

Educational Planning in Palestine: the role of PPGIS

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1. Introduction

Public participation geographic information systems (PPGIS) pertain to the potential of using information and communication technology (ICT) to enhance public participation in spatial decision making. This paper presents the viability for customizing PPGIS to enhance public participation in school planning processes. The range of participants in the traditional participation methods is often diminished due to geographical and temporal constraints (Kingston, 2002), this is especially true in the case of the Palestine with great restrictions on physical movement.

The Internet has partly changed the perception that GIS is an 'elite technology' (Pickles, 1995) and for some time now it has been possible to access GIS functionality over the Internet (Craig et al, 2002, Kingston et al., 2000). Not surprisingly, the Internet makes a well suited medium to facilitate broad-based participation in planning and decision making even in developing countries where Internet diffusion is growing rapidly, giving a wide range of people the opportunity to access and participate in the planning process (Hall and Leahy, 2005). Furthermore the diffusion of Open Source Software (OSS) technology including geospatial web services can be highly customized and easily adapted to various applications, using Open Geospatial Consortium (OGC) standards.

2. Problem definition

Educational planning in Palestine is described as a challenging experience because of the daily Palestinian – Israeli conflict. The critical problem facing the Ministry of Education and Higher Education (MEHE) is how to provide quality education in situations of emergency and crisis (Mahshi, 2001). For many years education services have been deeply affected by frequent closure, mobility restrictions and damage to school buildings by the conflict. Further, the construction of a wall which began in June 2002 cuts through a number of cities and villages and has created several movement barriers and separated teachers and students from their schools (PMEHE, 2005). Given the geo-political situation, governmental institutions including the MEHE have recently realised the importance of working with local communities and the pressing need for innovative means designed to communicate with districts, schools and other stakeholders (Said and Badawi, 2004). The Internet has become the preferred medium of information exchange for Palestinians due to movement restrictions among other aspects (ESCWA, 2005). Over recent years there has been renewed interest among local communities to participate in decision-making processes as they become

increasingly interested in educational and cultural activities as a result of the emergency needs during political crises (DSP, 2002).

Many educational planning problems such as physical accessibility to schools, redistricting schools, school performance and equity are geography-based. School Mapping (SM) techniques that integrate GIS and local communities have been effectively implemented in the school planning process (Govinda, 1999). The research is focused on the potential of web-based GIS in a geographical location faced with many political problems. While many aspects of PPGIS deployment could be investigated this research is focusing specifically on:

- How can the public be involved in school planning?
- What is the role of PPGIS in educational planning in Palestine?
- What tools are needed to assist the public in participation?
- How should the tools be designed and implemented?

The proposal here is to renew the traditional SM techniques as a ‘bottom up’ approach for school planning in the information age by developing Educational Planning Public Participation GIS (EPPGIS) tool for a more interactive communication platform.

3. Research Design:

3.1 Soft Systems Methodology approach

The potential participants using the EPPGIS come from a multiple of geographic locations and will be using the system at different times representing the interests of multiple cultures and a wide range of perspectives. All of these conditions point to the characteristics of this problem: semi-structured, spatial and unbounded organisations which necessitate multiple perspectives on the social, technical and organisational framework of developing an EPPGIS in a Palestinian context. Figure 1 represents the Web Information System Development Methodology (WISDM) used by Vidgen et al. (2002) which is adapted for this research.

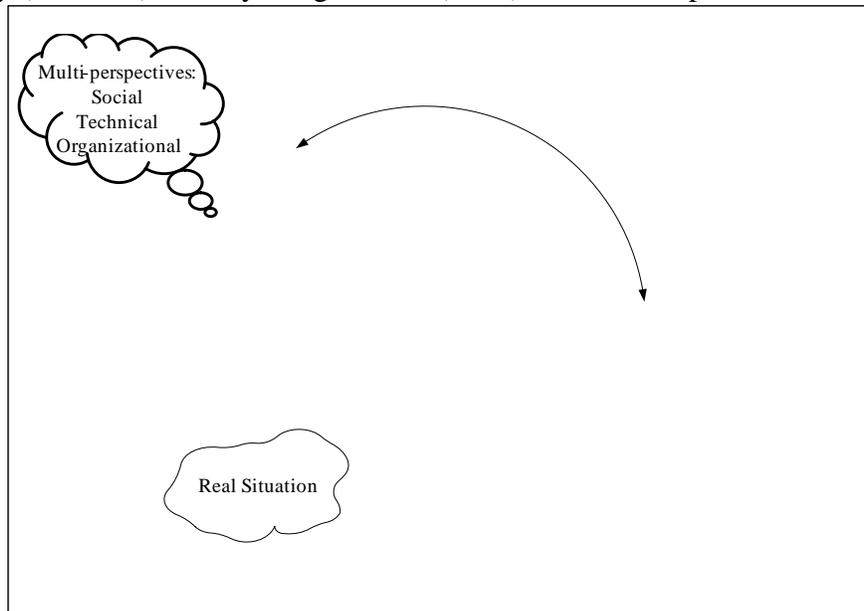


Figure 1: WISDM for EPPGIS (adapted from Vidgen et al. 2002)

The organisational analysis is based on human activity with a seven-stage Soft System Methodology (SSM) developed by Checkland (1999) aimed to arrive at a debate concerned with defining changes that are 'systematically desirable' and 'culturally feasible'. The technical design is concerned with how to integrate the stakeholders' needs and requirements and also with the direct participation of end-users in the information system development including the design of the human-computer interface (HCI). This was achieved by undertaking a series of in-depth stakeholder interviews and focus groups with residents in towns in Palestine during the summer of 2006. This was an extremely complex task considering the Lebanese conflict at the time. The focus here has been on asking potential users of the EPPGIS what they wanted to get out of the participation in school planning process. This was complemented by undertaking a series of interviews with Government officials and academics in Palestine and Jordan who had technical knowledge of web-based participation and GIS.

The findings from the interviews and focus groups suggested that utilising ICT for school planning required moving towards a more participative based process. The MEHE has already recommended the setting up of the required organisational procedures such as improving the technological infrastructure for EPPGIS, raising awareness and training program for stakeholders, and most importantly the legal framework. Since Al-Aqsa Intifada all meetings and workshops among Palestinian regions were conducted by video conference. One interviewee noted that ICT based participation has a good chance of succeeding in Palestine. He added that a high-technology tool is not strange in these environments as long as there is a group of people who can understand and use it. He also cited:

“ even if we are at the lowest level of participation that does not mean that we should move up the ladder gradually step by step. It is not too early to develop this tool and it is the right thing to do. What is required for its success is to put it in 'an incubator' make, an 'artificial environment' in the meantime. This environment would be temporary for developing 'hotbeds for the future... ”

Source: interviewee

3.2 System Functionality

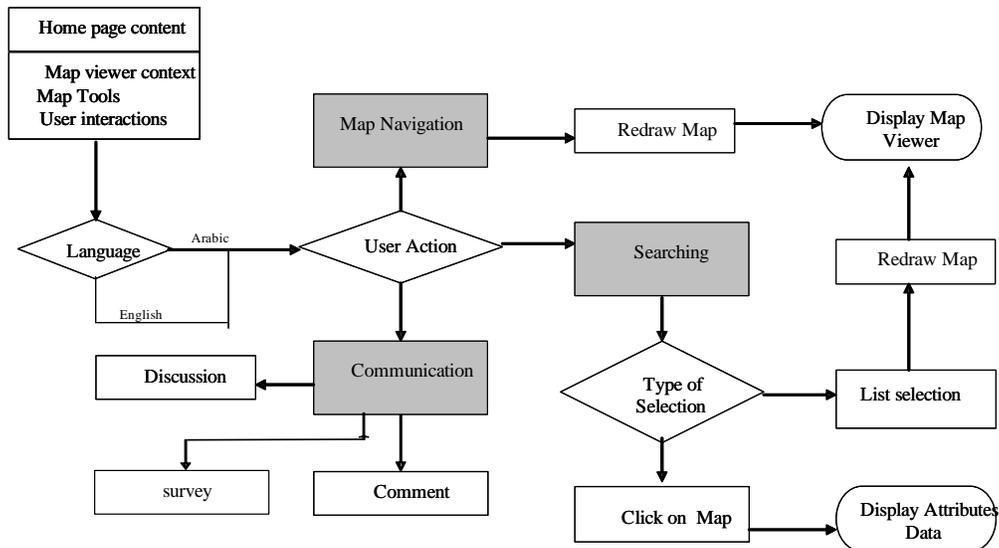
The results from the interviews and focus groups have helped to shape the design on the EPPGIS from many perspectives. Expected end users of this system fall into three categories: the official planners and the related professionals, stakeholders and general publics. Based on the analysis of their requirements, some features are identified as essential for an online participatory decision-making supporting system.

- Providing users with relative educational information (spatial and non spatial data) and instructions to help them understanding the spatial planning process;
- Providing the tools that handle a subset of map navigation (overlay, pan, zoom, measure).
- Enabling users for spatial and attribute queries by selecting features based on location or attribute values.
- Offering interactive ways for stakeholders to communicate with each other (such as online comment, voting and geo-referenced discussion groups); and
- Providing equal opportunity for the public to participate in educational policy making over the Internet.

In designing a web mapping system, critical considerations taken into account included the purpose and functionality of the system, the content and the target user groups. It has also been important to be mindful of the potential users' skills and their needs for an accessible site that has a simple and easy interface to navigate. EPPGIS will enable users to look at the schools within their spatial context by providing basic map layers including among others school locations, barriers to schools, road network and some school photos. Several key terms and concepts are also defined that will greatly aid users in understanding how the EPPGIS system works.

Once the users get general information about the schools in their areas and view spatial data by navigating maps, end users may specify the subject to participate in with three options: to text comments, to fill online survey and on line discussion forum Figure 2. Users also can view previous users' comments, results of the survey and the discussion forum.

Figure 2: Process flow of the EPPGIS



EPPGIS will create a channel for the official planners to collect diverse viewpoints about how to improve the equity, quality and acceptability of schools. It is anticipated that planners would initiate online survey or discussions on a particular topic at specific time. For example, problems like location and allocation of the educational resources, where to locate a new school, school safety, the requirements and needs of school facilities. After that, by joining in and leading an efficient and fair online discussion, decision makers and planners can determine the needs of each school which help in setting the proposed plans. Residents can also initiate and generate their own discussions when issues of importance to them arise.

3.3. System Design

In designing a typical web-based mapping application a thin client three-tier architecture is followed (Peng and Tsou, 2003) . The EPPGIS is now being developed as a pilot application figure 3. The tool will have a multi-lingual interface in Arabic and English with architecture based on OSS using OGC compliant WMS technology, mySQL for the database and PHP scripting language for the discussion forum. The next steps in the research are to improve the user interface based on feedback from stakeholders and through pilot testing to check its functionality and user friendliness. This provides a rich set of data with which to test the robustness of the system design and the future potential for EPPGIS in Palestine. While the technical development and implementation issues are not to be underestimated it is the usability and acceptance by the public and the decision making community which is most important.

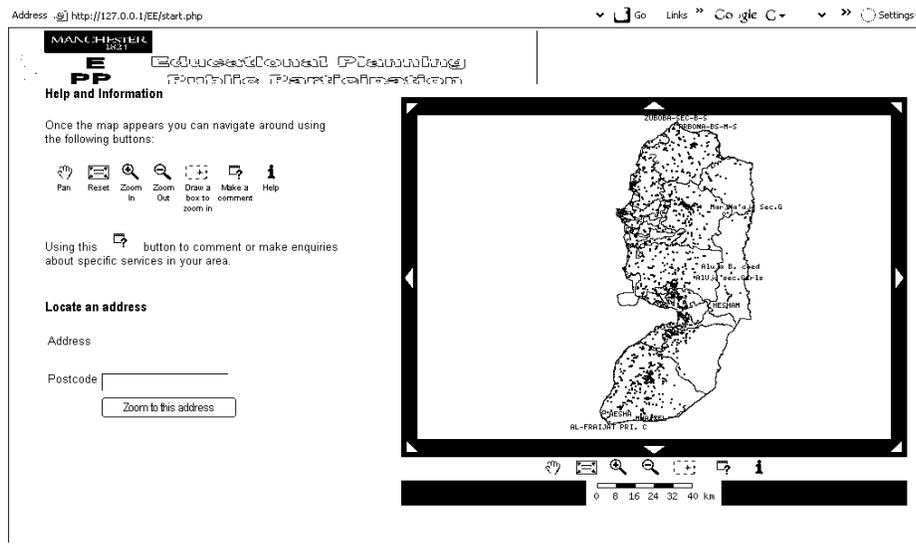


Figure 2: EPPGIS Interface

4. Conclusions

This paper presentation will focus on the system design and pilot testing which has been developed in conjunction with the stakeholders and focus group discussions. Over the coming months pilot testing will offer results to help improve this EPPGIS in Palestine. It is hoped that this will help to feed in to other participatory processes outside of the educational planning process in areas such as physical planning and redevelopment. There are many who have a preference for face to face interaction and the belief that these new technologies are not effective in empowering the general public and that they are targeted at skilled and educated people. The unique situation in Palestine means that the effectiveness of EPPGIS for providing information, communicating with, and discussing educational policy issues with stakeholders is promising for the near future with the Internet providing the potential to create a communication ‘bridge’ among Palestinian people.

5. Acknowledgements

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Biography

Khitam Shraim is a 2nd year PhD student funded by the Ford Foundation. She has an undergraduate degree in Computer Science, a masters degree in Finance and was previously a civil servant in the Palestinian Education Authority. Her supervisor, Richard Kingston, is a lecturer in urban planning and GIS who has broad research expertise in PPGIS.