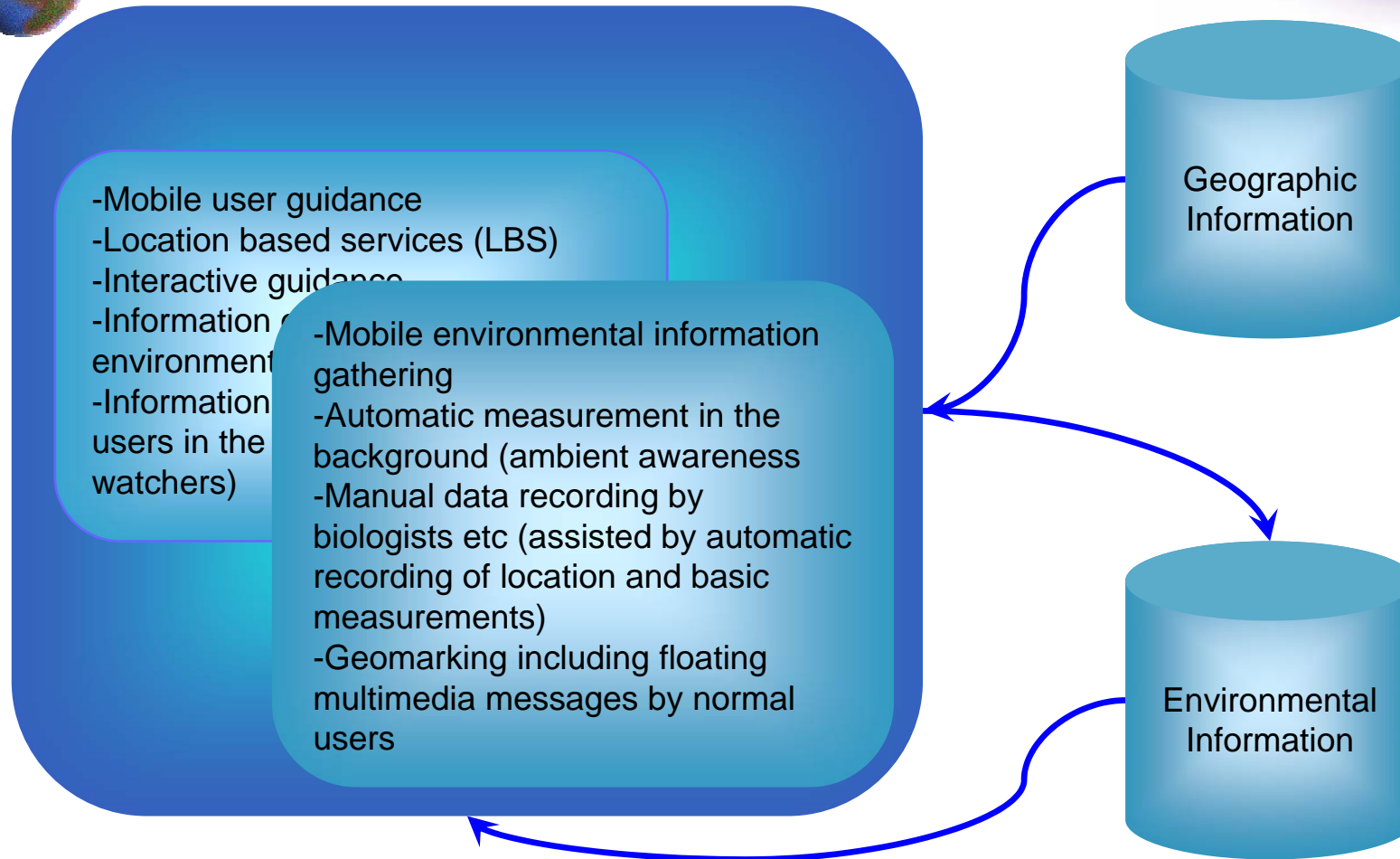
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2/5 Integrating Environmental Services



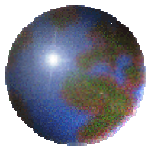
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3/5 Mobile Environmental Systems/Devices



User guidance and environmental data collection integrated in a mobile device



Not all MEIS include same functionalities

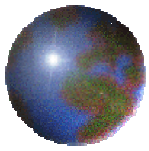


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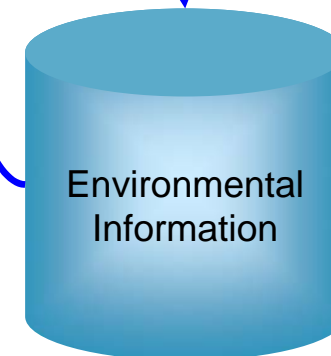
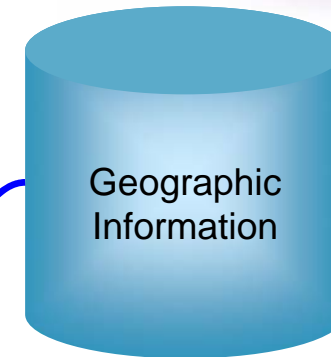
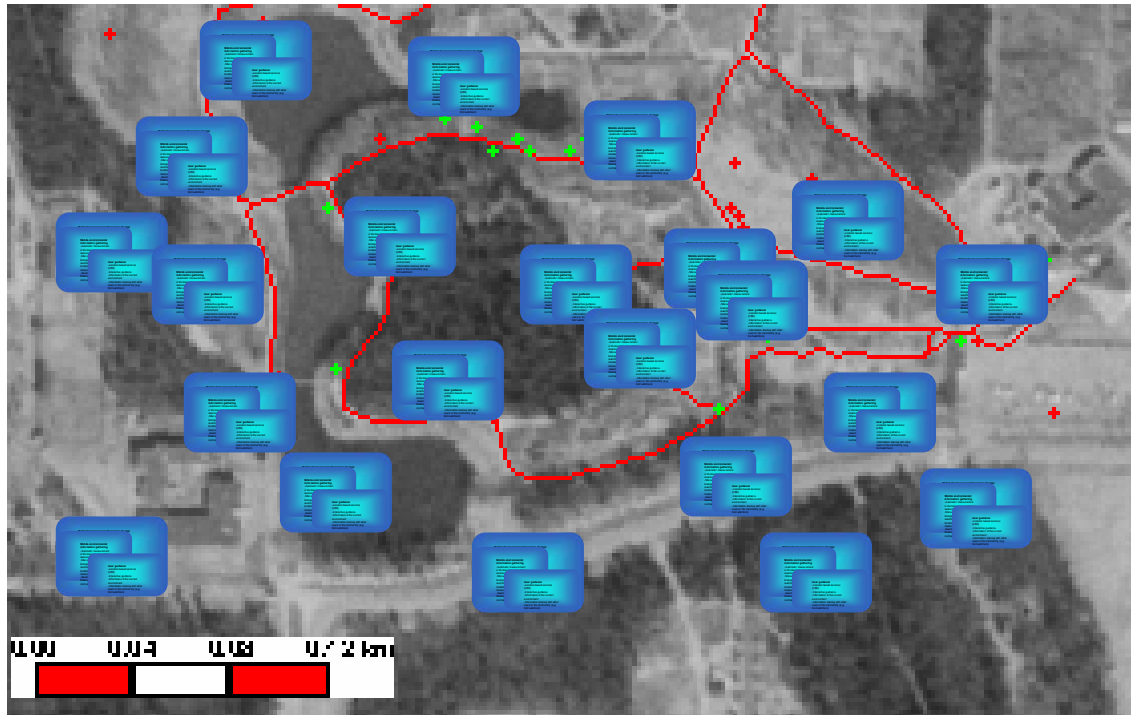
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4/5 Regional Environmental Networks

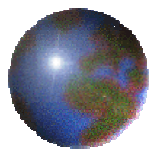


Large amount of MEIS forms a **dynamic real-time** wide area environmental information collection network

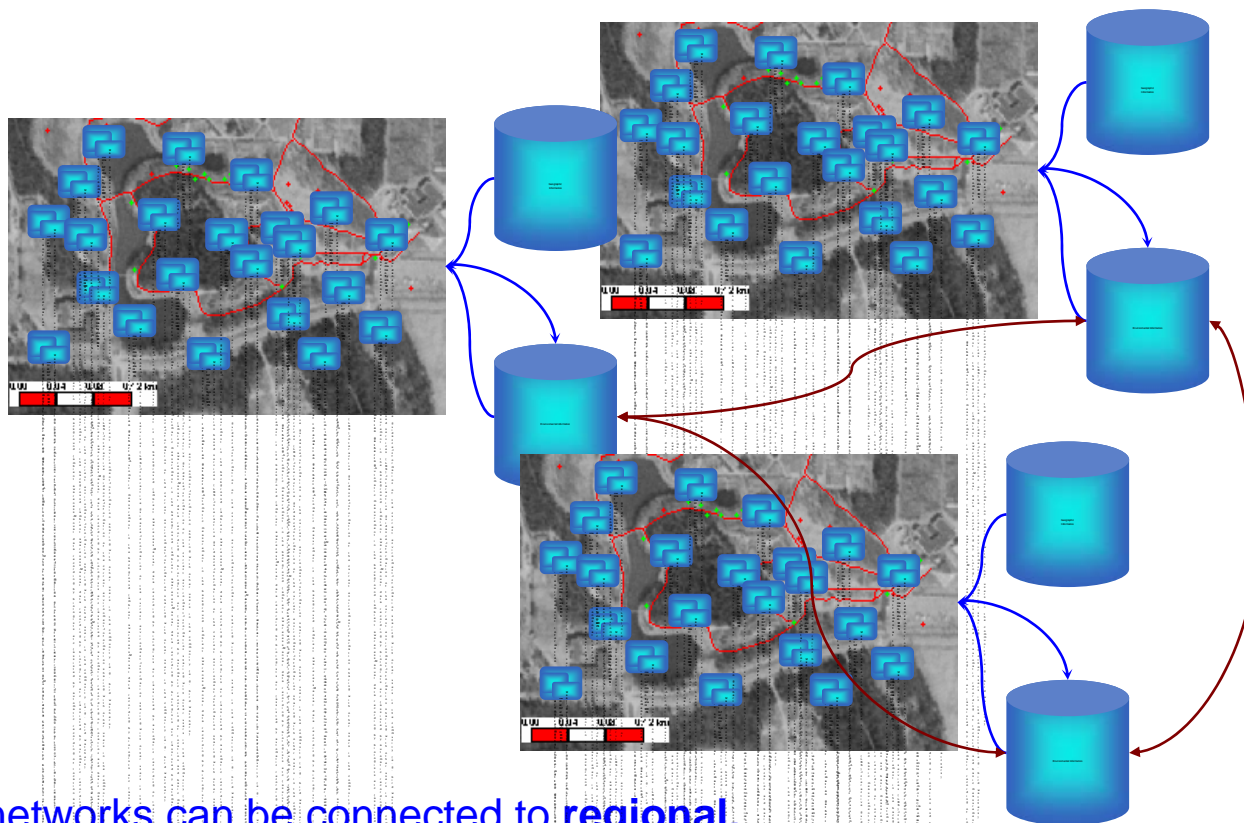
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5/5 Wide Area Environmental Networks



Local networks can be connected to **regional, national and international** environmental information networks

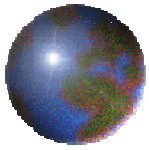
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MEIS usage: Mobile information acquisition and sharing

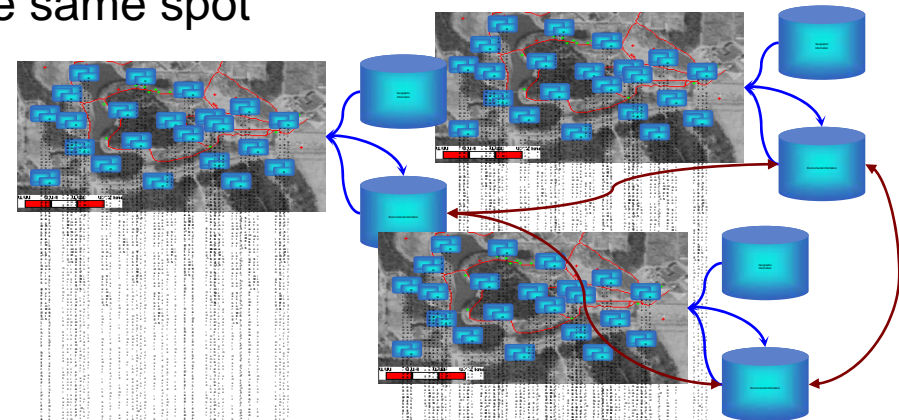


Automatic mobile acquisition of environmental information

- Real-time dynamic networks
- Eco-efficient tourism
 - Data collection as a by-product of tourism
 - Guide tourists so that environmental effects are minimized

Users can share information

- Mark authentic observations on the spot (LBS)
- Read what others observed in the same spot
- Read and comment anywhere

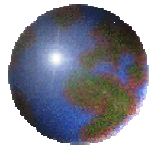


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MEIS usage: Features for Professionals

More advanced features for professionals

- Geographers, biologists, environmental protection agencies, authorities,...
- Data collection supported by automated and semi-automatic features

Traditional biology survey

Manual data gathering

- Paper notebooks
- Maps
- Off-line processing after gathering

towards

New mobile biology survey

Mobile data gathering

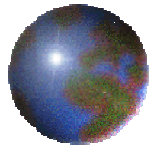
- Automatic position (LBS), time, and basic measurements
- Automatic on-line recording and transfer to main databases

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MINNE usage: Tourism, Recreation and Education

- Increase awareness of environmental issues
- Make learning environmental issues fun - edutainment
- Minimize negative effect of tourism
- Attract environmentally aware tourists
- Strong use of mobile location based services (LBS)

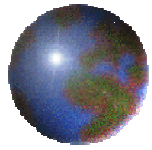
- Business opportunities for local companies in creating applications and digital content

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Integrating...

Integrating mobile environmental information gathering with recreational use provides fascinating new possibilities

- New ways for providing environmental information
- Ecological tourism

Business opportunities

- Global business opportunities for mobile device and software platform producers
- Local business opportunities for companies creating content for tourism

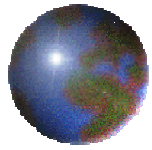
⇒ Business opportunities make it realistic to implement MEIS in real life

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Background – Tourism & Environment

The highest added value of mobile services and applications can be found when travelling in an unfamiliar environment

Traveling is a large global industry

Travelling is a complex phenomenon by its nature, consisting of different phases (planning, en route, in situ, post trip) as well as integrating many information and physical services

Travelling involves networks of business

Travelling is a social phenomenon

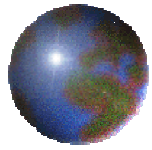
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Oulu – Kajaani mobile zone – a rural area vision



Before travelling

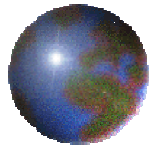
When travelling

After travelling

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Services

Two kinds of LBS

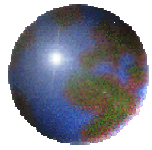
user-requested services : user asks services

triggered services : automated services

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Two kind of travellers

1) Family, from Oulu to Kuhmo

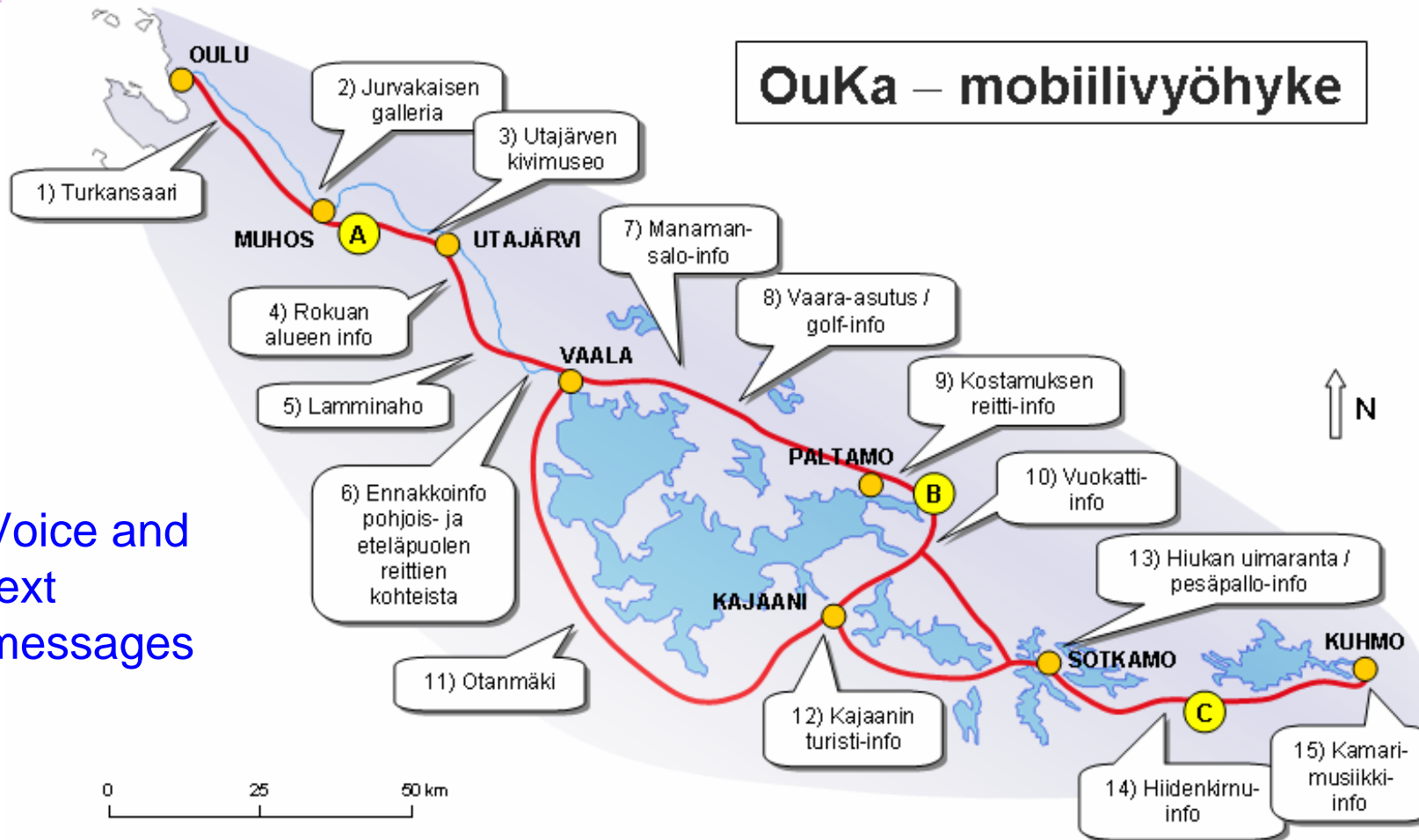
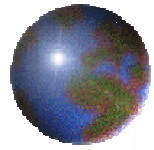
2) Russian shopper

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Example of car travel using car

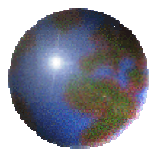


Voice and text messages

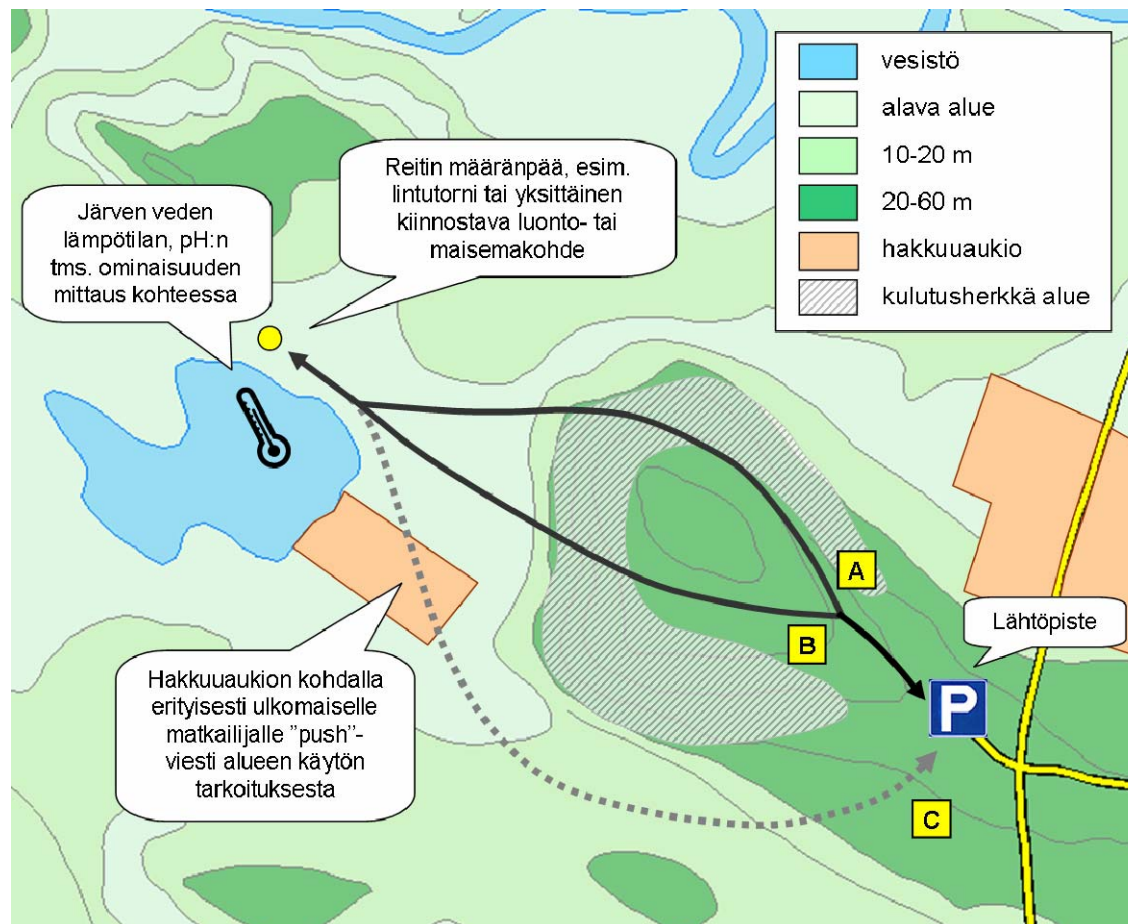
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Example of a route to forest

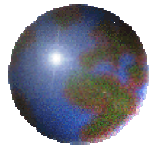


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Current status

First prototypes under development

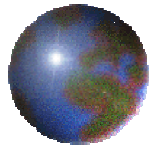
- Botanical Garden, University of Oulu
 - Ideal experimental environment: compact, nearby, versatile nature
- LBS for providing interactive environment information to users
- Guide users to specific plants



River: Hannu Hautala



Metsähallitus



Current status

Tourism areas involved

- Ranua Zoo
- Rokua National Park
- Kalajoki tourism area
- Oulu South region

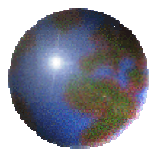
- All remotely located
- Tourism important industry



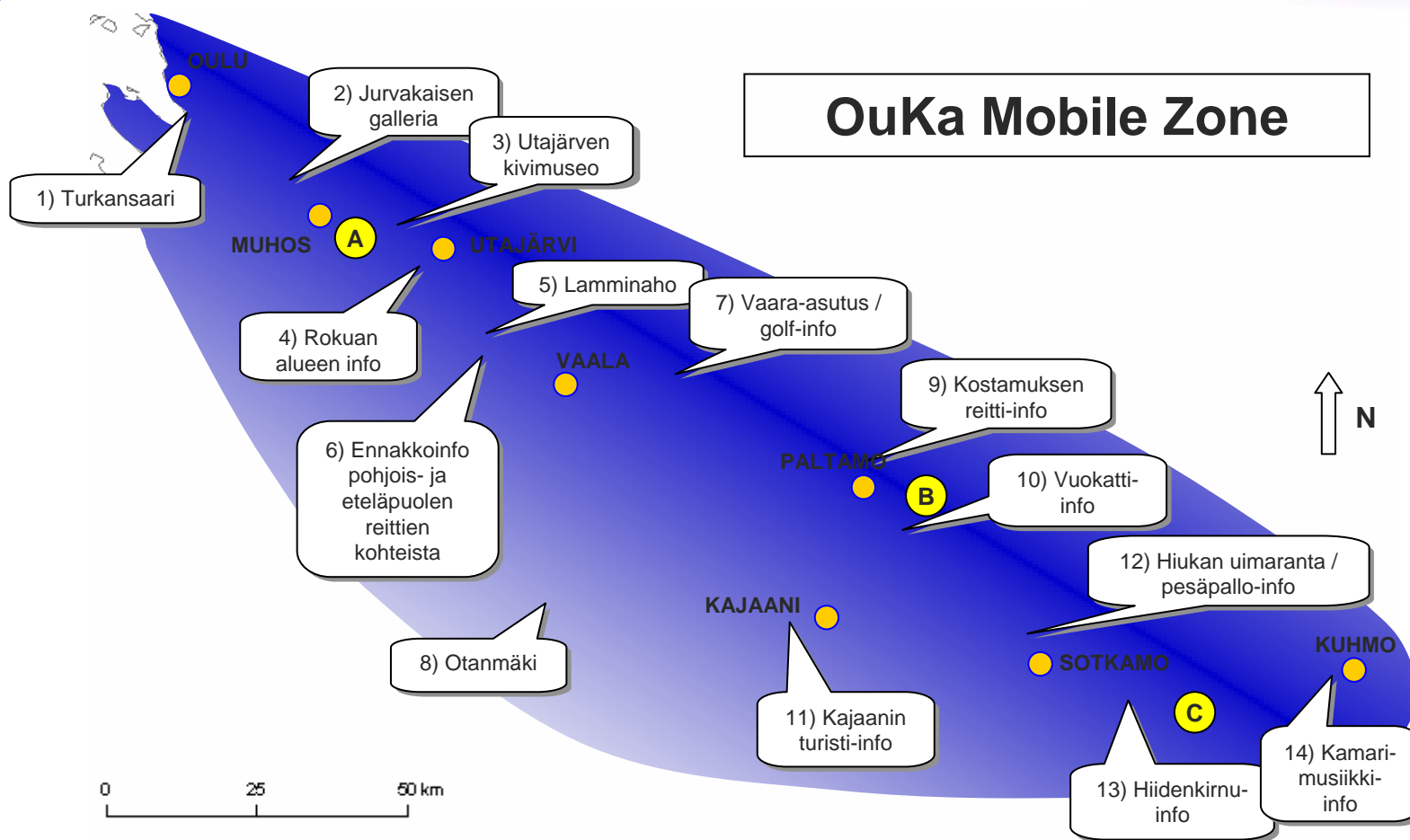
River: Hannu Hautala



Metsähallitus



OuKa Regional Development Project

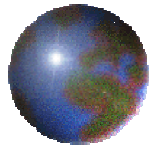


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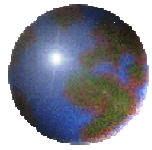




Conclusions

- Mobile Environmental Information Systems and Services have great potential for a variety of applications
 1. Mobile environmental measurements and information systems
 2. Ecological tourism
 - Combining 1) & 2) into a single mobile system
 3. Technical modernization of tourism
- Global and local business opportunities
 - Help in the trade-off of business vs. environment
- Interdisciplinary research is needed
 - No single organization has the required knowledge





Contacts

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