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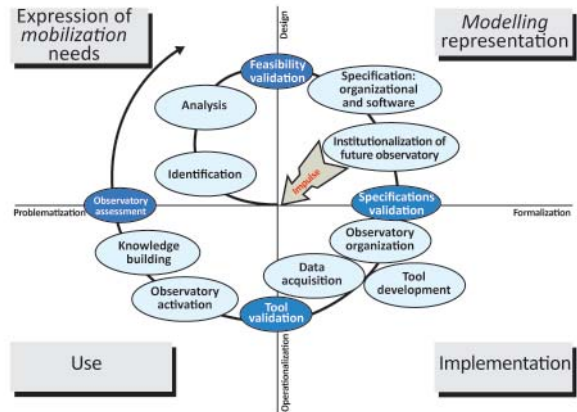
**Geoinformation  
and Earth Observation  
for environment  
and territories**



# Methods for the design and analysis of territorial information systems

In an ever-changing rural world, sharing targeted, reliable, updated information tailored to specific issues is a key element for territorial development. This is true regardless of the aim, i.e. to gain insight into territorial dynamics, coordinate agricultural practices, characterize and manage flood hazards, control pollution or restore the ecological balance of rivers, etc.

The joint research unit (UMR) TETIS conducts research on information system concepts, formalisms, design and setup methods by implementing them using specially tailored computer tools. For instance, in collaboration with UMR G-EAU, it has developed a new participatory approach for building observatories in given territories to fulfil the needs of a collective action targeting a specific issue. Between 2005 and 2007, a test was carried out in two areas of France: Aume-Couture Basin (Charente region) where quantitative water management was the key concern to deal with, and Hien Valley (Isère region), where biodiversity and water quality were the issues. Concerned rural stakeholders' organizations were queried to establish the base of an information system. There are four steps to this iterative approach: statement of requirements, representation of viewpoints, development of the computer application and use of the resulting information system.



From Lemoisson P. et al., 2008.

### ▲ Spiral observatory design pattern.

Long-term representation and capitalization of knowledge used during the development of information systems is another example of the unit's research. A case-tool, which was initially set up for the modelling and development of computer applications, was modified to focus on adding pictograms of spatial and temporal concepts used in observatories. The functions developed in this case-tool automatically enhanced the models developed during the analysis as a function of the spatial and temporal concepts introduced. Automation of model enrichment boosts the speed, traceability, quality, reliability and improves the efficiency of information system development processes.

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*Complicated negotiation between three urban sellers and a rural charcoal producer (sitting) in Mali.*

# Role playing games used in preliminary analysis of a participatory GIS for concerted management

GIS tools have been substantially criticized for being inaccessible to citizens and mainly available for the use of public authorities. Over the last 15 years, research has been under way with the aim of designing participatory GIS that could bring together different partners (especially basic communities) for spatial decisionmaking. This concept is still relatively vague and methods for designing such systems have not been formalized.

In this new research field, CIRAD (UPR Forest Resources and Public Policies), in collaboration with the Malian forestry administration, launched companion research with the aim of building a participatory GIS with all stakeholders of the fuelwood supply subsector in Bamako.

There is a very high number of stakeholders in this subsector, sometimes with antagonistic goals, with marked differences in information access. This research is based on the hypothesis that GIS, which is considered as an intermediate tool that can be used to collectively build a shared vision of the Bamako wood energy supply area, could facilitate stakeholder coordination and thus enhance forest resource management.

The selected approach is based on a role playing game and is similar to a scenario-based needs approach. It is aimed at encouraging stakeholders in the profession to describe their views on GIS, thus to express their needs, goals and the pathway that should be taken to achieve them. The game enables different stakeholders to be full-fledged protagonists of a simulated information system. They are introduced to the situation in a structured area (room) as information users, vectors and producers. The experiment highlights the efficacy of the game with respect to explaining viewpoints, analysing needs and documenting information sharing strategies. It boosts the prospects for designing information systems in relatively unstructured organizations.

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