A SOCIAL AND GENDERED ANALYSIS OF THE UTILIZATION OF A VR PLANNING TOOL FOR PUBLIC PARTICIPATION

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Abstract

The paper is a follow-up to earlier work investigating the research hypothesis that Virtual Reality (VR) is nowadays a mature technology, suitable for communicating planning ideas. A work in progress involving the redesign of two squares within the urban fabric of a deprived Athenian neighbourhood is presented. A VR model of existing and proposed layouts was constructed, focusing on accuracy of visualisation, ease of navigation, online spatialized commenting mechanism and ease of access. User groups were supported with appropriate training—researchers had the opportunity to observe the reactions of people and deliver questionnaires that help identify problem areas related to technophobia, disbelief, past knowledge, communication skills, understanding of the visualisation system used, usability of the navigation system as well as the commenting mechanism. Gender and social exclusion are key issues in this particular multicultural neighbourhood. Collecting demographic data on all participants (age, sex, education level, employment, marital status, etc.) during the commenting process enables a series of analyses testing the ways the system is used.

1. Introduction

The present study is a follow up to earlier work (Bourdakis 2004) investigating the conjecture that Virtual Reality (VR) is nowadays a mature technology, suitable for communicating planning ideas at different levels of urban design, for sustaining a dialogue amongst interested bodies and individuals and for encouraging active participation in the public domain of decision making. Whilst, the development of the VR planning tool[1] investigates technology mediated methods of improving public participation in urban planning, the usage analysis of the VR planning tool focuses in the social and gender issues of human-computer interaction[2].

The case study of urban planning discussed, involves the redesign of two squares within the urban fabric of the deprived Athenian municipality of Kato Agia Varvara, in Greece. This urban regeneration involves the refurbishment of street elevations, new plan layout, development of a small park, new flora as well as improvements on pedestrian movement, street lighting, etc.

Analysis of the implementation of the VR tool stresses the need to 'view' the tool as a technical artifact that is socially shaped and evolves within the social, economic and political context of the local community.

2. Network society and technological determinism

In a global economy, communities are experiencing historically unprecedented change as they try to adapt to a more interconnected but highly uncertain world. In the resulting 'Network Society', the compression of space and time made possible by the new information and communication technologies alters the speed and scope of decisions. Organizations can decentralize and disperse, with high-level decision making remaining in 'world cities' while lower level operations, linked to the centre by communication networks can take place virtually anywhere. For Castells (1996), the information age, organized around 'the space of flows and timeless time', marks a whole new epoch in the human experience.

In a similar line of thinking Virilio (1991) speculates that the '...*neo-geological [...] fossil of past societies whose technologies were intimately aligned with the visible transformation of matter*' will be displaced by electronic (virtual) constructs generated by use of the Internet. He writes that '...*[f]rom here on, urban architecture has to work with the opening of a new 'technological space-time [...] Instead of operating space of a constructed social fabric, the intersecting and connecting grid of highway and service systems now occurs in the sequences of an*

imperceptible organization of time in which the man/ machine interface replaces the facades of building as the surfaces of property allotments' (Virilio, 1991).

Castells and Virilio's speculations are seen by many as being well on their way to becoming reality in the early part of the 21st century. However, the above views are also criticized as portraying *'technological determinism'* overdrawn from the idea that technology, specifically information and communication technology, is the most important cause of social change (Wacjman, 2002). As far as urban planning is concerned, the European Council of Town Planners (ECTP) presents a vision on the future of European cities as the *'connected city'* where *'... new systems of representation and participation will be developed, making full use of easier access to information and to wider involvement of active citizens' networks, thus giving them all -residents and users- a voice on the future of their urban environment'*. In this realm, the EU and the individual member states are actively pursuing e-government strategies, with substantial claims being made for their potential of new technology, especially the Internet, to revise participation and reinvigorate democracy (PICT report). Thus, access to technological resources and educational training for the information age are promoted as the fundamental equity issues. This vision is further criticized as promoting a 'technocratic discourse', encouraging the belief in simple technological fixes to complex social problems, and also as obtaining the belief that *'technological rationality'* translates into '*political rationality'*.

A social perspective concerning technology use promotes the premise that the ways information technologies are being understood and used are affected at the most profound level by the society in which it is conducted. In this realm, technological artifacts are socially shaped. Similarly, the use of information technology as a tool for public participation in urban planning cannot be accepted as a straightforward utilization of 'technical rationality' for producing *'political rationality'*. Instead, one need to question what the quality of utilization is, who the users are and what the meaning of their participation in the process of decision making is.

3. The community of Kato Agia Varvara, the VR technology and questions about its utilization

Kato Agia Varvara is one of the poorest boroughs of Athens with half its households below the EU poverty line. A community of high multicultural mix (15% Roma gypsies and East European refugees or economic immigrants) on a total of almost 6000 inhabitants within 22 hectares. This deprived area has illiteracy levels reaching 40% (compared to an estimated 8% for Greece[3]), current school drop-out of 21% (compared to 3% for Greece), high unemployment (24% compared to 10.5% overall) and many single parent families.

Part of the borough's redevelopment agenda is the renovation of two of its three main squares; the one located centrally next to the welfare center for the elderly, whereas the other is an oblong area bordering a cemetery. Both squares are barely functional at the moment, with some vegetation, street furniture in a sorry state, no grass, etc. A 3D VR model of the existing and proposed layout (based on contractor's base plans and researchers' land photogrametric survey data) was constructed, focusing on accuracy of visualization, ease of navigation and an elaborate online specialized commenting mechanism (discussed in depth elsewhere, see Bourdakis 2004). All community members and visitors can potentially add comments visible by all other users and tracked by the researchers. Key to success is the ease of access from local points (welfare center for the elderly, public secondary schools, municipality premises) as well as from home via the internet.

'Public participation in planning', is for many a

Figure 1. Kato Agia Varvara site plan.

problematic concept, and as Burton (2003) argues we need a deeper consideration of which 'public' we mean, what type of 'participation' we desire, and what we mean by 'planning'. In addition, the use of technology as a mediator for increasing participation has been criticized as a superficial vision for the active participatory democratic citizen. Instead, technology can be approached as being part of a socially framed artifact. As a result, the central scope in our study was to explore how people utilize and interact with the VR technology and how this experience relates to the potential of their participation in planning for the square(s) renovation. This took place by employing a number of methods, namely by analyzing comments and relating them to a short questionnaire that maps users' profile, undertaking ethnographic observations at several times of our interactions with citizens, planners, the mayor at the municipality level and finally by employing focused interviews.

4. Profile of participants

The VR application as well as being available on the web[4], was also installed at the welfare center for the elderly. Two official sessions were organized, with lectures featuring audiovisual material, introducing the topic of public participation, examples of planning exercises carried out abroad, followed by detailed explanation of the VR tool, and how it generates feedback[5].

Following a period of almost two months, data were collected from two sources; the digital commenting mechanism that recorded 87 entries and a dozen semi-structured interviews following one-to-one sessions on the VR tool. Keeping in mind that one subject would sometimes comment more than once, the estimated number of people that interacted with the system was close to 50. The discussion that follows is based on the comments recorded and not on the estimated number of users. Starting with, 28% of the comments were made by men and 72% by women—not a representative distribution. The synthesis of age groups within the sample however is representative, with 36-45 year olds counting for 27% and 26-35 year olds for 21%. Due to

the placement of the computers in the welfare center for the elderly, old age pensioners are well represented with 20%. All but one of the comments are made by Greek nationals, there was only one Roma gypsy participating. Almost half the sample has completed the secondary education (compulsory in Greece up to the age of 15), there is a 8% of illiterate, 20% of primary education (mainly the elderly) and 15% of University graduates. In terms of occupation, the vast majority were working 80%, 7% retired and 5% unemployed. Compared to the

Figure 2. Aspects of the VR planning tool

available data for the area and the ages of the sample, we can assert that the system failed to attract the unemployed.

5. Types of commenting

During the VR tool design process, commenting was anticipated to be either positive or negative; hence the introduction of green rhombus and the orange-fuchsia exclamation mark as the relevant symbols. However the analysis showed that only 31% of the comments were negative, and only 9% positive. The majority of the comments (60%) can be classified as suggestive; not necessarily negative nor positive (see Figure 3).

Comments/suggestions listed in terms of importance by the public are: introduction of water in any form such as a pool or a fountain 18%, playground 13%, street furniture (disagreements with proposed design for seating and litter bins) 11%, security 10%, lighting 6%, followed by plants (types and number of trees, any trees cut), support for the disabled, aesthetics, colors (all under 5%). Public

Figure 3. Commenting mechanism of the VR tool

was also concerned on the long term implications and whether the municipality would take over and "manage" the squares (cleaning, watering and securing)

6. A gendered approach to technology use

Both 'urban planning' and 'public decision making' are domains traditionally out of the reach of women. Despite the advances that were made through the critique of science and technology in the 70s and the 80s, most feminist studies, saw science and technology as a masculine domain, alien and opposed to women's interests. However, recent studies go beyond sex differences and focus on articulating technology's sociality (Wacjman, 2002, Haraway, 1997) and attempt to challenge a naïve 'technological determinism' as far as the intertwining of technology and society are concerned, promoting the view that the content and direction of technological innovation are amenable to sociological analysis and explanation.

Towards this end, a gendered analysis needs to point out at least two issues. *First*, nowadays the role of women as technology users cannot be defined as subordinate to men, but as changing, fluid and performative (Haraway, 1997). Indeed, in our study, gender participation in the public process of commenting does not seem to follow the traditional pattern of women under-representation. On the contrary, it is important to ask what makes women commenting so much more than men in this context. What are the types of issues that they comment on? What hopes do they place on technology as a medium for their participation in this process of planning? Could we then conclude that women are more active users of the VR tool than men and thus potentially more active public participators through the use of technology?

Second, a gendered approach needs to approach technology as not fixed at the innovation stage but as evolving in their implementation and use. This means not only that technology is shaped through social context(s) and users (e.g. the notion of 'interpretative flexibility' as introduced by Pinch and Bijker, 1987), but it also retains a 'power' on its own (e.g. the notion of 'power of objects' and 'delegation to non-humans' as introduced by Latour, 1992).

In terms of 'interpretative flexibility', there are two distinct groups of users. Young users, mainly secondary school boys and girls, that had a *direct and independent interaction* with technology. They handled the VR model as yet another game environment, albeit with no enemies to shoot at, but they identified a well-known physical space compared to the typically unknown, "hostile" one of games. A *mediated interaction* was employed by older people who did not interact on their own – but talked and commented through the aid of a mediator[6] who demonstrated the VR tool, helped them navigate and typed in their comments. No-one over the age of 50 dared to actually 'grab' the mouse. Yet, their interaction evoked their own personal concerns about the area, their local stories and experiences in a very passionate form. The VR planning tool acted for them as a video-footage of a future situation that enabled reflection on past and present experiences.

The notion of 'power' has a double meaning here. On the one hand, the technology seems to (em)power women and older people to raise a voice by commenting either through direct or (more often) mediated interaction. On the other hand, the type of 'active' participation that both men and women can potentially perform during the actual planning process does not rest with technology itself, but is part of how stakeholders (planners, engineers, municipality, etc), citizens and technology interact and cooperate.

7. Concluding remarks

As far as the VR tool development is concerned, the spatial properties of the commenting process needs to be further analyzed, in terms of ways a user is affected by previous users/visitors comments and the overall placement of comments. Future work should, amongst others, also measure technophobia, navigability, landmark identification (relatively easy due to the topography of the particular squares[7]) and usability of birds' eye views in comparison to animated ones. At the gender level, further analysis is needed in terms of the typology of comments done by women and men, the type of interaction with the technology tool as well as how that affects their involvement in public decision making as far as urban planning is concerned.

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Endnotes

1 Planning Inclusion of Clients through e-training (PICT), Leonardo da Vinci funded, EU research grand (2001-2005)

2 'Technology, Mathematics and Gender', Pythagoras I, Greek Ministry of Education research grand (2004-2007)

3 Due to last decade's substantial increase of economic immigrants that have not yet been assimilated in the Greek education system. Pre 1990 value was approximately 4%

4 URL: http://fos.prd.uth.gr/vrml/uth/PICT/

5 The learning material developed for the project by the University of Thessaly, is organized in three distinct parts; the Core part introducing concepts, technology and tools to everybody, the Public oriented, focusing on communication and visualization for the public and finally the Planners' oriented where the emphasis is placed on co-operation and planning design. This structure enables the custom creation of teaching modules for taught courses, or distance-learning courses as designated by the skills of the participants.

6 There was a mediator/helper available most evenings at the welfare center for the elderly. Her approach was pro-active, challenging people and arranging sessions helping them investigate the model and comment on the proposals.

7 High-rise buildings on the north and west on the one square, continuous cemetery wall on the south-east on the other facilitates way finding.

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