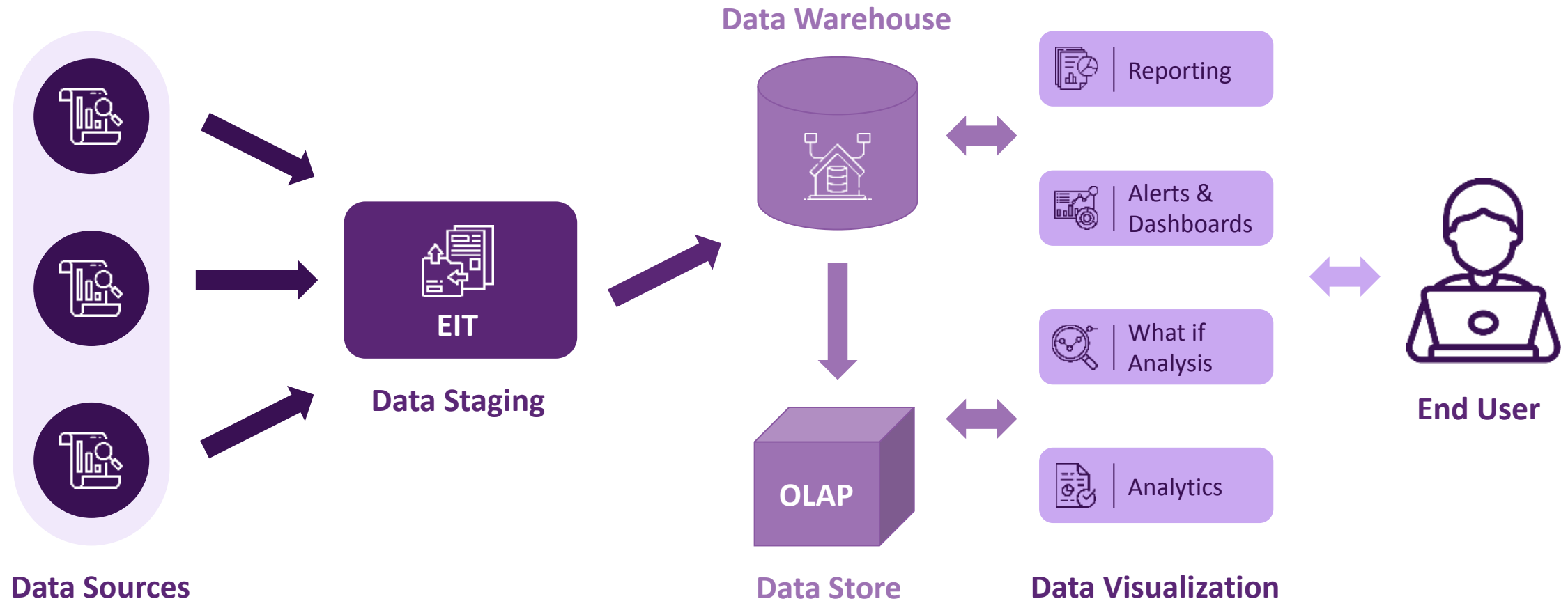


A hand is using a calculator on a desk. In the background, a tablet displays various business analytics charts, including a stacked bar chart, a line graph, and a pie chart. The tablet screen also shows a table with data for different regions and dates. The overall scene is set on a wooden desk with a purple overlay on the right side.

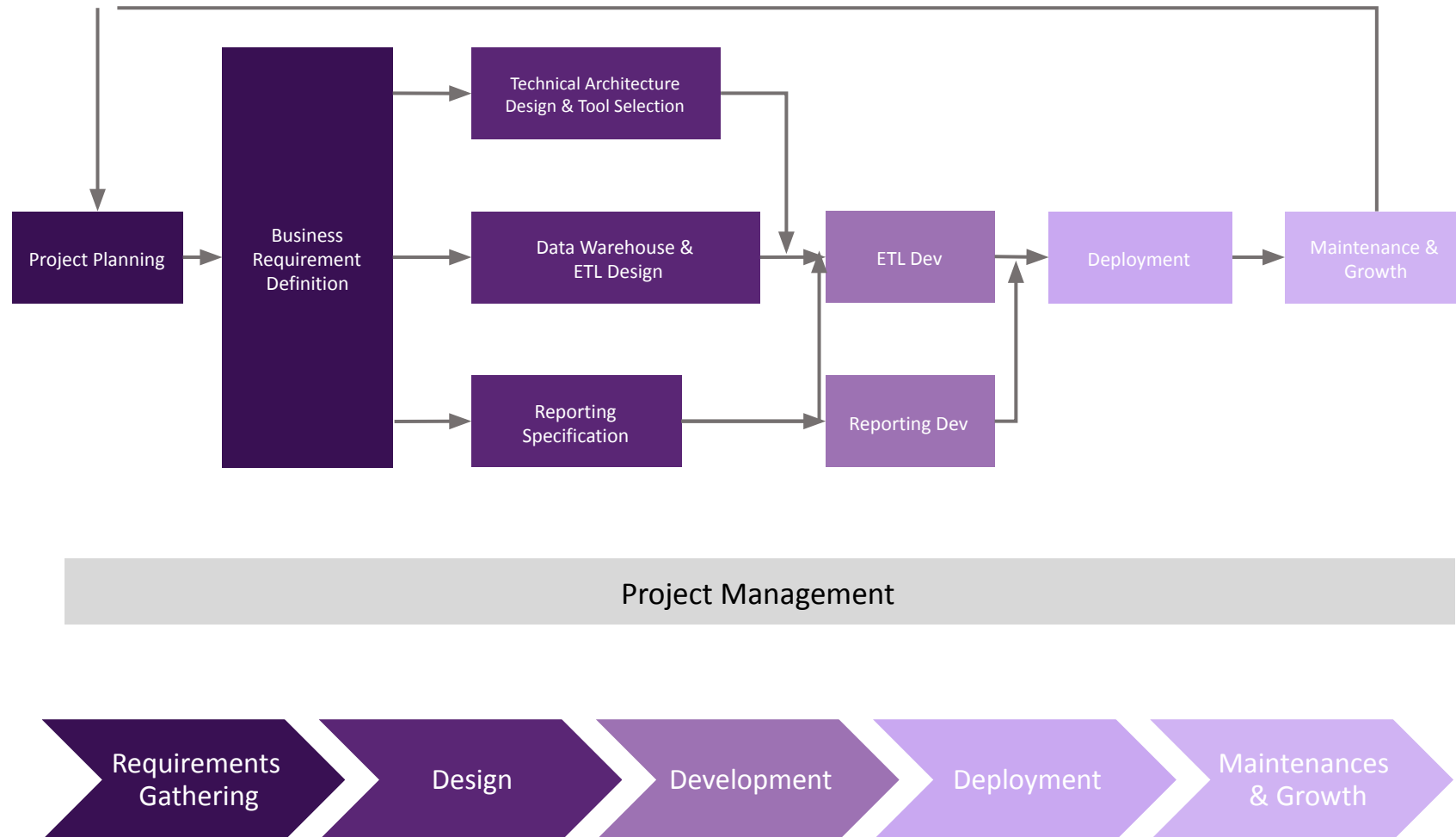
Business Intelligence

Unit : 1 Introduction to Business Intelligence and Analytics

Traditional BI/Analytics Architecture



BI Project Life Cycle



Data and Information



Data

A discrete fact; a number, a word, a statement, or a picture
Represents something in the real world, but on its own it is not useful.

Example: count of students 103



Information

Data that has meaning within a context. Information is data which is processed in a way that provides meaning to the person who receives it

Example: There are 103 students in 7th Semester BI and Analytics course

What is Data, Information and Business Action?



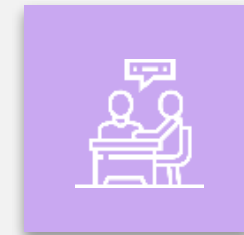
Data

is the raw numbers that we capture according to some agreed to standards



Information

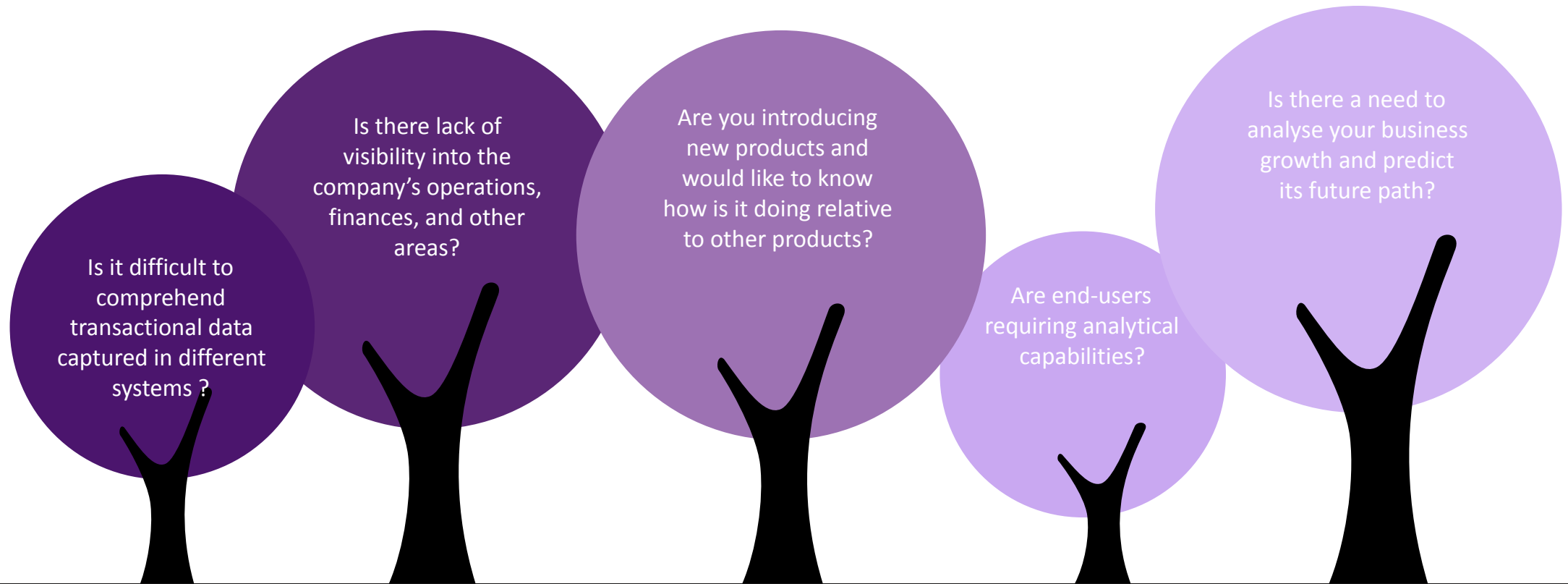
is a collection of data points that we can use to understand something about the thing being measured



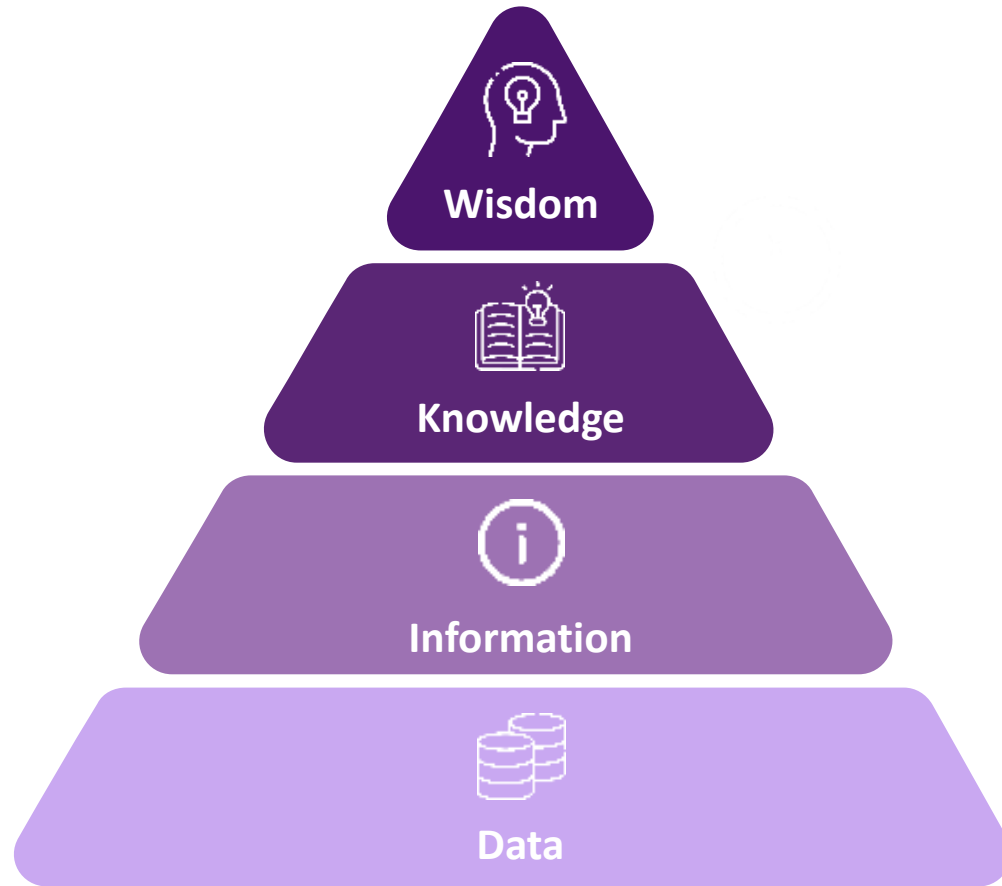
Business Action

is a decision taken by Managers to follow a certain step or sequence of steps based on the information unearthed

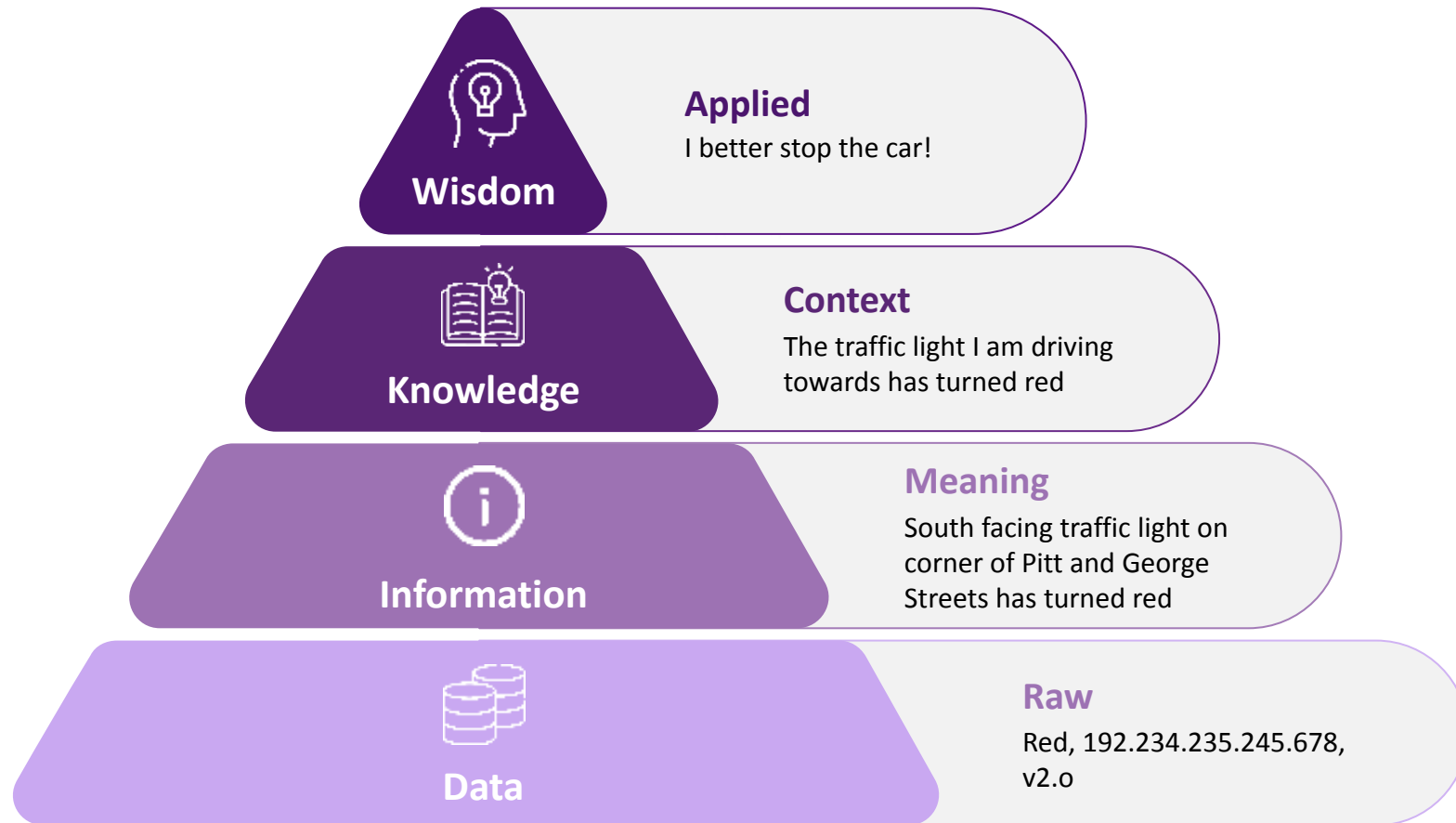
Need for Information



Information Pyramid



Information Pyramid Applied



Types of Decisions



Strategic

Focusses on
"What to do?"

Used to create the forward thrust in the business Top-level management sets long-term organizational goals and determines where an organization is going over the next year or more -typically 3 to 5 years



Tactical

Focusses on
"How to do?"

Involves identifying the initiatives taken to achieve the overall strategy Middle managers develop tactical plans (typically for a year or more) for their departments towards overall business strategy



Operational

Focusses on "How activities actually get done?"

Supervisors within departments implement operational plans that are short-term and deal with the day-to-day work of their team. Short-term goals are aligned with the long-term goals and can be achieved within a month, quarter or up to one year

Information Flow



Data is fed into
Information System



Information Systems use
data and process it to
create useful information



Business users use the
information and tools
provided by the
Information System to
make strategic, tactical or
operational decisions.

Types of Information Systems

01

Executive Information system (EIS)

- EIS gathers, analyses and summarises the key internal and external information used in the business
- Used by CXOs and other senior executives to make strategic decisions
- **For Example :** Sales Forecasting , Profit Planning, Competitor Analysis

02

Management Information System (MIS)

- Data from the internal transaction processing systems are summarised into a series of management reports.
- MIS reports are used by Middle Management and Operational Supervisors.
- **For Example :** Regional Sales Analysis , Customer Analysis

(Continued..
)

03

Decision support system (DSS)

- Tools and techniques to gather relevant information and analyse the options and alternatives. Uses complex spreadsheet and databases to create "what-if" models.
- DSS are specifically designed to help management make decisions in situations where there is uncertainty about the possible outcomes of those decisions.
- **For Example :** Sales Management, Annual Budgeting

04

Transaction Processing System (TPS)

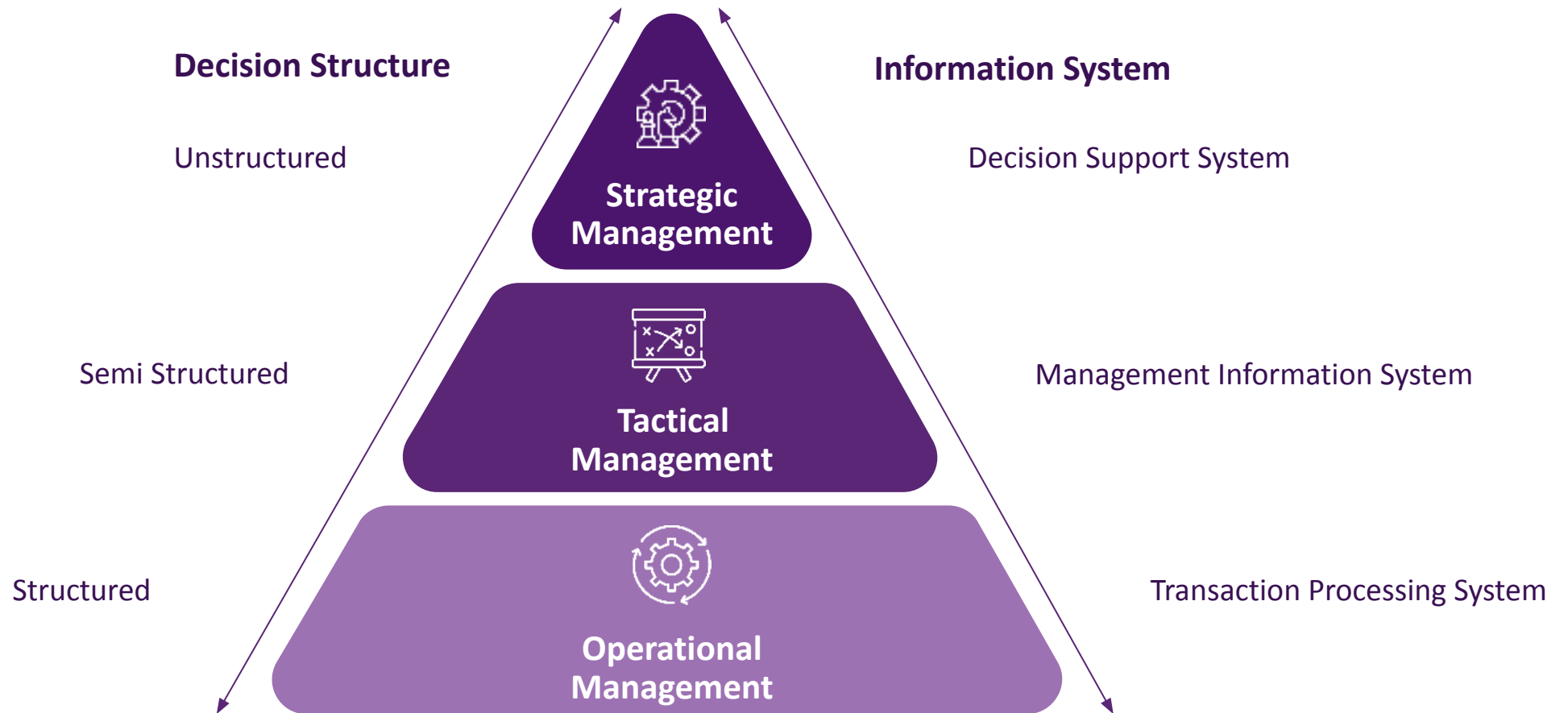
- TPS are systems which process routine transactions efficiently and accurately
- They are regularly used by Operational Managers to capture and review daily transactions.
- **For Example :** Order Processing, Payroll , Point-of-Sales (POS)

05

Knowledge Management System (KMS)

- KMS are created to help businesses create and share information within an organization.
- These are typically used where employees create new knowledge and expertise — which can then be shared by other people in the organisation.
- To share the knowledge, a KMS would use group collaboration systems such as an intranet.

Information System Pyramid



Business Intelligence Systems

01

Business Intelligence systems evolved from the existing information systems like EIS, MIS and DSS to meet the following needs:

- To handle integration of different, dispersed and heterogenic data
- Carrying out constant analyses of numerous data Monitoring competition
- A single system to cater to all levels of decision making within the organization

02

Business Intelligence systems

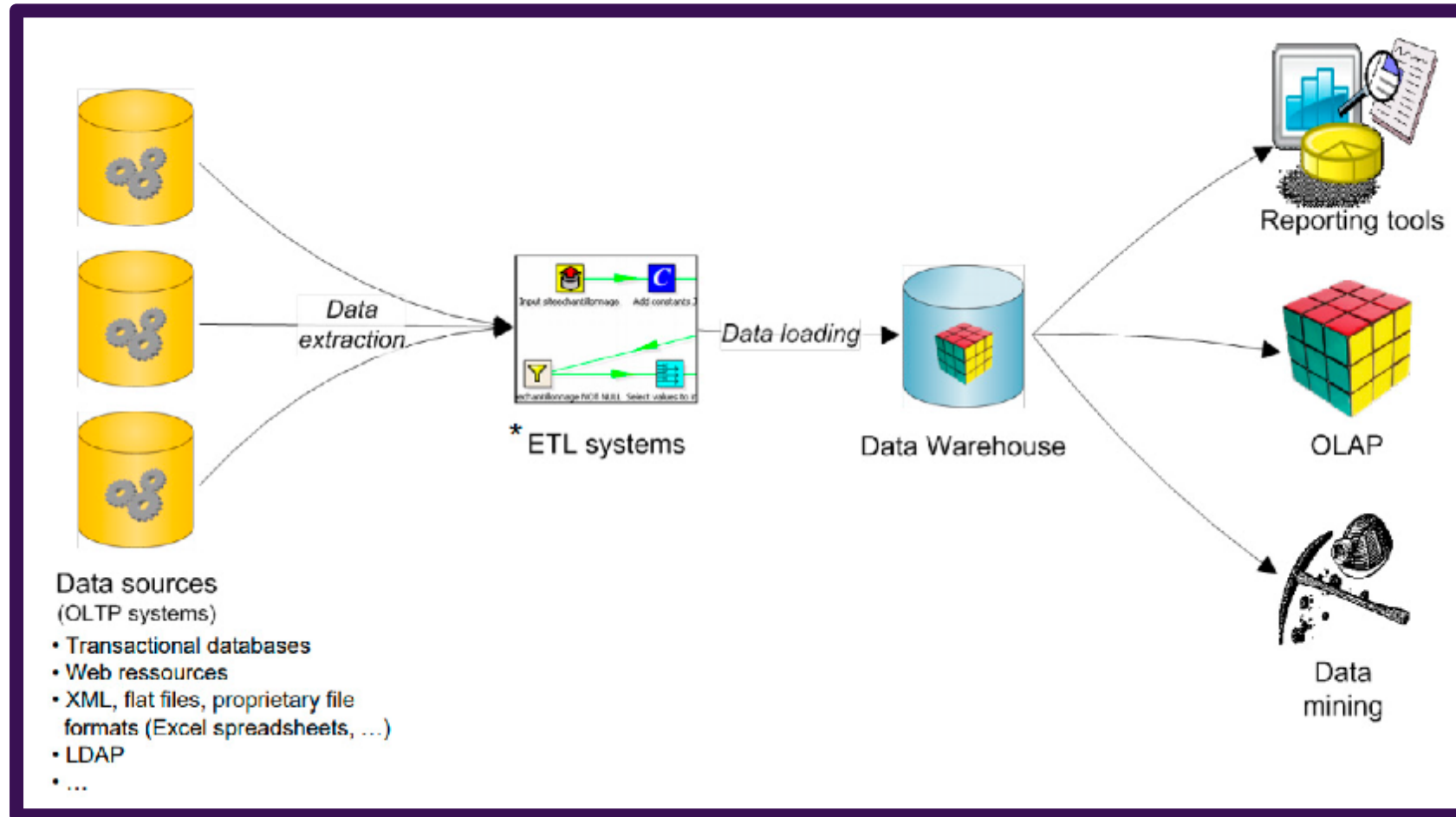
- Offer an integrated set of tools, technologies and software products that are
- Used to collect heterogenic data from dispersed sources in order
- To Integrate and analyse data to make it commonly available

03

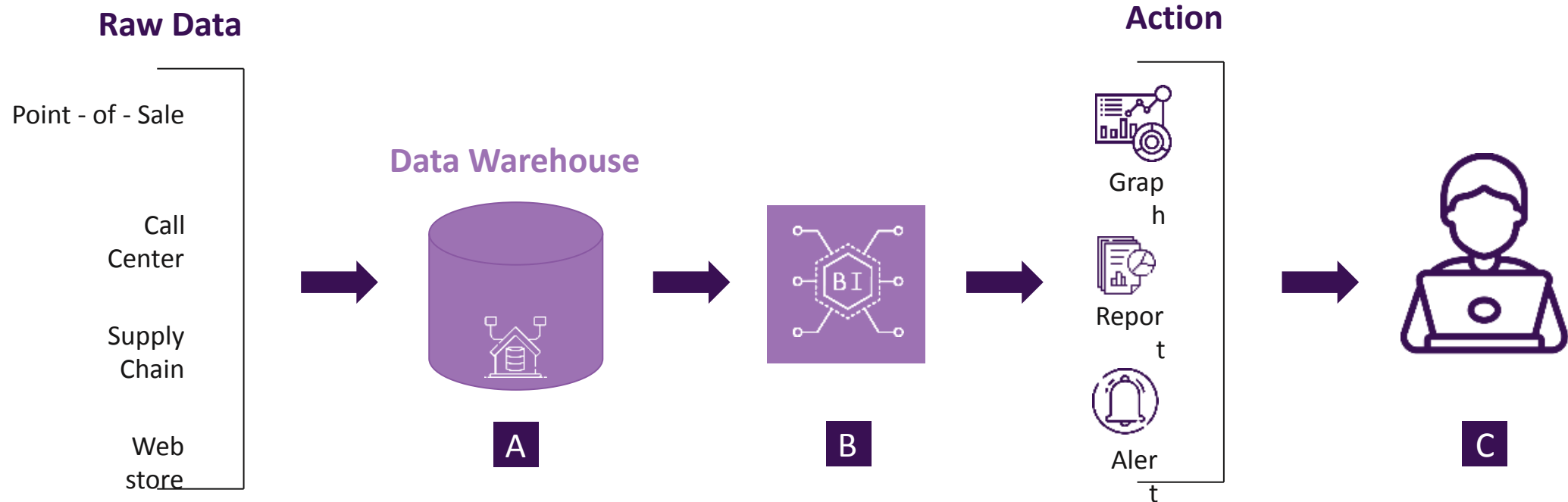
Business Intelligence Technological Infrastructure consist of three key components:

- Data Warehouse to serve as the central repository of all business related data
- ETI Tools to extract, transform and load data
- Analysis tools to analyse data in the warehouse and derive intelligence for the business

Business Intelligence Systems Architecture



Business Intelligence Architecture - Functional



A

Data: Centralized data from multiple sources into a data warehouse

B

Insight: BI tools analyze the data to help better understand the business

C

Action: Act on the insight provided by BI tools by reallocating resources

What is OLTP, OLAP?

OLTP (Online Transaction Processing)

OLTP refers to data processed for daily transactional needs. It is characterized by short on-line transactions like **INSERT**, **UPDATE** and **DELETE**. The main emphasis is on very fast query processing and maintaining data integrity in multi-access environments

Examples of OLTP systems are payroll system, online ticketing system, order processing system etc.

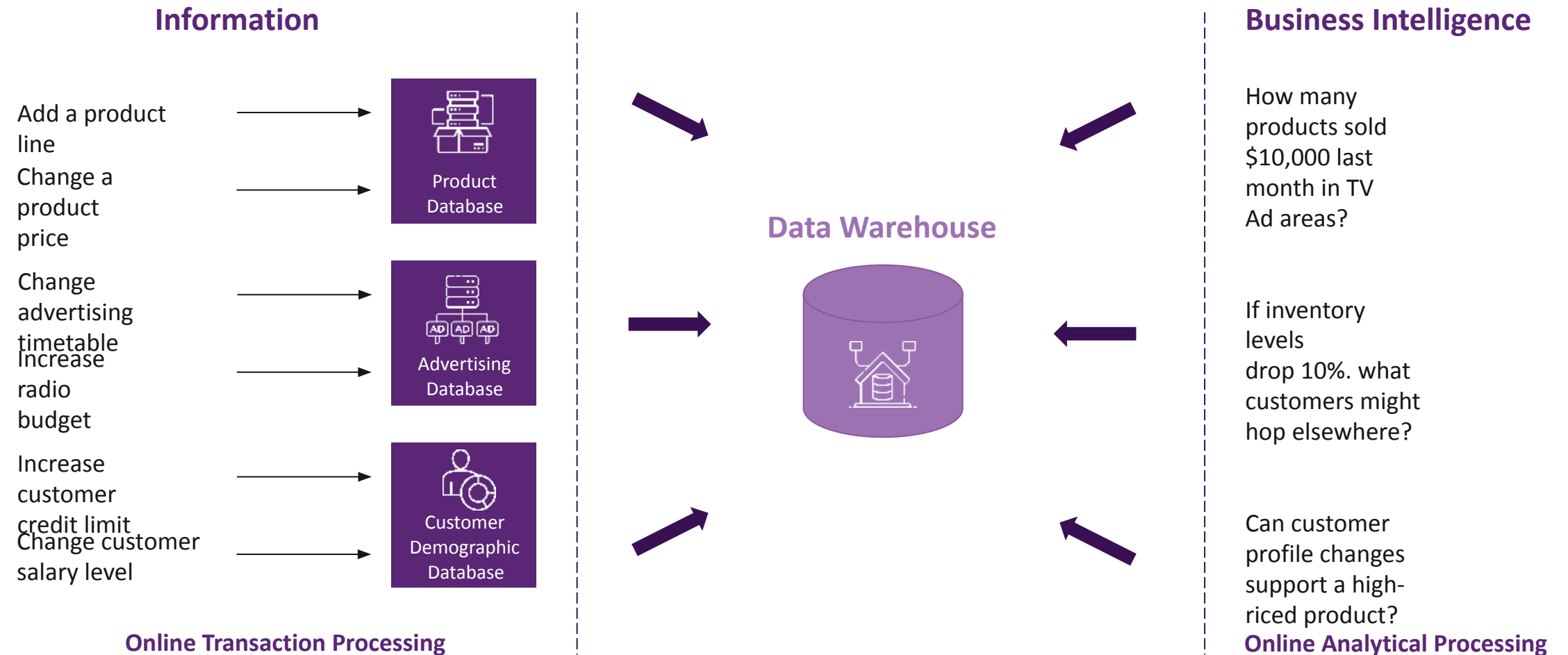
OLAP (Online Analytical Processing)

OLAP is an approach to answer multidimensional analytical queries to obtain business related information. In OLAP database there is aggregated, historical data, stored in multidimensional schemas. Queries are often very complex and involve aggregations. Response time is an effectiveness measure for an OLAP system. Typical applications of OLAP include sales reporting , budgeting and forecasting, financial reporting etc.

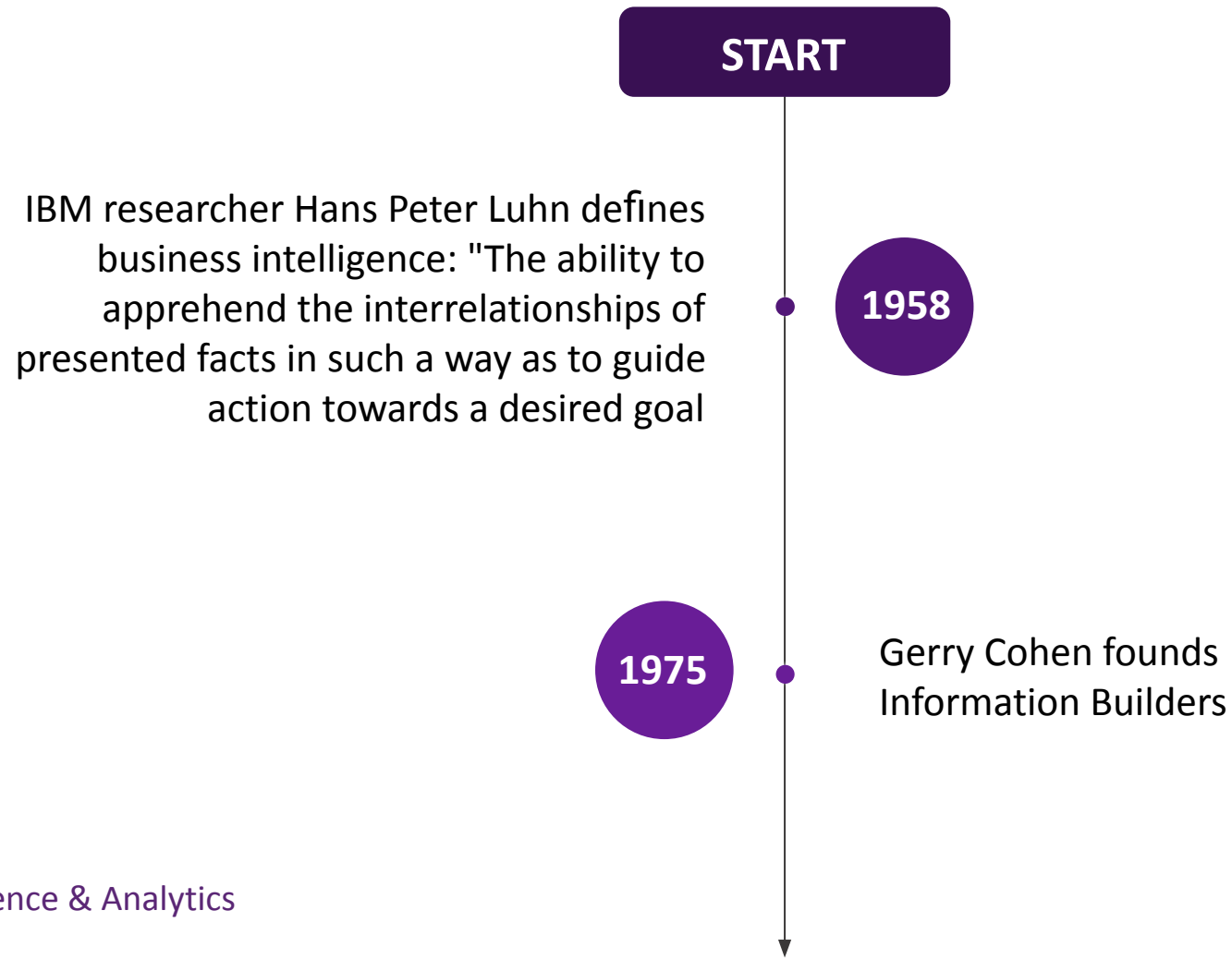
OLTP vs OLAP

Parameter	OLTP	OLAP
Type of Data	OLTP systems capture operational data. They are the original source of the data.	OLAP systems consolidate operational data; OLAP data comes from the various OLTP Databases
Usage	OLTP systems are used to control and run daily business tasks. Utilizes daily transactional data.	OLAP is used to help with planning, problem solving, and decision making. Utilizes historical data.
Used By	Used by Operational Managers for monitoring business	Used by Senior executives for strategic planning
Query Type	Uses simple queries returning relatively few records. Typically uses SQL query.	Uses complex queries involving aggregations. Typically uses MDX queries.
Processing Speed	Needs very fast processing to retrieve data or on-demand transactions	Processing speed depends on the amount of data involved. Typically batch processing is used.
Memory requirement	Memory needs can be relatively small if historical data is archived	Memory needs are larger due to the existence of aggregation structures and history data
Database Design	Database design is normalized	Database design is typically de-normalized
Database Connection	Typically uses ODBC connection	Typically uses XMLA for data access

Data Warehousing Process



History of Business Intelligence



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Future Gartner Group analyst Howard
Dresner defines business intelligence:
"Concepts and methods to improve business
decision making by using fact-based support
systems

1989

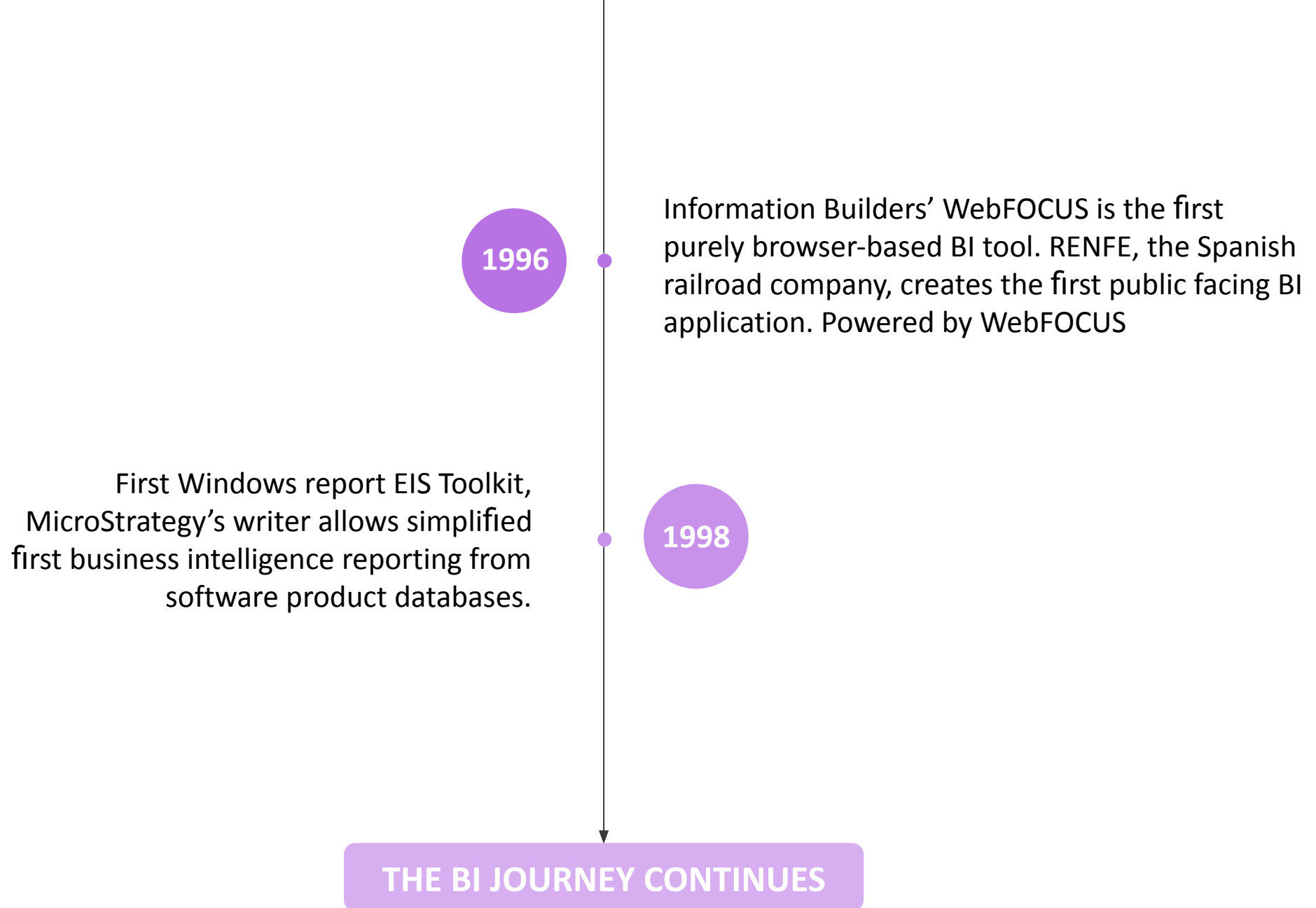
1990

Enterprise resource planning (ERP) links corporate
databases with client/server technologies;
supports selling process, customer service,
human resources, finance etc. & Information
Builders announces Focus EIS.

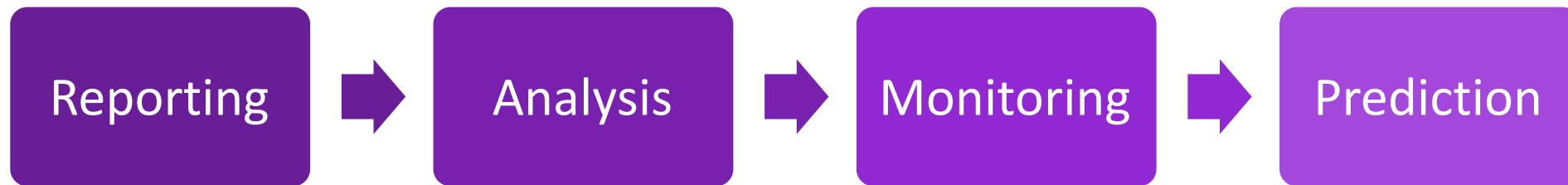
First Windows report EIS Toolkit,
MicroStrategy's writer allows simplified
first business intelligence reporting from
software product databases.

1992

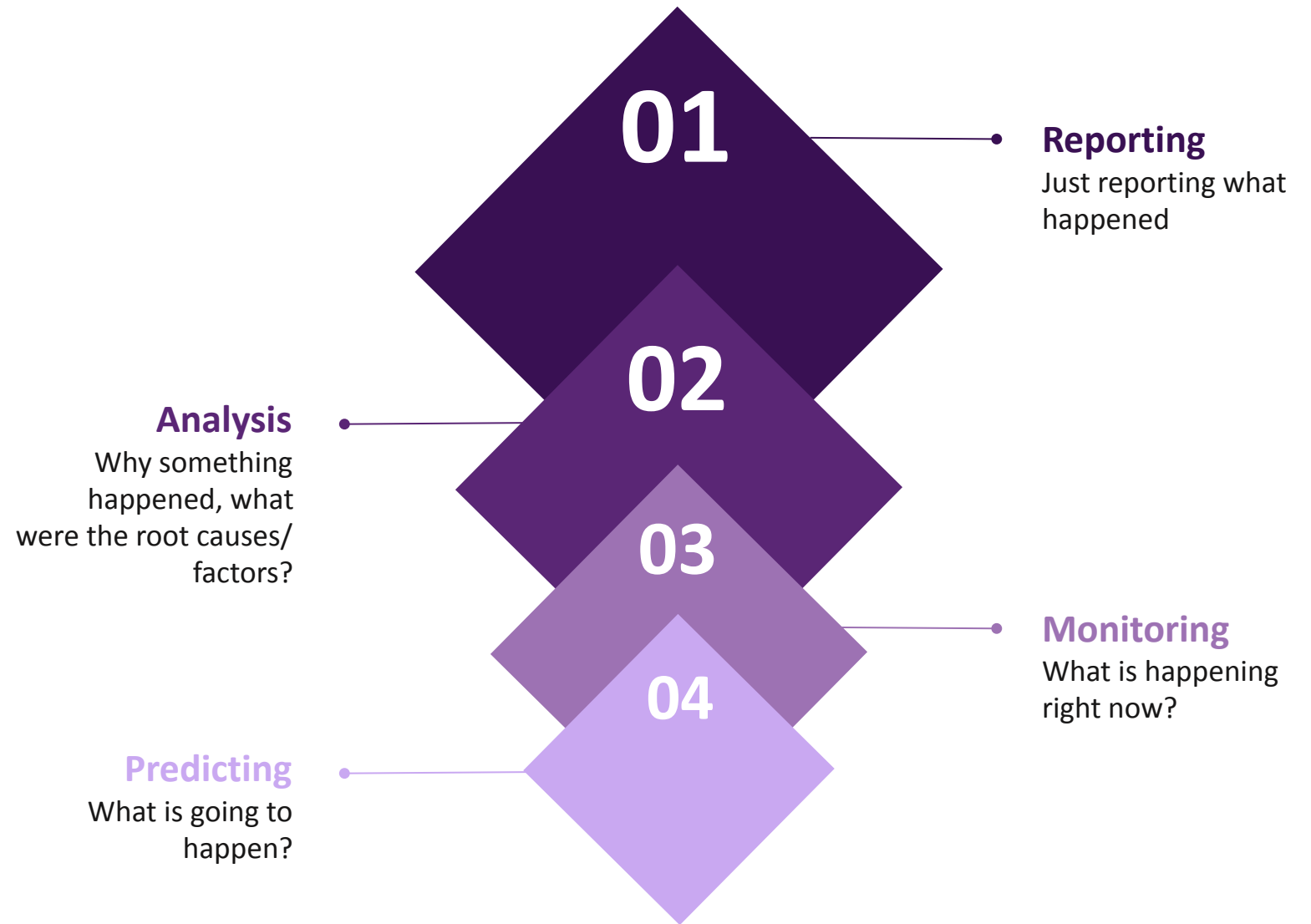
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Analytics Progression



4 Levels of Business Intelligence





THANK
YOU