

# **Lessons Learned from a Big Cadastral Project**

**John BADEKAS, Greece**

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## **SUMMARY**

It has been realized that the establishment of a new Land Administration System or the renewal of one is a very complicated, expensive, sensitive and time consuming task which however is not treated usually with the relevant attention. Much we can learn for the preparation of a Land Administration System from the execution of big relative projects. Such a project is the Greek National Cadastral Project started in 1994. In this report the directions for the proper preparation of the Land Administration System, as they come for the experience of this project are outlined. It has been concluded that this preparation must contain two phases. The Feasibility phase and the Design phase.

The Feasibility study is a short text 30-50 pages where a short description of all the actions of the project is given and on which the authorities can be based to take decisions.

The Design Phase is a text of 500-2000 pages it gives all the details for the execution of the project and the Strategic Plan which gives the sequence for the execution of the work.

Both phases are very difficult and is a big problem who is going to undertake the execution.

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## 1. INTRODUCTION

### 1.1 The Hellenic Cadastral Project

Although a law has been issued, as early as 1836, for the introduction of a cadastral system in Greece and although there were several attempts since then, in the country, a land registration system is operating which has been introduced in 1853.

This is the reason why the Greek government has proposed in 1994 to the European Union to include a cadastral project for Greece in the 2<sup>nd</sup> Community Support Program at a cost of € 152.600.000.

The European Union has accepted the proposal and has decided to cover the 75% of the expenses. The rest was covered by the Greek state.

Very briefly this part of the project contained:

- A positive cadastre ready for use for 35.000 km<sup>2</sup> (total area of Greece ~ 132.000km<sup>2</sup>).
- Digital Cadastral surveys prepared by photogrammetry at a scale 1:1000 for urban areas and 1:5000 for agricultural land.
- Application of a special adjudication procedure.
- Collection and formation of all data in digital form by private firms.

The preparation of the program (legislation, administrative arrangements, capacity building etc.) completed to an acceptable degree by the end of 1995 and the real implementation started in January of 1996.

That particular part of the project is very close to finish but has finally covered only 8400km<sup>2</sup> and it is going to cost about € 352.000.000.

It is obvious that this is a very important and interesting project and has made one of the foreign advisors to write that "The Hellenic Cadastre is one of the most significant property infrastructure projects currently underway anywhere in the world" (Mc Laughlin 1998).

From this project a lot of experience has been gained and must be used either to find out why these big discrepancies between the planned quantities and the realized ones have occurred or to redesign a new implementation procedure for the land administration system of the country.

The introduction of a new LAS is a very complicated project which requires huge amounts of money, quite long time, legal, administrative and technical and educational changes even some internal reorganization within specific departments. The project is much more complicated than the construction of a big bridge, a long auto road or an economic development project of

a part of a country. It is this why the detail study is very important which on the contrary usually is underestimated.

As far as the second item we have now a more clear view about the structure of the preparation actions which are necessary for the implementation of a new system of land administration or for the re-engineering one. The steps that must be followed for a thorough complete study are:

- The Feasibility Study.
- The Design Phase (D.P.).

In this paper the main facts related with the above actions will be examined.

## **2. THE FEASIBILITY STUDY (FS)**

The FS is a relatively short text (30-50 pages) where all items influencing the introduction of a new Land Administration System (LAS) or of the re-engineering of a LAS are briefly but clearly defined and described.

For each topic the objectives, the documentation and the justification of these objectives and the process with which these objective will be achieved must be given but not described in details.

The FS is an important document on which the authorities can be based to take decisions about a LAS.

A FS must contain at least the following:

- Identification of user needs  
“Before altering an existing system or introducing a new one, it is essential that the requirements of those who will use or benefit from the system are clearly identified. This means that a wide variety of user communities will need to be consulted in order to understand their requirements and the constraints under which they currently operate”.  
Part of the process of determining user needs should involved a review of the procedures whereby land policy is formed and how land as a resource is managed. It should examine present management structures and their supporting management information systems, making inquiries at all those ministries and departments that deal with land. (United Nations 1996)  
User representatives should be adequately involved in identifying needs and in setting priorities. Thus the objective of determination of user needs is threefold a) to identify user needs, b) to set priorities, c) to establish a cooperation and a support of the project by users.
- Definition of Programme Goals  
User needs and benefits to the society should be thoroughly surveyed and debated in order to proceed to the selection of project goals. We must have in mind however that the above process is not simple because this selection can be done only with thorough co

evaluation with all the parameters which are influencing the process and which are briefly describe in the other sections.

In this stage goals like deed system or title system, united registration and cadastre system or separate systems must be selected. Other important definition will be the ministry responsible for the system, the administrative structure, the legal environment, the adjudication procedure, the completion time etc. All this however must be very briefly defined at this stage. To give you an example at this stage we will accept that a unique code system giving one code to all purcels in the country will be introduced. The code system it self however will be fully defined during the Design Phase.

- The legal frame

In accordance with the goals the formation of a proper legal frame, followed by the necessary specifications and instruction manuals presidential art and ministerial decisions are important for supporting the implementation and the function of the system. Even in this stage the arrangements which will be expected by the legal frame must be explicitly described leaving however the actual action for the final formation of them at the Design Phase.

Since the compilation of the necessary legislation could require very long time it is important to specify which part of the legislation must be ready for starting the implementation and which part could be completed a little later giving the possibility at the project to start before the full completion of the legal frame.

- Administrative Options

In this part all items constituting the picture of the administrative structure both for the implementation and the operation and the maintenance phase must be briefly defined. First the ministry or the ministries by which the LAS will be supervised will be selected. Very important decision is if an existing public agency will be use for administering this activity or a new one will be created within the government or as a privet company belonging to the state.

The geographic distribution of this administration must be also given. An important factor for the administration arrangements will be the plan to secure the buildings which will house this activity and how the necessary staff will be acquired. The first factor will determine also the degree of decentralization of the system.

- Data collection-adjudication procedure

The amount and method of collection of geometric, legal and other data is very important for the cost and the duration of the project. We must have in mind that the geometric information will define the accuracy of the system, the legal information will define the adjudication method and the reliability of the system and the additional information will define the degree of usefulness and productivity of the system.

The above processes are going also to define the time required for the implementation of the project.

At this stage again general characteristics of the data collection and the adjudication method must be given but the description must be enough to allow reasonable cost estimates for that part of the project.

- Operation and Maintenance
 

Even from this stage the operation, the maintenance and the update of the system must be outlined. These are the activities at which the whole system is tested and these are also the parts where the whole system is usually failing.

Incorporated to these activities are also the degree of electronic use and management of the data, and the operational actions of the system. It is then a necessity all these to be adequately described hier.
- Economic and Financial Matters
 

The economic and financial matters are a very important and difficult part of the FS. It is very important because from it depends the realization of the project and very difficult because the estimation of the amount needed cannot be accurately assessed. Also the sources from which the needed funds will be financed are difficult to allocate and to be predicted.

The cost refers to equipment and maintenance cost, labour cost, hiring and constructing buildings, administration and management cost, overhead and interests costs in case loans has been taken.

All the above are very unclear since they contain new equipment and complicated works, not used before in the country, and thus very difficult to be assessed. The only way with which we can approach this problem is by using pilot projects but they require a lot of time and some how they postpone the actual realization of the project. The financing of a LAS can come from the state, from its own activities, from special taxation or special fee, from special aid, from special agencies or banks. Usually the in come from the activities of a LAS are not enough for the implementation of the system, although it is enough for the operation of it. It is then necessary for state or from other sources money to be used.
- Time consideration
 

Equally important is the reasonable planning of time because big deviations from the planned time results in loss of confidence from the state and the public and great damages to the economy of the country.

The completion time as well as the total cost of the project depends very much from the accuracy and the diversity of the data that we have prescribed as the objective of the project.

Many times it is recommended to start with a simple and quick program and proceed latter to the full completion of the project.

Very important for the completion of the project in short time is the degree of use the privet sector.

We must also keep in mind that legal and administrative reforms require a lot of time to be accepted by the public and approved by the authorities.
- Informing the users
 

It is very important to secure a favorable attitude of the users towards the project. It is then necessary to establish a permanent cam pain explaining the benefits of the project, the phases of the project and theirs justification, and the policy of the project to hear and apply recommendations from the users.

This campaign will consist from pamphlets, videos, radio and television shows and advertisements, and meetings and speeches to special groups.

All the above cannot bring favorable results if the processes of the project are not friendly and will not reflect the effort of the project to be friendly.

It is then worth to make any effort for planning a friendly project.

- Training and Educational requirements

To run such a complicated LAS we need a variety of staff with a variety of expertise. To produce this staff we need in house training and internal and external seminars some of which will take place abroad. Also a variety of training visits must take place by foreign experts to the LAS and by visits of the staff to operating LAS.

In some cases even the introduction of new courses at polytechnics or universities is anticipated. "Having skilled, competent, and motivated staff is critical for the success of any organization" (Hoogsteden 1998).

- Quality assurance

The first step to produce high quality data and services is to have high quality and clear specifications for collecting and operating. Equally important is to have very reasonable and clear procedure for testing the quality of the data and the quality of the operations within the LAS. Procedures for the quality control must cover both the creation and the operation phases of the LAS.

All incoming data and mapping sets must be carefully tested through sampling. This testing must be performed according to technical manuals produced especially for the project. The monitoring of the productivity is very important because from it productivity indicators could be established.

The quality and productivity control must have an additional objective. It must serve for the general supervision of the project and for applying in time the necessary modifications to the project. Thus the supervision of the program besides day by day examinations must foresee repeated (every year) large examinations with external consultants and foreign advisors. This way it will be accepted that the program of the project is valid only for one year.

- Citizen Access to the Cadastre Data

One item that it is good to clarify even from the FS is the citizen access to the cadastral data.

We can envisage many variations for such access like the direct access of citizens with the cadastral data, the access with the presence of a lawyer or a notary, the access through a private cadastral agency or the direct access through the computer and the internet. To select the way of access at a national level depends from the general customs of the country the data that are considered personal and the level of using the electronic media. This selection however determines the number of cadastral offices and the personnel which is needed for the operation of the system.

- External Advisors

In many cases, especially in countries under development, where experience for establishing LAS does not exist, the use of external advisors is essential.

Even if there exists some experience in the country and it is not very high it is probably better to not have the full responsibility but to be auxiliary.

The contribution of the external advisors can be more successful if this consultation is performed in adequate freedom and if the external advisors complete their tasks from the beginning to the end. Thus the local authorities and the local personnel must give enough freedom to the advisors and the advisors must listen and cooperate with the locals, use the data collected by them but must investigate their proposals. For instance if the local people have estimated that the country needs 100 cadastral offices and the advisor is working in that base the game is lost. Because it may be possible that the country needs only 10 or 20 cadastral offices. Many times the local authorities hesitate to use external advisors because of the cost which is associated with this. The cost however usually is many times compensated by the reduction of the cost of the project.

The selection of the external advisors is usually very difficult but can be facilitated through the consultation of international bodies like World Bank, UN/ECE, WPLA and others.

### **3. THE DESIGN PHASE (DP)**

The DP is a much longer text (500-2000 pages) which requires a lot of time, and a lot of experts to be completed.

It contains at least the topics treated in the FS and some additional ones which have been arisen from the preparation of the DP. In addition it contains the very important chapter of the strategic plan.

Whatever has described shortly in the FS is now treated in full details. For instance in the FS the adjudication procedure was described briefly. Now it is described in full details, the format of the papers which will be used must be given, and the actual text of the relative law which will rule the obligations and the actions of the LAS and the citizen must be given.

In the FS we have spoken briefly for the cadastral surveys and the technical specifications according to which will be executed now a full description of the procedure must be given together with the proper specifications.

The DP requires a lot of discussions with experts, central a local authorities, academics, unions etc. It requires discussions with small and big groups and open meetings with many audiences. It is this why it requires a lot of time. We must not be miserly in money and in time because if the study will be executed properly we will gain multiple money and time during the execution and the operation and in general we can avoid sudden obstacles.

The long period for the preparation and the approval of the DP can be used for several pilot projects which will clarify and complete several procedures and they will give data for more reasonable estimations of the cost and the time needed for the project.

### **3.1 Execution of the Design**

From what has been said so far it is obvious that the DP is not one person's task. Many times it is prepared by a public service, a private company, a special committee or by a special agent. A public service usually does not have the experience and the experts needed for such a study. The same thing is true also for a private company but a private company is more versatile in acquiring the proper experts.

A committee is completely inadequate for such a task because its members are not accustomed to work as a unique team. Also many times the members of the committee are appointed with political criteria and they do not have the needed experience. Probably the most favourable case is the preparation of such a DP by a company like the ones operating by successful cadastral organisations like the Cadaster. International associated with the Dutch Cadastre, or the Suede survey associated with the National Land Survey of Sweden.

Again we must be misery in cost and in time because after a good preparation the implementation and the operation of the project is smooth, fast and more economic.

### **3.2 The Strategic Plan**

The most critical for the success of a LAS project is the strategic plan. The strategic plan must describe in details the exact sequence of all the works or tasks for seeing by the DP. It will show how and when the legislation, the technical specifications and the instruction manuals will be approved, the buildings, the staff, and the equipment will be acquired, how and what works will be executed by the staff of the LAS agent and how and what works will be tendered to the private sector.

A full plan will contain the development of the IT of the LAS, the test of all works executed by the staff or the tender, and the incorporation of the operation and maintenance of the system.

The strategic plan must explicitly forecast the times where the evaluation and the possible modifications of the program will be done.

The strategic plan will consist from text but also from diagrams Gant or PERT. Especially important is the cash flow diagram where the incoming and outgoing money will be shown.

## **4. CONCLUSIONS**

From what has been reported it is evidence that for the introduction of a LAS extensive preparation studies performed in two phases are needed the feasibility study and the design phase.

These two phases require a lot of time and a quite high cost but their effect to the success of the project is critical.

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## CONTACTS

Prof. John Badekas  
Department of Rural and Surveying Engineering  
National Technical University of Athens NTUA  
9 Iroon Polytechniou Str.  
15780 Zographou  
GREECE  
Tel. + 30 210 7722676  
Email: [ibadekas@central.ntua.gr](mailto:ibadekas@central.ntua.gr)