

## **GEOGRAPHICAL INFORMATION SYSTEMS ON THE WEB FOR PUBLIC PARTICIPATION IN PLANNING**

**Ori Gudes, Eliahu Stern and Tal Svoray**

Department of Geography and Environmental Development, Ben-Gurion University of the Negev, Israel

### **Abstract**

*Planning in Israel was often affected, in the recent years, by the public reactions. Traditionally Public Participation (PP) is very limited and can lead to conflicts between different interest groups. The main goal of this research is to examine the quantitative contribution and the added value of using PPGIS on the Web as compared to the use of traditional methods (meetings) in PP process. The PPGIS on the WEB system enable the public to participate actively in the process of planning a master plan for the "Shapira Neighborhood" in Tel-Aviv, Israel. The PPGIS on the WEB system is composed from a Regular HTML website and GIS website using ArcIMS server. The site enables the public to participate in the process, everywhere and anytime. It enables viewing extensive amount of GIS-based data from surveys, and statistical analysis on the internet. In addition, the public is able to response and comment to the planning team. This study is still in processing and the system supervise on the PP continuous.*

### **IMPORTANCE**

In the recent years, planning in Israel was often affected by the public reactions. However there is no dispute about the importance of PP in the planning process; the main question, is how to do it. Traditional PP is very limited and can lead to conflicts between different interest groups. We should look for better method of PP, in order to improve the planning process. The use of a new method (PPGIS on the WEB) can achieve added values, such as: better accessibility, empowerment of the public, enhance the public reliability, objectivity and confidence in the data in the planning process. This research is pioneering and done for the first time in Israel planning agenda, a fact that enhances the importance of the research.

### **HYPOTHESES**

Three hypotheses are examined in this study.

- 1) The use of PPGIS on the WEB will enhance the participation of the public and their presentativity. Kingston (2001), presented that the use of PPGIS on the WEB enhances the public opinion and helps to reflect their real agenda (See also <http://www.ccg.leeds.ac.uk/slathwaite/>). Another aspect that Kingston claims is the increase of participants in PP process. Peng (2001) indicated that, Internet GIS, serving spatial data and GIS functionality on the web, offers a special and potentially important means to facilitate PP in the planning and decision-making process.
- 2) The use of PPGIS on the WEB in PP, will enhance the public reliability, objectivity and confidence on the data in the planning process. The PPGIS on the WEB system will enable online relative data, quick updating and easy accessibility from every where. Sarjakoski (1998), indicated that use of PPGIS on the WEB system, is functioning as a

tool of trust enhancing and can improve the connectivity between different groups in the public.

- 3) The use of PPGIS on the WEB in PP, will empower the public in the participation process, by increasing the number of participants, and by deepening the involvement of the public in the planning process. Weiner et al. (2002) claim that PPGIS contribute to more inclusive spatial decision making.

## **OBJECTIVES**

The main goal of this research is to examine the quantitative contribution and the added value of using PP GIS on the Web as, compared to the use of traditional methods (meetings) in PP process. Secondary goals of PPGIS on the web system are: 1) to examine the contribution to the empowerment of the public 2) to examine its influences on public positions 3) to characterize the usability of the PPGIS on the web system in the PP process.

## **INTRODUCTION**

PP is an integral part of planning processes. Traditionally, PP took place mainly via public meetings and led, in many cases, to conflicts rather than problem solving. These led to the awareness that PP requires new methods in order to achieve a better planning. In this study we developed a Web-based GIS to support a "real world" case of PP in the planning of "Shapira Neighborhood", Tel-Aviv, Israel. The research compares traditional PP methods to PPGIS on the Web method. This can lead to better achievements in the PP in general and in PPGIS on the WEB specifically. The comparative research applies three dimensions: 1) empowerment 2) confidence in the information 3) representation and involvement. The basic hypothesis adopted is that using PPGIS on the WEB will enhance all three aspects of PP. The motivation is twofold: scientific for better understanding the contribution of WEB PPGIS to the planning process; and practical, learning how to improve WEB based GIS interface in PP processes.

## **STUDY AREA**

The case study is the real-world planning process of "Shapira Neighborhood" in Tel-Aviv, Israel. The neighborhood area is 615,100 sq-mt, located near the new central bus station in the southern part of the city. It has 8700 residents including veterans, new immigrants and foreign workers.

## **METHODOLOGY**

The objective of PP in the "Shapira Neighborhood" plan is to enable the public, to participate actively in the planning a local master plan. The study examines the PP process in four steps. The PPGIS on the WEB consisted components that include the following pattern: development of PPGIS on the WEB architecture; development of an array of questionnaires in both methods; development of counter and monitoring system that analyzes, the number of entrances to the website based on time intervals, and finally hypothesis testing, Figure 1 illustrate process.

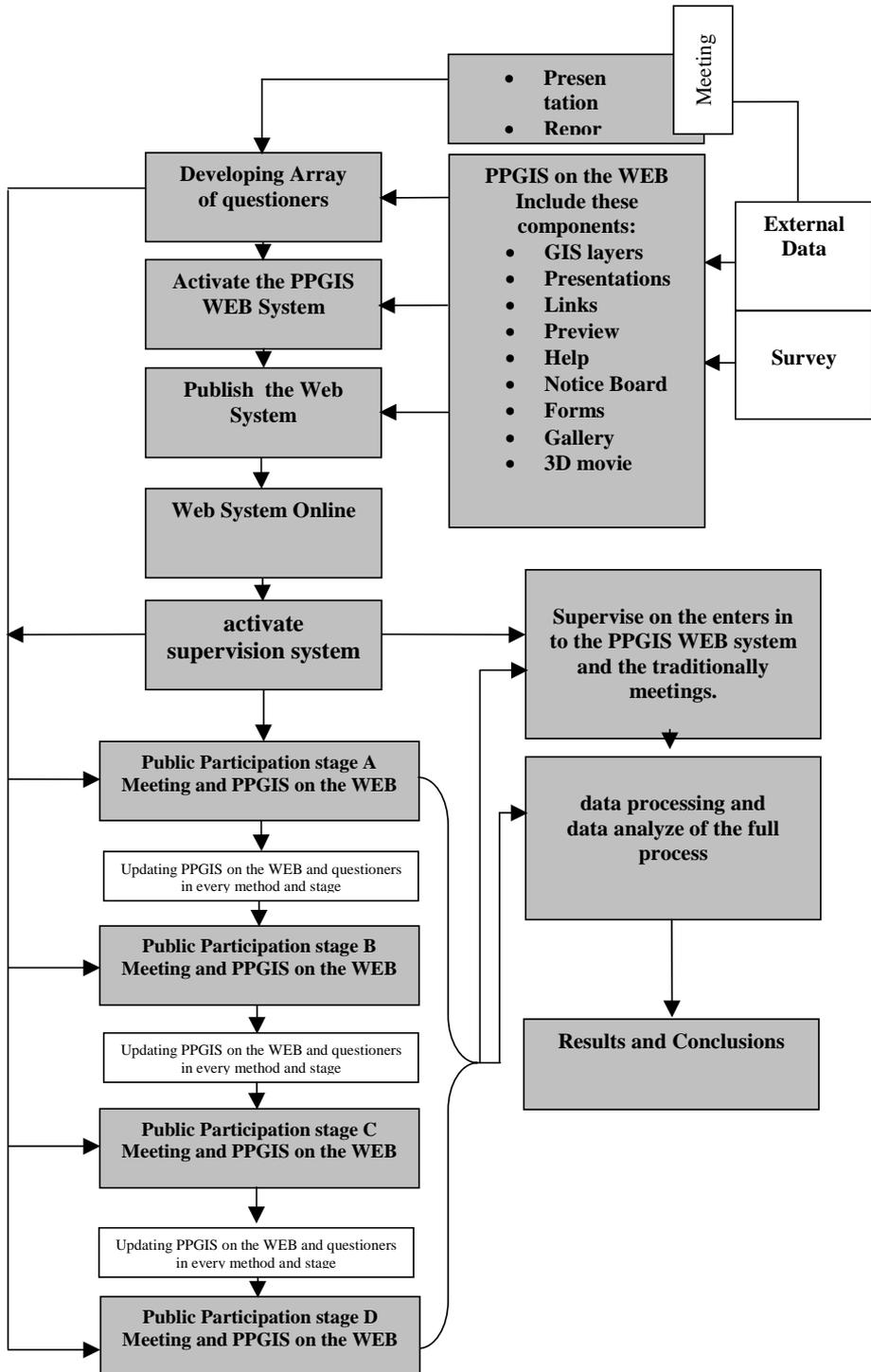


Figure 1: Research process.

## PPGIS ON THE WEB SYSTEM

The system is built on a website with no spatial data (presentations, maps, data), and the GIS web system on the web (based on ARCIMS tools). The site enables the public to participate in the process, everywhere and anytime. It enables viewing extensive amount of GIS-based data from surveys, and statistical analysis on the internet. The data include: Arial photographs geographic information layers such as: neighborhood buildings, business offices, homes, public buildings, open areas, streets, etc. The site contains presentations of various subjects. In addition, the public is able to respond and comment to the planning team and to get an update of the PP with the help of the online awareness billboard. The site address is: <http://shapira.bgu.ac.il> (Hebrew), Figure 2 present print screen of the PPGIS on the WEB system.

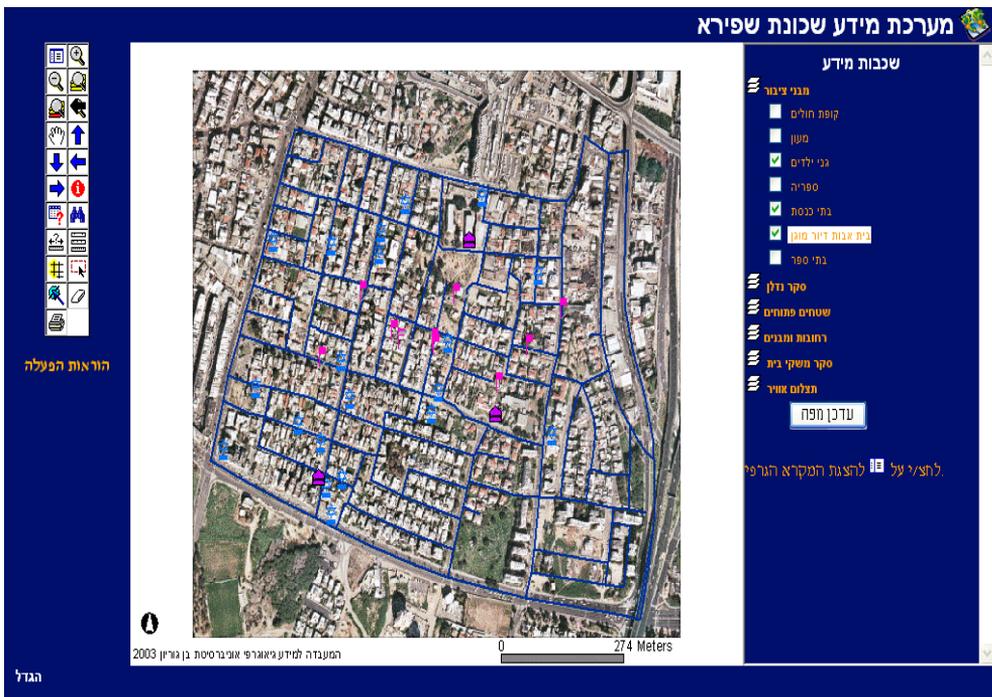


Figure 2: PPGIS on the WEB system.

## SYSTEM ARCHITECTURE

The website architecture contains ASP forms that are related with a Microsoft Access database. These forms enable the public to participate in the planning process. They are regular HTML pages and 3D movies, based on Arc scene, PDF files and galleries. The GIS is composed of a client and ArcIMS Server. The server interacts with the client through HTML viewer. The client is any PC or mobile device with a web browser. The client layer contains the web pages and forms that the user navigates to query and look in the data. The server consists of three layers: presentation layer, business logic layer and the data layer. The presentation layer is a web browser interface that let the users (clients) to examine and select different options. The business logic layer consists of spatial server, application server and connectors. All these components are aimed to transfer and translate the requests

to the right place in the data layer and to transfer the responses to the presentation layer. The data layer contains SQL Spatial database based on GIS software (Arcgis 8.3) .The clients interacts directly with the presentation layer. All communication between the presentation layer and the data layer is taking place in the business logic layer. This layer transfers the user's queries to the data layer and rearranges the results from the data layer in order to present them in the presentation layer, Figure 3 illustrate the system architecture.

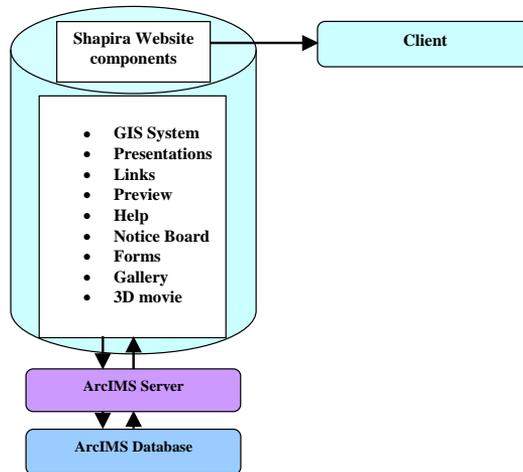


Figure 3 The system architecture.

## PROGNOSIS

Although this study demonstrates the available added values that can be achieved as a result of using a new PP method, additional research is needed. Further research is necessary on the proper user interface. It is also important to examine the improvements in the personal decision process as a result of using the PPGIS on the WEB method in PP. This study is still in process, and should be completed in the summer of 2004. Further conclusions would be prompted then. Since this is a pioneering research, more aspects can be asked and will be examined. Usability, accessibility and the amount of involvement in the personal decision processes, seem to deserve further research as the present study provides only partial

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