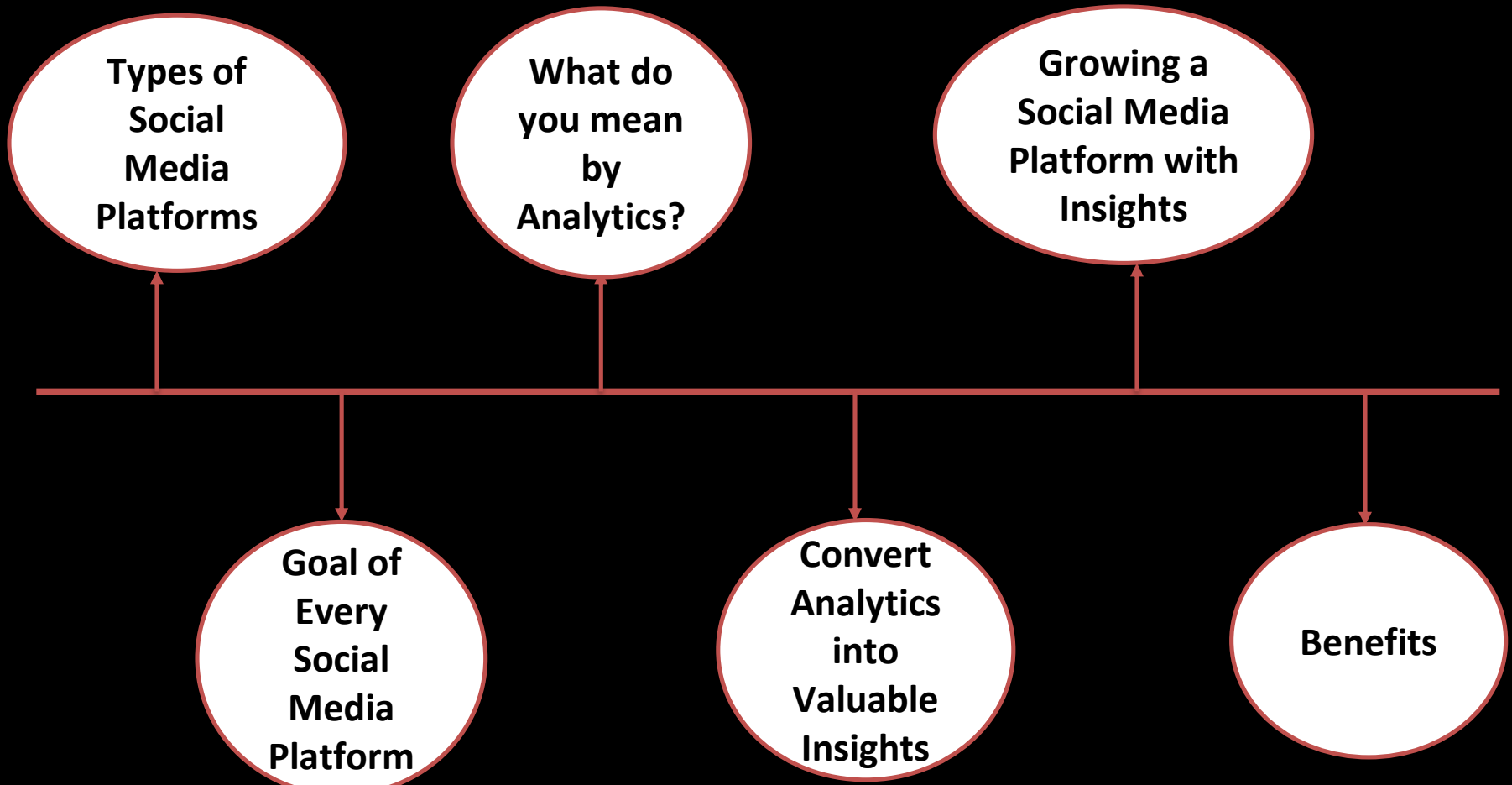
"Unit VI: Big Data Technologies – Applications and Impact"

Mapping of Course Outcomes for Unit V	**CO5**	
Unit VI	**BIG DATA TECHNOLOGIES APPLICATION AND IMPACT**	**(05 Hrs)**
Social media analytics, Text mining, Mobile analytics, Data analytics life cycle of case studies, Organizational impact, understanding decision theory, creating big data strategy, big data value creation drivers, Michael Porter's valuation creation models, Big data user experience ramifications, Identifying big data use cases, Big Data Analytics Challenges and Research directions.		

Social media analytics


Types of Social Media Platforms
What do you mean by Analytics?
Growing a Social Media Platform with Insights
Goal of Every Social Media Platform
Convert Analytics into Valuable Insights
Benefits

Your channel
JK Coding Pathshala

- Dashboard
- Content
- Analytics
- Community
- Subtitles
- Copyright
- Earn
- Customization
- Audio library

- Settings
- Send feedback

Channel analytics

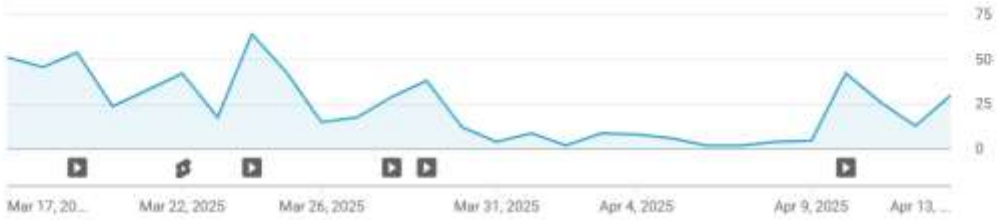
Advanced mode

Overview | Content | Audience | Trends

Mar 17 – Apr 13, 2025
Last 28 days

Your channel got 648 views in the last 28 days

Views	Watch time (hours)	Subscribers
648	9.9	+10
85% less than previous 28 days	95% less than previous 28 days	80% less than previous 28 days



See more

Realtime

Updating live

185
Subscribers

See live count

62
Views · Last 48 hours

Top content	Views
DSBDA Practical – Group B1...	34
TE IT – SPPU Practical	Pyt...	13
DSBDA PYQs: Bayes' The...	3

See more

Your top content in this period

Average view

Latest content

🔍 1. Types of Social Media Platforms

There are many types of social media apps like:

- **Instagram** – for photos and videos
- **Twitter/X** – for short messages and news
- **LinkedIn** – for jobs and professionals
- **Facebook** – for friends, groups, and news

Each platform has different users and different data

🎯 2. Goal of Every Social Media Platform

Every platform has some goals, like:
•Keep people engaged
•Reach more users
•Increase followers
•Get more customers or business
Social media analytics helps to achieve these goals.

❓ 3. What Do You Mean by Analytics?

Analytics means: 👉 Looking at your data (likes, comments, shares, views)

👉 Understanding what is working or not
👉 Using the data to improve your posts

🔁 4. Convert Analytics into Valuable Insights

We don’t just look at the data — we **learn from it**, like:
•Which post got the most likes?
•What time is best to post?
•What content do people like?
These are called **valuable insights**.

📈 5. Growing a Social Media Platform with Valuable Insights

When we use insights properly:
•We get more likes and shares
•Followers grow faster
•Our content becomes better and smarter
So, the social media page grows successfully.

✓ 6. Benefits

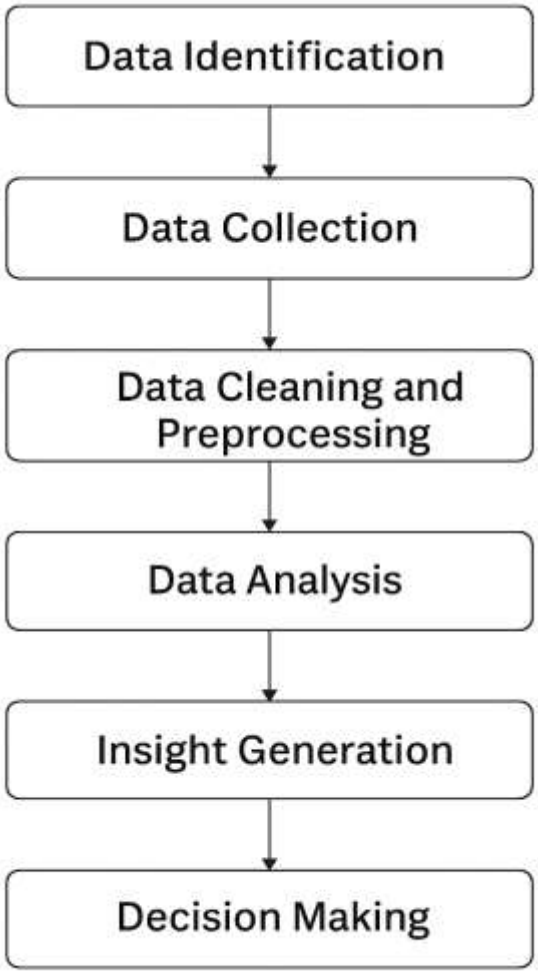
Here are the benefits of using social media analytics:
•Know your audience better
•Save time and effort
•Create better content
•Make smart business decisions
•Grow faster than others

b) What is social media analytic? Explain the process of social media data analytic. **[8]**

Definition:

Social Media Analytics (SMA) = Process of collecting, analyzing & interpreting social media data for better content or business decisions.

🗣️ *Simple Words:* Jaanna ki audience tumhare content pe kaise react kar rahi hai – views, likes, shares, comments dekhna + improve karna.



🔍 Process of Social Media Data Analytics:

1️⃣ Data Identification

- 🔸 Platform decide karo (YouTube, Instagram)
- 🔸 Data type: Likes, Comments, Views
- 🧷 *Example:* YouTube watch time data lena.

2️⃣ Data Collection

- 🔸 Use tools (YouTube Studio, APIs)
- 🧷 *Example:* Subscriber growth check karna.

3️⃣ Data Cleaning

- 🔸 Spam/missing data hatana, format sahi karna
- 🧷 *Example:* Bot comments remove karna.

4️⃣ Data Analysis

- 🔸 Graphs, KPIs banana
- 🧷 *Example:* Kaunsi reel pe highest engagement aaya?

5️⃣ Insight Generation

- 🔸 Understand audience behavior
- 🧷 *Example:* "Tech Shorts" pe zyada response aaya.

6️⃣ Decision Making

- 🔸 Post timing/content plan decide karo
- 🧷 *Example:* 7 PM pe zyada views milte hain, wahi time fix karo.

a) How Social Media analytics helps in value creation? Explain with suitable examples. [7]

SMA helps brands & creators understand audience, improve content, and take better decisions.

👉 Improves **engagement**, **customer experience**, and **brand growth** → creates **financial + brand value**.

1 Audience Understanding

→ What audience likes/dislikes

📌 *Ex:* Reels > static posts

2 Content Strategy

→ What & when to post

📌 *Ex:* Tech videos after 7 PM = more views

3 Product Feedback

→ Track user issues & fix

📌 *Ex:* Food app improved delivery via tweets

4 Ad Optimization

→ Better ROI from top platforms

📌 *Ex:* Shift budget to Facebook ads

5 Trend Detection

→ Viral trends = fast growth

📌 *Ex:* TikTok sound used for Insta reel growth

6 Engagement & Loyalty

→ Reply to build community

📌 *Ex:* Gaming brand on Reddit

7 Competitive Edge

→ Track rivals' strategy

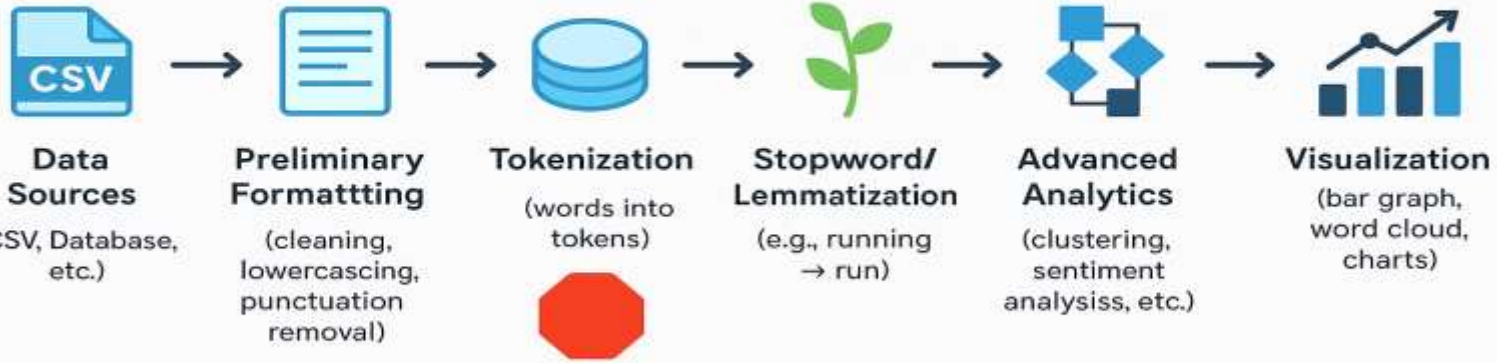
📌 *Ex:* Launch before Samsung

Text Mining

What is text mining? Draw and explain text mining architecture and its use. [8]

Explain Text mining with example.

Text Mining ek process hai jisme hum **text data ko extract, process, aur analyze** karte hain taaki usse **meaningful information** nikaali ja sake.


CSV
Data Sources
(CSV, Database, etc.)
Preliminary Formattting
(cleaning, lowercascing, punctuation removal)
Tokenization
(words into tokens)
Stopword/ Lemmatization
(e.g., running → run)
Advanced Analytics
(clustering, sentiment analysiss, etc.)
Visualization
(bar graph, word cloud, charts)

1. 📁 **Data Sources**

   Data aata hai alag-alag sources se jaise CSV files, databases, ya APIs. Yeh raw hota hai — matlab directly use karne laayak nahi.

2. 🗒️ **Preliminary Formatting**

   Yahaan pe basic cleaning hoti hai:

   - Sabko lowercase karna
   - Punctuation hataana
   - Extra white spaces nikalna
   - Encoding fix karna (jaise UTF-8)

3. 🧠 **Tokenization**

   Is step mein pura sentence ko chhote chhote words (tokens) mein tod diya jaata hai.

   Example: `"I love coding"` → `["I", "love", "coding"]`

4. 🔴 **Stopword Removal**

   Stopwords jaise "is", "the", "a", "in", etc. remove kar dete hain, kyunki ye analysis mein zyada help nahi karte.

5. 🌱 **Stemming / Lemmatization**

   Words ko unki root form mein convert karte hain:

   - "running", "runs", "ran" → "run"
   - Ye step NLP mein useful hota hai taaki similar words same treat kiye jaa sakein.

6. 📊 **Advanced Analytics**

   Ab cleaned and processed data ke upar hum kuch intelligent analysis kar sakte hain:

   - Sentiment analysis
   - Topic modeling
   - Clustering
   - Word frequency check, etc.

7. 📈 **Visualization**

   Last step hai data ko graphs, word clouds, charts, etc. mein dikhana for better interpretation.

🧠 Example:

Problem: Ek company ke paas 10,000 customer reviews hain. Company jaan na chahti hai ki log product ke baare me kya soch rahe hain.

Text Mining Steps:

1. **Data Collection:** 10,000 reviews collect kiye.
2. **Preprocessing:** "is", "the", "a" jaise common words remove kiye.
3. **Sentiment Analysis:** Har review ka mood detect kiya (positive, negative, neutral).
4. **Result:** 70% reviews positive nikle, 20% negative, 10% neutral.

Insight: Company ko pata chala ki log product se khush hain, par kuch log delivery time se naaraaz hain.

🔹 Mobile Analytics kya hota hai?

Mobile analytics ka matlab hai **mobile apps ke user behavior ko track karna**. Isme yeh dekha jata hai ki user app me kya kar raha hai, kitni der tak app use kar raha hai, kaha click kar raha hai, kaunsa page open kar raha hai, etc.

📱 **Example**:
Agar koi Swiggy app use karta hai, toh mobile analytics batayega:

- User ne app kab open kiya
- Kitni der tak scroll kiya
- Kya order kiya
- Kis screen pe jyada time spend kiya

🔹 Social Media Analytics kya hota hai?

Social media analytics ka matlab hai **social media platforms jaise Instagram, Facebook, X (Twitter) par log kaise interact kar rahe hain uska analysis**.

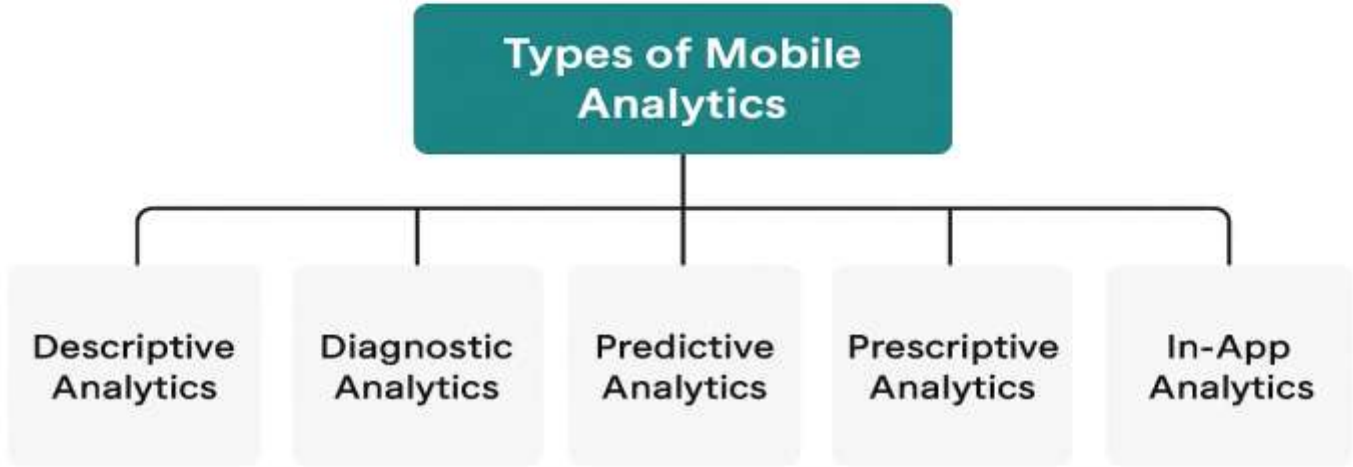
📱 **Example**:

Agar koi company Instagram pe post daalti hai, toh social media analytics batayega:

- Kitne likes aaye
- Kitne comments hue
- Kis post pe jyada engagement mila
- Kaunsa hashtag trending hai

Point	Mobile Analytics	Social Media Analytics
Platform	Mobile apps (like Zomato, WhatsApp)	Social media (like Instagram, Facebook, X)
Focus	App usage, user actions	Posts, likes, shares, comments
Goal	App performance aur user behavior samajhna	Brand awareness aur audience engagement measure karna
Tools Example	Firebase, Flurry	Hootsuite, Sprout Social

Types of Mobile Analytics



🔹 1. **Descriptive Analytics**

Kya batata hai?

– User app me kya kar raha hai, basic data dikhata hai.

Use:

– App installs, daily active users (DAU), session time, etc.

Example:

– 10,000 users ne app install kiya, aur average session time hai 5 minutes.

🟢 *Ye help karta hai user engagement samajhne me.*

🔹 2. **Diagnostic Analytics**

Kya batata hai?

– Problem kaha ho rahi hai, aur kyun ho rahi hai.

Use:

– Drop-offs, crashes, errors analyze karna.

Example:

– 70% users checkout screen pe app chhod rahe hain — shayad wo page slow hai ya confusing.

🟢 *Isse hum bugs ya UX issues identify kar sakte hain.*

🔹 3. **Predictive Analytics**

Kya batata hai?

– User future me kya karega, uska guess.

Use:

– User churn predict karna, ya purchase chance calculate karna.

Example:

– App batata hai ki agar user 3 din se active nahi hai, toh 80% chance hai wo app uninstall karega.

🟢 *Isse proactive steps liye ja sakte hain jaise notification bhejna.*

🔹 4. **Prescriptive Analytics**

Kya batata hai?

– Next step kya hona chahiye, solution suggest karta hai.

Use:

– Personalized recommendations, time of notification, etc.

Example:

– Suggestion: "Evening 6PM pe push notification bhejo, tabhi open rate high hota hai."

🟢 *Helps in decision making and improving results.*

In-App Analytics ka matlab hai:

App ke **andar user kya-kya kar raha hai**, uss behavior ko track karna.

👉 Ye analytics batata hai ki **user kaise interact kar raha hai app ke features** ke saath — jaise buttons, pages, forms, games, etc.

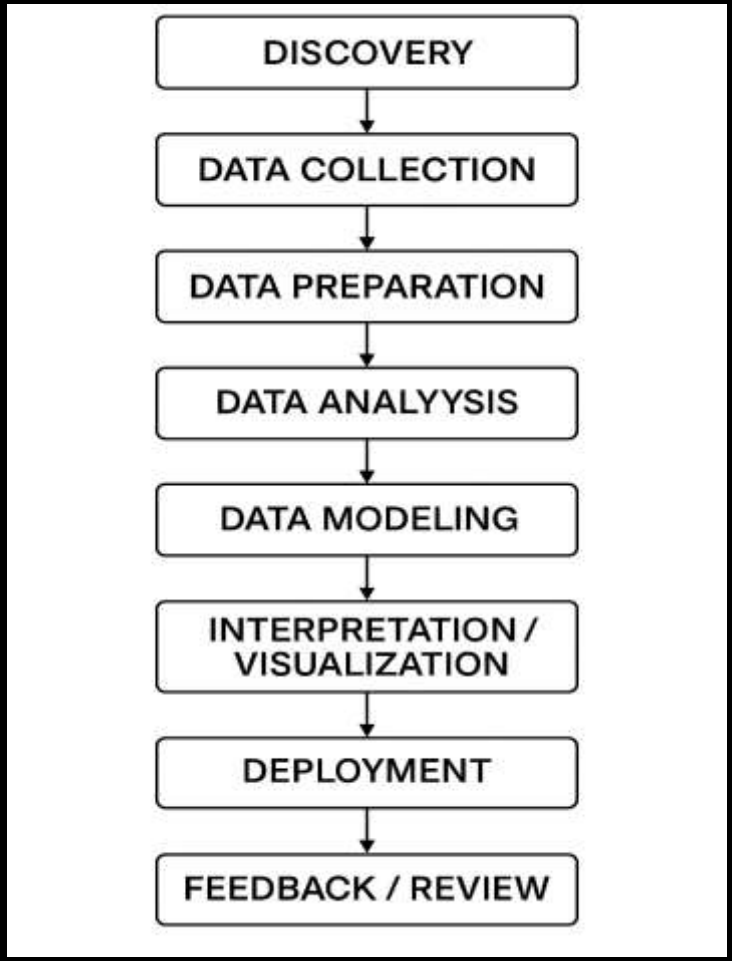
🧠 Simple Example:

Maan lo ek **shopping app** hai:

- **In-App Analytics** se pata chala ki 80% users **"Add to Cart"** tak ja rahe hain, lekin sirf 20% log **"Checkout"** karte hain.
  ➡️ App team ko samajh aata hai ki checkout page me kuch issue ho sakta hai (slow load ya complex process).
  ➡️ Fix karte hain → Conversion badhta hai ✅

Data Analytics Life Cycle

Explain in brief data analytics life cycle.


DISCOVERY
DATA COLLECTION
DATA PREPARATION
DATA ANALYYSIS
DATA MODELING
INTERPRETATION / VISUALIZATION
DEPLOYMENT
FEEDBACK / REVIEW

1. Discovery (Samasya ko samajhna)

Sabse pehle business ya problem ko samjhte hain.

👉 *Example: Ek online store dekh raha hai ki uski sales kam ho rahi hain.*

---

2. Data Collection (Data ikattha karna)

Problem solve karne ke liye data collect karte hain.

👉 *Example: Sales data, customer reviews, website traffic, etc.*

---

3. Data Preparation (Data ko saaf aur ready karna)

Data ko clean karte hain – galtiyan nikaalte hain, missing values fill karte hain.

👉 *Example: Duplicate orders hataana, empty cells fill karna.*

---

4. Data Analysis (Data ko analyse karna)

Data ko study karte hain patterns aur trends dekhne ke liye.

👉 *Example: Pata chalta hai ki log mostly weekend par shopping karte hain.*

5. Data Modeling (Prediction banana)

Algorithms ya models ka use karke future predictions banate hain.

👉 *Example: Model batata hai ki agar discount diya jaye toh sales badhengi.*

---

6. Interpretation / Visualization (Results dikhana)

Insights ko graphs, charts ya reports ke form mein dikhate hain.

👉 *Example: Ek dashboard banaya gaya jisme top-selling items aur reasons for low sales dikhte hain.*

---

7. Deployment (Solution ko apply karna)

Jo solution mila hai usse real world mein apply karte hain.

👉 *Example: Marketing team naye offers launch karti hai based on analysis.*

---

8. Feedback / Review (Kaam kar raha ya nahi – check karna)

Check karte hain ki solution ka result kaisa hai, aur agar zarurat ho toh improvement karte hain.

👉 *Example: New sales data monitor kiya gaya – sales waaqai badh gayi.*

💥 Big Data ka Organizations par Impact (Effect)

Big Data ka matlab hai **bahut bada aur complex data**, jo traditional tools se handle nahi hota. Aaj ke time mein organizations ke paas huge amount of data hota hai — customers ka, products ka, website traffic ka, etc.

✅ 1. **Better Decision Making (Behtar faisle lena)**

Big data se real-time insights milte hain jo organizations ko smart decisions lene mein help karte hain.

👉 *Example: Amazon customer ke past searches dekh kar unko sahi product suggest karta hai.*

✅ 2. **Customer Experience Improve Hota Hai**

Companies customers ka behavior samajh ke unke liye personalized services banati hain.

👉 *Example: Netflix user ke watch history ke basis pe unko matching shows suggest karta hai.*

✅ 3. **Cost Reduction (Kharch kam hota hai)**

Big data tools se waste aur inefficient processes identify kiye ja sakte hain.

👉 *Example: Manufacturing companies faulty machines ka data analyze kar ke unko jaldi repair kar leti hain.*

✅ 4. New Products & Services ka Innovation

Data ke basis pe companies naye products design karti hain jo market demand se match karte hain.

👉 *Example: Swiggy ne data analysis se dekha ki log raat ko bhi order karna chahte hain, toh unhone "Midnight Delivery" start kiya.*

✅ 5. Risk Management (Risk ka analysis)

Companies fraud detect kar sakti hain aur future risks ka andaza laga sakti hain.

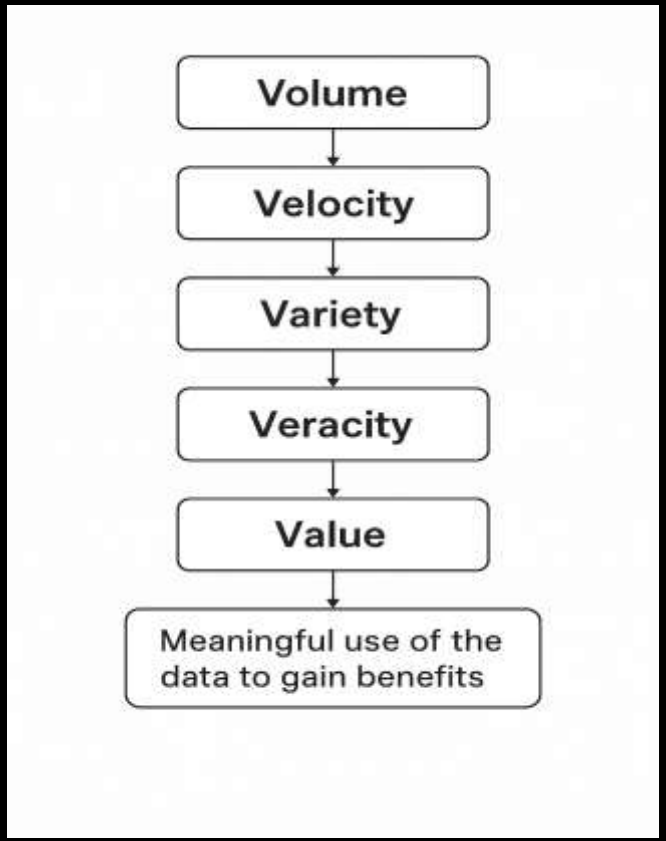
👉 *Example: Banks big data ka use karke suspicious transactions pe alert dete hain.*

✅ 6. Competitive Advantage milta hai

Jo company data ka sahi use karti hai, wo market mein aage nikal jaati hai.

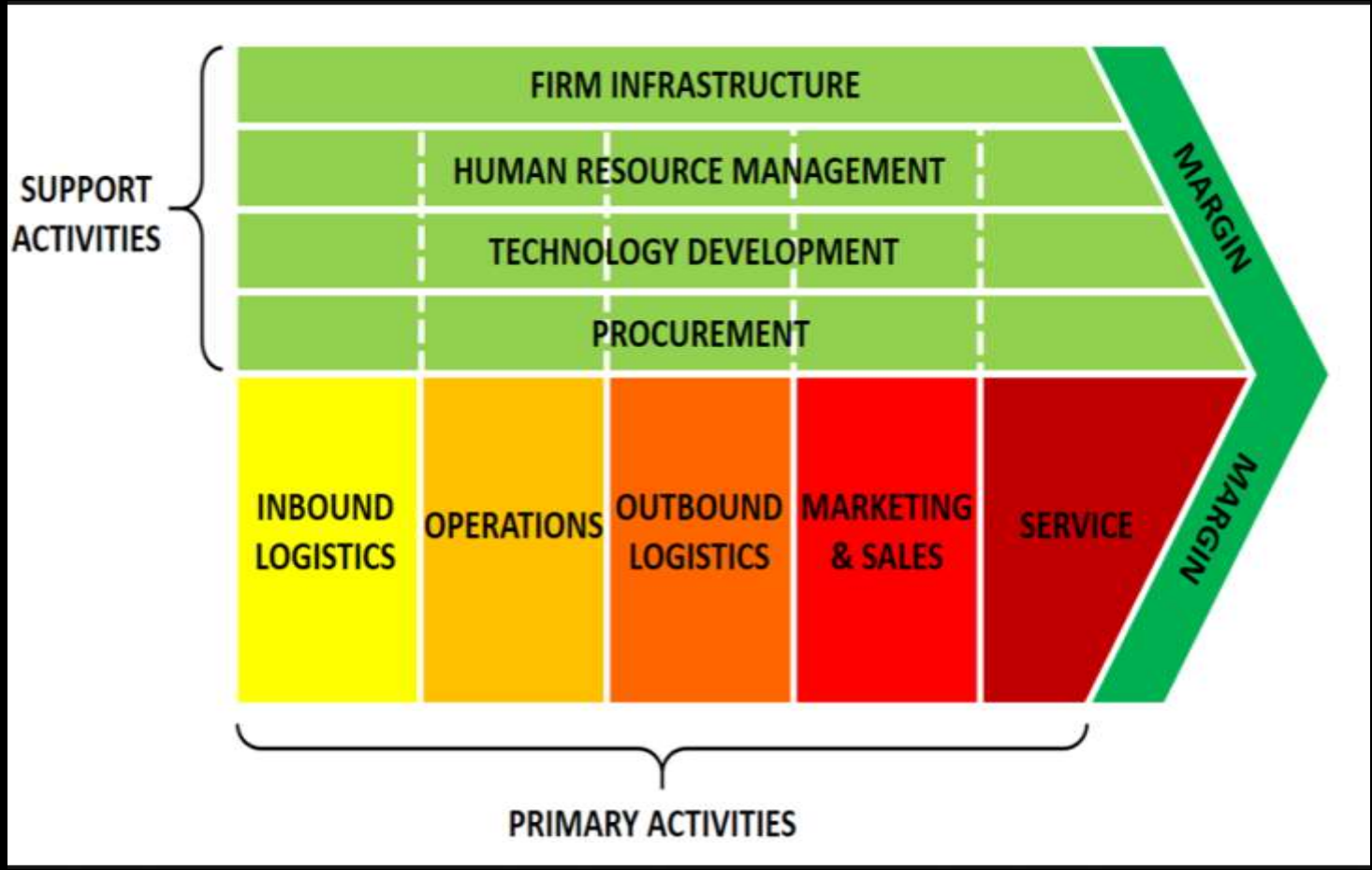
👉 *Example: Zomato ne user data se apni delivery timings optimize ki aur customer satisfaction badha.*

Big Data value terminology



1. **Volume** – Data ka amount
   - *Example: Facebook pe daily crores of posts.*
2. **Velocity** – Data aane ki speed
   - *Example: Twitter pe har second tweet.*
3. **Variety** – Data ke types
   - *Example: YouTube – text, video, image.*
4. **Veracity** – Data ki sachchai / accuracy
   - *Example: Wrong info = low veracity.*
5. **Value** – Data ka real use
   - *Example: Amazon data use karke sales badhata hai.*

Michael Porter's Value Chain



Michael Porter ne ek model diya jiska naam hai **Value Chain**, jisme bataya gaya hai ki ek company kaise apne business activities se **customer ke liye value create karti hai**.

🔑 2 Types of Activities hoti hain:

1. **Primary Activities** – Directly product/service banane aur bechne se related
2. **Support Activities** – Inhe support dene wale kaam

🏭 Example Company: *Maruti Suzuki (Car Manufacturing Company)*

🔸 Primary Activities (Direct kaam jo car banane aur bechne se jude hain):

Activity	Explanation (Hinglish)	Maruti Example 💡
1. Inbound Logistics	Raw materials, parts aur tools ka aana aur store karna.	Tyres, engine parts, seats factory mein aa rahe hain.
2. Operations	Assembling ya manufacturing ka actual process.	Factory mein workers car assemble kar rahe hain.
3. Outbound Logistics	Final product ka delivery/distribution.	Ready car ko trucks mein bhar ke dealers ko bhejna.
4. Marketing & Sales	Ads, promotions aur sales techniques.	TV par ad, showroom offers, EMI plans dikhana.
5. Service	Product ke baad ki support (maintenance, repair, warranty).	Free 3 service, 1-year warranty, service center support.

🔹 Support Activities (Jo upar wale sab kaam ko support karti hain):

Activity	Explanation (Hinglish)	Maruti Example 💡
Firm Infrastructure	Company planning, legal, finance, management.	Company ka head office jo decision banata hai.
HR Management	Employee hiring, training, salary, etc.	Engineers, workers ki hiring aur training.
Technology Development	Innovation, automation, software tools.	Car designs improve karna, automation tools.
Procurement	Saman kaha se kharidna, suppliers manage karna.	Tyre kis company se lena hai – ye decide karna.

Big Data Use Cases

1️⃣ Healthcare

➡️ **Use**: Patient data analyze karke better treatment decisions lena.

💡 *Example*: Hospitals patient ke X-rays aur reports ko AI se analyze karke cancer jaise diseases early detect karte hain.

2️⃣ E-commerce (like Amazon)

➡️ **Use**: Customer ke past behavior ke basis pe product recommend karna.

💡 *Example*: Tumne headphones search kiye, toh Amazon tumhe similar items suggest karega.

3️⃣ Banking & Fraud Detection

➡️ **Use**: Transactions ka real-time analysis karke fraud pakadna.

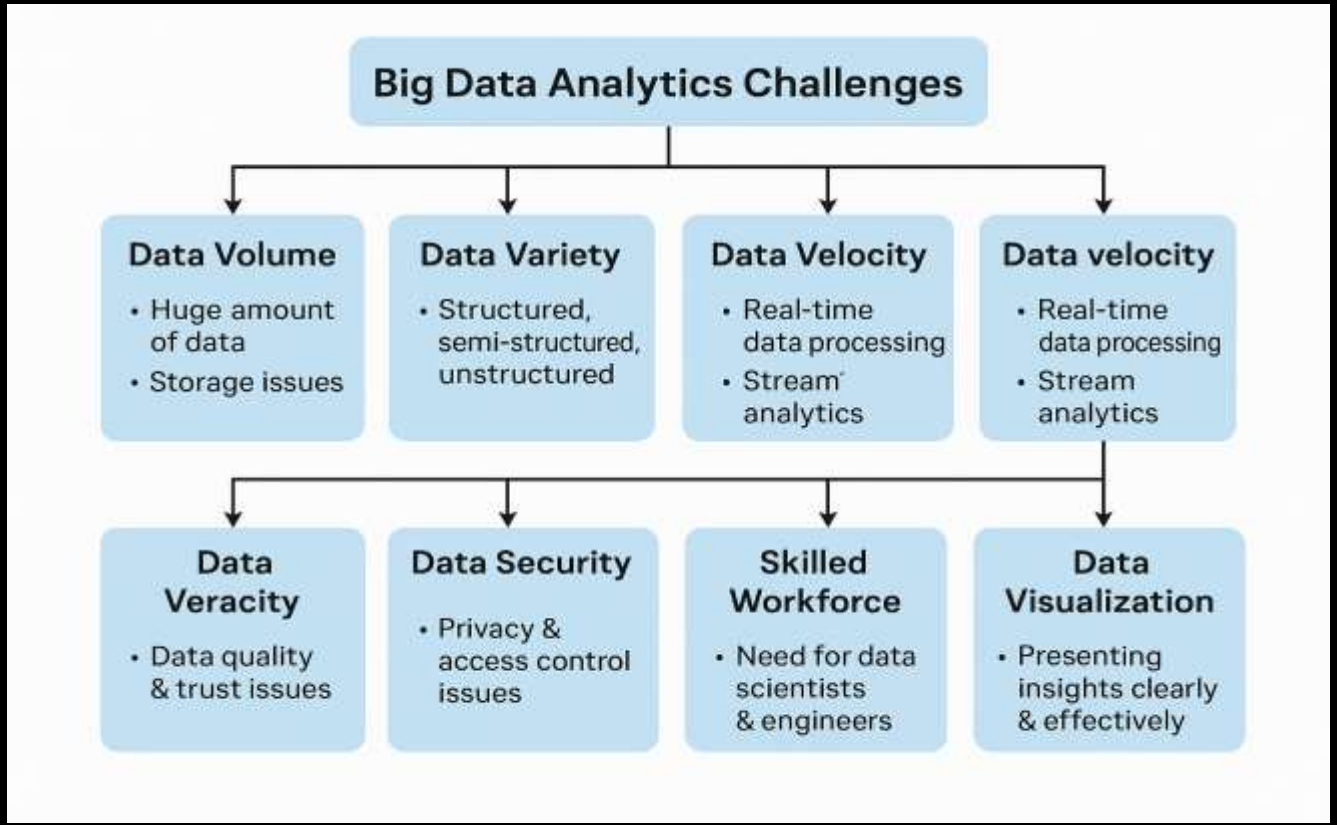
💡 *Example*: Agar kisi ATM card se ekdum alag jagah se paisa nikle, system alert bhejta hai.

4️⃣ Traffic & Smart Cities

➡️ **Use**: Real-time traffic data se traffic lights manage karna, jams reduce karna.

💡 *Example*: Google Maps tumhe live traffic dikhaata hai aur faster route suggest karta hai.

Explain Big Data Analytics Challenges in brief.



1. **Data Volume**
    - *Problem:* Huge data size
    - *Example:* Facebook stores petabytes of user data.
2. **Data Variety**
    - *Problem:* Different data types
    - *Example:* Text, images, videos in YouTube.
3. **Data Velocity**
    - *Problem:* Real-time data speed
    - *Example:* Stock market feeds updating per second.
4. **Data Veracity**
    - *Problem:* Low-quality or noisy data
    - *Example:* Fake news in Twitter data.
5. **Data Security**
    - *Problem:* Privacy risk
    - *Example:* Aadhaar data leaks.

6. **Data Integration**
    - *Problem:* Combining various sources
    - *Example:* Merging sales data from Amazon, Flipkart.
7. **Cost & Infrastructure**
    - *Problem:* Expensive setup
    - *Example:* Hadoop clusters require big investment.
8. **Skilled Workforce**
    - *Problem:* Lack of experts
    - *Example:* Shortage of data engineers.
9. **Data Visualization**
    - *Problem:* Complex data hard to show
    - *Example:* Visualizing COVID-19 spread on dashboards.

Big Data Analytics in Research

Definition:

Big Data Analytics in research means using advanced tools to study large, complex data sets to discover patterns, trends, and useful insights that help in scientific or academic progress.

📌 Uses in Research (With Examples):

1. **Medical Research**
   → Analyzing patient records to find disease patterns (e.g., cancer prediction)
2. **Environmental Research**
   → Climate change modeling using satellite data
3. **Social Science Research**
   → Studying behavior using social media trends
4. **Scientific Simulations**
   → Particle physics simulations (e.g., CERN)


BIG DATA ANALYTICS IN RESEARCH
DATA SOURCES
(sensors, web, experiments)
DATA STORAGE & CLEANING
(tools, APIs)
ANALYSIS
(ML, STATS, AI)
INSIGHT FOR BETTER RESEARCH