

2. The Cadastre Reengineering project

2.1. The contract

The first three years of the five-year contract were be used for applications development; the last two years for the operation and maintenance of the systems. The DMR contract "consisted of the development of a technological solution for the integration of geospatial numerical data and the alphanumeric descriptions of the properties. It also included the establishment of an information system infrastructure to support such a high volume of information, as well as to ensure the training of staff and the maintenance of the system." (9) Among the eight components identified, the main challenges were the development and implementation of four management systems:

- Cadastral data management
- Cadastral reform management
- Cadastral reform funds management
- Systems pilots

2.2. The deliverables and the management framework

DMR established a precise development and implementation schedule for the five deliverables identified at the beginning of the project: first deliverable due 12 months after the beginning of the project; third deliverable due 24 months after the beginning of the project; and last deliverable due 36 months after the beginning of the project. The third deliverable was identified as being the most crucial since it implied the operationalization and the beginning of cadastral data processing.

This very tight schedule, associated with severe penalties in case of noncompliance, came from the general plan adopted by the Ministry of Natural Resources for the implementation of the cadastre reengineering project. As soon as 1994, the first renovation contracts were awarded to the surveyors who then had 24 months to implement them. Hence the different management systems had to become functional quickly in order to manage the operations and collect the cadastral data.

In order to ensure the smooth flow of the project, the cadastre management team adopted a well-documented project management structure. It comprised two levels: the management level and the implementation level. The management structure dealt with the implementation of the contract, client--provider relationships, as well as with the planning of activities, and systems production and delivery.

The grounds/steps for this organizational infrastructure are included in the call for proposal (10) and are refined in the document entitled "Management Framework for the Project Related to the Implementation of Cadastre Systems," (11). This document was created in collaboration with DMR in the first phase of the project.

The first months of the contract were dedicated to the implementation of the project management part—to the improvement of the administrative and financial structures. From the start, MNR showed an extreme rigor in all points of view in order to "stay in control" of the implementation of the contract, in regard to the schedule, costs, or quality expected.

With the assistance of MRN, the project started with specifying and finalizing expectations and responsibilities. Six management mechanisms were established: (1) project planning; (2) project follow up and management indicators; (3) troubleshooting revision management; (4) deadlock management; (5) change management; and (6) documents management process.

Each deliverable followed the steps of quality. There was a series of treatment units' tests followed by the MNR trial test. The architect explained to the testers the deliverable and provided them with the functional file for approval. They had ten days to answer, and DMR had five days to make the corrections. After that, five days were provided for approvals and two days for integration.

When the deliverable was rejected, a negotiation stage occurred between the analyst and the testers. If the problem continued, negotiation involved the architect and the tester manager, the DMR deliverables manager, the MNR deliverables manager, the DMR project manager, and the overall project manager. In case of a lawsuit, a review and deliverables management process was put in place.

Similarly, during the trial phase of a deliverable, if a request for a change was considered outside the adopted

contract, change management procedure was followed. In order to respect the schedule and the costs, the MNR project management team accepted only requests crucial to the integrity of the system.

2.3 Implementation of the integration contract

In order to honor the contract, DMR had to put in place a team in the offices of MNR. It began its activities with a planning stage, which ended after a year in order to begin with the implementation of the architecture, deliverable 1.

Although choices concerning equipment, servers, implementation system, and platform went smoothly, problems increased with the use of software which was new on the market. The technological challenge came from the large number of components which had to be put in place. This deliverable involved about 65 treatment units each with multiple components. Several anomalies were detected in the software, which implied a continuous reexamination of the different components. For example, the calculation of surfaces from angles measured by surveyors led to major slowdowns.

The system of division of the reengineering contracts developed by DMR turned out to be very inefficient. The system was difficult to implement and often stalled. This led to operation problems, unpredictable and recurring errors. The lack of experience and expertise in the software led to very low response times. DMR had to hire specialized companies to set up the software and develop the necessary expertise. During this time, 105 external resources were working at the Ministry.

MNR had doubts regarding DMR's performance, and an environment of distrust and suspicion prevailed. There was much tension. As DMR was committed to honor the contract, it had to prove that it could do it.

Deliverable #1 was approved 1 ½ years after the beginning of the contract. MNR thought that the results were not bad but that there was room for improvement. DMR made the changes. When it came to deliverable #3(12), the most strategic deliverable for MNR which had been identified as the "keystone of the business plan," DMR hired subcontractors in order to ensure the success of this stage. Tests demonstrated to MNR that everything was fine and a trust environment started to develop between the two partners.

Deliverable #3 was approved on time, and DMR completely restored its credibility vis à vis its client. The following deliverables, mainly reports and change requests, were intense production periods, but they went smoother.

All the participants at DMR were unanimous in saying that they faced very difficult integration situation. In addition to problems related to the implementation of management systems and to the respect of the schedule, the management of staff delegated to the project required enormous work. During one of the most intense times, 125 people from DMR were working on the project in the offices of MNR when only a team of 75 people had been planned initially. As a comparison, the MNR provided a team of 25 people.

The MNR management team sympathized with the situation. They understood that this project, which was innovative and used new technology, served as a pilot for software not yet on the market.

(9) Garon "Cadastre Reengineering: Impossible without GIS," **Les Affaires**, October 9, 1993, p. 34.

(10) Schedule of Conditions, Call for Proposal

(11) Management framework for the project related to the implementation of cadastre systems, Initiation and implementation phases

(12) Deliverable 2 occurred simultaneously with Deliverable 1 and 3. After Deliverable 3, Deliverables 4 and 5 were divided to form Deliverables 4 to 9.