Multimedia as a documentation tool of forest planning

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Abstract

A forest plan is traditionally presented as a paper document to the forest owners and other stakeholders. The documents have been difficult to understand and even boring to read. Applying multimedia in forest planning could change this situation. Hyper text allows flexible reading. Visualizations, animations and sound can be used to communicate forestry information. The forest owner can see how the forest grows and how the landscape changes as a consequence of forestry operations. Multimedia can also be used during the planning process. Especially in participatory planning of public forests, this presentation media is an interesting and potentially efficient way to present alternative plans to the public; this can be done through a computer net. The computer net may also be used to collect people's opinions about alternatives. This article presents an application of multimedia as a documentation tool of forest planning. The plan was produced for a private forest land owner in eastern Finland.

Keywords: forest plan, hyper text, visualisation

1 Introduction

Forest planning is changing due to several reasons. One driving force is technical development. Computer and information technology now offers possibilities, which were hard to imagine some years ago. One of the new possibilities is to apply multimedia as a tool to present forestry information (Pukkala 1997).

Traditional forest plans are paper documents that are full of numbers. These reports are difficult to understand to many forest owners. A general tendency in reporting is to produce hypertext documents, which can be read interactively with software that is easily available to eve-

ryone. Hypertexts may be linked to a computer net, this enabling remote and flexible reading and efficient dissemination of information. Hypertext editors and multimedia tools make it possible to include visualisations, animations, and sound in the document. By reading a multimedia forest plan the forest owners can see in a realistic way, as computer animation, how the landscape changes as a consequence of tree growth and forestry operations. In the near future, they can also hear the sound of wind, rain, birds, and harvesters.

The majority of the present forest owners are still much more familiar with paper documents than hypertexts. However, the situation is changing rapidly if the present trend in the frequency of Internet usage continues. Very soon the owners expect receiving the forest plan as a multimedia document on CD-ROM.

This article reports an attempt to report the content of a forest management plan as a multimedia product. This product was prepared with a combined use of a forest planning software and multimedia tools that were available in the Internet.

2 A hypermedia plan

2.1 Structure of the plan

We used HyperText Mark-up Language (HTML) to produce a forest plan in the hypermedia format. The HTML is well known through the Internet, because it is the page description language (PDL) in World Wide Web documents. It is a simple and easy-to-understand PDL and it enables one to use pictures, sound and animations in electronic publications. It is also hardware-independent; one only needs a simple text editor to make an HTML document.

The data for our electronic forest plan (Figure 1) come from a traditional forest plan prepared with the
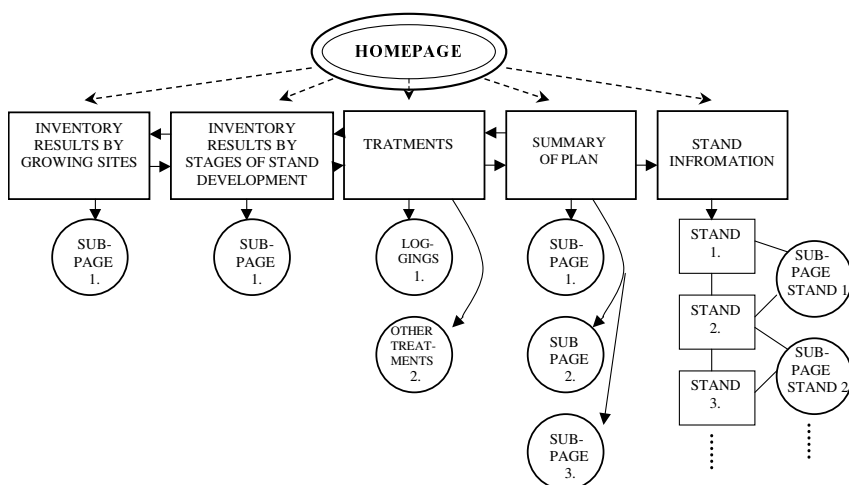
Figure 1. The page structure of the electronic forest plan.

2

MONSU forest planning software running in Windows 95 or NT (Pukkala 1998). We tried to make the hypermedia document easy to read use and understand. We used much visualisation to bring the forest on to the computer screen. Forest visualisations and tabular information were taken directly from MONSU output. The help files for the hypermedia plan were sound files recorded with a PC; when the reader clicks the help-button the voice message gives instructions of how to proceed.

The main page of the hypermedia plan is the homepage (Figure 2). It was prepared using frames, which enable the editor to split the screen into multiple parts, each part containing a different HTML document. Frames make the page making process easier and quicker if the electronic publication contains a fixed part, which is included on every page. WWW browsers like Netscape 2.0, Internet Explorer 3.0 and their later versions support this option. The homepage has links to pages showing the present forest status by growing sites or stages of stand development, loggings and silvicultural treatments, summary of the plan, and a map of tree stands (Figure 1). These primary pages include some text but majority of the information is conveyed through images. More information is made available through charts and tables on sub-pages (Figure 3).

Figure 2. The homepage of the electronic forest plan. It contains the general information of the forest holding. The landscape visualisation in the middle is animation showing the view when one flies over the forest. It is based on computer graphics produced with the MONSU planning software.
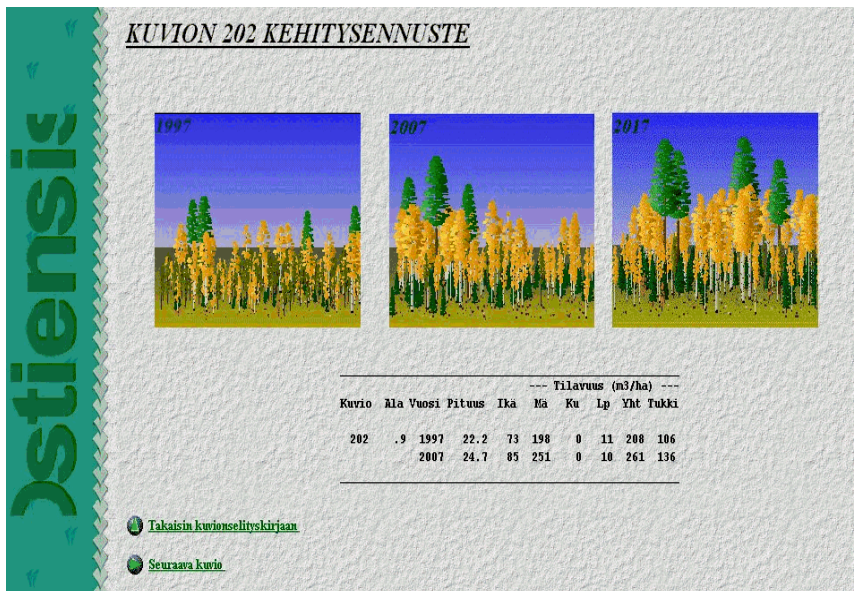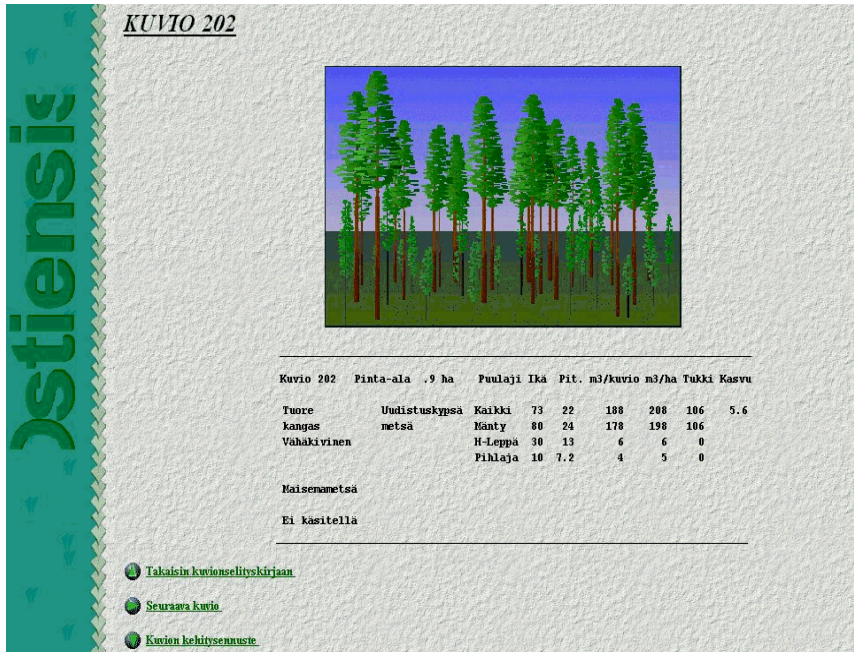
Figure 3. The stand main page (above), and a sub-page (below). One of the stand pictures on the sub-page is animation showing the stand development during the planning period.

2.2 Software used

An HTML document can be written with any word processor that can save text in the ASCII format. A web browser is used to view the final product. Different programs are needed to produce, use and edit pictures, sounds, animations, and interactive images. There are a huge variety of these programs available in the Internet. Almost every program used in our exercise was downloaded from the net for the evaluation period. The following introduces some of the programs used. In addition to the programs discussed below, common word and image editors such as Word 97 and Paint Shop Pro 4.12 were used.

Hippie 97

Hippie (HTML Interactive Personal Page Editor) version 2.0 is an interactive HTML editor, which needs Internet Explorer 3.02 to work properly. It is available for at least Windows 95 and Windows 3.x operating systems. Hippie 97 includes all the most typical tags as toolbar buttons. When creating an HTML document with Hippie 97, one uses the split-screen option and observes in real time how the document looks like in a web browser. With the help of HTML editor one quickly gets used to the HTML language and process web sites in a flexible way. But one also needs to learn the HTML properly, especially in the case of errors.

Mapedit

The interactive images of the hypermedia forest plan were prepared with the Mapedit software. An interactive image is a picture, the parts of which serve as links to other documents. With Mapedit the picture can be segmented into several active parts each of which can be a link. The segments may have different shapes such as circle, rectangle or polygon. These parts are called as hot spots, which are based on the coordinates of the picture. After hot spots and links are defined, the web browser recognises, which segment the mouse is pointing to. If the segment is clicked with the mouse the web browser opens the web site where the link points. The interactive images that we used were Client Side Image maps, which do not need a Common Gateway Interface program (CGI) to handle the coordinate information of the picture. In the Client side image maps the coordinates are embedded straight in the HTML document. For example, the stand map (Figure 4) was made with this method; clicking a stand opens the first page of the stand. The latest versions of web browsers (Internet Explorer, Netscape) support this function (Sirola and Veistola 1997). This is an advantage in such environment where one cannot use a server, for example in CD-ROM environment.

GIF Construction Set

The GIF Construction Set (32-bit version 1.0) is a versatile image-processing program. One can make transparent images, small-scale animations with the animation wizard, different kinds of banners, spinning images, and interlaced images. A transparent image is prepared by making one colour transparent to the web browser. This colour is then re-
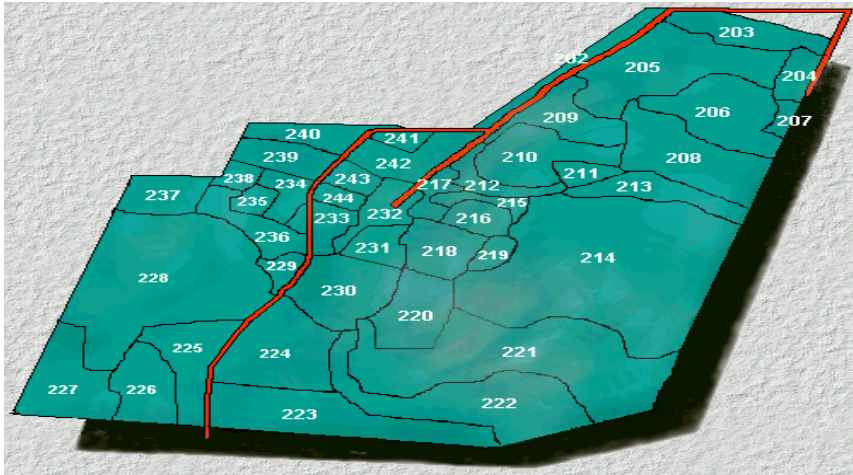
Figure 4. A Client Side Image map prepared with the Mapedit software. Clicking a stand opens the first page of this stand.

placed with the background colour or background image of the HTML document. When an interlaced image is loaded to the web browser the picture is drawn line by line on the screen. Images must be in the GIF format if one wants to edit them with the GIF Construction Set. We compiled all the animations and majority of the pictures with this software.

3   Conclusions

Our trial can be regarded as the starting point of a continuous development work. The multimedia product will be gradually improved, and forest owners' attitudes towards this type of plan will be tested. Our experience from multimedia was that the techniques needed for this kind of reporting are easily learned. An equally clear observation was that there is plenty of software available for the production of forest plans in multimedia format. As the readiness and willingness of forest owners to read multimedia documents is rapidly increasing, forest planning organisations should be prepared to the production of forest plans in this format. The information content of a hypermedia plan is several times higher than with a traditional plan, and the ample visual information of the multimedia plan is often more relevant and more easily understandable to the owners than the numbers of a paper document. An additional advantage of using hypertexts is that the document can be linked with the Internet. This offers interesting possibilities to develop people's participation in the planning of public forests and in the negotiation process of group decision making.

The most tedious step in our exercise was data preparation. Very much handwork was needed to produce the output with the MONSU planning software, store it, and transform the output into visualisations, animations, etc. However, once the format and outlook of the multimedia plan has been agreed upon, it is possible to automate the production of information needed for the hypermedia plan. Some parts of the plan are constant while the others are replaced with material that the planning software produces automatically. Thus, it may be concluded that the production of a hypermedia plan can be made almost as easy as the production of traditional plans.

References

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