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Modelling of the TICS Catalyse : Definition of a basic vocabulary

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Summary: The thinking launched since the creation of “Catalyse” tools led in 2008 to the necessity of integrating the tools of quantitative, qualitative and spatial analysis in an information system managing the contents from data collection to results publishing according to actor’s use. Within the framework of these information systems so-called TICS “Territorial Intelligence Community Systems” conception, an action of modelling started in 2009. After definition of first models, which describe the data manipulated by the existing tools of the "Valise Catalyse", we realized that it was important and essential, to define the vocabulary allowing territorial intelligence specialists and computing specialists to communicate. Reminding of realised works in the modelling action we present in this article this last aspect of our work.

Résumé : La réflexion lancée depuis la création des outils « Catalyse » a abouti en 2008 à la nécessité d’intégrer les outils d’analyse quantitative, qualitative et spatiale dans un système d’information gérant les contenus de la collecte des données à la publication des résultats en respectant les usages des acteurs. Dans le cadre de la conception de ces systèmes d'information appelés SCIT « Systèmes Communautaires d’Intelligence Territoriale », une action de modélisation a été lancée dès 2009. Après la définition de premiers modèles décrivant les données manipulées par les outils existants de la valise Catalyse, nous nous sommes rendus compte qu'il était important de définir le vocabulaire permettant aux spécialistes de l'intelligence territoriale et aux informaticiens de communiquer. Après un rappel des travaux réalisés dans le cadre de cette action, nous présentons dans cet article ce dernier aspect de notre travail.

Keywords: Territorial Intelligence, Territorial Intelligence Community System, Modelling, Information System, MDA, vocabulary

Mots clés : intelligence territoriale, Système Communautaire d'intelligence Territoriale, Modélisation, Système d'informations, MDA, vocabulaire

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The "TICS Modelling" action supported by INTI GDRI [8], has for objective to define clearly the concepts connected to the territorial intelligence and to the tools allowing to estimate the situation and the expectations of a group of individuals. The modelling of the “Territorial Intelligence Community Systems”, or TICS is useful to transcribe the methodological and technical specifications elaborated within the framework of the caENTI in a generic language accessible to computer specialists, but independent from specific informatics languages. It also allows researchers in social sciences and actors to exchange with researchers in computer science in order to elaborate reliable and long-lasting solutions.
The Catalyse toolkit suggests territorial actors a method and tools to make a diagnosis of community needs and then to evaluate the services implemented to meet these needs. It allows actors to conceive questionnaires, to use them to collect information and then to analyse these data.
During the modelling work a computing basic vocabulary was introduced to describe a part of TICS domain. The confrontation of this computing vocabulary with territorial intelligence specialists vocabulary showed us that it been very difficult to define a common vocabulary to territorial intelligence specialists and computing specialists.
In this article we first propose a reminder of the objectives and the context (Catalyse toolkit) of our modelling: the TICS modelling project. Then we present the definition of basic terms for computing specialists and territorial intelligence specialists.

1. TOOLKIT CATALYSE AND TICS

Within the framework of territorial intelligence the implementation of observatories and the data analysis which are collected are essential tools to estimate the state of a population with regard to certain criteria to propose actions to improve some situations.

1.1 Catalyse

The method of territorial observation Catalyse allows to realize territorial diagnoses, to elaborate projects, estimate them, and observe the territorial dynamics by giving the means to the actors to share their information and to work together in spite of the structures dispersion on the territory .
For it Catalyse proposes for several decades a set of computing tools allowing to manage survey and to analyze the obtained answers.
It integrates in particular computing tools of data analysis:

- Pragma is a software of surveys quantitative analysis. Il allows the construction or writing of questionnaires, the collection of the results and their quantitative analysis.
- Anaconda is a software of qualitative processing and graphic representation of results obtained from Pragma.

This set software is on the base of an information system which allows to collect information concerning a territory. It is called TIS or Territorial Information System.

1.2 Territorial Intelligence Community System : TICS

Toolkit Catalyse which met a striking success with the territorial actors community, evolved with languages and computing platforms advances. These new on-line versions modified working practices and allowed a better actors collaboration on projects. This led to the passage from TIS to TICS. Indeed the TICS proposes to territorial community actors a software environment which allows information sharing and collaboration within a partnership framework.
The figure 1 presents the data flow in a TICS in particular between Pragma and Anaconda, until its publication on Web.

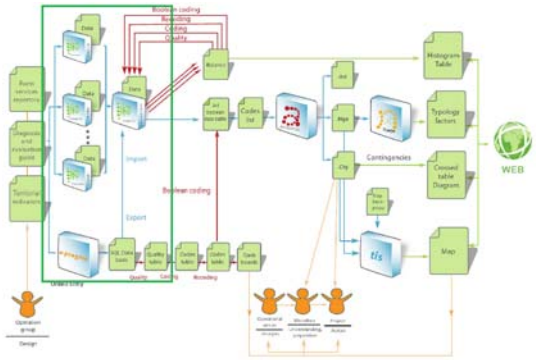

Figure 1 : Data flow in TICS

2. MODELLING ACTION: TICS MODELLING

The modelling action concerns the modelling of these new community systems. It started at the end of CAENTI project [7]. Since this action continues in INTI GDRI project.

2.1 Why?

The objective of TICS modelling is to define a common language understandable for TICS actors : territorial intelligence specialists and computer specialists. It is a privileged tool for TICS communication and pedagogy [3] et [1]. Il allows

territorial intelligence specialists to express their needs to computer specialists.
In an optics of software sustainable development, the approach MDA (Model Driven Architecture) was used [6].
This kind of approach allows to separate businesses data from those dependent on computer technology. In the TICS modelling, we want to describe the specific concepts of territorial intelligence without caring about aspects bound to computing: platform, informatics language, operating system.

From an computer point of view, a modelling based on the MDA approach assures a sustainable computer development, the interoperability of the software developed and their adaptability to languages and technological platforms.
From a thematic point of view, the modelling allows to define basic elements to communicate on TICS by defining a common language, understandable for all the actors of the TICS who can be of very different domains.

2.2 What was made

To realize this modelling of a so vast domain, we first chose to limit ourselves to a part of the data treated by Catalyse toolkit.
These data correspond to those represented in the green rectangle of figure 1. First data models representing questionnaires construction and manipulation of ([1] and [5]) were realized.

The number of businesses data occurring at the level of the Catalyse toolkit are very important, so we introduced the notion of step into our modelling [2] which is an additional decomposition level. Every step corresponds to a phase in the chronology of the data processing and is represented by a model. The model of a step leans on elements defined in the previous steps. This way of working allows to obtain simplified models. The various modelled steps are:

- Pool of questionnaires construction elements: this step is defined to allow persons creating a questionnaire to reuse existing questions and complete blocks of questions. The creation of questions and thematic blocks corresponds to a know-how; this pool allows to pass on this know-how in a simple way. An example of model is proposed in figure 2 which presents the notion of model question.
- Construction of a questionnaire: during this step the user creates a questionnaire by selecting and by organizing model questions or model thematic blocks stemming from the pool defined in the previous step.
- Submission of a questionnaire: this step allows to collect the answers to questionnaires made by individuals.

Other steps must be introduced into the modelling but they were not even developed for the moment. The language used to describe the first models is UML, standard graphic language recognized by all modelling actors.

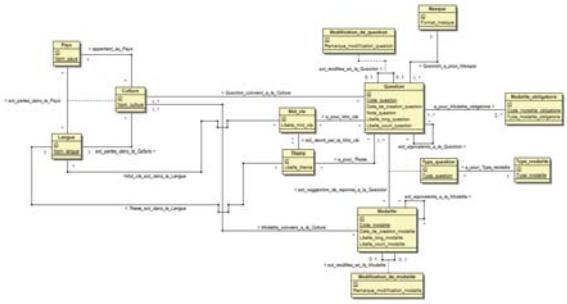

Figure 2 : Model question

2.3 Assessment

The design of data models came to a very complete questionnaires modelling. From an computer point of view numerous possibilities of questionnaire construction (loop, condition, ...) are taken into account. It allows on the other hand the systematic questionnaire construction. Databases as well as the classes object of programs can be generated in an automatic way from the UML models. From a territorial intelligence point of view the modelling allowed to formalize the re-use of questions or parts of questionnaire thanks to the introduction of model questions and model thematic blocks.
During the modelling work we used terms to name modelled objects. So a computing basic vocabulary was introduced to describe a part of TICS domain. The confrontation of this computing vocabulary with that of the territorial intelligence specialists showed us that it been very difficult to define a common vocabulary to territorial intelligence specialists and computing specialists.
Thus a work of definition or re definition of the domain main terms was realized.

3. VOCABULARY

For each term we give two definitions, one proposed by territorial intelligence specialists and the other proposed by computer specialists. To define this vocabulary, we based ourselves on the terms introduced into our modelling and on the project notion. The project is an important notion in territorial intelligence which had not been yet approached precisely from a computer point of view.

3.1 Project

Territorial intelligence definition : A project is based on actors' partnership. Actors define together an objective and realize in a collaborative way the tasks necessary to the realization of this objective, by sharing their resources.
A project leans on a shared information system, which includes indicators on one hand and information collected by means of surveys**.**

Computer definition : A project is mainly composed of :
- a set of surveys,
- an objective
- a reference to a project administrator.

3.2 Survey

Territorial intelligence definition : Approach based on a questionnaire and conducted over a given period. It includes creation of the questionnaire, collecting and processing the collected data and publication of results of treatment. This approach allows a rigorous collection of analyze-oriented data.
In Catalyse, surveys correspond generally to diagnoses which identify the needs of an individuals group and identify services that can meet these needs. A survey is based on a guide, but answers are formalized by means of a questionnaire. A part of the actors participates in the collection, in the management and in the data analysis, then in their publication, by means of an information system (observatory).

Computer definition : A survey is based on:
- a questionnaire
- a logic of data collection (individual record, guide, questionnaire)
- an organizer of questionnaire
- one or more collection coordinators
- one or more analyze coordinators

3.3 Individual record

Territorial intelligence definition : Record which accompanies a person and which is fed with information. It contains individual information, a part of which is without interest for a statistical processing. The data must be structured to be aggregate for a global analysis.

Computer definition : Information set concerning an individual.
The individual record contains two parts:
- Information which do not concern the processing. The information are rather intended for the territorial intelligence specialists.
- Information usable for processing.

3.4 Questionnaire

Territorial intelligence definition : Structured list of questions.
These questions are put to all the persons, in the same order and according to the same formulation so that all the persons are questioned in the same way.

Computer definition : Set of questions orderly and organized in thematic blocks.

3.5 Guide

Territorial intelligence definition : List of themes to be approached during a series of conversations, without order and no formal constraints; A set of themes which can be structured in the form of questions for a survey.

Computer definition : File.

3.6 Question

Territorial intelligence definition : A question is a sentence that expresses an interrogation.

Computer definition : It is defined by:
- A text
- Modalities
- A kind of possible answer

3.7 Thematic block

Territorial intelligence definition : A thematic block is a set of orderly and structured questions corresponding to a theme.

Computer definition : A thematic block is the basic element of a questionnaire. It is an ordered and structured set of questions bound to a theme.

3.8 Pool of construction elements of a questionnaire

This pool allows computer reuse of basic elements to build a questionnaire. These basic elements are models. They are ready to be used totally or partially or to be modified during the construction of a questionnaire. In territorial intelligence the reuse of elements to build a questionnaire was implicit and not formalized.
There are two kinds of models : question model and thematic block model. They are proposed by territorial intelligence specialists or are result of the professional experience.

4. CONCLUSION

The basic vocabulary definition of TICS domain brought to light perception differences of the vocabulary according to the disciplines. So in computer science the defined terms correspond to elements introduced during the modelling. They often correspond to classes or attributes which are precise elements. Detail level of the data's computing representation does not interest majority of territorial intelligence specialists. For these specialists the terms of the vocabulary represent concepts and are more general thus by nature.

This vocabulary definition, even restricted, supposed numerous discussions and meetings because of a real difficulty of understanding between territorial intelligence specialists and computer specialists. This work's starting point was the definition of project notion in territorial intelligence. For that purpose we leaned on the already realized data's models. To complete the description of elements occurring in Catalyse toolkit it remains to define the vocabulary concerning data collection.

An interesting and logical continuation of this work would be the definition of an ontology for territorial intelligence. It would allow to define a consensual terms set for and by all disciplines collaborating in territorial intelligence.

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