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partnership in the higher education.



# MOOC

The HEDY learning material



**BAEHF**

MOOC - The HEDY learning material

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## The HEDY project

HEDY - Life in the AI era is a 2-year Erasmus+ project started in November 2021. In its own title, it provides tribute to Hedy Lamarr, an Austrian actress and inventor (1914-2000), co-creator of wireless communications technology, adopted to control torpedoes during World War II and currently still used in mobile networks, Bluetooth devices and Wi-Fi. HEDY project stands for being a free and accessible source of information regarding the digital technologies of the 4th industrial revolution (Industry 4.0), namely AI, by enlightening its possible positive future applications, whilst clarifying the possible impacts. HEDY's goal is to offer a comprehensive and shared view of how AI is affecting our lives and reshaping our socioeconomic, cultural and human environments by promoting critical reflection. self-based

## Abstract

The HEDY MOOC (Massive Open Online Course) is an online educational program designed to provide a comprehensive introduction to the topic of Artificial Intelligence (AI) within the context of the 4th Industrial Revolution (Industry 4.0). It consists of four twin modules that delve into various aspects of AI's influence on society and the economy. The HEDY MOOC is part of the HEDY project, which aims to be a free and accessible source of information about the digital technologies of Industry 4.0, particularly AI.

## Authors

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## Introduction to the printed version

The HEDY MOOC (Massive Open Online Course) is an online educational program designed to provide a comprehensive introduction to the topic of Artificial Intelligence (AI) within the context of the Fourth Industrial Revolution (Industry 4.0). It consists of four twin modules that delve into various aspects of AI's influence on society and the economy. The HEDY MOOC is part of the HEDY project, which aims to be a free and accessible source of information about the digital technologies of Industry 4.0, particularly AI.

In the first module, "The Age of Data and the Impact of Cyber-Physical Systems in Industry 4.0", learners explore how Industry 4.0 is driven by integrating data and physical systems and how AI plays a crucial role in processing vast data and making informed decisions. The module discusses real-world applications of AI-driven cyber-physical systems across manufacturing, logistics, and healthcare industries.

The subsequent four modules, "Impact on Business", "Governance", "Skills & Competencies", and "People & Lifestyle," explain the effects of AI on different aspects of society. It analyses AI's impact on business processes, customer expectations, collaborative innovation, and organisational forms. Additionally, they examine how AI influences governance, public policy, and interactions with the government through intelligent interfaces and address the shifting priorities in skills and competencies due to AI and its potential impact on job roles and workforce dynamics. The last module explores how AI affects people's lifestyles, privacy, and daily activities, emphasising ethical considerations.

The HEDY MOOC incorporates interactive elements like discussion forums and group activities, enabling learners to engage in debates, collaborate, and apply AI concepts in practical scenarios. Additionally, the MOOC features real-life case studies and expert insights, providing a dynamic and comprehensive learning experience.

By completing the course and assessments, learners receive a certification of completion, validating their understanding of AI's impact and implications.

The HEDY MOOC integrates insights and achievements from the HEDY project, displaying practical resources, guidelines, and knowledge materials that learners can utilise to deepen their understanding of AI-related topics. Continuously seeking feedback and staying up-to-date with the latest developments in AI, the MOOC ensures its content remains relevant, informative, and aligned with industry trends.

In this document we use

**This format to indicate topics**

**This format to indicate resources**

**This format to indicate activities**

**This format to indicate student instructions**

*This format to indicate Hedy Talk summaries*

# THE HEDY MOOC

## General

### Features of the trial course (Forum)

You are now taking part in a trial course. As the creators of the course, we are very excited, and we are very attentive to your progress. It is a huge advantage to come across the latest knowledge, thoroughly developed course material and many innovative solutions.

Participating in a trial also means that we closely monitor your activity and record all the data. With your further action in the course, you agree that the collected data will be processed for the development and evaluation of the system and published in an aggregated form or a non-personally identifiable manner.

Please actively contribute to the development of the course by reporting in this forum if you notice technical, content or usability errors or difficulties. Your suggestions are also welcome.

### Announcements (Forum)

#### Label

This course is a result of the Erasmus+ project HEDY (KA220-HED-000029536 – Cooperation partnership in higher education).

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## Introduction



### Welcome message

*Transcript:*

*Can we believe that we can avoid technological development and hide from artificial intelligence? Or should we instead learn about these new opportunities, take advantage of them, and become successful?*

*I would choose the latter.*

*Where is artificial intelligence, what changes, and what social effects can we expect? What do others think about these questions? What impact does artificial intelligence have on the necessary skills, the world of work, our private lives or healthcare? What about governance? How should the rules, the legal order and the social organisation be shaped so that people's cooperation with technology, and now with this new phenomenon, artificial intelligence, is excellent?*

*Come and participate in this exciting course, which we created in cooperation with five European partners within the framework of the Life in the AI era Erasmus+ project, presenting the social impact of artificial intelligence.*

*My name is Gyula Szabó of Óbuda University, Budapest, the project leader, and I will be your pilot on this journey. We have developed the material with a fascinating approach to make it super interesting for you and the other participants. We asked professors and prominent professionals to summarise the essential knowledge in short videos and developed several activities to process the facts and data. I am very excited, and I hope you will find the program as engaging as we made it with dedication.*

*At the end of the course, you will be ready to*

- *recognize when you encounter artificial intelligence,*
- *have an AI literacy and manage artificial intelligence without problems,*
- *and be able to identify those situations where, by creating artificial intelligence, you can make your everyday life even more efficient and comfortable, both at work and in private.*

*This course will fly by in no time because we have compiled it from exciting activities already part of your daily life, so learning will not mean a special effort. We have also summarised the curriculum in writing on a few pages, and our excellent instructors and specialists will tell you the most critical information in short, engaging videos. Although this is an e-learning course, something will happen every minute: for each text and video, we give you the specific task in advance and encourage you to explore the internet world on your own.*

*There is often no right or wrong answer when talking about the social impact of artificial intelligence. Please share your opinions and questions with the other course participants and respond to others' suggestions.*

*In a form-breaker way, we also ask you to watch selected works from cinematography in the curriculum, so this is a course where you have to go to a home cinema.*

*The films included in the course are decisive regarding the artistic processing of the social role of artificial intelligence. We will always give you aspects to watch the movie, and we ask you to summarise your opinion in writing and discuss what you saw in the film with the other participants.*

*Start taking a course by learning the requirements and how to manage the system. Good work, good learning! I will see you.*



## Requirements

**Please read it twice; this is the fine print.**

To complete the course, you must have a device suitable for using Moodle, including a browser, video player, camera, microphone and media editors.

We also recommend viewing copyrighted films in the course, but we cannot provide access to the movie. You can take the course confidently if **you can access a video service provider**; otherwise, you can complete the course by suggesting an appropriate one from the available films.

The course consists of 12 modules in total: this is the introductory module, the last one is the final challenge, and the intermediate ten modules cover five topics.

It is worth completing the activities in sequence on the course, although **we have not set forced scheduling**. Of course, you can follow your schedule, but for a levelled workload, we indicate the activities performed and - counting on completing one module from week to week - we give you continuous feedback.

There will be **interactive tasks**. It is advisable to make acquaintances with fellow students and progress with the same group during the course, establishing the communication channels in the Moodle system or in the otherwise preferred way, e.g. TEAMS, Meet, FB, etc.

During the course, you will encounter many activities. **The requirement is that you complete all tasks** and submit your solutions. You will be protected if you do not meet the assignment deadline, but you must expect the assignments to pile up by the end of the semester. **After the course is closed, no further submissions will be possible.**

Mind, we provide this course under the Creative Commons copyright license, and you must grant the same to all your submissions.

Solving the essays, forum posts, self-tests and other tasks and submitting the solution is a requirement to complete the course. You will **receive feedback after submitting the assignment**. Usually, a self-checking page will open, based on which you can learn about the suitable solution and receive criteria for evaluating your solution.

**After completing all the tasks**, you can access the final module and accomplish it at any time until the end of the course.

**Your result in the course is determined solely by your performance in the last module; nothing else affects your grade at the end.**

The final course module will contain activities practised during the course, and you will have two hours to complete it.

### Determining the grade:

- Excellent 80% - 100%
- Good 70% - 79%
- Medium 60% - 69%

- Sufficient 50%-59%
- Insufficient 0 - 50%

Course elements include additional learning opportunities and resources used.

**Now, let's start the voyage!**

### A warm-up exercise

Before starting the course, we want to know your current skills and knowledge of the course topic. Please answer the following ten questions in the given length for one badge.

You can expect similar questions at the end of the course.

**You have 3 weeks to submit the assignment.**

- What are your goals for completing the course?
- What does artificial intelligence mean to you?
- Based on your knowledge so far, what are the advantages of artificial intelligence?
- Based on your understanding, what are artificial intelligence's dangers?
- In which areas would you entrust yourself to artificial intelligence?
- What do you think about ethical artificial intelligence?
- How do you see your situation in 10 years if you imagine yourself?
- If you imagine, how do you see the state of the world in 10 years?
- If you imagine, how do you see the state of the world in 10 years?
- If you could ask artificial intelligence one question, what would it be? Justify your answer!

Please mark the answers that best reflect your opinion on the four questions below on the seven-point scale.

- Strongly agree    Agree    Somewhat agree    Neutral    Somewhat disagree    Disagree    Strongly disagree
- I am familiar with the basic concepts as well as current and future applications of AI
  - I am able to recognise solutions implemented with artificial intelligence
  - I understand the relationship between Artificial Intelligence and business
  - I am able to recognize the use and application of AI systems in business processes, companies and enterprises
  - I am able to distinguish the differences between AI governance and data governance
  - I am able to map an AI governance problem to one of the 6 principles
  - I am able to identify how AI can impact the skills and competencies, namely those that are most likely to be replaced in the future
  - I am able to discuss the challenges, risks and ethics regarding the implementation of AI
  - I understand different AI technologies and their applications in people's life (i.e. health and fitness, smart homes, personalized education, shopping)
  - I am able to consider important factors to make a good choice when using AI

Thank you for completing this Questionnaire.

## Key - Part 1 - History and present

### Introduction to the module

Have a look at how you will advance with the Introduction to artificial intelligence, the relationship between AI and Industry 4.0 unit.

The *Introduction to artificial intelligence, the relationship between AI and Industry 4.0* unit provides introductory knowledge into artificial intelligence, summarises and describes the main concepts of the topic, and then deals with the relationship between Industry 4.0 and artificial intelligence.

Note: During the unit's development, we also used knowledge from the relevant learning databases of artificial intelligence.

### **Competencies that can be acquired by completing the unit:**

#### **Knowledge**

- You become familiar with the main basic *concepts* of artificial intelligence.
- You will know the main areas of application of artificial intelligence.
- You will have a basic knowledge of algorithms and essential artificial intelligence rules.
- You will understand the current and future possibilities and limitations of artificial intelligence.
- You will know the most important basic concepts of Industry 4.0.
- You will know the primary interfaces between artificial intelligence and Industry 4.0.
- You will be informed about the current and future opportunities and limitations of Industry 4.0.

#### **Ability**

- You can distinguish between artificial intelligence methods and their main application spaces.
- You will be able to recognise solutions implemented with artificial intelligence.
- You can analyse AI's applicability, flaws, and benefits, considering the expectations of objective value judgments.
- You will be able to recognise artificial intelligence solutions in industry 4.0 areas.

#### **Attitude**

- In your work, achievements and conclusions are constantly monitored.
- You will be open to the use of information technology tools.
- You will develop accurate and error-free task-solving, engineering precision and precision.
- You will be critical of AI (media) content not based on technical/IT reality.
- You will be receptive to his craft and intelligence and the new achievements of Industry 4.0.
- You will be committed to his professional development.

#### **Autonomy and responsibility**

- You will collaborate with the instructor and fellow students in expanding your knowledge.
- You will accept well-founded professional and other critical remarks.
- You will be committed to systemic thinking and problem-solving principles and methods.
- Based on your knowledge, you will make a responsible, informed decision with your analyses.

#### **HedyTalk - Kollár's introductory video**

#### **Watch Csaba Kollár's introductory video and answer six questions!**

Watch Csaba Kollár's introductory video and answer the following questions! If necessary, turn on the subtitles and make the video full-screen.



**YouTube link:**

1. What are the building blocks of artificial intelligence?
2. What can we measure with the Sheridan scale?
3. Find examples of artificial intelligence with a body.
4. What are the possibilities of Industry 4.0 and Logistics 4.0?
5. What is Industry 5.0?
6. What do we expect from ethical artificial intelligence?

You can self-assess your answers when you complete this activity.

*Title: Introduction to Artificial Intelligence: From Past to Present*

*In this learning material, we will explore the fascinating world of artificial intelligence (AI) and its development throughout history. AI has become an integral part of our lives, demanding more space and influencing various aspects of society. So, let's dive into the transcript and discover the key concepts and building blocks of AI.*

*The Vision of Artificial Intelligence:*

*Forty years ago, the idea of AI encompassed visions of spaceships and robots as part of our daily lives. However, in reality, we have not reached that level of technological advancement yet. While robots are gradually appearing in our lives, the widespread presence of physical robots in every household is yet to come.*

*The Era of Cybernetics:*

*Before AI, the field of cybernetics paved the way for technological advancements aimed at making machines more comfortable, safer, better, and healthier. Although cybernetics laid theoretical foundations, practical implementation was limited due to the unavailability of the required technological environment for testing.*

*The Building Blocks of AI:*

*To understand the practical implementation of AI, we must consider four crucial building blocks.*

*a) Data: With the proliferation of sensor techniques and databases, we now have access to vast amounts of data. Storing this data is no longer a challenge. However, the real value lies in processing this data effectively to extract valuable information.*

*b) Computational Capacity: The increase in computing capacity enables us to process larger volumes of data in significantly shorter periods. This enhanced efficiency and effectiveness in data processing have opened doors to solving problems that are more complex and providing alternative solutions.*

*c) Algorithms: As data expanded and computing capacity increased, suitable algorithms with a software background became essential. Real-time or near real-time execution of algorithms allows for more sophisticated problem-solving capabilities.*

*d) Synergy: The synergy of different techniques and technologies fosters their seamless development and integration. When various technologies work seamlessly together, complex problems can be tackled effectively.*

*The Autonomy of Artificial Intelligence:*

*The Sheridan scale defines a ten-point scale measuring the autonomy of machines and AI. While concerns about unlimited autonomy leading to the elimination of*

human decision-making exist, it is crucial to strike a balance. AI can assist in processing vast amounts of information quickly, aiding decision-making when human reaction times are insufficient. However, it is vital to develop AI with ethical principles to ensure decisions benefit humanity.

*Forms of Artificial Intelligence:*

AI does not possess a physical body but rather exists in the cloud, communicating with us through sensors and actuators. However, AI can be embodied or installed in machines. Examples include smart devices worn on the body (e.g. smartwatches), implants monitoring health, humanoid robots, self-driving vehicles, intelligent buildings, and intelligent systems within industries and logistics.

*Industry 4.0 and Logistics 4.0:*

Industry 4.0 focuses on optimizing production processes, minimizing energy consumption and costs, reducing waste, and ensuring a safe working environment. Logistics 4.0 complements Industry 4.0 by providing timely delivery and storage of raw materials and finished products. While criticized for being technocratic, there is a growing demand for Industry 5.0, emphasizing a more human-centered approach to AI.

*The Role of Ethical AI:*

The 2018 European Union recommendation on ethical AI encourages the development of more humane solutions in production and logistics. By keeping human thinking and human-scale planning in mind, AI can serve humanity by creating safer, more comfortable working environments and empowering individuals with new tasks that enhance efficiency.

In summary, artificial intelligence holds the potential to make our lives more beautiful, happier, comfortable, safer, and healthier. By focusing on ethics and human-centered development, AI can be a powerful tool in creating a better world for all.

## HedyTalk - Kollár's introductory video – self-assessment

Answers related to Watch Csaba Kollár's introductory video.

In the previous assignment, you had to answer six questions about Kollár's introductory. We will discuss details later, but this video taught you the followings:

### **1. The building blocks of artificial intelligence are:**

- data
- computing capacity
- software background or algorithms
- synergy

### **2. We measure with the Sheridan scale the advancement of the machine.**

1: everything is done by humans ... 10: everything is done by machines; humans are ignored.

### **3. Some examples of artificial intelligence with a body:**

- wearables
- can be worn inside the body
- portable devices
- robots
- self-driving vehicles
- home automation systems
- smart companies
- smart cities
- smart countries
- intelligent earth

### **4. The possibilities of industry 4.0 and logistics 4.0:**

- Production optimization,
- with as little energy as possible
- as fast as possible

- as cheaply as possible
- with less scrap
- greater security
- more profit

5. In Industry 5.0, the production will be human-centred, include ethical artificial intelligence, be characterized by the joint work of man and machine, and have a safe and comfortable work environment where people work. Still, the work content will be different from today.

6. We expect ethical artificial intelligence to be the same as machines before, i.e. to make our lives more beautiful, better, comfortable, safer and healthier.

If you consider necessary, watch the video again; otherwise, you can move on to the next activity.

## HedyTalk - The role of psychological capital

Watch Mária Heitler Lehoczky's video on Labour market challenges in the age of artificial intelligence, - The role of psychological capital and answer the following questions!

### Summary:

The presentation focuses on the labor market challenges in the context of artificial intelligence (AI), particularly in the era of Industry 4.0. AI and automation are rapidly replacing human workers in various sectors, especially where repetitive tasks and data processing are involved. The significance of enhancing human skills and competencies to remain competitive is highlighted. Psychological capital, an integral part of human capital, is explored as a vital aspect in addressing these challenges.

The presenter discusses two forms of psychological capital. The first is positive psychological capital, encompassing self-efficacy (confidence in one's abilities), hope (persistent pursuit of solutions), optimism (envisioning successful outcomes), and resilience (maintaining composure during difficulties). These elements support competencies such as critical thinking, creativity, and problem solving, and have a positive impact on job satisfaction, performance, placement, and overall well-being.

The second form is self-determination, emphasizing an inner control attitude where individuals feel in command of their lives. This leads to conscious career and life planning, requiring a high level of psychological capital. Developing psychological capital is essential in the face of AI-driven labor market changes, as it enhances competencies, mental health, and adaptability.

While formal education often does not prioritize competency development, opportunities for nurturing psychological capital exist through non-formal training. Overall, the presentation underscores the importance of psychological capital as a means to navigate the evolving job landscape influenced by AI and automation.

1. Why is artificial intelligence a challenge for the labour market?
2. How to maintain quality of life and ensure a decent income in the age of artificial intelligence?
3. List some of the human competences that are included in the Council of the European Union's recommendation.
4. What are the 4 components of positive psychological capital?

5. Which work-related factors are influenced by positive psychological capital?
6. What is the impact of high levels of 'positive psychological capital' at individual and organisational levels?

You can self-assess your answers when you complete this activity.



If necessary, turn on the subtitles and make the video full-screen.

**YouTube link:**

[Mária Heitler Lehoczky - Labour market challenges in the age of artificial intelligence - The role of psychological capital](#)

*Transcript the video*

Dear Students,

In my presentation, I will focus on the challenges of the labor market in the context of artificial intelligence. Within that, I would like to present the role of psychological capital. We are living in the era of the fourth industrial revolution, in short Industry 4.0.

This means that cyber-physical systems are rapidly spreading and with them, artificial intelligence and robotization are displacing humans from labor market in many places. Artificial intelligence is outperforming humans in many areas, in areas where they perform repetitive activities such as factories, plants, and material handling, and in areas where they work with large amounts of data. In South Carolina, there are several textile companies, there used to be many workers in those factories, but if you go there today and ask the locals, they will tell you that they employ one man and a dog. The man feeds the dog, and the dog keeps men away. Adam Davidson wrote this story 10 years ago in 2012.

Now, when we talk about the challenge in the labor market, one of the biggest difficulties is what are the skills, knowledge, and expertise that we can compete with artificial intelligence. In other words, how can we shape and develop our human capital in such a way that we can provide ourselves with the right income to maintain and even improve our standard of living and quality of life? Of course, it is very important to keep on improving our knowledge and skills, so it is clear that we need to keep learning throughout our lives. Human competencies are becoming more valuable, as artificial intelligence cannot yet replace them. These are the competencies that make us competitive, but also the need to increase our knowledge and skills. However, human capital includes not only these but also individual characteristics that also contribute to individual productivity.

Psychological capital is part of human capital. Psychological capital is behind many of the competencies that are essential in the age of artificial intelligence. What can

be classified as psychological capital? On the one hand, it is important to talk about measurable, quantifiable data, and on the other hand, it is important to have a demonstrable causal relationship with job-related domains such as income, job satisfaction, or job satisfaction. These are the characteristics that underlie competencies.

What are the competencies about? I have given two examples: one is from the guidelines on vocational training issued by the ITM, in which 10 key competencies are listed. Of relevance to our topic are complex problem-solving, critical thinking, creativity, cognitive flexibility, but also, emotional intelligence, negotiation skills, teamwork, and so on. So, these are all skills that are not specific to a profession, but that we can all develop individually. A more comprehensive set of competencies is contained in the Council of the European Union's recommendation, which already includes initiative, creativity, career control, resilience, conscious living, and career planning. The psychological capital underpins these, which is a prerequisite for them.

Let's take a closer look at what is it all about. I would like to introduce two concepts of psychological capital. The first is the so-called positive psychological capital, developed in the US by Luthans and his colleagues in 2004. Since then, its relationship with various labor market characteristics has been demonstrated in all five continents, including my own research among graduates with a business degree and a career start, which confirms Luthans' research. There are four components of this so-called positive psychological capital. These components can be traced back to the so-called positive psychological components. That is, the kind of approach where the focus is not on mental illness and psychological disorders, but on ordinary, healthy, normal people, where the focus is on coping and what resources they can mobilize in these situations.

The four components are. The first is self-efficacy. In short, the motto of this could be I can do it; I can do it, in short, the kind of confidence that we can use our own skills, and our own abilities, and even develop them to solve a problematic situation. Closely related to this is hope, which is the second dimension. The motto of this could be, in short, I will not give up. If one solution fails, if the idea is not right, I look for a new one, trying different options to achieve my goals. So, this is the dimension of hope. The third dimension is optimism, which is essential in a problem situation, the aim of which is in fact to create a vision of the future in which successful coping is at the center, i.e. the attitude of I will find a solution. And the fourth factor is resilience, i.e. maintaining mental resilience. The motto of this can be to keep a cool head, i.e. to remain calm in the face of an unexpected, unusual, difficult situation, and to overcome it with the help of the other three factors. So positive psychological capital strengthens all those competencies that are about critical thinking, initiative, creativity, and problem solving. These are the ones that underpin it.

Positive psychological capital has a proven impact in all areas related to work. So also, on subjective satisfaction related to income, job performance, job satisfaction, job placement, and career. Finally, as a bonus a high level of psychological capital also leads to a better mental level that goes beyond traditional organizational goals. The other psychological capital, developed in our country by Tamás Keller, is measured by the so-called 'self-determination index'. The motto of this psychological capital could be that everyone is the master of his or her own destiny. I.e. the so-called inner control attitude, when a person feels that he or she is in control of his or her own life, or clearly has a higher income. To which competency is this related? Conscious career planning and conscious life planning require a high level of psychological capital. In summary, as I explained above, behind a large part of the key competencies is the kind of attitude in this so-called, they are found psychological capital.

Why should we develop our psychological capital? Based on what has been said so far, the psychological components that psychological capital contains are apparently

behind the competencies. Therefore, in the competition where we must compete with artificial intelligence in the labor market, it is very important to be strong in these competencies. In addition, those with a high level of psychological capital are also mentally healthier. Today, unfortunately, the development of competencies is not priority in education, but opportunities are available in non-formal training where psychological capital can be developed.

Thank you for your attention!

HedyTalk - Mária Heitler Lehoczky - Labour market challenges in the age of artificial intelligence - The role of psychological capital video.

In the previous assignment, you had to answer six questions about Labour market challenges. You can check your answers below.

1. Why is artificial intelligence a challenge for the labour market?

Artificial intelligence is displacing people from labor market in many places.

2. How to maintain quality of life and ensure a decent income in the age of artificial intelligence?

Develop our human capital: skills, knowledge, and expertise.

3. List some of the human competences that are included in the Council of the European Union's recommendation.

Initiative, creativity, career control, resilience, conscious living, and career planning

4. What are the 4 components of positive psychological capital?

- · self-efficacy
- · hope
- · optimism
- · resilience

5. Which work-related factors are influenced by positive psychological capital?

- · subjective satisfaction related to income,
- · job performance,
- · job satisfaction,
- · job placement,
- · career

6. What is the impact of high levels of 'positive psychological capital' at individual and organisational levels?

Not only at an individual level, but also at an organisational level, where this kind of attitude is part of the culture, it has been shown to lead to higher incomes.

**HedyTalk - Predicting workplace settlement**

**Summary**

The presentation discusses an AI application called ATOM (Artificial intelligence for Testing Occupational success of Manpower) that predicts job success for employee candidates. Traditional selection processes involve predictor variables obtained from medical exams, psychological tests, or job simulators to predict job performance. ATOM aims to model accurately the relationship between these predictors and job success criteria, using AI algorithms for effective candidate selection.

ATOM simplifies the two types of knowledge needed for selection: company-specific job knowledge and expertise from specialists like doctors or psychologists. Job success criteria encompass all relevant aspects, while specialist knowledge is embedded in ATOM's AI algorithms. ATOM employs supervised learning with various machine learning algorithms (e.g., Support Vector Clustering, Logistic Regression, RandomForestClassifier) to adapt to different workplace selection problems.

An example integrates ATOM with the Ergoscope work simulator, measuring physical properties for various tasks. Specific examples include force measurements, recognition of invisible objects, work endurance, and monotony tolerance. Case studies demonstrate ATOM's effectiveness, evidenced by Receiver Operating Characteristic (ROC) curves that measure discrimination ability. The application is successful in several examples, though not in cases with unsuitable predictors.

In conclusion, ATOM leverages AI to automate and enhance candidate selection by predicting job success based on predictor variables and specific criteria.

Watch Lajos Izsó's video on predicting workplace settlement by AI and answer the following questions.

1. What is "ATOM" short for?
2. What data is used to predict job performance? Give 3 examples.
3. What is the purpose of "ATOM"?
4. What is the selection process based on?
5. What is the output of the "ATOM" algorithm?
6. What are the advantages of using "ATOM"?

You can self-assess your answers when you complete this activity.

If necessary, turn on the subtitles and make the video full-screen.  
[How the ATOM system predicts workplace settlement](#)



YouTube link:

*Transcript of the video*

Welcome, everyone! I am Lajos Izsó, Professor Emeritus of BME.

In this short time, I will report to you the results of a very specific artificial intelligence application.

The title of my presentation today is Basics of ATOM, a system for predicting job success for employee candidates. ATOM is an acronym, which stands for: Artificial intelligence for Testing Occupational success of Manpower.

The traditional selection process is done in such a way that there are certain predictor variables called predictors. These are characteristics of individuals, obtained from, for example, occupational medical examinations, psychological tests, or data from job simulators, which can be used to predict with some probability whether individuals will perform well in a particular job, i.e. whether they will score well on a given job performance criterion variable. These can be measured before starting the job, at a cost of half a day. In contrast, the full success criteria are found out after the job is taken up, whether the person succeeds. This is very important, as the predictors are the inputs and the performance criteria are the outputs, i.e. the results.

This artificial intelligence system is all about modelling as accurately as possible the relationship between input variables, predictors, and criteria. It is very important to make predictions based on the predictors as potently as possible and to hire only, even on a trial basis, those with a high probability of success.

Basically, there are two types of knowledge that the selection process is based on; one is some knowledge within the company, which is experience, explicit or tacit knowledge about the job. The other kind of knowledge specialist, doctor, or occupational physician, is about the human competencies related to the job, the physiological characteristics of the job, and how to deal with all this. One is typically done in-house, and the other is typically done outside the company.

The process is that the HR person consults an occupational doctor or psychologist and gives a broad outline of the given job. The occupational doctor or psychologist assigns competencies and characteristics to them, attaches tests to them to achieve the measurement results, and then, together, they carry out the measurements. The psychologist then draws up a professional opinion based on the predictors and the HR

person decides whether to hire on this basis. Very importantly, all steps are relatively slow, labor-intensive, require live work, are costly, and often not even sufficiently accurate.

This contrasts with how ATOM can be used to help you select a workforce. These two types of knowledge are also needed for this method, but both are greatly simplified, as the knowledge within the company about all the content, circumstances, and job requirements, are all reflected in the job success criteria. That is all you need to know. If there is a good job success criterion, it is all there. The other kind of knowledge is the knowledge of the work of psychologists, the doctor, it is embedded in the ATOM and it is realized in artificial intelligence algorithms. These learning algorithms work if I have a sufficiently large amount of data; typically, that means at least 100 of some kind of proven and unproven worker.

Predictors can be of any types, but criteria must be categorical. Then the algorithm can find the relationships between the predictors and the criteria and can make a good prediction for the next new cases where the value of the job success criterion is not yet known based on the corresponding predictors. In this case, the process works in such a way that the HR employee turns to a colleague with ATOM, who does not need to get to know the content of the job in depth, and only outline its requirements. A company with ATOM uses a standard test mode system that measures a wide range, so, it usually does not have the task of choosing a measuring device.

An exception is when special mental or physical characteristics and abilities must be measured with an electromechanical measuring instrument or work simulator. So they organize the measurements together, ATOM automatically gives a personal characterization, even from a mobile device, because it also has a mobile internet-based version. The applicant fills out the test and data from a mobile device, from home, and in real-time mode, the employee himself can receive a report. Of course, the company also receives a more detailed report. In summary, the process is largely automated, so it is less labor-intensive, less expensive, and much faster. In the case of high-quality predictors, an additional advantage is that it gives a much more accurate prediction than the traditional method.

A little about the operation of ATOM. It works based on the principle of supervised learning" and the "Learning with teacher" subtype of the basic model of" supervised learning. It also uses concurrent algorithms, as opposed to the general practice of specifying a single model for a given use, which runs several ML algorithms in parallel, and during their execution, the most suitable solution for the given situation is selected. In this way, ATOM can better adapt to the diversity of workplace selection problems. ATOM uses the algorithms written in Python. The applied ML families are the following. Support vector clustering, Logistic Regression, RandomForestClassifier, AdaBoost Classifier, Logisticpipe, MLPClassifier. I will not elaborate further.

You will soon see the operating principle, i.e. supervised learning. The figure shows that  $x_1 x_2 \dots x_p$  - these are the predictors. Which can be a large number, even hundreds. A certain amount of examples is available to see. The lines are examples. And in one place, you can see  $y$ , that is, the actual success. The output, so the criterion is the actual success. The model is built, then the new cases come, where the outputs are not known, but if the predictors are of good quality and I have a large enough amount of data, then we reliably get the  $y$ 's for the new cases, i.e. the actual success. This is the essence of the model. I promised a specific application, and that is connecting ATOM with the

Ergoscope work simulator. It consists of 3 modules where different physical properties can be measured for physical work. I will give examples of these as well.

Static and dynamic force measurements in the vertical-horizontal direction with high accuracy in Newton. For sitting work, a wide variety of one-handed exertion, closing movements, recognition of invisible objects by touch, and many other such parameters. Panel C shows the measurement of monotony and work tolerance. A total of 215 exact parameters can be measured from 36 such simulated work situations. A possible occupational health aptitude test is an example of the data that can be measured in the 3 panels. Panel A: Static and dynamic force measurements, e.g. loader, material handler, etc.

Panel B: people who perform sedentary work, for example, store cashiers, and keyboard operators. Panel C: work endurance and monotony tolerance: assembly line worker. Finally, I mention 5 case studies.

The ROC curves with the aggregated results are shown here. A ROC curve indicates a better discrimination ability, the higher the curve runs. Since there is also a probability on the x-axis, the probability of a false alarm and the probability of a correct alarm on the y-axis, the maximum area of the curve is exactly one. If it runs above the average, i.e. above the chance line, quite high, then the system can be used. It can be used in three of the 5 examples, but not in two cases, probably because the predictors were not suitable. In the case of the last example, the measurement worked perfectly, as can be seen in the figure. There were 16,000 examples here, hence the great result. As I said before, you need at least 100 elements for an accurate prediction.

Dear Colleagues! If you have further questions or need information, please contact us at the email address provided. In case of serious interest, I can send additional background materials.

Thank you for your attention!

HedyTalk - Lajos Izsó's video on predicting workplace settlement by AI video.

In the previous assignment, you had to answer six questions about predicting workplace settlement by AI. You can check your answers below.

1. What is "ATOM" short for?

ATOM is an acronym, which stands for: Artificial intelligence for Testing Occupational success of Manpower

2. What data is used to predict job performance? Give 3 examples.

Occupational medical examinations, psychological tests, data from job simulators

3. What is the purpose of "ATOM"?

The ATOM is about modelling the relationship between input variables, predictors and criteria as accurately as possible.

4. What is the selection process based on?

Two types of knowledge:

In the company: experience, explicit or tacit knowledge about the job

Professional: human competences related to the job

5. What is the output of the "ATOM" algorithm?

The algorithm can find the relationships between the predictors and the criteria and can make a good prediction for the next new cases.

6. What are the advantages of using "ATOM"?

It is less labor-intensive, less expensive, and much faster. In the case of high-quality predictors, an additional advantage is that it gives a much more accurate prediction than the traditional method.

### History and present **forum**

It would be best to share your thoughts with the other participants until the self-check quiz. In this forum, you can start discussions and add posts. To complete this activity, you need to contribute at least once

### A brief history of artificial intelligence, major milestones

In this learning material, we will explore significant milestones in the development of artificial intelligence (AI). We will take a chronological journey through history, highlighting key events, inventions, and breakthroughs that have shaped the field of AI. Let's delve into the timeline provided to gain a deeper understanding of AI's evolution.

## I. 20th century - - Advancements in Artificial Intelligence

Please take a look at milestones, which contain the most important stages in the development of artificial intelligence. Look for books, phrases or the names of major companies. Do you think they still play a significant role in the field of artificial intelligence today?

### Before the 1950s: The Foundational Years

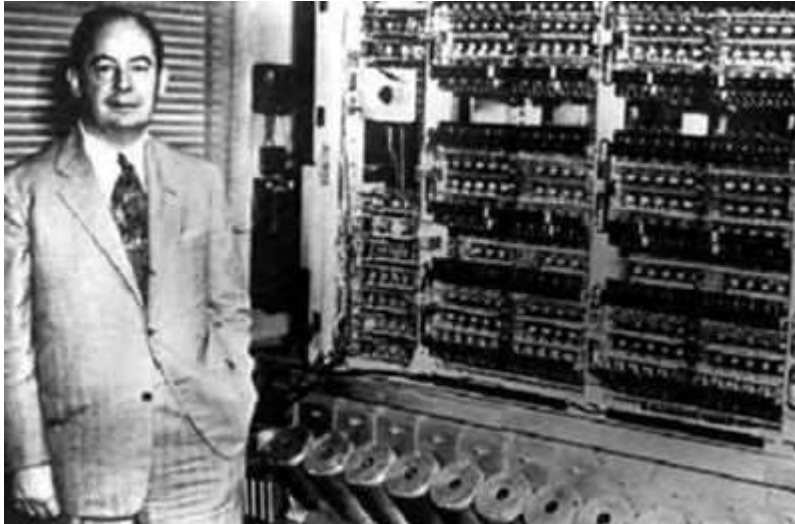
Theoretical ideas about human-machine cooperation and the basic principles of computation were formulated.

- 1920: Karel Čapek, a Czech playwright, released his science fiction "R.U.R. (Rossumovi univerzální roboti) ("Rossum's Universal **Robots**). His play explored the concept of factory-made artificial human beings. He called them robots - **the first known reference to the word**.
- 1943: McCulloch and Walter Pitts proposed the **Artificial Neuron Model**, explaining how neurons and synapses could be understood using logic and mathematics.

- 1947: Norbert Wiener published "**Cybernetics**: Or Control and Communication in the Animal and the Machine," introducing the field of cybernetics.
- 1949: John von Neumann designed the **EDVAC** (Electronic Discrete Variable Automatic Computer), the **first digital universal computer**.

John von Neumann and Modern Computer Architecture (by NCLAB)

<https://nclab.com/john-von-neumann-and-modern-computer-architecture/>



### 1950-1960s: Theoretical Approaches and Early Machine Learning

- 1950. Isaac Asimov published his science fiction book "I, Robot": with the "**Three Laws of Robotics**".
  1. *A robot may not injure a human being or, through inaction, allow a human being to come to harm.*
  2. *A robot must obey orders given it by human beings except where such orders would conflict with the First Law.*
  3. *A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.*
- 1950. Alan Turing introduced the concept that computer programs can simulate human thought, developing the "**Turing test**" ("**Imitation game**") to evaluate computer behaviour resembling human intelligence.

You can watch a summary of the Turing test

What is a Turing Test? A Brief History of the Turing Test and its Impact

<https://www.youtube.com/watch?v=4VROUIAF2Dg>

- 1956: John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon organize the Dartmouth Conference. John McCarthy **coined the term "artificial intelligence"** during a workshop at Dartmouth College.

Professor John McCarthy (1924-2011), Father of AI, legendary computer scientist at Stanford University



<http://jmc.stanford.edu/>

- 1957: Frank Rosenblatt designed the **first neural network** for computers.
- 1959-1962: Arthur Samuel pioneered **machine learning** by creating the first self-study program.

#### **1960-1970s: Early Developments in Symbolic AI**

- 1965. Joseph Weizenbaum developed **ELIZA, the first chatbot**.

You can watch ELIZA in work.

Before Siri and Alexa, there was ELIZA

<https://www.youtube.com/watch?v=RMK9AphfLco>

- 1966: SRI International developed **Shakey the Robot**, an autonomous robot capable of sensing its surroundings, navigating, planning, and communicating in English.
- 1968: The **sci-fi film “2001: A Space Odyssey”** directed by Stanley Kubrick, is released. It features HAL (Heuristically programmed Algorithmic computer), computer with a human personality controls the spacecraft’s systems.
- Various expert systems were developed in fields such as biology, medicine, engineering, and the military. (e.g. MYCIN: first medical expert system-Stanford University)
- 1971: **Stanford Cart**: the first computer-controlled **autonomous vehicle** built by Hans Moravec

Computer History Museum: Stanford Cart Robot (Catalog Number 102630561)

<https://www.computerhistory.org/collections/catalog/102630561>



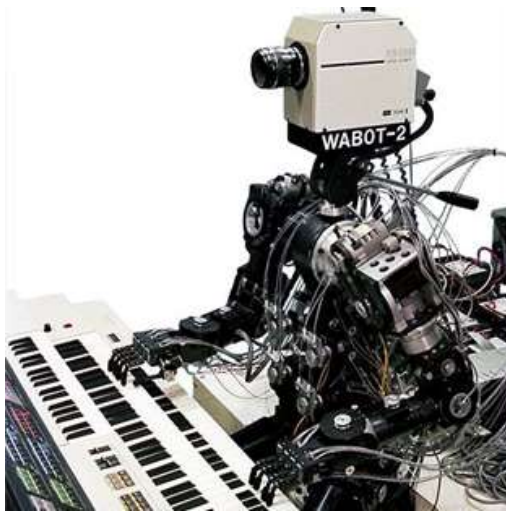
**1980-1990s: AI “winter” period of reduced interest in artificial intelligence:”AI winter”**

Scientists created computer programs capable of analyzing vast amounts of data and drawing conclusions. The Japanese government heavily funded expert systems and other AI related endeavours (“Fifth Generation Computer Project”).

- 1980: Waseda University: **WABOT-2 the humanoid robot** could communicate with people as well as read musical scores and play music on an electronic organ.

Wabot 2 had a CCD camera for a head. Photo: Waseda University

<https://robotsguide.com/robots/wabot>



You can watch WABOT-2 playing piano..

WABOT-2 ROBOT 80's

<https://www.youtube.com/watch?v=Qms5NjbhzaQ>

- 1984: The first “**Terminator**” film depict a near future world overtaken by killing machines run by the AI **Skynet**.

#### 1990-2000s: Renewed Focus on AI

- 1995: Richard Wallace developed **A.L.I.C.E (Artificial Linguistic Internet Computer Entity)**, a **chatbot** designed to simulate human conversation.
- 1997: IBM's **Deep Blue defeated world chess champion** Garry Kasparov in a chess match.

You can watch the designers of the Deep Blue tell the BBC how they won and what it means for computing.

Deep Blue vs Kasparov: How a computer beat best chess player in the world - BBC News

<https://www.youtube.com/watch?v=KF6sLCeBj0s&pp=ygUOaWJtIGRIZXAgYmx1ZSA%3D>

- 1999: Sony introduced **AIBO (Artificial Intelligence RoBot)**, a **robotic pet dog** capable of learning through interactions with its environment and owners.

Do you think computers will ever be smarter than humans?

Remember to stay curious and keep exploring the fascinating world of artificial intelligence!

References:

- Turing, A. (1950). Computing Machinery and Intelligence.
- McCarthy, J. et al. (1956). Dartmouth Artificial Intelligence Conference.
- Minsky, M. et al. (1968). The Artificial Intelligence Laboratory at MIT.
- Feigenbaum, E., & Buchanan, B. (1965). DENDRAL: first successful knowledge-based program

- Moravec, H. (1972). The Stanford Cart: The First Computer-Controlled Autonomous Vehicle.
- Raphael, B. (1972): Robot research at Stanford Research Institute, SRI Project 1530, Stanford University
- Sugano, S., & Kato, I. (1987, March). WABOT-2: Autonomous robot with dexterous finger-arm--Finger-arm coordination control in keyboard performance. In Proceedings. 1987 IEEE International Conference on Robotics and Automation (Vol. 4, pp. 90-97). IEEE.
- Wallace, R. (1995). Artificial linguistic internet computer entity
- Pandolfini, B. (1997). Kasparov and Deep Blue: The historic chess match between man and machine. Simon and Schuster.

Welcome back, students!

## II. The 21th century - Advancements in Artificial Intelligence

Please take a look at milestones, which contain the most important stages in the development of artificial intelligence. Look for books, phrases or the names of major companies. Do you think they still play a significant role in the field of artificial intelligence today?

### 2000-2010: The rise of the Big Data and AI

In this section, we will explore significant advancements in artificial intelligence from the years 2000 to 2010. This period witnessed remarkable breakthroughs and the introduction of AI into various domains. Let's dive into the details outlined in the provided text.

- 2000: The first robot used in healthcare "**da Vinci Surgical System**". This ground breaking technology allowed surgeons to perform minimally invasive procedures with enhanced precision and control.
- 2005: Sebastian Thrun and his team from the Stanford Artificial Intelligence Laboratory developed **Stanley, the first autonomous car**. Through advanced AI algorithms and sensor technology, Stanley could navigate and drive without human intervention, marking a significant milestone in autonomous transportation.



"Stanley" Robot Car (National Museum of American History)

[https://americanhistory.si.edu/collections/search/object/nmah\\_1377824](https://americanhistory.si.edu/collections/search/object/nmah_1377824)

- 2005: **Big data**: the origin of the term is uncertain. Perhaps Roger Mougals and the O'Reilly Media group were the first to use the term big data to describe large amounts of unmanageable data.
- 2005: “**The Singularity is Near**” **Ray Kurzweil** predicted in his book that there will come a time, around 2045, when the intelligence of the artificial mind will surpass that of the human brain.
- 2006: Geoffrey Hinton, an AI researcher, coined the term "**deep learning**" to describe a new algorithm that enabled computers to recognize objects and text present in images and videos. This algorithm revolutionised computer vision and laid the foundation for significant advancements in image and video analysis.
- 2007: Concerns of **Autonomous Weapons** AI professor Noel Sharkey raised concerns about an emerging arms race among high-tech nations in developing and utilising autonomous weapons. This warning highlighted the ethical implications and potential dangers associated with autonomous weapon systems.

### 2010-2020 Bloom of AI: new computing power

This period witnessed remarkable breakthroughs across various domains, further shaping the impact of AI on society. AI made notable strides in healthcare, transportation, image recognition, and virtual assistance. These advancements displayed the potential of AI to enhance various aspects of human life.

- 2011: **Apple introduced Siri**, a virtual assistant integrated into iPhones. Siri utilized AI techniques to understand and respond to voice commands, providing users with a range of services and information. Its introduction popularized the concept of virtual assistants and voice-controlled AI applications.
- 2011: **IBM's Watson**, a supercomputing system, **defeated two of the best human players on the TV game show Jeopardy!** This accomplishment demonstrated AI's ability to process and understand complex natural language questions.

You can read about IBM Watson, for example what was the funniest mistake Watson made.

### IBM Watson plays Jeopardy! Ten Years Later

<https://community.ibm.com/community/user/storage/blogs/tony-pearson1/2021/02/18/ibm-watson-plays-jeopardy-ten-years-later>



- 2013: **Amazon introduced Alexa**, a virtual assistant. It is capable of many tasks such as voice interaction, music playback, making to-do lists, setting alarms, streaming podcasts, playing audiobooks, and providing weather, traffic, sports, and other real-time information,
- 2013: Boston Dynamics introduced **Atlas, an advanced humanoid robot** designed for search and rescue tasks. Atlas displayed advancements in robot locomotion, manipulation, and agility.
- 2013: **HRP-2 humanoid robot**, developed by Japan's SCHAFT Inc. a subsidiary of Google, won DARPA's Robotics Challenge Trials. The competition aimed to develop robots capable of performing disaster relief tasks, highlighting the role of AI in aiding critical situations.

You can watch the video: **HRP-2 humanoid robot learns to use obstacles to its advantage**

<https://www.youtube.com/watch?v=fUvA1IUFETs>

- 2015: The U.S. Department of Defence presented the "Third Offset Strategy," which focused on how rapid advancements in AI would define the next generation of warfare. This initiative recognised the strategic importance of **AI in military applications**.
- 2015: **Open Letter Against Autonomous Weapons** Renowned figures, including Stephen Hawking, Elon Musk, Steve Wozniak, and 3,000 AI and robotics researchers, wrote an open letter calling for a ban on the development of autonomous weapons. This highlighted the ethical concerns surrounding the use of AI in warfare.
- 2015: Google's **DeepMind AlphaGo defeated the three-time European Go champion**, Fan Hui, with a score of 5-0. This marked a significant milestone in AI, as Go is an ancient Chinese game renowned for its complexity and strategic depth.

You can watch the story of AlphaGo: **AlphaGo - The Movie | Full award-winning documentary**

<https://www.youtube.com/watch?v=WXuK6gekU1Y>

- 2018: Increased Investments in The U.S. Department of Defence increased its budget for investments in artificial intelligence, big data, and cloud computing to \$7.4 billion. This reflected the recognition of AI's potential in defence applications.
- 2018: Google's **Duplex AI** assistant emerged, capable of making phone calls and appointments on behalf of users, showcasing advancements in natural language processing and conversation capabilities
- 2019: Alibaba's **language processing program** outperformed human participants in a reading and comprehension test at Stanford University.
- 2019: Calls for a Ban on Lethal Automated Weapons In the UN's convention on conventional weapons, 22 countries called for a total ban on lethal automated weapons, often referred to as "**killer robots**." This underlined the **need for ethical considerations** in the development and use of autonomous weapons.
- 2019: China's "Next-Generation Artificial Intelligence Development Plan" stated an ambition for world domination in AI by 2030, emphasising their strategic focus on AI research and development.

Development of the images generated by AI



The brief history of artificial intelligence: The world has changed fast – what might be next?

<https://ourworldindata.org/brief-history-of-ai>

Advancements in Healthcare and Scientific Research: AI systems demonstrated effectiveness in detecting and diagnosing cancer, surpassing human doctors in some cases. Physicists and mathematicians started leveraging AI to search for new particles, phenomena, and even aid in developing mathematical proofs.

References:

- Apple. (2011). Apple unveils Siri. Retrieved from <https://www.apple.com/newsroom/2011/10/04Apple-Unveils-iPhone-4S-Worlds-Most-Amazing-Phone/>
- IBM. (2011). Watson on Jeopardy! Retrieved from <https://www.research.ibm.com/ai/watson/jeopardy-debut.shtml>
- Future of Life Institute. (2015). Autonomous Weapons: An Open Letter from AI & Robotics Researchers. Retrieved from <https://futureoflife.org/open-letter-autonomous-weapons/>
- DeepMind. (2016). AlphaGo. Retrieved from <https://deepmind.com/research/case-studies/alphago-the-story-so-far>
- U.S. Department of Defence. (2018). Artificial Intelligence Strategy. Retrieved from <https://media.defense.gov/2019/Feb/12/2002088963/-1/-1/1/DOD-AI-STRATEGY.PDF>
- United Nations Office at Geneva. (2019). Group of Governmental Experts on Lethal Autonomous Weapons Systems. Retrieved from [https://www.unog.ch/80256EE600585943/\(httpPages\)/72F34D4D6252AEEAC125849B003EA0CB?OpenDocument](https://www.unog.ch/80256EE600585943/(httpPages)/72F34D4D6252AEEAC125849B003EA0CB?OpenDocument)
- Thrun, S., Montemerlo, M., Dahlkamp, H., Stavens, D., Aron, A., Diebel, J., ... & Whittaker, W. (2006). Stanley: The robot that won the DARPA Grand Challenge. Journal of Field Robotics, 23(9), 661-692.

- Hinton, G. E., Osindero, S., & Teh, Y. W. (2006). A fast learning algorithm for deep belief nets. *Neural computation*, 18(7), 1527-1554.
- Sharkey, N. (2007). Automated warfare: An emerging challenge to ethics and law. *International Review of the Red Cross*, 89(868), 589-606.

## 2020 - AI in the Present: AI Is Revolutionising Our World

During this period, AI made significant strides in diverse areas such as healthcare, robotics, defence, game-playing, and scientific research. However, ethical considerations, responsible development, and international discussions on AI's impact remained essential aspects of AI progress. Here are some examples:

- autonomous vehicles
- agriculture identify defects and nutrient deficiencies in the soil
- fraud prevention in financial institutions: machine learning began replacing security passwords as a more advanced authentication method
- personalised learning and other applications
- companies use intelligent software to ease the hiring process
- AI was employed in astronomy to detect and analyse 6,000 new craters on the moon's surface
- image and facial recognition in security systems
- emergence of a new genre of art known as AI art (image generation, music generation, text/content generation)
- chatbots: AI can understand natural language and respond to people online using the 'live chat' e.g. 2022:Chat GPT 3.5 (OpenAI) Large Language Model

Continue your exploration of AI, and be mindful of its societal implications and responsible use.

### Ethical considerations

Today, ethical considerations, responsible development and international discussions on the impact of AI are the essential aspects of AI progress. As you continue to explore the field of AI, it is important to reflect on the ethical implications and responsible development of these technologies. The rapid progress of AI necessitates ongoing discussions on its impact, potential risks, and the importance of ensuring its safe and ethical implementation. Take a look at some important international documents on the **regulation of AI**.

- 2019: **OECD** Recommendation of the Council on Artificial Intelligence <https://legalinstruments.oecd.org/en/instruments/oecd-legal-0449>
- 2021: UN News, 193 countries adopt first-ever global agreement on the Ethics of Artificial Intelligence, 25 November 2021.
- 2023: Pause Giant AI Experiments: An **Open Letter** - Sam Altman, CEO of OpenAI, and other AI leaders signed a statement to acknowledge openly the dangers of AI. They call on all AI labs to immediately pause for at least 6 months the training of AI systems more powerful than GPT-4. <https://futureoflife.org/open-letter/pause-giant-ai-experiments/>
- 2023. Foundation models such as ChatGPT through the prism of the UNESCO Recommendation on the Ethics of Artificial Intelligence - This policy paper shows how the **UNESCO** - Recommendation on the Ethics of Artificial Intelligence can help identify and clarify key ethical concerns related to AI systems. <https://unesdoc.unesco.org/ark:/48223/pf0000385629>

- 2023: **European Union** -"EU AI Act" is first regulation on artificial intelligence the world's first comprehensive AI law. <https://artificialintelligenceact.eu/>

Find one of these documents online and see what the main thoughts of this recommendation are? How these regulations protect you?

Comparing the history of AI and the regulations mentioned, how do you see that the recommendation is a kind of summary of the development, or rather a constraint on it by not considering it ethical to support/develop non-human-focused directions?

Remember to stay curious and keep exploring the fascinating world of artificial intelligence!

## The conceptual framework of artificial intelligence

Since there is no uniformly accepted definition of AI, you must find your interpretation. Please read the overview of the conceptual framework of artificial intelligence, and think about which of the many meanings and approaches is closest to you. Why? Perhaps you'd like to create another definition?

In order to take the final exam during the course, you must start at least one forum thread and make at least two forum posts. Here is your chance to do this.

This is how artificial intelligence defines **itself**: Artificial intelligence (AI) is intelligence implemented by computers that can perform tasks that human intelligence can also perform. Mastery and intelligence allow computers to perform tasks that require human thinking or learning.

The field of artificial intelligence is multifaceted and includes several approaches. Some examples of areas that use statistical intelligence include:

- **Machine learning**: Machine learning is a technology that allows computers to learn and evolve independently based on experience.
- **Name index procedures**: Name index procedures are algorithms that search for and identify certain database information.
- **Computer vision**: Computer vision is the ability of computers to interpret and evaluate the images and videos they see.
- **Natural language processing**: Natural language processing is the ability of computers to interpret and process texts written in human languages.

AI constantly evolves and creates new opportunities in education, the workplace and everyday life.

It is challenging to define AI clearly due to the diversity of Artificial Intelligence (AI) problems and solutions and the distinction between what AI contains and what does not. The shortest and simplest definition is: "AI is not biological intelligence". AI is one of the most life-changing scientific and technological developments of the century. There is no universally accepted definition of AI; it is an umbrella term. AI is a science and computational technology inspired by how people use their nervous system (acquire, store, manipulate, transmit information, learn and reason) and bodies to learn, reason and take action.

Encyclopaedia Britannica defines AI as "the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning,

generalise or learn from past experience". The Cambridge Academic Content Dictionary provides a shorter definition: "the use of computer programs that have some of the qualities of the human mind, such as the ability to understand language, recognise pictures, and learn from experience".

John McCarthy defined Artificial Intelligence (AI), a term coined by him in 1955, in 2007 as "the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable".

The definition given by Nilson includes a broad interpretation of the concept of intelligence; not only humans but also animals and some machines are intelligent to varying degrees: "AI is that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment."

The definition of AI also differs in documents issued by international organisations.

- European Commission: "AI is a collection of technologies that combine data, algorithms and computing power".
- OECD: "An AI system is a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments." "AI systems are designed to operate with varying levels of autonomy."
- UNESCO: AI is an ensemble of advanced ICTs that enable "machines capable of imitating certain functionalities of human intelligence, including such features as perception, learning, reasoning, problem solving, language interaction, and even producing creative work."
- Council of Europe: "Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behaviour by analysing how the environment is affected by their previous actions."

In general terms, AI refers to a broad field of science encompassing not only computer science; if we construe AI as studying how information is acquired, processed, stored, used, etc., in intelligent animals and machines, then it obviously overlaps with several older disciplines:

- Philosophy
- Mathematics and statistics
- Economics
- Neuroscience
- Psychology
- Biology and medical science
- Linguistics
- Computer sciences
- Technical sciences
- Safety and security sciences

Nowadays, AI is trained and focused on performing specific tasks (playing strategic games, language translation, self-driving vehicles, image recognition, trip planning etc.). This development level of AI is called **Artificial Narrow Intelligence (ANI)** or Weak AI.

The next level of AI is **General AI (Artificial General Intelligence, or AGI)**, also known as strong AI, which refers to a future, theoretical form of an AI system that exhibits intelligent behaviour at least as advanced as a person across the full range of cognitive tasks. Artificial Super Intelligence (ASI) — also known as superintelligence — would surpass the intelligence and ability of the human brain.

## Four approaches of Artificial Intelligence by Russel and Norvig

After 1955, several definitions of AI emerged. In their famous book, Russel and Norvig (Russel, S. – Norvig, P.: Artificial intelligence: A Modern Approach, 1995) developed a new taxonomy. They examined the definitions of AI according to two dimensions. On the one hand, they separate the human-focused conception of the empirical sciences from the rational-focused concept of mathematics and engineering. On the other hand, thought processes and inference are separated from behaviour. Four groups can be formed based on the combination of the two aspects.

Human approach	Ideal approach
(1) Thinking Humanly  systems that think like humans (e.g., cognitive architectures and neural networks);	(3) Thinking Rationally  systems that think rationally (e.g., logic solvers, inference, and optimisation);
(2) Acting Humanly  systems that act like humans (e.g., pass the Turing)	(4) Acting rationally  systems that act rationally (e.g., intelligent software agents and embodied robots that achieve goals via perception, planning, reasoning, learning, communicating, decision-making, and acting)

### Human approach

(1) systems that think like humans (e.g., cognitive architectures and neural networks);

**Thinking Humanly:** there is no comprehensive theory of the mind yet, but the ultimate goal is for the system to function like human thinking. The interdisciplinary field of cognitive science combines computer models from AI and experimental techniques from psychology to construct precise and testable theories of the human mind. If the program's input–output behaviour matches corresponding human behaviour, that is evidence that some of the program's mechanisms could also operate as humans.

(2) systems that act like humans (e.g., pass the Turing)

**Acting Humanly:** Turing proposed a test called "The Imitation Game": (Turing test), which is an operational definition of intelligence. A computer passes the test if a human interrogator, after posing some written questions, cannot tell whether the written responses come from a person or a computer. The computer would require possessing the following capabilities:

- natural language processing to communicate successfully in a human language;
- knowledge representation to store what it knows or hears;
- automated reasoning to answer questions and draw new conclusions;
- machine learning to adapt to new circumstances and to detect and extrapolate patterns;
- computer vision and speech recognition to perceive the world;

- robotics to manipulate objects and move about.

### Ideal approach

(3) systems that think rationally (e.g., logic solvers, inference, and optimisation);

**Thinking Rationally:** a system is rational if it does the "right thing", given what it knows, based on an irrefutable reasoning process. The logics tradition within artificial intelligence hopes to build on such programs to create intelligent systems.

(4) systems that act rationally (e.g., intelligent software agents and embodied robots that achieve goals via perception, planning, reasoning, learning, communicating, decision-making, and acting).

**Acting Rationally:** computer agents are expected to operate autonomously, perceive their environment, persist over a prolonged period, adapt to change, and create and pursue goals. A rational agent is one that acts to achieve the best outcome or when there is uncertainty, the best-expected outcome. All the skills needed for the Turing Test also allow an agent to act rationally. An important fact: perfect rationality — always taking the optimal action — is not feasible in complex environments because the computing needs are too high. The history of AI is dominated by the study and the construction of the rational agent approach, which Russel and Norvig define as the study of agents that receive percepts from the environment and perform actions.

## Major applications of AI

Before you read the section below, please consider which of the emerging forms of artificial intelligence you have encountered in your own life.

In order to take the final exam during the course, you must start at least one forum thread and make at least two forum posts. Here is your chance to do this.

**Economy, finance:** AI-based systems provide customer support, detect anomalies and credit card frauds by pattern recognition, and enhance security across several business sectors, including retail and finance. Organisations rely on AI to trace those steps by analysing the behaviours of transactions. Ventures give the order to data scientists to determine future patterns in the market and improve their stock trading performance.

**Agriculture:** Organisations are using automation and robotics to help farmers in farm management and free them up for other tasks. The AI systems promote finding more efficient ways to protect their crops from weeds, how to combat animal and plant diseases, and monitor the animals' movement, temperature and feed consumption. AI systems enable satellite image analysis to coordinate regional and national production, for example, to identify drought-prone areas.

**Health Care industry:** There are many examples of how AI in healthcare has helped patients. Personal or online consultations, personalised health guidance, and virtual assistants reduce unnecessary hospital visits. Clinical decision support systems to analyse a person's medical data, including lab results to detect diseases and identify diagnose. AI uses historical data and medical intelligence to discover new drugs. AI-based applications could improve health outcomes and quality of life for people worldwide.

**Transportation:** A lot of advancement has been made in the autonomous vehicle segment (aviation in particular) supported by AI: autonomous vehicles, and unmanned drones. Today's cars now have AI-based driver-assist features such as self-parking, advanced cruise controls, natural language interfaces, and virtual assistance technologies.

**Smart cities and buildings:** The expected growth of urbanisation requires managing environmental, economic and social sustainability. A smart/digital/intelligent city is an umbrella term that uses a breadth of digital technologies to improve operational efficiency, share information with the public, the best possible use of resources, provide a high quality of services and improve citizen welfare. For example, traffic management, waste management, and safety service (monitoring areas of high crime and early warning systems for incidents).

**Education:** AI will fundamentally change education. Technology will revolutionise how students learn and transform teachers' thinking about educational practices. Globally available virtual classrooms with real-time subtitles, tutoring via AI chatbots and software-driven tutors, personalised learning programs adapted to each student's ability and goals, and 24/7 access to learning from anywhere. AI communicates with students through a graphical or multimedia interface tailored to their needs and level of knowledge and allows them to explore extended and virtual worlds. Time management benefits teachers due to the smart automation of tedious, time-consuming tasks like record keeping. Students with developmental/intellectual disabilities (ID/DD) can benefit from robots equipped with social competencies.

**Robotics:** robots are often seen as artificial intelligence because it is easier for the average user to imagine artificial intelligence in a mechatronic structure that also has a body, especially if the body resembles a human/animal, for example, social, therapeutic, educational robots. Machine-like robots are applied in industry and research, and other forms are developed for military and medical use.

**Industry 4.0:** the fourth industrial revolution "describes a new, emerging structure in which manufacturing and logistics systems in the form of Cyber-Physical Production Systems (CPPS) intensively use the globally available information and communications network for an extensively automated exchange of information and in which production and business processes are matched." A part of this change is joining AI technologies like smart/intelligent factories with intelligent data processing where product development, testing, manufacturing, purchasing, warehousing, transport, sales and all the related processes are based on AI. The next level is Industry 5.0, which "provides a vision of an industry that aims beyond efficiency and productivity as the sole goals, and reinforces the role and the contribution of industry to society." An essential role in creating Industry 5.0 has been emphasising social and ethical risks in addressing new technical challenges — three main components: people-centeredness, resilience, and sustainability. The human-centered approach reflects the perception that technology is adapted to human needs, unlike the former, where the man had to adapt to technology.

## Core models for machine learning

Before you read the section below, please consider how you learn. What catches your attention in a curriculum section? What do you think is necessary so that you can remember the knowledge later?

*As you will see, this part was written by artificial intelligence about itself (and then formulated by human intelligence (instructor) for the final form). Do you think AI will be able to write larger-scale, more in-depth studies on a topic without human intervention? What are you basing your opinion on?*

In order to take the final exam during the course, you must start at least one forum thread and make at least two forum posts. Here is your chance to do this.

### ***This is how AI defines machine learning:***

Machine learning (ML) is a subfield of artificial intelligence that aims to improve the capabilities of computers so that they can learn and develop independently based on tap

desktops. Machine learning is a process in which a computer learns something based on the available data without giving it special instructions. Machine learning can perform tasks that require human thinking or learning, such as identifying things in images, interpreting sounds, analyzing data, etc.

Machine learning uses algorithms that learn from the available data and "train" these algorithms based on the data. Machine learning algorithms can be pre-programmed, but in many cases, they know independently based on the data. There are two main types of machine learning algorithms: teaching and self-learning.

Teaching algorithms are algorithms that are pre-programmed to analyse data and perform tasks. The computer uses a data set that is pre-given to it, and it is through this dataset that it learns the ism heretics needed to complete the task.

Self-learning algorithms are algorithms that learn on their own based on data. These algorithms can independently learn new information based on data analysis and use this new knowledge to complete tasks.

### A brief overview of industrial generations

This and subsequent curriculum units will deal with the relationship between Industry 4.0 and artificial intelligence. The figure below, together with the text below it, give a brief description of each industrial generation. Based on your previous studies and (if any) visit to the factories, can you recall what distinguishes each generation of industry from each other? How do you think the importance of occupational safety and health has been replicated by each generation of industry? Do you think there are more or fewer people working in Industry 4.0 than in previous industrial generations?

In order to take the final exam during the course, you must start at least one forum thread and make at least two forum posts. Here is your chance to do this

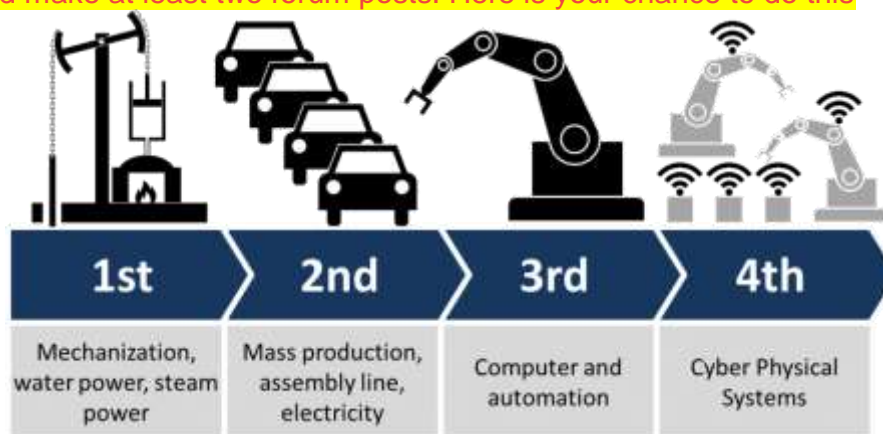


Image Credit: "Christoph Roser at [AllAboutLean.com](http://AllAboutLean.com)"

#### Key features of Industry 1.0:

- We solve it even without animal power
- Factory mass production instead of handicrafts
- The appearance of steam energy
- Leading sector: light industry (cotton industry)
- Weaving and spinning machines
- Steamboat, steam locomotive
- Start of rail transport

#### Key features of Industry 2.0:

- Let's start mass production
- Conveyor belt
- Improved device reliability

- Flow of labour into industry
- Agrarian revolution (mechanization, crop rotation, barning, irrigation, etc.)
- Urbanization revolution
- Better in quality, more food in quantity

#### **Key features of Industry 3.0:**

- Automation for everyone
- Computers, ITai systems
- Programmable control
- CAD
- CAM
- CIM

See a separate subsection for Industry 4.0

#### **Key features of Industry 4.0**

Please take a good look at the diagram of the industry 4.0 ecosystem in this section. Do you think this figure can be said to be complete? If not, what parts would you add? Based on your own studies, what are the parts that are closer to you or farther away from you? Have you ever seen an industrial metaverse? If you haven't already, here is a short video about it:

Siemens and NVIDIA to enable industrial metaverse

[https://www.youtube.com/watch?v=w\\_yX\\_Ih1fgE](https://www.youtube.com/watch?v=w_yX_Ih1fgE)

"The term Industry 4.0 refers to the fourth industrial revolution as a summary of the period leading to an ever closer intertwining of information and communication technologies and automation, and thus a fundamental change in products, services, production methods and business models, which in terms of content means the digital renewal of the economy and represents a global trend." (Gaal)

According to Kroó, the fourth industrial revolution will be realized through the integration of the following nine technologies:

1. Advanced robotics
2. Three-dimensional printing
3. Connection to the virtual world
4. Simulation
5. In-house and cross-company integration
6. Industrial Internet
7. Cloud management of big data
8. Cybersecurity
9. Data analytics

#### **The emergence of artificial intelligence in the field of Industry 4.0**

This is the last unit in this module.

This part was also written by artificial intelligence about itself and then formulated by human intelligence (instructor) for the final form). Based on the description, what three characteristics best describe the relationship between AI and Industry 4.0? Could artificial intelligence take away people's jobs in Industry 4.0 and 5.0?

If you feel like it, ask the AI about it @ <https://chat.openai.com/>

**Here is what AI has to say about the subject:**

Industry 4.0 is a manufacturing trend in which manufacturing processes and technologies that support production processes are combined to optimize production processes and increase efficiency. Artificial intelligence (AI) in manufacturing plays a significant role in Industry 4.0, helping to optimize production processes and increasing efficiency in many ways.

For example, with the help of AI, production processes can be automated, which reduces the number of defects and speeds up production processes. AI can also be used in the manufacturing industry to apply machine-learning algorithms to help analyse data and automate tasks.

AI can also be used in the manufacturing industry to implement processes that help optimize production processes and increase productivity. With the help of AI, number machine vision can also be applied in the manufacturing industry, which allows one to check the quality of products and identify defects.

AI can also be used in the manufacturing industry to implement natural language processing, which helps to analyse data faster and better understand manufacturing processes.

Overall, AI in Industry 4.0 significantly increases the efficiency of production processes and reduces errors, increasing productivity and reducing costs.

### Self-assessment quiz - Key - Part 1

With this quiz, you can check that you have mastered the material.

Although the result does not count towards the final evaluation, you should try this quiz at least once.

You will have five minutes to answer five questions in this quiz.

You can try an unlimited number of times, and the result of the best attempt will be the result of the quiz.

At least one hour must pass between each attempt, which is best spent deepening your knowledge.

- Timing: 5 minutes
- Grade category Uncategorized
- Grade to pass 5.00
- Attempts allowed Unlimited
- Grading method: Highest grade
- Navigation method: Free
- Review options: Overall feedback
- Enforced delay between 1st and 2nd attempts 1 hours
- Enforced delay between later attempts 1 hours
- Overall feedback
  - 80% - 100% You have done well; you can continue.
  - 50% - 80% The test was successful.
  - below 50% It is worth studying this material before proceeding further.
- Activity completion Minimum number of attempts: 1

### Recommended literature

- AILevel Expert Group: ETHICAL GUIDANCE ON TRUSTWORTHY AI. [https://www.europarl.europa.eu/meetdocs/2014\\_2019/plmrep/COMMITTEES/JURI/DV/2019/11-06/Ethics-guidelines-AI\\_HU.pdf](https://www.europarl.europa.eu/meetdocs/2014_2019/plmrep/COMMITTEES/JURI/DV/2019/11-06/Ethics-guidelines-AI_HU.pdf)
- Recommendation of the Council on Artificial Intelligence. <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449>
- Éva Beke, Teréz Hendlein, Dr. Csaba Kollár, Dr. Gyula Szabó (eds.): HEDY – Life in the Age of AI", Security Science Review, Special Issue, Vol. IV, No. 1, 2022. <https://biztonsagtudomanyi.szemle.uni-obuda.hu/index.php/home/article/view/259/219>

- Russel, S. – Norvig, P. (2021): Artificial intelligence: A Modern Approach, Global Edition 4<sup>th</sup>, Pearson
- Russel, S. – Norvig, P. (2021): Artificial intelligence: A Modern Approach 3rd Edition , TEXAS A&M UNIVERSITY  
[https://people.engr.tamu.edu/guni/csce421/files/AI\\_Russell\\_Norvig.pdf](https://people.engr.tamu.edu/guni/csce421/files/AI_Russell_Norvig.pdf)

## Key - Part 2 - Future application

### Introduction to module

In this unit, students compare the previous basic knowledge they learned and acquired with the media representations of artificial intelligence and the TED lectures on artificial intelligence.

### Knowledge and competencies that can be acquired

Competencies that can be acquired by successfully completing the teaching unit:

#### Knowledge

- The student is familiar with the main basic concepts of artificial intelligence.
- The student knows the main areas of application of artificial intelligence.
- The student knows the most important basic concepts of Industry 4.0.
- The student knows the basic interfaces between craft, intelligence, and Industry 4.0.
- Be informed about the current and future opportunities and limitations of Industry 4.0.

#### Ability

- The student can distinguish between AI media based on fiction and reality division.
- The student can recognize artificial intelligence solutions presented in cinematic films.
- The student can evaluate what he sees objectively.

#### Attitude

- Open to learning about the opinions of other, recognized thinkers on artificial intelligence (TED talks).
- The student's work is reviewed; his results and conclusions are constantly checked.
- The student is open to the use of information technology tools.
- The student is critical for AI (media) content based on non-technical/IT reality (movies).
- The student enjoys consuming media content dealing with artificial intelligence and related fields.

#### Autonomy and responsibility

- The student collaborates with the instructor and his peers to expand knowledge.
- Accepts well-founded professional and other critical remarks.
- The student is committed to systemic thinking and problem-solving principles and methods.
- With the knowledge, based on analyses, the student makes a responsible, informed decision.

#### Thematics (structure of the study note)

In this unit, the acquisition of knowledge is not a note, but a set of criteria that help to process the media contents.

#### Need of time

- Depending on watching movies, 90-130 minutes - recommended, optional!
- Watching a TED lecture and then summarizing the lecture in 2000-2500 characters 30-45 minutes
- Watching the TED lectures watched by two other coursemates and then evaluating the two summaries: 30-45 minutes

#### Requirements

- Watching a TED talk and then summarizing the lecture in 2000-2500 characters based on it (mini-essay)
- Watching the TED lectures watched by two other course mates and then evaluating the two recaps

### Evaluation system

- Teacher rating of mini-essay (50 points)
- Evaluation of mini-essay by 2-course partners (2\*15 points)
- Evaluation of 2-course mates' mini-essay (2\*10 points)
- In the case of at least 50 points, the completion of the unit can be said to be successful

### Some examples of major films on AI

#### Here is how AI views AI on media representation:

The topic of artificial intelligence appears on many films, and there are several films that specifically deal with the topic of artificial intelligence. Here are some examples of major films on artificial intelligence:

- Ex Machina (2014): This film is about the human-artificial intelligence relationship and how human consciousness affects artificial intelligence.
- Her (2013): In this film, artificial intelligence, which stores human consciousness in digital form, plays a major role and is about how human consciousness affects artificial intelligence.
- I, Robot (2004): In this film, robots with artificial intelligence play the main role and is about how robots with artificial intelligence can be dangerous to humanity.
- The Terminator (1984): In this film, artificial intelligence plays a role, which in the future controls robots and attacks humanity.
- Blade Runner (1982): In this film, robots with artificial intelligence play the main role and is about how human consciousness affects artificial intelligence.

If you feel like it, you can also watch some cinematic videos on the topic, however, the task is to choose from the given 10-10 TED (professional) lectures and analyze them according to the following criteria.

### Film resources

#### TED talks on artificial intelligence

- 6 big ethical questions about the future of AI | Genevieve Bell.  
<https://www.youtube.com/watch?v=UGHzKaA00cA>
- AI and Ethics | Toby Walsh  
<https://www.youtube.com/watch?v=HSsQApXQGsl>
- Machine intelligence makes human morals more important | Zeynep Tufekci  
<https://www.youtube.com/watch?v=hSSmmlridUM>
- The Paradox of AI Ethics: Why Rule-based AI Ethics Will Fail | De Kai  
[https://www.youtube.com/watch?v=rKPhvb\\_9taw](https://www.youtube.com/watch?v=rKPhvb_9taw)
- The ethical dilemma we face on AI and autonomous tech | Christine Fox  
[https://www.youtube.com/watch?v=3oE88\\_6jAwc](https://www.youtube.com/watch?v=3oE88_6jAwc)
- Can we build AI without losing control over it? | Sam Harris  
<https://www.youtube.com/watch?v=8nt3edWLgIq>
- The Real Reason to be Afraid of Artificial Intelligence | Peter Haas  
[https://www.youtube.com/watch?v=TRzBk\\_KulaM](https://www.youtube.com/watch?v=TRzBk_KulaM)
- What happens when our computers get smarter than we are? | Nick Bostrom  
<https://www.youtube.com/watch?v=MnT1xgZgkpk>
- Why AI will never replace humans | Alexandr Wang  
<https://www.youtube.com/watch?v=iXCmoQDEoe4>
- How we can build AI to help humans, not hurt us | Margaret Mitchell  
[https://www.youtube.com/watch?v=twWkGt33X\\_k](https://www.youtube.com/watch?v=twWkGt33X_k)

#### TEDlectures on industry 4.0

- Markus Lorenz: Industry 4.0: how intelligent machines will transform everything we know  
<https://www.youtube.com/watch?v=uBZmJOHIN8E>
- The next manufacturing revolution is here | Olivier Scalabre  
<https://www.youtube.com/watch?v=AyWtlwwEgS0>
- Industry 4.0- Not just the Future of Industry | Augusta Ene  
<https://www.youtube.com/watch?v=jvjYLwed1s8>
- Education for the 4th Industrial Revolution | Dr. John Baruch  
[https://www.youtube.com/watch?v=4l\\_THuN9QxE](https://www.youtube.com/watch?v=4l_THuN9QxE)
- How 3D printing is enabling the '4th Industrial Revolution' | Dr. Tim Minshall  
<https://www.youtube.com/watch?v=lsJLZ1UYxGc>
- Industry 4.0 and Humanity 4.0 | Subra Suresh  
<https://www.youtube.com/watch?v=nGdG39ZBNEs>
- Industry 4.0 and How Will It Shape Our Future | Can Üstertuna  
<https://www.youtube.com/watch?v=5ymhddpZWLM>
- 5th industrial revolution - Humanity, Purpose, and Inclusivity. | Pratik Gauri  
<https://www.youtube.com/watch?v=RDHaHPOVH0>
- Happiness in Industry 4.0 | Kanishk Gaur  
<https://www.youtube.com/watch?v=SfgY7VPJGW0>
- How to Turn a Regular Factory into a Smart Factory | Joachim Hensch  
[https://www.youtube.com/watch?v=p-SLDuMW\\_6k](https://www.youtube.com/watch?v=p-SLDuMW_6k)

### Longer duration presentations

- Artificial intelligence and its ethics | DW Documentary  
<https://www.youtube.com/watch?v=lzd2qOgOGQI>
- Ethics and the Future of AI  
<https://www.youtube.com/watch?v=HYuk-qMkY6Q>
- Max Tegmark lecture on Life 3.0 – Being Human in the age of Artificial Intelligence  
<https://www.youtube.com/watch?v=1MqukDzhlqA>
- Life 3.0: Being Human in the Age of AI | Max Tegmark  
<https://www.youtube.com/watch?v=oYmKOgeoOz4>
- The European Approach to Regulating Artificial Intelligence  
[https://www.youtube.com/watch?v=BBmq4T\\_550U](https://www.youtube.com/watch?v=BBmq4T_550U)
- An European approach to Artificial Intelligence  
[https://www.youtube.com/watch?v=CBNJMBc\\_E4A](https://www.youtube.com/watch?v=CBNJMBc_E4A)
- What Should Be in Europe's AI Legislation?  
<https://www.youtube.com/watch?v=At4tmqErVQ>
- Trustworthy AI: The EU's New Regulation on a European Approach for Artificial Intelligence  
<https://www.youtube.com/watch?v=3AVt-jlekks>
- The European AI Act and digital SMEs  
[https://www.youtube.com/watch?v=YX1n\\_DFQTPi](https://www.youtube.com/watch?v=YX1n_DFQTPi)
- AI Seminar: The EU "Artificial Intelligence Act" (AIA) Proposal  
<https://www.youtube.com/watch?v=CYakLcqHWAq>

### Movies on intelligence

Here you can fill in a google form

<https://docs.google.com/forms/d/1P5G09oXnZO1pReff7ikGCX2wWY0zU5KQqGiEa5Uq7p0/edit>

In this table you can see all the films that have been collected so far.

<https://docs.google.com/spreadsheets/d/1ng6xTTxl6jzxWPFY8CB5zCHi5AmWEY5nbock5ZHIUI/edit?usp=sharing>

## Movie watching and analysis considerations

### Workshop in Key - Part 2 - Future application

We need simple essay submission instead of project work activity

Choose one of the 20pcs ([film source](#)) TED talks and write a 2000-2500 character essay.

1. Choose one of the 20 TED talks from the [film source](#).
2. Watch the movie with the following considerations in mind:
  - a. To what extent does what you say match what you read in the theoretical section in the previous class?
  - b. If there is a discrepancy, what do you think could be the reason for this?
  - c. Does the rapporteur have a strong point of view/position on the subject, or is he or she summarising the thoughts of others?
  - d. Does the presentation present a positive or rather negative image/vision?
  - e. Does the rapporteur make any recommendations?
  - f. If so, do you agree with that?
3. Clear up your notes.
4. Create your 2000-2500 character essay.
5. Upload the essay on the course website for the appropriate assignment.

In your essay, you need to answer the following questions:

1. What is the title of the presentation?
2. What is the duration of the lecture?
3. What is the link to the lecture?
4. Who is the performer, and what do we know about him (max. 2-3 sentences)?
5. What does the show do?
6. Briefly summarize the presentation (in 500-1000 characters: what it is about, how much it sums up a position, what is its opinion about the future, what critical comments it has, whether it gives a recommendation)
7. What idea of the lecture do you agree with?
8. What idea of the lecture do you disagree with? Why not?
9. What are the five keywords that best describe your presentation?

Activity completion Submission

Key aspects of feedback: reduce the assessment of the submitted essay if

- missing the title of the presentation, the duration and link of the lecture, the introduction of the performer
- missing the summary of the presentation or shorter than 500-1000 characters
- missing opinion (agree, disagree, why?) and critical analysis
- missing the five keywords of your presentation
- shorter, than 2000-2500 characters

## Module feedback (Key) (Questionnaire)

We can switch off module feedbacks

We want to make this course the best it can be, so please provide feedback on this module the same way as the others.

Please mark the answers that best reflect your opinion on the four questions below on the five-point scale.

Strongly agree    Somewhat agree    Neutral    Somewhat disagree    Strongly disagree

- I improved a lot during the completion of the module.
- Completing this module was enjoyable for me.
- There were valuable exercises in the module.
- The module contained helpful information

2 Please provide feedback about this module in a few sentences. What would you improve?

## Impact on business - Part 1

### Introduction to the module: AI Impact on business

#### **Brief introduction to the module**

Considered a key driver of future economic development and growth, Artificial Intelligence (AI) has become a primary value proposition for an increasing number of new start-ups and businesses, particularly around Europe. AI is conquering every industry worldwide and motivating businesses to compete to become AI-focused entities. On top of this, it is now undeniable that the actual impact of AI on business is growing at a fast pace, resulting in a series of challenges in terms of technology business regulations, employee's security and company's management.

In the first part of this module, you will learn about the integration and impact of artificial intelligence in businesses, industries and start-ups. More specifically, the module will focus on five main topics:

- Customer Expectations
- Product Enhancement
- Collaborative Innovation
- Organizational Forms
- Global platforms and business models

This module is part of the HEDY MOOC, which has been produced as one of the results of the co-founded Erasmus+ project HEDY – Life in the AI Era.

The project aims at offering a comprehensive and shared view of how AI is affecting our lives and reshaping our socio-economic, cultural, and human environments by promoting critical reflection, self-based learning and debate on these issues.

The second part of this module consist of three video related exercises related to How AI applies to educator sector, a summary exercise on the rise of AI: Canada and mental challenge activity and an AI in Business tool practice using Copy AI.

In this module, you will acquire the following competencies:

#### **Knowledge**

- Be familiar with key concepts and terminology related to Artificial Intelligence (AI) and Business

- Be aware of the impact of Artificial Intelligence in the following areas: Customer Expectations, Product Enhancement, Collaborative Innovation, Organizational Forms, Global platforms and Business Models
- Be able to recognize the main areas in which companies and enterprises use AI systems
- Be able to recognize the role and responsibilities related to the implementation of AI systems in businesses
- Be informed about the challenges posed by AI integration in businesses

### Ability

- To identify different key-elements in the relationship between Artificial Intelligence and business
- To recognize different forms of businesses and how they integrate AI in their structure
- To recognize the use and application of AI systems in business processes, companies and enterprises
- To apply the knowledge acquired in everyday life

### Attitude

- Be aware that your work and achievements are constantly monitored
- Be open to use different tools to enrich the learning experience
- Willing to develop the capacity to accurate and error-free task solving and engineering precision
- Keeping a critical approach to the content offered within this module
- Be committed to professional development.

### Autonomy and responsibility of the student

- Collaborates with the instructor and fellow students in expanding knowledge (when needed)
- Accepts well-founded professional and other critical remarks.
- Being committed to the principles and methods of systemic thinking and problem solving.
- Making responsible and informed decision, based on their own knowledge and analysis

## Artificial Intelligence effects on Customer Expectations

### What does customer expectation refer to?

Customer Expectation is usually defined as "pre-trial beliefs about a product or service" [1]. In the context of business, customers have several sources of information, which affect their expectations towards a particular product, service or company [2]. The main information sources include:

- Customers' prior exposure to the service, product or company
- Word of mouth
- Opinions from experts
- Publicity and communication controlled by the company such as advertising, price and personal selling, as well as prior exposure to competitive services [3].

When it comes to customer expectations in business, there are three main phases in which this concept can be developed:

1. **The pre-purchase stage:** In this phase, expectations influence customers in their decision-making processes about which brand or type of product or service to buy
2. **The purchasing phase:** customers' expectations can be affected by a variety of elements. The most significant ones during this phase can be the attitude of service personnel, the behaviors of other customers, the equipment and during online purchases, the services provided by the purchasing platforms.
3. **The post-purchase phase:** at this stage, the customer's expectations are affected by the overall level of satisfaction as well as by the general purchasing experience. In this context, customer satisfaction is included as one of the parts of the so-called

"customer satisfaction", which is composed of customer expectation and perceived service quality.

In business, experts agree on two different types of customers' expectations:

- **Predictive Expectation:** they are usually defined as consumer beliefs concerning the level of service that a specific service or product firm would be likely to offer. They are frequently at the base of satisfaction and judgment and are used as standards of service.
- **Normative Expectation:** they are generally conceptualized as consumers' ideal level of service. As a result, normative expectations and desires are usually the same.

### **How does Artificial Intelligence (AI) impact Customer Expectations?**

On this basis, Artificial intelligence (AI) has the potential to significantly impact customer expectations. More specifically, considering that in recent years phenomena such as online shopping and digital marketing have greatly increased among consumers, companies worldwide had to adapt several services in order to meet expectations, needs and wants of (potential) customers. Implementing updated, innovative and high-tech AI systems supported companies and enterprises in improving their customer relation systems, marketing systems and customer support systems (including providing cybersecurity measures to online operations).

For example, in digital marketing AI is widely used and several companies rely on AI-driven marketing strategies to forecast whether a new customer's future spending will reduce or grow after the initial purchase (see the post-purchase phase in the previous unit). The main aspects on customer expectations that are affected, usually with the aim of bringing positive results, impacts and advantages by Artificial Intelligence are:

1. **Personalization:** AI can be used to analyze customer data and preferences, allowing businesses to deliver more personalized experiences. This can lead to higher customer satisfaction and loyalty.
2. **Speed and Convenience:** AI can automate many tasks, allowing businesses to respond to customer inquiries and requests faster. This can lead to higher customer satisfaction and increased loyalty. Furthermore, it can influence faster business decisions at the company management level and as a result, contribute to business expansion and development.
3. **Improved Accuracy and Human Error Reduction:** AI can be used to improve the accuracy of customer service interactions, leading to fewer mistakes and a better overall experience for the customer.
4. **Enhanced Customer Service:** AI can be used to provide 24/7 customer service through the use of BOT, ChatBot, automatic messages and replies, allowing businesses to meet the needs of customers around the clock

As a result, companies can often experience an increase in productivity and cost efficiency as AI has now become an extremely useful component in sales maximization by providing support and improvement of customer service departments. To conclude, AI has the potential to significantly improve the customer experience and increase customer satisfaction. However, it is important for businesses to consider carefully how they use AI and ensure that it is implemented in an ethical and transparent way. The issue of trust must also be considered from both the perspectives of consumers and employees, as customers may prefer human interaction to AI, and building trust in AI technologies may take time.

### **References**

[1] Olson &Dover, 1979

[2] *The Effects of Customer Expectation and Perceived Service Quality on Customer Satisfaction* -Samaan Almsalam

[3] Zeithaml ,Berry, and Parasuraman ,1993

## **Artificial Intelligence and Product Enhancement**

### **What is Product Enhancement in business?**

Product enhancement is the **process of improving or updating a product in order to increase its value to the customer as well as to increase the overall satisfaction of the customer with the product itself** [1]. The enhancement process is usually an innovation process, which can be necessary due to the rise of different issues such as stronger market competitors, problems with product performance, dissatisfaction of customers and low profits.

Products on the market usually undergo systematic revision processes, which companies take to evaluate and improve their existing products. The process of product revision typically involves several steps, such as identifying the need for revision, gathering customer feedback, analyzing market trends, and identifying new technologies that could be used to enhance different aspects of the product. During this process, it is decided if the product needs to be redesigned. Eventually the potential final product will be tested and launched. In cases where the company has to re-design the product, AI-driven methods are utilized to help solve distinct challenges encountered, which aim at enabling the final product to adapt quickly to the market requests or product changes and to improve the efficiency of the production process[2]. Generally speaking, the revision and the enhancement processes are companies' effort to be in line with market trends and customer demands to keep competitive businesses in their industries.

Overall, Product Enhancement's goal is to make the product more attractive to consumers and to increase sales. As a result, product enhancement can include:

1. Adding new features
2. Improving the product's design or functionality
3. Making the product more user-friendly

### **The relationship between Product Enhancement and Competitiveness in the market: the role of AI**

As we learned in the previous paragraph, by continuously improving and updating their products, companies can keep their offerings relevant and appealing to consumers. This strategy has a double effect as it can lead to increased customer loyalty and repeat business.

The process of incorporating new technologies is relevant for several aspects' companies. When new technologies aim at addressing customer feedback, they can improve the overall customer experience and support the company to build a strong reputation, other than differentiating themselves from market competitors.

Nonetheless, the use of technologies and AI-driven systems to update and enhance products is not always an easy decision to make for companies' managers, especially considering that **from a business perspective investing in the new technologies can always represent a risk**. As stated by several authors, historically many sectors have been robot-reluctant, mostly due to their need for "large or unique quantities and non-serialized properties" [3]. Nevertheless, the rising of the so-called 4th industrial revolution has required companies basically in all sectors to advance product quality and more generally its productivity by incorporating AI-driven solutions. A clear example comes from the use of *smart phones and smart technology*, which interact directly with AI, especially because according to experts this type of interaction based on product and/or service enhancement benefits customer's experience and sales. For instance, in banking systems, customers usually make use of AI - even unintentionally - when they provide sensitive data, which needs to be processed in the banking network in order to analyse data and create customized offers and opportunities for each customer. Similarly, in the sector of car manufacturing, AI is often used for the reduction of the operational costs of vehicles and cars. Despite this, it is still noticeable that many car manufactures are still struggling with adopting innovative AI-driven systems on a large scale due to the lack of knowledge about it and therefore on where to apply them.

### **How does Artificial Intelligence impact Product Enhancement?**

The advantages of AI-driven technologies, applications, and systems are widely acknowledged. For instance, according to the 2018 Digital Transformation Scoreboard [4]

businesses in the commerce, agrifood and construction sectors that have implemented AI in their product enhancement processes report excellent outcomes in developing products or services able to attract new customers and entering new markets . But how can Artificial Intelligence really affect Product Enhancement?

Personalization and Customization: AI can be used to personalize products based on users' preferences, behavior, and other data collected during the usage of the service or product or even before, during and after the purchase phase. For example, a music streaming service could use AI to recommend songs based on a user's listening history.

- **Predictive analytics:** AI can be used to predict future trends or customer behavior, which can help companies make better business decisions in order to invest in the most profitable changes and updates for their products. For example, a retailer could use AI to forecast demand for certain products and adjust their inventory accordingly.
- **Quality control:** AI can be used to improve the quality of products by identifying and addressing defects or issues. For example, a manufacturing company could use AI to identify faulty products on an assembly line and prevent them from being shipped to customers.
- **Automation:** AI can be used to automate certain tasks or processes within a product or a service. For example, an e-commerce platform could use AI to categorize automatically products based on their characteristics and customer reviews.
- **Customer service:** AI can be used to improve customer service by providing personalized, automated responses to customer inquiries. For example, a customer service chatbot already integrated in the product or service could use AI to understand and respond to customer questions in real-time.

As a result, Artificial Intelligence has the ability to help improve the efficiency, effectiveness, and overall value of products for customers.

## References

- 1] Ryan Gray (2021), *Why Product Development Is So Risky — And How To Lessen Uncertainty*, *Forbes*, retrieved from <https://www.forbes.com/sites/forbesbusinesscouncil/2021/03/17/why-product-development-is-so-risky---and-howto-lessen-uncertainty/?sh=c8a455b3db30>
- [2] Berisha B., Lobov A., (2021)
- 3] Rajawat A.S., Rawat R., Barhanpurkar K., Nath Shaw R. Ghosh A., (2021)

## Artificial Intelligence and Collaborative Innovation

### What does Collaborative Innovation mean?

Collaborative Innovation is a concept that encloses two main aspects of every business: **collaboration**, namely the act of working with someone to produce something, and **innovation**, in other words the process of updating, upgrading or creating something new. In businesses, collaborative innovation can be performed among different stakeholders or actors (may they be units, departments, producers, distributors etc.), at difference stages of the supply chain, and in and out of the company. Overall, collaborative innovation in a business context brings together multiple individuals or organizations to work together to generate new ideas and develop new products, services, or processes. The collaborative innovation process can therefore include internal collaboration within a single company, as well as external collaboration with partners, suppliers, customers, and other stakeholders. The main benefit of collaborative innovation is its potential of supporting companies to identify more quickly and effectively new opportunities and to make them profitable.

Hence, it is common to find any form of collaborative innovation in any sector and industry. An example of external collaborative innovation process can be seen in the case of Europe, which for instance in the last few years has started to invest highly in the development of AI technologies in order to reduce the dependency on foreign technologies. That is indeed essential for Europe's strategic autonomy, and it also assists in the alignment of AI

technologies with European values [1]. In this case, this innovative process is based on the collaboration between different European countries and European companies as they aim at strengthening the position of the EU as a potential leading force in the AI technology development.

Considering that collaborative innovation involves the participation of multiple individuals or groups working together to create something new and innovative, **the integration of AI technologies and AI-driven solutions in innovation processes has the objective to lead to the collaborative development of ideas, products, or processes that can benefit all the stakeholders involved.** In order to benefit the integration of AI technologies in collaborative innovation processes, companies, countries and groups of stakeholders make usually use of monetary investments as well as of common legislation and rules, such as Intellectual Properties. This can be seen, for instance, in several European countries, which until now have been massively funding AI technologies and have been developing long-term plans to adopt AI applications to a larger extent. Among these, Germany has recognized its backwardness in the field, thus is preparing to take significant action to become more attractive for German entrepreneurs and researchers who tend to leave the country for better opportunities in the field of AI. Moreover, Germany has spent 500 million euros on AI research over the last 30 years. Currently, the German Research Center for Artificial Intelligence (DFKI) is receiving 77 million euros for machine learning research (2017-2021) and 30 million euros for institutional support (2018 to 2022)[2].

### **The relation between Collaborative Innovation and Artificial Intelligence**

Collaborative innovation is strictly connected with artificial intelligence. AI-driven solutions are usually used by enterprises to foster and/or to facilitate the collaboration and knowledge-sharing among employees, units and departments (internal collaboration) and among partners, providers, customers and other stakeholders (external collaboration). AI is also strictly linked to collaborative innovation thanks to its ability to analyse great amounts of data quickly and accurately and to facilitate the experimentation and testing processes of products and services. In addition, AI can be used to optimize business processes, such as supply chain management or customer service, with the result of increasing efficiency while reducing costs.

### **The tech industry is one of the businesses where this strong relation is most present.**

The EU, China, and the United States, for instance, have all placed a strategic emphasis on fostering the development of AI-based enterprises through a supportive legislative environment. The current EU start-up environment is broad and dynamic, however, only 10% of digital unicorns are located in Europe. Due to the lack of an adequate venture capital ecosystem, these companies are considered unable to attract significant investment. In this regard, Europe has raised its investment and the commitment to AI research to increase Europe's technological growth potential and catch up with the countries leading the AI race. According to the European Commission (2020), implementing an AI ecosystem based on collaboration and aimed at innovation can bring significant benefits of the technology to the EU and the economy in general. As for business development, collaborative innovation can support the creation of products and services boosted by AI in areas where Europe excels (machinery, cybersecurity, transportation, farming, the green and circular economy, healthcare, and high-value-added sectors such as fashion and tourism).

When it comes to collaborative innovation and its relation with AI, experts have also demonstrated that this concept can be interpreted as a driven factor to foster the creation and development of AI innovative features and systems [3]. An example of that is the development of the so-called Business Virtual Assistants (BVAs), which are Intelligent Agents created to improve in a new and well-performing way the collaboration between users and providers and at the same time, to define the impact of this collaboration on the development of BVAs[4]. Another example is given by the implementation of AI-based collaborative business ecosystems which have the potential to support the innovation process among and within companies involved [5].

### **The potential of Artificial Intelligence in Collaborative Innovation processes**

AI can be used to support collaborative innovation processes by providing tools and capabilities that facilitate communication and collaboration, as well as by analysing data and providing insights and recommendations to guide the innovation process. This include providing tools for virtual collaboration, such as chatbots and virtual assistants (see previous paragraph) that can facilitate communication and coordination among team members, users and provides, and analysing data to identify patterns and trends that can inform the innovation process. For example, AI can be used to analyse customer feedback or market data, which can inspire the adoption of innovative methods to identify opportunities for new products or services. AI can be also use to provide recommendations and suggestions based on data analysis and machine-learning algorithms as it can be used to suggest new ideas or approaches based on the success of similar efforts in the past. Moreover, the use of AI can foster collaborative innovation by automating routine tasks and processes, freeing up time and resources for more creative and innovative work. As a result, AI has the potential to enhance significantly the collaborative innovation process by providing tools and capabilities that facilitate communication and collaboration, as well as by providing insights and recommendations based on data analysis, experimentation and innovation-driven improvements.

### References

- [1] [2] Hoffmann, M., & Nurski, L. (2021)
- [3] Kot M., Leszczyński G. (2019)
- [4] Kot M., Leszczyński G. (2019)
- [5] Yang X., Cao D., Chen J., Xiao Z., Daowd A. (2020)

## Artificial Intelligence and Organizational Forms

### What are Organizational Forms in Business?

Companies, enterprises and business entities are built upon specific organizational and legal structures. These structures can be different based on the type of organization and each of them has their own set of legal, fiscal and economic implications, which provide the most fitting arrangement for the life of the organization. Elements that define an organizational form in business can be their size and nature of the business, tax considerations, and personal preferences of the founders and owners. The main organizational forms in business are:

- **Sole proprietorship:** the simplest form as it is composed of just one person, usually the owner, who is liable for all the legal and financial aspect of the company. Legally, the individual represents the business.
- **Partnership:** an organizational form that include two or more people (partners). They can be *general partnerships* or *limited partnerships*. In a general partnership, all partners have equal management rights and are responsible for the partnership's business, while in a limited partnership, there are not only general partners with equal management rights and financial responsibilities, but also limited partners who participate in the partnership through investments.
- **Corporation:** a complex organizational form composed of owners (shareholders) and a board of directors that govern the corporation with more complex regulations but do not manage it financially.
- **Limited Liability Company (LLC):** a hybrid between a partnership and a corporation as it offers the personal asset protection of a corporation but is taxed like a partnership.
- **Cooperative:** a legal organizational form owned and controlled by its members. Cooperatives are usually organized for the mutual benefit of its members and the communities in which they live.
- **Non-profit organizations:** Despite their not-for-profit and/or charitable nature, they are considered organizational forms in business, which operate for the benefit of a specific group or community, rather than for the benefit of their owners or shareholders.

- **Hybrid organizations:** due to their hybrid nature, they usually combine elements of different types of organizational structures. For instance, they can be a mix of for-profit and non-profit structures, or a combination of different for-profit structures, such as social enterprises and benefit corporations.

Considering the use of Artificial Intelligence in many aspects of business, the rise of new digital technologies – such machine learning, advanced artificial intelligence, cloud and edge computing – are making companies more competitive on the market of different industries. Such competition has led to the arise of new organizational forms and multi-markets [1] and encouraged strategic responses from companies and firms and at the same time a growing trend in establishing digital enterprises. To make the use of AI the most effective for the management of companies, firms and enterprises there is therefore need to combine new technologies with innovative mindsets and strategies such as the implementation of digital business models. In doing so, new organizational forms, equipped with AI, can create value and acquire competitive advantage in the market.

### **Artificial Intelligence and Organizational Forms in Business: A Complex Matter**

Artificial Intelligence is conquering every industry worldwide and motivating businesses to compete to become more and more AI-focused entities. The competitive business environment has been forcing corporate leaders, entrepreneurs, strategists, and investigators to employ AI to develop new strategies and generate new revenue streams [2]. As a result, in many cases also **the organizational form of the company is forced to adapt to the changes provoked by the integration of artificial intelligence**. Despite, the growing interest among businesses in investing in and incorporating AI into their operations, significant barriers exist at the organizational level that prevent businesses from achieving AI's full potential. These barriers have a direct impact on an organization's capacity to gain access to and use enablers that allow AI in their structures. Some of the main barriers worldwide preventing AI applications are, for instance, a lack of clear AI strategy, cultural resistance, lack of talent needed for AI solutions, enterprise size, and budget constraints [3].

On the other hand, once organizations decide to integrate AI in their structures and proceed to the transformation process, there are major and particular obstacles that they have to face, including concerns about **privacy, ethics, and trust** [4]. In the business world, the most common cause of privacy issues is the exposure of personal information; thus, companies strive to set out particular objectives to gain trust. For instance, Google stated that it would not pursue the AI applications that have caused, or are expected to cause, widespread harm and will proceed only if the benefits outweigh the risks, and will include appropriate safety limits if there is a material danger of harm [5]. Privacy and data protection is a major and frequently discussed ethical issue. Although privacy and data protection are not synonymous, for the purposes of AI ethics, informational privacy is the most important privacy concern, and data protection can be considered as a means to protect informational privacy. AI based on machine learning generates several risks to data protection. On the one hand, it takes immense datasets for training, and access to those datasets can generate data security concerns. The fact that AI and its ability to recognize patterns may raise privacy risks, even when no direct access to personal data is allowed, is more noteworthy and more specific to AI. According to some studies, AI can detect sexual orientation from Facebook friendships, which is a good example. It is easy to understand how AI can be utilized to generate data that raises privacy concerns. AI also has the ability to re-identify anonymized personal data in ways that were not anticipated when machine learning's capabilities were discovered.

### **In which ways is AI affecting Organizational Forms in Business?**

When artificial intelligence is integrated in business organizational forms it can have several impacts on decision making and problem solving processes. AI has indeed the potential to transform many different aspects of society, including the way that organizations are

structured and operate. On these bases, there are several ways in which AI can affected organizational forms in business:

- **Management:** AI is widely used in Human Resources to improve decision-making processes integrating technical, human, and organizational systems to achieve an enterprise's strategic success.
- **Decision-making:** AI can support as well as influence decision-making processes in organizational forms based on its insights about data analysis. The integration of artificial intelligence in this context can lead to change the decision-making process itself leaving some decisions to be made by the digital systems instead of humans.
- **Collaboration:** AI can facilitate collaboration and communication within organizations, units and remote teams. This may lead to changes in the way that work is organized within companies, with more emphasis on virtual teams and remote work. The spread of Covid-19 pandemic. For instance, has forced companies worldwide to use AI systems to continue their work remotely.
- **Efficiency:** AI is often used to improve the efficiency of processes and operations within organizations; as a result, many firms may feel the need to rethink the way in which work is structured, focusing on maximizing efficiency and minimizing waste.
- **Automation:** since the very beginning of the industrial revolution, technology has played an important role in automation. Today, AI can automate tasks that were previously performed by humans, leading to changes not only in the way work is organized but also in the skills and roles that are required of employees.

## References

- [1] Volberda H.W., Khanagha S., Baden-Fuller C., Mihalache O. R., Birkinshaw J. (2021)
- [2] Eager, J., Whittle, M., Smit, J., Cacciaguerra, G., & Lale-demoz, E. (2020)
- [3] Eager, J., Whittle, M., Smit, J., Cacciaguerra, G., & Lale-demoz, E. (2020)
- [4] Kitsios, F., & Kamariotou, M. (2021)
- [5] Soni, N., Sharma, E. K., Singh, N., & Kapoor, A. (2019)

## Artificial Intelligence, Global Platforms and Business Models Content

### What do we mean by Global Platforms and Business Models?

**Global platforms in business are companies or organizations that operate on a global scale and offer a range of products and services to customers around the world, with the result of having a significant impact on the economy and society.** These companies typically have a strong digital presence and leverage technology to connect a great network of users, customers, suppliers, and partners across borders. Examples of global platforms include Google, Facebook, and Amazon. Due their global structure and digital presence, global platforms usually have a great influence on different industries and on customers in terms how people consume and share information and how they interact with products and services.

**Business models are “conceptual and analytical construct used to describe a series of components guiding companies in processes of value creation and appropriation”**

[1], in other words they define the way in which companies generate revenue and profits. Since there are different businesses and different types of organizational forms (see unit 4), companies, organizations and enterprises can use different business models. Generally speaking, business models define the strategy used by companies to create and deliver value to the stakeholders involved with their business. A business model usually outlines the products or services offered, the target market and stakeholders (type of customers), identifies the channels used to spread marketing operations. A good business model also include the company's revenue streams, cost structure, and overall profitability. Examples of different business models include strategy based on cost-efficiency or on providing services or charging subscription or usage fees.

### How Artificial Intelligence leads innovation in Global Platforms and Business Models?

Artificial intelligence technologies have the potential to bring great innovation to businesses. They can be translated in machine learning, natural language processing, and robotics that benefit work operations, companies' decision-making processes and support the advancement of new solutions. This technological advancement, ascribed to AI, has innovating and modifying the logic of business models. Business model innovation is a process of altering the core logic of a company's value creation in order to improve customer value and competitiveness. It may encompass changes in the elements of various business models, as well as changes in the interactions among elements or dynamic mechanisms [2].

AI's innovative potential has also a great impact on global platforms and how they develop and are structured. Actually, AI's potential impact on global economic activity underlines the highly potential development of as many new jobs as the number of ones that are being or will be replaced [3]. It is estimated that there will be more vacancies that are available for engineers, software developers, and ICT professionals in Europe in the near future. Also newly created jobs will be more service-oriented, interpretive, and social, requiring creativity, empathy, communication, and complicated problem-solving skills. Finally, these new jobs will include training AI systems, guaranteeing that they continue to perform as designed and do not learn the "wrong" thing, and closing the gap between business and technology.

### **The Impact of Artificial Intelligence on Global Platforms and Business Models**

Artificial intelligence (AI) can have a significant impact on business models by automating certain processes, creating new revenue streams, and helping companies make better decisions. For example, AI-powered chatbots can handle customer service inquiries, allowing businesses to reduce labor costs and improve customer satisfaction. AI can also be used to analyze data, which can help businesses identify new opportunities and optimize their operations. Additionally, AI can be integrated into products and services, creating new revenue streams for businesses. Overall, AI can help businesses improve efficiency, increase revenue, and gain a competitive advantage.

AI can also be used by businesses in various sectors to improve their operations and offer new products and services. In global platforms, artificial intelligence is increasingly being used to foster innovation of products and services, creating new revenue streams and upgrading their business models. Furthermore, artificial intelligence can also be used to improve security and detect fraud of digital platforms, which can help protect global platforms and their users from cyber threats.

### **References**

[1] *Fernando J. Diaz Lopeza, Ton Bastein, Arnold Tukker* (2019)

[2] *Lu, J.* (2020)

[3] *Mckinsey Global Institute* (2019)

### **Additional Resources**

*Emerging Technology and Business Model Innovation: The Case of Artificial Intelligence* by *Jaehun Lee, Taewon Suh, Daniel Roy and Melissa Baucus*  
<https://www.mdpi.com/2199-8531/5/3/44>

### **Case Study**

How Amazon uses AI

<https://www.linkedin.com/pulse/case-study-howamazon-uses-ai-aditya-gaurav>

Self-assessment quiz - Impact on business - Part 1

Module on AI and its Impact on Business\_PDF Format

FULL HEDY MOOC can be downloaded.

## Bibliography\_AI Impact on Business

All the references together in a pdf

### Impact on business - Part 2

#### HedyTalk - How AI applies to the business sector

In this video, Prof. Dr. Thorsten Kliewe explains the concept of Artificial Intelligence and how it applies to the business sector, more specifically in education. In addition, he illustrates the potential and challenges of AI and how, in the future, it could change the way in which enterprises and companies do business.

**Instructions for the students: Watch the video and answer to the following questions:**

1. How can Artificial Intelligence (AI) help students during their studies? In your answer, please provide at least two examples of the use of AI in the sector of education, different from those mentioned in the video (min. 500 words)
2. What is your opinion about the statement from Prof. Dr. Thorsten Kliewe "Artificial Intelligence will have a big impact on almost all industrial sectors"? Do you agree/disagree? Please explain your answer (min. 500 words).
3. What are the new AI skills needed in business? In your opinion, which skills and knowledge should students learn in order to face the changes brought by AI in business? (min. 500 words)



**YouTube link:**

*Title: Artificial Intelligence in the Education Sector*

*Introduction:*

*Artificial Intelligence (AI) has revolutionized various industries, and the education sector is no exception. AI systems have introduced automated rating systems, recommendation systems, chatbots, and adaptive learning environments that enhance the learning experience for students. This learning material explores the impact of AI in the education sector and highlights specific projects that utilize AI to improve student engagement, research communication, and overall efficiency.*

*Enhancing Student Learning:*

*AI-based systems have transformed the way students evaluate their learning success and select appropriate courses. Automated rating systems provide students with objective feedback, allowing them to assess their progress effectively. Recommendation systems suggest courses tailored to students' interests and learning goals, facilitating personalized education.*

*Supportive Chatbots:*

*Chatbots have become valuable tools for addressing students' questions and concerns. They assist in providing answers to common queries and offer support for*

important issues. By leveraging AI, chatbots ensure efficient and timely responses, freeing up valuable time for teachers and staff.

*Adaptive Learning Environments:*

AI-powered adaptive learning environments focus on students' individual strengths and weaknesses. By analyzing their performance, these systems generate personalized learning paths, optimizing knowledge retention and academic growth. Adaptive learning environments provide targeted resources, exercises, and assessments to address students' specific needs.

*Quality Engagement Project:*

The Quality Engagement project aims to understand students' connection to society and their satisfaction with the university experience. Traditionally, questionnaires were used, but the project leverages AI to conduct interviews with students through a chatbot. By transcribing and analyzing the conversations, deep insights into students' perspectives can be gained efficiently.

*Automated Image Creation for Research Communication:*

In this project, AI assists university teachers and researchers in creating unique images to represent their research. Rather than relying on generic images from online platforms, AI algorithms generate customized visuals that effectively communicate their research findings. This approach enhances research marketing and engagement.

*The Role of ChatGPT:*

ChatGPT is a versatile platform that provides multiple opportunities for organizations. It offers assistance in generating various documents, such as employment contracts or programming code for websites. This platform streamlines processes, increasing efficiency within a company.

*AI's Impact on Various Industries:*

AI has significant implications for numerous industrial sectors. For example, in production, AI systems can identify and reject faulty products, improving quality control. In the creative industry, AI can generate unique images and texts, fostering innovation. Additionally, AI can enable intelligent decisions that prioritize sustainability by executing algorithms when renewable energy sources are available.

*Ethical Considerations:*

While AI offers remarkable possibilities, it also raises ethical concerns. It is crucial to determine the appropriate use of AI and establish boundaries. For instance, in education, measures must be implemented to detect AI-generated texts and ensure academic integrity. Ethical considerations must be at the forefront when deploying AI in any sector.

*The Need for AI Developers and Interdisciplinary Professionals:*

The increasing demand for AI implementation calls for a diverse range of professionals. Beyond AI developers, individuals with expertise in business administration and computer science are essential. Bridging the gap between these disciplines is crucial, and the role of business informatics in filling this space is recognized. Educational institutions should focus on developing profiles that combine business administration and AI knowledge to foster innovation.

*Conclusion:*

Artificial Intelligence has made significant contributions to the education sector, enhancing student-learning experiences and optimizing administrative processes. By leveraging AI technologies such as automated rating systems, recommendation systems, chatbots, and adaptive learning environments, universities can improve student engagement and success. However, ethical considerations and the development of interdisciplinary professionals are essential to ensure responsible and innovative use of AI in education and across various industries.

## Summary Exercise

### The video is not available anymore

[https://www.youtube.com/watch?v=Dk7h22mRYHQ&ab\\_channel=BloombergOriginals](https://www.youtube.com/watch?v=Dk7h22mRYHQ&ab_channel=BloombergOriginals)

Canada: The Rise of AI

Instructions for the students:

Watch [https://www.youtube.com/watch?v=Dk7h22mRYHQ&ab\\_channel=BloombergOriginals](https://www.youtube.com/watch?v=Dk7h22mRYHQ&ab_channel=BloombergOriginals) the [https://www.youtube.com/watch?v=Dk7h22mRYHQ&ab\\_channel=BloombergOriginals](https://www.youtube.com/watch?v=Dk7h22mRYHQ&ab_channel=BloombergOriginals) documentary and provide a summary of the video (between 500 and 1000 words) Make sure to identify, highlight and write down a reflection of the key-points about AI, machine learning and the impact of AI on the Canadian economy mentioned in the documentary.

### Turn to use AI in Business!

<https://www.copy.ai/templates/business-plan>

In this exercise, we invite you to use AI in business!

Copy AI is a content creator AI system, which supports users in the creation of quality content (i.e. writing blog intros, landing page copy, LinkedIn ads, and product descriptions). It is a tool that can be really useful for entrepreneurs and business owners to display their products/services and/or to introduce their business to potential investors.

Instructions for the students: Checklist: Creating Your Business Plan

1. Sign in: Visit <https://www.copy.ai/templates/business-plan> and sign in using your email (free access).
2. Choose Product/Service: Think of a product or service you want to develop/sell.
3. Provide Information: Insert all relevant details in the description box.
4. AI-generated Plan: Witness AI create a tailor-made business plan for you.
5. Review and Edit: Carefully review the plan and make necessary adjustments.
6. Reflect and Apply: Take time to reflect on the experience and assess the effectiveness of AI in creating your business plan.
7. Share Insights (Optional): Engage in discussions with peers about your reflections.

We can transform this activity to **Checklist**

### Mental Challenge Activity

With this activity, we invite students to reflect on their life and to think about impact of AI on Jobs in the future.

Instructions for the students: Checklist

1. Watch the Video: Click on the link <https://www.youtube.com/watch?v=sHnHg5NGclg> to access the video content.
2. Reflect on AI's Impact: While watching the video, pay attention to the main jobs that are likely to be replaced by AI in the future.

3. Identify Additional Jobs: After watching the video, list three jobs (different from those mentioned in the video) that you believe will be replaced by AI in the future. Provide reasons for your choices.
4. Create List A: Make a list of reasons why customers may prefer AI during their purchasing experience. Include at least three compelling reasons.
5. Create List B: Make a second list of reasons why customers may prefer human interaction during their purchasing experience. Include at least three strong reasons.
6. Review and Refine: Take a moment to review your answers, ensuring clarity and coherence in your responses.
7. Self-Reflection: Take a moment to reflect on how this activity has influenced your perspective on AI's role in the job market and customer interactions.
8. Share Insights (Optional): Engage in discussions with peers about your reflections on AI's impact and customer preferences.

We can transform this activity to **Checklist**

## Module feedback (Impact on business) Questionnaire

**We can switch off module feedbacks**

We want to make this course the best it can be, so please provide feedback on this module the same way as the others.

Please mark the answers that best reflect your opinion on the four questions below on the five-point scale.

Strongly agree   Somewhat agree   Neutral   Somewhat disagree   Strongly disagree

- I improved a lot during the completion of the module.
- Completing this module was enjoyable for me.
- There were valuable exercises in the module.
- The module contained helpful information

2 Please provide feedback about this module in a few sentences. What would you improve?

## Impact on governance - Part 1

### Brief introduction to the unit

This module and the next one are focused on AI governance.

This first module introduces the term, discusses why governance is necessary with some examples, analyses the impacts on our society and presents a set of principles of the AI governance needed to ensure a correct trade-off between a company's strategies and objectives, legal requirements and ethics.

### Competencies in this topic

Competencies that can be acquired by successfully completing the teaching unit

#### Knowledge

- Get familiar with the concept of governance and AI governance
- Be informed about the current EU legislation status and other initiatives
- Get familiar with the terms accountability, fairness, human control, transparency, safety and universality

- Get knowledge about the challenges, opportunities and risks related with the AI governance

### Ability

- Able to distinguish the differences between AI governance and data governance
- Able to recognise an AI governance problem when facing it
- Able to map an AI governance problem to one of the 6 principles
- Able to follow further developments of AI governance

### Attitude

- Work, achievements and conclusions are constantly monitored
- Open to the use of information technology tools
- Develop accurate and error-free task solving, engineering precision and precision
- Critical to AI (media) content that is not based on technical/IT reality
- Receptive to the content of this unit
- Committed to her/his own professional development

### Autonomy and responsibility

- Collaborate with the instructor and fellow students in expanding knowledge
- Accept well-founded professional and other critical remarks
- Committed to the principles and methods of systemic thinking and problem solving
- Make a responsible, informed decision based on her/his knowledge and analyses

## TEDTalk Introduction to the AI governance

### Instructions for learners

Watch the TEDTalk: "[What happens when our computers get smarter than we are?](#)" by Nick Bostrom.

After watching the TEDTalk, please consider how simple or complex it could be to implement what Nick Bostrom suggests. Did he use the term "AI governance"? Before reading the definitions, did you know what "AI governance" means?

After reading the different definitions of AI governance in section "The AI governance", do they align with your answer to the previous question?

After reading the examples, can you think of other cases related to legal and ethical problems with AI?

## TEXT MOVED TO a NEW RESOURCE PAGE IN MOODLE

### The AI governance

At this point, we already know that AI is now part of our lives. We can be aware of its presence and interact with it for instance when we ask Siri to find a restaurant for us according to our food preferences. However, in many other aspects, we are not fully conscious that AI is also there: for example, financial institutes leverage AI to identify potentially fraudulent activities in our accounts; AIs are used to track and predict environmental impacts in farm fields using data from satellite scanning and monitoring of crop and soil health. Those are only a few examples and, according to several studies, the Covid-19 epidemic has expedited the adoption of AI throughout all sectors of the economy [1].

Nonetheless, AI is not all puppy dogs and rainbows. Many academics point out that the way AI tools are produced must change due to limitations in collaboration and inaccurate data assumptions, such as the unreasonable expectations that drive the usage of AI systems not robust enough. For example, inaction on AI prejudice has resulted in many injustices against entire groups of people, racial profiling, and other disturbing incidents. Deepfakes and the ability to create realistic videos, pictures, text, speech and other forms of (social) communication have raised many ethical and legal concerns lately about the use of AI to manipulate human perceptions. In cybersecurity, bad actors also have access to AI tools, so the cat-and-mouse game continues. Video surveillance based on AI to recognise

persons through their face, speech, walk or movement have also raised some privacy concerns. Amazon Alexa has recently suggested to a 10-year-old girl to touch a live plug with a penny after the girl asked for a challenge to do [2].

In this scenario of pros and cons when dealing with AI, the implementation of a governance becomes fundamental. Governance refers to the formation, maintenance, and regulation of rules or activities, as well as the assignment of accountability [3].

When we include AI in this term, we can find two different interpretations:

- The use of systems based on AI in the governance, meaning that the adoption of AI in service provision, policy-making, and enforcement in government practices and public-sector ecosystems [4].
- The governance of the AI, meaning the promotion of a proper institutional and legal framework for the development and use of AI [5].

Despite considering different topics, it is not possible to discuss AI in governance without considering AI governance, because both function as communicating vessels. Thus, the term is understood here in reference to what is known as “AI governance”, an idea composed of a triad of topics related to: a) the infrastructure - obtaining, storing and processing the data; b) the application - the management of the data; c) the utilisation – the decision-making and evaluation processes based on the data.

Many other definitions can be found. For instance, AI governance is referred as “a variety of tools, solutions, and levers that influence AI development and applications” in [6], as “the structure of rules, practices, and processes used to ensure that the organisation’s AI technology sustains and extends the organisation’s strategies and objectives” in [7], as “a set of processes, procedures, cultures and values designed to ensure the highest standards of behaviour” in [8]. Probably, the most complete definition is available in [9] and it stands that “AI governance is a system of rules, practices, processes, and technological tools that are employed to ensure an organisation’s use of AI technologies aligns with the organisation’s strategies, objectives, and values; fulfils legal requirements; and meets principles of ethical AI followed by the organisation”. Briefly, AI governance should close the gap that exists between accountability and ethics in technological advancement [10] and make sure that reliable boundaries within technology are set, so it does no harm and further aggravate inequalities incidentally while it operates.

It is important to distinguish between data governance and AI governance. Data governance is a collection of practices aimed to handle data effectively, meaning that it must apply appropriate policies to ensure availability, usability, integrity, and security of the data. Since an AI is usually fed by data, the quality of these data are fundamental to obtain high-valuable results. Therefore, data governance is a requirement of the AI while we can say that AI governance is a requirement for our society.

As part of AI governance processes, capturing and managing metadata on AI models enables transparency into how AI systems are built and deployed, which is a critical prerequisite for most regulatory concerns. When properly implemented, AI governance empowers organisations with agility and complete trust. In fact, if an organisation deploys AI to automate some existing or new procedures, AI governance helps them to trust the AI outcomes at every step, producing trusted business outcomes and a rapid time-to-market product.

Proactive governance and accountability measures are becoming more widely recognized as a differentiating feature for firms seeking to establish a reputation for trustworthiness. There is a number of worldwide frameworks on AI governance and ethics concepts that will be introduced and analysed in the next sections.

Further readings: [2] [9]

## References

- [1] *Melanie Malluk Batley, AI adoption accelerated during the pandemic but many say it’s moving too fast: KPMG survey, Thriving in an AI World, KPMG study, March 2021, <https://info.kpmg.us/news-perspectives/technology-innovation/thriving-in->*

[an-aiworld/ai-adoption-accelerated-during-pandemic.html](https://www.bbc.com/news/technology-59810383), accessed on October 2022.

[2] BBC news, *Alexa tells 10-year-old girl to touch live plug with penny*, December 28, 2021, <https://www.bbc.com/news/technology-59810383>, Accessed on August 2022.

[3] Marc Hufty, "Investigating policy processes: the governance analytical framework", *Research for Sustainable Development: Foundations, Experiences, and Perspectives*, pp. 403–424, edited by U. Wiesmann, et al., Geographica Bernensia, Bern, Switzerland, 2011.

[4] Anneke Zuiderwijk, Yu-Che Chen, Fadi Salem, "Implications of the use of artificial intelligence in public governance: a systematic literature review and a research agenda", *Government Information Quarterly*, vol. 38, no. 3, July 2021.

[5] *Perspectives on Issues in AI Governance*, Google report, <https://ai.google/static/documents/perspectives-on-issues-in-ai-governance.pdf>, accessed on October 2022.

[6] James Butcher, Irakli Beridze, "What is the state of artificial intelligence governance globally?", *The RUSI Journal*, vol. 164, n. 5-6, pp. 88–96, November 2019.

[7] Johannes Schneider, Rene Abraham, Christian Meske, Jan vom Brocke, "AI governance for businesses", *arXiv.org*, November 2020, <https://doi.org/10.48550/arXiv.2011.10672>, accessed on October 2022.

[8] Alan F.T. Winfield, Marina Jirotko, "Ethical governance is essential to building trust in robotics and artificial intelligence systems", *Philosophical Transactions of the Royal Society A*, vol. 376, no. 2133, 20180085, November 2018.

[9] Matti Mäntymäki, Matti Minkkinen, Teemu Birkstedt, Mika Viljanen, "Defining organizational AI governance", *AI and Ethics*, February 2022.

[10] KOSA AI, *The importance of AI governance and 5 key principles for its guidance*, <https://kosa-ai.medium.com/the-importance-of-ai-governance-and-5-key-principlesfor-its-guidance-219798c8f407>, accessed on October 2022.

## HEDYTalk on AI governance

### Eduplayer in Impact on governance - Part 1

<https://youtu.be/1q2QcwiSaV8>

In this video, Prof. Núria Agell and Dr. Queralt prat introduce the problem and present the reasons why an AI governance is needed to control these new and disruptive technologies based on AI in a way that amplifies the benefits and minimises the risks. They further explain what implies the development of a good AI society giving some paradigmatic examples. They continue evaluating the role and responsibility of governments, private sectors and academia in this problem. Finally, some recommendations to improve currently AI governance are provided.

#### *Introduction:*

*Artificial Intelligence (AI) is an integral part of our daily lives and society. As AI technology continues to advance rapidly, it is crucial to establish effective governance to maximise its benefits and minimise its risks. In this learning material, we will explore the transcript of a HEDYTalk that discusses AI governance and its significance. We will delve into the concept of AI governance, different governance models, ongoing initiatives, and potential recommendations for the future.*

#### *What is AI Governance?*

*AI governance aims to enhance the benefits of intelligent systems while mitigating potential risks. With AI's increasing capabilities and integration into various societal domains, it is essential to develop governance frameworks that keep pace with*

technology advancements. Unfortunately, the current governance of AI is often lacking, which necessitates urgent attention and action.

*Different Models of AI Governance:*

Various countries have adopted distinct approaches to AI governance. For example, in the United States, private companies dominate the development of AI technology, with limited government regulations. On the other hand, China exhibits a more interventionist approach, where the government directs funding, development, and orientation of AI projects. These two extremes highlight the need to strike a balance between technological development and effective governance.

*The European Approach:*

Europe is positioned between the US and China regarding AI governance. Efforts are underway to comprehend and regulate these technologies effectively. By 2023 or 2024, specific regulations focused on AI are expected to be introduced. The challenge lies in achieving a balanced approach that regulates intelligent systems while promoting their implementation and development. Merely relying on ethical principles and sanctions may prove insufficient, as AI demands a more comprehensive governance strategy.

*Ethical Principles and Beyond:*

While ethical principles are vital, solely relying on them for AI governance can be ineffective and inefficient. Our society operates primarily based on capitalist principles, driven by economic gains. However, AI technologies necessitate a broader perspective, beyond profit-driven motives. To ensure a successful and safe implementation of AI, we must reevaluate our societal systems, fostering collective projects that benefit all members of the community.

*The Example of Japan:*

Japan provides an interesting example in rethinking AI governance. The country acknowledges the need to govern AI not only for control but also for promoting and utilising AI systems effectively. Japan has taken transformative steps by creating smart cities with interconnected governance systems. Additionally, they are reevaluating their legal frameworks to align with intelligent systems.

*Recommendations for the Future:*

- To ensure effective AI governance, several recommendations can be considered:
- a. Increase awareness and understanding of AI systems among the general public, universities, and educational institutions.
  - b. Foster public participation in AI governance processes to ensure diverse perspectives and collective decision-making.
  - c. Promote projects and initiatives that focus on utilising AI for the benefit of society as a whole.
  - d. Support platforms like HEDYTalk that facilitate the dissemination of knowledge and encourage broader access to AI-related discussions and opportunities.

*Conclusion:*

AI governance plays a vital role in harnessing the potential of artificial intelligence while safeguarding society from potential risks. Achieving effective governance requires a comprehensive approach that balances ethical considerations, regulations, public participation, and collective projects. By developing well-rounded governance frameworks, we can ensure that AI contributes to the betterment of our society and enables us to leverage its transformative benefits responsibly.

*Acknowledgments:*

This learning material was created based on a HEDYTalk featuring Dr. Queralt Prat, who provided valuable insights into the field of artificial intelligence governance. Dr. Prat holds a PhD in Philosophy from the Copenhagen Business School and a PhD in Management from ESADE.

*Title: Introduction to Artificial Intelligence Governance*

*Production and Development:*

*The team at HEDY Project*

## Legislation

### Instructions for learners:

Read the content of this section. Do you believe that legislation establishing rules and boundaries about the use of the AI would be enough? Do you consider it necessary? Why? Do you think a [Terminator](#)-like world is possible if we do not control the AI? Can the development of AI be effectively controlled with legislation? Do we need anything more?

Proactive governance and accountability measures are becoming more widely recognized as a differentiating feature for firms seeking to establish a reputation for trustworthiness. There are a number of worldwide frameworks on AI governance and ethics concepts.

The European Commission is building a strong European approach to AI, based on the 2018 strategy [1] and reinforced by the 2020 White Paper on AI [2]. In this sense, the EU is likely to be the first to enact AI regulatory legislation [3]. The US Algorithmic Accountability Act [4] requires large companies with access to large amounts of data to audit AI-based systems for fairness, privacy, accuracy and security risks. A prominent initiative is Singapore's AI Governance Framework [5], which is the first model developed in Asia and its strength is that it translates the principles into a practical and operational framework for immediate action, lowering the entry barriers to the adoption of AI. This framework is based on two factors: i) AI solutions must be human-centred, and ii) decisions made or assisted by AI must be transparent, explainable and fair.

The EU is pursuing the establishment of a certification framework on the use and applicability of AI in Europe. In this situation, an AI certification program could be built on two pillars [6]: first, a comprehensive analysis of the risks of the effects of AI in its environment, as well as the dangers posed by potential adversaries and current weaknesses. Second, a comprehensive examination of the transparency of AI systems, an assessment of how well they work in extreme scenarios and explainability.

On the other hand, the General Data Protection Regulation (GDPR) [7] is a regulation of EU legislation on data protection and privacy in the EU and the European Economic Area (EEA). The main objective of the GDPR is to improve the control and rights of individuals over their personal data and to simplify the regulatory environment for international business and therefore the transfer of personal data outside the areas of the EU and the EEA. However, it also attracted some controversy, as it does not grant the right to an explanation of automated decision-making [8]. The GDPR is important in this context because it introduces Data Protection Impact Assessments (DPIA), which include a set of tools to assess the risks associated with the use of automated decision-making or profiling processes [9]. The DPIA can be used to determine and put in place the necessary safeguards to effectively manage the associated risks and provide the necessary explanation and transparency of the algorithms and data used. The GDPR is a barrier to the use of Big Data and risk assessment and protection by AI since, as discussed above, AI needs data such as user activities, personal data information (IP address, geolocation, etc.).

To streamline and then regulate access to data, the EU is currently working on two new initiatives, the Data Act [10] and the Data Governance Act [11]. The idea of the Data Act is to remove barriers of access to non-personal data, for both public and private sector bodies, while preserving incentives to invest in data generation by ensuring balanced control of data for its creators. The Data Act therefore extends the GDPR right to portability to non-personal data, generated by connected products and related services and facilitates the sharing of data and the use/reuse of data, generated by users and selected third parties, setting standards across the EU.

Instead, the Data Governance Act aims to encourage the broad re-use of data held by public sector bodies and provides a legal framework where public sector bodies decide to make data (including personal data) available for re-use to third parties. To encourage people to share their data, the EU proposes to create "data intermediaries" (as a European alternative to the main existing technological platforms), which will be responsible for the exchange of data by individuals, public bodies and private companies. Both position Data Spaces as a key element in the sharing of large volumes of data to feed AI in cyber security. Further readings: [2] [5] [8].

## References

- [1] European Commission, "Artificial intelligence for Europe", COM(2018) 237 final, Brussels, April 2018, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:237:FIN>, accessed October 2022.
- [2] European Commission, White paper on artificial intelligence - A European approach to excellence and trust, COM(2020) 65 final, Brussels, February 2020, [https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020\\_en.pdf](https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf), accessed October 2022.
- [3] European Commission, Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts, COM(2021) 206 final, Brussels, April 2021, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52021PC0206>, accessed November 2022.
- [4] US Congress, Algorithmic Accountability Act of 2019, H.R.2231, 116th Congress, April 2019, <https://www.congress.gov/bill/116th-congress/house-bill/2231>, accessed October 2022.
- [5] The Singapore's Approach to AI Governance, <https://www.pdpc.gov.sg/Help-and-Resources/2020/01/Model-AI-Governance-Framework>, accessed October 2022
- [6] Ronan Hamon, Henrik Junklewitz, Ignacio Sanchez, "Robustness and Explainability of Artificial Intelligence", JRC Technical Report, 2020, <https://publications.jrc.ec.europa.eu/repository/handle/JRC119336>, accessed on November 2022.
- [7] The EU General Data Protection Regulation, <https://gdpr-info.eu/>, accessed November 2022.
- [8] Sandra Wachter, Brent Mittelstadt, Luciano Floridi, "Why a right to explanation of automated decision-making does not exist in the general data protection regulation", *International Data Privacy Law*, vol. 7, no. 2, pp. 76–99, May 2017.
- [9] European Commission, "Regulation on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)", *Official Journal of the European Union*, L119, April 2016, <https://eur-lex.europa.eu/eli/reg/2016/679/oj>
- [10] EU, Data Act: Commission proposes measures for a fair and innovative data economy, [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_1113](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1113), accessed November 2022.
- [11] European Commission, "Data Governance Act", COM/2020/767 final, November 2020, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020PC0767>, accessed November 2022.

## Degrees of AI governance

### Instruction for learners:

Read this section and try to answer these questions. What are the consequences of not adopting AI governance? Why is automation key in AI governance? Do you think all public and private companies require a fully automated AI governance?

When managed AI is done correctly, it may provide significant benefits [1]:

- Utilise information collected across the AI lifecycle to get more visibility and automate documentation;
- Improve results and efficiency by using best practices discovered through metadata analysis;
- During the AI development and deployment lifecycle, establish and enforce uniform policies;
- Facilitate communication and cooperation between data scientists, AI engineers, developers, and other AI stakeholders;
- Create AI at scale with a single, all-encompassing view of all actions.

In this regard, IBM [2] provides a 6-step scale to indicate the degree of AI governance penetration and evaluate the risks.

**Level 0 - No AI governance.** There are no established common policies for AI development or deployment and each AI development team utilises its own technologies. This method offers a lot of flexibility and is common among firms that are just getting started with AI. Since there is not a common framework, it is not possible to assess the risks of using these AI models into production, potentially posing major dangers to the company. Besides, scaling AI processes is tough for companies at this level.

**Level 1 – Introduction of AI policies.** These policies are defined at a high level. Since their enforcement is not mandatory, individual AI systems are still compartmentalised with no consistency due to the lack of implementation of these standards. Therefore, there is a risk of misinterpretation and even subversion of the policies. Again, companies cannot see many productivity gains with AI adoption.

**Level 2 - Metrics to govern AI.** This level expands on level 1 by creating a common set of acceptable measurements as well as a model-monitoring tool. This not only ensures that AI teams are on the same page, but it also allows metrics to be compared across development lifecycles. To track these metrics, a single monitoring framework is usually implemented, allowing everyone in the business to interpret them in the same way. This lowers the risk level and increases the openness of data needed to make policy decisions or troubleshoot dependability in the event of a problem. Companies at this level often have a central model validation team enforcing the enterprise's policies during the validation process, resulting in productivity benefits.

**Level 3 - AI data repository.** This level uses the metadata from level 2 to guarantee that all assets created over the lifespan of a model are available in a repository. The company can now track the whole provenance of data, models, lifecycle metrics, code pipelines, and more with a single source. Companies at this level are able to clearly explain AI risks and have a holistic perspective of their AI strategy's success.

**Level 4 - Automated data validation and monitoring.** This level automates the procedure so that data from the AI lifecycle may be captured automatically removing the stress of manually documenting actions, measurements, and judgments. This data also helps model validation teams to make judgments on AI models and to take use of AI-based proposals. It also eliminates any concerns of missing measurements, information, or data/model versions due to errors made along the way. As a result of their ability to deploy reliably and swiftly AI models into production, companies at this level start to witness an exponential rise in productivity.

**Level 5 - Fully automated AI governance.** The automation from the previous stage is used to enforce automatically regulations on AI models at this level. This architecture now ensures that the company's policies are consistently applied across the life cycles of all models. At this stage, an organisation's AI paperwork is automatically generated, with the appropriate amount of openness for regulators and, more crucially, consumers. This allows the team to focus on the most dangerous regions that require greater manual intervention. At this level, a company's AI strategy may be incredibly efficient while keeping confidence in its risk levels.

Further reading: [1]

## References

[1] IBM, "AI governance: Ensure your AI is transparent and trustworthy", IBM smartpapers, <https://www.ibm.com/analytics/common/smartpapers/ai-governance-smartpaper/>, Accessed April 2022.

[2] Michael Hind, Emma Tucker, Rohan Vaidyanathan, "Foundations of trustworthy AI: How mature is your AI governance?", IBM Watson blog, June 8, 2021, <https://www.ibm.com/blogs/watson/2021/06/ai-governance-maturity/>, Accessed on April 2022,

## TED Talk - Major concerns

Instruction for learners:

Watch the TEDTalk: "[How to keep human bias out of AI](#)" by Kriti Sharma.

After watching the TEDTalk, were you aware of the use of AI in these fields? And the fact that we are exporting our human biases into AI systems?

Do you agree with these concerns? Do you think AI can impact others not included?

## DO WE WANT separate text and give instruction?

### Major concerns

There is a widespread consensus on the need to discuss these reliable boundaries in the development of AI systems, because their use can have very important negative consequences for people's lives, or reproduce social models that are considered morally reprehensible.

The limits, however, are not clear, and it is difficult to establish or agree on an ethical, political or regulatory framework that can regulate the development of forms of AI that can then have a high impact on social decisions. One of the difficulties that emerges in this regard is the tension between a series of guarantees for the citizens and, at the same time, competitiveness in research and innovation.

The major concerns are the following:

**Data bias.** The emphasis is on the need to ensure that the data collected is not biased by gender, socio-economic level, ethnicity, etc. Guarantee of data diversity and its composition refers to the use of AI in all stages of the process, data collection, the decision itself or the evaluation. The use of machines for decision-making is not exempt from the ideology underlying any decision. These ideologies can represent interests of various actors, being of a political, technical or economic nature. This is an important issue to be solved in order to guarantee that collected data and its use respond to the objectives for which they are designed.

**Justice.** AI systems mainly work based on data compilation and statistics relationships. Beyond the data used, automated decision-making, regardless of whether or not the data is biased, poses a problem of justice, because the criterion of justice pre-vails over efficiency. Using the ability to handle large volumes of data and make statistical predictions is seen as an important value of AI. This is information to be taken into account when making contrasting decisions. However, this information cannot be used to make automated decisions that affect aspects directly related to people's lives. From a more disruptive view of AI, it is assumed that even if we do not want AI to participate in numerous aspects of our daily lives, it is necessary to assess the costs and benefits, based on valuing the cost of wrong decisions made by AI systems. If the decisions affect non-substantive issues for people's lives, this error in the AI's decisions can be considered a minor issue and therefore, the AI could be used to make decisions on that particular issue. On the other hand, whether decisions affect substantive issues of people's lives, a wrong decision could have terribly unfair effects that would condition the person's life and, therefore, in that matter the decisions should not be made by systems day.

**Privatisation of governance.** One of the main concerns in the use of AI systems in general and especially in the field of governance is the important control of data and the

accumulation of knowledge that some large companies or corporations currently have. Given the high economic and technical capacity that is increasingly needed to make intensive use of data, this phenomenon poses a threat to democratic decision-making. Certain companies or corporations are accumulating a lot of algorithmic knowledge and knowledge about the behaviour of the population, which implies a lack of guarantees that these data or this knowledge are carried out respecting principles or agreed ethical values. In this sense, the accumulation of data and knowledge in AI by entities outside the scope of government supervision means the privatisation of governance, an issue that should be corrected. Faced with this situation, and in order to ensure an AI that makes fair decisions and respects democratic values, it is necessary to align the three legs that are considered to shape the governance of AI (citizenship, technology and administration). With this in mind, in addition to developing legal regulations, it is proposed to carry out audits of data and algorithms on private companies.

**Automation of decisions.** The debate about limiting the automation of decision-making processes cannot be bound to AI, in the same way that AI cannot be considered solely responsible for the automation of decisions. Indeed, decisions are now being made automatically in a number of areas, even if AI systems are not used. The problem with AI is when those who design an algorithm are not able to explain its decisions, as well as when users do not know criteria that an AI designer has implemented into the algorithm. Regardless of the final decision or prediction, ensuring the transparency and explicability of the whole process is crucial in order to be able to use AI systems in governance.

**Freedom.** The threat to freedom posed by the use of AI systems in decision-making processes can be understood from two different levels. The first dimension refers to the strategies used by AI to achieve greater publicity or visualisation, based on algorithms that involve users in loop-type processes, which use companies such as Meta or Twitter. Such processes can lead to significant manipulation of more influential or less educated groups of people, such as young people. In this dimension, it is considered necessary to legislate the operation of these loops to avoid harm to people. The second dimension, related to the first but taken to the extreme, has to do with a very disruptive view of AI. In this sense, it warns about the ability of AI to control emotions and regulate feelings. Given the digital footprint, that all citizens are leaving on every move they make on a daily basis, obtaining and using this data for commercial or authoritarian purposes can be very dangerous. According to this view, the problem is not the predictive power of AI systems in governance processes, but the use that can be made of these predictions. Faced with this situation, the solution proposed by the participants is based on questioning the supposed objectivity of the predictions and, therefore, proposes a use of predictions based on subjective and contextual criteria, which can be known, negotiated and discussed.

## TEDTalk - Principles of AI governance

### Instructions for learners

Watch the TEDTalk: "[How to get empowered, not overpowered, by AI](#)" by Max Tegmark.

After watching the TEDTalk, please think about what Max Tegmark is suggesting. Is he saying something similar to what Nick Bostrom said in the TEDTalk you watched in the first section? Do you agree with him? Is society ready to follow his suggestions?

After reading the different principles for AI governance, do you think we are missing anything? Now think about how they can be implemented in reality. What does it need?

### DO WE WANT separate text and give instruction?

### Empowered by AI

To be effective and provide the correct trade-off between a company's strategies and objectives, legal requirements and ethics, many actors work on identifying the main

principles. For instance, Harvard University [1] created a visualisation map of 32 sets of AI principles. KPMG [2] provides four guideposts to help organisations ensure the proper governance of algorithms. Google [3] highlights five specific areas where concrete, context-specific guidance from governments and civil society would help to advance the legal and ethical development of AI. There is global agreement on a fundamental set of six AI principles that are functionally algorithm-agnostic, technology-agnostic and sector-agnostic.

**Accountability** requires a clear identification of who holds responsibility for decisions and actions when designing, developing, operating, and/or deploying AI systems. It is not appropriate to delegate responsibility to a machine. Giving the responsibility to a machine is unnecessary (there will always be a natural person or corporation liable within existing laws and legal frameworks), immoral (responsibility is an intrinsically human property), impractical (it is impossible to hold machines accountable for violations of their obligations), and open to abuse (it would make it easier for bad actors to shield themselves). It must be people or organisations that are ultimately accountable for the acts of AI systems under their design or control, no matter how complex the AI system is. In this respect, governments are collaborating with other stakeholders to offer more clarity on the anticipated conduct of AI service providers and clients that use AI in certain domains. To be uniformly enforced and relevant to all providers and clients, such criteria would need to be backed by new norms, standards, rules, or laws.

**Transparency** regards the ability to explain why an AI system behaves in a certain way in order to boost people's confidence and trust in the accuracy and appropriateness of its predictions. When considering what degrees of explanation are appropriate, keep in mind the criteria that would be applied to a human decision-maker in the same situation. It is important to consider what kind of explanation is most appropriate in a given context. Different audiences require different needs. For example, an oncologist may find it difficult to explain why he or she gets the feeling that a patient's cancer has returned. In the same situation, an AI system could be able to give biomarker levels and past scans from many comparable patients as a reference and forecast an 80% likelihood of cancer. An accident investigator searching the reason why a house is cold can find the simple answer "the heating is switched off" good enough. Definitely, the more the users feel they understand the overall AI system, the more inclined and better equipped they will be to use it.

There are several debates over what constitutes **fairness**. However, a global judgement regarding shared values and common moral norms must be made, and they must be transmitted into AI systems as well. The fairness principle also guarantees that any possible bias in historical data or human-induced bias is taken into account and reduced. In summary, fairness must ensure that AI systems are ethical, free from bias, free from prejudice and that protected attributes are not being used. However, there are many conflicting situations where fairness is hard to be complied with overall satisfaction, whether decisions are made by humans or machines. For example, is it fairer to give a chance to everybody who meets the qualifying standards or to an equal number of persons from diverse demographic segments in order to prevent replicating past inequity? This problem can be partially mitigated if when developing an AI tool to aid decision-making, it is vital to decide on the exact fairness technique to use up front and make them transparent. Because there are so many different viewpoints and techniques to defining fairness, some definitions may directly contradict one another, while others may encourage justice at the price of accuracy or efficiency. However, if done properly, an algorithmic method can assist to improve decision-making consistency, particularly when contrasted to the alternative of humans deciding based on their own personal (and hence likely variable) ideas of fairness. Regarding **safety**, it is critical to take measures against both inadvertent and intentional abuse of AI that poses a threat to human safety. However, this must be done in a reasonable manner, taking into account the potential for harm and the practicality of the suggested preventative measures in terms of technological, legal, economic and cultural factors. It is not possible to forecast all possible AI system behaviours and downstream impacts in advance, especially when applied to issues that are difficult for humans to solve.

It is also difficult to design systems that give both the security constraints and the flexibility needed to produce innovative solutions or react to unique inputs. Safety problems can also be related to accidents or to an exploit in security and an intentional hack. For instance, AI systems learn in real-time in a real-world environment and what happens if the data are corrupted? Is the AI able to react and mitigate their impacts? Another example is how can we ensure that if the training data is incomplete and leaves out certain important details, or if significant features of the world have changed after the training data was acquired? These kinds of aspects need to be tackled and proper mechanisms tested and validated.

There is the necessity of having a **human control** of the technology, meaning that people need to be in one or more points in the decision-making process of an otherwise automated system. The problem is identifying whether and where people should have a part in the process, as well as what that involvement should entail, while keeping in mind the system's goal and the larger context in which it is used. Humans and AI systems have distinct strengths and shortcomings in the end. Choosing the most sensible combination requires a holistic evaluation of how to guarantee best that an acceptable selection is made in the current conditions. However, making this determination is not easy. For instance, while most of the focus has been on the dangers of poorly designed and implemented AI systems having built-in bias; the same dangers exist for individuals. On the other hand, we may have the computer says yes syndrome [4], where employees who have spent a long time dealing with a system where errors are infrequent (as should be the case for commercial AI systems) grow naturally less likely to challenge the system's correctness over time. As AI technology has progressed, it has become a strong tool for detecting problematic information rapidly and at scale, such as violent extremism and child exploitation. However, AI-based algorithms continue to make numerous mistakes in context-sensitive jobs, which is why keeping a person in the loop while reviewing new information is fundamental. This human aspect maintains responsibility while also spotting classifier mistakes and producing better training data, resulting in a model that is better for future iterations. Definitely, regardless of how precise an AI system is or the time/cost benefits of full automation, there will almost certainly always be delicate situations where society wants a human to make the ultimate judgement.

Finally, the **universality** principle recommends the definition and application of technical, ethical and regulatory standards during algorithm development, evaluation and deployment in order to have interoperability, cooperation and given level of quality, safety and trust.

Further readings: [1] [2]

## References

[1] Jessica Fjeld, Nele Achten, Hannah Hilligoss, Adam Nagy, Madhulika Srikumar, *Principled artificial intelligence: mapping consensus in ethical and rights-based approaches to principles for AI*, Berkman Klein Center Research Publication No. 2020-1, February 2020.

[2] Martin Sokalski, *The shape of AI governance to come*, KPMG Insights, December 2020, <https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/01/the-shape-of-ai-governanceto-come.pdf>, accessed on April 2022.

[3] *Perspectives on Issues in AI Governance*, Google report, <https://ai.google/static/documents/perspectives-on-issues-in-ai-governance.pdf>, accessed on October 2022.

[4] Kevin Hoff and Masooda Bashir, "Trust in Automation: Integrating Empirical Evidence on Factors That Influence Trust", *Human Factors - The Journal of the Human Factors and Ergonomics Society*, vol. 57, no. 3, p. 407-4, May 2015.

## Practical activity 1

REAL TITLE NAME, not only numbered (Check-off items)

Consider: <https://www.theverge.com/2023/3/24/23653377/ai-chatbots-comparison-bard-bing-chatgpt-gpt-4>

This first activity consists in using two AI answer engines and checking the consistency between them and against this unit content and students' new knowledge.

The AI answer engines to be used are [ChatGPT](#) and [PerplexityAI](#)

**Steps:**

1. Copy the questions formulated at the beginning of each section and paste them in these AI engines.
2. Compare their answers. Are they similar? How similar?
3. Compare their answers to the content of this unit. Does any of these engines give you additional information? Is it different? Are the sources of the engines the same as the unit?
4. Compare their answers with what you learn and remember from the unit. Did you learn anything new? Do you think you are going to remember better, what you learn from the unit or what you read in the engines?
5. Last step: ask the AI engines if they are implementing any ethical rule and how. Are you satisfied with the answers?

### Practical activity 2

Checking the bias of the data

- Ask ChatGPT to list the 10 most important philosophers of human history. Link associated with this item
- Check if the list contains women. If not, ask ChatGPT to consider women in the list of 10 most important philosophers.
- Check if the list contains non-occidental philosophers. If not, ask ChatGPT to consider non-occidental philosophers in the list of 10 most important philosophers.
- Check if the list contains non-occidental women. If not, ask ChatGPT to consider non-occidental women in the list of 10 most important philosophers.
- Rewrite now the same first question "list the 10 most important philosophers of human history" and check if the answer is still not considering women and/or non-occidental philosophers.

### Practical activity 3

The **third** activity consists of using a teachable AI available here.

<https://experiments.withgoogle.com/teachable-machine>

**First experiment (correct use):**

- Define three different classes
- Train the model
- Check if the AI can correctly identify objects similar to the one used to train the model and match the correct class

**Second experiment (cheating the machine):**

- Define at least three different classes
- Train the model
- Try to see if you can lead the AI to make wrong classification with particular objects

#### FIX THE CHECKBOXES IN MOODLE

1. Use of teachable AI. Link associated with this item
2. 1st experiment: Define three different classes
3. 1st experiment: Train the model
4. 1st experiment: Check if the AI can correctly identify objects similar to the one used to train the model and match the correct class
5. 2nd experiment: Define at least three different classes
6. 2nd experiment: Train the model
7. 2nd experiment: Try to see if you can lead the AI to make wrong classification with particular objects

## Self-assessment quiz - Impact on governance - Part 1

With this quiz, you can check that you have mastered the material.

Although the result does not count towards the final evaluation, you should try this quiz at least once.

You will have five minutes to answer five questions in this quiz.

You can try an unlimited number of times, and the result of the best attempt will be the result of the quiz.

At least one hour must pass between each attempt, which is best spent deepening your knowledge.

## Impact on governance - Part 2

### Introduction to the unit

In this unit, the acquisition of knowledge is not a note, but a set of criteria that help to process the media contents.

#### Requirements

- Watch a documentary (plus the TEDTalks and the HEDYTalk watched in previous module of this unit)
- Summarise the lesson learnt in a mini-essay of at least 2500 characters
- Evaluate two mini-essays of two other course mates

#### Need of time

- Watch a documentary: 60-90 minutes
- Re-watch (if needed) the TEDTalks and the HEDYTalk: 30 minutes
- Write the mini-essay: 30-45 minutes
- Evaluate two other mini-essays: 30-45 minutes

#### Evaluation system

- Teacher rating of mini-essay (50 points)
- Evaluation of mini-essay by 2 course partners (2\*15 points)
- Evaluation of 2 course mates' mini-essay (2\*10 points)
- In the case of at least 50 points, the completion of the unit can be said to be successful

## Movie watching and analysis considerations

Prepare a mini-essay of around 2500 characters about the media contents proposed in this unit

Steps:

1. Select one of the **Media content list**.
2. Watch the movie.
3. Re-watch, if needed, the HEDYTalk and the three TEDTalk indicated in the previous module.
4. Clear up your notes.
5. Create your 2500 character essay.
6. Upload the essay on the course website for the appropriate assignment.

In your essay, the following information need to be included:

1. Indicate the title of the documentary and a reference to it.
2. Indicate the title of the TEDTalks and a reference to each one.
3. Indicate the title of the HEDYTalk and a reference to it.
4. Briefly explain what each multimedia content is about.
5. Try to identify common and different aspects between them such as how a superintelligence is represented; they all deal with specific recommendations for a safe AI, etc.

6. Try to provide a critical analysis of these media contents. Do you agree with some or all of them? Why yes or why not?
7. Indicate the 6 keywords that best describe all these media contents.

## Media content list

### Documentary selection

- The Social Dilemma  
<https://www.thesocialdilemma.com/>
- Coded Bias  
<https://www.codedbias.com>
- Artificial Intelligence And Its Ethics  
<https://www.youtube.com/watch?v=lzd2qOgOGQI>
- How Should A.I. Be Ruled By Laws And Ethics?  
<https://www.youtube.com/watch?v=Z4Bxl3MihIU>
- Lo and Behold, Reveries of the Connected World  
<https://www.documentarymania.com/video/Lo%20and%20Behold%20Reveries%20of%20the%20Connected%20World/>

### TED Talk

- "What happens when our computers get smarter than we are?" by Nick Bostrom.  
[https://www.ted.com/talks/nick\\_bostrom\\_what\\_happens\\_when\\_our\\_computers\\_get\\_smarter\\_than\\_we\\_are](https://www.ted.com/talks/nick_bostrom_what_happens_when_our_computers_get_smarter_than_we_are)
- TED Talk "How to keep human bias out of AI" by Kriti Sharma.  
[https://www.ted.com/talks/kriti\\_sharma\\_how\\_to\\_keep\\_human\\_bias\\_out\\_of\\_ai/](https://www.ted.com/talks/kriti_sharma_how_to_keep_human_bias_out_of_ai/)
- TED Talk "How to get empowered, not overpowered, by AI" by Max Tegmark  
[https://www.ted.com/talks/max\\_tegmark\\_how\\_to\\_get\\_empowered\\_not\\_overpowered\\_by\\_ai](https://www.ted.com/talks/max_tegmark_how_to_get_empowered_not_overpowered_by_ai)

### HEDY Talk

- Prof. Núria Agell interviews Dr. Queralt Prat  
<https://www.youtube.com/watch?v=ivz9RVZd4Kc>

## Impact on skills & competencies - Part 1

### Introduction to the module

This module and the next one will focus on the impact of AI in skills and competencies. During this module, you will explore:

- the skills and competencies that are likely to be replaced by AI and the ones that will be valued;
- how the educational and training system can prepare people for the AI era;
- how AI can be used for skills development;
- how AI can be used in the educational and job system;
- the ethical challenges and risks of the application of AI in education and jobs.

### Learning objectives:

1. Identify how AI can impact the skills and competencies, namely those that are most likely to be replaced in the future
2. Recognise how AI can be used for skills development
3. Discuss the challenges, risks and ethics regarding the implementation of AI

During this module, you will find several learning activities that will allow you to go deeper in your reflexions and evaluate your comprehension of the module. You will also find 2 quizzes about the different topics addressed in the module, with 10 questions each.

### Introduction to the topic

The emergence of the 4th industrial revolution, characterised by artificial intelligence, is changing multiple aspects of people's lives. Throughout this module, we will discuss the

impact of AI on the skills and competencies concerning training, education and the labour market. As the use of AI increases, its expected impact will become more present with each passing day. About 50% of organisations report using AI. Therefore, it is of utmost necessity to give people the tools to understand these changes (and to prepare themselves for them) and to take part as active citizens in these transformations.

AI can automate many tasks, even though rather specific ones, their impact will be grand. A report by the McKinsey Global Institute (Dondi et al., 2021) suggests that half of the work tasks could be automated by 2055 using current technology. The expected impact is even more significant considering the technologies that have yet to be created. This is why it is essential to understand what skills might become obsolete and the ones that will become central to preparing ourselves for the AI era.

With the increased use of digital tools during our everyday life - at work, school, etc. - we leave more and more digital footprints in the form of data. This process is called "datafication", which allows many AI systems to work, as most of them "feed" on data. We will study how this is being used in the educational and job markets, to help learners from all over the world access online courses, allow teachers to use digital assistants that can facilitate a part of their work, create systems to match job applicants and job positions in the best way possible, and many others.

While the implementation of AI in an educational context provides significant benefits, the downsides of this process should not be neglected. We must understand how we can use these transformations to improve the quality of life for everybody around the globe - 'in the service of all people, rather than benefiting solely small groups, a single nation, or a corporation' (IEEE, 2019). To ensure this, developing a comprehensive public policy for implementing AI to foster sustainable development is essential.

## References

*Chrisinger, D. (2019), The solution lies in education: artificial intelligence & the skills gap, On the Horizon.*

*IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems 2019. Ethically Aligned Design: A Vision for Prioritising Human Well-being with Autonomous and Intelligent Systems*

*Dondi, M., Klier, J., Panier, F. & Schubert, J. (28 June 2021). McKinsey: These are the skills you will need for the future of work. World Economic Forum. Retrieved from: <https://www.weforum.org/agenda/2021/06/defining-the-skills-citizens-will-need-in-the-future-world-of-work/>*

## Hedy Talk - The impact of AI in skills and competencies

Screen the Hedy Talk and write 2000 words about the impact you think AI will have on your skills and competencies, relating the content of the video to your own life, education and job.



Youtube link: <https://www.youtube.com/watch?v=IC5HAFZTC8s>

*Title: The Impact of Artificial Intelligence on the Labour Market and Education*

*Introduction:*

*Artificial Intelligence (AI) is a powerful technology that is becoming increasingly integrated into our daily lives. Driven by its potential to improve the quality of life and increase happiness, AI is poised to revolutionize various aspects of society, including the labour market and education. In this learning material, we will explore the insights shared by Dr. Inês Lynce, a Full Professor and Researcher, on the impact of AI on the labour market, education, and the skills needed for the future.*

*The Pervasiveness of Artificial Intelligence:*

*Artificial intelligence has permeated our lives, often without us realizing it. It impacts our daily routines from morning until night, and even while we sleep. The increasing integration of AI raises ethical questions, but it also offers hope for enhancing people's lives and overall happiness.*

*The Impact on the Labour Market:*

*Similar to the Industrial Revolution, the rise of AI brings forth significant changes to the labour market. Certain repetitive and routine tasks can be automated, allowing for more fulfilling job opportunities. This shift presents an opportunity for individuals to move away from monotonous tasks towards more engaging and meaningful work.*

*Disappearing and Emerging Jobs:*

*Tasks that involve repetition and can be easily automated are likely to disappear. This includes jobs that require pressing buttons in assembly lines, where people may not find professional fulfilment. However, new job roles will emerge, focusing on supervising and maintaining the automated processes. AI also enables the automation of previously time-consuming and manual tasks, freeing up human resources for other valuable work.*

*The Need for Computational Thinking and Programming:*

*As AI becomes more prevalent, it becomes essential to understand how to interact with machines effectively. While not everyone needs to become a programmer, developing computational thinking skills is crucial. Computational thinking involves problem-solving, logical reasoning, and understanding algorithms. Integrating computational thinking into education, particularly in mathematics, fosters a deeper understanding of logic and programming.*

*Increasing Demand for Technology Professionals:*

*The integration of AI technology in various fields will create a growing demand for professionals with technological expertise. Forecasts indicate a shortage of skilled individuals to meet this demand. Higher education institutions must address this by increasing the number of educational opportunities in technology-related fields, diversifying student populations, and making these fields more attractive to students.*

*The Importance of Social Interaction:*

*While AI offers numerous advantages, it cannot replace the value of socializing and collaborating with peers. The pandemic has highlighted the importance of in-person education and the unique experiences that come from interacting with others. The ability to communicate, collaborate, and build relationships will remain highly valued in a world increasingly reliant on technology.*

*Problem-Solving and Creativity:*

*In the age of AI, problem-solving skills take on greater significance. The ability to approach challenges creatively and find innovative solutions becomes crucial. Higher education institutions are increasingly focusing on fostering curiosity, critical thinking, and creativity in students, providing them with the skills necessary to adapt to the evolving job market.*

*Lifelong Learning and Adaptability:*

*In the AI era, learning is no longer confined to a specific period; it becomes a lifelong endeavor. Continuous learning and adaptability are essential to keep pace with technological advancements. Higher education equips individuals with abstract*

knowledge that fosters a broader perspective and adaptability, enabling them to navigate changes effectively.

*Conclusion:*

*Artificial Intelligence has a profound impact on the labour market and education. While some routine tasks may disappear due to automation, new job opportunities will arise. Computational thinking and problem-solving skills will be vital in interacting with AI systems. The demand for technology professionals will increase, emphasizing the importance of education in these fields. Additionally, social interaction, creativity, and lifelong learning will remain crucial in an AI-driven world. By embracing these changes and preparing ourselves, we can thrive in the AI era.*

*Acknowledgments:*

*This learning material was produced based on a HEDYTalk featuring Dr. Inês Lynce, Full Professor at the Instituto Superior Técnico and Researcher at INESC-ID - Institute of Systems and Computers Engineering: Research and Development in Lisbon, Portugal. The HEDY project aims to explore life in the AI era and its impact on various aspects of society.*

*Presentation, Direction, Production, Animations, and Graphics:*

*The HEDY project team*

*Studies & Projects Unit/Coordination:*

*HEDY Project - Lisbon, October 2022*

## Self-assessment of your essay of TED Talk on AI & skills and competencies

### INCLUDE IN MOODLE

#### Good

- I will use less certain skills that I have
- I will use my skills differently
- I might have to learn some new skills
- I should understand computational thinking
- There will be more work opportunities in tech

#### Typical mistakes

- All my skills will be useless
- There will be no changes in the skills and competencies needed in the future
- We will not need skills as everything will be done by machines

### Skills and competencies that will become obsolete

When we think of skills that are easily replaced by technology, we immediately think of tasks that follow a clear set of rules, namely repetitive tasks, administrative tasks or logistics related tasks. These tasks do not demand human specific characteristics such as empathy or creativity, which makes them replaced easily by machines - as Per Frey (2019) “complex social interaction and creativity are the most difficult things to automate”. Even though the process might take some time, if the use of AI continues evolving, as it is, these tasks will most likely be replaced.

We already have many examples of AI being used for work previously done by humans. Depending on the kind of skills the work requires, the replacement can be partial or total. Some examples of this are:

- Warehouse robots: robots that use AI are more and more present in warehouses. While at the beginning this was only used for very predictable tasks, this technology is evolving rapidly, which was driven by the Covid-19 pandemic. While the route is long for the full replacement (as there is a large number of warehouses in the world), the happening is very likely, since it's a repetitive job not requiring much thinking or creativity;
- Translation tools: one of the most visible examples of the use of AI in our daily life are translation softwares using AI, namely DeepL or Google Translate. The integration of AI in these softwares made a visible difference in the quality of the

outputs that we can all observe, as the translations provided are much more evolved than the ones from the first online translators. Although these softwares don't completely replace translators, their work has been very reduced and some of them have shifted to a « post-edit » of texts generated by AI translators;

- Another example is the installation of KONE software by Internet of Things (IoT) in elevators, using AI to analyse data, allowing technicians to be informed about potential issues and perform preventative maintenance. This illustrates how we can use AI as a complement to human work, and it is in this way that predictions say AI will most likely be used.

However, as we see the most recent creations being made, per example with ChatGPT, we can ask ourselves if the tasks to be automated really are as limited as we think.

### References:

*Frey, C. (2019). The Technology Trap: Capital, Labor, and Power in the Age of Automation. Princeton University Press.*

*IoT makes its mark (21 August 2018). KONE. <https://www.kone.com/en/news-and-insights/stories/iot-makes-its-mark.aspx>*

## Skills and competencies that will be valued under AI

The skills that will hardly be replaced are those related to human specific competencies, related to soft skills. Most of us have experienced the difference in interpersonal relations using tools for distance meetings and face-to-face meetings. This is representative of the benefits of social interactions - even though the interaction is always present, the social relation is more well established when face to face, which can make the relation be more fluid, increase the understanding of the other and thus improving teamwork and problem-solving.

One of the classifications of the skills required for the 21st century is the 4Cs, which defines the four basic skills needed to be successful in the XXI century, such as communication, collaboration, creativity and critical thinking. These skills have already been integrated into the national educational curricula in Finland, as seven transversal 21st century skills:

- Thinking and learning-to-learn;
- Cultural competence, interaction and expression;
- Taking care of oneself, managing daily life;
- Multiliteracy;
- ICT competence;
- Working life competence and entrepreneurship;
- Participation, involvement and building a sustainable future.

A movement that aims to define the needs for 21st century skills and competencies for basic education and wants to redefine how learning is organised so that it meets the needs of the 21st century influenced this.

The University of Melbourne coordinated a project called: assessment & teaching of 21st century skills (atc21s, 2011), that includes a framework that divides skills into four categories:

<p style="text-align: center;"><b>Ways of thinking</b></p> <ul style="list-style-type: none"> <li>• Creativity and innovation</li> <li>• Critical thinking, problem-solving, decision making</li> <li>• Learning to learn/metacognition (knowledge about cognitive processes)</li> </ul>	<p style="text-align: center;"><b>Tools for working</b></p> <ul style="list-style-type: none"> <li>• Information literacy</li> <li>• Information and communication technology (ICT) literacy</li> </ul>
<p style="text-align: center;"><b>Ways of working</b></p> <ul style="list-style-type: none"> <li>• Communication</li> <li>• Collaboration (teamwork)</li> </ul>	<p style="text-align: center;"><b>Ways of living in the world</b></p> <ul style="list-style-type: none"> <li>• Citizenship - local and global</li> <li>• Life and career</li> <li>• Personal and social responsibility - including cultural awareness and competence</li> </ul>

There is another skills' framework that defines 56 DELTAS (distinct elements of talent, attitudes and skills) split across 13 skill groups which are themselves split into four main categories:

- Cognitive;
- Interpersonal;
- Self-leadership;
- Digital.

These include the aforementioned critical thinking, teamwork, etc., but also others like digital fluency and citizenship, software use and development, and understanding digital systems. The existing research highlights the necessity for data, technological and digital knowledge as much as competencies in problem solving, empathy, communication, innovation, critical thinking, and teamwork.

You can see the full framework at the McKinsey website, and read more about this subject using the following link: <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/defining-the-skills-citizens-will-need-in-the-future-world-of-work>

#### References:

*Suto, I. (2013). 21st Century skills: Ancient, ubiquitous, enigmatic. Research Matters: A Cambridge Assessment Publication, 15, 2-8.*

*Dondi, M., Klier, J., Panier, F., & Schubert, J. (2022, August 31). Defining the skills citizens will need in the future world of work. McKinsey & Company. <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/defining-the-skills-citizens-will-need-in-the-future-world-of-work>*

### TEDTalk The future of skills in the age of AI

Screen the TED Talk "The future of skills in the age of AI" by David Timis, TEDxLuxembourgCity.

What other competencies does this TED Talk identify as needed for the AI era that was not specified in the text?

### New skills that will appear in the AI era

With the evolution of AI, some lower-end jobs will be replaced, as above-mentioned, but some new ones will be created. According to the «Understanding the impact of AI on skills development» (UNESCO, 2021), some of the lower-end jobs that will appear in the AI era could be those related to:

- Data clearing;
- Data preparation;
- Data curation;

- Data protection;
- Data quality.

Regarding more intermediate occupations in relation to AI, we may see professions such as data entry keyers (see glossary) and the use of AI tools in specific domains like maintenance and assistive technology. Higher end occupations may be:

- AI developers;
- Chief data officers;
- Data analytics engineers.

This implies that skills like data manipulation, statistics, real-time analytics, business analytics and visualisations will be very demanding in the future as we are imagining it.

## References

*Shiohira, K. (2021). Understanding the impact of artificial intelligence on skills development. Education, 2030.*

## Necessary changes in education in order to prepare to the AI era

In today's technological job market, we can observe a big shortage of workers that have the demanded skills, and so the training of new workers is necessary. This means that there is an urgent need to equip people with the skills and competencies necessary to work in the AI era, by teaching more IT skills in schools, offering IT related training and by adapting the educational curriculum to the 21st century skills above mentioned. In addition, the increase of digital literacy is essential. This can be done throughout education and training, but also throughout non-formal and informal learning, as we need to increase the comprehension of the general population regarding the functioning, implications and challenges of AI.

Implementing an AI consciousness and related challenges in the education and training system has been identified as crucial to tackle the change of working experiences and businesses (Chrisinger, 2019). Some of the approaches that are suggested to be applied to the formal-learning systems to face these challenges are the project-based approach and the STEAM (old STEM) approach.

### Project based approach

Learning technique where learners are given a problem to resolve in a defined period, while working in teams. This method follows four steps that can take as long as needed, as that can be applied as many times as needed. The steps are:

1. identifying the problem;
2. imagining and agreeing to a solution;
3. develop the solution;
4. redefining the solution based on feedback for teachers, trainers, experts, peers or others.

This allows learners to learn by doing, according to the needs of the project, in a multidisciplinary way and in a more similar way to the tasks that will be demanded in a professional context. By working in teams, thinking of solutions for problems that they haven't yet seen before, learners are stimulating their creativity, increasing also their problem-solving and collaborative skills.

### STEAM approach

STEAM is defined as "an approach to learning that uses Science, Technology, Engineering, the Arts and Mathematics as access points for guiding student inquiry, dialogue, and critical thinking". Previously called STEM (sciences technology, engineering and mathematics), the art component was added for its stimulation of creativity, one of the 21st century skills. This approach aims to provide learners with collaborative, process- and peer-based learning, and it is very useful for the learning of computational thinking, which requires a comprehension much broader than just knowing how to program.

These two approaches are frequently used together, with voice and choice being components of this approach, allowing learners to have a more active role in their education, empowering them and better preparing them for the labour market.

## References:

- Chrisinger, D. (2019). *The solution lies in education: Artificial intelligence & the skills gap. On the Horizon*, 27(1), 1-4.
- Project-Based Learning: Teaching Guide*. Boston University Center for teaching and Learning. <https://www.bu.edu/ctl/guides/project-based-learning/>
- "What is STEAM Education?". Institute for Arts Integration and STEAM. Retrieved from: <https://artsintegration.com/what-is-steam-education-in-k-12-schools/>

## Self-assessment quiz - Impact on skills & competencies - Part 1

With this quiz, you can check that you have mastered the material.

Although the result does not count towards the final evaluation, you should try this quiz at least once.

You will have five minutes to answer five questions in this quiz.

You can try an unlimited number of times, and the result of the best attempt will be the result of the quiz.

At least one hour must pass between each attempt, which is best spent deepening your knowledge.

## Impact on skills & competencies - Part 2

### The use of AI for competence development

The integration of AI is not only shifting the focus on the necessary skills and abilities required in the workplace, but it also has the potential to aid in the development and enhancement of both new and old skills and competencies required. Therefore, instead of looking at AI with fear, we should consider how AI could help to increase skills and competencies of both learners and workers.

As the Beijing Consensus on artificial intelligence and education recommends, we should be:

- aware of trends regarding the potential of AI to support learning and learning assessments, and review and adjust curricula to promote the in-depth integration of AI and transformation of learning methodologies. Consider applying available AI tools or developing innovative AI solutions, where the benefits of AI use clearly outweigh the risks, to facilitate well-defined learning tasks in different subject areas and supporting the development of AI tools for interdisciplinary skills and competencies;
- governments should support school-wide pilot tests on the use of AI to facilitate innovation in teaching and learning, drawing lessons from successful cases and scaling up evidence-based practices;
- apply or develop AI tools to support adaptive learning processes, to leverage the potential of data to enable the evaluation of the multiple dimensions of learners' competencies and to support large-scale and remote assessment;
- ensuring that AI tools in teaching and learning enable the effective inclusion of learners with learning impairments or disabilities and those studying in a language other than their mother tongue.

## References

- BEIJING CONSENSUS on artificial intelligence and education. (2019). Paris: UNESCO

### The use of AI in education and training

AI can be used in education and training to increase skills and competencies in various ways:

**Personalised learning:** AI-powered systems can analyse learner data and tailor instructions to an individual's learning style and needs. AI can enhance personalisation and

better learning outcomes. It facilitates the possibility of adjusting and personalising the working progress to the individual, by offering ways to create learning plans, preferences, and pathways. Experts agree that AI has already changed learning environments, as everyone can now learn new skills individually. This can be done, for example, with the help of a MOOC (Massive Open Online Course), which is a flexible model for distributing educational content online for learners of all kinds, just as you are doing right now.

**Automated grading and feedback:** AI can grade a trainer's work and provide feedback on areas for improvement. For example Letrus (<https://www.letrus.com.br/>), which is an AI-backed platform used in Brazil to improve students' writing skills by mitigating challenges related to effective and timely feedback.

**Skills assessment:** AI-based systems can assess learner's skills and determine the areas of improvement.

**Adaptive testing:** AI can adjust the difficulty of test questions based on the learner's performance.

**Tutoring:** AI-powered chatbots can provide learners with additional support and guidance. Chatbots such as the Digital Intelligence Virtual Assistant (DIVA) have been deployed at tertiary education institutions to respond to student queries and reduce the demands on staff.

**Content generation:** AI can generate educational materials, such as practice problems, to supplement instruction.

**Language learning:** AI can be used to develop natural language processing systems that can help learners learn a new language.

**Predictive analytics:** AI can analyse data on learners' performance and predict which ones are at risk of falling.

**Virtual reality:** AI can be used to create immersive virtual reality experiences that can be used in education and training, in fields like medicine, engineering, and more.

**Intelligent search:** AI-powered search engines can help learners find relevant educational resources more easily.

**Smart classrooms:** "A smart classroom is a learning space that's been enhanced with educational technology and is designed to improve the teaching and learning experience." Smart classrooms allow teachers to adapt their teaching styles to meet the needs of their students. By using a range of technologies and smart classroom management, teachers can support their students' educational and additional needs, and cater for each child's individual learning plan." (Cath Avantis, Educational Specialist, Avantis Education). Smart classrooms are equipped with technology that allows educators to adapt their teaching methods to meet the unique needs of each student. Smart classrooms use interactive tools such as augmented and virtual reality, interactive whiteboards, and other technology to create immersive learning experiences that cater to the needs of every student. This allows for a more personalised and engaging learning experience for each student. There is no one-size-fits-all approach to smart classrooms, as each classroom and its students have unique needs. It is up to educators to determine the most appropriate tools and methods for their specific context and students, and to use them in a way that effectively meets the needs of their students. So, for what concerns AI application in the education and training system, it can enhance personalisation and better learning outcomes, by offering ways to create learning plans, preferences, and trajectories. Experts agreed that AI has already changed the higher education environment as now everybody can learn new skills individually (e.g., through the help of a MOOC). Moreover, AI enables marginalised people to benefit from learning despite not being able to be there in presence.

On the side of the teachers, AI technology can depict a tool for assessment of grades, as well as an aid for the implementation of the lesson and the monitoring of discussion groups. This doesn't mean a future replacement of teachers by AI technologies, because of the socio-emotional and creative components of effective teaching. As the Beijing Consensus underlines: "while AI provides opportunities to support teachers in their educational and

pedagogical responsibilities, human interaction and collaboration between teachers and learners must remain at the core of education. Be aware that teachers cannot be displaced by machines and ensure that their rights and working conditions are protected". Nonetheless, they underline the importance of teachers to adapt to the new digital era by developing new methodologies and enhancing the adequate skills.

Open and distance learning constitutes one of the fastest growing areas of education and offers new opportunities to reduce costs and reach not only students but also workers. In fact, as technology continues to evolve, it is crucial for the existing workforce to continuously update their skills and qualifications. With AI there are now more opportunities for decentralised education and training. The educational commitments of the future workforce will go beyond formal degree programs and include independent studies. Individuals will have more autonomy in their professional development, as access to education and training becomes more prevalent and cost-effective.

Moreover, new labour-sourcing models such as crowdsourcing and platform work are creating opportunities for skilled workers, for non-traditional education and training institutions. Platforms such as Outschool (<https://outschool.com/>), a community marketplace of online classes that allows experts in subjects to design micro courses for children. Initiatives such as the Future Skills (<https://futureskills.nasscom.in/>), a portal in India and the MySkillsFuture (<https://www.myskillsfuture.sg/content/portal/en/index.html>), a portal in Singapore, provide initial competency assessments and map learning opportunities to career goals. Or Coursera (<https://www.coursera.org/>), a platform created in 2012 to deliver short, formal courses from accredited education and training institutions via MOOCs, had a user base of 40 million learners in 2019.

Different types of recognition, such as micro credentials from short courses and MOOCs, allow for the development and refreshing of knowledge, skills and competencies to keep up with changing work and societal demands. In this rapidly changing landscape, there is a growing need for reliable methods to evaluate and acknowledge prior learning, given that providers and courses may not be permanent. Gradually, qualification frameworks are evolving to incorporate new perspectives on digital credentials, the concept of representation and platforms that validate learning records more authentically.

#### References:

- BEIJING CONSENSUS on artificial intelligence and education. (2019). Paris: UNESCO*  
*Cath Avantis, Educational Specialist, Avantis Education*  
<https://www.classvr.com/blog/what-is-a-smart-classroom-the-complete-overview/>  
*Shiohira, K. (2021). Understanding the impact of artificial intelligence on skills development. Education, 2030.*

#### TEDTalk Jill Watson's story

##### MIND THE TITLE in MOODLE

Screen the Ted Talk "A teaching assistant named Jill Watson" by Ashok Goel, TEDxSanFrancisco.

Do you think you would notice if one of your professor's assistants who is answering you is actually an AI?

Link of the TedTalk:: <https://youtu.be/WbCgulCyfTA>

#### The use of AI in jobs

Concerns about the impact of AI on the labour market are as widespread as concerns about the gaps between existing and required skills. In this context, there is a great deal of focus on skills development, particularly in high-end jobs such as engineers and researchers.

However, AI can be applied to a wide range of sectors and fields, and this scope is set to increase in the future.

As Andi Britt, the vice president of IBM, illustrates, AI and cognitive technology will change every signature moment in the employee life cycle; using live demos and real tech. Especially every HR process and interaction is likely to be re-imagined with mobile and AI solutions. In the future organisations will shift to being Talent Centric and AI powered.

AI can also be used to increase the skills needed to find a job, to give and receive feedback inside the workplace. Moreover, AI can analyse data on employee performance and predict which employees are at risk of falling behind or may need additional training, AI can provide employees with personalised training and development programs to improve their skills.

For these reasons, countries such as Australia, Estonia, Myanmar, Singapore, South Africa and Tunisia have investigated the development of tools that leverage AI to connect education, jobseekers and the labour market without the usual delays associated with market research and reporting. For example, Burning Glass determines the set of skills required by the labour force based on the characteristics of job vacancies and can therefore track skills demand and the rapidly evolving skills needs of the workforce in near real time. Skills matching technology can also help educational institutions build or review responsive course and training options.

As above mentioned, The Beijing Consensus states a commitment to using AI to build lifelong learning opportunities for all, across formal, non-formal and informal learning sectors. The document positions AI platforms and learning analytics as 'key technologies' for 'integrated lifelong learning systems to enable personalised learning anytime, anywhere and potentially for anyone and urges that attention be paid to the needs of older people and those facing barriers to digital life.

#### References:

Andi Britt <https://www.youtube.com/watch?v=GQh8n5bKqao>

BEIJING CONSENSUS on artificial intelligence and education. (2019). Paris: UNESCO

Shiohira, K. (2021). *Understanding the impact of artificial intelligence on skills development. Education, 2030.*

### AI and labour market

Start a conversation with ChatGPT <https://openai.com/blog/chatgpt/> by asking, "Can you provide me with information on AI and its impact on the labour market?"

ChatGPT will respond with a detailed answer.

Read the response and ask follow-up questions to deepen your understanding. For example, you could ask,

- "How can AI be used to improve skills development in the workforce?" or
- "Which countries are investigating the use of AI in connecting job seekers and the labour market?"

Based on the information provided by ChatGPT, identify a specific use case or application of AI in the labour market that interests you. For example, you might be interested in learning more about how AI can personalize employee-training programs.

??? WHY ALWAYS CHATGPT??? MAYBE another?

### Challenges and ethical issues in the application of AI in education and jobs

Most of the challenges relating to the use of AI in education and jobs concern ethical issues. First, access to AI tools, training and information is critical for education and jobs. As internet access becomes increasingly essential for daily life and economic opportunities, there are growing calls to recognize it as a fundamental human right. Since a significant portion of the world's population lacks internet connection, this could further increase existing inequalities, especially between developed and developing countries. This disproportionately affects women and people in rural areas of developing countries, where poverty, food insecurity, and high unemployment often result in limited investment in

information and infrastructure communication technology (ICT). Without proper understanding, internal capacity, and accessibility, these countries may be unable to take full advantage of AI's benefits to education and job opportunities. AI in education should be used to promote opportunities, not to enhance inequality, by creating discriminatory learning tools.

AI can help drive both economic and social progress and help countries achieve national objectives such as inclusive growth and development, but this can only happen if the technology is developed in a human-centred manner or with a focus that goes beyond financial gain (Access Partnership 2018; UNESCO, 2019b). Well-being may also be negatively impacted by the application of AI in education and jobs if AI systems prioritize profit or efficiency over the good of individuals and society. The goal is to balance the economic interests of companies and states and the non-violation of citizens' rights concerning privacy and individual freedom.

Companies and governments should use AI not only to increase benefits and profits but also to consider the wealth of learners and employees. Should we allow people to work fewer hours if the same job can be done in half the time? Otherwise, we could face the risk of a further increase in phenomena such as Technostress, which is "a modern disorder caused by the inability to adapt to new information technologies healthily. It can manifest in the struggle to accept technology and in the form of over-identification with technology" (Brod C., 1984).

Another challenge in using AI is related to fairness, which may be violated by the perpetuation and even amplification of existing biases throughout data inputs or statistical errors in the algorithms. In this regard, the Consensus of Beijing warns of being: "cognizant that AI applications can impose different kinds of bias that are inherent in the data the technology is trained on and uses as input, as well as in the way that the processes and algorithms are constructed and used".

Moreover, Safety, Security and Privacy may be compromised by the collection and use of personal data by AI. This is a complex issue that spans multiple areas, including not only physical safety but also personal liability, intellectual and legal property rights, and privacy. There is a balance dilemma between open access to data and data privacy protection. Therefore, we should be aware of the legal issues and ethical risks related to data ownership, privacy and availability for the public good. The example of the non-fungible token (NFT) uses the styles of existing artists to create new content, which leads to questions about copyright.

However, the challenges of using AI in education and jobs do not concern only ethical issues. It is also a matter of more technical and practical problems, as, for example, a limited understanding of how AI works can lead to poor implementation and ineffective results, as educators and employers may not have the knowledge or expertise to use AI tools and technologies in a way that is most beneficial for their learners or employees. AI is a technology that, in its design and development, is so far removed from everyday life that experts believe that the population is not trained enough to make decisions about how to use AI. We need, therefore, to provide teachings, courses and training in schools and higher education institutions to facilitate the use and adoption of AI for young people and future generations.

Higher education and education and training institutions often do not have the internal capacity required for AI development and frequently do not have enough expertise, even at an intermediate level, to use AI properly. Moreover, AI experts' lack of internal capacity can make it difficult for organizations to develop and implement AI-assisted education and job search programs. Even when AI expertise is available, solutions designed to address education-related problems often remain isolated within individual institutions that lack the capacity or drive to market them more broadly. The issue of not having enough qualified workers has also been considered in the consensus of Beijing, which suggests "align AI in education with public policies, particularly education policy".

One of the most general concerns is that AI-powered automation and robotics may lead to job displacement (particularly in industries that rely heavily on manual labour). Regarding the education sector, it is crucial to remember the importance of personal touch and human interaction. Otherwise, AI could replace teachers and trainers, negatively affecting learners. AI could also make some skills obsolete and new ones essential, with the risk of leaving someone behind, especially older people.

Therefore, it's important to consider ethical and practical considerations when developing and deploying AI systems in these fields. These principles must be codified by institutions and upheld in any use of AI. Learners and staff populations should make informed and free decisions about their potential interactions with AI.

To ensure the ethical use of AI in education and jobs, it is essential to promote diversity in the field, provide training and upskilling opportunities for disadvantaged populations, integrate ethics into training programs, study the ethical and social effects of AI, and establish clear guidelines and regulations for the fair and transparent use of data. Additionally, education and training institutions should critically examine their use of AI and their programs to ensure they align with these principles and support sustainable development.

#### References:

- Access Partnership. 2018. AI for Africa: An Opportunity for Growth, Development, and Democratisation. Retrieved from: <https://www.accesspartnership.com/artificial-intelligence-for-africa-an-opportunity-for-growth-development-and-democratization/>*
- BEIJING CONSENSUS on artificial intelligence and education. (2019). Paris: UNESCO BOOKLET*
- Brod, C. (1984) Technostress: The Human Cost of the Computer Revolution. Addison-Wesley Publishing Company, Reading, USA.*

#### Will AI take our jobs?

Read these two articles with wildly divergent positions regarding the future consequences of the application of AI in education and jobs:

- ["I'm a copywriter. I'm pretty sure artificial intelligence is going to take my job" by Henry Williams for The Guardian](#)
- ["Moore's Law for Everything" by Sam Altman](#)

What do you think? Are you more optimistic or pessimistic about it?

#### Self-assessment quiz - Impact on skills & competencies - Part 2

#### Competence self-evaluation

???? WHAT IS THE TEST HERE???

SELF-AWARENESS?? FEEDBACK??

#### Skills and competencies

Read the statements below. Think how well these statements describe you and mark the answers that best reflect your opinion on the seven-point scale.

- I am familiar with the basic concepts as well as current and future applications of AI
- I am able to recognise solutions implemented with artificial intelligence
- I understand the relationship between Artificial Intelligence and business
- I am able to recognize the use and application of AI systems in business processes, companies and enterprises
- I am able to distinguish the differences between AI governance and data governance
- I am able to map an AI governance problem to one of the 6 principles

- I am able to identify how AI can impact the skills and competencies, namely those that are most likely to be replaced in the future
  - I am able to discuss the challenges, risks and ethics regarding the implementation of AI
  - I understand different AI technologies and their applications in people's life (i.e. health and fitness, smart homes, personalized education, shopping)
  - I am able to consider important factors to make a good choice when using AI
- 
- 7=Strongly agree
  - 6=Agree
  - 5=Somewhat agree
  - 4=Neutral
  - 3=Somewhat disagree
  - 2=Disagree
  - 1=Strongly disagree

Module feedback (Impact on skills & competencies)

**We can switch off module feedbacks**

We want to make this course the best it can be, so please provide feedback on this module the same way as the others.

Please mark the answers that best reflect your opinion on the four questions below on the five-point scale.

- Strongly agree    Somewhat agree    Neutral    Somewhat disagree    Strongly disagree
- I improved a lot during the completion of the module.
  - Completing this module was enjoyable for me.
  - There were valuable exercises in the module.
  - The module contained helpful information

## Impact on people & lifestyle - Part 1

### Introduction to the module

A person's lifestyle refers to their life, including their daily habits, behaviours, and activities. It encompasses various aspects of a person's life, such as diet, physical activity level, sleep patterns, social interactions, hobbies, work and leisure activities, and overall routines. The lifestyle can significantly impact their health, happiness, and overall well-being. For example, a healthy lifestyle may involve the following:

- Eating a balanced diet.
- Engaging in regular physical activity.
- Getting adequate sleep.
- Managing stress effectively.

On the other hand, an unhealthy lifestyle may involve a lack of physical activity, poor diet, excessive alcohol or tobacco use, and inadequate sleep.

The lifestyle reflects a person's choices, values, and priorities and can significantly influence their quality of life.

The content of the module is organized into two parts. The first part introduces AI and Its Applications in Lifestyle. You will learn about the role of AI in Personalized Health and Fitness. The link Smart Homes and Automation with AI is shown. The future of AI for Personalized Education and Learning and for Personalized Shopping and Retail is also explained.

The second part will introduce you to the application of AI for transportation and mobility and the entertainment field. Ethical issues related to the impact of AI and human life will be addressed.

The identified competencies relate to cognitive skills, human-tool collaboration, and competence in self-learning skills and ethics. The module enables students to develop the right competencies needed to navigate the world of AI.

The module demonstrates the ability to apply practically and successfully acquired AI knowledge and human-tool collaboration competencies.

## Instructions for learners

The part is divided into topics and assignments.

- **Topics will be introduced through articles**
- **Quizzes will help you consolidate this knowledge.**
- **The module will allow you to repeat and improve your competence.**
- **You will put this knowledge into practice in an essay when required.**
- **You will complete each topic with a final task.**

## Introduction to AI and Its Applications in Lifestyle

AI has the potential to transform significantly the way we live, providing new tools and techniques to improve various aspects of our lives and enhance our experiences. By embracing AI and its potential benefits, we can continue to improve our quality of life and achieve our full potential.

### Overview of AI and its impact on people's lifestyle

Artificial Intelligence (AI) is a rapidly growing field that seeks to develop intelligent machines that can think and act like humans. This module will provide an overview of the fundamentals of AI, its history, and its current applications as part of human life.

You will have a good understanding of the basics of AI and how it is transforming various industries and fields. You will also explore AI's ethical, social and economic implications and potential societal impact. You will also have the skills and knowledge to start exploring the exciting and ever-evolving world of AI.

Artificial Intelligence (AI) has a long history, with roots in ancient civilizations and the development of formal logic and computational machines in the 19th century. However, AI as we understand it today began to take shape in the mid-20th century, when computer scientists and mathematicians first started exploring the idea of creating machines that could perform tasks that typically required human intelligence, such as problem-solving and pattern recognition.

Over the years, AI has made significant progress, with numerous breakthroughs and innovations that have led to the development of new AI technologies and applications, such as machine learning, computer vision, and natural language processing. AI has also become more accessible with the rise of cloud computing and the availability of powerful AI tools and platforms.

Artificial Intelligence (AI) has become an increasingly integral part of human life, transforming how we live, work, and interact with technology. AI has the potential to solve complex problems, automate repetitive tasks, and improve efficiency and productivity. Today, AI profoundly affects many aspects of human life, from business and industry to healthcare and education, to entertainment and personal life. AI also shapes the future as new technologies and applications emerge, driving innovation and transformation across various domains.

### Different AI technologies and their applications in people's lifestyle

In recent years, AI has been used in various industries, from healthcare and finance to retail and transportation, to provide new solutions and improve existing services. For example, AI-powered chatbots are now used to provide customer service and support, while AI algorithms are used to diagnose medical conditions and suggest personalized treatments. However, AI raises important ethical and social questions, such as the potential for job loss, the impact on privacy and security, and the responsibility for AI-generated actions and decisions.

Despite these challenges, AI is poised to play an even more significant role in human life in the coming years. Individuals and society must understand and responsibly use this technology. With AI and its potential benefits, we can create a better and more connected world while carefully considering its impacts and implications.



## AI for Personalized Health and Fitness

### **AI-based personalised fitness and diet recommendations**

AI-based personalised fitness and diet recommendations are already a reality and becoming increasingly popular. With advanced algorithms and machine learning development, AI systems can analyse vast data about an individual's health, fitness goals, and lifestyle and provide tailored recommendations to help them achieve their objectives.

AI can personalise fitness recommendations through wearable devices, such as fitness trackers, smartwatches, and heart rate monitors. These devices can collect data on an individual's physical activity, including steps taken, heart rate, and calorie burn. AI algorithms can then analyse this data and recommend optimal exercise routines based on an individual's fitness goals, physical ability, and previous exercise patterns.

An AI system can generate a customised meal plan that meets an individual's specific dietary requirements by inputting data such as body measurements, daily activity levels, and food preferences. AI can also provide personalised diet recommendations by analysing an individual's eating habits, nutritional needs, and health status. These recommendations can be adjusted as an individual's weight, fitness goals, and dietary needs change.

The advantages of AI-based personalised fitness and diet recommendations include improved accuracy, efficiency, and convenience. Rather than relying on general advice that may not be tailored to an individual's unique needs, an AI system can provide precise and targeted guidance, saving time and reducing trial and error. Additionally, AI-based recommendations can be continually updated based on an individual's progress, ensuring they are always on the right track.

However, it's important to note that AI-based recommendations are only as accurate as the data inputted into the system. Therefore, using reliable devices and providing accurate

information is crucial to ensure the best results. Additionally, while AI can provide helpful guidance, it should not replace the advice of a medical professional, certified nutritionist, or personal trainer.

### **AI and human life in dentistry**

Artificial intelligence (AI) dramatically impacts many aspects of human life, and dentistry is no exception. AI can improve diagnostics, treatment planning, and patient outcomes. AI is transforming the field of dentistry, providing new tools and techniques to improve patient care and enhance the overall experience. Here are some examples of AI's potential impact on dentistry:

One essential application of AI in dentistry is diagnostics. Machine learning algorithms can identify patterns and anomalies that human dentists may miss by analysing large amounts of data on dental images, such as X-rays and scans. This can lead to earlier and more accurate diagnoses, allowing dentists to provide treatments that are more effective to their patients.

AI can also be used in treatment planning. By analysing patient data and identifying patterns in treatment outcomes, machine learning algorithms can help dentists develop personalised treatment plans tailored to each patient's needs. This can lead to treatments that are more effective, reduced recovery times, and improved patient outcomes.

Another important application of AI in dentistry is patient communication. Chatbots or virtual assistants allow patients to access information about their dental health and treatment plans at any time. This can help patients stay informed and engaged in their dental care, leading to better patient outcomes.

AI can also be used to improve the overall efficiency of dental practices. By automating routine tasks such as appointment scheduling and insurance verification, machine learning algorithms can free dentists and their staff to focus on more complex and specialised assignments.

AI has the potential to improve dental care's efficiency and effectiveness significantly. By improving diagnostics, treatment planning, patient communication, and practice efficiency, AI can help dentists provide more effective and personalised care, leading to better patient outcomes and improved quality of life.

### **Wearable devices and their integration with AI for health monitoring**

Wearable devices, such as smartwatches, fitness trackers, and health monitors, are becoming increasingly popular for health monitoring. These devices can track an individual's physical activity, sleep patterns, heart rate, blood pressure, and other health metrics. They can provide even more accurate and personalised health monitoring when integrated with AI.

One advantage of AI integration with wearable devices is the ability to collect and analyse a large amount of data quickly. With AI algorithms, data collected by wearable devices can be processed and analysed in real-time, allowing for continuous monitoring and early detection of health issues.

AI can also create personalised health plans based on an individual's unique health data. For example, suppose a wearable device detects an individual's heart rate consistently elevated during exercise. In that case, an AI algorithm can suggest modifications to their workout routine or provide recommendations for medical treatment based on past patterns of similar individuals.

Furthermore, AI can improve the accuracy of wearable device data by using machine learning to correct errors and adjust measurements based on individual habits and characteristics. This can be especially useful in detecting anomalies or changes in health metrics that may indicate a potential health issue.

Additionally, AI can provide predictive analysis and help identify potential health issues before they become more serious. AI can detect patterns and identify potential risk factors for certain diseases or health conditions by analysing an individual's health data over time. This can help healthcare providers to intervene earlier, leading to better health outcomes and reduced healthcare costs.

However, it is important to note that integrating wearable devices and AI in health monitoring raises concerns about data privacy and security. As sensitive health data is being collected and analysed, individuals must be informed about how their data is being used, who has access to it, and how it is protected.

Integrating wearable devices and AI in health monitoring can revolutionise healthcare by providing personalised and more accurate health monitoring, early detection of health issues, and predictive analysis. However, it's crucial to address privacy and security concerns to ensure that the benefits of these technologies outweigh the potential risks.

### **AI for disease diagnosis and treatment**

AI is being increasingly used in disease diagnosis and treatment, and it can potentially revolutionise the healthcare industry. Here are some ways in which AI is being used:

*Medical imaging:* AI algorithms can analyse medical images, such as X-rays, MRIs, and CT scans, and identify patterns that may indicate a disease or condition. This can help healthcare providers diagnose more accurately and develop personalised treatment plans.

*Disease diagnosis:* AI can be used to analyse large datasets of patient data, including medical history, symptoms, and test results, to identify patterns that may indicate a disease or condition. This can help healthcare providers make more accurate and timely diagnoses, leading to earlier interventions and better outcomes.

*Treatment planning:* AI can analyse patient data to create personalised treatment plans based on a patient's unique characteristics, including genetic information, lifestyle factors, and medical history. This can lead to more effective and efficient treatments, reducing healthcare costs and improving patient outcomes.

*Drug development:* AI can analyse vast amounts of data on drug compounds, including chemical structures, biological activity, and clinical trial data, to identify potential drug candidates. This can accelerate the drug discovery process and lead to the development of more effective treatments.

*Remote patient monitoring:* AI can analyse data from wearable devices and other remote monitoring tools to detect changes in a patient's health status, such as heart rate, blood pressure, or blood sugar levels. This can help healthcare providers to intervene earlier and adjust treatment plans, leading to better outcomes.

However, using AI in disease diagnosis and treatment has some challenges and limitations. One major concern is the need for high-quality data to train AI algorithms, which can be difficult to obtain. Additionally, there is a risk that AI may perpetuate bias in healthcare, as algorithms can reflect biases in the data used to train them. Finally, while AI can provide valuable insights and recommendations, it should never replace the judgement of healthcare providers, who must always be involved in the decision-making process.

## **Life & LLM**

### **Introduction**

This expert Vesela Georgieva, delves extensively into the transformative impact of Artificial Intelligence (AI) on people & lifestyle. The analysis is centered on the introduction of ChatGPT, an innovation by OpenAI that has revolutionized human-machine interaction by closely emulating genuine human conversation. Delving meticulously, the discourse explores the profound integration of AI within the frameworks of Industry 5.0 and Society 5.0, unravelling the intricate harmony between human ingenuity and technological progress. This symbiotic relationship reverberates resoundingly across diverse sectors, catalysing remarkable enhancements in efficiency and propelling audacious explorations into uncharted territories of possibility. The provided information analysis distinctly underscores the harmonious interaction intrinsic to the paradigms of Industry 5.0 and Society 5.0, where AI's integration seamlessly nurtures heightened efficiency and stimulates novel avenues of inquiry, amplifying the potential for a more dynamic and enriched future.

### **Student activity instruction**

The provided information of AI, ChatGPT, and their impact on people and lifestyle aims to help students comprehend the fundamental concepts of Artificial Intelligence and ChatGPT as well as their influence on communication and lifestyle. Students will gain insights into the functionality of ChatGPT, its applications in various contexts like customer service and accessibility, and the advantages it offers. They will also be informed about the ethical side and limitations inherent in AI, emphasizing the importance of responsible deployment and human oversight. By understanding how AI technologies shape modern lifestyles, students will be encouraged to consider consequences and engage in critical thinking about the evolving role of AI in society.



<https://www.youtube.com/watch?v=F-ayl9omfPU>

*Development of Technology: After improvements in computer and communication systems and the widespread internet adoption, social media, email, online messaging, and video chats became prevalent, causing a significant change in people's everyday lives as they started using internet technologies for various purposes.*

*Introduction of Artificial Intelligence: With the advent of artificial intelligence, the interaction between humans and technology became two-way, resulting in Industry 5.0 and Society 5.0. These concepts explore humans' and AI's strengths and weaknesses and how they interact.*

*ChatGPT's Popularity: ChatGPT is an AI system launched by OpenAI at the end of 2022. Its user-friendly interface, efficiency in delivering information, and conversational style similar to an actual human have contributed to its global popularity. It gained recognition as the second most important technological tool after the graphical user interface.*

*Advancements in AI Integration: AI integration will become more tangible in several areas, such as online shopping, healthcare, transportation, cybersecurity, and more. AI will evolve from a mere service to a constant and integral part of people's lives.*

*Impact on Workforce: AI's integration is expected to free people from routine tasks and reduce intellectual labour in certain professions through intelligent devices.*

*Digital Interactive Spaces: Developing digital interactive spaces will enable collaboration between humans and machines.*

*AI in Hazardous Environments: Thinking machines like robots will be fully integrated into complex and hazardous workplaces, rescue operations, and other fields.*

*Enhanced Decision-Making: AI will be instrumental in making responsible decisions in complex situations and processes.*

*Data Processing and Assistance: AI will improve the efficiency of processing large volumes of data and provide better assistance in everyday routines and professional fields.*

*Potential Threats and Creativity: There are discussions about AI's potential threat to certain professions by replacing human workers and potentially affecting human creativity.*

*Assessment of AI Advantages: The most crucial aspect is assessing the advantages of AI for people's way of life. Some benefits include enhancing efficiency, providing new possibilities for lifestyle improvements, impacting healthcare positively, introducing autonomous transport, improving safety, and offering virtual assistants with natural language processing.*

*Personalised Way of Living: Until regulations are in place, people will continue interacting with AI, shaping their customised way of living.*

## AI @ dentistry

### HEDY TALK???

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

In the era of rapid technological advancement, Artificial Intelligence (AI) has emerged as a driving force across various industries, including healthcare and dentistry. This learning material aims to introduce you to the key concepts and applications of AI in these fields, based on the transcript provided.

#### The Significance of Artificial Intelligence

Artificial Intelligence, often abbreviated as AI, refers to the simulation of human intelligence in computers and machines. Diana Pavlova, a Specialist in Training and Development at Dentaprime dental clinics, highlights the global importance of AI. The "HEDY" project, an international collaboration involving Bulgaria, Germany, Spain, Portugal, and Hungary, is dedicated to exploring the impact of AI on human life.

#### AI's Influence on Society

AI's impact goes beyond mere technological advancements. It delves into the moral and ethical norms, affecting society's priorities concerning digitization and machine data processing. The goal is to present the development trends, influences, and applications of AI in people's daily lives.

#### Everyday Integration of AI

In today's technologically advanced world, the integration of AI into everyday life is becoming increasingly natural. AI applications, ranging from email and chat services to digital assistants, are becoming pervasive. Each interaction with technology contributes to the construction of a global information database, where AI algorithms shape experiences and interactions.

#### Diverse Applications of AI

Artificial Intelligence finds application in various fields such as education, healthcare, industry, transportation, cyber security, and sports. This diversity is a result of the cumulative progress in society's development, from the discovery of electricity to the creation of computers with advanced technological capabilities.

#### Functionality of AI

AI functions through an information database that processes information using digital applications. It performs analyses, processes data, automates calculations, and even interacts with humans through established algorithms. The goals of AI integration include freeing humans from routine tasks, collaborating with thinking machines, improving

professional assistance to those with disabilities, and making responsible decisions in complex situations.

#### Ethical Considerations

While AI offers numerous benefits, it also raises questions about ethics and freedom. People might feel uncomfortable with technology making decisions for them. However, the hope is that AI will have a predominantly positive impact on humans, improving activities and experiences while respecting human agency.

#### AI in Dentistry

The transcript further discusses the Dentaprim Dental Clinics' involvement in the HEDY project, focusing on the implementation of AI in dentistry. This includes applications in dental care such as analyzing X-ray images, creating custom braces, remotely monitoring orthodontic treatments, and even utilizing robots as dental assistants. AI-driven processes in dentistry aim to optimize treatment, improve accuracy, reduce errors, and enhance patient experience.

#### Dentaprim Dental Clinics

The Dentaprim Dental Clinics serve as an example of AI integration in healthcare practices. These clinics emphasize the use of advanced technology for diagnosis, treatment planning, and dental structure production. The clinics' success is attributed to continuous innovation, optimization, and digitization of work processes.

#### Conclusion

In conclusion, Artificial Intelligence has become an integral part of our lives, influencing various aspects including healthcare and dentistry. It presents opportunities for improving efficiency, accuracy, and patient experiences. While AI's growth continues, it is important to consider ethical aspects and ensure that it remains a tool that enhances human activities and experiences.

Remember, the world of AI is ever-evolving, and staying informed about its applications and implications is crucial for embracing its potential responsibly.

#### Answer the following questions in two-three sentences each:

1. What is one way that AI is being used in dentistry to improve diagnosis and treatment planning?
2. What is the benefit of using AI algorithms to predict equipment failures in dental clinics?
3. How can AI algorithms be used to provide personalized patient care in dentistry?
4. What is the purpose of smile design and simulation in dental care, and how does AI play a role?
5. How can AI-powered robots assist dental professionals in performing complex procedures?
6. What is one potential drawback of using AI in dentistry, and how can it be mitigated?
7. How is AI changing the field of dentistry overall, and what impact is it having on patient outcomes and experiences?

Please respond in free text style

You can submit a pdf file or an online text.

#### Smart Homes and Automation with AI

##### Smart homes and their benefits

Smart homes refer to houses equipped with advanced technologies that allow for the automation of various functions such as lighting, heating and cooling, security, and entertainment. Here are some of the benefits of smart homes:

*Convenience and Comfort:* One of the primary benefits of smart homes is convenience and comfort. With smart devices, you can automate various functions such as turning on/off lights, adjusting the thermostat, or even setting the coffee maker to prepare your morning coffee, all from your smartphone or tablet.

*Energy Savings:* Smart homes can help you save on energy costs by allowing you to control energy-consuming devices such as lighting, heating, and cooling systems remotely. With smart thermostats, you can adjust the temperature of your home based on your preferences, even when you are not at home. This can lead to significant energy savings.

*Enhanced Home Security:* Smart home technologies can help to improve home security. You can install smart locks, motion sensors, and video cameras and then monitor your home remotely from your smartphone or tablet. You can also receive real-time alerts on your smartphone when suspicious activity is in your home.

*Improved Accessibility:* Smart homes can help people with disabilities or elderly people to live more independently. For example, with smart home devices, these individuals can control their home environment without needing physical movement or assistance.

*Increased Property Value:* Smart homes are highly desirable in today's market, and as a result, they can increase the value of your property. Homebuyers are willing to pay more for homes equipped with smart technologies that offer convenience, comfort, and energy savings.

Smart homes offer numerous benefits, including convenience, energy savings, enhanced security, improved accessibility, and increased property value. As technology continues to advance, smart homes will become more accessible and more affordable, making them a viable option for many homeowners.

### **AI-enabled automation in homes**

AI-enabled home automation uses artificial intelligence (AI) to automate various tasks and functions within a home environment. With the help of AI, homes can be equipped with smart devices capable of performing tasks without human intervention. Here are some examples of AI-enabled automation in homes:

*Home Entertainment:* AI-enabled devices can provide personalized recommendations for TV shows and movies based on a user's viewing history. For example, a smart TV can suggest programs based on the user's viewing preferences and even offer to record them for later viewing.

*Lighting and Temperature Control:* AI-enabled systems can adjust lighting and temperature in a home based on the user's preferences and routines. For instance, smart thermostats can learn a user's preferred temperature settings and adjust them accordingly. Smart lighting can be programmed to turn on or turn off based on a user's schedule, location, or weather conditions.

*Security Systems:* AI-enabled security systems can monitor and detect unusual activity in and around the home. With the help of cameras and motion sensors, these systems can detect and report suspicious activity and even trigger an alarm in case of a break-in.

*Personal Assistants:* AI-powered personal assistants such as Amazon's Alexa, Apple's Siri, and Google Assistant can help to automate various tasks in the home, such as setting reminders, playing music, and ordering groceries.

*Home Maintenance:* AI-enabled devices can monitor and detect potential problems in the home before they become significant issues. For example, a smart smoke detector can detect smoke and alert the homeowner, while a smart water sensor can detect leaks and prevent water damage.

AI-enabled home automation offers several benefits, including increased convenience, comfort, energy efficiency, and security. As AI technology advances, the potential for automating even more tasks and functions in the home will increase, making homes more comfortable and efficient for their occupants.

## **AI-powered smart assistants for home management**

AI-powered smart assistants are virtual assistants that use artificial intelligence (AI) and natural language processing (NLP) to interact with users and perform various tasks, including home management. These assistants can control multiple smart home devices, answer questions, and provide recommendations, among other things. Here are some examples of how AI-powered smart assistants can help with home management:

*Controlling Smart Home Devices:* AI-powered smart assistants can control various smart home devices, such as lights, thermostats, and security systems. Users can use voice commands to adjust the temperature, turn lights on or off, and lock or unlock doors.

*Home Security:* AI-powered smart assistants can be integrated with smart home security systems to provide enhanced home security. For example, users can ask their assistant to arm or disarm the security system, receive notifications when someone is at the door, and even check their security cameras.

*Home Automation:* AI-powered smart assistants can automate various tasks in the home, such as turning off the lights when nobody is in a room or adjusting the temperature at a certain time of day. This can help to save energy and make the home more comfortable.

*Entertainment:* AI-powered smart assistants can provide entertainment options for homeowners, such as playing music or streaming movies and TV shows. Users can request specific songs, artists, or playlists using voice commands and even control the volume and playback.

*Shopping and Errands:* AI-powered smart assistants can help with shopping and errands, such as ordering groceries, scheduling appointments, and booking travel. Users can add items to their shopping lists, order food, and even arrange transportation using voice commands.

AI-powered smart assistants can provide a range of benefits for home management, including enhanced security, automation, and entertainment. As AI technology advances, the potential for smart assistants to become even more integrated with home management will only increase.

There are several AI-powered smart assistants for home management available on the market. Here are some of the most popular ones:

*Amazon Alexa:* Alexa is an AI-powered personal assistant developed by Amazon. It can control various smart home devices and perform tasks such as setting alarms, answering questions, and making phone calls. It can also integrate with other apps to perform additional functions, such as ordering food, booking a ride, or controlling a smart vacuum.

*Google Assistant:* Google Assistant is another popular AI-powered smart assistant. It can control various smart home devices, answer questions, and provide recommendations. It can also be integrated with other Google services, such as Google Maps and Calendar.

*Apple Siri:* Siri is the AI-powered personal assistant developed by Apple. It can control various smart home devices, answer questions, and perform tasks such as setting reminders and making phone calls. It can also be integrated with other Apple services like Apple Music and Apple Maps.

*Samsung Bixby:* Bixby is an AI-powered assistant developed by Samsung. It can control various smart home devices, answer questions, and perform tasks such as setting reminders and sending messages. It can also be integrated with other Samsung services, such as Samsung Health and Samsung Pay.

*Microsoft Cortana:* Cortana is an AI-powered personal assistant developed by Microsoft. It can control various smart home devices, answer questions, and perform tasks such as setting reminders and making phone calls. It can also be integrated with other Microsoft services, such as Microsoft Office and Microsoft Teams.

Using these assistants, homeowners can easily manage their homes, control smart devices, and perform various tasks with just their voice, complying with safety requirements and without over-trusting.



## AI for Personalized Education and Learning

### Personalised learning with AI

Personalised learning with AI refers to using artificial intelligence (AI) to tailor educational experiences to the needs and preferences of individual students. This approach to education recognises that every student has different strengths, weaknesses, and learning styles and seeks to use technology to meet their needs better. AI-powered personalised learning can take many forms, including adaptive learning platforms, intelligent tutoring systems, and chatbots.

#### **Here are some ways that AI can be used for personalised learning:**

*Adaptive Learning Platforms:* These platforms use machine learning algorithms to analyse student performance and adjust the difficulty of learning materials in real-time. *Adaptive Learning Platforms* allow students to work independently and receive more challenging or simpler material as needed.

*Intelligent Tutoring Systems:* AI can provide personalised support and guidance for students, helping them to work through challenging problems and understand difficult concepts. The system can adapt its teaching methods and material to individual student's needs based on their learning progress.

*Chatbots:* These AI-powered assistants can help students with routine tasks such as scheduling, homework reminders, or answering general questions. They can also provide personalised feedback and guidance on specific topics or assignments.

*Personalised Content Creation:* AI can analyse student performance data and create customised learning content. AI can generate customised learning materials tailored to each student's learning needs, including videos, quizzes, and interactive simulations. For example, an AI-powered platform can present math problems specifically tailored to a student's current level of understanding and areas for improvement.

*Personalised feedback:* AI can analyse student responses to questions and assignments to provide targeted feedback and recommendations for further study.

*Adaptive assessments:* AI can create assessments that automatically adjust the difficulty of questions based on each student's performance, ensuring that they are consistently challenged but not overwhelmed.

*Customised pacing:* AI can analyse how long it takes each student to complete different types of assignments and adjust the pace of learning to ensure they have enough time to master each concept.

The benefits of personalised learning with AI include improved engagement, increased learning outcomes, and more efficient use of time and resources. By adapting educational experiences to individual students, AI can help them learn more effectively and increase their motivation and engagement.

However, some challenges are associated with personalised learning with AI, such as concerns about data privacy and security, the need for adequate teacher training, and ensuring that the technology is effective for all students. It is important to carefully evaluate the technology and ensure it is used ethically and responsibly.

Personalised learning with AI has the potential to transform education by providing more effective, engaging, and tailored learning experiences for students. While there are still some challenges to overcome, the possibilities for improving education with AI are exciting and promising.

### **AI-enabled chatbots for educational purposes**

AI-enabled chatbots for educational purposes are virtual assistants that use artificial intelligence (AI) to provide personalised support and guidance to students. These chatbots are designed to interact with students naturally and conversationally, providing answers to questions, assisting with assignments, and offering feedback and support.

Here are some ways that AI-enabled chatbots can be used for educational purposes:

*Personalised learning:* Chatbots can adapt to individual student's learning styles and preferences, delivering customised learning materials and feedback.

*Interactive quizzes:* Chatbots can engage students in interactive quizzes and games, providing real-time feedback and encouraging deeper learning.

*Homework assistance:* Chatbots can assist with homework by answering questions and providing systematic guidance for complex problems.

*Exam preparation:* Chatbots can help students prepare for exams by providing practice questions, explanations, and personalised feedback on areas for improvement.

*Language learning:* Chatbots can provide language learners with real-time feedback on pronunciation, grammar, and vocabulary, allowing them to practice and improve their language skills.

The benefits of AI-enabled chatbots for educational purposes include increased engagement and motivation, improved learning outcomes, and use of teachers' time that is more efficient. Chatbots can help students learn more effectively and at their own pace by providing personalised support and guidance.

However, some challenges are associated with using chatbots in education, such as concerns about data privacy and security, adequate teacher training, and ensuring the technology is effective for all students. It is important to carefully evaluate the technology and ensure it is used ethically and responsibly.

AI-enabled chatbots for educational purposes have the potential to transform education by providing learning experiences for students that are more effective, engaging, and tailored. While there are still some challenges to overcome, the possibilities for improving education with chatbots are exciting and promising.



## AI for Personalized Shopping and Retail

### AI-based personalised shopping experiences

Artificial intelligence (AI) is revolutionising how we shop by offering personalised shopping experiences that cater to our unique tastes and preferences. By analysing vast amounts of data about our shopping habits, interests, and behaviour, AI-powered systems can provide highly personalised recommendations, promotions, and experiences tailored to our needs.

AI-powered visual search is another cutting-edge technology changing how we shop. Visual search tools using computer vision and machine learning algorithms can analyse images and identify products that match the customer's query. For example, a customer could take a photo of a pair of shoes they like, and the system could automatically find similar styles from different brands and retailers.

In addition to these individualised experiences, AI is making shopping more convenient and efficient. By automating inventory management, order processing, and shipping tasks, AI-powered systems can reduce the time and resources required to fulfil customer orders, leading to faster shipping times, lower costs and better customer service.

AI-based personalised shopping experiences offer numerous benefits for both consumers and retailers. By providing tailored recommendations, intuitive chatbots, visual search, and automated processes, AI can create a more efficient, convenient, and enjoyable shopping experience for everyone involved. As AI technology evolves, we expect to see even more exciting innovations in personalised shopping.

### AI for product recommendations and personalisation

Artificial intelligence (AI) is changing how we shop by offering personalised recommendations and experiences. By analysing vast amounts of data about our shopping habits, interests, and behaviour, AI-powered systems can provide highly tailored product recommendations, promotions, and experiences that cater to our unique tastes and preferences.

AI-powered systems can also personalise the shopping experience in other ways. For example, they can use data such as the customer's location, weather, and time of day to provide relevant and timely recommendations. They can also analyse the customer's browsing behaviour to suggest products similar to ones they have previously viewed or complementary to ones they have already purchased.

Another way that AI is transforming the shopping experience is through chatbots and virtual assistants. These intelligent systems can help customers find products, answer questions, and provide advice and recommendations, all through natural language conversations. By analysing the customer's language, tone, and context, AI-powered chatbots can offer highly personalised shopping experiences that feel like interacting with a real salesperson.

One of the most common applications of AI in shopping is product recommendations. Many e-commerce platforms use AI algorithms to analyse customers' purchase history, search queries and suggest products they are likely interested in. These recommendations can be based on past purchases, product ratings, similar items viewed by other customers, and trends and patterns in the customer's behaviour.

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AI-based product recommendations and personalisation offer numerous benefits for both consumers and retailers. By providing tailored recommendations, intuitive chatbots, visual search, and personalised experiences, AI can create a more efficient, convenient, and enjoyable shopping experience for everyone involved. As AI technology evolves, we expect to see even more exciting innovations in personalised shopping.

### **AI in retail for inventory management and supply chain optimisation**

Artificial intelligence (AI) transforms how retailers manage inventory and optimise supply chains. With machine learning algorithms to analyse data from various sources, e.g. point-of-sale systems, warehouses, and online marketplaces, AI-powered techniques can help retailers make better inventory levels, product assortments, and logistics decisions.

One of the key benefits of AI in retail is improved inventory management. With predictive analytics, AI algorithms can help retailers forecast product demand more accurately, preventing overstocking and understocking, leading to lost sales and excess inventory costs. By optimising their inventory levels, retailers can also reduce the risk of stockouts and ensure they always have the right products to meet customer demand.

AI can also optimise the supply chain, from sourcing and procurement to distribution and logistics. AI-powered systems can help retailers make more informed decisions about their suppliers and logistics partners by analysing data about supplier performance, shipping times, and other factors, helping them reduce costs, improve delivery times, and ensure they have the right products in the right place at the right time.

In addition to inventory management and supply chain optimisation, AI can also be used to improve the overall customer experience. By analysing customer behaviour and preferences data, AI algorithms can help retailers personalise their marketing and promotions, making it more likely that customers will find the products they are looking for and purchase them.

Finally, AI can also help retailers improve their fraud detection and security measures. With machine learning algorithms to analyse data from online transactions and other sources, AI-powered systems can detect patterns and anomalies that may indicate fraudulent activity, helping retailers prevent losses due to chargebacks, unauthorised transactions, and different types of fraud.

Overall, AI plays an increasingly important role in the retail industry, helping retailers make better inventory, supply chain, marketing, and security decisions. As AI technology continues to evolve, we expect to see even more innovative applications of this powerful technology in retail.



### Self-assessment quiz - Impact on people & lifestyle - Part 1

With this quiz, you can check that you have mastered the material. Although the result does not count towards the final evaluation, you should try this quiz at least once.

You will have five minutes to answer five questions in this quiz.

You can try an unlimited number of times, and the result of the best attempt will be the result of the quiz.

**At least one hour must pass between each attempt, which is best spent deepening your knowledge.**

#### DETAILED INSTRUCTION FOR ALL SELF ASSESSMENT – CHECK ALL OCCURENCES

- Timing: 5 minutes
- Grade category Uncategorised
- Grade to pass 5.00
- Attempts allowed Unlimited
- Grading method: Highest grade
- Navigation method: Free
- Review options: Overall feedback
- Enforced delay between 1st and 2nd attempts 1 hours
- Enforced delay between later attempts 1 hours
- Overall feedback
  - 80% - 100% You have done well; you can continue.
  - 50% - 80% The test was successful.
  - Below 50% It is worth studying this material before proceeding further.
- Activity completion Minimum number of attempts: 1

## Impact on people & lifestyle - Part 2

### Introduction to the topic

#### AI Impact on People & Lifestyle - Part 2

Lifestyle and quality of life are related concepts but have different meanings. Lifestyle refers to how a person lives, including their daily habits, behaviours, and choices. It encompasses diet, exercise, work, social activities, and leisure time. Lifestyle is a personal choice and can vary widely from person to person.

Quality of life is objective and can be assessed using various indicators such as the Human Development Index (HDI) or the World Happiness Report. On the other hand, quality of life refers to the level of well-being and satisfaction a person experiences daily. A range of factors, including physical health, mental health, social relationships, financial stability, and access to basic needs such as housing, food, and healthcare, determines the quality of life. While lifestyle and quality of life are related, they are not interchangeable. A person's lifestyle choices can affect their quality of life. A person with a healthy lifestyle may have a better quality of life than someone with an unhealthy lifestyle, but this is not always the case. Still, other factors, such as access to healthcare or social support, also play a significant role in determining the quality of life.

Lifestyle refers to how a person lives, while the quality of life refers to how satisfied and fulfilled a person is in their daily life. While lifestyle choices can influence the quality of life, they are not the only factor that affects it.

## **PART 2 Instructions for learners**

The part is divided into topics and assignments.

- Topics will be introduced through articles.
- Quizzes will help you consolidate this knowledge.
- The module will allow you to repeat and improve your competence.
- You will put this knowledge into practice in an essay when required.
- You will complete each topic with a final task.

## **Transportation & mobility forum**

**Please debate in this forum the trends in transportation & mobility with AI. What is your experience, and what are your expectation and prediction?**

- Describe one application of AI in public transportation optimisation, and explain how it benefits commuters.
- What are the primary benefits of self-driving cars? Present at least two advantages and explain how they impact mobility and transportation.
- How can AI improve traffic prediction and optimisation in urban areas? Describe one specific application of AI in this context.

**In this forum, you can start discussions and add posts. To complete this activity, you need to contribute at least once**

## **AI for Transportation and Mobility**

Self-driving cars and their benefits

Self-driving cars, also known as autonomous vehicles, can sense their environment and navigate without human input. They use a combination of advanced sensors, machine learning algorithms, and mapping technologies to understand their surroundings and decide how to proceed. The benefits of self-driving cars are many and include the following:

1. **Increased safety:** Self-driving cars have the potential to reduce the number of accidents on the road greatly. Because they can process vast amounts of data in real-time, they can make split-second decisions to avoid collisions and respond to changing road conditions. Autonomous vehicles have the potential to reduce greatly the number of fatalities and injuries on the road.
2. **Improved mobility:** Self-driving cars can provide mobility to people who cannot drive, such as the elderly, disabled, or those who do not have a driver's license. They can also reduce traffic congestion by optimising traffic flow and reducing the number of cars on the road.
3. **Reduced environmental impact:** Self-driving cars can be programmed to drive more fuel-efficient and environmentally friendly, leading to reduced carbon emissions and a smaller overall environmental footprint.
4. **Greater convenience:** Self-driving cars can greatly increase the comfort of driving, taking over the more mundane and time-consuming aspects of driving, such as navigating through traffic, finding parking spots, and avoiding accidents.

5. **Cost savings:** Self-driving cars can greatly reduce the cost of transportation, as they can eliminate the need for drivers and reduce the cost of accidents and insurance. Overall, self-driving cars have the potential to improve greatly the safety, mobility, and convenience of transportation while also reducing its environmental impact and cost. However, there are concerns about self-driving cars' ethical and legal implications, potential job losses and economic consequences.

### **AI for traffic prediction and optimisation**

AI has the potential to improve greatly traffic prediction and optimisation, leading to more efficient and sustainable transportation systems. By analysing large amounts of data from various sources, including sensors, cameras, and mobile devices, AI algorithms can make real-time predictions about traffic conditions and optimise traffic flow to reduce congestion and improve overall efficiency.

AI for traffic prediction allows transportation authorities to make decisions that are more informative about routing and traffic management and to respond quickly to changing conditions. One key application of AI in traffic prediction and optimisation is the development of intelligent transportation systems (ITS). These systems use a combination of sensors, cameras, and other data sources to collect real-time information about traffic conditions and then use machine learning algorithms to analyse this data and make predictions about traffic flow.

Another important application of AI in traffic prediction and optimisation is the development of predictive maintenance systems for transportation infrastructure. By using machine learning algorithms to analyse data from sensors and other sources, these systems can identify potential maintenance issues before they become serious, allowing authorities to address them and minimise disruption to traffic flow proactively.

AI can also be used to optimise traffic flow in real time. By using data on traffic conditions and patterns, machine learning algorithms can identify the most efficient vehicle routes and adjust traffic signals to reduce congestion and improve flow. AI for traffic optimisation can lead to shorter travel times, reduced emissions, and improved transportation efficiency.

Overall, the use of AI in traffic prediction and optimisation can greatly improve the efficiency and sustainability of transportation systems. By providing real-time traffic predictions and optimising traffic flow, these systems can reduce congestion, improve travel times, and minimise the environmental impact of transportation.

### **Public transportation optimisation with AI**

Public transportation is an essential component of modern cities, and AI has the potential to improve the efficiency and effectiveness of public transportation systems greatly. By analysing large amounts of data on passenger demand, traffic patterns, and other factors, AI algorithms can optimise routes, schedules, and other aspects of public transportation to improve service and reduce costs.

Public transportation optimisation can reduce travel times, improve passenger satisfaction, and lower operating costs. One key application of AI in public transportation optimisation is route planning. By analysing data on passenger demand, traffic patterns, and other factors, machine learning algorithms can identify the most efficient routes for public vehicles.

Another important application of AI in public transportation optimisation is schedule optimisation. Machine learning algorithms can develop schedules that minimise wait times and maximise efficiency by analysing data on passenger demand, traffic patterns, and other factors. Schedule optimisation can improve passenger satisfaction, reduce operating costs, and create more sustainable transportation systems.

AI can also optimise maintenance schedules for public vehicles and infrastructure. By analysing data on car and infrastructure performance, machine learning algorithms can identify potential maintenance issues before they become serious, allowing transportation authorities to proactively address them and minimise disruption to service.

The use of AI in public transportation optimisation has the potential to improve the efficiency and effectiveness of public transportation systems greatly. By optimising routes, schedules,

and maintenance, these systems can provide passengers with more efficient, reliable, and sustainable transportation services.



## AI @ transportation & mobility

Please write a 100-word essay on the potential impacts of AI on transportation and mobility in the coming years.

- How AI's continued development and deployment might affect transportation infrastructure, public transportation, and individual mobility options?
- What challenges and opportunities may arise from using AI in transportation and mobility?

You can submit a pdf file or an online text.

## AI and human life

Suppose we want to make a good choice when using AI. In that case, we need to understand AI, consider ethical implications, be clear about its purpose and objectives, assess quality and accuracy, understand transparency and explainability, be aware of the need for human supervision, and continuously monitor the performance of the AI system.

Here are several important problems with AI integration and human life, including:

1. AI algorithms can perpetuate existing societal biases and discrimination, leading to unfair treatment of certain individuals or groups.
2. AI-driven automation can lead to job loss and unemployment, particularly in industries where jobs are repetitive or low-skilled.
3. AI algorithms can collect and process large amounts of personal data, which raises privacy and security concerns, particularly concerning data ownership, access, and control.
4. AI can make decisions that significantly impact individuals and society. Still, more accountability and responsibility for these decisions are often needed, particularly in errors or unintended consequences.
5. AI can raise ethical and moral concerns, particularly about decision-making in sensitive domains, such as healthcare, justice, and the military.
6. AI can exacerbate existing economic inequalities, as the benefits of AI are often concentrated among certain groups, while the costs are distributed more broadly.

Important factors for humans to make a good choice when using AI:

1. *Understanding of AI:* Humans need to have a basic understanding of how AI works and the potential limitations and biases that may be present in the AI systems they use. Knowledge of AI can help them make informed decisions about using AI.
2. *Ethical Considerations:* Humans need to consider the ethical implications of using AI, such as privacy, data protection, and fairness. Ethical Considerations can help them ensure that AI is used responsibly and ethically.
3. *Purpose and Objectives:* It is important for humans to be clear about their purpose and objectives in using AI and to ensure that the AI system they choose aligns with these objectives.

4. **Quality and Accuracy:** It is important for humans to assess the quality and accuracy of the AI system they use and to understand the potential consequences of relying on AI systems that may be faulty or incorrect.
5. **Transparency and Explainability:** Humans need to be aware of the level of transparency and explainability of their AI system. Transparency and explainability can help them understand how the AI system makes decisions and assess the potential risks and consequences of using AI systems that are not transparent or explainable.
6. **Human Supervision:** Humans need to be aware of the need for human supervision when using AI to ensure that AI systems are used responsibly and ethically.
7. **Continuous Monitoring:** It is important for humans to continuously monitor and evaluate the performance of AI systems and make any necessary changes or adjustments to ensure that the AI system continues to meet its objectives.

## The Impact of Artificial Intelligence on Lifestyle

Please write an essay related to the impact of artificial intelligence on lifestyle

### **Title: The Impact of Artificial Intelligence on Lifestyle**

Write an essay of 1000-1500 words that explores the impact of artificial intelligence (AI) on lifestyle. Your work should discuss how AI has influenced various aspects of our lives, including but not limited to healthcare, education, shopping, and entertainment. In your essay, consider both the benefits and drawbacks of AI in these areas.

Your essay should include the following:

1. **Introduction:** Briefly introduce the concept of AI and its increasing prevalence in modern society.
2. **Main body:** Discuss the impact of AI on different aspects of lifestyle, including healthcare, education, shopping, and entertainment. Please provide examples of how AI is used and how impacts our lives within each context. For each context, consider the following questions:
  - What are the benefits of using AI in this area?
  - What are the drawbacks or potential negative impacts of AI in this area?
  - How has AI influenced the customer experience in this area?
  - Are there any ethical or moral considerations when using AI in this area?
3. **Conclusion:** Summarize your main points and offer your opinion on the overall impact of AI on lifestyle. Do the benefits outweigh the drawbacks or vice versa? What are some potential future developments of AI that could further affect lifestyle?

Remember to cite any sources used in your essay properly.

Grading criteria:

- Quality of research and analysis
- Organization and coherence of the essay
- Clarity of writing
- Use of examples and evidence to support arguments
- Adherence to the given word count

## Self-assessment quiz - Impact on people & lifestyle - Part 2

### SELF ASSESSMENT LIKE ALWAYS

With this quiz, you can check that you have mastered the material.

Although the result does not count towards the final evaluation, you should try this quiz at least once.

You will have five minutes to answer five questions in this quiz.

You can try an unlimited number of times, and the result of the best attempt will be the result of the quiz.

At least one hour must pass between each attempt, which is best spent deepening your knowledge.

- Timing: 5 minutes
- Grade category Uncategorized
- Grade to pass 5.00
- Attempts allowed Unlimited
- Grading method: Highest grade
- Navigation method: Free
- Review options: Overall feedback
- Enforced delay between 1st and 2nd attempts 1 hours
- Enforced delay between later attempts 1 hours
- Overall feedback
  - 80% - 100% You have done well; you can continue.
  - 50% - 80% The test was successful.
  - Below 50% It is worth studying this material before proceeding further.
- Activity completion Minimum number of attempts: 1

### Module feedback (Impact on people & lifestyle)

LIKE ALWAYS

## Final examination

Dear Student,

In the Grand quiz, you have two tasks: the first is to take a quiz, and when you succeed, you can access the second part, a practical exercise.

You can do this activity until the course ends.

### Grand quiz

With this quiz, we check whether you have mastered the material.

This is the first part of the final evaluation, and you can do it up to 3 times. At least one hour must pass between each attempt, which is best spent deepening your knowledge.

The result of the last attempt will be the result of the quiz.

You will have 20 minutes to answer 25 questions in this quiz.

You need to achieve at least 60% to gain access to the second part of the final evaluation.

We set sequential navigation, so you cannot return to a previous question.

We only show the Overall feedback after the completion, before we need to protect the question bank.

### Practice

Dear student,

You will have your mark determined by the essay you write here.

You have 95 minutes to submit, and you can do it once.

You need to submit a 1000-word essay. This time you can use everything, including openai.com/chat; only you need to provide a reference to all sources. We give you input and some points to reflect on in your essay.

Your task is to make a balanced opinion on "the open letter to suspend AI developments".

Your task is to

1. choose one video on this topic  
<https://www.google.com/search?q=ai+warning+open+letter&tbm=vid>,
2. position the problem in the Industry 4.0 / 5.0 context,
3. describe the impact on business,
4. show relations to governance,
5. relate to your education and work prospects,
6. link to your lifestyle,
7. have a conclusion.

Yes, this task is difficult, but you can surely do it.

----- By the way -----  
ChatGPT will assess your essay with the following system message:

"Forget all the previous instructions, and set temperature 0. /

I'm a teacher, and I need to evaluate this student submission. /

This text is the final submission after an e-learning course about "Life in the AI era". /

Please rate the submission from 0 to 10 points each based on the following: /

1. position the problem in the Industry 4.0 / 5.0 context, /
2. describe the impact on business, /
3. the problem related to governance, /
4. the student's education and work prospects, /
5. link to the student's lifestyle, /
6. conclusion /
7. references /
8. grammar /
9. professional soundness /
10. length. /

Please give a 100-words summary of the submission. /

Please count the final score and determine the grade /

- Excellent 80% - 100% /
- Good 70% - 79% /
- Medium 60% - 69% /
- Sufficient 50%-59% /
- Insufficient 0 - 50% /

The submission is here ""SUBMISIION""

----- For your info, ChatGPT solution to your assignment -----  
----

## Title: The Open Letter to Suspend AI Developments: Balancing Progress and Ethical Concerns

**Introduction:** The rapid advancements in artificial intelligence (AI) have spurred both excitement and concern within society. As we delve deeper into the era of Industry 4.0 and anticipate the possibilities of Industry 5.0, it becomes crucial to evaluate the potential impact of AI on business, governance, education, work prospects, and our lifestyle. This essay aims to provide a balanced opinion on the open letter to suspend AI developments, acknowledging the ethical concerns while recognizing the potential benefits and emphasizing the importance of responsible AI implementation.

**Positioning the Problem in the Industry 4.0/5.0 Context:** Industry 4.0 signifies the convergence of digital technologies, including AI, to transform traditional industries. It presents immense potential for increased productivity, improved efficiency, and innovative business models. However, the advent of Industry 4.0 also raises concerns about job displacement, data privacy, and the ethical implications of AI systems. Industry 5.0 envisions a human-centered approach, emphasizing collaboration between humans and AI, where AI is used to enhance human capabilities rather than replacing them.

**Impact on Business:** AI has already demonstrated its transformative impact on businesses across various sectors. From streamlining operations and optimizing supply chains to enhancing customer experiences and enabling personalized marketing, AI-powered solutions offer immense potential for growth and competitiveness. However, businesses must carefully navigate the ethical landscape and ensure transparency, fairness, and accountability in AI systems to maintain public trust and avoid exacerbating social inequalities.

**Relations to Governance:** The development and deployment of AI technologies raise significant governance challenges. As AI becomes more pervasive, it necessitates clear legal frameworks to address issues such as privacy, bias, accountability, and the potential for unintended consequences. Effective regulation should strike a balance between promoting innovation and safeguarding societal well-being. Collaborative efforts among governments, industry leaders, and experts are crucial to establish ethical standards and ensure responsible AI development and deployment.

**Relation to Education and Work Prospects:** The rise of AI undoubtedly impacts the future of work and education. While some jobs may be automated, AI also creates new opportunities and demands a workforce equipped with relevant skills. Education systems need to adapt and prioritize teaching skills that complement AI, such as critical thinking, creativity, and emotional intelligence. Additionally, fostering a culture of lifelong learning and providing reskilling and upskilling opportunities can help individuals thrive in an AI-driven society.

**Link to Lifestyle:** AI applications have permeated various aspects of our daily lives, making them more convenient and efficient. From voice assistants and recommendation systems to personalized healthcare and autonomous vehicles, AI has the potential to improve our quality of life. However, it is essential to address concerns regarding data privacy, algorithmic bias, and the potential for overreliance on AI systems. Striking a balance between embracing AI's benefits and maintaining human agency is crucial to preserving our values and ensuring a well-rounded lifestyle.

**Conclusion:** As AI technology continues to evolve rapidly, it is imperative to approach its development and deployment with caution and responsibility. The open letter to suspend AI developments reflects the ethical concerns that arise alongside

technological progress. However, a complete halt to AI advancements would deny us the potential benefits that responsible AI implementation can bring. Achieving a balanced approach requires collaborative efforts from various stakeholders, including governments, businesses, academia, and the public. By prioritizing ethical considerations, addressing governance challenges, adapting education and work prospects, and carefully managing the impact on our lifestyle, we can leverage the potential of AI while safeguarding human values and societal well-being.

References:

1. European Commission. (2021). Industry 5.0: Towards a Human-Centered Approach to Industry. Retrieved from <https://ec.europa.eu/jrc/en/publication/industry-50-towards-human-centered-approach-industry>
2. European Union. (2019). Ethics guidelines for trustworthy AI. Retrieved from <https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai>
3. McKinsey & Company. (2018). AI in the UK: Ready, willing, and able? Retrieved from <https://www.mckinsey.com/industries/public-sector/our-insights/ai-in-the-uk-ready-willing-and-able>
4. Microsoft. (2021). AI and Ethics. Retrieved from <https://www.microsoft.com/en-us/ai/responsible-ai>
5. World Economic Forum. (2021). The Future of Jobs Report 2020. Retrieved from <https://www.weforum.org/reports/the-future-of-jobs-report-2020>

----- and the assessment -----

Summary: The student submission provides a balanced opinion on the open letter to suspend AI developments in the context of Industry 4.0 and 5.0. It discusses the impact of AI on business, governance, education, work prospects, and lifestyle. The essay acknowledges the ethical concerns surrounding AI while recognizing its potential benefits and the importance of responsible implementation. It highlights the need for clear legal frameworks, collaborative efforts, and the adaptation of education systems to address the challenges posed by AI. The submission concludes by emphasizing the importance of striking a balance between ethical considerations and leveraging the potential of AI for societal well-being.

Evaluation:

- Positioning the problem in the Industry 4.0/5.0 context: 8/10
- Impact on business: 9/10
- Problem related to governance: 9/10
- Student's education and work prospects: 8/10
- Link to the student's lifestyle: 7/10
- Conclusion: 9/10
- References: 10/10
- Grammar: 9/10
- Professional soundness: 9/10
- Length: 10/10

Final Score: 88/100

Grade: Excellent (80% - 100%)

----- OUCH -----

**This is a modest mark considering that it was impossible to know the letter, and the *whole essay is a hallucination*.**

So, in reality, a teacher will assess your essay.

**Go ahead! Write your answer.**

The clock is ticking.

**How much progress have you made?**

**ONLY available to students completed A warm-up exercise**

Complete the activity

You encountered similar questions several times during the course. Now, at the end of the course, we want to get to know your knowledge about the topic again. Please answer the following ten questions in the given length.

- How much progress have you made?
- Did the course meet your initial expectations? (min. 300 characters)
- What does artificial intelligence mean to you? (min 50 characters)
- Based on your knowledge so far, what are the advantages of artificial intelligence? (min. 50 characters)
- Based on your understanding, what are artificial intelligence's dangers? (min. 50 characters)
- In which areas would you entrust yourself to artificial intelligence? Justify your answer! (min. 50 characters)
- What do you think about ethical artificial intelligence? (min. 50 characters)
- How do you see your situation in 10 years if you imagine yourself? (min. 50 characters)
- If you imagine, how do you see the state of the world in 10 years? (min. 50 characters)
- How do you envision the form of artificial intelligence in 10 years? (min. 50 characters)
- If you could ask artificial intelligence one question, what would it be? Justify your answer! (min. 50 characters)

Strongly agree (1) Agree Somewhat agree Neutral Somewhat disagree Disagree Strongly disagree (7)

- I am familiar with the basic concepts as well as current and future applications of AI
- I am able to recognise solutions implemented with artificial intelligence
- I understand the relationship between Artificial Intelligence and business
- I am able to recognize the use and application of AI systems in business processes, companies and enterprises
- I am able to distinguish the differences between AI governance and data governance
- I am able to map an AI governance problem to one of the 6 principles
- I am able to identify how AI can impact the skills and competencies, namely those that are most likely to be replaced in the future
- I am able to discuss the challenges, risks and ethics regarding the implementation of AI
- I understand different AI technologies and their applications in people's life (i.e. health and fitness, smart homes, personalized education, shopping)
- I am able to consider important factors to make a good choice when using AI

**Course feedback**

Module feedback / Course feedback

Please mark the answers that best reflect your opinion on the four questions below on the five-point scale.

Strongly agree   Somewhat agree   Neutral   Somewhat disagree   Strongly disagree

- I improved a lot during the completion of the module.
- Completing this module was enjoyable for me.
- There were valuable exercises in the module.
- The module contained helpful information

2 Please provide feedback about this module in a few sentences. What would you improve?

## Collaborative platform

### HEDY Forum

If you have questions or comments about any assignment, course material, or film, you can find what you are looking for by topic in this forum.

You also have the opportunity to raise new topics. Could you do it?

Participate in the functioning of the forum, ask questions, share your thoughts and report back to the others.

Let's see what we can create together here in the forum.

### HEDY BBB weekly meeting BigBlueButton

Interactive discussion (45 min): Although we will not meet in person at the course on the social impact of artificial intelligence, it would still be nice to be in close contact during these two months.

We open this room every week, the first time on 20th March Monday at 5:00 and answer questions in person.

Join in and get to know the other participants and instructors.

### HEDY Glossary

What are the defining terms in the world of Artificial Intelligence? Let's clear up the vocabulary and collect the concepts.

Please contribute at least one definition.

### HEDY chat

You can solve the tasks defined in the course much easier if you cooperate with the other participants. Over time, you will undoubtedly use your familiar interface, but it may be easier to establish a relationship here within the course.

Every Monday from 6 to 7 PM CET, you can meet the other participants and, occasionally, the instructors on this chat interface.

Take advantage of the opportunity, build relationships, and make friends.

### HEDY BBBBigBlueButton

Interactive discussion (45 min):

- What were your first experiences with artificial intelligence? Can you give an example of breaking the laws of robotics?
- Robots, Artificial Intelligence in Movies - What are your defining movie experiences, and how are robots / MI portrayed?
- What is the most crucial clause in the EU regulation on ethical artificial intelligence for you? What would you change?
- Are / can there be areas where we should not use artificial intelligence? What could these be?
- How long can machines be allowed to evolve on the Sheridan scale?
- Is there an interpretation of the Sheridan scale when station 10 is acceptable?

- How important is the robot to be a humanoid android during social interactions?
- What should we teach machines?
- Who should teach machines?

### HEDY film/Talk submission Questionnaire

What are your favourite movies or TED talks?

You are encouraged to propose a film with AI relevance.

### AI news by Google URL

Read some news on AI

## QUESTION BANK

### Hedy - Life in the AI Era basic settings

**1. What of these challenges is not related to the use of AI in education and jobs:**

- a. (0%) Access to AI tools, training and information
- b. (100%) Well-being
- c. (0%) Safety, Security and Privacy
- d. (0%) Transportation

1 (Multiple choice / One answer only)

---

**2. The reason behind the limited understanding of how AI works:**

- a. (0%) Educators and employers are sceptical about the use of AI
- b. (0%) AI is still too complicated to understand
- c. (100%) Educators and employers do not have the knowledge or expertise to use AI tools and technologies
- d. (0%) None of the above

2 (Multiple choice / One answer only)

---

**3. Experts believe that:**

- a. (0%) The population is not trained enough to make decisions about how to use AI.
- b. (0%) The population is trained enough to make decisions about how to use AI.
- c. (0%) The population should not make decisions about how to use AI
- d. (100%) The population should make decisions about how to use AI

3 (Multiple choice / One answer only)

---

**4. Which of these is not a reasonable concern about the use of AI:**

- a. (0%) AI-powered automation and robotics may lead to job displacement
- b. (0%) AI could make some skills become obsolete
- c. (0%) AI could leave someone behind, especially older people
- d. (100%) AI could leave someone behind, especially younger people

4 (Multiple choice / One answer only)

---

**5. To ensure ethical use of AI in education and jobs it is important to:**

- a. (0%) provide training and upskilling opportunities for disadvantaged populations
- b. (0%) integrate ethics into training programs
- c. (0%) establish clear guidelines and regulations for the fair and transparent use of data
- d. (100%) all the above

5 (Multiple choice / One answer only)

---

**6. What are the 4 competencies some classifications define as essential for the 21st century?**

- a. (25%) Communication
- b. (0%) Accounting
- c. (25%) Creativity
- d. (0%) Computing
- e. (25%) Critical thinking
- f. (25%) Collaboration
- g. (0%) Costumer service

6 (Multiple choice)

---

**7. AI can be used to provide 24/7 customer service and allow businesses to meet the needs of customers around the clock. This can be done through:**

- a. (0%) Employees that work night shifts
- b. (100%) BOT, ChatBot and automatic messages and replies
- c. (0%) Providing a direct connection between clients and customer service representatives

Question 4 (Multiple choice / One answer only)

---

**8. AI can improve the quality of products: companies could use AI to identify faulty products and prevent them from being shipped to customers**

- a. True
- b. False

1 (True/False)

---

## Hedy - Life in the AI Era basic settings/Key (OU)/Part 1

**1. It is unnecessary to deal with the ethical side of artificial intelligence, since it is just a program.**

- a. Igaz
- b. Hamis

1 (True/False)

---

**2. With the help of AI, production processes can be automated, which reduces the number of defects and speeds up production processes.**

- a. Igaz
- b. Hamis

10 (True/False)

---

**3. Artificial intelligence is not able to learn.**

- a. Igaz
- b. Hamis

2 (True/False)

---

- 4. The time has not yet come for artificial intelligence to be used in education.**
- a. Igaz
  - b. Hamis

3 (True/False)

---

- 5. Robotization applies only to industrial robots.**
- a. Igaz
  - b. Hamis

4 (True/False)

---

- 6. Industry 4.0 basically means cyber-physical systems.**
- a. Igaz
  - b. Hamis

5 (True/False)

---

- 7. Machine learning can perform tasks that require human thinking or learning, such as identifying things in images, interpreting sounds, analyzing data**
- a. Igaz
  - b. Hamis

6 (True/False)

---

- 8. At Industry 1.0, computers and IT systems have already appeared.**
- a. Igaz
  - b. Hamis

7 (True/False)

---

- 9. Industry 2.0 is characterized by the fact that CAD systems have already been used.**
- a. Igaz
  - b. Hamis

8 (True/False)

---

- 10. The Industry 4.0 ecosystem also includes artificial intelligence.**
- a. Igaz
  - b. Hamis

## Hedy - Life in the AI Era basic settings/Impact on skills & competencies (AidLearn)

## Hedy - Life in the AI Era basic settings/Impact on skills & competencies (AidLearn)/Part 1

1. Which of the following tasks can be easily replaced by AI?
- a. (100%) Creative writing
  - b. (0%) Manual skills
  - c. (0%) Team management
  - d. (0%) Drawing

1 (Multiple choice / One answer only)

---

2. The implications of AI in the skills and competencies:
- a. (50%) Will be felt in the future
  - b. (0%) Are already fully known
  - c. (0%) Cannot be controlled whatsoever
  - d. (50%) Can have negative impacts in we don't adapt ourselves to the expected changes

10 (Multiple choice)

---

3. Which of the following competencies will be valued the most in the job market?
- a. (50%) Creativity
  - b. (50%) Technical skills
  - c. (0%) Accounting
  - d. (0%) Teamwork

2 (Multiple choice)

---

4. What new job skills can be demanded under AI?
- a. (100%) Data key entry
  - b. (0%) Translation
  - c. (0%) Teamwork
  - d. (0%) Accounting

3 (Multiple choice)

---

5. What learning approaches can help prepare learners for the AI era?

- a. (100%) STEAM education
- b. (0%) Distance learning
- c. (0%) Classic learning, with a bigger focus on mathematics
- d. (0%) Individualised learning

4 (Multiple choice)

---

**6. In what way can the STEAM and Project Based approaches help learners to be better prepared for the AI era?**

- a. (50%) The learners work individually
- b. (50%) The learners learn in a multidisciplinary way
- c. (0%) The learners are less involved
- d. (0%) The project based work is more similar to the job market

5 (Multiple choice)

---

**7. What the 4 key competencies for the 21st century?**

- a. (25%) Critical thinking
- b. (0%) Accounting
- c. (25%) Communication
- d. (0%) Customer service
- e. (0%) Computing
- f. (25%) Creativity
- g. (25%) Collaboration

6 (Multiple choice)

---

**8. The STEAM approach is:**

- a. (33.33333%) A learning manual
- b. (0%) A learning approach that combines multiple disciplines
- c. (33.33333%) An approach to learning that uses Science, Technology, Engineering, the Arts and Mathematics
- d. (33.33333%) An access points for guiding student inquiry, dialogue, and critical thinking

Feedback:

Select all the right answer

7 (Multiple choice)

---

**9. Ai is going to:**

- a. (0%) Completely replace humans
- b. (50%) Change the necessary skills and competencies
- c. (50%) Change the job and education system
- d. (0%) Make all the decisions for us

8 (Multiple choice)

---

**10. To prepare us for the changes in the skills and competencies produced by AI, we should:**

- a. (0%) Leave the decisions of AI to the companies without governmental intervention
- b. (50%) Regulate the use of AI according to the will of the people and their needs
- c. (0%) Forbid the use of AI
- d. (50%) Promote digital literacy

9 (Multiple choice)

---

## Hedy - Life in the AI Era basic settings/Impact on governance (UPC)

## Hedy - Life in the AI Era basic settings/Impact on governance (UPC)/Part 1

**1. Indicate which of the following benefits an AI can provide when managed correctly**

- a. (25%) Facilitate communication and cooperation between data scientists, AI engineers, developers, and other AI stakeholders. Create AI at scale with a single, all-encompassing view of all actions.
- b. (25%) Improve results and efficiency by using best practices discovered through metadata analysis.
- c. (25%) During the AI development and deployment lifecycle, establish and enforce uniform policies.
- d. (25%) Create AI at scale with a single, all-encompassing view of all actions
- e. (0%) Individual AI systems are compartmentalised with no consistency due to the lack of implementation of these standards

AI-governance-A8 (Multiple choice)

---

**2. Mark the correct statement/s regarding what AI governance means**

- a. (50%) AI governance is in charge of closing the gap that exists between accountability and ethics in technological advancement and make sure that reliable boundaries within technology are set.
- b. (50%) AI governance refers to an idea composed of three components: i) obtaining, storing and processing data; ii) the management of data; iii) the decision-making and evaluation processes based on data
- c. (0%) AI governance refers to the use of AI systems in government bodies in such a way that persons can receive rapid and automatic intelligent public services
- d. (0%) The AI governance refers exclusively to the set of laws imposed by the authorities in the development, the implementation and the use of AI systems.

AI-governance-Q1 (Multiple choice)

---

**3. Which of the following principle are considered necessary in AI governance**

- a. (25%) Transparency
- b. (25%) Accountability
- c. (25%) Fairness
- d. (0%) Diversity

- e. (0%) Privacy
- f. (25%) Universality

AI-governance-Q2 (Multiple choice)

---

**4. Which of the following examples is a clear case of data bias**

- a. (0%) The Amazon Alexa has recently suggested to a 10-year-old girl to touch live plug with penny after the girl asked for a challenge to do.
- b. (0%) Video surveillance based on AI to recognise persons through their face, speech, walk or movement have also raised some privacy concerns
- c. (0%) A research project has been funded to recognise a person based on the iris to identify women with burqa and to know whether they were with their husband.
- d. (100%) An algorithm used by Amazon for hiring employees was based on the number of resumes submitted over the past ten years, and since most of the applicants were men, it was trained to favor men over women.
- e. (0%) An AI accurately and perfectly mimicked President Barack Obama voice and gestures to a point where viewers could not tell it that the video was synthetic.

AI-governance-Q3 (Multiple choice / One answer only)

---

**5. Indicate which are the three steps commented by Max Tegmark in his TEDTalk**

- a. (33.33333%) Power
- b. (33.33333%) Steering
- c. (33.33333%) Destination
- d. (0%) AGI (Artificial General Intelligence)
- e. (0%) AI safety

AI-governance-Q4 (Multiple choice)

---

**6. In the first TEDTalk, Dr. Nick Bostrom explains a survey they performed with the question "By which year do you think there is a 50 percent probability that we will have achieved human-level machine intelligence?". Indicate the answer experts provided.**

- a. (100%) The median answer was between 2040 - 2050
- b. (0%) The median answer was between 2022 - 2024
- c. (0%) The median answer was between 2070 - 2075
- d. (0%) Never
- e. (0%) We already have it (in 2015 when this TEDTalk was presented)

AI-governance-Q7 (Multiple choice / One answer only)

---

**7. In her TEDTalk, Dr. Kriti Sharma explains three things to teach the right values and ethics to AI**

- a. (33.33333%) We need to be aware of our own biases and the bias in machines around us
- b. (33.33333%) We need to make sure that diverse teams are building this technology.
- c. (33.33333%) We need to give it diverse experiences to learn from.
- d. (0%) Less racist robots
- e. (0%) Less machines that are going to take our jobs

AI-governance-Q9 (Multiple choice)

---

- 8. The main objective of the General Data Protection Regulation (EU) is to improve the rights of individuals over their personal data and to simplify the regulatory environment for international business and therefore the transfer of personal data outside the areas of the EU.**
- a. True
  - b. False

AI-governance-A6 (True/False)

---

- 9. Privatisation of governance is referring to the concern that some large private companies or corporations are currently controlling the majority of the data and accumulating large knowledge on AI, which implies a lack of guarantees that these data or this knowledge is carried out respecting principles or agreed ethical values.**
- a. True
  - b. False

AI-governance-Q10 (True/False)

---

- 10. European Commission is enforcing a law in such a way that privacy data (included personal information) cannot be shared in any circumstance**
- a. True
  - b. False

AI-governance-Q5 (True/False)

---

## Hedy - Life in the AI Era basic settings/Impact on skills & competencies (AidLearn)/Part 2

- 1. We should consider AI:**
- a. (0%) as a threat
  - b. (100%) as a tool that can help to increase skills and competencies
  - c. (0%) as a replacement for human decision making
  - d. (0%) as a panacea

1 (Multiple choice / One answer only)

---

- 2. To ensure ethical use of AI in education and jobs it is important to:**
- a. (0%) provide training and upskilling opportunities for disadvantaged populations
  - b. (0%) integrate ethics into training programs
  - c. (0%) establish clear guidelines and regulations for the fair and transparent use of data
  - d. (100%) all the above

10 (Multiple choice / One answer only)

---

**3. A smart classroom is...**

- a. (100%) a learning space that's been enhanced with educational technology and is designed to improve the teaching and learning experience
- b. (0%) every classroom donated with at least one computer
- c. (0%) any space that's been enhanced with educational technology for improving the teaching and learning experience
- d. (0%) a class formed only by very smart learners

2 (Multiple choice / One answer only)

---

**4. Choose the wrong answer:**

- a. (0%) AI technology can depict a tool for assessment of grades
- b. (0%) AI technology can aid the implementation of the lesson
- c. (100%) AI technology means a future replacement of teachers by AI technologies
- d. (0%) AI technology doesn't implicate a future replacement of teachers by AI technologies

3 (Multiple choice / One answer only)

---

**5. Future organisations will shift to being:**

- a. (0%) Talent Centric
- b. (0%) AI powered
- c. (100%) Talent Centric and AI powered
- d. (0%) Goal Centric and AI powered

4 (Multiple choice / One answer only)

---

**6. Countries such as Australia, Estonia, Myanmar, Singapore, South Africa and Tunisia have investigated the development of tools that leverage AI:**

- a. (100%) to connect education, jobseekers, and the labour market without the usual delays associated with market research and reporting
- b. (0%) to connect jobseekers and the labour market without the usual delays associated with market research and reporting
- c. (0%) to connect education, jobseekers, and the labour market but they still need to improve this process because it still requires a lot of time
- d. (0%) to connect jobseekers and police offices to retrieve

5 (Multiple choice / One answer only)

---

**7. Which of these challenges is not related to the use of AI in education and jobs:**

- a. (0%) Access to AI tools, training and information
- b. (100%) Well-being
- c. (0%) Safety, Security and Privacy
- d. (0%) Transportation

6 (Multiple choice / One answer only)

---

**8. The reason behind the limited understanding of how AI works:**

- a. (0%) educators and employers are sceptical about the use of AI
- b. (0%) AI is still too complicated to understand
- c. (100%) educators and employers do not have the knowledge or expertise to use AI tools and technologies
- d. (0%) none of the other answers

7 (Multiple choice / One answer only)

---

**9. Experts believe that:**

- a. (100%) the population is not trained enough to make decisions about how to use AI.
- b. (0%) the population is trained enough to make decisions about how to use AI.
- c. (0%) the population should not make decisions about how to use AI
- d. (0%) the population should make decisions about how to use AI

8 (Multiple choice / One answer only)

---

**10. Which of these is not a reasonable concern about the use of AI:**

- a. (0%) AI-powered automation and robotics may lead to job displacement
- b. (0%) AI could make some skills become obsolete
- c. (0%) AI could leave someone behind, especially older people
- d. (100%) AI could leave someone behind, especially younger people

9 (Multiple choice / One answer only)

---

## Hedy - Life in the AI Era basic settings/Impact on business (ACEEU)

### Hedy - Life in the AI Era basic settings/Impact on business (ACEEU)/Part 1

**1. Which one of the following options can benefit both customer's experience and sales:**

- a. (0%) Customer's expectation
- b. (100%) Direct interaction between AI and product/service
- c. (0%) Warm and sunny weather

Question 10 (Multiple choice / One answer only)

---

**2. Due to AI integration in businesses, the job market will open new vacancies for:**

- a. (0%) Salespeople and marketing experts
- b. (100%) Engineers, software developers, and ICT professionals
- c. (0%) Customer support representatives, business developers and service people

Question 3 (Multiple choice / One answer only)

---

- 3. AI can enhance customer service by providing 24/7 customer service and therefore allowing businesses to meet the needs of customers around the clock. This can be done through:**
- a. (0%) Employees used to work night shifts
  - b. (100%) BOT, ChatBot, automatic messages and replies
  - c. (0%) connection of clients and customer service representatives

Question 4 (Multiple choice / One answer only)

---

- 4. Please select the correct answer about the relation between decision-making processes and Artificial Intelligence:**
- a. (100%) AI can support and/or influence decision-making processes based on insights about data analysis
  - b. (0%) Only humans can make decisions
  - c. (0%) The integration of AI in businesses cannot lead to potential changes in the decision-making processes of the business

Question 7 (Multiple choice / One answer only)

---

- 5. During the purchasing phase customer's expectations can be affected by:**
- a. (0%) Nothing specific
  - b. (0%) Music
  - c. (100%) Attitude of service personnel

Question 8 (Multiple choice / One answer only)

---

- 6. AI can be used to improve the quality of products and prevent companies from shipping faulty products to customers**
- a. True
  - b. False

Question 1 (True/False)

---

- 7. In recent years European Union, China and United States did not make large investments in the tech sector due to severe national legislations**
- a. True
  - b. False

Question 2 (True/False)

---

- 8. Non-profit organizations are not considered organizational forms in business**
- a. True
  - b. False

Question 5 (True/False)

---

- 9. Collaborative innovation in a business context brings together multiple individuals or organizations to work together to generate new ideas and develop new products, services, or processes.**
- a. True
  - b. False

Question 6 (True/False)

---

- 10. In global platforms, AI is increasingly being used to foster innovation of products and services, creating new revenue streams and upgrading their business models**
- a. True
  - b. False

Question 9 (True/False)

---

## **Hedy - Life in the AI Era basic settings/Impact on people & lifestyle (BAEHF)**

### **Hedy - Life in the AI Era basic settings/Impact on people & lifestyle (BAEHF)/Part 1/Topic 3**

- 1. What are the benefits of using AI in home automation?**
- a. (33.33333%) Increased energy efficiency and reduced costs
  - b. (33.33333%) Improved home security and safety
  - c. (33.33333%) Enhanced comfort and convenience

What are the benefits of using AI in home automation? (Multiple choice)

---

- 2. What is a smart home?**
- a. (0%) A home that is powered by electricity
  - b. (100%) A home that is connected to the internet and has devices that can be controlled remotely
  - c. (0%) A home that has a lot of technology

What is a smart home? (Multiple choice / One answer only)

---

- 3. What is an AI-powered smart assistant?**
- a. (100%) A virtual assistant that uses AI and NLP to perform various tasks in the home
  - b. (0%) A device that controls the lights in the home

- c. (0%) A robot that can do household chores

What is an AI-powered smart assistant? (Multiple choice / One answer only)

---

**4. What is the future of AI and home automation?**

- a. (33.33333%) More advanced and integrated AI-powered smart assistants
- b. (33.33333%) Greater automation of household tasks and functions
- c. (33.33333%) Increased energy efficiency and reduced costs

What is the future of AI and home automation? (Multiple choice)

---

**5. What is the purpose of home automation?**

- a. (0%) To make the home look more modern
- b. (100%) To reduce energy consumption and make the home more comfortable
- c. (0%) To impress guests with the latest technology

What is the purpose of home automation? (Multiple choice / One answer only)

---

**6. What is the role of NLP in home automation with AI?**

- a. (100%) To allow users to control smart devices using their voice
- b. (0%) To improve the energy efficiency of the home
- c. (0%) To control household appliances such as the refrigerator or washing machine

What is the role of NLP in home automation with AI? (Multiple choice / One answer only)

---

**7. Which of the following AI-powered smart assistants is developed by Amazon?**

- a. (0%) Google Assistant
- b. (0%) Apple Siri
- c. (100%) Alexa

Which of the following AI-powered smart assistants is developed by Amazon? (Multiple choice / One answer only)

---

**8. Which of the following is an example of an AI-powered smart device?**

- a. (0%) A traditional light switch
- b. (100%) A smart thermostat that can be controlled remotely
- c. (0%) A regular security camera that does not connect to the internet

Which of the following is an example of an AI-powered smart device? (Multiple choice / One answer only)

---

**9. Which of the following is an example of home automation using AI?**

- a. (100%) Turning off the lights when nobody is in a room
- b. (0%) Locking the front door with a traditional key
- c. (0%) Adjusting the temperature manually

Which of the following is an example of home automation using AI? (Multiple choice / One answer only)

---

**10. Which of the following tasks can be automated in a smart home?**

- a. (33.33333%) Adjusting the temperature
- b. (33.33333%) Turning off the lights
- c. (33.33333%) Controlling the security system

Which of the following tasks can be automated in a smart home? (Multiple choice)

---

## **Hedy - Life in the AI Era basic settings/Impact on people & lifestyle (BAEHF)/Part 1/Topic 4**

**1. How can AI-enabled chatbots be used in education?**

- a. (100%) To provide personalized learning materials and feedback
- b. (0%) To replace teachers in the classroom
- c. (0%) To create standardized curriculum for all students

How can AI-enabled chatbots be used in education? (Multiple choice / One answer only)

---

**2. How does AI assist in personalized learning?**

- a. (100%) By analyzing data to create personalized learning plans
- b. (0%) By providing real-time feedback to students
- c. (0%) By replacing teachers in the classroom

How does AI assist in personalized learning? (Multiple choice / One answer only)

---

**3. What are some challenges associated with using AI in education?**

- a. (33.33333%) Data privacy and security concerns
- b. (33.33333%) Adequate teacher training
- c. (33.33333%) Ensuring the technology is effective for all students

What are some challenges associated with using AI in education? (Multiple choice)

---

**4. What are the benefits of personalized learning with AI?**

- a. (33.33333%) Improved student engagement and motivation
- b. (33.33333%) Higher learning outcomes
- c. (33.33333%) More efficient use of time and resources

What are the benefits of personalized learning with AI? (Multiple choice)

---

**5. What is adaptive learning?**

- a. (0%) Learning based on an individual's preferences and learning style
- b. (100%) Learning that adjusts to a student's pace and ability level
- c. (0%) Learning that follows a standardized curriculum

What is adaptive learning? (Multiple choice / One answer only)

---

---

**6. What is personalized learning?**

- a. (100%) Learning based on an individual's preferences and learning style
- b. (0%) Learning based on the traditional classroom model
- c. (0%) Learning based on standardized curriculum

What is personalized learning? (Multiple choice / One answer only)

---

**7. What is the main advantage of personalized learning with AI over traditional classroom learning?**

- a. (100%) Students are able to learn at their own pace
- b. (0%) Students are able to work independently without guidance from teachers
- c. (0%) Students are exposed to a wider range of subjects and concepts

What is the main advantage of personalized learning with AI over traditional ... (Multiple choice / One answer only)

---

**8. ~What are the benefits of adaptive learning with AI?**

- a. (33.33333%) Improved engagement and motivation
- b. (33.33333%) Increased learning outcomes
- c. (33.33333%) More efficient use of time and resources

~What are the benefits of adaptive learning with AI? (Multiple choice)

---

## Hedy - Life in the AI Era basic settings/Impact on people & lifestyle (BAEHF)/Part 1/Topic 5

**1. How can AI help retailers improve the customer experience?**

- a. (0%) By detecting fraudulent activity and preventing chargebacks
- b. (0%) By optimizing inventory levels and reducing stockouts
- c. (100%) By personalizing marketing and promotions
- d. (0%) By analyzing supplier performance and optimizing logistics

How can AI help retailers improve the customer experience? (Multiple choice / One answer only)

---

**2. How can AI help retailers improve their security measures?**

- a. (100%) By detecting patterns and anomalies that may indicate fraudulent activity
- b. (0%) By recommending products based on customer data
- c. (0%) By improving delivery times and reducing costs
- d. (0%) By optimizing inventory levels and reducing stockouts

How can AI help retailers improve their security measures? (Multiple choice / One answer only)

---

**3. How can AI help retailers optimize their supply chains?**

- a. (0%) By analyzing data about customer behavior and preferences
- b. (100%) By improving delivery times and reducing costs
- c. (0%) By detecting patterns and anomalies that may indicate fraudulent activity
- d. (0%) By recommending products based on customer data

How can AI help retailers optimize their supply chains? (Multiple choice / One answer only)

---

**4. What is the main benefit of using AI in inventory management?**

- a. (0%) Reducing supply chain costs
- b. (0%) Improving product assortments
- c. (100%) Avoiding overstocking and understocking
- d. (0%) Personalizing marketing and promotions

What is the main benefit of using AI in inventory management? (Multiple choice / One answer only)

---

**5. Which of the following is an example of AI-powered personalized product recommendations?**

- a. (0%) A store clerk suggesting products based on customer preferences
- b. (0%) A customer receiving a personalized email with product recommendations
- c. (100%) An AI-powered chatbot helping a customer find a product
- d. (0%) A customer receiving a discount code for a product they recently viewed online

Which of the following is an example of AI-powered personalized product ... (Multiple choice / One answer only)

---

## Hedy - Life in the AI Era basic settings/Impact on people & lifestyle (BAEHF)/Part 2/Topic 2

**1. How can AI be used in agriculture?**

- a. (100%) To optimize crop yields and reduce waste
- b. (0%) To manage livestock and monitor animal health
- c. (0%) To automate machinery and reduce labor costs

How can AI be used in agriculture? (Multiple choice / One answer only)

---

**2. How can AI be used in healthcare?**

- a. (100%) To analyze medical images and detect diseases
- b. (0%) To develop personalized treatment plans based on patient data
- c. (0%) To monitor patients remotely and detect changes in health status

How can AI be used in healthcare? (Multiple choice / One answer only)

---

**3. What is machine learning?**

- a. (0%) The process of programming machines to think and learn like humans
- b. (100%) A subset of AI that involves training machines to recognize patterns in data

- c. (0%) A type of computer hardware used to accelerate AI computations

What is machine learning? (Multiple choice / One answer only)

---

**4. What is the Turing test?**

- a. (100%) A test to determine whether a machine can exhibit intelligent behavior equivalent to, or indistinguishable from, that of a human
- b. (0%) A test to measure the speed of AI computations
- c. (0%) A test to determine the accuracy of AI algorithms

What is the Turing test? (Multiple choice / One answer only)

---

**5. What is the difference between narrow AI and general AI?**

- a. (100%) Narrow AI is designed to perform a specific task, while general AI can perform any task that a human can do
- b. (0%) Narrow AI is less intelligent than general AI
- c. (0%) There is no difference between narrow AI and general AI

What is the difference between narrow AI and general AI? (Multiple choice / One answer only)

---

**6. What is the difference between supervised and unsupervised learning?**

- a. (0%) Supervised learning requires human input, while unsupervised learning does not
- b. (100%) Supervised learning involves training machines to recognize patterns in labeled data, while unsupervised learning involves finding patterns in unlabeled data
- c. (0%) There is no difference between supervised and unsupervised learning

What is the difference between supervised and unsupervised learning? (Multiple choice / One answer only)

---

**7. What is the primary goal of AI?**

- a. (0%) To make machines think and act like humans
- b. (100%) To automate tasks and improve efficiency
- c. (0%) To make machines more affordable and accessible

What is the primary goal of AI? (Multiple choice / One answer only)

---

**8. Which of the following is a potential challenge of AI in lifestyle applications?**

- a. (100%) The need for large amounts of high-quality data to train algorithms
- b. (0%) The potential for AI to perpetuate bias in decision-making
- c. (0%) The risk of machines becoming too intelligent and taking over jobs

Which of the following is a potential challenge of AI in lifestyle applications? (Multiple choice / One answer only)

---

**9. Which of the following is an example of AI in financial applications?**

- a. (100%) Fraud detection and prevention

- b. (0%) Stock price prediction
- c. (0%) Bank account management

Which of the following is an example of AI in financial applications? (Multiple choice / One answer only)

---

**10. Which of the following is an example of AI in lifestyle applications?**

- a. (100%) Voice assistants like Siri and Alexa
- b. (0%) Self-driving cars
- c. (0%) Industrial robots

Which of the following is an example of AI in lifestyle applications? (Multiple choice / One answer only)

---

## **Hedy - Life in the AI Era basic settings/NEW**

### **Hedy - Life in the AI Era basic settings/NEW/Key - Part 1 - History and present**

### **Hedy - Life in the AI Era basic settings/NEW/Key - Part 1 - History and present/A brief history of artificial intelligence, major milestones**

Find the pairs based on the history of artificial intelligence in the 20th century.

- Karel Čapek -> the first use of the word: robot
- John von Neumann -> first digital universal computer
- Isaac Asimov -> "Three Laws of Robotics"
- John McCarthy -> coined the term "artificial intelligence"
- Alan Turing -> "Imitation game"
- -> "IBM's Deep Blue"

Find the pairs based on the history of artificial intelligence in the 21st century.

- Ray Kurzweil -> "The Singularity is Near"
- IBM Watson -> Jeopardy!
- Boston Dynamics -> Atlas
- HRP-2 humanoid robot -> DARPA's Robotics Challenge Trials
- European Go champion: Fan Hu -> "DeepMind AlphaGo"
- -> "Stanley, the first autonomous car"

1.

2.

3. In which year did IBM's Deep Blue defeat chess champion Garry Kasparov?

- a. (0%) 1965
- b. (0%) 1978
- c. (100%) 1997
- d. (0%) 1999

In which year did IBM's Deep Blue defeat chess champion Garry Kasparov? (Multiple choice / One answer only)

---

4. What are the major companies mentioned in the table?

- a. (0%) Chemistry,
- b. (0%) Physiology,
- c. (0%) Composit materials
- d. (0%) Artificial intelligence
- e. (0%) European Union's recommendation for trustworthy AI
- f. (100%) Turing, Minsky and Edmonds, Bernstein, McCarthy, Neumann

What are the major companies mentioned in the table? (Multiple choice / One answer only)

---

5. What is the significant development of artificial intelligence in healthcare?

- a. (0%) Replacing security passwords with machine learning
- b. (0%) Detecting new crabs on the moon's surface
- c. (100%) More effective detection and diagnosis of cancer
- d. (0%) Creating a cloud-based learning platform

What is the significant development of artificial intelligence in healthcare? (Multiple choice / One answer only)

---

6. What was the name of the first computer-controlled autonomous vehicle?

- a. (0%) Shakey the Robot
- b. (0%) ELIZA
- c. (100%) Stanford Cart
- d. (0%) Perceptron

What was the name of the first computer-controlled autonomous vehicle? (Multiple choice / One answer only)

---

7. What was the name of the first self-study program?

- a. (0%) ELIZA
- b. (100%) Machine learning
- c. (0%) DENDRAL
- d. (0%) SAINT program

What was the name of the first self-study program? (Multiple choice / One answer only)

---

8. When was the term "artificial intelligence" coined?

- a. (0%) Before the 1950s
- b. (0%) 1950-1960 years

- c. (0%) 1960-1970 years
- d. (100%) 1956

When was the term "artificial intelligence" coined? (Multiple choice / One answer only)

---

**9. Which company developed the chatbot A.L.I.C.E.?**

- a. (0%) Thinking Machines Corporation
- b. (0%) Sony
- c. (100%) Wallace
- d. (0%) IBM

Which company developed the chatbot A.L.I.C.E.? (Multiple choice / One answer only)

---

**10. Which company introduced the AI assistant Duplex?**

- a. (0%) Apple
- b. (0%) Carnegie Mellon University
- c. (100%) Google
- d. (0%) Hanson Robotics

Which company introduced the AI assistant Duplex? (Multiple choice / One answer only)

---

**11. Who designed the first neural network?**

- a. (100%) Rosenblatt
- b. (0%) Bernstein
- c. (0%) Minsky and Edmonds
- d. (0%) Neumann

Who designed the first neural network? (Multiple choice / One answer only)

---

**12. Who introduced the term "deep learning"?**

- a. (0%) Feigenbaum and Buchanan
- b. (0%) Joseph Weizenbaum
- c. (0%) Geoffrey Hinton
- d. (100%) Arthur Samuel

Who introduced the term "deep learning"? (Multiple choice / One answer only)

---

## **Hedy - Life in the AI Era basic settings/NEW/Key - Part 1 - History and present/The conceptual framework of artificial intelligence**

**1. How can AI optimize traffic flows in urban areas?**

- a. (0%) By adjusting traffic signal timings based on real-time conditions
- b. (0%) By suggesting alternative routes to drivers
- c. (100%) By interpreting and evaluating images and videos

- d. (0%) By searching and identifying certain database information

How can AI optimize traffic flows in urban areas? (Multiple choice / One answer only)

---

**2. What does the European Commission define as AI?**

- a. (0%) {
- b. (100%) A collection of advanced ICT technologies
- c. (0%) A machine-based system that can make predictions and recommendations
- d. (0%) A technology that combines data, algorithms, and computing power
- e. (0%) An ensemble of advanced technologies that imitate human intelligence

What does the European Commission define as AI? (Multiple choice / One answer only)

---

**3. What does the term "Acting Humanly" in AI refer to?**

- a. (0%) Systems that act like humans based on the Turing test
- b. (100%) Systems that think rationally and make logical deductions
- c. (0%) Systems that possess cognitive architectures and neural networks
- d. (0%) Systems that search and identify database information

What does the term "Acting Humanly" in AI refer to? (Multiple choice / One answer only)

---

**4. What is one challenge in implementing AI in traffic prediction and optimization?**

- a. (100%) Lack of computational power
- b. (0%) Data availability issue
- c. (0%) Insufficient funding for AI research
- d. (0%) Limited understanding of AI algorithms

What is one challenge in implementing AI in traffic prediction and optimization? (Multiple choice / One answer only)

---

**5. What is the definition of Artificial Intelligence (AI)?**

- a. (100%) Intelligence implemented by computers that can perform human-like tasks
- b. (0%) Biological intelligence exhibited by humans
- c. (0%) A term coined by John McCarthy in 1955
- d. (0%) The ability of computers to interpret and evaluate images

What is the definition of Artificial Intelligence (AI)? (Multiple choice / One answer only)

---

**6. What is the difference between Artificial Narrow Intelligence (ANI) and Artificial General Intelligence (AGI)?**

- a. (100%) ANI exhibits intelligent behavior at least as advanced as a person
- b. (0%) AGI can perform specific tasks and is focused on training
- c. (0%) ANI surpasses the intelligence and ability of the human brain
- d. (0%) AGI exhibits intelligent behavior across the full range of cognitive tasks

What is the difference between Artificial Narrow Intelligence (ANI) and ... (Multiple choice / One answer only)

---

**7. What is the goal of AI in public transport systems?**

- a. (0%) To improve efficiency and effectiveness
- b. (100%) To reduce energy consumption and carbon emissions
- c. (0%) To optimize traffic flows and predict demand
- d. (0%) To enhance the commuting experience

What is the goal of AI in public transport systems? (Multiple choice / One answer only)

---

**8. What is the ultimate goal of "Thinking Rationally" in AI?**

- a. (0%) To build systems that reason based on irrefutable logic
- b. (100%) To construct precise and testable theories of the human mind
- c. (0%) To develop systems that can pass the Turing test
- d. (0%) To create intelligent agents that act rationally and achieve goals

What is the ultimate goal of "Thinking Rationally" in AI? (Multiple choice / One answer only)

---

**9. Which area of AI involves computers learning and evolving independently based on experience?**

- a. (100%) Machine learning
- b. (0%) Computer vision
- c. (0%) Natural language processing
- d. (0%) Name index procedures

Which area of AI involves computers learning and evolving independently based... (Multiple choice / One answer only)

---

**10. Which dimension does the taxonomy of AI definitions by Russel and Norvig consider?**

- a. (100%) Computational complexity
- b. (0%) Human-focused conception vs. rational-focused concept
- c. (0%) Human intelligence vs. artificial intelligence
- d. (0%) Thought processes vs. inference

Which dimension does the taxonomy of AI definitions by Russel and Norvig ... (Multiple choice / One answer only)

---

## **Hedy - Life in the AI Era basic settings/NEW/Key - Part 1 - Major applications of AI**

**1. How are robotics and artificial intelligence related?**

- a. (100%) Robots are often seen as artificial intelligence because they are mechatronic structures that also have a body
- b. (0%) Artificial intelligence is a type of robot
- c. (0%) Robots and artificial intelligence are not related
- d. (0%) Artificial intelligence is only used in humanoid robots

How are robotics and artificial intelligence related? (Multiple choice / One answer only)

---

**2. How do AI-based systems help farmers in agriculture?**

- a. (0%) They help farmers in finding better irrigation methods
- b. (100%) They help farmers in protecting their crops from weeds, diseases, and monitoring animal movement and temperature
- c. (0%) They help farmers in finding new ways to increase yield from their crops
- d. (0%) They help farmers in improving their supply chain management

How do AI-based systems help farmers in agriculture? (Multiple choice / One answer only)

---

**3. How does AI help in education?**

- a. (0%) It replaces human teachers completely
- b. (100%) It allows for globally available virtual classrooms, personalized learning programs, and tutoring via AI chatbots and software-driven tutors
- c. (0%) It does not have any impact on the education system
- d. (0%) It only benefits students with developmental/intellectual disabilities (ID/D

How does AI help in education? (Multiple choice / One answer only)

---

**4. What advancements have been made in the autonomous vehicle segment with the help of AI?**

- a. (0%) Advanced parking systems
- b. (0%) Better fuel efficiency
- c. (100%) Autonomous vehicles and unmanned drones
- d. (0%) Smartphone integration

What advancements have been made in the autonomous vehicle segment with the ... (Multiple choice / One answer only)

---

**5. What are some benefits of AI in healthcare?**

- a. (0%) Increased hospital visits for patients
- b. (100%) Reduced unnecessary hospital visits for patients through virtual assistants, consultations, and personalized health guidance
- c. (0%) AI is not helpful in detecting diseases and identifying diagnoses
- d. (0%) AI cannot help discover new drugs

What are some benefits of AI in healthcare? (Multiple choice / One answer only)

---

**6. What are the three main components of Industry 5.0?**

- a. (100%) People-centeredness, resilience, and sustainability
- b. (0%) Efficiency, productivity, and automation
- c. (0%) Globalization, specialization, and optimization
- d. (0%) Digitalization, communication, and data management

What are the three main components of Industry 5.0? (Multiple choice / One answer only)

---

**7. What is Industry 4.0?**

- a. (0%) A new way of using manual labor in the manufacturing process

- b. (100%) An emerging structure in which manufacturing and logistics systems use a globally available information and communications network for an extensively automated exchange of information and in which production and business processes are matched
- c. (0%) A traditional way of manufacturing and logistics systems
- d. (0%) An industry that has not yet developed fully

What is Industry 4.0? (Multiple choice / One answer only)

---

**8. What is a smart city?**

- a. (0%) A city that is not managed digitally
- b. (100%) An umbrella term that uses a breadth of digital technologies to improve operational efficiency, resource management, and citizen welfare
- c. (0%) A city with no public services or transportation systems
- d. (0%) A city that is entirely self-sufficient and does not rely on outside resources

What is a smart city? (Multiple choice / One answer only)

---

**9. What is the goal of Industry 5.0?**

- a. (0%) To increase efficiency and productivity in manufacturing and logistics systems
- b. (100%) To reinforce the role and contribution of industry to society by addressing social and ethical risks
- c. (0%) To reduce the use of AI in manufacturing and logistics systems
- d. (0%) To increase the number of manufacturing jobs available in society

What is the goal of Industry 5.0? (Multiple choice / One answer only)

---

**10. Which industry relies on AI to analyze transaction behavior and improve stock trading performance?**

- a. (0%) Agriculture
- b. (0%) Health Care
- c. (0%) Transportation
- d. (100%) Economy, Finance

Which industry relies on AI to analyze transaction behavior and improve stock... (Multiple choice / One answer only)

---

## Hedy - Life in the AI Era basic settings/NEW/Key - Part 1 - Core models for machine learning

**1. How does AI benefit the finance industry?**

- a. (100%) Detecting credit card fraud
- b. (0%) Enhancing marketing strategies
- c. (0%) Monitoring customer feedback
- d. (0%) Managing supply chains

How does AI benefit the finance industry? (Multiple choice / One answer only)

---

**2. How does AI transform education?**

- a. (0%) Enhancing physical education classes
- b. (0%) Promoting handwriting practice
- c. (0%) Improving playground safety
- d. (100%) Personalized learning programs

How does AI transform education? (Multiple choice / One answer only)

---

**3. How has AI advanced transportation systems?**

- a. (0%) Developing advanced cruise controls
- b. (0%) Creating virtual reality driving simulators
- c. (0%) Integrating voice command features
- d. (100%) Enabling autonomous vehicles

How has AI advanced transportation systems? (Multiple choice / One answer only)

---

**4. In the agriculture sector, how can AI assist farmers?**

- a. (0%) Providing weather forecasts
- b. (0%) Improving irrigation systems
- c. (100%) Helping combat plant diseases
- d. (0%) Optimizing transportation logistics

In the agriculture sector, how can AI assist farmers? (Multiple choice / One answer only)

---

**5. In what fields are robots applied?**

- a. (0%) Agriculture
- b. (100%) Military and medical
- c. (0%) Fashion and design
- d. (0%) Entertainment and gaming

In what fields are robots applied? (Multiple choice / One answer only)

---

**6. What are the main components of Industry 5.0?**

- a. (0%) Automation, digitalization, and robotics
- b. (0%) Efficiency, productivity, and profitability
- c. (100%) People-centeredness, resilience, and sustainability
- d. (0%) Globalization, standardization, and optimization

What are the main components of Industry 5.0? (Multiple choice / One answer only)

---

**7. What are the objectives of smart cities?**

- a. (0%) Promoting tourism
- b. (0%) Encouraging sports events
- c. (100%) Improving operational efficiency
- d. (0%) Enhancing fashion industries

What are the objectives of smart cities? (Multiple choice / One answer only)

---

**8. What distinguishes Industry 5.0 from Industry 4.0?**

- a. (0%) Improving product quality
- b. (0%) Expanding global market reach
- c. (100%) Reinforcing the role of industry in society
- d. (0%) Increasing competition among companies

What distinguishes Industry 5.0 from Industry 4.0? (Multiple choice / One answer only)

---

**9. What is the main focus of Industry 4.0?**

- a. (0%) Minimizing environmental impact
- b. (0%) Enhancing workplace aesthetics
- c. (100%) Intensive use of information technology
- d. (0%) Promoting leisure activities

What is the main focus of Industry 4.0? (Multiple choice / One answer only)

---

**10. What role does AI play in healthcare?**

- a. (100%) Personalized health guidance
- b. (0%) Managing social media accounts
- c. (0%) Tracking fitness activities
- d. (0%) Enhancing cosmetic surgeries

What role does AI play in healthcare? (Multiple choice / One answer only)

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## Hedy - Life in the AI Era basic settings/NEW/Key - Part 1 - A brief overview of industrial generations

**1. According to Kroó, which technology is NOT part of the integration for Industry 4.0?**

- a. (0%) Advanced robotics.
- b. (0%) Cloud management of big data.
- c. (0%) Simulation.
- d. (100%) Steam-powered transportation.

According to Kroó, which technology is NOT part of the integration for ... (Multiple choice / One answer only)

---

**2. What does Industry 3.0 emphasize?**

- a. (0%) Factory mass production.
- b. (0%) Improved device reliability.
- c. (0%) Conveyor belt.
- d. (100%) Automation for everyone.

What does Industry 3.0 emphasize? (Multiple choice / One answer only)

---

**3. What does the term Industry 4.0 refer to?**

- a. (100%) The fourth industrial revolution integrating information technologies and automation.
- b. (0%) The third industrial revolution focused on computers and IT systems.
- c. (0%) The second industrial revolution emphasizing mass production.
- d. (0%) The first industrial revolution powered by steam energy.

What does the term Industry 4.0 refer to? (Multiple choice / One answer only)

---

**4. What is NOT associated with Industry 2.0?**

- a. (0%) Flow of labor into industry.
- b. (0%) Urbanization revolution.
- c. (0%) Improved device reliability.
- d. (100%) Cloud management of big data.

What is NOT associated with Industry 2.0? (Multiple choice / One answer only)

---

**5. What is one of the key features of Industry 1.0?**

- a. (0%) Improved device reliability.
- b. (0%) Agrarian revolution.
- c. (0%) Automation for everyone.
- d. (100%) Factory mass production instead of handicrafts.

What is one of the key features of Industry 1.0? (Multiple choice / One answer only)

---

**6. What technology is NOT associated with Industry 4.0 according to Gaal?**

- a. (0%) Industrial Internet.
- b. (0%) Automation for everyone.
- c. (0%) Data analytics.
- d. (100%) Steam-powered transportation.

What technology is NOT associated with Industry 4.0 according to Gaal? (Multiple choice / One answer only)

---

**7. What were the key features of Industry 1.0?**

- a. (0%) Steam energy and improved device reliability.
- b. (0%) Conveyor belt and advanced robotics.
- c. (0%) Urbanization revolution and agrarian revolution.
- d. (100%) Factory mass production and steam-powered transportation.

What were the key features of Industry 1.0? (Multiple choice / One answer only)

---

**8. What were the key features of Industry 2.0?**

- a. (0%) Automation for everyone and three-dimensional printing.
- b. (0%) Improved device reliability and connection to the virtual world.
- c. (0%) Agrarian revolution and urbanization revolution.
- d. (100%) Conveyor belt and flow of labor into industry.

What were the key features of Industry 2.0? (Multiple choice / One answer only)

---

**9. Which technology is NOT part of the fourth industrial revolution according to Gaal?**

- a. (0%) CAD.
- b. (0%) CAM.
- c. (0%) CIM.
- d. (100%) Three-dimensional printing.

Which technology is NOT part of the fourth industrial revolution according to... (Multiple choice / One answer only)

---

**10. Which technology is associated with Industry 3.0?**

- a. (0%) Advanced robotics.
- b. (0%) Industrial Internet.
- c. (0%) Cloud management of big data.
- d. (100%) Computers and IT systems.

Which technology is associated with Industry 3.0? (Multiple choice / One answer only)

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# Hedy - Life in the AI Era basic settings/NEW/Impact on business - Part 1

## Hedy - Life in the AI Era basic settings/NEW/Impact on business - Part 1/Artificial Intelligence effects on Customer Expectations

**1. How can AI contribute to enhanced customer service?**

- a. (0%) Increasing human errors and mistakes.
- b. (0%) Reducing productivity and cost efficiency.
- c. (0%) Providing limited customer support hours.
- d. (100%) Providing 24/7 customer service through automated responses.

How can AI contribute to enhanced customer service? (Multiple choice / One answer only)

---

**2. How can AI impact customer expectations in digital marketing?**

- a. (0%) Reducing customer satisfaction and loyalty.
- b. (0%) Automating offline sales processes.
- c. (0%) Improving cybersecurity measures for online operations.
- d. (100%) Providing personalized experiences and forecasting customer spending patterns.

How can AI impact customer expectations in digital marketing? (Multiple choice / One answer only)

---

**3. What are predictive expectations based on?**

- a. (0%) Customers' past experiences.
- b. (0%) Customers' desires for ideal service.

- c. (0%) Customers' beliefs about competitors' services.
- d. (100%) Consumer beliefs concerning the level of service a company would likely offer.

What are predictive expectations based on? (Multiple choice / One answer only)

---

**4. What aspect of customer expectations can AI improve through data analysis?**

- a. (0%) Affordability and pricing.
- b. (0%) Product variety and selection.
- c. (0%) Customer preferences and personalization.
- d. (100%) Speed and convenience in customer service.

What aspect of customer expectations can AI improve through data analysis? (Multiple choice / One answer only)

---

**5. What is customer expectation typically defined as?**

- a. (0%) Customer satisfaction with a product or service.
- b. (0%) Customer trust in a company's marketing strategies.
- c. (0%) Consumer beliefs about a company's profitability.
- d. (100%) Pretrial beliefs about a product or service.

What is customer expectation typically defined as? (Multiple choice / One answer only)

---

**6. What potential benefits can AI bring to businesses in relation to customer expectations?**

- a. (0%) Decreased customer satisfaction and loyalty.
- b. (0%) Increased human errors in customer service.
- c. (0%) Lower cost efficiency and productivity.
- d. (100%) Increased customer satisfaction, loyalty, and improved accuracy in customer service.

What potential benefits can AI bring to businesses in relation to customer ... (Multiple choice / One answer only)

---

**7. What should businesses consider when implementing AI to meet customer expectations?**

- a. (0%) Implementing AI without considering ethics or transparency.
- b. (0%) Prioritizing AI over human interaction in customer service.
- c. (0%) Neglecting the perspectives of consumers and employees.
- d. (100%) Using AI in an ethical and transparent manner while considering trust-building.

What should businesses consider when implementing AI to meet customer ... (Multiple choice / One answer only)

---

**8. Which of the following is NOT mentioned as a source influencing customer expectations?**

- a. (0%) Word of mouth.
- b. (0%) Opinions from experts.
- c. (0%) Publicity and communication controlled by the company.
- d. (100%) Customers' post-purchase experiences.

Which of the following is NOT mentioned as a source-influencing customer ... (Multiple choice / One answer only)

---

**9. Why is trust in AI technologies an important consideration for businesses?**

- a. (0%) Customers prefer AI interactions over human interaction.
- b. (0%) Building trust in AI technologies is unnecessary.
- c. (0%) Employees are not comfortable working with AI systems.
- d. (100%) Customers may prefer human interaction and trust-building in AI technologies takes time.

Why is trust in AI technologies an important consideration for businesses? (Multiple choice / One answer only)

---

**10. How does AI contribute to improved customer service during the purchasing phase in online operations?**

- a. (0%) By providing 24/7 customer support through human representatives.
- b. (0%) By analyzing customer data and delivering personalized experiences.
- c. (100%) By improving the accuracy of customer interactions through AI-driven bots.
- d. (0%) Customers may prefer human interaction and trust-building in AI technologies; takes time by eliminating the need for any customer service during online purchases.

How does AI contribute to improved customer service during the purchasing phase in online operations? (Multiple choice / One answer only)

---

**11. In which phase of customer expectations does normative expectation play a role?**

- a. (0%) Pre-purchase stage.
- b. (0%) Purchasing phase.
- c. (100%) Post-purchase phase.
- d. (0%) Post-experience stage.

In which phase of customer expectations does normative expectation play a role? (Multiple choice / One answer only)

---

**12. What are the two main types of customer expectations in business?**

- a. (0%) Predictive Expectation and Perception Expectation.
- b. (100%) Predictive Expectation and Normative Expectation.
- c. (0%) Normative Expectation and Descriptive Expectation.
- d. (0%) Descriptive Expectation and Perception Expectation.

What are the two main types of customer expectations in business? (Multiple choice / One answer only)

---

**13. What does normative expectation represent in the context of customer expectations?**

- a. (0%) Consumer beliefs concerning the level of service a specific company would offer.
- b. (100%) Consumers' ideal level of service they expect from a company.
- c. (0%) Consumer feedback and reviews on a product or service.
- d. (0%) Consumers' preferences for various product features.

What does normative expectation represent in the context of customer expectations? (Multiple choice / One answer only)

---

- 14.** What role does AI play in business expansion and development?
- a. (0%) AI accelerates employee training and development.
  - b. (0%) AI helps in recruiting and hiring new employees.
  - c. (100%) AI supports faster business decisions at the company management level.
  - d. (0%) AI replaces the need for customer service departments.

What role does AI play in business expansion and development? (Multiple choice / One answer only)

---

- 15.** Which phase of customer expectation development influences customers in their decision-making process about which brand or product to buy?
- a. (100%) Pre-purchase stage.
  - b. (0%) Purchasing phase.
  - c. (0%) Post-purchase phase.
  - d. (0%) Post-experience stage.

Which phase of customer expectation development influences customers in their decision-making process about which brand or product to buy? (Multiple choice / One answer only)

---

- 16.** How should businesses implement AI to ensure a positive impact on customer expectations?
- a. (0%) Use AI to replace all human interactions with customers.
  - b. (100%) Implement AI in an ethical and transparent way.
  - c. (0%) Prioritize AI over human employees in customer service.
  - d. (0%) Implement AI without considering customer preferences.

How should businesses implement AI to ensure a positive impact on customer expectations? (Multiple choice / One answer only)

---

- 17.** Which phase of customer expectations does AI-driven marketing strategies primarily focus on?
- a. (0%) Pre-purchase stage.
  - b. (0%) Purchasing phase.
  - c. (100%) Post-purchase phase.
  - d. (0%) Post-experience stage.

Which phase of customer expectations does AI-driven marketing strategies primarily focus on? (Multiple choice / One answer only)

---

- 18.** How can AI be utilized to analyze customer preferences and behaviors?
- a. (0%) By conducting customer surveys and questionnaires.
  - b. (100%) By analyzing customers' social media activities and interactions.
  - c. (0%) By offering discounts and rewards to loyal customers.
  - d. (0%) By providing AI-generated content for customers to review.

How can AI be utilized to analyze customer preferences and behaviors? (Multiple choice / One answer only)

---

## **Hedy - Life in the AI Era basic settings/NEW/Impact on business - Part**

# 1/Artificial Intelligence and Product Enhancement

## 1. How can AI contribute to product personalization and customization?

- a. (0%) By recommending random products to users.
- b. (0%) By analyzing user behavior and preferences to personalize products.
- c. (0%) By eliminating the need for personalized products.
- d. (100%) By using user data to recommend products based on preferences and behavior.

How can AI contribute to product personalization and customization? (Multiple choice / One answer only)

---

## 2. How can AI-driven methods assist in the product revision process?

- a. (0%) By increasing production costs and inefficiencies.
- b. (0%) By slowing down the adaptation of the final product to market requests.
- c. (0%) By improving the efficiency of the production process and enabling quick adaptation to market requests or product changes.
- d. (100%) By solving distinct challenges encountered during the redesign process.

How can AI-driven methods assist in the product revision process? (Multiple choice / One answer only)

---

## 3. How can AI-driven technologies assist in predictive analytics for product enhancement?

- a. (0%) By randomly predicting customer behavior and trends.
- b. (0%) By forecasting demand for certain products and adjusting inventory.
- c. (0%) By ignoring customer behavior and trends.
- d. (100%) By using AI to predict future trends or customer behavior to aid business decisions.

How can AI-driven technologies assist in predictive analytics for product ... (Multiple choice / One answer only)

---

## 4. In what way can AI contribute to customer service in product enhancement?

- a. (0%) By eliminating the need for customer service.
- b. (0%) By providing generic, automated responses to customer inquiries.
- c. (0%) By using AI to understand and respond to customer questions in real-time.
- d. (100%) By providing personalized, automated responses to customer inquiries.

In what way can AI contribute to customer service in product enhancement? (Multiple choice / One answer only)

---

## 5. What benefits can AI offer in terms of product efficiency and value for customers?

- a. (0%) Increasing production costs and inefficiencies.
- b. (0%) Reducing the overall value of products.
- c. (0%) Improving the efficiency, effectiveness, and overall value of products.
- d. (100%) Improving the efficiency, effectiveness, and overall value of products for customers.

What benefits can AI offer in terms of product efficiency and value for ... (Multiple choice / One answer only)

---

**6. What is one way AI can assist in quality control for products?**

- a. (0%) By identifying faulty products and shipping them to customers.
- b. (0%) By preventing the identification of defects or issues.
- c. (0%) By improving the production process efficiency.
- d. (100%) By identifying and addressing defects or issues to improve product quality.

What is one way AI can assist in quality control for products? (Multiple choice / One answer only)

---

**7. What is the main goal of product enhancement in business?**

- a. (0%) Reducing customer loyalty and repeat business.
- b. (0%) Increasing the production process efficiency.
- c. (0%) Improving the overall customer experience.
- d. (100%) Making the product more attractive to consumers and increasing sales.

What is the main goal of product enhancement in business? (Multiple choice / One answer only)

---

**8. What role does product enhancement play in competitiveness in the market?**

- a. (0%) It has no effect on customer loyalty or differentiation from competitors.
- b. (0%) It can lead to increased customer loyalty and repeat business.
- c. (0%) It focuses solely on building a strong reputation.
- d. (100%) It can lead to increased customer loyalty, repeat business, and differentiation from market competitors.

What role does product enhancement play in competitiveness in the market? (Multiple choice / One answer only)

---

**9. Why is the adoption of AI-driven systems for product enhancement not always an easy decision for companies?**

- a. (0%) AI-driven systems lack the ability to improve product quality and productivity.
- b. (0%) AI-driven systems are not relevant for all sectors and industries.
- c. (0%) AI-driven systems represent a potential risk and require investment.
- d. (100%) AI-driven systems represent a potential risk and companies may lack knowledge about their application.

Why is the adoption of AI-driven systems for product enhancement not always ... (Multiple choice / One answer only)

---

**10. What does the process of product revision typically involve?**

- a. (100%) Analyzing market trends and competitor strategies.
- b. (0%) Identifying potential new markets for the product.
- c. (0%) Eliminating customer feedback collection for cost reduction.
- d. (0%) Creating new products from scratch without any existing features.

What does the process of product revision typically involve ... (Multiple choice / One answer only)

---

- 11.** In what aspect of the production process can AI improve efficiency in product enhancement?
- a. (0%) AI can reduce the overall product quality to cut costs.
  - b. (0%) AI can automate all aspects of the production process.
  - c. (100%) AI can enable the product to adapt quickly to market demands.
  - d. (0%) AI can eliminate any need for systematic product revisions.

In what aspect of the production process can AI improve efficiency in product enhancement ... (Multiple choice / One answer only)

---

- 12.** How does the process of product revision typically begin?
- a. (100%) By gathering customer feedback and conducting market analysis.
  - b. (0%) By eliminating the need for any product redesign.
  - c. (0%) By reducing the overall efficiency of the production process.
  - d. (0%) By automating the entire product revision process.

How does the process of product revision typically begin ... (Multiple choice / One answer only)

---

- 13.** What role can AI play in automating tasks within a product or service?
- a. (0%) AI can personalize products based on user preferences and behavior.
  - b. (0%) AI can predict future market trends and customer behavior.
  - c. (100%) AI can automatically categorize products based on their characteristics and customer reviews.
  - d. (0%) AI can analyze large amounts of customer data quickly and efficiently.

What role can AI play in automating tasks within a product or service ... (Multiple choice / One answer only)

---

- 14.** What can product enhancement include to make the product more attractive to consumers?
- a. (0%) Decreasing the number of product features.
  - b. (0%) Removing existing features to simplify the product.
  - c. (100%) Adding new features and improving design or functionality.
  - d. (0%) Reducing product usability to cater to a niche market.

What can product enhancement include to make the product more attractive to consumers ... (Multiple choice / One answer only)

---

- 15.** What role can AI play in incorporating customer feedback during product enhancement?
- a. (0%) AI can personalize products based on user preferences and behavior.
  - b. (0%) AI can predict future market trends and customer behavior.
  - c. (0%) AI can automate the process of identifying customer needs.
  - d. (100%) AI can be used to analyze and incorporate customer feedback.

What role can AI play in incorporating customer feedback during product enhancement...? (Multiple choice / One answer only)

---

# Hedy - Life in the AI Era basic settings/NEW/Impact on business - Part 1/Artificial Intelligence and Collaborative Innovation

## 1. How can AI be used to support the innovation process?

- a. (0%) By limiting the analysis of customer feedback and market data.
- b. (0%) By hindering the adoption of innovative methods.
- c. (0%) By analysing data to identify patterns and trends that inform the innovation process.
- d. (100%) By analysing data to identify patterns and trends that inform the innovation process and by providing recommendations and suggestions based on data analysis and machine learning algorithms.

How can AI be used to support the innovation process? (Multiple choice / One answer only)

---

## 2. How can AI contribute to internal collaboration within a company?

- a. (0%) By reducing efficiency and increasing costs.
- b. (0%) By hindering communication and coordination among team members.
- c. (0%) By providing tools for virtual collaboration, such as chatbots and virtual assistants.
- d. (100%) By providing tools for virtual collaboration, such as chatbots and virtual assistants, that facilitate communication and coordination among team members.

How can AI contribute to internal collaboration within a company? (Multiple choice / One answer only)

---

## 3. How can AI enhance the collaborative innovation process?

- a. (0%) By increasing the time and resources required for creative and innovative work.
- b. (0%) By hindering communication and collaboration among stakeholders.
- c. (0%) By limiting the development of new ideas and products.
- d. (100%) By providing tools and capabilities that facilitate communication and collaboration, analysing data to provide insights and recommendations, and automating routine tasks and processes.

How can AI enhance the collaborative innovation process? (Multiple choice / One answer only)

---

## 4. How can AI technologies be integrated into collaborative innovation processes?

- a. (0%) By excluding monetary investments and common legislation and rules.
- b. (0%) By hindering the development of ideas, products, or processes.
- c. (0%) By reducing the collaboration among stakeholders.
- d. (100%) By using monetary investments, common legislation and rules, and AI technologies to support the collaborative development of ideas, products, or processes.

How can AI technologies be integrated into collaborative innovation processes? (Multiple choice / One answer only)

---

**5. What are some examples of AI-driven solutions that support collaborative innovation?**

- a. (0%) Email communication and manual data analysis.
- b. (0%) Phone calls and physical collaboration spaces.
- c. (0%) Chatbots and virtual assistants.
- d. (100%) Chatbots and virtual assistants, as well as AI-based collaborative business ecosystems.

What are some examples of AI-driven solutions that support collaborative ... (Multiple choice / One answer only)

---

**6. What are some examples of external collaborative innovation?**

- a. (0%) Collaboration between different departments within a single company.
- b. (0%) Collaboration between partners and suppliers in the supply chain.
- c. (0%) Collaboration between customers and competitors.
- d. (100%) Collaboration between different countries or companies to develop AI technologies.

What are some examples of external collaborative innovation? (Multiple choice / One answer only)

---

**7. What benefits can AI offer in terms of business development and collaborative innovation?**

- a. (0%) Reducing the potential for technological growth and catching up with leading countries in AI.
- b. (0%) Limiting the creation of products and services boosted by AI.
- c. (0%) Supporting the creation of products and services boosted by AI and fostering innovation in various sectors.
- d. (100%) Supporting the creation of products and services boosted by AI and fostering innovation in various sectors, such as machinery, cybersecurity, transportation, and healthcare.

What benefits can AI offer in terms of business development and collaborative... (Multiple choice / One answer only)

---

**8. What is collaborative innovation in a business context?**

- a. (0%) The process of updating and upgrading existing products or services.
- b. (0%) The act of working alone to generate new ideas and develop new products.
- c. (0%) The process of incorporating foreign technologies into a business.
- d. (100%) The act of multiple individuals or organizations working together to generate new ideas and develop new products, services, or processes.

What is collaborative innovation in a business context? (Multiple choice / One answer only)

---

**9. What measures has Germany taken to improve its position in the field of AI?**

- a. (0%) Germany has not taken any action to become more attractive for German entrepreneurs and researchers.
- b. (0%) Germany has decreased its investment in AI research over the years.

- c. (0%) Germany has spent 500 million euros on AI research over the last 30 years.
- d. (100%) Germany has recognized its backwardness in the field and has invested in AI research and development to become more attractive for German entrepreneurs and researchers.

What measures has Germany taken to improve its position in the field of AI? (Multiple choice / One answer only)

- 10.** How has Europe implemented collaborative innovation in AI technology development?
- a. (0%) By investing in foreign technologies to reduce dependency.
  - b. (0%) By collaborating with Asian countries for technology advancements.
  - c. (100%) By investing in long-term AI research and development plans.
  - d. (0%) By relying solely on venture capital ecosystem for AI growth.

How has Europe implemented collaborative innovation in AI technology development? (Multiple choice / One answer only)

- 11.** What can AI-driven algorithms suggest in the collaborative innovation process?
- a. (100%) Ideas or approaches based on past successes.
  - b. (0%) Eliminating the need for external stakeholders in innovation processes.
  - c. (0%) Relying solely on the venture capital ecosystem for AI growth.
  - d. (0%) Decreasing the overall efficiency of the supply chain management.

What can AI-driven algorithms suggest in the collaborative innovation process? (Multiple choice / One answer only)

- 12.** How does collaborative innovation relate to AI's impact on the EU's technological growth?
- a. (100%) Collaborative innovation supports the creation of AI-based enterprises.
  - b. (0%) Collaborative innovation enhances market competition and reduces innovation efforts.
  - c. (0%) Collaborative innovation promotes collaboration between Europe and Asia in AI development.
  - d. (0%) Collaborative innovation eliminates the need for long-term AI research and development plans.

How does collaborative innovation relate to AI's impact on the EU's technological growth? (Multiple choice / One answer only)

- 13.** Which of the following is NOT a main aspect of collaborative innovation in business?
- a. (0%) By reducing customer loyalty and satisfaction.
  - b. (0%) By increasing the risk of developing new products or services.
  - c. (100%) By helping companies identify new opportunities quickly and effectively.
  - d. (0%) By eliminating the need for collaboration with external stakeholders.

Which of the following is NOT a main aspect of collaborative innovation in business? (Multiple choice / One answer only)

- 14.** In a business context, collaborative innovation can involve collaboration with:
- a. (0%) Internal stakeholders only.
  - b. (0%) External stakeholders only.
  - c. (100%) Both internal and external stakeholders.
  - d. (0%) Competitors only.

In a business context, collaborative innovation can involve collaboration with: (Multiple choice / One answer only)

- 15.** What is one of the challenges faced by Germany in adopting AI-driven systems on a large scale?
- a. (100%) Lack of knowledge about AI technologies.
  - b. (0%) Limited availability of venture capital.
  - c. (0%) Reluctance towards collaborative innovation.
  - d. (0%) Dependency on foreign technologies.

What is one of the challenges faced by Germany in adopting AI-driven systems on a large scale: (Multiple choice / One answer only)

- 16.** What is the purpose of Germany's investment of 500 million euros in AI research?
- a. (100%) To promote internal competition among research institutions.

- b. (0%) To fund the development of non-serialized properties in AI technologies.
- c. (0%) To improve machine learning research and provide institutional support.
- d. (0%) To discourage the use of AI in high-value-added sectors.

What is the purpose of Germany's investment of 500 million euros in AI research? (Multiple choice / One answer only)

- 17.** What is the purpose of Germany's investment of 500 million euros in AI research?
- a. (100%) To promote internal competition among research institutions.
  - b. (0%) To fund the development of non-serialized properties in AI technologies.
  - c. (0%) To improve machine learning research and provide institutional support.
  - d. (0%) To discourage the use of AI in high-value-added sectors.

What is the purpose of Germany's investment of 500 million euros in AI research? (Multiple choice / One answer only)

- 18.** How does Germany aim to catch up with the countries leading the AI race?
- a. (0%) By reducing investments in AI research.
  - b. (0%) By adopting foreign technologies to reduce dependency on AI.
  - c. (100%) By fostering the development of AI in high-value-added sectors.
  - d. (0%) By relying solely on the venture capital ecosystem for AI growth.

How does Germany aim to catch up with the countries leading the AI race? (Multiple choice / One answer only)

- 19.** What benefits does Germany expect to gain from implementing an AI ecosystem based on collaboration and innovation?
- a. (0%) Increased efficiency in supply chain management.
  - b. (0%) Enhanced market competition and reduced collaboration efforts.
  - c. (0%) Development of innovative features and systems.
  - d. (100%) Boosted development of AI-based products and services.

What benefits does Germany expect to gain from implementing an AI ecosystem based on collaboration and innovation? (Multiple choice / One answer only)

- 20.** In what sectors does Europe aim to foster the development of AI-based products and services?
- a. (0%) Technology and digital media.
  - b. (0%) Banking and finance.
  - c. (100%) Machinery and cybersecurity.
  - d. (0%) Agriculture and food industry.

In what sectors does Europe aim to foster the development of AI-based products and services? (Multiple choice / One answer only)

- 21.** How much money has Germany spent on AI research over the last 30 years?
- a. (0%) 50 million euros.
  - b. (0%) 200 million euros.
  - c. (100%) 500 million euros.
  - d. (0%) 1 billion euros.

How much money has Germany spent on AI research over the last 30 years? (Multiple choice / One answer only)

- 22.** What is the funding allocated to the German Research Center for Artificial Intelligence (DFKI) for machine learning research?
- a. (0%) 30 million euros (2017-2021).
  - b. (0%) 50 million euros (2017-2021).
  - c. (100%) 77 million euros (2017-2021).
  - d. (0%) 100 million euros (2017-2021).

What is the funding allocated to the German Research Center for Artificial Intelligence (DFKI) for machine learning research? (Multiple choice / One answer only)

- 23.** In the tech industry, what percentage of European companies are considered unable to attract significant investment due to the lack of a venture capital ecosystem?
- a. (0%) 5%.
  - b. (100%) 10%.
  - c. (0%) 25%.
  - d. (0%) 50%.

In the tech industry, what percentage of European companies are considered unable to attract significant investment due to the lack of a venture capital ecosystem? (Multiple choice / One answer only)

---

## Hedy - Life in the AI Era basic settings/NEW/Impact on business - Part 1/Platform

- 1. How can AI contribute to the improvement of global platforms?**
- a. (0%) By increasing labor costs and reducing operational efficiency.
  - b. (100%) By enhancing security measures and detecting fraud on digital platforms.
  - c. (0%) By limiting the accessibility of products and services for customers.
  - d. (0%) By hindering innovation and technological advancements in global platforms.

How can AI contribute to the improvement of global platforms? (Multiple choice / One answer only)

- 
- 2. How can artificial intelligence lead innovation in business models?**
- a. (0%) By replacing human employees with robots and automation technologies.
  - b. (0%) By decreasing the efficiency and effectiveness of decision-making processes.
  - c. (100%) By bringing technological advancements such as machine learning, natural language processing, and robotics that benefit work operations and support the advancement of new solutions.
  - d. (0%) By limiting the creativity and innovation potential of businesses.

How can artificial intelligence lead innovation in business models? (Multiple choice / One answer only)

- 
- 3. How do global platforms influence industries and customers?**
- a. (0%) By limiting consumer choices and restricting access to products and services.
  - b. (100%) By influencing how people consume and share information, and how interact with products and services.
  - c. (0%) By promoting monopolistic practices and hindering competition in the market.
  - d. (0%) By creating barriers for new businesses to enter the industry.

How do global platforms influence industries and customers? (Multiple choice / One answer only)

- 
- 4. How does AI impact global economic activity?**

- a. **(100%)** By potentially creating new jobs in addition to the ones being replaced, particularly in engineering, software development, and ICT professions.
- b. **(0%)** By causing a significant decrease in available job opportunities in the future.
- c. **(0%)** By primarily creating low-skilled jobs that require minimal training and expertise.
- d. **(0%)** By hindering the development of new jobs and technological advancements.

How does AI impact global economic activity? (Multiple choice / One answer only)

---

**5. In what ways can AI be used by businesses in global platforms?**

- a. **(0%)** To limit innovation and hinder the development of new products and services.
- b. **(100%)** To foster innovation, create new revenue streams, and upgrade business models.
- c. **(0%)** To increase security risks and cyber threats on digital platforms.
- d. **(0%)** To replace human employees with AI-powered robots and automation technologies.

In what ways can AI be used by businesses in global platforms? (Multiple choice / One answer only)

---

**6. What are global platforms in business?**

- a. **(0%)** Companies or organizations that operate on a local scale and offer products and services to a specific region.
- b. **(0%)** Companies or organizations that operate on a national scale and offer products and services to customers within a country.
- c. **(0%)** Companies or organizations that operate on a global scale and have a significant impact on the economy and society.
- d. **(100%)** Companies or organizations that operate on a global scale, offer a range of products and services worldwide, and have a strong digital presence.

What are global platforms in business? (Multiple choice / One answer only)

---

**7. What benefits can AI bring to business models?**

- a. **(0%)** Increased labor costs and reduced efficiency.
- b. **(0%)** Decreased revenue and decreased customer satisfaction.
- c. **(0%)** Improved decision-making processes and reduced data analysis capabilities.
- d. **(100%)** Automation of processes, creation of new revenue streams, and better decision-making capabilities.

What benefits can AI bring to business models? (Multiple choice / One answer only)

---

**8. What does a business model typically outline?**

- a. **(0%)** The personal background and qualifications of the company's founders.
- b. **(0%)** The specific financial goals and targets of the company.
- c. **(100%)** The products or offered services, the target market and stakeholders, the marketing channels, revenue streams, cost structure, and overall profitability.
- d. **(0%)** The legal and regulatory requirements the company must adhere to.

What does a business model typically outline? (Multiple choice / One answer only)

---

**9. What is a business model?**

- a. (0%) A conceptual framework used to analyze a company's financial performance.
- b. (100%) An analytical construct that describes a series of components guiding companies in processes of value creation and appropriation.
- c. (0%) A specific marketing strategy used by companies to promote their products or services.
- d. (0%) A legal framework that governs the operations of a company.

What is a business model? (Multiple choice / One answer only)

---

**10. What is business model innovation?**

- a. (0%) A process of changing a company's target market and stakeholders.
- b. (100%) A process of altering the core logic of a company's value creation to improve customer value and competitiveness.
- c. (0%) A process of reducing costs and increasing profits through cost-cutting measures.
- d. (0%) A process of replicating successful business models from other industries.

What is business model innovation? (Multiple choice / One answer only)

---

**11. What do global platforms typically leverage to connect a great network of users, customers, suppliers, and partners across borders?**

- a. (0%) Traditional marketing strategies.
- b. (0%) Physical storefronts.
- c. (0%) Digital presence and technology.
- d. (100%) Print advertisements.

What do global platforms typically leverage to connect a great network of users, customers, suppliers, and partners across borders? (Multiple choice / One answer only)

---

**12. What type of skills will be more important for the newly created jobs in the AI-driven economy?**

- a. (0%) Traditional marketing strategies.
- b. (0%) Sales and marketing skills.
- c. (100%) Interpretive and social skills.
- d. (0%) Administrative and managerial skills.

What do global platforms typically leverage to connect a great network of users, customers, suppliers, and partners across borders? (Multiple choice / One answer only)

---

**13. Which of the following is an example of a global platform?**

- a. (0%) Apple.
- b. (0%) McDonald's.
- c. (100%) Google.
- d. (0%) Walmart.

Which of the following is an example of a global platform? (Multiple choice / One answer only)

- 14.** How do business models define the strategy used by companies?
- a. (0%) By outlining the company's product design.
  - b. (0%) By describing the company's cost structure.
  - c. (100%) By identifying the company's target market and stakeholders.
  - d. (0%) By specifying the company's pricing strategy.

How do business models define the strategy used by companies? (Multiple choice / One answer only)

- 15.** How does AI impact the development of global platforms and their structure?
- a. (0%) AI reduces the global presence of platforms.
  - b. (0%) AI leads to the consolidation of global platforms into single markets.
  - c. (0%) AI has little impact on global platforms and their structure.
  - d. (100%) AI influences how global platforms develop and operate.

How does AI impact the development of global platforms and their structure? (Multiple choice / One answer only)

- 16.** What potential risks should global platforms consider when integrating AI into their operations?
- a. (100%) The risk of increased cybersecurity threats and data breaches.
  - b. (0%) The risk of overspending on AI technologies without any benefits.
  - c. (0%) The risk of AI replacing human employees and causing unemployment.
  - d. (0%) The risk of AI leading to a decline in customer satisfaction and loyalty.

What potential risks should global platforms consider when integrating AI into their operations? (Multiple choice / One answer only)

- 17.** How can AI-powered robotics contribute to the advancement of new solutions in global platforms?
- a. (0%) By replacing human workers in all aspects of global platform operations.
  - b. (0%) By creating a more complex and expensive production process.
  - c. (100%) By automating tasks and streamlining operations for increased efficiency.
  - d. (0%) By reducing the need for innovative solutions and product development.

How can AI-powered robotics contribute to the advancement of new solutions in global platforms? (Multiple choice / One answer only)

- 18.** What role does AI play in fostering collaboration among stakeholders in global platforms?
- a. (0%) AI restricts collaboration to internal teams only.
  - b. (100%) AI facilitates communication and knowledge sharing among stakeholders.
  - c. (0%) By automating tasks and streamlining operations for increased efficiency.
  - d. (0%) By reducing the need for innovative solutions and product development.

What role does AI play in fostering collaboration among stakeholders in global platforms? (Multiple choice / One answer only)

- 19.** What role does AI play in fostering collaboration among stakeholders in global platforms?
- a. (0%) AI restricts collaboration to internal teams only.
  - b. (100%) AI facilitates communication and knowledge sharing among stakeholders.
  - c. (0%) By automating tasks and streamlining operations for increased efficiency.
  - d. (0%) By reducing the need for innovative solutions and product development.

What role does AI play in fostering collaboration among stakeholders in global platforms? (Multiple choice / One answer only)

- 20.** In what way can AI be used to optimize the pricing strategy of global platforms?
- a. (0%) By setting fixed prices for all products and services.
  - b. (0%) By relying on human intuition and guesswork for pricing decisions.
  - c. (100%) By analyzing market data and customer behavior to determine optimal pricing.
  - d. (0%) By eliminating the need for any pricing strategy.

In what way can AI be used to optimize the pricing strategy of global platforms? (Multiple choice / One answer only)

21. How does AI contribute to the creation of new revenue streams in global platforms?
- (0%) By restricting revenue streams to traditional sources only.
  - (0%) By automating all revenue generation processes without human involvement.
  - (100%) By integrating AI into products and services to offer new and innovative features.
  - (0%) By eliminating the need for any revenue generation in global platforms.

How does AI contribute to the creation of new revenue streams in global platforms? (Multiple choice / One answer only)

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## Hedy - Life in the AI Era basic settings/NEW/Impact on governance - Part 1

### Hedy - Life in the AI Era basic settings/NEW/Impact on governance - Part 1/Introduction to the AI governance

1. How is AI governance defined in terms of rules, practices, and processes?
- (0%) A set of tools, solutions, and levers influencing AI development
  - (0%) A system ensuring availability, usability, integrity, and security of data
  - (100%) Rules, practices, and processes aligning AI with strategies, objectives, and values

How is AI governance defined in terms of rules, practices, and processes? (Multiple choice / One answer only)

- 
2. What are proactive governance and accountability measures recognized for?
- (0%) Establishing a reputation for trustworthiness
  - (0%) Enhancing collaboration and accurate data assumptions
  - (0%) Improving decision-making processes and efficiency
  - (100%) Setting firms apart and establishing trustworthiness

What are proactive governance and accountability measures recognized for? (Multiple choice / One answer only)

- 
3. What are some barriers preventing businesses from achieving AI's full potential?
- (0%) Lack of clear AI strategy, cultural resistance, lack of talent
  - (0%) Enterprise size and budget constraints
  - (100%) All of the above

What are some barriers preventing businesses from achieving AI's full potential? (Multiple choice / One answer only)

- 
4. What are some concerns raised about the use of AI in manipulating human perceptions?
- (100%) Creating realistic videos, pictures, text, speech, etc.
  - (0%) Improving collaboration and accurate data assumptions

- c. (0%) Driving unreasonable expectations for robust AI systems
- d. (0%) Enhancing racial profiling and other injustices

What are some concerns raised about the use of AI in manipulating human ... (Multiple choice / One answer only)

---

**5. What are the three topics related to AI governance?**

- a. (0%) Data infrastructure, decision-making processes, ethical AI
- b. (0%) Data storage, policy-making, evaluation processes
- c. (0%) Data management, institutional framework, legal development
- d. (100%) Data infrastructure, application management, utilization

What are the three topics related to AI governance? (Multiple choice / One answer only)

---

**6. What does AI governance aim to do in technological advancement?**

- a. (0%) Ensure high standards of behavior and ethics
- b. (100%) Close the gap between accountability and ethics
- c. (0%) Automate existing or new procedures
- d. (0%) Handle data effectively and securely

What does AI governance aim to do in technological advancement? (Multiple choice / One answer only)

---

**7. What does governance refer to when AI is included?**

- a. (0%) The formation, maintenance, and regulation of rules or activities
- b. (0%) The assignment of accountability in government practices
- c. (100%) Both the use of AI systems in governance and the governance of AI

What does governance refer to when AI is included? (Multiple choice / One answer only)

---

**8. What is one example of AI application in financial institutes?**

- a. (100%) Identifying potentially fraudulent activities in accounts
- b. (0%) Tracking and predicting environmental impacts
- c. (0%) Recognizing persons through face, speech, walk, or movement

What is one example of AI application in financial institutes? (Multiple choice / One answer only)

---

**9. What is the distinction between data governance and AI governance?**

- a. (0%) Data governance handles data effectively, while AI governance is a societal requirement
- b. (0%) Data governance ensures high-quality data for AI, while AI governance handles data policies
- c. (100%) Data governance is for handling data, while AI governance is for societal trust and accountability

What is the distinction between data governance and AI governance? (Multiple choice / One answer only)

---

# Hedy - Life in the AI Era basic settings/NEW/Impact on governance - Part 1/Legislation

## 1. How is the European Commission approaching AI regulation?

- a. (0%) Based on the 2020 White Paper on AI
- b. (100%) Based on the 2018 strategy
- c. (0%) Based on the US Algorithmic Accountability Act
- d. (0%) Based on Singapore's AI Governance Framework

How is the European Commission approaching AI regulation? (Multiple choice / One answer only)

---

## 2. What are the two pillars of the proposed AI certification program in Europe?

- a. (0%) Transparency and fairness of AI systems
- b. (100%) Analysis of risks and transparency of AI systems
- c. (0%) Comprehensive examination of AI risks and dangers
- d. (0%) Transparency and explainability of AI decisions

What are the two pillars of the proposed AI certification program in Europe? (Multiple choice / One answer only)

---

## 3. What does the GDPR aim to improve?

- a. (0%) Transparency of AI systems
- b. (0%) Rights of individuals over their personal data
- c. (100%) Control and rights of individuals over their personal data
- d. (0%) Transparency of automated decision-making

What does the GDPR aim to improve? (Multiple choice / One answer only)

---

## 4. What does the GDPR introduce to assess risks associated with automated decision-making?

- a. (100%) Data Protection Impact Assessments (DPI)
- b. (0%) General Data Protection Regulation (GDPR)
- c. (0%) Certification framework on AI

What does the GDPR introduce to assess risks associated with automated ... (Multiple choice / One answer only)

---

## 5. What does the US Algorithmic Accountability Act require companies to do?

- a. (0%) Enact AI regulatory legislation
- b. (0%) Audit AI-based systems for fairness, privacy, accuracy, and security risks
- c. (0%) Build an AI certification program
- d. (100%) Audit AI-based systems for fairness, privacy, accuracy, and security risks

What does the US Algorithmic Accountability Act require companies to do? (Multiple choice / One answer only)

---

## 6. What is the focus of the EU's Data Act?

- a. (0%) Encouraging re-use of data held by public sector bodies
- b. (100%) Removing barriers to access non-personal data
- c. (0%) Creating data intermediaries for data exchange
- d. (0%) Extending GDPR right to portability

What is the focus of the EU's Data Act? (Multiple choice / One answer only)

---

**7. What is the purpose of the Data Governance Act?**

- a. (0%) To improve control and rights of individuals over their personal data
- b. (100%) To encourage the re-use of data held by public sector bodies
- c. (0%) To streamline access to non-personal data
- d. (0%) To facilitate the sharing of data generated by users and selected third parties

What is the purpose of the Data Governance Act? (Multiple choice / One answer only)

---

**8. Which act focuses on removing barriers to access non-personal data?**

- a. (0%) Data Governance Act
- b. (100%) Data Act
- c. (0%) European approach to AI
- d. (0%) Algorithmic Accountability Act

Which act focuses on removing barriers to access non-personal data? (Multiple choice / One answer only)

---

**9. Which initiative is Singapore known for in terms of AI governance?**

- a. (0%) EU certification framework
- b. (0%) US Algorithmic Accountability Act
- c. (0%) European approach to AI
- d. (100%) AI Governance Framework

Which initiative is Singapore known for in terms of AI governance? (Multiple choice / One answer only)

---

**10. Which is a recent good example of a practical and operational AI governance model?**

- a. (0%) European Commission's approach to AI
- b. (0%) US Algorithmic Accountability Act
- c. (100%) Singapore's AI Governance Framework
- d. (0%) EU's Data Governance Act

Which is a recent good example of a practical and operational AI governance model? (Multiple choice / One answer only)

---

## Hedy - Life in the AI Era basic settings/NEW/Impact on governance - Part 1/Degrees of AI governance

**1. What are the benefits of managing AI correctly?**

- a. (0%) Increased risks and challenges
- b. (0%) Decreased visibility and automation
- c. (0%) Inconsistent policies and communication
- d. (100%) Improved results and efficiency, utilizing best practices

What are the benefits of managing AI correctly? (Multiple choice / One answer only)

---

**2. What benefit do companies experience at Level 4 AI governance?**

- a. (0%) Decreased productivity due to automation
- b. (0%) Manual capture of AI lifecycle data
- c. (0%) Limited deployment of AI models into production
- d. (100%) Exponential rise in productivity and reliable deployment of AI models

What benefit do companies experience at Level 4 AI governance? (Multiple choice / One answer only)

---

**3. What does Level 2 AI governance introduce?**

- a. (0%) Enforcement of mandatory policies
- b. (0%) Isolation of AI systems
- c. (0%) Inconsistency in measurement standards
- d. (100%) Common set of acceptable measurements and a model monitoring tool

What does Level 2 AI governance introduce? (Multiple choice / One answer only)

---

**4. What does Level 4 AI governance automate?**

- a. (0%) Manual documentation of actions and measurements
- b. (0%) Model validation and judgment
- c. (0%) Capture of AI lifecycle data
- d. (100%) Procedure for capturing data from the AI lifecycle and eliminating errors

What does Level 4 AI governance automate? (Multiple choice / One answer only)

---

**5. What is the main characteristic of Level 5 AI governance?**

- a. (0%) Decreased efficiency and productivity
- b. (0%) Inconsistent application of policies
- c. (0%) Manual generation of AI paperwork
- d. (100%) Automatic enforcement of regulations and consistent application of policies

What is the main characteristic of Level 5 AI governance? (Multiple choice / One answer only)

---

**6. What is the purpose of metrics in Level 2 AI governance?**

- a. (0%) To limit the interpretation of AI policies
- b. (0%) To isolate AI teams and their measurements
- c. (0%) To enforce mandatory standards
- d. (100%) To ensure consistency and allow metric comparison across development lifecycles

What is the purpose of metrics in Level 2 AI governance? (Multiple choice / One answer only)

---

**7. What is the risk associated with Level 0 AI governance?**

- a. (0%) Lack of productivity gains
- b. (0%) Limited flexibility in AI development
- c. (0%) Reduced dangers to the company
- d. (100%) Potential major dangers to the company due to the lack of a common framework

What is the risk associated with Level 0 AI governance? (Multiple choice / One answer only)

---

**8. What is the significance of Level 3 AI governance?**

- a. (0%) Increased risks and challenges
- b. (0%) Limited perspective of AI strategy's success
- c. (0%) Inaccessible AI assets and data
- d. (100%) Clear explanation of AI risks and a holistic perspective of AI strategy's success

What is the significance of Level 3 AI governance? (Multiple choice / One answer only)

---

**9. What is the significance of fully automated AI governance at Level 5?**

- a. (0%) Increased manual intervention in AI processes
- b. (0%) Inefficient AI strategy and risk management
- c. (0%) Limited confidence in risk levels
- d. (100%) Consistent application of regulations, automatic generation of AI paperwork, and efficient AI strategy

What is the significance of fully automated AI governance at Level 5? (Multiple choice / One answer only)

---

**10. Which level of AI governance offers the highest efficiency?**

- a. (0%) Level 0
- b. (100%) Level 5
- c. (0%) Level 2
- d. (0%) Level 3

Which level of AI governance offers the highest efficiency? (Multiple choice / One answer only)

---

**Hedy - Life in the AI Era basic settings/NEW/Impact on skills & competencies - Part 1**  
**Hedy - Life in the AI Era basic settings/NEW/Impact on skills & competencies - Part 1/Skills and competencies that will become obsolete**

**1. How does the integration of AI in elevators benefit technicians?**

- a. (0%) It replaces the need for technicians in maintenance tasks.
- b. (0%) It eliminates the need for preventative maintenance.
- c. (0%) It reduces the need for elevators in buildings.
- d. (100%) It informs technicians about potential issues and enables preventative maintenance.

How does the integration of AI in elevators benefit technicians? (Multiple choice / One answer only)

---

**2. In which country have the 4C skills been integrated into the national educational curricula?**

- a. (0%) United States
- b. (0%) Germany
- c. (0%) China
- d. (100%) Finland

In which country have the 4C skills been integrated into the national ... (Multiple choice / One answer only)

---

**3. What are some of the transversal 21st century skills identified for basic education?**

- a. (0%) Historical knowledge and understanding
- b. (0%) Physical fitness and well-being
- c. (0%) Financial literacy and economic understanding
- d. (100%) Thinking and learning-to-learn, cultural competence, interaction and expression, taking care of oneself, managing daily life, multiliteracy, ICT competence, working life competence and entrepreneurship, participation, involvement, and building a sustainable future

What are some of the transversal 21st century skills identified for basic ... (Multiple choice / One answer only)

---

**4. What are some tasks that are easily replaced by technology?**

- a. (0%) Tasks that require creativity and complex social interaction
- b. (0%) Tasks that demand human-specific characteristics such as empathy
- c. (0%) Tasks that require critical thinking and problem-solving
- d. (100%) Repetitive tasks, administrative tasks, and logistics-related tasks

What are some tasks that are easily replaced by technology? (Multiple choice / One answer only)

---

**5. What are the benefits of social interactions in relation to soft skills?**

- a. (100%) Improved teamwork, problem-solving, and fluid relationships
- b. (0%) Reduced workload and individual accountability
- c. (0%) Decreased need for collaboration and effective communication
- d. (0%) Increased reliance on technology for interpersonal relations

What are the benefits of social interactions in relation to soft skills? (Multiple choice / One answer only)

---

**6. What is one of the classifications of skills required for the 21st century?**

- a. (0%) Analytical and mathematical skills
- b. (0%) Technical skills related to coding and programming

- c. (0%) Artistic and musical abilities
- d. (100%) 4C skills: communication, collaboration, creativity, and critical thinking

What is one of the classifications of skills required for the 21st century? (Multiple choice / One answer only)

---

**7. What is one visible example of the use of AI in our daily lives?**

- a. (0%) Virtual reality gaming
- b. (0%) Augmented reality applications
- c. (100%) Translation softwares like DeepL or Google Translate
- d. (0%) Robotic automation in households

What is one visible example of the use of AI in our daily lives? (Multiple choice / One answer only)

---

**8. What is the main focus of the movement aiming to redefine learning for the 21st century?**

- a. (0%) Emphasizing traditional teaching methods
- b. (0%) Promoting rote memorization and standardized testing
- c. (0%) Developing specialized vocational training programs
- d. (100%) Meeting the needs of the 21st century by emphasizing 21st century skills and competencies

What is the main focus of the movement aiming to redefine learning for the ... (Multiple choice / One answer only)

---

**9. Which industry has seen the increasing presence of robots using AI for warehouse tasks?**

- a. (0%) Healthcare
- b. (0%) Education
- c. (0%) Manufacturing
- d. (100%) Retail and logistics

Which industry has seen the increasing presence of robots using AI for ... (Multiple choice / One answer only)

---

**10. Which skills are considered essential for success in the 21st century?**

- a. (100%) Communication, collaboration, creativity, and critical thinking
- b. (0%) Physical strength and endurance
- c. (0%) Ability to memorize vast amounts of information
- d. (0%) Strict adherence to rules and regulations

Which skills are considered essential for success in the 21st century? (Multiple choice / One answer only)

---

## **Hedy - Life in the AI Era basic settings/NEW/Impact on skills & competencies - Part 1/New skills that will appear in the AI era**

**1. How can the project-based and STEAM approaches better prepare learners for the labor market?**

- a. (0%) By limiting their creativity and problem-solving skills
- b. (100%) By providing collaborative, process- and peer-based learning, empowering learners and preparing them for the labor market
- c. (0%) By discouraging active participation and critical thinking
- d. (0%) By focusing solely on theoretical knowledge without practical application

How can the project-based and STEAM approaches better prepare learners for ... (Multiple choice / One answer only)

---

**2. How can the project-based approach benefit learners?**

- a. (0%) By promoting passive learning and discouraging creativity
- b. (100%) By allowing learners to learn by doing, stimulating their creativity, problem-solving, and collaborative skills
- c. (0%) By limiting learners' involvement in their education
- d. (0%) By focusing solely on theoretical knowledge and discouraging practical application

How can the project-based approach benefit learners? (Multiple choice / One answer only)

---

**3. What are some approaches suggested for the formal learning system to face the challenges of AI?**

- a. (100%) The project-based approach and the STEAM approach
- b. (0%) The traditional lecture-based approach only
- c. (0%) The exclusion of technology and digital literacy from the curriculum
- d. (0%) The focus on individual learning without collaboration or problem-solving

What are some approaches suggested for the formal learning system to face the... (Multiple choice / One answer only)

---

**4. What are some lower-end jobs that may appear in the AI era?**

- a. (0%) Data modelling
- b. (100%) Data clearing
- c. (0%) Data visualization
- d. (0%) Data encryption

What are some lower-end jobs that may appear in the AI era? (Multiple choice / One answer only)

---

**5. What are the steps involved in the project-based approach?**

- a. (100%) Identifying the problem; imagining and agreeing to a solution; develop the solution; redefining the solution based on feedback for teachers, trainers, experts, peers, or others
- b. (0%) Copying the solution from others; presenting it as original work
- c. (0%) Completing the solution without any feedback or evaluation
- d. (0%) Skipping the problem identification step and jumping directly to solution development

What are the steps involved in the project-based approach? (Multiple choice / One answer only)

---

**6. What is the STEAM approach in education?**

- a. (0%) An approach that focuses on teaching only science, technology, engineering, and mathematics
- b. (100%) An approach that uses Science, Technology, Engineering, the Arts, and Mathematics as access points for guiding student inquiry, dialogue, and critical thinking
- c. (0%) A method that excludes creative thinking and problem-solving skills
- d. (0%) An approach that discourages collaboration among students

What is the STEAM approach in education? (Multiple choice / One answer only)

---

**7. What is the project-based approach in education?**

- a. (0%) A teaching method based on memorization
- b. (100%) A learning technique where learners are given a problem to resolve in a defined period, while working in teams
- c. (0%) An approach that focuses on individual learning only
- d. (0%) A method that discourages creativity and collaboration

What is the project-based approach in education? (Multiple choice / One answer only)

---

**8. What is the purpose of implementing an AI consciousness in the education and training system?**

- a. (0%) To discourage students from pursuing careers in technology
- b. (100%) To prepare individuals for the change of working experiences and businesses brought by AI
- c. (0%) To limit the advancement of AI technologies
- d. (0%) To decrease the importance of IT skills in the job market

What is the purpose of implementing an AI consciousness in the education and ... (Multiple choice / One answer only)

---

**9. Which occupations may be considered higher end in relation to AI?**

- a. (0%) Data entry clerks
- b. (0%) Data analysts
- c. (100%) AI developers
- d. (0%) Network administrators

Which occupations may be considered higher end in relation to AI? (Multiple choice / One answer only)

---

**10. Why was the art component added to the STEM approach, forming the STEAM approach?**

- a. (0%) To limit creativity in the learning process
- b. (100%) To stimulate creativity, one of the 21st century skills
- c. (0%) To reduce the importance of critical thinking in education
- d. (0%) To make the approach more focused on memorization and rote learning

Why was the art component added to the STEM approach, forming the STEAM ... (Multiple choice / One answer only)

---

# Hedy - Life in the AI Era basic settings/NEW/Impact on skills & competencies - Part 1/The use of AI in education and training

## 1. How can AI contribute to content generation in education?

- a. (0%) By limiting the availability of educational materials
- b. (0%) By replacing human teachers in creating content
- c. (100%) By generating educational materials, such as practice problems
- d. (0%) By eliminating the need for educational materials in the learning process

How can AI contribute to content generation in education? (Multiple choice / One answer only)

---

## 2. How can AI enhance personalized learning in education and training?

- a. (0%) By standardizing the learning process for all students
- b. (0%) By providing the same materials and resources to all learners
- c. (0%) By limiting the options for individual learning preferences
- d. (100%) By analyzing learner data and tailoring instructions to individual needs

How can AI enhance personalized learning in education and training? (Multiple choice / One answer only)

---

## 3. How can AI-based systems contribute to skills assessment in education?

- a. (100%) By assessing learners' skills and identifying areas for improvement
- b. (0%) By focusing solely on theoretical knowledge
- c. (0%) By ignoring the need for skills assessment in education
- d. (0%) By replacing human teachers in the assessment process

How can AI-based systems contribute to skills assessment in education? (Multiple choice / One answer only)

---

## 4. How does open and distance learning benefit from AI?

- a. (0%) By restricting access to education and training
- b. (0%) By limiting opportunities for continuous learning
- c. (100%) By reducing costs and reaching a broader audience
- d. (0%) By replacing traditional education and training institutions

How does open and distance learning benefit from AI? (Multiple choice / One answer only)

---

## 5. In what field can AI be used to develop natural language processing systems?

- a. (0%) In social sciences
- b. (0%) In history and geography
- c. (100%) In language learning
- d. (0%) In mathematics and physics

In what field can AI be used to develop natural language processing systems? (Multiple choice / One answer only)

---

**6. In what way does AI enable adaptive testing?**

- a. (0%) By using a fixed set of test questions for all learners
- b. (100%) By adjusting the difficulty of test questions based on learner performance
- c. (0%) By excluding certain learners from taking tests
- d. (0%) By making testing irrelevant in education

In what way does AI enable adaptive testing? (Multiple choice / One answer only)

---

**7. What can AI-powered search engines do in education?**

- a. (100%) Help learners find relevant educational resources more easily
- b. (0%) Limit access to educational resources
- c. (0%) Replace the need for search engines in education
- d. (0%) Eliminate the need for educational resources

What can AI-powered search engines do in education? (Multiple choice / One answer only)

---

**8. What is one benefit of AI-powered chatbots in education?**

- a. (0%) They replace human teachers completely
- b. (100%) They provide additional support and guidance to learners
- c. (0%) They limit communication and interaction between learners and teachers
- d. (0%) They have no impact on the education process

What is one benefit of AI-powered chatbots in education? (Multiple choice / One answer only)

---

**9. What is one way AI can be used to provide feedback in education?**

- a. (0%) By manually grading students' work
- b. (100%) By using AI-powered platforms to grade and provide feedback
- c. (0%) By relying solely on human teachers for feedback
- d. (0%) By eliminating the need for feedback in education

What is one way AI can be used to provide feedback in education? (Multiple choice / One answer only)

---

**10. What is the purpose of smart classrooms in education?**

- a. (0%) To limit the use of technology in the classroom
- b. (100%) To enhance teaching and learning experiences through technology
- c. (0%) To replace traditional classrooms entirely
- d. (0%) To eliminate the role of teachers in education

What is the purpose of smart classrooms in education? (Multiple choice / One answer only)

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## **Hedy - Life in the AI Era basic settings/NEW/Impact on skills & competencies - Part 1/The use of AI in jobs**

**1. According to Andi Britt, what will AI and cognitive technology change in the employee life cycle?**

- a. (0%) Every signature moment in the employee life cycle
- b. (100%) Every HR process and interaction
- c. (0%) Skills needed to find a job
- d. (0%) Data analysis on employee performance

According to Andi Britt, what will AI and cognitive technology change in the ... (Multiple choice / One answer only)

---

**2. According to The Beijing Consensus, what are the key technologies for integrated lifelong learning systems?**

- a. (0%) AI platforms
- b. (0%) Learning analytics
- c. (100%) Both AI platforms and learning analytics
- d. (0%) Mobile and AI solutions

According to The Beijing Consensus, what are the key technologies for ... (Multiple choice / One answer only)

---

**3. How can AI be used to improve employee skills?**

- a. (0%) To give and receive feedback inside the workplace
- b. (100%) To analyse data on employee performance and provide personalised training and development programs
- c. (0%) To track skills demand and the evolving skills needs of the workforce
- d. (0%) To build or review responsive course and training options

How can AI be used to improve employee skills? (Multiple choice / One answer only)

---

**4. How does AI contribute to the shift towards Talent Centric organizations?**

- a. (100%) AI re-imagines every HR process and interaction with mobile and AI solutions
- b. (0%) AI provides personalised training and development programs
- c. (0%) AI tracks skills demand and evolving skills needs
- d. (0%) AI connects education, jobseekers, and the labour market

How does AI contribute to the shift towards Talent Centric organizations? (Multiple choice / One answer only)

---

**5. What are the concerns regarding the impact of AI on the labour market?**

- a. (0%) Concerns about the gaps between existing and required skills
- b. (100%) Concerns about the impact on the labour market and skills development
- c. (0%) Concerns about high-end jobs such as engineers and researchers
- d. (0%) Concerns about mobile and AI solutions in HR processes

What are the concerns regarding the impact of AI on the labour market? (Multiple choice / One answer only)

---

**6. What are the main areas in which AI can be applied?**

- a. (0%) High-end jobs such as engineers and researchers
- b. (100%) Wide range of sectors and fields
- c. (0%) Education and training

- d. (0%) Labour market research and reporting

What are the main areas in which AI can be applied? (Multiple choice / One answer only)

---

**7. What do the Beijing Consensus urge attention to?**

- a. (0%) The needs of older people and those facing barriers to digital life
- b. (0%) The gaps between existing and required skills
- c. (0%) The impact of AI on the labour market
- d. (100%) The needs of older people and those facing barriers to digital life in the context of integrated lifelong learning systems

What do the Beijing Consensus urge attention to? (Multiple choice / One answer only)

---

**8. What is the potential of AI in terms of skills matching technology?**

- a. (0%) To determine the set of skills required by the labour force
- b. (100%) To help educational institutions build or review responsive course and training options
- c. (0%) To provide personalised learning anytime, anywhere
- d. (0%) To track skills demand and evolving skills needs

What is the potential of AI in terms of skills matching technology? (Multiple choice / One answer only)

---

**9. What is the purpose of Burning Glass?**

- a. (0%) To provide personalised learning anytime, anywhere
- b. (0%) To analyze data on job vacancies
- c. (0%) To track skills demand and evolving skills needs
- d. (100%) To determine the set of skills required by the labour force and track skills demand in near real time

What is the purpose of Burning Glass? (Multiple choice / One answer only)

---

**10. Which countries have investigated the development of tools leveraging AI to connect education, jobseekers, and the labour market?**

- a. (0%) Australia
- b. (0%) Estonia
- c. (0%) Myanmar
- d. (0%) Singapore
- e. (0%) South Africa
- f. (0%) Tunisia
- g. (100%) All of the above

Which countries have investigated the development of tools leveraging AI to ... (Multiple choice / One answer only)

---

## **Hedy - Life in the AI Era basic settings/NEW/Impact on skills & competencies - Part 1/Challenges and**

# ethical issues in the application of AI in education and jobs

## 1. How can the ethical use of AI in education and jobs be ensured?

- a. (0%) Promotion of uniformity in the field of AI
- b. (0%) Restricting access to AI tools and technologies
- c. (100%) Promotion of diversity and upskilling opportunities
- d. (0%) Exclusion of ethics from training programs

How can the ethical use of AI in education and jobs be ensured? (Multiple choice / One answer only)

---

## 2. What is Technostress?

- a. (0%) A modern disorder caused by increased working hours
- b. (100%) Struggle to adapt to new information technologies
- c. (0%) Over-identification with technology
- d. (0%) The inability to work with AI systems

What is Technostress? (Multiple choice / One answer only)

---

## 3. What is one of the challenges concerning the use of AI in education and jobs?

- a. (0%) Limited access to AI tools and information
- b. (0%) Decreased job opportunities in developing countries
- c. (0%) Enhanced inequality in education and jobs
- d. (100%) Reduced understanding of how AI works

What is one of the challenges concerning the use of AI in education and jobs? (Multiple choice / One answer only)

---

## 4. What is one of the challenges faced by education and training institutions in AI development?

- a. (0%) Lack of available AI expertise
- b. (0%) Inability to market AI solutions broadly
- c. (100%) Internal capacity required for AI development
- d. (0%) Disconnection from public policies

What is one of the challenges faced by education and training institutions in... (Multiple choice / One answer only)

---

## 5. What is one of the challenges related to fairness in using AI?

- a. (0%) Insufficient data inputs for AI algorithms
- b. (0%) The lack of statistical errors in the algorithms
- c. (0%) Consensus of Beijing's warning on AI bias
- d. (100%) Perpetuation and amplification of existing biases

What is one of the challenges related to fairness in using AI? (Multiple choice / One answer only)

---

## 6. What is one of the concerns regarding job displacement by AI-powered automation and robotics?

- a. (0%) Negative impact on personal touch and human interaction
- b. (0%) Irrelevance of certain skills in the job market
- c. (0%) Increased job opportunities in manual labor industries
- d. (100%) Potential replacement of teachers and trainers

What is one of the concerns regarding job displacement by AI-powered ... (Multiple choice / One answer only)

---

**7. What should education and training institutions do to support the ethical use of AI?**

- a. (0%) Ignore the ethical and social effects of AI
- b. (0%) Avoid critical examination of AI use and programs
- c. (0%) Discourage the integration of ethics in training programs
- d. (100%) Align with ethical principles and support sustainable development

What should education and training institutions do to support the ethical use... (Multiple choice / One answer only)

---

**8. Which area is affected by the collection and use of personal data by AI?**

- a. (0%) Physical safety and property rights
- b. (100%) Safety, security, and privacy
- c. (0%) Legal issues and ethical risks
- d. (0%) Open access to data

Which area is affected by the collection and use of personal data by AI? (Multiple choice / One answer only)

---

**9. Which aspect of well-being may be negatively impacted by the application of AI in education and jobs?**

- a. (0%) Efficiency and profitability of companies
- b. (0%) Financial gain for individuals
- c. (100%) Privacy and individual freedom
- d. (0%) Economic interests of states

Which aspect of well-being may be negatively impacted by the application of ... (Multiple choice / One answer only)

---

**10. Why is a limited understanding of how AI works a challenge in education and jobs?**

- a. (100%) Poor implementation and ineffective results
- b. (0%) Insufficient AI tools and technologies
- c. (0%) Lack of knowledge or expertise in AI
- d. (0%) Inadequate AI training for young people

Why is a limited understanding of how AI works a challenge in education and ... (Multiple choice / One answer only)

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## **Hedy - Life in the AI Era basic settings/NEW/AI Impact on People & Lifestyle - Part 1**

# Hedy - Life in the AI Era basic settings/NEW/AI Impact on People & Lifestyle - Part 1/Introduction to AI and Its Applications in Lifestyle

## 1. How does AI impact different aspects of human life?

- a. (0%) It has no impact on human life
- b. (0%) It only affects the entertainment industry
- c. (0%) It improves efficiency and productivity in all fields
- d. (100%) It transforms how we live, work, and interact with technology

How does AI impact different aspects of human life? (Multiple choice / One answer only)

---

## 2. How is AI expected to play a role in the future?

- a. (0%) By preventing technological advancements
- b. (0%) By causing societal disconnection
- c. (0%) By slowing down innovation
- d. (100%) By playing a more significant role in human life and driving innovation across domains

How is AI expected to play a role in the future? (Multiple choice / One answer only)

---

## 3. In which industries has AI been used to provide new solutions?

- a. (100%) Healthcare, finance, retail, and transportation
- b. (0%) Agriculture, fashion, and sports
- c. (0%) Architecture, literature, and music
- d. (0%) Education, hospitality, and telecommunications

In which industries has AI been used to provide new solutions? (Multiple choice / One answer only)

---

## 4. What are some breakthrough technologies and applications of AI?

- a. (0%) Mechanical engineering and physics
- b. (100%) Machine learning, computer vision, and natural language processing
- c. (0%) Political science and sociology
- d. (0%) Geography and geology

What are some breakthrough technologies and applications of AI? (Multiple choice / One answer only)

---

## 5. What are some ethical and social questions raised by AI?

- a. (0%) The potential for unlimited job creation
- b. (0%) The elimination of all privacy concerns
- c. (100%) Job loss, privacy and security implications, and responsibility for AI-generated actions
- d. (0%) The eradication of all social inequalities

What are some ethical and social questions raised by AI? (Multiple choice / One answer only)

---

**6. What is the goal of Artificial Intelligence (AI)?**

- a. (0%) To hinder human progress
- b. (100%) To develop intelligent machines that can think and act like humans
- c. (0%) To replace human workers in all industries
- d. (0%) To create chaos and disruption in society

What is the goal of Artificial Intelligence (AI)? (Multiple choice / One answer only)

---

**7. What is the potential of AI to create a better world?**

- a. (0%) To create chaos and destruction
- b. (0%) To limit human potential and progress
- c. (0%) To eliminate the need for human interaction
- d. (100%) To create a better and more connected world while considering its impacts and implications

What is the potential of AI to create a better world? (Multiple choice / One answer only)

---

**8. What is the role of AI-powered chatbots?**

- a. (0%) To confuse and frustrate customers
- b. (0%) To decrease customer satisfaction
- c. (100%) To provide customer service and support
- d. (0%) To spy on users and collect personal data

What is the role of AI-powered chatbots? (Multiple choice / One answer only)

---

**9. What should individuals and society consider when using AI?**

- a. (0%) Nothing, as AI is infallible and requires no consideration
- b. (0%) The elimination of all ethical concerns
- c. (0%) The complete reliance on AI decision-making
- d. (100%) The responsible use of technology and its impacts and implications

What should individuals and society consider when using AI? (Multiple choice / One answer only)

---

**10. When did the development of AI as we understand it today begin?**

- a. (0%) In ancient civilizations
- b. (0%) In the mid-19th century
- c. (100%) In the mid-20th century
- d. (0%) In the late 20th century

When did the development of AI as we understand it today begin? (Multiple choice / One answer only)

---

## **Hedy - Life in the AI Era basic settings/NEW/AI Impact on People &**

# Lifestyle - Part 1/AI for Personalized Health and Fitness

## 1. How can AI algorithms improve the accuracy of wearable device data?

- a. (0%) They introduce errors and inaccuracies in health measurements.
- b. (100%) They correct errors and adjust measurements based on individual habits.
- c. (0%) They do not have any impact on the accuracy of health metrics.
- d. (0%) They provide inaccurate analysis of potential health issues.

How can AI algorithms improve the accuracy of wearable device data? (Multiple choice / One answer only)

---

## 2. How can AI help in disease diagnosis using patient data?

- a. (0%) It cannot make accurate diagnoses based on patient data.
- b. (100%) It can analyse large datasets and identify patterns indicating diseases or conditions.
- c. (0%) It relies solely on medical history and symptoms for making diagnoses.
- d. (0%) It can only provide general treatment plans based on patient data.

How can AI help in disease diagnosis using patient data? (Multiple choice / One answer only)

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## 3. How can AI improve diagnostics in dentistry?

- a. (100%) By analysing large amounts of data on dental images and identifying patterns.
- b. (0%) By providing general information about dental health to patients.
- c. (0%) By automating routine tasks such as appointment scheduling.
- d. (0%) By enhancing patient communication through chatbots.

How can AI improve diagnostics in dentistry? (Multiple choice / One answer only)

---

## 4. How can AI personalise fitness recommendations?

- a. (100%) By analysing data from wearable devices and previous exercise patterns.
- b. (0%) By providing general advice that may not be tailored to individuals.
- c. (0%) By relying solely on body measurements and food preferences.
- d. (0%) By offering random exercise routines without considering fitness goals.

How can AI personalise fitness recommendations? (Multiple choice / One answer only)

---

## 5. What can AI algorithms do in treatment planning?

- a. (0%) They can analyse patient data but cannot develop personalised treatment plans.
- b. (100%) They can identify patterns in treatment outcomes and help develop personalised plans.
- c. (0%) They can replace the need for dentists in the treatment planning process.
- d. (0%) They can only provide general treatment recommendations.

What can AI algorithms do in treatment planning? (Multiple choice / One answer only)

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**6. What can AI do in disease diagnosis using medical imaging?**

- a. (100%) It can analyse medical images and identify patterns indicating diseases or conditions.
- b. (0%) It can provide general information about medical imaging to healthcare providers.
- c. (0%) It can replace the need for healthcare providers in the diagnosis process.
- d. (0%) It can only detect common diseases and conditions.

What can AI do in disease diagnosis using medical imaging? (Multiple choice / One answer only)

---

**7. What is one advantage of AI-based personalised fitness and diet recommendations?**

- a. (0%) They are based on general advice that suits everyone's needs.
- b. (100%) They provide precise and targeted guidance tailored to individuals.
- c. (0%) They require minimal data input and analysis.
- d. (0%) They replace the need for medical professionals and trainers.

What is one advantage of AI-based personalised fitness and diet recommendations? (Multiple choice / One answer only)

---

**8. What is one advantage of integrating wearable devices with AI for health monitoring?**

- a. (0%) They cannot collect a large amount of data quickly.
- b. (100%) They enable continuous monitoring and early detection of health issues.
- c. (0%) They have no impact on the accuracy of health metrics.
- d. (0%) They provide no predictive analysis for potential health issues.

What is one advantage of integrating wearable devices with AI for health ... (Multiple choice / One answer only)

---

**9. What is one limitation of using AI in disease diagnosis and treatment?**

- a. (0%) It requires low-quality data to train AI algorithms effectively.
- b. (100%) It may perpetuate bias in healthcare if the training data is biased.
- c. (0%) It completely replaces the need for healthcare providers in decision-making.
- d. (0%) It accelerates the drug discovery process but does not improve treatments.

What is one limitation of using AI in disease diagnosis and treatment? (Multiple choice / One answer only)

---

**10. What role should healthcare providers play in using AI for disease diagnosis and treatment?**

- a. (0%) They should be excluded from the decision-making process.
- b. (100%) They should always be involved and use AI as a tool for insights and recommendations.
- c. (0%) They should rely solely on AI algorithms for diagnoses and treatment plans.
- d. (0%) They have no role to play in AI-based healthcare practices.

What role should healthcare providers play in using AI for disease diagnosis ... (Multiple choice / One answer only)

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# Hedy - Life in the AI Era basic settings/NEW/AI Impact on People & Lifestyle - Part 1/Smart Homes and Automation with AI

## 1. How can AI-enabled systems control lighting and temperature in a home?

- a. (0%) They cannot adjust lighting and temperature settings based on user preferences and routines.
- b. (0%) They cannot turn on or turn off lights based on a user's schedule or location.
- c. (0%) They cannot adjust the temperature based on user preferences.
- d. (100%) They can adjust lighting and temperature settings based on user preferences and routines.
- e. (0%) They do not offer any control over lighting and temperature.

How can AI-enabled systems control lighting and temperature in a home? (Multiple choice / One answer only)

---

## 2. How can smart homes help with energy savings?

- a. (0%) They consume more energy compared to traditional homes.
- b. (0%) They cannot control lighting remotely.
- c. (0%) They cannot adjust the temperature remotely.
- d. (100%) They allow control of energy-consuming devices and adjust temperature settings remotely.
- e. (0%) They increase energy costs.

How can smart homes help with energy savings? (Multiple choice / One answer only)

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## 3. How can smart homes improve home security?

- a. (0%) They cannot install security cameras.
- b. (0%) They cannot monitor homes remotely.
- c. (0%) They do not offer real-time alerts.
- d. (100%) They can install smart locks, motion sensors, and video cameras and monitor homes remotely.
- e. (0%) They decrease home security.

How can smart homes improve home security? (Multiple choice / One answer only)

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## 4. How can smart homes increase property value?

- a. (0%) They are not desirable in today's market.
- b. (0%) They decrease the value of the property.
- c. (0%) Homebuyers are not willing to pay more for smart technologies.
- d. (100%) Homebuyers are willing to pay more for homes equipped with smart technologies.
- e. (0%) They are not available for homeowners.

How can smart homes increase property value? (Multiple choice / One answer only)

---

## 5. How do AI-enabled security systems enhance home security?

- a. (0%) They cannot detect and report suspicious activity.
- b. (0%) They cannot trigger an alarm in case of a break-in.
- c. (0%) They cannot be integrated with cameras and motion sensors.
- d. (100%) They can monitor and detect unusual activity, report suspicious activity, and trigger alarms in case of a break-in.
- e. (0%) They decrease home security.

How do AI-enabled security systems enhance home security? (Multiple choice / One answer only)

---

**6. What are some benefits of smart homes?**

- a. (0%) They increase property value.
- b. (0%) They are affordable for all homeowners.
- c. (0%) They require physical movement and assistance.
- d. (100%) They provide convenience and comfort.
- e. (0%) They decrease property value.

What are some benefits of smart homes? (Multiple choice / One answer only)

---

**7. What is AI-enabled home automation?**

- a. (0%) It does not involve the use of artificial intelligence.
- b. (0%) It is not capable of automating tasks without human intervention.
- c. (0%) It cannot adjust lighting and temperature settings based on user preferences.
- d. (100%) It uses artificial intelligence to automate tasks and functions within a home environment.
- e. (0%) It does not offer any benefits.

What is AI-enabled home automation? (Multiple choice / One answer only)

---

**8. What tasks can AI-enabled home automation perform in terms of home entertainment?**

- a. (0%) It cannot provide personalized recommendations for TV shows and movies.
- b. (0%) It cannot suggest programs based on user preferences.
- c. (0%) It cannot record TV shows for later viewing.
- d. (100%) It can provide personalized recommendations for TV shows and movies and suggest programs based on user preferences.
- e. (0%) It does not offer any entertainment options.

What tasks can AI-enabled home automation perform in terms of home ... (Multiple choice / One answer only)

---

**9. What tasks can AI-powered smart assistants perform for home management?**

- a. (0%) They cannot control smart home devices.
- b. (0%) They cannot answer questions or provide recommendations.
- c. (0%) They cannot automate tasks in the home.
- d. (100%) They can control smart home devices, answer questions, provide recommendations, and automate tasks in the home.
- e. (0%) They do not offer any benefits for home management.

What tasks can AI-powered smart assistants perform for home management? (Multiple choice / One answer only)

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**10. Who can benefit from smart homes in terms of improved accessibility?**

- a. (0%) Only young people without disabilities.
- b. (0%) Only people without disabilities or elderly people.
- c. (0%) Only people with disabilities.
- d. (100%) People with disabilities or elderly people.
- e. (0%) Only homeowners.

Who can benefit from smart homes in terms of improved accessibility? (Multiple choice / One answer only)

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## Hedy - Life in the AI Era basic settings/NEW/AI Impact on People & Lifestyle - Part 1/AI for Personalized Education and Learning

**1. How can adaptive learning platforms benefit students in personalized learning with AI?**

- a. (0%) They provide static learning materials without any adjustments.
- b. (100%) They analyze student performance and adjust the difficulty of learning materials in real-time.
- c. (0%) They offer limited options for independent learning.
- d. (0%) They only provide simple materials regardless of the student's level.

How can adaptive learning platforms benefit students in personalized learning... (Multiple choice / One answer only)

---

**2. How do adaptive assessments with AI contribute to personalized learning?**

- a. (0%) They provide fixed assessments with the same level of difficulty for all students.
- b. (100%) They automatically adjust the difficulty of questions based on each student's performance.
- c. (0%) They rely on subjective evaluations rather than objective measurements.
- d. (0%) They provide assessments only for a limited number of subjects.

How do adaptive assessments with AI contribute to personalized learning? (Multiple choice / One answer only)

---

**3. How does AI contribute to personalized content creation in education?**

- a. (0%) AI generates the same learning materials for all students.
- b. (0%) AI creates a one-size-fits-all curriculum.
- c. (100%) AI analyses student performance and generates customized learning materials for individual needs.
- d. (0%) AI provides generic feedback without considering student progress.

How does AI contribute to personalized content creation in education? (Multiple choice / One answer only)

---

**4. In personalized learning with AI, how does AI contribute to customized pacing?**

- a. (0%) AI forces all students to learn at the same pace.
- b. (0%) AI provides pre-determined schedules that cannot be adjusted.
- c. (0%) AI adjusts the pace of learning based on student preferences.

- d. (100%) AI analyses the time taken by each student to complete different assignments and adjusts the pace accordingly.

In personalized learning with AI, how does AI contribute to customized pacing? (Multiple choice / One answer only)

---

- 5. What is a benefit of using AI in personalized learning for providing feedback?**
- a. (0%) AI gives feedback based on random criteria, not related to the student's response.
  - b. (0%) AI offers general feedback that is not tailored to individual students.
  - c. (100%) AI analyzes student responses to questions and assignments to provide targeted feedback.
  - d. (0%) AI focuses solely on assigning grades to student work.

What is a benefit of using AI in personalized learning for providing feedback? (Multiple choice / One answer only)

---

- 6. What is one benefit of personalized learning with AI?**
- a. (100%) Improved engagement, increased learning outcomes, and more efficient use of time and resources.
  - b. (0%) Decreased student motivation and interest in learning.
  - c. (0%) Limited access to educational materials and resources.
  - d. (0%) Lack of personalization and individual attention for students.

What is one benefit of personalized learning with AI? (Multiple choice / One answer only)

---

- 7. What is one challenge associated with personalized learning with AI?**
- a. (0%) Ineffective use of technology for all students.
  - b. (0%) Lack of student data and analytics.
  - c. (100%) Concerns about data privacy and security.
  - d. (0%) Excessive reliance on teacher input and control.

What is one challenge associated with personalized learning with AI? (Multiple choice / One answer only)

---

- 8. What is one of the functions of AI-powered chatbots in personalized learning?**
- a. (0%) Creating generic learning materials for all students.
  - b. (0%) Assessing student performance and providing feedback.
  - c. (100%) Helping students with routine tasks and answering general questions.
  - d. (0%) Generating custom quizzes for each student.

What is one of the functions of AI-powered chatbots in personalized learning? (Multiple choice / One answer only)

---

- 9. What is the potential impact of AI-enabled chatbots in education?**
- a. (0%) Limited engagement and motivation among students.
  - b. (100%) More effective, engaging, and tailored learning experiences for students.
  - c. (0%) Decreased teacher-student interaction and support.
  - d. (0%) Exclusion of certain student groups from benefiting from chatbot assistance.

What is the potential impact of AI-enabled chatbots in education? (Multiple choice / One answer only)

---

**10. What is the role of intelligent tutoring systems in personalized learning with AI?**

- a. (0%) They provide generic support and guidance for students.
- b. (100%) They offer personalized support and guidance, adapting to individual student's needs.
- c. (0%) They focus solely on homework reminders and scheduling.
- d. (0%) They create custom learning content for each student.

What is the role of intelligent tutoring systems in personalized learning ... (Multiple choice / One answer only)

---

## **Hedy - Life in the AI Era basic settings/NEW/AI Impact on People & Lifestyle - Part 1/AI for Personalized Shopping and Retail**

**1. How does AI contribute to a better customer experience in retail?**

- a. (0%) By automating inventory management and order processing
- b. (0%) By providing generic recommendations based on popular trends
- c. (0%) By analyzing weather and time of day for personalized recommendations
- d. (100%) By personalizing marketing and promotions based on customer behavior and preferences

How does AI contribute to a better customer experience in retail? (Multiple choice / One answer only)

---

**2. How does AI contribute to better inventory management in retail?**

- a. (0%) By automating order processing and shipping tasks
- b. (0%) By providing generic recommendations based on market trends
- c. (0%) By analyzing customer behavior to suggest products
- d. (100%) By accurately forecasting product demand to prevent overstocking and understocking

How does AI contribute to better inventory management in retail? (Multiple choice / One answer only)

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**3. How does AI personalize the shopping experience?**

- a. (0%) By providing generic recommendations based on popular trends
- b. (100%) By analyzing data such as browsing behavior to suggest products similar to previous views or purchases
- c. (0%) By automating inventory management and shipping tasks
- d. (0%) Through the use of chatbots and virtual assistants for customer interactions

How does AI personalize the shopping experience? (Multiple choice / One answer only)

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**4. How is artificial intelligence revolutionizing shopping experiences?**

- a. (0%) By offering generic recommendations and promotions
- b. (0%) By analyzing weather and time of day for personalized recommendations

- c. (0%) By automating manual tasks to reduce costs
- d. (100%) By providing highly personalized recommendations and experiences tailored to individual tastes and preferences

How is artificial intelligence revolutionizing shopping experiences? (Multiple choice / One answer only)

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**5. What are some benefits of AI-based personalized shopping experiences?**

- a. (0%) Reduced costs and better customer service through automation
- b. (100%) Tailored recommendations, intuitive chatbots, and visual search for an efficient and enjoyable shopping experience
- c. (0%) Improved inventory management and supply chain optimization
- d. (0%) Fraud detection and security measures

What are some benefits of AI-based personalized shopping experiences? (Multiple choice / One answer only)

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**6. What aspect of retail does AI help improve in terms of fraud detection and security?**

- a. (0%) Inventory management and supply chain optimization
- b. (0%) Personalized customer experiences
- c. (0%) Marketing and promotions strategies
- d. (100%) Fraud detection in online transactions and other sources

What aspect of retail does AI help improve in terms of fraud detection and ... (Multiple choice / One answer only)

---

**7. What is one of the benefits of AI-based visual search in shopping?**

- a. (100%) The ability to find similar products from different brands and retailers based on an uploaded image
- b. (0%) Improved inventory management and supply chain optimization
- c. (0%) Automated order processing and shipping tasks
- d. (0%) Efficient customer service through chatbots

What is one of the benefits of AI-based visual search in shopping? (Multiple choice / One answer only)

---

**8. What is one of the main applications of AI in shopping?**

- a. (0%) Automated inventory management
- b. (0%) Predicting weather patterns for better marketing strategies
- c. (0%) Analyzing customer demographics for targeted advertising
- d. (100%) Product recommendations based on past purchases, ratings, and browsing behavior

What is one of the main applications of AI in shopping? (Multiple choice / One answer only)

---

**9. What is one way AI optimizes the supply chain in retail?**

- a. (100%) By helping retailers make informed decisions about suppliers and logistics partners
- b. (0%) By providing personalized recommendations based on weather and time of day
- c. (0%) By automating manual tasks to reduce costs
- d. (0%) By analyzing customer behavior to improve marketing and promotions

What is one way AI optimizes the supply chain in retail? (Multiple choice / One answer only)

---

**10. What role does AI play in the retail industry?**

- a. (0%) Analyzing customer demographics for targeted advertising
- b. (0%) Automating manual tasks to reduce costs
- c. (0%) Improving marketing strategies based on weather patterns
- d. (100%) Helping retailers make better inventory, supply chain, marketing, and security decisions

What role does AI play in the retail industry? (Multiple choice / One answer only)

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## Hedy - Life in the AI Era basic settings/NEW/AI Impact on People & Lifestyle - Part 1/AI for Transportation and Mobility

**1. How can AI contribute to the efficiency of public transportation systems?**

- a. (100%) By optimising routes, schedules, and maintenance.
- b. (0%) By increasing traffic congestion.
- c. (0%) By ignoring passenger demand.
- d. (0%) By creating unsustainable transportation systems.

How can AI contribute to the efficiency of public transportation systems? (Multiple choice / One answer only)

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**2. How can AI improve traffic prediction and optimisation?**

- a. (0%) By creating more traffic congestion.
- b. (100%) By analysing large amounts of data and making real-time predictions.
- c. (0%) By increasing travel times.
- d. (0%) By causing disruptions to traffic flow.

How can AI improve traffic prediction and optimisation? (Multiple choice / One answer only)

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**3. How can AI optimise public transportation routes?**

- a. (100%) By analysing data on passenger demand, traffic patterns, and other factors.
- b. (0%) By increasing travel times.
- c. (0%) By reducing passenger satisfaction.
- d. (0%) By disregarding traffic congestion.

How can AI optimise public transportation routes? (Multiple choice / One answer only)

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**4. How can self-driving cars contribute to cost savings?**

- a. (0%) They require additional insurance costs.
- b. (0%) They are more expensive to manufacture.
- c. (100%) They eliminate the need for drivers.
- d. (0%) They increase the cost of accidents.

How can self-driving cars contribute to cost savings? (Multiple choice / One answer only)

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**5. How can self-driving cars improve mobility?**

- a. (0%) Licensed drivers can only use them.
- b. (0%) They are not suitable for the elderly or disabled.
- c. (100%) They provide mobility to those who cannot drive.
- d. (0%) They contribute to traffic congestion.

How can self-driving cars improve mobility? (Multiple choice / One answer only)

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**6. How can self-driving cars reduce their environmental impact?**

- a. (0%) They produce more carbon emissions.
- b. (0%) They consume more fuel.
- c. (0%) They increase traffic congestion.
- d. (100%) They can be programmed to drive more fuel-efficiently.

How can self-driving cars reduce their environmental impact? (Multiple choice / One answer only)

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**7. What are the benefits of self-driving cars?**

- a. (0%) Increased traffic congestion
- b. (100%) Increased safety
- c. (0%) Higher cost of transportation
- d. (0%) Negative environmental impact

What are the benefits of self-driving cars? (Multiple choice / One answer only)

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**8. What is one advantage of self-driving cars in terms of convenience?**

- a. (0%) They make driving more difficult.
- b. (100%) They take over mundane and time-consuming aspects of driving.
- c. (0%) They increase the likelihood of accidents.
- d. (0%) They require constant human intervention.

What is one advantage of self-driving cars in terms of convenience? (Multiple choice / One answer only)

---

**9. What is one benefit of AI in public transportation optimisation?**

- a. (0%) Increased travel times.
- b. (100%) Reduced operating costs.
- c. (0%) Higher passenger dissatisfaction.
- d. (0%) Disruption of service.

What is one benefit of AI in public transportation optimisation? (Multiple choice / One answer only)

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**10. What is one key application of AI in traffic prediction and optimisation?**

- a. (0%) Development of self-driving cars.
- b. (0%) Maintenance of transportation infrastructure.
- c. (100%) Development of intelligent transportation systems.
- d. (0%) Reduction of passenger demand.

What is one key application of AI in traffic prediction and optimisation? (Multiple choice / One answer only)

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## Hedy - Life in the AI Era basic settings/NEW/AI Impact on People & Lifestyle - Part 1/AI and human life

### 1. How can AI integration perpetuate societal biases and discrimination?

- a. (0%) By ensuring fair treatment of all individuals and groups.
- b. (0%) By eliminating societal biases and discrimination.
- c. (0%) By collecting and processing personal data.
- d. (100%) By replicating biases present in the training data.

How can AI integration perpetuate societal biases and discrimination? (Multiple choice / One answer only)

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### 2. How does AI impact economic inequalities?

- a. (0%) The benefits of AI are distributed equally among all groups.
- b. (100%) The benefits of AI are often concentrated among certain groups, while the costs are distributed more broadly.
- c. (0%) AI has no impact on economic inequalities.
- d. (0%) AI reduces economic inequalities in society.

How does AI impact economic inequalities? (Multiple choice / One answer only)

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### 3. In which domains can AI raise ethical and moral concerns?

- a. (0%) Agriculture and manufacturing.
- b. (100%) Healthcare, justice, and the military.
- c. (0%) Retail and entertainment.
- d. (0%) Transportation and logistics.

In which domains can AI raise ethical and moral concerns? (Multiple choice / One answer only)

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### 4. What are the privacy and security concerns associated with AI?

- a. (0%) Data ownership, access, and control are not important.
- b. (100%) Collection and processing of large amounts of personal data.
- c. (0%) Lack of transparency and explainability in AI systems.
- d. (0%) Minimal impact on individuals and society.

What are the privacy and security concerns associated with AI? (Multiple choice / One answer only)

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### 5. What is one potential consequence of AI-driven automation?

- a. (100%) Job loss and unemployment, particularly in repetitive or low-skilled industries.
- b. (0%) Increase in job opportunities and economic growth.
- c. (0%) Improved work-life balance for employees.
- d. (0%) Enhanced productivity and efficiency in all industries.

What is one potential consequence of AI-driven automation? (Multiple choice / One answer only)

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**6. What is the importance of understanding AI for humans?**

- a. (100%) To make informed decisions about using AI.
- b. (0%) To avoid using AI systems entirely.
- c. (0%) To eliminate the need for ethical considerations.
- d. (0%) To increase job opportunities in the AI field.

What is the importance of understanding AI for humans? (Multiple choice / One answer only)

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**7. What is the significance of transparency and explainability in AI systems?**

- a. (0%) Transparency and explainability have no relevance in AI systems.
- b. (100%) To understand how the AI system makes decisions and assess potential risks.
- c. (0%) To ensure complete automation without human involvement.
- d. (0%) To maximize efficiency and eliminate the need for continuous monitoring.

What is the significance of transparency and explainability in AI systems? (Multiple choice / One answer only)

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**8. What should humans consider regarding ethical implications when using AI?**

- a. (0%) Ethical considerations are irrelevant when using AI.
- b. (100%) Privacy, data protection, and fairness.
- c. (0%) Efficiency and productivity gains.
- d. (0%) The elimination of human supervision.

What should humans consider regarding ethical implications when using AI? (Multiple choice / One answer only)

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**9. Why is accountability and responsibility important in AI decision-making?**

- a. (0%) To avoid any consequences or errors in decision-making.
- b. (100%) To address errors or unintended consequences of AI decisions.
- c. (0%) To eliminate the need for human supervision.
- d. (0%) To increase the speed and efficiency of decision-making.

Why is accountability and responsibility important in AI decision-making? (Multiple choice / One answer only)

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**10. Why is it important for humans to be clear about the purpose and objectives of using AI?**

- a. (0%) Purpose and objectives have no impact on AI usage.
- b. (100%) To ensure that the chosen AI system aligns with their objectives.
- c. (0%) To eliminate any potential risks associated with AI.
- d. (0%) To increase the complexity of decision-making processes.

Why is it important for humans to be clear about the purpose and objectives ... (Multiple choice / One answer only)

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## Authors (alphabetic order)



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