

includes "Distributed Data" which includes the compressed word processing document that was put in the EDF (which includes the unedited replica). The REV file further includes "Revision Properties" which include compressed eXtended Markup Language (XML) data including the title of the revision, date, time, etc.

[0045] The response file has information about the changes and comments that have been made by one contributing author to a revision of the reviewed document and shows the name of the contributing author that responded. This file takes the form of a ".RSP" file. The RSP file includes: "Redline Data," which is attached to each response and contains the "redline" document shown in the tab view of the manager for that response, in compressed RTF format; "Change Data," which is also attached to each response and includes a compressed XML stream which describes all the changes in that response; "Change Data Status," which is compressed XML data describing the status of each change; and "Response Properties," which is compressed XML data including the title of the response, date, time, etc.

[0046] For an internal contributor the edited replica he/she produces is stored in the DMS and used by a comparison tool such as WORKSHARE® DELTAVIEW® from Workshare Technology Ltd. of London, U.K., along with the unedited replica to produce the redline RTF and the change data XML files.

[0047] For an external contributor a RDF, having a binary difference file, is received by the managing author. The unedited replica is used with the binary difference file to reproduce the edited replica. A comparison tool then uses the edited replica along with the unedited replica to produce the redline RTF and change data XML files.

[0048] FIG. 4 is a flowchart of the collaboration between a managing author 350 and an internal contributing author 360 of an embodiment of the present invention. At step 352 a word processing document, e.g., evolving document 126, stored in the DMS 118, is opened by a manager application 214 and is displayed in a manager mode graphical user interface (GUI), e.g., FIG. 5. At step 362, when the contributing author 360 tries to open the same word processing document, the contributing author is only allowed to open a replica using the contributor application 218 that displays a contributor mode GUI, e.g. FIG. 6. Whether an individual user can open the word processing document in manager or contributor mode, is dependent on the user's editing rights inside the DMS. Normally, an internal contributing author has no editing rights to the original document or its various revisions. Only the manager has editing rights to the original document and its various revisions.

[0049] Both the managing author 350 and the (internal) contributing author 360 have direct access to the DMS 118, and their files are stored in the DMS 118. Any proposed changes by the contributing author 360 and any accepted changes by the managing author 350 are maintained in the DMS 118. The proposed changes to a revision file by a contributing author are in his/her response file, where both the revision file and the response file are stored in the DMS.

[0050] At step 364 the contributing author 360 edits the replica and then submits the proposed changes to the DMS 118 and exits (step 366). The contributing author has the option of saving a draft of his/her edits in order to save a

temporary back-up copy or to continue work later on. When the draft is finished it can then be submitted to the managing author as the contributing author's response.

[0051] In one embodiment, after the contributing author's response is stored in the DMS 118, the managing author 350 manually selects on the manager mode GUI a refresh button to display the contributing author's proposed changes in the form of a document with mark ups (step 354).

[0052] In an alternative embodiment the manager mode GUI is automatically updated with the contributing author's proposed changes. At step 356 the managing author 350 accepts or rejects each of the proposed changes from each contributing author. As the managing author accepts the changes, the accepted changes are incorporated into the evolving document 126 (step 358).

[0053] If a user is a managing author, then he/she may also send an EDF file 130, having a replica of the word processing document, to an external contributor, who displays the EDF file using an EDF editor GUI. Typically the external contributor is a user without direct access to the DMS for the collaboration, and receives the EDF, e.g., by email or by downloading from a server. The external contributor edits the replica and returns proposed changes and comments in an RDF file by, e.g., email, to the managing author. The manager application 214 puts the RDF information into the DMS 118. The managing author then accepts or rejects the proposed changes using the manager mode GUI, e.g., FIG. 5. The manager mode GUI is essentially the same for processing proposed changes from both internal and external contributing authors.

[0054] FIG. 5 is an example of a manager GUI 410 of one embodiment of the present invention. The manager GUI 410 includes an evolving document window 412, a comparison window 414, and a change summary window 420. The evolving document window 412 shown is for the revision 450 ("Revision as at Dec. 18, 2001 12:51:19") of the collaboration 448 "Try a Collaboration," where the word "to" 434 has replaced the word "too" (not shown). The comparison window 414 shows the proposed changes by contributing author Victoria (Victoria tab 416). The proposed changes for contributing author Michael (Michael tab 418) are hidden in this embodiment. In an alternative embodiment Michael's proposed changes are shown in a separate, unhidden window. In comparison window 414 proposed change 432 shows the word "too" struck through, i.e., deleted, and the word "to" double-underlined, i.e., added. By accepting the proposed change 432, replacing the word "too" with "to," the evolving document window 412 shows the result, i.e., the word "to" 434. A synchronization button 430, causes a portion of the text in the display in the comparison window 414 around a selected proposed change, e.g., 432, to also be shown in the evolving document window 412 around the associated text affected by the proposed change, e.g., the word "to" 434. A revision pull-down menu 422 allows different revisions (and associated responses) to be displayed in the windows of GUI 410. A contribution refresh button 440 updates the manager GUI 410 with the latest response information from the contributing author(s). For example, if a response comes in from a contributing author "Gary," then, when the refresh button 440 is selected, a tab labeled "Gary" is added along with a new comparison window showing Gary's proposed edits.