

VERSION MANAGEMENT SYSTEM

COPYRIGHT NOTICE

A portion of the disclosure of this patent document contains material which is subject to copyright protection. The copyright owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all copyright rights whatsoever.

BACKGROUND OF THE INVENTION

The present invention relates generally to version management systems for spreadsheet and word processing documents and more particularly to systems for minimizing storage requirements by storing delta-formatted versions of such documents and systems that generate difference reports to facilitate comparisons between different versions of a document.

Common uses for computers, especially personal computers, include the processing of documents by spreadsheet processors, using programs such as Lotus 1-2-3, Microsoft Excel and Borland Quattro Pro, for displaying a tabular presentation of numerical data and word processors, using programs such as WordPerfect, Microsoft Word and Lotus Ami Pro, for generating and modifying primarily textual data. One of the major strengths of a computer is that its use allows a user to generate and evaluate modifications from original versions of documents. As part of this evaluation, a user or group of users may desire to compare different versions of these documents to determine an optimum result. Presently, this requires the storage of multiple versions of each document, which multiplies the data storage, i.e., disk storage, requirements of the computer. While disk storage capacity has vastly increased since the introduction of the IBM PC as well as the availability of disk compression software, it is still desirable to minimize disk storage requirements. Additionally, the known capabilities for comparing documents is limited. For example, Microsoft Excel is known to be able to generate a list of differences by cell addresses but fails to show version comparisons within its normal spreadsheet display format.

SUMMARY OF THE INVENTION

The present invention is directed toward a version management system, applicable for maintaining a plurality of versions of spreadsheet or word processing documents, for operation on a digital computing system, e.g., a personal computer (PC). Embodiments of the present invention preferably include delta-formatting means for storing subsequent versions of each document such that only changes from each prior version are stored.

A version management system in accordance with the invention preferably includes a version management processor operating in combination with a document processor for storing and retrieving a plurality of documents stored in a digital computer. An original version of a document is stored in a common file with subsequent versions of the document as delta-formatted data representative of the differences from a each prior version document.

In a preferred embodiment of the present invention, all of said delta-formatted document versions are stored in a pair of commonly used files where a first file contains said delta-formatted data pertaining to differences from a prior version of a document and a second file contains identifi-

cation data and pointers for selecting delta-formatted data from within the first file to be applied to generate a desired document version.

Embodiments of the present invention preferably include means to format documents to emphasize changes between versions. In one mode, only difference data is displayed and any unaltered data, such as in a spreadsheet, is displayed with a value of 0. Alternatively, the altered data is formatted according to user-selectable options to emphasize the changes via bolding, font selection or color.

In a preferred embodiment, sets of delta-formatted data are consecutively applied to regenerate intermediate files until a desired version is regenerated. In an alternative embodiment, the delta-formatted data is directly applied to the original version of a document.

Embodiments of the present invention preferably include version management processors for interfacing to spreadsheet processors, e.g., Lotus 1-2-3, Microsoft Excel and Borland Quattro Pro, and word processors, e.g., Microsoft Word, WordPerfect and Lotus Ami Pro.

Other features and advantages of the present invention should become apparent from the following description of the presently-preferred embodiments, taken in conjunction with the accompanying drawings, which illustrate, by way of example, the principles of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 comprises a typical prior art spreadsheet processing system;

FIG. 2 comprises a functional block diagram of a version management system in accordance with the present invention as applied to spreadsheet processing;

FIG. 3 comprises a simplified block diagram of the structure of version control files comprising a version file and a delta-formatted difference file;

FIG. 4 comprises a simplified block diagram of the check-in, check-out procedure to the library directory;

FIG. 5 comprises a simplified block diagram of the structure of a project area;

FIG. 6 comprises a simplified block diagram of the structure of a project group;

FIG. 7 comprises a representation of the menu for a preferred embodiment;

FIG. 8 comprises a block diagram of the functions available from the menu in FIG. 7;

FIGS. 9-14 comprise representations of various dialogue boxes accessible from the menu of FIG. 7;

FIGS. 15-16 comprise displays representative of two versions of a spreadsheet document as normally displayed by a spreadsheet processor;

FIGS. 17A-17C comprise alternative representations of difference data displays available from a preferred embodiment;

FIGS. 18-21 comprise additional representations of various dialogue boxes accessible from the menu of FIG. 7; and

FIG. 22 shows a block diagram of top level implementation for a user interface.

FIG. 23 shows a block diagram of an initialization sequence for the user interface.

FIG. 24 shows a block diagram for an initialization menu for a user interface.

FIG. 25 shows a block diagram for a menu with selection and action blocks for a user interface.