BUSINESS INTELLIGENCE

WHAT IS BUSINESS INTELLIGENCE

- BI as an *information system*
- BI *as a data analytic processor*
- BI as a *decision management*

- Business Intelligence (BI) is about using the right data to get the right information, to the right decision makers, at the right time.
- BI is an enterprise-wide platform that supports reporting, analysis and decision making.

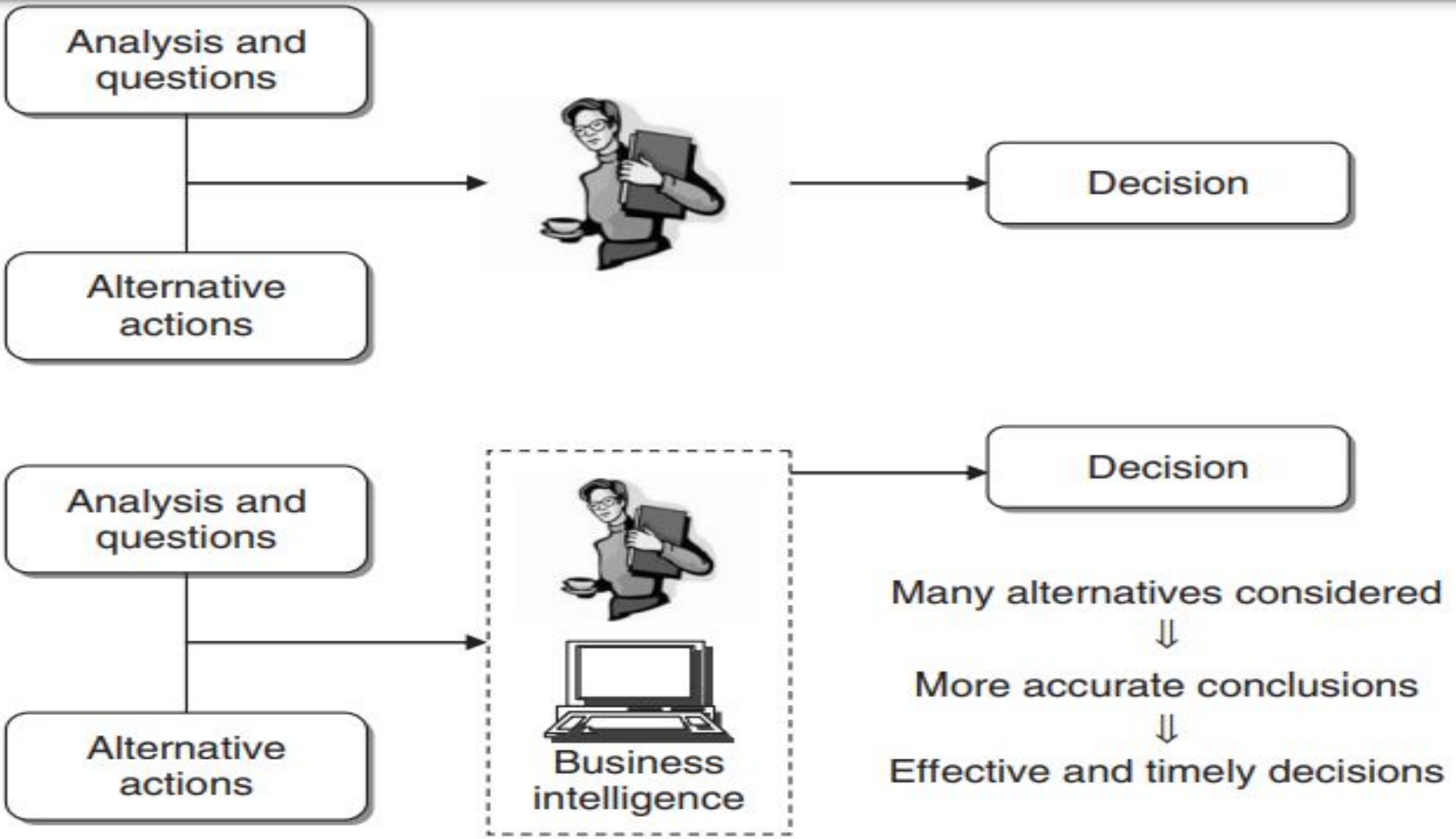
Howard Dresner, of the Gartner Group, in 1989 coined the term BI. He defined BI as

"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. Yes, decisions were made earlier too (without BI). The use of BI should lead to improved decision making.

- BI is more than just technologies. It is a group of concepts and methodologies.

- It is fact based. Decisions are no longer made on gut feeling or purely on hunch. It has to be backed by facts.



Benefits of a business intelligence system

- fact-based decision making.
- “single version of the truth”.
- useful, actionable insight from stored data.
- effective business decisions can be made.
- allows the act of using historical data to gain new information.
- quick decisions can be made.

Improving organizations by providing business insights to all employees leading to better, faster, more relevant decisions.

HOW CAN WE DEFINE BI?

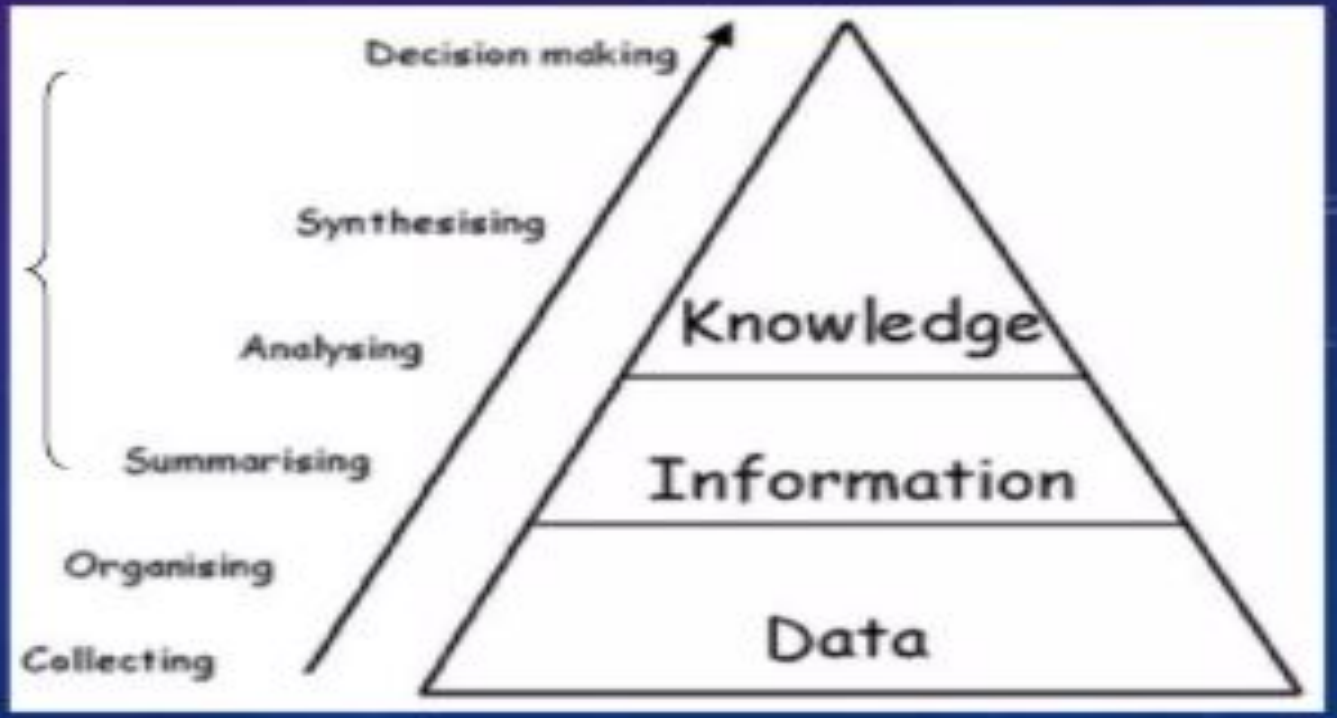
Business Intelligence is a set of methods, processes, frameworks, architectures, applications, and technologies that gather and transform raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making (to drive business

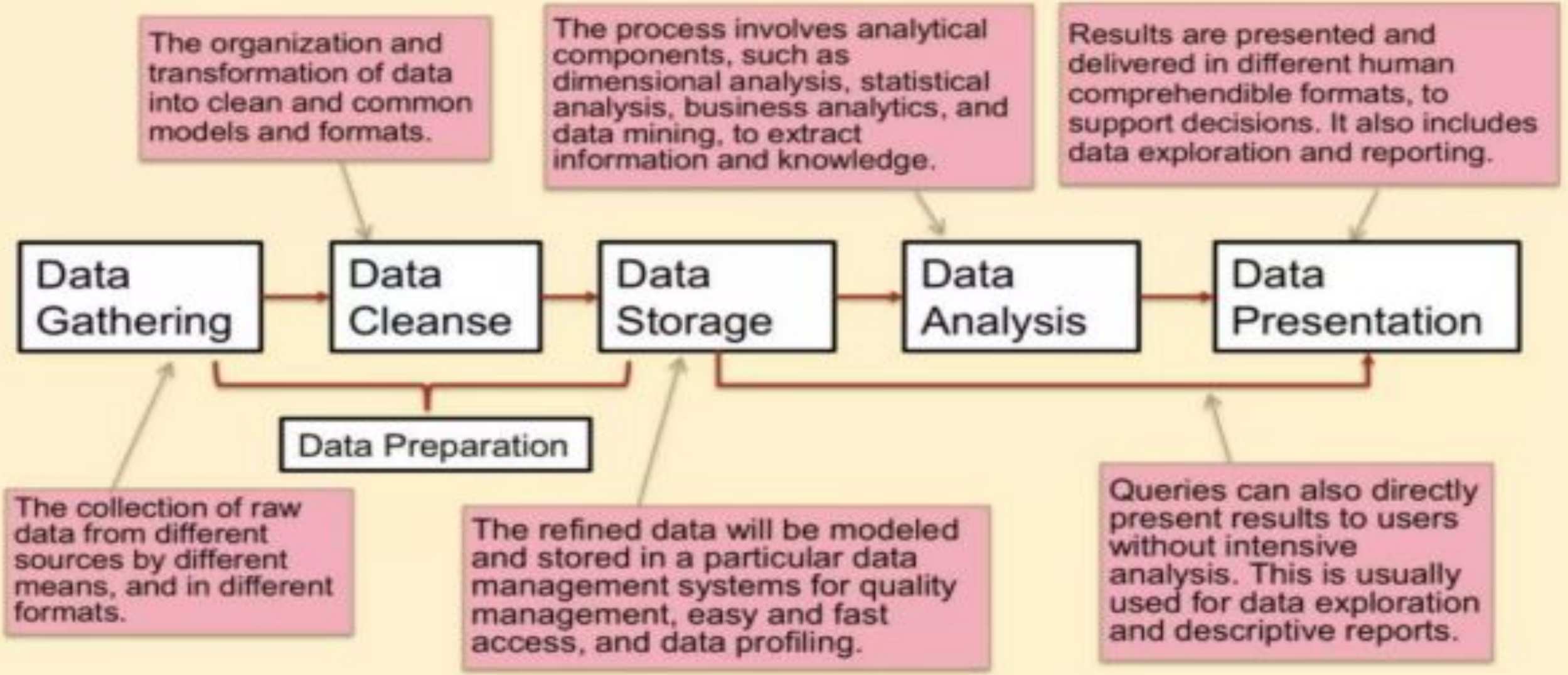
"DIK" TO ACHIEVE BUSINESS SUCCESS

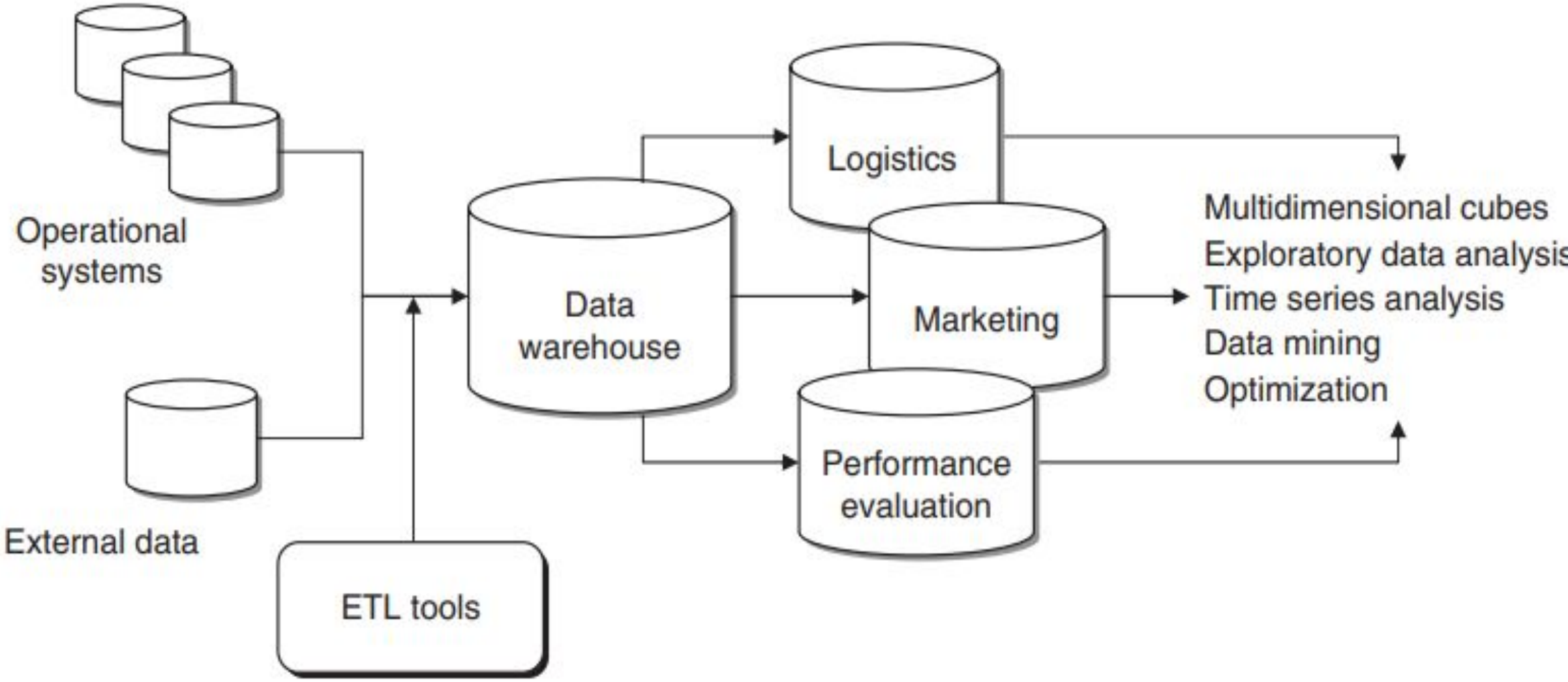
- Data: raw value elements or facts
- Information: the result of collecting and organizing data that provides context and meaning
- Knowledge: the concept of understanding information that provides insight to information, thus useful and actionable

Analytical Processing

Transactional Processing

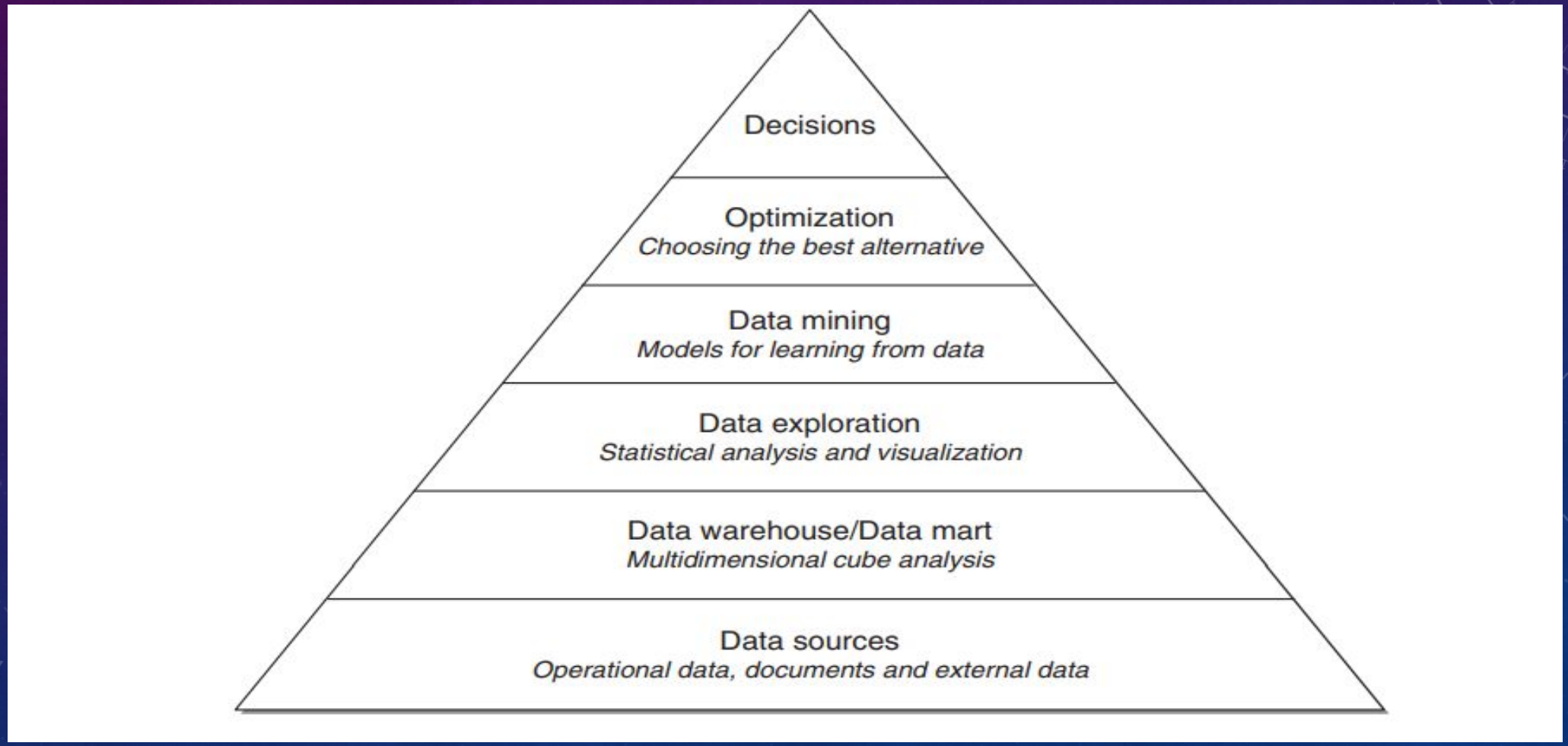



The organization and transformation of data into clean and common models and formats.
The process involves analytical components, such as dimensional analysis, statistical analysis, business analytics, and data mining, to extract information and knowledge.
Results are presented and delivered in different human comprehendible formats, to support decisions. It also includes data exploration and reporting.
Data Gathering
Data Cleanse
Data Storage
Data Analysis
Data Presentation
Data Preparation
The collection of raw data from different sources by different means, and in different formats.
The refined data will be modeled and stored in a particular data management systems for quality management, easy and fast access, and data profiling.
Queries can also directly present results to users without intensive analysis. This is usually used for data exploration and descriptive reports.



A typical business intelligence architecture

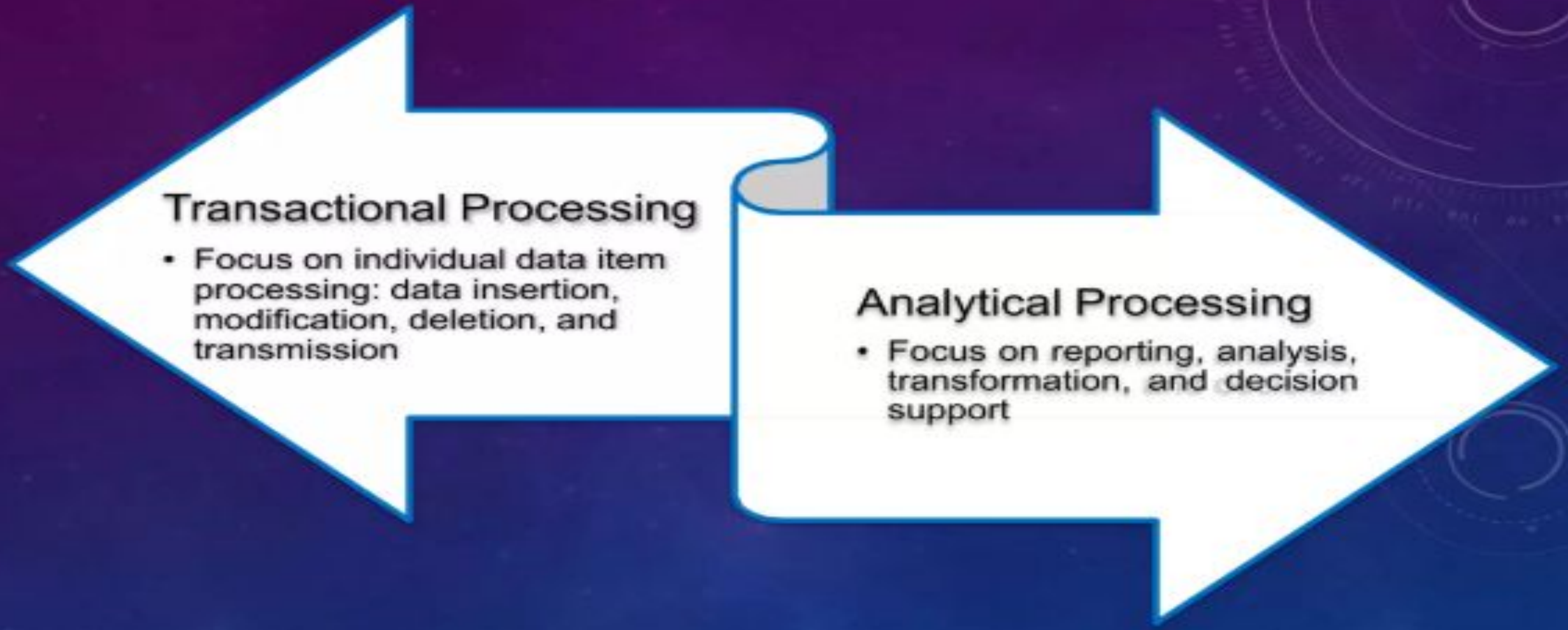
COMPONENTS OF BI



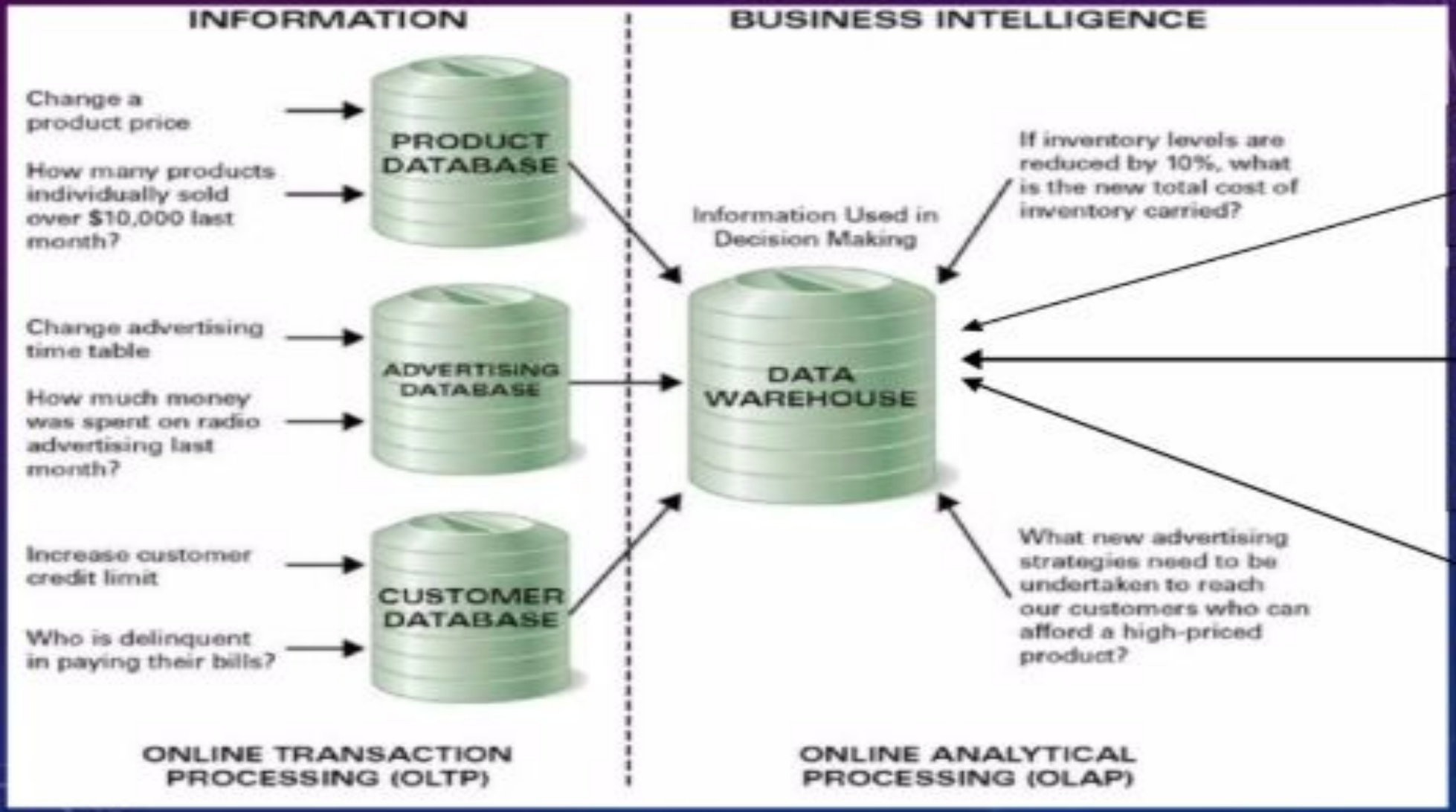
BASIC TECHNIQUES IN BUSINESS ANALYTICS

- Correlation
- Regression
- Forecasting
- Cluster analysis
- Factor analysis

TYPES OF INFORMATION PROCESSING



EXAMPLES OF ANALYSIS



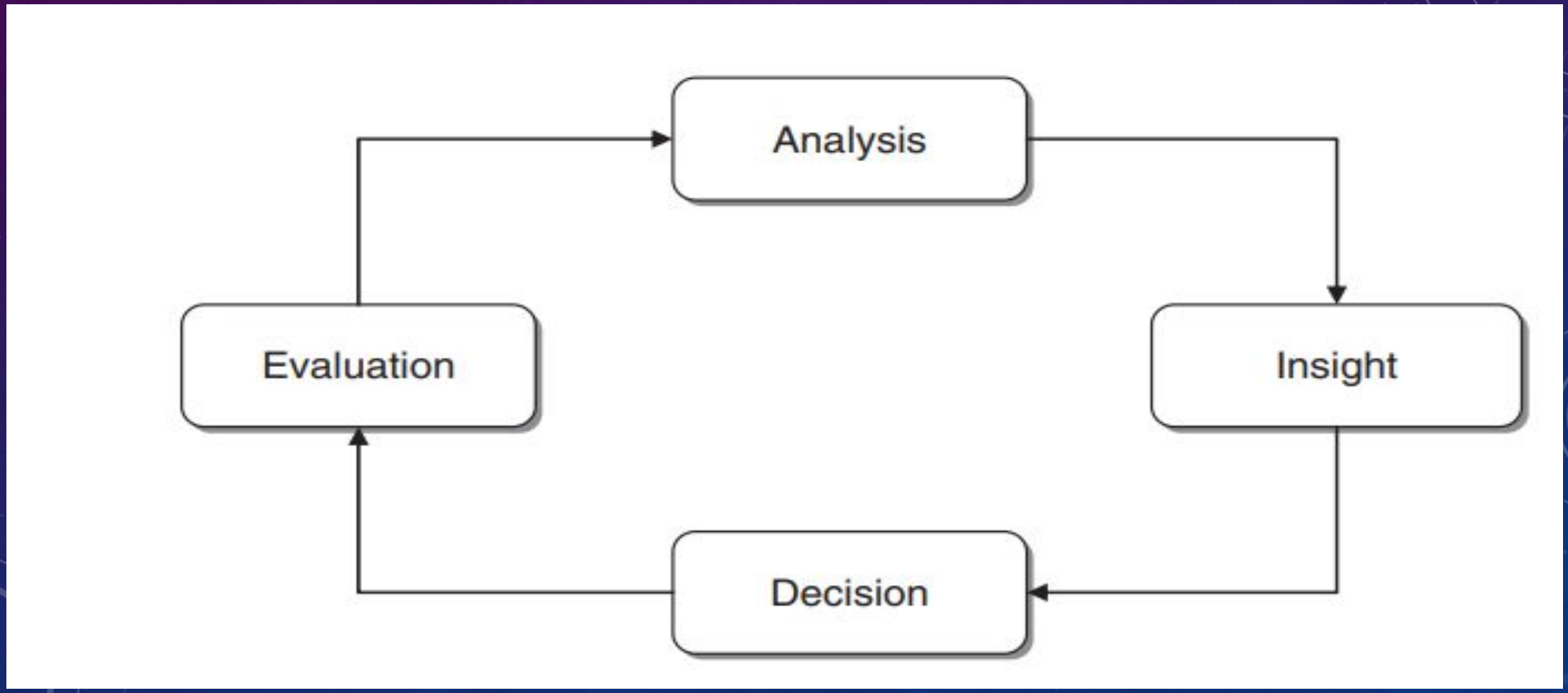
What is the reason for a decrease of total sales this year? (reasoning)

How do advertising activities affect sales of different products bought by different type of customers, in different regions? (synthesizing)

Should we invest more on our e-business? (fuzzy question → need high level analysis for decision making)

Figure from Database Processing, 13th Edition, by David Kroenke and David Auer

CYCLE OF BI ANALYSIS



ANALYSIS

During the analysis phase, it is necessary to recognize and accurately spell out the problem at hand. Decision makers must then create a mental representation of the phenomenon being analyzed, by identifying the critical factors that are perceived as the most relevant

the analysis phase in the business intelligence cycle leads decision makers to ask several questions and to obtain quick responses in an interactive way

INSIGHT

The second phase allows decision makers to better and more deeply understand the problem at hand, often at a causal level.

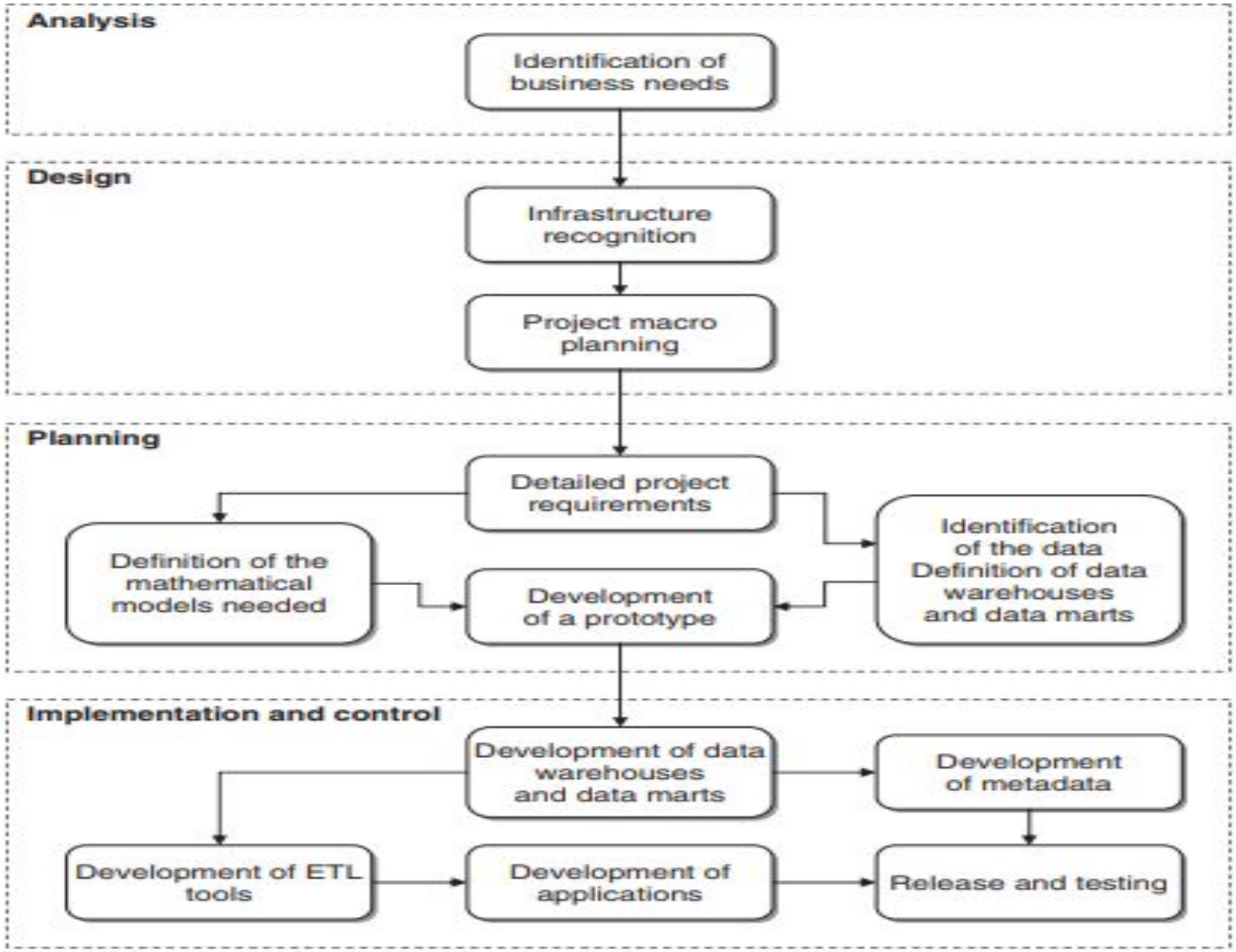
The information obtained through the analysis phase is then transformed into knowledge during the insight phase. On the one hand, the extraction of knowledge may occur due to the intuition of the decision makers and therefore be based on their experience and possibly on unstructured information available to them. On the other hand, inductive learning models may also prove very useful during this stage of analysis, particularly when applied to structured data. Decision.

DECISION

- During the third phase, knowledge obtained as a result of the insight phase is converted into decisions and subsequently into actions. The availability of business intelligence methodologies allows the analysis and insight phases to be executed more rapidly so that more effective and timely decisions can be made that better suit the strategic priorities of a given organization. This leads to an overall reduction in the execution time of the analysis–decision–action– revision cycle, and thus to a decision-making process of better quality.

EVALUATION

- he fourth phase of the business intelligence cycle involves performance measurement and evaluation. Extensive metrics should then be devised that are not exclusively limited to the financial aspects but also take into account the major performance indicators defined for the different company departments


Analysis
Identification of business needs
Design
Infrastructure recognition
Project macro planning
Planning
Detailed project requirements
Definition of the mathematical models needed
Development of a prototype
Identification of the data Definition of data warehouses and data marts
Implementation and control
Development of data warehouses and data marts
Development of metadata
Development of ETL tools
Development of applications
Release and testing

DATA PRESENTATIONS

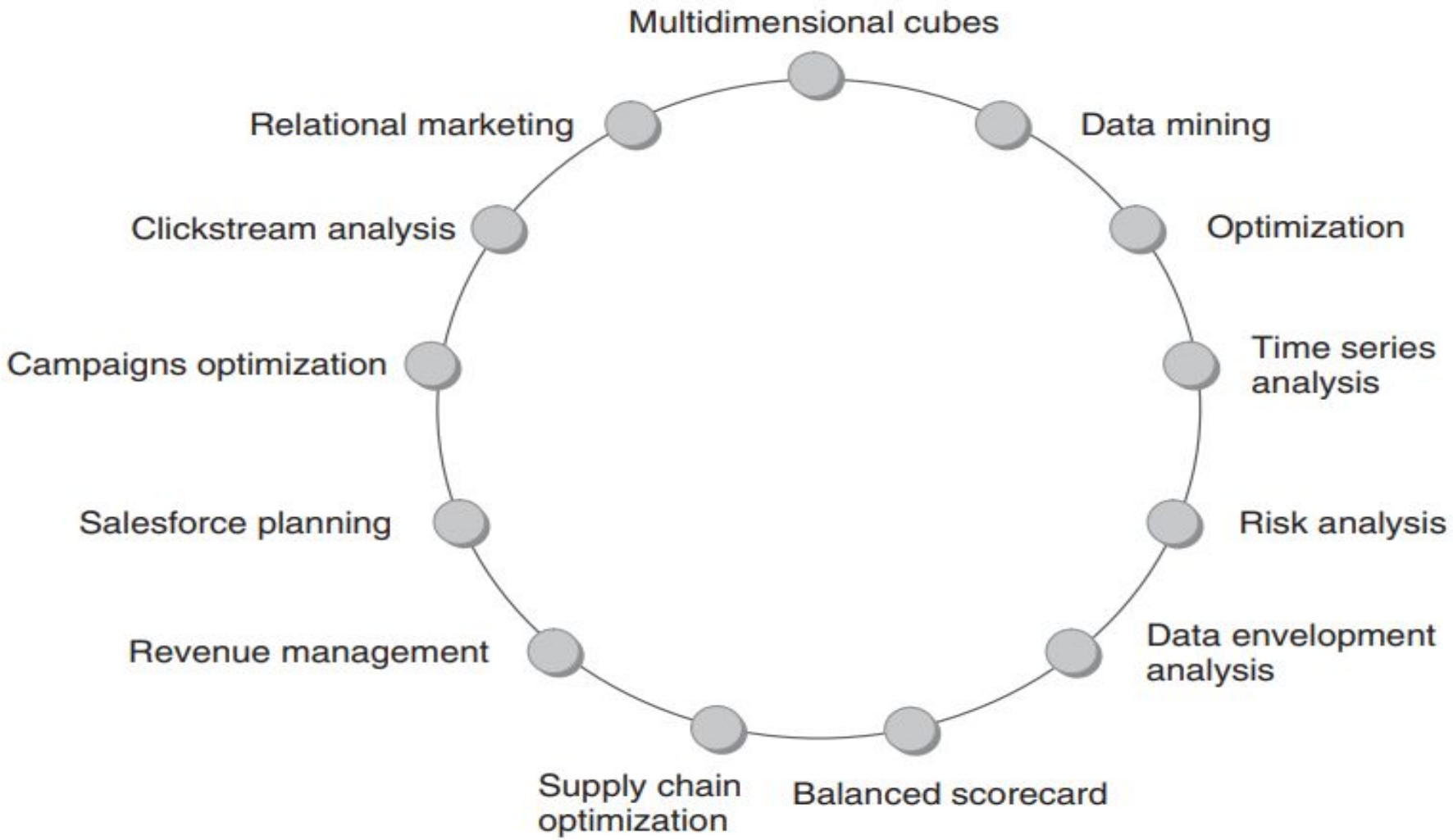
REPORTS

DASHBOARD

VISUAL ANALYTIC TOOL

SCORECARD

METHODOLOGIES AVAILABLE IN A BUSINESS INTELLIGENT SYSTEM



MULTIDIMENSIONAL CUBE

- A multidimensional cube is a data structure that stores and organizes information for analysis. It's a logical structure that allows users to retrieve data quickly.

- **Data mining** is the process of extracting knowledge or insights from large amounts of data using various statistical and computational techniques
- optimization makes the best or most effective use of a situation or resource. "companies interested in the optimization of the business"

Time series analysis is a statistical method that studies data points collected at regular intervals over time to find patterns and trends. It can help predict future data points and make informed decisions.

Risk analysis is the process of identifying, evaluating, and mitigating potential risks.

Data Envelopment Analysis (DEA) is a mathematical tool that measures the efficiency of decision-making units (DMUs). It's used to identify best practices and areas for improvement in resource use.

A balanced scorecard (BSC) is a strategic management tool that helps organizations improve their performance. It helps companies identify areas for improvement and make better decisions.

- Supply chain optimization is the process of improving the efficiency and effectiveness of a supply chain. It involves adjusting the supply chain to minimize costs and maximize performance.
- **Revenue management** is the strategic process of optimizing the revenue generated by a company through the pricing and distribution of its products or services

- Sales force planning is the process of developing a strategy to help a sales team achieve their revenue goals and company objectives. It involves creating a sales plan that outlines the steps to take to improve sales performance.
- Campaign optimization is the process of improving marketing campaigns to get the best return on investment (ROI). It involves analyzing data to make strategic adjustments to a campaign's target audience, key performance indicators (KPIs), and other aspects.

- Clickstream analysis is the process of collecting, analyzing, and reporting data about how users interact with a website or app. It's a type of web analytics that uses log files from web servers to track user behavior.
- Relational marketing is a strategy that focuses on building and maintaining long-term relationships with customers. It's a part of customer relationship management (CRM). The goal is to increase customer satisfaction and loyalty, which can lead to repeat business and long-term growth.