

# 3dkroner.dk – an interactive, web based 4D public participation tool

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## 1 INTRODUCTION / ABSTRACT

In an intensive workshop from November 11<sup>th</sup> to November 18<sup>th</sup> 2002, five teams consisting of members of architectural offices, artists, planners, developers, citizens & students came forward with a series of ideas & designs at urban & landscape level for Trekroner Øst, a new neighbourhood in Roskilde, Denmark.. 3dkroner.dk<sup>1</sup>, an interactive, web based 4D public participation tool (PPT) was created and used for communicating the workshop's results to a broader public on the one hand, and to start a two way communication process between planners and citizens on the other hand. In this paper I will rather describe the tool's development, its implementation in the workshop and the experiences the project team made from this process than discuss public participation tools in general.

## 2 BACKGROUND

In Roskilde, a town of 53.000 inhabitants about 50 kilometres west of the city centre of Copenhagen, the city council has been working on the development of an area called Trekroner for some years now. According to HUR (Hovedstadens Udviklingsråd)<sup>2</sup>, the Greater Copenhagen Authority, Trekroner is one of the focus areas which were selected as priority zones for urban development within the Øresund region containing greater Copenhagen and parts of southern Sweden. The area's proximity to Roskilde university centre (RUC), a railway station on a main line to Copenhagen and the vicinity to recreational areas are some of the attractive factors pointed out by the city council. Nature and knowledge in symbiosis should be – according to the city council – objectives in the development of Trekroner.

While some parts of Trekroner have already been developed and inhabited and others are currently under construction, Trekroner Øst was still in a pre-sketch phase at the beginning of November 2002. Funds set aside by the „bedre Byrum“ (Better urban spaces) pool (Fonden Realdania 2002), supplied by the city council's own finances should be the main driving force in developing Trekroner Øst. For the first time in Denmark, a new approach in planning was used, where the space between future buildings was to be developed before plans for buildings actually existed. “Et netværk af oplevelsessteder og forbindelser” - *A network of eventful places and connections* [translation by the author], was the title of the project which was initiated by a workshop in the second week of November 2002 (Roskilde Kommune and Valeur 2002). Artists, planners from the city council, developers and representatives from non-governmental organizations and local resident's associations were asked to participate in the workshop in one of five groups, led by a member of five selected, recently founded architectural offices<sup>3</sup>. Every team was asked to work with one future linear urban space. As these spaces overlapped, the teams were forced to meet and discuss the zones they had to work on in common throughout the workshop. (See Fig1.) Every evening throughout the week, the public was invited to visit the place where the workshop was held to establish direct contact with the participants. On the last evening a wider presentation was given to the public. The press were invited to follow the workshop too.



Fig. 1 the five linear urban spaces, © Roskilde Kommune & Uid

<sup>1</sup> 3dkroner.dk is a product of the collaboration between Bernhard Snizek / metascapes and Henrik Valeur/Uid

<sup>2</sup> <http://www.hur.dk>

<sup>3</sup> The five offices involved were Copenhagenoffice, kollision, PlanB, plot & Uid, a list of all participants can be seen at <http://www.3dkroner.dk/teams/grupper.htm>

### 3 DEVELOPMENT OF A 4D PUBLIC PARTICIPATION TOOL

#### 3.1 Goals

As public participation was intended to be a key issue in the development process of Trekroner and the initial attempt of implementing a simple Internet based discussion forum into the main project's homepage was not too successful, a new way of discussing the project was sought. At the initial phase of developing Trekroner Øst, the workshop seemed to be a good starting point for developing and introducing a completely new kind of planning support system (PSS) or rather a public participation tool (PPT) in a Denmark.

The task was to develop an Internet site that should

1. inform about the project's basic constraints and announce the workshop before its beginning
2. show the workshop's results in interactive 3D
3. show the additions and changes made every day through the workshop period
4. give the opportunity to get in contact with the workshop's participants during and after the workshop by discussion
5. make an ongoing discussion between citizens, planners and other interested people possible
6. make it possible to discuss specific places (locations)
7. store opinions and discussions for further use in the planning process
8. document the planning process visually
9. be useful in presenting the progress of the workshop in desktop VR

#### 3.2 Structure & functions of the PPT

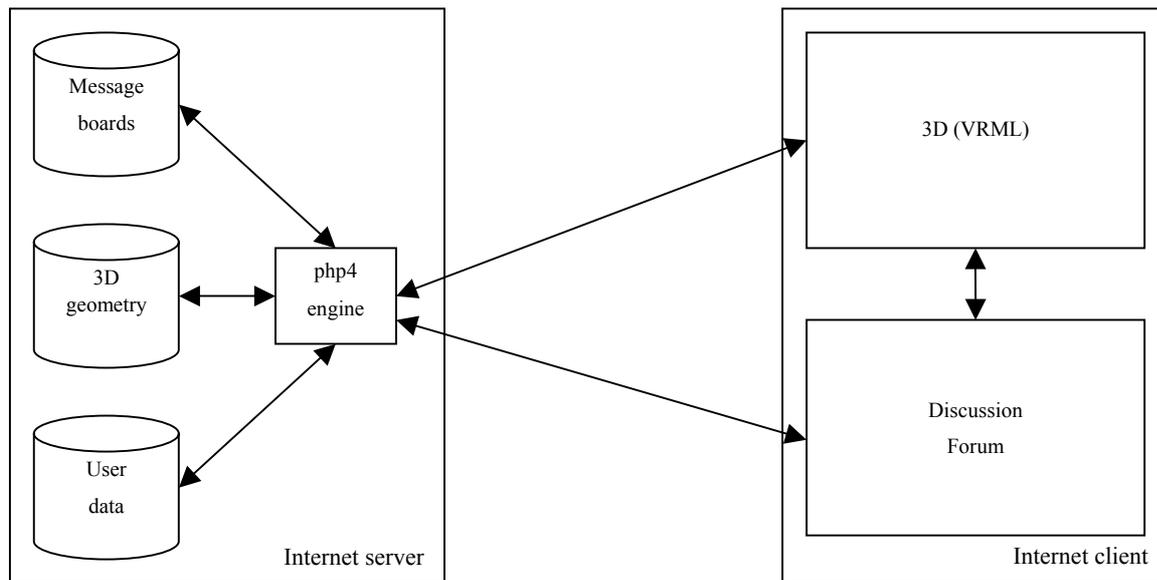


Fig. 2 Basic structure of the PPT

To achieve these goals the following considerations concerning the structure and functionality of the PPT had to be made initially. It soon became clear that the system should basically consist of a database to store geometry, discussion threads and user data, an interactive three-dimensional interface and message boards linked to the geometry of each of the linear spaces the teams had to work with. From day one on the website should show the terrain, the five zones and the buildings already existing in the area. Throughout the workshop the suggestions of five teams should be continuously fed into the system and appear immediately after update. From day one on the five spaces (see Fig. 1), visually shown as areas of a lighter colour in the terrain, should give the possibility for the Internet user to add remarks and questions by clicking on different parts of these zones. As the five zones stretched from spaces at the fringe of the project area, across areas overlapping with other zones to already urbanized areas, they had to be split up into smaller zones. These zones worked as three dimensional hot zones – by clicking on them inside the 3D window the responding message thread was revealed on the user's screen. A message thread concerning the planning area as a whole was also available. Here issues regarding the planning process, technical questions etc. could be discussed.

Two types of access to the site were implemented: Access by guest privileges, where it was possible to experience the model simply by reading the discussion boards and access by identification, where the user had to supply their name, email and postal code in order to be granted full access rights.

Special rights for participants of the teams were granted. They could retrieve a list of messages only regarding the zones they were working with.

### 3.3 Choosing the right technology

Cheap and fast implementation were key constraints in the development of the PPT, while it was one of the goals that the site should require the user only to download one, free plug-in. In addition the necessity to store the workshop's results in every state of the workshop process, i.e. once every day during the workshop required a database. All these needs could be fulfilled by choosing an Internet provider who offered php<sup>4</sup>, a server side UNIX based scripting language, as a web technology and mysql<sup>5</sup>, an open source database, – a nowadays common and cheap combination. A more difficult task was the selection of the technology used to communicate the teams' suggestions in three dimensions. The financial situation did not allow the use or adaptation of expensive solutions. Therefore the decision was easily made to build the interactive 3D element from scratch based on VRML<sup>6</sup>. It was decided to use the CORTONA VRML Client<sup>7</sup> as a VRML plug-in for the PPT as on the one hand it currently is the currently most common VRML viewer and on the other hand enables visualisation in stereo in connection with a 3D graphics accelerator. The latter is frequently called Desktop VR which will be discussed in chapter 4.3 below.

### 3.4 Visual Design

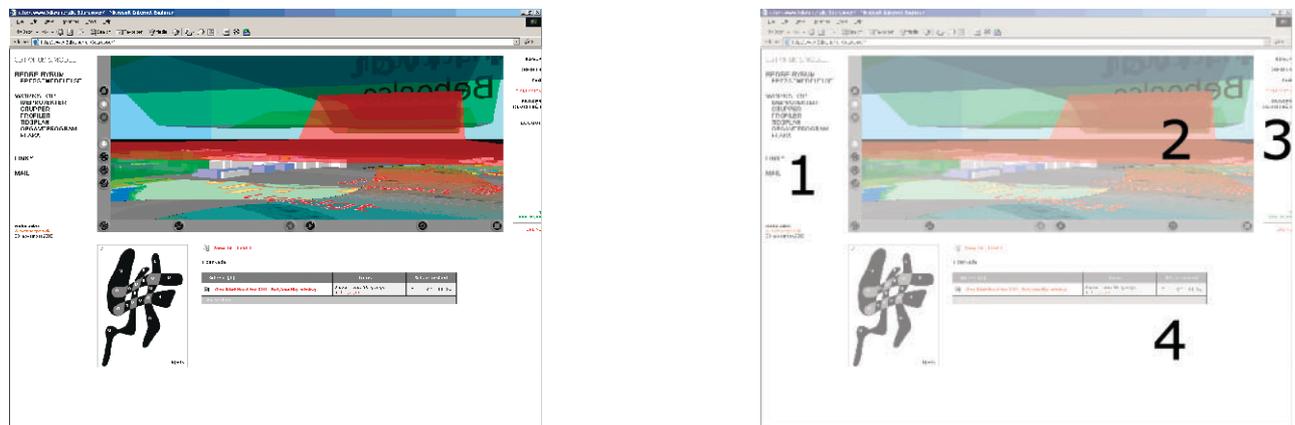


Fig. 3 The visual design of 3dkroner.dk  
the actual design (left)  
the five frames (right)

Visually the site was designed within 4 frames. On the left side of the screen from the main menu is placed, (1) where links were leading to pages with background information about the project area, the workshop and the project's funding. A large part of the screen contained the VRML frame 2 where one can navigate the model intuitively and by clicking on the hot zones reveal the message boards in frame 4. Frame 3 contains a menu relating to the model and discussion threads, where help and FAQ can be accessed as well as the message boards and later in the development the 2D map. Those who log in to the system with name and password could leave the model, the others had the opportunity to get registered and thereby actively participate in the discussion.

### 3.5 Creating the basis for the workshop

Before the workshop started, terrain data was prepared and sliced into the different zones, converted to VRML and uploaded to the PPT. By indexing the parts of the terrain to become hot zones, the system automatically creates links from the VRML scene to the corresponding message boards. Models of existing buildings were also prepared and uploaded into the PPT.

<sup>4</sup> see more at <http://www.php.net/>

<sup>5</sup> see more at <http://www.mysql.com>

<sup>6</sup> Virtual Modelling Reality Language, see a discussion of VRML in planning in Lehmkuhler (1998)

<sup>7</sup> see more at <http://www.parallelgraphics.com/products/cortona/>

## 4 USE OF THE PPT DURING THE WORKSHOP

### 4.1 Updating the systems – filling geometry into the systems

During the workshop, every evening each group was asked to deliver their results of each day. Thereby it was hoped to fulfil the goals set at the beginning in a way so that the model was up to date with the groups' progress. Ideally the material should be delivered digitally to the VR designer who then converted geometry to VRML format, indexed it, defined the time horizon of the geometry (.i.e. from which day to which day the respective geometry should be visual to the public) and then upload it into the system. But the expectations of the project supervision were set far too high, only one of the groups had something to present on the first evening, two other groups followed the next day. On the last evening the model was in the state shown below on their, covering most of the ideas the workshop participants had developed throughout the workshop.

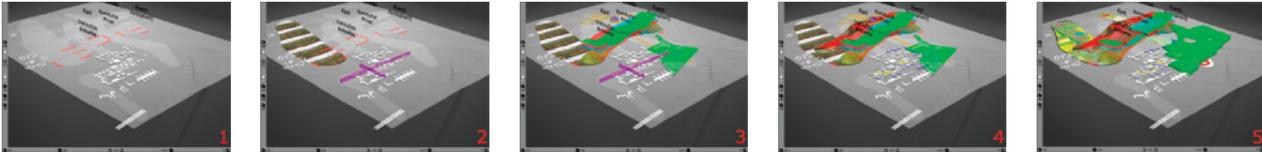


Fig. 4 development of the model during the workshop from left to right day 1, day 2, day 3, day 4 and day 5

### 4.2 Start of a message thread by the seminar groups

The big issue in creating 3dkroner.dk was the attempt to create direct communication between the citizens on the internet and the workshop participants during the workshop. Therefore representatives of the five teams were asked to comment on the changes by starting a message thread in the respective areas, every time they changed the model. Unfortunately and probably due to time pressure, illustrating comments were first added to the PPT only after the workshop.

### 4.3 Desktop VR



Fig. 5 – 3dkroner.dk being shown to a large audience in anaglyphic stereo  
Photographer: Peter Schulz Jørgensen

Another issue was the implementation of the PPT in presentations of the teams' proposals during the workshop. Using a stereo graphics adapter<sup>8</sup> in two different ways made it possible for the seminar's participants to watch the 3D model in stereographic 3D. For larger audiences the PPT was projected anaglyphically by a beamer; that means that actually two colour-coded images were visible

<sup>8</sup> in the project a ASUS V8460 Ultra Deluxe graphics adapter was used

at the same time (see Fig. 5). Simple spectacles made of cardboard with red and cyan filters decoded the images projected to stereographic pictures<sup>9</sup>. Shutter glasses and a joystick were provided for one spectator at a time to view the model in stereo.



Fig. 6 Navigating 3dkroner.dk in stereo with a joystick and VR goggles

## 5 IMPROVEMENTS AFTER THE WORKSHOP

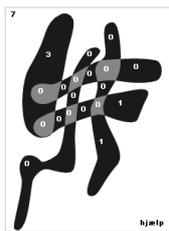


Fig. 7 interactive map

Due to complaints from users having difficulties in navigating and finding the hot zones within the three-dimensional model, an interactive map was added showing of how many questions each message thread consisted of in real time. (See Fig. 7) By clicking on the zones on the map, the respective message board was revealed. Additionally, help texts were revised and developed further. A series of functional problems was eliminated and the site was made more consistent.

## 6 CONCLUSION AND PERSPECTIVES

If one measured the success of 3dkroner.dk solely by the number of messages fed into the message board one could argue that the system did not live up to the planners' expectations. Only two questions came from citizens, both asking for more help regarding the use of the site, in other words a more detailed description of how to put questions into the systems. As only three groups explained

<sup>9</sup> read more about this technology at: <http://www.3d-brillen.de/>

their ideas by starting a thread in the respective zones the public was literally left alone with abstract visualisations of ideas. It is hard to say why the expected discussion did not start, following reasons could be indicated:

- technical reasons
  - difficulties in viewing the 3D content due to installation problems of the plug-in
  - difficulties in downloading the model – the download took actually up to 5 minutes on a modem connection
- understanding the system & skills
  - difficulties in understanding the iconic character of the proposals
  - difficulties in how to navigate the 3dscene
  - difficulties in understanding the logic of a message board in general
- data security issues
  - uneasiness at having to enter one's name and email in order to participate in the discussion
- interest
  - no interest in actively taking part in a discussion
  - no interest in the project area

Nevertheless, the use of desktop VR during the workshop can be called successful. Several members of residents' associations living in the area showed an active interest in using the VR goggles supplied during the workshop. Also a presentation in the evening of the third day, where the model was shown with the help of a beamer to a larger audience supplied with anaglyphic (red/green) stereo goggles was a new and exciting experience for many. That shows that cheap desktop VR equipment can be used for local presentations where it is impossible or too expensive to get the audience into bigger VR facilities.

The process of the workshop showed that the guidelines for exchanging data between the project teams and the person operating the PPT should be revised and certain members of the project teams should be responsible for starting message threads about their proposals. The same persons should be available for a certain period to answer questions put into the system by the public.

Finally, one can conclude that 3dkroner.dk has big potentials for improvement regarding the writing of communicative texts and instructions for the use of the site and definitely greater potential for discussing projects with the broad public. Further in-depth research has to be made to develop and implement systems as 3dkroner.dk into the Danish planning system.

## 7 REFERENCES

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