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The Role of Data Warehouse in Decreasing the Time of Decision Taking

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ABSTRACT

The needs of decision-makers that have become increasing constantly, and require the integration of different data sources, to present the data in away contributing to determine the best alternative for the organization, among the alternatives available, That was in the previous times require significant time that lead to the end of its need or changes in the circumstances of decision-making and the loss of opportunities to change the organization. So there was a need to create data warehouses, which is one of the most important developments of databases. This paper provide an glance of Data warehousing, and Highlighting the role of data warehouse in decreasing the time of decision taking, DW is a set of decision support technologies, purpose enabling the knowledge worker(executive, manager, analyst) to taking better and faster decisions.

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INTRODUCTION

Data and information has become a fundamental pillar of the decision-making and determining the best alternative choice (Turban *et al*: 2007). The data warehouse is a new technical trend (Nur Hani Zulkifli Abai, Jamaiah H. Yahaya, Aziz Deraman, 2013), described only as of the latest concepts of information systems field and is of great importance in many business applications and particularly in large organizations with multiple branches and distribution (Satyanarayana reddy *et al*: 2010), because of its active role in the management of information resource (Kanika Talwar, Anjana Gosain, 2012).

The basis of the data warehouse is to achieve integration among heterogeneous information in different databases, systems transaction processing and Legacy System (Inmon: 2002), as well as external data sources that is relevant to it, so it (Manole velicanu, Gheorghe matei: 2007) provide to the Organization unified and integrated environment for current and historical data in the context of a data in a single warehouse (Krishnaveni, Hemalatha, 2013).

The unrealistic data and information and the weakness of their suitability for the situation that needs the decision, leads to weakness of determining the features of the problem and therefore the loss of opportunities for organizations, and here comes the role of data warehouses in the provision of appropriate data and turn it into a very precise information, discovering patterns and knowledge to diagnose the problem and identify it`s landmarks, and they provide the data and information at the right time (Loshin: 2013).

Background:

The data warehouse is a new technical trend, described only as of the latest concepts of information systems field and is of great importance in many business applications and particularly in large organizations with multiple branches and distribution, because of its active role in the management of information resource (El-Sappagh, Hendawi, El Bastawissy, 2011).

The basis of the data warehouse is to achieve integration among heterogeneous information in different databases, systems transaction processing and Legacy System, as well as external data sources that is relevant to it (M. Laxmaiah, A. Govardhan: 2013), so it provide to the Organization unified and integrated environment for current and historical data in the context of a data in a single warehouse(Kanika Talwar, Anjana Gosain, 2012). Data warehouse is an analytic data storage system, to support the decision of unification the heterogeneous data, and save them after removing the redundant (Kanika Talwar, Anjana Gosain, 2012).

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Defined Data warehouse as a set of integrated historical data, that help in decision-making, they are designed to extract, storage, processing and present data in an appropriate image for this purpose, and include large amounts of data are collected from various internal and external sources (Turban *et al*: 2007). While Ralph Kiall pointed that the data warehouse is a system that extracts data from diverse sources, after removing the repeated information, and make it homogeneous, and store it in multiple directions to support and execute the query and analysis forms to help in the decision-making process (Kimball Ralph, Joe Caserta: 2004). Whereas Golfarelli & Rizzi define The data warehouse as a set of methods and techniques that analyze data to help the workers in knowledge field, managers and analysts in to make better and faster decisions (Matteo Golfarelli, Stefano Rizzi: 2009; Nur Hani Zulkifli Abai, Jamaiah H. Yahaya, Aziz Deraman, 2013).

William H. Inmon who is considered the father of the data warehouse define it: "subject-oriented, integrated, time varying, non-volatile collection of data that is used primarily in organizational decision making'' (Inmon: 2002).

Subject – oriented: to organize the data into the data warehouse by subject, any data is divided into small parts that hold certain part of the Organization section (such as sales data, marketing, products, customers, suppliers, human resources) so that they can organize and employ them to support decisions within the organization and help to give a comprehensive overview of all activities of the organization (Inmon:2002; Satyanarayana reddy *et al*: 2010).

Integrated Approaching the concept of integration towards the subject-oriented. Data integrity is also means access from many different sources, always be heterogeneous, and are converted in the data warehouse into forms can be displayed and easily accessible (Crescenzio Gallo, Michelangelo De Bonis e, Michele Perill, 2010).

Non –volatile after the arrival of the data to the data warehouse, you can't make any editing on them (no deletions nor additions) On the contrary of databases, meaning that the data is read-only and extract the appropriate analysis, but it is updated at specified intervals (Balacanu Daniel, 2007).

Time Variant preserve historical data, to help the organization in knowing the current status of the organization and predicting the future (Inmon:2002).

Business requires the ability to access and integrate data from different modes of storage, and execution analyzes through these warehouses to create a multi-dimensional tables, as well as the needs of decision-makers that have become increasing constantly, and require the integration of different data sources, to present the data in away contributing to determine the best alternative for the organization, among the alternatives available (Sheng-Hui Lin, Yuan-Chii G. Lee, Chien-Yeh Hsu, 2010), That was in the previous times require significant time that lead to the end of its need or changes in the circumstances of decision-making and the loss of opportunities to change the organization So there was a need to create data warehouses, which is one of the most important developments of databases (Shao Yi Chuan, Xingjia Yao, 2012).

The data warehouse is considered the technical base that operate on the bases of quick and flexible responses to the activities of business.

Dan power pointed that the data warehouse provides three main benefits for the organization Data Integration, because of the multiplicity of sources. Data analysis to make it easy to understand, which helps in the decision-making. Reduce the cost through access to historical data.

Mark I. Hwang point of view says that the data warehouses have become one of the most modern technologies that support the decision, and in spite of the high cost, companies still trying to build, and use the data warehouses. Because of its benefit for the organization, including the benefits of ease of use and access to information, the speed of information retrieval and Information of high quality thus reduce the time of decision taking (Hwang Mark I. and Hongjiang Xu, 2007).

Data mart each mart contain data for one activity in the organization, (production, sales, suppliers, human resources) (Reddy Satyanarana, 2010) each one is a small data warehouse that focus only on one subject or partition (Han jwan and M, Kamber, 2006).

The benefits of data mart

- Quick response for query, because they contain specific data.
- Integration and data load process, Need less time than the data warehouse.
- Building data mart is simple, takes less time and cost less than building a data warehouse for the organization as a whole (Güz_n türkmen 2007).

Meta data:

It's a data about data that describe the physical and technical environment of the data(Kimball Ralph, Joe Caserta2004), by describing the tables inside the data warehouse, including the field of the tables, the type of the data of each field (number, text, date, time) and the limit of each field. So it resemble a dictionary. It should be ordered in alphabetical order according to the first letter of the name of each field. The Importance of this order become clear when editing (delete, add, update) the data or on the application that use this data (M. Laxmaiah, A. Govardhan, 2013).

Decision Taking:

Decision taking process play a major role in the efficiency and activity of the organization, as it's considered the corner stone of the whole organization

operation. And it's defined as the process of comparing between the alternative choices and choosing the best one to solve specific problem in specific situation (Laudon & loudon 2012). Another point says that it's the process of choosing the best alternative choice according to the situation, after studying the expected result of each choice and its effect in achieving the goals (Oriana Negulescu, Elena Doval, 2014).

Taking in consideration that the most important decisions are not made by one person, on the contrary it's made by multiple workers on different level of administration, on many stages so the decision emerge as a finale result of integrated effort of thinking , communication and researching that take place in different level of the organization, that's why the decision making process is an essential process in the organization, so the administrative business is concentrating on the process of decision making and the factor that affect it.

divides the decision into three types;

1- Structured (programmed): which is repetitive and routine decision, where the process of decision making is clear and definite.

2- Semi structured (semi programmed): where part of the problem is clear and the process is definite, but its not enough for decision taking.

3- Unstructured (not programmed): where the circumstance is unclear (Turban: 2007).

The role of data warehouse in decreasing the time of decision making:

The rapid changes of that occurred for the organization like globalization and the strong competition of overtaking the market and the customer is considered a real challenge for the business of the organization (Iwona, Okrglicka, 2014), as it forced it to react for the new reality to avoid the risks and continue to survive and achieving the goals. And it also force the decision maker to make fast, precise and effective decision to preempt the crises and be prepared before it happens, preserve the progress of the business and invest the opportunity in the surrounding environment (Emma E.H. Doyle, *et al*, 2014).

That's where the data warehouse help, by preamble the circumstance to make a fast decision, by providing high quality and integrated data about every part of the organization, from deferent sources from the internal and external environment of the organization in the appropriate time.

The characteristics of the data provided by the warehouse that decrease the time of decision taking:

1- Precision (Accuracy): Accurate data that contribute to the quality of the decision.

2- Relevancy: Providing the data that's relevant for the problem that need the decision.

3- Less time: by providing easy accessibility to the data when its needed.

4- Integrity: gathering the data from different sources and from the internal and external environment of the organization.

Conclusion:

In crisis times good decision-taking becomes awkwardness, thus, decision maker are prevented from making the better and faster decision, , because they are not provided with the information they need and the right time, therefore led manager rely on forecasts, guesses, and luck. The result is poor response times. These poor outcomes lose customer. data warehouse have made it possible for managers to use real-time data when taking decisions, became are essential elements of decision support, Data warehouse serve manger in the role of data analysis and decision making, can organize and present data in diverse formats in order to accommodate the diverse needs of the different users. Data warehouse enables managers to solve problems that would be impossible using less flexible systems with lengthy response times.

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