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SOFIA UNIVERSITY  
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# ICT-TEX course on Digital skills

## Topic 8: Business Analytics

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Cooperation for innovation and the exchange of good practices [Knowledge Alliance](#)

**ICT IN TEXTILE AND CLOTHING HIGHER EDUCATION AND BUSINESS**

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## 8.3. Big Data and Analytics



These slides are part of the topic on  
*“Topic 8: Business Analytics”* of the course on  
Digital skills in Textile and clothing industry.

Check also the other themes in this topic:

- 8.1. Analytics and Classification of Analytics
- 8.2. Business Analytics



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# 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.

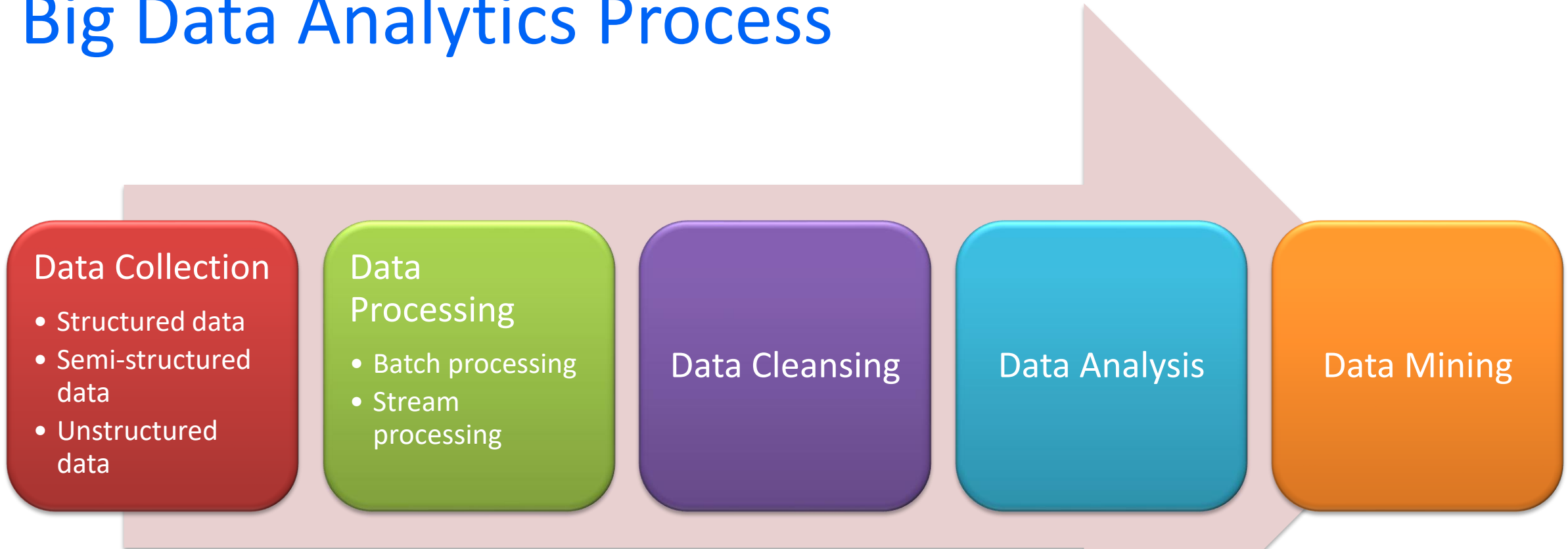


# Big Data Analytics

- 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.





## References

- Evans, J.: Business Analytics: Methods, Models, and Decisions, (2nd ed.), Pearson Education, USA 2017, ISBN: 9781292095448 (2017)
- Schniederjans, M., Schniederjans, D. and Starkey, C.: Business Analytics Principles, Concepts and Applications: What, Why, and How. Pearson FT Press, USA 2014, ISBN: 978-0-13-355218-8 (2014)
- Bahga, A., Madiseti, V.: Big Data Science & Analytics: A Hands-On Approach. 1st Edition, Arshdeep Bahga & Vijay Madiseti 2019. ISBN: 978-1-949978-00-1 (2019)
- Davenport T H & Harris J G. Competing on Analytics: The New Science of Winning. Harvard Business School Press Boston, USA 2007. ISBN: 978-1-422-10332-6 (2007)
- Cooper, A.: CETIS Analytics Series: What is Analytics? Definition and Essential Characteristics, CETIS Analytics Series Vol 1, No 5., The University of Bolton, UK 2012, ISSN 2051-9214 (2012)

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