Big Data Analytics
Lecture 2

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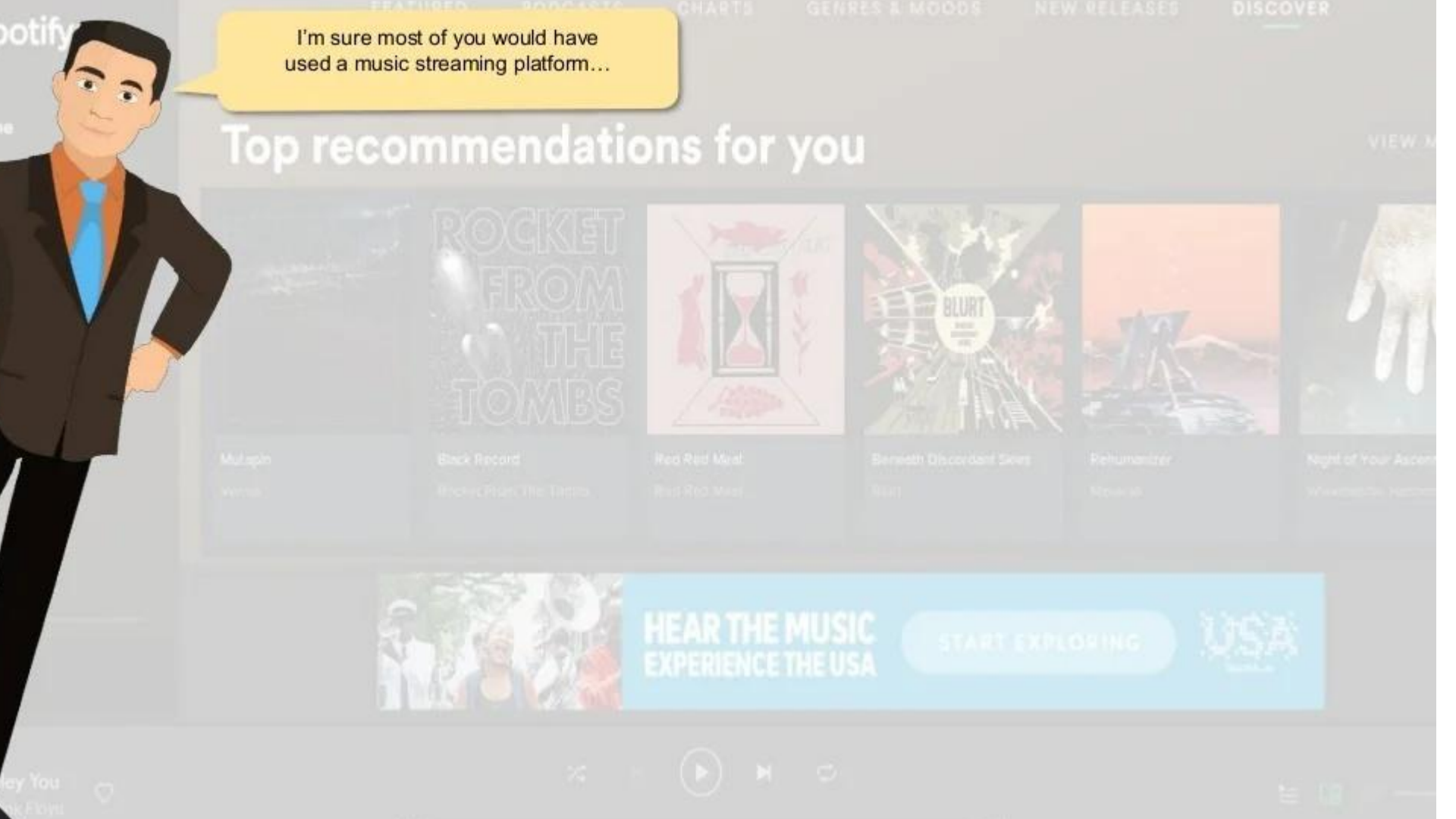
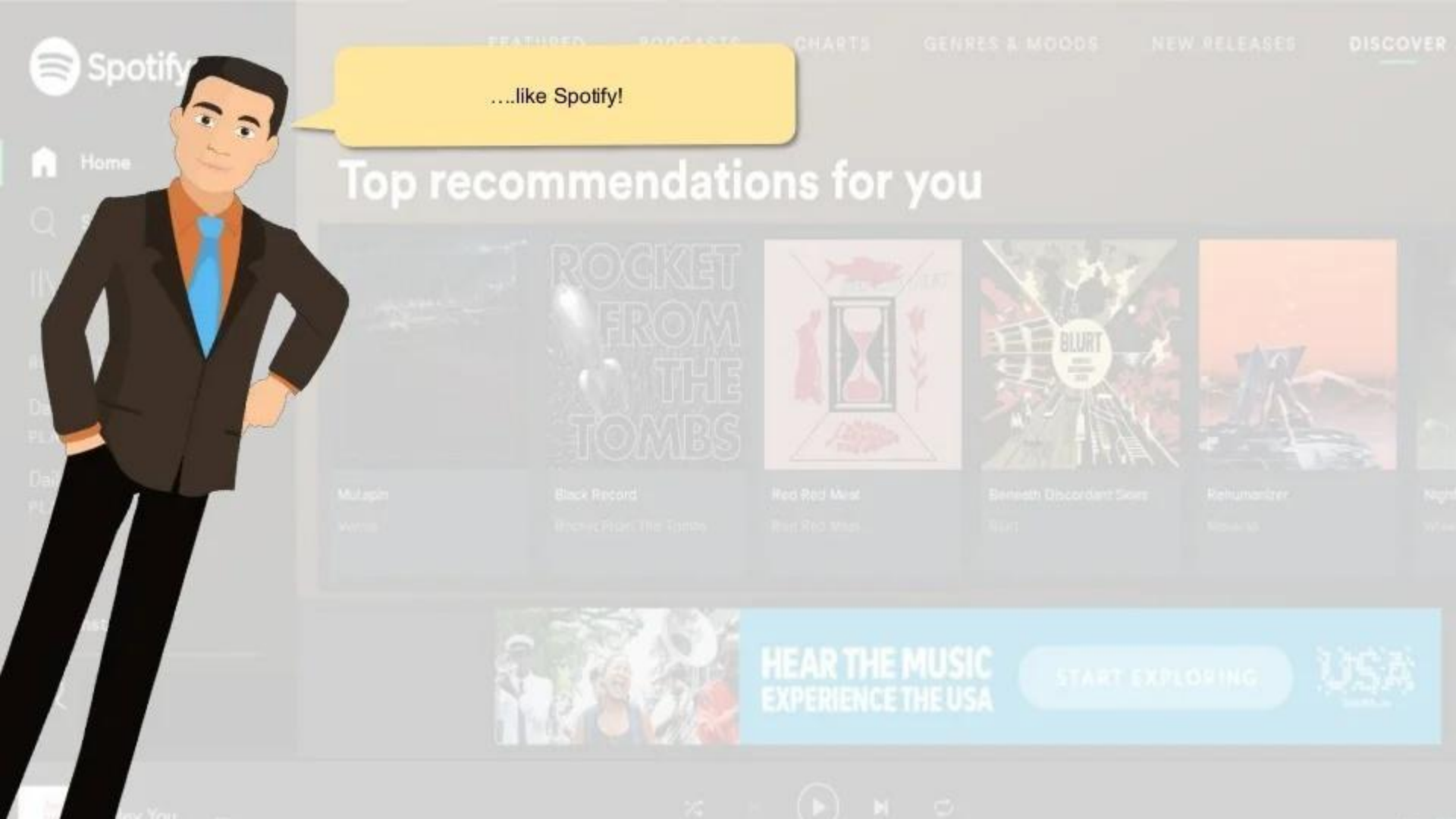
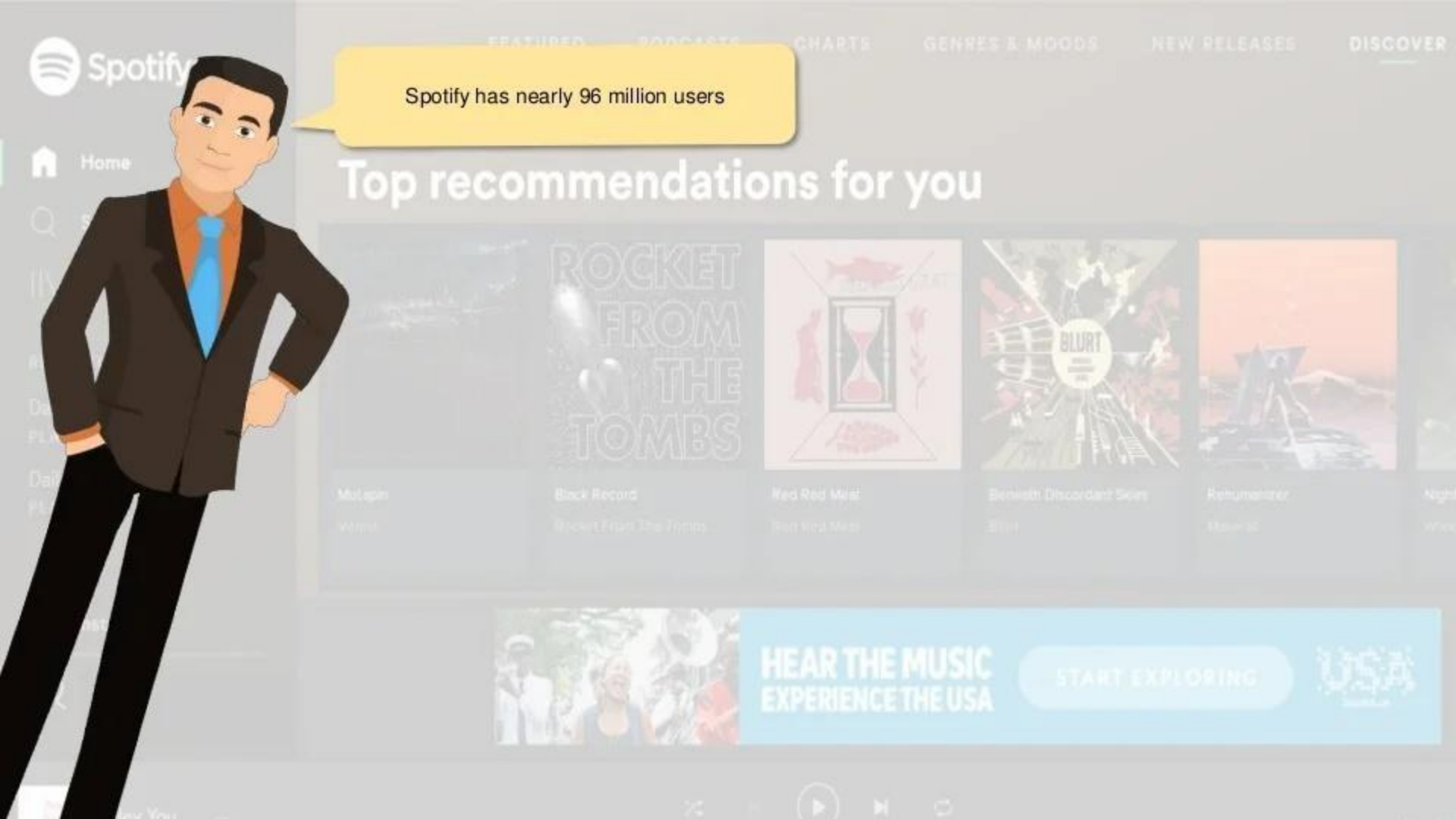
Why big data analytics?

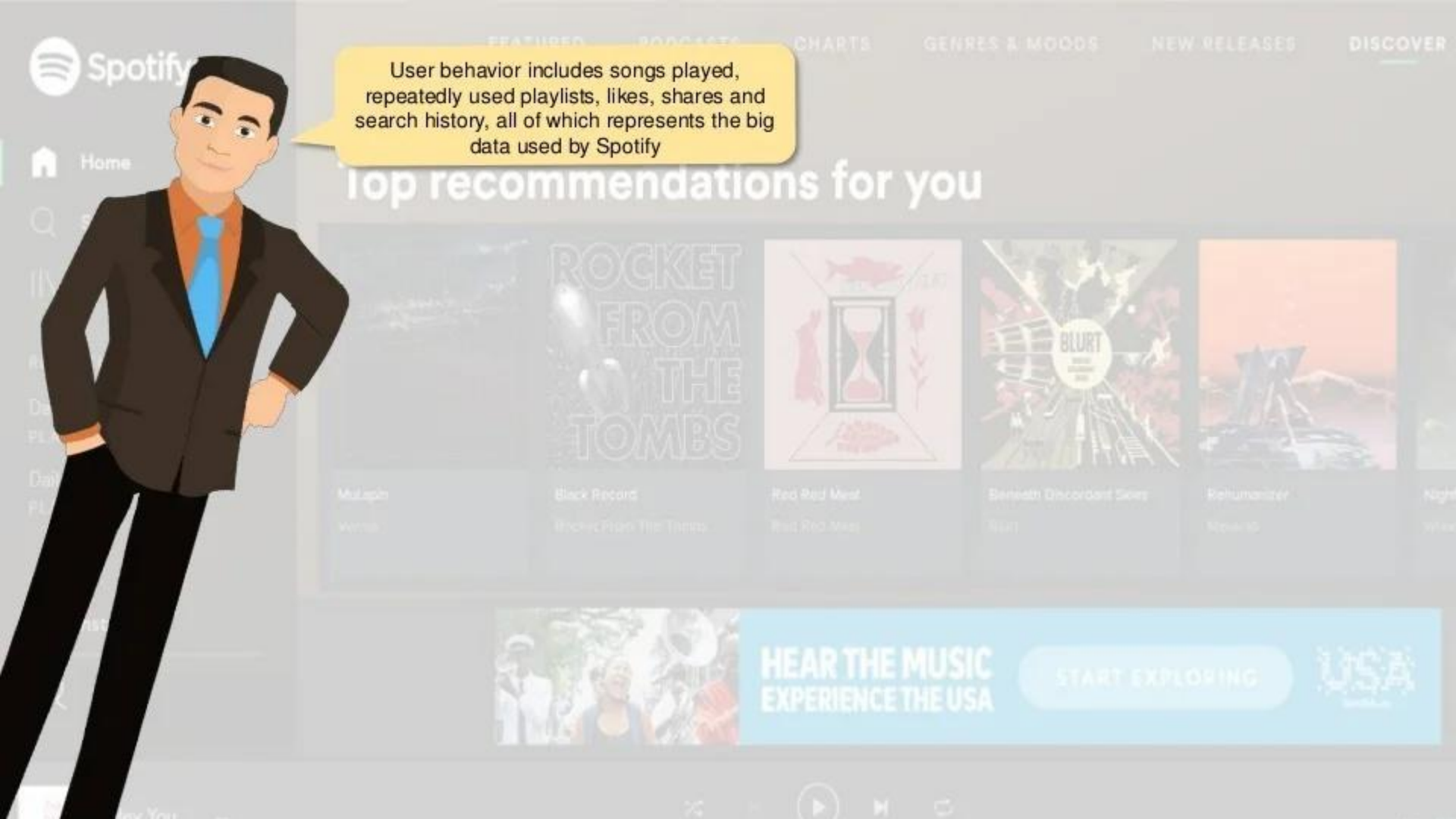
What's in it for you?

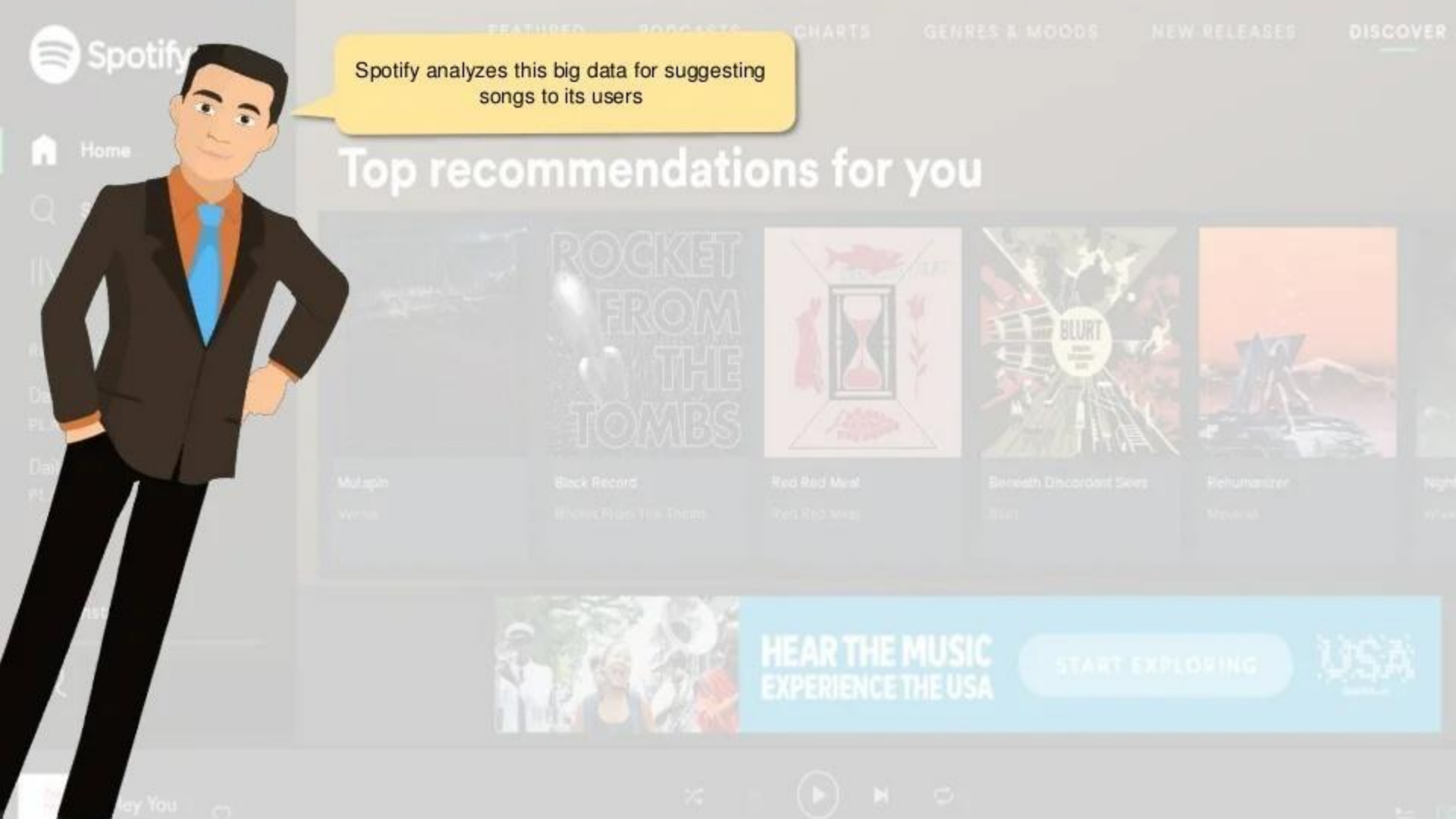
1. Why big data analytics?
2. What is big data analytics?
3. Lifecycle of big data analytics
4. Types of big data analytics
5. Tools used in big data analytics
6. Big data application domains


I'm sure most of you would have used a music streaming platform…
Top recommendations for you
HEAR THE MUSIC
EXPERIENCE THE USA


Spotify
FEATURED
PODCASTS
CHARTS
GENRES & MOODS
NEW RELEASES
DISCOVER
Home
….like Spotify!
Top recommendations for you
ROCKET FROM THE TOMBS
BLURT
Black Record
Red Red Meat
Beneath Discordant Skies
Rehumanizer
HEAR THE MUSIC
EXPERIENCE THE USA
START EXPLORING
USA


Spotify has nearly 96 million users
Top recommendations for you
HEAR THE MUSIC
EXPERIENCE THE USA


Spotify
FEATURED
PODCASTS
CHARTS
GENRES & MOODS
NEW RELEASES
DISCOVER
Home
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
ROCKET FROM THE TOMBS
BLURT
MuLapin
Black Record
Red Red Meat
Beneath Discordant Skies
Rehumanizer
HEAR THE MUSIC
EXPERIENCE THE USA
START EXPLORING
USA


Spotify analyzes this big data for suggesting songs to its users
Top recommendations for you
HEAR THE MUSIC
EXPERIENCE THE USA

Spotify

FEATURED PODCASTS CHARTS GENRES & MOODS NEW RELEASES DISCOVER

Home

Search

Your Library

RECENTLY PLAYED

Daily Mix 2
PLAYLIST

Daily Mix 1
PLAYLIST

Install App

Top recommendations for you

Mul.apin

Verma

Black Record

Rocket From The Tombs

Red Red Meat

Red Red Meat

Beneath Discordant Skies

Blurt

Rehumanizer

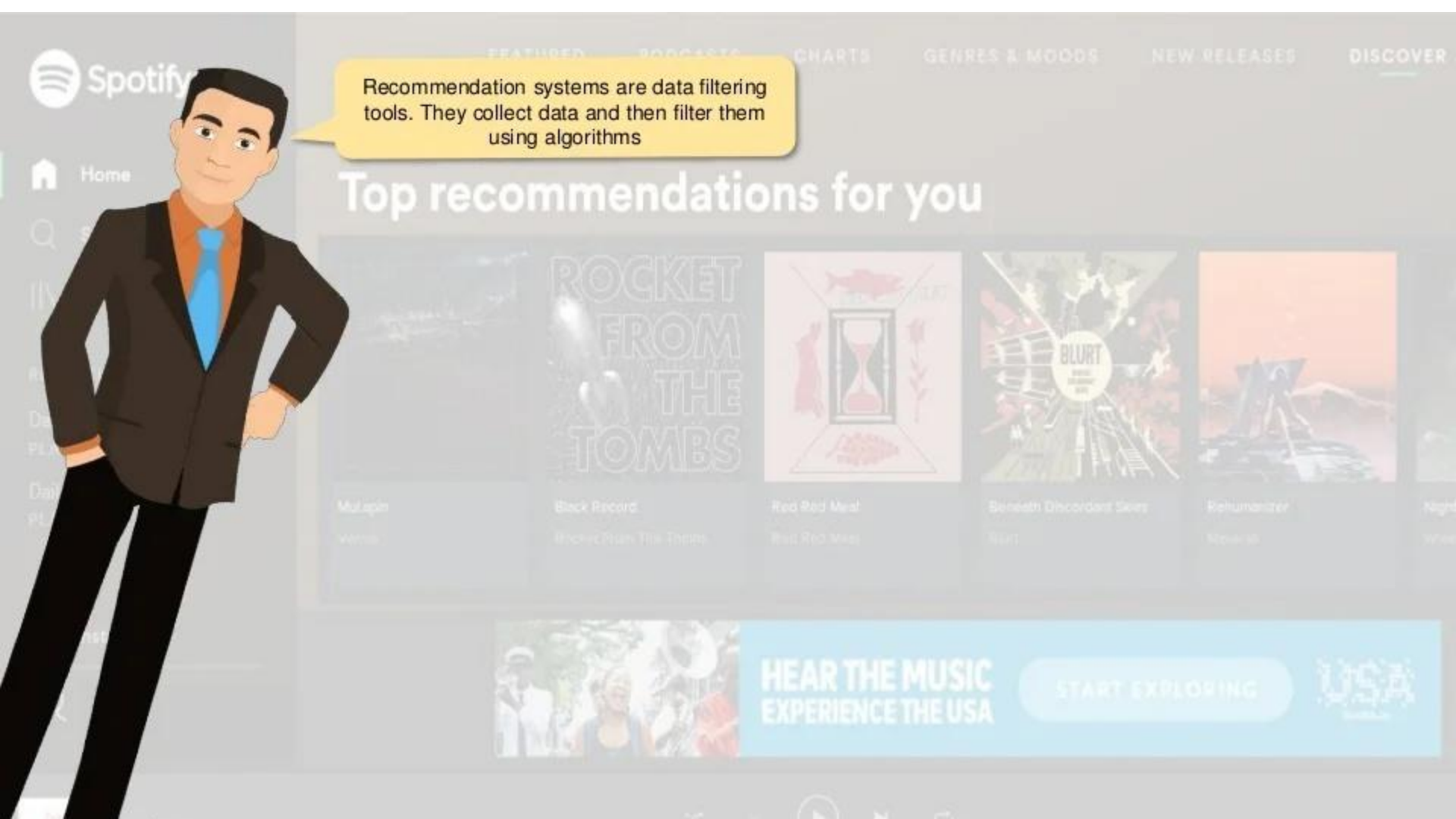
Maserati

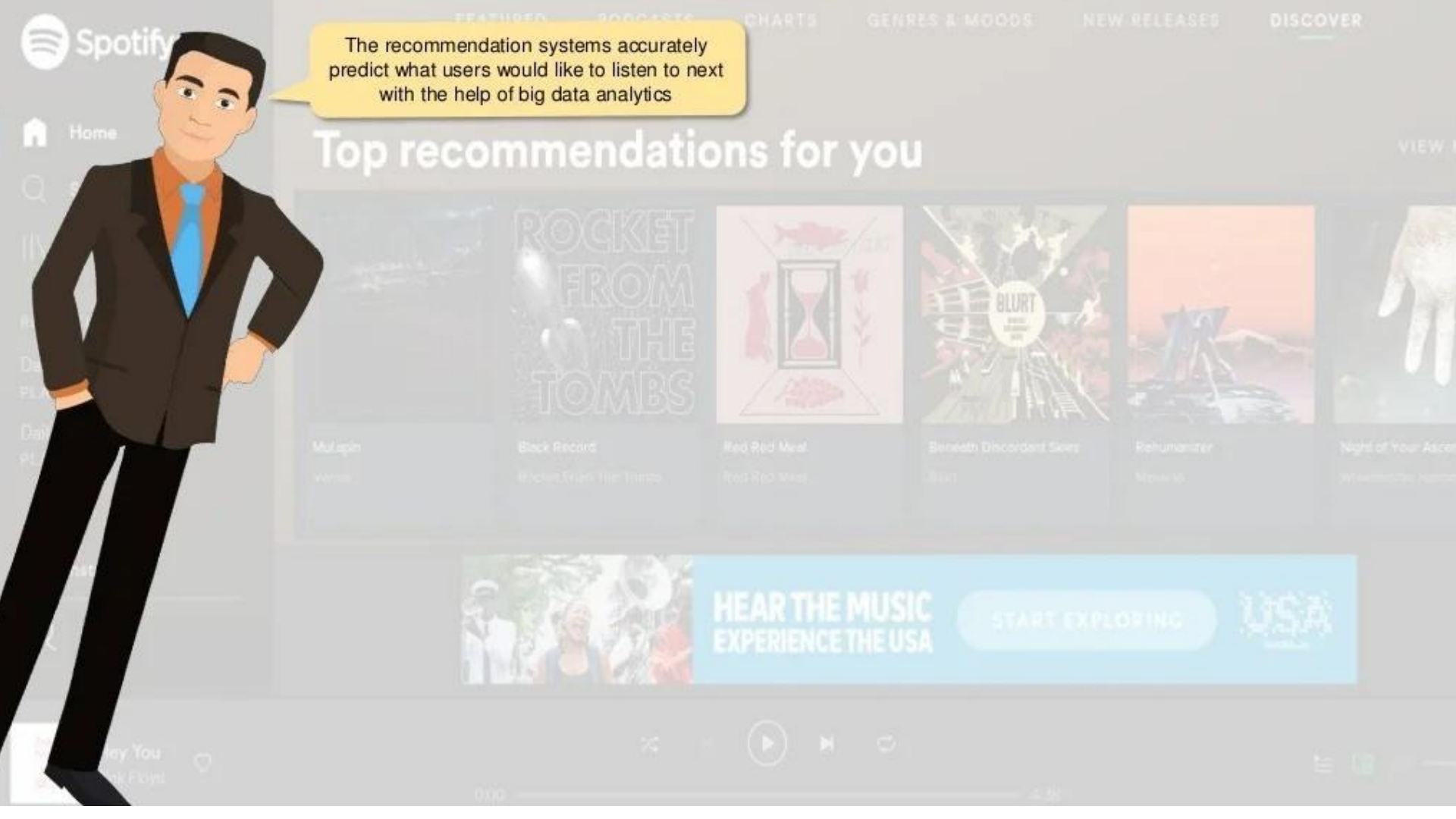
HEAR THE MUSIC
EXPERIENCE THE USA

START EXPLORING

USA
GoUSA.in

Hey You


Spotify
Home
FEATURED
PODCASTS
CHARTS
GENRES & MOODS
NEW RELEASES
DISCOVER
Recommendation systems are data filtering tools. They collect data and then filter them using algorithms
Top recommendations for you
ROCKET FROM THE TOMBS
BLURT
HEAR THE MUSIC
EXPERIENCE THE USA
START EXPLORING
USA


The recommendation systems accurately predict what users would like to listen to next with the help of big data analytics
Spotify
Home
FEATURED
PODCASTS
CHARTS
GENRES & MOODS
NEW RELEASES
DISCOVER
Top recommendations for you
VIEW
ROCKET FROM THE TOMBS
BLURT
Mulapin
Black Record
Red Red Meat
Beneath Discordant Skies
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HEAR THE MUSIC
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START EXPLORING
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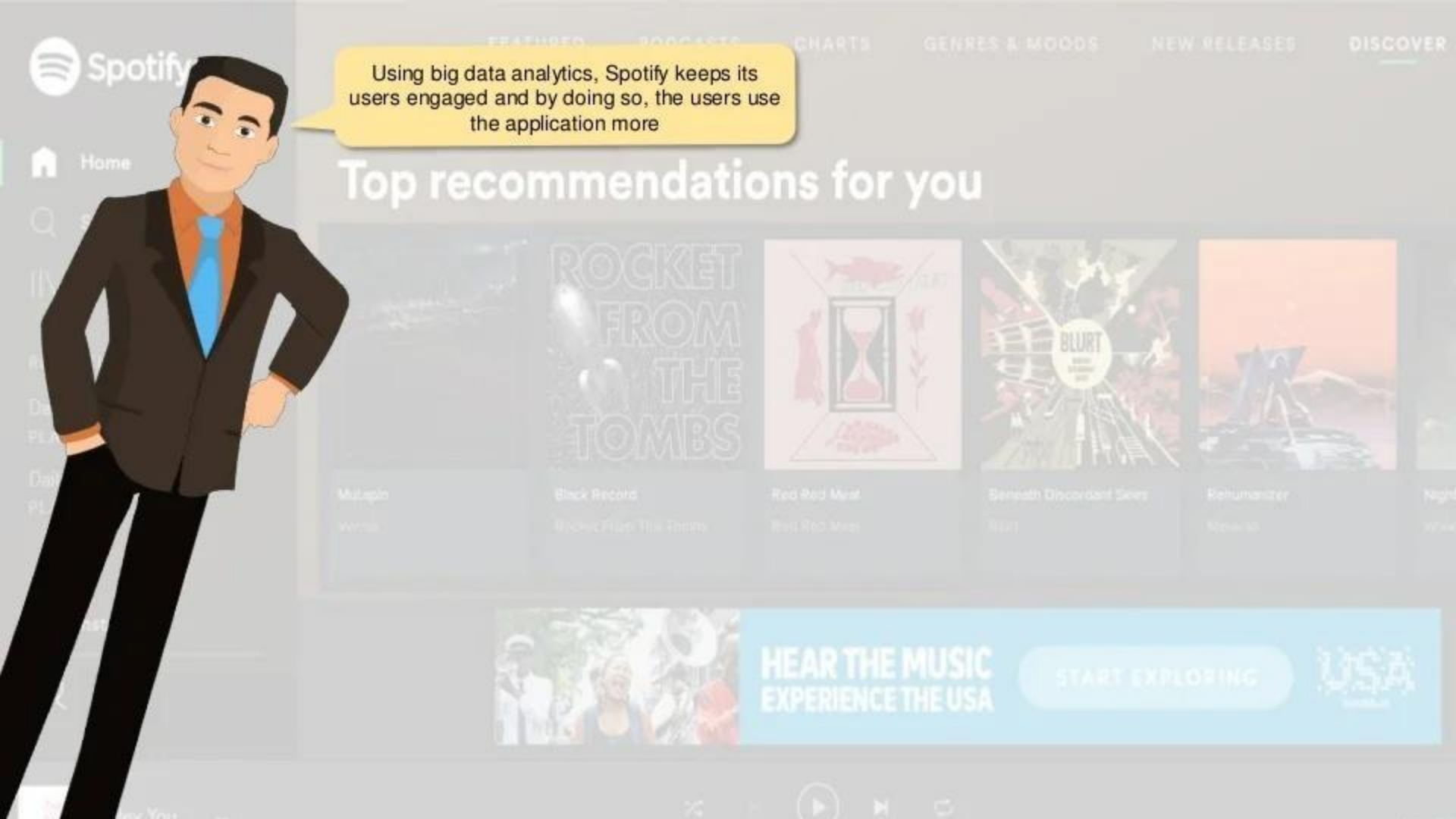
Using big data analytics, Spotify keeps its users engaged and by doing so, the users use the application more
Spotify
Home
FEATURED
PODCASTS
CHARTS
GENRES & MOODS
NEW RELEASES
DISCOVER
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ROCKET FROM THE TOMBS
BLURT
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HEAR THE MUSIC
EXPERIENCE THE USA
START EXPLORING
USA

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

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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

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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

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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

What is big data analytics?

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

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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

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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

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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

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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

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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

TM

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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

TM

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

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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 is used to improve customer experience

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

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What is big data analytics?

Delta airline uses analysis to improve customer experiences

DELTA

What is big data analytics?

Delta airline uses analysis to improve customer experiences

DELTA

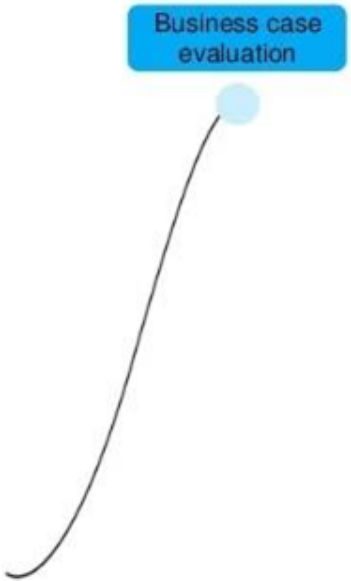
They monitor tweets to find out their customers' experience regarding the journey, delays and so on

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

Lifecycle of big data analytics



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

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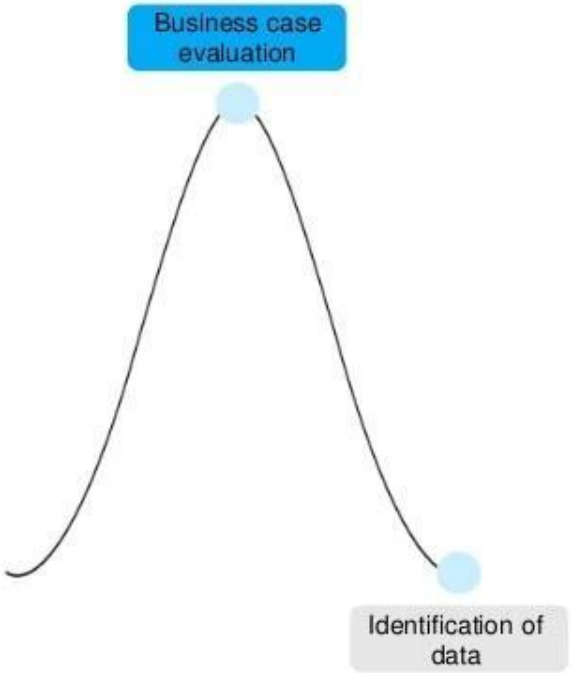
Lifecycle of big data analytics



A broad variety of data sources are identified

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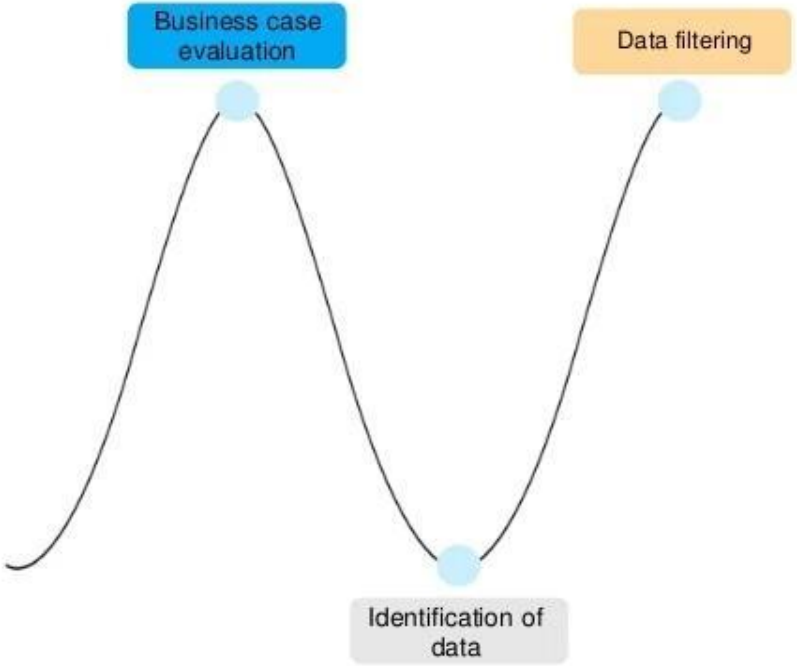
Lifecycle of big data analytics



All the identified data from the previous stage is filtered here to remove the corrupt data

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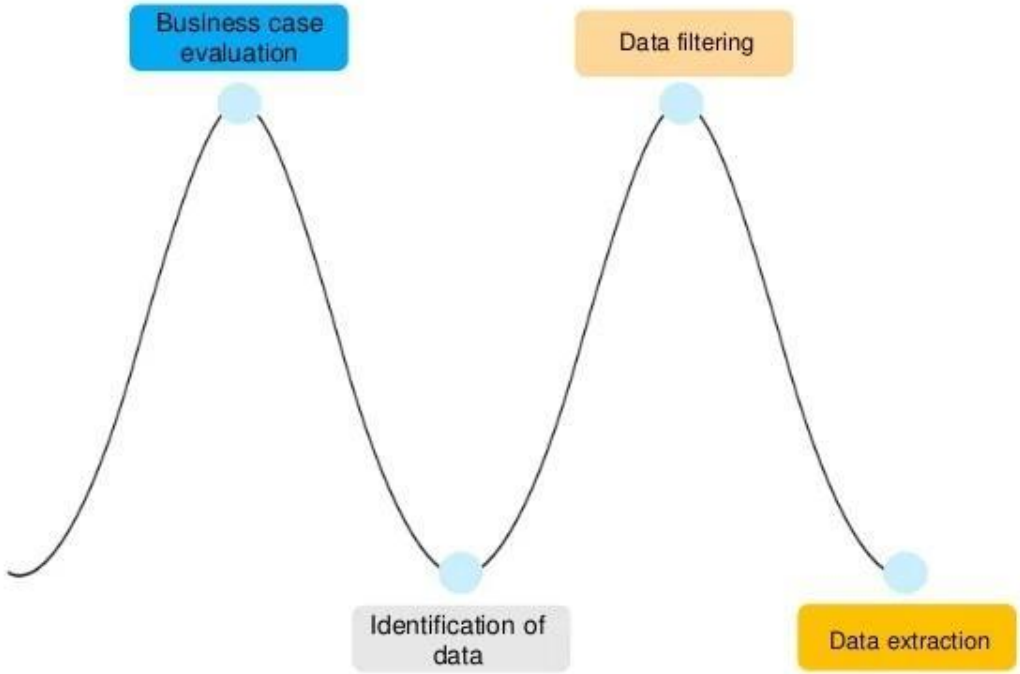
Lifecycle of big data analytics



The data that is not compatible with the tool is extracted and then transformed to a form that is compatible

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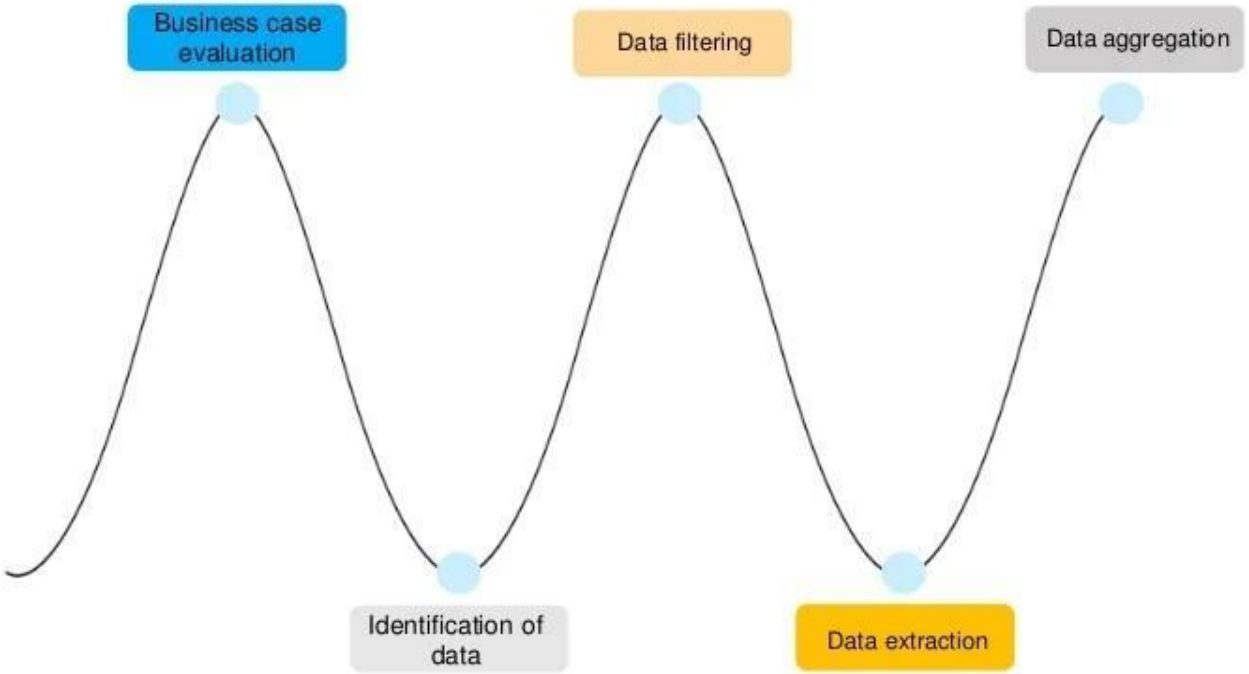
Lifecycle of big data analytics



In the **data aggregation** stage, data with the same fields across different datasets are integrated

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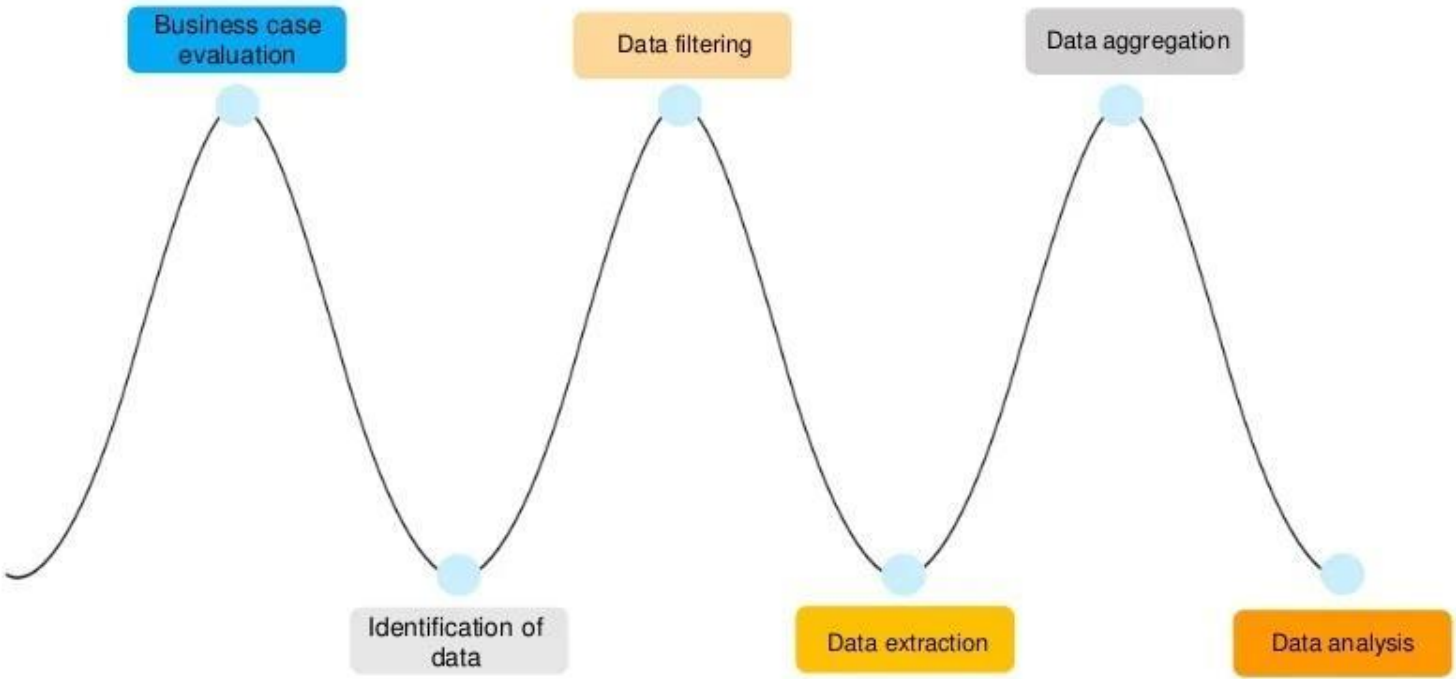
Lifecycle of big data analytics



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

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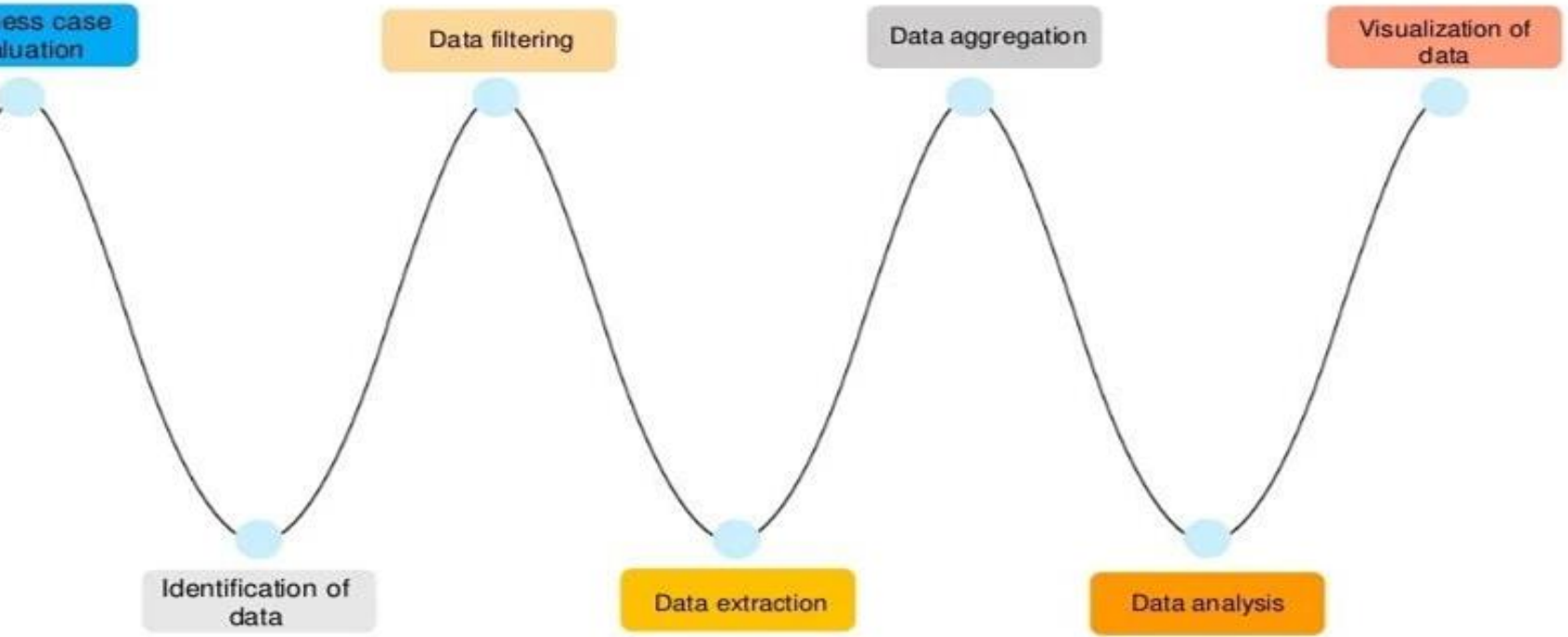
ycle of big data analytics



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

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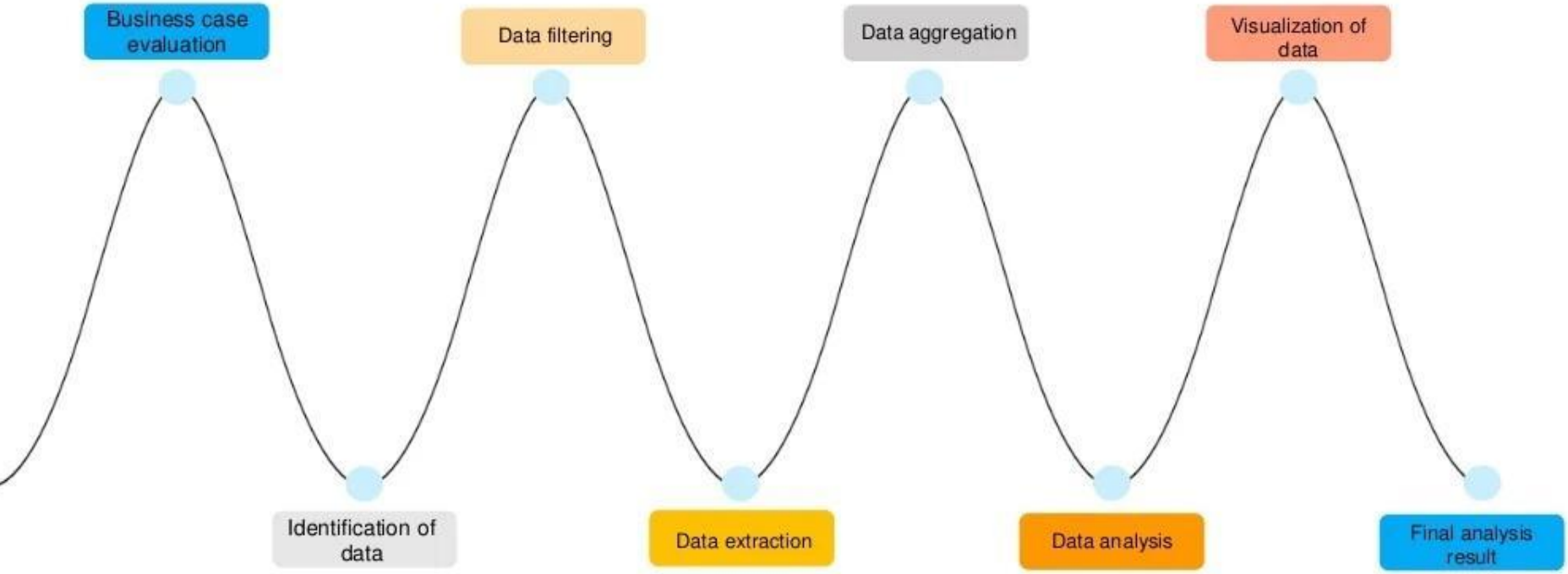
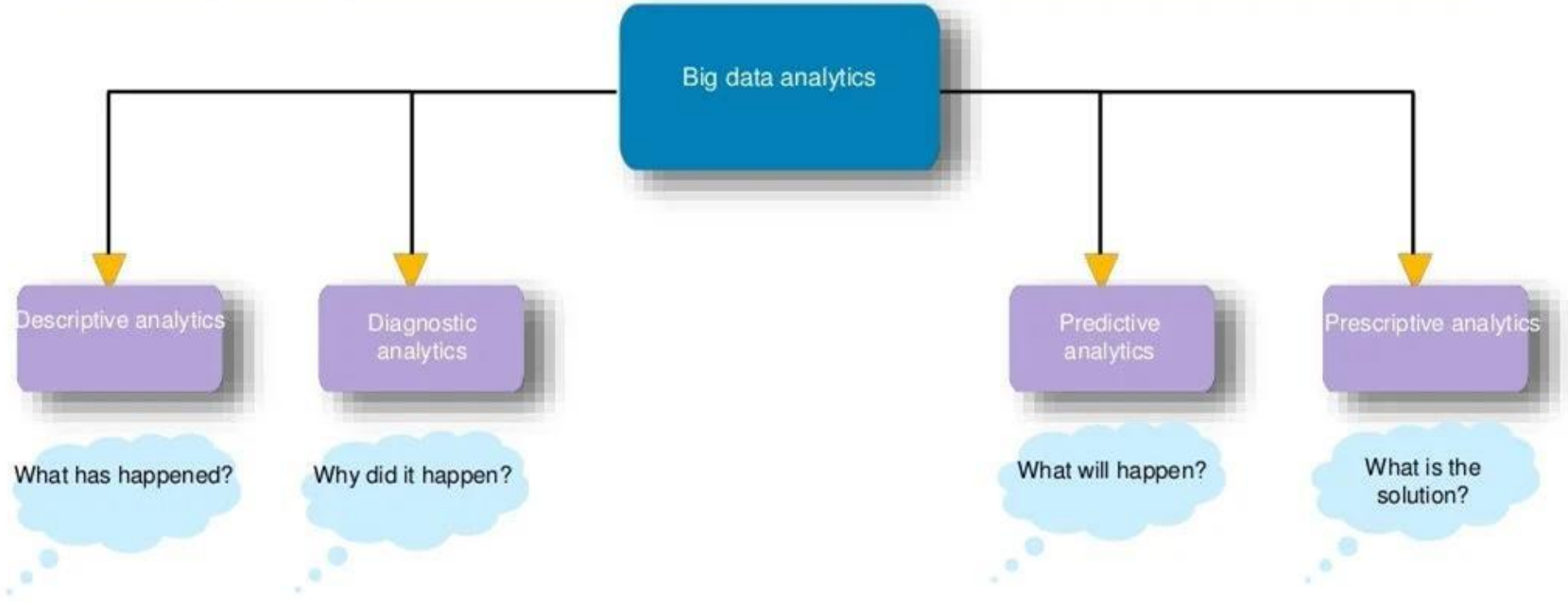
Lifecycle of big data analytics



Types of big data analytics

Types of big data analytics



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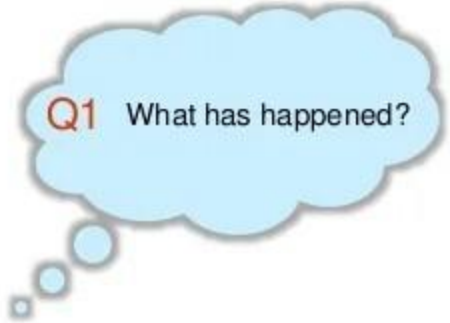
Types of big data analytics



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

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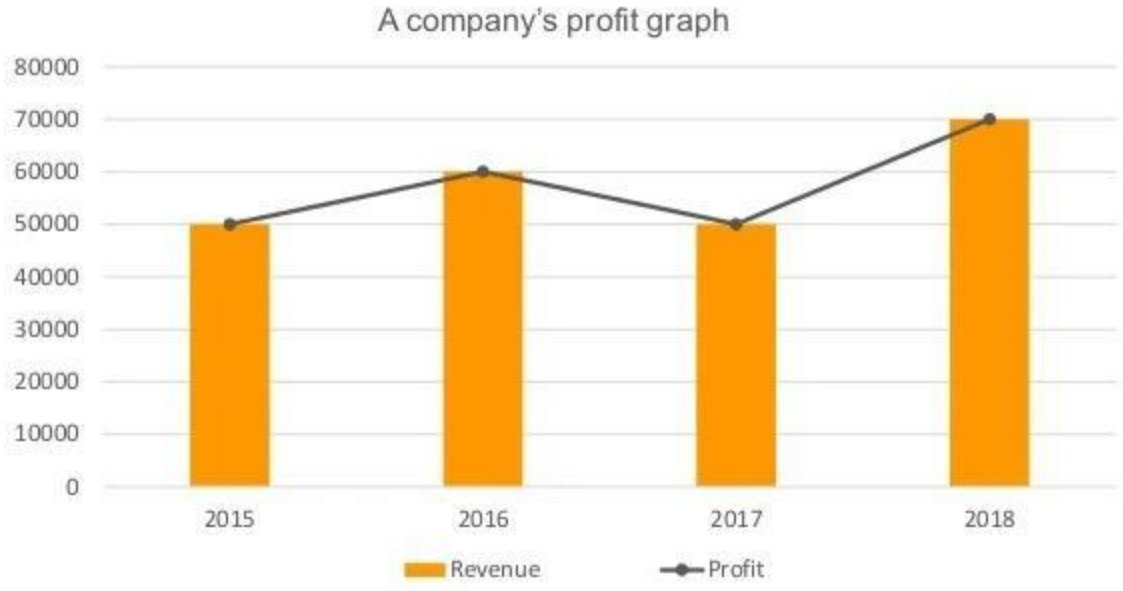
Types of big data analytics

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

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

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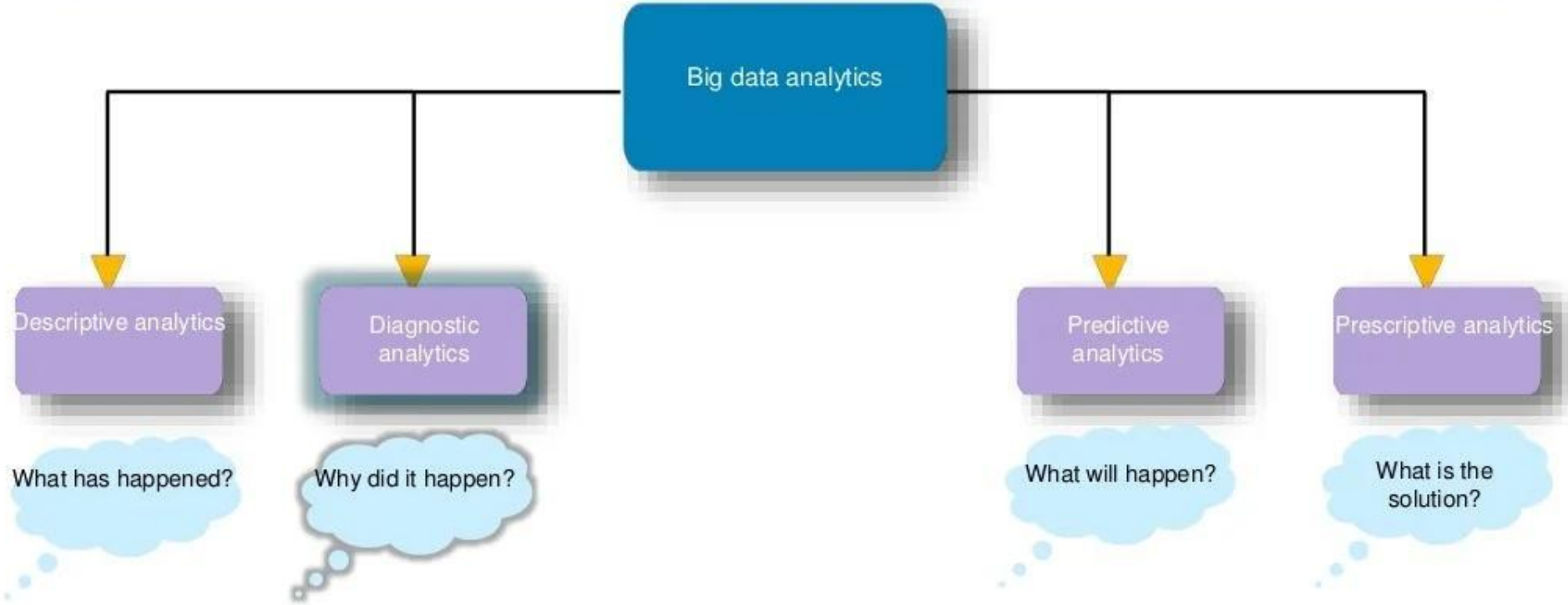
Types of big data analytics



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Types of big data analytics

Diagnostic analytics

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

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Types of big data analytics

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Types of big data analytics

Q2 Why did it happen?

Diagnostic analytics

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

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

Types of big data analytics

Q2 Why did it happen?

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

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

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

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Types of big data analytics

Q2 Why did it happen?

Diagnostic analytics

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

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

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

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

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Types of big data analytics

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?

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?

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

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

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

Diagnostic analytics

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

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

Using diagnostic analytics, we can find out the reason why this happened

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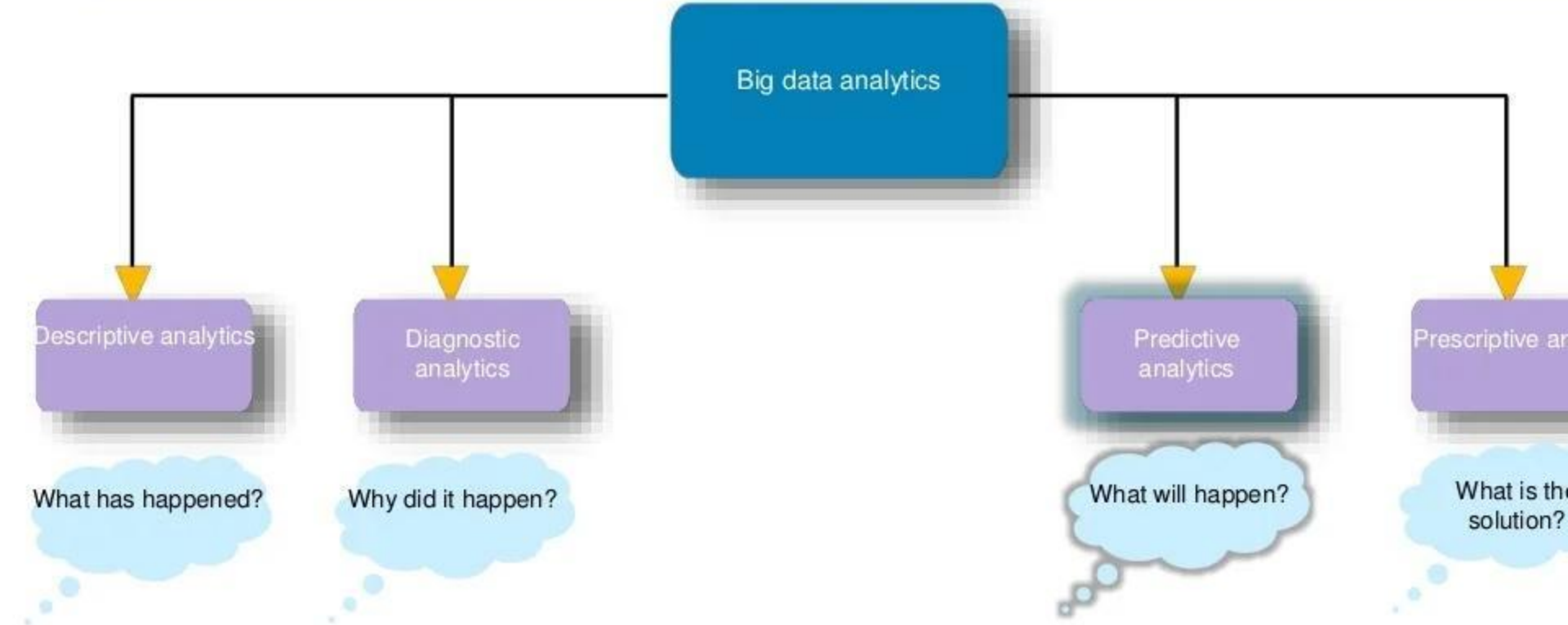
Types of big data analytics



Types of big data analytics

Predictive analytics

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

Types of big data analytics

Q3 What will happen?

Predictive analytics

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

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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Types of big data analytics

Q3 What will happen?

Predictive analytics

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

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 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

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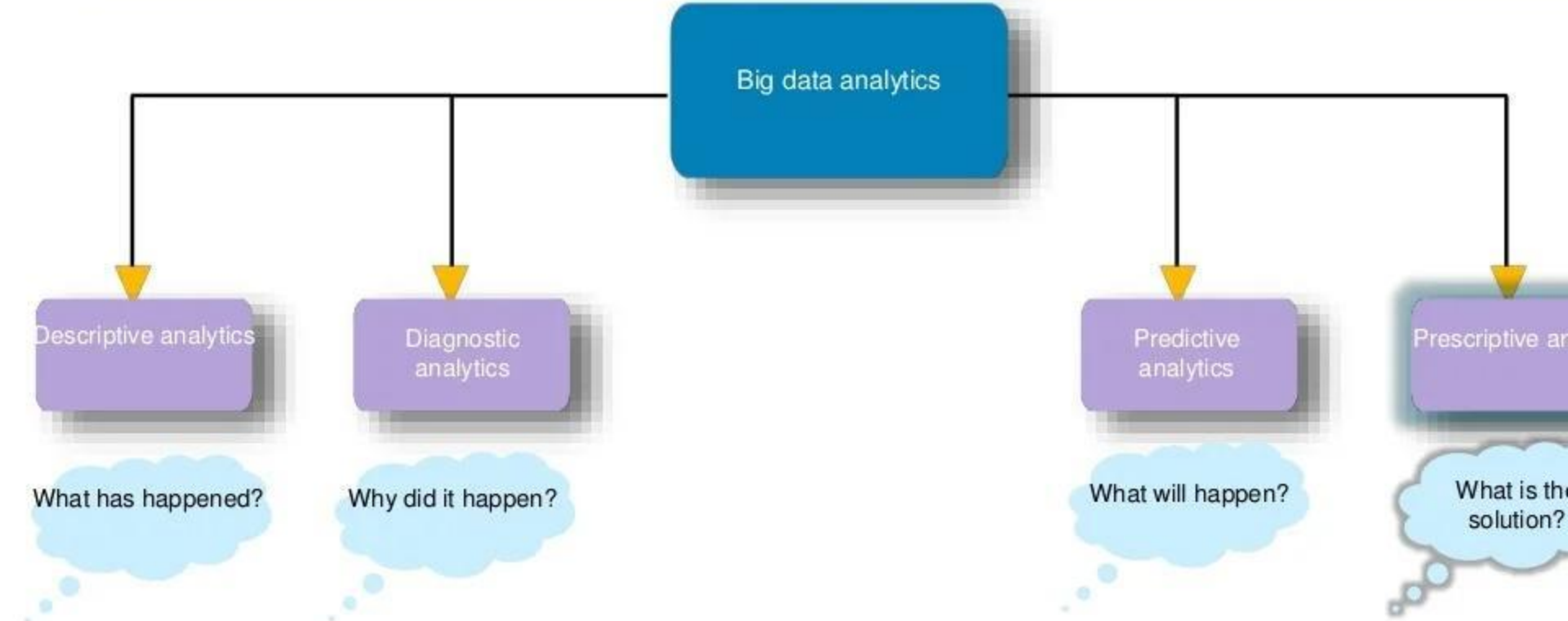
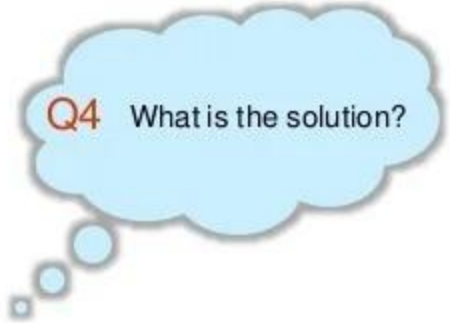
Types of big data analytics



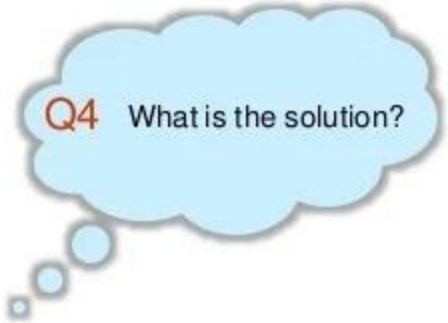
Types of big data analytics



Prescriptive analytics

This type of analytics prescribes the solution to a particular problem

Types of big data analytics



Prescriptive analytics

This type of analytics prescribes the solution to a particular problem

Prescriptive analytics works with both descriptive and predictive analytics

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 works with both descriptive and predictive analytics

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

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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 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

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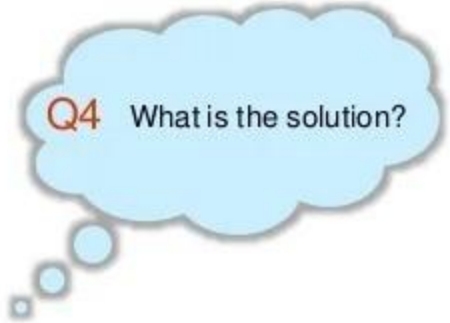
Types of big data analytics



Prescriptive analytics

This type of analytics prescribes the solution to a particular problem

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

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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

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Tools used in big data analytics

Tools used in big data analytics

Tools used in big data analytics

hadoop

Hadoop helps in storing and analyzing big data

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Tools used in big data analytics

mongoDB.

MongoDB is used on datasets that change frequently

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Tools used in big data analytics

talend

Talend is a tool used for data integration and management

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Tools used in big data analytics

cassandra

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

STORM

It is an open source real time computational system

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Tools used in big data analytics

kafka

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

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Big data application domains

Big data application domains

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

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Big data application domains

Healthcare

Education

Marketing

Ecommerce

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

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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

Education

Marketing

Ecommerce

Healthcare

Media and entertainment

Banking

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

Education

Marketing

Ecommerce

Healthcare

Media and entertainment

Banking

Telecommunications

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

Big data application domains

Education

Marketing

Ecommerce

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Banking

Telecommunications

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 helps governments in law enforcement

Government

Big data application domains

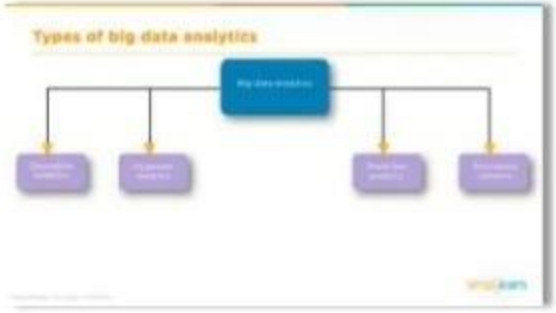
Big data application domains

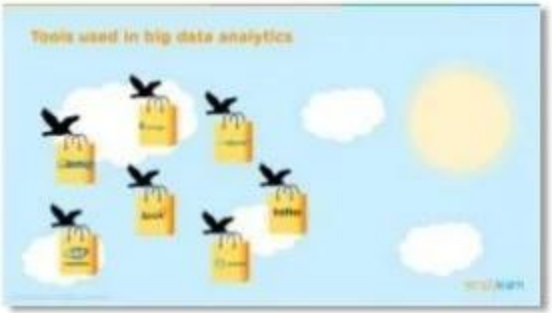
Big data analytics helps governments in law enforcement

In Durham, the police department was able to reduce the crime rate using big data analytics

Government

Key Takeaways





Thank You