

for a word processing program. This makes it very efficient to represent a hierarchy of styles, with each style based on a parent style. Changes to a parent style then ripple forward to the children styles, because each child is defined as its difference between itself and its parent. Specifically, one can define a "Normal" style, which is applied to the majority of text in a document, and an "Emphasis" style that is based on Normal, with the change that "bold" is turned on. For example, if the font of the "Normal" style is changed say from "Courier" to "Helvetica", so also is the font of the "Emphasis" style changed.

It will be appreciated that the improved "single property modifiers" or sprms described above, when combined into sets, can represent a difference between the values of a structure with base (or default) values and another instance of the same structure with different values. In the case where it's common for a large structure with many individual values to have most of those values take on default values, this represents a very space efficient way to store the values of the specific structure instance.

Further, these improved property modifiers make it possible to add new fields to the structure, or rearrange fields, without invalidating the sprm groups stored in a file. Because the structure itself is not stored, but rather only differences in values in specific fields, the file-base representation has no dependence on the specifics of the structure. This is significant for storing binary data for an application program document when that application program will undergo revisions over time. It makes it easier for features to be added to the application program and corresponding values to be stored in the application program's documents, while allowing older and newer versions of the same application to continue to correctly interpret the binary files created by different program versions.

Accordingly, an improved method and system for applying formatting information to strings of text, text objects such as paragraphs, sections, or other data has been described. In accordance with the principles of the invention, a wide variety of formatting information may be associated with the string of text while preserving the ability for different versions of a computer application program to cross-handle files created with other versions of the program. The principles of the present invention are also readily applicable to virtually any type of computer application program such as databases, spreadsheets, web browsers, etc. Other uses and modifications of the present invention will be apparent to persons of ordinary skill in the art without departing from the spirit and scope of the present invention. All of such uses and modifications are intended to fall within the scope of the appended claims.

What is claimed is:

1. An improved method of formatting information in a program module operative in a computer system, comprising the steps of:

- storing a property information array stored in association with a program module, the property information array comprising formatting information for applying to data elements in a computer file upon which the program module is operative for manipulating;
- providing a data structure for storing data elements corresponding to the data to be formatted;
- providing a property modifier structure for storing groups of data formatting property modifiers and corresponding arguments that represent the appearance of the data elements;
- providing a data format structure for storing linking information that associates the data elements with corresponding groups of data formatting property modifiers,

in response to an output display device command with respect to a selected data element in the data structure, accessing the data formatting structure to determine the location in the property modifier structure of a selected one of the groups of the data formatting property modifiers corresponding to the selected data element, each data formatting property modifier having a corresponding property modifier argument and comprising an index field including an index into the property information array associated with the program module; and

displaying the selected data element in accordance with the formatting information obtained in response to accessing the property information array with each index of the data formatting property modifiers in the selected group of data formatting property modifiers.

2. The method of claim 1, wherein the property information array is stored in association with an executable portion of the program module, and the data structure, the data format structure, and the property modifier structure are stored in association with the computer file.

3. The method of claim 1, wherein each data formatting property modifier further comprises a size field including information indicating the size of the property modifier argument, and further comprising the step of traversing the selected group of data formatting property modifiers associated with selected information by utilizing the information in the size field of the current data formatting property modifier to determine the location of the next data formatting property modifier in the group of data formatting property modifiers.

4. The method of claim 1, wherein each data formatting property modifier further comprises

a data type code field comprising a data type code indicative of a type of data object for formatting to which the data formatting property modifier applies; and

a special handling data field comprising information indicating whether the data formatting property modifier requires a special handling operation.

5. The method of claim 1, wherein the step of displaying the selected information in accordance with the formatting information comprises the steps of:

in response to the output display device command, determining the selected data element to be displayed;

determining the selected property modifier group associated with the selected data element to be displayed;

locating each property modifier and its argument in the property modifier group associated with the selected data element to be displayed;

utilizing the index of each data formatting property modifier to reference the property information array associated with the program module to obtain formatting information; and

applying the formatting information to the selected data element to be displayed.

6. For use with a program module, a system for displaying information with formatting, comprising:

a property information array associated with the program module and comprising property information for applying to data elements in a document file upon which the program module is operative for manipulating;

the document file comprising:

a data structure for storing the data elements;

a property modifier structure for storing data formatting property modifiers and corresponding arguments that represent the appearance of the data elements; and