

The Mexican Spatial Data Infrastructure (IDEMEX) – A Tool for Development

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SUMMARY

Mexico is a country who based its development in information. For this reason building the Spatial Data Infrastructure of Mexico (IDEMEX), is a fundamental pre-requisite for the development and implementation of policy, for improving services to the citizen in general (fundamental and basic data) and for stimulating the private sector (value added data).

To realize the full potential of IDEMEX, there are a number of obstacles that have to be overcome. These include the availability of products harmonized to agreed standards and access to better metadata about available products. However, it is also recognized that it is the ‘institutional’ rather than ‘technical’ obstacles that present the biggest barriers. In particular different policies, for example, for pricing and licensing make ‘easy’ access to data a major challenge.

This paper identifies the policy challenges and the solutions that are being developed to improve access to geographic information in Mexico. It will focus in particular on the key role that INEGI, the Mexican National Geographic Agency, is playing in the development and implementation of IDEMEX, as a coordinator for the spatial data generators in the country.

RESUMEN

México es un país que basa su desarrollo en la información. Por esta razón la construcción de la Infraestructura de Datos Espaciales de México (IDEMEX), es un prerrequisito indispensable para el desarrollo e implementación de políticas, para mejorar el servicio a la ciudadanía en general (datos fundamentales y básicos) y para estimular al sector privado (datos de valor agregado).

Para realizar el potencial de IDEMEX, existen un número de obstáculos que tienen que ser vencidos. Esto incluye la disponibilidad de productos que armonicen con los estándares y el acceso a metadatos sobre los productos disponibles. Sin embargo, se reconoce que los obstáculos son ‘institucionales’ en lugar de ‘técnicos’ y presentan las mayores dificultades. En particular, diferentes políticas, por ejemplo, precios y licencias para un acceso fácil de los datos es un reto mayor.

Este documento identifica los retos políticos y las soluciones que han sido desarrolladas para mejorar el acceso a la información geográfica en México. Se centra en particular en el papel clave del INEGI, la agencia nacional geográfica mexicana, en el desarrollo e implementación de la IDEMEX, como el coordinador para la generación de datos espaciales en el país.

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1. INTRODUCTION

The knowledge of the territory, understood as a space over the earth surface, has always been one of the greatest interest of the human being, provided that it is the context in which he moves and where he obtains his satisfactors and possibilities of development. Probably in the past, the needs of the knowledge of the territory were limited to the possibilities of mobilizing in within; nevertheless, nowadays the competition for resources and development has been intensified due to the demographic growth, so the attention given to the territory also has grown. In this context, it has become necessary to develop a model for correlating the interaction of the human being with his territory with the help of the geographical knowledge.

2. GEOSPATIAL INFORMATION SYSTEM

In the age of globalization and technological development, geography is one of the sciences that more impact has received, through the adoption of technologies like the Global Positioning System, remote sensing of satellite imagery, geographic information systems and informatics itself. The technological change allows us to create new reference systems much more precise in order to inter-correlate distant positions, all wide and along the national territory or globally as well, to produce computer-assisted cartography and generate geospace data bases, understanding this concept as *that event or phenomenon present in a certain territory when its geographical position is known and registered in the geographic information systems.*

Within the set of requirements at all three levels of government, some related items are outlined such as the planning of the territory, urban and rural cadastre, territorial limits, urban development, education and combat to poverty, among others. For supporting the decision making as for the territory, the INEGI proposes a geoespatial information system by means of a national inventory of the real property linked to the public records, as well as of human settlements which are correlated to other factors, such as fiscal collection and territorial reservations, all included in a concept called Spatial Data Infrastructure of Mexico (IDEMEX for Infraestructura de Datos Espaciales de México).

3. SPATIAL DATA INFRASTRUCTURE OF MEXICO

Not long ago, the geographical information was considered as a way of expressing the past and, perhaps, an approximation to the present; however, with the current tools it is not only possible a graphic representation, but also a correlation across data bases and data networks that should allow the modelling to answer questions like: what would it happen if a certain variation occurs in the territory, an important demographic movement or a modification in the natural conditions of the territory? In this respect, the geographic information answers to this

questioning and allows decision makers to rely on solid bases in a highly developed technological context. Hereby, the approach of the IDEMEX, which central objective is to *spread, socialize and achieve the best utilization of the geospatial information in the ambit of the state, municipal, national, regional and global integration*, allows to propose the need of a wide interinstitutional coordination for the construction of the enormous set of information which, due treated and analyzed, will lead to the correct decisions.

In general, some of the several essential components needed for the construction of IDEMEX are: producers and users, data sources and catalogues, data bases, networks, metadata, technologies for compilation, access and dissemination of information, interinstitutional agreements, standards and procedures, as well as legal and financial aspects.

The IDEMEX is distributed in three data groups:

- Fundamental group: national territory imagery, geodesy, relief, hydrographic network, territory division and cadasters.
- Basic group: topographic information, geostatistics and urban information.
- Added-value group: environment, natural resources and information derived through the correlations established among different variables.

4. REGISTRY OF THE TERRITORY

Now then, under the concept of IDEMEX, the register of the territory is proposed to be defined as *an instrument of coordination that allows to compile information of the cadasters and its link with the Public Registry of the Property, based on the use of standards which identify in a unique manner every piece of land and its attributes, for its inscription in the National Registry of Geographical Information*. The governing elements of the Registry of the Territory must be based on standards, considering the piece of land as the territorial object; likewise, there must exist a close link among the areas in charge of the national territory administration, in order to promote the efficient use of the resources and strengthen the exchange of information in the public administration to assure that the national, regional, state and municipal set be understood under the same scheme and the same system.

Thus, the fundamental components of the Registry of the Territory are the geographical names, territory division and cadaster information related to the Public Registry of the Property. For correlating this information, it has been considered necessary to construct an only key of piece of land identification, which should be related to the property key, the folio of the Public Registry of the Property, and the only key for the Registry of Population (CURP for Clave Única de Registro de Población), by which it will be possible to associate the territory with the persons interacting with it [Reyes-Ibarra, 2003].

On the other hand, the only key will be complemented with the geometric information of the piece of land, as it is the case for the geographic coordinates that, by developing an algorithm, an only unrepeated piece of land centroid may be obtained for each case.

The above mentioned demands an intense process of normalization of geographical names at the different levels of the government, and it is fundamentally related to the numeration of buildings, names of streets, colonies and localities, homologation of keys, among others.

5. BENEFITS AND PERSPECTIVES

As this key is not repeatable in any other piece of land in the national territory, the registry will be a very useful tool to officialize the cartography, protect the information as common good, georefer statistical information, interrelate geographical data bases and stimulate the improvement of the systems of geographical information. An initial unit of work, which can be the developmental base for this Registry of the Territory System, would be the 32 federative entities, 2448 municipalities, 200 000 localities, 295 000 geographical names, 89 000 territorial documented limits and 7 600 000 pieces of land of social property that, through the definition of procedures and standards, is being developed by the Institute.

Also, it is necessary to keep working on the standards, strengthen the inter-institutional coordination, agree this information of the Registry of the Territory among all three levels of government of the public administration, and consolidate the National Registry of Geographical Information. Ultimately, the Registry of the Territory, considered as a common good, is orientated to "have a government mechanism of on line-services" referred to an only cartographic data base, normalized and registered to a piece of land level and, at its universal phase, rely on the complete record of the territory and create a patrimony of the whole society, connected with the rest of the world, having high standards of precision and of quality in the information models for the integral growth of our country.

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BIOGRAPHICAL NOTES

Mario Alberto Reyes -Ibarra has a bachelor in Surveying and Geodetic Engineering from the National Autonomous University of Mexico. Since 1975 has been work at the Mexican National Institute of Statistics, Geography and Informatics, actually he is the General Director of Geography.

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