**Introduction**

Slowly Changing Dimensions in Data Warehouse is an important concept that is used to enable the historic aspect of data in an analytical system. As you know, the data warehouse is used to analyze historical data, it is essential to store the different states of data. In data warehousing, we have fact and dimension tables to store the data. Dimensional tables are used to analyze the measures in the fact tables. In a data environment, data is initiated at operational databases and data will be extracted-transformed-loaded (ETL) to the data warehouse to suit the analytical environment.

**SCD Type**

**Type 0**

Ignore any changes and audit the changes.

**Type 1**

Overwrite the changes

**Type 2**

History will be added as a new row.

**Type 3**

History will be added as a new column.

**Type 4**

A new dimension will be added

**Type 6**

Combination of Type 2 and Type 3

**SCD Type 0**

There are situations where you ignore any changes. For example, when an employee joined an organization, there are joined related attributes such as joined Designation and JoinedDate, etc. that should not change over time.

**SCD Type 1**

In the Type 1 SCD, you simply overwrite data in dimensions. There can be situations where you don’t have the entire data when the record is initiated in the dimension. For example, when the customer record is initiated, you may not get all attributes. Therefore, when the customer record is initiated at the operational database, there will be empty or null records in the customer records. Once the ETL is executed, those empty records will be created in the data warehouse. Once these attributes are filled in the operational databases, that has to be updated in the data warehouse.

**SCD Type 2**

Type 2 Slowly Changing Dimensions in Data warehouse is the most popular dimension that is used in the data warehouse. As we discussed data warehouse is used for data analysis. If you need to analyze data, you need to accommodate historical aspects of data. Let us see how we can implement SCD Type 2.

For the SCD Type 2, we need to include three more attributes such as StartDate, EndDate and IsCurrent.

**SCD Type 3**

Type 3 Slowly Changing Dimension in Data warehouse is a simple implementation where history will be kept in the additional column. If we relate the same scenario that we discussed under Type 2 SCD to Type 3 SCD, the customer dimension would look like below.

**SCD Type 4**

As we discussed in SCD type 2, we maintain the history by adding a different version of the row to the dimension. However, if the changes are rapid in nature Type 2 SCD will not be scalable. SCD Type 4 is introduced in order to fix this issue. In this technique, a rapidly changing column is moved out of the dimension and is moved to a new dimension table. This new dimension is linked to the fact table as shown in the below diagram.

**SCD Type 6**

Type 6 Slowly Changing Dimensions in Data Warehouse is a combination of Type 2 and Type 3 SCDs. This means that Type 6 SCD has both columns are rows in its implementation.