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ICT-TEX course on Digital skills

Topic 10: Business Analytics

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ICT IN TEXTILE AND CLOTHING HIGHER EDUCATION AND BUSINESS

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10.3. Big Data and Analytics



These slides are part of the topic on
“Topic 10: Business Analytics” of the course on
Digital skills in Textile and clothing industry.

Check also the other themes in this topic:

- 10.1. Analytics and Classification of Analytics
- 10.2. Business Analytics
- 10.4. Data Visualizations and Analytics
- 10.5. Popular Analytics Software tools



Contents

3. Big Data and Analytics

- [Big Data Introduction](#)
- [Big Data Characteristics](#)
- [Big Data Value](#)
- [Big Data Applications](#)
- [Big Data Technologies](#)
- [Big Data Analytics](#)
- [Big Data Analytics Process](#)
- [Benefits of Big Data Analytics](#)



Big Data Introduction

- Definition of Big Data

“Big data is defined as collections of datasets whose volume, velocity or variety is so large that it is difficult to store, manage, process and analyze the data using traditional databases and data processing tools.”

- Bahga, A., Madisetti, V.: *Big Data Science & Analytics: A Hands-On Approach*. 1st Edition, Arshdeep Bahga & Vijay Madisetti 2019. ISBN: 978-1-949978-00-1 (2019)



Big Data Introduction

- The term “**Big Data**” also refers to the massive amounts of business data, generated (and in real-time) from any sources of data.
- The data can be of different types of data:
 - **Structured data**
 - **Semi-structured data**
 - **Unstructured data**



Big Data Introduction

- The business data includes information from different sources of data, collected from companies.
- From an organizational perspective, this data can be:
 - Created **inside** an organization (Internal sources of data)
 - Available **outside** an organization (external sources of data)
- Nowadays companies thrive to collect, store and manage data to make strategic business decisions.



Big Data Characteristics

- Companies need all the data they can get.
- In particular, the term "Big Data" is often used as the ultimate limit of a company's ability to collect, store, process, and access this big data, for the company's operation and its work, supporting decision-making processes, management risk, customer service and more.



Big Data Characteristics

- Big Data has many characteristics starting with the letter "V"

Examples of Big Data characteristics

Volume

Velocity

Variety

Veracity

Value

Viability

Vulnerability

Volatility

Visualization

Others



Big Data Characteristics

Big Data Volume:

- Represents the scale of data.
- Represents enormous business data that is constantly generated in real-time
- All the data must be collected, stored, and measured, representing petabytes and exabytes of data, generated from any sources of data.



Big Data Characteristics

Big Data Velocity:

- Represents how fast the data is generated, from the different sources of data
- Represents how fast the data is used for the companies
- This characteristic is focused on the analysis of streaming data.
- One of the most common challenges facing organizations is the speed of data (velocity) and the response of companies to process it quickly.



Big Data Characteristics

Big Data Variety:

- Represents the diversity of the data.
- This characteristic of Big data represents different types of business data, such as:
 - Structured data
 - Semi-structured data
 - Unstructured data
- Data systems need to have the ability to handle the variety of generated data.



Big Data Characteristics

Big Data Veracity:

- Represents the accuracy of the data.
- The control of data quality is one of the key elements to resolve the problem of the large volumes of data, generated from different sources of data, and any form (structured, semi-structured, unstructured)
- To extract valuable information from business data, the reliability (veracity) of big data must be preserved



Big Data Value

- Represents the usefulness of the data for the specifically defined purpose.
- The value of data is not related to the volume of data, but it is focused on the amount of valuable and reliable data that needs to be processed to extract insights and generate valuable business information and knowledge.
- The value of big data must be related to the generation of economic value to the business



Big Data Value

Big Data is valuable for example:

Accessibility to Data

Decision Making

Marketing Trends

Performance Improvement

New Business Models/Services



Big Data Applications

The application of Big data covers a wide range of applications

Manufacturing
Industry

Retail Industry
and Wholesale
trade

Social Media
Sector

Education
Industry

Healthcare
Industry

Banking
Sector

Government
Sector



Big Data Applications

The application of Big data covers a wide range of applications

Ecommerce

Digital
Marketing

Media and
Entertainment
Industry

Cloud
Computation

Internet of
Things

Customer
Oriented
Services

Securities,
Insurance
Industry



Big Data Applications

The application of Big data covers a wide range of applications

Transportation
Industry

Digital
Communications

Airline Industry

Tourism

Energy and
Utilities

Natural
Resources

Many others



Big Data Technologies

The Big data technologies:

Hadoop Ecosystem

Artificial Intelligence

NoSQL Database

R Programming

Python Programming

Data Lakes

TensorFlow

Beam

Docker

Airflow

Kubernetes

Blockchain and many others



Big Data Analytics

- Represents a type of Analytics tools and techniques to explore, analyze, and visualize Big data from different data sources.
- Focused on Big Data and Big Data Characteristics
- Uses Big Data technologies and Analytics capabilities to extract valuable insights over the vast amounts of Big data
- Helps the management to make informed business decisions, based on the processed Big Data.

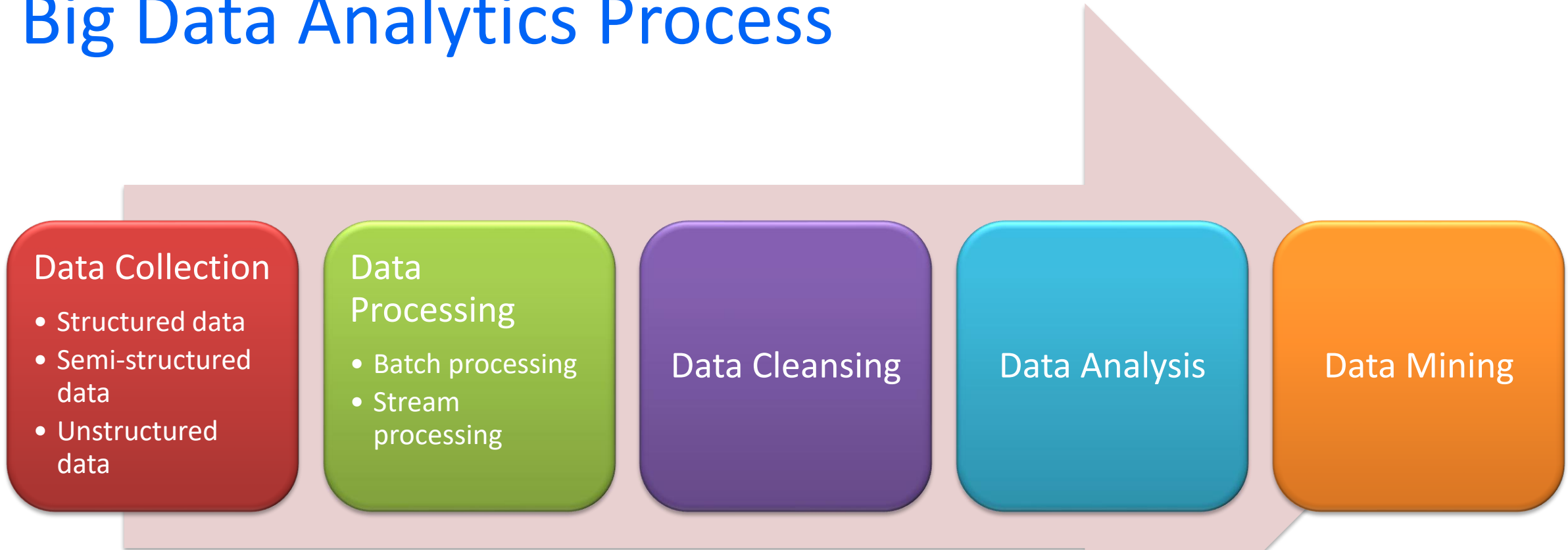


Big Data Analytics

- Companies need to be prepared to use Big Data in their corporate structures and take advantage of the provided Big Data Analytics capabilities.
- Big Data and Big Data Analytics can improve business performance and other key business factors.
- Companies need to be receptive to new technologies and their integration.



Big Data Analytics Process





Benefits of Big Data Analytics

Enterprises are increasingly looking to integrate and use Big Data Analytics into their companies.

Big Data Analytics helps management cope with the characteristics of big data related to the business and the challenges to process it.

Big Data Analytics contribute to finding actionable insights to answer defined business questions.



Benefits of Big Data Analytics

Big Data Analytics tools are useful instruments for the enterprise and can stimulate key factors for the business as:

- Boost Sales
- Increase Efficiency, Performance, etc.
- Improve Operations, Customer Service, Risk Management

Big Data Analytics contributes to decision-making processes, based on extracted valuable business information and knowledge.



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