

11.522: UIS Research Seminar (Fall 2005) - Discussion notes

Session 7

The Role of GIS in Delivery of Municipal Public Services

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Requirements of the study: Municipalities are recognizing the need to invest in GIS to provide better services. The ability to process, manage, and update large amounts of information efficiently is an invaluable asset for local governments. Whether for urban planning, tax assessment, or infrastructural development, municipalities require fast and easy access to map and associated data in an automated system. Further, they need to be able to analyze these data to meet increasing service demands.

Iller Bank is the main organization that gives financial and technical support for urbanization related services such as creating maps, developing urban plans, delivering water, wastewater and solid waste services for all municipalities in Turkey. The Bank has the biggest spatial data archives because it is the unique authority to approve all kinds of maps of urban areas in the country.

But over time, the working system has not been updated or renewed and it becomes insufficient to meet all the needs of municipalities. In other words, its working system is behind the latest technological developments. So, it is necessary to update its working system according to contemporary progress.

GIS can play a very important role both in delivering public services and in improving the working system of Iller Bank to guide urban and infrastructural development more efficiently in Turkey. But developing a GIS is a complex process. It requires reconciliation of diverse source materials, conversion of paper maps and other hard copy data, and the acquisition of new data, hardware and software, and user applications. In the process, management structure could be redefined, work flow could be redesigned, and personnel should be trained.

The advantages of GIS: GIS has many advantages in the managements of spatial problems. According to Nedovic-Budic (1999) the efficiency of an information system depends on two dimensions: information quality and system quality (p. 286). In the case of information quality first, GIS system needs accurate data and it combines different data sources. With existing data, advanced analysis such as modeling of a real world, environmental impact assessment and suitability analysis can be done and their results can be visualized. In this way, system produces information as an output. Because of used data and produced information, the system becomes more reliant and transparent. Moreover, as Nedovic-Budic (1999) has noted, “User satisfaction has been used as one of the most prominent measures of system success and effectiveness” (p. 287). In this context, GIS supply user friendly environment. More complex operations can be handled in a simple way. Users of the system are satisfied with the high quality of visual outputs. In addition to this, a decision making process becomes more transparent and reliant, because of powerful analysis of GIS and everyone can follow everything in that system easily. Staff and managers can be more productive in this environment. GIS also has many effects on organizations in which it is used. Nedovic-Budic (1999) claimed that “Efficiency and effectiveness are the criteria used to evaluate how information systems affect organizational performance” (p. 288). First of all, it decreases the inputs and increases the outputs in order to supply the same amount of services. For example, while operating costs and numbers of staff are reduced, work volumes, product qualities, goal achievement and service effectiveness increase. As a result of all these advantages, organizations can return their investments with increased revenues. Finally, GIS brings equity, participation and transparency to society. Because people, politicians, managers and citizens are aware of their situation, they can participate in deciding their priorities, needs and quality of services. In this way, GIS plays an important role in community development as a whole.

Examples: In order to establish GIS in the working system of Iller Bank, it is useful to know other countries’ experiences. For this reason, the United States and Australia, which have been using these systems at advanced levels for many years were selected as examples. Smith, Campbell, Subramanian, Bird and Nelson (2001) analyzed GIS experiences in municipalities in United States. The municipalities used GIS in the establishment of municipal information systems. Their starting point was preparation of the strategic plan for the municipal information systems. After three years, they evaluate

the effectiveness of the system. According to authors' findings, GIS is very important in all land related operations. Moreover it has a very important role in delivering public services, in management of governmental operations and in organizational controls. But its success depends on organizational structure. In order to share information with other municipalities and other organizations, attention was drawn to create requirements for national guidelines for combining common basic rules, policies and formats about the GIS. In addition, Maguire and Longley (2005) explained the development of spatial data infrastructure (SDI) as a common national GIS guideline which was coined in 1993 under the coordination of U.S. Federal Geographic Data Committee (FGDC). According to them "FGDC defines SDI as the totality of 'technology, policies, standards, human resources, and related activities necessary to acquire, process, distribute, use, maintain, and preserve spatial data throughout all levels of government, the private and non-profit sectors, and academia'" (p. 5). According to Harvey (2003), the roles of local governments are very important in developing national spatial data infrastructure (NSDI). They are producers and end users of the data. Therefore, NSDI should be based on local governments.

Jacoby, Smith, Ting and Williamson (2002) emphasized Australian experiences about the SDI over the last decade. They underlined the problems of using different data sets and the requirements of state SDI. According to them, "[the] objective of SDIs is to ensure users of spatial data will be able to acquire consistent datasets to meet their requirements" (p. 307). All these studies show that common spatial data infrastructure is necessary for sharing data and information to reduce redundancy. One guideline could be developed for all countries.

Expectations from the class discussion: This topic will be studying during the whole academic year. For this reason, in order to guide this research in an efficient way, the followings will be expected from the participants of the discussion:

1. Is there any Iller Bank kind of organization in US?

What are the similarities and differences between them?

2. What are the possibilities and obstacles in current situation in Iller Bank for the use of GIS?

3. What kind of opportunity can GIS bring to the Bank?

4. Can GIS facilitate the change in Iller Bank?