

**SYSTEM FOR SELECTIVELY CONVERTING
A PLURALITY OF SOURCE DATA
STRUCTURES WITHOUT AN
INTERMEDIARY STRUCTURE INTO A
PLURALITY OF SELECTED TARGET
STRUCTURES**

This is a continuation of application Ser. No. 07/880,626 filed on May 8, 1992, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a data interchange system and, more particularly, to a computer system that is adapted to communicate and translate data between various computer systems.

2. Discussion

Data interchange systems are used to allow at least one computer system that is adapted to process data having a first data structure, to communicate this data with at least one other computer system, adapted to process data, having a second and dissimilar data structure or format. More particularly, the interchange system transforms or translates data having a first structure, into a targeted data structure format, which is communicated to the target computer system. Moreover, while these prior interchange systems have adequately allowed for the transformation of dissimilar data structures, they have suffered from a number of drawbacks.

Most of these prior systems have used a "dictionary structure technique", for describing the translation of messages. More particularly, this technique requires that a received message be separated into a fixed number of hierarchical levels, each being associated with a unique dictionary. This dictionary is then used to translate or transform the associated hierarchical data structure level, into a corresponding target structure. While effective in some situations, this technique fails to achieve the desired transformation if the message format requires more hierarchical levels than there are dictionaries available. In this situation, the incoming messages are not properly translated and the interchange system fails to provide the desired communication.

Moreover, these dictionaries are often of a fixed format, corresponding to specific types of messaging or data structure formats which are allowed to be translated. Should other types of structured messages be received by these prior interchange systems, the received messages fail to become translated and the desired communication does not occur. Therefore, these prior interchange systems are incapable of accepting new or other types of data formatted messages, which have not been previously described.

Moreover, many of these prior data interchange systems directly map or "couple" the definition of the translating or mapping functions between each source and target message. Therefore, should new message formats be desired, or current formats modified, a sizable effort is required to change the entire source and target mapping arrangement. Therefore, should additional formats be desired, a large amount of time and effort is wasted in adding these new structures to the previously defined system. Moreover, many of these systems requires a different methodology or manner of message specification, requiring a great deal of effort upon the part of the designer or user and further adding to the overall inefficiency and undesirability of these systems. Lastly, many of these prior interchange systems require that

the mappings or translations be performed at the time that the source message or data is found, and do not allow the data to be withheld until a later time. This timing constraint requires a relatively complex and inefficient system scheduling operation, and further increases the overall transformation time associated with these systems.

There is therefore a need to provide a data interchange system which allows various types of data formats to be translated and received by targeted systems. Moreover, there is a further need to allow this provided data interchange system to be easily adaptable and operable with a variety of data structures, and to allow the interchange system to efficiently transform these data structures from one format to another.

SUMMARY OF THE INVENTION

It is therefore, a primary object of this invention to provide a data interchange system that is adapted to translate or transform a first message, having a first data format, into a second message, having a second and dissimilar data format or structure.

It is another object of this invention to provide a data translator, adapted to process a wide variety of dissimilar data structure messages, and which is easily modifiable, effective to relatively easily allow previously defined data formats to be modified and changed as desired.

It is yet a further object of this invention to provide a data interchange system, adapted to receive a message having a first data format, to receivably store the first message, and to translate the received message into a second data structure or format, at a predefined time later.

It is yet a further object of this invention to provide a distributed translator system, having a number of translators, each adapted to transform or translate a data message having a first data format, into a second data message having a second data format.

According to a first aspect of the present invention, a data interchange system is provided. More particularly, the interchange system includes a translator adapted to transform or translate a first data message having a first format, into a second data message having a second format.

Further objects, features and advantages of the present invention will become apparent from a consideration of the following description and claims, when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Various advantages of the present invention will become apparent to those skilled in the art by reading the following specification and by reference to the following drawings in which:

FIG. 1 is a block diagram of the data interchange system of the present invention, shown in communication relationship to typical computer systems;

FIG. 2 is a block diagram of the data interchange system shown in FIG. 1;

FIG. 3 is a block diagram of the computeraided modeling system, shown in FIG. 2, in communication relationship with the controlling server and model and state databases of the data interchange system of the present invention;

FIG. 4 is a block diagram showing the communication relationship between the communication server of the present invention and a variety of external communication networks;