

950 may connect hundreds of computers into computer communications.

In operation, a software module operating on one computer, say for example, computer 910, can address data stored on any disk unit attached to any computer connected to communications pathway 950. For example, data stored on disk unit 1001 may be obtained by a software module running on computer 910 by a messaging protocol between computer 910 and any of the computers 960, 970, 980 connected through hub 990 to disk unit 1001. Also, any other computer connected to communications pathway 950 may obtain, or write, data to disk unit 911 by using a messaging protocol with computer 910.

Accordingly, mapping parameter 150-9 from FIG. 2 contains a pointer to the location where the corresponding table data values are stored on the computer system. That is, some table data values may be stored on one disk, for example disk unit 911, other table data values may be stored on another disk unit, for example disk unit 1001, or 1003, or 921, or 931, etc. Mapping parameter 150-9 is a sufficient mechanism for a software module running on any of the computers to keep track of the location of the corresponding data values. Even further, any of the software modules of the present invention may run on any of the computers in a computer system 900. For example, a control module may be invoked on a particular computer, say computer 910. This control module may then invoke other needed modules on the same computer, for example, computer 910, or may alternatively invoke any needed software module on any other computer 920, 930, 960, 970, 980 etc., connected to the communications system 950. Distributed processing, as described herein, may be accomplished by, for example, remote procedure calls between the various software modules.

As will be recognized by those skilled in the art of scientific data interchange between instruments and data analysis modules, the advantages and conveniences of the invention will be apparent, and will have uses for interchanging data far beyond the examples set forth herein.

It is to be understood that the above-described embodiments are simply illustrative of the principles of the invention. Various other modifications and changes may be made by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. An apparatus for storing data, comprising:
  - means for measuring physical data from a chemical sample;
  - means for storing a configuration data structure, said configuration data structure having a plurality of data items, a one of said plurality of data items further having a name, a data type, a size, and a mapping parameter;
  - means for arranging ones of said plurality of data items into at least one group, said at least one group defining a table data structure;
  - said table data structure having a plurality of table data values, said table data values arranged in a plurality of columns and in a plurality of rows, a one of said table data values identified by a said column and a said row;
  - means, responsive to a one of said data items of said configuration data structure, for defining a one column of said plurality of columns;

- means, responsive to said mapping parameter of said one said data items, for referencing said one column of said table data structure; and,
  - means for storing at least one set of data, obtained by said measuring means, in a predetermined row of said table data structure, said table data structure and said configuration data structure defining a data model, and data corresponding to said model accommodated in each said row.
2. The apparatus as in claim 1 further comprising: means for editing said configuration data structure, to define said data model.
  3. The apparatus as in claim 1, wherein said table data values further comprise:
    - at least one of said table data values capable of containing an n dimensional array, said n dimensional array having a plurality of elements.
  4. The apparatus as in claim 1, wherein said table data values further comprise:
    - at least one of said table data values capable of containing an arbitrary data structure.
  5. The apparatus as in claim 1 wherein said plurality of data items of said configuration data structure further comprises:
    - indicators of a class, a superclass, and a sub class, to indicated a node location of said data item in a hierarchical data structure.
  6. The apparatus as in claim 1 wherein said table data structure further comprises:
    - means for storing a said one of said plurality of data items as a header of said one column defined in response to said one of said plurality of data items, to make data stored in said one column self describing.
  7. The apparatus as in claim 1 wherein said means for storing said table data structure further comprises a computer disk.
  8. An apparatus as in claim 1 wherein said table data values further comprise:
    - at least one of said table data values containing a spread sheet.
  9. An apparatus for interchanging data between at least one source and at least one target, comprising:
    - means for measuring physical data from a chemical sample;
    - means for storing a configuration data structure, said configuration data structure having, a plurality of data items, a one of said plurality of data items further having a name, a data type, a size, a required flag, a modifiable flag, and a mapping parameter;
    - means for arranging ones of said plurality of data items into at least one group, said at least one group defining a table data structure;
    - said table data structure having a plurality of table data values, said table data values arranged in a plurality of columns and in a plurality of rows, a one of said table data values identified by a said column and a said row;
    - means, responsive to a one of said data items of said configuration data structure, for defining a one column of said plurality of columns;
    - means, responsive to said mapping parameter of said one of said data items, for referencing data stored in said one column of said table data structure;
    - means for said at least one source with a source format to store selected data in at least one row of said table data structure;