

# Intelligent Digital Transformation



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# Overview

1. What is Digital Transformation (DT) ?
2. Automation vs. Artificial Intelligence (AI) and Data Science (DS)
3. Need of Big Data Analytics
4. How AI Boosts DT to Form Intelligent DT (IDT) ?
5. Impact of IDT on Education 4.0
6. Leap of the Global Economy via IDT
7. Glimpse on DT in Algeria and Some Recommendations
8. Conclusion
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# 1. What is Digital Transformation ?

- ❑ Digital Transformation (DT) is the process of changing how an enterprise leverages technology, people and processes to **improve business performance and embraces new business models**
- ❑ What is needed for a DT to Operate ?
  - Automation (including IOT, Virtual and Augmented Reality technologies)
  - AI/ML
  - Data Science

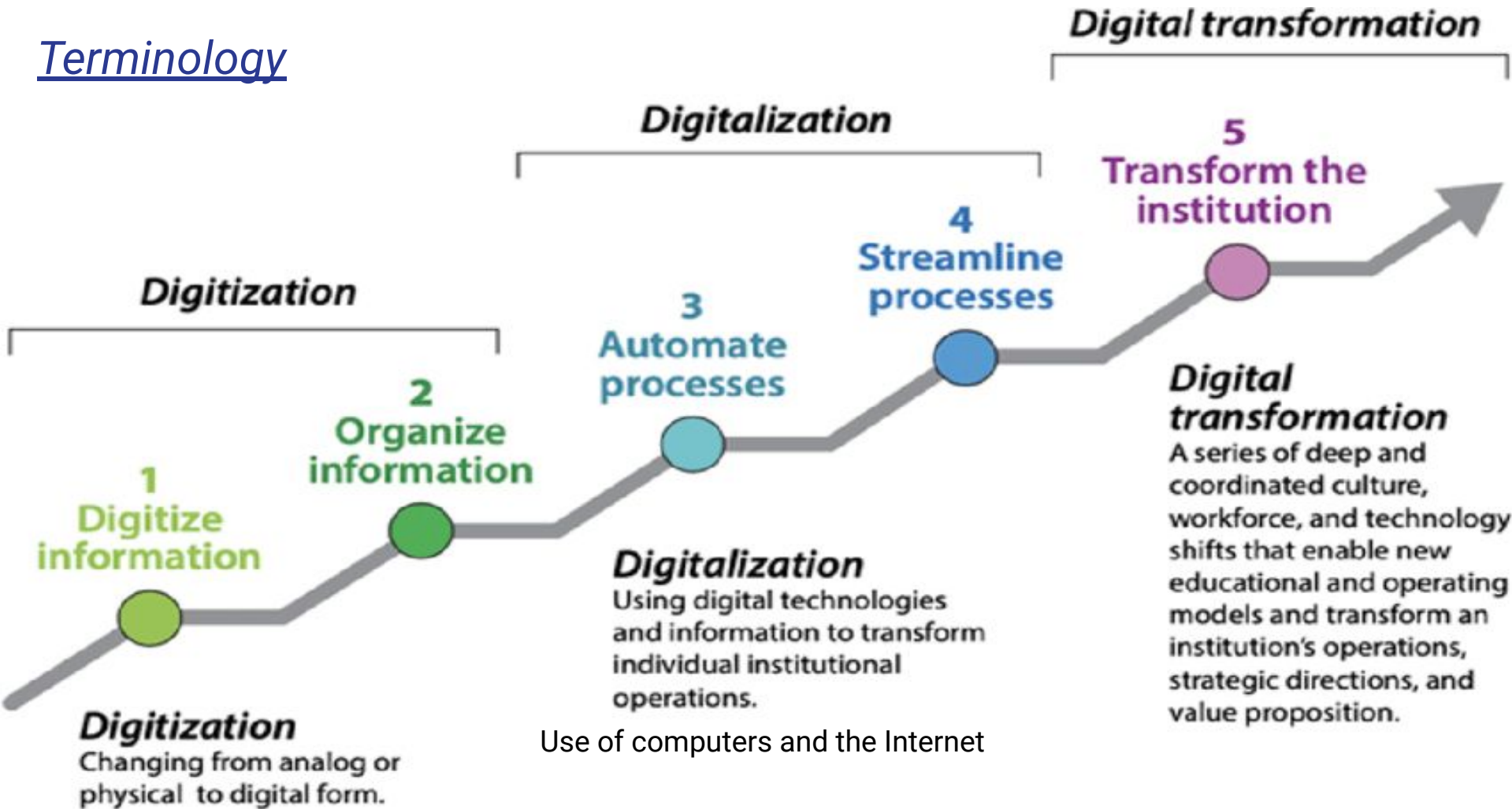
However, the focus is on people!



# Examples of DT

- ❑ Information Technology Modernization such as switching to a cloud environment, being remote ready
- ❑ Reskilling employees
- ❑ Implementing automation to speed up customers support and service
- ❑ Using AI-driven insight to enhance sales efficiency

# Terminology



## 2. Automation, AI/Machine Learning and Data Science

- ❑ **Automation** [Original Definition]: “the technique of making an apparatus, a process, or a system operate **automatically**”
- ❑ **Current Definition:** “the creation and application of technology to **monitor** and **control** the production and delivery of products and services”



Automation provides benefits to virtually all of industry, for example:

- Manufacturing, including food and pharmaceutical, chemical and petroleum, pulp and paper
- Transportation, including automotive, aerospace, and rail
- Utilities, including water and wastewater, oil and gas, electric power, and telecommunications
- Defense
- Facility operations, including security, environmental control, energy management, safety, and other building automation

# ARTIFICIAL INTELLIGENCE VS MACHINE LEARNING VS DEEP LEARNING

## 1 Artificial Intelligence

Development of smart systems and machines that can carry out tasks that typically require human intelligence

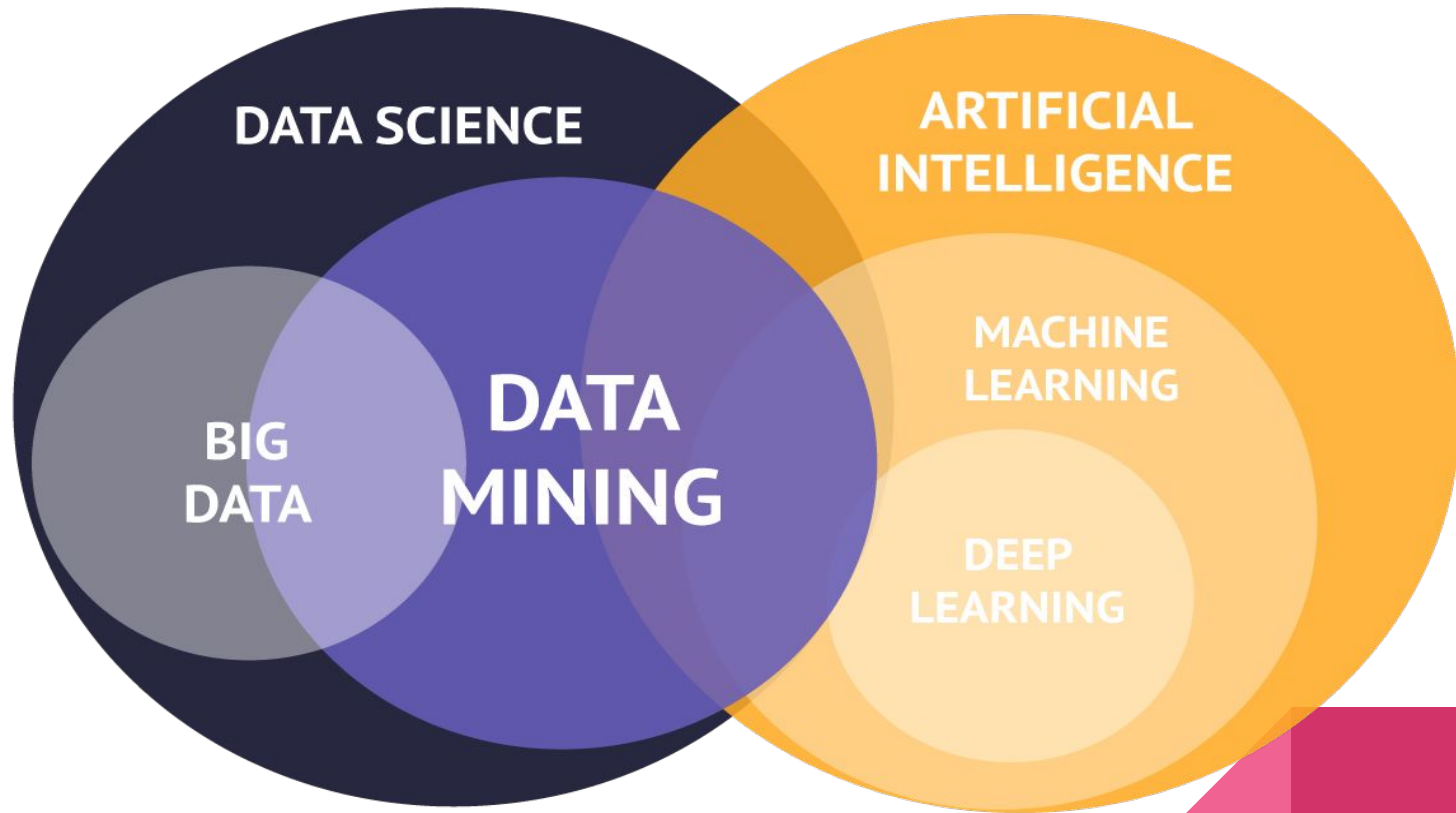
## 2 Machine Learning

Creates algorithms that can learn from data and make decisions based on patterns observed  
Require human intervention when decision is incorrect

## 3 Deep Learning

Uses an artificial neural network to reach accurate conclusions without human intervention





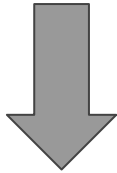
Data Science (DS) is a field which incorporates Data Mining, Big Data Analysis, AI (Machine Learning: Shallow and Deep Learning).

- Companies make strategic recommendations. **DS transforms raw data into knowledge**
- By analyzing big data, **we can detect specific events or phenomena**, and then model them to predict (predictive analytics) how and when they will appear
- Through Machine Learning, we can then **teach machines** to adopt a specific behaviour to **respond to them**
- Data Science (including Machine Learning) have already found a number of applications in a huge variety of sectors, ranging from fraud detection to X-ray analysis. These resources are now an essential tool for Industry 4.0, in particular allowing companies to optimize their industrial performance

# 3. Need of Big Data Analytics

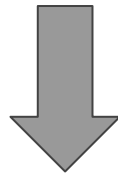
- ❑ **Big Data Analytics:** “it consists in examining big data to uncover information (such as hidden patterns, correlation, market trends as well as customers’ preferences) that can help organizations make informed business decisions (promote Business Intelligence): *Peanuts vs Tea, Sugar vs. Flour*

## Predictive models



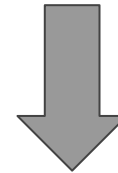
such as ML algorithms  
In data-driven decisions

## Statistical analysis



Tendency, mean  
mode, clustering

## Data mining



super market product  
ordering,  
products association

## 4. How AI Boosts DT to form Intelligent Digital Transformation (IDT)

- ❑ DT is in large part powered by artificial intelligence to become IDT
- ❑ It encompasses digital innovations such as shallow and deep learning, natural language processing (Transformers with Large Language Models such as GPT), and predictive analytics
- ❑ Each of these technologies helps an institution system become smart enough to analyze our data, anticipate our futures, automate routine tasks, and remind us of the most important ones

# IDT (continues)

## AI improves:

1. Customer service (chatbots, virtual assistants)
2. IT and security (biometrics and abnormality detection)
3. Sales (guess prospective buyers' needs via historical record)
4. Business operations (optimal inventory-best time stocks renewal)
5. Human resources (match jobs requirements with targeted applicants profiles)



## 5. Impact of IDT on Education 4.0

- ❑ **Education 4.0 aligns with industry 4.0:** It is a technique of learning that is connected with the **fourth industrial revolution** and focuses on transforming the future of education through advanced technology and automation
- ❑ **Industry 4.0:** It can be defined as the **integration of intelligent digital technologies** into manufacturing and industrial processes. It encompasses a set of technologies that include industrial IoT networks, AI, Big Data, Robotics, and Automation
- ❑ **Smart technology, artificial intelligence and robotics** (including virtual reality and augmented reality) are part of this industrial revolution.  
They are all affecting our daily lives!



IDT has a profound impact on education 4.0

### ❑ **Access to information via the Internet**

- Access to educational resources, textbooks, research articles, multimedia content from anywhere at any time

### ❑ **Blended Learning**

- Digital technologies combines traditional classroom instructions with online resources and tools
- Participate in online discussions and receive immediate feedback
- Promotes personalized learning experiences that cater to individual needs and learning styles

## ❑ **Online courses and distance learning**

## ❑ **Collaborative learning**

- Students can collaborate with peers locally and globally via video conferencing, sharing documents
- It promotes teamwork communication skills

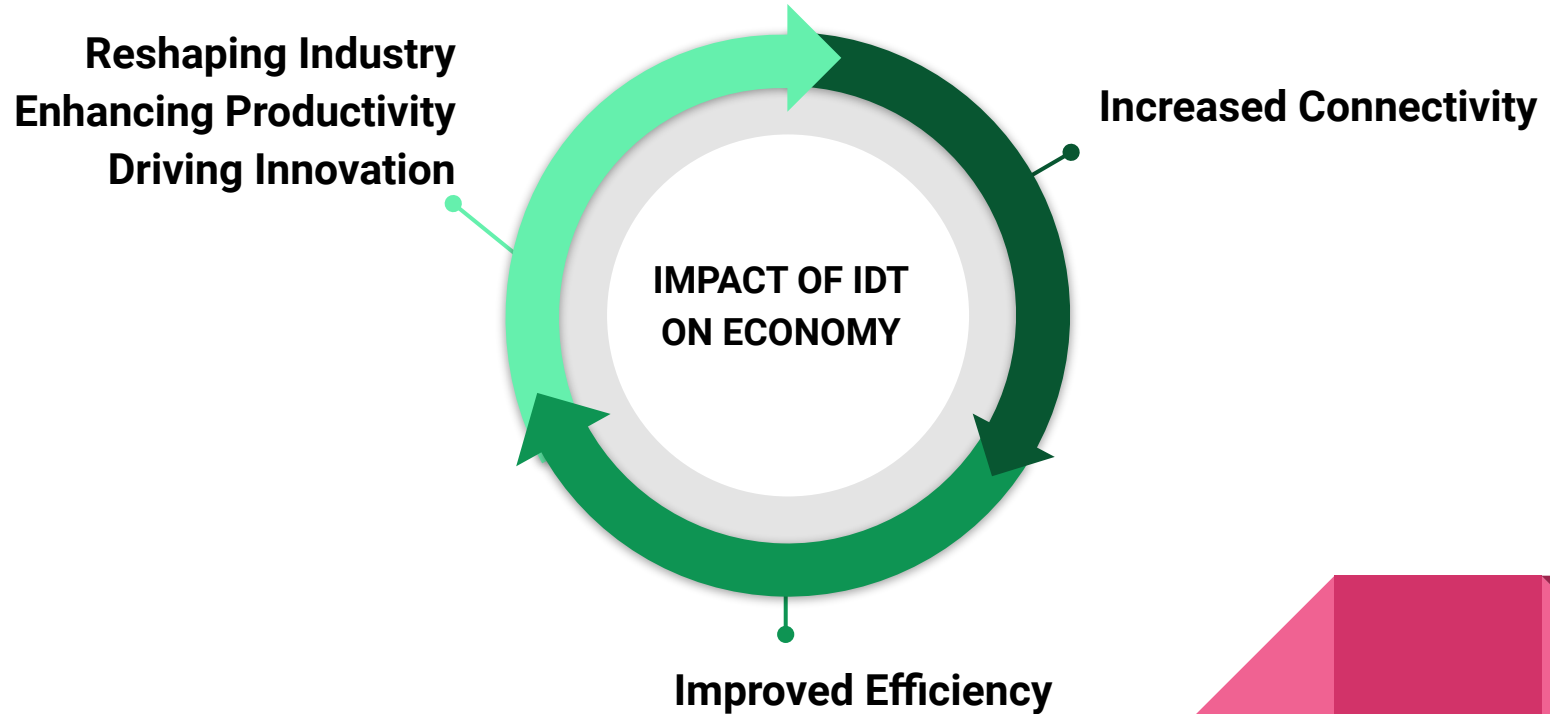
## ❑ **Adaptive learning**

- Investigate the matching between students capabilities and exams difficulty levels using AI tools

## ❑ **Immersive learning through virtual reality and augmented reality**



## 6. Leap of the Global Economy via IDT



# Impact of IDT on Economy (continued)

- ❑ Connect people, business and devices globally, and thus promote collaboration across borders
- ❑ Streamline processes using digital tools and automation, reducing manual workload
- ❑ Disrupt, transform traditional industries and reskill workers
- ❑ Create jobs and transform workforce in areas such as software development, data analysis and cybersecurity
- ❑ Enhance customers' experience by adding convenience and personalization (mobile apps)

“According to **Gartner**, 91% of US organizations are already engaged in some form of digital transformation initiative. As they are pursuing digital technologies and digital transformation, they are also channeling huge investments toward it.

By 2025, **global digital transformation investment** is predicted to reach US \$2.8 trillion, up from US \$1.8 trillion in 2022.” [PECB Magazine]

# 7. Glimpse on Digital Transformation in Algeria



- Algeria is the largest country in Africa (by Area)
- **Population:** 44.2 million. 59.6% of the population connected to Internet (+16% yoy growth).
  - Mostly young (median age 28.6).
  - Concentrated in urban areas (74%).
  - Mostly connecting through social media.
- **New Government** has put an emphasis on digitalisation and startups with the establishment of deputy ministries and preparation of a host of related legislations
- State of digitalisation inline with the MENA region average

**44.2 M**  
POPULATION

**26.3 M**  
INTERNET USERS

**42.8 %**  
HAS A BANK  
ACCOUNT

**74 %**  
POPULATION  
LIVES IN  
URBAN CENTERS

**25 M**  
SOCIAL MEDIA  
USERS

**105.8 %**  
MOBILE  
PENETRATION

Source: Digital 2021 Algeria, Hootsuite (2020)

Source: Digital 2021 Algeria, Hootsuite (2020)

# State of Digital Transformation in Algeria

- ❑ **Consumers** represent a large young population of connected and well-informed individuals-internet, mobile, social media usage
- ❑ **Producers** represent various startupper, patent creators, human investors, information and communication technology (ICT) providers deal with a few talented personnel. However, a large fraction of women in ICT is observed
- ❑ **Regulation:** Government promotes digitalisation and creation of startups industry
- ❑ **Infrastructure:** there is a large investment in the technological infrastructure with a good coverage and not very affordable access
- ❑ These four measurements allow computing

**the key performance indicator** index KPI (scale 1 to 10) in DT

**One of the AAST missions is to work on the Algerian KPI**

# Ways to Achieve DT in the Context of Algeria

- ❑ **Creation of Talents:** ICT talents are rare: research center and university institutions are ill prepared to live up to this challenge
- ❑ **Vision Development:** A task force with a crystal-clear vision that is compatible with local stakeholders should be devised
- ❑ **Roadmap Execution:** A concrete roadmap that follows this vision has to be implemented
- ❑ **Stability and Cost:** Need of a stable and cheap technological and technical infrastructure
- ❑ **Payment Procedure:** Online payment procedure should be widely implemented in order to unleash commercialization services
- ❑ **Funding:** Digital technology providers need to be subsidized (funded partially)
- ❑ **Leadership and Culture:** Companies, corporates should believe in DT, trust its infrastructure and take the lead

**AAST recommendation**

## 8. Conclusion

- ❑ DT(IDT) has a profound impact on society, transforming the way we communicate, learn and access services
- ❑ While it has brought numerous benefits, it also poses challenges such as workers' culture and adaptability will that need to be addressed
- ❑ Embrace IDT while ensuring inclusivity, privacy, and ethical practices will be key to maximizing its positive impact on society
- ❑ Emerging technologies from 4G, 5G networks to quantum computing, will boost security levels drastically within these technologies
- ❑ Prepare an AAST Task force with DT recommendations.



## 9. Some Literature

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(Professional Evaluation and Certification Board, USA)
2. <https://www.bcg.com/capabilities/digital-technology-data/digital-transformation/overview>  
[ew](#) (Boston Consulting Group, USA)
3. **Digital Transformation: Survive and Thrive in an Era of Mass Extinction**  
Book by Thomas Siebel, 2019, publisher RosettaBooks
4. **HBR's 10 Must Reads on Leading Digital Transformation (with bonus article "How Apple Is Organized for Innovation" by Joel M. Podolny and Morten T. Hansen)** by [Harvard Business Review](#), 2021, [Michael E. Porter](#), [Rita Gunther McGrath](#), [Thomas H. Davenport](#), [Marco Iansiti](#)



**Any Questions ?**