ABSTRACT
Participatory planning is a new paradigm in urban and
community planning and a part of the future of the partici-
pation is on the Web. In this paper, new Web-based par-
ticipation methods, along with their possibilities and chal-
lenges are studied. An urban planning experiment was car-
ried out in the autumn 2007 in Pyhäjärvi, Finland. A Web
mapping application was developed for the experiment to
help the planners to acquire local knowledge from the citi-
zens. In addition to the planning data provided by the ap-
plication, the experiment was investigated by monitoring
the traffic on the Web site of the experiment, a Web
questionnaire and also by in situ observations. The results
indicate that a Web mapping application not only supports
the traditional participation methods, but may also change
the nature of participation in the planning process.

Keywords
Participatory design, urban planning, Web-based participa-
tion, Web mapping, e-democracy

INTRODUCTION
During the past decade, a need to involve new stakeholders
in the urban planning process has arisen. Local knowledge
based on people’s daily life experiences is attached to the
physical places where people live, work and act [8]. Urban
development changes these places, making it essential to
give local people an opportunity to contribute to the plan-
ning knowledge traditionally dominated by specialists [9].
In Finland this need has been sharpened by a change in the
legislation on land use and development. Previously the
only legal form of influencing the urban planning process
has been to make a formal complaint against the finished
plan, but from 2004 on it has been obligatory to involve
citizens already in the process of preparation of plans.
No standard procedure how to do this exists, however, and
so the Laboratory of Planning and Urban Design has been
already for several years developing a participatory ap-
proach in urban planning, based on citizen support groups
involved in the design process. In cooperation with them
our research group has made an experiment, if citizen par-
ticipation can be improved by the means of a Web-based
commenting system. This paper reports on the experiment
and results of it.

PREVIOUS RESEARCH
Over recent years, conventional methods of participation
have been criticized by many [5]. Nowadays, citizens pre-
fer selective, focused, and limited local level involvemen-
t [12], which is not supported by these methods. Equality in
communication among the citizens and between laymen
and the responsible officials is difficult to ensure in public
meetings that, in addition, are usually held at a fixed time
and in fixed place. Moreover, the firm and unreceptive ur-
ban planning system is founded on expert knowledge that
during the process takes the form of planning maps and
surveys difficult for laymen to understand and prepare [9].
Therefore, new methods for public participation are needed
in order to make the urban planning process more democ-
ratic.

Electronic democracy or e-democracy may be defined as
the use of information and communications technology
(ICT) to connect politicians and citizens by means of in-
formation, voting, polling, or discussion [1]. ICT can be
used to improve traditional ways of citizens’ involvemen-
to urban planning processes by e.g. enabling asynchronous
communication, making participation more flexible in
terms of time and location and supporting new ways of
visualization [12]. Particularly the Internet as an informal
and open medium can provide an efficient means of coop-
eration and information exchange between the involved
parties [9]. The importance of the Internet and particularly
the World Wide Web (Web) as a tool of e-democracy has
increased significantly over the last years as is seen in the
latest definitions of policy drawn in the information society
strategies of the European Union (EU) [2]. Due to the exe-
cution of these strategies, the availability of the electronic
services (e-services) has improved significantly. A good
example of this is the Planning Portal enabling access to
planning advice, guidance and service provided by the UK Government [4]. So far, only a few experiments have been made where Web-based participation methods are applied in urban planning processes. One of them is softGIS in Finland [3], where textual comments on the quality of living environment were collected from citizens by using a map-based system. There was, however, no actual planning process going on. The research group led by Prof. Ueno in Mushashi Institute of Technology at Yokohama is currently doing very similar experiments than the one reported here, but they are related to citizen activity in general, not to actual urban planning.

New Web-based methods of participation should be designed to enhance, not to replace the conventional ones [6]. All methods of participation are, at least to some extent, contextual and therefore, it is important to ground the new methods in practice in order to ensure the additional value the local knowledge gives to the knowledge creation of the planning process. In this paper, possibilities and challenges of new Web-based participation methods in an urban planning project are explored.

CASE PYHÄJÄRVI, FINLAND

An experiment related to participatory planning in cooperation with the Laboratory of Planning and Urban Design was conducted within a course of urban planning during the autumn 2007. A group of 11 students of architecture and applied geography and regional planning volunteered to take part in the study.

Pyhäsalmi is a rural municipality with 6200 inhabitants in Northern Finland. Pyhäsalmi is facing challenges quite typical of many Finnish rural towns such as decreasing number of inhabitants and aging population. A special characteristic of the town is the Pyhäsalmi mine, which produces zinc and copper and is by far the biggest employer in the area. Knowing that the mining activity will continue only for a limited time, the uncertainty about the future puts pressure on municipal officials to consider new alternatives to diversify the economic and redesign the regional structure. Because of that, the focus of economic activity is being redirected to the junction area of south – north highway E75, which is located about five kilometers north-west from the Pyhäsalmi centre. The development of the residential area built for miners on 1960’s, the complementary building of the Pyhäsalmi centre and the new building of the E75 highway junction area were three main objectives of this participatory urban planning experiment (Figure 1).

During the 3-month planning work, the students initially produced three alternative plans for the target areas. By synthesizing these alternative solutions, the final strategic plan of the land use for the possible future use by municipality was made. The essential feature in the planning process was participation, which was supported by four conventional participation methods. During the five visits the planning group made from Oulu (160 km north from Pyhäsalmi), a citizen support group consisting of local parties of interest: inhabitants, municipal officials, entrepreneurs and other active members of the community had a chance to influence in the planning process by making comments and suggestions. Two public meetings were held, at the beginning and at the end of the planning experiment. The initial alternative plans and the final plan were exhibited to public in the town hall with an opportunity to give feedback. For analyzing the target areas, a participation method called “gätur” (“a walk trip”) was used. Gätur is an environmental psychological method developed in Sweden from POE (Post-Occupancy Evaluation) used in e.g. the United States and UK. Beside the conventional methods, new Web-based participation technologies were developed for supporting the acquisition of local knowledge, enhancing the variational method of design and making the planning process more transparent.

TECHNICAL SETTING

The extensive coverage of wideband Internet also in rural areas of Finland made the Web a natural platform for participation. As in general, Pyhäsalmi municipality had very limited resources to support the participation during the urban planning process. Therefore, one goal of the technology development in the experiment was to produce an inexpensive technology, which could be easily used and maintained after the experiment by municipal officials in similar planning processes. However, the main objective for the selection of the methods and technologies was to make citizen group actively involved in the planning process larger and more heterogeneous.

Figure 1: Three target areas of the planning in WMM map.

Three months prior to the start of the actual planning work, Web pages informing citizens of the experiment were opened. Free open source software called WordPress (http://wordpress.org/) was used as a publishing platform.
for delivering information and plans as well as supporting the discussion and moderation. The purpose of discussion forums was to enhance the externalization and combination phases of the urban planning knowledge creation [7][9] to get local knowledge utilized in the process. The sketches of the alternative plans and the final strategic plan of the land use were opened for discussion on the Web pages of the experiment, as it is crucial for citizens to see their contribution to the planning process in concrete when the essence of participation is considered.

A Web mapping application called WebMapMedia (WMM) for obtaining the local knowledge in the form of comments and pictures was developed for the experiment and embedded in the WordPress platform. WMM can be considered a virtual combination of two traditional participation methods: photovoice, by which people can identify, represent and enhance their community through a specific photographic technique [11], previously used to give voice to people whose views are overlooked or discounted [13], and sticker-map method that enables citizens to mark locations with personal significance by placing colored symbols on the map [10]. WMM was built on Google Maps, a free Web Map Server and its API (http://code.google.com/apis/maps/) offering JavaScript functions to operate with draggable street maps and satellite images.

WMM allows citizens to place three kinds of markers on the map: red color symbolizes places that need to be developed, green meant places that should be preserved and yellow other opinions. Comments, pictures and the geographic coordinates related to the marker are formatted with a PHP script and stored in the MySQL database (http://www.mysql.com) of WordPress. When a citizen wants to use the WMM for viewing the marked places, Google Maps API places the symbols on the map using the XML data generated by PHP script with Ajax technology that results in a flowing interaction for the user. The whole idea of WMM is in map-based discussion. By clicking a marker on the map, a bubble with a thumbnail of the picture and hyperlink to the discussion about the place opens (Figure 1). To control the continuous flow of local data, RSS feeds were provided by WMM for the planners.

RESULTS AND ANALYSIS
The data for the analysis of the experiment was acquired in three different ways. Statistical data about the usage of the Web pages of the experiment was provided by Google Analytics (http://www.google.com/analytics/) application. In order to find out background information of the users and their opinions about WMM, optional Web questionnaire forms for both the citizens and the planners were available in the Web pages of the experiment. The public meetings, the meetings of the citizen support group and the planning work of the students were observed in situ. In addition, the comments and pictures collected with WMM were used in the analysis.

In total, 136 comments were posted in WMM. About two thirds, i.e. 27 markers placed on the map of WMM indicated the need of development of a place. The questionnaire form was completed by 28 citizens of whom 24 had marked a place on the map. All respondents found WMM easy to use. An interesting result revealed by the responses was that about a third of respondents were under 20 and over half of them under 30-years old. On the other hand, according to the in situ observations, the participants of the public and the citizen support group meetings were mostly over 50-years old men. In fact, in the public meetings there were only two other participants besides the active members of the citizen support group. From the questionnaire responses, it was also found that a few citizen users of WMM were former inhabitants of Pyhätärvi. From these results, it can be concluded that WMM increased the size of the active participant group as well as made the group more heterogeneous.

In the aspect of the urban planning knowledge creation, WMM managed to support the externalization of local knowledge in some extent. On the other hand, the results of the planners’ questionnaire and the lack of comments about the sketches and plans revealed that the combination of externalized local knowledge with the expert knowledge of the planners failed. Particularly interesting was the discussion about the E75 highway junction area already under development. Threat of a change in immediate surroundings is known to activate people. As a result of communication, the opinions about the area took the form of explicit knowledge that was, however, only partly used in the planning. Planners stated that the proposals made by citizens were too general to be used in the specific planning work. The findings of the questionnaire study reveal that the planners were not, on the other hand, willing to participate in discussion on the WMM forum.

Google Analytics registered about 1600 visits in the Web pages of the experiment during the 3-month planning work. In addition to the Web, the information about the experiment and WMM in participation was delivered in the public meetings, in the articles of a local newspaper and in the posters sent to schools, library, swimming hall and other public places. The importance of traditional media in informing was discovered during the experiment. Google Analytics shows highest frequencies of visits on the days following the appearance of WMM advertisements in the newspaper and the meetings of the citizen support group. Thus, the analysis of the visit frequency with respect to time indicates that a Web-based participation technology can support the traditional participation methods and vice versa.

Examination of the usage of WMM shows that the establishment of a new virtual discussion forum is challenging. For a few days, the citizens’ debate on the experiment was fierce on a national discussion forum called suomi24 (http://keskustelu.suomi24.fi/). During that time, only few
comments were posted in WMM. On the other hand, after the link to the Web pages of the experiment was given out in the suomi24 forum, the frequency of referral visits in the WMM increased by a factor of five, according to Google Analytics. Considering the small quantity of digital photographs posted in WMM, one could deduce that people are not yet used to express their opinions by pictures on the Internet. Furthermore, the data collected by Google Analytics reveals that the use of WMM concentrated almost solely on weekdays, which suggests that WMM was used mainly in workplaces and schools during the breaks. This raises a question whether a planned, non-spontaneous participation such as taking and posting a picture requires more commitment to the planning process than people are ready for. This suggestion is supported by the fact that the commentary map of WMM was viewed approximately 4000 times whereas the Web pages including the sketches and the plans were viewed only under 400 times. However, the visitors stayed clearly longer time on the pages with the three alternative plans than on WMM. In addition, a careful analysis of the WMM data revealed that most comments about the sketches were posted by the active participants i.e. members of the citizen support group and that the planners, despite having RSS feeds available, found the following of the discussion forum too time consuming.

CONCLUSION

The results of the experiment showed that a Web-based mapping solution supports well the traditional methods used in the participatory urban planning process. A Web-based application is suitable especially for acquiring local knowledge and it is an easy and inexpensive way to enlarge and diversify the group of participants. It was, however, found that the Web-based participation was more random, shallow and short-term than the traditional participation. Anyhow, by using a map based participation methods the communication between the citizens can be focused on the issues relevant to the planning process, thus simplifying the integration of the local knowledge in the process.

The biggest challenge also to the Web-based participatory urban and community planning is in combining the local knowledge with the planning knowledge and vice versa. Although the local level creation and planning can be supported by discussion forums, it is essential to mould the attitudes of the planners more responsive towards the knowledge produced by laymen. The discussion in the Web forums should be made truly two-way which can be achieved with the aid of experiments like this and a suitable technology. In future, new technologies, particularly for the visualization of the planning sketches are needed. As the mobile phones with an integrated GPS are becoming common the acquisition of also image data from the target areas of planning will become easier. Interesting topics for the future research include the development of virtual Web-based versions of other traditional participation methods such as gâtur and finding new ways to use the pictures taken by the local people in the planning process.

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