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Data Warehouse Architecture: Kimball vs Inmon

***Abstract* -** The amount of data has been growing at an exponential rate over the past two decades; and analyzing this huge influx of data is a huge task. This is where a data warehouse can be used. A data warehouse will allow companies to analyze large amounts of data which can be used in making important decisions from business. Though there are many types of architectures to use in these data warehouses and finding the best architecture for the job can greatly affect the performance and usefulness of the data warehouse. In this paper, I will be reviewing the differences between two main data warehouse architectures, Kimball and Inmon; and provide you the best uses for both.

1. Introduction

The ever-growing amount of data have led to the creation of huge data warehouses. There are two prominent types of data warehouse architecture: Kimball and Inmon. Both these architectures are debated often among database architects and choosing the best data warehouse is not always straightforward. The differences between the two is how the data structures are modeled, stored, and loaded in the data warehouse. These differences in the architecture can greatly impact the building time of the data warehouse and the ability to add or modify the warehouse for any future needs. Though both have their set ways of being architected there are several ways to create a hybrid between Kimball and Inmon. These hybrids have both the pros and cons of the architectures and provide the architect with exactly what is needed in the data warehouse.

1. Kimball’s Architecture

Ralph Kimball’s bottom up approach to architecting a data warehouse begins with recognizing key business process and key questions that the data warehouse will need to answer. With the bottom up approach, the data marts are created first to provide the specific needs of a business. These data marts are later merged to create the data warehouse using a bus architect. Once the data marts are created an ETL (extract, transfer, load) software is used to bring all the different sources of data into the staging area. Then the data is loaded into the dimensional data warehouse. The data loaded into the data warehouse is not normalized; this is one of the key differences between Kimball and Inmon. This is the basic concept of dimensional modeling: “In the star schema, there is typically a fact table surrounded by many dimensions. The fact table has all the measures that are relevant to the subject area, and it also has the foreign keys from the different dimensions that surround the fact” (Rangarajan). With the de-normalized data, the user can access many tables without joining to another table. Without the need of joining tables querying the database requires less work and easier for the end user.

1. Inmon’s Architecture

With Bill Inmon top down approach, building a data warehouse begins with knowing the data model of the business. This model identified the main subject areas and the key entities the business operate with and care about. From these key entities, a detailed logical model is created for each major entity. Unlike Kimball’s approach, the entities are in a normalized form and the redundancy of data is avoided. This helps prevents issues when dealing with updates which could cause abnormalities in the data. This makes the data structure easier to understand but querying is difficult as you must use many tables and joins. The data warehouse is also the only source of data for the data marts which makes the data consistent across the organization.

1. Comparisons and uses

Inmon and Kimball both have their uses in data warehouses; Inmon’s objective is to “Deliver a sound technical solution based on proven database methods and technologies” while Kimball’s objective is to “Deliver a solution that makes it easy for end users to directly query the data and still get reasonable response times” (Breslin 16). Inmon is inherently more complicated since it required normalized data thus expanding the data warehouse could require a lot of table joins, while Kimball is relatively easy to set up and maintain. Since the data in Kimball is not normalized, there can be redundant data which can cause issues when one updates the data, unlike in Inmon.

Since Inmon is an ‘enterprise warehouse,’ it allows it be used in places where large number of individual items need to be kept. Thus, it is suited for places like an insurance company or a hospital. With a hospital, it is important to collect all the information in an overall picture with respect to individuals, groups, history of patients, income of each practice, etc. Marketing, on the other hand is a specialized division which can benefit using Kimball’s approach, since only data marts are required. If the business is in a rush to produce a data warehouse, Kimball can provide a quick solution while Inmon needs a larger staff and more time.

1. Conclusion

Both Inmon and Kimball approach work for creating an effective data warehouse. Both are so great that architects even combine the two together to create a hybrid model which can cater more towards the need of a specific business. They both work effectively in certain scenarios and we cannot say that one is better than the other; any approach can be successful if the architect thoroughly plans the data warehouse and organizes the data for the business’ needs.

Works Cited

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