

CelDial: Case Study Analysis

INTRODUCTION

CelDial is a corporation which manufactures and distributes cellular telephones. It quickly expanded to include broad range of telecommunication products. As the demand for the company increased the company started its own sales outlets in both corporate and retail. The company's main intension was the expansion rather than effectiveness. So, now the management is focusing on performance of the organization. The information present after analysis of company is present as whole but not at a granular level.

To solve this, the IT Department proposed to create a data warehouse. Due to the expansion of the company, huge amount of data will be produced which can be stored and processed for analysis and reporting. This will help the company understand its strengths and weaknesses.

OBJECTIVE

To create a data warehouse for analysis on different parts of company at a granular level based on the requirements

The two systems are defined as

1. Operational System

Operational System refers to a system which is used for day to day transactions where the integrity of transactional data is preserved. As the company has expanded, huge amount of data will be produced daily. In these cases operational systems are used for transactions, which are again stored in the database.

When the redundant data exists in different databases the quality deteriorates. This results in poor strategic and tactical decision making. This shows the importance of having integrated data for business Intelligence which can be attained by using operating systems.

If the company has huge amount of data across all physical regions in different applications across multiple technical platforms. This will be extremely difficult to process as the data is scattered. Taking Business decisions on this data is not a good practice. By using Operational Systems integrated data is stored which can be accessed from any region as the data is consistent.

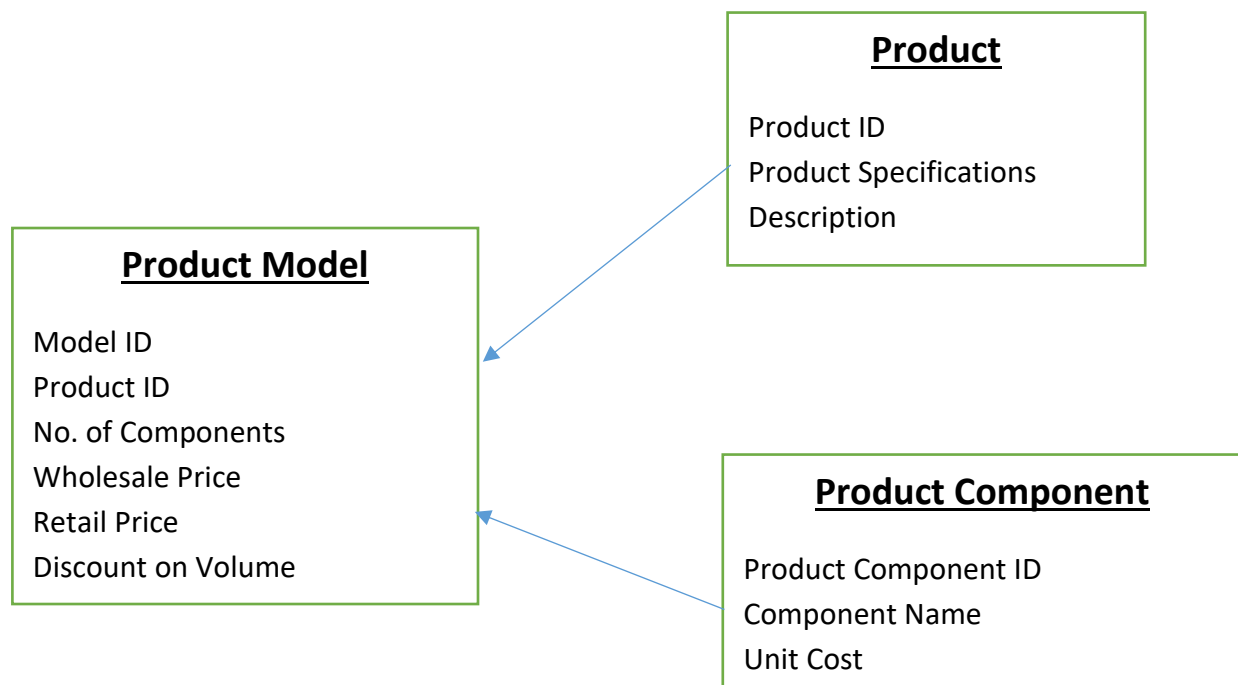
2. Data warehouse System

A Data Warehousing is a process for collecting and managing data from varied sources to provide meaningful business Insights.

A Data Warehouse is used to connect and analyze business data from multiple sources. As the CelDial company has grown rapidly the need to create data warehouse is increasing. To create a data warehouse we need to find the necessary data from different data sources extract them to form dimensions. This helps the company gather required data for the creation of data warehouse .These dimensions are connected to fact table which consists of foreign keys and summarized information. Data warehouse helps to reduce total time for analysis and reporting this helps the company save time in analysis of this huge data produced. The Data warehouse also allows users to access critical data from the number of sources in single place. Therefore, it saves company's time for retrieving data from multiple sources. Data warehouse stores a large amount of historical data, which helps users to analyze different time periods and trends to make future predictions.

As new requirements arise, there will be a change throughout the life cycle and this is one of the main reason for defining scope or limit of the project. Here in Data warehouse we have the advantage of its flexibility and capability to handle a new or unknown situation. Therefore, the delivered data warehouse needs to be somewhat broader than indicated by the initial requirements.

E-R Diagram v/s Dimensional Modeling - Example



E-R Diagram of Product

Product Dimension:

Product

Product Key
Effective from Date
Effective to Date
Description
Model Code
Unit Cost
Suggested Whole Price
Suggested Retail Price
% eligible for Volume Discount

Dimensional Modeling

SCOPE OF THE PROJECT

As the company CelDial has grown rapidly huge data is gathered. For the performance of company there is a need to create a data warehouse system. This data warehouse system helps in analysis of data at a granular level. For the creation of the data warehouse system extraction of data from different databases is required. This selected data from database is converted to dimensional model for the creation of data warehouse.

The main goal is to create a data warehouse which can answer all the questions users want. Below are the questions on which data warehouse must be created:

- 1. What is the average quantity on hand and reorder level in a month for each model from each manufacturing plant?**
- 2. What is the total cost and revenue of each model sold daily from each outlet?**
- 3. What is the total cost of each model to build, by manufacturing plant and region?**

- 4. What percentage of models are eligible for discounting, and from those, which percentage was actually given on sale, by each store, on total sales happen in a week and each month?**
- 5. For each model on monthly, what is the percentage sold on retail, what percentage sold on corporate through order desk, and the percentage sold by a salesperson?**
- 6. Which models and products have not sold in the last week? The last month?**
- 7. What are the top five models sold last month by total revenue? By quantity sold? By total cost?**
- 8. Which sales outlets had no sales recorded last month for each of the models in each of the three top five lists?**
- 9. Which salespersons had no sales recorded last month for each of the models in each of the three top five lists?**

Currently the manufacturing costs are not known so only component costs are included. In the future there is a chance of allocation of these manufacturing costs. Hence this warehouse must be flexible enough for any kind of future changes. It must be able to satisfy the user requirements for coming years too.

If the dimensional model in data warehouse is not designed in a flexible way, the analysis of the company on revenue and cost of product cannot be determined on a granular level and the project crashes.

UNDERSTANDING & ANALYZING REQUIREMENTS - Design Approach:

- Conceptual Model Design

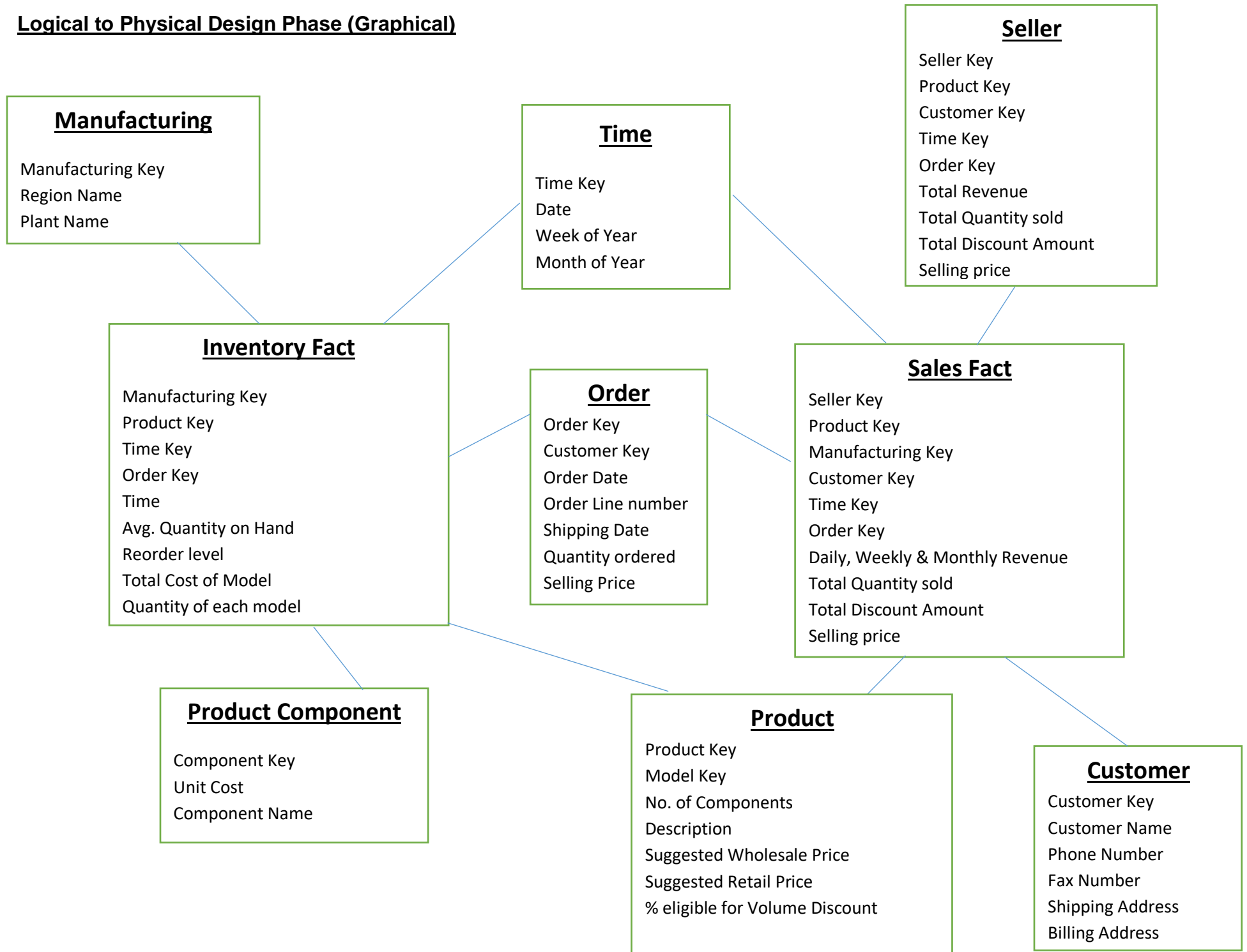
- Entity Details

FACTS	DIMENSION
INVENTORY	TIME MANUFACTURING PRODUCT PRODUCT COMPONENT ORDER
SALES	TIME ORDER CUSTOMER SELLER PRODUCT

- Logical Model Design

<div><div>Fact</div><div>Dimension</div></div>	Total Qty sold	Total Quantity produced	Re-Order Level	Total Revenue	Total Cost	Discount
Order	X		X	X		
Seller	X			X		X
Manufacturing		X	X		X	
Product	X	X	X	X	X	
Customer						
Time	X	X	X	X	X	X

Logical to Physical Design Phase (Graphical)



SUBJECT AREA	KEY-BUSINESS MEASURES	GRANULARITY	DIFFERENT KIND OF ANALYSIS	DIMENSIONS INVOLVED IN ANALYSIS
SALES	Total Revenue	Daily, Monthly	<ul style="list-style-type: none"> Total Revenue for each model in each outlet daily 	Time
	Quantity sold	By Retail Outlet, Salesperson & Corporate Office in a week or month	<ul style="list-style-type: none"> Total Revenue for each model in each plant or region 	Customers
	Discount amount	Weekly, Monthly	<ul style="list-style-type: none"> No. of salespersons who had no sales for each model Models not sold Models sold by Total Quantity & Revenue % of models eligible for discounting % sold by retail, corporate and salesperson 	Seller Product Order
INVENTORY	Total Cost	Daily, Monthly	<ul style="list-style-type: none"> Avg. Quantity on hand and Re-order level for each model 	Time
	Quantity on hand	Monthly		Manufacturing
	Re-order level	Monthly	<ul style="list-style-type: none"> Total Cost for each model in each outlet daily Models by Total Cost 	

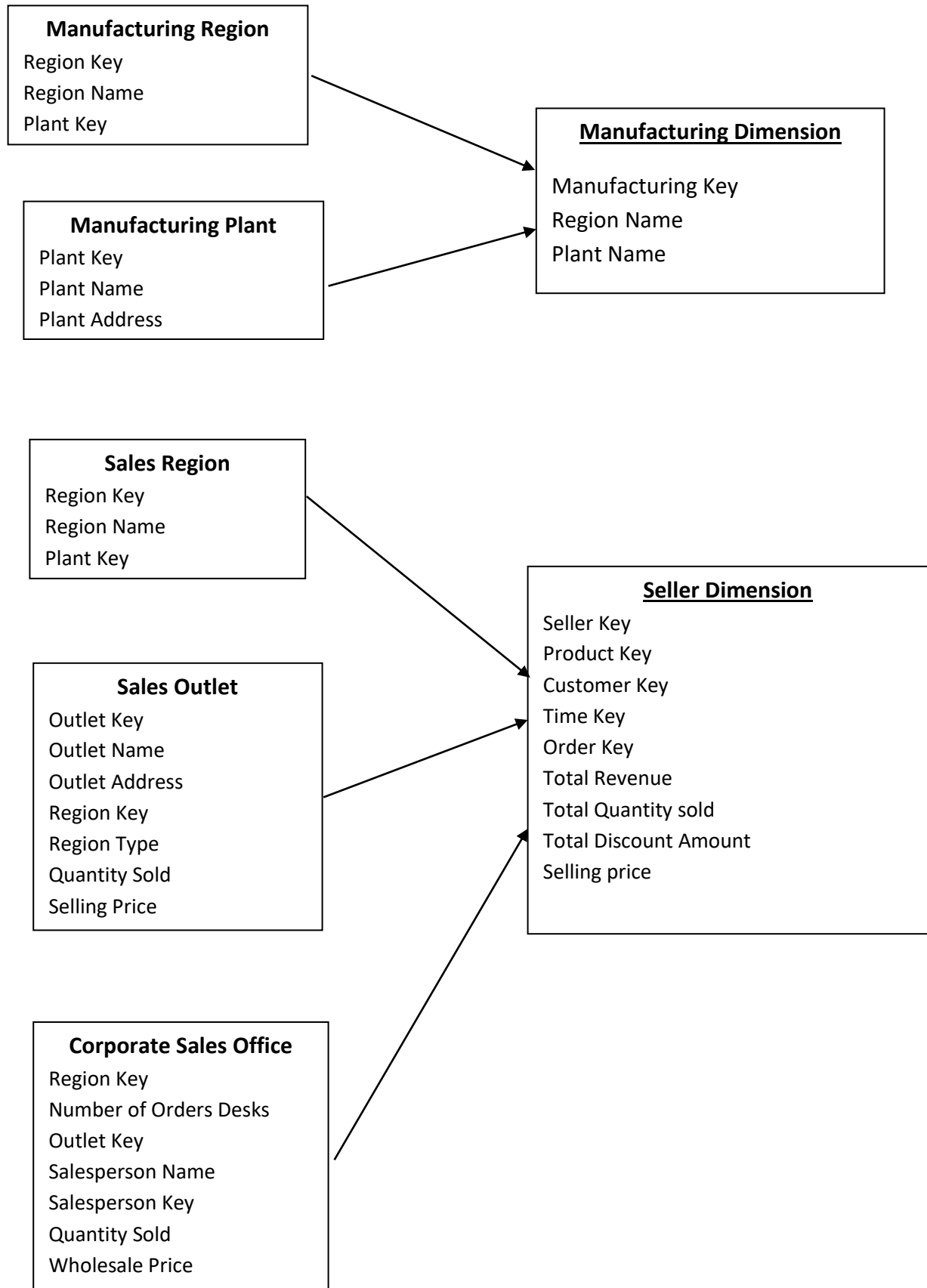
- **Physical Model Design**

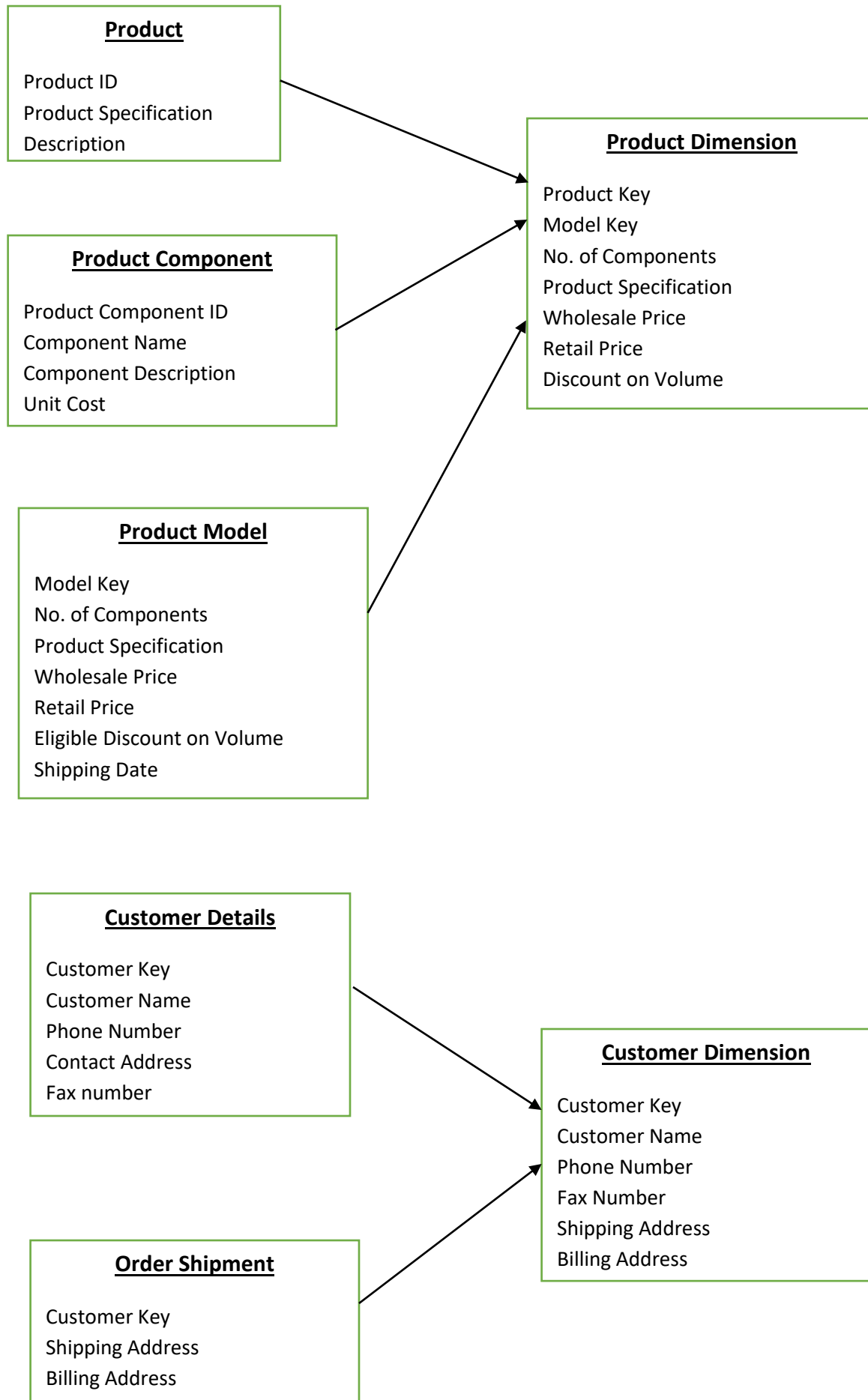
Data Usage	Standard	Datatype	Number of Attributes
Manufacturing_Dim	Manufacturing Key Region Name Plant name	Number(5) Varchar2(20) Varchar2(20)	3
Inventory_Fact	Manufacturing key Product Key Time Key Order Key Time Avg. Quantity on Hand Re-order level Total Cost of Model Quantity of each model	Number(5) Number(5) Number(5) Number(5) Date Number(5) Number(5) Number(5) Number(5)	9
Order_Dim	Order Key Product Key Model Key Quantity	Number(5) Number(5) Number(5) Number(5)	4
Product Component_Dim	Component Key Unit Cost No. of Components Model Key	Number(5) Number(5,2) Number(5) Number(5)	4
Product_Dim	Product Key Model Key Effective from Date Effective to Date Description Model Code Suggested Wholesale Selling Price Suggested Retail Price	Number(5) Number(5) Date Date Varchar2(20) Number(5) Number(5) Number(5,2) Number(5,2)	10

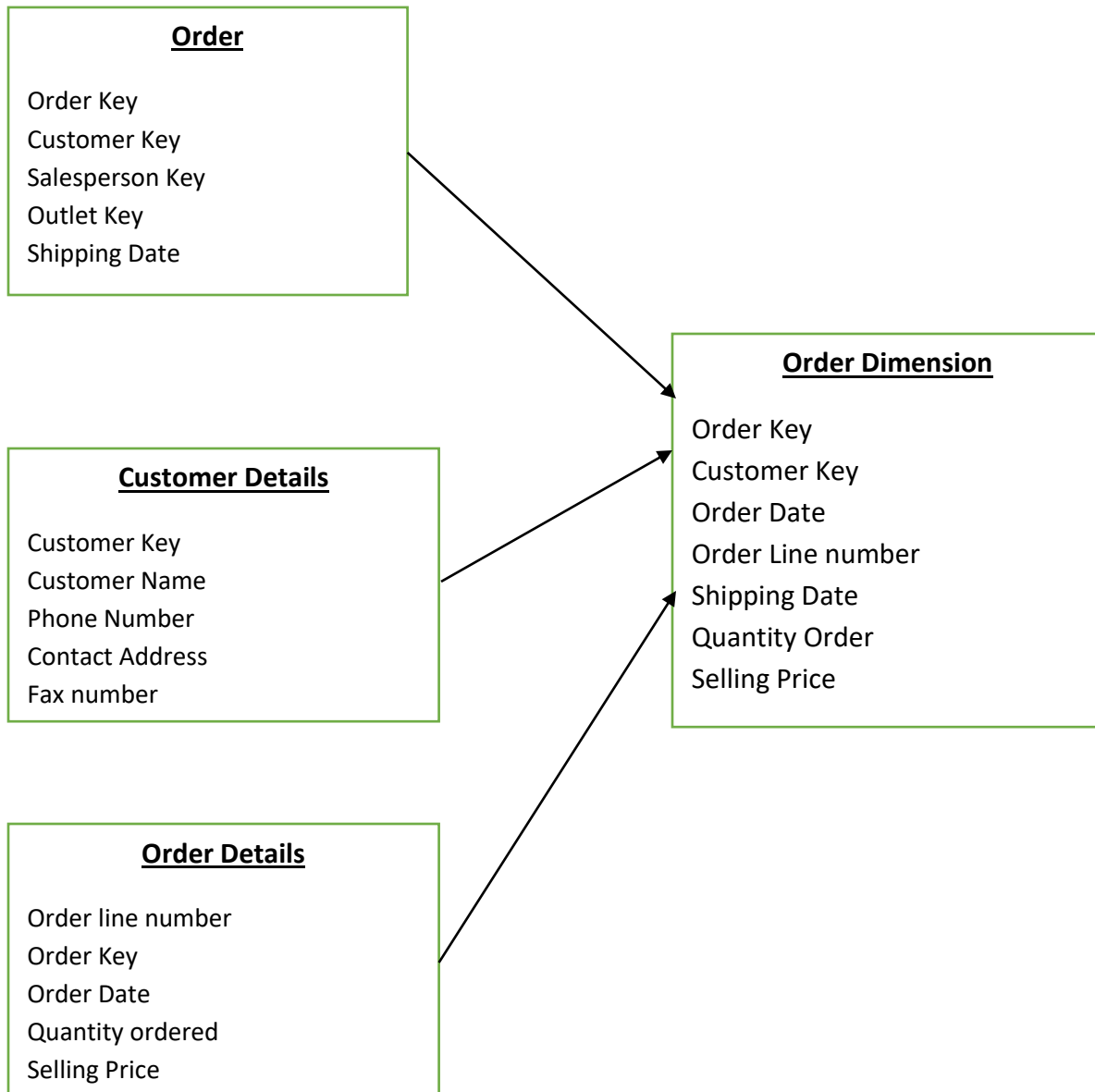
	Quantity eligible for Volume Discount	Number(5)	
Sales_Fact	Seller Key Product Key Manufacturing Key Customer Key Time Key Order Key Total Revenue Total Quantity sold Total Discount amount Selling Price	Number(5) Number(5) Number(5) Number(5) Number(5) Number(5) Number(9,2) Number(5) Number(5,2) Number(9,2)	10
Seller_Dim	Seller Key Region name Outlet name Outlet type Salesperson name Floor space No. of cash registers	Number(5) Varchar2(20) Varchar2(20) Varchar2(20) Varchar2(20) Number(9,2) Number(5)	7
Customer_Dim	Customer Key Customer Name Shipping Address	Number(5) Varchar2(20) Varchar2(20)	3
Time_Dim	Time Key Day Week Month	Date Date Date Date	4

Operational to Dimensional Model - Map:

Map:







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