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Presentation of the giCASES case studies

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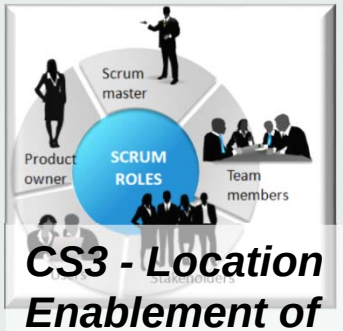
Which are the giCASES' Case study?

CS1 - Use of indoor GIS in healthcare

CS2 - Environmental analysis using cloud service system



CS3 - Location Enablement of e-Government

CS4 - Integrated management of the underground

CS5 - Harmonizing data flows in Energy saving EU policies

CS6 - GIS Applications in Forestry

Which are the main object of each case study?

- Offering support for similar case-based learning initiatives - participation in a new project;
- Re-using the training modules and the 6 case •Offering internships for students;
- Student education;
- Create cooperation and solve specific problems with private business;
- Create cooperation and solve specific problems with public authorities.

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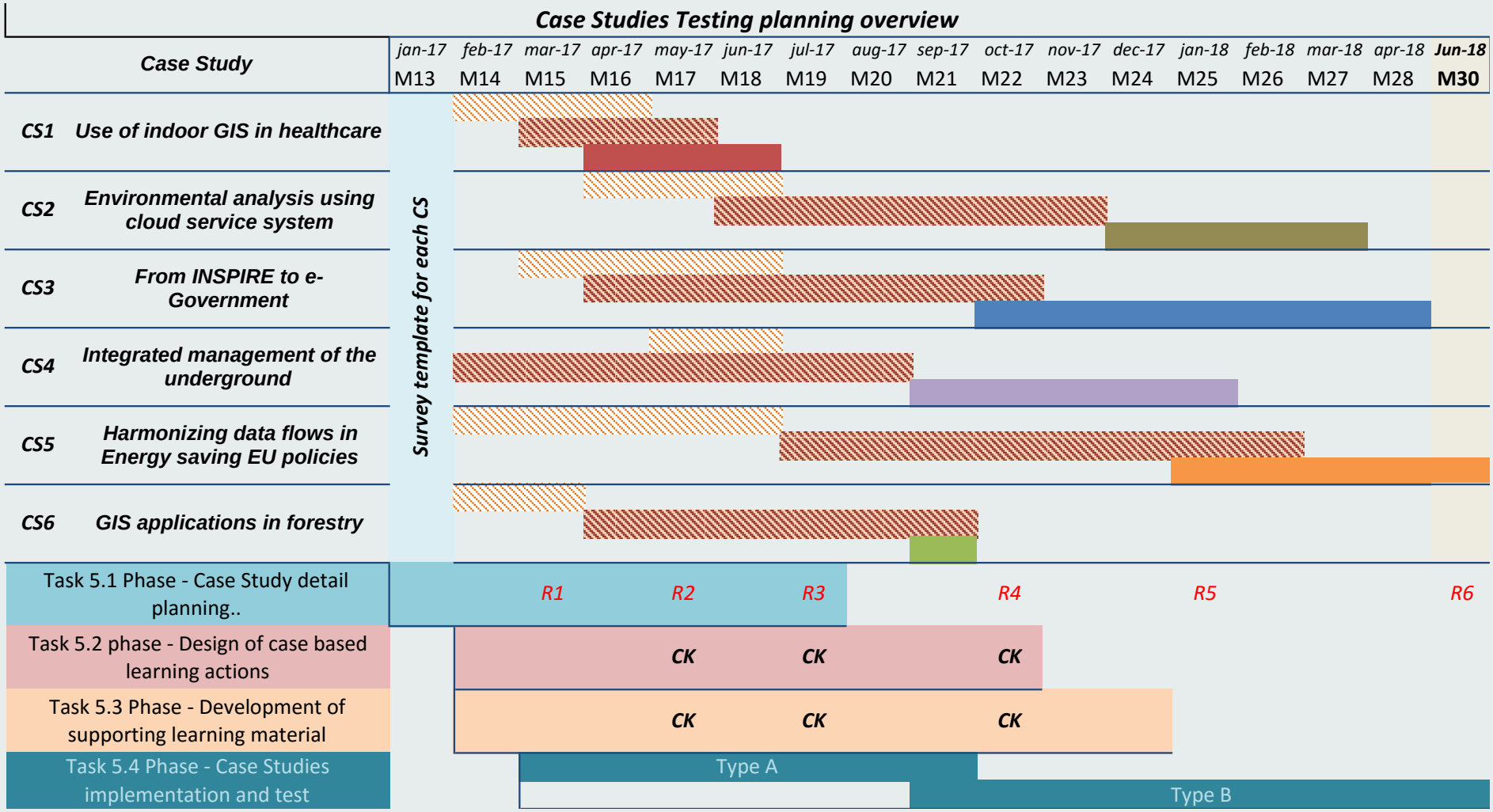
Case Study planning overview



Case Study 1

Use of indoor GIS in healthcare

Application domain

- indoor Location Based Services (LBS)
- integration of indoor and outdoor location for tracking and managing assets (human or material) based on open Geographic Information Systems (GIS)
- privacy issues related to indoor tracking of people
- data and software standardization

Case Study Objectives

- to introduce a group of 4-5 students to the topic of GIS-based indoor LBS and engage them in the development of a real application in a context of interaction between a university (POLIMI) and a SME company (TRILOGIS)
- the students will develop a project that exploits a Wi-Fi based indoor location system
- the students will develop a GIS-based desktop, web or mobile application that tracks and visualizes the movement of devices or people within the faculty

Provision of training/education

The Case Study will be developed within the course “Geographic Information Systems (GIS)”, offered at Politecnico di Milano. This course is entirely taught in English as part of the MSc in Geoinformatics Engineering. Students attending the course have a background either in Computer Science Engineering or in Environmental Engineering.

Learning contents

- Location Based Services (LBS)
- Indoor LBS principles
- OGC IndoorGML standard

Learning outcomes

- The students will tackle a real case study (proposed by a real company and where a real result is expected) and will benefit from a practical teamwork experience with industry indoor GIS technologies.

- At the end of the Case Study implementation, students will be able to develop a complete mobile, web or desktop application based on indoor LBS.

- They will practice on one specific technology and they will be able to apply the same concepts learned during the Case Study also to different technologies.

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Case Study 2

Environmental analysis using cloud service system

Application domain

The evaluation of Sites of Community Importance (SCI) vulnerability to plant protection products (agrochemicals and pesticides), through an analysis of threats and potential threats to the target species and habitats resulting from the use of such products in the agricultural sector, in compliance with protection objectives of habitats and species in the European Natura 2000 network.

Case Study Objectives

The case study wants to address the use of new web technologies and GIS analysis to perform an integrated multi-criteria assessment for the evaluation of potential hazard to SCI areas caused by the exposure to agrochemicals and pesticide.

For those analyses the next generation of technique has to use more extensively web tools and geo-processing. In fact, most data are now available via the web thought web services (OGC WxS or ArcGIS Server) and Linked Open Data protocols.

Provision of training/education

This case study will be implemented as Master thesis in a well-known International Master in Geographic Information Systems and Science at NOVA-IMS.

2 Thesis are proposed and implemented:

- *Evaluation the potential hazard impact of pesticides in a Protection site*
- *Tool for supporting unstructured/semi-structured data from the web*

Learning contents

- Geographic Information Systems and Science
- Spatial Databases
- GIS Applications
- Cartographic Sciences
- Geostatistics
- Databases and Geospatial Web Services

Learning outcomes

After the Master the students will acquire:

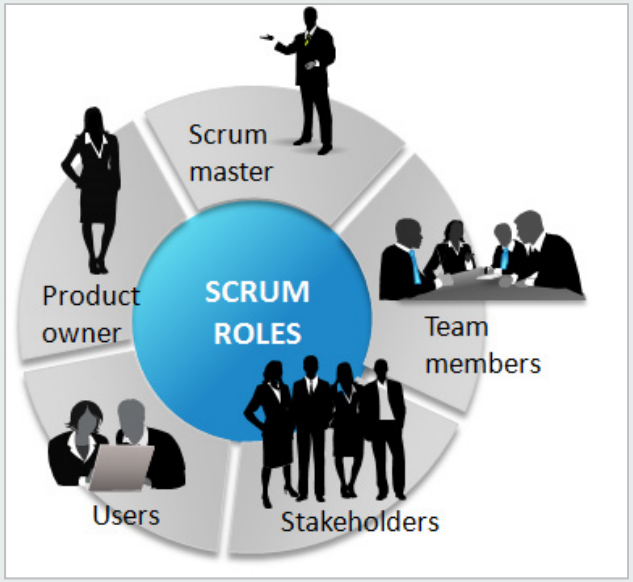
- a new professional set of skills and expertise to integrate the GIS competences of Analyst using more web-GIS tool;
- a capacity to solve problems related to the Environmental domain and to set-up data and perform analysis in a new type of platform, starting to increase hazard analysis.

Specific outcomes from the Master thesis will be:

- Produce tool re-useable in different contest or domain;
- Produce a model and a workflow to perform specific geo-processing that are needed to produce pesticides hazard model.

Case Study 3

Location Enablement of e-Government



Application domain

Over the past years important efforts have been made to improve the access to and sharing of location information, e.g. through the INSPIRE Directive at European level, and the development of Spatial Data Infrastructures (SDI) at national and regional level. However, **the uptake and integration of this information and the services in e-Governmental business processes** remains relatively weak.

In this Case Study the students will work on developing applications supporting the process for obtaining environmental permits.

Case Study Objectives

The case study aims the set-up of a case-based and collaborative learning environment in the private company in the context of an existing internship course offered by KU Leuven. Students will apply their already acquired knowledge and skills on GIS, SDI and ICT to work in a mixed team with staff from the company to design, develop and/or test location enabled applications. The students will also be involved where possible in the user requirements analysis.

Provision of training/education

The Case Study will be developed within the course “Geographic Information Systems (GIS) Internship”, offered at KU Leuven. Students must have taken several other courses prior to the start of the internship: e.g. “Spatial Data Infrastructures”. Additional training might be required, e.g. on agile programming methods (scrum) and the geomajas open source platform. The internship itself consists of 20 working days in the company and the preparation of a detailed internship report.

Learning contents

- Programming and testing apps using the scrum methodolgy
- Integration of INSPIRE components and use of API’s
- Geomajas and other Open Source environments
- Team work: students work with company staff

Learning outcomes

- To consolidate the theoretical knowledge and basic technical skills regarding GI and GIS development and usage;
- To gain a thorough experience in designing and developing applications for making spatial data available, for decision making and e-Government, using state-of-the art methods and tools: (i) Information analysis, (ii) Functional analysis, (iii) Prototyping, (iv) Documenting;
- To learn analysing and describing e-Government processes in which location information and services will be embedded through geospatial web applications using existing SDI components and API's;
- To learn thinking from the user perspective in the design phase of such applications and in particular to learn analysing user requirements and translate them into software code;
- To exercise social skills, to develop attitudes such as flexibility, coping with stress, the ability to organize, to be critical as well as to be geared towards results.

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Case Study 4

Integrated management of the underground

Application domain

- ***Utility networks*** are owned and maintained by utility companies in different sectors such as water, electricity, sewage, storm-water, fiber optics, cable-TV and telecommunication.
- ***GI technologies*** plays an important role in the management of utility networks, but despite its economic and environmental impact, management of utility networks are rarely taught in GI-related university program.

Case Study Objectives

1. the asset management of utility networks
   - the objectives are to achieve maximum return on investments and/or to provide the best possible services to the end users.
2. the sharing of utility network data
   - the objectives are to learn how the INSPIRE Directive specifies the data structures and services to be used when sharing data and how the Directive on broadband cost reduction specifies more specific conditions for access to utility network data

Provision of training/education

This case study will be implemented as an elective course included in a well-known International Master in Applied Geoinformatics offered by UNIGIS at University of Salzburg.

Learning contents

- INSPIRE Data Specification & Network Services
- Metadata and Data validation for INSPIRE
- GeoSmartCity Data Models
- Basic principles of utility asset management & Underground utility infrastr.
- District Heating & Electricity Networks
- Advanced topics in utility asset management
- Architecture (WFS, WMS, …) & Standards (OGC, CityGML, …)
- Workflows (Data Acquisition, Monitoring, …)

Learning outcomes

After the course, the students will:

- become acquainted with the main problems related to utility networks and asset management
- have knowledge about the concepts and terms used in data sharing, data harmonisation and service provision
- have knowledge about the concepts and terms used in project management and in the management of electricity networks and water supply systems
- be able to publish utility network data through standardised network services
- be able to specify different requirements on asset management system for utility network, for instance risk models and cost and revenue models
- understand the complexity, objectives and benefits of modern software for management of utility network

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Case Study 5

Harmonizing data flows in Energy saving EU policies

Application domain

This Case Study (CS) will have the overall purpose of co-creating knowledge in the field of **GIS-based data flow harmonization in Energy efficiency EU policies**. There are indeed several EU Directives (e.g. Energy Performance of Buildings Directive, Energy Efficiency Directive, Renewable Energy Directive) as well as voluntary initiatives such as Covenant of Mayors, which, at different geographical scales and from different perspectives, aim to reduce greenhouse gases emissions and to increase energy saving. In all these policy instruments location data can play an enabling role to support the whole policy lifecycle, from planning to implementation, monitoring and reporting.

Case Study Objectives

The objective of this Case Study is to engage a group of 4-5 students in the development of an application focused on one or more specific aspects of a data flow in support of one of the energy policies. The implementation will rely on the concepts, principles and technicalities of the EU INSPIRE Directive and will be based on a preliminary analysis of the current EU policies on energy efficiency.

Provision of training/education

The Case Study will be developed within the course “Geographic Information Systems (GIS)”, offered at Politecnico di Milano. This course is entirely taught in English as part of the MSc in Geoinformatics Engineering. Students attending the course have a background either in Computer Science Engineering or in Environmental Engineering.

Learning contents

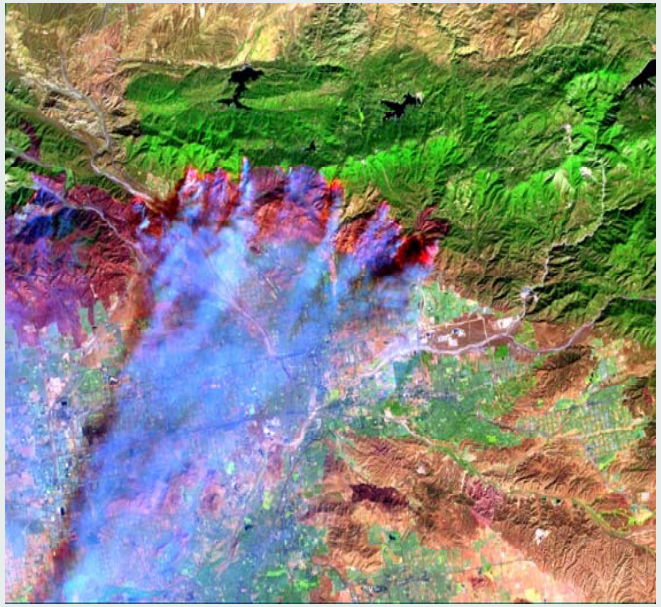
- Energy Saving/Efficiency Policies
- Data harmonization and interoperability according to INSPIRE
- Open source geospatial software and open standards

Learning outcomes

- At the end of the CS implementation, students will acquire a deep understanding of the issues related to spatial data harmonization workflows contained in the different phases of the energy efficiency policies lifecycle and how to effectively apply IT and GIS technologies in this field.
- Applying the knowledge acquired to a real case, the students will exploit their personal knowledge and skills to find solutions to the problems encountered.
- The interaction between the academic and business approaches will benefit and enrich both the industry and the university staff.
- The collaboration between the partners will lead to concrete outputs other than the learning material such as academic and scientific publications or white papers.
- The CS shared work may also lead to the identification of new research/business topics/ideas which can potentially enable further collaboration.

Case Study 6

GIS Applications in Forestry



Application domain

Forests are important renewable natural resources and have a crucial role in preserving an environment suitable for human life.

GIS technology is a valuable tool both in decision-making and in forest planning and forest management.

Case Study Objectives

To bridge the gap between academic institutions and private sector on GIS applications in forestry by:

- providing students with the theoretical background (including the social and environmental parameters) and real-case experience and management.
- introducing GIS tools that can be used in forest management
- providing novel data processing, spatial and multi-objective methods

Provision of training/education

Learning material will be implemented within **Forestry MSc Programme by University of West Hungary** during the spring semester of 2016-2017 (From February to June 2017) as an individual test course.

Learning contents

- Forestry GIS database
- Forest Mapping & data collection
- LIDAR based timber volume estimation
- Climate change
- Multi-objective forest management
- Forest Fire Risk mapping
- Forest Fire Monitoring
- Forest Fire Simulation

Learning outcomes

After completion the course the students will get familiar with GIS applications in Forestry and more specifically they will be able to:

- Prepare thematic maps for decision makers
- Develop a critical awareness of forest management from a multidisciplinary perspective
- Use complex tools and methods serving at the real world fire cases
- Be able to conduct geospatial analysis and simulation of forest fire events

The outcomes of this procedure are not only student related, but are also expected to benefit the rest of the actors involved from the academic and private field.

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Stay tuned and ….
Thank you for your attention!!