Development of a Better Cadastral Practice at the Survey of Israel

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SUMMARY

The Survey of Israel is a national agency for geodesy, cadastre and geographic information. The Survey is responsible for cadastral mapping, as a part of an inter-ministry procedure of documentation and registration of rights to land, according to a British mandatory law (Survey Ordnance, 1929). Private licensed surveyors are deeply involved in the cadastral activity. The cadastre system in Israel is based on Torrens registration principles.

The responsibility for the inspection and the approval of block maps and mutation plans is shared by five district surveyors and three senior civil servants acting at SOI central office. This historical, geographic distribution led to heterogeneity of various local standards of working and managing methods and procedures, data formats, hardware and software facilities, etc. In the era of worldwide standardization, the Israeli cadastre practice remained anachronistically particular and essentially not standardized.

At the end of 2003, a comprehensive project was initiated aiming at the establishment of a better, highly standardized and homogeneously regularized cadastral practice. The existing working procedures will be critically studied and analyzed, and practical steps for their improvement will be proposed. Furthermore, a software application will be specified for control, follow-up, management and decision making.

The paper elaborates on the main ideas of the project and gives a status report on its advancement and the interim results achieved.

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1. INTRODUCTION

The institutionalized surveying and mapping activities in the country began in 1920, when the British mandate authorities established a Survey Department and decided that its first task should be the triangulation to cover the populated area of the country. The next and no less important decision was the establishment of a juridical cadastre based on Torrens principles. Survey Ordinance came into being in 1929, limiting the profession to licensed and government surveyors, a state of affairs, which has remained unchanged up to the present [Adler and Forrai, 2000].

With the Torrens method (Fradkin and Doytsher, 1998), the subject of registration is the land parcel. The borders of the parcel and objects that are related to it (such as buildings) are thoroughly surveyed, and the area of the parcel is calculated. This type of registration establishes an effective and convenient way for proper real estate management, and effective planning and land transaction. In addition, equitable collection of taxes imposed on the land is enabled.

As in every country where the Torrens method has been adopted, the settlement of land rights in Israel was performed only once. However, over the years attention has been given to its updating and improvement. Despite the fact that at present it is possible to achieve centimeter-level surveying accuracy, which is much higher than that achieved in the past, the parcels that have been settled are not being resurveyed [Forrai at al., 2000]. Rather, efforts are being made to optimize the use of former measurements in cases where merging or subdivisions are introduced.

Since 1948, the Survey of Israel (SOI) is the governmental institution responsible, among others, for cadastral mapping in the country. SOI supervises and collects the entire cadastral mapping (block maps as well as mutation plans). SOI is responsible for issuing the instructions and standards for cadastral mapping, and also for licensing surveying and mapping professionals.

2. THE CADASTRAL PROCEDURE

As mentioned before the modern Cadastre based on Torrens principles was established by the British mandate on Palestine in 1920. Settlement of rights was accomplished until now in about 95 % of the area of Israel. The population of Israel grew from about 800,000 in 1948 (the establishment of the state of Israel), to about 6 million in 2004. Most of this growth was due to immigration which with natural growth, the increase in standard of living and some changes in the concepts of living, caused high pressure on the demand for land and the need for new planing.

Any change in the original settlement of land right has to be based on mutation plans. The birth of every mutation plan (re-parceletion) begins with a municipal plan. According to the Israeli law of planning and building, every merging or subdivisions of parcels should only be according to municipal plans. The initiative to such plans can be originated in the private sector, the government or the municipality itself. It may contain one or two new parcels and may be up to some hundred new parcels that can form a new part of a city. The municipal building plan (town plan) is based on some topographic or planimetric map, including the cadastral boundaries as a background (usually in accuracy of digitization of graphic maps). The boundaries of the town plan may not coincide with the cadastral boundaries. In order to register a mutation plan, a licensed surveyor should prepare it. As mentioned above, the mutation plan should fit the town plan. The criteria for this fit are written in the survey regulation that were updated by the SOI in June 1998 .The head of the municipal planning authority approves the above mentioned fit. This approval is a prerequisite for beginning a checking process in the SOI. It should be noticed that according to the same law of planning and building mentioned above, a mutation plan should be accepted by the SOI as "approved for registration" before the plan reaches the register at the Ministry of Justice.

The process of checking is started at one of four district surveyors offices (Haifa, Tel-Aviv, Jerusalem and Beer-Sheba), were most of the cadastral original mapping is kept and used for the preparing of the mutation plan by the licensed surveyor from the private sector. The most important part of the checking concerns with the correct reconstruction of the old boundaries, keeping the registered area of the original parcels, using all the available official sources. The district surveyor is authorized to decide about the need to check the plan in the field. Another important part of the check concerns with keeping the graphic (computerized) drawings according to the survey regulations, as well as appropriate to the electronic computation formats which guaranties a successful upload to the database of the cadastral GIS. The surveyor who prepared the mutation plan gives temporary new parcel numbers and parcel area size. Once the plan is accepted as approved for registration, it goes to the land registry at the Ministry of Justice, which gives final numbering to the temporary parcel numbers, registers the area size and the ownership. The "final numbers" are distributed then to the SOI in order to update the plans and the registration blocks.

3. THE "SHALOM" PROJECT

The accelerated development of the technology of measurements and computerization have put new challenges in front of the SOI and revealed many problems in the old material and in the checking process. The main issue concerns the use of old measurements that suffer from low accuracy. Boundary lines, which seem accurate when plotted by hand on paper (in a scale of 1:1250 or 1:2500) become inaccurate in the modern technology. This situation may cause ambiguity of the reconstructed boundaries and the surveyor should quite often take a decision with the hope that his decision would be adopted by the SOI's examiner of the mutation plan. A wrong decision (that the examiner dose not agree with) might change the whole plan.
The SOI is not organized to approve those decisions or to answer questions, which arise during the preparation of the mutation plans. Besides this major problem, which requires

organizational solution, a lot of other problems have arisen, mainly due to the potential and requirements of the new technologies.
Old procedures were changed very fast in order to accelerate the process of a checking and approval of the mutation plans. The most important of those changes was the permission given to the district surveyors (Haifa and Tel Aviv) to approve the plans by themselves. This permission was kept many years exclusively in the main office. It introduced non-uniformity in the managerial process, as well as different requirements from the licensed surveyors by the district offices.
Unfortunately there is a shortage of means in the district offices, as well as only partial access to the data in the main office. The organizational system that was not perfect was damaged. The communication between the units involved in the cadastral process is insufficient. Another issue that was neglected, was the connection to the financial data and the accounting process and the compensation and benefit methods.
In order to address all those problems, and in order to improve the control of the process, the SOI decided that a special project is needed. The project was called “SHALOM”, the Hebrew abbreviation for “Control, Follow-up and Management" which also means both Peace and Perfection.

4. THE GOALS OF THE "SHALOM" PROJECT

The main goal of “SHALOM” is to establish a modern, fully computerized, comprehensive control and management system for the direct cadastral procedure (including production and supervision), and for related activities (like national cadastral GIS development and update, surveyor's quality ranking [Forrai at al., 2004], employees' compensation methods, related accountancy, etc.).

The planned control and management system will not be applied to the present production and supervising activity; First, *a critical analysis of the current process and standards* will be carried out, aiming at a basic re-organization of the cadastral practice. In the second phase, “SHALOM” system will be introduced in accordance with the improved procedure.

5. HOW TO REACH THE GOALS?

The main ideas for achieving the goals of the project are:

The introduction of a standardized process for cadastral surveying, mapping and supervision (the existence of heterogenic local standards of working and managing methods and procedures, data formats, hardware and software facilities is the reality in the present process.)

Establishment of a smooth and highly automated data processing. Utilization of existing databases and systems is preferable. Quality and administrative data regarding the work and outcomes will be introduced on a routine basis, for later enquiry. Manual data input will be avoided in any case when data can be derived from other computerized processes or existing original data files.

The implementation of advanced technologies, both to production and to management.

Development of a better service to the public and to the professional community, such as the inspection and confirmation of mutation plans and block maps on a high quality level within a short time, supply of digital data and relevant information through Internet, integration of relevant databases (like those of the Land Registration Office, the Israel Land Administration, Ministry of Construction and Housing, etc.).

Aspiration to a convergence with the Cadastre-2014 idea.

6. THE TENDER PROCESS

6.1 Common Procedures In The Public Offices

Public authorities are obliged to minimize their in-house activities and are encouraged to contract as many activities as possible from the private sector, by means of downsizing the public sector. In other words it is encouraged to decrease the public expenditure, and shift the weight of activities to the private sector. In addition, the government is obliged to contract only through tender procedures.

6.2 The Law

The rationale behind the "Obligatory Public Tender Law" (1992) are the principles of equal opportunities, fairness and objectivity. The Law declares that the state and its agencies will not commit to any agreement of transaction of goods or of real estate or for the completion of any work, but by means of a public tender, which gives everyone an equal participation opportunity. There are some exceptions and restrictions for the obligatory law; in the regulations for the tender obligation that were issued a year later. Moreover, applying the tender procedures the public authority obtains the best value and business results for the public expenditures.

6.3 The Public Tender

The public tender is fundamental for free competition. Those who participate or intend to participate have to declare that they are able to satisfy the specifications detailed in the tender offer. On the other hand, for the authority, the law suggests a selection process that aims to select the best offer. When a public office wishes to attain services or goods by public tender it advertises the request, including specifications, administrative details and the relevant information. Those who are willing to partake in the tender will submit their proposal according to the conditions specified in the tender. The proposal can be in form of a quote, a methodology or any other means of replying to the request. A tender offer committee examines the proposals and selects the most appropriate offer. The decision is made according to predefined criteria.
Therefore, the public tender procedure, on the one hand, holds the advantages of efficiency and cost effectiveness, and on the other hand, ensures fairness. Keeping the principles of the

law improves the decision-making process and helps keeping appropriate standards in the management in the public administration.

6.4 The Preparation Of The Tender

The professional specialists should define the specification or technical descriptions. The specifications must be meticulously accurate and edited carefully so as to reflect properly the needs of the agency. These specifications will be conveyed in the final contract. When creating the specifications one should also prepare it in order to satisfy the equality principle. The specifications aim also to acknowledge the participants on the framework of the tender. In addition, the specifications should ensure a selection process that results with the selection of the proposal that promises the best value for the authority.

7. A TENDER TO A BETTER CADASTRAL PRACTICE

In our case, determined by current situation in the SOI, we put in writing the problems, defined the objectives of the project and characterized some action plans. That was the first phase, after defining the problems and goals we could proceed to determine the specifications of the tender. The reasoning behind publishing the tender is that although SOI employees are experts in the cadastral practice, we are inclined to outsource the carrying out of the project because of two main reasons. First, as a public agency we are encouraged to contract with the private sector. Second, we would like to have an assessment by an outside party that holds fresh views and ideas about the cadastral practice. Notwithstanding, we asked in the specification that three specific disciplines should be employed in the realization of the project: organizational consultation, geodesy and system analysis. The cadastral practice is complex and runs across the organization, therefore we considered the contribution of all disciplines as essential and the combination of all three as indispensable. The main objective is improving and standardizing procedures and practices, for that we need the organizational consultant expertise, the surveyor is needed for the cadastral specialization, knowledge and understanding of the cadastral practice and process. Likewise, the system analyzer should transform the proposal (the result of the project) into specification of new software application.

8. STAGES OF THE PROJECT

For the completion of the work we divided the tasks into three main stages. The first is organization and process study together with definition of a framework. The second stage includes additional elements, such as analysis of existing databases or recommendation of new reward methods. The third is the future system description. The contractor will study the current practice and processes in the SOI and the practice by the main suppliers and customers, as well will study the management and administrative process of the cadastre. Then the contractor will identify formats and standards used in the curse of action, will spot bottlenecks and gaps in processes, examine the databases that are currently in use and ensures that the future application should be adequate for the existing and future technology environment. The study will end with the suggestion for alternatives to standard practice, pointing at the needed improvements and the management and administration of the working

practice. After the SOI chooses an alternative for the cadastral practice an application for managing and controlling will be specified. System description includes definitions of users, processes, data tables, relations, queries, reports, as well as technology and hardware requirements. The description will be the basis for developing the application, but this activity is not included in the project.

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BIOGRAPHICAL NOTES

Dr. **Joseph Forrai** was awarded an M.Sc. (1974) and D.Sc. (1980) degrees at Technical University of Budapest, Hungary. Dr. Forrai was Lecturer and Senior Lecturer at TU Budapest, Tel Aviv University, Israel Institute of Technology (Technion) and Bar Ilan University (Tel Aviv) since 1976. Appointments at the Survey of Israel: Chief of Research Division (1987-1992); Head of Photogrammetry Department (1989-1993); Deputy Director (1993-1994), and Chief Scientist (1995-2003), Deputy Director General of cadastre (2003-). Professional and research background (partial): crustal movement detection; photogrammetric data acquisition (national GIS topographic database); permanent GPS station network; GPS support for geodynamics. Memberships of the Israeli Society of Photogrammetry and Remote Sensing (president between 1995-2001); Association of Licensed Surveyors in Israel; Israeli Cartographic Society.

Sarit Murkes was awarded a BA degree (2001) in Economics and Management at the Academic College of Tel-Aviv – Yaffo (Tel-Aviv, Israel); an MBA degree (2003) in International Business Administration and a Master degree (2003) in European Human Resources Management at ESADE - Escuela Superior de Administracion y Direccion de Empresas (Barcelona, Spain). At the Survey of Israel acts as Economic Planning Supervisor (since 1993). Research: leadership development framework in Denmark.

Larisa Voznesensky was awarded M.Sc. in Hydraulic and Construction Engineering at the Institute for Water Transport of Leningrad (1981) and accomplished study of Geodetic Engineering in the Technion - Israel Institute of Technology (1992). Licensed surveyor from 2000. Appointments at the Survey of Israel: Inspector of mutation plans (1992-2001); Deputy of district surveyor of Tel-Aviv and Central Areas of Israel (2001-2003).

Michael Klebanov was awarded an M.Sc. degree (1985) at Polytechnic Institute of Cheliabinsk (Civil Engineering Faculty), Russia. In 2000-2002 completed qualification enhancement program at Israel Institute of Technology - Technion (Civil Engineering Faculty, Division of Geodetic Engineering) and was awarded degree of Licensed Surveyor. Appointments at the Survey of Israel: Coordinator of Survey Control (1991-2000); Senior Coordinator of Public Housing Survey (2000-2001); Deputy Head of Survey Supervision Department (2001-). Professional background: cadastral mapping; cadastral boundaries restoration; block mutation plans arranging; system analysis and data base development. Membership of the Israeli Society of Architects and Civil Engineers.

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