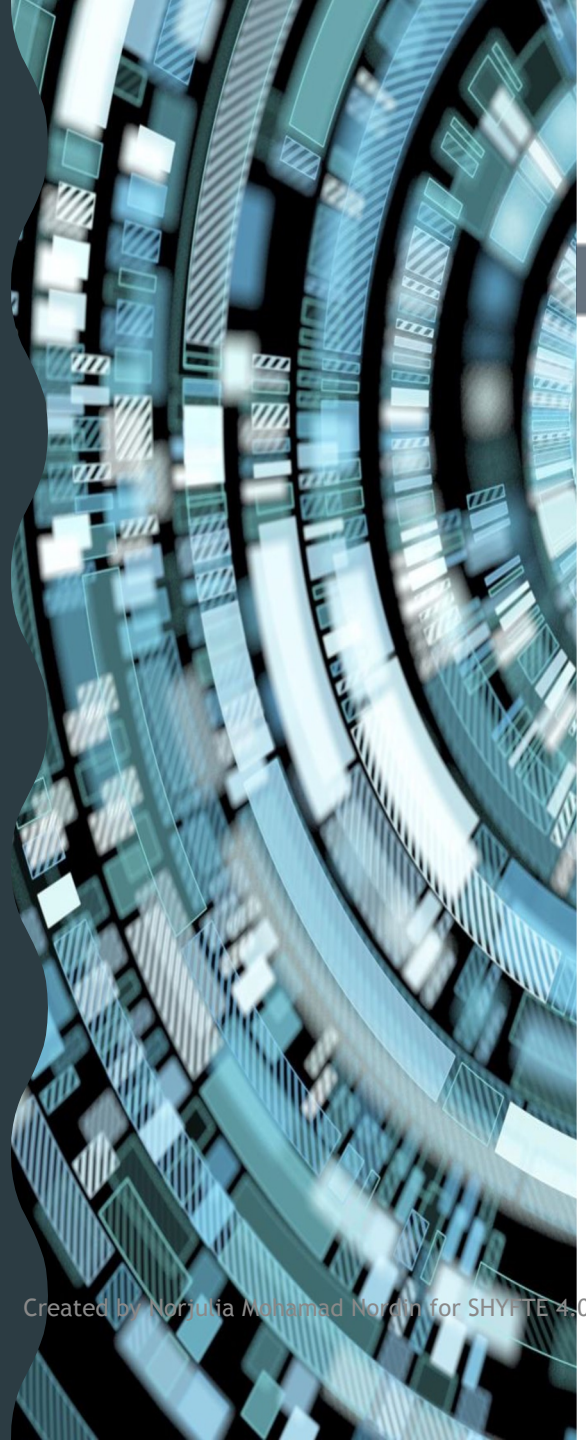

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SHYFTE 4.0

Module Title:
Fundamental of Artificial Intelligence

Created by Norjulia Mohamad Nordin for SHYFTE 4.0

OUTLINE

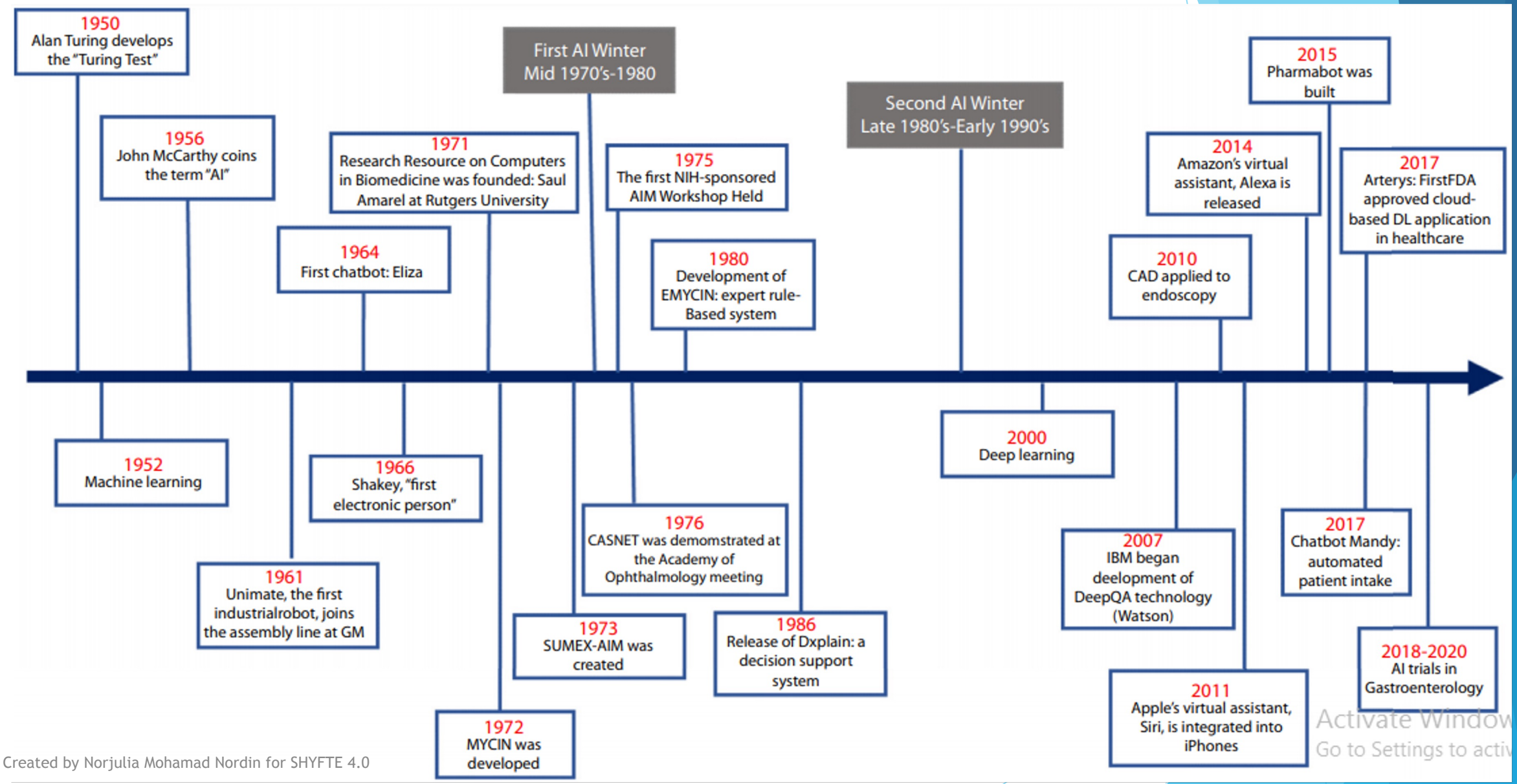
- Artificial and Human Intelligence: An Introduction, history and current trends.
- What is artificial intelligence (AI)? Narrow AI, General AI or Super AI.
- Artificial Intelligence: Benefits, Challenges and Risks.
- Standardization of AI (ethical and trustworthiness).
- The Future of Artificial Intelligence – Human and Machine Together.

ARTIFICIAL AND HUMAN INTELLIGENCE

Introduction to Artificial Intelligence: There are four definitions of AI:

- AI is concerned with the development of computers able to engage in human-like thought processes such as learning, reasoning, and self-correction.
- The concept that machines can be improved to assume some capabilities normally thought to be like human intelligence.
- The extension of human intelligence through the use of computers.
- The study of techniques to use computers more effectively by improved programming techniques.

Timeline of AI History



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WHAT IS ARTIFICIAL INTELLIGENCE?

Artificial Intelligence (AI):

- AI is a "tool" that has been developed to imitate human intelligence and decision-making functions, providing basic reasoning and other human characteristics.
- AI is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.

word "intelligence" can be defined as follows:

- ability to understand
- reason
- perceive
- quickness in learning
- mental alertness
- ability to grasp relationships
- clever
- information
- news

One way to understand "intelligence" is by looking at our own capabilities, which means that humans are able to:

- think
- understand
- recognize
- perceive
- generalize
- adapt
- learn
- make decisions
- solve daily problems

Several forms of biological systems intelligence

- Able to learn
- Able to classify @ generalize
- Able to survive
- Able to gather the information
- Able to recognize the patterns (human very good at this)
- Self-repair
- Self-guidance
- Reproduction
- Making decisions
- Reasoning capability
- Predicting/forecasting
- Understanding noisy or fuzzy information

Video : what is artificial intelligence?

https://youtu.be/kWmX3pd1f10

Class activity

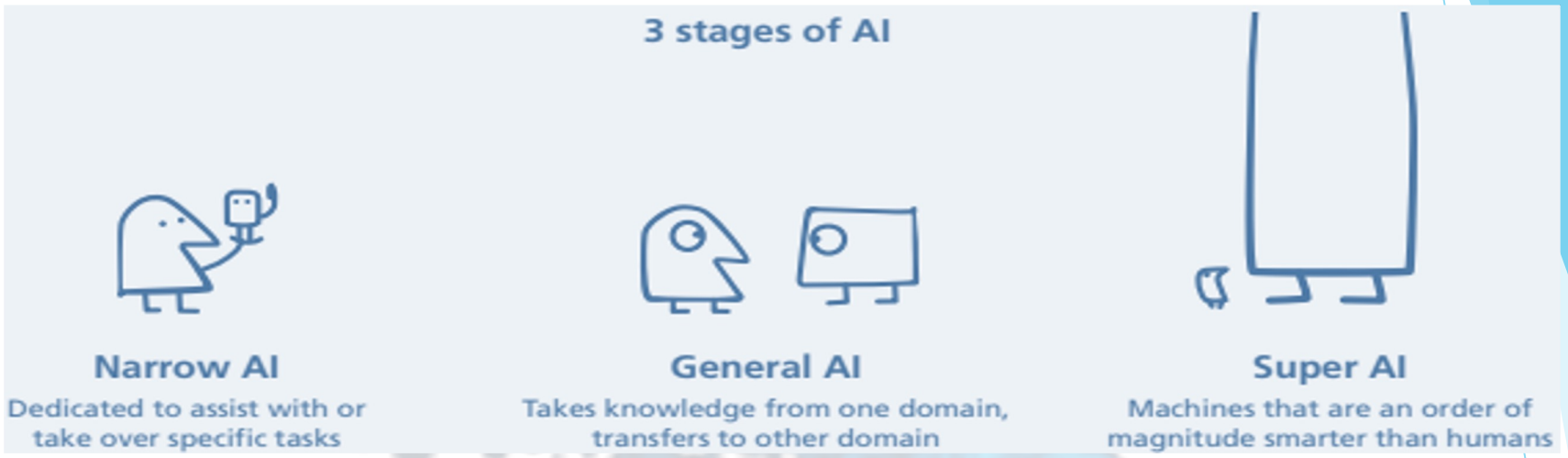
In your group,

1) list three implication of adding "intelligence" in machines.
2) Choose one device/machine that can be called as "intelligent" and explain that device/machine "intelligence"
3) Present to the class within 7minutes

Can we develop an intelligent machine? How?

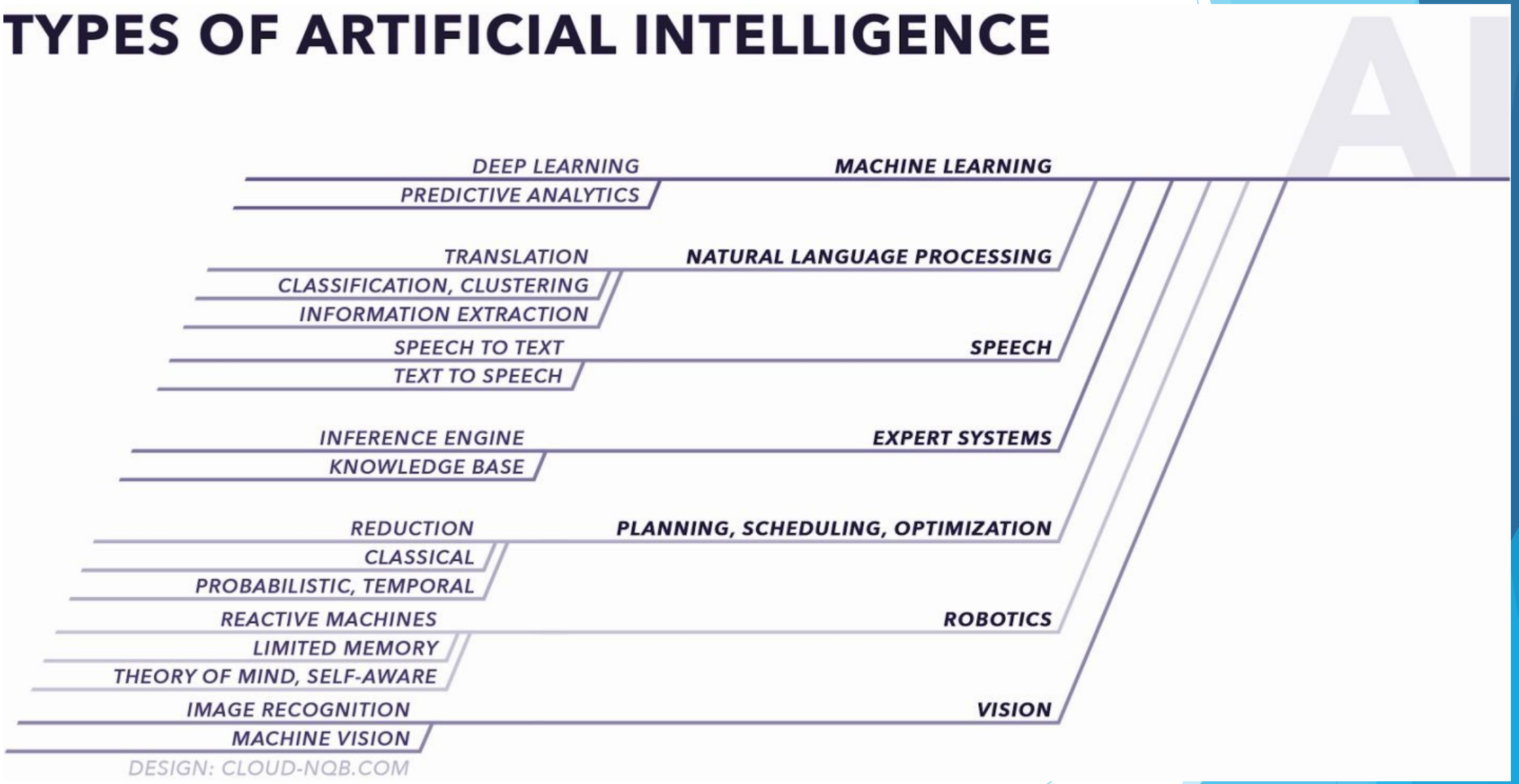
By developing an algorithms based on the human or animal intelligence.

Types of Artificial Intelligence



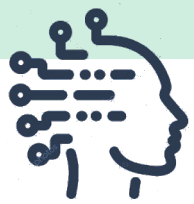
- Narrow AI : These AI systems are designed to solve one single problem. They have narrow capabilities, like recommending a product for an e-commerce user or predicting the weather. This is the only kind of Artificial Intelligence that exists today.
- General AI : It is still a theoretical concept. It's defined as AI which has a human-level of cognitive function, across a wide variety of domains such as language processing and image processing.
- Super AI : The systems in this type would be able to surpass all human capabilities such as decision making and taking rational decisions.

TYPES OF ARTIFICIAL INTELLIGENCE



AI vs Machine Learning vs Deep Learning

ARTIFICIAL INTELLIGENCE (AI)	MACHINE LEARNING (ML)	DEEP LEARNING (DL)
❖ Artificial Intelligence originated around 1950s. ❖ AI represents simulate intelligence in machine ❖ AI is a subset of data science. ❖ Aims to build a machines which are capable to think like human.	➢ Originated around 1960s. ➢ ML is the practice of getting machines to make decisions without being programmed. ➢ Aims to make machines learns through datasets thus can solve the related problem.	❑ Originated around 1970s. ❑ DL is the processed of using artificial Neural Network (ANN) to solve complex problem. ❑ DL is a subset of ML, AI and data science. ❑ Aims to build a NN that automatically discover patterns for future.



Class activity

Determine the **types of AI** of that device/machine that has been chosen previously. Justify your answer.

AI: BENEFITS, RISKS AND CHALLENGES

Artificial Intelligence Benefits:

- Task optimization: The focal goal of most of the new age technologies is to optimize our daily chores and make the process more efficient. AI is not an exception. It allows machines to perform general and more advanced operations such as Amazon and autonomous vehicles using AI technology.

- Reduction of human error: by automating operations we can successfully avoid most of the human-made errors. AI is an ideal example of how a machine can reduce mistakes and accelerate processes.

- Applicable to different industries: from the healthcare sector to aviation AI is thriving with its innovative solutions, where AI concept is flexible.

AI: BENEFITS, RISKS AND CHALLENGES

Artificial Intelligence Risks:

- High costs: on the other hand, artificial intelligence can cause some disadvantages. One of the biggest concerns for companies is high costs. AI itself is a complex mechanism, thus, to create and install it to the business requires a lot of money.

- Lack of improvement with experience: AI was developed to assists humans and make our daily tasks easier. However, technology is missing the main point of this concept – self-improvement. Colloquially, it can perform perplexing operations, yet it doesn't learn and improve itself.

- Can cause unemployment: when it comes to AI, unemployment is the biggest concern. People are afraid that AI can easily replace them as it doesn't require a salary and can consistently perform the same functions.

AI: BENEFITS, RISKS AND CHALLENGES

Artificial Intelligence Challenges [5]:

- Computing Power: The amount of power these power-hungry algorithms use is a factor keeping most developers away. ML and Deep Learning are the stepping stones of AI, and they demand an ever-increasing number of cores and GPUs to work efficiently.
- Trust Deficit: One of the most important factors that are a cause of worry for AI is the unknown nature of how deep learning models predict the output.
- Human-level: This is one of the most important challenges in AI, one that has kept researchers on edge for AI services in companies and start-ups. These companies might be boasting of above 90% accuracy, but humans can do better in all of these scenarios.
- Data Privacy and Security: The main factor on which all the deep and Ml models are based on is the availability of data and resources to train them. There are chances this data can be used for bad purposes.

AI: BENEFITS, RISKS AND CHALLENGES

Standardization of Artificial Intelligence [6]:

- Human agency and oversight: AI systems should empower human beings, allowing them to make informed decisions and fostering their fundamental rights.
- Technical Robustness and safety: AI systems need to be resilient, safe and secure.
- Privacy and data governance: besides ensuring full respect for privacy and data protection, adequate data governance mechanisms must also be ensured, taking into account the quality and integrity of the data.
- Transparency: the data, system and AI business models should be transparent.
- Accountability: Mechanisms should be put in place to ensure responsibility and accountability for AI systems and their outcomes.

THE FUTURE OF ARTIFICIAL INTELLIGENCE

From the possible the area as listed below, imagine The future AI or AI “things” that you dreamed on of based on it.

1) Transportation
2) Manufacturing
3) Education
4) Healthcare
5) Media
6) Customer Service

THE FUTURE OF ARTIFICIAL INTELLIGENCE

- Transportation: Although it could take a decade or more to perfect them, autonomous cars will one day ferry us from place to place.
- Manufacturing: AI-powered robots work alongside humans to perform a limited range of tasks like assembly and stacking, and predictive analysis sensors keep equipment running smoothly.
- Healthcare: In the comparatively AI-nascent field of healthcare, diseases are more quickly and accurately diagnosed, drug discovery is sped up and streamlined.
- Education: Textbooks are digitized with the help of AI, early-stage virtual tutors assist human instructors and facial analysis gauges the emotions of students to help determine who's struggling or bored and better tailor the experience to their individual needs.
- Media: Journalism is harnessing AI, too, and will continue to benefit from it. Bloomberg uses Cyborg technology to help make quick sense of complex financial reports.
- Customer Service: Last but hardly least, Google is working on an AI assistant that can place human-like calls to make appointments. In addition to words, the system understands context and nuance.

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THANK YOU