National and Regional Spatial Data Infrastructure (NSDI & RSDI) and National Cartographic Center of Iran's Activities about it

Peyman Baktash

Head of Coordination section for GIS Users Councils
Department of Geographic Information System (GIS)
National Cartographic Center (NCC) of IRAN
Tehran, IRAN
baktash@ncc.neda.net.ir

Abstract: The concept of a Spatial Data Infrastructure (SDI) has emerged globally to facilitate the transit of spatial information from data producers to a vast and ever-growing community of users. SDI have become very important in determining the way in which spatial data are used throughout an organization, a nation, different regions, and the world. SDI is an initiative intended to create an environment in which all stakeholders can cooperate with each other and interact with technology, to better achieve their objectives at different political / administrative levels.

Islamic Republic of Iran began her participation in the Global map project and SDI activities in 1998. In this related, National Cartographic Center (NCC), as the representative of Iran, started the job with identifying the suitable sources of data for creation of those layers stated in the specifications of Global Mapping. NCC started making GIS Users Councils (National & Provincial Councils) for the making National SDI and Local SDI too. Now, NCC is doing some activities to joining its National SDI to Regional and Global SDI.

This paper in first section, discuss about SDI as basic point in Information Technology (IT). In second section, SDI situation in IRAN and National Cartographic Center's roles in realization of future scope of RSDI and GSDI is discussed. (NCC is one of the greatest Map Producer organizations in IRAN). The way that be applied, is analyzing of fundamental points especially Sustainable development, IT and SDI and their complementing policy in Information Society. These include some applications in National, Regional and Global levels.

Keywords: Developing Countries, GIS, Technology, Information, Data Structures, Framework Data, Metadata, Spatial Infrastructures.

1. Introduction

The concept of a Spatial Data Infrastructure (SDI) has emerged globally to facilitate the transit of spatial information from data producers to a vast and ever-growing community of users. An SDI encompasses the policies, technologies, standards and human resources necessary for the effective collection, management, access, delivery and utilization of spatial data for a specific jurisdiction or community. The best use of geospatial data, which is being produced more every day for sustainable development, requires some infrastructure, which facilitates search, query, access, share and use of the data. Such an infrastructure is called SDI, which ranges from local, provincial, national, and regional to global levels. Fundamental in making decision is existence of accurate and up to date information. This information can be optimized applied in sustainable development if it has spatial infrastructure. Applying operational methods in gaining sustainable development goals and it technology is possible by encouraged. Required infrastructures are of the important information is spatial information and especially national spatial information.

2. Spatial Data Infrastructure (SDI)

2.1) SDI Components

Many of National and Regional SDIs in world, describe common components as bellow:
- o Institutional Framework
- o Technical Standards
- o Fundamental Datasets
- o Technology
- o People
- o Existing Models
- o Metadata
- o Clearinghouse

2.2) Objectives in Developing an SDI

There are a number of other objectives that should be considered when developing an SDI:
- ❑ Produce Standardized fundamental spatial datasets
- ❑ Avoid unnecessary duplication of cost in developing and maintaining those data
- ❑ Facilitate access to and application of those data
- ❑ Enable integration of other application specific data by all users.

2.3) Sustainable Development

Society improvement is possible if influence of development progress is sustainable. We need executive sustainable development program to have it in different part of society and it can be done if we consider economical and social and political factors in our decision.

2.4) IT Position in NSDI

We can see an overview of this topic in Fig 1. The main point of this diagram is it position and effective factors on it that cause IT modern concept by putting strategies and policies in spatial data infrastructure.
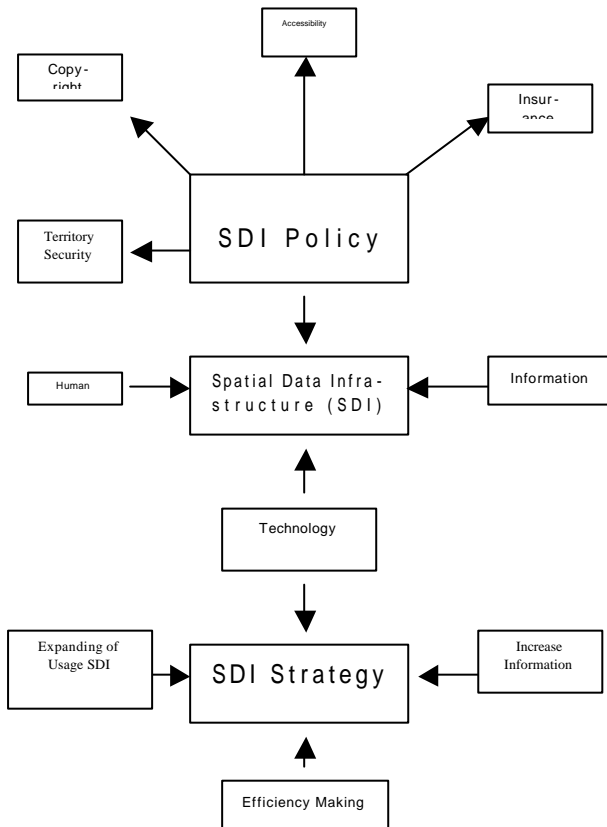

Fig. 1. An Overview of IT position in SDI.

3. Principles and specifications of SDI in National Cartographic Center (N.C.C.) of IRAN

3.1) Current Development of SDI Situation in NCC

The spatial data produced from local to national levels include 1:200 to 1:1,000,000 map scales. Significant efforts have been undertaken towards the development of a nationwide digital map and topographic database (NTDB) at scale of 1:25,000 by NCC, which is responsible for national surveying, mapping and GIS activities in Iran. The project (NTDB) consists of about 10,000 sheets at scale of 1:25,000.

3.1.1) Producing Digital Maps in NCC

Large-scale maps
Producing urban maps in the scale of 1:2000 plan was putted on Formula in NCC before that, maps of some cities was made by case study in 1:1000 and 1:2000 but this plan are for all of cities that one prioritized in 800 cities.

Medium-scale maps
The Islamic Parliament as one of the most important projects approved the national project of preparing base maps at the scale of 1:25,000 after the Islamic Revolution.
The maps include 10,000 sheets, of which 3000 belong to desert areas, and 7000 sheets cover the other areas.

small-scale maps
As user requirements to different scales of spatial data, NCC produces 1:50,000, 1:100,000, 1:250,000 , 1:1,000,000 map.

3.1.2) Development of National Council of GIS users (NCGISU)

NCGISU was established in 1993 in order to policy, planning and coordination GIS activities, requirement analysis, applying all scientific and technical capacity and professional ability to set up a GIS system and practical use of that under direction of NCC.

NCGISU try to spread GIS' wings and also transfer experience and results in regional, national and international level. Council members are full expert of administrations and executive sections and NCC has its chairman. GIS department of NCC as a secretariat of this council provides essential facilities to hold council meetings and perform its approval. Up to now this council has been holding more than 105 meetings and makes deliberate decisions on different matters.

National council of GIS users activities:
The important actions and activities, which have been done:
- Making decision about national topographic database features in the scale of 1:25,000
- Making decision about geographical database features in the scale of 1:100,0000
- Provincial council of GIS users conformation (PCGISU)
- Facility, images and satellite information analysis in NCGISU member organizations to produce image map in the scale of 1:100,000
- Approval of duty description chart for suggested GIS department in administrations and other related executive organization in provinces.
- Policy on format of geographical information exchange
- Approval of preparation and updating digital maps for special cities in the scale of 1:2000
- Establishment of data clearinghouse
- Leading and conducting national topographic database collection and compilation committee activities in the scale of 1:25,000

3.1.3) Province councils of GIS users (PCGISU)

Following to Provincial Council of GIS Users con-

formation plan, the statute approval of this council in 45th meeting of National Council of GIS Users dated 1998, in order to coordinate and arrangement of GIS activities in provinces, programming to set up a GIS system and holding continues PCGISU meetings in all provinces of country and also leadership of these committees by GIS department of NCC, the PCGISU was created.

3.1.4) The Other NCC' sactivities are as follow :

- *Development of Standards*
- *Iran's membership in PCGIAP*
- *Contributing in preparing global map*
- *Creating Clearinghouse*

3.2) Future Development of SDI Situation in NCC

3.2.1) Futures NCGISU research

NCGISU has especial program for its prospective meeting and follows special work plan such as analyzing and discussing on:

- How we can use global map and fundamental dataset of Asia and Pacific region.
- Applying international standard in GIS system like (ISO/TC211 GIS standards).
- Establishment of data clearinghouse.
- Compilation of data exchanges standard.
- Finding effective solution for NCGISU and PCGISU member organizations in set up and apply GIS systems.
- Effective endeavor to access ideal statue in applying GIS systems in country

4. Comments and conclusions

The goal of this Infrastructure is to reduce duplication of effort among agencies, improve quality and reduce costs related to geographic information, to make geographic data more accessible to the public, to increase the benefits of using available data, and to establish key partnerships with states, counties, cities, tribal nations, academia and the private sector to increase data availability. The NSDI has come to be seen as the technology, policies, criteria, standards and people necessary to promote geospatial data sharing throughout all levels of government, the private and non-profit sectors, and academia. Much has been accomplished in recent years to further the implementation of the NSDI, but there is still much to be done to achieve the vision of current and accurate geographic data being readily available across the country. There are some problems and difficulties experience in exchanging data in I.R. of Iran as: lack of standard format of data exchange; lack of uniformity in used software in different sections; Different Farsi language support utilities in different sections. N.C.C. Is thinking about these problems and is solving them. We can find out from NCGISU background in Iran that that up to now this council as a policy and making decision origin with presenting useful comments and plan, has an effective role in coordination and integration GIS activities, presentation training course, spreading GIS culture, preparation topographical database in different scale, requirement determination, analyzing database in various kind of information and available potential facilities, setting up special multimedia system and propose practical useful plan and suggestion in national level. In order to shared use all benefit of applying GIS systems and appear positive results of that technology in our society, the following points are recommended:

- GIS core in each executive organization should be played an active role.
- Private and public organization parallel to each other can activate in contribution of GIS systems performance.
- GIS training courses will be held periodically and regularly for directors, specialist, operator and technician and all GIS activities and actions regularly execute in private or public organizations.

References

[1] Rajabifard, Abbas, (2002), Diffusion of Regional Spatial Data Infrastructure users: with particular reference to Asia and the Pacific, Submitted in total fulfillment of the requirements of the degree of doctor of philosophy, University of Melbourne, Australia, March 2002.

[2] Aniruddha, Roy (2003), ESRI India (NIIT-GIS Ltd.), GIM International Magazine, March 2003, Volume 17, pages 30-33.

[3] Baktash, Peyman (2002), Current Situation of GIS in Iran and Future Development, Symposium on "Korea - Iran Relations: The Past, Present and Future", Tehran, Iran, October 31,2002.

[4] Norouzi, Shahdad (2002), Digital Mapping in Iran, Submitted to the "Expert Group Meeting on GIS between Korea and Iran", Tehran, Iran, November 1, 2002.

[5] FGDC, USGS, 590 National Center, Reston, VA 20192 URI: http://www.fgdc.gov /nsdi/nsdi.html

[6] Delavar, Mahmoud R. & Rezayan Hani (2001), Development of an urban Geo- Spatial Data Infrastructure, Tehran, Iran.

[7] Mansourian, Ali (2002), PhD Confirmation Report, K.N.Toosi University of Technology, Tehran, Iran, December 2002.

[8] Delavar, Mahmoud R. & Rezayan Hani (2001), Development of a Conceptual Framework for Iran' s National Spatial Data Infrastructure, International Symposium on SDI, University of Melbourne, Australia, November 19-20, 2001.

[9] Delavar, Mahmoud R. & Rajabifard, Abbass & Rezayan Hani (2003), Role of NSDI to reach goals of IT in IRAN, Geomatics 82 conference, National Cartographic Center of IRAN, Tehran, Iran, April 2003.

[10] Clarke, D. (2001), Development of Australian Spatial Data Infrastructure, Proceeding of the International Symposium on Spatial Data Infrastructure, The University of Melbourne, Australia, 2001.