DATA WAREHOUSE & ERP: A COMBINED APPROACH
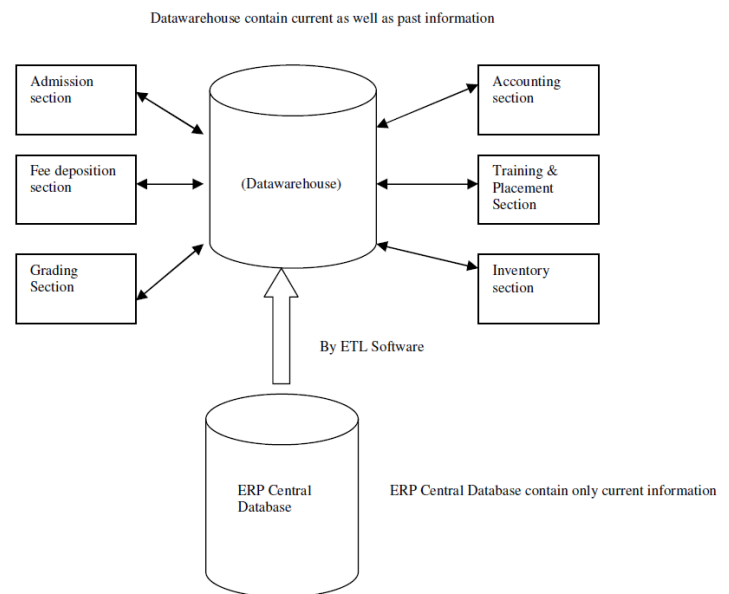
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Abstract: The use of ERP has led to an explosion in source data capture, and the existence of a central ERP database has created the opportunity to develop enterprise data warehouses for manipulating that data for analysis. ERP software is divided into functional areas of operation; each functional area consists of a variety of business processes. Common functional areas of operation in most companies would include: Marketing and Sales; Production and Operations (Materials Management, Inventory, etc.); Accounting and Finance; Human Resources. With the use of the ERP's common database and the implementation of DSS/DW user support products companies can design a decision support/data warehouse database that allows cross-functional area analysis and comparisons for better decision-making. Topics which we will discuss in this paper are: Data Integration from various sources of data into data warehouse, Design issue for a data warehouse from ERP. Enterprise Data Model, Extracting ERP information using SAS is the benefits of data warehouse in ERP.

I. DATA INTEGRATION

Data warehouse is a database which stores collection of past (historical) as well as present (current) data. Data inside the data warehouse should come from different sources called data marts. Each of these sources has its own designer which creates its database file (collection of data) in different format. Integration of all files in a Data warehouse require transformation program which transforms many sources into one particular format so that integration program integrate all same format files into one consistent database.

The challenge therefore is to collect and store data from multiple sources (i.e. data marts) into one coherent structure (i.e. Data warehouse) by using ETL (Extract, Transform & Load) process based on which data analysis can be performed.

Data warehouses aim at physically framing multiple sources of data (e.g., databases and other) in an architecture that requires the mapping of data from one or more operational data sources to a target database management system.

II. ISSUES IN CREATING DATA WAREHOUSE FOR ERP

A. Slowly changing dimensions

Slowly changing dimensions are those values that exist in data that change over time, but are not considered transactions. Things like Customer Address, Age, and Marital Status may all be considered slowly changing dimensions. Depending on the type of reporting desired, these changes may have to be tracked different ways. There are 3 basic ways that the EDW

supports slowly changing dimensions. These 3 ways is to consider the value as old, new or track value over time.

A composite key is used to incorporate all three types in design. Composite key is based on current flag & Date. A vector is also used for all columns having only character value 0 or 1 indicating the column value is change or not.

B. Change data capture/integration

Change Data Management can be defined as the total process of finding records that have changed in a transaction system, and applying those changes to a data warehouse.
Change Data Capture has to capture data for three different events.
• New data
• Change data
• Deleted data

C. Surrogate keys

Surrogate keys are nothing but integers which do not have any meaning in terms of business and used as primary key in dimension table. These are generally smaller integer's numbers which make index size smaller when used as index column.
Where multiple source system loads data into a single dimension, we have to maintain a single SK to enforce the uniqueness of SK. If duplicate record comes from different source, there is a potential risk of duplicates being loaded into the target since the unique constraint in defined on SK not on natural key.
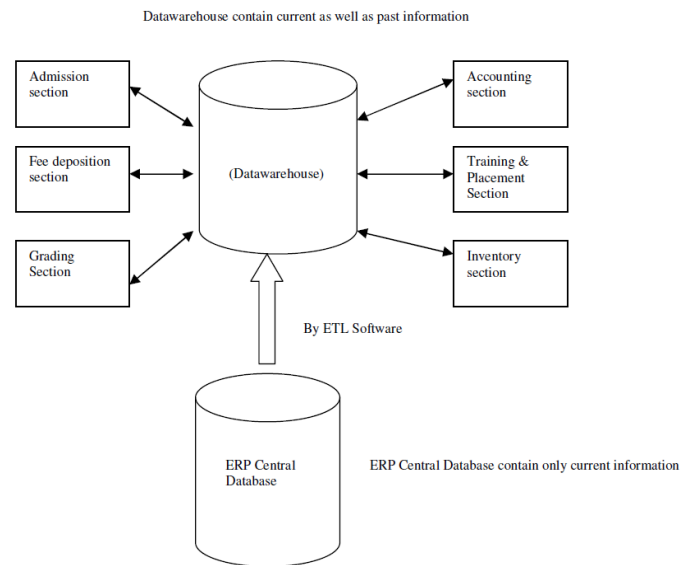
D. Hierarchies

Hierarchy is a set of levels having many to one relationship between each other and the set of levels collectively makes up a level or tree. The hierarchy is a series of parent child relationships, typically where a parent member represents consolidation of the members which are its children.

III. ENTERPRISE DATA MODEL

Data is stored on various systems which make silos of information. It is time consuming to get the data and compile it. There is no easy way to get access to the data from heterogeneous systems and it requires manual processing to gather data & create reports.

Enterprise data model is nothing more than a piece of metadata that describes entities and attributes that describes your corporation. The purpose of this model is to get a consistent model of multiple data marts.

Information that is not used for a long time is retrieved periodically from ERP system and stored into the Data warehouse. Now all departments/sections communicate with the Data warehouse & can retrieve past as well as present information from it and can take better decisions. ERP system creates central repository for current information sharing, while Data warehouse creates central repository for current as well as past information sharing.

While modeling the data warehouse for ERP, we need to lookup below points:

• Data should be filtered as per needs.
• Data should be converted from one format to other.
• Design should embody subject matter expertise.
• Data should be consistent across subject area.
• Surrogate keys should be handled correctly. Surrogate keys are new keys that replace transaction keys from the ERP system.

IV. EXTRACTING ERP INFORMATION USING SAS

ERP works on SAP and data warehouse works on SAS. SAS extracts the required information from ERP system whenever

required. Metadata that exist in the application layer is used by SAS product to make sense of data SAS extracts the metadata in SAS view. Once a data file is requested, a RFC server is activate to retrieve that data directly from SAP. RFC further access the SAP database and create the view to export.

SAS tool has an export option which will export the SAP view directly into data warehouse. it export the short descriptions as labels and long descriptions as notes.

V. BENEFITS OF DATA WAREHOUSE IN ERP IMPLEMENTATIONS

Information is the assets of any organization and data ware-house provide whole information about the enterprise to the decision makers so Data warehouse is beneficial to any organization. Here are some of the Benefits of the Data warehouse:

a) Due to whole information, it allows decision makers to take correct decisions so Data warehouse improves organizational intelligence.

b) In the Data warehouse all information are placed in common place which are taken from multiple sources. So decision makers access the information from the Data warehouse without spending time for access data from multiple sources.

c) A data warehouse implementation includes the conversion of data from numerous source systems into a common format. Since each data from the various departments is standardized, each department will produce results that are in line with all the other departments. So one can have more confidence in the accuracy of the data used by him and accurate data is the basis for strong business decisions.

d) A data warehouse stores large amounts of historical data so one can analyze different time periods and trends in order to make future predictions.

VI. CONCLUSION

With the growth of ERP applications, it is important to make sure that you are getting the most benefit possible from this investment. It is important to build a different structure for the reporting and analysis to fully recognize the value of this information

VII. REFERENCES

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