TOWARDS A MODEL OF REPRESENTATION IN AN INFORMATION SYSTEM

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ABSTRACT

The article presented here proposes a decision-making tool in the service of the reasoning of the curator of the real estate property.

The elaboration of this tool dedicated to the maintenance passes by the necessity of informing the building, concerning its shape and its manners. Indeed, a relevant modelling of the studied architectural object allows sticking to its morphology a set of data and of information. The objective being to end in a system of information referenced spatially on the scale of the architecture, in which the representation of the building can serve as interface privileged by navigation. The model has to answer a certain number of requirements.

The principal objective of project SIGL is to constitute a system of graphic and alphanumeric data allowing a management of the inheritance of the UVHC. This system of optimized management uses data for the seizure, storage, the extraction, the interrogation, the analysis and the data display localised or geographical.

KEY WORDS

Information system, decision making, representation.

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INTRODUCTION

All the actors of the field building are producers of information: the owner building customers, the companies of the sector of realization and the companies of industrial sector who offer products for the building. All wish today to develop a better communication of this information. With these problems, it is necessary to work for a model facilitating the division and the consultation of the whole of information related to the real inheritance. This model constitutes a tool of decision-making aid with the various actors of this sector.

It is thus in the particular fields of technical maintenance of the real inheritance and its management that intends to position the application of this model. The systems of DAO, the management' systems of data bases and their exploitation via Internet network make it possible to consider answers for the questions related to the structuring of descriptive information of the building, the management of a process of conservation, the division of information distributed between distant partners, the traceability of the decisions for the maintenance of the building.

The article presented here proposes a tool of decision-making aid with the service of the reasoning of the conservative of the real inheritance. This tool is interested in the questions specifically related on the production and the use of forward plans of management of the real inheritance.

GEOGRAPHICAL INFORMATION SYSTEM AND MANAGEMENT OF THE REAL INHERITANCE

THE INFORMATION SYSTEM

In first, it is necessary to agree on some terms, acceptances and precise details on the system, the information system and in particular the role of the SIG in information technologies.

By system, we want to say the whole of elements in dynamic interaction, organized according to a finality. A system is a whole of elements which interact between them by exchanging internal and external information with support of transportation. For Jean-Louis Moigne (1990) an information system is the whole of methods and means collecting, controlling, memorizing and distributing information necessary to the exercise of the activity of any point of an organization. It has the role to ensure the coupling between the system of operation and the system control : it's function is to produce and memorize information, representations of the activity of the physical system then to place them at the disposal of the system control.

The functional diagram on figure 1 explains the positioning of the Information system within the organization, being used as means of connection and exchange between the physical elements of the organization (men, machines, produced...) and the system control and management (place of management, planning, prospection).

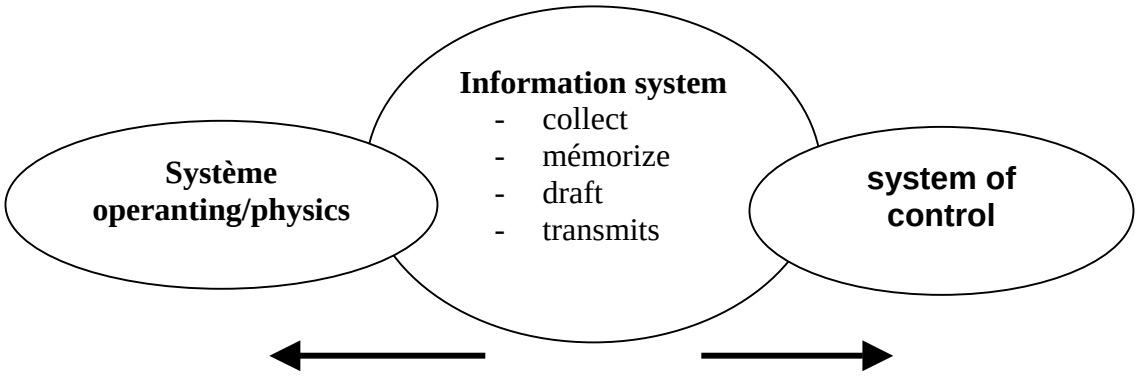

Figure 1 : Positioning of the information system

THE SIG

Compared to the many definitions and existing descriptions, let us retain this one :

a SIG can be defined like a system of management of data bases conceived to seize, store, handle, analyze and post data with space reference in order to solve complex problems of management and planning.

The SIG integrate primarily two modules : a Data base management system DBMS and a module allowing to treat the space character of information.

Like any data base management system, a SIG is equipped with relative functions (figure 2) :

- the acquisition of the data
- storage,
- the handling and analyzes data,
- the posting and the generation of the interfaces,
- an interface with the user.

What can be expressed by the five "to acquire, file, reach, analyze and post". The SIG resting on a DBMS makes it possible to the user to act in entry and exit of the system.

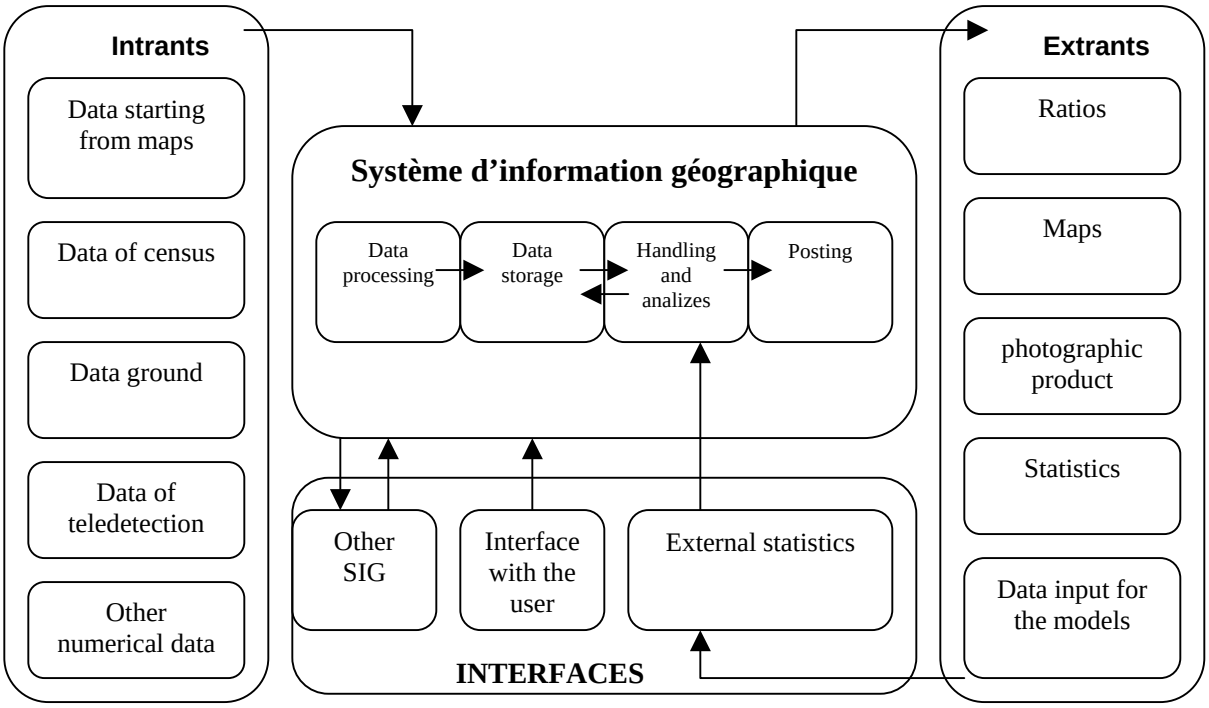

Figure 2 : Components of a SIG [FIS-93] in [LAA 00]

Within the framework of this work, it is important to identify the contributions of the SIG to the management of the real inheritance.

The questions concerned with the co-education of the urban functions, the durable development and the occupation of the ground, are overlapping and maintain relations of the causal type. The decisions are numerous and they are blocked by their increasing complexity that the actors of the urban development have to solve. The design of a Geographical Information system must answer above all with management, the control of this increasing complexity to accompany the practices by urban refitting, the control of operations of town planning and the installation of the new documents of city planning.

The SIG are tools which make it possible to satisfy the need for information and communication. The problems of patrimonial management that the actors of installation have to solve complex because they are largely overlapping. The management of the urban project, local installation have need for objective information answering this complexity.

The need for communicating information enters the various actors requires an instrument making it possible to assist the collaboration of administrative and technical competences for a global and synthetic solution of the problems of installation.

LE SIG: A TOOL OF ASSISTANCE A THE DECISION IN MANAGEMENT OF THE REAL– INHERITANCE.

The SIG can not be regarded as tool of decision-making aid because it does not integrate a clean decision-making process. However, it makes it possible to have, several years in advance, a detailed image from what will occur on the ground. Moreover, much of treatments sets of themes (built inheritance and not built, demography, health, employment...) can be carried out and thus allow to treat the future data of census to support the decisions of the actors on a whole of knowledge multi-sets of themes and organized.

The SIG makes it possible to show the induced effects of the policies of development, by providing a quantitative characterization of the medium, according to scenarios of development. It is what makes of it a tool of decision-making aid within the framework of the urban development.

But it misses methods however making it possible to carry out choices among the various possible solutions relative to a decisional problem given to become genuine tools of decision-making aids.

Although the SIG provide to the decision maker a whole of powerful tools for handling, the management and the analysis of the data with space reference, they miss a whole of mechanisms making it possible to integrate the preferences of the decision maker and to carry out a choice in a context of evaluation of objectives and criteria conflict.

It is this report which returns many researchers to couple the SIG and the methods of multicriterion analysis; because the SIG alone does not offer the means of making of the decision-making aid strategic or of the multicriterion evaluation of an urban problem.

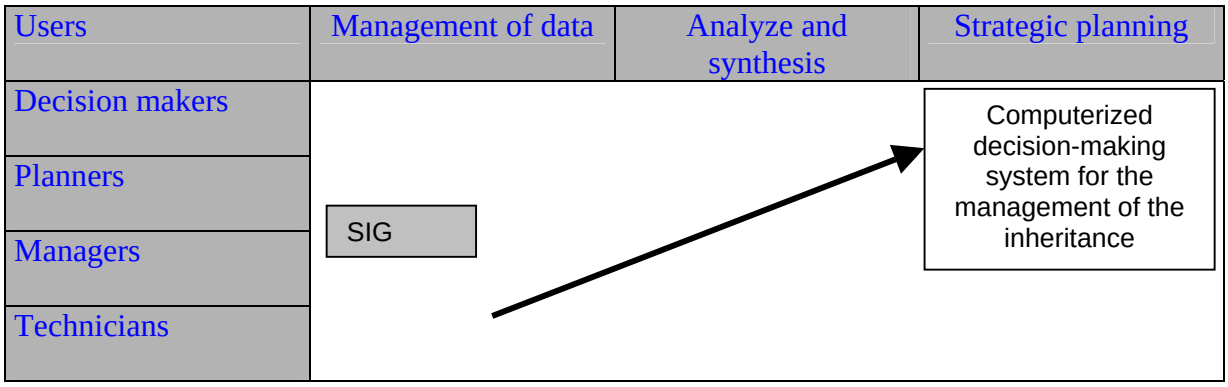

Figure 3 : Position of the SIG with respect to the users and the activities.

Because of their role of collecting, storage and data processing, Clarke (1990) notes that the SIG provide more decision-making aid at the operational level than at the technical and strategic levels.

PROPOSAL FOR AN INFORMATION SYSTEM GEOGRAPHIQUE AND LOGISTIC "SIGL"

Far from a simple "mechanization" of the traditional methods, SIGL is a system which transforms the field of the maintenance of the real inheritance and modifies of them several aspects particularly in the field quantitative and qualitative increase in

- of the information management:
- interconnection of the information systems of each actor,
- information, will to have a description
- development of tools of simulation and assistance, of the building throughout its cycle of life.

It is thus towards a methodology of development and uses of this tool that this research is directed, in a spirit of generalization and diversification of the grounds of experimentation since those will include at the same time urban fabric but also from the point of view of the particular building like urban screen.

Making of this tool of decision-making aid dedicated to the maintenance of the real inheritance passes by the need for documenting the building, concerning its form and its uses. Indeed, a relevant modelling of the studied architectural object makes it possible to attach to its morphology a whole of data and information. The objective being to lead to an information system referred spatially on the scale of the architecture, in which the representation of the building can be used as privileged interface of navigation.

The model must answer a certain number of visualization on the Web, without material–requirements. It must allow :

- the visualization of these scenes on each
- investment, of various scenes;
- reaction of the user on the scene visualized either while
- operating system;
- That the scene serf of–moving there, or by questioning it, or by modifying it; interface with a System of Management of Data bases.

Lastly, the management of information relating to the maintenance of the inheritance, is of course the basic problem which this study tackles. In addition, the project aims at benefiting from the development of a whole of techniques data-processing (approach object, technologies of the Web, etc...) to try providing the foundations of an information system localised.

PROTOCOL OF APPLICATION

Within the framework of the management of the real inheritance of the university, the logistic service set up project "SIGL".

INHERITANCE NOT BATI

For the management of its inheritance, the university of Valenciennes needs, on her territory, of exhaustive geographical knowledge and an information management increasingly finer.

The SIGL constitutes a response to these daily problems: it enables them to easily integrate the geographical component in management, to optimize it and improve knowledge of the territory. It does not act more than one simple tool of census of geographical information but of a true Information system federator, interoperable with all the components which are attached to it and all the trades applications which result from this. The data is centralized and shared with the users of the SIG, or the improvement the knowledge of the–users of other applications.

SIGL allows one:

- **improvement of knowledge of the territory,**

It is possible to reach the land register and information which is attached to it. One can visualize microfiches and the data relating to the pieces (name of the building, of the occupant, surfaces...), while profiting from a cartographic representation.

Many management tools trades can be developed by our services around tool SIGL: management of the networks, follow-up of permit building, management of the roads, installation of the parks... As many applications which make it possible to enrich knowledge by the university territory, and to improve the exploitation

- **Cartography and management of the–of it in an intuitive and interactive way networks**

The exploitation of the various networks requires their geographical representation. That constitutes a stage impossible to circumvent. This achieved operation, one can then visualize them and update them from the station office or directly on the ground thanks to the mobile solutions. Very simply, with the solutions trades developed one is able to analyze and anticipate the incidents

– **Planning of the interventions**

Once the isolated failures, the management tools of networks, cleansing helps us to decide actions and means to implement for repairing and maintain them

– **Optimization of the management of the inheritance not built**

Beyond its capacities of representation, SIGL makes it possible to manage and chart the inheritance. Using the solutions trades integrated into the application, one can decide and optimize the equipment installation of and organize in an optimal way the interventions of maintenance on the inheritance...

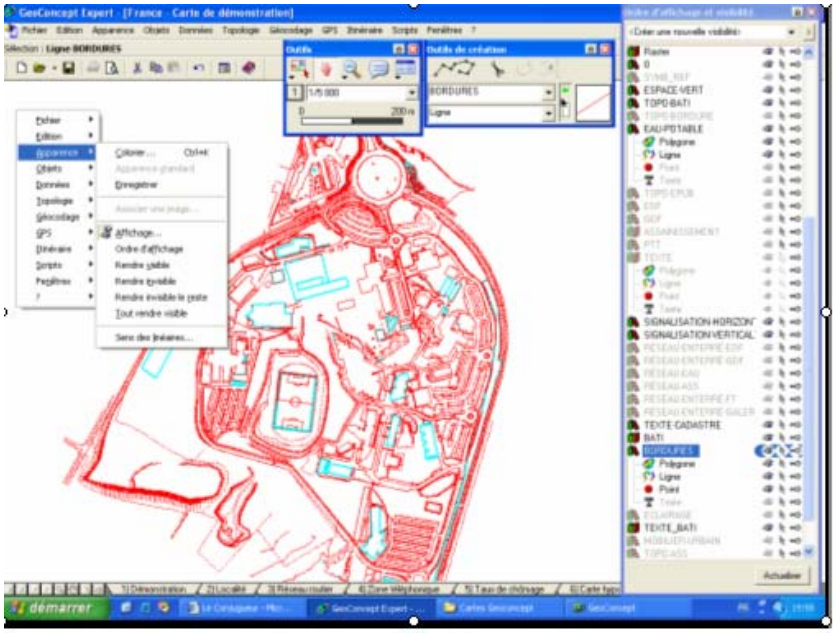

Figure 4 : Geolocalisaion of university site Mont Houy

INHERITANCE BUILT

The missions of the SIGL within the framework of this project :

– Administration of the data base and specification of the description of the real inheritance and the associated information

– Parameter setting of the functions of exploitation and development of specific applications for the university managers of buildings and the in charge ones of technical maintenance

- Data-processing seizure initial of the buildings and the university sites and seized by the major updates (Raised of the buildings, Training–seizure of the plans, integration of already computerized data...).
- Formation of the managers of buildings and the persons in charge for maintenance for the consultation and the regular information of the base
- Assistance of the users to the implementation of the system.

Project SIGL consists in formalizing a whole of graphic and alphanumeric data in response to a double patrimonial strategy: the management of the costs and the offer of services in the users.

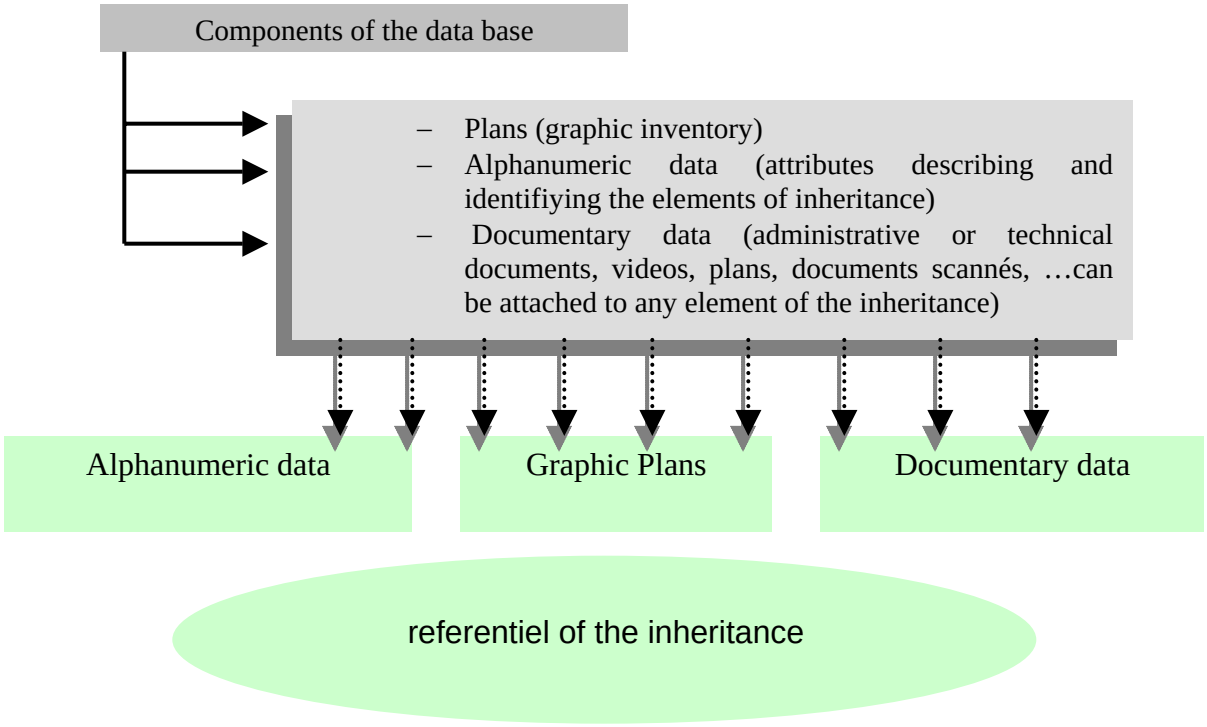

Figure 5 : Components of SIGL project

SIGL : TOOL OF ASSISTANCE A THE DECISION AND COMMUNICATION

SIGL is a genuine tool of decision-making aid. It in particular contributes to identify the stakes of the site of the university. It makes it possible to organize all the stages preliminary to the choices of a future establishment bus it takes part to carry out analyses sets of themes

on statistical and geographical data. It facilitates the analysis of the territory and brings a synthetic vision of information.

It makes it possible in particular to the various actors of the inheritance to visualize the evolution of fabric in space and time. SIGL becomes a genuine tool of communication and assistance to convince the decision makers and the users of the inheritance. So initially, the SIGL contributes to better managing geographical data and to integrate all information relating to the territory, the real advantage lies in its capacity to disseminate and share relevant information with a certain number of actors for fast decision-makings. The data are stored on a waiter of data and are shared by all the users. According to rights' which are allotted to them, they reach information in reading mode or writing. Information is accessible to all and is integrated into a reference frame supporting collaboratif work thus.

SIGL : TOOLS FOR DIAGNOSIS, TOOLS FOR EVALUATION

Knowledge, thanks to the acquisition of information on behalf of a manager of the inheritance, enables him to carry out choices, because it has a global vision of the problem and possible solutions and their consequences, while bringing a satisfactory technical solution and best accepted.

But before the decision maker can choose, it is necessary to design a panel of choices possible to propose to him, objective of a tool of decision-making aid. This panel corresponds to a series of possible actions, even with scénarii. By scenario one understands at the same time the whole of the essential elements structured in space (or groundwork) and the course envisaged of the action (for example intervention of work) which takes into account the elements considered. The scenario of a management of the real inheritance thus constitutes the tool which supports the process of its development: each expression of the scenario corresponds to a determined phase, thus adapting to the successive needs for an evolutionary process. Michel Godet defines a scenario as a coherent unit, having a temporal dimension, "formed by the description of a future situation and advance of the events which make it possible to pass from the situation origin to the future situation"[5]. The true difficulty is the formalization of the scénarii. It is thus interesting to consider the methods of development of the scénarii, at the same time as a concrete translation of the mental representation that is made the manager (like the actor of the intervention); and as elements of representation of the concretization of waiting of the users of the buildings.

The recourse to the tools of decision-making aid can intervene constantly of the process of exploitation and throughout cycle of life of the frame. In an approach quality, it is desirable that it is committed very upstream of the decision, as of the preliminary studies. Moreover

[5] Godet, M. (2004) « La boîte à outils de prospective stratégique : problèmes et méthodes », Cahiers du LIPSOR, n°5, page 20.

one could distinguish various types of tools of decision-making aid, according to the tools–moment when they intervene, and thus according to also the objectives:

- Tools for diagnosis; they intervene upstream, and they are used to estimate the state and thus the degree of quality of an element of the existing frame, in a concern of defining the failing elements, weak points, who can transform themselves into strong points and thus constitute the elements necessary in order to build the tools for evaluation;
- those–tool of decision-making aid for the intervention; intervene a posteriori, to evaluate the results and the consequences of the decisions taken and installations. The retrospective analysis of the decisions taken can be regarded as a factor of quality assurance, in the optics of a step of control permanent of the quality of the interventions carried out

CONCLUSION

Any organization (community, CCI,...) having problems of territorial information and management of inheritance, needs on its territory exhaustive geographical knowledge and an information management increasingly finer. Thanks to the SIGL, it is from now on possible to easily integrate the geographical component in the management of the inheritance of the university, to optimize it and improve knowledge of its territory.

For a few years, the university engineering departments have been computerized, thus allowing the mutualisation of the resources, competences and information; and supporting the professionalisation of territorial management.
The management of the inheritance becomes from now on a service with whole, transverse share within the organizations. It touches several services and makes it possible to exploit, analyze and manage all the data of the university park.

Our objective is not to create a documentation base which would be adjusted with the need with our project to enable us to validate our starting assumption, but to confront well this assumption and the step of project which accompanies it with concrete cases. This is why we will use several documentation data bases already implemented within the framework of the grounds of experimentation described further, and which concern problems of documentation of the building or the site.

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