DATA FORMATING PROPERTY MODIFIERS

RELATED APPLICATIONS

The present application is a divisional of non-provisional patent application entitled "Forward Extensible Property Modifiers for Formatting Information in a Program Module", filed on Jul. 16, 1997 and assigned U.S. application Ser. No. 08/893,939 now U.S. Pat. No. 6,016,492.

TECHNICAL FIELD

The present invention relates generally to the field of computer systems, and more specifically relates to providing improved property modifiers operative to format information associated with a computer program and extensible from older to updated versions of the computer program.

BACKGROUND OF THE INVENTION

Word processing computer application programs are a well-known means for processing text information in a computer system. An example of a word processing program is the Microsoft "WORD" program, available from Microsoft Corporation. Many aspects of word processing programs have been extended to other types of computer application programs, for example, spreadsheets, project management programs, graphics programs, database programs, and the like. It is a requirement for these and many other types of computer programs that text, numbers, or other data stored in a document file be displayed in an attractive, formatted manner on a computer monitor, printed via an output device, or otherwise represented.

Many present day computer application programs have the ability to display or output information on output display devices in various formats, often in a form corresponding to the appearance of the data as it will be printed or otherwise output. For example, characters may be printed with any number of fonts, in various sizes, with the characters in boldface, underlined, italicized, centered, in sections, tables, etc.

In many computer application programs, information is represented by a "document". A document is what a user sees and edits. A document can change as the user types, makes formatting changes, adds and deletes text, etc. A document, also called a "document file", comprises a number of different data structures or sections that collectively represent a discrete quantity or unit of data for manipulation with the application program. For example, in a word processing program, a document file typically consists of a header defining file ranges for text and formatting information, a text data structure that stores text-based information, a property modifier structure for storing groups of property modifiers and corresponding arguments or parameters representing formatting information for application to the text, and a format structure containing information for linking the text in the data structure to the groups of property modifiers in the property modifier structure. The property modifiers (and their respective arguments) describe formatting applied to characters, paragraphs, sections, tables, and pictures in the document.

In this prior property modifier structure, formatting information is represented by an 8-bit pointer that constitutes a single property modifier or "sprm". The sprm indicates an offset address within a format "default" table that is stored in conjunction with the executable code of the application program. There is a default table in the executable corresponding to each different type of property, e.g., character, paragraph, table, section and picture. Because the default tables comprise a part of the executable file, they are "permanent" and cannot be modified by the user; these default tables merely serve as reference data containing formatting information that are applied to data items. Each entry in this type of default table consists of an argument size (a "single property argument" or "spra"), a group code (a single property group code or "sgc"), and a special status bit ("fSpec"). The spra indicates the size of parameter value associated with the sprm, which could be a 8-bit byte, a 16-bit word, a 32-bit long, or a variable length array of bytes in the executable. The sgc indicates a type or category of object to be formatted (e.g. character, paragraph, section, etc.). The fSpec status bit indicates whether or not the sprm needs special code to carry out its action.

Each entry in a default table applies a particular single form of formatting to a run of text, in accordance with the type of formatting to be applied, i.e., whether the run of text is a string of characters, a paragraph, a table, etc. In order to apply multiple items of formatting to a selected string of characters, plural sprm entries are provided in the prior property modifier structure. A group of sprm entries indicating a plurality of different formattings applied to a run of characters is indicated as a "group of property modifiers in a list" or "grpprl". Each sprm in a group points to a different entry in one or more of the default tables in the executable.

Turning now to a prior text formatting system used by "Microsoft WORD FOR WINDOWS 95" program, formatting information for an example text run will be examined in detail, as shown in Tables 1, 2 and 3. Table 1 generally describes the formatting for a sample text string, "The quick brown fox jumped over the lazy dog." The typical structure of a document file created in the prior word processing computer program, "Microsoft WORD FOR WINDOWS 95", is shown in Table 2. This document file contains formatting information and the related structures to support the formatting for the text string shown in Table 1. The typical structure of a default format table contained in executable code of the "Microsoft WORD FOR WINDOWS 95" program is shown in Table 3. This table contains default formatting information that supports the formatting for the text string shown in Table 1.

TABLE 1

Text String
The quick **brown** fox jumped *over* the lazy dogs. wherein: All text is font size 10 "**brown**" is bold "*over*" is italic and has been made 2 sizes larger than the rest of the text

TABLE 2

Document File

Section	FC Range	Contents	Description/ Comments
header	0–1FF	<header information>	In this case, data range: 200–22D, format range: 400–42B