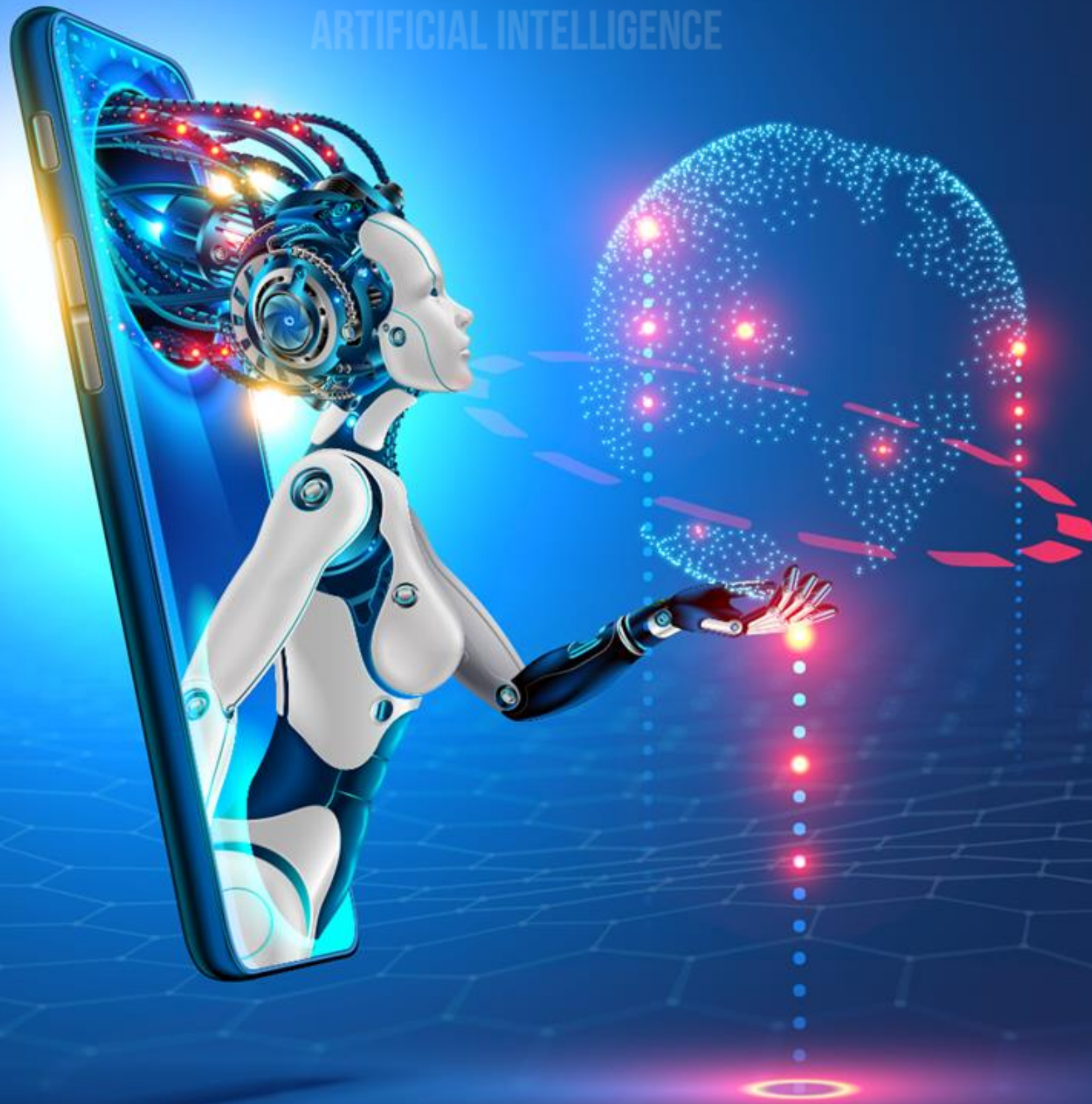


# DATA AND ARTIFICIAL INTELLIGENCE



## Data Analytics with R



## Introduction to Data Analytics



# Learning Objectives

By the end of this lesson, you will be able to:

- 🕒 Explain data analytics
- 🕒 Explain the importance of statistics in data analytics
- 🕒 Identify the roles and responsibilities of data analyst
- 🕒 List industrial use case and applications of data analytics



# Business Scenario

Anna recently graduated from college and is evaluating her future move. She has heard that data analytics technology is the future, but she is not clear about what all that is.

Approach: Let's help Anna understand why data analytics is required and how it has become crucial to learn data analytics.



## Introduction to Data Analytics

# Data Analytics

The purpose of data analytics is to enhance productivity and business performance by analyzing data.



In data analysis, data are extracted from various sources, cleaned up, and categorized to determine various behavioral patterns.

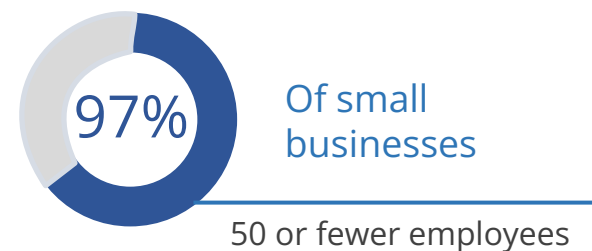
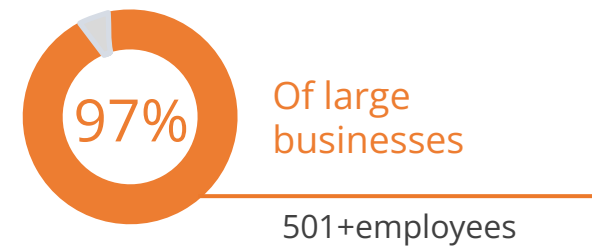


# Data Analytics

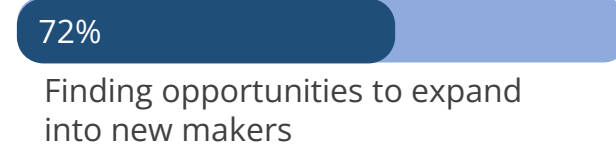
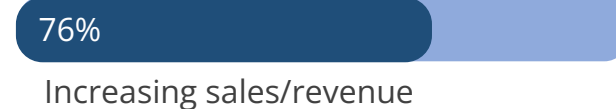
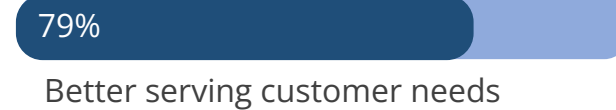
The role of data analytics in the United States financial system:

## How does data analytics benefit the US financial system?

69% of US business  
Decision-makers  
say data analytics  
are important to  
their companies



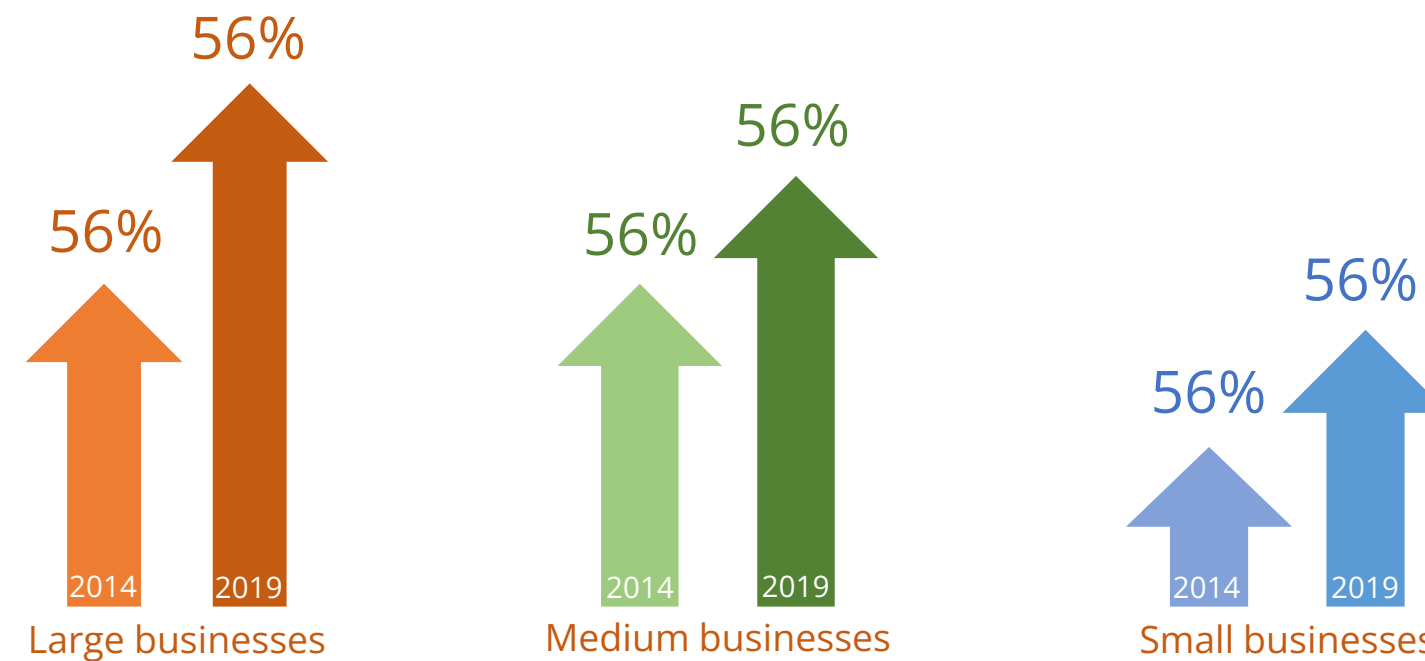
US business decision-makers  
say data analytics will be  
important to their plans in  
each of the following areas:



<https://www.softwaretestinghelp.com/data-analytics-companies/>

# Data Analytics

Senior US executives say that data analytics will contribute 10% or more to their companies' growth.



<https://www.softwaretestinghelp.com/data-analytics-companies/>



# Importance of Data Analytics

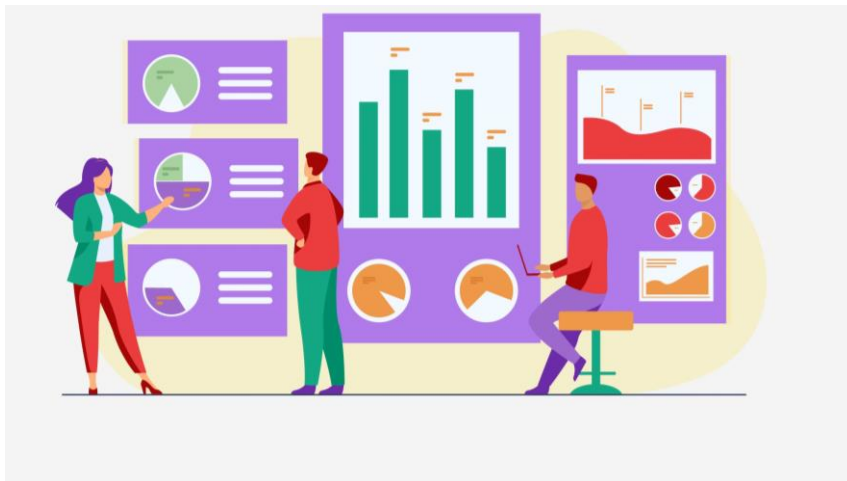
Data analytics plays an important part in company improvement and is utilized to:



Collect hidden insights



Develop reports



Conduct market study



Enhance business requirements

# Types of Data Analytics

There are four types of data analytics:

## Descriptive analytics

It analyses what happened in the past, such as monthly revenue, quarterly sales, and yearly website traffic.

## Diagnostic analytics

It identifies patterns, relationships, and dependencies by comparing descriptive data sets.

## Predictive analytics

It determines likely outcomes by detecting tendencies in descriptive and diagnostic analyses.

## Prescriptive analytics

It tries to find the business action to take.

# Data Analytics Tools

The following are the tools available in data analytics:

● R programming

● Python

● Tableau Public

● QlikView

● SAS

● Microsoft Excel

● RapidMiner

● KNIME

● OpenRefine

● Apache Spark



## Career in Data Analytics



# Data Analyst Career Paths

There are many opportunities in the data analytics sector:

Business analyst

Management reporting

Corporate strategy analyst

Budget analyst

Actuary

Sales analytics

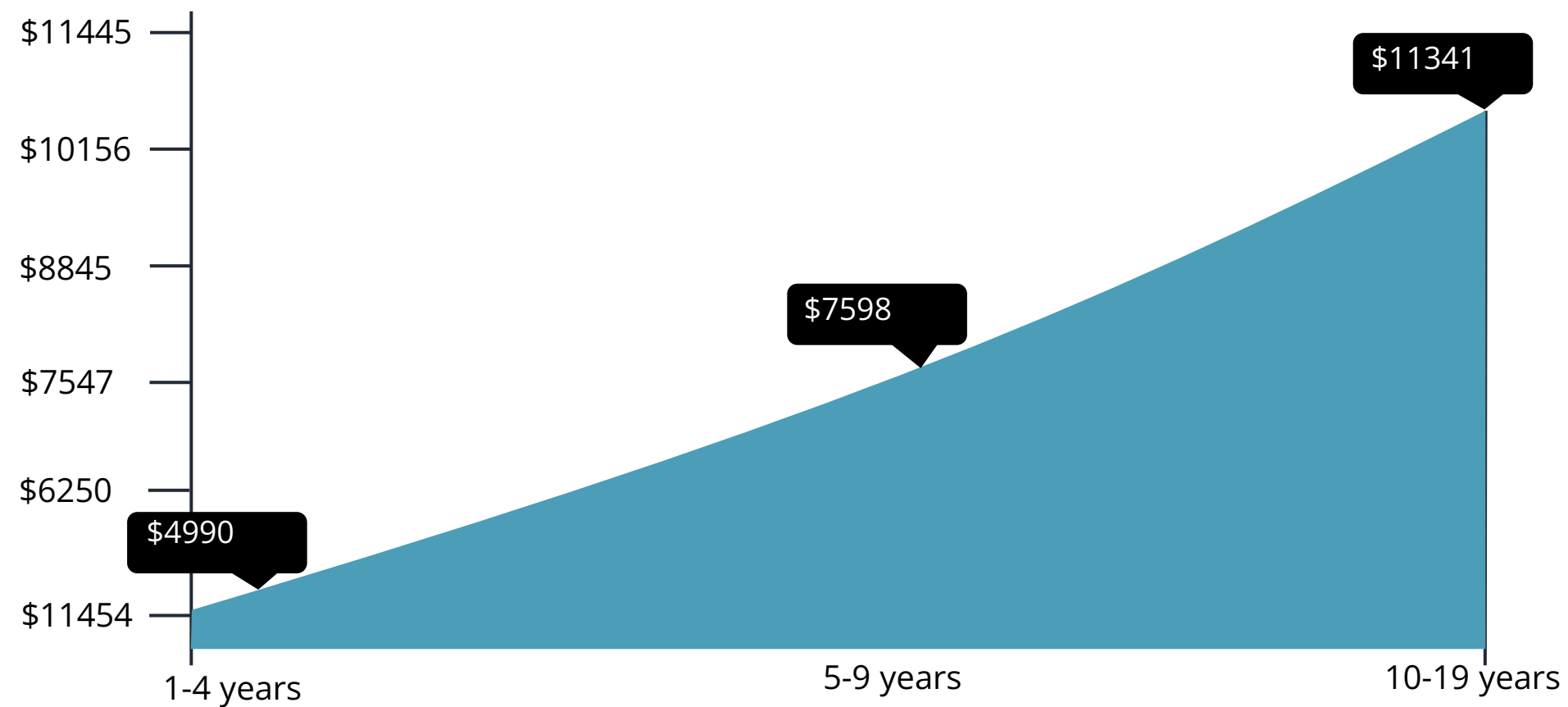
Web analytics

Fraud analytics

Machine learning analyst

# Rising Careers in Data Analytics

The following graph illustrates the pay scale based on the level of experience of data analysts:



## Data Science vs. Data Analytics

# Data Science vs. Data Analytics

The differences between data science and data analytics are:

## Data science

- The goal is to gain actionable insights from large sets of raw and structured data.
- It involves math, advanced statistics, predictive modeling, machine learning, and programming.
- It identifies data trends for making business predictions.
- It can be used in auto manufacturing, banking, consumer goods, and insurance.

## Data analytics

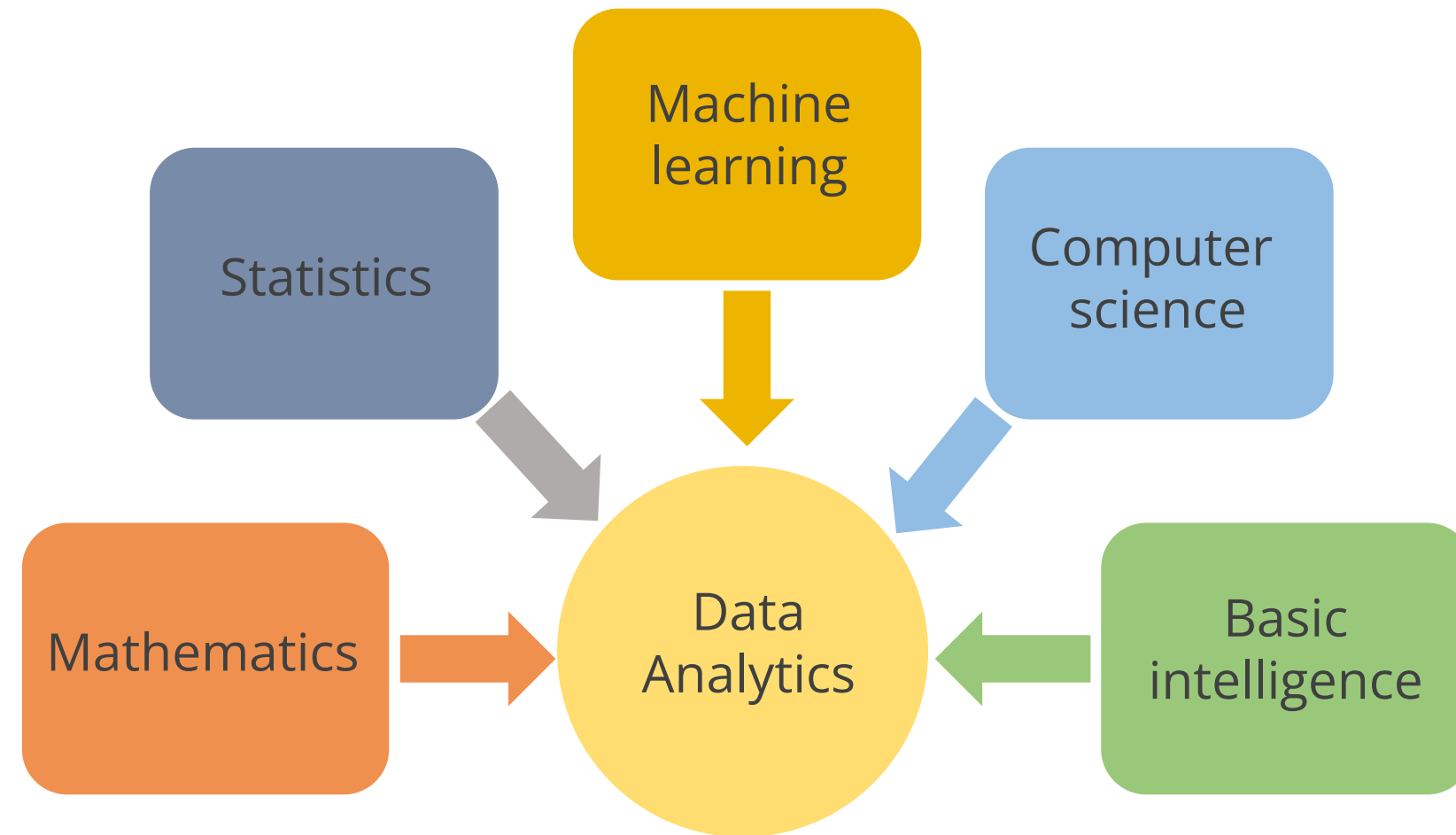
- Data analytics deals with processing and analyzing existing datasets.
- It requires intermediate statistics knowledge and great problem-solving skills.
- It uses tools such as Tableau and IBM Cognos Analytics for visualizing the extracted information.
- It can be used in banking and finance, accounting, automotive, and supply chain management.



## Importance of Statistics in Data Analytics

# What Is Statistics for Data Analytics?

Statistics is a branch of mathematics concerned with the collection, organization, and interpretation of data to represent specific characteristics.



Subjects involved in Data analytics



# Types of Statistics

There are two types of statistics:



## Descriptive statistics

Descriptive statistics describe essential properties of data to provide an overview of data, which aids in summarizing, evaluating, and sharing in a meaningful manner.



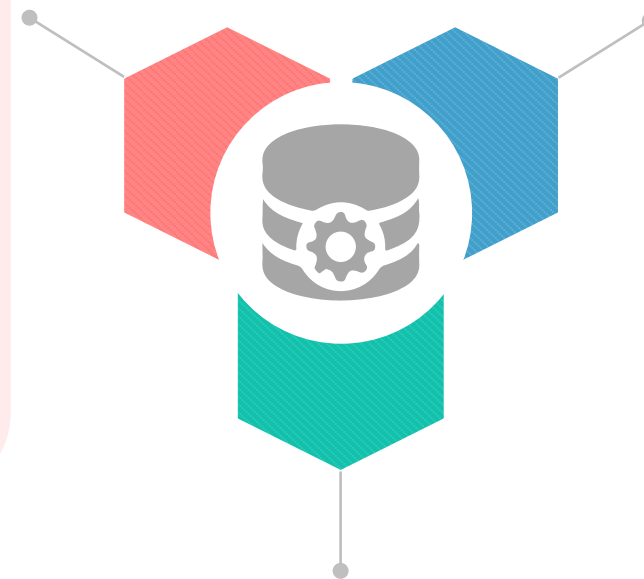
## Inferential statistics

Inferential statistics are used to create predictions, conclusions, and decisions based on data.

# Importance of Statistics in Data Analytics

The importance of statistics in data analytics are:

Statistics help acquire insights into business operations, making them an important component of the Data Analytics project life cycle.



In addition to understanding statistical measurements, it is important in data preparation and feature engineering.

It helps to comprehend patterns and trends in quantitative data.



## Roles and Responsibilities of Data Analyst

# Data Analyst

Data analysts use data to make better business decisions.

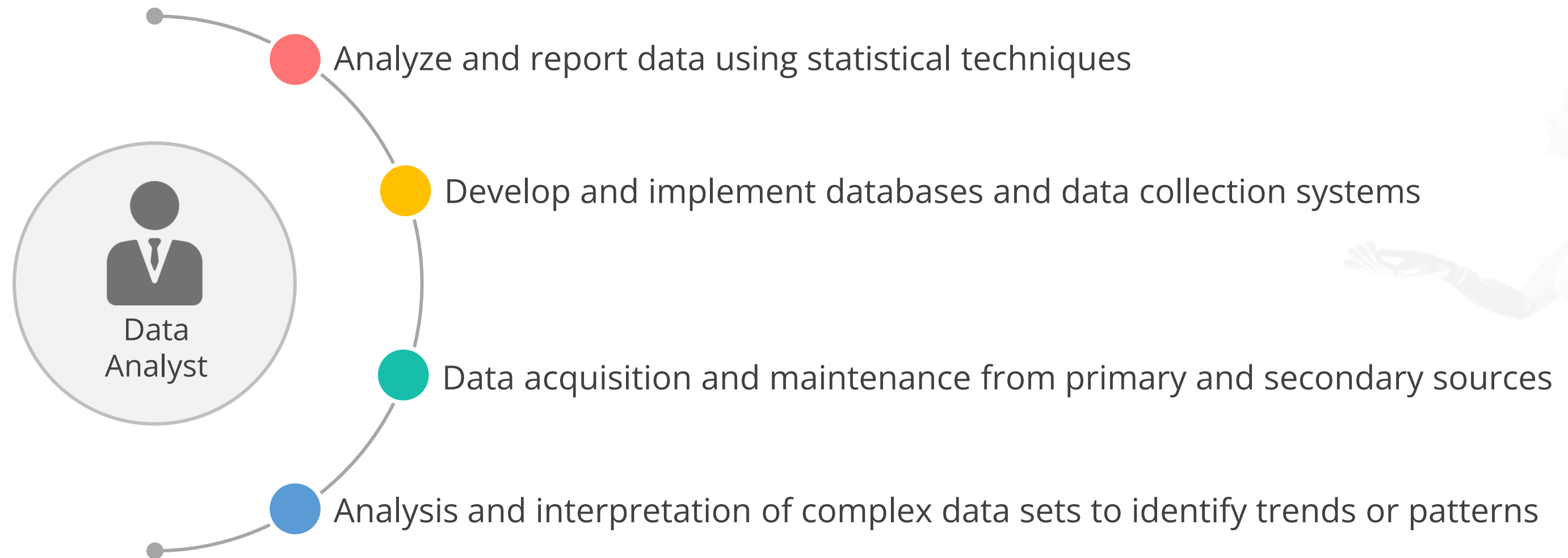


Data analysts use skills from a variety of disciplines, such as computer programming, mathematics, and statistics, to derive inferences from data to characterize, forecast, and improve company performance.



# Data Analyst Roles and Responsibilities

Data analyst responsibilities include the following:

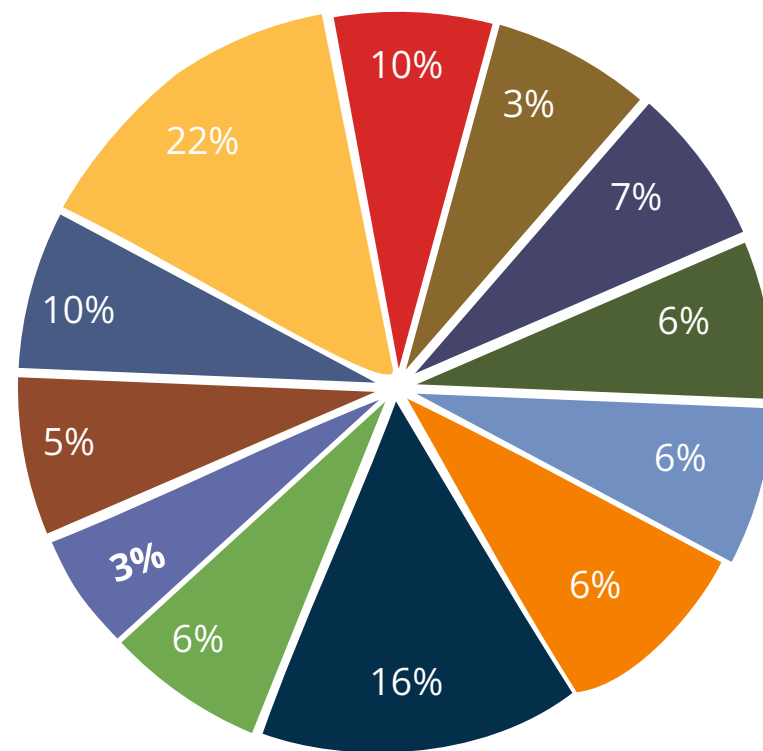


## Industrial Use Case and Applications of Analytics



# Data Analytics in Banking and Finance

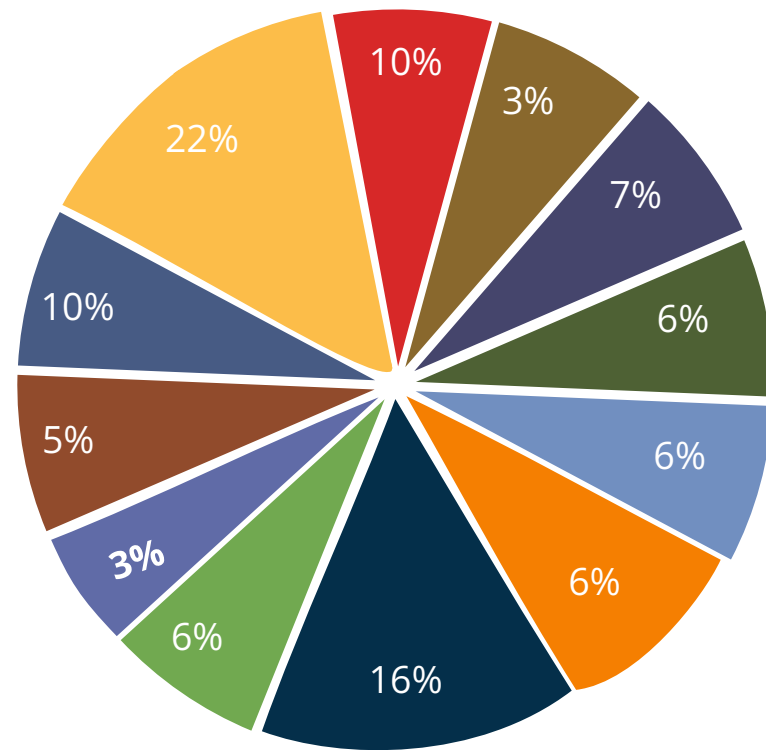
Futuristic banks and financial institutions are leveraging data in a variety of ways, from capturing new markets to reducing fraud and managing investment risk.



- Data analytics for risk
- Asset allocation automation
- Digital experience with human support
- Enable investments in new markets
- Standardize customer experience across all points of contact
- Lower time-to-market for new offerings

# Data Analytics in Banking and Finance

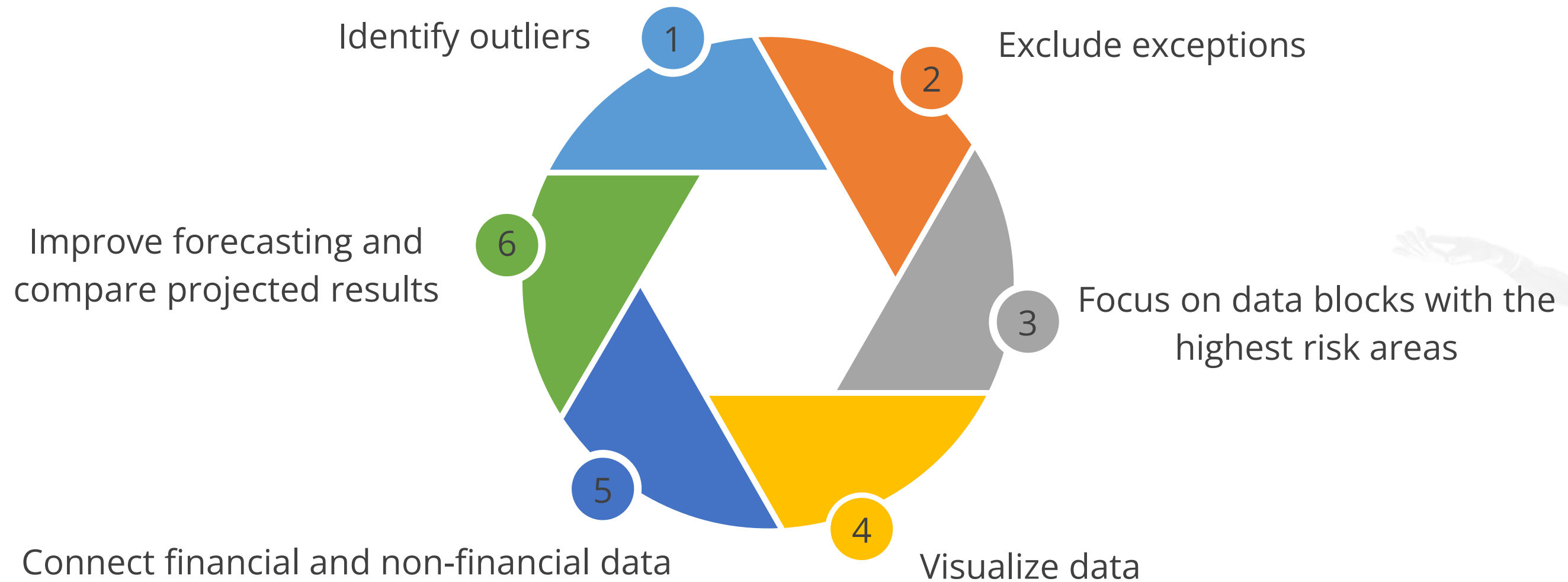
Futuristic banks and financial institutions are leveraging data in a variety of ways, from capturing new markets to reducing fraud and managing investment risk.



- Alternative marketing and distribution channels
- New products for traditionally unprofitable customers
- Brokerage service, investment decision support
- Custom investment solutions
- Crowdsourcing, investment decisions
- Blockchain

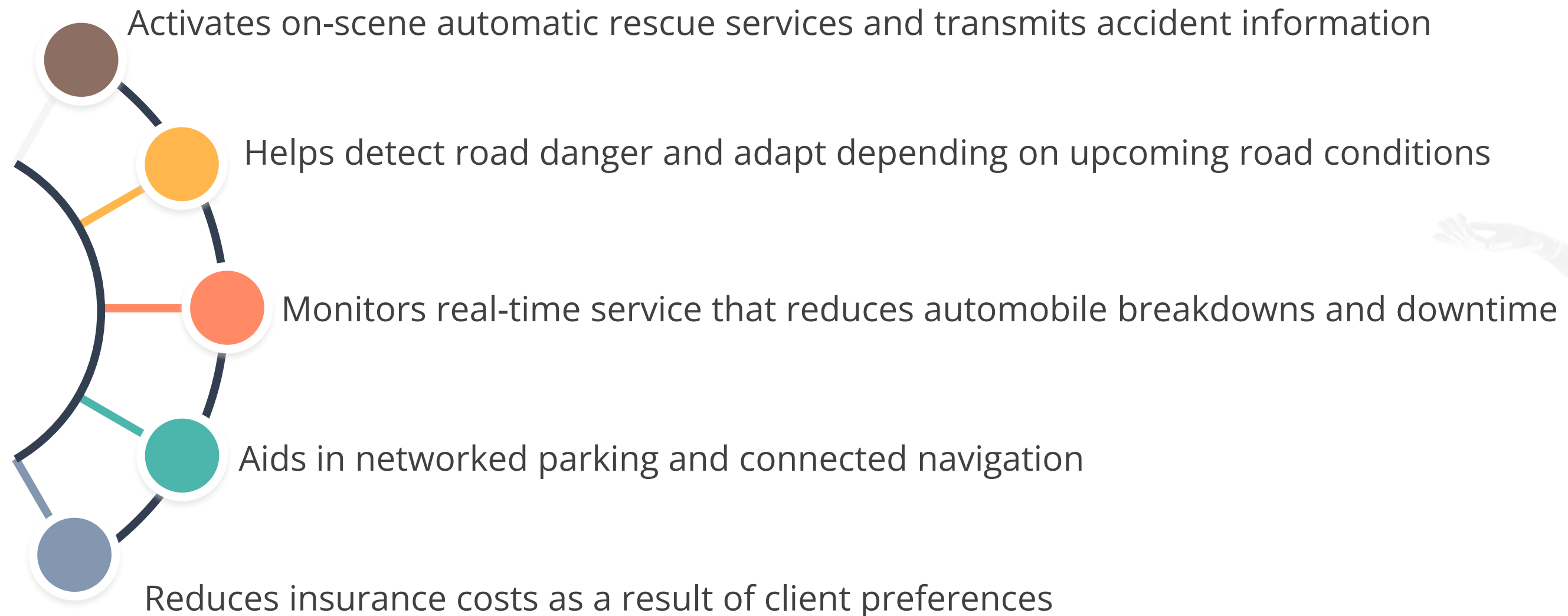
# Data Analytics in Accounting

The consultant deals with a variety of data types, both structured and unstructured, and analytics can help them:



# Data Analytics in Automotive

There is a wide range of applications for data analytics in the automotive industry.



# Data Analytics in Biomedical Research and Healthcare

Data analytics in biomedical and healthcare explores key applications, such as:

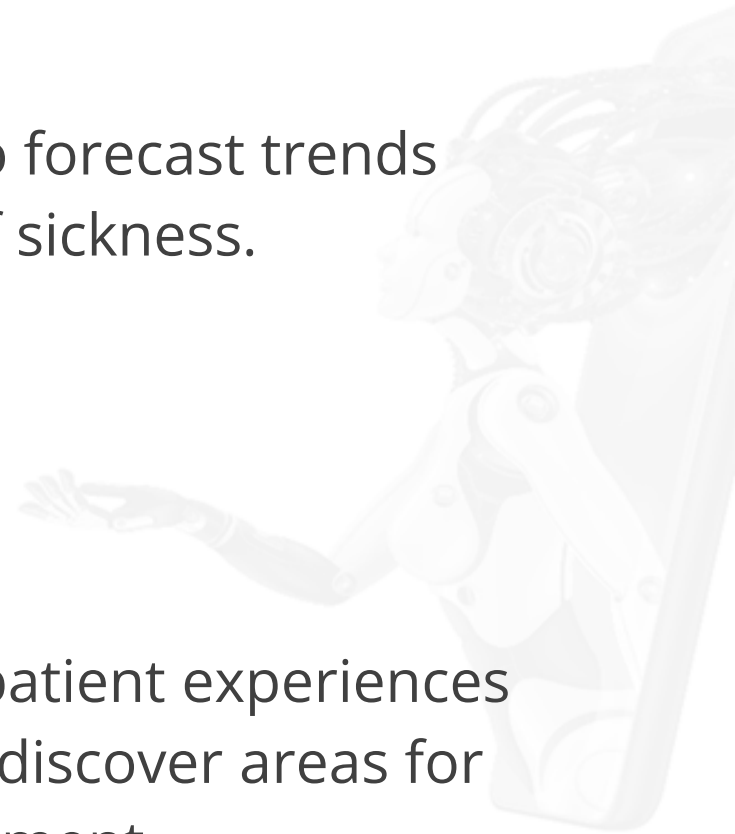
Informatics uses knowledge to create interventions and impactful tools.

Clinical data are utilized in making informed diagnostic decisions.



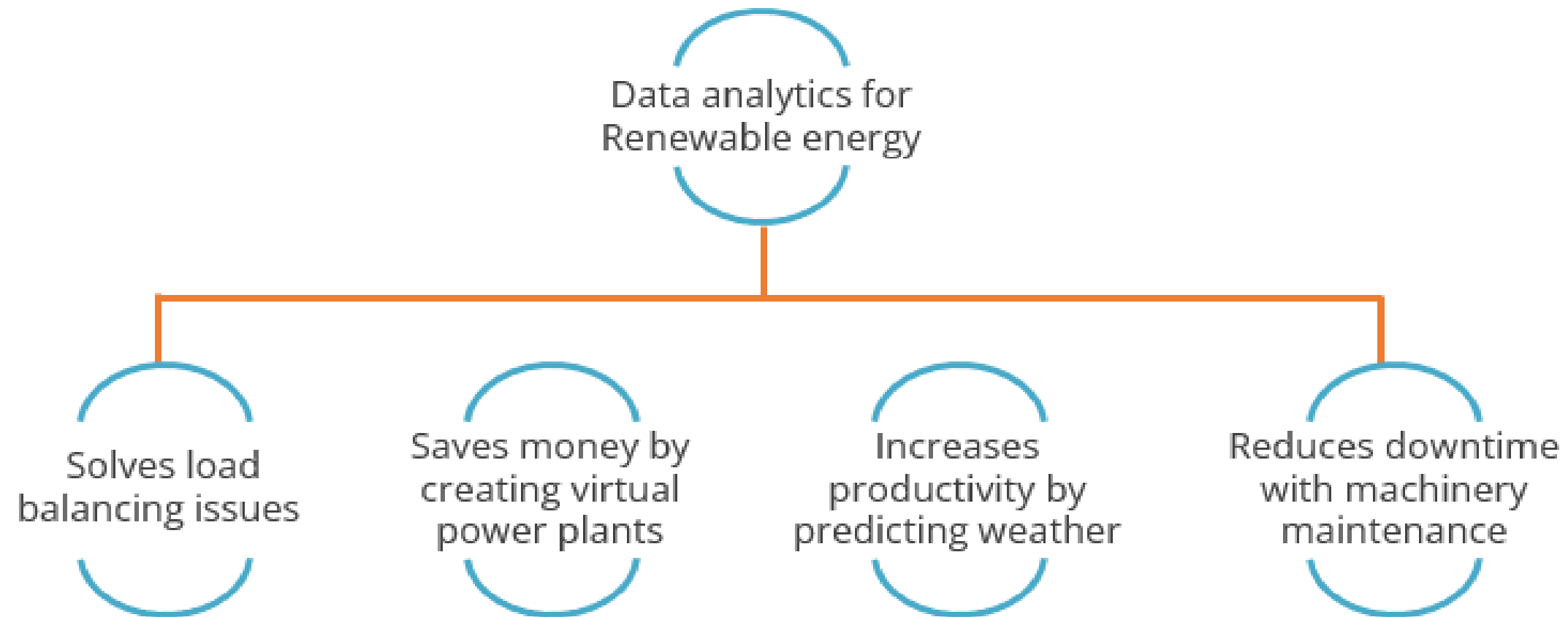
Data analytics can also forecast trends in the spread of sickness.

Data acquired from patient experiences may be analyzed to discover areas for improvement.



# Data Analytics in Renewable Energy

Data analytics has several applications in the energy business, from providing new methods to develop for diverse sectors to tracking and monitoring new preserves utilizing data sensors.





# Data Analytics in Supply Chain Management

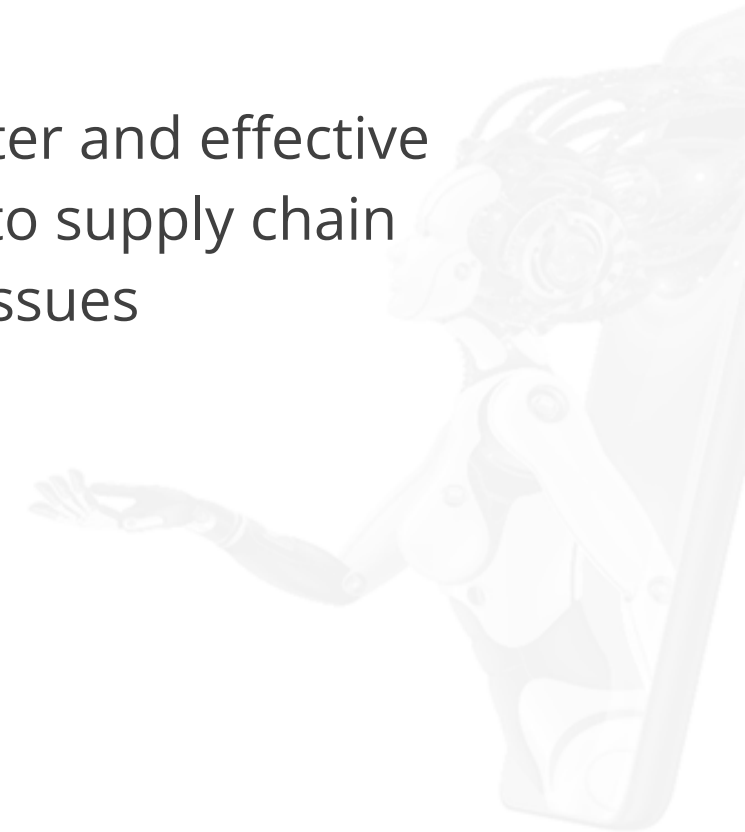
Data analytics may help firms modernize supply networks in a variety of ways, such as:

Improve customer service and demand fulfillment

Provide faster and effective response to supply chain issues

Increase in supply chain efficiency of 10% or more

Provide greater integration across the supply chain



# Data Analytics in Supply Chain Management

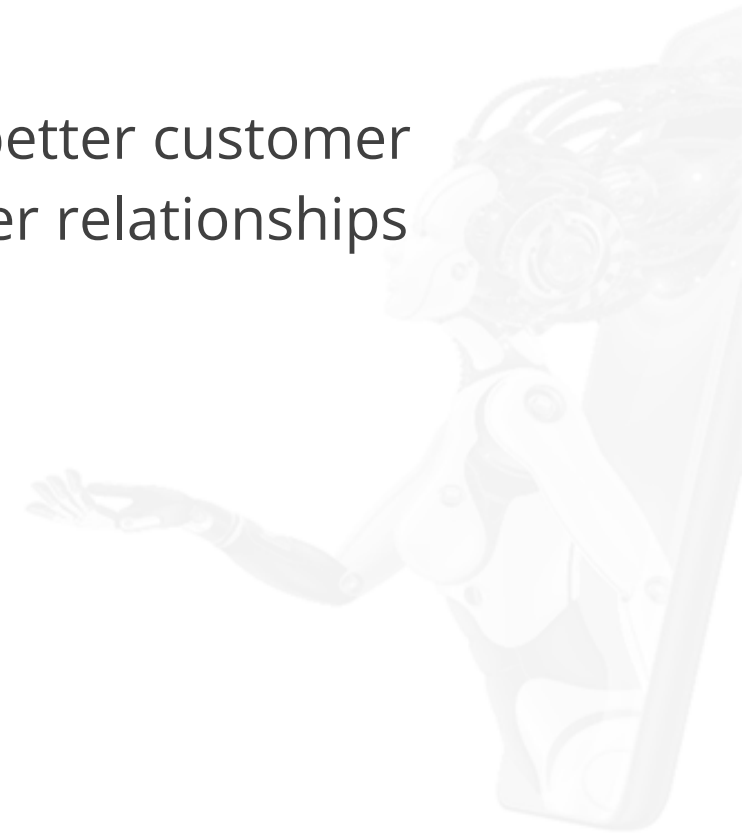
Data analytics may help firms modernize supply networks in a variety of ways, such as:

Optimize inventory and asset productivity

Help with better customer and supplier relationships

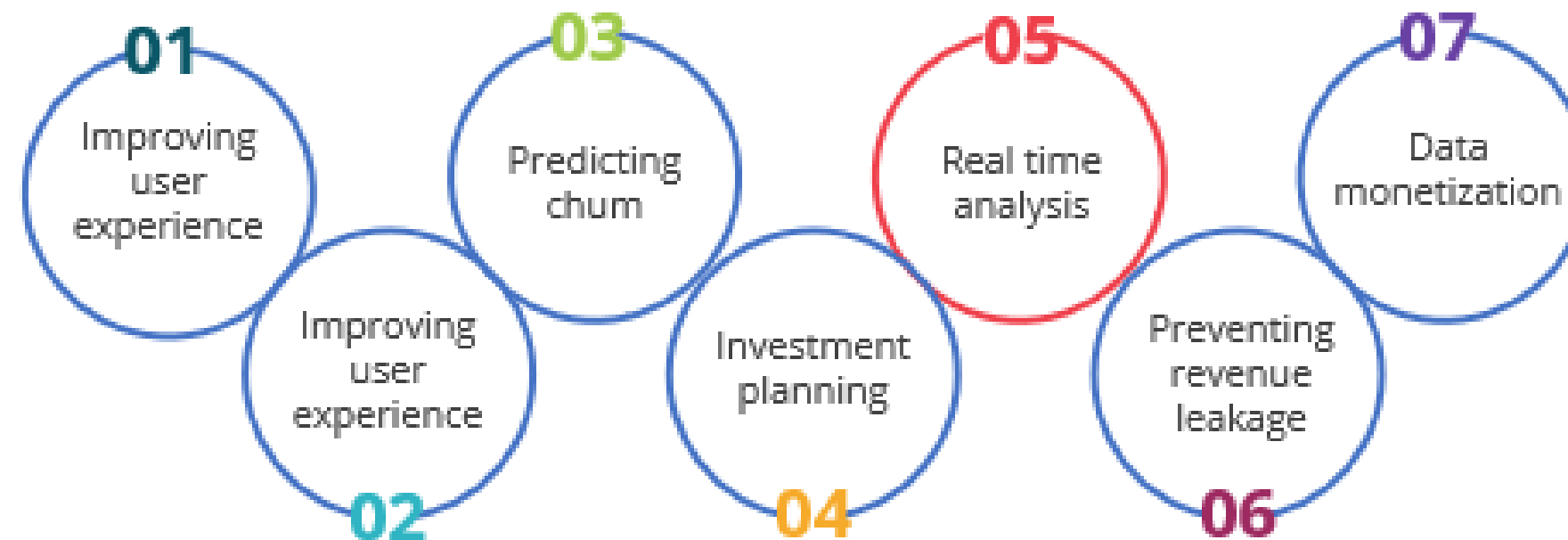
Improve demand-driven operations

Provides shorter order-to-delivery cycle times



# Data Analytics in Telecom

The telecom business is undergoing a massive digital transformation and revolution as a result of improved technology and data analytics.



Role of Data Analytics in Telecom Industry



## Key Takeaways

- The purpose of data analytics is to enhance productivity and business performance by analyzing data.
- Statistics help acquire insights into business operations, making them an important component of the data analytics project life cycle.
- The objectives of data analysts are to analyze, forecast, and improve company performance by inferring inferences from data.
- Data analytics has applications across different domains and industries.





## Knowledge Check

## Knowledge Check

1

What are the steps involved in Data Analysis?

- A. Inspecting data
- B. Cleaning data
- C. Transforming data
- D. All of the above





## Knowledge Check

1

What are the steps involved in Data Analysis?

- A. Inspecting data
- B. Cleaning data
- C. Transforming data
- D. All of the above



The correct answer is **D**

In data analysis, data are extracted from various sources, cleaned up, and categorized to determine various behavioral patterns.

Knowledge  
Check

2

Data Analytics uses \_\_\_\_\_ to get insights from data.

- A. Statistical figures
- B. Numerical aspects
- C. Statistical methods
- D. None of the above



Knowledge  
Check

2

Data Analytics uses \_\_\_\_\_ to get insights from data.

- A. Statistical figures
- B. Numerical aspects
- C. Statistical methods
- D. None of the above



The correct answer is C

Data Analytics uses statistical methods to extract insights from data by examining all their data. Organizations may utilize data analytics to find trends and produce insights.

Knowledge  
Check

3

Data analytics can be applied in which of the following domains?

- A. Healthcare
- B. Banking and Finance
- C. Supply chain management
- D. All of the above



Knowledge  
Check

3

Data analytics can be applied in which of the following domains?

- A. Healthcare
- B. Banking and Finance
- C. Supply chain management
- D. All of the above



The correct answer is **D**

Data analytics can be integrated with any domain.