

Digi-VET

Project number: 2018-1-DE02-KA202-005145

# Digi-VET

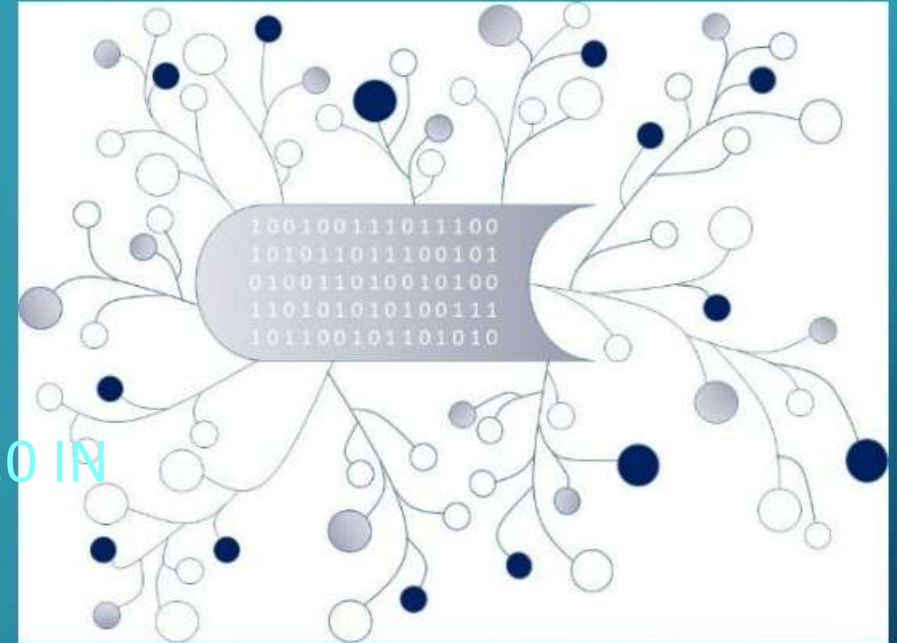
FOSTERING DIGITISATION AND INDUSTRY 4.0 IN  
VOCATIONAL EDUCATION AND TRAINING

## Training Modules for the Learner

Module B: Industry 4.0 Terms and history

A.O.A. Arges – Dr. Ing. Daniel CRISAN

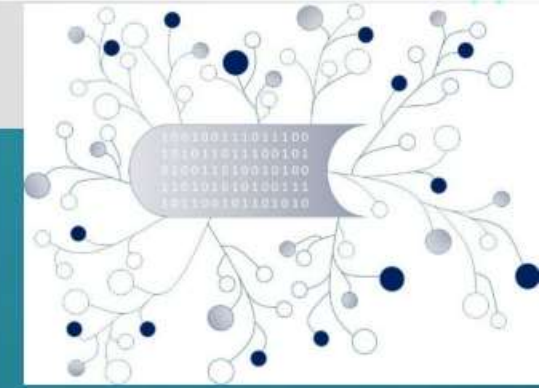
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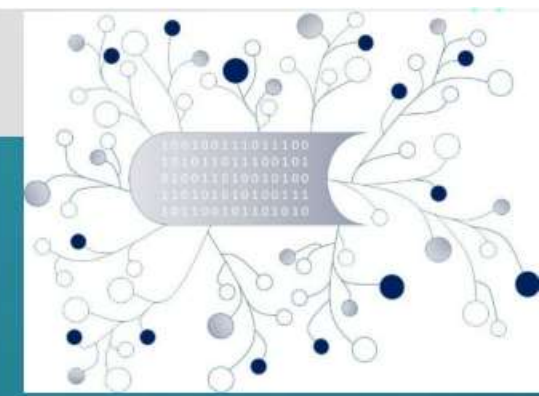
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# Agenda of Module B: Industry 4.0 – Terms and history



1. The technologies's evolution from the first industrial revolution until today
2. Industry 4.0
  - 2.1 History and Terms
  - 2.2 Task – Video
  - 2.3 Tasks – Multiple choices

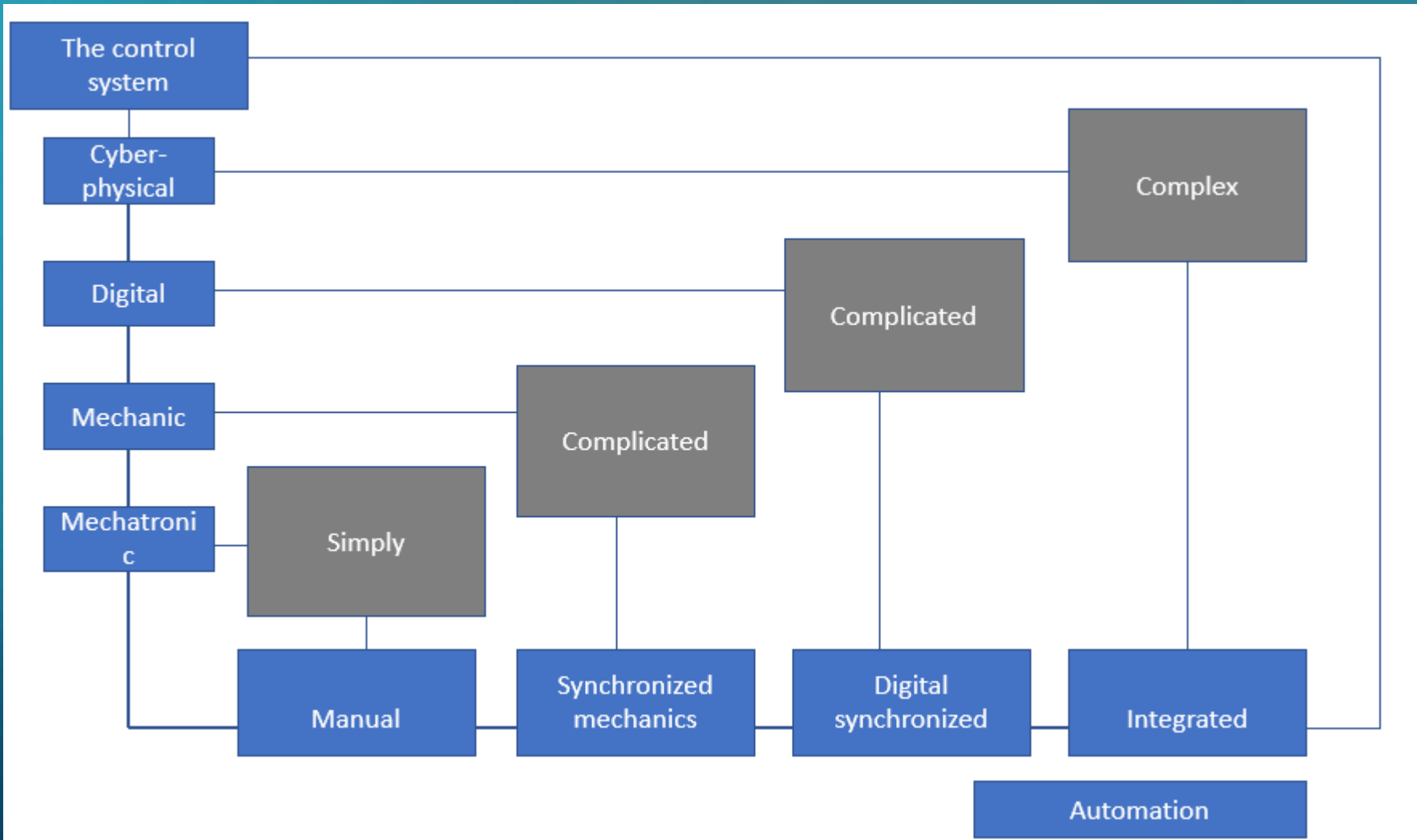
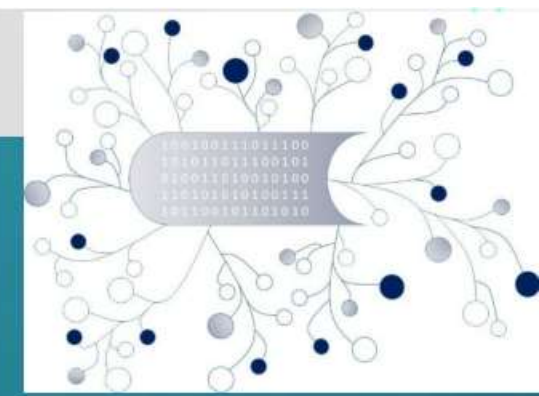


## Industrial Revolution

1. Industrial Revolution	2. Industrial Revolution	3. Industrial Revolution	4. Industrial Revolution
<ul style="list-style-type: none"><li>• End of 18th</li><li>• Mechanization</li></ul>	<ul style="list-style-type: none"><li>• Start of 20th Century</li><li>• Electrification</li></ul>	<ul style="list-style-type: none"><li>• Start of 70ies</li><li>• Digitization</li></ul>	<ul style="list-style-type: none"><li>• today</li><li>• Conectivity</li></ul>

Own figure, followed Banabic, D. (2016), p. 195.

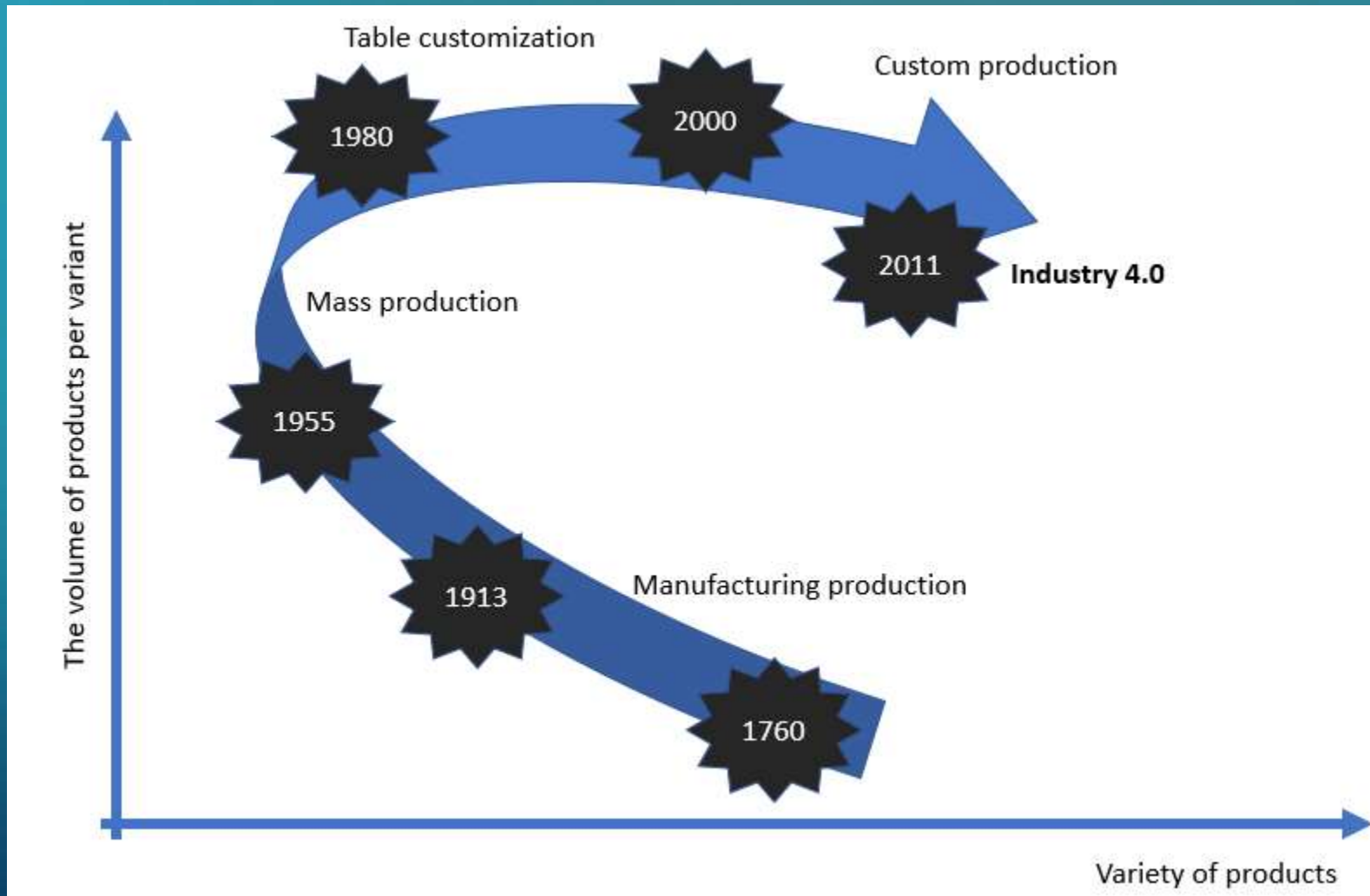
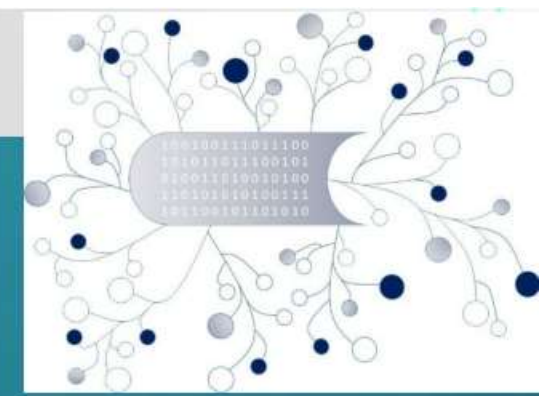
# 1. The technologies's evolution from the first industrial revolution until today



The automation process evolution in the field of plastic deformation technologies

Own figure, followed Banabic, D. (2016), p. 196.

# 1. The technologies's evolution from the first industrial revolution until today



The cyclical evolution of manufacturing from the first to the fourth industrial revolution.

Own figure, followed Banabic, D. (2018), S. 8.

# 2. Industry 4.0

## 2.1 Short history

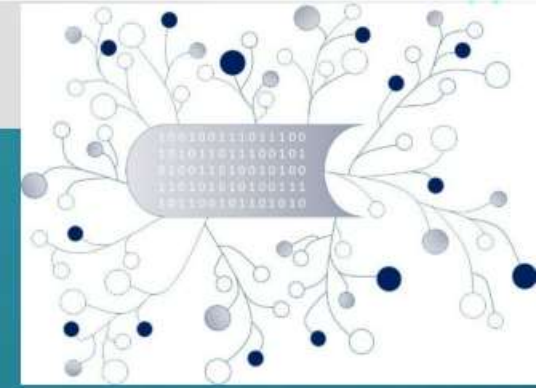
The Industry 4.0 initiative was introduced by the German government in 2011 at the Hanover trade fair (3)



Other states followed:  
Factory of the Future (Franța și Italia),  
Catapult (UK),  
Smart Manufacturing in US  
Made in China - 2025 in China  
Innovation 2025 in Japan.



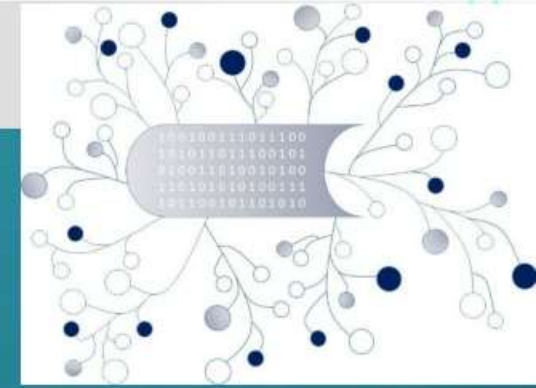
The term remain final within the debate on this topic organized by the founder Klaus Schwab, at the World Economic Forum, in Davos in January 2016



## 2. Industry 4.0

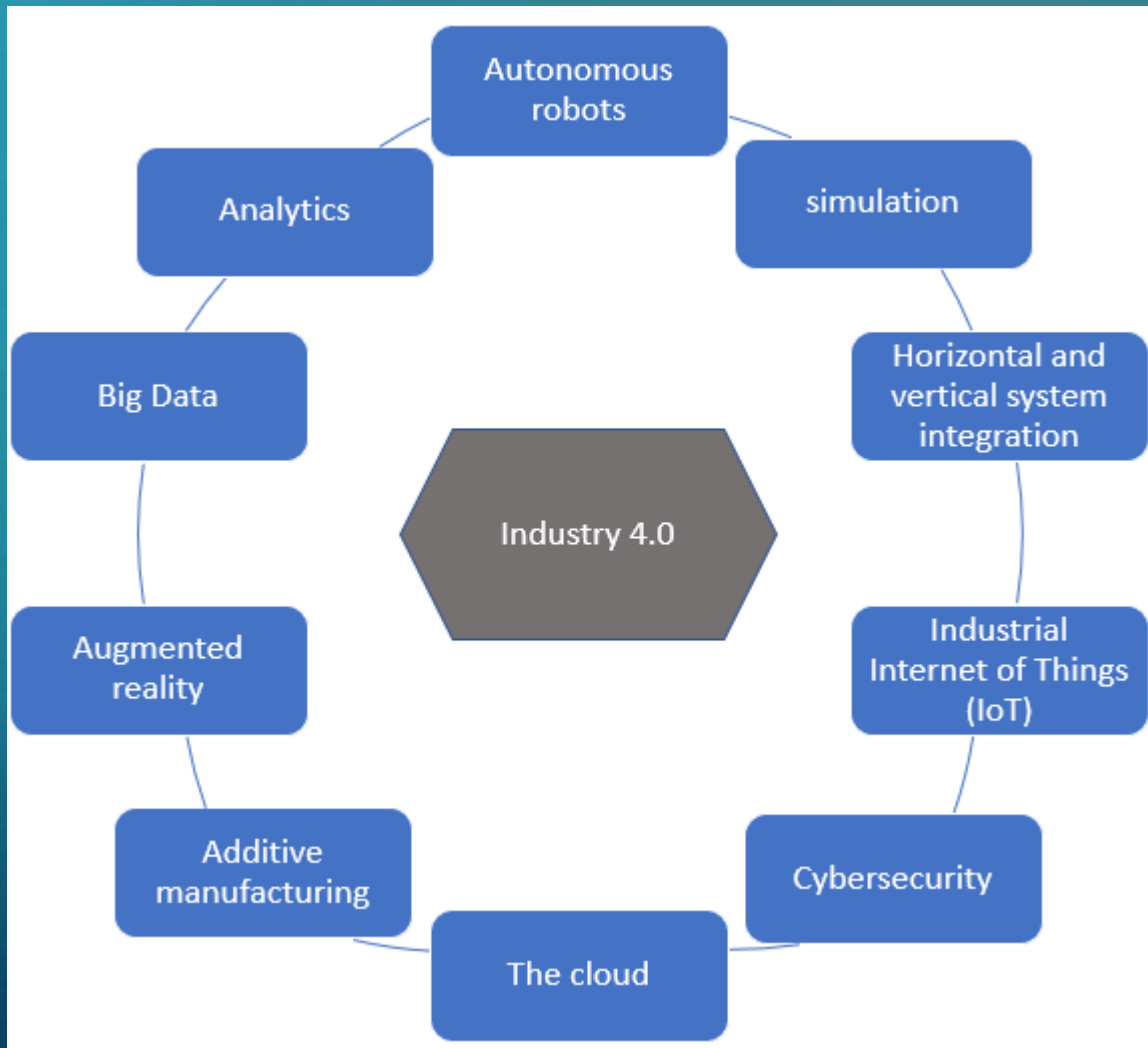
### 2.1 Short history and terms

Industry 4.0 is characterized by the automation, digitization and interconnection of all components in the production processes.



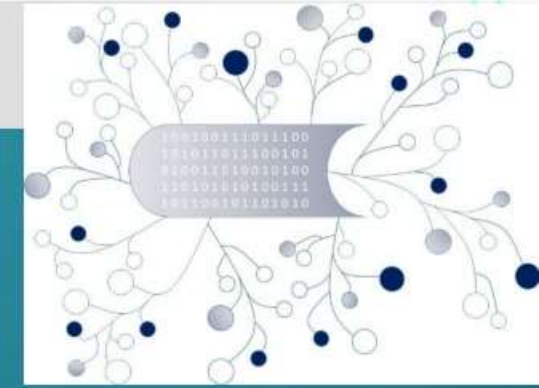
# 2. Industry 4.0

## 2.1 Short history and terms



The specific technologies of the fourth industrial revolution, Industry 4.0.

Own figure, followed Banabic, D. (2016), p. 198.





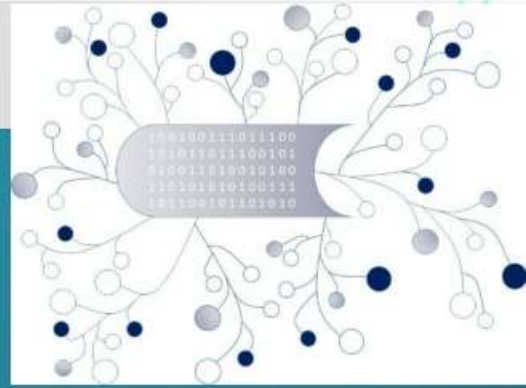
# 2. Industry 4.0

## 2.1 Short history and terms

### *Process chain structure*

In the classical system, the production process takes place in a well-defined manufacturing flow, between independent work cells.

In the new Industry 4.0 concept there is a flow of both products and data, integrated between them.



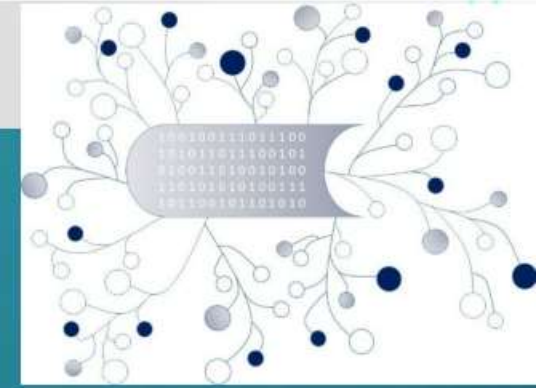
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Source: <https://www.flickr.com/photos/44124348109@N01/5201796697>, Access date: 15.07.2021.

# 2. Industry 4.0

## 2.1 Short history and terms

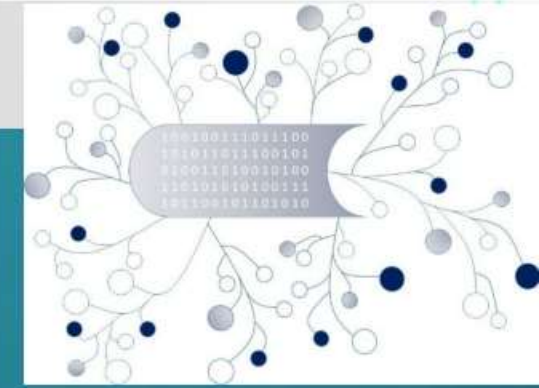
Specific features of the new manufacturing concept **Industry 4.0**:

- an integrated communication throughout the entire work cycle ;
- a high degree of automation, which will lead to the replacement of operators performing low-skilled work with robots;
- increasing the number of highly qualified people for monitoring and managing the manufacturing flow;
- a high degree of communication between Machines (Machine to Machine-M2M) and respectively between Machine and Human (Machine to Human-M2H);
- optimizing the entire process chain using artificial intelligence programs in each structure of the technology chain.



# 2. Industry 4.0

## 2.1 Short history and terms



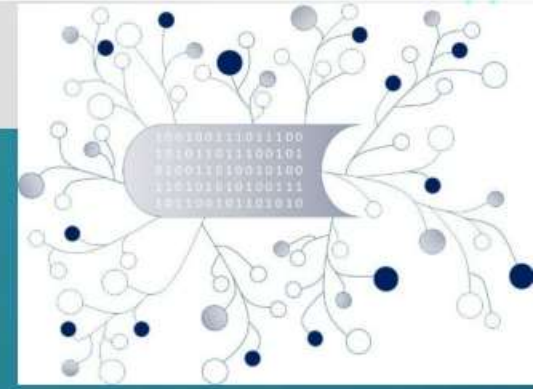
### Conclusions

The main expectations following the transition to the fourth phase of development - Industry 4.0:

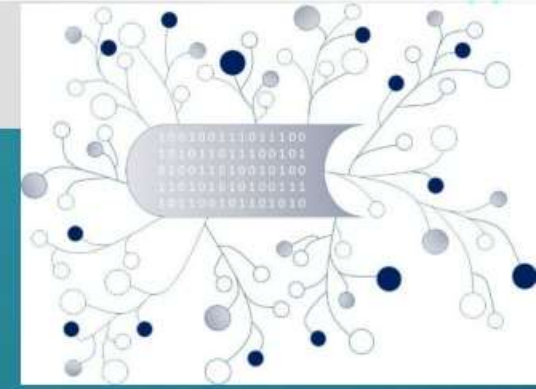
- more flexibility and adaptability;
- transformation of rigid structures into network type structures;
- vertical integration of flexible and reconfigurable production systems;
- modularization and autonomy of production systems;
- the use of production systems with fractal structure;
- optimization of resources by connecting equipment in the network;
- the use of artificial intelligence in the production systems control, in order to make quick and optimal decisions;
- development and use of new business models;
- the use of “app-store” and “cloud” applications as new concepts in knowledge management, etc.

## 2.2. Task

Please watch the following video about the **history of Industry 4.0.**  
Please take some notes!



## 2.2. Task



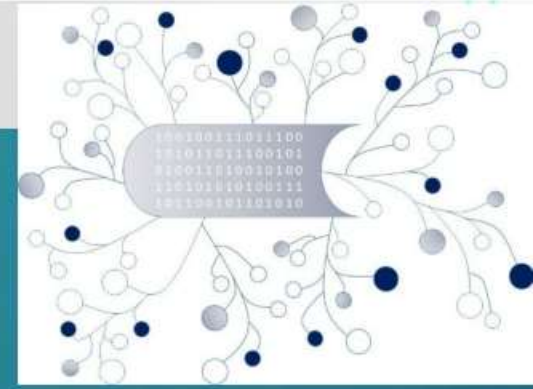
TASK

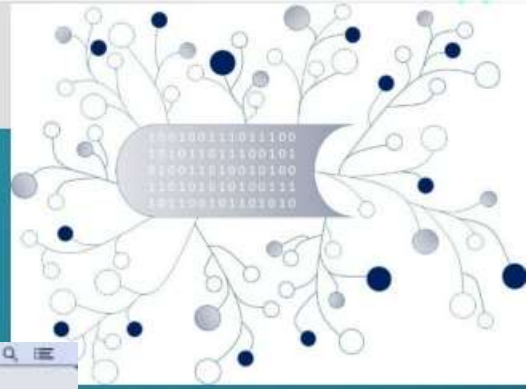


<https://www.youtube.com/watch?v=v9rZOa3CUC8>

## 2.3 Task

Please answer the next H5P.org tasks!





# 2.3. Task

Task

Chrome File Edit View History Bookmarks People Tab Window Help

What is the Fourth Industrial R... X Digital Future 2030 #Digital20... X (1 unmed) - simetes@yahoo... X Digi-VET complete overview w... X Learners module b \_RO\_I | H5P X +

h5p.org/node/860400?feed\_ma=hps

## Learners module b \_RO\_I

View Edit

Submitted by DigiVET on Sat, 05/09/2020 - 10:09

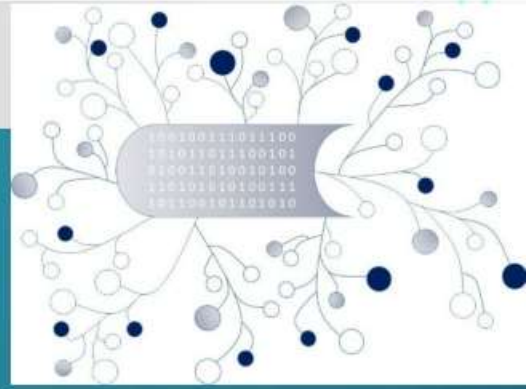
**!** Thank you for trying out H5P. To get started with H5P read our [getting started guide](#)

What do you think will characterize Industry 4.0?

- The fact that all these communicate, they analyze information and can act on it.
- Data security
- The speed with which decisions can be made.
- The existence of: robots, drones, autonomous vehicles, 3D printers, artificial intelligence (AI), Internet of Things (IoT), cloud computing, nanotechnology.

Pause Embed

# 2.3 Task



Task

Chrome File Edit View History Bookmarks People Tab Window Help

What is the Fourth Industrial R... Digital Futures 2030 #Digital2030... (1 unread) - almatex@yahoo.com... Digi-VET complete overview... Learners module b\_RO\_II | H5P

h5p.org/node/960407

## Learners module b\_RO\_II

View Edit

Submitted by DigiVET on Sat, 05/09/2020 - 10:19

Thank you for trying out H5P. To get started with H5P read our [getting started guide](#)

Which of the following technologies are specific to the fourth industrial revolution, Industry 4.0

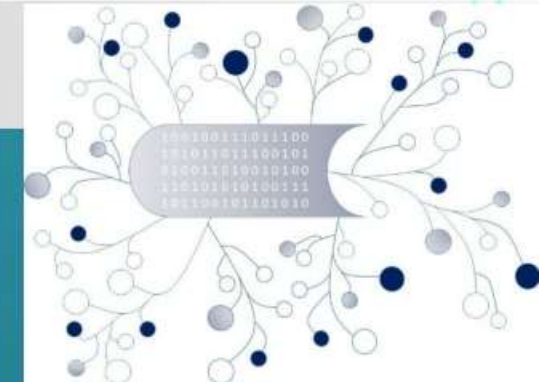
- autonomous robots
- manufacturing parts in closed systems, for data protection
- vertical systems integration
- processing by adding material
- data security
- Internet of Things (IoT)
- augmented reality

Check

Feedback



# 2.3 Task



Task

Chrome File Edit View History Bookmarks People Tab Window Help

h5p.org/node/880410?feed\_me=rps

## Learners module b \_RO\_III

View Edit

Submitted by Dig/VET on Sat, 05/09/2020 - 10:23

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The industry 4.0 is characterized by:

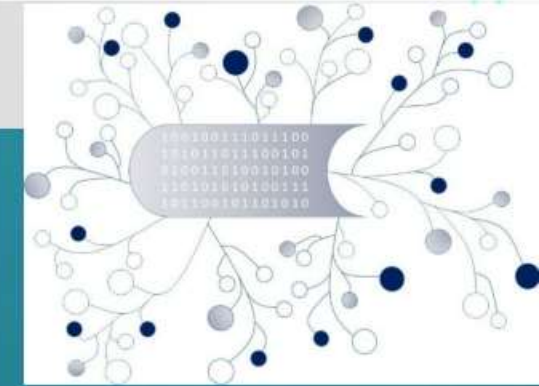
- Automation of all components
- Interconnection of all components of the production process
- Non-human intervention in the manufacturing process
- Digitization
- Increased need for data security
- The existence of a highly performing IT sector

Check

Reuse Embed

Feedback

# References of Module B: Industry 4.0 –Terms and history



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- Romanian Academy, Bucharest (2016): The fifth international workshop on cyberphysicalsystems-IWoCPS-5,

## Online Quelle:

YouTube: <https://www.youtube.com/watch?v=RPC7yo99Nxs>

<http://www.siemens.com/innovation/en/home/pictures-of-the-future/industry-andautomation/digital-factory-trends-industrie-4-0.html>

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