Business Intelligence

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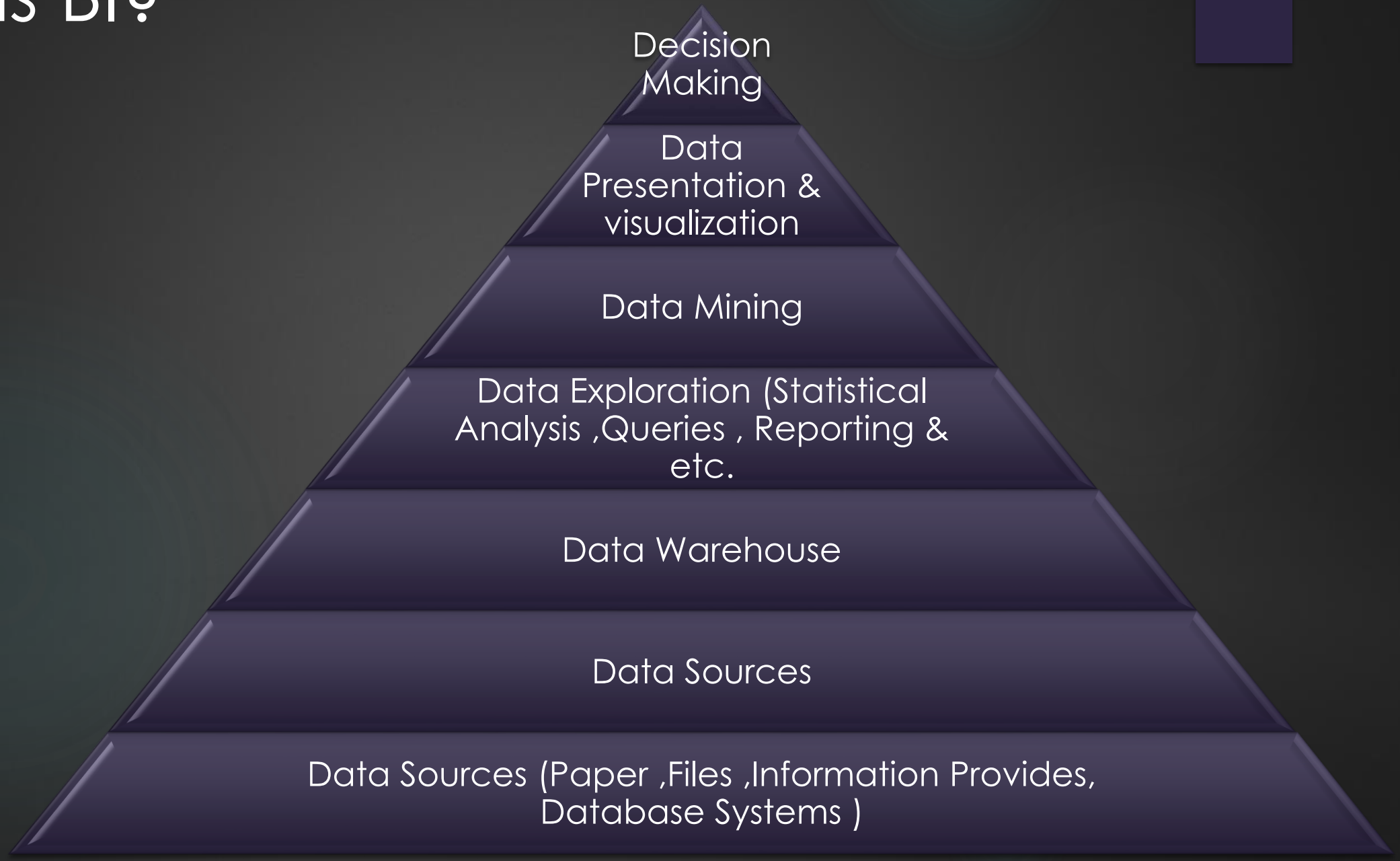
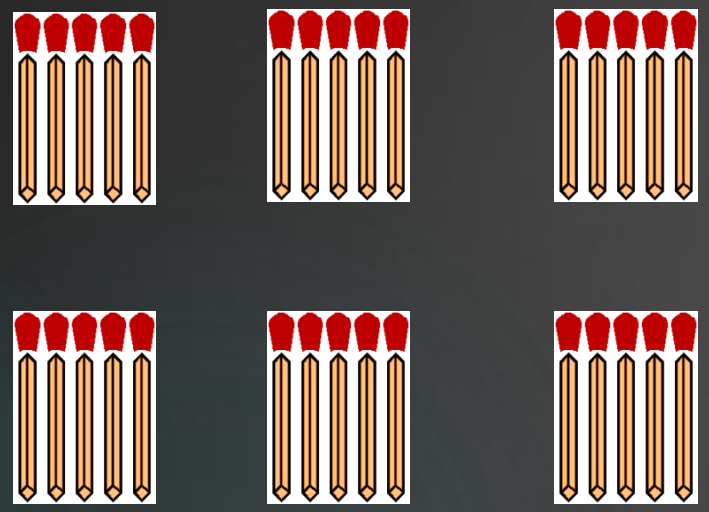
Three main type of Data

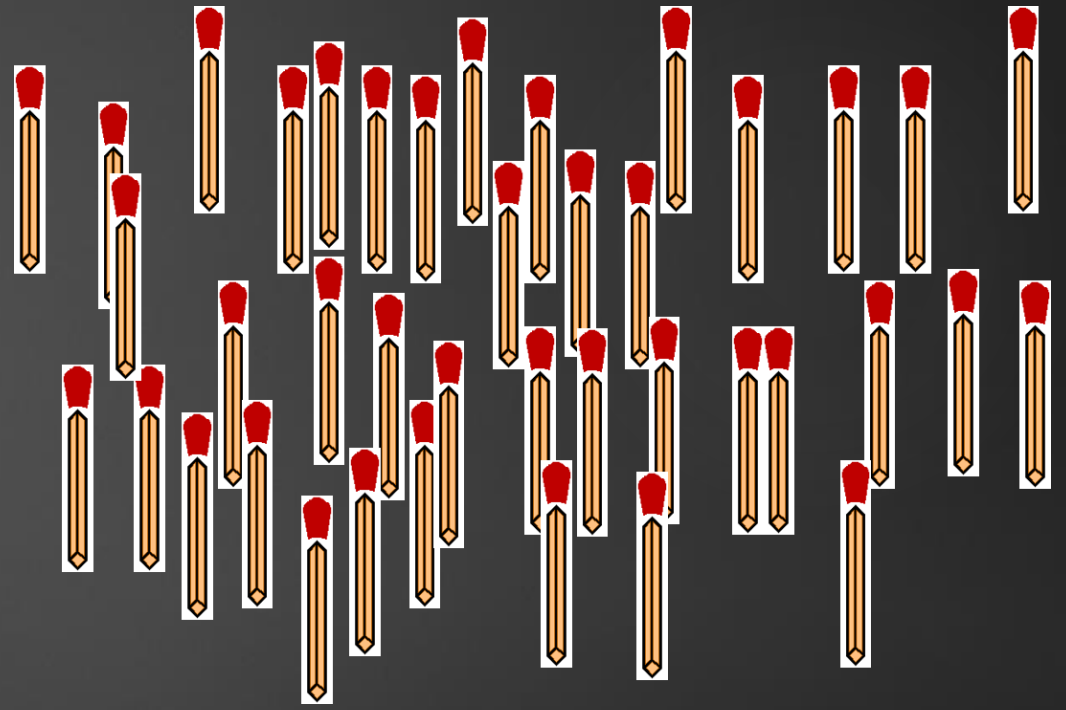
- Structured Data
- Unstructured Data
- Semi Structure Data

What is BI?

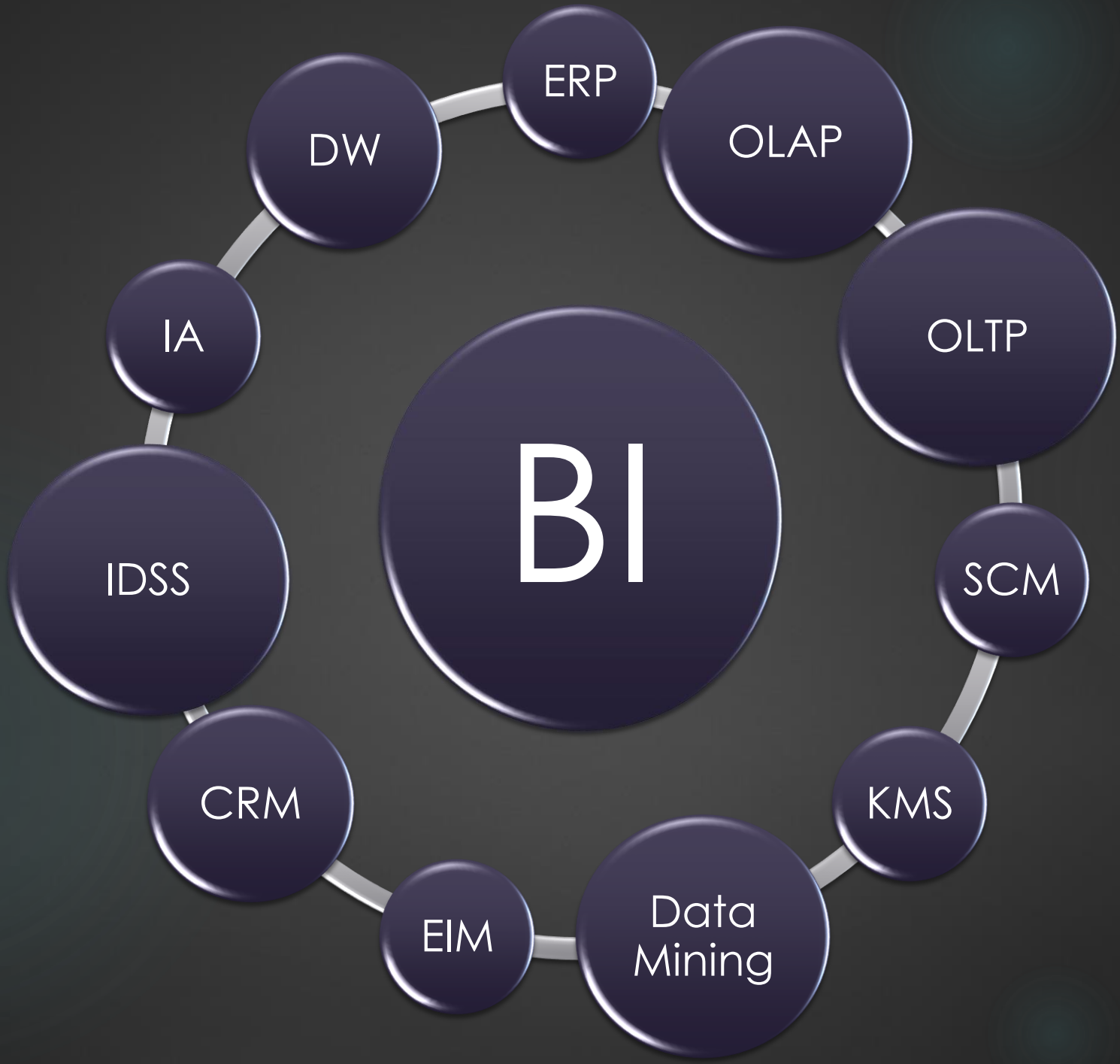

Decision Making
Data Presentation & visualization
Data Mining
Data Exploration (Statistical Analysis ,Queries , Reporting & etc.
Data Warehouse
Data Sources
Data Sources (Paper ,Files ,Information Provides, Database Systems)

BI in simple words





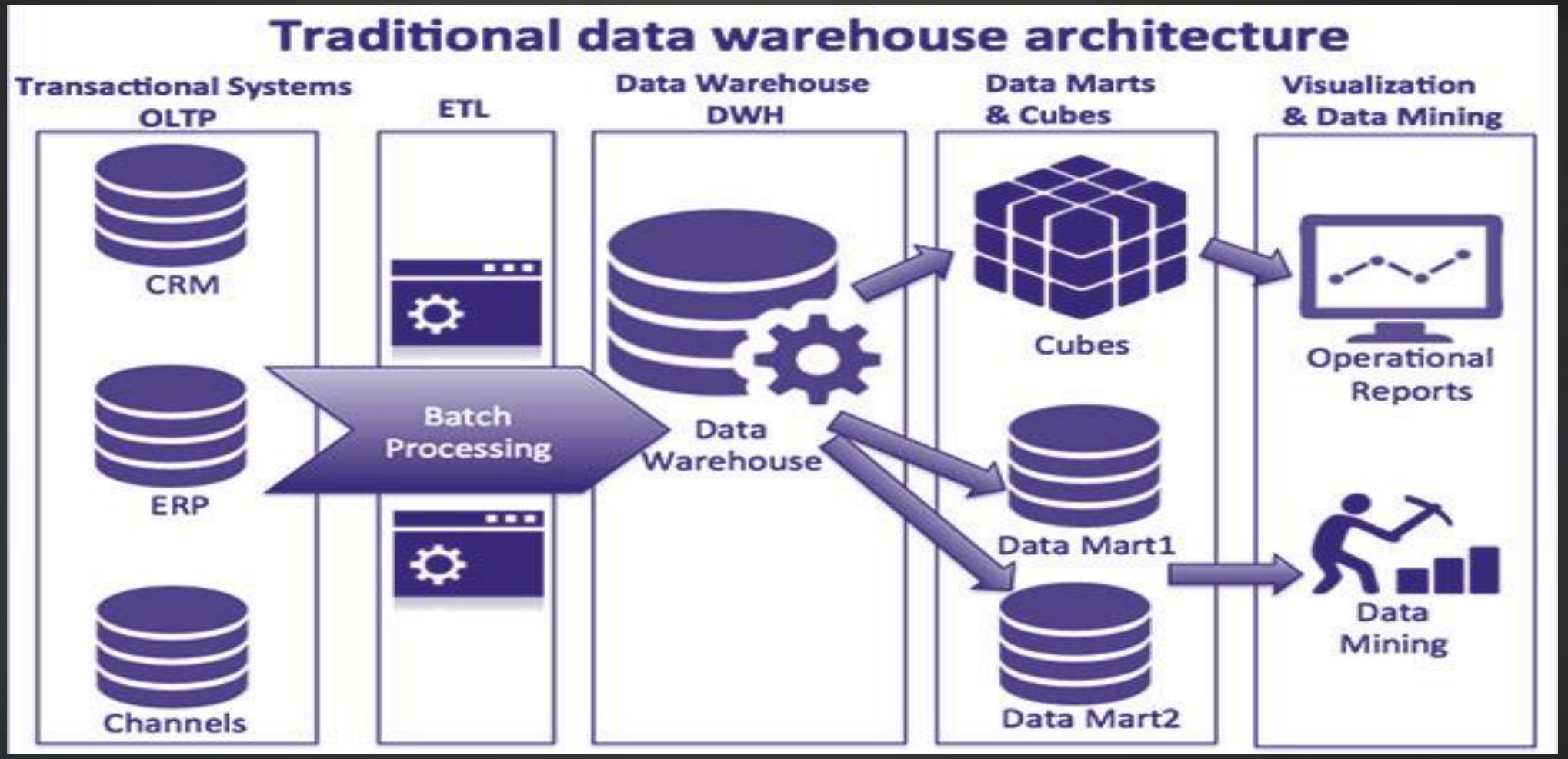
A Simple Definition: The applications and technologies transforming Business Data into Action


BI
ERP
OLAP
OLTP
SCM
KMS
Data Mining
EIM
CRM
IDSS
IA
DW

The techniques that we use in BI

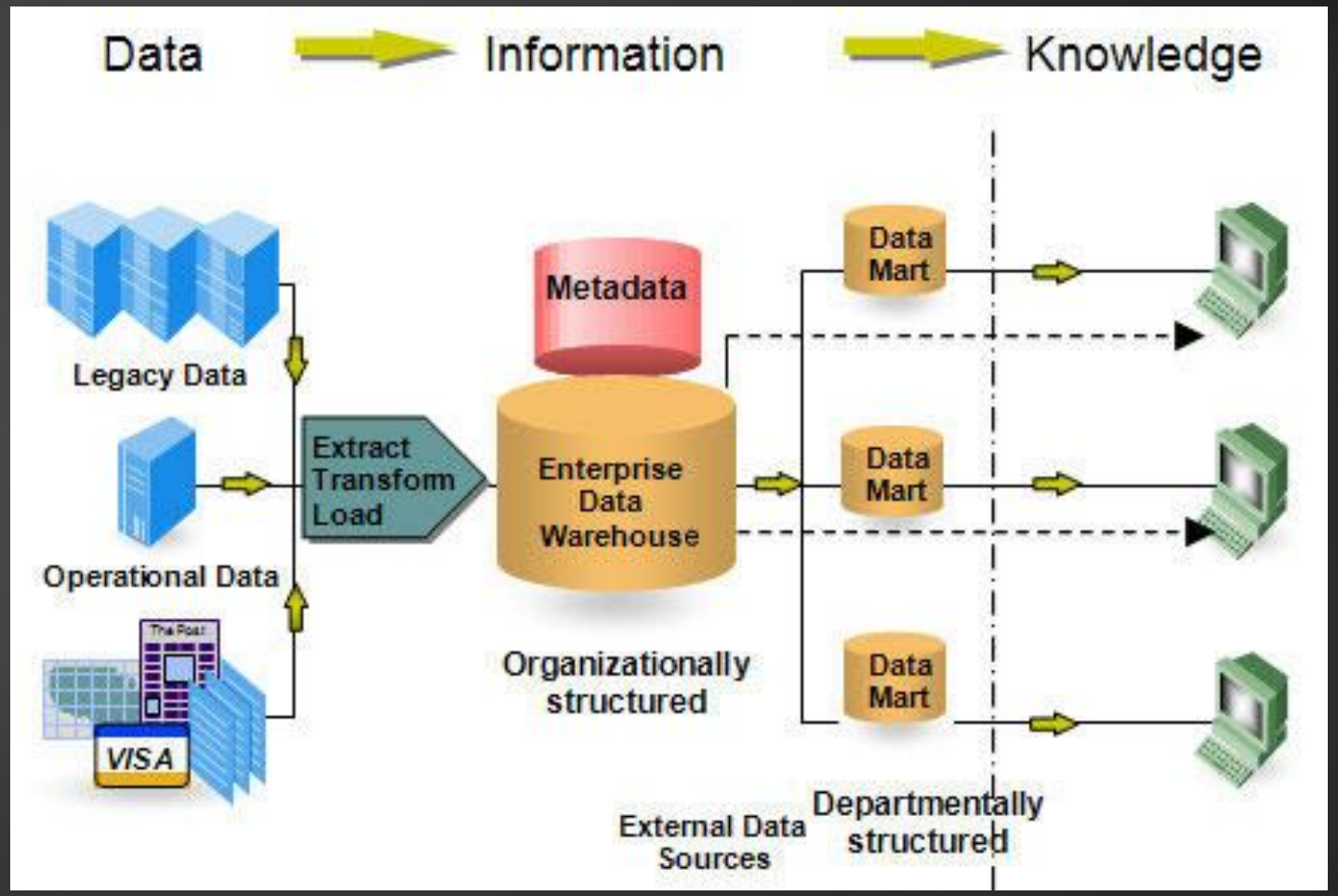
- **OLAP** : On-Line Analytical Processing
- **OLTP**: On-Line Transaction Processing
- **DW** : Data Warehousing
- **Data Mining**
- **IDSS** : Intelligent Decision Support System
- **IA** : Intelligent Agent
- **KMS** : Knowledge Management System
- **SCM** : Supply Chain Management
- **CRM** : Customer Relationship Management
- **ERP** : Enterprise Resource Planning
- **EIM** : Enterprise Information Management

Data Warehouse(DW/DWH)

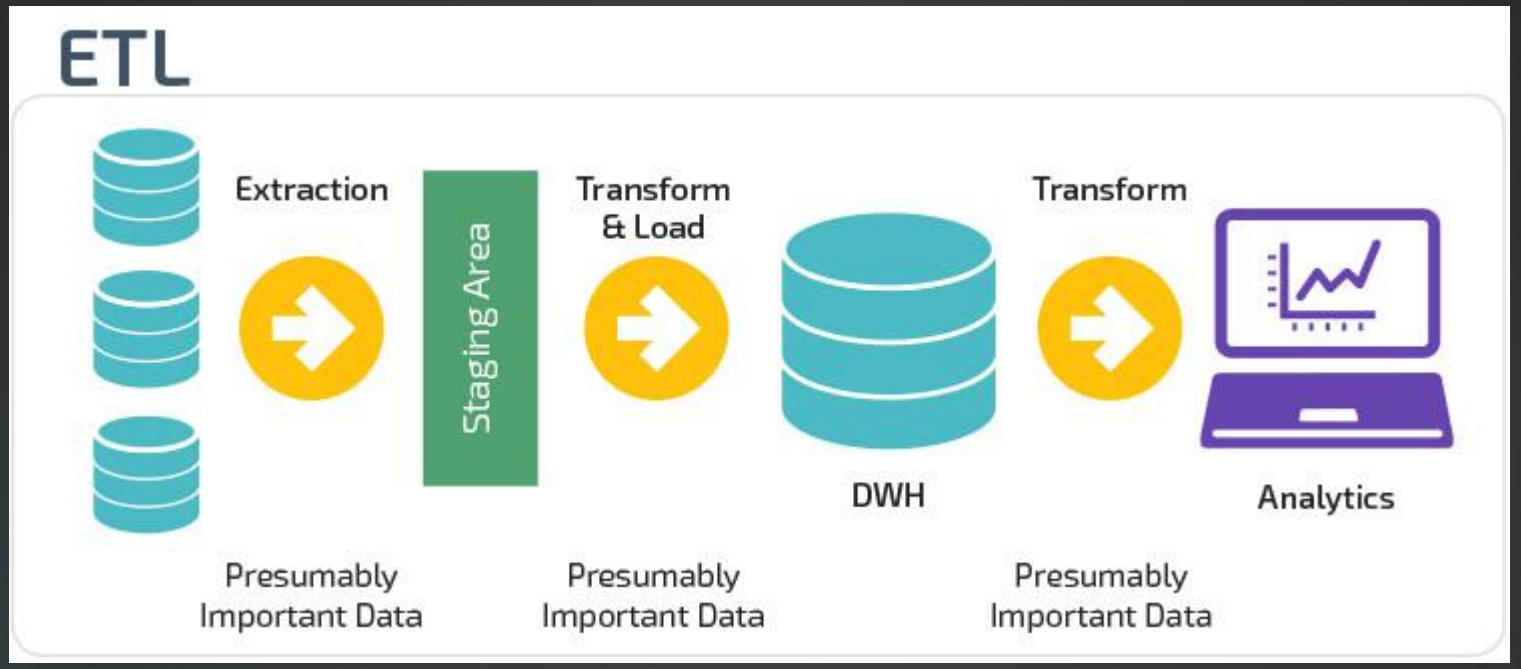


Data Warehouse(DW/DWH)

- **ETL**
  - **Extraction**
  - **Transforming**
  - **loading**
- **Meta Data**
- **Data Marts**



ETL



- **1. EXTRACTION: Extracting data from outside sources**

  reading and understanding the source data and copying the data needed for the data warehouse into the staging area for further manipulation.

- **2. TRANSFORMATION : Transforming it to fit business needs**

  cleansing, combining data from multiple sources, reduplicating data, and assigning warehouse keys

- **3. LOADING: Loading it into the data warehouse**

  loading the data into the data warehouse presentation area

OLTP & OLAP

- Online Transaction Processing (OLTP)
- Online Analytical Processing (OLAP)
- Characteristics of an OLAP database
- Facts, Dimensions, and OLAP Cubes
- OLAP Schema:
  - MOLAP
  - HOLAP
  - ROLAP

OLTP vs OLAP

	OLTP	OLAP
User	Clerk/IT professional	Knowledge Worker
Function	Day to Day Operations	Decision Support
Database Design	Application Oriented	Subject Oriented
Data	Current, Isolated	Historical, Consolidated
View	Detailed, Flat Relational	Summarized, Multidimensional
Usage	Structured, Repetitive	Ad Hoc
Access	Read/Write	Read

OLTP vs OLAP

Relational Database (OLTP)	Analytical Data Warehouse (OLAP)
Contains current data	Contains historical data
Useful in running the business	Useful in analyzing the business
Based on Entity Relationship Model	Based on Star, Snowflake and Fact Constellation Schema
Provides primitive and highly detailed data	Provides summarized and consolidated data
Used for writing data into the database	Used for reading data from the data warehouse
Database size ranges from 100 MB to 1 GB	Data Warehouse size ranges from 100 GB to 1 TB
Fast; provides high performance	Highly flexible; but not fast
Number of records accessed is in tens	Number of records accessed is in millions
Ex: All bank transactions made by a customer	**Ex**: Bank transactions made by a customer at a particular time.

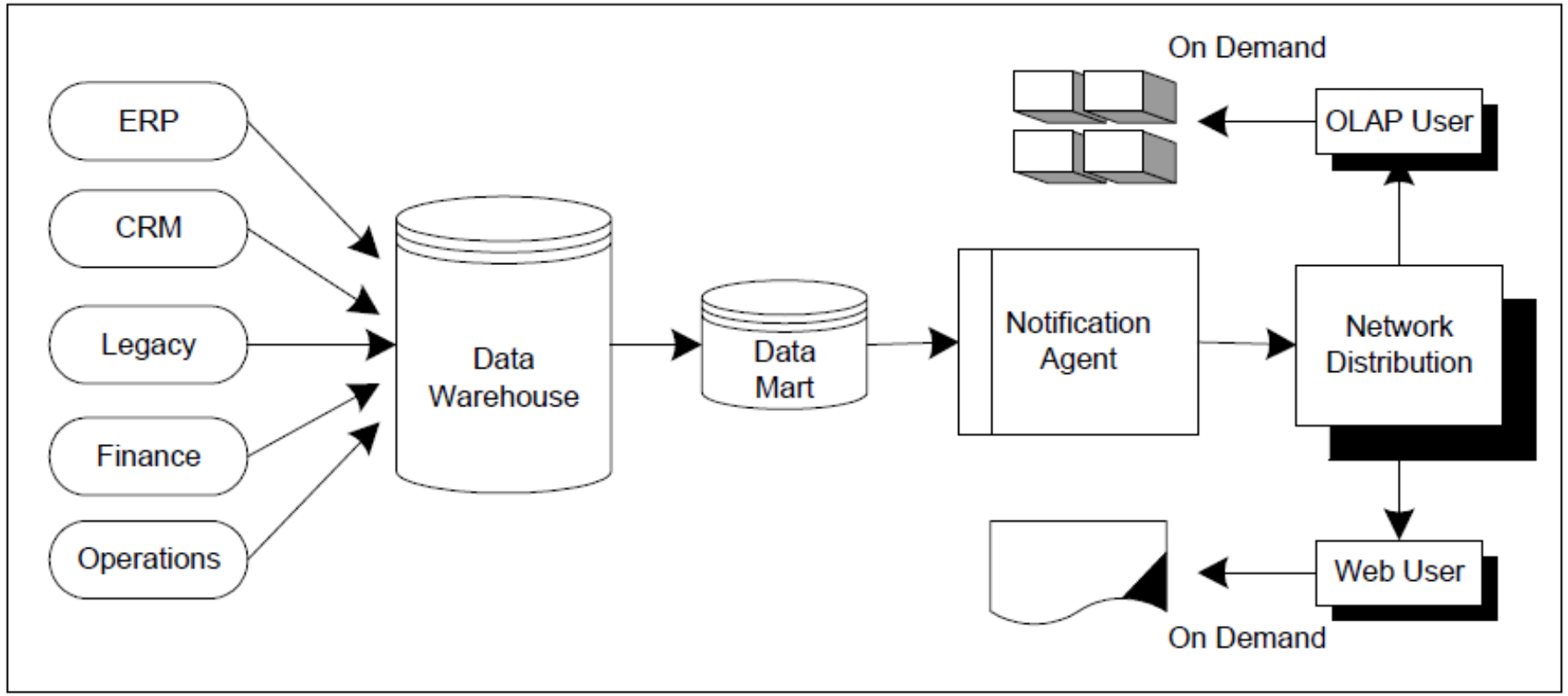
CRM


CUSTOMER CARE
ANALYSIS
DOCUMENTATION
ACQUISITION
PR
CRM
CUSTOMER RELATIONSHIP MANAGEMENT
COMMUNICATION
DATABASE
CUSTOMER LOYALTY

ERP


Financial Management
Customer Relationship Management
Supply Chain Management
ERP SYSTEM
Human Resource Management
Manufacturing Resource Planning

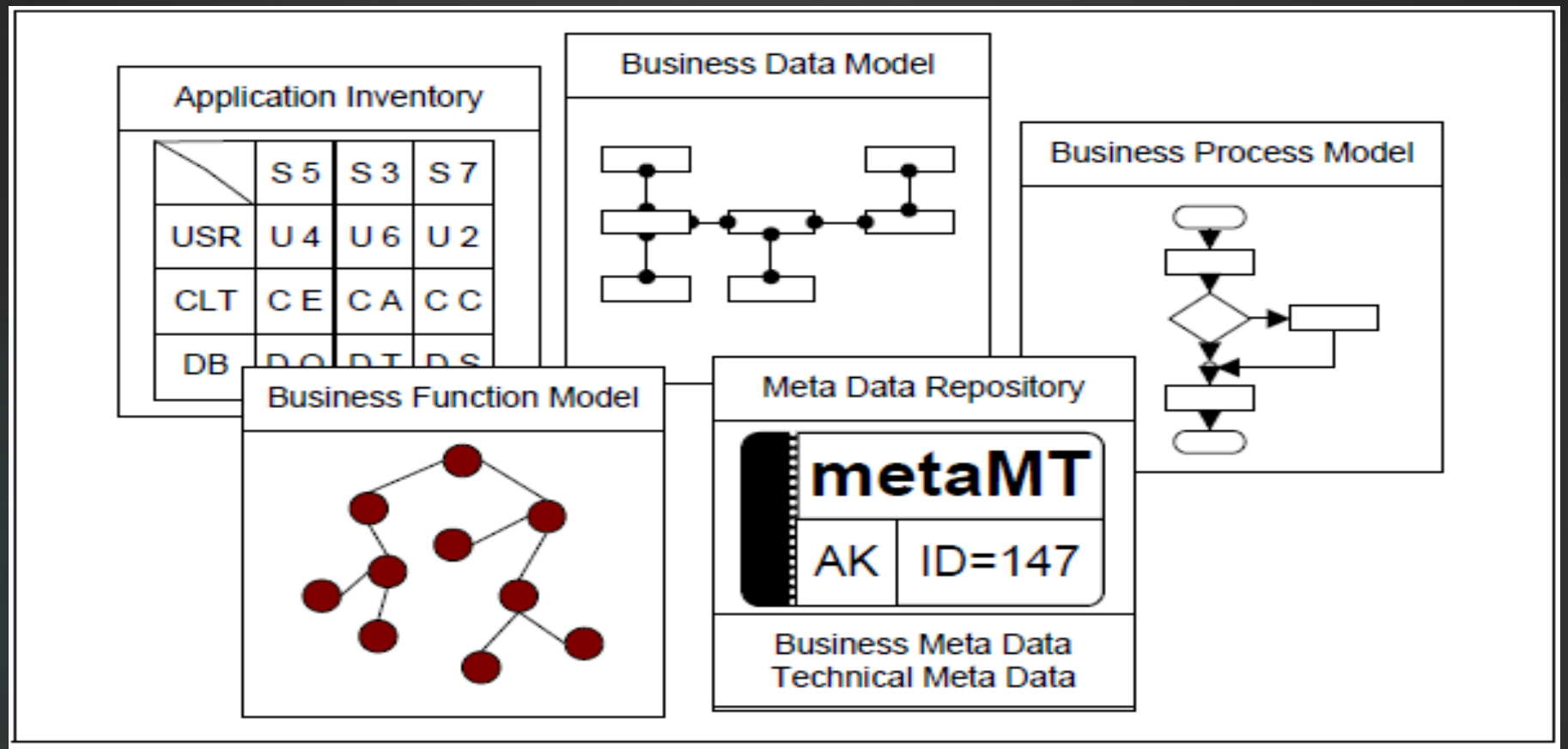
BI Architectures



Adapted from DM Review

Figure 5. Typical BI Architecture for Structured Data

BI Architectures



Adapted from Moss [2003]

Figure 6. BI Architecture for Semi-structured Data

BI Architectures

Presentation Layer

Reporting

Analysis

Data Warehouse Layer

Dara Warehouse

Source Layer

Finance Dept.

HR Dept.

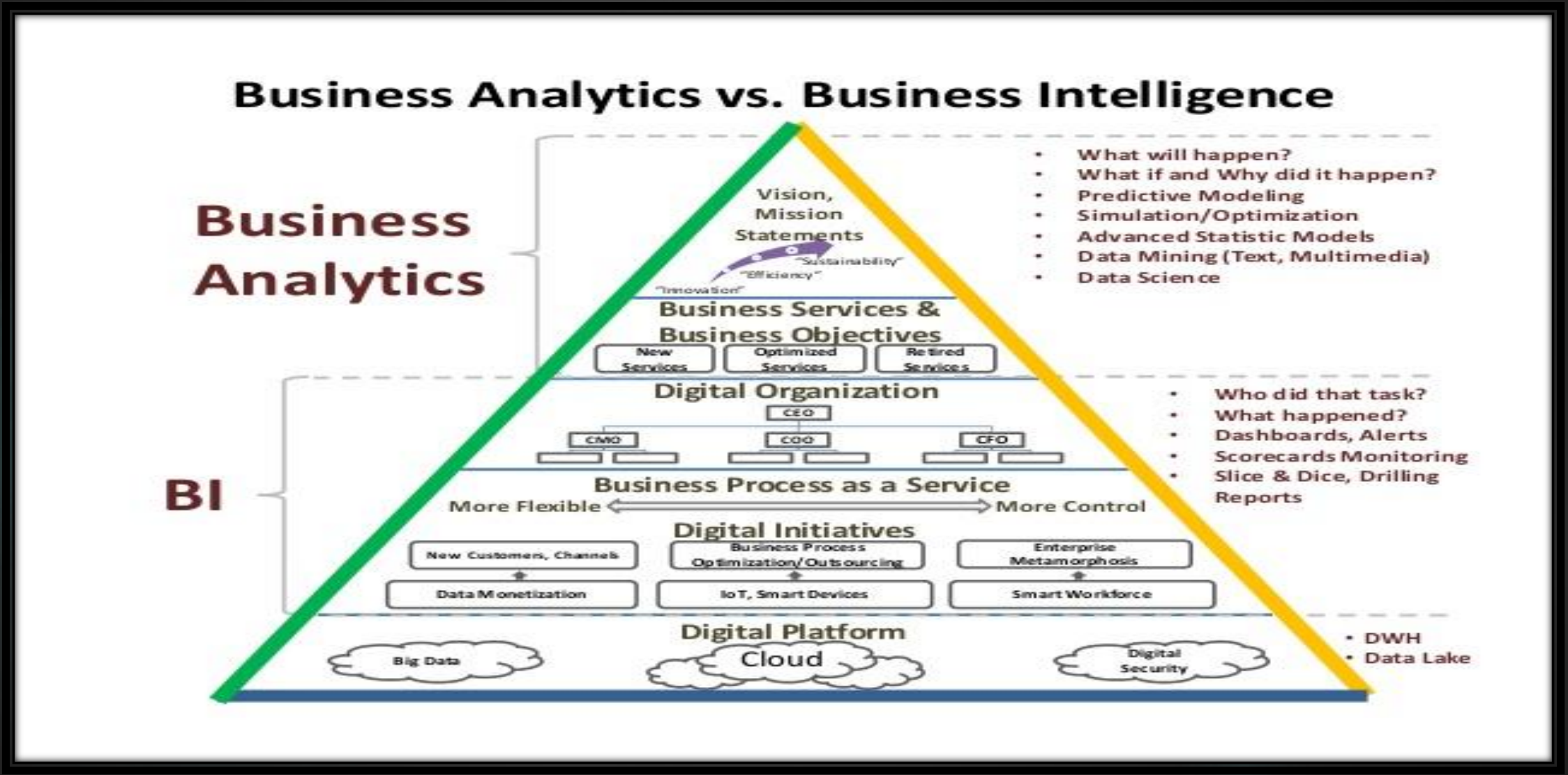
CRM

OS

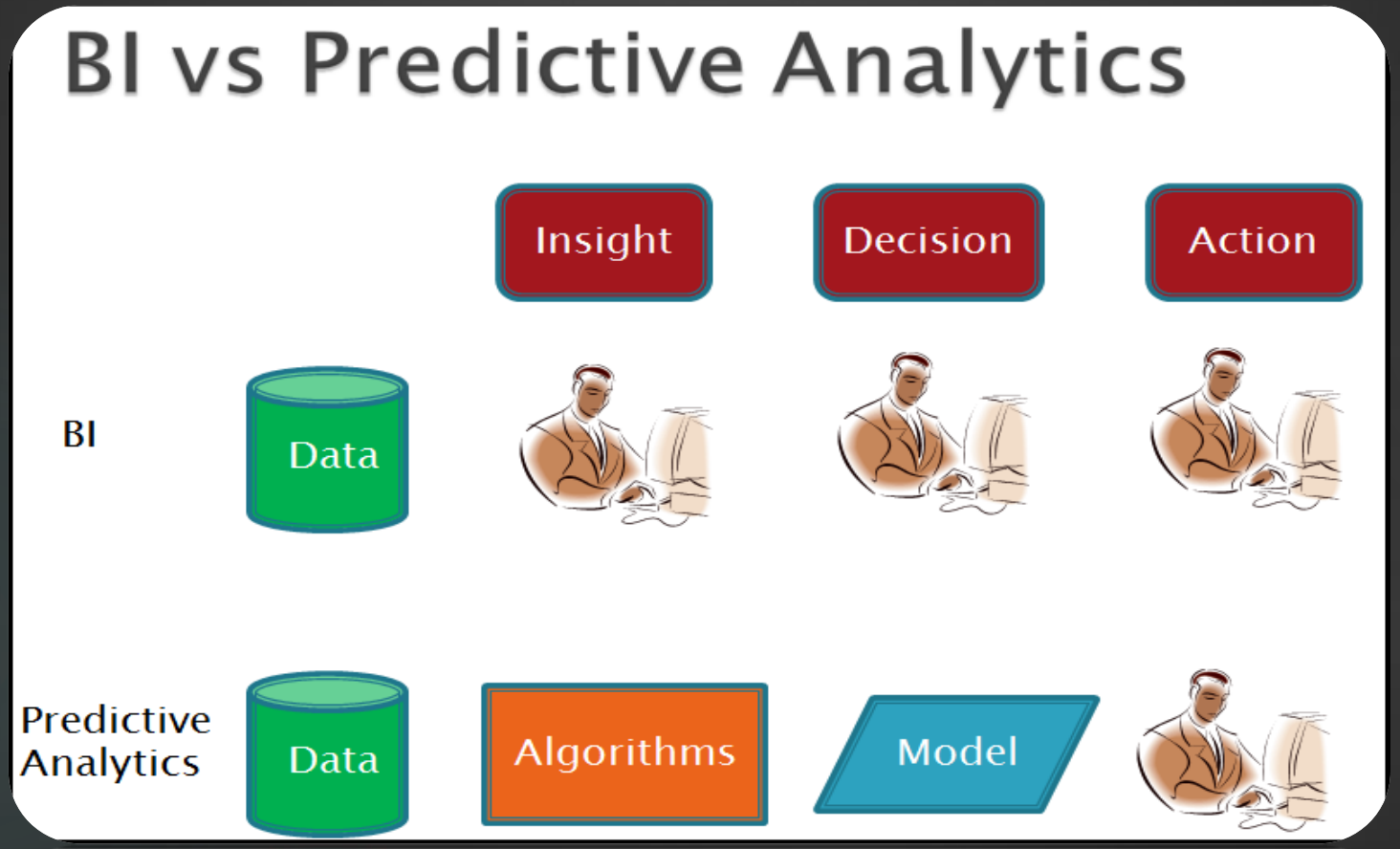
Excel

Business Analytics

BA vs BI


Business Analytics vs. Business Intelligence
Business Analytics
BI
Vision, Mission Statements
"Innovation"
"Efficiency"
"Sustainability"
Business Services & Business Objectives
New Services
Optimized Services
Retired Services
Digital Organization
CEO
CMO
COO
CFO
Business Process as a Service
More Flexible
More Control
Digital Initiatives
New Customers, Channels
Business Process Optimization/Outsourcing
Enterprise Metamorphosis
Data Monetization
IoT, Smart Devices
Smart Workforce
Digital Platform
Cloud
Big Data
Digital Security
What will happen?
What if and Why did it happen?
Predictive Modeling
Simulation/Optimization
Advanced Statistic Models
Data Mining (Text, Multimedia)
Data Science
Who did that task?
What happened?
Dashboards, Alerts
Scorecards Monitoring
Slice & Dice, Drilling Reports
DWH
Data Lake

BI vs PA


BI vs Predictive Analytics
Insight
Decision
Action
BI
Data
Predictive Analytics
Data
Algorithms
Model

Who sells BI productions?

- Actuate)Demo‹(
- IBM Cognos) Demo‹(
- Information Builders) Demo‹(
- Microsoft ‹
- Microstrategy‹
- Oracle‹
- Panaroma Software‹
- Qlik Tech‹
- SAP Business Objects‹
- SAP) Demo‹(
- SAS Institute ‹
- TIBCO Spotfire‹