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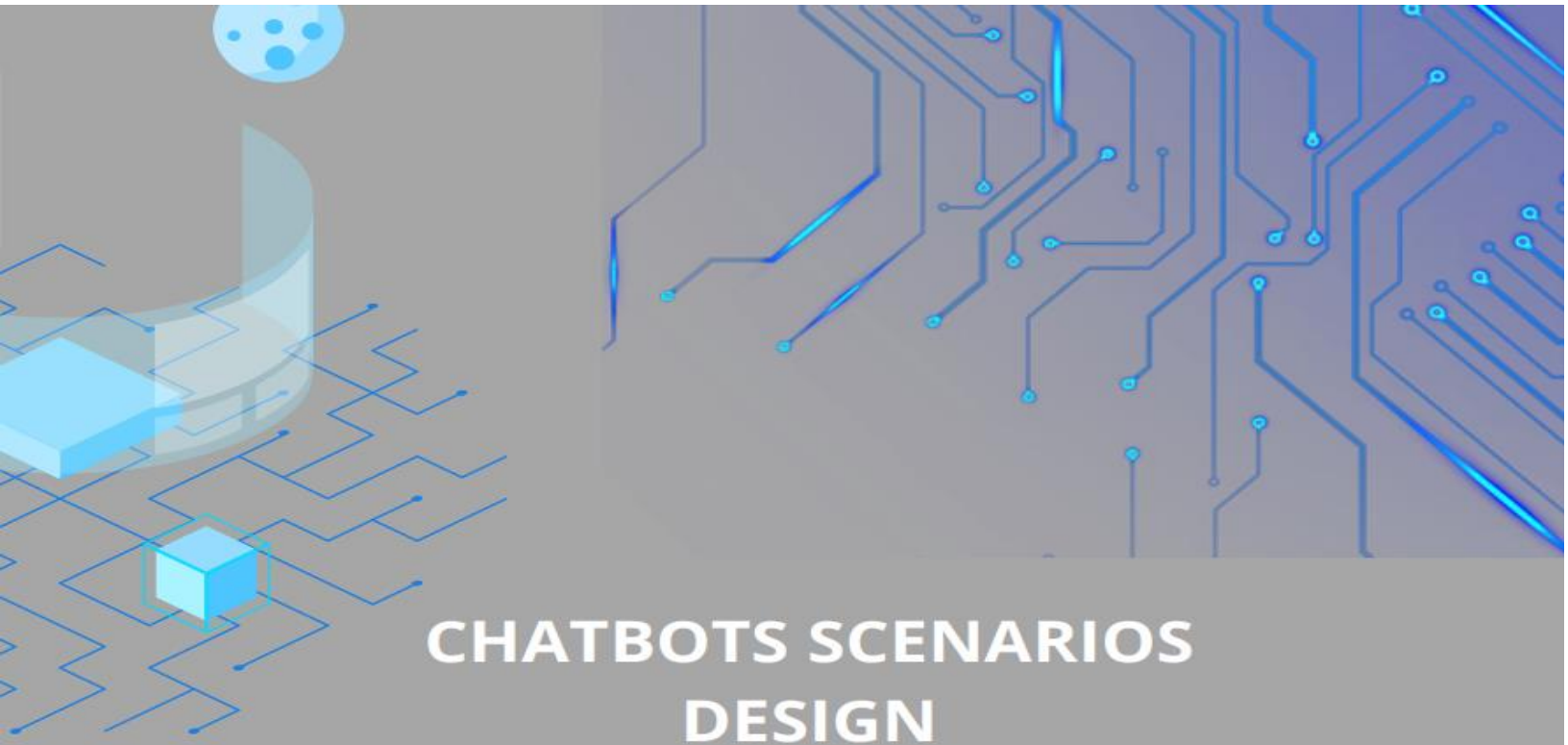
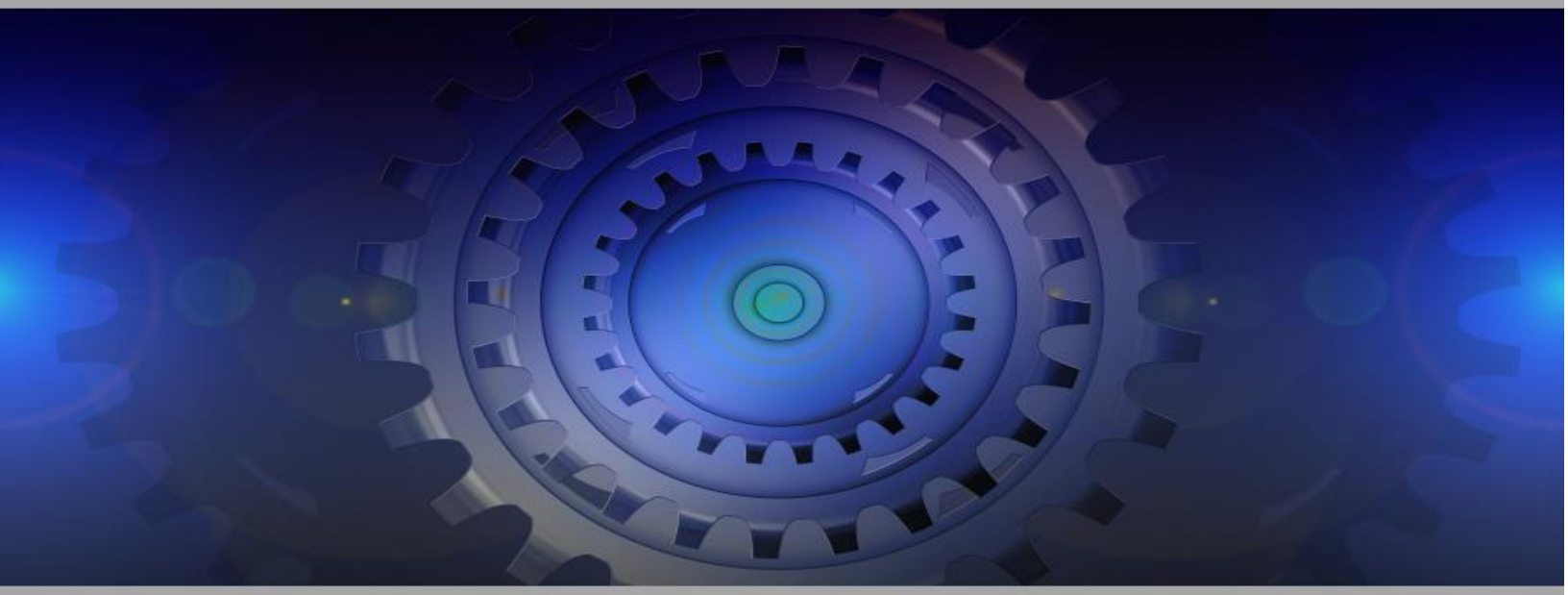


CHATBOTS SCENARIOS DESIGN



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ASSISTANT project

CHATBOTS SCENARIOS DESIGN

(3.1 activity)

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1. INTRODUCTION

Educational chatbots are digital tools designed to assist learners in various educational settings. These chatbots use natural language processing (NLP) and machine learning algorithms to simulate human conversation and respond to user queries in a way that facilitates learning. They can be integrated into various educational platforms such as learning management systems, educational apps, and websites to provide learners with a personalized and interactive learning experience.

Educational chatbots can be used for a variety of purposes, including:

1. *Student support:* Chatbots can be used to assist students with coursework and answer questions about subjects.
2. *Administrative support:* Chatbots can be used to automate routine tasks, such as course registration, scheduling, and grading.
3. *Personalized learning:* Chatbots can be used to provide personalized learning experiences by tailoring content and lessons to individual students' needs and abilities. They can adapt to the student's learning style, pace, and preferences to provide the best possible educational experience.
4. *Student engagement:* Chatbots can be used to increase student engagement by providing interactive and gamified learning experiences.
5. *Tutoring:* Chatbots can be used to provide students with on-demand tutoring services, including answering questions and providing feedback on assignments. They can help with homework, test preparation, and even offer feedback on writing assignments.
6. *Mentoring:* Chatbots can be used to provide mentoring or coaching services to users providing personalized feedback, offering insights into specific areas of interest, and providing guidance on how to achieve goals or overcome obstacles. They can be used to help individuals develop new skills, or provide emotional support. They can provide information on job opportunities, offer advice on career paths, and even provide interview preparation.
7. *Scaffolding (challenge support):* Scaffolding (challenge support) chatbots can be used to provide support or guidance to users as they complete a challenging task or process. Scaffolding refers to the use of prompts, hints, or other forms of guidance to help users navigate through a process or complete a task. For example, a scaffolding chatbot might ask a series of questions to help a user troubleshoot an issue with a product, or provide step-by-step instructions for filling out a complex form. Scaffolding chatbots can be

particularly useful in situations where users may be unfamiliar with a process or task, or where the process is complex or multi-step. By providing guidance and support, scaffolding chatbots can help to reduce frustration and increase the likelihood of successful completion.

8. *Student mental health:* Chatbots can be used to provide students with support for their mental health and wellness, including resources for stress management and coping strategies.
9. *Distance learning:* Chatbots can be used in distance learning to provide students with instant access to information and support, regardless of their location.
10. *Library assistance:* Chatbots can be used to help users to access and utilize library resources and services. Library chatbots can be integrated into library websites, social media platforms, or messaging apps to provide quick and convenient assistance to library patrons. Library chatbots can help users with a variety of tasks, such as finding books or articles, accessing databases, reserving meeting rooms, and getting information about library hours and events. They can also answer frequently asked questions about library policies and procedures. They can provide 24/7 support to library patrons, even when library staff is not available. This can be especially helpful for users who may be unable to visit the library during regular business hours. Library chatbots can improve the user experience by making library services more accessible and convenient, and by reducing the workload of library staff.
11. *Cultural support:* These chatbots are designed to help users learn about different cultures and languages. They can provide historical and cultural context, offer language lessons, and even provide travel recommendations.

Thus, educational chatbots can help learners with a range of tasks and offer recommendations based on the learner's interests and learning needs. The benefits of educational chatbots are numerous, including increased student engagement, improved learning outcomes, and personalized learning experiences. They also provide a scalable and cost-effective solution to educational institutions that may struggle to provide individual attention to each student. With the continued advancement of machine learning and NLP technologies, educational chatbots are poised to become an increasingly important part of the educational landscape.

2. CHATBOT SCENARIOS

T 3.1. Design of chatbots scenarios aims to design 4 chatbot scenarios. The aim of this task is to develop totally four scenarios *directly related to the study process*, that could assure better quality of education and incensement of using intelligence technologies in education by developing virtual assistant i.e.

1) chatbot for course guiding and support,
2) chatbot for content material support,
3) assessment,
4) individual tasks support.

A course guiding and support chatbot would be designed to assist students in navigating their educational journey. The chatbot would be available 24/7 and accessible from any device with an internet connection. It would be programmed with a range of features to support students in achieving their academic goals. Some of the features that a course guidance and support chatbot might include are:

- *Course recommendations*: The chatbot could suggest courses based on a student's interests, academic history, and career aspirations.
- *Enrollment assistance:* The chatbot could help students enroll in courses, answer questions about enrollment requirements, and provide guidance on how to register for classes.
- *Course scheduling:* The chatbot could help students schedule courses in a way that fits their availability, and ensure they are taking the appropriate courses to meet their degree requirements.
- *Study support:* The chatbot could provide tips and resources to help students study effectively, manage their time, and prepare for exams.
- *Academic counseling:* The chatbot could offer advice and support for students who are struggling academically, and connect them with appropriate resources such as tutoring services or academic advisors.
- *Career guidance:* The chatbot could provide information about career options related to different courses, and connect students with career counselors for more personalized guidance.

A course guidance and support chatbot would be a valuable resource for students, providing them with quick and convenient access to information and support that can help them succeed in their academic pursuits.

Chatbot for content material support would be used to assist students with the material covered in their courses. This type of chatbot would be especially useful for students who need additional support outside of the classroom, or who prefer to study independently. Some features that a content material support chatbot might include:

- *Topic overviews:* The chatbot could provide overviews of the topics covered in a course, breaking down complex concepts into easy-to-understand language.
- *Answer questions:* The chatbot could answer specific questions about course material, providing students with quick and accurate responses to their inquiries.
- *Study aids:* The chatbot could provide students with study aids such as flashcards, summaries, and quizzes to help them reinforce their understanding of course material.
- *Additional resources:* The chatbot could suggest additional resources such as textbooks, articles, and videos that can help students deepen their understanding of course material.
- *Learning strategies:* The chatbot could provide tips and strategies for learning and retaining course material, such as note-taking techniques and memory aids.
- *Personalized learning:* The chatbot could customize its responses based on a student's specific needs and learning style, providing personalized support to help them succeed.

A content material support chatbot would be a valuable tool for students who want to enhance their learning experience and succeed in their courses. It would provide quick and convenient access to information and resources that can help students understand and retain course material more effectively.

A chatbot designed to support assessment would be designed to assist students in preparing for exams, quizzes, and other assessments. This type of chatbot would be especially useful for students who struggle with test anxiety, need additional support outside of the classroom, or who want to improve their performance on assessments. Some features that an assessment chatbot might include:

- *Test preparation:* The chatbot could provide students with test preparation resources such as study guides, practice exams, and sample questions.
- *Test-taking strategies:* The chatbot could provide tips and strategies for taking exams, such as time-management techniques, strategies for answering multiple-choice questions, and approaches for tackling essay questions.
- *Feedback:* The chatbot could provide feedback on student performance on practice exams and quizzes, identifying areas where the student needs improvement and suggesting ways to strengthen their knowledge.

- *Test anxiety support:* The chatbot could provide strategies for managing test anxiety and reducing stress before and during exams.
- *Personalized learning:* The chatbot could customize its responses based on a student's specific needs and learning style, providing personalized support to help them succeed on assessments.
- *Progress tracking:* The chatbot could track a student's progress over time, providing insights into their strengths and weaknesses and suggesting areas where they might benefit from additional support.

An assessment chatbot would be a valuable resource for students who want to improve their performance on exams and quizzes. It would provide quick and convenient access to information and resources that can help students feel more confident and prepared, and ultimately achieve better results on their assessments.

A chatbot designed to provide **individual task support** would be used to assist students with specific tasks related to their academic work. This type of chatbot would be especially useful for students who need help with tasks outside of the classroom, such as research, writing assignments, or formatting papers. Some features that an individual task support chatbot might include:

- *Research support:* The chatbot could provide assistance with research tasks such as finding sources, evaluating information, and organizing research materials.
- *Writing support:* The chatbot could provide guidance on writing tasks such as brainstorming, outlining, drafting, and revising essays and other written assignments.
- *Formatting support:* The chatbot could provide guidance on formatting papers according to specific guidelines, such as APA or MLA style.
- *Citation support:* The chatbot could assist students with citing sources in their work, including generating bibliographies and correctly formatting in-text citations.
- *Proofreading support:* The chatbot could provide assistance with proofreading and editing written work, including identifying errors and suggesting improvements.
- *Personalized learning:* The chatbot could customize its responses based on a student's specific needs and preferences, providing personalized support to help them succeed.

An individual task support chatbot would be a valuable tool for students who need help with specific tasks related to their academic work. It would provide quick and convenient access to information and resources that can help students complete their work more efficiently and effectively.

Chatbots scenarios will be provided in the digital format with a possibility for downloading and printing.

Chatbots will be used for the following courses:

- Big Data,
- Digital Education,
- Artificial Intelligence,
- Robotics and IoT.

Leading partner is TU (Estonia), but all partners will contribute to the task implementation.

The list of the scenarios provided by project partners

KTU	Chatbot for content material support
UAb	Chatbot for assessment support
TU	Chatbot for course guiding and support
FHM	Chatbot for CBL-support

3. TEMPLATES FOR SCENARIOS

3.1 Template for describing a **course guiding and support chatbot** for the course “Digital education” (Tallinn University)

The name of the chatbot	A course guiding and support chatbot for the course "Digital Education"
The purpose of the chatbot and what it can help users with	To support students in achieving their academic goals; answering frequently asked questions, providing study support, offering personalized recommendations.
Features that a chatbot includes	• *Course Overview:* The chatbot could provide an overview of the course, including the syllabus, course objectives, and expectations for student performance. • *Enrollment assistance:* The chatbot could help students enroll in courses, answer questions about enrollment requirements, and provide guidance on how to register for classes. • *Course scheduling:* The chatbot could help students schedule courses in a way that fits their availability, and ensure they are taking the appropriate courses to meet their degree requirements. • *Study support:* The chatbot could provide tips and resources to help students study effectively, manage their time, and prepare for exams. • *Digital Tools:* The chatbot should provide information on the digital tools used in the course, including the learning management system, communication tools, and any other relevant software. • *Course Materials:* The chatbot should provide access to course materials such as readings, videos, and other resources, either by providing links or by embedding the content directly in the chatbot. • *Assignments:* The chatbot should provide information on course assignments, including due dates, submission guidelines, and grading criteria. • *Quizzes and Tests:* The chatbot should provide information on quizzes and tests, including how they are

	administered, what material they cover, and how they are graded. ● *Learning Activities:* The chatbot should provide information on learning activities such as discussion forums, group projects, and other collaborative work, including expectations for student participation and how to access and complete these activities. ● *Personalized Learning:* The chatbot should be able to provide personalized support to students based on their individual needs and preferences. This could include answering questions, providing feedback on assignments, and suggesting additional resources for further learning. ● *Feedback and Progress Tracking:* The chatbot should provide feedback to students on their progress in the course, including grades on assignments, quizzes, and tests, as well as feedback on participation in learning activities. It should also provide progress tracking so that students can see how they are progressing throughout the course. ● *Academic counseling:* The chatbot could offer advice and support for students who are struggling academically, and connect them with appropriate resources such as tutoring services or academic advisors. ● *Career guidance:* The chatbot could provide information about career options related to different courses, and connect students with career counselors for more personalized guidance. By incorporating these key elements, a chatbot for "Digital Education" can provide students with a comprehensive and interactive learning experience that helps them succeed in the course.
The technology used to develop the chatbot	Melibo
The target audience for the chatbot, including demographics, interests, and any other relevant characteristics	Students of the micro-credential programme
The benefits of using the	Improved efficiency, increased student satisfaction, reduced

chatbot	costs.
The availability of the chatbot	They can provide 24/7 support to students
Information on the support available	There are troubleshooting guides, FAQs, and contact information for technical support

3.2. Template for describing **a course content material support chatbot** for the course "Big data".

The name of the chatbot	A course content material support chatbot for the course "Big Data"
The purpose of the chatbot and what it can help users with	To support users with navigating content material, to answer frequently asked questions related to the topics and activities of the course.
Features that a chatbot includes	• **Overview of course topics.** Explanation on how topics in course syllabus relate to each other and how learning them helps to reach course goals. Listing of available course resources on a specific topic in question. • **Explaining the main terms.** Encyclopedic information on the main terms, used in the course, with links provided for more detailed information. • **Guidance on installing tools.** Instructions on how to prepare an environment with selected tools and troubleshooting tips. • **Help with usage of tools.** Support for the main steps of using the tools when solving course assignments. • **Support in challenge-based learning.** Explain the purpose of the given mini challenge, provide some hints on where to start and what courses of action could be perspective, advice on which topics are important to revise at each step for solving the challenge on time. Explain main terms of challenge-based learning.
The technology used to develop the chatbot	Melibo chatbot, integrated into Moodle course.
The target audience for the chatbot, including demographics, interests,	Students of the micro-credential programme.

and any other relevant characteristics	
The benefits of using the chatbot	Alternative modality for interactive learning of course content.
The availability of the chatbot	Chatbot is available 24/7 for subscribers of the Moodle course.
Information on the support available	

3.3. Template for describing an assessment chatbot for the course "Artificial Intelligence"

The name of the chatbot	An assessment chatbot
The purpose of the chatbot and what it can help users with	The chatbot is designed to assist students in all evaluation tasks. Is like a personal trainer that helps the student to maximize its final grade. Its focus is advice not only on maximizing the performance on assessments, but also with test anxiety.
Features that a chatbot includes	• *Test preparation:* The chatbot could provide students with test preparation resources such as study guides, practice exams, and sample questions. • *Test-taking strategies:* The chatbot could provide tips and strategies for taking exams, such as time-management techniques, strategies for answering multiple-choice questions, and approaches for tackling essay questions. • *Feedback:* The chatbot could provide feedback on student performance on practice exams and quizzes, identifying areas where the student needs improvement and suggesting ways to strengthen their knowledge. • *Test anxiety support:* The chatbot could provide strategies for managing test anxiety and reducing stress before and during exams.
The technology used to develop the chatbot	Melibo

The target audience for the chatbot, including demographics, interests, and any other relevant characteristics	Students of the micro-credential programme.
The benefits of using the chatbot	An assessment chatbot would be a valuable resource for students who want to improve their performance on exams and quizzes. It would provide quick and convenient access to information and resources that can help students feel more confident and prepared, and ultimately achieve better results on their assessments.
The availability of the chatbot	Chatbot is available 24/7 for subscribers of the Moodle course.
Information on the support available	

3.4. Template for describing an individual task support chatbot for the course ….

The name of the chatbot	**Robotic & IOT – An individual task support chatbot**
The purpose of the chatbot and what it can help users with	helps the users to assemble and program a simple ready-to-build nano robot.
Features that a chatbot includes	• **Overview** of the required robot kit Makeblock, its structure and its components. • **Overview** of the assembly procedure of the robot on the example Makeblock • **Overview** of Support Materials and Scources • **Description** of the programming tool **scratch** and the programming procedure of the robot in principle. • **Glossary: explaining the** relevant terms of the kit • **Bug Fixing:** “First Aid” Notes on typical errors and their prevention and elimination.
The technology used to develop the chatbot	melibo chatbot, Chatflow and Q&A including AI integration (knowledge hub), integration into LMS moodle.

The target audience for the chatbot, including demographics, interests, and any other relevant characteristics	Students of the course “Digital Innovation Lab”, part curriculum “BA Digital Business Administration”
The benefits of using the chatbot	Alternative modality for interactive learning of course content. Additional "just-in-time" guidance while performing a practice task.
The availability of the chatbot	Chatbot is simultaneously available 24/7 for subscribers of the Moodle course.
Information on the support available	content: learning materials and available documentation of the kit, available on the website of the manufacturer (makeblock)

4. GLOSSARY OF ITEMS

Term	Definition	Reference
Digital transformation	Digital transformation is the adoption and implementation of computer-based technologies by a company and integration of such technologies into all areas of a business. Digital transformation is the act of adopting and integrating technology into all aspects of business, creating a foundational shift that allows sustainable innovation and creative progress for an organisation. It comprises of cultural changes, internal resource considerations, and product development that supports improved, technology-powered user experiences. Digital transformation is the process of integrating digital technologies into all areas of a company's business model to fundamentally alter how customer value is created and delivered. It involves changing business processes, culture, and customer experiences.	What is Digital Transformation | IGI Global (igi-global.com)
Higher education (HE)	Tertiary institutions which provide dual mode approach to teaching and learning to students to acquire knowledge, skills and attitudes to make them develop critical thinking skills, empowering knowledge, and digital skills to become useful in their communities and impact productivity at workplace	What is Higher Education Institutions | IGI Global (igi-global.com)
Innovative learning	Innovative learning is the process of creating an atmosphere where students learn about new things regularly, question them, and think of new ideas on their own. It can involve using technology like – Augmented reality, Deep Learning, or something as common and necessary as the Internet to let students explore and understand things. It could be inclusive of more practical and DIY projects to let learners take risks and learn by doing. It can also facilitate group explorations that can help in developing skills like learning from others, growing, and developing harmony amongst themselves.	https://www.jigsawacademy.com/blogs/design-thinking/innovation-in-teaching/

Artificial Intelligence Technology	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. As a scientific discipline, AI includes several approaches and techniques, such as machine learning (of which deep learning and reinforcement learning are specific examples), machine reasoning (which includes planning, scheduling, knowledge representation and reasoning, search, and optimization), and robotics (which includes control, perception, sensors and actuators, as well as the integration of all other techniques into cyber-physical systems).”	https://digital-strategy.ec.europa.eu/en/library/definition-artificial-intelligence-main-capabilities-and-scientific-disciplines
Big data	The term big data is used when the amount of data that an organisation has to manage reaches a critical volume that requires new technological approaches in terms of storage, processing, and usage. Volume, velocity, and variety are usually the three criteria used to qualify a database as “big data.” “Data set that is extremely large in size and mostly unstructured in nature”. “Is data with at least one of the ten big characteristics, consisting of big volume, big velocity, big variety, big veracity, big intelligence, big analytics, big infrastructure, big service, big value, and big market”.	What is Big Data | IGI Global (igi-global.com)
Digital education	A rather term describing the use of digital technologies in education. Education that uses digital technologies to engage in the learning process including computers, software, phones, and cameras.	What is Digital Education | IGI Global (igi-global.com)

Robotics and IoT	Objects with a digital network and internet have a virtual identity and communicate with the environment in a physical and social context. A network comprised of physical objects capable of gathering and sharing electronic information. The Internet of Things includes a wide variety of "smart" devices, from industrial machines that transmit data about the production process to sensors that track information about the human body. Often, these devices use Internet Protocol (IP), the same protocol that identifies computers over the world wide web and allows them to communicate with one another. The Internet of Things (IoT) is a system of interconnected, internet-connected devices that are capable of collecting and transmitting data via a wireless network. IoT-aided robotics applications a tangible reality of our upcoming future. Accordingly, new advanced services, based on the interplay between robots and "things", are being conceived in assisting humans. Nevertheless, the path to a mature development of IoT-aided robotics applications requires several pivotal issues to be solved, design methodologies to be consolidated, and strong architectural choices to be discussed.	What is Internet of Things | IGI Global (igi-global.com)

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