CHANDIGARH UNIVERSITY

Discover. Learn. Empower.

Apex Institute of Technology

Department of Computer Science & Engineering

Bachelor of Engineering (Computer Science & Engineering)

Big Data Analytics and IoT– (CSD-432)

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DISCOVER . LEARN . EMPOWER

Big Data Analytics in IoT

Course Objective

The objective of this course is :

CO Number	Title	Level
CO1	To Understand the fundamental of big data analytics and computing in IoT domain.	Understand
CO2	To Acquire knowledge on data analytic tools and techniques.	Understand
CO3	To learn the practical implementation of big data analytics and solve the real time problem.	Understand

Will be covered in this lecture

Big Data Analytics in IoT

Course Outcome:

Upon successful completion of this course, students will be able to:

CO Number	Title	Level
CO1	Understand the big data analytics concepts with respective to IoT along with their challenges.	Understand
CO2	Explain the concepts of the development of smart systems.	Understand
CO3	Implement the use of big data tools to process IoT data in various fields of communication by find a solution.	Understand

Will be covered in this lecture

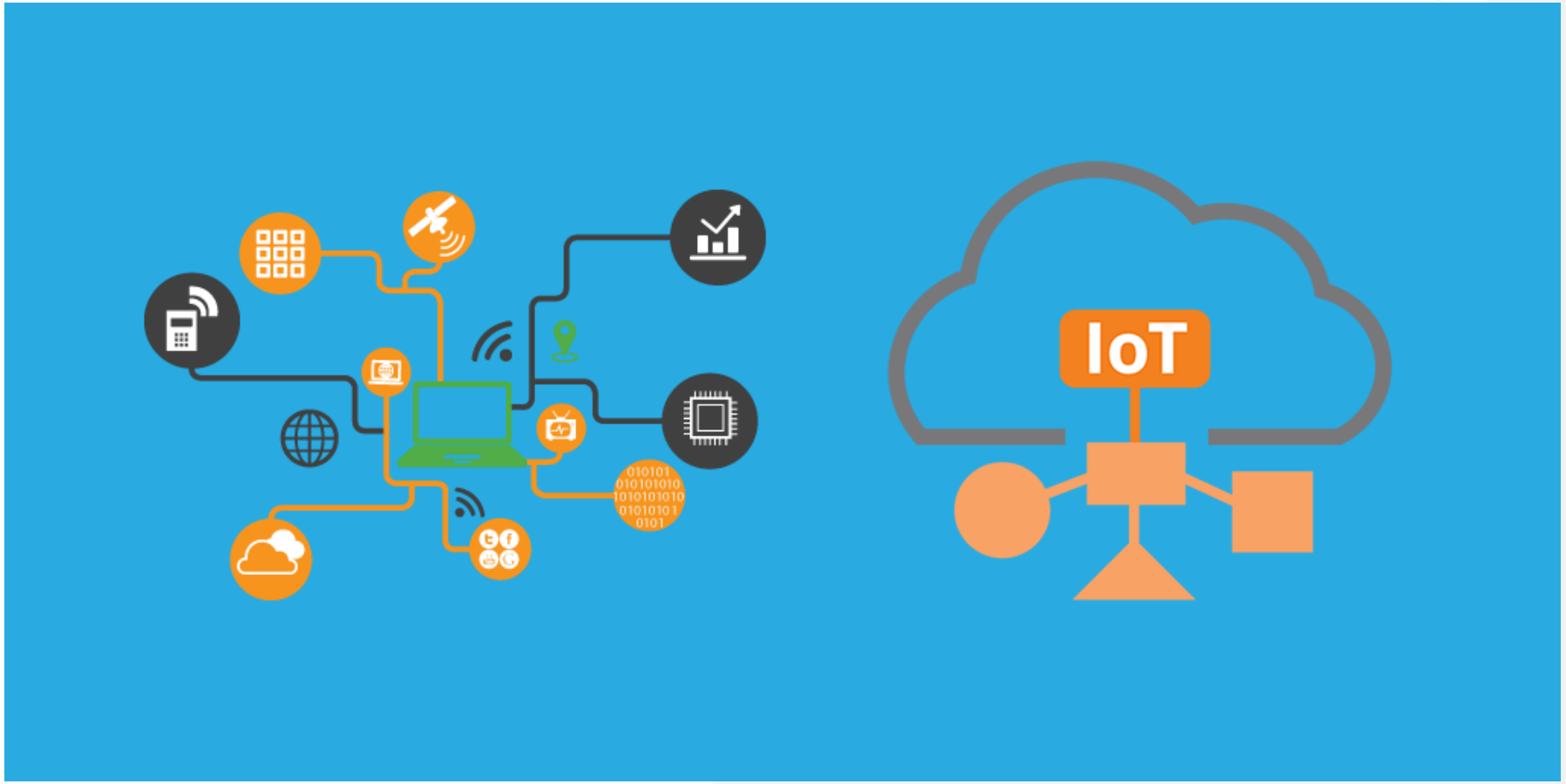
Welcome to the session of

Unit-1: *Introduction to Big Data analytics in IoT Domain*

Chapter-1: Overview of Bigdata

...Activity...

What do you find in ?



https://www.promptcloud.com/wp-content/uploads/2018/07/data-integrity-maintenance-1.png

Agenda

Chapter:1 __Lecture: 1

- Evolution of Data
- What is Data
- Need of Big Data
- What is Big Data
- Understanding Big Data with practical examples
- Application of Big Data
- Emerging and growth of Big data.

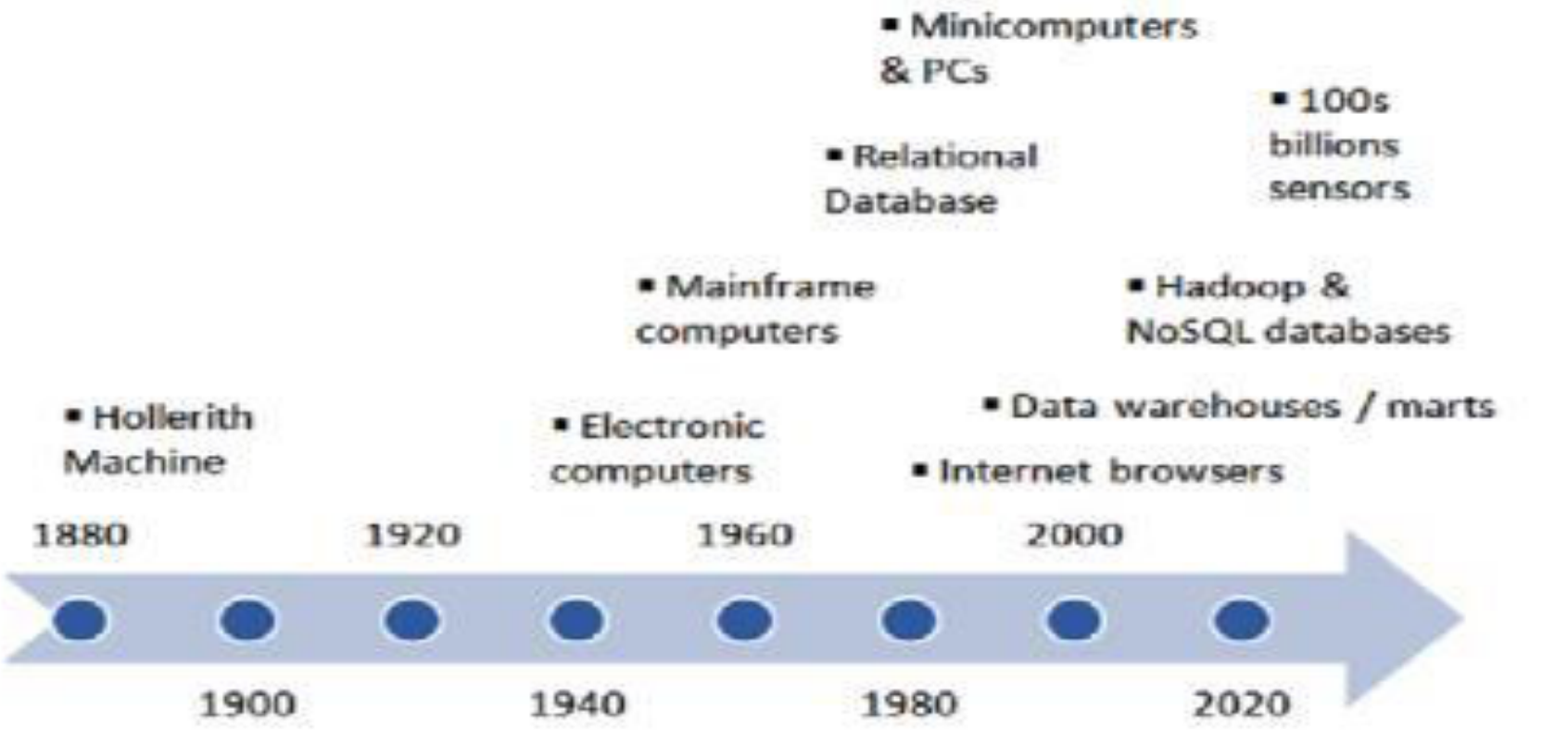
Link: https://www.orangemantra.com/blog/java-plays-evolutionary-role-big-data-iot/

Evolution of Technology

Let us step back and go through the journey ….

What do you understand form thins picture ???

Evaluation of data



Link: https://towardsdatascience.com/the-evolution-of-analytics-with-data-8b9908deadd7

Remember : Data → plural , Datum → singular

What is Data???

Data are characteristics or information, usually numerical, that are collected through observation._ Wikipedia

Link: https://hospitalitytech.com/data-hygiene-big-datas-big-problem

Let us define data in our way:

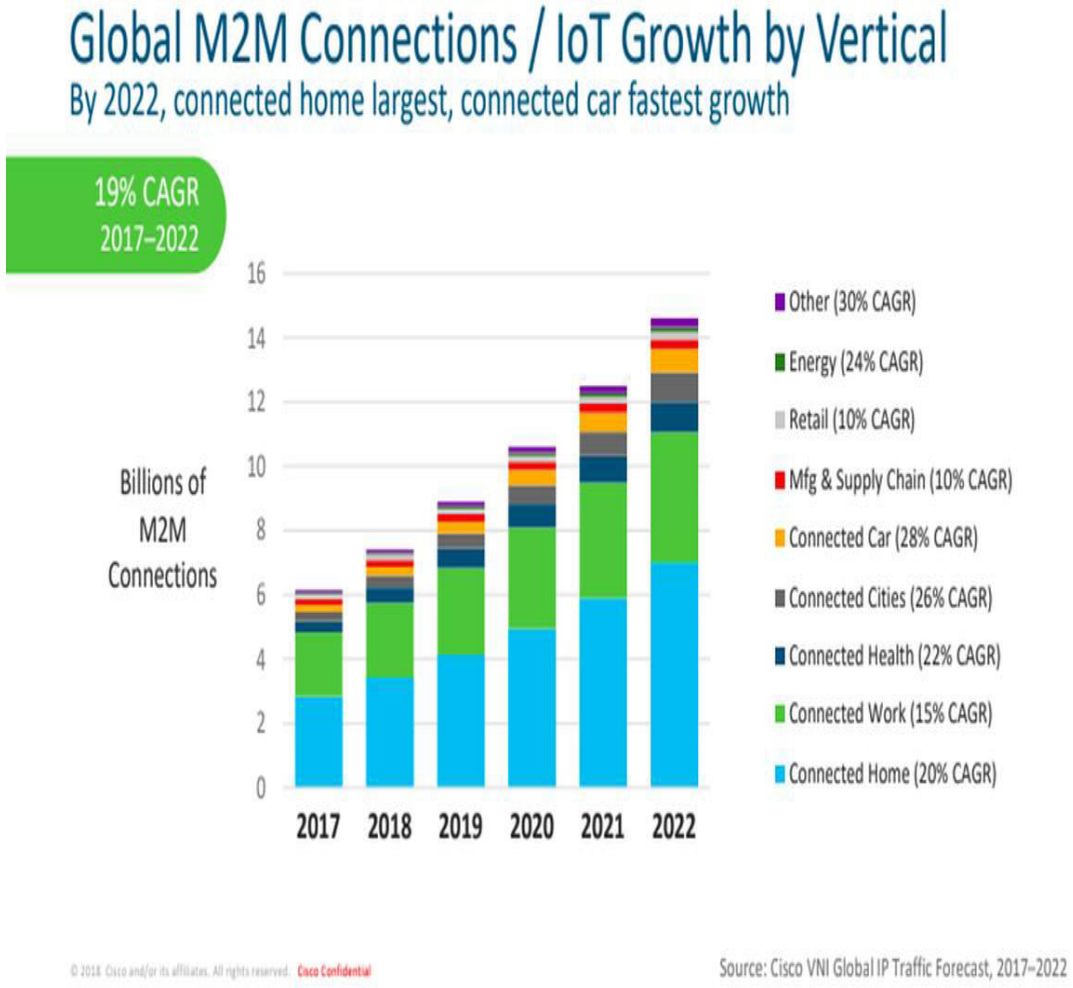
Data can be quantity (1,2,3), character (A,B,C), Symbols (@,%,$) operations are performed by a computer, which may be stored or transmitted in the from of electrical signals and recorded on magnetic, electronic, optical or machinal recording media.

Or *in simple way*

All the facts and figures which can be stored in a digital format can be termed as data. All text, numbers, images, videos, audios are some examples of data.

Fun Facts about Global Data

- In every 5 years there will be over 50 billion smart connected devices all-over the world.
- we create 2.5 quiultillion of data every day.



Link: https://www.zdnet.com/article/iot-to-drive-growth-in-connected-devices-through-2022-cisco/

Data sources

Variety of sources from where data is being generated has also undergone a shift.

The types of data being created has changed from structured to semi-structured to unstructured data Structured Data Semi- Structured Data Unstructured Data. There are basically 3 types of data sources

1. Structured data source (Enterprise)
   - Spreadsheets
   - Relational Databases
   - ERP
   - CRM
   - Legacy systems
   - File share
2. Semi-structured data source
   - RSS
   - XML
3. Unstructured data source (Cloud)
   - Documents
   - Machine Data
   - Messaging
   - Photographs
   - Video
   - Social Media

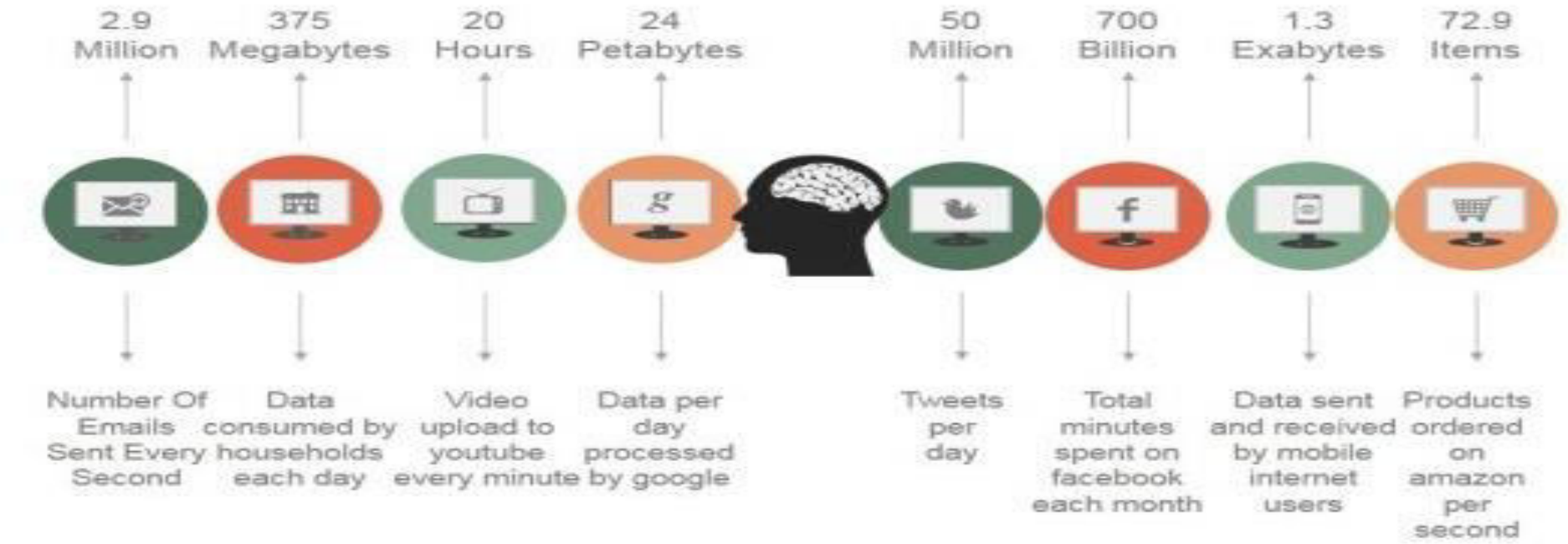
Introduction to Big Data

- Big Data may well be the Next Big Thing in the IT world.
- Big data burst upon the scene in the first decade of the 21st century.
- The first organizations to embrace it were online and startup firms. Firms like Google, eBay, LinkedIn, and Facebook were built around big data from the beginning.
- Like many new information technologies, big data can bring about dramatic cost reductions, substantial improvements in the time required to perform a computing task, or new product and service offerings.

Link: https://tdwi.org/articles/2017/02/08/10-vs-of-big-data.aspx

Need of Big Data

This is what happened is 1 minute with data.



Link: https://www.slidegeeks.com/business/product/big-data-and-social-media-analytics-ppt-powerpoint-presentation-background-designs

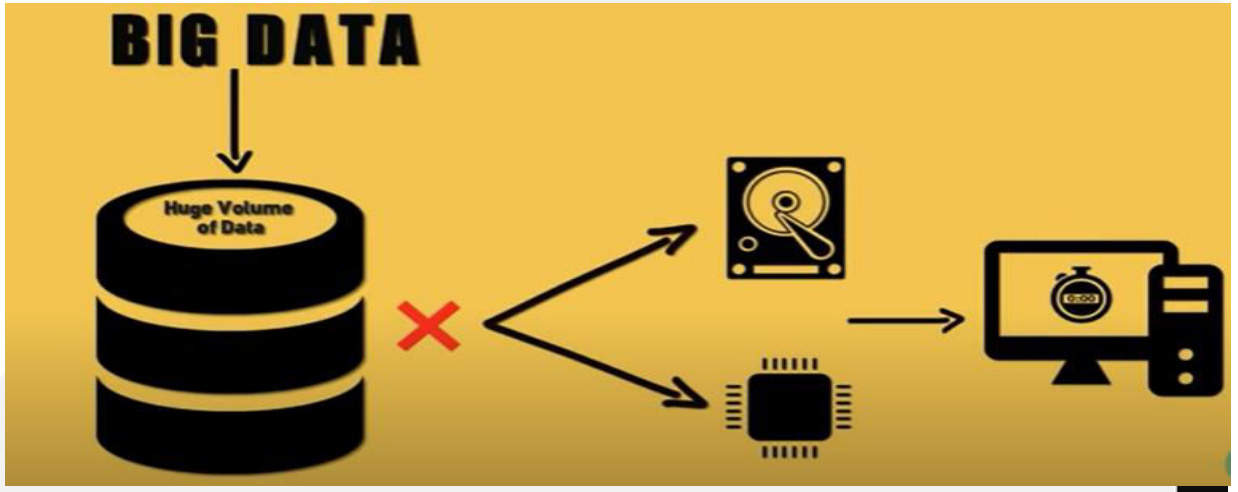
Big Data Analytics Domains

What is Big Data ???

- "Large volumes of a wide variety of data collected from various sources across the enterprise including transactional data from enterprise applications/databases, social media data, mobile device data, unstructured data/documents, machine-generated data and more." Source: IDG: Big Data – Growing Trends and Emerging Opportunities.

Or

- BIG-DATA Big data is the term for a collection of data sets so large and complex that it becomes difficult to process using on-hand database management tools or traditional data processing applications. Social Media Mobile Internet of Things / Sensors Video and Media Web Cloud.
- In our words big data refers to huge volume of data, that cannot be stored or processed using the traditional approach with in the given time frame.



How huge the data needs to be ???

Lets understand the concept easily with an example.

100 MB

Document

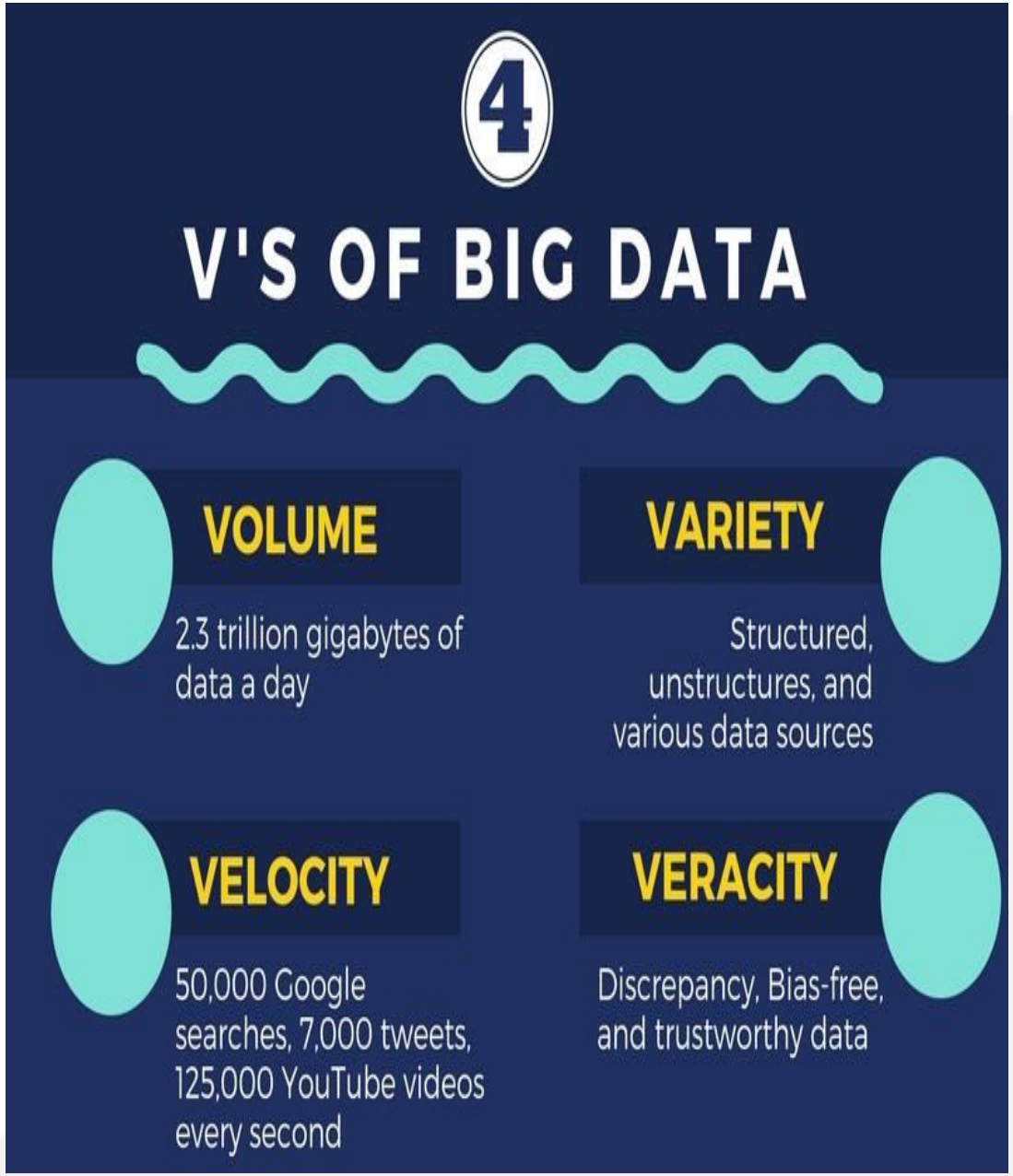
Attachment

This is nor possible, as the email system will not support the attachment of this size.

With respective to email this attachment can be referred as BID DATA

Understanding Big Data

- Data is the heart of everything today, data and its collection, sorting, organizing, analyzing and interpreting is termed as ‘Big Data’.
- If data would have been only one of these i.e. either volume (too large) or variety (mix a structured, unstructured, semi structured data) or velocity (growing at a fast pace), it would have been relatively easy to hold it. However, data generated with mix of all three V’s complicate the scenario.
- Volume: Volume refers to the size or extent of data.
- Velocity: Velocity is the rate at which data is generated and examined.
- Variety: Variety refers to structural heterogeneity in data set.
- Veracity: IBM framed Veracity as the fourth V, which epitomize to the inconsistency or uncertain nature of data.



Applications of Big Data

Companies	Applications
Amazon	Improve customer relations, personalized recommendation system, book recommendations from kindle highlighting, one-click ordering, anticipatory shipping model, supply chain optimization, price optimization, Amazon web services
American Express	Forecast of potential churn and customer loyalty, Big Data, cloud computing and mobile infrastructure laboratory, combining client exchange and interactions data to foresee client changes
BDO	To identify risk and fraud
Capital one	Examination of the socioeconomics and spending propensities for clients, to find ideal occasions to show different offers to customers
General Electric	To create tools and upgrades for increased proficiency
Miniclip: Gaming Platform	To monitor and improve user experience, measure the successful elements, eliminating or improving the problematic components
Netflix	To view habits of millions of international consumers, programme content that appeals globally
Next Big Sound	Give insight into internet based life ubiquity, the effect of TV appearances
StarBucks	To determine the potential accomplishment of each new area, taking information on area, traffic, territory statistic and client conduct into account
TMobile	Information on billing and client relations administration alongside data via web-based networking media use, T-Moblie USA claims they split client abandonments within a single quarter

Link: Text book with the name IoT and BDA for smart generations

Summary

In todays session we tried understanding the below concept :

- ☞Evaluation of data ?
- ☞What is data ?
- ☞Need of data processing?
- ☞What is big data?
- ☞Understanding big data
- ☞Applications of big data

In the next session we will discuss about data modelling, implementation challenges, big data market and there features.

...Activity...

Discussion on data

What are the types of data?

Guess the characters of data to be précised big data ??

References:

- ✓ https://www.simplilearn.com/how-facebook-is-using-big-data-article?source=CTAexp
- ✓ https://www.icas.com/ca-today-news/10-companies-using-big-data
- ✓ https://www.bernardmarr.com/default.asp?contentID=1076
- ✓ Bryant, R.E., Katz, R.H., Lazowska, E.D.: Big-Data Computing: Creating Revolutionary Breakthroughs in Commerce, Science and Society
- ✓ Sathi, A.: Implementation section (book 1). In: Big Data Analytics: Disruptive Technologies for Changing the Game, 1st ed. MC Press Online (2012)

Assessment Pattern

S.No.	Item	Number/semester	Marks
1	MSTs	2	20 per each
2	Quiz	2 per unit	4 per each quiz
3	Time bound surprise test	3 (one per unit)	12 per each test
4	Assignments	3 (one per unit)	10 per each Assignment
5	Engagement task (non gradable)	One per each topic	depends
6	Attendance + Engagement score	Above 90%	2
Internal (division as mentioned above points 1-6)			**40**
External			**60**
Total			**100**

THANK YOU

For queries
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