

# **The Egyptian Survey Authority Business Model to Strengthen Public Private Partnership in the Real Estate Industry**

**M. Mostafa RADWAN, The Netherlands, M. Hisham NASR, Egypt, Christiaan LEMMEN, The Netherlands, Sohir HUSSEIN, Egypt**

**Key words:** business Model, Cost Recovery, Public Private Partnership PPP, Downsizing, Outsourcing, Virtual Enterprise, Workflow, Chaining of Services, Spatial Data Infrastructure

## **SUMMARY**

In the year 2001, a decision was taken by the Egyptian Government to convert the Egyptian Survey Authority, ESA, to be an ‘Economic Authority’, operating on ‘cost recovery’ basis, aiming to be fully self-subsidized, generating revenues from the services it offers without violating its national mandate. Such a decision was taken in the framework of the government’s policy to reduce the burden on the government’s budget as well as to free large public institutions like ESA from the government’s bureaucracy in many business aspects. Several improvement actions took place in ESA, based on IT technology and modern concepts in operations management and control; the ultimate aim is to strengthen the competitive power of ESA and to improve mapping and cadastre services. Further actions are taken by the present government in the year 2004 requesting ESA to allow an apparent role of the private sector in its mapping and cadastre activities. ESA at the moment is busy exploring new strategic directions and business models to respond to these government’s policies. Such strategies should include options for outsourcing many of basic mapping activities, re-orientation of core tasks focusing on geo-information management and the delivery of diverse services, optimization and downsizing, Public Private Partnership PPP, etc.

This paper proposes a platform for implementing ‘PPP’, including the networking of the various public and private Mapping and GIS institutions in Egypt for the delivery of mapping services that beyond their individual capacity. Such a platform operates as a ‘virtual enterprise’ comprising dynamic collaboration of many of these institutions partnering on the basis of competencies and shared business objectives. The distribution of mapping responsibilities on the bases of mutual benefit and capability of the participating partners, standardization and legislation of mapping industry and the technical and business rules for the chaining of workflows across the boundaries of participating organizations, are the key tasks in such platform.

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## **1. CHALLENGES FACING NATIONAL MAPPING AGENCIES**

Most of the National Mapping Agencies NMA around the world is still characterized by their traditional way of doing business, built up in a time when government funds were secure and the mapping market was relatively stable. They had a limited range of products (mainly hard copy maps), lacking the capacity for efficient information management and being criticized for their poor respond to users requests for tailored, almost on-line, products. Although digital technologies had been introduced since the sixties, experiences in these organizations, however, indicate that revenues on the heavy investments are still below expectation. Further, these organizations as public sector bodies often have natural monopolies over their information sources. Such control over information gives them considerable market power, thus restricting competition and having negative impact on the GIS market. They are lacking experience with collaborative work and partnership with other public and private institutions (Public Private Partnerships, PPPs) for the creation of services beyond their capacity and as a consequence of these users are permanently dissatisfied. Such business barriers might hamper the possibilities for the economic exploitation of foundation data available in these organizations and in particular the creation of value-added, diverse services by private companies.

## **2. TRENDS AND IMPROVEMENT TARGETS IN NMA**

Many NMA, in both industrial and developing countries, are under the pressure to revise their mission from business perspective and to be competitive, without violating its national mandate. In this pursuit, many NMAs initiated several improvement projects to apply modern management concepts applied in other industries such as Business Process Redesign (BPR), and modern concepts in managing technical operations, workflows and quality of services as well as exploring new business models for collaboration with other public and private institutions (PPPs). In such context, NMAs in many countries are paying an active role in the initiatives taking place to create the national spatial data infrastructure NSDI. Several examples of such initiatives took place in Ordnance Survey in the UK, the Netherlands Cadastre, US Geological Survey USGS, etc, as reviewed in [6], [10].

Further, many of NMAs are in the process of operating on ‘cost recovery’ basis, aiming to be fully self-subsidized, generating revenues from the services it offers without violating its national mandate. Such a decision was taken in the framework of the government’s policy in many countries to reduce the burden on the government’s budget as well as to free large public institutions such as NMAs, from the government’s bureaucracy in many business aspects.

With new trends towards a free, global, economy around the world, there is worldwide government pressure on most of these NMAs as public agencies to allow an apparent role to the private sector in the mapping and GIS industry. The ultimate aim is to create the healthy conditions for large economic potential of the GIS market. It is apparent nowadays that the monopolies of these NMAs over geo-information are fading away, while public private partnerships, PPPs, will characterize the GIS market in the future.

### **3. OPTIONS FOR PUBLIC PRIVATE PARTNERSHIP IN MAPPING INDUSTRY**

Many NMAs at the moment are busy exploring new strategic directions to respond to such government's policies. Such strategies include options for the re-orientation of their core tasks focusing on core competencies, while outsourcing of many activities which either are no longer profitable (such as base mapping activities) or fall outside their scope of expertise (like the delivery of on-line services, ICT and information management activities). These organizations are also searching for an effective business model for the participation of the private sector in their base mapping programs and options for public private partnerships, as well as the handling of consequences such as competition and optimization issues, downsizing and the social impact on its employees, training programs for job re-orientation and job opportunities, etc.

The objective of a 'PPP' is to strengthen the capability for the delivery of large services, like the nation-wide coverage of up to date spatial data and land registers, which is beyond the capacity of individual institutions.

Examples of collaboration strategies can be found in Ordnance Survey (UK), the National Imagery and Mapping Agency, NIMA (USA), the U.S. Geological Survey USGS (USA), Public Sector Mapping Agencies PSMA (Australia), Cadastre and Public Registry and Mapping Agency, Kadaster (NL), as elaborated in [6]. These examples include collaboration with:

- Distributors (for electronic service delivery)
- Value-added resellers (partnership to create and sell diverse, value-added and customer oriented services)
- Data partners (for the cyclic and continuous revision of land related information and maps in the U.K., the large scale topographic map of NL, the USGS National Map project for on-line, continuously maintained set of geographic base information)
- System partners (dealing with IT companies to provide core technology and qualified personnel to support information management)
- Notaries, Conveyors and legal Surveyors (legal cadastral services)
- The collaboration of the private and public sectors for the establishment of a national spatial data infrastructure NSDI to support the sharing of data and geo-services falls in this context
- Etc.

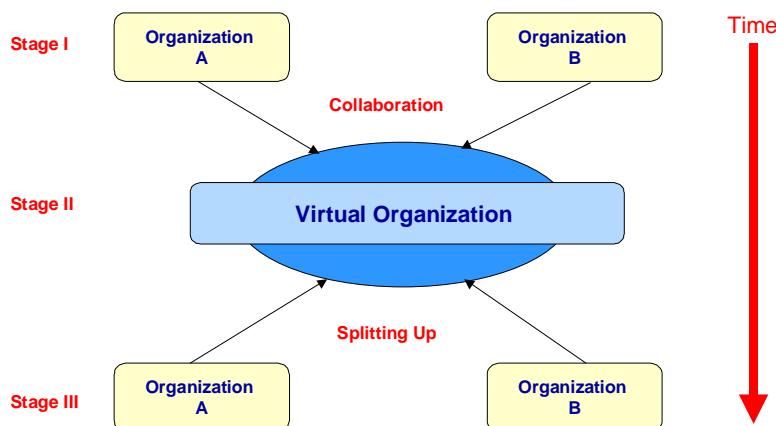
The role of the private sector is growing in such business environment; including the wide spectrum of professional activities, such as the survey and mapping activities, the software development, the ICT and information management activities, etc.

### 3.1 The virtual enterprise: a platform for PPP Implementation

Today's dynamic business environment forces industrial and service sectors to work beyond their boundaries and to operate in a more tightly coupled mode, forming integrated 'virtual' enterprises, to seize business opportunities. A Virtual Enterprise (VE) is a (temporal) network of independent organizations (legally autonomous, public or private, institutions) that joins functions with a particular objective, [2], [3], [4]. A VE is structured and managed in such a way that third parties see it as an identifiable and complete organization (one enterprise). The participating organizations can join or split over time according to their business interests, as shown in figure (1). The principles of the VE are: better customer satisfaction, reduced time-to-market and adaptation to changes in the surrounding environment.

These principles are applied mainly with the aim of having a share in a wider global market. This approach provides an organization with enough flexibility to handle an uncertain changing environment. These enterprises are called "virtual" because of their temporal nature, seizing certain, often short-lived, business. The products and services provided by VEs are dependent on innovation and are strongly customer-based.

The implementation of these new ideas of virtual communities, collaborative work, etc. and integrating processes and information from different organizations, for the delivery of products or services on the basis of common business understanding is an inevitable future characteristic of the GIS market worldwide. By taking this approach, more tightly integration and communication is achieved through a common mission, strategy and use of ICT, with mechanisms to establish clear responsibilities improving the production relationships and thus improving success for the organizations.

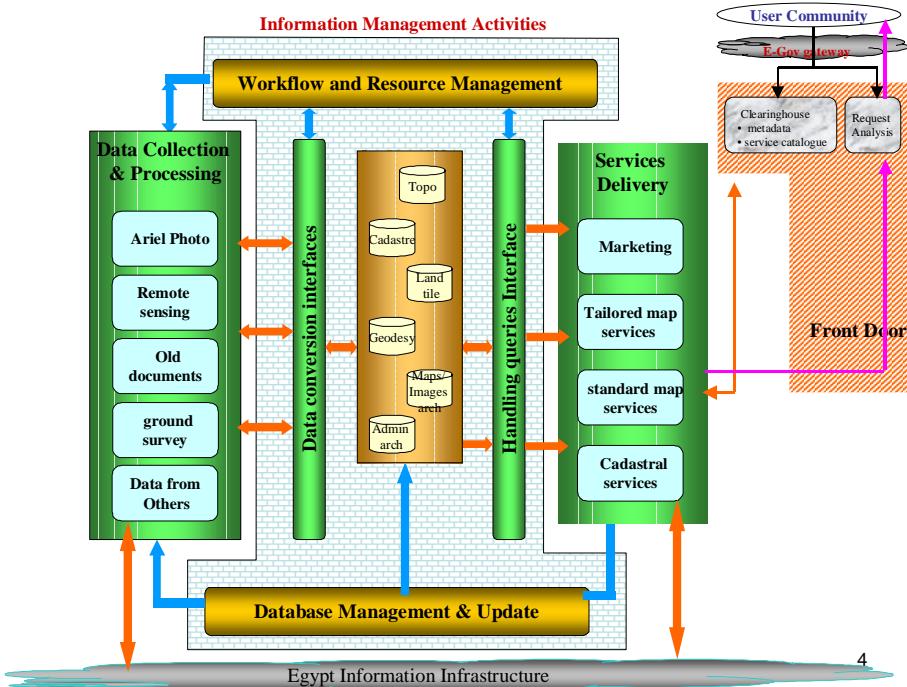


**Figure (1) The stages of co-operation of organizations**

A research project conducted at the International Institute of Geo-Information Science and Earth Observation, ITC in the Netherlands, to develop a platform for ‘PPP’, that operates as a ‘virtual enterprise’ comprising dynamic collaboration of many of public and private institutions in map-making, partnering on the basis of competencies and shared business objectives. It enables such enterprises, that are otherwise autonomous entities, to share pool of spatial resources together, and to share business processes and knowledge towards meeting user needs. Such platform will take care of the identification of competence and core business of each of these partners, distribution of tasks based on mutual benefit and capability, standardization and legislation of the mapping industry, technical and business rules for the chaining of workflows across the operational boundaries of the participating institutions, interoperability of data and geo-operations, etc. [6], [10], [11]

The operational model of such an enterprise is based on the concept of unbundling of the functionalities of current stand-alone systems in the traditional Geo-organizations, including mapping agencies, to make them available as independently developed, yet interoperable autonomous services. These functionalities include processes from different data sources, processes to create databases and manage their access, processes for map visualization, GIS functionality for spatial data analysis, etc., as shown in figure (2).

An infrastructure, with institutional and technical arrangements will be required to support the networking and chaining of these functionalities and services to create customized solutions and to achieve common business goals. Integration is not limited to data exchange capabilities, but also concerns the rest of the enterprise by connecting all necessary functions and heterogeneous functional entities: business processes, information systems, application packages, organization units, resources, etc. The infrastructure will manage information, processes, control and workflows across the boundaries of the participating organizations. These basic functionalities and services are processes that can run as Web services, made accessible via standardized, interoperable, access interfaces. Semantic unification must be assured to support data exchange and needs to be documented and registered in order to be located in a distributed environment; all these are the main requirements to utilize such an infrastructure. Further, special services will be developed to provide the option of combining and chaining of services (a kind of broker/mediator), also to manage inter-organizational workflows and manage the quality of services in such wider network of services, operating under different rules and constraints, [2], [6], [9].



**Figure (2):** The functional components for the creation and delivery of data and geo-services

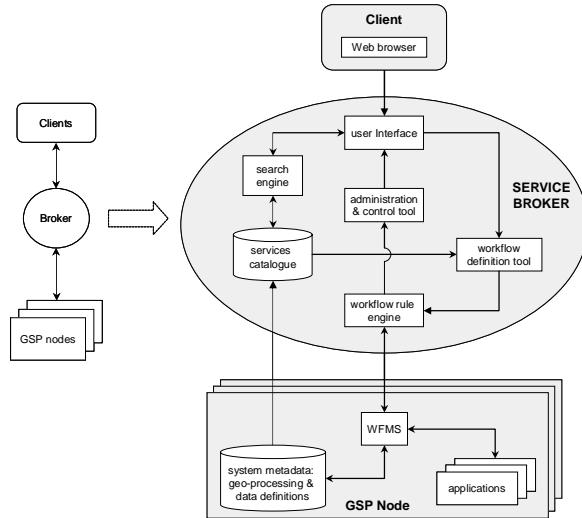
In a virtual environment, where the participating enterprises are not transparent to each other, there must be a mechanism to facilitate their cooperation. For that the broker concept can be used. A broker in the VE context is the facilitating mechanism to find partners to cooperate with and to provide a complex product to fulfill a client demand. Such broker will serve as the mechanism supporting the searching for products by users, the selection of partners and the creation and control of workflows, as detailed in [1], [5], [6].

This broker, as shown in Figure [3], is composed of several functionalities such as:

- User Interface: a browser (with a graphic interface) to provide access to different services; cadastre data and functionalities (simple or complex) in the registered agencies.
- Services to create Data and Service Catalogs, and metadata query.
- A pool of specially designed tailored services, such as mapping/cadastre services, which are composed by chaining several functionalities that are available at registered agencies. Capabilities to access supporting functionalities, which are provided by several service nodes over the Internet, such as Web GIS-Services, including data download and delivery, geo-services for spatial data analysis. Workflow Management capabilities with:
  - Search Engine: searches for business processes in the Workflow Service Catalogue
  - Workflow Service Catalog: support various enterprises to advertise their data and services
  - Workflow Definition Tools: creates definitions of the various processes
  - Workflow Rule Engine: executes the workflow and chain services across the boundaries of the various enterprises

- Administration and Control Tool: keeps track of workflow progress

Further, this broker will operate in the framework of the NSDI initiatives, making use of all tools offered to resolve various business constraints as well as data and processes interoperability issues amongst the participating nodes, as detailed in [6].



**Figure (3): The 'PPP' Broker Conceptual Architecture**

Several examples were tested, based on Web and workflow management technologies at ITC. Further, this broker also offers tools to resolve various institutional as well as data interoperability issues amongst the participating nodes, as reviewed in [6], [10], [11].

## 4. NEW BUSINESS MODEL FOR THE EGYPTIAN SURVEY AUTHORITY

### 4.1 Background

The Egyptian Survey Authority (ESA) is currently the only governmental organization responsible for the coverage of the entire territory of Egypt with base topographic maps of several scales. ESA has also the responsibility to the support of the national cadastre and land registration scheme, in cooperation of the Real Estate Office in the Ministry of Justice.

Since the beginning of the 90s, several initiatives have taken place in the Egyptian Survey Authority, ESA, to modernize its production facilities, work procedures and to upgrade its resources. A number of international donors contributed to these initiatives. A strategic plan was set in the year 1994, where the establishment of ESA 'Land Information System' is the main target. Several working programs initiated in order to implement such strategic plan, [13], [14]. In order to achieve sustainability of the modernization program and to ensure the effective use of the investments made, a special training program was specially established in 1999, aiming at capacity building to improve performance of ESA, [15].

In the year 2001, a decision was taken by the Egyptian Government to change the Egyptian Survey Authority, ESA, to be an ‘Economic Authority’, operating on ‘cost recovery’ basis, aiming to be fully self-subsidized, generating revenues from the services it offers without violating its national mandate. Such a decision was taken in the framework of the government’s policy to reduce the burden on the government’s budget as well as to free large public institutions like ESA from the government’s bureaucracy in many business aspects. Several strategic directions and improvement actions were set in ESA to strengthen its competitive power as well as to improve mapping and cadastre services, [15].

#### **4.2. New Government Policies**

In the Year 2004, the present government has requested ESA to allow an apparent role for the private sector in the mapping industry. Such a request is taken in the framework of the government’s strategic policy concerning most of large governmental institutions involved in providing services to citizen and business bodies; to limit their role to decision, planning and control, while outsourcing the execution of many of its operational tasks to the private sector. These government’s policies are aiming at:

- Speedup efforts to complete the national cadastre in order to improve the Real Estate Industry and to encourage international investors; a matter of strategic importance
- Increase the share of the private sector in the evolving GIS market in Egypt; leading to more job opportunities in this sector
- Convert large public institutions like ESA to a ‘slim’ institution; leading to downsizing and job re-orientation of government employees
- Creating advantages for the mapping industry from the private sector and its flexible approach to changing requirements
- Reducing monopolies imposed by the public sector agencies and consequently creating healthy conditions for large economic potential of GIS industry

#### **4.3 ESA Respond to Government’s Policies**

ESA at the moment is busy with other related organizations and the Ministry of Communication and Information Technology, exploring new strategic directions and effective new business models to respond to such government’s policies. Such model should include options for outsourcing many of the basic mapping activities, re-orientation of core tasks in various organizations and options for Public Private Partnership. From ESA perspective, such efforts should focus on:

- The initiation of national programs to complete the entire urban areas with up-to-date large-scale maps and land registers. The establishment of land information databases and

the necessary mechanism to access them, in the framework of the Egyptian Spatial Data Infrastructure, should be included in these programs.

- Exploring new ways and technologies, thus replacing traditional ways in map-making, in order to shorten time for the delivery of the required services in these programs.
- The tasks involved in these programs are beyond the capacity of single organizations and require the collaboration of many public and private mapping and GIS institutions.
- The execution of such programs requires the financial support from all interested parties, both public and private parties, as well as financial bodies, both local international bodies. The government will be requested to support and guarantee the allocation of the required funds. Such support, however, is not necessarily coming from the government central budget.
- Careful examination and restructuring of the various functionalities in the current mapping and cadastre systems in ESA, converting them to autonomous, well defined and accessible services. Such effort allows the possibilities for outsourcing as well as for integration and chaining with services provided by other organizations.
- ESA will set its business strategy on outsourcing of most of its data acquisition activities in base mapping to private companies while focusing on information management and the delivery of diverse services. ESA will also rely on partnership with private companies in areas outside their expertise, such as ICT services, information management, generation of diverse value-added services, marketing and partnering for wide distribution of data and geo-services, the on-line delivery of services, etc.
- The government is requested to support large public organizations such as ESA to minimize the negative social impact as a result of optimization, downsizing and the re-orientation of tasks and core business. Such support will include the necessary legislation for the layout of staff, financial compensations for early retirement, training and job-reorientation, job allocation, etc.
- ESA will play a key role in the establishment of the Egyptian Spatial Data Infrastructure, partnering with other interested including public and private institutions, for the development of the necessary tools and regulations to support the sharing, updating and distribution of spatial data.
- The establishment of a regulatory body, formed from the main stakeholders in GIS industry, including representative from public and private institutions, with the task to address requirements to initiate large mapping programs, rules and business practices for public private partnership, licensing professionals, competitive issues, copy rights and the conditions for re-use issues which govern the exploitation of geo-information and the creation of added value applications. Such body is mainly concerned with all barriers that

prevent the mapping business from achieving the full economic potentials of geo-information and GIS industry.

## 5. CASE STUDY TO IMPLEMENT ‘PPP’ IN THE REAL ESTATE INDUSTRY IN EGYPT

The Egyptian Government requires the establishment of the Land Information System (LIS) and the provision of advanced cadastre services, to improve the local Real Estate market and encourage foreign investments in such market. The data and functionalities to achieve such tasks are distributed in various private and public organizations, such as:

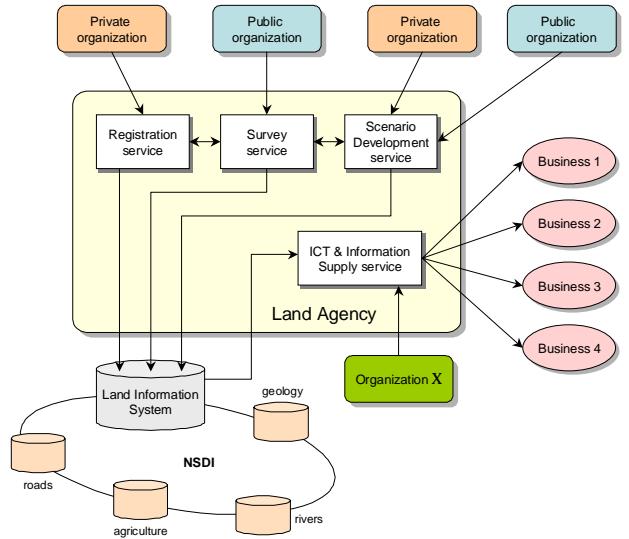
- The Egyptian Survey Authority in charge of the rural and urban parcel surveying
- The Registration Estate Publicity and Notary Department: in charge of ownership registration for cadastre parcels
- The Real Estate Taxation Department: in charge of collecting tax on properties, both in rural and urban areas
- The State Owned Land Agency: in charge of managing the State-owned land and responsible for the development of land use scenarios for investors in real estate
- Several institutions from the private sector are playing a role in the real estate market, according to their competent and expertise, such survey and mapping companies, IT companies, companies experience in management and control, real estate brokers and layers, banks and financial bodies, etc.

A possible solution is to use these agencies as nodes of a PPP Broker and the concepts of VE as outlined above in Section 3. By linking them, their workflows and data, these agencies behave as a ‘virtual’ Land Information Agency.

The participating agencies require a service orientation attitude, clear business process definitions, high commitment for collaboration and ICT infrastructure to create and maintain the LIS which will support the land market players and other organizations, also it participates as a node in the National SDI. A prototype was developed at ITC, in the framework of the TMS/ESA project for capacity building in the Egyptian Survey Authority, [14]. Figure (4) depicts the participating organizations (Listed above) and the services they provide in the ‘Virtual’ Land Agency.

The tool used for the agencies, or enterprises to interact with each other, is the PPP broker. Such broker will provide both data and services that are relevant to the different players in the real estate market. Services can be simple as well as complex, chained from various service nodes, as described in Section 3 in this paper.

## V.E. example



**Figure (4):** Virtual land Agency and its participating

This broker supports the creation, execution, control and management of business virtual processes, as shown in figure(4). It is composed of the components explained above in figure (3), mainly the user interface unit, pools of composed cadastre services (to be chained from the functionalities performed in the participating organizations), Workflow Service Catalogue, Workflow definition tool, Workflow rule engine and Administration and control tool. Further, this broker also offers tools to resolve various institutional as well as data interoperability issues amongst the participating nodes. More details are given in [6],[11],[16].

## 6. CONCLUDING REMARKS

Today's dynamic business environment forces industrial and service sectors to work beyond their boundaries and operate in a more tightly coupled mode, forming integrated 'virtual' enterprises, to seize business opportunity. In this context, the Public Private Partnership 'PPP' in Mapping and GIS industry is aiming to strengthen the capability for the delivery of large services, like the nation coverage of up to date land-related data, which is beyond the capacity of individual institutions. Large public institutions like NMA are requested to explore new business options, based on outsourcing, focusing on core business and partnership with other public and private institutions in areas outside their expertise.

The opportunities offered by ICT and Web technologies, SDI initiatives, modern concepts in information-, operations- and workflow- management, concepts for managing workflows across boundaries of organizations, etc., make such PPP implementation feasible.

The ultimate aim is to create the healthy conditions for large economic potentials in mapping and GIS industry.

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## CONTACTS

Dr M. Mostafa Radwan, Senior Scientific Staff  
International Institution for Geo-information Sciences and Earth Observation, ITC  
Hengelostraat 99  
7533BX Enschede, THE NETHERLANDS  
Tel. +31 53 4874351  
Fax + 31 53 4874 575  
Email: Radwan@itc.nl  
Web site: www.itc.nl.com

General Eng. M. Hisham Nasr, Chairman of ESA  
Eng. Sohir Hussein, Supporting Technical Staff, Chairman Office  
Egyptian Survey Authority  
Orman, Giza, Egypt  
Tel: +202 784904/362  
Email: esa1@idsc.net.eg

Ir. Christiaan Lemmen  
Cadastre, Land Registry and Mapping Agency  
P.O. Box 9046  
7300 GH Apeldoorn, THE NETHERLANDS  
Tel.+31.55.5285695  
Fax +31.55.3557362  
E-mail : lemmen@itc.nl  
Web site: www.kadaster.nl