

REGIONAL SDI DEVELOPMENT

Abbas Rajabifard¹ and Ian P. Williamson²

¹Deputy Director and Senior Research Fellow
Email: abbas.r@unimelb.edu.au

²Director, Professor of Surveying and Land Information,
Email: ianpw@unimelb.edu.au
Centre for Spatial Data Infrastructures and Land Administration
Phone: +61 3 8344 0234 Fax: +61 3 9347 4128
Department of Geomatics, The University of Melbourne, Victoria 3010, Australia
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INTRODUCTION

Spatial Data Infrastructure (SDI) is a dynamic, hierarchy and multi-disciplinary concept that include, institutional, policy, technical, standards and human resources dimensions. SDI is an evolving concept about facilitation and coordination of the exchange and sharing of spatial data between stakeholders (data providers, value-adders and data users) from different jurisdictional levels. They have become very important in determining the way in which spatial data are used throughout an organisation, a nation, different regions and the world.

With this in mind, many countries throughout the world are developing SDIs to better manage and utilise their spatial data assets. Increasingly, these countries are finding it necessary to cooperate with other countries to develop Regional SDIs to assist in decision-making that has an important impact across national boundaries. This is one of the distinctive features of the last decade as highlighted by Masser *et al.* (2003).

Regional SDI is an initiative intended to create an environment as an infrastructure that a wide variety of users who require a regional coverage, will be able to access and retrieve a complete and consistent data sets in an easiest and secure way. Its roots are in the regional governments and their cooperation. Having said that, there are many regional organisations and groups that are made up of countries from a particular region. These organisations often cooperate to address common economic, social and environmental issues. The primary purpose of this cooperation is to organise economic activity in such a way as to maximise regional and individual country benefit. Regional and global cooperation presents serious challenges to prevailing ideas about the world being constructed out of a collection of building blocks described as nation-states.

Some of the regional interests that encourage different governments to cooperate with each other in the context of Regional SDI development and also encourage them to form different regional groups, can be summarised as follows:

- Regional emergency management,
- Regional mapping,
- Regional security,
- Regional access to health care resources,
- Regional environmental monitoring and management,
- Shared oceans surroundings,
- Fishing,
- Shipping and transport,
- Economic development and cooperation,
- Agricultural and forestry management,
- Partnership (initially with emphasis on technical assistance to the regional members).

In order to respond to these regional interests, all regional bodies need to access accurate and consistent regional spatial databases to make the right decisions and to implement and resulting regional initiatives. These databases might need to contain data and information about the whole or part of the region. However, the required databases that contain regional data sets of sufficient accuracy and detail do not exist or are not accessible.

THE NEED FOR SDI DEVELOPMENT

The current complexity of communications between the various countries and regional bodies in any region is very high. For the purpose of data sharing, regional organisations and member nations must develop one-on-one agreement with each and every other user within the region for sharing regional data. However, this complexity can be reduced to a manageable form by developing a Regional SDI built upon the cooperation of the regional users. The establishment of a Regional SDI will form a fundamental framework to exchange data across many countries in a region. This will also provide a clear picture to support and improve existing or even new bilateral and multilateral relations and structures.

Further, a Regional SDI can provide the institutional, political and technical basis to ensure the regional consistency of content to meet regional needs in the context of sustainable development. Within this regional framework, the fundamental data set can be collected and maintained through partnerships. This data set will include all data necessary to understand the region, in both spatial and non-spatial forms.

A Regional SDI ideally should provide benefits for all member nations. In particular the needs of the cooperating member nations must be met but there must exist provision for joining by previously non-participating nations. As the membership grows the data pool widens and there are further economies and benefits realised.

Much geographic data development effort is based on the developer learning from the experience of others. The Regional SDI and its fundamental data sets represent the combined results of such experience. Further benefits of a Regional SDI additional to those already outlined are:

- Reduced costs of data production and elimination of duplication of effort;
- Developing applications more quickly and easily by using existing data and data development standards;
- Provide better data for decision making;
- Save development effort by using fundamental and standardised data, guidelines, and tools;
- Perform analysis, decision making, and operations in cross-jurisdictional areas;
- Expanding market potential and program funding through recognition and credibility as a Regional SDI participant;
- Providing consolidated directions to vendors regarding required technical features.

To realise the advantages of a Regional SDI and to speed up its development, at least six key factors should be considered. These factors are:

- awareness of spatial information and SDIs;
- cooperation between the various stakeholders;
- involvement of the politicians concerned;
- knowledge about the type, location, quality and ownership of data;
- accessibility of data sets; and
- the successful widespread use of the data sets.

Any spatial data stakeholders (data providers, value-adders and data users), including politicians and technical people, should be aware of the potential and advantages of spatial information and SDIs. The coordinating agency responsible for a Regional SDI initiative (such as the Permanent Committee on GIS Infrastructure for Asia and the Pacific-PCGIAP, or the Permanent Committee on SDI for the Americas- PC IDEA) must help to raise this awareness. The development of a Regional SDI is a matter of regional cooperation. The involvement of those politicians concerned with the Regional SDI development is essential. The politicians' support provides legitimacy and encourages the necessary financial investment for the Regional SDI development. Knowledge about the types of data, its location and quality is also required. It is also important to provide access to the data as the measure of success of the Regional SDI will be the widespread use that is made of it and an appreciation by its users that it is providing the promised benefits which were the justification for establishing the Regional SDI. Also, there is considerable documented experience in designing different level of SDIs. As a result there are a number of key issues and strategies to be considered within the design process (Rajabifard and Williamson 2002):

- The development of a strategic vision and associated implementation strategy,
- The recognition that SDI is not an end in itself,

- The key institutional strategy is to have all coordinating processes administered within one government department.

Further, based on the results and outcomes of research on regional fundamental datasets in Asia and the Pacific region as an example as highlighted by Rajabifard and Williamson (2001), there are large amounts of digital data with many common data layers are available at different scales in the region that could be useful for the creation and facilitation of the Regional SDI. However, the most anticipated political barriers regarding the establishment of a regional dataset includes access to datasets for security reasons, lack of resources, national administrative boundaries as a data layer, and copyright issues.

CURRENT REGIONAL SDI DEVELOPMENT

As was mentioned before, the emergence of Regional SDI organisations is one of the distinctive features of the last decade. At the regional level, currently, there are four SDI initiatives in the Europe, Asia-Pacific, the Latin American, and in the Africa regions. According to Masser *et al* (2003), this began with the creation of the European Umbrella Organization for Geographic Information in 1993 and was quickly followed in Asia and the Pacific by the establishment of a Permanent Committee (PCGIAP) for this region in 1995 under the auspices of the United Nations Regional Cartographic Conference. A similar organisation for the Americas (PCIDEA) followed in 2000, after a three years process, with support from 21 nations. At the turn of the century Africa and the Middle East were the only regions of the world without such an organisation. However, moves are currently under way to create a Committee on Development Information under the auspices of the UN Economic Commission for Africa, and it is due to the potential benefits of developing any type of SDI, promised and documented by other similar organisations.

All Regional SDI organisations achieved some important steps toward the development of their Regional SDI initiatives since their establishment. For example some of the achievements by PCGIAP in Asia and the Pacific region are the implementation of the regional precise geodesy network, definition of a regional geodesy datum, development of a policy on sharing fundamental data, development of guidelines on custodianship and in particular, the definition of APSDI itself. Also, projects are underway for the ultimate goal of APSDI development in this region.

Although these type of achievements are very important and provide a valuable contribution and will form the basis for any Regional SDI development, but there are some other issues involved in the progress of Regional SDI initiatives which need to be mentioned. These issues include the low rate of participation in these activities, the organisational structure of Regional SDI coordinating agencies, designs of the work program and working groups, and availability of resources to pursue programs.

DISCUSSION AND CONCLUSION

SDI is whole about facilitation and coordination of spatial data and information that requires a long term process. Due to this process, the development of an effective and functioning SDI therefore requires a long-term vision and strategy. One suggested strategy is taking short-term goals and demonstrating their results to all stakeholders as soon as they reach completion. Also, the success of an SDI is not dependent on its legal or technical sophistication, but whether it provide an effective communication channel between all stakeholders and permits to easy access to spatial data adequately, simply, quickly, securely and at low cost. However if the resources are not available to keep the SDI up-to-date then there is little justification for its development. Therefore, funding and resources to secure the implementation of SDI is always an important issue

Further, there are large amounts of digital data with many common data layers are available at different scales in different regions that could be useful for the creation and facilitation of Regional SDI initiatives. However, the most anticipated political barriers regarding the establishment of a regional data set includes access to datasets for security reasons, lack of resources, national administrative boundaries as a data layer, and copyright issues. These issues are the major impediments to the widespread and successful use of Regional SDI rather than only technical issues.

There are also some other factors which influence the initiative of a Regional SDI and make it difficult to prepare an environment for implementation by a large number of potential member nations. These factors are the lack of awareness of the potential usefulness of SDIs, social and cultural diversities, languages, total land area of the nations, and so forth.

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Author/s:

RAJABIFARD, A; WILLIAMSON, I

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