CONTROL OF DATA FLOWS IN HETEROGENEOUS ENTERPRISE SYSTEMS

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Abstract

Control of data flows and importer object structure provides the efficient data processing during the actual flow and provides process control and data monitoring at several stages. The information about controls and import results is recorded. It can also provide data archiving.

Key words

system integration, data flow, data import, heterogeneous enterprise systems, ERP.

INTRODUCTION

ICT implementation has become part of all areas in our society. One of the factors of ICT implementation is the integration of individual subsystems. Integration within the enterprise is usually performed at different levels, from the process levels to the data levels. The company, which has introduced the integration of individual subsystems, has usually faster and more efficient production. These factors significantly affect the competitiveness and market position. The efficiency can be also increased by error control followed by the data flow adjustment before their processing in the system.

CONTROL OF DATA FLOWS

Effective data integration and control of data flows leads to the formation of a coherent integrated database that is becoming a more and more complex problem. Information of the enterprise includes the functions from processing of offers, orders via computer design and production to production management. The size of integration is different in various companies, because business and production processes require different implementation. Therefore, there are efforts to integrate all these functions in order to increase process efficiency and responsiveness. The specialists agree that computer integration of production systems is relatively smooth, from technical point of view. The biggest problem is the management of information technology support, from their choice to application (1-3). In other words, the focus of integration in manufacturing company is currently changing from

the manufacturing systems integration to integration of the information obtained from consistent data, which support and provide the meaningful use.

Control of data flow is the transfer of data into the import system. Then the data is loaded into the appropriate data structure of importer storage interlayer. At this level, it is possible to process data with the use of different ways of pre-processing operations. They may include transformations, cleaning, derivations, calculations, aggregations, disaggregation, coding, etc (Fig.1).

Data is maintained and transformed in order to meet the conditions and structure of the data in the target system.
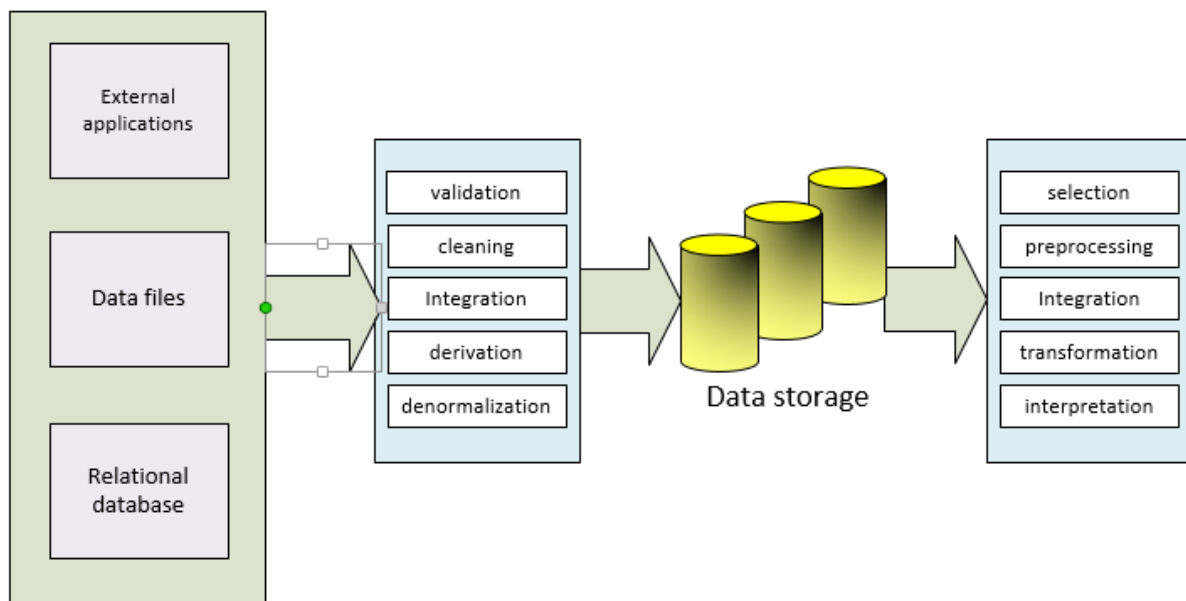

Fig. 1 The transformation and data processing in OLAP

The difference between pre-processing and post-processing is that the pre-processing processes the source data into the form enabling to combine the source data with the target data within the data transformation.

Post-processing carries out data transformation already combined with the target data. This kind of processing is necessary to create derived data values and data calculations (4-6).

In the next step, target data is loaded from import system. This step is necessary, because the imported data is divided into categories according to whether the target records will be added, updated, or deleted. This kind of data pre-processing significantly speeds up the import process, because the data in the source dose, which is unchanged in comparison with the value of the target attributes, will be omitted from subsequent processing (Fig. 2).

At the end of the data processing, there is the validation of process results. If the result of importing is not validated, then control of the data starts.
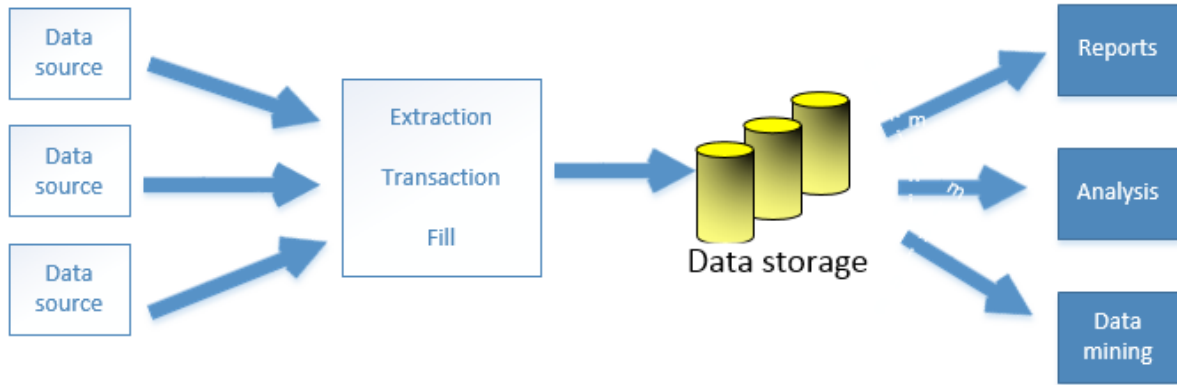
Fig. 2 *Data processing in a data warehouse*

Then control of the result of data processing will be extended to the control of the amount of changes of individual attributes and their values. If we can precisely define the criteria of this control, its parts could be fully automatic. In some cases, we cannot avoid human intervention in the process, for example, when we need to find the people responsible for the source data and the results of the inspection should be discussed directly with them. If there are made major changes in the source system (for example, Bulk update data), the amounts of imported attributes can be unexpectedly increased, but even the increased amount is shown to be valid for the import (5).

Parameters for validation are set for each import in advance and they prevent damage of the target data. For example, they include the boundary conditions for a number of processed records, or define valid values of attributes. If the results contain satisfying criteria, integration application can be started. The data that is identified as acceptable for further processing is transferred to integration application. There is the transfer of individual records into the target system and its updating. The feedback, implemented within integration application can control values of individual attributes in the target system during the actual import. Data is imported into ERP system, which serves for operational activities (Fig. 3). The feedback enables us to eliminate the errors caused by the change of data in the target system during import processing. If the system finds such records that have changed values, and they do not meet the import conditions, this kind of information is recorded in the importer log structure. If the data satisfies the conditions, it is successfully imported into the target system and it is recorded. The result of import is first recorded in the integration module of the target application and then all results are transferred back to the importer structure of data flow.
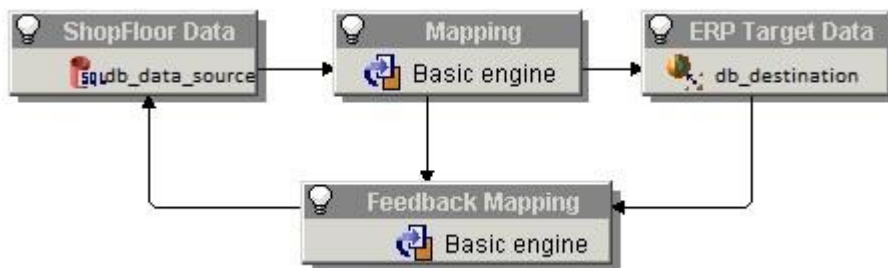

Fig. 3 *Data mapping feedback*

After completing and transferring all data, it is important to archive the data from import system. Data archiving can serve for searching import errors or for various reports on the quality and quantity of integrated data (Fig. 4).
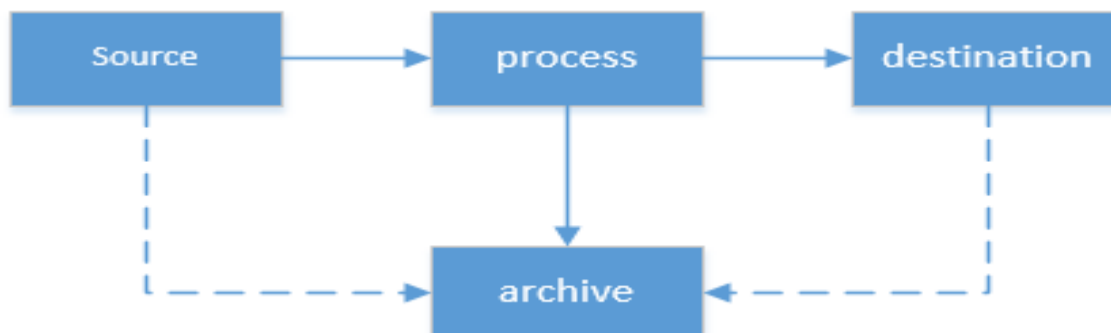

Fig. 4 *Data archiving*

CONCLUSION

We were able to increase efficiency and speed in production by error control followed by the data flow adjustment before processing in the system.

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