How to deal with the conflicting views of the world expressed in regional economic development policies?

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Summary: The work presented here considers mainly territorial intelligence as a cooperative system in support of public decision-making. The paper is organised in three parts, each of them presenting a particular stage of our approach. A first stage is dedicated to the analysis of the knowledge that can be identified (or re-constructed) on the basis of the texts issued by the regional government, and of the regional actors' speech. This analysis is led through a three-level grid: the level of views of the world, that of models and that of norms. During the second stage, the knowledge previously identified is structured in the form of ontologies. Conflicting views of the world can lead to concurrent ontologies that can be so described as polydoxical ontologies. In a third and last stage the conceptualisations built in the previous stage are embedded in some (basic) decision support tools that are proposed to the regional decision-makers.

Résumé : Le travail présenté ici considère l'intelligence territoriale avant tout comme un système coopératif d'aide à décision publique. Le papier est organisé en trois parties, chacune représentant une étape particulière de notre démarche. Une première étape est consacrée à l'analyse de la connaissance qui peut être identifiée (ou reconstruite) dans les textes et le discours des acteurs régionaux. Cela analyse est menée à l'aide d'une grille à trois niveaux : le niveau des visions du monde, celui des modèles et celui des normes. Lors de la deuxième étape, la connaissance précédemment identifiée est structurée sous forme d'ontologies. Des visions du monde incompatibles peuvent mener à ontologies concurrentes que l'on peut qualifier alors de polydoxiques. Dans une troisième et dernière phase les conceptualisations construites à l'étape précédente sont utilisées comme base pour des outils d'aide à la décision (simples), proposés ensuite aux décideurs régionaux.

Keywords: Territorial Intelligence System (TIS); regional policy making; decision support; views of the world; polydoxical ontologies; territorial economic development.

Mots clés : Système d'Intelligence Territoriale (SIT) ; formation des politiques régionales ; aide à la décision ; vision du monde ; ontologies polydoxiques ; développement économique territorial.

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INTRODUCTION

The work presented here considers mainly territorial intelligence as a cooperative system in support of public decision-making. Decision-making may either be envisaged with respect to the implementation or formation of public policies. The present paper addresses the global issue of Territorial Intelligence Systems (TIS's) conception from the latter viewpoint. TIS's are here viewed as supporting the constitution of target systems, *i.e.* the definition of strategic axes, their breakdown into operational objectives, and the concrete implementation of actions up to their evaluation.

In our view, TIS's are to be considered mainly as information systems. Following Jean-Louis Le Moigne's broad canonical definition, we regard IS as "a meaningful formal or informal set of symbols circulating within an organisation". This definition thus equates the information system with a language, understood as the capacity to express "reality" in a form that may be shared by all members of a given community. The information system therefore appears as a system that allows the formalisation of views of the world. On that basis, it is not a system that objectively expresses an immanent reality, but a social construction, reflecting a set of representations which refer to paradigmatic or ideological choices.

The conception of a Region's TIS should therefore be seen as the creation of a language to be shared by all players involved in the Region's development. Such a language is intended to make regional public decisions possible (*i.e.* to support the formation of decisions and their subsequent implementation) through coherent representation of regional economic development. To elaborate their policy, Regional Council members need to reach group consensus on a comprehensive strategy, on the main objectives to be pursued, on a general approach, *etc*. To implement the policy, regional players need to have information about the regional industrial base, enterprise location on the regional territory, available scientific competences, population distribution, enterprise financial condition, distribution channels, employment areas, *etc*. At the end of the process, a Regional Authority should have indicators at its disposal with a view to evaluating the financial effort made and the impact of actions undertaken.

In the absence of such specifically built TIS's, a Regional Authority – like any organisation – has a *de facto* information system, a language which allows services to operate and enables the institution to cooperate with other players and to communicate with the population, *etc*. Such an information system is partly produced "naturally" by the organisation itself, in the course of its history (*e.g.* hierarchy of administrative services, list of delegations of powers, classification of enterprise financial support mechanisms, typology of training sessions, *etc.*). However, such an information system is also partly "imported". Indeed, part of the organisations' information systems is constrained by *categories* stemming from other organisations (public regulations, chart of accounts items, INSEE[1] reference systems, E.U. funds eligibility criteria, various norms, *etc.*).

Several types of difficulties render the objective of building a TIS complex, thus translating it into a research theme.
The paper address one of these difficulties, regarding the views of the world expressed on the main issues of economic development policy: economic development modes, structure of the regional industry, regional territory… The views of the world one can identify in the texts or the speeches produced by the regional decision-makers are poorly clarified, sometimes ambiguous, and not formalised enough to provide concrete guidance of action. These views of the world may also diverge rather significantly from one player to the other. Furthermore, they are greatly influenced by national statistical information systems (such as the INSEE for instance) whose weight can particularly be felt through the reference system used (industrial nomenclatures, territory partitioning, *etc.*). It should be reminded here that these reference systems were initially conceived for other purposes than territorial development.

The present work proposes a method to support to clarify the various views of the world, in order to facilitate the formation of regional economic development policy, and its implementation.
The paper is organised in three parts, each of them presenting a particular stage of our approach.
A first stage is dedicated to the analyse of the knowledge that can be identified or reconstructed on the basis of the texts issued by the regional government, and of the regional actors' speech. This analyse is led through a

three-level grid: the level of representations (views of the world), the level of models (methods, or logics of action, which allow the interpretation of representations), and the level of norms (procedures, reference systems, which permit the concrete action of operational players).

During the second stage, the knowledge previously identified is structured in the form of hierarchies of concepts (light ontologies). Conflicting views of the world can lead to concurrent ontologies that can be described as *polydoxical* ontologies.

In a third and last stage the conceptualisations built in the second stage are embedded in some (basic) decision support tools that are proposed to the regional decision-makers.

Examples will be provided for each stage, on the basis of the CAVALA project[2]. The CAVALA project, financed by the Midi-Pyrenees Region, is aimed to produce a set of evaluation (effort and impact) indicators about the Regional Council's economic policy, with special emphasis placed on enterprises financial support actions.

1. FIRST STAGE: LOOKING FOR THE "INVISIBLE STRUCTURE" OF INFORMATION

As noticed before, the knowledge used in the regional government texts (notably Région Midi-Pyrénées, 2006) does not constitute a coherent nor structured body of knowledge. Regional economic development strategies are therefore expressed within a world of vague and implicit knowledge.

The purpose of the first stage is to identify the "invisible structure" of the information used in the texts and speeches produced by the regional government, as well as in the academic research texts: which views of the world are expressed, how they are codified by such-and-such information, on what categories the interpretation of strategic axes are based to define concrete actions, *etc.*

This work is conducted through a three-level grid, *i.e.* the level of representations, that of models, and that of norms (Salles, 2007a; Salles & Colletis, 2007). Theses levels are detailed below.

1.1. The Level of Representations (Views of the World, Doxas)

The information expressed in the regional government texts, like any information, is not regarded here as a simple "image" of reality, but as the expression of views of the world. Representations may, depending on the circumstances, be equated with relatively homogeneous and coherent schools of thought, or with partly confuse and poorly structured opinions. On this account, representations take us back to the broader notion of *doxa*[3].

The doxas found in the texts or in the speeches partly are those of players from the Regional Council and those "imported" from other organisations. These "exogenous" views of the world, however, have mostly been formed for other purposes than territorial development policy support. Their utilisation in the elaboration of policies is probably not neutral.

In the case of the Midi-Pyrenees Region, several meaningful representations may be identified. These opinions are underlying and very rarely expressed directly. There can be several successive conflicting representations in one and the same document (this is particularly true for the representations of the territory). These have a major influence on both the level of models and of norms insofar as, each time, they determine specific and sometimes irreconcilable conceptualisation of the "real" world.

We shall quote three examples here: the first one concerns the notion of territory, the second relates to the notion of territory resources whereas the third involves the relationship between attractiveness and competitiveness.

1.1.1.   The Notion of Territory

The territory is the subject of two contradictory views (not explained as such in the texts): it is either regarded as a space receiving potential pre-existing and mobile external resources, or as a place of coordination unveiled on the occasion of a project's implementation. The first view relates to spaces defined by their borders (chiefly fixed borders), which are mainly expressed through administrative territorial divisions (region, departments, communes), or INSEE zonings[4]. The second view corresponds to territories not defined by their borders, but by a concentration of players. In this case, the territory borders are changing ones. The territories geometry then depends on the players' coordination process (competitive clusters, conurbation communities, localised production systems or LPS's, districts, *etc.*). These territories are sometimes expressed in the Region texts through new notions like "emerging territory" or "changing territory", which are not defined.

1.1.2.   The Territory Resources

In the Regional Government texts, the notion of territory resources is very poorly defined, and rather unstructured. Territory resources are regarded as pre-existing and available. There is no mention of *creation* of new resources.

In the academic research, on the contrary, the notion of resource is the subject of thorough research work for many years (Colletis & Pecqueur, 1993). A distinction is established between *resources* and *assets*. Resources are potential or even virtual factors, and need to be activated, organised or even unveiled. Assets are active factors. Resources, to the difference of assets, constitute a reserve, a latent or virtual potential that can turn into asset if the conditions of production or creation of technology permit it.

These two doxas can lead to rather opposite political choices, the first one putting the stress on optimisation or attracting of pre-existing resources, when, conversely, the latter is focused on *creation* of new assets, notably by activating potential factors.

1.1.3.   Attractiveness and Competitiveness

The regional Council's texts explicitly expresses the Midi-Pyrénées Region's will to embark on "a competitive course" against other territories (national or international). This view, which is never argued, nor questioned, constitutes the only relational mode envisaged amongst territories. A correlation is even established between *competitiveness* and *attractiveness* ("there is no attractiveness without competitiveness"). This correlation is contradicted by many examples yet.

As far as information systems are concerned, the level of representations is mostly linked to the choice of adequate general concepts and their definition. In the case of the Midi-Pyrenees Region's texts, it may perfectly be theorised that the conflicting views of the territory, or the poorly documented view of territory resources, will render the constitution of a TIS even more complex.

1.2.   The Level of Models and Methods (or Logics of Action)

Representations are general views, which cannot guide action concretely. To allow the implementation of policies, representations must be transposed into *i)* information describing the axes and objectives formalised, *ii)* logics of action, *iii)* methods to define typologies, or *iv)* principles to determine sets of indicators, *etc.* This transposition is carried out on the basis of so-called models and methods, which are sometimes partly detailed in texts, but are more generally underlying. These models or methods permit to specify how, and with what objects, the general concepts will be made more operational.

We shall present two examples of models, the first being focused on activity aggregations, whereas the second is about attractiveness and competitiveness-related models.

1.2.1.   Activity and Enterprise Aggregations

The activity aggregations used in the Regional Council texts are most often INSEE-inspired. But it can be found in some texts (notably those exposing actions) notions relating to other types of aggregation, which unfortunately are not clearly specified. The method to define a "strategic sector" still has not been determined. In addition, the terms "field" or "sector" are not very stable, referring to variable aggregation levels from one word occurrence to the other. To a certain extent, the Regional Council texts acknowledges the necessity of conceiving these methods when it is proposed to "commission forward-looking studies on the evolution of different industries", or to "detect key sectors or technologies".

1.2.2.   Attractiveness and Competitiveness-Related Models

The territory attractiveness-related model is one focusing on the input/output of players. Each enterprise is regarded as an entity, *i.e.* individually. Government financial support is dedicated to enterprises alone, and not to industrial sectors or activities.

Conversely, competitiveness is a systemic notion applying to a whole territory, whose components are not enterprises, but industrial branches and/or localised clusters. The elementary unit considered here is the relationship amongst various players. In this case, government financial aids are allocated to projects involving several players.

As showed above (*§ 1.1.3.*), there can be found some confusion between attractiveness and competitivity in the Region's texts. Yet the models ensuing from each notion are quite divergent. These notions have to be clarified in order to implement a coherent set of measures.

The last level of information that is liable to allow the concrete implementation of economic development measures is that of norms (procedures, rules, coded references, *etc.*), which operational players require.

1.3. The Level of Norms (or Codifications)

The level of norms represents the most operational level of information. It is produced through application of the previous level's models and methods. In information systems, the level of norms is the most "visible". It is that of codifications, which regional players use concretely for the purposes of their work. Any member of the Regional Council services who examines an enterprise's financial support application should, for instance, be in a position to follow a specific application processing procedure, or have at his disposal a list of priority sectors/territories, or a set of eligibility criteria, *etc.*

It is at the level of norms that evaluation indicators are to be found (list of indicators, range of values, methods of interpretation, *etc.*).

1.3.1. Attractiveness and Competitiveness Indicators

Which norms could express the representations or models pertaining to attractiveness and competitiveness? On the one hand, usual attractiveness indicators are connected with production factors (capital and labour). Among other possible attractiveness indicators, we could, for instance, mention foreign direct investments (FDI's) and qualified migrants' flows. On the other hand, the indicator that is most often used for competitiveness is sales balance surplus. These indicators are not clearly correlated.

1.4. First Stage Outputs

The analysis work conducted in the first stage permits to identify different *doxas* (views of the world) conveyed in texts and speeches, and gives rise to a list of relevant "objects", each of them completed, when available, by a description.
The next stage aim is to identify the hierarchical organisation of these objects, from the most abstract concepts to the very concrete "objects", thus building some (light) ontologies.

2. SECOND STAGE: BUILDING ONTOLOGIES

It is not our place to judge the value of the different doxas, be it in terms of their coherence, their effectiveness, and *a fortiori* their capacity to denote the "real". Our goal here is to make as clear as possible the concepts used in order to raise the regional players' awareness of the range of potential alternatives.

We will present two ontologies about territory, each of them corresponding to a specific *doxa*. We describe such set of ontologies as a *polydoxical ontology*.

2.1. First Representation of the Territory: a Space with Borders

Figure 1 shows an ontology build on the basis of concepts used in the regional government texts and speeches.
In these texts and speeches, only the ontology last level (the very lowest, that one of *instances*) can be identified. We had to add a global organisation of these concept in order to provide more clarity and coherence. This work has been done with the aid of Archonte methodology (Bachimont, 2004).
The notion of "emerging territory" that we have mentioned above, can not be included in the main hierarchy. It obviously pertains to another conceptual organisation, of which it is the sole "representative".
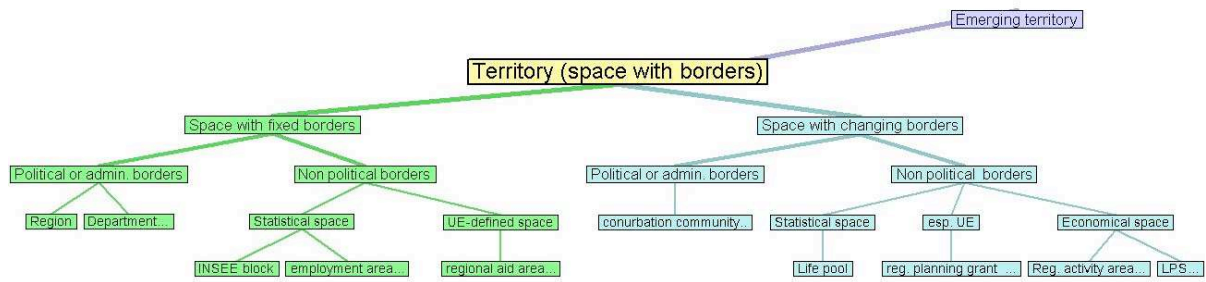
Figure 1: *territory as a space defined by borders*

2.2. Second Representation of the Territory: a Concentration of Players

In the second *doxa*, stemming from research texts, the territory is mainly considered as a concentration of players. In this case, territories are revealed as "collective cognitive systems" (Colletis & Pecqueur, 2005). Their geometry depends on the players' coordination process. In the first representation of territory, the "emerging territory" notion is probably an attempt to express such a concept.

Figure 2 represents the concept from the second *doxa*. Territories with borders are integrated in this ontology, because these concepts (or objects) are actually used in the second *doxa*.
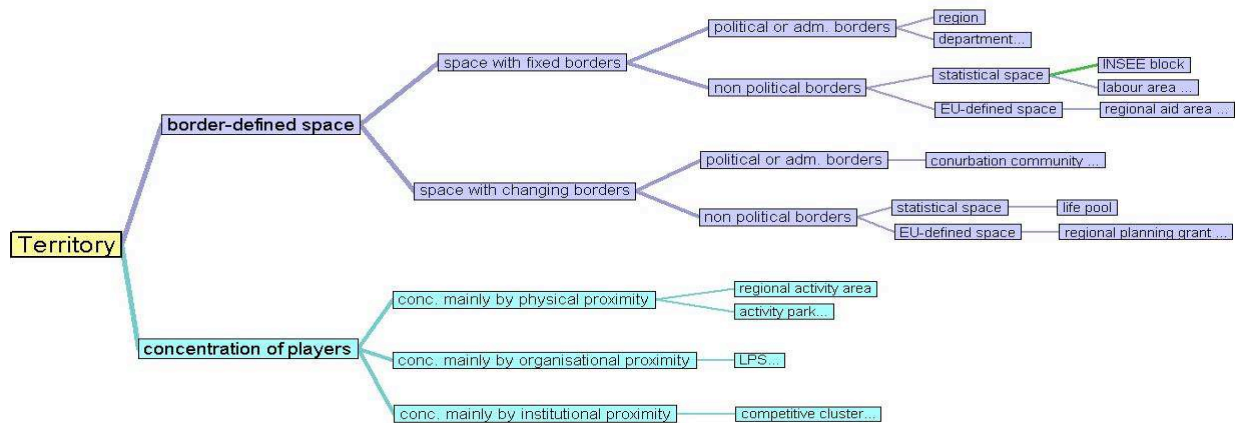

Figure 2: *territory as a space defined by borders*

It can be noted that the branch at the very right side in the first ontology (space with changing borders - non political space – economical space) has disappeared in the second ontology. It can be considered that the concentration of players branch in the second ontology represent in some respect a clarification and an extension of that branch.

2.3. Consequences of each Doxa on Economic Development Policy

Depending on which doxa is dominant, the political choice about economic development can be radically opposed, as showed in the table below.

	Doxa 1	*Doxa 2*
Proximity type taken into account	Physical proximity only	Three types of proximity (physical, organisational, institutional)
Elementary unit considered	Firm	Inter-relation between players
Policy type	Firm policy, aiming at promoting basic spatial agglomeration of firms	Networking policy, aiming at favouring cooperation among firms
Type of competitivity addressed	Territory competitivity = competitivity of the firms established into the territory	Territory competitivity = systemic competitivity
Response to economy mutation	Adaptation (to exogenous shocks or mutations) Ex. : globalization seen as exogenous	Participation

2.4.   Second Stage Outputs

The ontologies built on the basis of texts and speeches are to be submitted to the involved players. In the case of CAVALA project, players are elected representatives who have delegated power over economic issues, members of the Regional Council service in charge of processing enterprises' financial support applications, or members of economic development local agencies.

3.   THIRD STAGE: IMPLEMENTING ONTOLOGIES INTO DECISION SUPPORT TOOLS

In the third and last stage, ontologies are used to produce decision support tools that will be proposed to the various concerned players.

A first use of these tools can be that of clarifying policy expression, making regional players aware of the necessity of specifying the concepts (words, notions) expressing economic development policies. Ontologies can help to conduct this clarification at the three levels described above (representations, models, and norms). Such a process is necessary to *i)* evaluate coherence within and amongst each level (Salles, 2007b) and, in consequence, *ii)* clarify both the concrete objectives to be achieved and their evaluation indicators.

At the level of representations, the economic development policy clarification process will – by definition – concern high-level concepts, such as the representation of territory, either as a space defined by its borders, or by a concentration of players. The same goes for the awareness of what the various options for a global economic development strategy are (*e.g.* territorial competitiveness, territorial attractiveness, or both?).

In the frame of CAVALA project, some basic decision support tools are being designed, as, for instance, tables about effort indicators (supplied amount of financial aid, number of financial aid applications processed, …) with concurrent figures breakdowns. These concurrent breakdown structures are matching the concurrent views of the world (*doxas*) expressed in the ontologies (two views for the territory, two or three views for the territory resources, two views for the activity aggregation, *etc*.).

CONCLUSION

In the present paper, the Territorial Intelligence Systems issue was addressed from the viewpoint of information system in support of public decision-making. The work was here focused on the support to public policies formation.

We have underlined that policy expression interprets a set of representations that are often unspecified, and even sometimes conflicting. Our opinion is that the TIS to be built should take these various views of the world into consideration, and should preserve diversity insofar as it is a source of adaptability. Consequently, our choice was to build concurrent (polydoxical) ontologies and not to seek a consensus at all costs (such a consensus, if reached, would inevitably be reflected through a very low common denominator).

As said before, views of the world one can identify in the regional governments' texts or speeches are poorly clarified, often ambiguous, and not or very insufficiently formalised. In such a case, the identification of the concepts used does not constitute the major part of the work to build the concepts' hierarchies. As mentioned above (*§ 2.1.*), within the CAVALA project, there was the necessity of providing the global logic of the ontologies (*i.e.* the upper levels and the breakdown principles).

The contribution of knowledge engineering in TIS design thus appears as a decisive one.

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[1] French National Institute of Economic and Statistical Information.

2 CAVALA: economic development regional policy monitoring and evaluation cooperative method.

[3] From the Greek *δόξα* (opinion): a more or less homogeneous set of shared beliefs.

[4] French national institute of economic and statistical information.