

# Big Data Analytics

## Lecture 2

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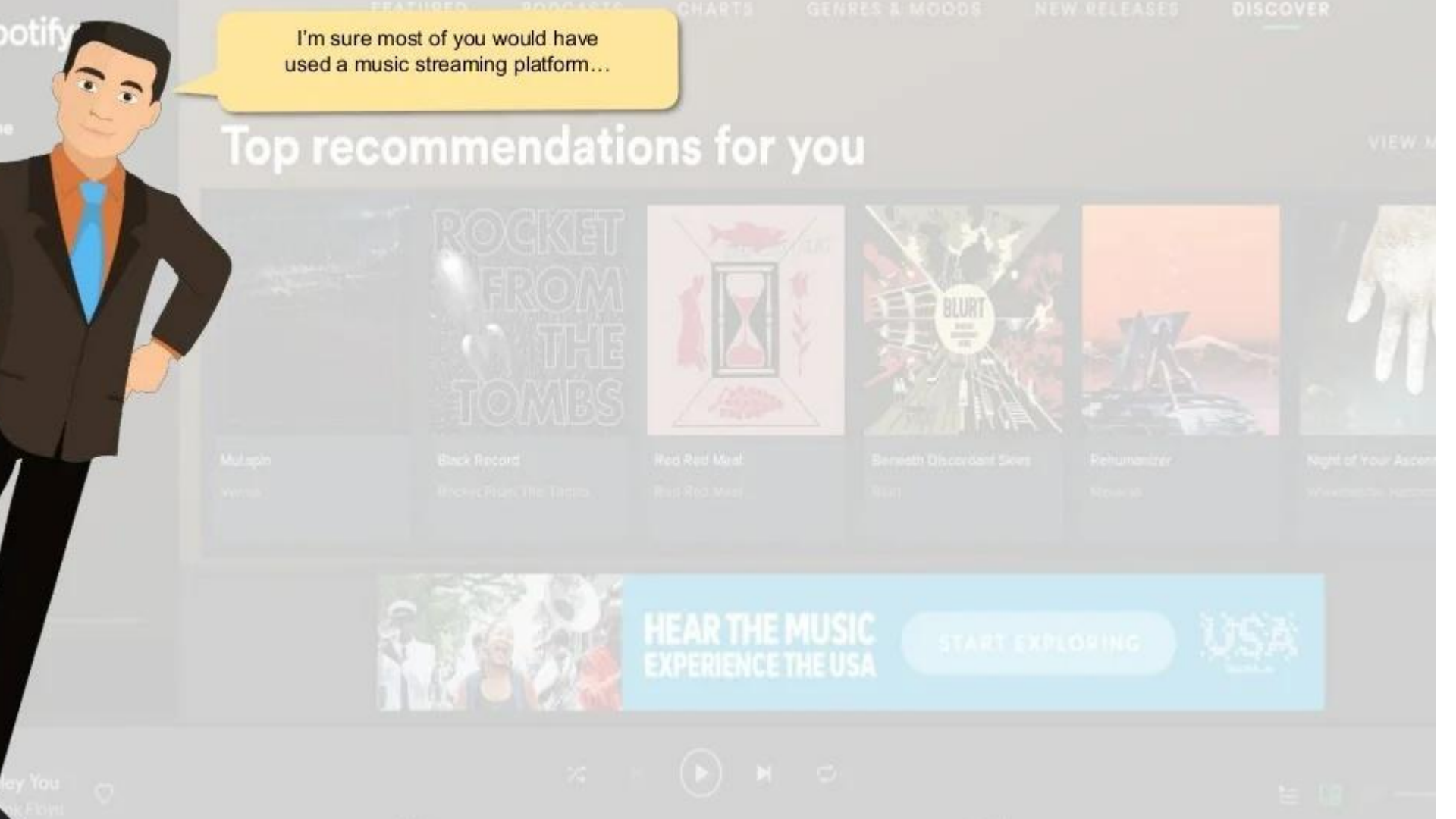
Why big data analytics?



# What's in it for you?

- 1 Why big data analytics?
- 2 What is big data analytics?
- 3 Lifecycle of big data analytics
- 4 Types of big data analytics
- 5 Tools used in big data analytics
- 6 Big data application domains





I'm sure most of you would have used a music streaming platform...

## Top recommendations for you

Mulan

Various Artists

Black Record

Brockhampton

Red Red Meat

Red Red Meat

Beneath Discordant Skies

(SZA)

Rehumanizer

Stevie Nicks

Night of Your Ascension

Willow Smith

HEAR THE MUSIC  
EXPERIENCE THE USA

START EXPLORING

USA  
Experience the Music

Play You  
Pink Floyd





FEATURED

PODCASTS

CHARTS

GENRES &amp; MOODS

NEW RELEASES

DISCOVER

....like Spotify!



Home



## Top recommendations for you



Mulapin

Various



Black Record

Black Record: The Tomb



Red Red Mist

Red Red Mist



Beneath Discordant Sails

BLURT



Relhumanizer

Various



Night

Various



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GENRES &amp; MOODS

NEW RELEASES

DISCOVER

Spotify has nearly 96 million users

## Top recommendations for you

Multipin  
Various

Black Record  
Rocket From The Tombs

Red Red Meat  
Red Red Meat

Beneath Discordant Skies  
Blurt

Returnerizer  
Blurt

Night  
Blurt



HEAR THE MUSIC  
EXPERIENCE THE USA

START EXPLORING

USA  
MUSIC





Home



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DISCOVER

User behavior includes songs played, repeatedly used playlists, likes, shares and search history, all of which represents the big data used by Spotify

## Top recommendations for you



Muladh  
Worms



Black Record  
Black Record The Tapes



Red Red Meat  
Red Red Meat



Beneath Discordant Sirens  
BLURT



Rehumanizer  
Mowad



Night  
Worms



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MUSIC



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NEW RELEASES

DISCOVER

Spotify analyzes this big data for suggesting songs to its users

## Top recommendations for you

Mullapin

Wanna

Black Record

Black Record: The Truth

Red Red Meat

Red Red Meat

Beneath Discordant Skies

BLURT

Relhumanizer

Mowat

Night

Wanna



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Play You



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PLAYLIST](#)[Daily Mix 1  
PLAYLIST](#)[Install App](#)

## Top recommendations for you



Mulapin

Verme



Black Record

Rocket From The Tombs



Red Red Meat

Red Red Meat



Beneath Discordant Skies

Blurt



Rehumanizer

Meserati



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PODCASTS

CHARTS

GENRES &amp; MOODS

NEW RELEASES

DISCOVER

Recommendation systems are data filtering tools. They collect data and then filter them using algorithms

## Top recommendations for you

Mulan

Wanna

Black Record

Black Record The Thriller

Red Red Meat

Red Red Meat

Beneath Discordant Skies

SEAT

Rehumanizer

Shower

Night

Whore



HEAR THE MUSIC  
EXPERIENCE THE USA

START EXPLORING

USA  
MUSIC



Home



Library

Discover Weekly

Release Radar

Daily Mix 1

Radio

Podcasts

Spotify Connect

Settings

Help

Log Out

The recommendation systems accurately predict what users would like to listen to next with the help of big data analytics

## Top recommendations for you



Mulipin

Various



Black Record

Black Record



Red Red Meat

Red Red Meat



Beneath Discordant Skies

Blurt



Rehumanizer

Rehumanizer



Night of Your Ascension

Wavelength



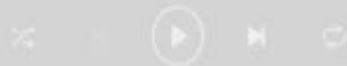
HEAR THE MUSIC  
EXPERIENCE THE USA

START EXPLORING



Hey You  
Sing Along

0:00



4:30



FEATURED

PODCASTS

CHARTS

GENRES &amp; MOODS

NEW RELEASES

DISCOVER

Using big data analytics, Spotify keeps its users engaged and by doing so, the users use the application more

## Top recommendations for you



Mulapin

Wompi



Black Record

Brock Pfen Tila Tella



Red Red Meat

Red Red Meat



Beneath Discordant Skies

BLURT



Rehumanizer

Shovels



HEAR THE MUSIC  
EXPERIENCE THE USA

START EXPLORING

USA  
ambassador



What is big data analytics?



# What is big data?

Massive amount of data which cannot be stored, processed and analyzed using traditional tools is known as big data



Big data



# What is big data?

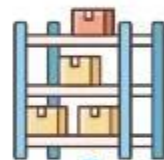
Massive amount of data which cannot be stored, processed and analyzed using traditional tools is known as big data



Big data



Storing



Processing



Analyzing



Storing, processing and analyzing big data became difficult using traditional methods

## What is big data analytics?

Big data analytics is a process to extract meaningful insights from big data such as hidden patterns, unknown correlations, market trends and customer preferences

# What is big data analytics?

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Big data analytics is used for risk management

Big data analytics

# What is big data analytics?



Banco de Oro, a Philippine banking company uses big data analytics



# What is big data analytics?

Big data analytics is a process to extract meaningful insights from big data such as hidden patterns, unknown correlations, market trends and customer preferences

Big data analytics is used for risk management

Big data analytics

Big data analytics is used for product development and innovations

# What is big data analytics?



Banco de Oro, a Philippine banking company uses big data analytics



Identifying fraudulent activities and discrepancies is easier using big data analytics. Thus the organization was able to narrow down the list of suspects using big data analytics



# What is big data analytics?



Rolls-Royce manufactures massive jet engines.  
These engines are used by airlines and armed forces  
across the world



**Rolls-Royce®**



# What is big data analytics?



Rolls-Royce manufactures massive jet engines. These engines are used by airlines and armed forces across the world



## Rolls-Royce®



The company uses big data analytics to analyze how good the engine design is and if there has to be any more improvement

Big data analytics is used here in designing a product of higher quality

# What is big data analytics?

Big data analytics is a process to extract meaningful insights from big data such as hidden patterns, unknown correlations, market trends and customer preferences

Big data analytics is used for risk management

Big data analytics is used for product development and innovations

Big data analytics

Big data analytics helps in quicker and better decision making in organizations

# What is big data analytics?



Starbucks uses big data analytics for important decisions. For example, big data analytics is used to decide if a particular location would be suitable for a new outlet or not





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Starbucks uses big data analytics for important decisions. For example, big data analytics is used to decide if a particular location would be suitable for a new outlet or not



The analysis is done based on factors such as population demographics, accessibility of the location, competition in the vicinity, economic factors, parking adequacy and so on

The business grows if the right location is chosen wisely by considering the above parameters

TM

# What is big data analytics?

Big data analytics is a process to extract meaningful insights from big data such as hidden patterns, unknown correlations, market trends and customer preferences

Big data analytics is used for risk management

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Big data analytics

Big data analytics is used to improve customer experience

Big data analytics helps in quicker and better decision making in organizations



# What is big data analytics?



Delta airline uses analysis to improve customer experiences



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They monitor tweets to find out their customers' experience regarding the journey, delays and so on

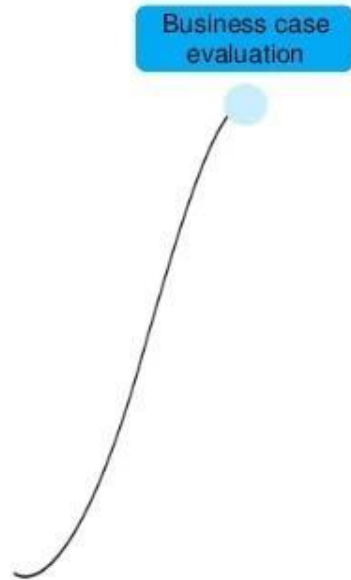
Airline identifies negative tweets and does the needful by upgrading the customer's ticket for the next journey if it is found out to be the airline's fault.

This helps the airline build good customer relations



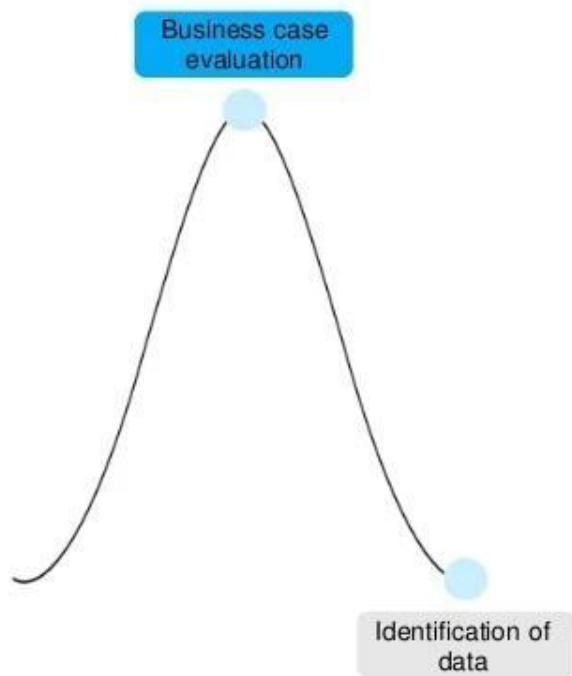
# Lifecycle of big data analytics

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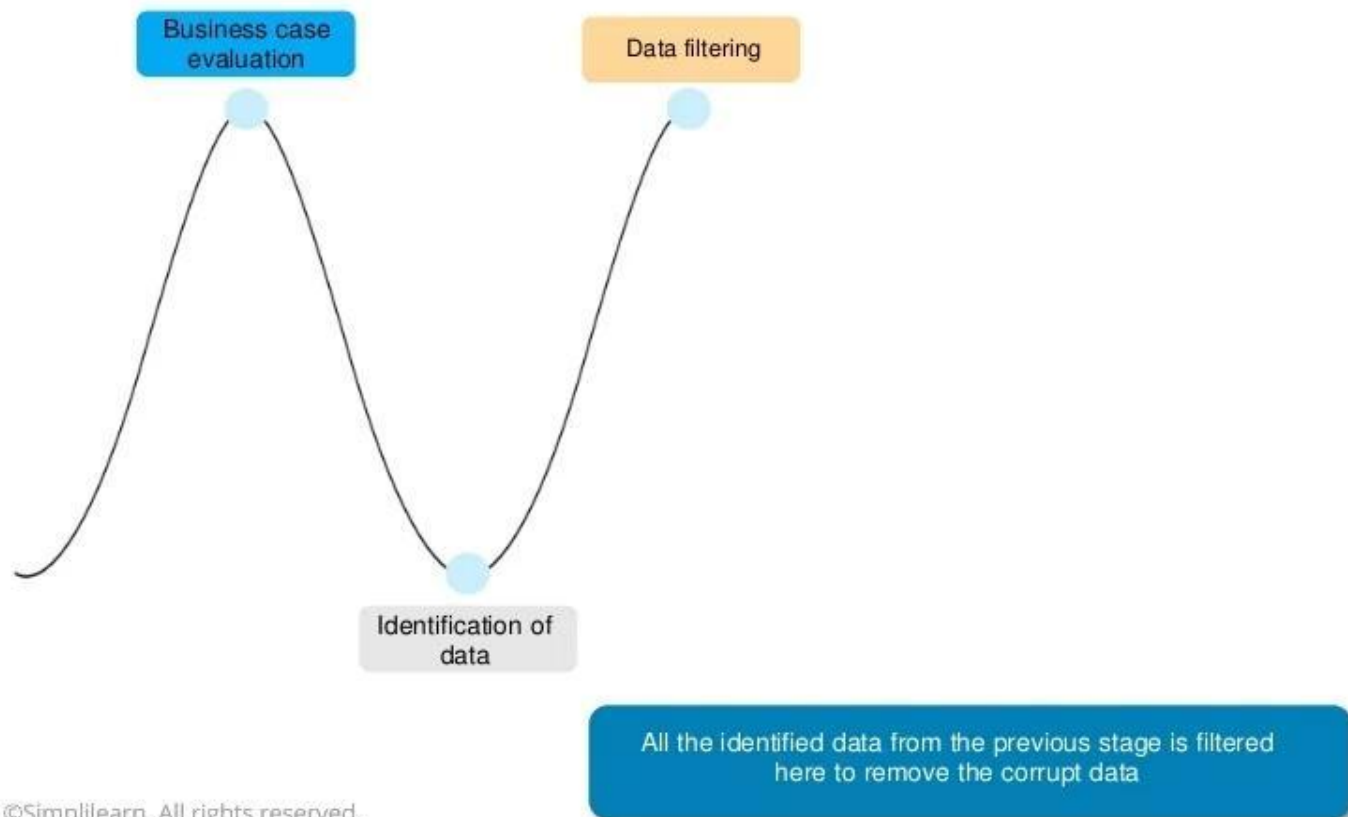
Big data analytics lifecycle begins with a **business case** which defines the reason and goal behind the analysis

# Lifecycle of big data analytics



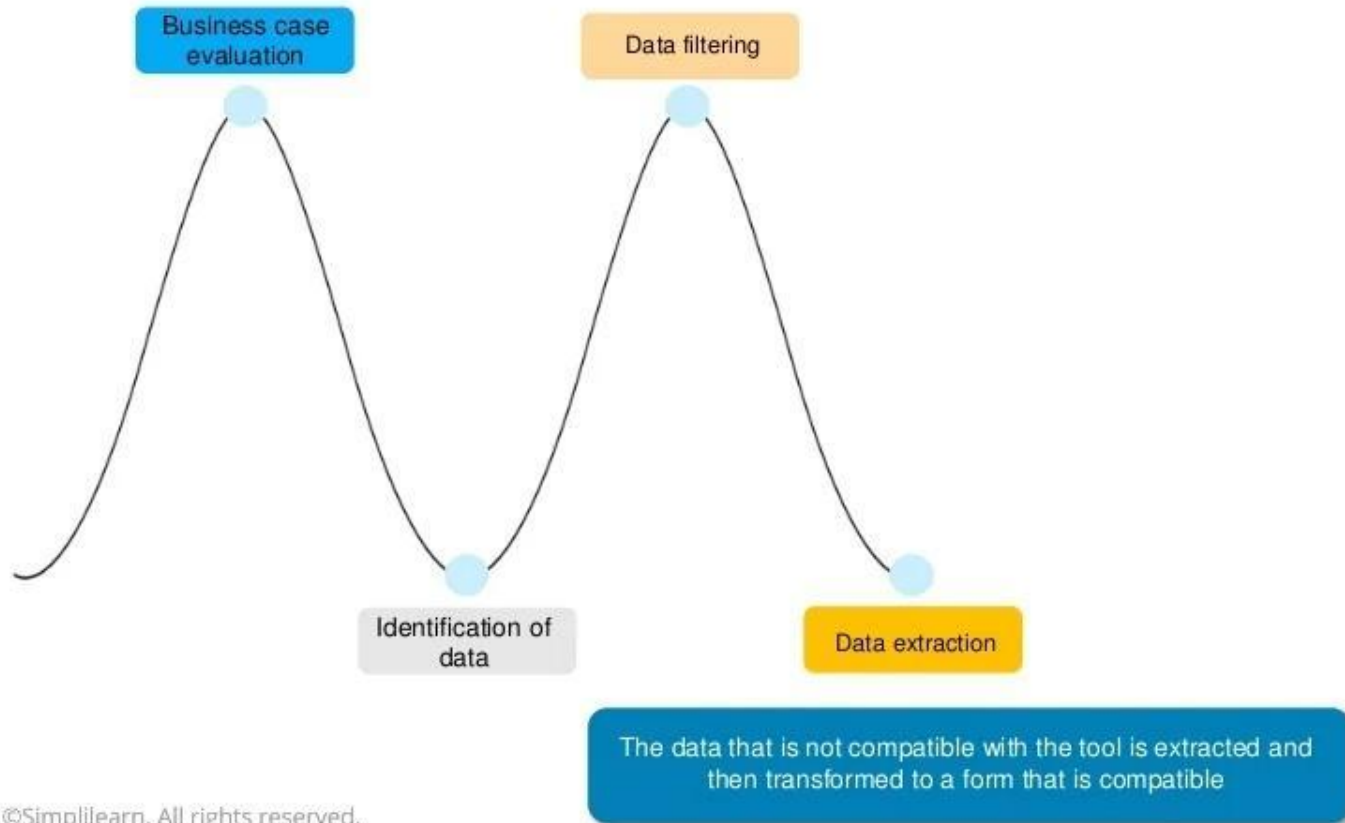
A broad variety of data sources are identified

# Lifecycle of big data analytics

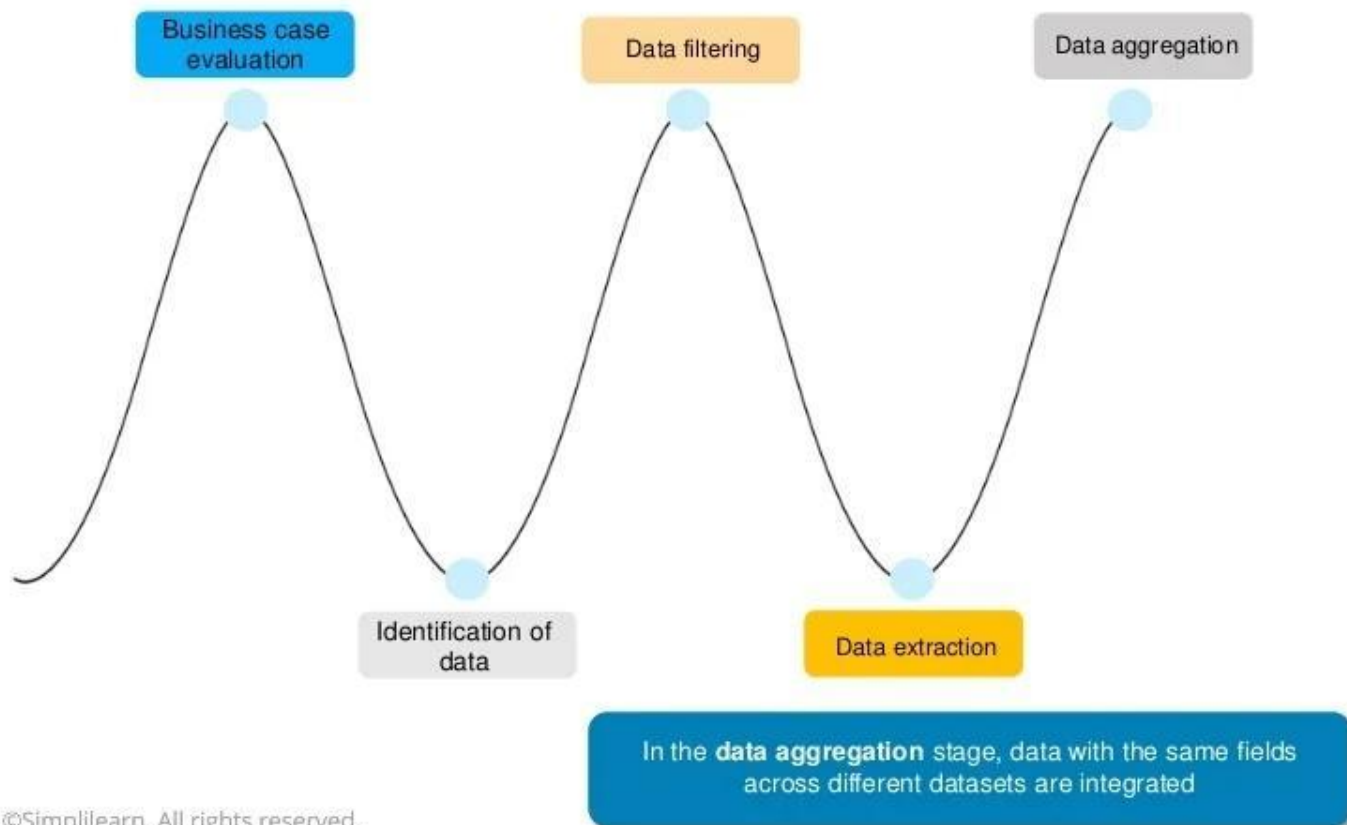




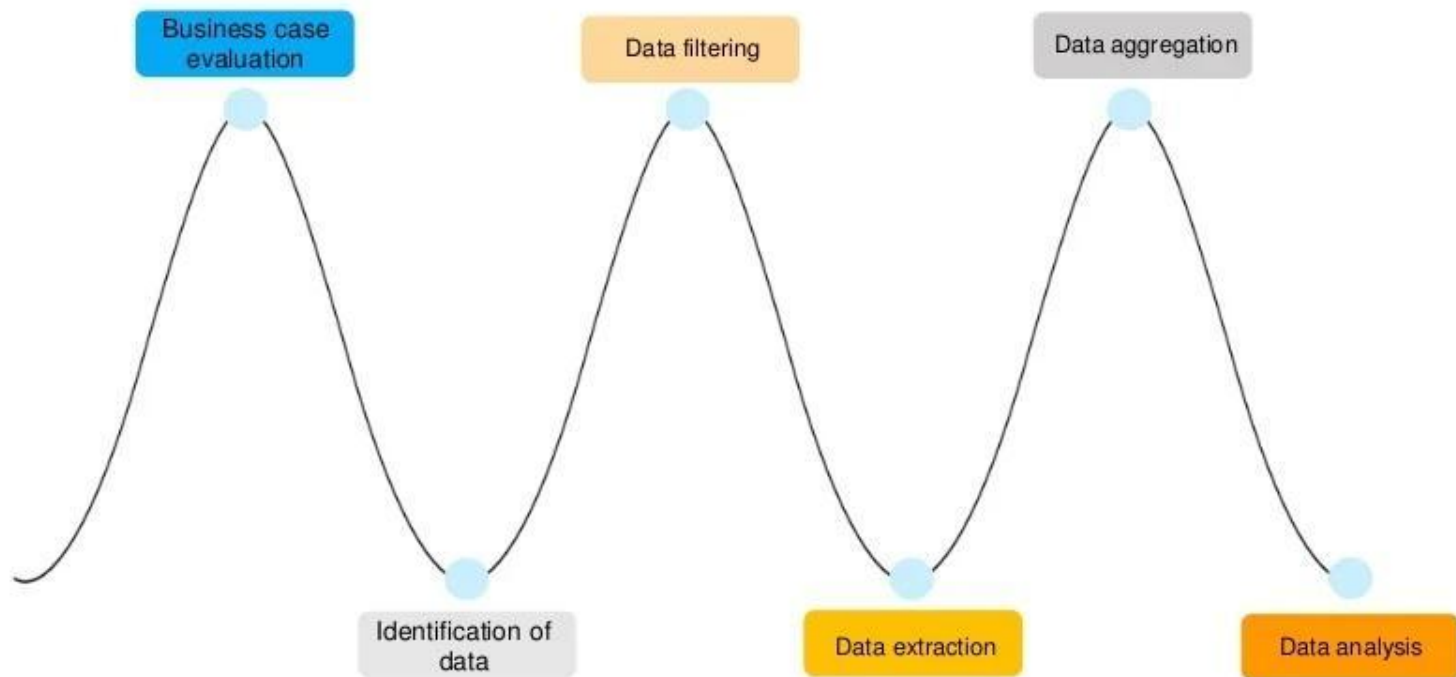
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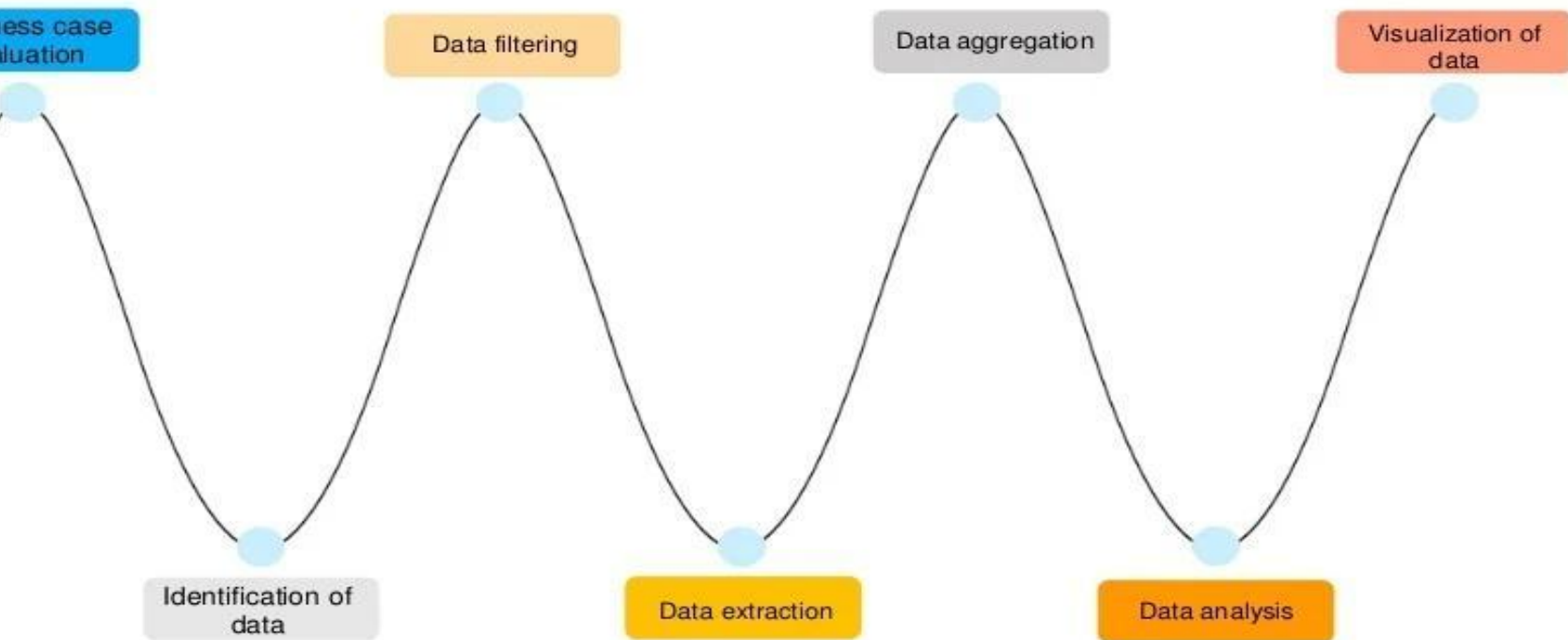


# Lifecycle of big data analytics



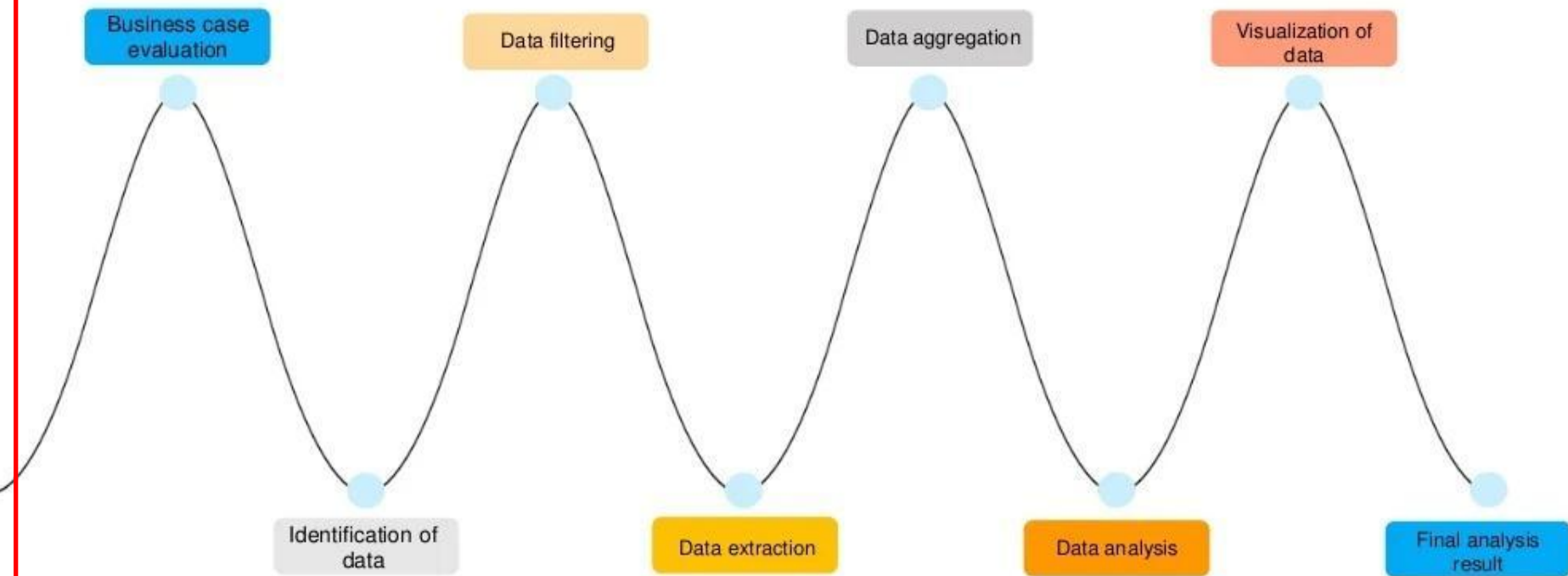
This is the process of evaluating data using analytical and statistical tools to discover useful information

# cycle of big data analytics



**Visualization of data** is done by graphically communicating the analysis results. Tools like Tableau, PowerBI and QlikView are

# Lifecycle of big data analytics



## Types of big data analytics





## Types of big data analytics

Big data analytics

Descriptive analytics

Diagnostic analytics

Predictive analytics

Prescriptive analytics

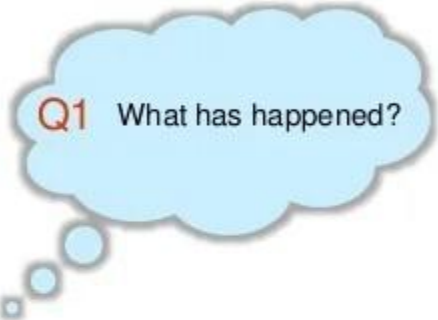
What has happened?

Why did it happen?

What will happen?

What is the solution?

## Types of big data analytics



Q1 What has happened?

Descriptive analytics

It summarizes past data into a form that is interpretable by humans

# Types of big data analytics

Q1 What has happened?

Descriptive analytics

It summarizes past data into a form that is interpretable by humans



The Dow Chemical Company analyzed its past data to increase facility utilization across its office and lab space

Using descriptive analytics, Dow was able to identify under-utilized space. This space consolidation helped the company save nearly USD 4 million annually

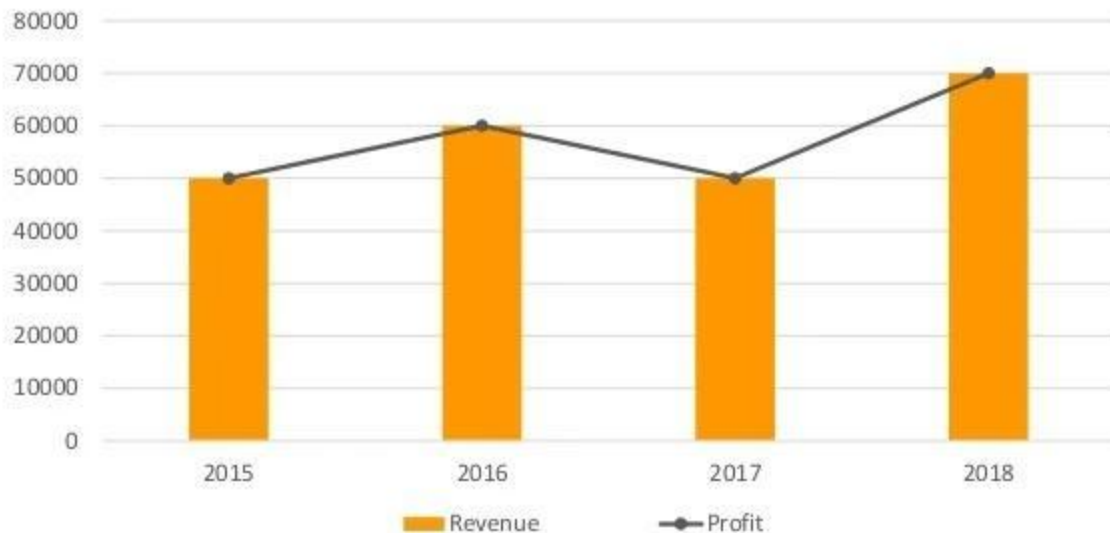
# Types of big data analytics

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A company's profit graph



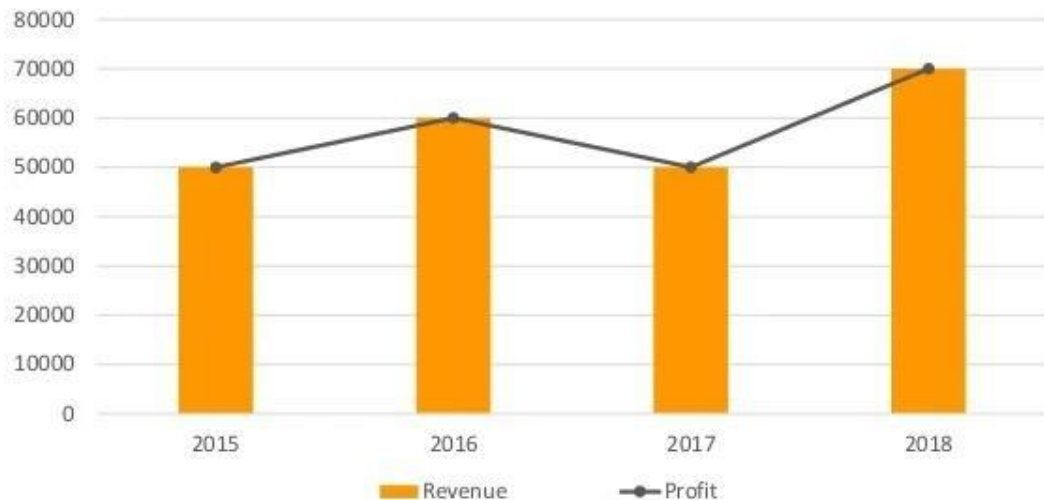
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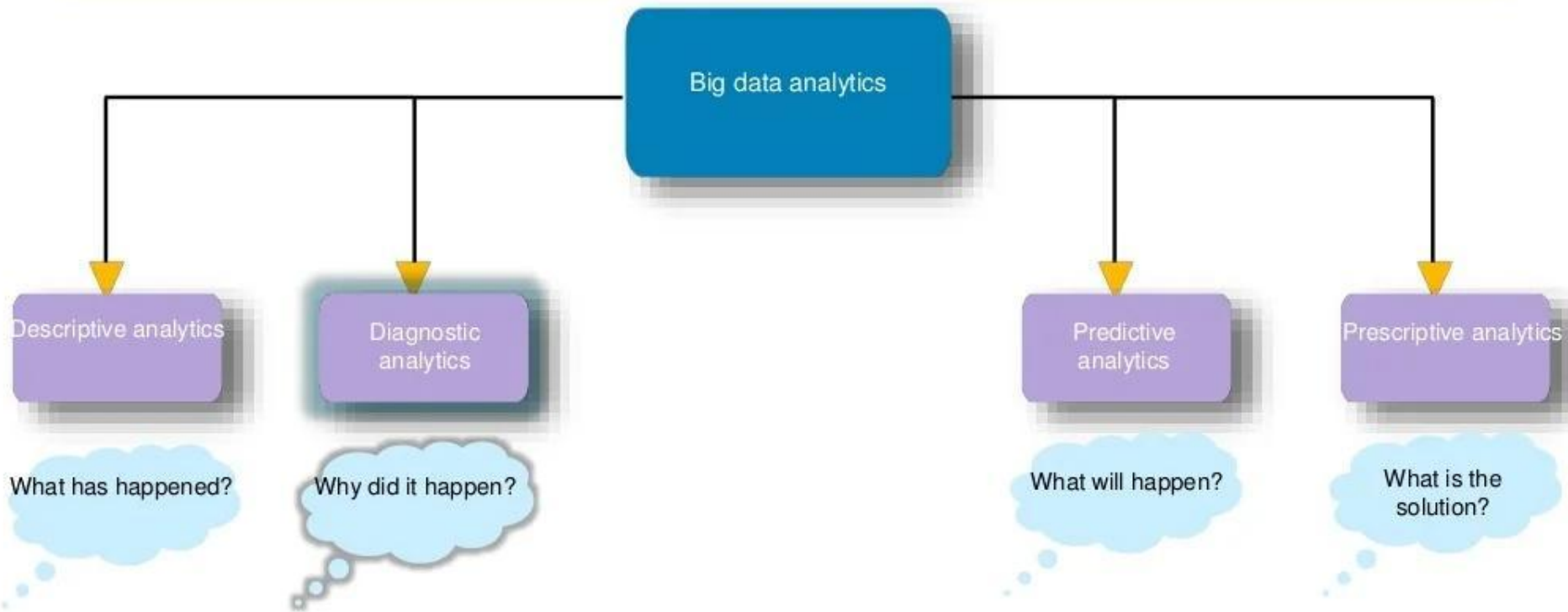
This analytics helps in creating reports like company's revenue, profit, sales and so on



Tabulation of social media metrics like Facebook likes and tweets are done using descriptive analytics



# Types of big data analytics





# Types of big data analytics

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Diagnostic analytics

This analysis is done to understand why a problem has occurred. It looks into the cause of a problem

# Types of big data analytics

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Q2 Why did it happen?

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This analytics is characterized by techniques such as drill-down, data mining and data discovery

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Organizations go for diagnostic analytics as it gives an in-depth insight into a particular problem



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Query tool is one of the tools used for diagnostic analysis. InetSoft's BI query tool is an example

# Types of big data analytics

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## Diagnostic analytics

An ecommerce company's report shows that their sales have reduced although customers are adding products to the cart





# Types of big data analytics

## Diagnostic analytics

Why did we make fewer online sales although we had good marketing?

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# Types of big data analytics

## Diagnostic analytics

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A lot of things could have gone wrong :

- The form didn't load correctly
- The shipping fee was too high
- Not enough payment options available



# Types of big data analytics

## Diagnostic analytics

Why did we make fewer online sales although we had good marketing?

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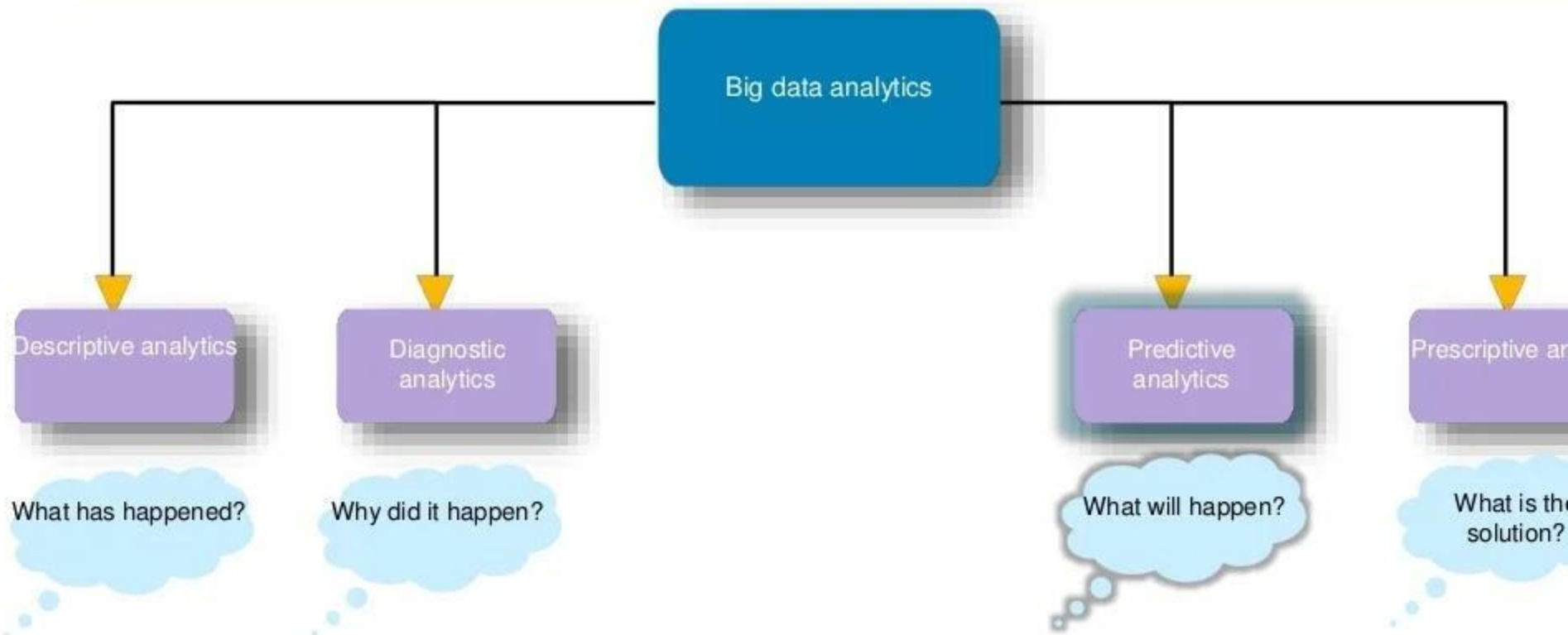
- The form didn't load correctly
- The shipping fee was too high
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Using diagnostic analytics, we can find out the reason why this happened




# Types of big data analytics



## Types of big data analytics

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Q3 What will happen?

Predictive analytics

Looks into the historical and present data to make predictions of the future

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This type of analytics uses data mining, artificial intelligence and machine learning to analyze current data to make predictions about future



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Q3 What will happen?

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This type of analytics uses data mining, artificial intelligence and machine learning to analyze current data to make predictions about future

It works on predicting the customer trends, market trends and so on. This analysis works on probability



# Types of big data analytics

Q3 What will happen?

Predictive analytics

Looks into the historical and present data to make predictions of the future

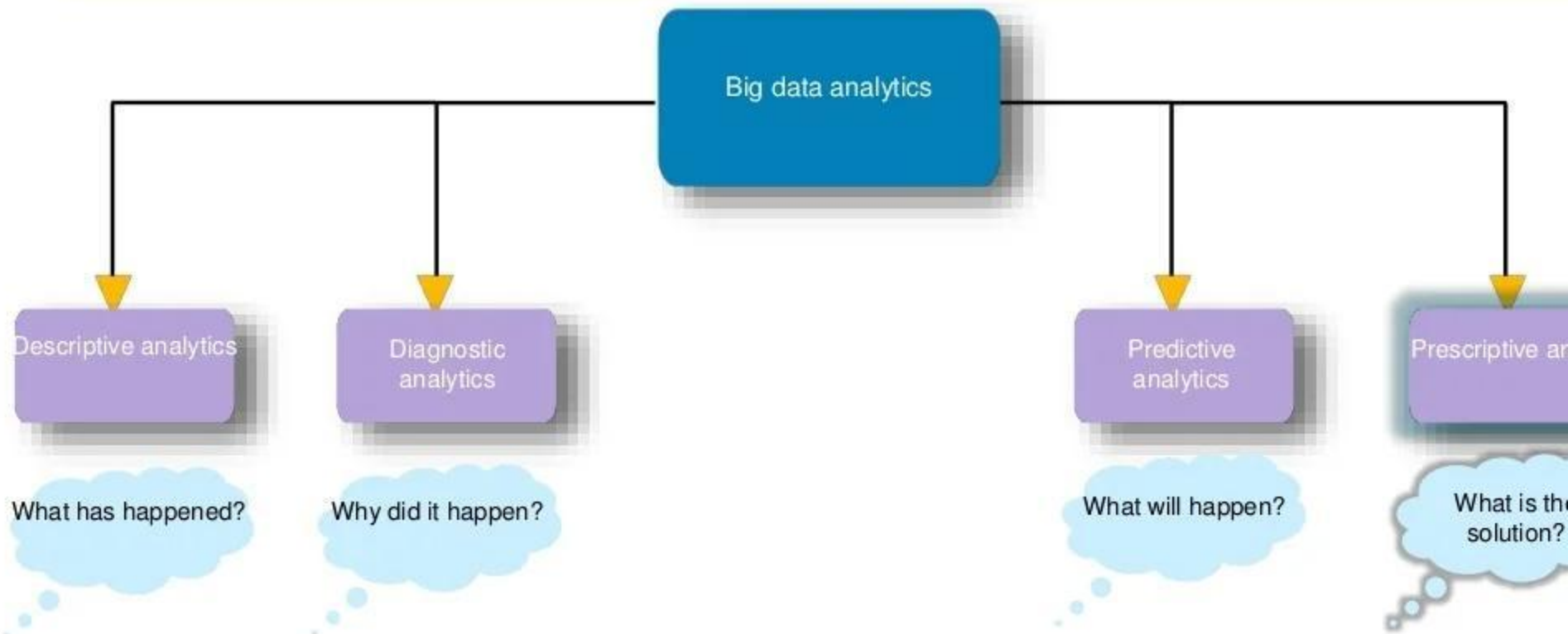
**PayPal**



Paypal determines what kind of precautions they have to take to protect their clients against fraudulent transactions

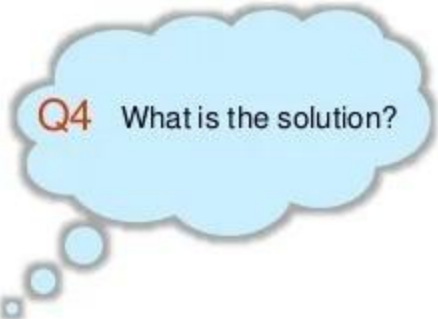
Using predictive analytics, the company uses all the historical payment data, the user behavior data and builds an algorithm which predicts fraudulent activities

# Types of big data analytics



## Types of big data analytics

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Q4 What is the solution?

Prescriptive analytics

This type of analytics prescribes the solution to a particular problem

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Prescriptive analytics works with both descriptive and predictive analytics

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Most of the times prescriptive analytics relies on artificial intelligence and machine learning





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Prescriptive analytics works with both descriptive and predictive analytics

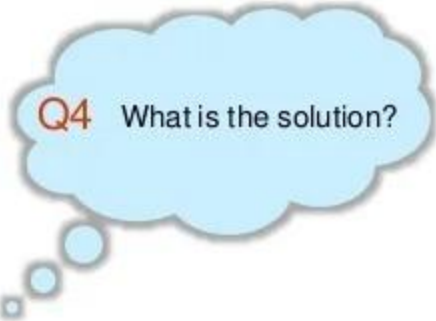
Most of the times prescriptive analytics relies on artificial intelligence and machine learning



Business rules, algorithms, computational modelling procedures are used in prescriptive analytics

# Types of big data analytics

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# Types of big data analytics

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Prescriptive analytics can be used to maximize an airline's profit



# Types of big data analytics

Q4 What is the solution?

Prescriptive analytics

This type of analytics prescribes the solution to a particular problem

Prescriptive analytics can be used to maximize an airline's profit



This analytics is used to build an algorithm that will automatically adjust the flight fares based on numerous factors, including customer demand, weather, destination, holiday seasons and oil prices

Tools used in big data analytics



# Tools used in big data analytics






# Tools used in big data analytics



Hadoop helps in storing and analyzing big data

## Tools used in big data analytics



 **mongoDB.**

MongoDB is used on datasets that change frequently

## Tools used in big data analytics



Talend is a tool used for data integration and management

# Tools used in big data analytics



It is a distributed database that is used for handling chunks of data

## Tools used in big data analytics



Spark

It is used for real time processing and analyzing large amount of data

# Tools used in big data analytics



It is an open source real time computational system



## Tools used in big data analytics



### kafka

It is a distributed streaming platform that is used for fault tolerant storage

Big data application domains



# Big data application domains

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Ecommerce



Predicting customer trends, optimizing price are few of the ways e-commerce uses big data analytics

# Big data application domains



Marketing



Ecommerce



Big data analytics helps in driving high ROI marketing campaigns which result in better sales

# Big data application domains



Education



Marketing



Ecommerce



New courses are developed based on the market requirement using big data analytics

# Big data application domains



With the help of a patient's medical history, big data analytics is used to predict how likely they are to have health issues



# Big data application domains



Education

Marketing

Ecommerce

Healthcare

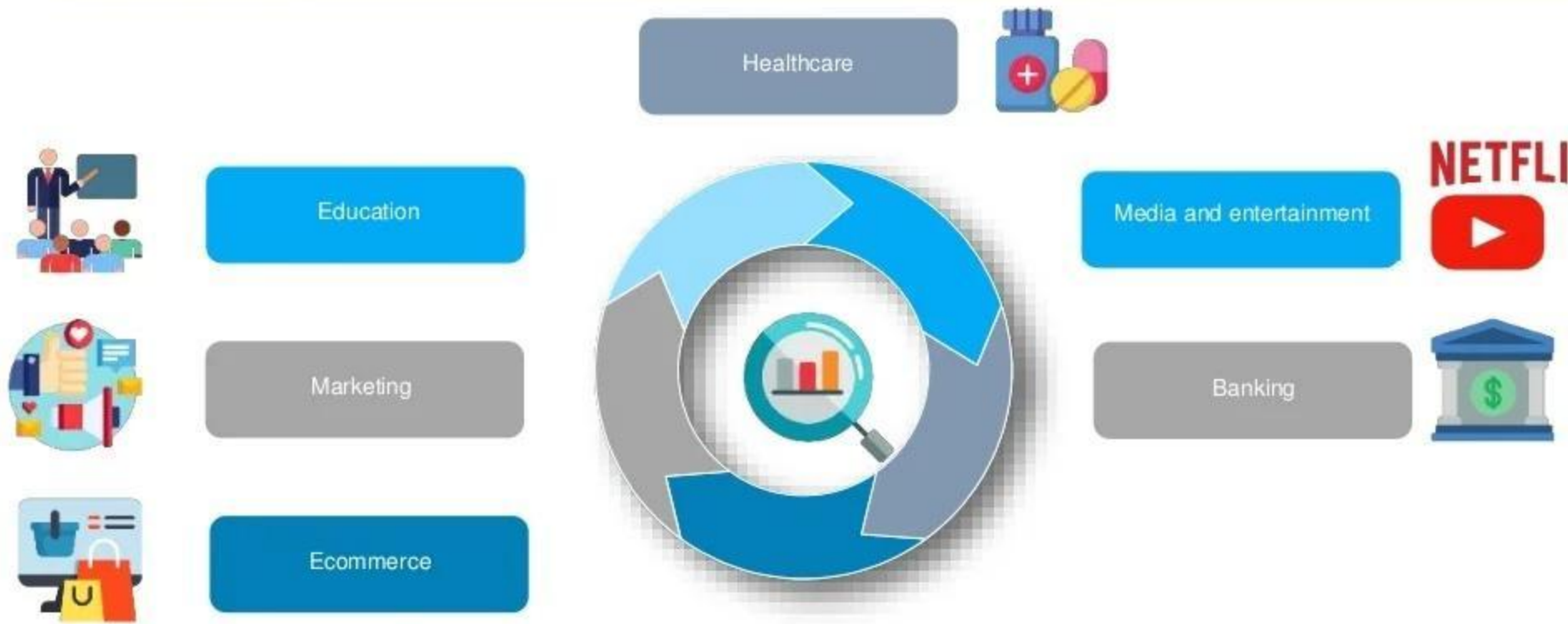


Media and entertainment



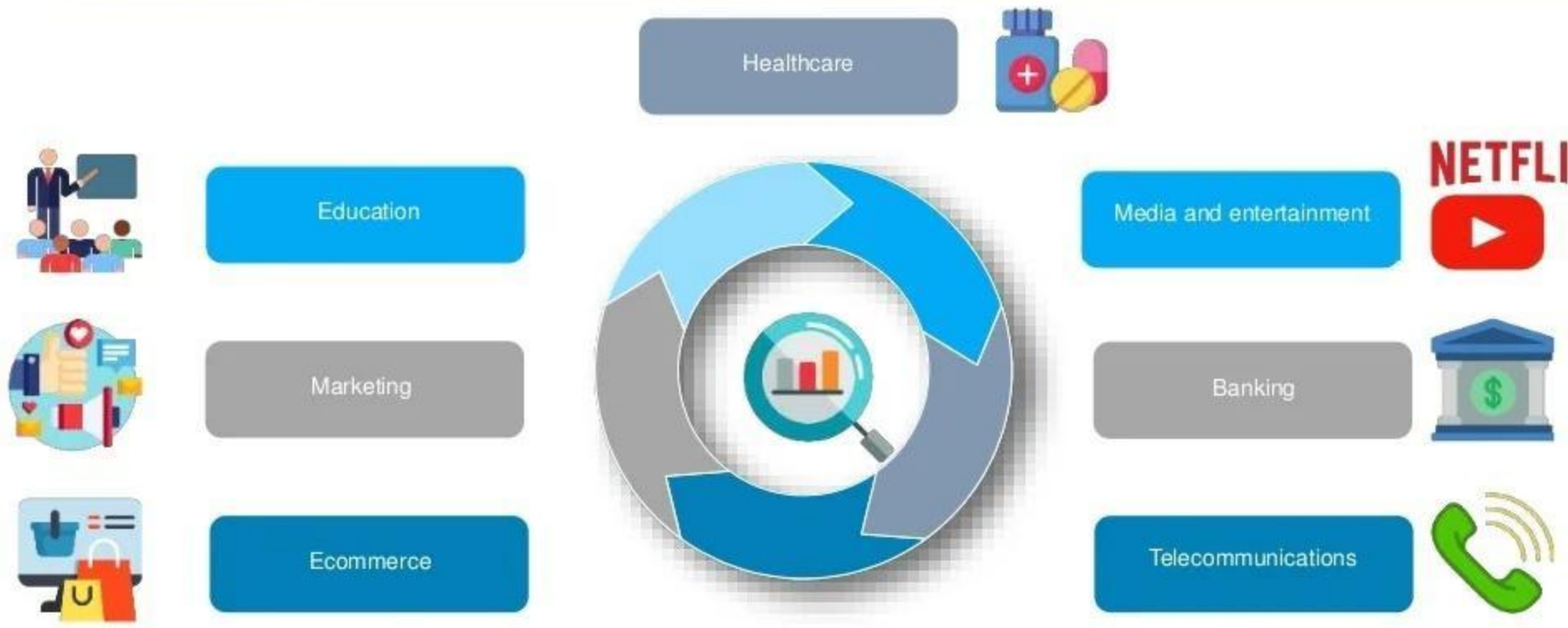
Big data analytics is used to understand the demand of shows, movies, songs and so on to deliver a personalized recommendation

# Big data application domains



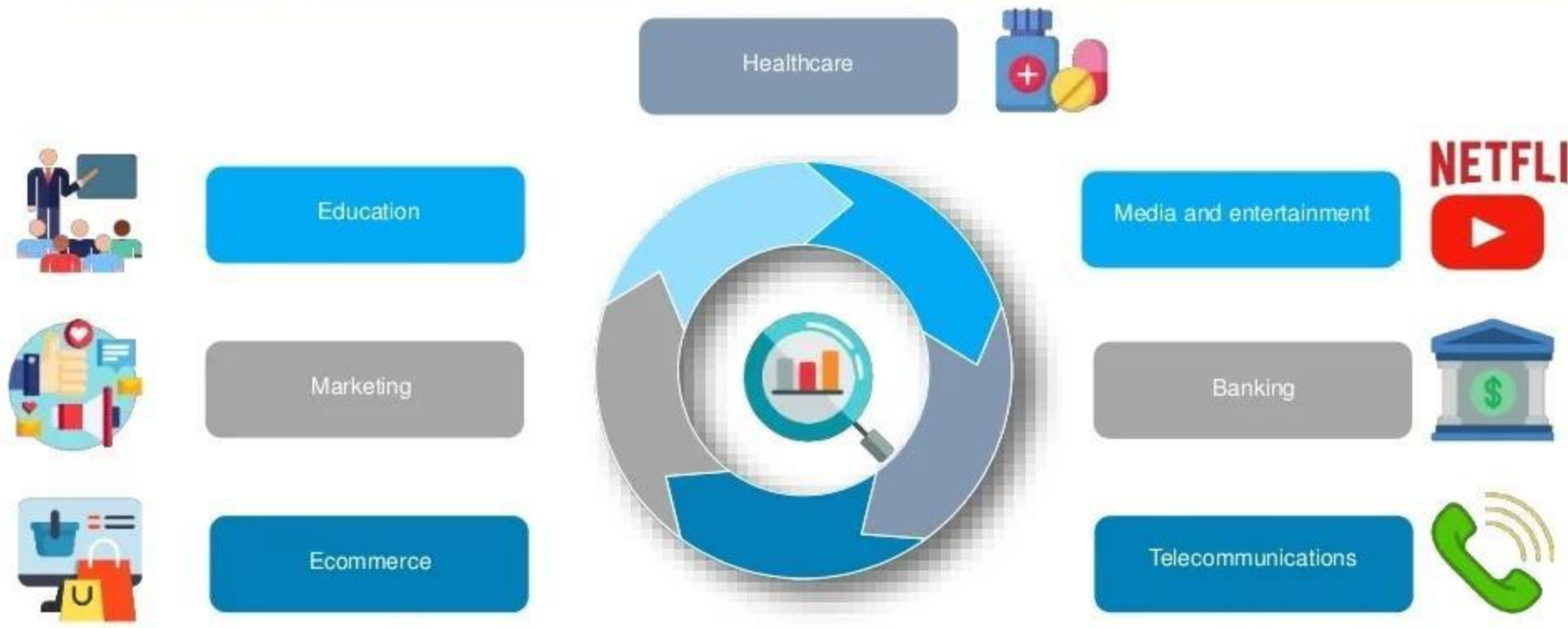
Customer income and spend patterns help in predicting the customer likelihood for choosing various banking offers like loans, credit card schemes and so on

# Big data application domains



Big data analytics is used to forecast network capacity and improve customer experience in the field of telecommunication

# Big data application domains



Big data analytics is used to forecast network capacity and improve customer experience in the field of telecommunication

# Big data application domains



# Big data application domains





# Big data application domains





# Key Takeaways



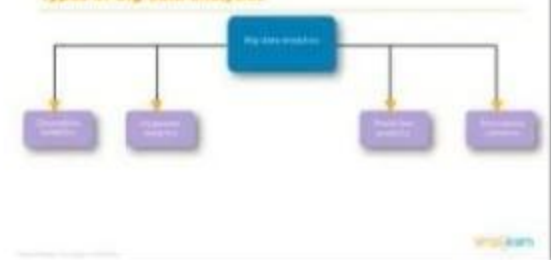
## What is big data?



## Lifecycle of big data analytics



## Types of big data analytics



## Tools used in big data analytics



## Big data application domains





**Thank You**