AS PER RANI CHANNAMMA UNIVERSITY (NON CBCS), BELAGAVI – MAY 2021

BCA VI SEM

BUSINESS INTELLIGENCE

UNIT – II
INTRODUCTION TO OLTP & OLAP, BI

PRESENTATION BY :
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SYLLABUS

RANI CHANNAMMA UNIVERSITY, BELAGAVI

17BCAECOT63: Business Intelligence

Teaching Hours: 4 Hrs/week **Marks: Main Exam: 50**
IA: 20

Unit I: Business View of Information Technology applications: Business Enterprise Organization , Its functions, and core business process, baldrige business excellence frame work (Optional reading) Key purpose of using IT in business, The connected world : Characteristics of Internet _Ready IT Applications, Enterprise applications(ERP/CRM) and bespoke IT applications, information users and their requirements, Types of digital data , structured data , unstructured data, Semi-structured data , Difference between semi structured and structured data. 10 Hrs

Unit II: Introduction to OLTP and OLAP : OLTP(online transaction processing) OLAP(online Analytical Processing) Different OLAP Architectures , OLTP and OLAP, Data models for OLTP and OLAP, Role of OLAP tools in the BI Architecture , should OLAP be performed directly on operational data bases. Business intelligence: Using analytical information of decision support, Information sources before dawn of BI , BI defined , evolution of BI and role of DSS , EIS, MIS and digital dash boards, Need for BI at virtually all levels , BI for past , present and future, The BI value Chain , Introduction to Business analytics. 08 Hrs

Unit III:BI definitions and concepts : BI component Framework , BI Users, Business Intelligence Applications, BI roles and responsibilities, Basics of data integration , Need for data Warehouse ,Definition of data Warehouse, ODS, Ralph Kimball's Approach vs Inmon's Approach , Goals of data warehouse, Constituents of data Warehouse , Data integration, Data integration technologies , Data Quality , Data Profiling, A case Study from the Healthcare Domain. 10 Hrs

SYLLABUS

Unit IV:Types of Data Model: Data Modelling techniques, Fact table, Dimension table, Typical dimensional Models, Dimensional Modelling Life cycle, Understanding Measures and performance measurement System terminology , navigating a Business Enterprise. 10 Hrs

Unit V:Basics of Enterprise Reporting: Reporting perspectives common to all levels of Enterprise, Report Standardization and Presentation practices, Enterprise Reporting characteristics in OLAP World , Balanced score card , Dash boards. 10 Hrs

Text Books:

1. R.N.Prasad, Seema Acharya , Fundamentals of Business analytics, First Edition , 2011, Wiley-India

Reference Books:

1. GaliShmueli,. Nitin R Patel , peter C . Bruce, " Data mining for Business Intelligence" Wiley-India, 2011.
2. Ralph Kimball ,Margy Ross, "Practical tools for Data Warehosuing and Business Intelligence" , second Edition Wiley-India 2011.

OLTP – ONLINE TRANSACTION PROCESSING

(Picture yourself in a scenario)

- Consider a point-of-sale (POS) system in a supermarket store
- You have picked a bar of chocolate and await your chance in the queue for getting it billed
- The cashier scans the chocolate bar's bar code
- Consequent to the scanning of the bar code, some activities take place in the background

OLTP – ONLINE TRANSACTION PROCESSING

Point-of-sale (POS) system in super market

OLTP – ONLINE TRANSACTION PROCESSING

point-of-sale (POS) system

OLTP – ONLINE TRANSACTION PROCESSING

- The database is accessed
- The price and product information is retrieved and displayed on the computer screen
- The cashier feeds in the quantity purchased
- The application then computes the total, generates the bill, and prints it. You pay the cash and leave
- The application has just added a record of your purchase in its database. This was an OLTP system

OLTP – ONLINE TRANSACTION PROCESSING

- OLTP system is designed to support online transactions and query processing
- The POS – Point of Sale System of the super market store is best example of OLTP
- OLTP refers to a class of systems that manage transaction oriented applications
- These applications are mainly concerned with the entry, storage, and retrieval of data

OLTP – ONLINE TRANSACTION PROCESSING

- They are designed to cover most of the day-to-day operations of an organization such as purchasing, inventory, manufacturing, payroll, accounting, etc
- OLTP systems are characterized by a large number of short on-line transactions such as
- INSERT
- DELETE
- UPDATE

OLTP – ONLINE TRANSACTION PROCESSING

- **INSERT : A record of final purchase by a customer was added to the database**
- **UPDATE : The price of a product has been raised from Rs.10 to Rs.12**
- **DELETE : A product has gone out of demand and therefore the store removes it from the shelf as well as from its database**

OLTP – ONLINE TRANSACTION PROCESSING

Characteristics of OLTP

- **Online connectivity:** LAN,WAN
- **Availability:** Available 24 hours a day
- **Response rate:** Rapid response rate load balancing by prioritizing the transactions
- **Cost:** Cost of transactions is less
- **Update facility:** Easy updation

OLTP – ONLINE TRANSACTION PROCESSING

- Consider the example of super market store POS system, which is an OLTP system

Product ID	Productname	ProdDescription	UnitPrice	Qtyinstock
P101	Glucon D	Energy Drink	125.00	250
P102	Boost	Energy Drink	135.00	300
P103	Moserbaer DVD	DVD	20.00	500
P104	Wild Stone	Perfume	200.00	100
P105	Reynolds	Pen	7.00	125
P106	Maggie Sauce	Tomato Sauce	50.00	250

OLTP – ONLINE TRANSACTION PROCESSING

Queries that an OLTP system can process are for example

- **Search a particular product's record**
- **Retrieve the product description and unit price of a particular record**
- **Filter all products with a unit price >=50**
- **Sort the details of the product**
- **Search and display the particular record**

OLTP – ONLINE TRANSACTION PROCESSING

Advantages of OLTP System

- **Simplicity:** It is designed for use by clerks, cashiers, clients, etc
- **Efficient:** It allows its user to read, write and delete data quickly
- **Fast query processing:** It responds to user actions immediately

OLTP – ONLINE TRANSACTION PROCESSING

Challenges of an OLTP System

- **Security:** An OLTP system requires concurrency control and recovery mechanisms
- **OLTP systems data content not suitable for decision making:** OLTP system manages only the current data within an organization, not helpful for decision making

OLTP – ONLINE TRANSACTION PROCESSING

Queries that an OLTP cannot answer

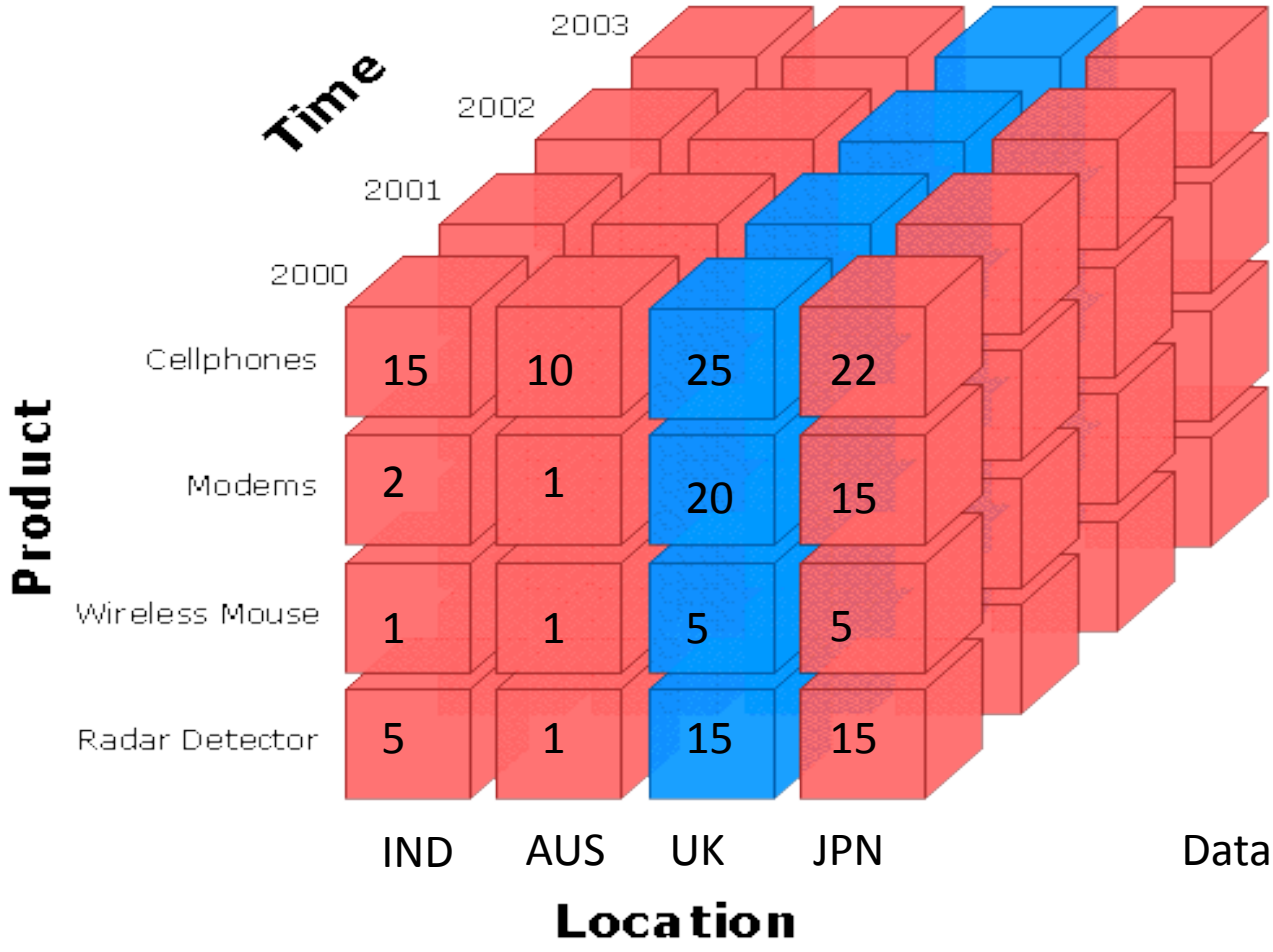
Considering market store example;

- **Which product should they introduce?**
- **How much discount should they offer?**
- **Which product needs to be dropped from the list of products?**
- **Who is the most consistent customer?**
- **What impact will a 5% increase in the price of products have on the customers?**

OLTP – ONLINE TRANSACTION PROCESSING

ATM is a OLTP system

OLAP – ONLINE ANALYTICAL PROCESSING



Data is in millions

* This is the sample data, not accurate

OLAP – ONLINE ANALYTICAL PROCESSING

- OLAP (online analytical processing) is a computing method that enables users to easily and selectively extract and query data in order to analyze it from different points of view
- OLAP business intelligence queries often aid in trends analysis, financial reporting, sales forecasting, budgeting and other planning purposes

OLAP – ONLINE ANALYTICAL PROCESSING

- **Most business data have multiple dimensions—multiple categories into which the data are broken down for presentation, tracking, or analysis. For example, sales figures might have several dimensions related to location (region, country, state/province, store), time (year, month, week, day), product (clothing, men/women/children, brand, type), and more**

OLAP – ONLINE ANALYTICAL PROCESSING

- OLAP differs from traditional databases in the way data is conceptualized and stored
- In OLAP data is held in the dimensional form rather than the relational form
- OLAP's life blood is multi dimensional data
- OLAP tools are based on the multi dimensional data model
- The multi dimensional data model, views data in the form of a data cube

OLAP – ONLINE ANALYTICAL PROCESSING

- With OLAP, data can be pre-calculated and pre-aggregated, making analysis faster
- It provides multidimensional view of data
- It is used for analysis of data
- With OLAP, data can be viewed from different perspectives
- It determines why data appears the way it does

OLAP – ONLINE ANALYTICAL PROCESSING

- OLAP applies complex queries to large amounts of historical data, aggregated from OLTP databases and other sources, for data mining, analytics
- Basically, OLAP differs from OLTP in the way the data is stored

OLAP – ONLINE ANALYTICAL PROCESSING

Sample OLTP data from the store

Section	ProductCategoryName	YearQuarter	SalesAmount
Men	Accessories	Q1	5000.00
Men	Accessories	Q2	3000.00
Women	Accessories	Q3	1000.00
Women	Accessories	Q4	2000.00
Men	Clothing	Q1	7000.00
Men	Clothing	Q2	5000.00
Women	Clothing	Q3	10000.00
Women	Clothing	Q4	9000.00

Total SalesAmount = 42000.00

OLAP – ONLINE ANALYTICAL PROCESSING

One Dimensional Data

- Viewing/ Extracting/Filtering the data using only one dimension
- For ex: Data by one dimension ie. by Section

1D data by Section

Section	SalesAmount
Men	20000.00
Women	22000.00

Total SalesAmount = 42000.00

Queries can be answered

- Which section is giving more profit?
- On which section the store needs to concentrate more?
- To which section discount need to be provided?

OLAP – ONLINE ANALYTICAL PROCESSING

One Dimensional Data

- Viewing/ Extracting/Filtering the data using only one dimension
- For ex: Data by one dimension ie. by ProductCategoryName

1D data by ProductCategoryName

ProductCategoryName	SalesAmount
Accessories	11000.00
Clothing	31000.00

Total SalesAmount = 42000.00

Queries can be answered

- Which category is giving more profit?
- On which category the store needs to concentrate more?
- To which category discount need to be provided?
- Which category needs to improve?

OLAP – ONLINE ANALYTICAL PROCESSING

One Dimensional Data

- Viewing/ Extracting/Filtering the data using only one dimension
- For ex: Data by one dimension ie. by YearQuarter

1D data by YearQuarter

YearQuarter	SalesAmount
Q1	12000.00
Q2	8000.00
Q3	11000.00
Q4	11000.00

Total SalesAmount = 42000.00

Queries can be answered

- In which quarter sale is better?
- In which quarter store need to work on?

OLAP – ONLINE ANALYTICAL PROCESSING

Two Dimensional Data

- Viewing/ Extracting the data using two dimensions
- For ex: Data by two dimensions, ie. Section & Product Category Name

2D data by Section & ProductCategoryName

ProductCategoryName	Section	SalesAmount
Accessories	Men	8000.00
	Women	3000.00
Clothing	Men	12000.00
	Women	19000.00

Total SalesAmount = 42000.00

Queries can be answered

- In which section & category attention should be given?
- By which section & category store is in profit?
- Which category needs to improve?

OLAP – ONLINE ANALYTICAL PROCESSING

Three Dimensional Data

- Viewing/ Extracting/Filtering the data using three dimensions

- We can also go beyond three dimension ato get segregated data, which helps in analyzing and decision making
- Multidimensional data provided by OLAP helps in ‘what if’ analysis

OLAP – ONLINE ANALYTICAL PROCESSING

Queries that an OLAP can answer

Considering market store example;

- Which product should they introduce?
- How much discount should they offer?
- Which product needs to be dropped from the list of products?
- Who is the most consistent customer?
- What impact will a 5% increase in the price of products have on the customers?

OLAP – ONLINE ANALYTICAL PROCESSING

Advantages of OLAP

- Multidimensional data representation
- 'What if' analysis can be done
- Consistency of information
- Summarized data helps in decision making
- Helps in planning, budgeting, forecasting, reporting and also analyzing

OLAP – ONLINE ANALYTICAL PROCESSING

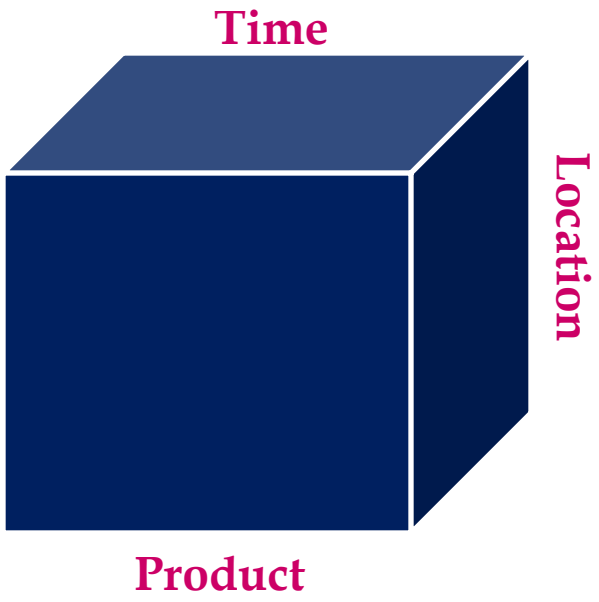
Different OLAP architectures

- **MOLAP (Multidimensional OLAP)**
- **In MOLAP, data is stored in a multi dimensional cube**
- **MOLAP uses a multidimensional cube that accesses stored data through various combinations**
- **For ex: The user is able to view different aspects of data aggregates such as sales by time, location, and product model**

OLAP – ONLINE ANALYTICAL PROCESSING

Different OLAP architectures

- **MOLAP (Multidimensional OLAP)**



Cube with time, product & location dimensions

Advantages

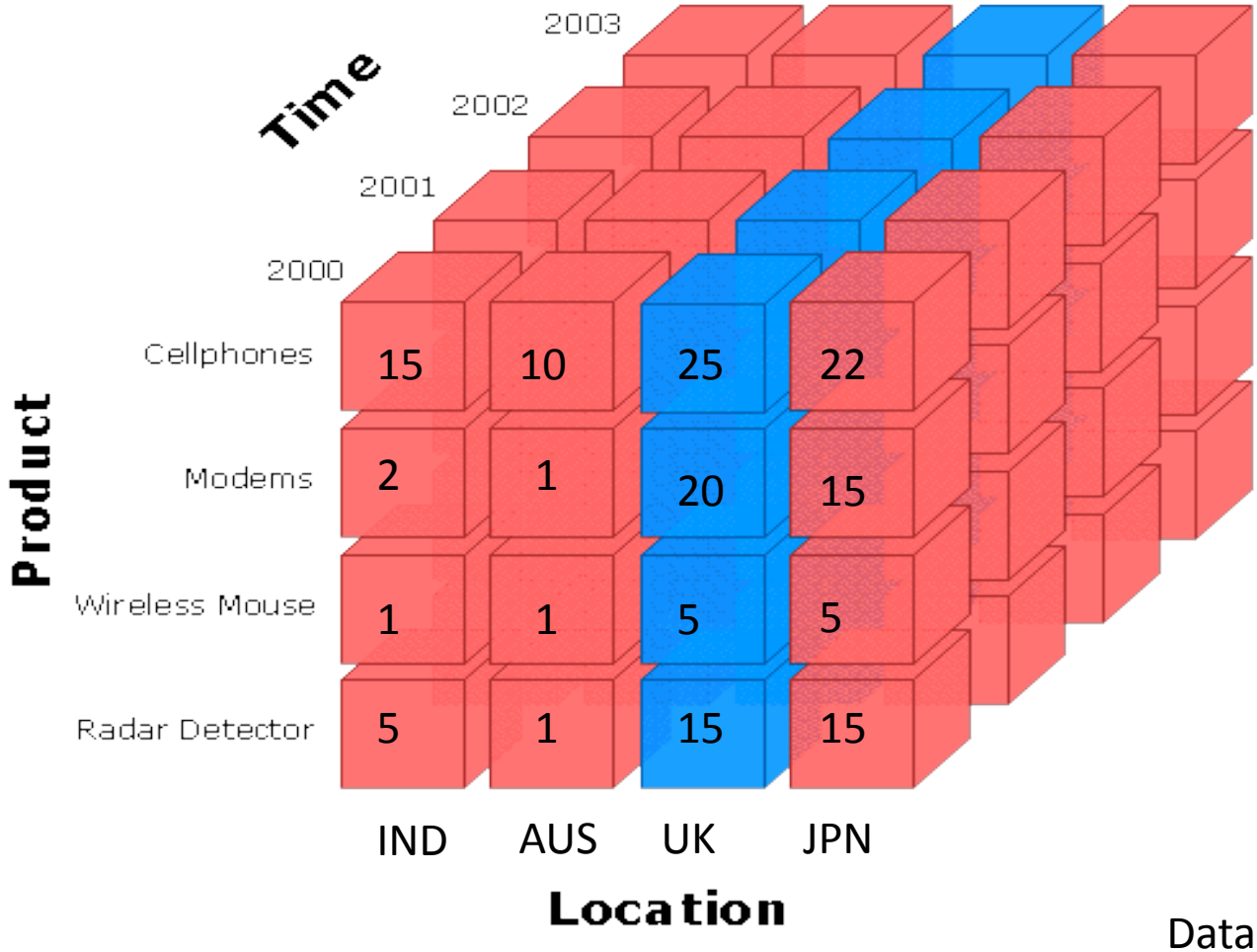
- Fast data retrieval
- Optimal for slicing & dicing
- Can perform complex calculations

Disadvantages

- Limited in amount of data that it can handle
- Additional investment in human & resources may be required

OLAP – ONLINE ANALYTICAL PROCESSING

MOLAP (Multidimensional OLAP)



Data is in millions

OLAP – ONLINE ANALYTICAL PROCESSING

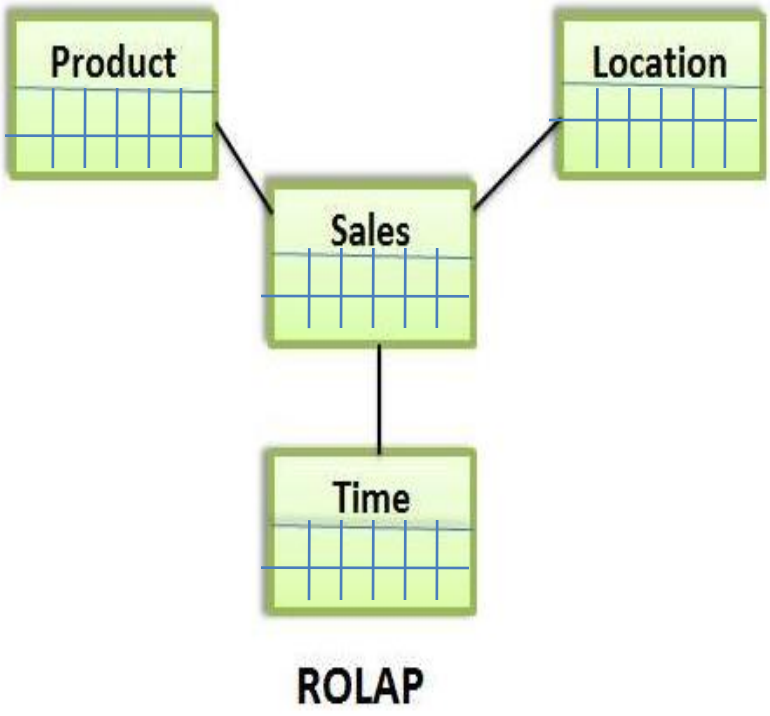
Different OLAP architectures

- **ROLAP (Relational OLAP)**
- **ROLAP stores data in columns and rows (also known as RDBMS)**
- **Retrieves the information on demand through user submitted queries using "where" clause**
- **ROLAP engine deals with large volumes of data**

OLAP – ONLINE ANALYTICAL PROCESSING

Different OLAP architectures

- **ROLAP (Relational OLAP)**



ROLAP

Advantages

- Can handle large amount of data
- Tools are better at handling non aggregatable facts

Disadvantages

- Difficult to perform complex calculations using SQL
- Performance can be slow

OLAP – ONLINE ANALYTICAL PROCESSING

Different OLAP architectures

- **HOLAP (Hybrid OLAP)**
- **It is a combination of ROLAP (Relational OLAP) and MOLAP (Multidimensional OLAP)**
- **HOLAP allows storing part of the data in a MOLAP store and another part of the data in a ROLAP store**

OLTP vs OLAP

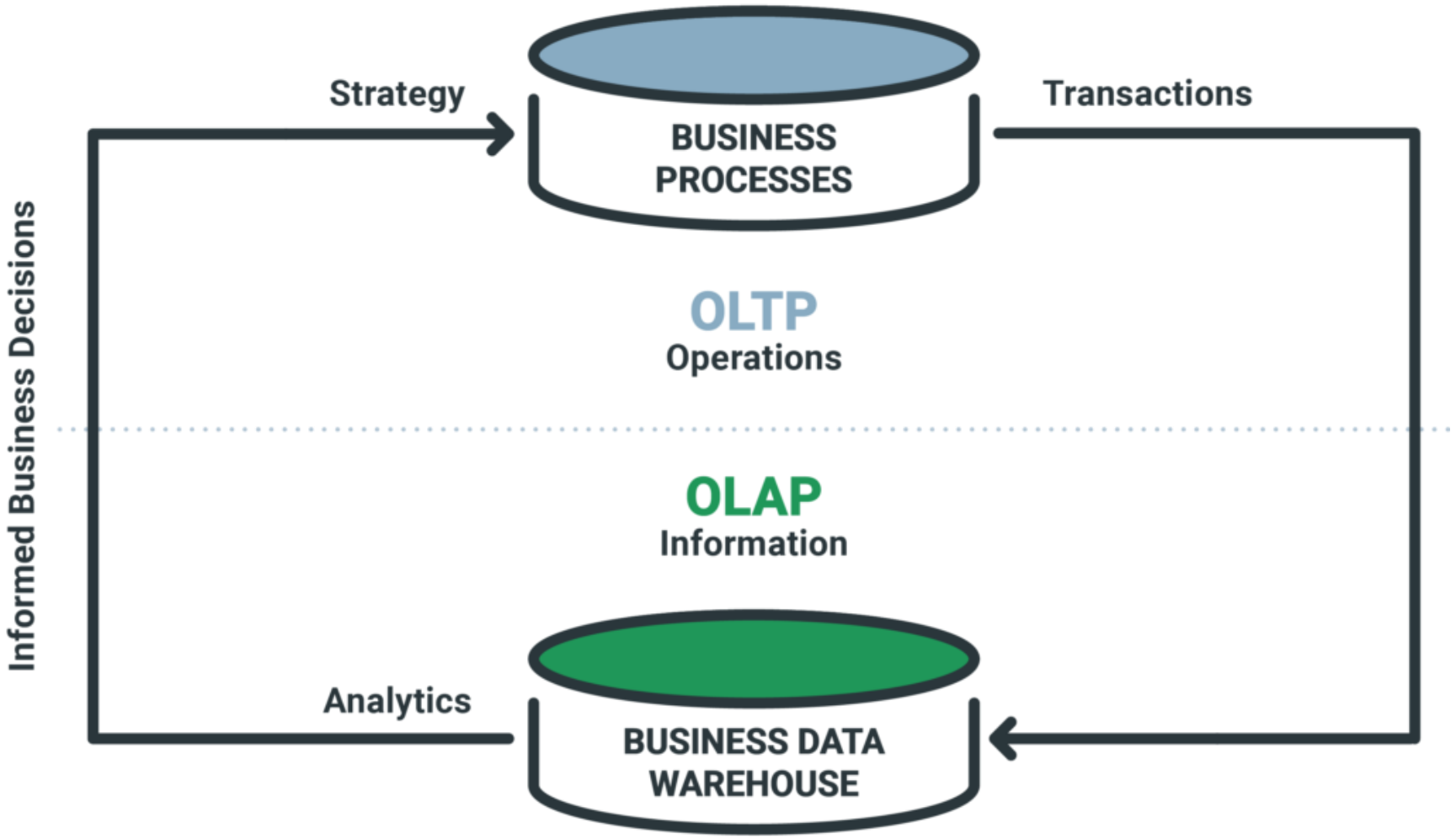
OLTP :

- It helps in the execution of day to day operations of an organization
- It helps keep record of each and every transaction taking place on day to day basic

OLAP :

- Data from multiple transactional system brought together in an enterprise data warehouse(by ETL process)
- This data is then used for analysis, for decision making

OLTP vs OLAP


Strategy
BUSINESS PROCESSES
Transactions
Informed Business Decisions
OLTP
Operations
OLAP
Information
Analytics
BUSINESS DATA WAREHOUSE

OLTP vs OLAP

FEATURE	OLTP	OLAP
Focus	Data in	Data out
Source of data	Transactional/operational data	Various data sources
Purpose of data	Manages basic tasks	Assists in planning, budgeting, forecasting & decision making
Data contents	Current data, Far too detailed – not suitable for decision making	Historical data, has support for summarization & aggregation, suitable for decision making
Inserts & Updates	Very frequent	Periodic data
Queries	Simple queries	Complex queries
Processing speed	Usually fast	Slower
Space required	Relatively small	Comparatively huge
Database design	ER model	Star & snowflake models
Access	Field level access	Aggregated access
Operations	Read/write	Mostly read
Aggregates	Rare	Common
Data structures	Complex	Multidimensional

DATA MODELS FOR OLTP & OLAP

- **Data model for OLTP**

  As you know OLTP supports transaction based systems and it stores the data in RDBMS, hence OLTP adopts an ER model

- **Data model for OLAP**

  OLAP is a multidimensional model and it can exist in the form of a

  - Star schema/model
  - Snowflake schema/model

DATA MODELS FOR OLTP & OLAP

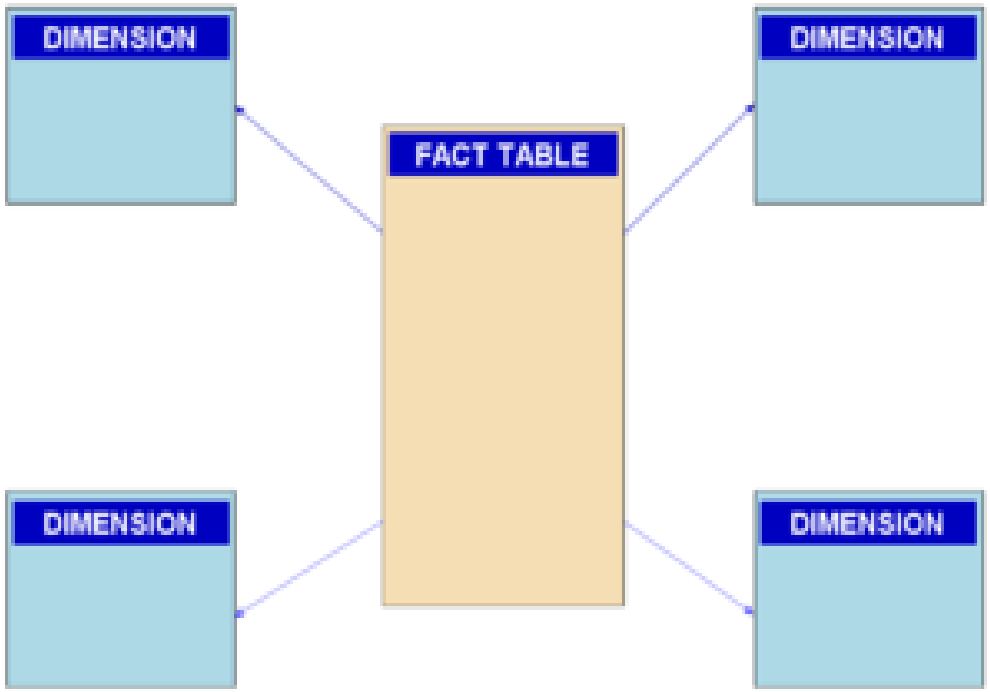
Data model for OLAP

- Facts : Measurements
- Dimensions : Context/perspectives which impact the facts
- Ex: Price of a mobile phone is a fact, but it is dependent on various dimensions such as screen size, camera quality, brand, RAM
- Ex: Number of tickets booked, amount paid are the facts, but customer details, time of booking, to city, from city, mode of payment are dimensions

DATA MODELS FOR OLTP & OLAP

Data model for OLAP

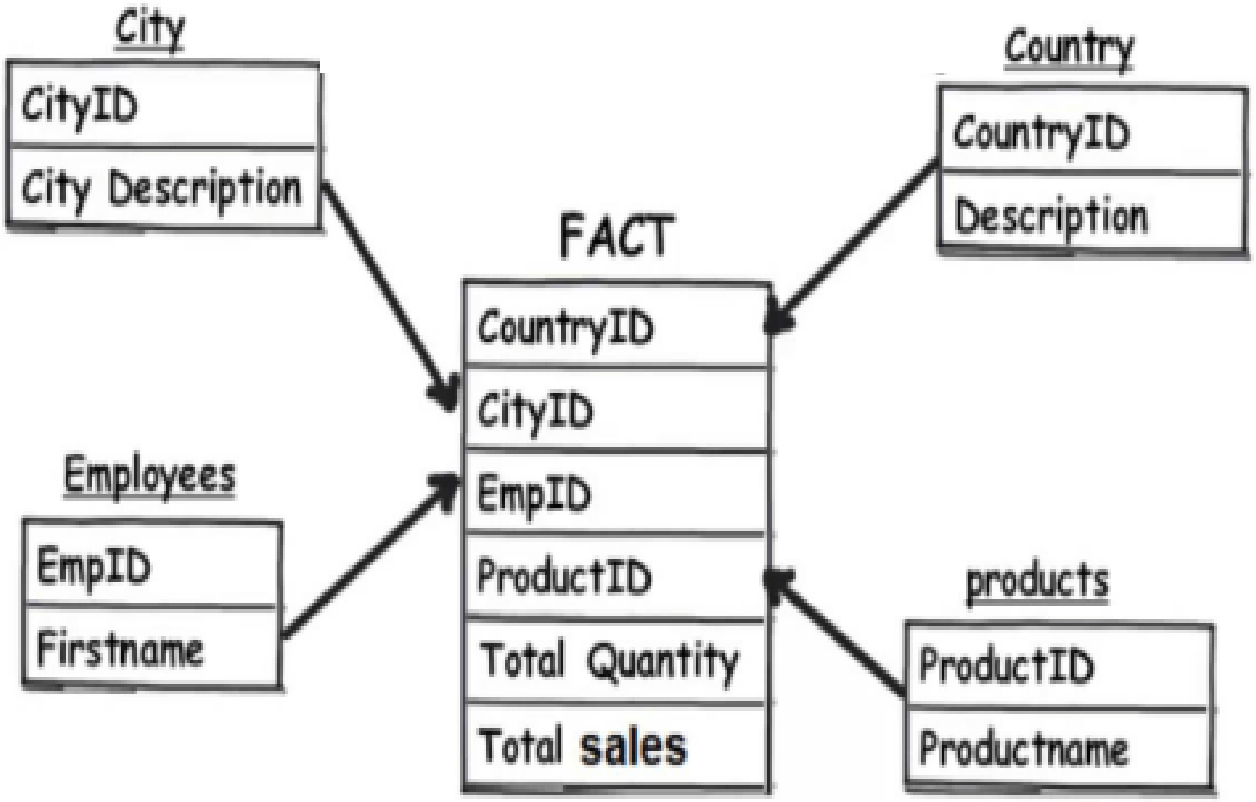
- **Star model/scheme :**



DATA MODELS FOR OLTP & OLAP

Data model for OLAP

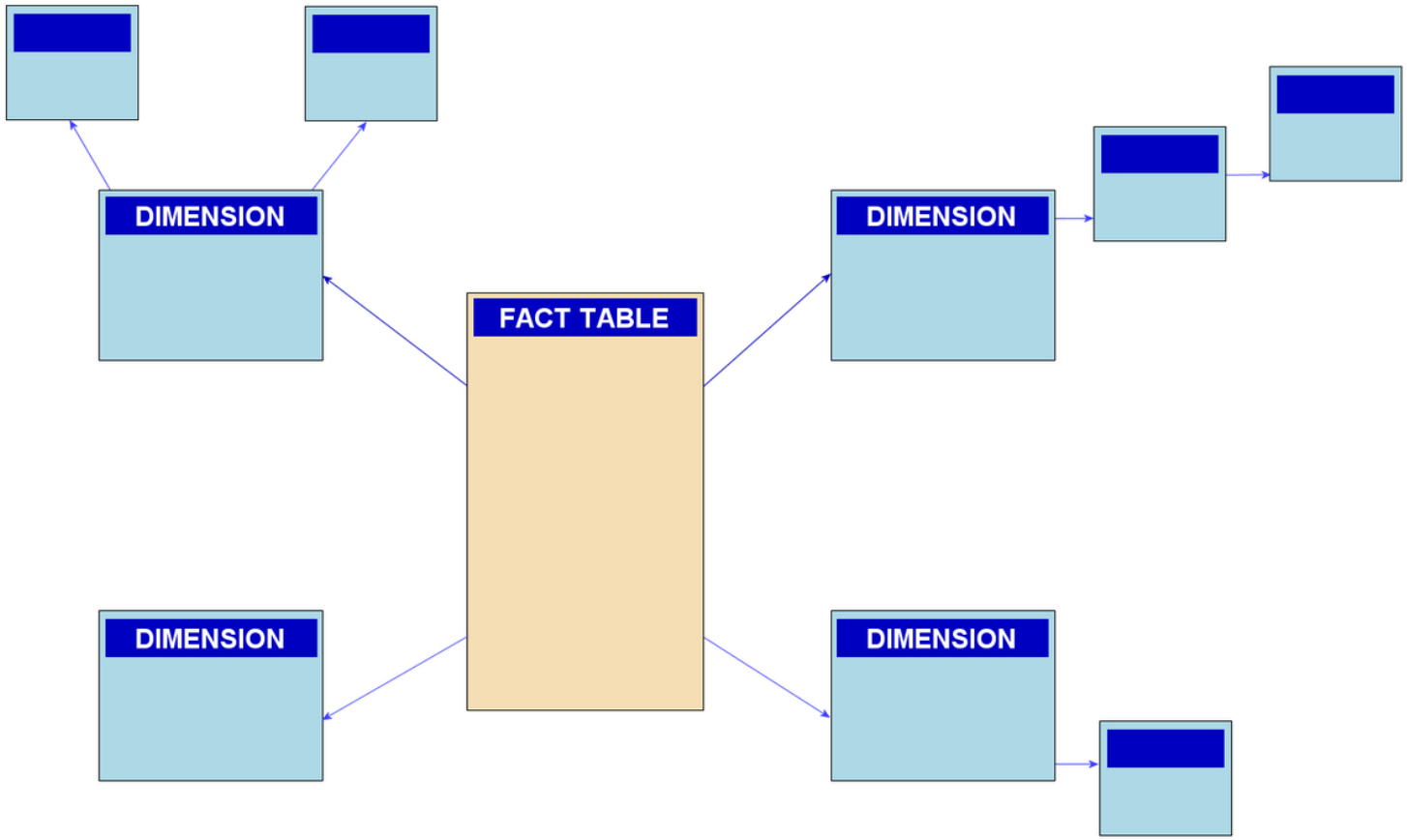
- **Star model/scheme :**



DATA MODELS FOR OLTP & OLAP

Data model for OLAP

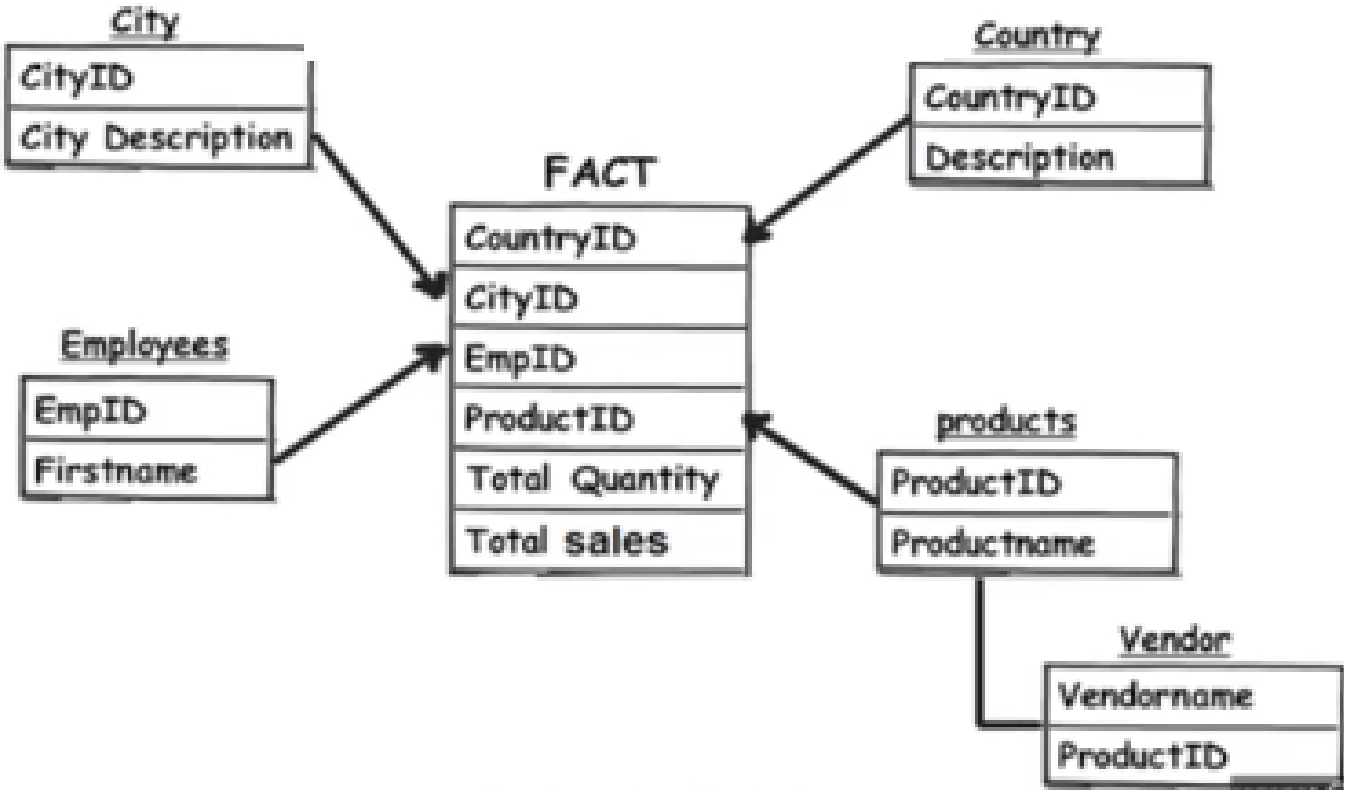
- **Snowflake model/schema :**



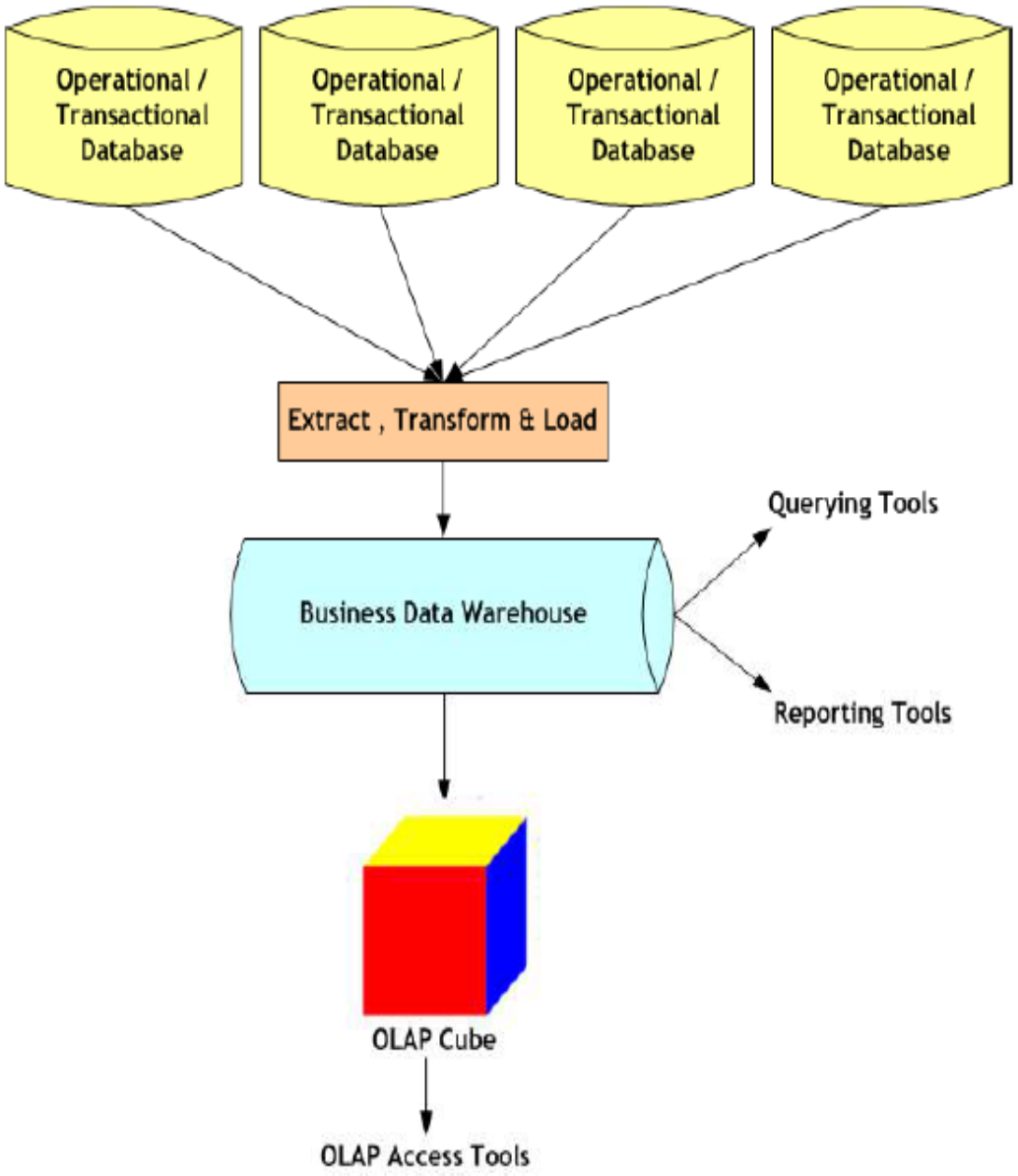
DATA MODELS FOR OLTP & OLAP

Data model for OLAP

- **Snowflake model/schema :**

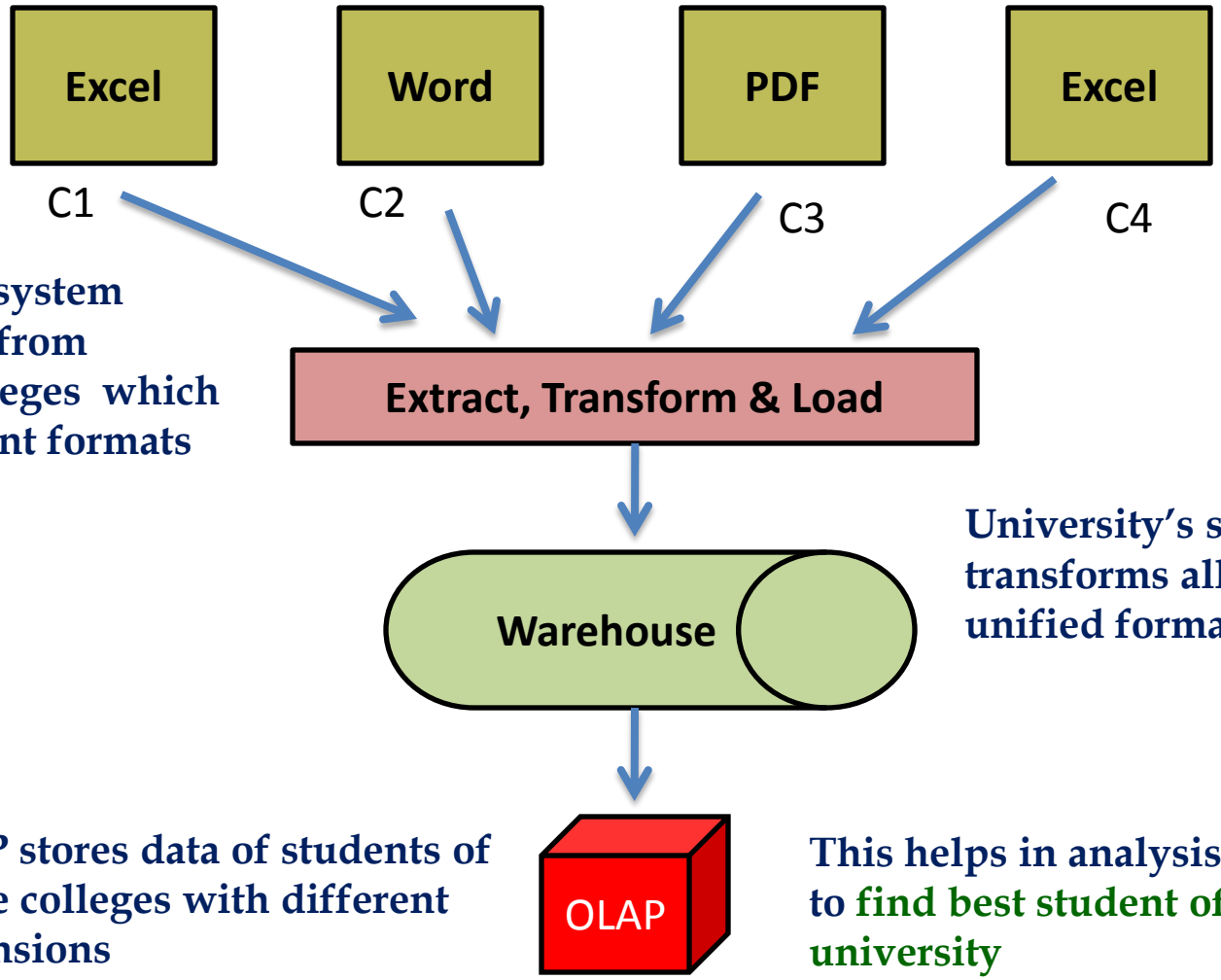


ROLE OF OLAP IN THE BI ARCHITECTURE



ROLE OF OLAP IN THE BI ARCHITECTURE

Ex: University wants data of all the top students of the colleges to find best student of the university, so it is requesting all the colleges to send the reports as soon as possible



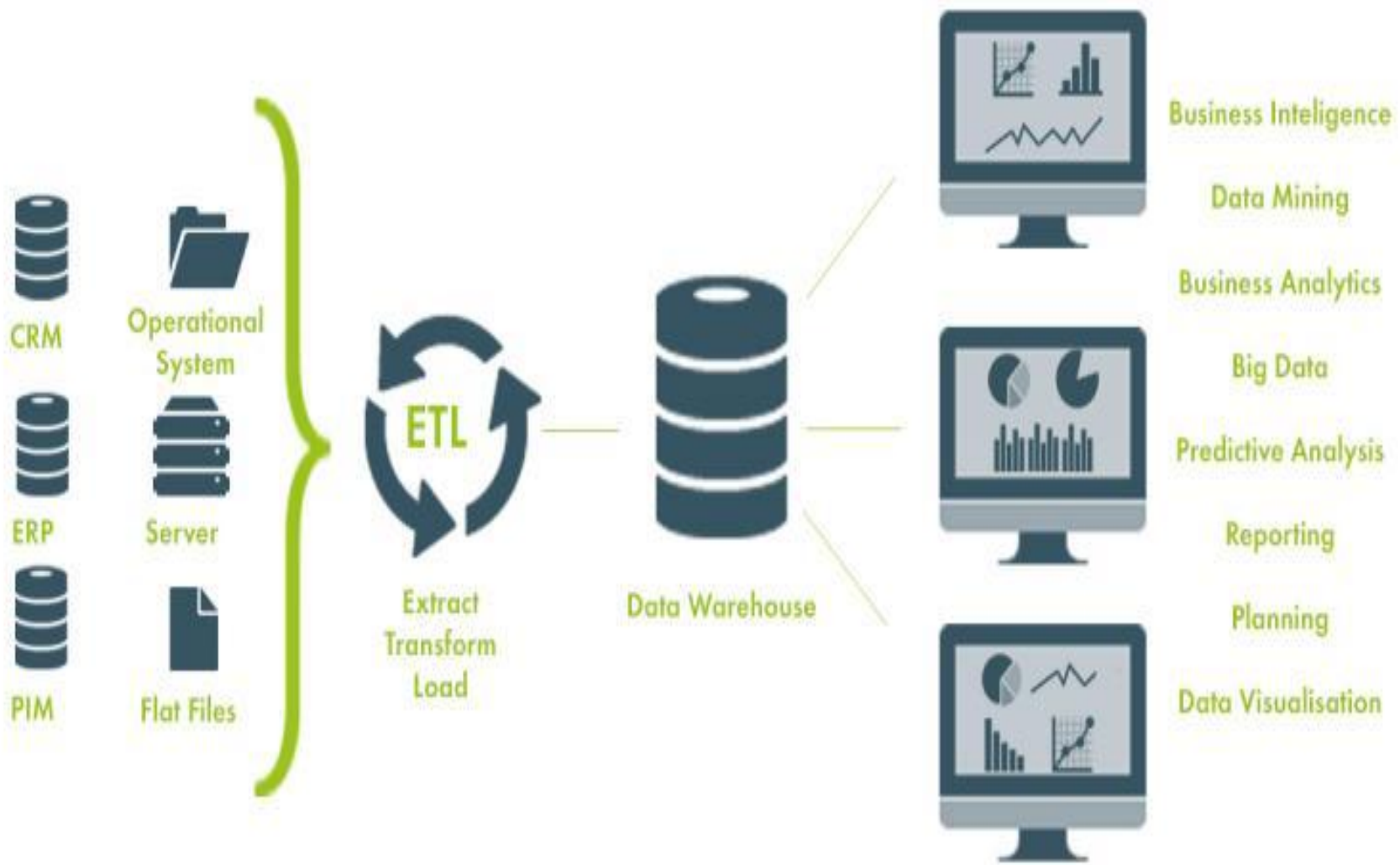
University's system extracts data from different colleges which are in different formats

University's system transforms all the data in unified format & stores

OLAP stores data of students of all the colleges with different dimensions

This helps in analysis ie. helps to find best student of the university

ROLE OF OLAP IN THE BI ARCHITECTURE



ROLE OF OLAP IN THE BI ARCHITECTURE

- Data has to be brought/extracted from multiple database systems, cleansed(error detection & rectification), transformed (conversion of data from host format to the database format), and loaded into the common business data warehouse
- The OLAP system then stores it in multi dimensional form, then from this, users can access the data by querying accordingly which in turn helps in analysis and decision making

OLAP OPERATIONS ON MULTIDIMENSIONAL DATA

- There are number of OLAP data operations available that allow interactive querying and analysis of data, they are
- Slice
- Dice
- Roll up/Drill up
- Roll down/Drill down
- Drill access
- Drill through
- Pivot

OLAP OPERATIONS

Consider this example to know the operations

Section	ProductCategoryName	YearQuarter	SalesAmount
Men	Accessories	Q1	5000.00
Men	Accessories	Q2	3000.00
Women	Accessories	Q3	1000.00
Women	Accessories	Q4	2000.00
Men	Clothing	Q1	7000.00
Men	Clothing	Q2	5000.00
Women	Clothing	Q3	10000.00
Women	Clothing	Q4	9000.00

Total SalesAmount = 42000.00

OLAP OPERATIONS ON

- **Slice :** Slicing is filtering/selecting the data using one dimensions

Ex: Data is sliced/filtered along the section dimension using the criteria Section="Men"

Section	ProductCategoryName		SalesAmount
	Accessories	Clothing	
Men	8000	12000	20000.00

OLAP OPERATIONS ON

- **Dice :** Dicing is also filtering/selecting the data but using two dimensions

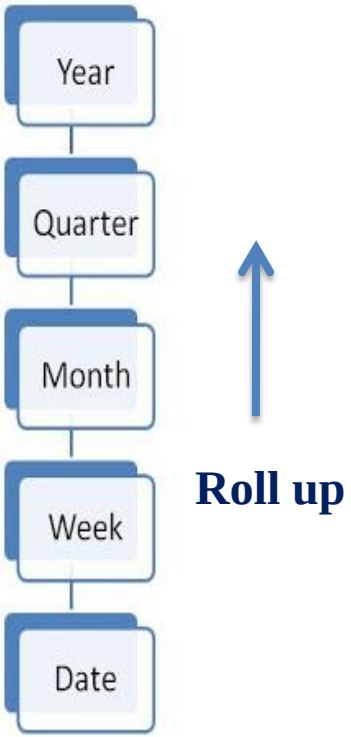
Ex: Data is diced/filtered along the section dimension using the criteria
Section="Men" and
ProductCategoryName="Accessories"

Section	ProductCategoryName	SalesAmount
	Accessories	
Men	8000	8000.00

OLAP OPERATIONS

- **Roll up :** It is also called Drill up. Here the data is viewed at higher level of hierarchy of a dimension

  Ex: Year has four quarters Q1,Q2,Q3 & Q4, Here roll up/higher level of quarter is a year

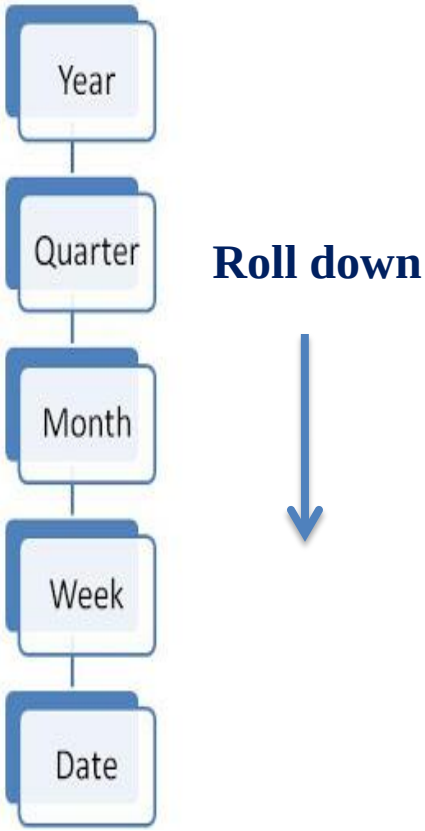


Complete OneYear Data

ProductCategoryName	SalesAmount
Accessories	11000.00
Clothing	31000.00

OLAP OPERATIONS

- **Roll down :** It is also called Drill down. Here the data is viewed at lower level of hierarchy of a dimension



USING ANALYTICAL INFORMATION FOR DECISION SUPPORT

- In the past, the senior executives of the company dependent on "numerical information" to support their decisions
- They started using the term BI, for the set of concepts & processes that allows a business executive to make informed decisions
- The decision making became informed decision making with the use of BI
- Informed decision means, it is decision which is based on fact and fact alone

USING ANALYTICAL INFORMATION FOR DECISION SUPPORT

- The informed decisions are based on the fact and not on gut feeling
- This type of decision making will lead to business benefits
- BI helps to reveal analytical information which helps in decision making
- The evolution of BI made decision making faster, reliable, consistent, and highly team oriented

INFORMATION SOURCES BEFORE EVOLUTION OF BI

- **Marketing research :** This analysis helps understand better the marketplace. It is about understanding customers, the competitors, the products, the changing market dynamics
- **Statistical data :** This is essential to know hidden patterns, trend analysis through proven mathematical techniques, such as shopping pattern of customers, sales prediction, etc

INFORMATION SOURCES BEFORE EVOLUTION OF BI

- **Management reporting :** These reports help organizations to take necessary actions in the required areas of the process. Companies invest a lot in reporting tools which are handled by IT teams
- **Market survey :** This helps in consumer survey and competitive analysis. Helps to know strengths, weaknesses, opportunities for the enterprises

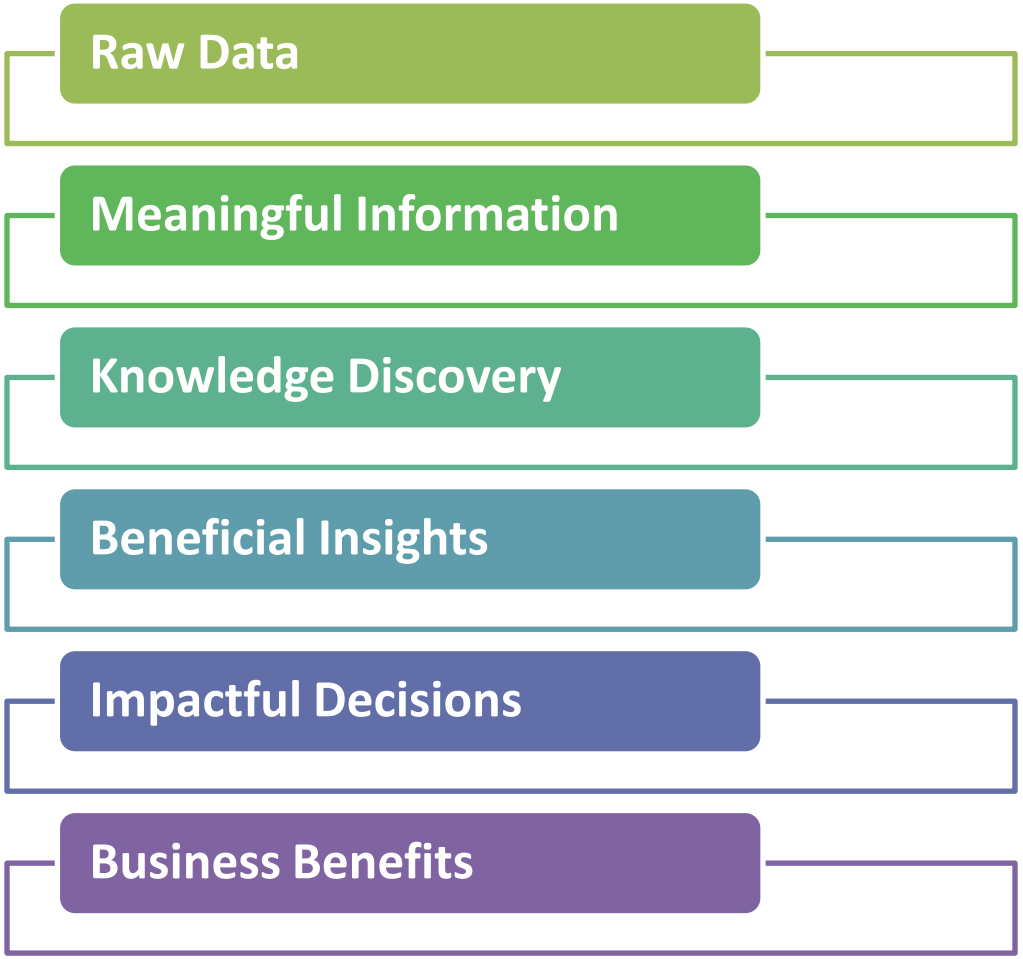
BUSINESS INTELLIGENCE

- Howard Dresner in 1989 coined the term BI
- BI is a set of concepts and methodologies to improve decision making in business through use of facts and fact based systems
- The goal of BI is improved decision making
- BI is more than just technologies. It is a group of concepts and methodologies
- BI is a fact based system, decisions are not made on gut feeling
- Decisions need to be backed up by facts

BUSINESS INTELLIGENCE

- **BI helps to gain the business benefits using raw data**

BI is about providing the right information in the right format to the right decision makers at the right time



BUSINESS INTELLIGENCE

- **Features of BI**
- **Fact-based decision making : Decisions made through business intelligence are based purely on fact and history, which leads to improved decision making**
- **Single version of truth : BI provides single version of truth. It means that if the same piece of data is available at more than one place, all the copies of the data should agree wholly and in every respect**

BUSINESS INTELLIGENCE

- **Features of BI**
- **360 degree perspective on your business : BI allows looking at the business from various perspectives which helps in improvement of overall performance of the organization**
- **Virtual team members on the same page: BI helps all the members of the organization unite together through technology to access the same facts, same data irrespective of their geographic locations with high speed in the required formats**

BUSINESS INTELLIGENCE

VISIBILITY INTO ENTERPRISE PERFORMANCE

- BI provides a clear insight into the enterprise's performance
- BI supports decision making at all levels in the enterprise as,

- Strategic level decision making
- Tactical level decision making
- Operational level decision making

VISIBILITY INTO ENTERPRISE PERFORMANCE

- **Strategic level** decision making : BI supports decision making for long term. Such decisions affect the entire organization. BI helps enterprises see the 'big picture'

- For example:
- Where could be the next 5 restaurants? (Considering the restaurant example)
- Which product should we need to introduce? (Considering the shopping store)

VISIBILITY INTO ENTERPRISE PERFORMANCE

- **Tactical level decision making : These decisions are made frequently. These will not affect the organization that much. They are like seasonal/periodic decisions.**
- **For example:**
- **Which menu item should be included for this winter season? (Considering the restaurant/hotel example)**
- **How much discount should we offer for the summer holidays? (Considering the shopping store)**

VISIBILITY INTO ENTERPRISE PERFORMANCE

- **Operational level decision making : These decisions are made even more frequently. These decisions help in conducting the day to day operations of the business**
- **For example:**
- **Which menu item should be dropped for this week? (Considering the restaurant/hotel example)**
- **Whether to extend store working timing today, to avoid rush? (Considering the shopping store)**

VISIBILITY INTO ENTERPRISE PERFORMANCE

TYPES OF DECISIONS

EVOLUTION OF BI AND ROLE OF DSS, EIS, MIS, AND DIGITAL DASHBOARDS

- With increasing globalization of markets, fierce competition, increase in the speed with changes in market conditions and customer needs, all market participants and companies face new challenges
- In the long run, companies will be able to assert themselves, who can adapt to these conditions, who can respond flexibly and quickly to changes while at the same time keeping their costs under control

EVOLUTION OF BI AND ROLE OF DSS, EIS, MIS, AND DIGITAL DASHBOARDS

- For this purpose, however, an exact knowledge of the current corporate and market situation is necessary
- To ensure this and to provide management with the information needed in their planning and decision-making, sophisticated information and communication systems are used
- Since the 1960s, various approaches have been developed for such as MIS, DSS & EIS

EVOLUTION OF BI AND ROLE OF DSS, EIS, MIS, AND DIGITAL DASHBOARDS

- **MIS : Management Information System evaluates, analyzes and processes organizational data to produce useful information**
- **It collects stores and distributes data as information**
- **It also allows taking summarized reports. These reports help the management to monitor the organization, understand the current performance status and to take future business decisions**

EVOLUTION OF BI AND ROLE OF DSS, EIS, MIS, AND DIGITAL DASHBOARDS

- **DSS : DSS stands for Decision Support System. It is a system that allows senior managers to take non-routine decisions**
- **This kind of system allows solving problems that are unique and frequently change**
- **DSS uses mathematical models and statistical techniques to support decision making. Some common statistical techniques are predictive modeling and probability**

EVOLUTION OF BI AND ROLE OF DSS, EIS, MIS, AND DIGITAL DASHBOARDS

- **EIS : EIS stands for Executive Information System. It is designed to support the information needs for executive managers**
- **Information is usually external, unstructured and uncertain. Furthermore, this information is intelligence-based**
- **Some examples of intelligent information are databases, patent records, financial reports, market reports, technical reports from consultants, government policies and confidential information about competitors**

EVOLUTION OF BI AND ROLE OF DSS, EIS, MIS, AND DIGITAL DASHBOARDS

- Today, the term Business Intelligence (BI) has become established both in practice and in research
- A few years ago, almost only large companies showed interest, but now this topic has become increasingly attractive for start-up companies. Because there they discovered what potential could be tapped with Business Intelligence. One reason for this is that BI software has become increasingly cheaper and more affordable for many start-ups

NEED FOR BI AT VIRTUALLY ALL LEVELS

- **There is too much data, but too little insight!**
  Enterprises receive huge amount of data in different formats, but all that data might not be helpful for decision making. There is a need to integrate this data, and convert it into meaningful information that can be used effectively for business benefits
- **BI has been there in the boardroom for long. There is a need to expand BI from the boardroom to the front lines!**
  Companies have to react faster to changing market conditions. This involves integrating business intelligence into operational processes

NEED FOR BI AT VIRTUALLY ALL LEVELS

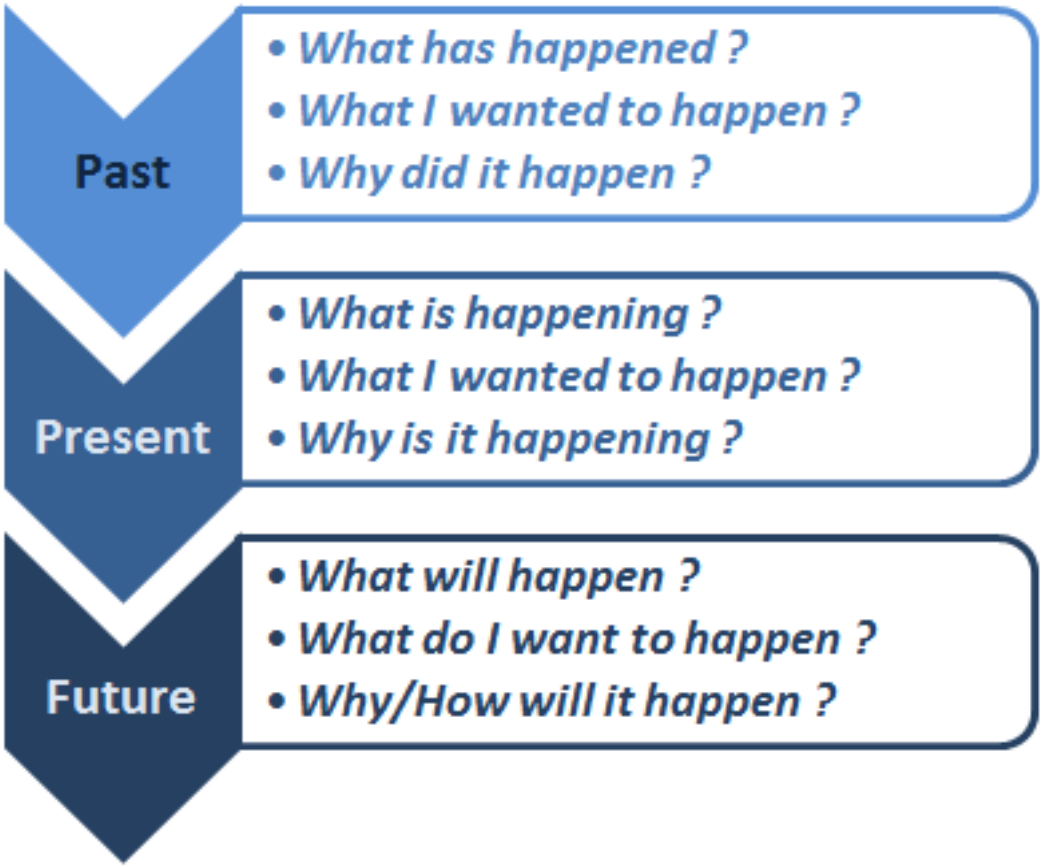
- **Structured and unstructured data need to converge!**

  Unstructured data such as emails, voicemail messages, memos, etc. are rich sources of information. Along with the data that is available in the rows and columns(structured data), there is a need to blend the unstructured data to support better decision making

BI FOR PAST, PRESENT, AND FUTURE

- **BI is not only for the present context and scenario but also takes into consideration the past and the future**

Why BI



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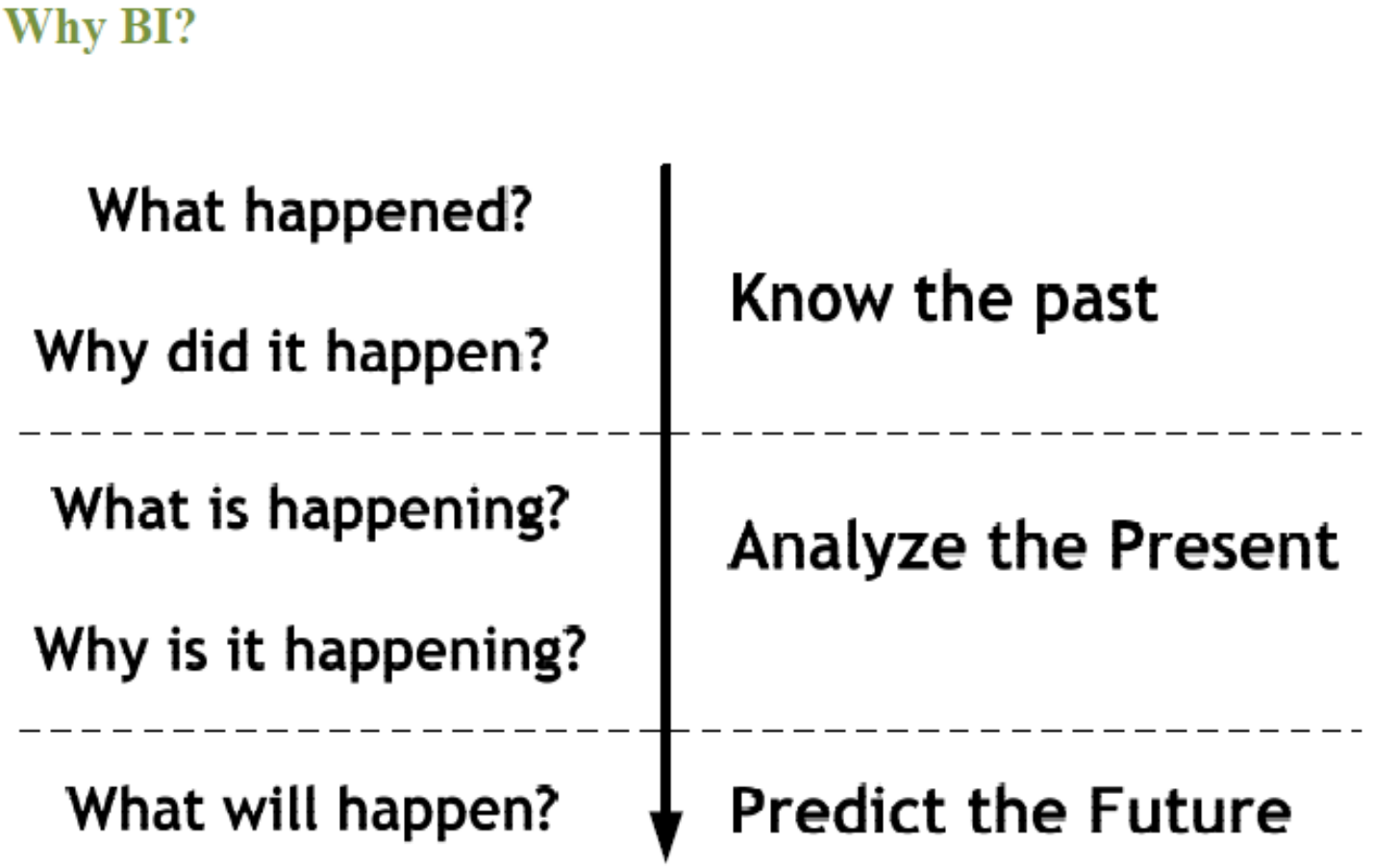

THE BI VALUE CHAIN

- Data from different OLTP/transactional systems is brought together into an enterprise data warehouse. This is after the data has been cleansed and is free of all errors. The data has also been transformed which converts different formats of data into unified format. The data is then loaded into the data warehouse. Then the information is delivered as reports to the respected departments or individuals

INTRODUCTION TO BUSINESS ANALYTICS

- Business analytics is heavily dependent on data. For its successful implementation, business analytics requires a high volume of high quality of data
- The challenges faced by business analytics are: storage, integration, reconciliation of data from multiple sources across several business functions, and the continuous updates to the data warehouse
- It can help businesses optimize existing processes, better understand customer behavior, help recognize opportunities

BI vs BA

	Business Intelligence	Business Analytics
Answers the questions:	•What happened? •When did it happen? •Who is accountable for what happened? •How many? •How often? •Where did it happen?	•Why did it happen? •Will it happen again? •What will happen if we change x ? •What else does the data tell us that we never thought to ask? •What is the best that can happen?
Makes use of:	•Reporting (KPIs, metrics) •Automated Monitoring/Alerting (thresholds) •Dashboards /Scorecards •OLAP (Cubes, Slice & Dice, Drilling) •Ad hoc query	•Statistical/Quantitative Analysis •Data Mining •Predictive Modeling •Design of experiments to extract learning out of business data •Multivariate Testing

END