Case study: active data warehousing

Education

1. Describe " active" data warehousing as it is applied at Continental Airlines. Does Continental apply active or real-time warehousing differently than this concept is normally described? An active data warehousing, or ADW, is a data warehouse implementation that supports near-time or near-real-time decision making. It is featured by event-driven actions that are triggered by a continuous stream of queries that are generated by people or applications regarding an organization or company against a broad, deep granular set of enterprise data.

Continental uses active data warehousing to keep track of their company’s daily progress and performance. Continental’s management team holds an operations meeting every morning to discuss how their company is performing in regards to the data collected by their active data warehousing program. The management team believes, “ you can’t manage what you can’t measure,” so they use active data warehousing to keep track of their customers experience while using Continental Airlines.

The information that the management team uses to analyze their company in regards to customer relationship is on-time arrival, on-time departures, baggage handling, and other key performance indicators. Continental also uses active data warehousing for revenue management, revenue accounting, flight operations, fraud detection and airline security. Continental restructured theirgoalsto try to become customers “ favorite” airline to use. They use their active data warehousing to gain as much information about the company’s performance as well as the customers experience.

They use this real-time warehousing program to interpret information that is provided and make changes that will better improve their customers experience and help Continental better suit their business in regards to their customers' needs. 2. In what ways does real-time data warehousing fit with the Continental strategy and plans? Continental Airlines decided to shift their strategy once they went from " worst to first. " The new goal that they wanted to achieve was making the move from " first to favorite. Continentals' new strategy and plan of becoming their customers' favorite airline could only be achieved by using real-time data warehousing. Continental made plans to become the " favorite" airline and their strategy involved making business decisions based on information they receive from real-time data warehousing such as: on-time arrival, on-time departures, baggage handling, and other key performance indicators. This information gives the Continental management team the necessary information needed to make corrections or changes in order to better their customers' experience while using Continental Airlines.

Continental's strategy and plans to become the " favorite" airline would be much harder to accomplish without real-time data warehousing. They need this information in order to realize what parts of their company need to be tweaked to keep the customer happy. Without real-time data warehousing Continental wouldn't be able to achieve their goal of moving from " first to favorite. " 3. Describe the benefits of real-time data warehousing at Continental. Real-time data warehousing has allowed Continental to make significant changes to its business in a variety of ways.

According to Continental’s president and COO Larry Kellner, “ Real-time BI is critical to the accomplishment of our business strategy and has created significant business benefits. " There is a wide-range of benefits that Continental has gained from real-time or “ active” data warehouse in the categories of marketing, corporate security, IT, and revenue management. One key benefit in the marketing field is the average increase of travel amongst Continental’s most valuable customers, approximately $800 per customer (35, 000 customers).

A central benefit in is that all employees have the ability to access important facts and information about its customers and the business in its entirety. This in turn allowed Continental to check passenger reservations and flight manifests by cross-referencing with the FBI’s “ watch” list only hours about the 9/11 attacks, deciding if it was safe to fly. Above all, Continental has recognized over $500 million of cost saving and revenue generation (tracking and forecasting, fare designs and analysis, and full reservation analysis) due to the advantages of the business intelligence. . What elements of the data warehousingenvironmentat Continental are necessary to support the extensive end-user business intelligence application development that occurs? There are numerous elements of the data warehousing environment at Continental that are necessary in the support of the extensive end-user BI application development that takes place. Two important elements that are necessary to discuss are the systems scalability and data security. Since the real-time data warehousing warehouse never gets rid of information, the amount of data increases exponentially over time.

Additionally, with the development of BI application, the number of uses will also increase. To deal with the amount of usage and data, the data warehouse at Continental should have scalability which allows the data warehouse to expand the accessible disc space and throughput. The Continental design team took this into account when going through the architecture design of the warehouse. The other element that is important to take care of is data security. Data security is extremely important when a company handles customer information and personal data.

Continentals' warehouse stores all of the customer's information that can be accessed by other users in order to gain the data that they need. The customers can rest assured knowing that their personal information (i. e. social security numbers and credit card numbers) are protected from being opened by any users that are not authorized to view this sensitive information. 5. What special issues about data warehouse management (e. g. , data capture and loading for the data warehouse (ETL processes) and query workload balancing) does this case suggest occur for real-time data warehousing? How has Continental addressed these issues?

Real-time data warehousing creates some special issues that need to be solved by data warehouse management. These can create issues because of the extensive technicality that is involved for not only planning the system, but also managing problems as they arise. Two aspects of the BI system that need to be organized in order to elude any technical problems are: the architecture design and query workload balancing. Architecture design is important because when a company is progressively receiving business and

different aspects of the customers' usage of the company changes the warehouse needs to frequently be updated.

Continental planned for the company to use real-time data warehousing so they structured the design to accommodate for the demand of real-time information. The information then became easier to update the warehouse in a timely manner. Query workload balancing is another important aspect of the warehouse that needed to be addressed in order to fulfill Continentals' need to use the warehouse for tactical and strategic purposes. Continental would run into issues of backed up query processing in their warehouse if query workload balancing wasn't introduced.

The queries would be processed in a " first in first out" system and would essentially cause backups. Continental resolved this issue by making the warehouse process queries according to the query type. They set up the warehouse to process the specific queries that access single records first and marked them with high priority. Then they prioritized other queries to either be marked with medium priority or low priority depending on what information they are asking for and for what reason it's needed.

Continental's utilization of using prioritized groupings of queries has led them to be able to process information in a timely manner that is most convenient for the person trying to access this information. (Information regarding the case as well: not sure which one you wanted so I included both) There are two issues that thecase studysuggests in terms of data management. The first is to recognize that some data cannot and should not be real-time, for three reasons. The first is that Continental knows that real-

time data feed are hard to administer because the constant flow of transaction data must always be supervised.

The second reason is the need for extra hardware. The last reason Continental is extremely cautious with the movement of additional data is because real-time data feed is extremely costly to bring about. The second issue Continental deals with when it comes to data warehouse management is having the right people in the right positions. Anny individual who handles any aspect of a real-time warehouse must be highly qualified and knowledgeable in boththetechnologyand business.

According to the case study, “ At Continental, data warehouse staff members in the more technical positions (e. g. , design of ETL processes) have degrees in computerscience. Some of them previously built and maintained reservation systems before they joined the warehouse team. Consequently, they have experience with transaction oriented, real-time systems, which serves them well for real-time BI and data warehousing. The warehouse team members who work closely with the business units have previous work experience in the business areas they now support. ”