

8-21-1995

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## Recommended Citation

Gitesh K. Raikundalia and Michael J. Rees. (1995) "A scenario of a web user interface tool for electronic meeting document generation and presentation". Aug. 1995.

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# A Scenario of a Web User Interface Tool for Electronic Meeting Document Generation and Presentation

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## Abstract

Log files generated by electronic meeting software record the remarks typed by meeting participants and many other meeting events. In their raw format, these meeting logs are not convenient for the meeting participants to read and use as input to future meetings. LoganWeb is a tool which processes meeting log files and produces polymorphic meeting documents which contain a variety of summaries in human-readable form such as keyword indexes and participant summaries.

LoganWeb generates polymorphic documents in the HTML format used for laying out documents on the World-Wide Web (Web). This allows exploitation of the powerful Web layout, hypertext and user interface facilities. Using a Web browser alongside the electronic meeting tool allows remotely located participants to consult valuable polymorphic documents from the current and past meetings.

This paper describes the design of the user interface which is generated by LoganWeb in HTML. The design includes the extensive use of hyperlinks to bring together related meeting information. The powerful features of LoganWeb are illustrated by means of a meeting scenario which shows the main features of the meeting document tool and its user interface.

## Keywords

World-Wide Web, Computer-Supported Cooperative Work, electronic meetings, document management.

## Introduction

Text-based electronic meeting tools are able to generate verbatim meeting logs. These logs include timestamped meeting events as well as the word-for-word record of the remarks typed by meeting participants. Because of the cryptic format of the the log files, the meeting logs are not easily read by the participants, and must be processed further to yield more valuable meeting records such as minutes, keyword summaries, and so on.

LoganWeb is a software tool which automatically generates useful *polymorphic* meeting documents (*polymorphs*) from meeting log files. Various techniques are being developed to achieve this postprocessing and are discussed elsewhere ([1]). Once produced, however, the polymorphs must be presented to meeting participants prior to and during future electronic meetings. The World-Wide Web (Web) browsers are exploited to allow remotely located participants to access and search polymorphs while a meeting is in progress, and, of course, during the post-meeting and pre-meeting phases.

User interface design on the Web involves careful employment of the features of the HyperText Markup Language (HTML). Apart from the general layout of the textual information the main features of HTML used by LoganWeb are:

- to show the relationships between meeting documents and allow convenient navigation within related information
- *fill-in forms* which provide the interaction features of the LoganWeb user interface and allow the user to search for and select meeting documents relevant to the meeting
- inline *images* to help convey the structure of the polymorphic documents particularly where dates are concerned

The use and presentation of meeting documents via the Web is illustrated by a typical meeting scenario. Screen dumps of the LoganWeb user interface designs are shown in conjunction with the scenario to demonstrate how a Web browser may grant access to various meeting document information.

During remote electronic meetings various participants need to gain access to documents which form the input to the meeting and are used to guide the discussion. When these documents exist as Web pages they can form the input to and output from a series of electronic meetings where participants are globally distributed. This means participants have a uniform method of access to the meeting documents as given by the Uniform Resource Locator (URL). Web browsers also supply a universally familiar user interface for the display of documents so that participants can view meeting documents in the same way.

Several meeting documents can be generated from the log files of electronic meetings. Information polymorphs from, and auxiliary to, a given meeting log can be controlled by the *secretarius* (a meeting participant whose task includes administrative meeting activities). In addition, log analysis applications such as LoganWeb can generate some information automatically.

## The Yarn Electronic Meeting Tool

The system used for meeting purposes and whose logs are analysed for polymorph generation is the *Yarn* meeting system ([2], [3]). It is a conversationally-oriented system in that it allows participants to submit remarks via the interface, which are viewed by all in a WYSIWIS ("What You See is What I See") manner. The tool may be used either synchronously or asynchronously, so that meetings are indefinite in time, and in the experience of the authors in using it asynchronously a meeting may take quite a few days in duration.

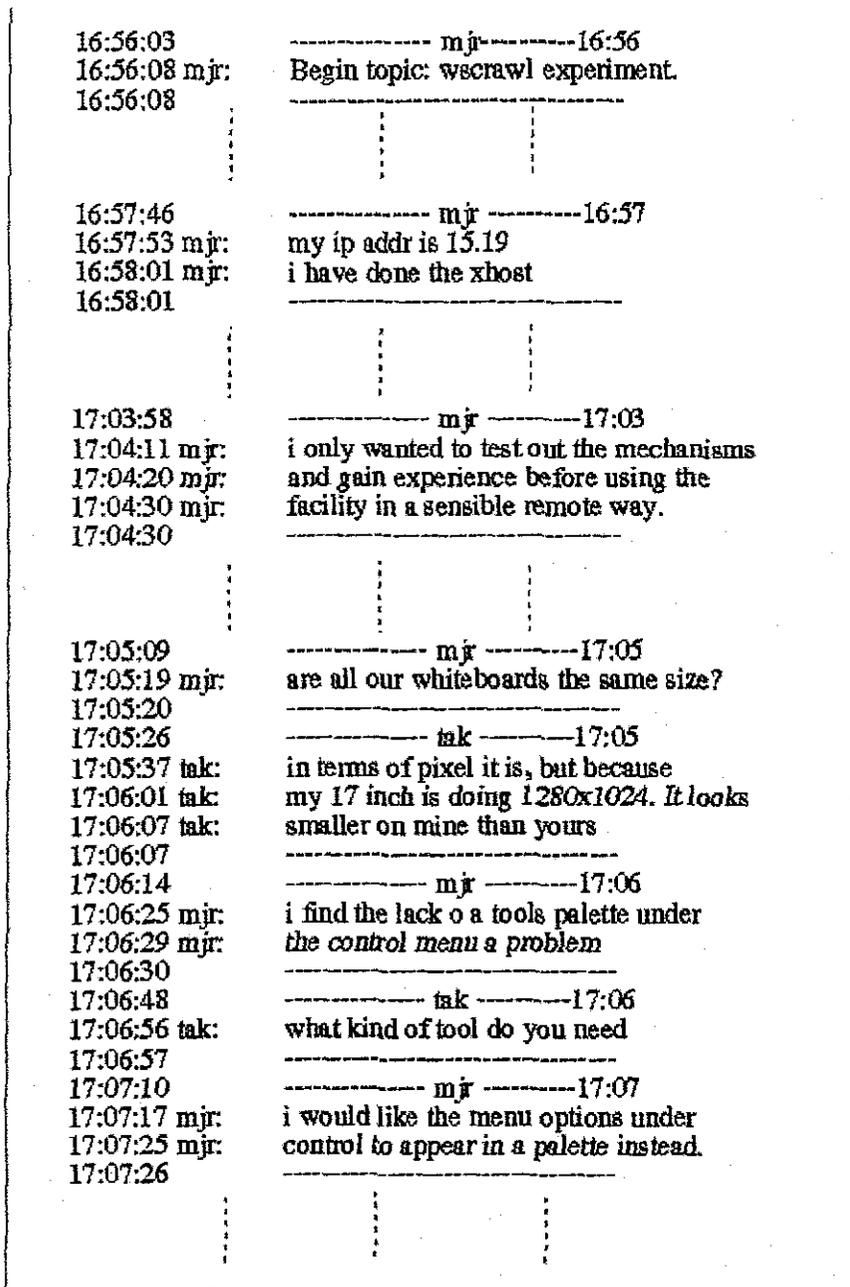


Figure 1 Sample Yarn log

Figure 1 presents an example of a log produced from a meeting. Remarks made by participants are contained within a pair of dashed lines with the participant's name inside the first of the pair, and alongside the lines of the remark. Timestamps are also recorded throughout giving accurate information about the timing of the remark.

Procedures are being developed to allow a scheme of commencing and concluding topics and sub-topics during a meeting by the use of recognised keywords. The start of a topic, "wscrawl experiment", is shown at the top of the log. Although non-existent in the example, a sub-topic within this topic could be commenced by simply starting another topic in the same way, carrying out the discussion and concluding with the ending keyword phrases.

## Document Types

The logs produced from a Yarn meeting are in a raw, and therefore less readable, form. Analysis of these logs yields new document types that are more meaningful and relevant to participants for meeting practice. A set of documents may be produced from rearranging or "massaging" log content and these are auxiliary documents referred to as *polymorphs*. Another set of documents may be produced using any of the log or *polymorphs* as input, and reflect more general information about meeting content. Examples of *polymorphs* include:

- Verbatim minutes polymorph: a variation of traditional minutes in that remarks made are retained verbatim.
- Topic polymorph: the hierarchical structure of a meeting as recorded in the log is rearranged according to topic and further subtopics. Participants are then able to access content according to pertinent topics.
- Participant remarks polymorph: a reordering of remarks according to the participants making them.

Other documents of interest include:

- Concept categories document ([1]): a document that for each topic in a meeting provides the issues discussed and the extent to which they are discussed.
- Agenda and summary: the same as the accepted conventional documents. Of course, hypertext capability and the Web are to be exploited in accessing and presenting such documents.

## LoganWeb

Document access is provided by the Web pages known as *LoganWeb*. It employs a number of Web user interface mechanisms such as image-based selection (of information), option menus and fill-out forms as well as the usual hypertext linking. These are used to implement and manipulate a document index, direct access to documents and generation of polymorphs from the original logs. The implication of the use of LoganWeb for generation purposes is that it goes beyond mere presentation capability as found usually with meeting information placed on the Web, such as at [4] and [5]. The browser in combination with the Web operates as an automated document generator. The remainder of this paper will present user interface designs of LoganWeb where applicable to the scenario.

## Scenario

The scenario is centred around a company, "XYZ Enterprises", which wishes to place pages on the Web advertising itself. The purpose of conducting a linear series of meetings is to establish a business plan involving discussion of the issues in producing such pages. This goal is anticipated to require four meetings so that for any given meeting, documents generated from previous meetings will be available. The group of participants consists of Susan, Peter, John and Emma, where the former two participants are situated locally and the other two are situated remotely. The role of the secretarius is fulfilled by Peter.

Figure 2 shows the two representations of a meeting. The first is the general structure suggested in the research conducted by the authors, where each shape, going from left to right, indicates the pre-meeting, meeting and post-meeting phases. The second is merely a convenient diagram used to indicate events occurring in each phase, with the same phases from left to right. The phases are labelled PR, M and PO, for each respective phase. Figure 3 illustrates the events pertinent to meeting document access occurring throughout the scenario.

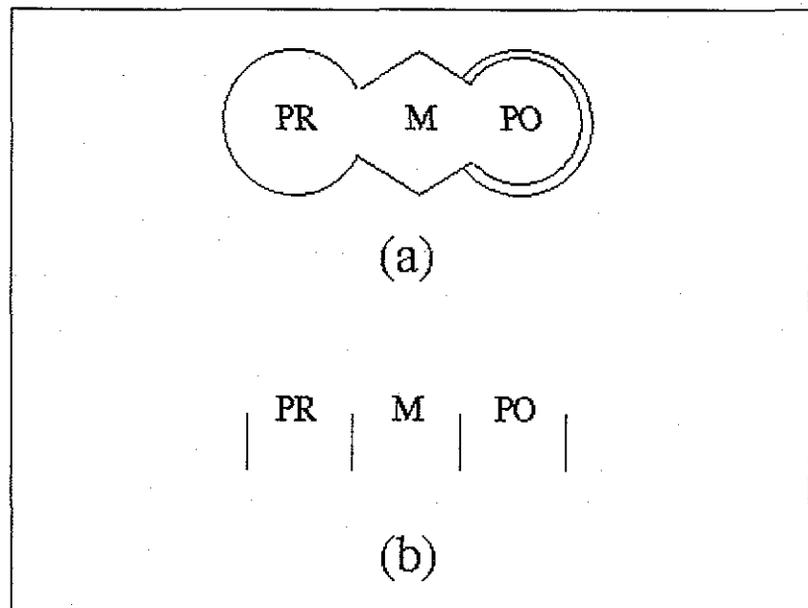


Figure 2 Two meeting representations

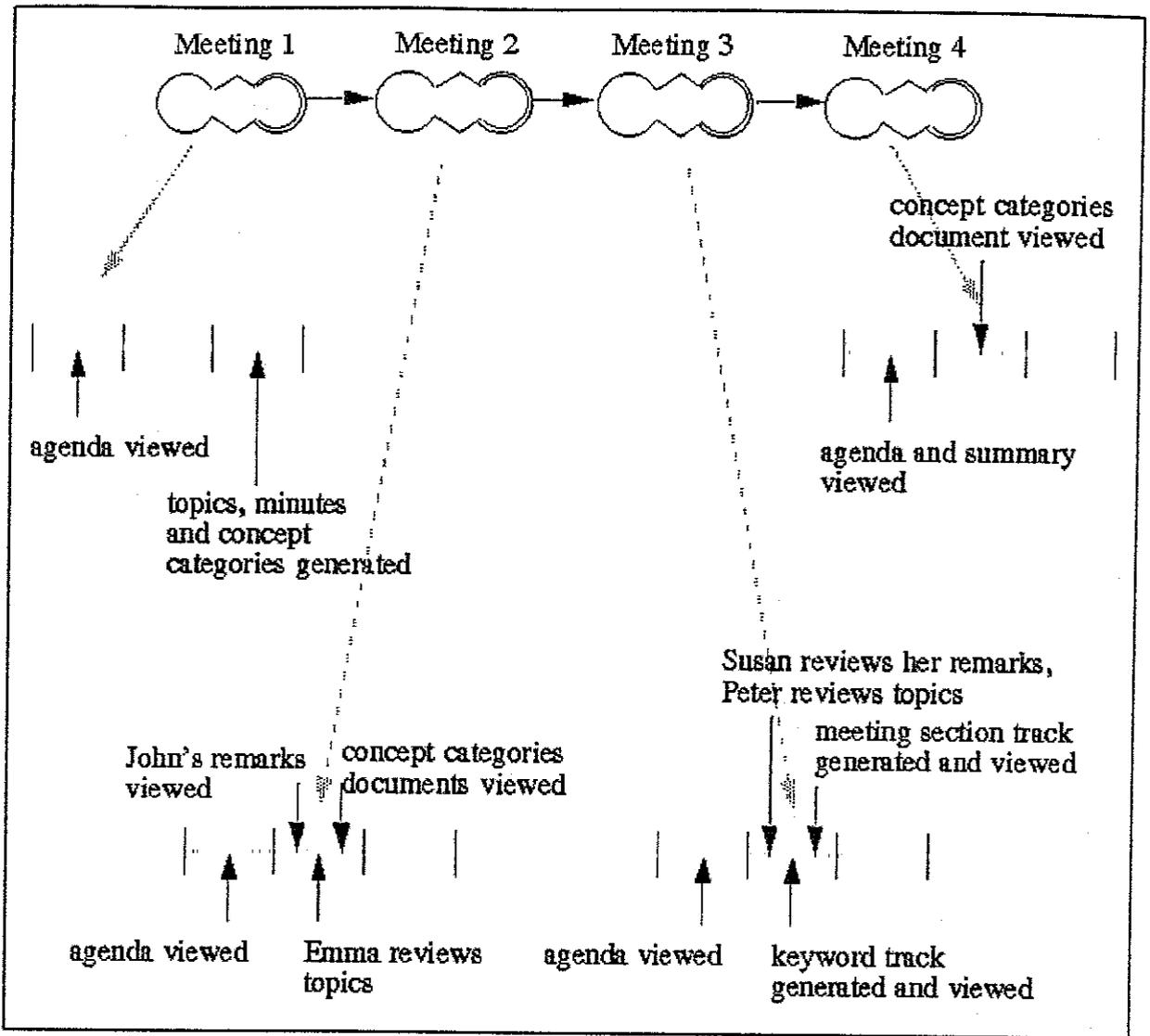


Figure 3 Scenario meeting series and events

### The first meeting

During the pre-meeting phase of the first meeting, all participants are expected to initially have about five minutes thought regarding the agenda. The Web page for the agenda would simply consist of text with agenda points numerically ordered and containing hypertext links for each agenda item to the corresponding topic in the original log (not shown for reasons of space). The meeting phase is then carried out with two windows on the computer screens, one for the electronic meeting system and one for the Web browser displaying the agenda. Peter, the secretarius, generates with LoganWeb the concept categories document and the minutes and topic polymorphs which are stored locally. Web page designs of these are shown in Figures 4, 5 and 6, respectively.



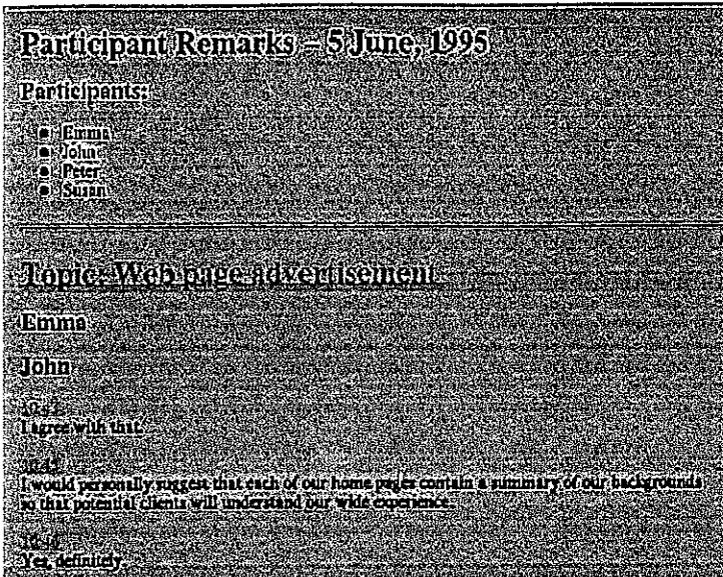


Figure 7 Participant remarks polymorph

### The second meeting

The second meeting begins with the pre-meeting phase in the same way as the previous meeting. During the second meeting, however, the group wishes to look at some of John's remarks in the first meeting. They request Peter to generate the participant remarks polymorph for the first meeting which they each access through their browsers. This document would appear as that in Figure 7 where only John's remarks are displayed for the topic. The time of a remark being hypertext will link the participant back to the original remark in the corresponding log. Access to other polymorphs in existence is provided by hypertext links at the bottom of the document (not shown, but similar to those in Figure 5), being the standard method in LoganWeb of linking together documents of the same type.

Also in the course of the meeting, Emma finds personal need in referring back to topics in the previous meeting and so views the topic polymorph for this meeting. Figure 6 indicates such a topic polymorph. The topic heading above the topic itself would be a hyperlink allowing the user to go back to the actual topic in the original log. As in the case of the participant remarks polymorph, each timestamp could provide hypertextual access to the original remark.

The participants are unsure as to whether discussion of a particular issue occurred prior to this meeting but do realise such discussion could not have occurred before the last two week period. Hence, the concept categories documents for meetings in the last two weeks are consulted, with the result that no such discussion of the issue existed.

Figure 4 illustrates the concept categories document. The first part of the document contains a listing of topics in each topic hierarchy from which discussion is constructed. Each line begins with an indicator of the level of the topic in the hierarchy, followed by the actual topic. Clicking on the topic takes the user to the position in the table (in the same document), via an HTML anchor, where the category information about that topic resides. This is the information relevant to the group that is needed to determine if that particular issue arose previously.

### The third meeting

During the third meeting, a question surfaces to which the participants are faced with finding a solution. Susan recalls making points relevant to the problem in the second meeting and so accesses her remarks. Peter remembers discussion of the area but is unaware that Susan made such points. As a result, he does not consider viewing her remarks, but feels that looking at the topic through the topic polymorph would assist in solving the problem. Accordingly, both Susan and Peter indicate through Yarn of their suggestions to the other members to look at these particular polymorphs.

It is then suggested to inspect a keyword related to the problem in the last meeting's logs. A keyword polymorph for that particular keyword is generated to provide all its occurrences in the discussion. Referring to Figure 8, it can be seen that each line of content of the log containing the keyword (here it is "scan") is shown. The keyword can be a substring of another word in the log. Each occurrence of the keyword in the polymorph provides immediate hyperlinked access to the line in the log where it occurs. Hypertextual access regarding timestamps and topic headings in the polymorph is the same as explained before.

Additionally, Peter wishes to view a meeting section polymorph that displays conversation bounded by the first and last occurrences of the keyword in the log. This is because he is interested in understanding the use of the keyword in the discussion. In Figure 9, the first and last comments involving the word "scan" are displayed, timestamped "10:41" and "10:47", with all discussion in between.

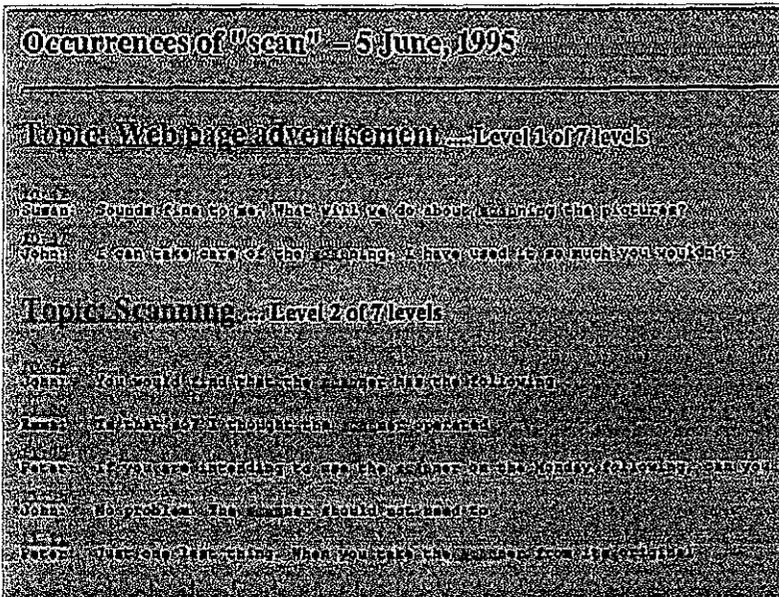


Figure 8 Keyword polymorph

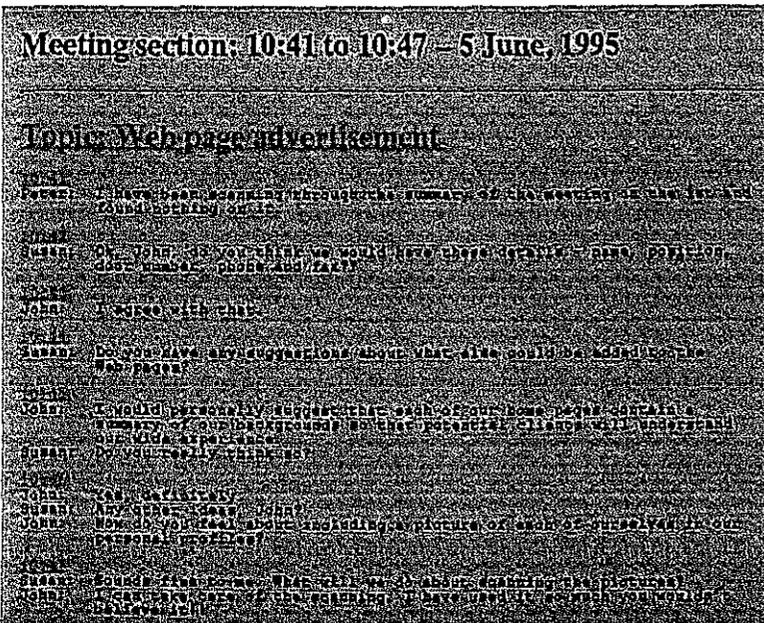


Figure 9 Meeting section polymorph

## The fourth meeting

The agenda of this meeting and the summary of the last meeting are viewed pre-meeting. It is believed that the main ideas of the previous meeting should be known in carrying out the current meeting. The final consultation of documents in the series of meetings is the access of the concept categories document of the third meeting. This is to clarify if an issue was discussed during that meeting and how much emphasis was devoted to it.

## Conclusion

This paper has demonstrated, by use of a common scenario where people meet via the telemeeting system, Yarn, how the World-Wide Web may be used to provide powerful access to documents. The interface of a Web browser can easily be manipulated during a meeting process, in any of the three phases, to view documents and move from one to another

as necessary. A diagrammatic representation of the three-phase structure was also introduced.

User interface examples have illustrated Web hypertextual capability being exploited for linking related documents. Such capability may help the user arrive at the exact information within documents that he or she desires. Certain textual parts of polymorphs ordinarily having a simple meaning within the document may be assigned special linking roles; these roles connect sections of the polymorph to the context in the log from which they are derived.

Exploitation of the Web interface relies on treating the browser as more than just a document viewer but also as a document generator by execution of Common Gateway Interface scripts. Further work is being undertaken in the creation and implementation of these scripts.

## Acknowledgement

The work reported in this paper has been funded in part by the Cooperative Research Centres Program through the Department of the Prime Minister and Cabinet of Australia.

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