CHANDIGARH UNIVERSITY
Discover. Learn. Empower.

APEX INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Introduction to data science (21CSH-232)

Faculty: Dr. Jitender Kaushal (E14621)

Associate professor

Applications of Big Data

COURSE OUTCOMES

On completion of this course, the students shall be able to:-

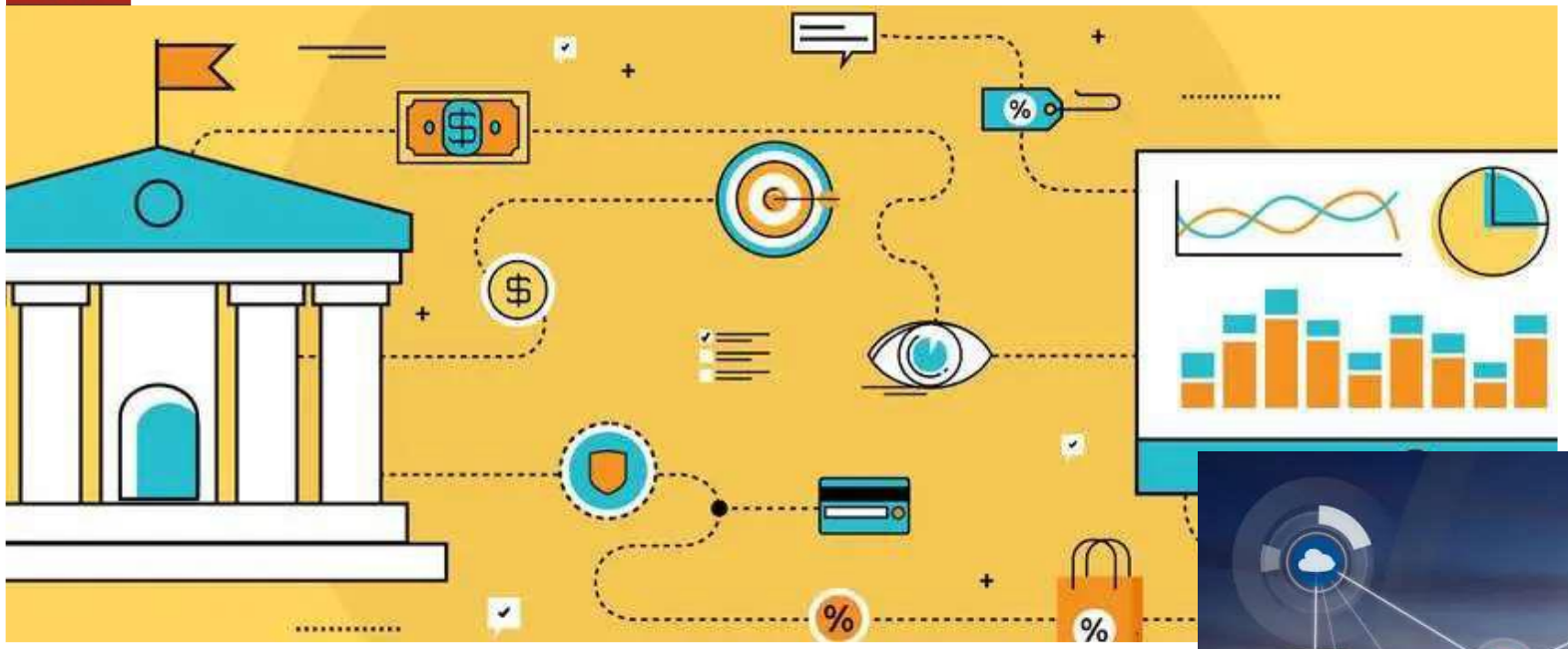
CO1	Identify and describe the importance of Big data analysis over Conventional Database management System.

Applications of Big Data

In today's world, there are a lot of data. Big companies utilize those data for their **business growth**. By analyzing this data, **useful decisions** can be made in various cases as discussed next.


Banking And Securities
Media and Entertainment
Insurance
HealthCare
Big data Applications
Transportation
Energy and Utilities
Education
Manufacturing

Big Data Application in Banking Sector

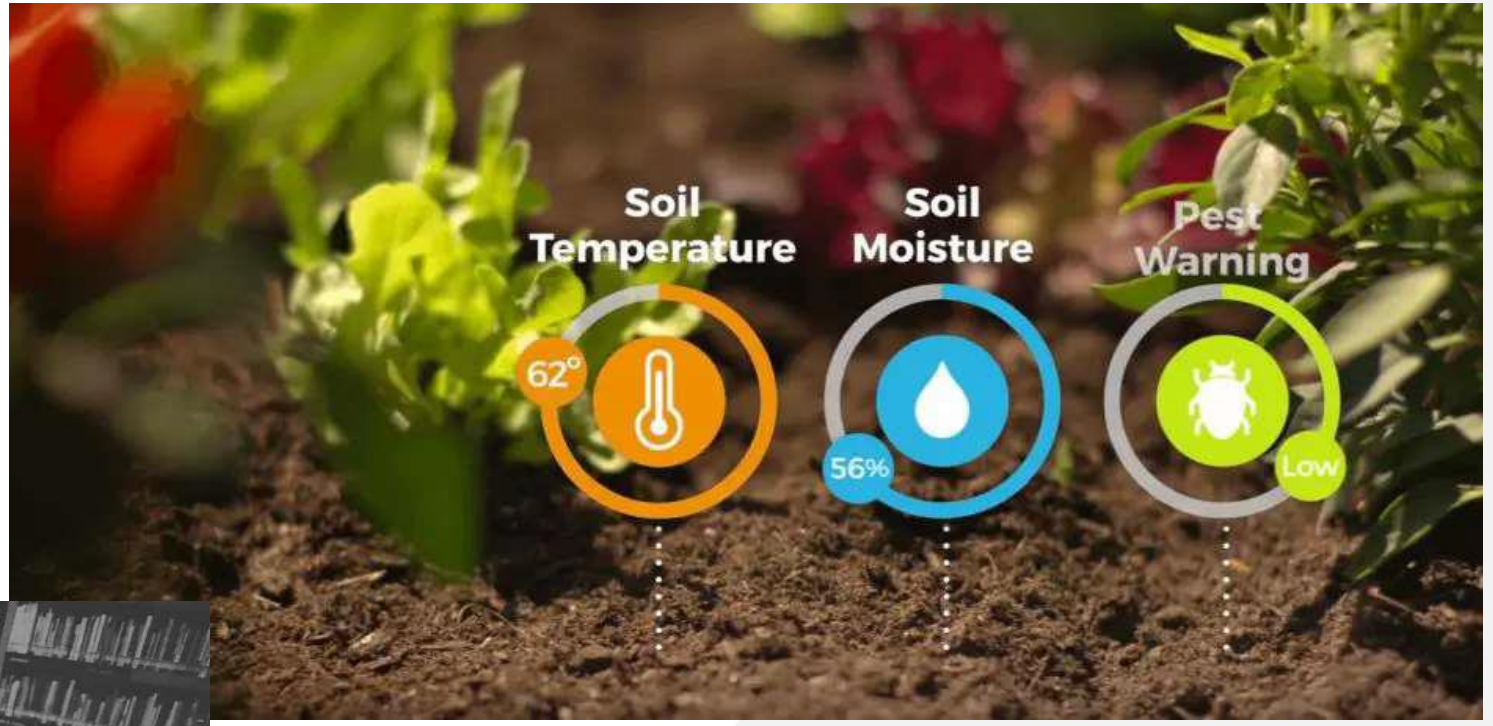


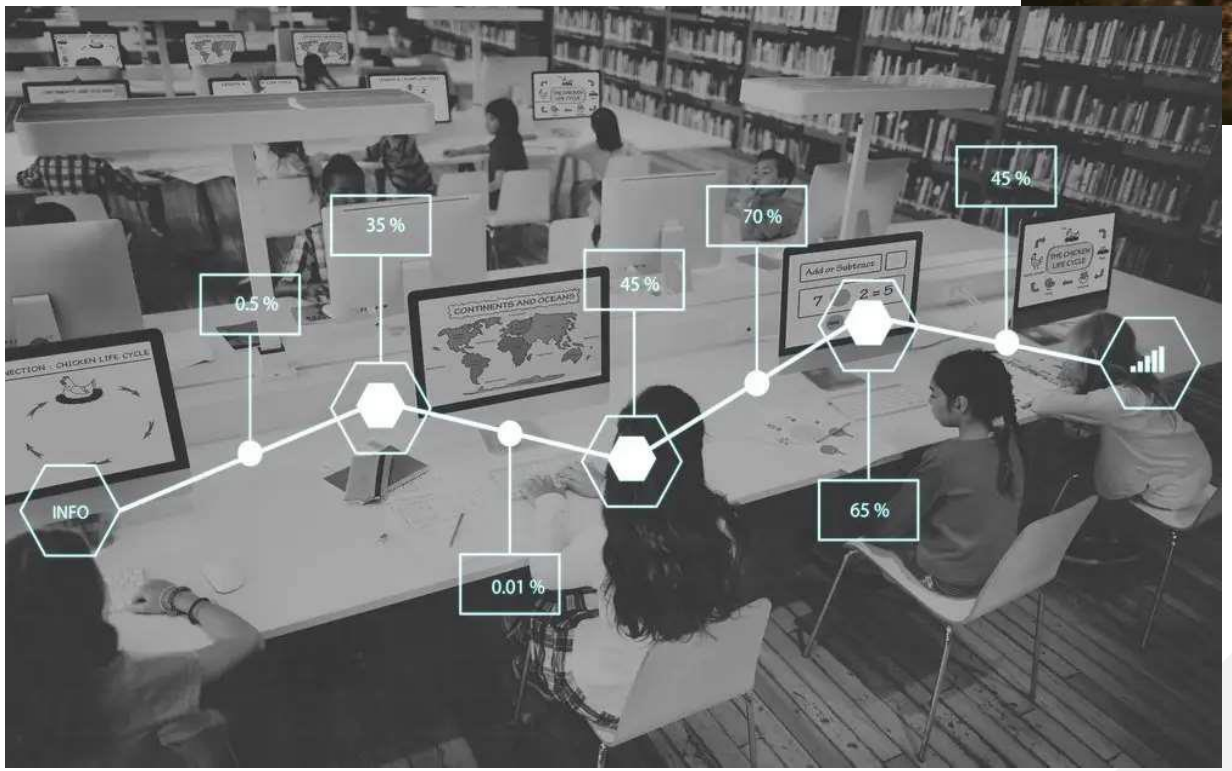
Big Data Application in Tourism

Big Data Application in E-commerce

Big Data Application to Ensure National Security

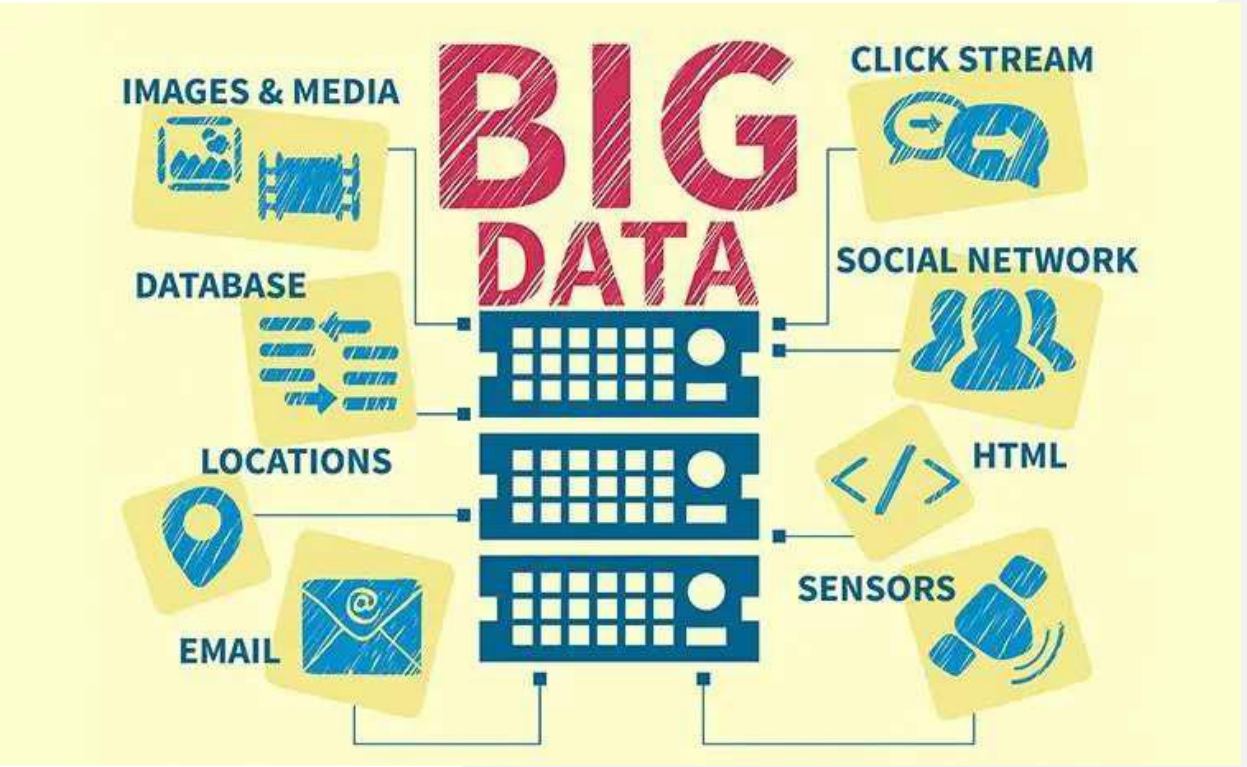
Big Data in Agriculture





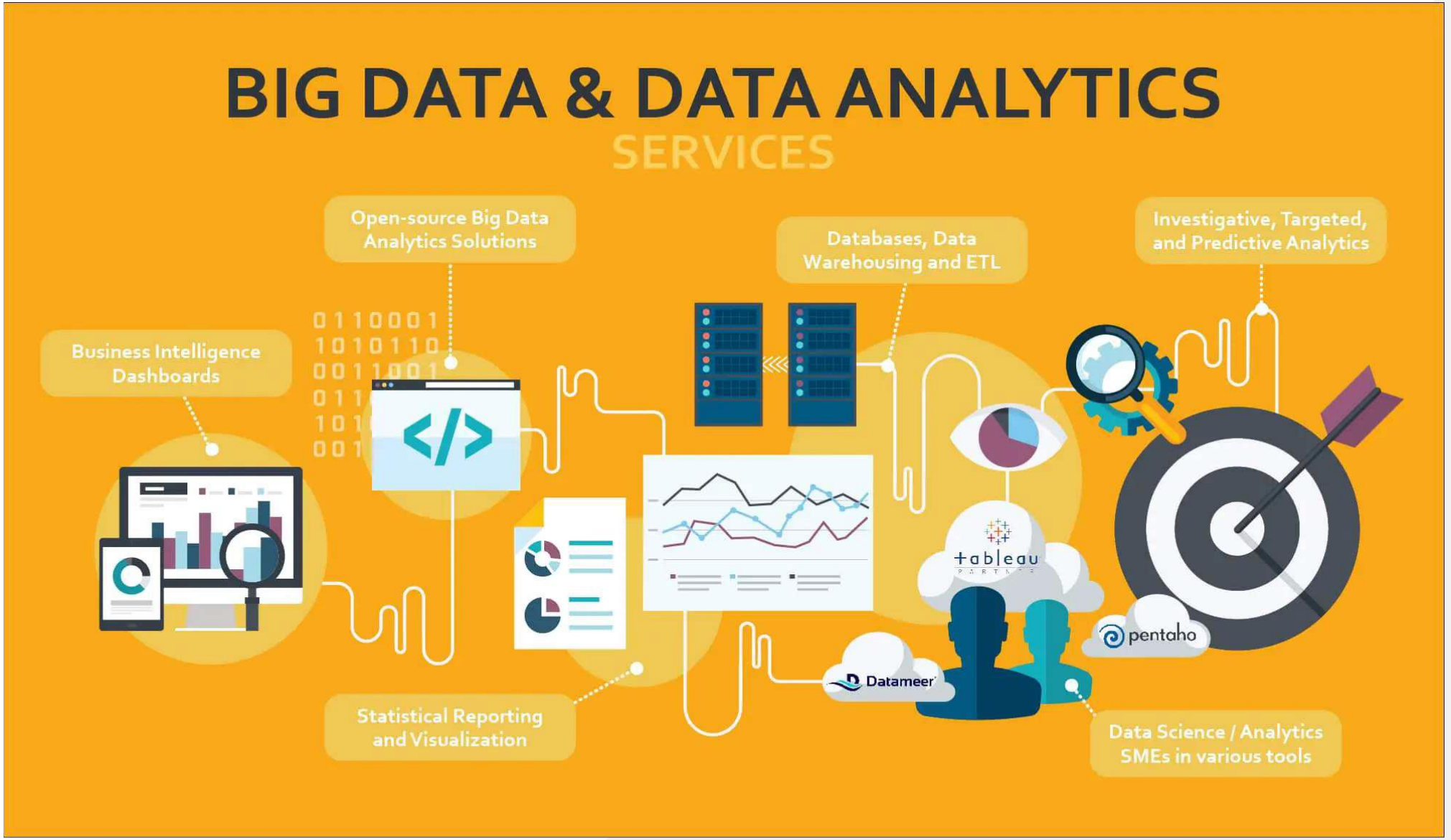
Big Data Application in Education

Big Data in Digital Marketing



Big Data and Cloud Computation

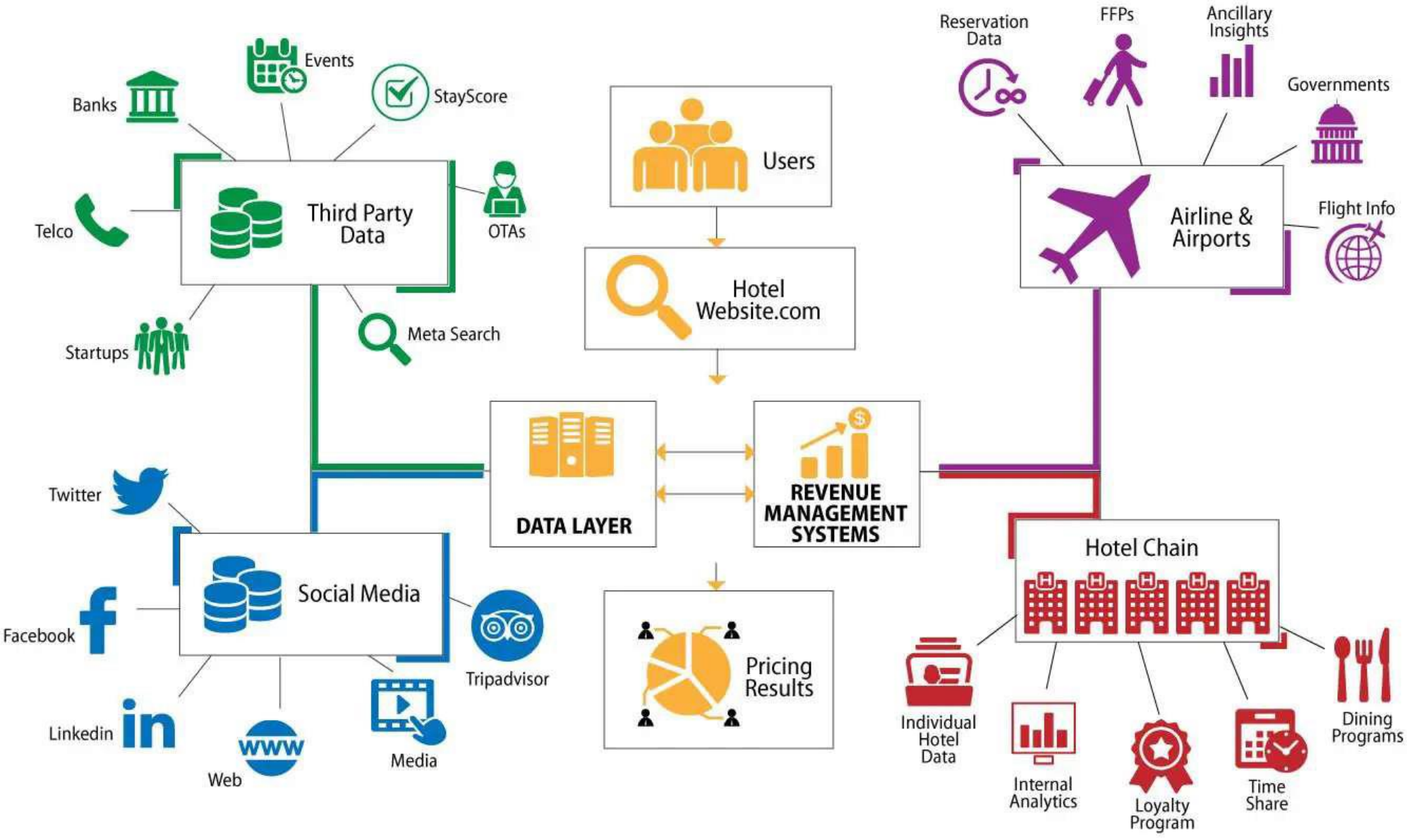
Big Data Application in Government Sector



Big Data Application in Telecommunication

Big Data Application in Retail Industry

Big Data Application in Airline Industry



Applications of Big Data

1. Tracking Customer Spending Habit, Shopping Behavior:

- In big retail stores (like Amazon, Walmart, Big Bazar, etc.) management team has to **keep data on customer's spending habits** (in which products customers spent, on which brand they wish to spend, how frequently they spent), **shopping behavior**, **customer's most liked product** (so that they can keep those products in the store).
- Which product is being **searched/sold most**, based on that data, the production/collection rate of that product gets fixed.
- **Banking sector** uses their **customer's spending behavior-related data** so that they can provide an **offer to a particular customer** to buy his particular liked product by using the bank's credit or debit card with discount or cashback. In this way, they can send the **right offer to the right person at the right time**.

Applications of Big Data

2. Recommendation:

- By **tracking customer** spending habits, and shopping behavior, big retail store provide **a recommendation to the customer**.
- E-commerce site like Amazon, Walmart, and Flipkart does product recommendations. They track what product a customer is searching, and based on that data they recommend the type of product to that customer.
- For example, any **customer searched bed cover on Amazon**. So, Amazon got data that customer may be interested to buy bed covers. Next time when the same customer will go to any google page, advertisements of various bed covers will be seen. Thus, advertisement of the right product to the right customer can be sent.

Applications of Big Data

2. Recommendation:

- **YouTube** also shows recommend videos based on **users' previous liked, and watched video type**. Based on the content of a video, the user is watching, relevant advertisement is shown during the video running.
- As an example, suppose someone watching a tutorial video on Big data, then an advertisement of some other big data course will be shown during that video.

Applications of Big Data

3. Smart Traffic System:

- Data about the condition of the **traffic on different roads**, collected through a camera kept beside the road, at entry and exit points of the city, and GPS device placed in the vehicle (Ola, Uber cab, etc.).
- All such data are analyzed and jam-free or less jam way, less time taking ways are recommended. In such a way **smart traffic system can be built in the city through Big data analysis**.
- One more profit is **fuel consumption can be reduced.**

Applications of Big Data

4. Secure Air Traffic System:

- At various places of flight (like propeller etc.) sensors are present. These sensors capture data like the speed of flight, moisture, temperature, and other environmental condition.
- Based on such data analysis, environmental parameters within the flight are set up and varied.
- By analyzing flight's machine-generated data, it can be estimated how long the machine can operate flawlessly when it is to be replaced/repaired.

Applications of Big Data

5. Auto Driving Car:

- Big data analysis helps to drive a car without human interpretation.
- In the various spot of the car camera, a sensor is placed, that gather data like the size of the surrounding car, obstacle, distance from those, etc.
- These data are analyzed, then various calculations like how many angles to rotate, what should be speed, when to stop, etc. are carried out.
- Hence, these calculations help to take action automatically.

Applications of Big Data

6. Virtual Personal Assistant Tool:

- Big data analysis helps **virtual personal assistant tools (like Siri on Apple Devices, Cortana on Windows, and Google Assistant on Android)** to provide the answer to the various question asked by users.
- This tool **tracks** the **location of the user, their local time, season, other data** related to questions asked, etc. analyzing all such data, and providing an answer.
- As an example, suppose one user asks **“Do I need to take an Umbrella?”**, the tool collects data like the location of the user, season, and weather conditions at that location, then analyze these data to conclude if there is a chance of raining, then provide the answer.

Applications of Big Data

7. IoT:

- **Manufacturing companies** install IoT sensors into machines to collect operational data.
- Analyzing such data, it can be predicted **how long the machine will work without any problem** when it requires repairing so that company can **take action before the situation** when the machine faces a lot of issues or gets totally down. Thus, the **cost** to replace the whole machine can be **saved**.
- In the **Healthcare** field, big data is providing a significant contribution. Using big data tools, data regarding **patient experience is collected** and used by doctors **to give better treatment**.
- IoT devices can sense **a symptom of probable coming disease** in the human body and prevent it from giving advance treatment. IoT sensors are placed near-patient, and newborn baby constantly keeps track of various health condition like **heart beat rate, blood pressure**, etc.
- Whenever any parameter crosses the safe limit, an alarm is sent to a doctor, so that they can take a **step remotely very soon**.


BIG DATA IN
MANUFACTURING INDUSTRY
AUTOMATION
SMART FACTORY
REMOTE
CONTROL
TRANSPORTATION

Supply drivers

Medical & patient data
Electronic Health Records (EHR) health sensors, social media, and genomics create rich new data sources for analytics

Big data analytics
Cheap computing power and sophisticated analytics drive insights into patient behavior, treatment costs and R&D

Moblie/mHealth
Pervasive mobile and smart phone adoption creates new engagement models within daily routines

Health care professionals digital workflow
Increasing integration of EHRs and telehealth drives new digitally-enabled coordinated workforce models of care

Demand drivers

Roll out business models tied to patient outcomes that also reduce medical errors and improve quality

Discover and deliver targeted and personalised therapies with real-world evidence of impact

Influence patients behaviors beyond the pill' and sustain engagement outside the traditional care setting

Drive population health management, protocol-driven patient risk pool and stratification management

Applications of Big Data

8. Energy Sector:

- A **smart electric meter** reads consumed power every 15 minutes and sends this read data to the server, where data analyzed and it can be estimated **what is the time in a day when the power load is less throughout the city**.
- By this system, the **manufacturing unit or housekeeper** is suggested the time when they should **drive their heavy machine** in the night time when power load less to enjoy **less electricity bill**.

Applications of Big Data

9. Media and Entertainment Sector:

- Media and entertainment service-providing companies like **Netflix, Amazon Prime, and Spotify** do analysis on data collected from their users.
- Data like **what type** of video, and music users are watching, and listening mostly, how long users are **spending on site**, etc. are collected and analyzed **to set the next business strategy**.

Big Data Application examples in different Industries:

Retail/Consumer

- Merchandizing and market basket analysis
- Campaign management and customer loyalty programs
- Supply-chain management and analytics
- Event- and behavior-based targeting
- Market and consumer segmentations

Finances & Frauds Services

- Compliance and regulatory reporting
- Risk analysis and management
- Fraud detection and security analytics
- Credit risk, scoring and analysis
- High speed arbitrage trading
- Trade surveillance
- Abnormal trading pattern analysis

Web and Digital media

- Large-scale clickstream analytics
- Ad targeting, analysis, forecasting and optimization
- Abuse and click-fraud prevention
- Social graph analysis and profile segmentation
- Campaign management and loyalty programs

Health & Life Sciences

- Clinical trials data analysis
- Disease pattern analysis
- Campaign and sales program optimization
- Patient care quality and program analysis
- Medical device and pharmacy supply-chain management
- Drug discovery and development analysis

Telecommunications

- Revenue assurance and price optimization
- Customer churn prevention
- Campaign management and customer loyalty
- Call detail record (CDR) analysis
- Network performance and optimization
- Mobile user location analysis

Ecommerce & customer service

- Cross-channel analytics
- Event analytics
- Recommendation engines using predictive analytics
- Right offer at the right time
- Next best offer or next best action

FAQs

- Different types of big data application.
- Use of big data in different field.

References

- https://www.geeksforgeeks.org/applications-of-big-data/
- https://www.javatpoint.com/applications-of-big-data
- https://www.simplilearn.com/tutorials/big-data-tutorial/big-data-applications

THANK YOU

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