BIG DATA TOOLS FOR MANAGERS

(N2MBA07)

Syllabus

Unit-1: Big Data, Database

- Overview of Big Data
- Data, Information, Database

Syllabus

Unit-1: Big Data, Database

- Overview of Big Data
- Data, Information, Database

Unit-2: SQL

- Introduction to SQL, MySQL
- Data retrieval using MySQL

Syllabus

Unit-1: Big Data, Database

- Overview of Big Data
- Data, Information, Database

Unit-2: SQL

- Introduction to SQL, MySQL
- Data retrieval using MySQL

Unit-3: R Programming

- Introduction to R Language
- Data Manipulation, Graph, Regression

Syllabus

Unit-1: Big Data, Database

- Overview of Big Data
- Data, Information, Database

Unit-2: SQL

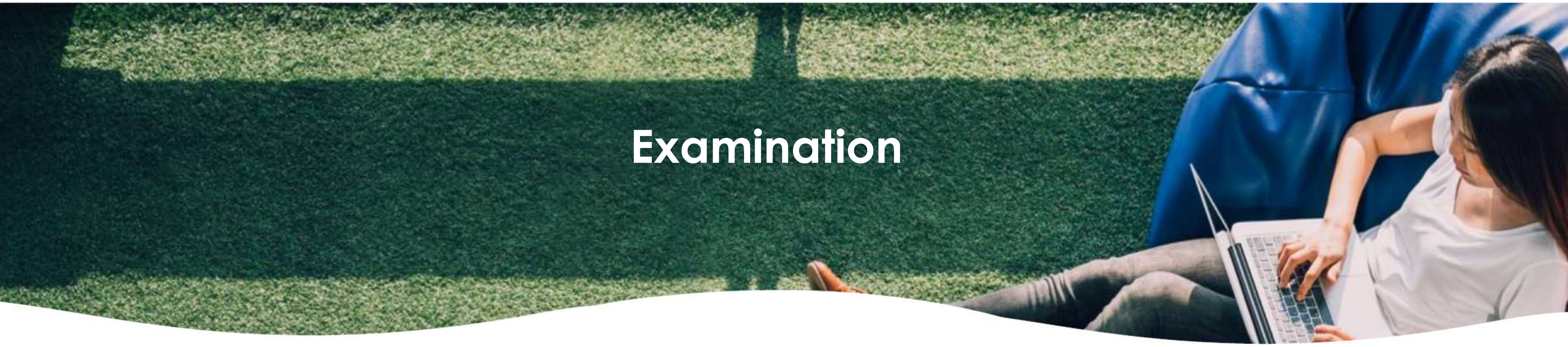
- Introduction to SQL, MySQL
- Data retrieval using MySQL

Unit-3: R Programming

- Introduction to R Language
- Data Manipulation, Graph, Regression

Unit-4, 5: Python

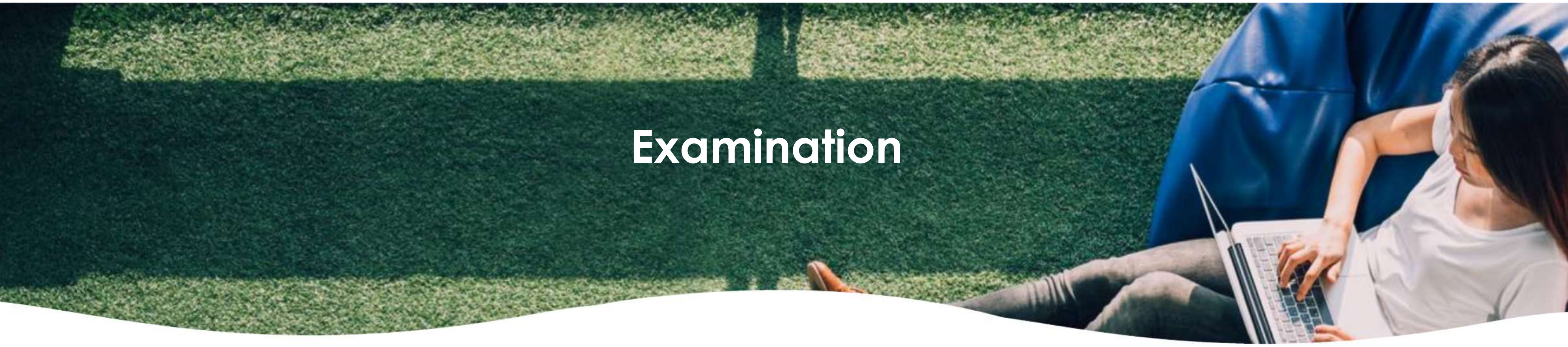
- Introduction to Python Programming Concept
- Data Manipulation, Time Series & Text Analytics using Python



Examination

Internal assessment

- 50 Marks Question Paper
- Practical Exam
- Write SQL/R/Python code
- 1.5 hrs



Examination

Internal assessment

- 50 Marks Question Paper
- Practical Exam
- Write SQL/R/Python code
- 1.5 hrs

Semester end assessment

- 50 Marks MCQ Question Paper
- 50 questions with multiple choice option
- 1.5 hrs

Class timings

Weekly once (on Saturday)

09:00AM – 10:10AM	Theory Sessions
10:10AM – 10:30AM	Break
10:30AM – 12:00PM	Practical Sessions

~3 hrs

Class timings

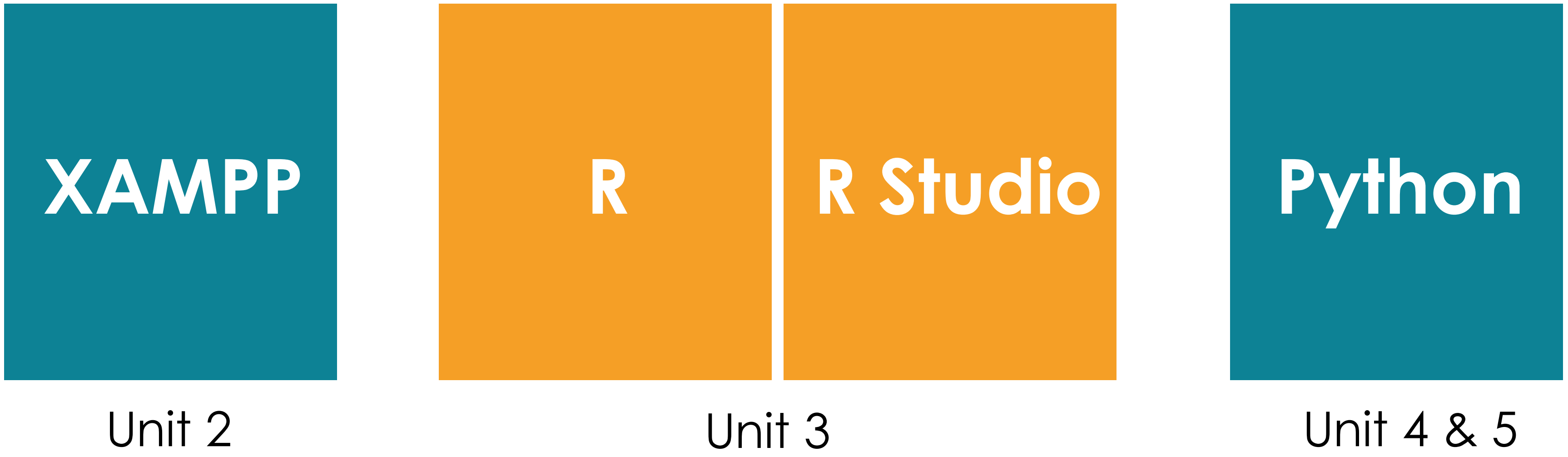
Weekly once (on Saturday)

09:00AM – 10:10AM	Theory Sessions
10:10AM – 10:30AM	Break
10:30AM – 12:00PM	Practical Sessions

~3 hrs

Theory Sessions	01:00PM – 02:10PM
Break	02:10PM – 02:30PM
Practical Session	02:30PM – 04:00PM

Software Tools for BDTM



XAMPP

Unit 2

R

R Studio

Unit 3

Python

Unit 4 & 5

What is a Data ?

- ✓Data is a collection of information gathered by observations, measurements, research or analysis
- ✓It consists of facts, numbers, names, figures or even description of things.
- ✓Data can be organized in the form of free text, images, graphs, tables
- ✓Example :

City	Min. Temp. (in Degrees)	Max. Temp. (in Degrees)	Rain
Mumbai	25	40	22%
Delhi	32	45	16%
Bangalore	23	35	28%
Chennai	33	48	21

What is a Digital Data ?

✓Digital data is data that represents other forms of data using specific machine language systems that can be interpreted by various technologies.

✓The most fundamental of these systems is a binary system, which simply stores complex audio, video or text information in a series of binary characters, traditionally ones and zeros, or "on" and "off" values.

Data Sources

Internal data sources

Information that comes directly from the company's systems and are specific to the company in question

Example:

- Sales, Cash Flow, Production
- Customer Relationship Management(CRM)
- Enterprise Resource Planning(ERP) system
- OLTP and operation data

Data Sources

Internal data sources

Information that comes directly from the company's systems and are specific to the company in question

Example:

- Sales, Cash Flow, Production
- Customer Relationship Management(CRM)
- Enterprise Resource Planning(ERP) system
- OLTP and operation data

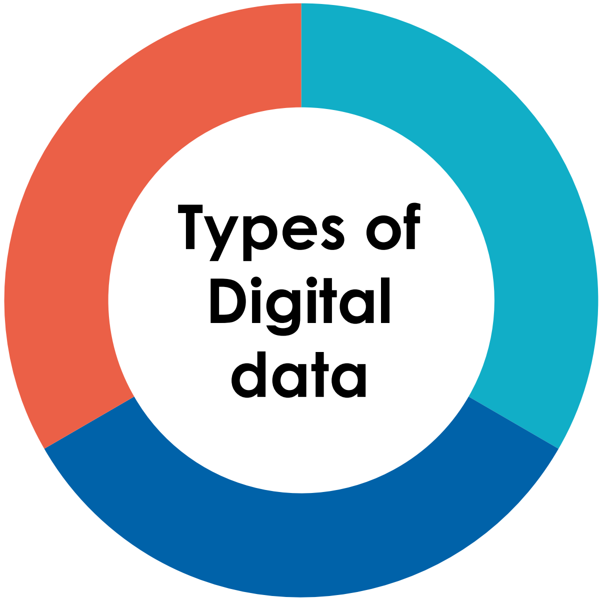
External data sources

Information that comes from outside of company's or provided 3rd party vendor.

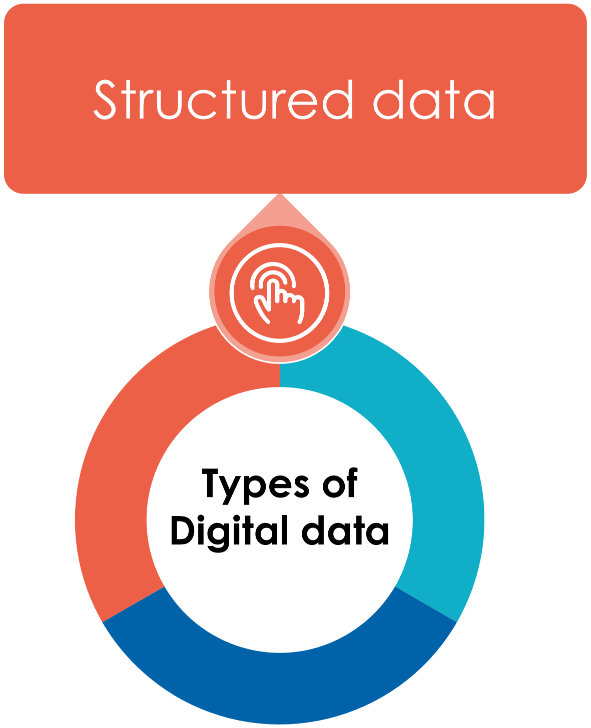
Example:

- Internet, Social Media data
- Government
- Market Research Organization
- Business Partners**

Types of Digital Data

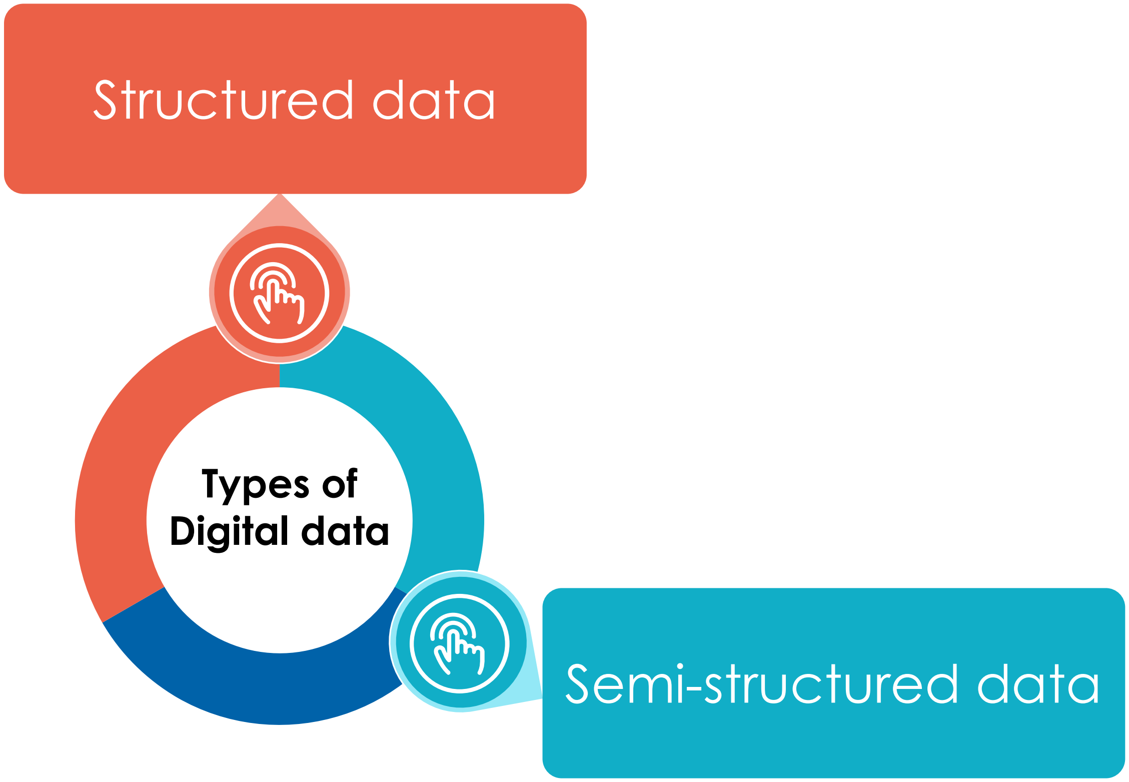


Types of Digital data



Structured data

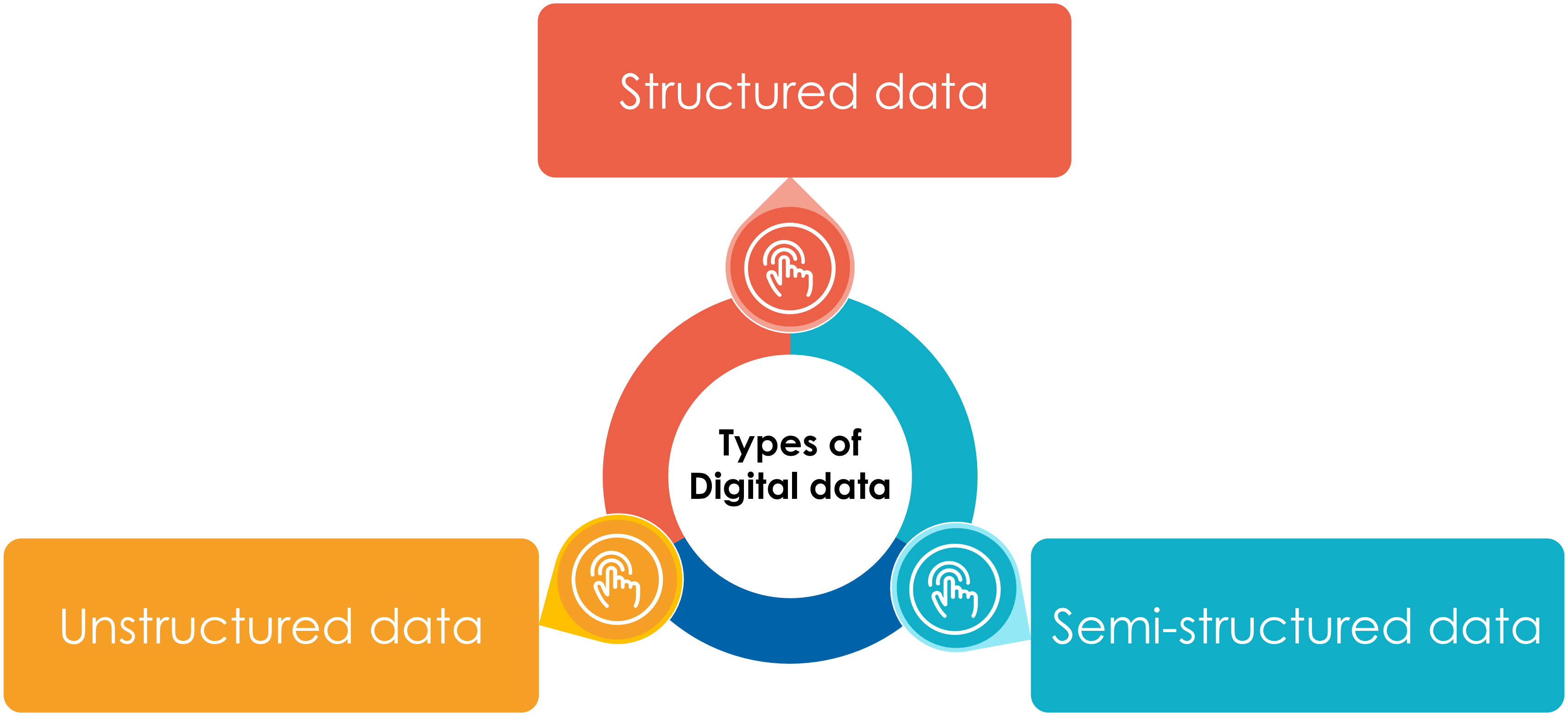
Types of Digital data

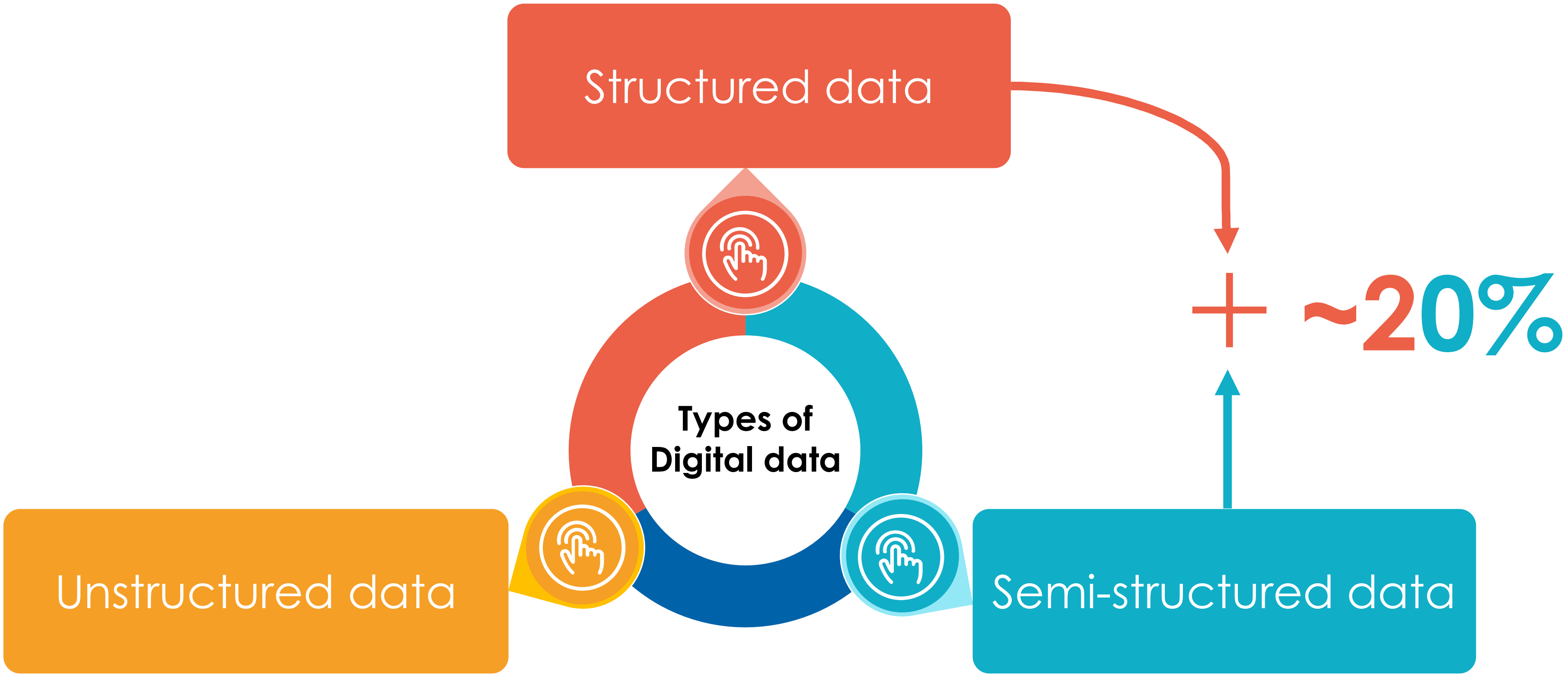


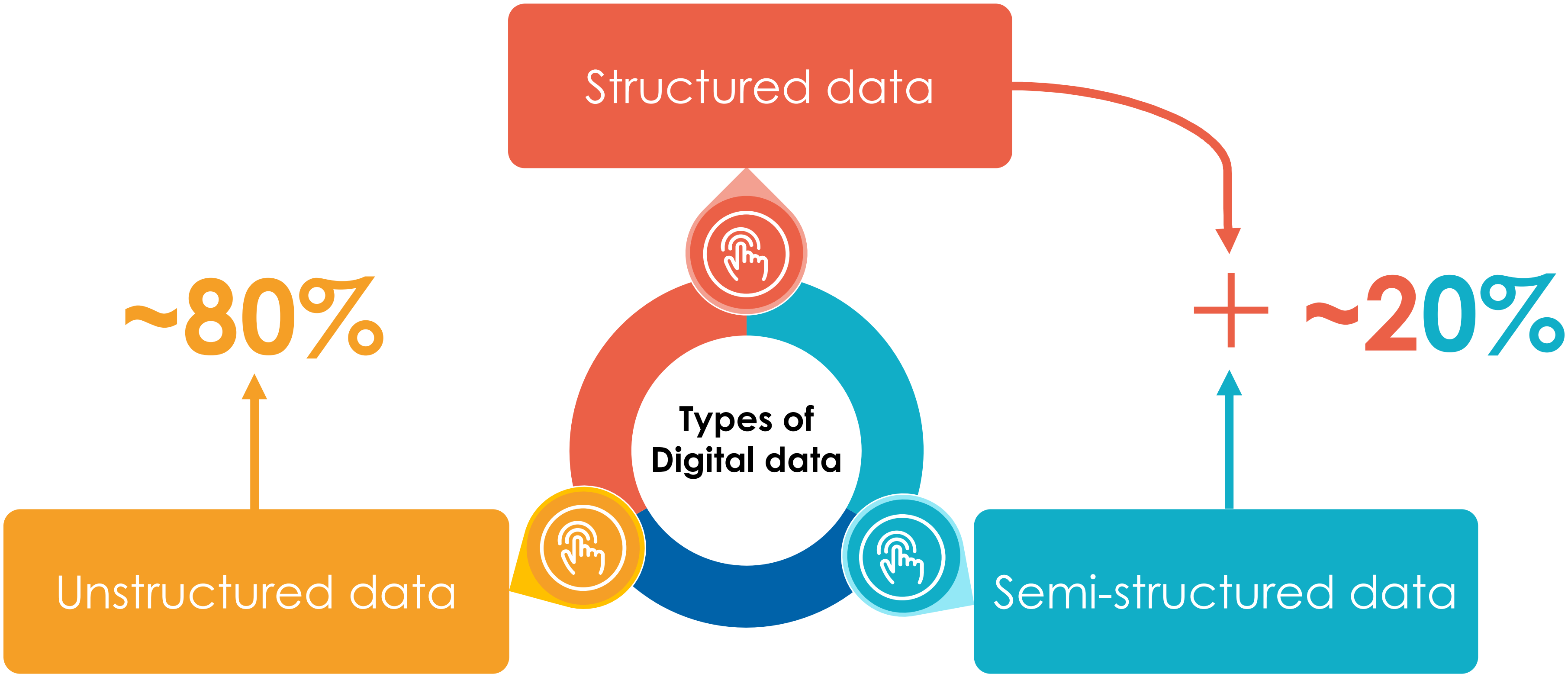
Structured data

Types of Digital data

Semi-structured data


Structured data
Types of Digital data
Unstructured data
Semi-structured data


Structured data
Types of Digital data
Unstructured data
Semi-structured data
+ ~20%



Structured data

Unstructured data

Semi-structured data

Types of Digital data

~80%

+ ~20%

Structured Data

- Structured data can be defined as the data that has a defined repeating pattern.
- This pattern makes it easier for any program to sort, read, and process the data.
- Processing structured data is much easier and faster than processing data without any specific repeating patterns.

Structured Data

- Structured data can be defined as the data that has a defined repeating pattern.
- This pattern makes it easier for any program to sort, read, and process the data.
- Processing structured data is much easier and faster than processing data without any specific repeating patterns.
- Example:

Customer ID	Customer Name	Product ID	City	State
12345	Smith	214	Mumbai	Maharashtra
23456	John	365	Bangalore	Karnataka
34567	Nick	222	Pune	Maharashtra
45678	Sagar	456	Chennai	Tamil Nadu

Semi-Structured Data

- Semi-structured data, also known as having a schema-less or self describing structure, refers to a form of structured data that contains tags or markup elements in order to separate out the elements and generate hierarchies of records and fields in the given data.

Semi-Structured Data

- Semi-structured data, also known as having a schema-less or self describing structure, refers to a form of structured data that contains tags or markup elements in order to separate out the elements and generate hierarchies of records and fields in the given data.
- Example:

#No	Name	Email
1	Sam Jocabs	smj@xyz.com
2	First Name : David Last Name : Brown	davidb@xyz.com
3	Nick Sagar	Email-1: nick.sager@xyz.com Email-2: nicksager@gmail.com
4	First Name : John Middle Name : P Last Name : Todd	Personal Email: johntodd@gmail.com Business Email: john@xycompany.com

Unstructured Data

- Unstructured data is a set of data that might or might not have any logical or repeating patterns. About 80% of enterprise data consist of unstructured content.
- What are the unstructured data ?

Unstructured Data

- Unstructured data is a set of data that might or might not have any logical or repeating patterns. About 80% of enterprise data consist of unstructured content.
- What are the unstructured data ?

Videos

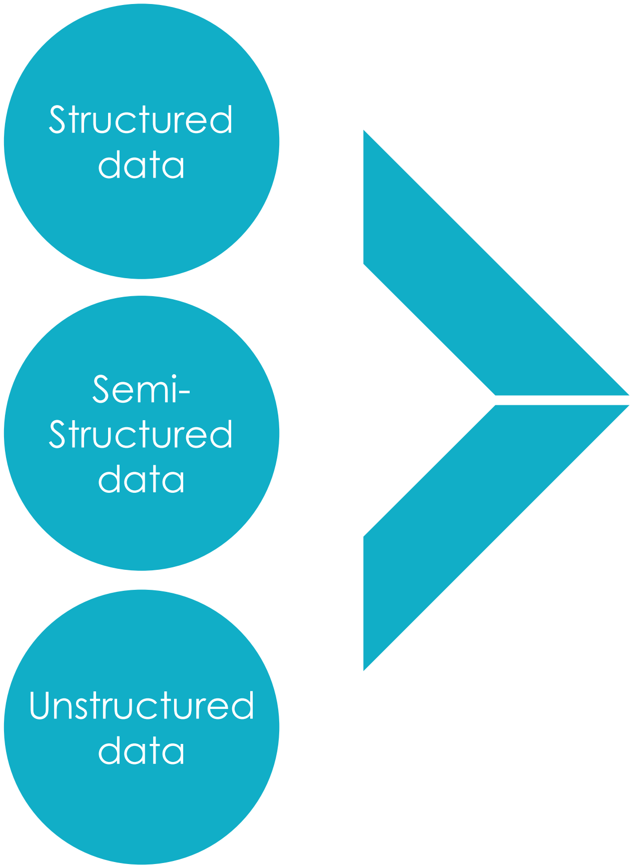
Audio/Music

Emails

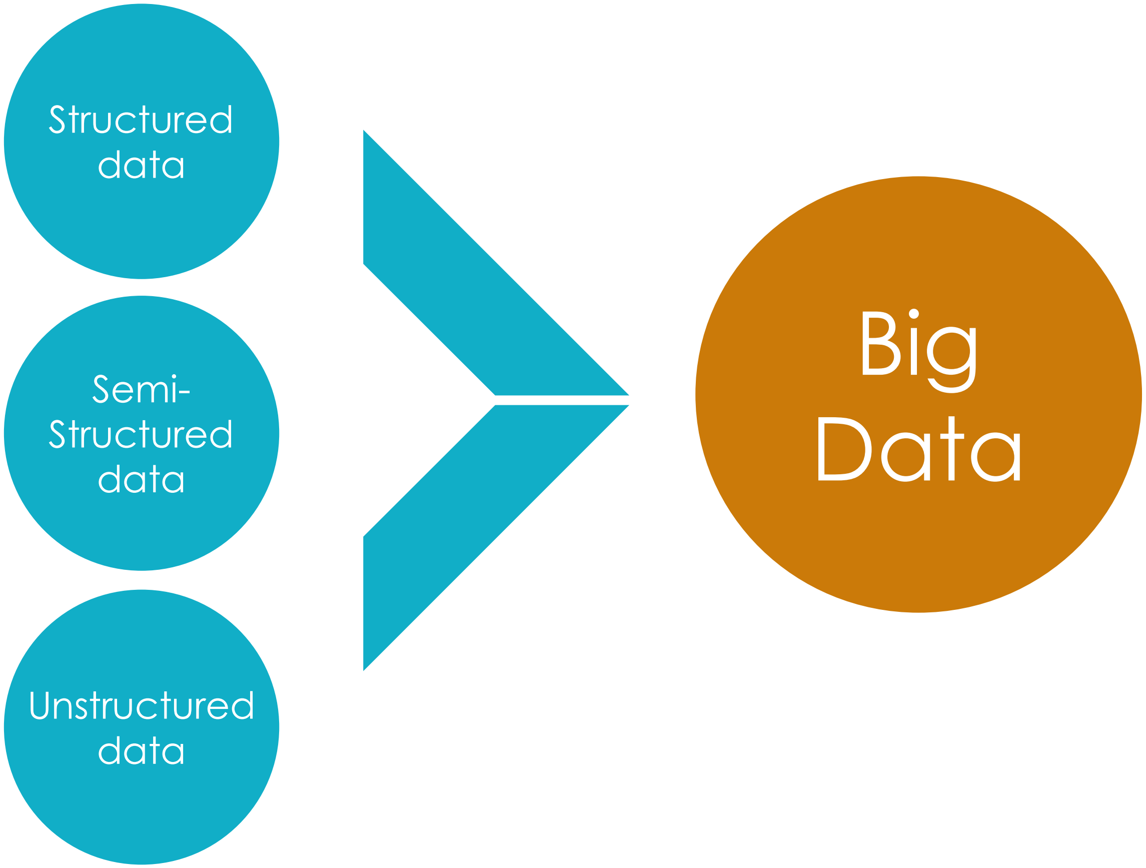
Social media

Maps

What if it gets combine?



What if it gets combine?



Structured data

Semi-Structured data

Unstructured data

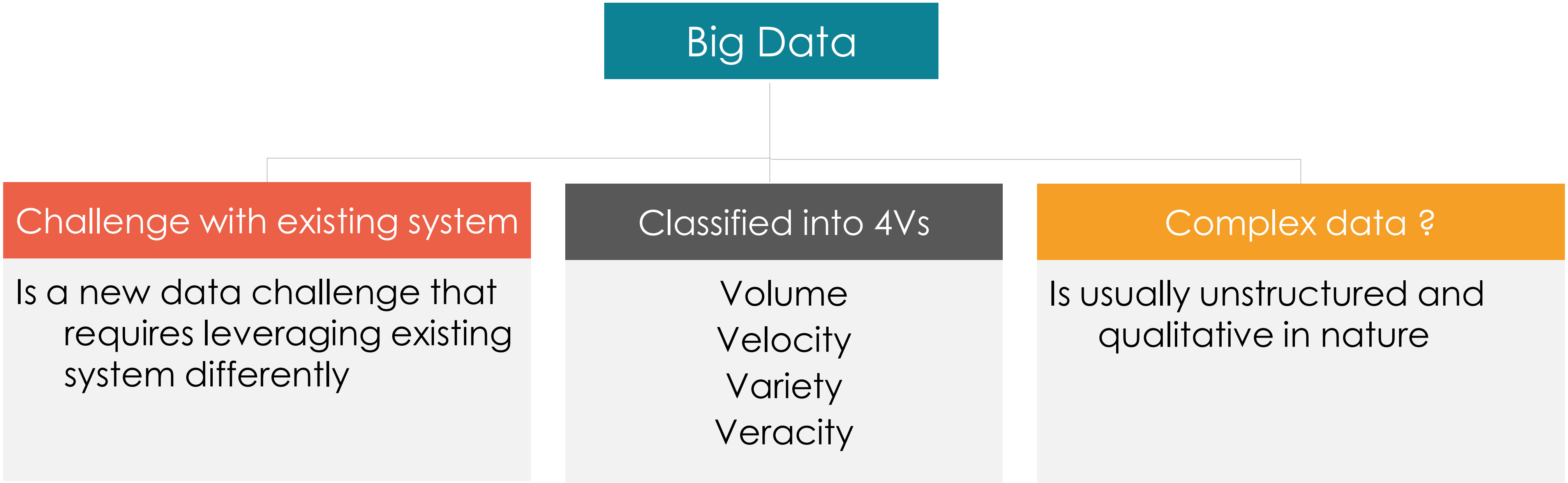
Big Data

What is a Big Data?

- ✓Big data refers to the datasets that are too large or complex to be manage by traditional data-processing software.

- ✓Big data is structured, unstructured and semi-structured or heterogeneous in nature. It becomes difficult for computing system to manage “Big Data” because of the extreme speed and volume at which it is generated

Characteristics of Big Data



Big Data

Challenge with existing system

Is a new data challenge that requires leveraging existing system differently

Classified into 4Vs

Volume
Velocity
Variety
Veracity

Complex data ?

Is usually unstructured and qualitative in nature

BIG DATA

Tweets

Every second ~6000 tweets

UPI

Every day around

~6.5 billion transactions

Facebook

Every minute
~5 lacs comments,
~3 lacs status update,
~1.5 lacs photos upload

E-Commerce

Every day approximate 1.6 million shipment

Big Data - 4Vs

According to Gartner, data is growing at the rate of 59% every year. This growth can be depicted in terms of the following four Vs.

Volume

Volume is the amount of data generated by organizations or individuals.

Variety

Variety describe the different formats for data such as images, text, video, audio, GPS.

Velocity

Velocity describes the rate at which data is generated, captured, and shared

Veracity

Veracity generally refers to the uncertainty of data. Whether the obtained data is correct or consistent.

THE 4 V'S OF BIG DATA

Volume

SCALE OF DATA

40 ZETTABYTES
of data will be created by 2020, an increase of 300 times from 2005

6 BILLION PEOPLE
have cell phones
WORLD POPULATION: 7 BILLION

2.5 QUINTILLION BYTES
of data are created each day

Most companies in the U.S. have at least
100 TERABYTES
of data stored

Variety

DIFFERENT FORMS OF DATA

As of 2011, the global size of data in healthcare was estimated to be
150 EXABYTES

30 BILLION PIECES OF CONTENT
are shared on facebook every month

4 BILLION + HOURS OF VIDEO
are watched on You Tube each month

4 MILLION TWEETS
are sent per day by about 200 million monthly active users

Velocity

ANALYSIS OF STREAMING DATA

The New York Stock Exchange captures
1TB OF TRADE INFORMATION
during each trading session

Modern cars have close to
100 SENSORS
that monitor items such as fuel level and tire pressure

Veracity

UNCERTAINITY OF DATA

1 IN 3 BUSINESS LEADERS
don't trust the information they use to make decisions

27% OF RESPONDENTS
in one survey were unsure of how much of data was inaccurate

Reference : http://www.ibmbigdatahub.com/infographic/four-vs-big-data

Future of Big Data

- Most organizations today consider data and information to be their most valuable and differentiated asset. Big Data can unlock significant value by making information transparent.

- Sophisticated analytics can improve decision-making, minimize risks, and unearth valuable insights that would otherwise remain hidden.

- At the same time, the volume and variety of data is also increasing at the immense rate every day, so big data can be used to develop the next generation of products and services.

Thank You