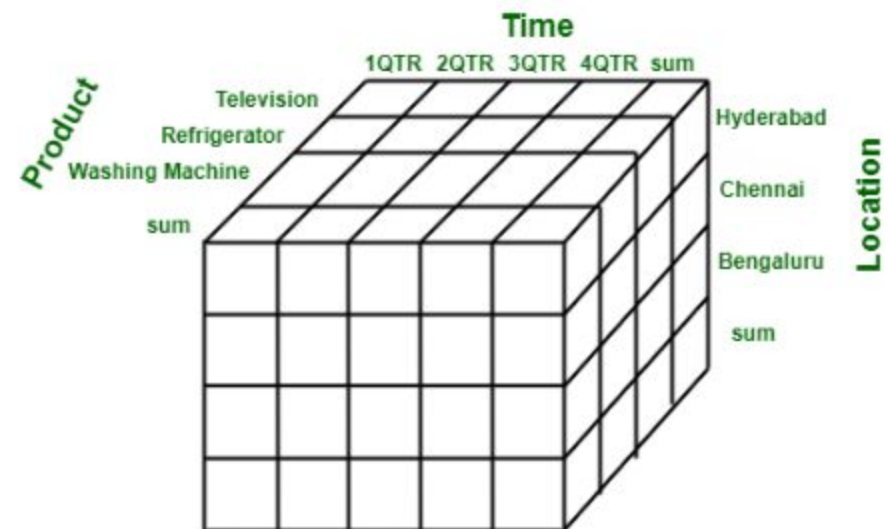


# MultiDimensional Data Model

- The **multi-Dimensional Data Model** is a method which is used for ordering data in the database along with good arrangement and assembling of the contents in the database.
- The Multi Dimensional Data Model **allows customers to interrogate analytical questions associated with market or business trends, unlike relational databases which allow customers to access data in the form of queries.** They allow users to rapidly receive answers to the requests which they made by creating and examining the data comparatively fast.
- **OLAP (online analytical processing) and data warehousing uses multi dimensional databases.** It is used to show multiple dimensions of the data to users.
- **It represents data in the form of data cubes.** Data cubes allow to model and view the data from many dimensions and perspectives. **It is defined by dimensions and facts and is represented by a fact table.** Facts are numerical measures and fact tables contain measures of the related dimensional tables or names of the facts.



*Multidimensional Data Representation*

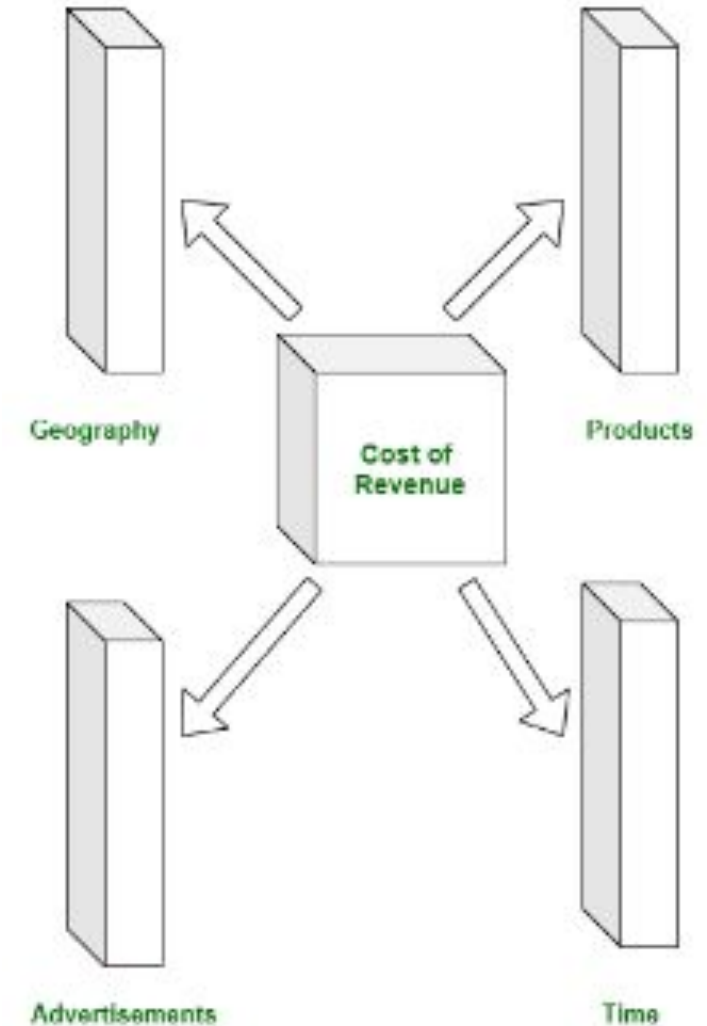
# Working on a Multidimensional Data Model

- On the basis of the pre-decided steps, the Multidimensional Data Model works.
- The following stages should be followed by every project for building a Multi Dimensional Data Model :
- **Stage 1 : Assembling data from the client** : In first stage, a Multi Dimensional Data Model collects correct data from the client. Mostly, software professionals provide simplicity to the client about the range of data which can be gained with the selected technology and collect the complete data in detail.
- **Stage 2 : Grouping different segments of the system** : In the second stage, the Multi Dimensional Data Model recognizes and classifies all the data to the respective section they belong to and also builds it problem-free to apply step by step.
- **Stage 3 : Noticing the different proportions** : In the third stage, it is the basis on which the design of the system is based. In this stage, the main factors are recognized according to the user's point of view. These factors are also known as "Dimensions".
- **Stage 4 : Preparing the actual-time factors and their respective qualities** : In the fourth stage, the factors which are recognized in the previous step are used further for identifying the related qualities. These qualities are also known as "**attributes**" in the database.

- **Stage 5 : Finding the actuality of factors which are listed previously and their qualities** : In the fifth stage, A Multi Dimensional Data Model separates and differentiates the actuality from the factors which are collected by it. These actually play a significant role in the arrangement of a Multi Dimensional Data Model.
- **Stage 6 : Building the Schema to place the data, with respect to the information collected from the steps above** : In the sixth stage, on the basis of the data which was collected previously, a Schema is built.

# For Example :

- 1. Let us take the **example of a firm**. The **revenue cost of a firm** can be recognized on the basis of different factors such as **geographical location of firm's workplace, products of the firm, advertisements done, time utilized to flourish a product, etc.**



*Example 1*

- 2. Let us take the **example of the data of a factory which sells products per quarter in Bangalore**. The data is represented in the table given below :

Location = "Bangalore"				
Time (quarter)	Type of item			
	Jam	Bread	Sugar	Milk
Q1	350	389	35	50
Q2	260	520	50	90
Q3	483	256	20	60
Q4	436	396	15	40

*2D factory data*

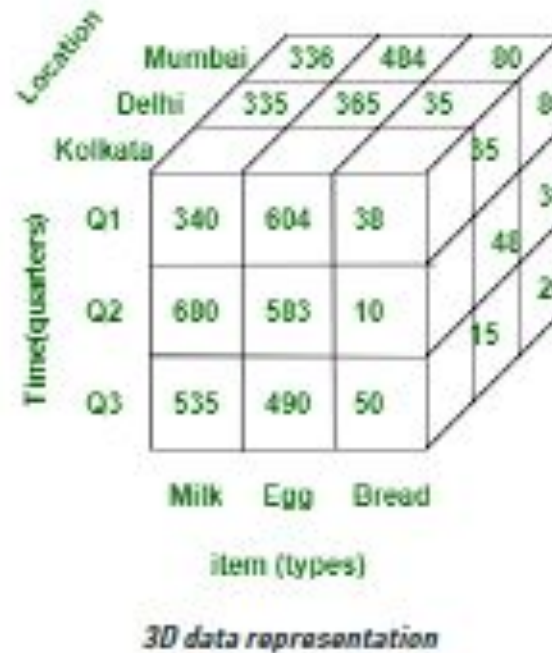
- In the above given presentation, the factory's sales for Bangalore are, for the time dimension, which is organized into quarters and the dimension of items, which is sorted according to the kind of item which is sold. The facts here are represented in rupees (in thousands).
- Now, if we desire to view the data of the sales in a three-dimensional **table**, then it is represented in the diagram given below. Here the data of the sales is represented as a two **dimensional table**. Let us consider the data according to item, time and location (like Kolkata, Delhi, Mumbai). Here is the table :



Time	Location="Kolkata"			Location="Delhi"			Location="Mumbai"		
	item			item			item		
	Milk	Egg	Bread	Milk	Egg	Bread	Milk	Egg	Bread
Q1	340	604	30	335	365	35	336	404	00
Q2	600	503	10	604	490	40	595	594	39
Q3	535	490	50	309	305	15	366	305	20

*3D data representation as 2D*

- This data can be represented in the form of three dimensions conceptually, which is shown in the image below :



# Advantages of Multi Dimensional Data Model

- The following are the advantages of a multi-dimensional data model :
- A multi-dimensional data model is **easy to handle**.
- It is **easy to maintain**.
- Its **performance is better than that of normal databases** (e.g. relational databases).
- The representation of data is better than traditional databases. That is because the **multi-dimensional databases are multi-viewed and carry different types of factors**.
- It is **workable on complex systems and applications**, contrary to the simple one-dimensional database systems.
- The **compatibility in this type of database is an upliftment for projects** having lower bandwidth for maintenance staff.

# Disadvantages of Multi Dimensional Data Model

- The following are the disadvantages of a Multi Dimensional Data Model :
- The multi-dimensional Data Model is slightly complicated in nature and it requires **professionals to recognize and examine the data in the database.**
- During the work of a Multi-Dimensional Data Model, when the system caches, there is a great effect on the working of the system.
- It is **complicated in nature due to** which the databases are generally **dynamic in design.**
- The path to achieving the end product is complicated most of the time.
- As the Multi Dimensional Data Model has complicated systems, databases have a **large number of databases due to which the system is very insecure** when there is a security break.