BUSINESS INTELLIGENCE

BY ELAD PELEG

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ABOUT MYSELF

- BI consultant and trainer. Experienced in Microsoft and open-source environments
- Providing professional services including front-end design, development, setting up BI solutions, and building reports
- Delivering data-related trainings in wide range of technologies such as Oracle, SQL Server, BI, and Python
- Working with wide range of organizations such as Mizrahi-tefahot bank, UPS ,HP Indigo, Prime minister's office, Israel Police, Leumi Card and many more

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הטכניון
היחידה ללימודי המשך
ולימודי חוץ עיש עמריאלי

AGENDA

Business Intelligence

1. INTRODUCTION
2. BASICS
3. POSSIBLE APPLICATIONS
4. TOOLS
5. BI PROCESS

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In god we trust
- all others must bring data”

William Edwards Deming

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INTRODUCTION

BUSINESS INTELLIGENCE

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Business Intelligence (BI) is about providing the right data at the right time to the right people so that they can make the right decisions.”

Nic Smith with Microsoft BI Solutions Marketing

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INTRODUCTION

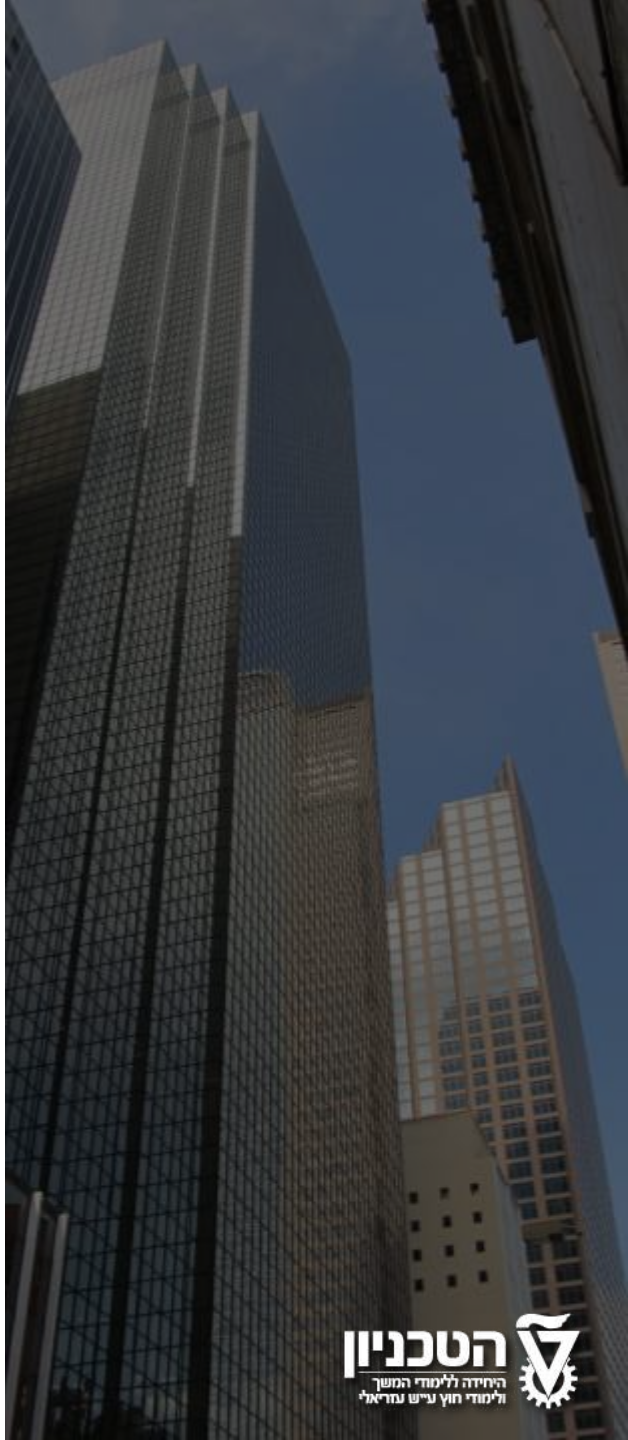
BI is Becoming Increasingly Important

Globalization, competitive pressure and ever-changing trends are an integral part of our economic system. With accelerating markets, demands on the company also increase.

For this reason, business intelligence solutions are becoming increasingly important. They provide support in collecting, processing and analyzing existing data.

The increase of data in and outside the company has made acquiring useful information more complicated.

The business intelligence market has expanded in recent years due to growing interest not only from large companies, but from small and medium-sized businesses as well.



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INTRODUCTION

Definition

Business intelligence (BI) is a technique to collect and process business-related information in order to gain useful insights for operational decision making.

It can also be described as an analysis of business-relevant data to optimize operational and strategic decisions in the company.

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BASICS

Data Usage Timeline

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INTRODUCTION

Definition

A FOCUS ON DECISIONS

The focus is on information relevant to decisions. This improves the basis of decision-making.

DATA COLLECTION

This is a core function of BI and includes the link to databases or third-party systems.

DATA PREPARATION

Useful information should be developed from the available raw data. This is required so that decisions can be made for corporate management.

DATA REPRESENTATION

Information generated in data processing should be provided to users in an adequate and appropriate way.

BUSINESS-RELATED INFORMATION

Quality assurance is the focus when selecting data. Too much data complicates the process and puts high demands on capacities, while too little data leads to incomplete or no results.

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BASICS

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BASICS

Advantages of Business Intelligence

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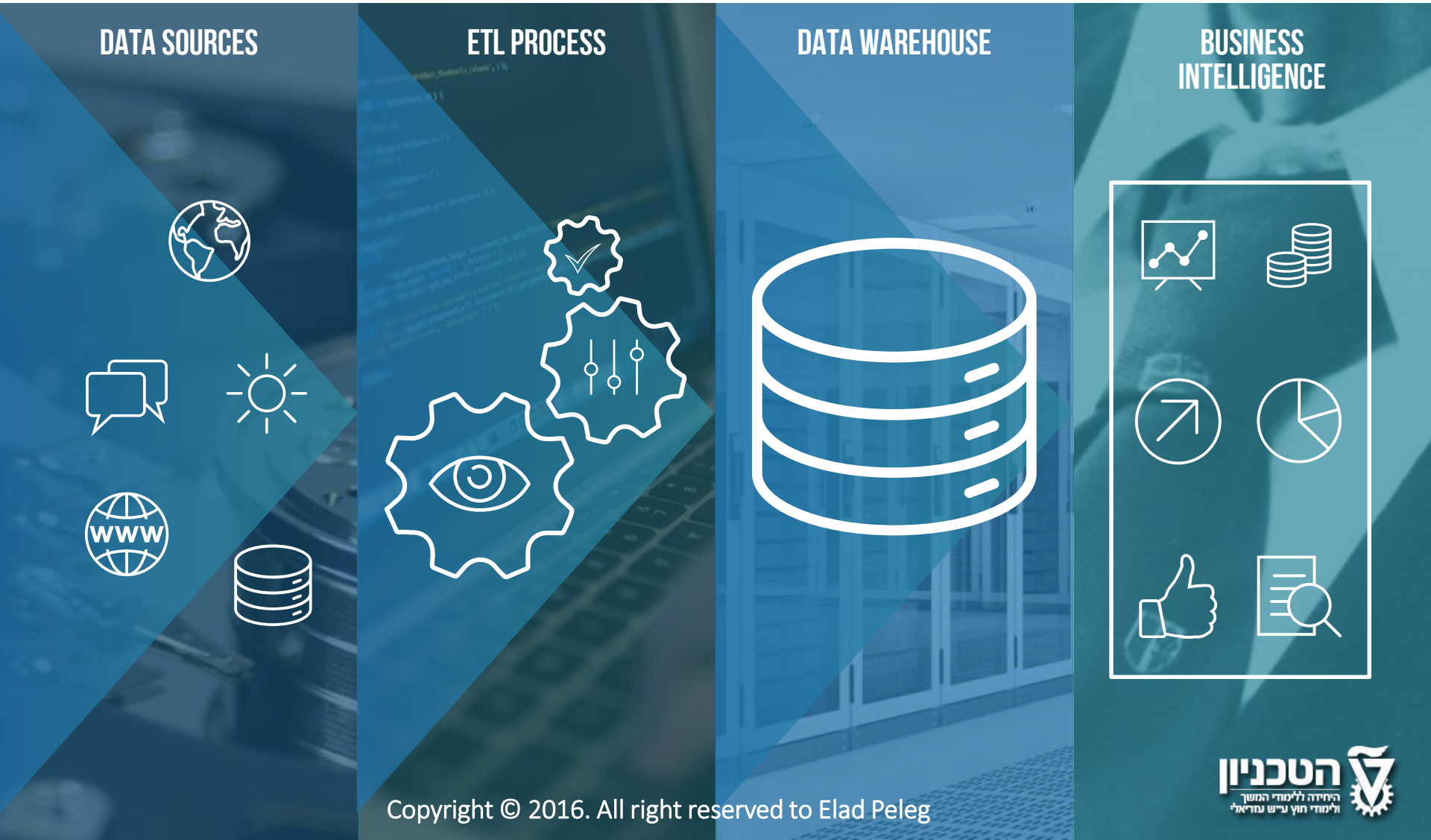
BASICS

Data Warehousing and Business Intelligence



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POSSIBLE APPLICATIONS

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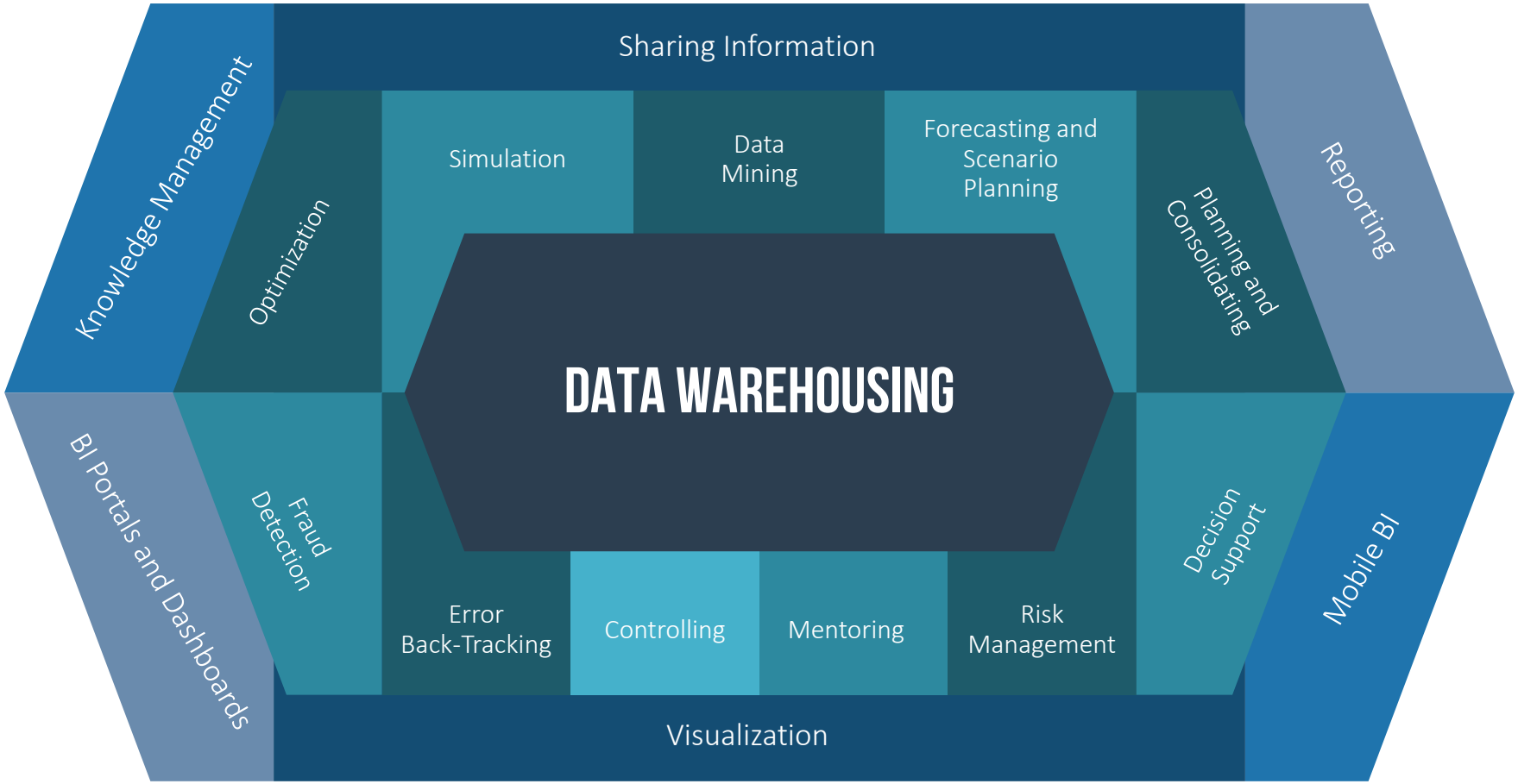
POSSIBLE APPLICATIONS

Business Intelligence Overview



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POSSIBLE APPLICATIONS

Possible Applications of Business Intelligence

CONTROLLING	DISTRIBUTION	MARKETING	HR
Flexible revenue, cost and profit analysis	Recognizing customer potential, analyzing distribution channels and classifying products	Assessing consumer behavior, managing campaigns, analyzing range, markets and competition	Analyzing staff costs, planning and overtime

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POSSIBLE APPLICATIONS

Possible Applications of Business Intelligence

PRODUCTION	QUALITY MANAGEMENT	WAREHOUSING	PURCHASING
Analyzing capacity utilization and errors	Expediting the complaint process and improving product quality	Analyzing inventory and range	Managing suppliers and procurement

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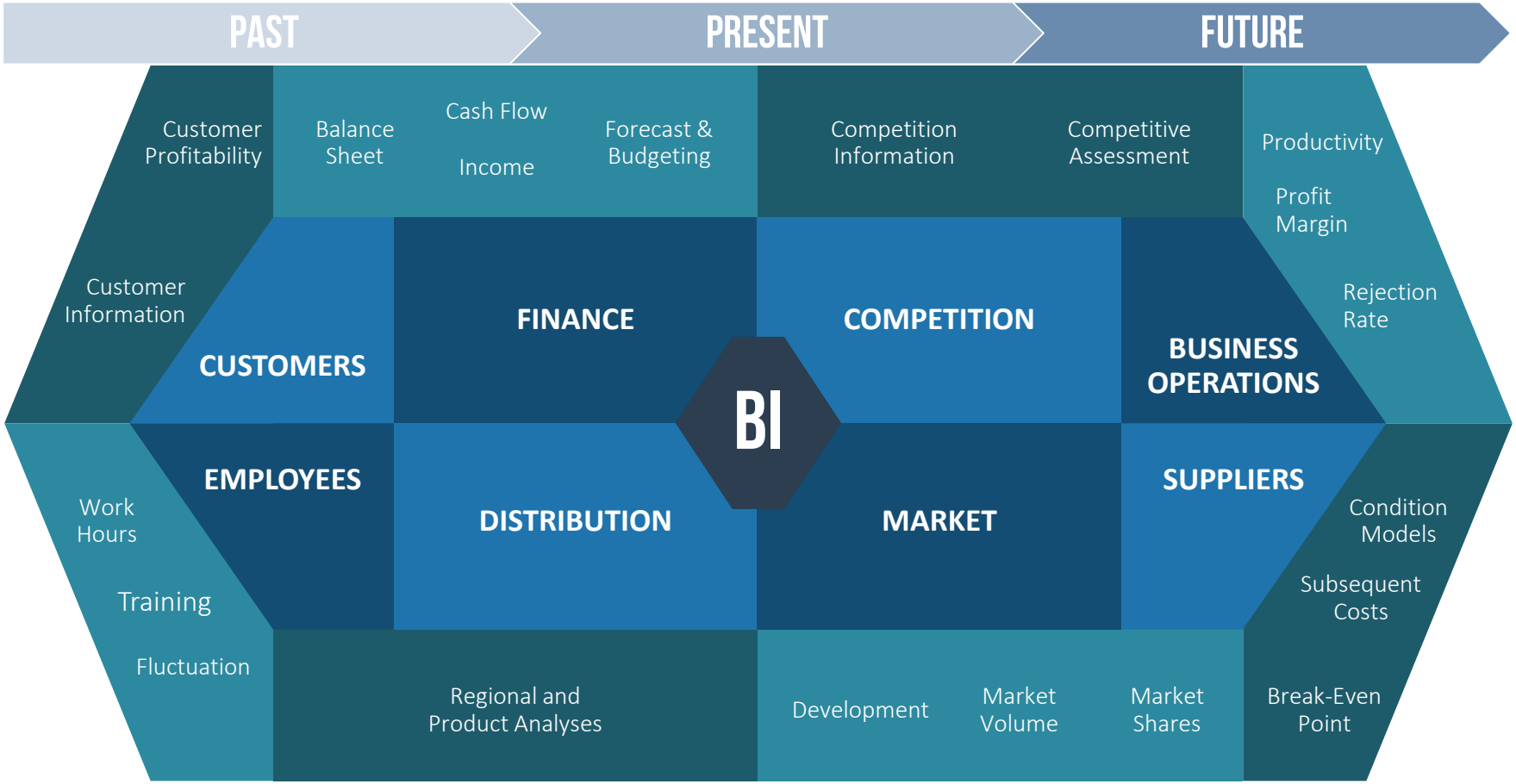
POSSIBLE APPLICATIONS

Company-Wide Perspective Through BI



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POSSIBLE APPLICATIONS

BI Classification in the Company

BI classification extends to the entire senior management of a company.
It also involves top, middle and lower management.

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TOOLS

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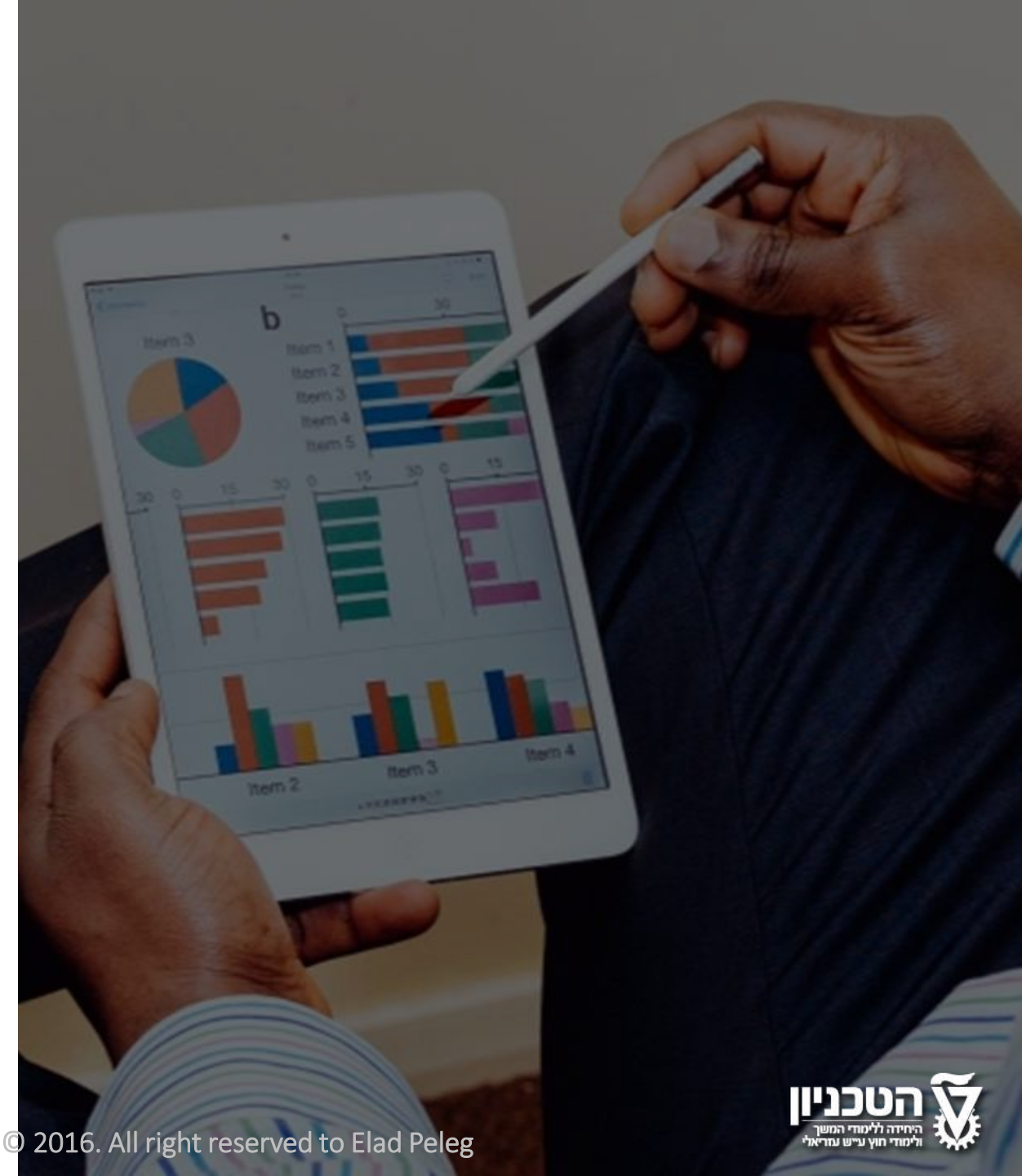
TOOLS

Introduction

BI software is available both commercially and as open source.

Commercial software is usually highly durable and reliable but is also expensive. Open source products are cheaper but have the risk of being bought and commercialized at any time.



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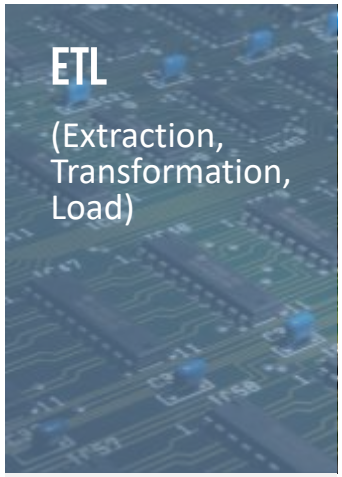
TOOLS

Typical BI Tools and Analytical Methods

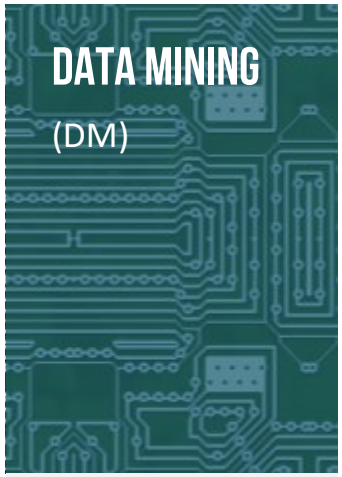


Tools that are used to extract, transform and load raw or source data

Tools that help view key business indicators, which are grouped by any number of features

Tools used for investigating corporate data with an emphasis on statistical analyses

A new generation of BI tools that search for specific data from multiple sources



Tools for analyzing trends or patterns in large data sets

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BASICS

SQL – The first tool

- Invented in the early 70's
- Used as a central mean to interact with Databases.
- Standardized in the mid 80's
- Today SQL is a crucial skill to anyone working with data, including Big Data Platforms

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SQL - Functional Division

SELECT

The main usage of the SQL language is to fetch and retrieve results for the specified query from the DB engine

DML

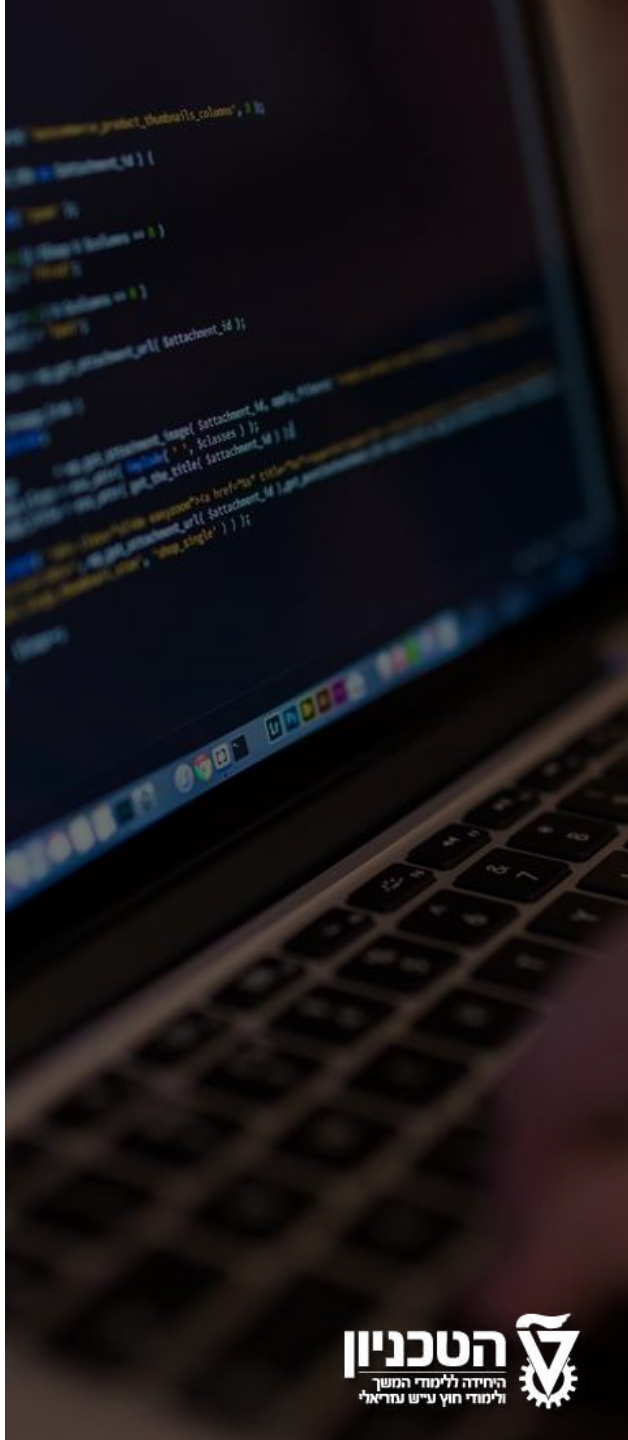
The Data Manipulation Language is used to add, remove or modify the actual data in the DB

DDL

The Data Definition Language is used to create the data structures as well as other various DB objects

DCL

The Data Control Language is used to manage the different roles and permissions of the various users who access the DB



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ETL

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OLTP and OLAP Comparison

OLTP	OLAP (DWH)
Varied sources of data	Source of data is the OLTP system
Data is used for the day-to-day operational needs	Data is used for planning, problem solving and decision support.
A snapshot of the current business processes	A complex, on-going, multidimensional view of business activities
Short and frequent DMLs	Complex and periodically ETLs
Very fast processing speed	Processing of complex queries may take many hours
Space requirements can be relatively small	Typically very large and may spread across many machines
Highly normalized and backed up very frequently with multiple backup tiers	Typically de-normalized and contains fewer tables. Backups may be performed parallel to ETLs or even none at all

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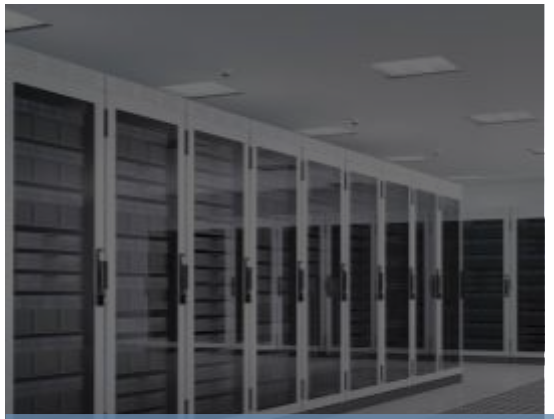
ETL (Extraction, Transformation, Load) – Process Phases

EXTRACTION

The ETL process begins by extracting relevant data from various data sources. This data is made available for the next phase. Examples of structured data sources are databases (MySQL or Oracle) or file formats (CSV or XML).



TRANSFORMATION

The data is transformed into a format that can be used in the load stage. This includes eliminating errors or outliers, splitting the data into many pieces of information or adapting it to a desired data type.

LOAD

The transformed source data is filed in the database of the data warehouse. This is updated as new or changed data is considered.

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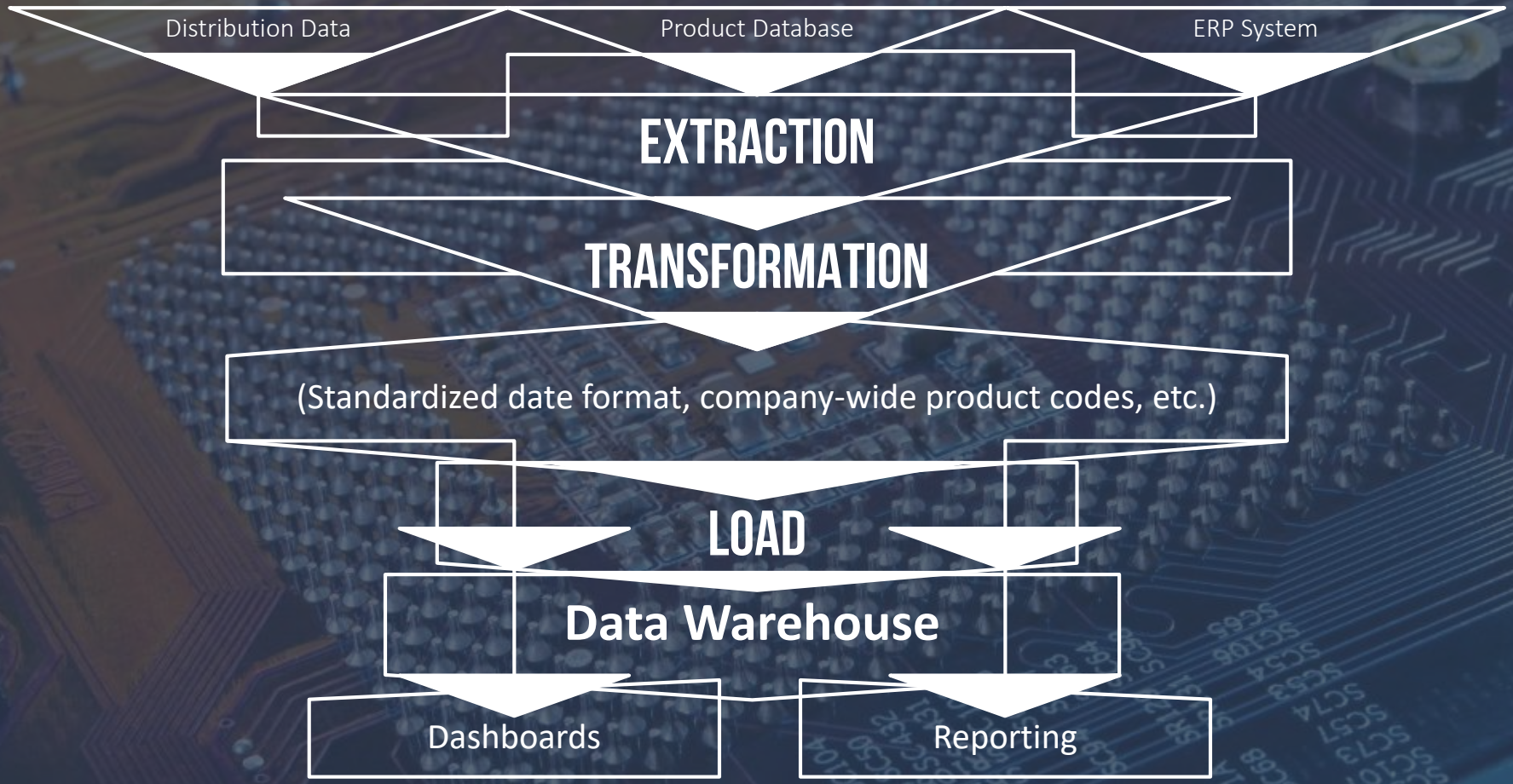
ETL (Extraction, Transformation, Load) – Entire Process



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OLAP

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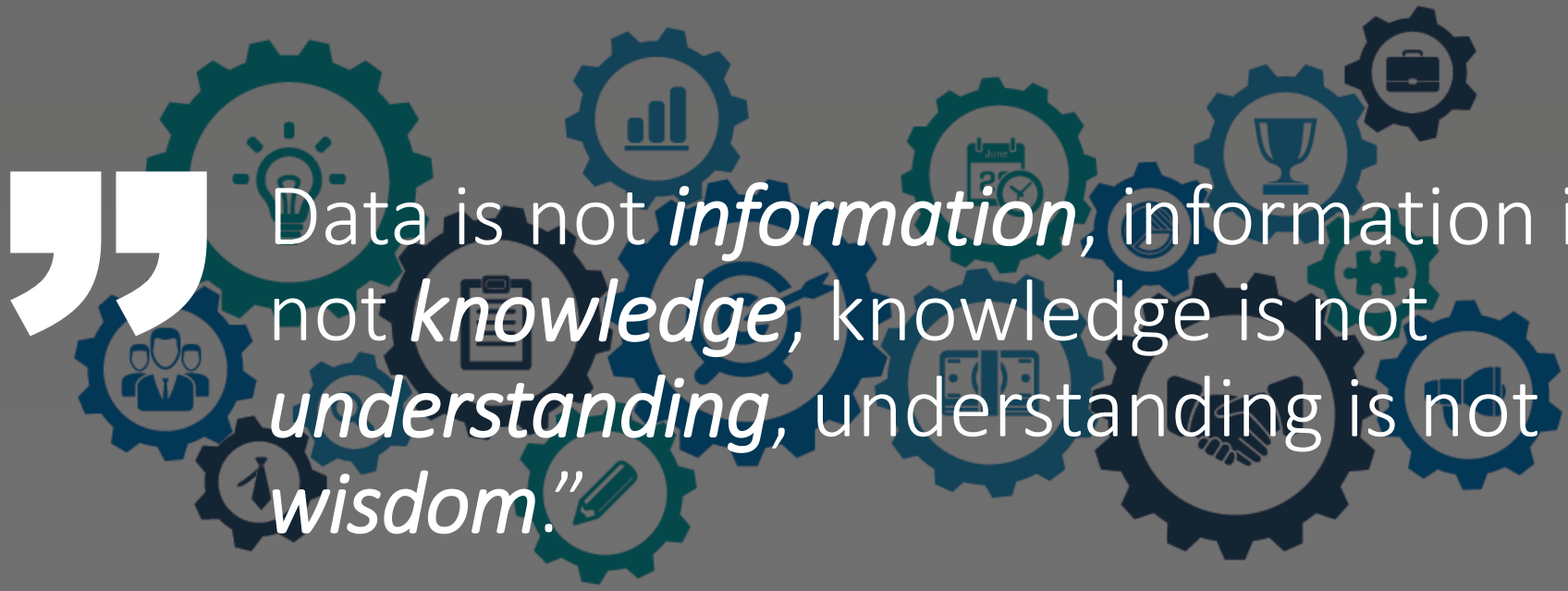

Data is not ***information***, information is not ***knowledge***, knowledge is not ***understanding***, understanding is not ***wisdom***."

Clifford Stoll

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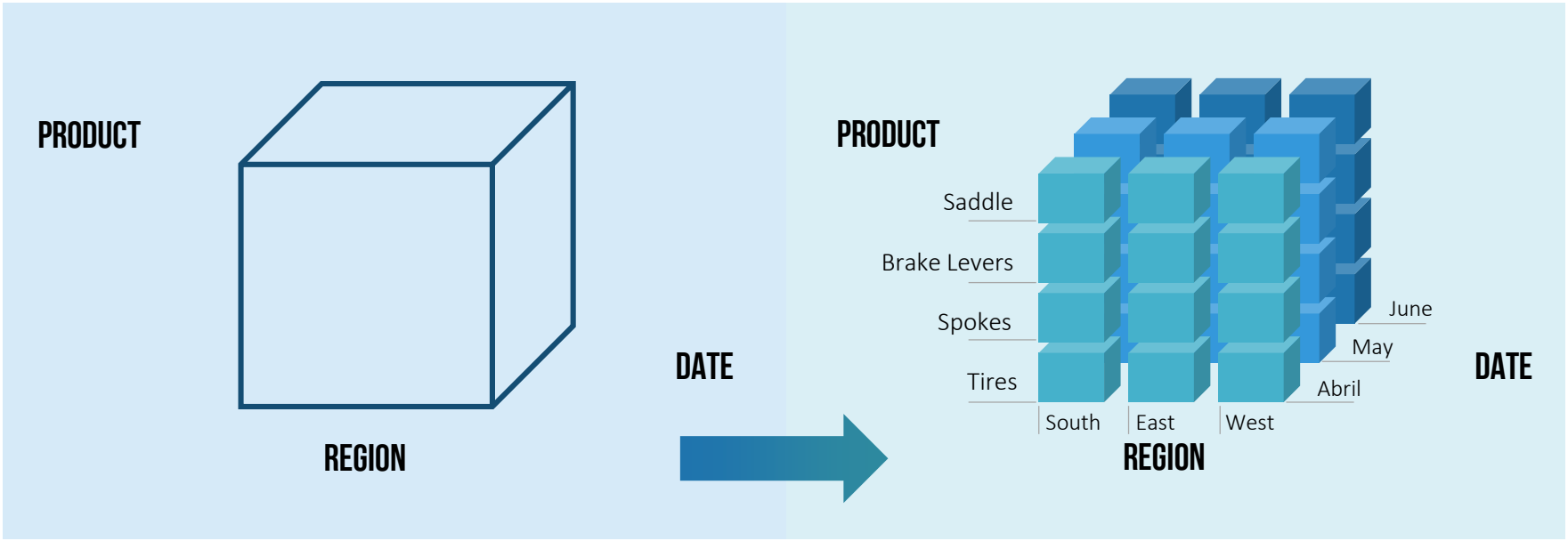
OLAP (Online Analytical Processing) – Multidimensional Analysis



OLAP, a multidimensional analysis, can help group performance indicators (number of products sold, revenue) into categories such as date, month, region or product.

This system is also known as an OLAP cube:

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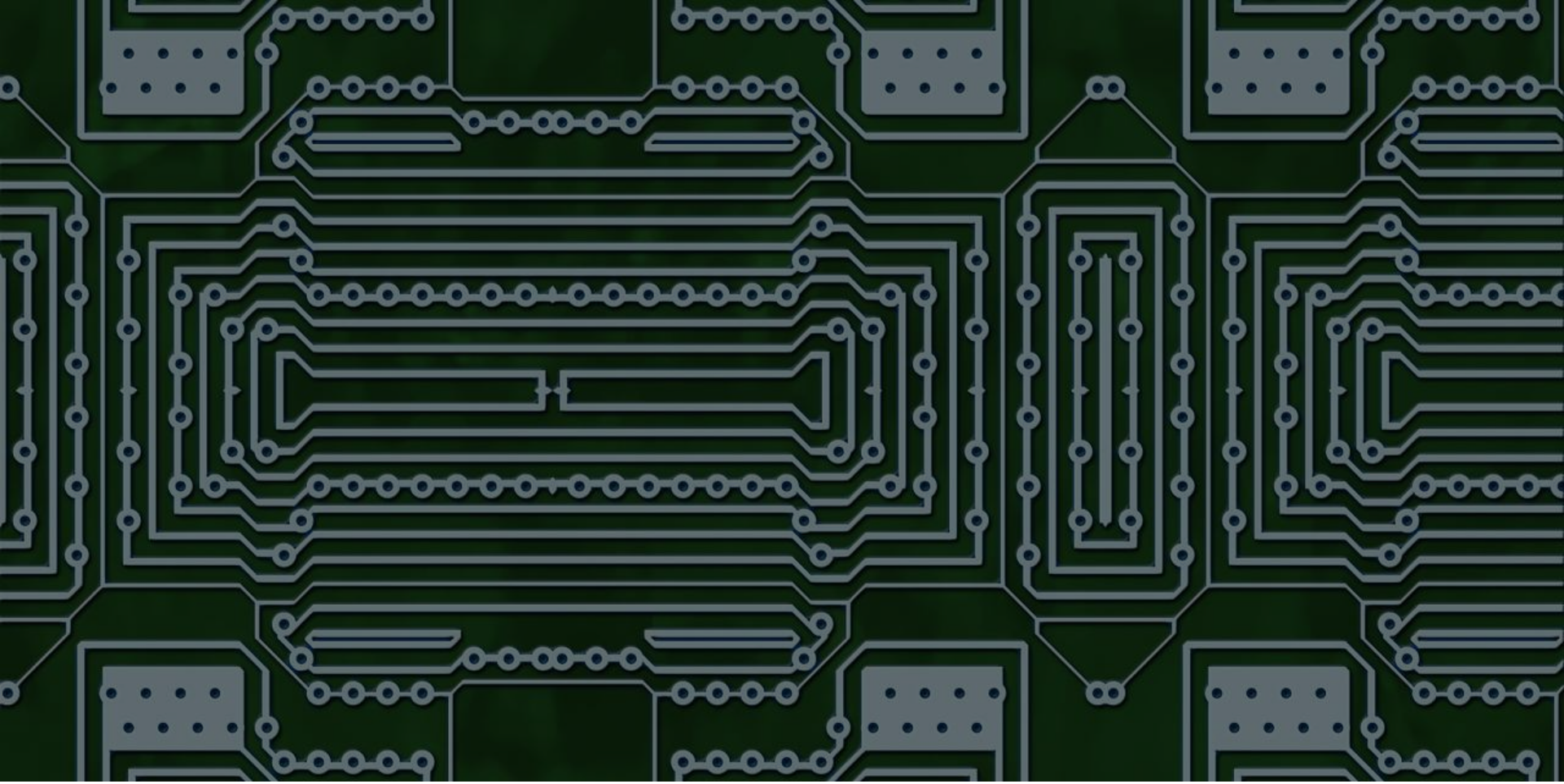

DATA MINING

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BASICS

Big Data

TERM

Technologies used to collect and analyze data sets

DATA SETS

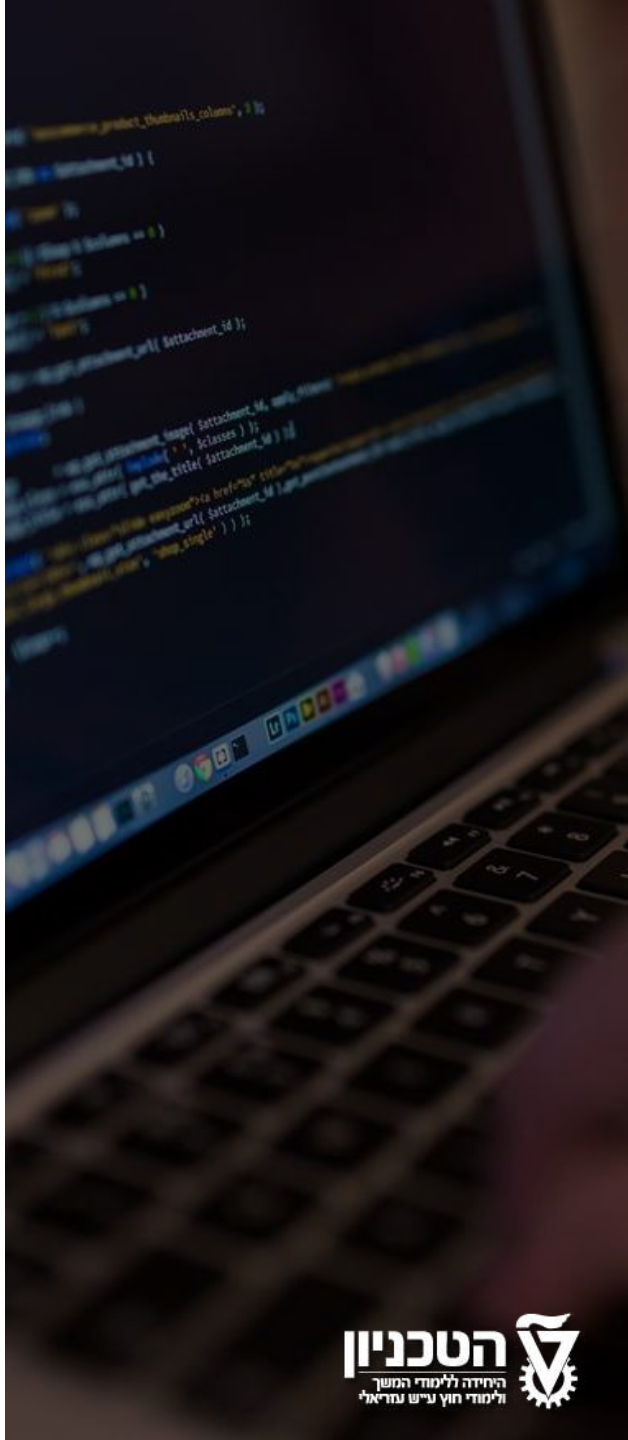
Data sets that are too large or complex and change too rapidly to be evaluated by traditional methods

GOALS

To analyze data with predictive analytics and use new correlations to generate more value

IMPLEMENTATION

Requires massive parallel processing software that runs partly on thousands of servers



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TOOLS

Data Mining

DATA MINING AIMS TO EXTRACT KNOWLEDGE FROM DATA.

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DATA DISCOVERY

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Data Discovery and Business Intelligence

Data discovery is a business intelligence architecture that aims to create and use interactive reports as well as exploitable data from multiple sources.

It uses visual tools such as maps, pivot tables and heat maps to find specific patterns quickly and intuitively.

Data Discovery is part of business intelligence and provides end-users with an application for visualizing data.

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BUSINESS ANALYTICS

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TOOLS

Business Analytics vs. Business Intelligence

Business analytics (BA) analyzes data for forecasting purposes. It is a tool used for strategic decisions in the company, specifically geared to future decisions. The BA solutions are applied company-wide.

Business analytics is a subset of business intelligence. BA follows the collection and processing of data through BI. Through this new knowledge, based on traditional reporting, is gained.

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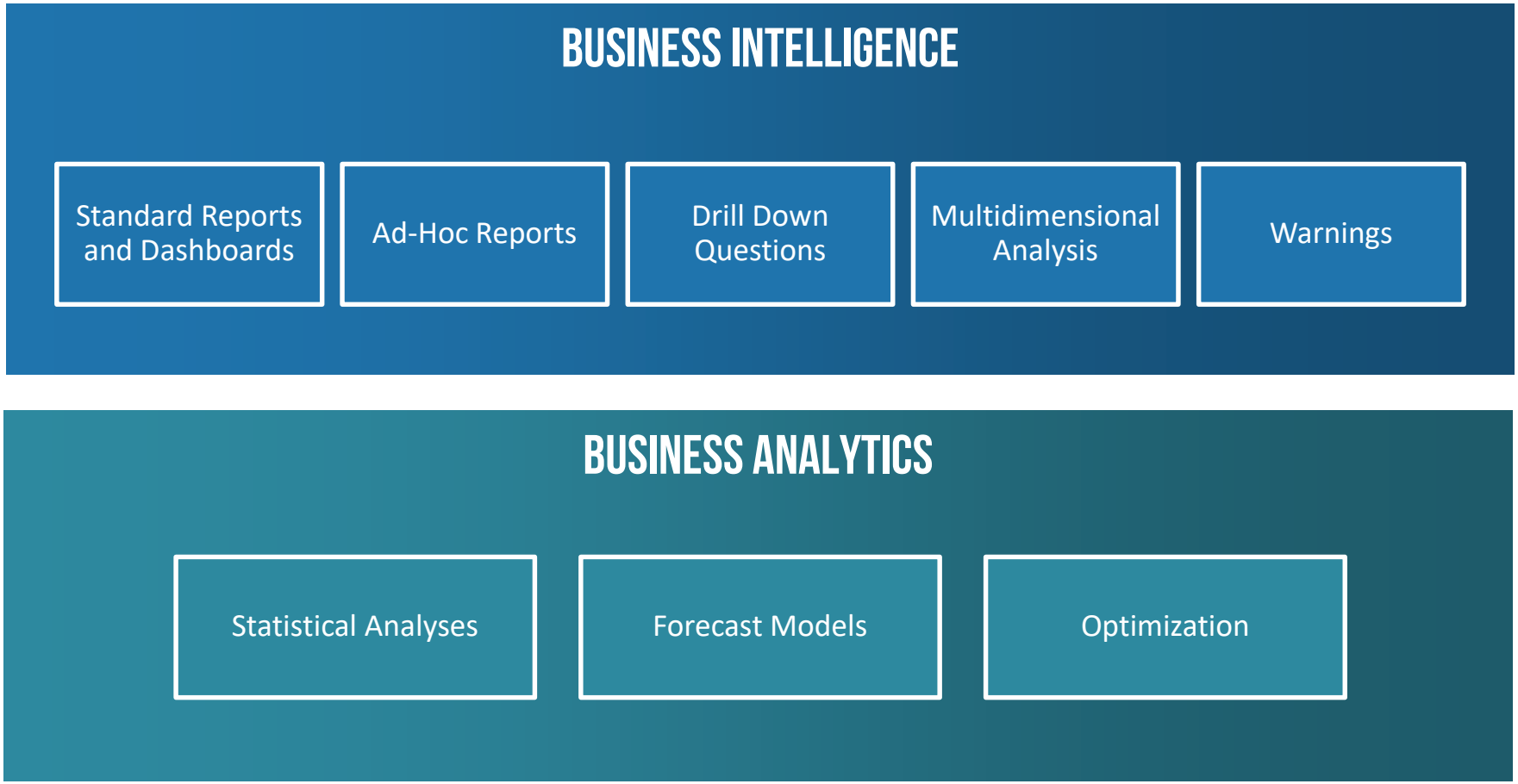
TOOLS

Comparison of Business Analytics and Business Intelligence



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BI PROCESS

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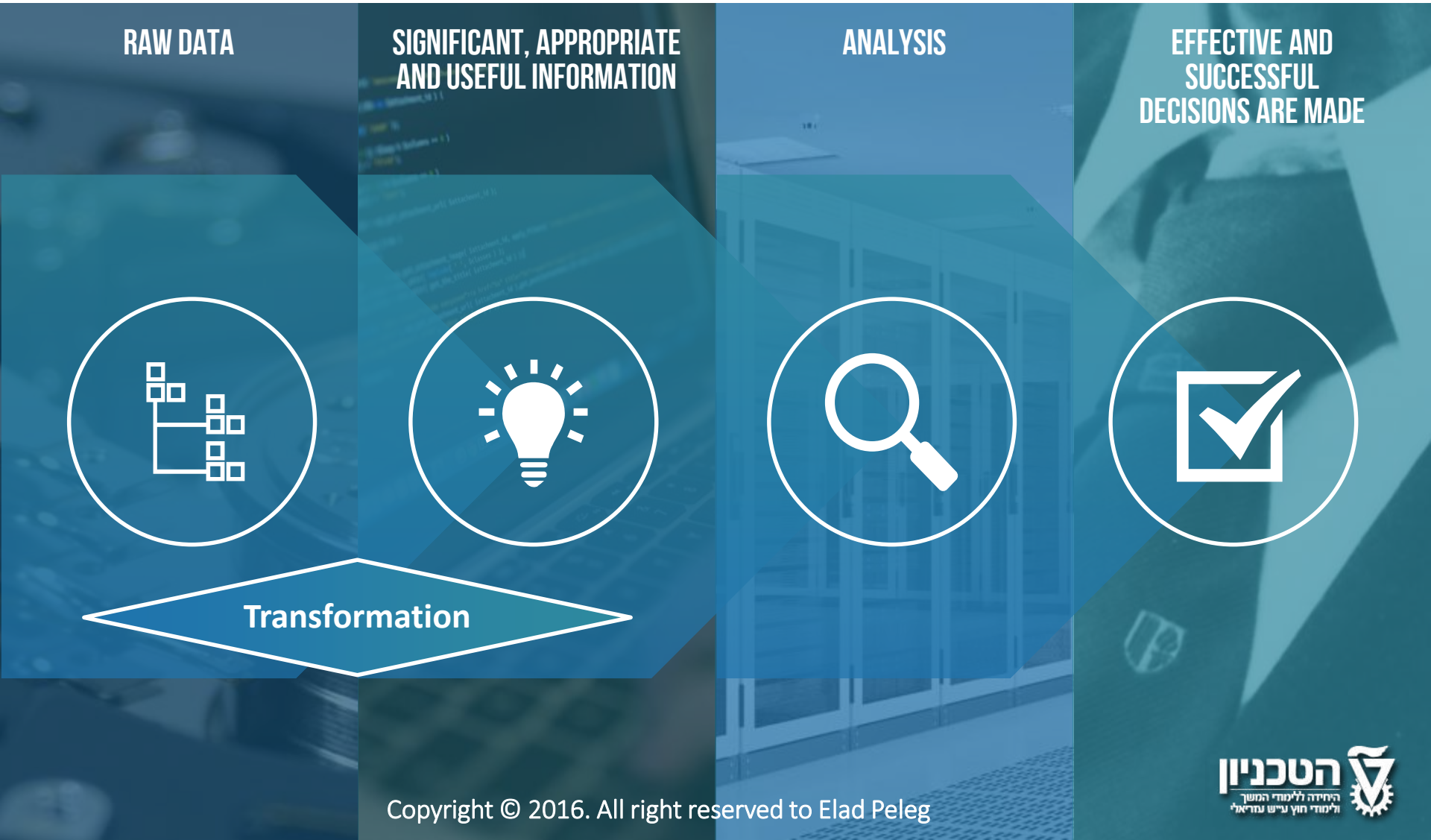
BI PROCESS

Summary of Business Intelligence Process



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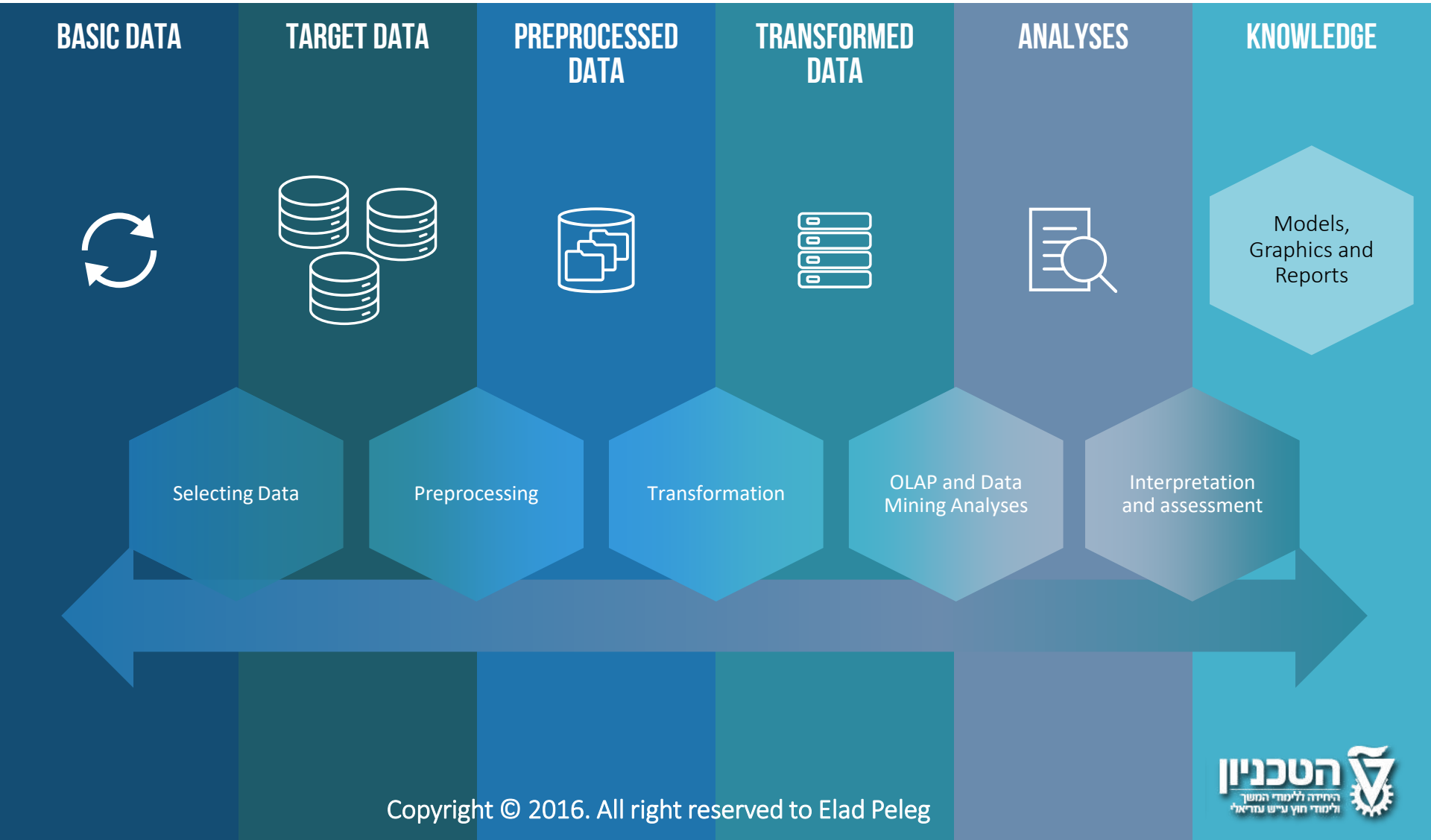
BI PROCESS

Business Intelligence Road Map



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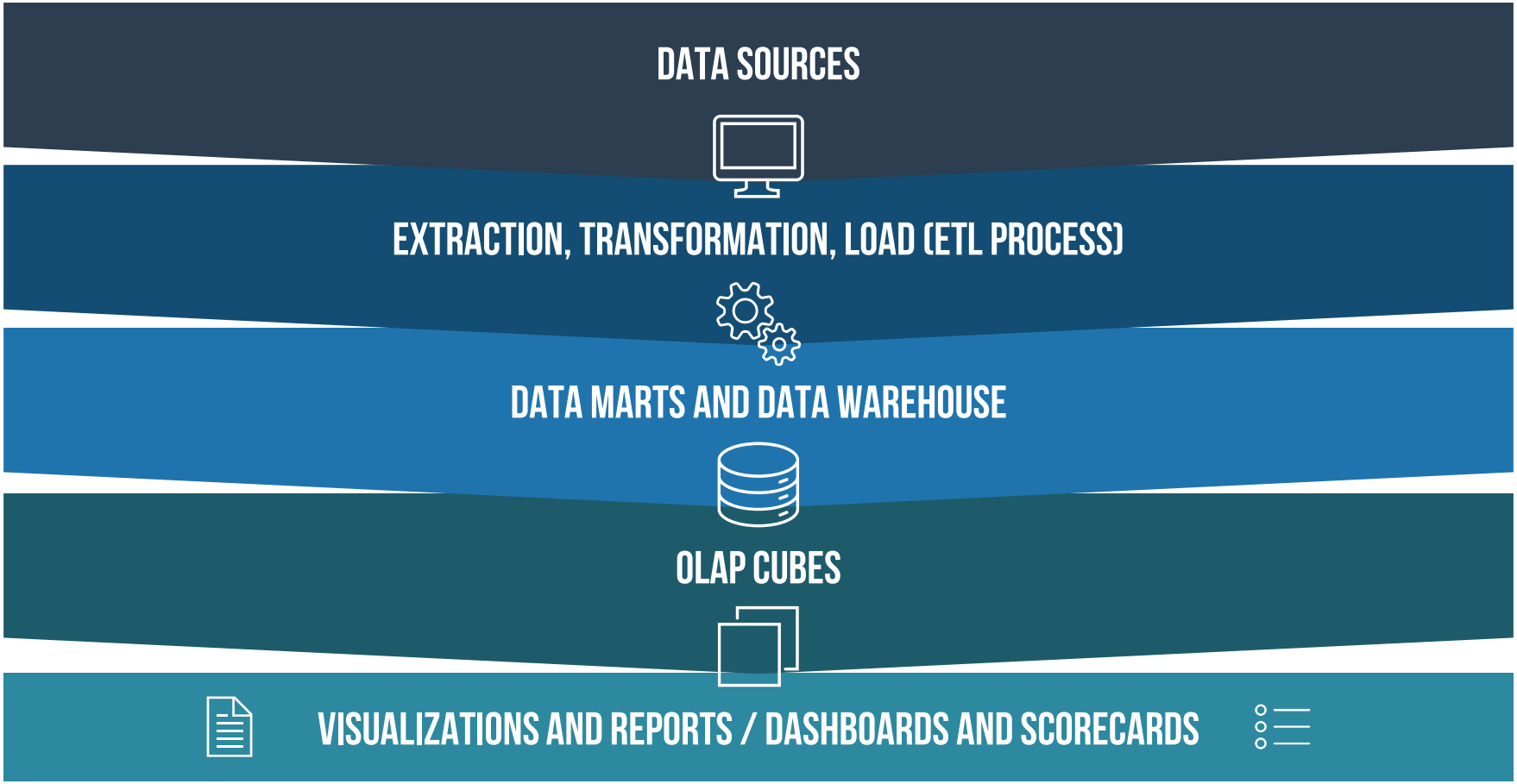
BI PROCESS

Detailed Sequence of BI Process



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