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REVIEW ON DATA WAREHOUSE, DATA MINING, OLAP AND OLTP TECHNOLOGY: SEEING THAT VITALLY IMPORTANT ASPECT OF DECISION-MAKING PROCESS

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The growth of data is more and more from the previous few decades. which leads us to search out the innovative ways to extract information used for making a comprehensive decision data warehousing, on-line transaction processing (OLTP),Data mining, on-line analytical processing(OLAP), be vital fundamentals for decision making that is continuously come to be as a center of interest about database industry. Data warehousing is the act of distilling as well as converting operational data into informative data along with storing it into data warehouse. Data mining obtain from the taking out of concealed forecasting information about large databases. Data warehousing backing on-line analytical processing (OLAP), effective practical moreover performance requisite that is absolutely distinct from on-line transaction processing (OLTP) applications commonly supported through the operational databases. The OLAP system and online Transactional Processing (OLTP) system be developed to make available data to clients into a consequential form via a DSS (Decision Support System) Request. In this paper, we provide an review about, OLTP technologies, analyze the appearance, Data warehousing, Data Mining, OLAP applications and the architecture of Data Warehousing in decision making.

Keywords : Data Warehousing, Data Mining, OLAP, OLTP and decision making.

INTRODUCTION

A data warehouse is a subject-oriented, integrated, time-variant, and nonvolatile collection of data in support management's decision making process.

Commonly, data warehouse is keep independently as of the organization's operational databases. Because numerous adequate causes in favor of doing this. Data warehousing based OLAP from those functional including presentation necessities are somewhat distinct from OLTP (online transaction processing) applications routinely fundamental of the databases that are operational.

The Data warehouse holds a set of technologies that support decision, that permissive the acquaintance workers that may be executive, manager, and analyst toward generate more suitable as a consequence quicker decisions. The data warehouse present physical application about data model that supports decision with the information storage lying on which a firm wants to compose all-important determinations.

Data mining tools forecast upcoming trends and behaviors, permitting enterprise to generate appropriate information and expertise finding. The computerized proposed analysis provide by data mining move after the analysis from the previous occurrence offered by demonstration tools of DSS. Data mining thinks about for the reasoning regarding data furthermore the adoption of software methods for locating prototypes and consistency in sets about data. [1]

Decision support system gives out the administration, procedure, including suggestions for organization make decisions that can be quickly altering and no more simply stated in earlier. [3]

The data warehouse is capable of semantically reliable data store to give as a physical employment of a (DSD) Decision Support Data Model and saves the material on that firms require to generate important implementations. [2]

Decision support technologies used in data warehouse intended knowledge worker to formulate healthier and quicker decisions. [5]

Particular data base architecture that is a short time ago emanated is the data warehouse, a storehouse of multiple heterogeneous data sources, coordinated in a combined schema on a particular one site so as to make possible management decision production. [6]

Data warehouses offer OLAP tools designed for the interactive decisive test of data of multidimensions

assorted granularities, which make possible efficient data mining. Performance and Functional prerequisites of OLAP are somewhat dissimilar as of the OLTP applications usually supported by the operative databases. [4]

The data warehouses are the provision of right data also turn it into a extremely accurate information, find out patterns and facts to identify the problem and recognize it's landmarks, and provision of data and information at the accurate time.[7]

DATA WAREHOUSING DATA WAREHOUSE DEFINITION.

W.H.Inmon, a principal architect in the construction of data warehouse systems, a data warehouse is integrated, subject-oriented, non-volatile and timevariant collection of data in support of management's decision making process. Within data warehouses past, summarized plus merged data is added significant than complete, separate personal records. Because data warehouses hold repository of data, may be from numerous functional data bases, possibly long periods of time, they inclined to be greatly bigger than functional data bases. Mainly queries are 1) ad hoc queries 2) complex queries of two types That is able to perform a lot of scans, access millions of records, joins, and aggregates. Owing to these complexity queries response times and output are more significant than transaction output.

The Data Warehouse technologies have been successfully installed in numerous industries like, financial services, manufacturing retail transportation, utilities, healthcare and telecommunications.

DATAWAREHOUSING ESSENTIALS

Inmon categorized data warehouse definition into four parts:

SUBJECT-ORIENTED: The data warehouse be categorized in the order of the dominant subjects of the firms like consumers, merchandise, and sales more willingly than dominant application sphere like invoicing, goods sales and stock control. That is mirrored in the requirement to pile up decision support data more willingly than

Application Oriented Data.

INTEGRATED: The Data warehouse provides the integrity of source data because source data come

from different organizations are different in format. The integrated source data provides persistent data to show a combined view of data to the clients.

TIME VARIANT: Time variant is also property of data warehouse according to inmon, as data in warehouse is just valid and accurate at some specific period of time. Data warehouse time-variance of the is additionally revealed within the comprehensive time in which data is detained, the explicit or else implicit involvement by all data of that time, and the information that the data express a sequence of snapshots.

NON-VOLATILE: Because the data is not refreshed in real time although refresh from operational systems on a routine basis. Latest data is constantly additional as a enhancement to the database, more willingly than a substitution .The database continuously ingest this contemporary data, addition integrating it with the past data.

NEED OF DATA WAREHOUSE

Following point's shows to identify the need of data

- Data loss: Decision support system depend upon historical data, that operational databases do not normally retain
- Data amalgamation: Decision support needs strengthen of data as of many heterogeneous sources: operational databases, external sources.
- Data quality: Diverse source usually employ unpredictable data illustrations, formats, and codes that have to be merged.

TYPICAL DATA WAREHOUSE ARCHITECTURE

Data ware house contains tools used for distilling data from various operational databases and external sources designed for purifying, altering and integrating this data for weighted data into the data ware house furthermore for from time to time uplifting the warehouse to reproduce updates by the sources and to clean data from the warehouse, possibly adjacent slower archival repository. The warehouse servers managed the data marts as well as data of warehouse using a range of front end tools: report writers, analysis tools, query tools, and data mining tools. Lastly, there exists a storage area that performs the functions of managing and storing metadata, also tools intended for governing and supervising the warehousing system.



Figure 1: Typical data warehouse Architecture

BASIC CONCEPTS OF OLTP AND OLAP

The Online Transaction Processing is described through a number of small online transactions: INSERT, UPDATE, and DELETE. The most important consideration for OLTP systems is put on extremely high speed query processing; maintaining data integrity in multi access environments and the effectiveness of system is considered by numeral transactions per second. Online transaction processing system database contain on detailed and current data.

OLTP deals with data essential used for the efficient on a regular basis operation of an industry or institute. In OLTP data records are focus to numerous access and regular update. On the contrary, in a warehouse the data is in parts for the reason that the data is no longer use to the OLTP environment. The greater part of data in a warehouse is historical and not subject to change.

Online Analytical Processing is indicating through comparatively little number of transactions. In OLAP queries are frequently incredibly complicated and include aggregations. In OLAP systems a response time is an valuable gauge. Data mining techniques also used OLAP applications widely. OLAP database consist historical and aggregated reserved in multi dimensional schemas typically star schema. Concurrent processing of multiple transactions is also supported by transactional processing. Consistency and strength of transactions are ensuring by the Concurrency control and recovery mechanisms. Although OLAP query frequently requires read only access of data records intended for characterization aggregation and summarization. The mechanisms of recovery and Concurrency control if implemented for

such OLAP operations may put at risk the execution of concurrent or simultaneous transactions. DATA WAREHOUSING VS. OLTP SYSTEMS

OLTP systems	Data warehousing systems
Handle huge amount of clerical/operational customers	Handles comparatively small amount of
Occupy current data	Occupy historical data
Saves data in depth	Saves data in depth , lightly, and highly summarized data
Data is dynamic	Data is largely static
Repetitive processing	Ad hoc, unstructured, and heuristic processing
Top level of transaction output	Average to low level of transaction output
Conventional model of practice	Un Conventional model of practice
Transaction driven	Analysis driven
Application oriented	Subject-oriented
Supports day-to-day decisions	Supports strategic decisions

DATA MINING

Data mining is the technique of extraction of concealed anticipating information from huge databases is a powerful latest technology with enormous potentiality to facilitate companies' center of attention on the large amount vital knowledge in their ware houses. Data mining tools forecast prospect trends along with behaves, permit businesses to make extremely enthusiastic, know how-based decisions.

Now the working on central part of data mining technology has been facing hardships for epochs in research fields like as, AI , Machine learning ,Statistics.

For extract the data patterns in data mining applying different intelligent techniques applied. Front end tools are used for this purpose. The most compiling front end application for Online Analytical Processing (OLAP) is spreadsheet is yet now.

Nowadays the development and use of these techniques joined by means of wide data integration attempts and high production relational database engines and attempts frame these technologies useful intended for present Data warehouse layout.

DEFINITION AND CHARACTERISTICS OF DECISION SUPPORT SYSTEM

The interactive flexible and adjustable system specially designed for support of solving unstructured or semi structured decision making problems intending to get better the decision process.

A Decision Support System is some tool employs to boost the process of forming decision in complicated systems.

The decision Support System be able to variety of answers of simple queries along with permits a consequent decision to be completed to a system which uses AI and grants comprehensive querying over a spectrum of relevant data sets.

DECISION SUPPORT SYSTEM IN DATA WARE HOUSE

Following are the characteristics of the data supply by the data warehouse which decrease the time of decision taking:

Precision: The quality of decision is improved by the contribution of precision.

- Relevancy: Relevancies provide the correspondence data according to the problem that need the decision.
- ➤ A smaller amount time: provide simple accessibility to the data when it's needed.
- Integrity: Data gathering from different sources are different in formats. Integrity feature overcome to this problem.

COMPONENTS OF DECISION SUPPORT SYSTEM

THE DATA BASE

- A set of the present or the historical data from a number of the applications.
- Especially well arranged.
- Make available easy access intended for a huge range of the applications required.
- Provide data integrity in an efficient way.
- Decision Support System utilized the data extracted from the related databases together the internal and the external as well as then stored specially for the Decision Support System.

THE MODEL BASE

- Represents an abstract representation.
- Emphasize on diverse components or else the relationships of a phenomenon.
- Can be a mathematical model, physical model, or the verbal model.

THE DECISION SUPPORT SYSTEM

- The DSS allows interaction among the clients of the system and the Decision Support System data base.
- Provide assistance in the creation, storage space and the recovery of the models in the model base.
- Provides a user interface.



Figure 2 View of DSS architecture and components

CONCLUSION

The data warehouse is a historical database with the aim of summarize, put together, and sort out data from one to many operational databases in a format which is well organized and efficient for analytical queries. The purpose of the creation of data warehouse involves recognizing operational sources, extraction of data plus loading of data and cleansing the data into the data ware house. Data warehouse provide the benefits and solutions to different organizations that are essential for decision making. The information can be consistently accessed from a sole, integrated and advanced source of high valued. A data warehouse thus sets the base for decision support environment. In addition, OLAP provides an emerging technique designed for handling data online through offering easy resources for manipulating data and figure out new information suitable to particular demand. Consequently, OLAP is an encouraging way in support of extracting information to provide strong information and quick decisions that are significant to competitiveness and expansion for organizations.

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