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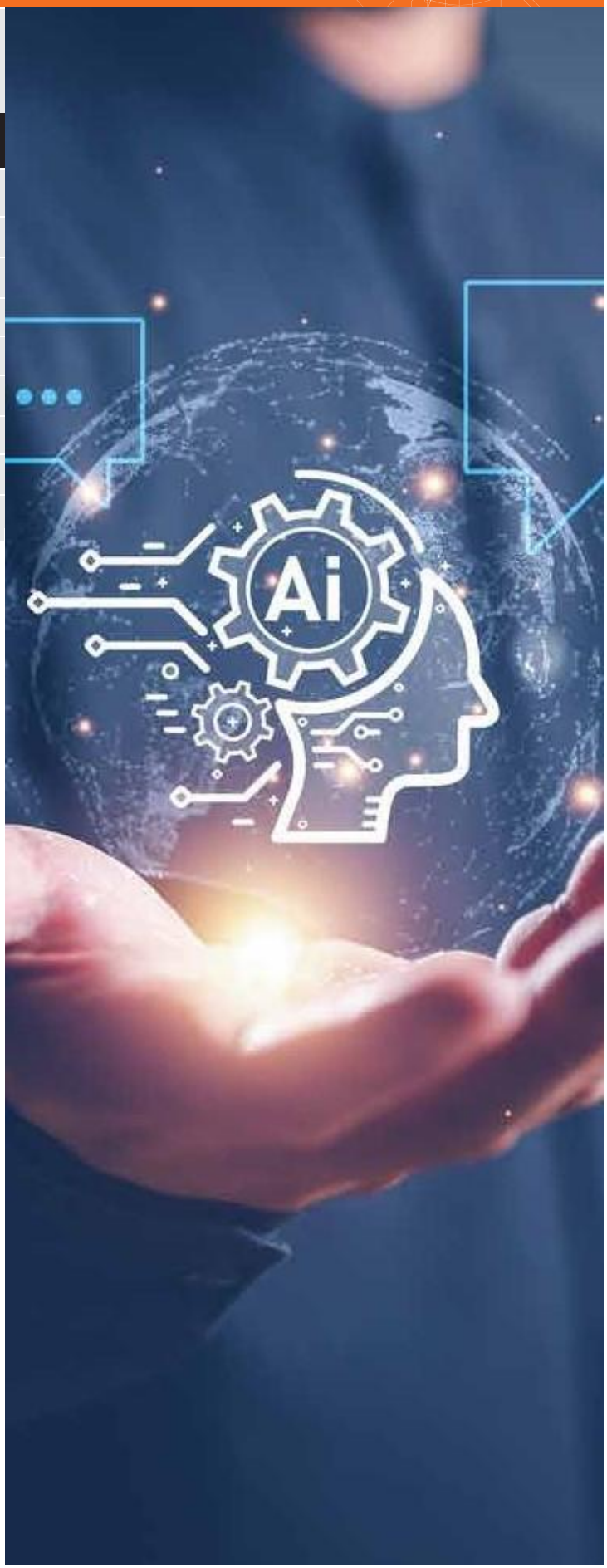
CONTENT



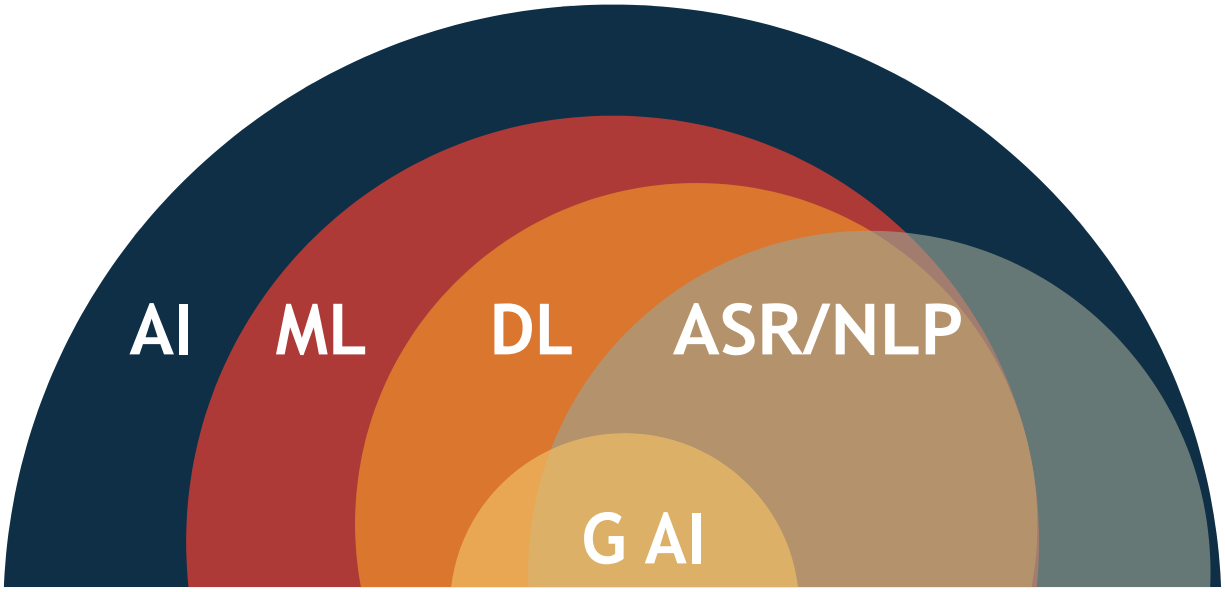
The **University of Lima** has become a promoter of academic research in Peru and also has engineering programs that are in high demand. By adopting a proactive role given the rapid digital evolution, the University created its Technological Observatory, made up of a team of professors and students, to continuously monitor emerging technologies and trends.

Undoubtedly, **Artificial Intelligence (AI)** has been the most talked-about technology in recent times, especially with the popularization of OpenAI's ChatGPT. However, beyond its amazing capabilities and media noise, it is important to understand what impact it could have in the short and long term, how to make the most of it and how to be prepared for its rapid evolution.

The **Technological Observatory (TO)** aims to help students and professors, as well as the general public, to identify the impact of new technologies, contribute to their successful adoption and provide guidance on how they might evolve.

In this first bulletin of the TO, an introduction to **Generative AI** is developed as a core topic, which covers several AI techniques. Its purpose is to learn from various data artifacts in order to use them in the generation of new artifacts that could be reminiscent of the original data. Data artifacts can be texts, videos, images, among others. Generative AI covers several types of technologies, such as GANs (Generative Adversarial Networks) and foundation models (Burke, Chandrasekaran, & Sicular, 2022). In this bulletin, some of the most popular tools that have emerged in recent months are also mentioned.

TYPES OF ARTIFICIAL INTELLIGENCE



- Artificial Intelligence
- Machine Learning
- Deep Learning
- Automatic Speech Recognition/Natural Language Processing
- Generative AI

(Mearian, 2023).

Overview of Generative AI Tools

AI has gone from being analytical to content generator.

This Generative AI ability creates opportunities in almost all fields.

By leading development, we can distinguish Generative AI models that are key to developing a sector.

In the background, an ecosystem is being formed which will focus on training models for specific uses.

Sector	Objective	Examples	Tools
Text	Write new content	Customized communications, summaries	Copy.ai, Jasper, Copysmith, ChatGPT, Bard
	Assist	Customer service, chatbots	Quickchat, Boost-ai
	Analyze	Extraction of data from conversations	Viable, MLQ.ai, Harvey
Code	Generate programs	Developer support	OpenAI, OctoML, Amazon
	Generate test data	Synthetic data for testing models	Mostly.AI, Datagen
	Create prototypes	Interface proposal	Durable
Images	Create images	Creation from specifications	DALL•E 2, Stable Diffusion
	Edit images	Customized modification	Runway
	Compose images	Combination of images, collage	Synthesia, Google's Image Video, Pictory
Audio	Move from text to speech	Education, assistance to disabled people	Voicebooking, Amazon Polly
	Create audio	Creation of new sounds and effects	Boomy, Amper, Alva
	Edit audios	Recording modification/enhancement	Deepgram, AssemblyAI
Video	Create/edit videos	Short videos, customization, education	MetaAI's Make-A-Video
	Translate dialogs	Copies, meetings, voice changes	DubDub.ai, Dübverse, ReSpeecher
	Adjust appearance	Effects, face swap	Reface, Deep Voodoo, NVIDIA Broadcast

Source: Prepared by Professor Carlos Torres Paredes.
For a comprehensive review of new applications daily released, we suggest you visiting the following website: https://theresanaiforthat.com/

WHAT CAN GENERATIVE AI DO?

Text Generation

Text generation enables us to carry on a natural conversation with a chatbot, obtain human-like responses, and recognize patterns based on what has been written (Stevens, 2021).

Several AI technologies, such as foundation models, transformer architectures, among others, have these capabilities.

What can be done?
Write an email, get responses, create stories and scripts, generate exams, write mathematical or Excel formulas..., among endless possibilities.

What cannot be done?
Its sources cannot be contrasted and, in the case of ChatGPT-3, data from the Internet up until September 2021 can only be accessed.

To compete with ChatGPT, Google has launched Bard in May 2023, which has a more up-to-date knowledge.

Image Generation

Depending on the model used, image generators can create images from text (DALL•E, Midjourney, etc.), download and customize models (Stable Diffusion) or interact with images (Google Image) (Brown et al., 2021).

What can be done?
Generate complex images for illustration, marketing, advertising, publishing or journalism.

What cannot be done?
Trace the origin of visual references.

As with text generation, we cannot know whether an image is human or AI generated. This may have ethical implications, such as if it is used to create hyper-realistic images of people or events that did not occur and that may cause misinformation, reputational damage and an undesired emotional effect, something that is already occurring, as problems have even been generated by images that caused confusion (Maraza, 2023).

Task Automation

In March 2023, Microsoft launched Microsoft 365 Copilot for automatic content generation in order to speed up or replace tasks that used to be done manually.

The use of Copilot can be embedded in apps such as Word or Business Chat.

Embedded in apps, it can create documents or presentations with a simple prompt; in Excel, it can improve data analysis and visualization; in e-mail, it can suggest replies or summarize long email threads; in Teams, it can summarize meetings or suggest next steps, among other uses (Microsoft, 2023).

Via Business Chat, it creates a knowledge model using app information and organizational data.

STUDENT AREA

Creative Applications of Generative AI

Music: Artificial Intelligence Virtual Artist (AIVA) is an AI that uses machine-learning algorithms to create original music in a variety of genres and styles (AIVA, n.d.).

Design: Microsoft has recently been granting free access to its new generative AI, Microsoft Designer, responsible for creating publications through design algorithms (Microsoft, 2023).

Arte: The most well-known is DALL•E, but there are also others such as Nvidia Picasso, which is responsible for generating images according to the parameters requested (Brown et al., 2021).

Literature: Scheherazade-IF is an AI that creates interactive stories. This means that it generates unique characters according to the decisions made by the characters (Li, Riedl, & Yee, 2016).

Cinema: Nvidia Deep Learning Super Sampling (DLSS) is an AI used in post-production to improve the quality of images and reduce rendering time. Although it is known for being used in video games, its use is not only limited to that (Nvidia DLSS, n.d.).

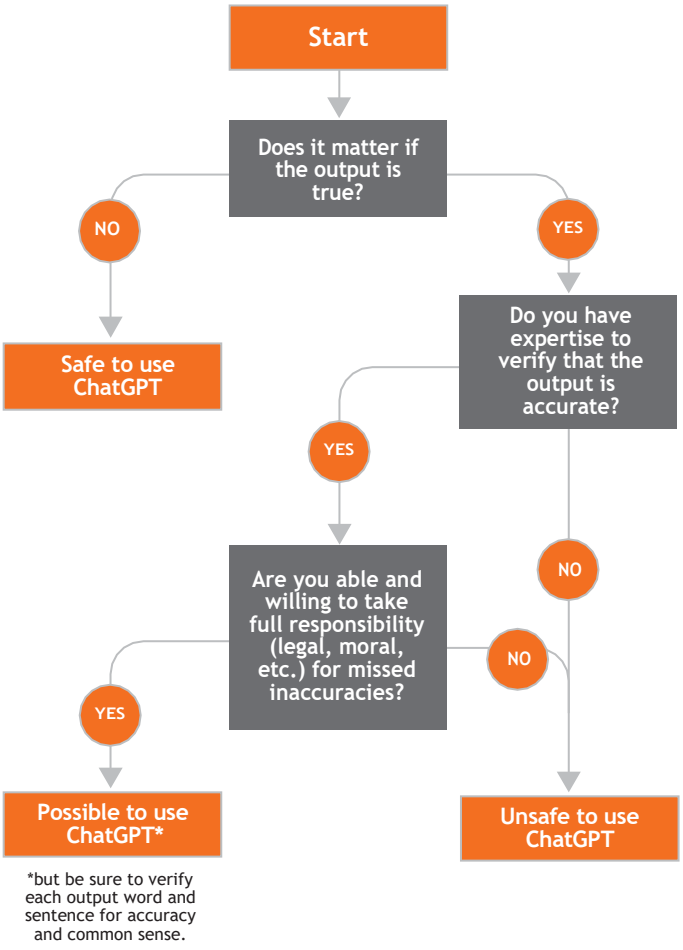
Generative AI and Social Networks

In times like this, with an increasing number of generative artificial intelligences, it has not been simpler to produce content that does not infringe copyright laws or prevent you from literally being able to see your words (Huan, He, & Sun, 2020).

Thanks to AI, the creation of images for publications has increased its effectiveness and efficiency in exorbitant numbers, and even more now with Microsoft Designer (https://designer.microsoft.com/), which allows us to create any content template cued by your words and customize it.

It is no exaggeration to say that AI boom has been, in turn, boosted (and perhaps exaggerated) by the great boom of social networks that multiply indications and apps on how to take advantage of the new tools, which are becoming simpler and simpler to use.

When Is it Safe to Use ChatGPT?



ChatGPT decision map.
Source: Sabzalieva and Valentini (2023: 6).

PROFESSOR AREA

Ethics and Social Implications of Generative AI

Use

Positive Use: It has the ability to reduce professor workload and provide students with immediate feedback.

Negative Use: It provides alternative responses or responses that sometimes contradict previous responses provided on the same topic.

Ethics

Positive Ethics: AI can be used to reference, summarize, paraphrase or format texts in order to improve the quality of the documents delivered.

Negative Ethics: If students become highly dependent on an AI such as ChatGPT, ethics may be compromised; therefore, professors are advised to ask more questions that encourage critical thinking during classes.

AI Used to Improve Students' Learning Experiences

New technologies that are being implemented in university classes: Natural Language Processing (NLP), Machine Learning (ML) and Deep Learning (DL).

Methods Used

Language-Learning Chatbot:
Duolingo (NLP) (Duolingo, n.d.).

Customized Learning:
ChatGPT is used to create customized classes aimed at students with the greatest need for attention. Professors can program AI to answer students' most frequently asked questions, provide feedback on assignments and exams, and guide students through specific study materials (ML) (Mandernach, Gonzales, & Garrett, 2018).

Intelligent Tutoring Systems:
CogBooks uses an AI technique known as "machine learning" to analyze student data and create customized knowledge models in real time (CogBooks, n.d.).

HOW TO USE CHATGPT?

ChatGPT has the ability to generate text based on the prompt provided

A good prompt can provide an accurate and relevant response from ChatGPT

Some prompt categories for ChatGPT

- **Search for information** — What and how?
- **Review searcher** — What would happen if...?
- **Comparatives** — "A" strengths compared to those of "B"
- **Role assignment** — "As an Italian chef, what dish would you recommend and why?"

AI will always try to agree with you even if you are wrong. That is why it is a good idea to make sure you have some idea of what you are asking the AI about.

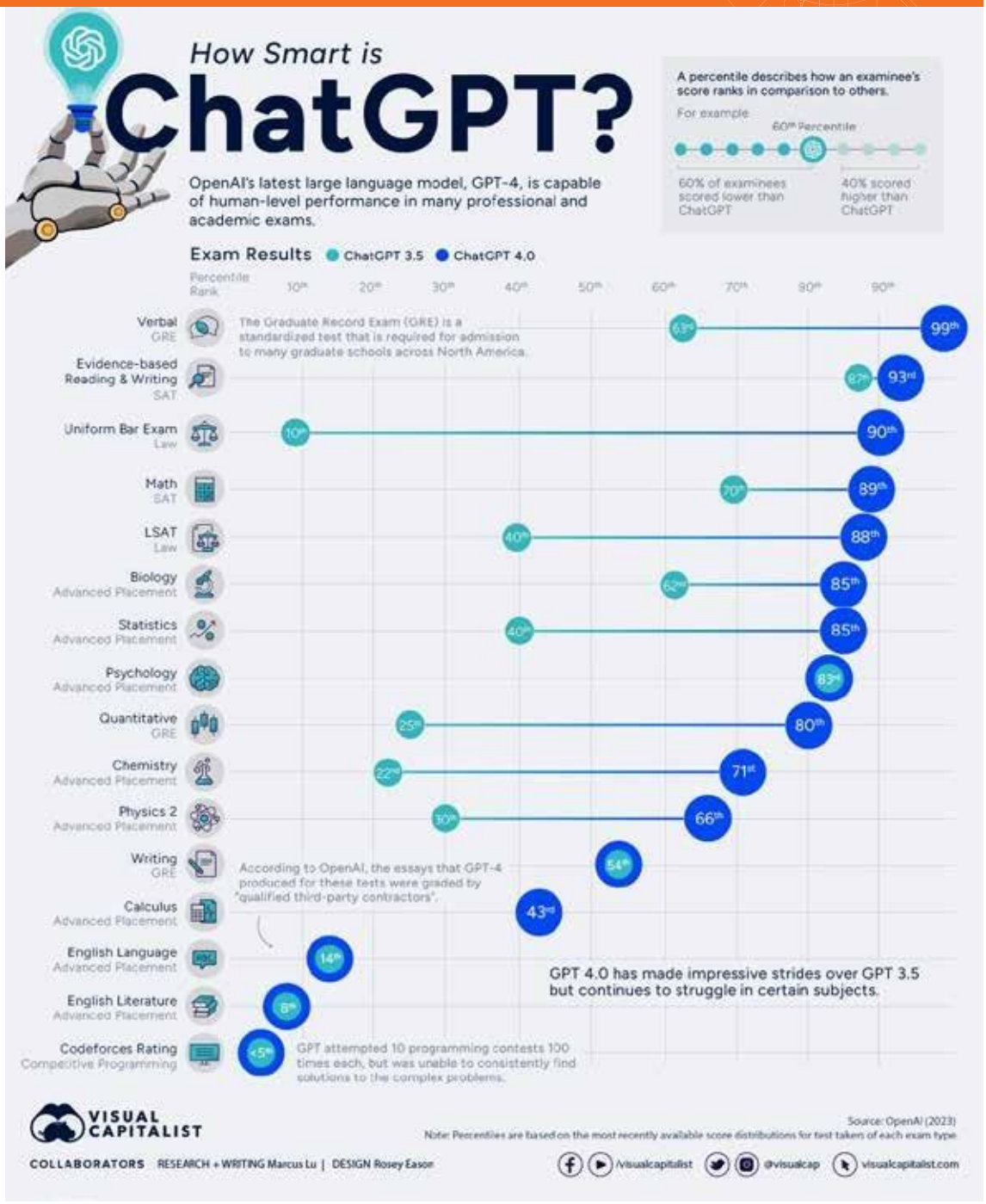
Considerations when using ChatGPT

- **Prioritize information**
- **Make clear indications**
- **Request step-by-step explanation**
- **Provide context**
- **Rephrase your question**
- **Establish restrictions**
- **Divide consultations**
- **Check the accuracy of the response generated**

Source: Nyakundi (2023).

HOW SMART IS CHATGPT?

Source: Lu Marcus (2023).



OpenAI's latest release, ChatGPT-4, is said to have high performance capability in professional areas and academic exams compared to its previous version. However, what is exactly the magnitude of the difference between ChatGPT-3 and ChatGPT-4?

OpenAI answered through a technical report published in March 2023, in which both versions were subjected to complex level examinations in different areas of knowledge.

Percentile explanation:
A percentile describes how an examinee's score ranks in comparison to others.
For example, ChatGPT ranks in the 60th percentile.
60% of examinees scored lower than ChatGPT.
40% of examinees scored higher than ChatGPT.

Given these results, crucial questions are: What skills do these professional exams assess? What intelligence are they trying to "measure"? These questions will lead us to future reflections in the university community.

CHATGPT IN MEDICINE

A research published by *JAMA Internal Medicine* in April 2023 presented the results of a comparative study between responses from real physicians and those from ChatGPT to real patients, evaluated by a panel of licensed healthcare experts.

- The panel of licensed healthcare professionals preferred ChatGPT's responses 79% of the time and rated ChatGPT's responses as higher quality and more empathetic.
- ChatGPT's responses were rated significantly higher in quality than physicians' responses (physicians 22.1% vs. ChatGPT 78.5%).
- ChatGPT's responses were also more empathetic tan physicians' responses (physicians 4.6% vs. ChatGPT 45.1%).

Mark Dredze (Ayers et al., 2023), study co-author and associate professor at Johns Hopkins University, noted: "When doctors are overwhelmed, empathy with their patients can be the first thing to go. […] This study is evidence that AI could help doctors maintain empathetic and accurate communication with their patients."

How could this tool be applied in a Peruvian case?
Recently, a person died of dengue hemorrhagic fever in Peru; among other aspects, how the patient's parents were treated was criticized.

What would ChatGPT response be in this case?
Prompt entered: I want you to act as a doctor. How can a doctor tell a parent that his/her child is having severe dengue hemorrhagic fever and is at high risk, and that his/her body should be expected to withstand the treatment being given?

ChatGPT responds:
"As a doctor, it is important to be honest and compassionate in communicating difficult information to parents about their child's health," and it articulates a response explaining that it is important to provide clear information on the child's condition and potential risks, while offering support and quality care to the family. It also emphasizes the importance of maintaining open communication and being willing to answer any questions parents may have.

OK VS. NOT OK

1 **“The age of AI is filled with both opportunities and responsibilities” (Bill Gates).**
Microsoft’s co-founder and former CEO and current philanthropist wrote an essay in which he comments AI potential and states that it caused him as much surprise as graphical interface (Gates, 2023).

2 **“[Generative AI] is going to also help create more engaging experiences, which should create more engagement by users” (Mark Zuckerberg).**
Meta’s founder and CEO maintains a positive attitude about AI and thinks it will help increase monetization by 30% on Instagram and 40% on Facebook (Schafer, 2023).

3 **“We need to adapt as a society for it”(Sundar Pichai).**
CEO of Alphabet (Google) believes that AI can become an assistant in any profession, but that its use must be “aligned to human values, including morality” (Elias, 2023).

4 **“Leaders need to understand how AI and Generative AI will impact their business models” (Alexander Osterwalder).**
Strategyzer’s founder and CEO advocates for companies to use tools such as ChatGPT to accelerate their strategic decisions (Osterwalder, 2023).

1 **“AI is more dangerous than, say, mismanaged aircraft design or production maintenance or bad car production” (Elon Musk).**
One of the founders of OpenAI and CEO of multiple companies thinks that AI should be regulated and encourages caution; however, he is developing TruthGPT chatbot (Duffy & Maruf, 2023).

2 **“The problem is that he does good things for us, but he can make horrible mistakes by not knowing what humanity is” (Steve Wozniak).**
The legendary Apple co-founder remains concerned about technologies that simulate human reasoning without having human emotions (Sauer, 2023).

3 **“I don’t know if human can survive AI” (Yuval Noah Harari).**
The Israeli historian and philosopher, best-selling author of *Sapiens*, argues that such a powerful tool could become a weapon of mass destruction, so it must be regulated and controlled (De Quetteville, 2023).

4 **“AI is incredibly smart and shockingly stupid”(Yejin Choi).**
Professor at the University of Washington and computer scientist mentioned in a TED talk that AI should be taught common sense, norms and values. She has a team working on new technologies to do so (Choi, 2023).

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