What is generative AI?

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Carl Rosseel

Head of Business Intelligence Curriculum at DataCamp

datacamp

(Generative) Artificial Intelligence

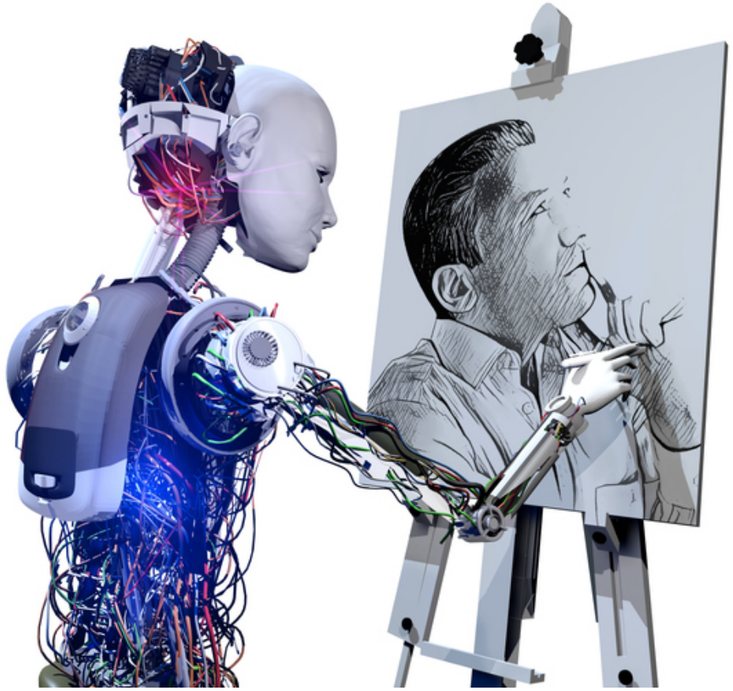
Artificial intelligence (AI)

= branch of computer science that enables computers to perform tasks

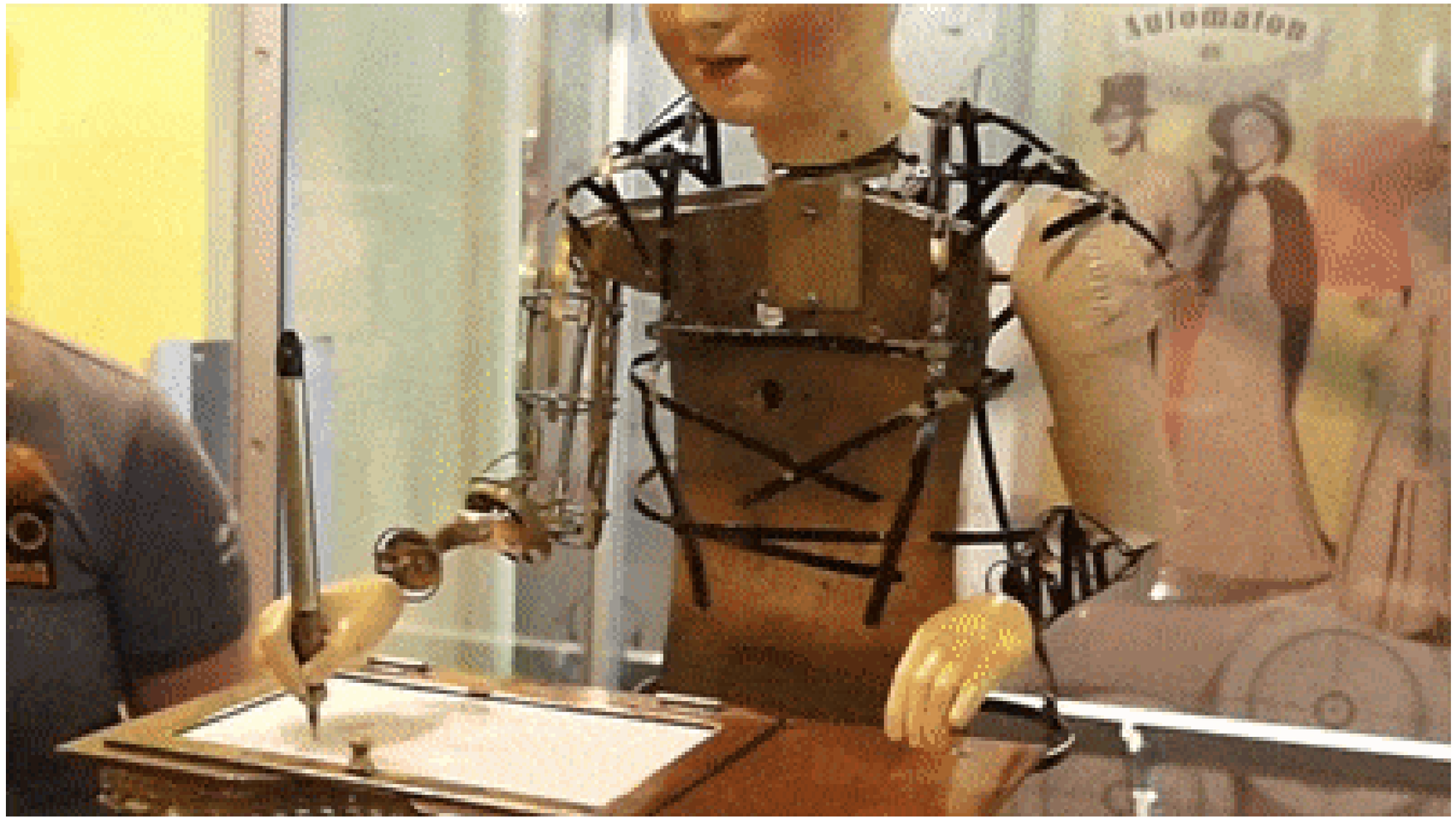


Generative Artificial Intelligence (Gen AI)

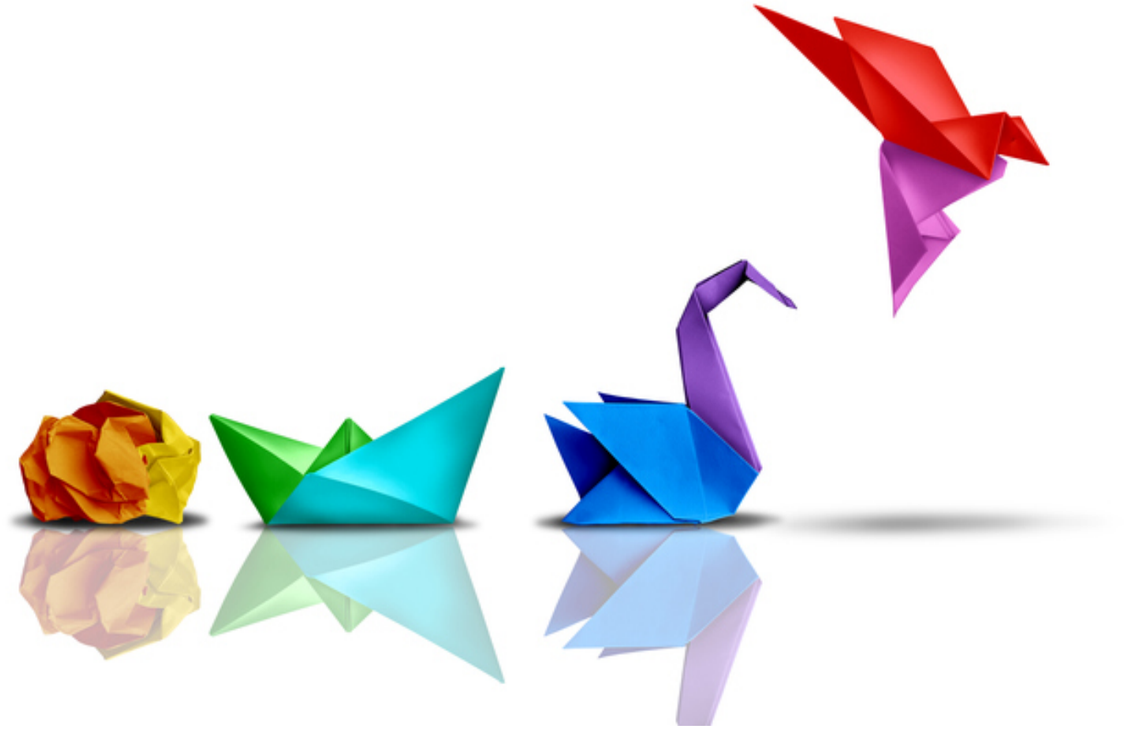
= enables machines to create like humans



Machines that create - Juvenile Artist

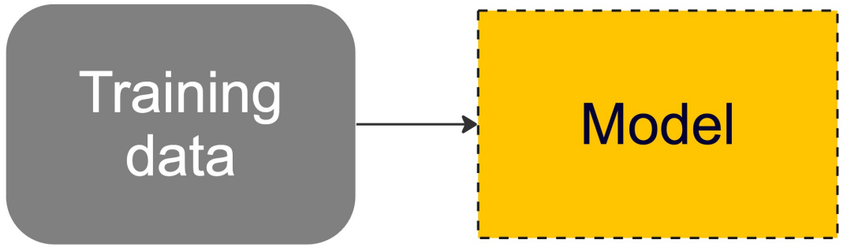


"Creativity is the art of concealing your sources"



How it works

Training

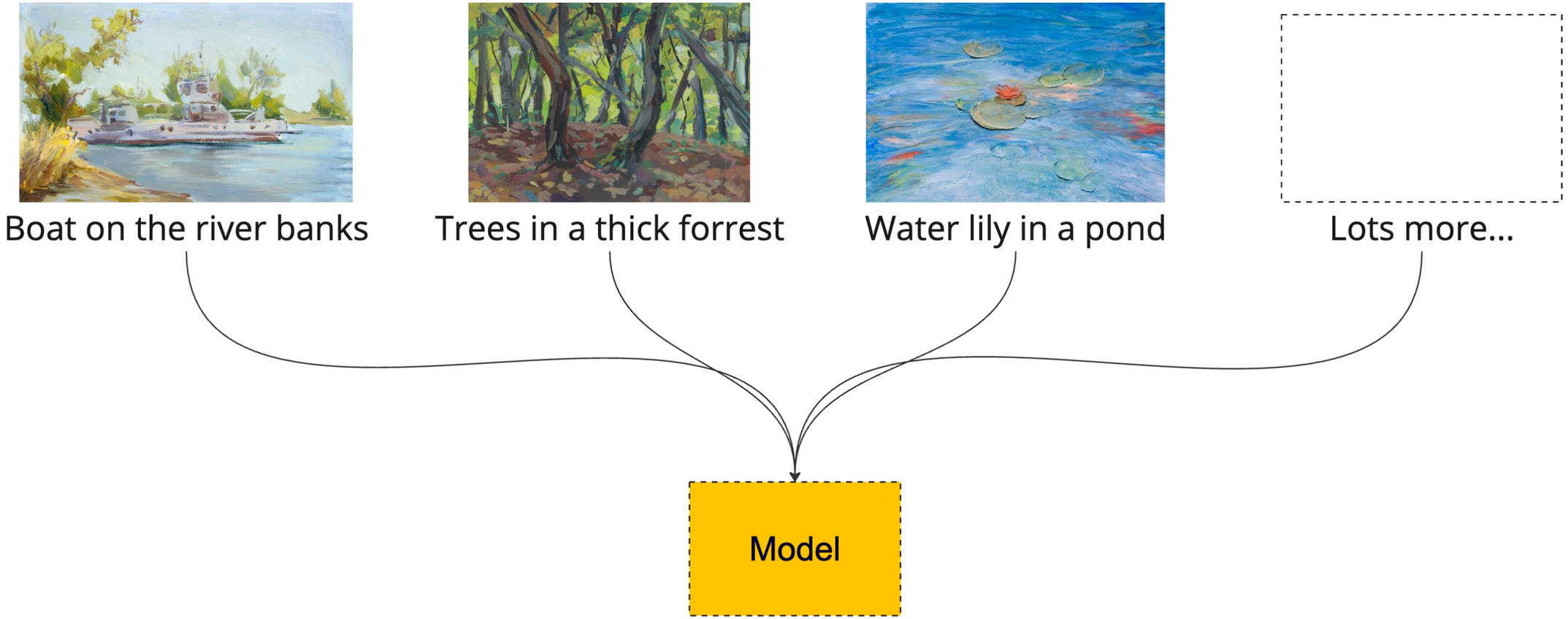


Prompting



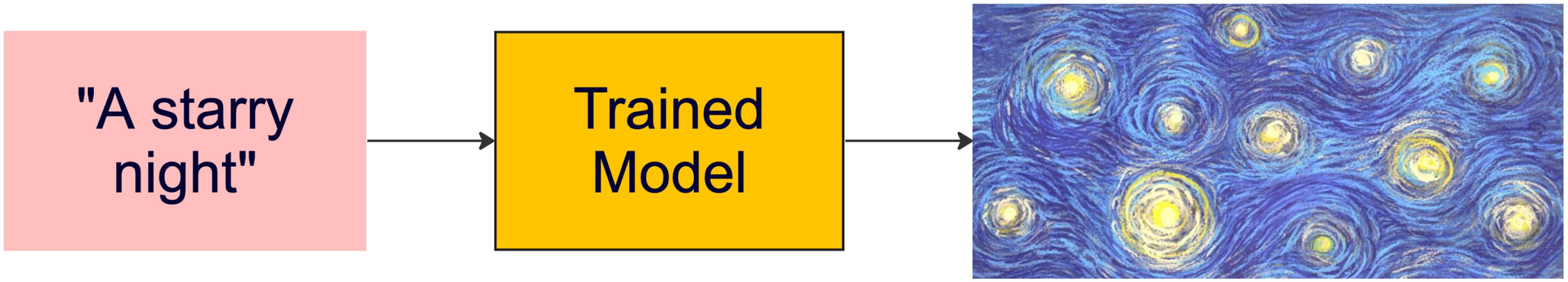
An example

Training



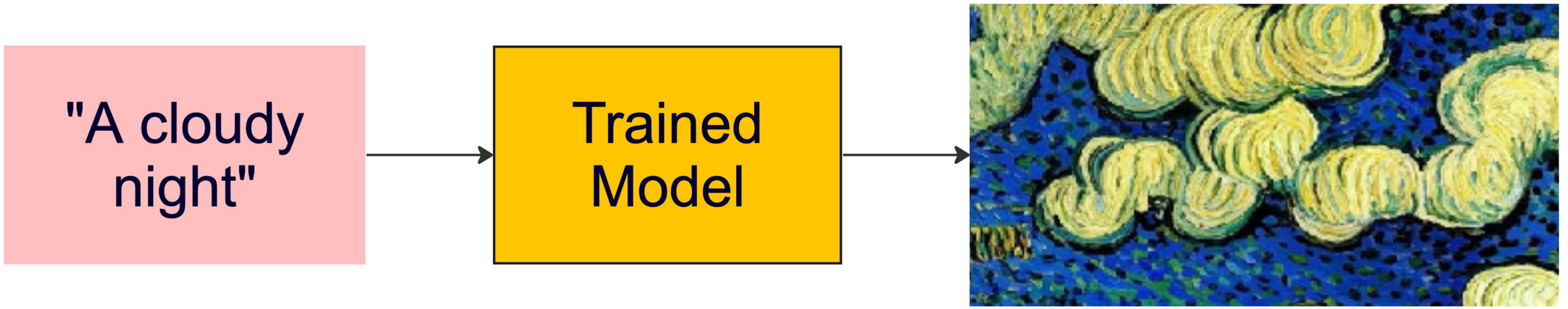
An example

Prompting



An example

Another prompt



Images are not everything

CA

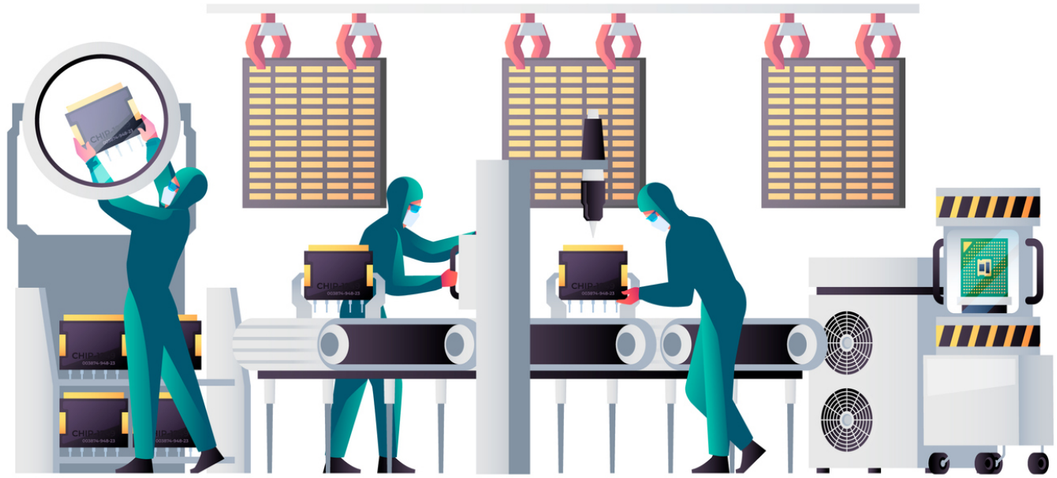
Write a Haiku to showcase the power of Generative AI

Code breathes, dreams take flight,
Silent whispers shape the void,
Worlds birthed from the mind.

Business applications

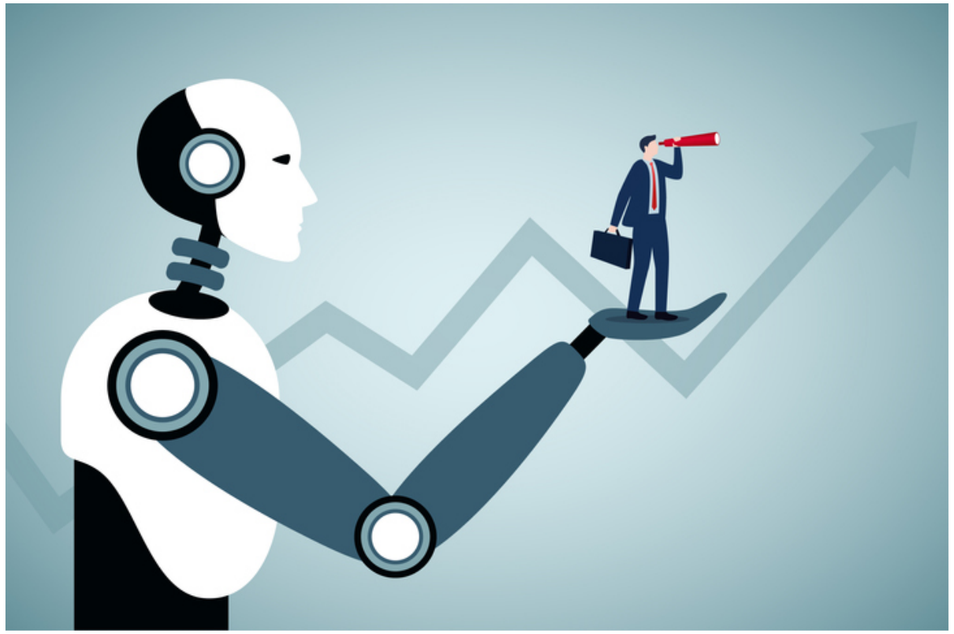
Daily operations

- Personalized customer service
- Enhanced software development



Strategic initiatives

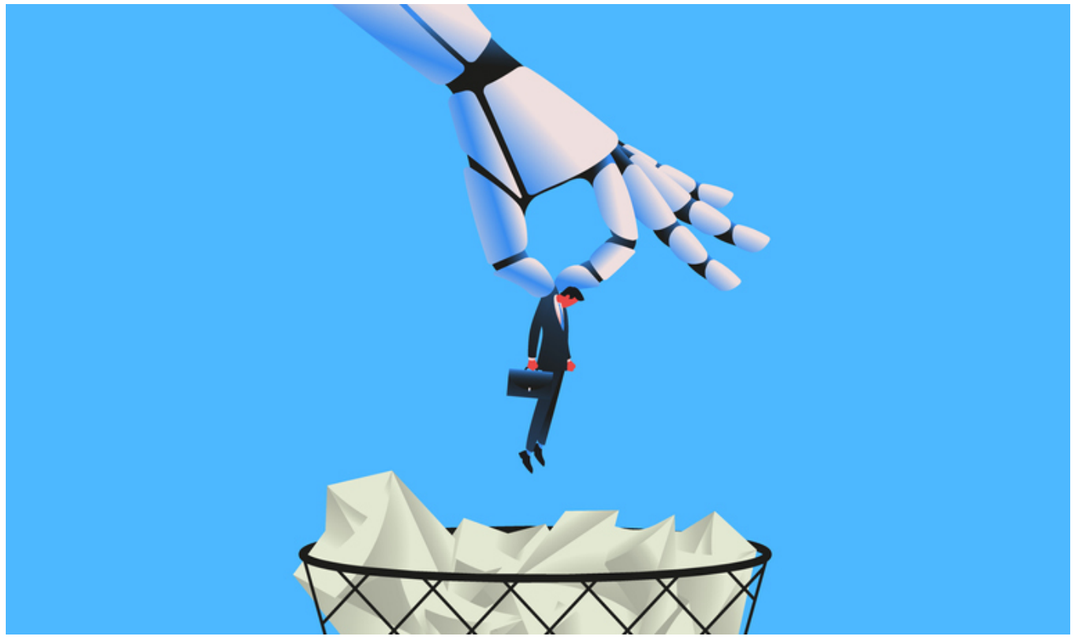
- Document drafting and summarization
- Designing the next generation of products



Will we be replaced?

No, we will collaborate

- AI and Chess
  - Gary Kasparov lost to Deep Blue in 1997
  - Chess players and AI work together



- Harness the power of generative AI through human oversight

[1] https://www.alezan.ai/blog/how-ai-has-advanced-chess-players

Our goals



- Key concepts of generative AI
- How to enhance existing business workflows
- Navigate the legal and ethical challenges
- Be future-proof!

Let's practice!

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Innovations that led to Generative AI

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The ChatGPT phenomenon



[1] Yahoo Finance

The ChatGPT phenomenon

Industry use-cases

- Enhanced customer service
- Personalized marketing
- Innovative product development



Duolingo

- Duolingo Max allows learners to converse with a generative AI



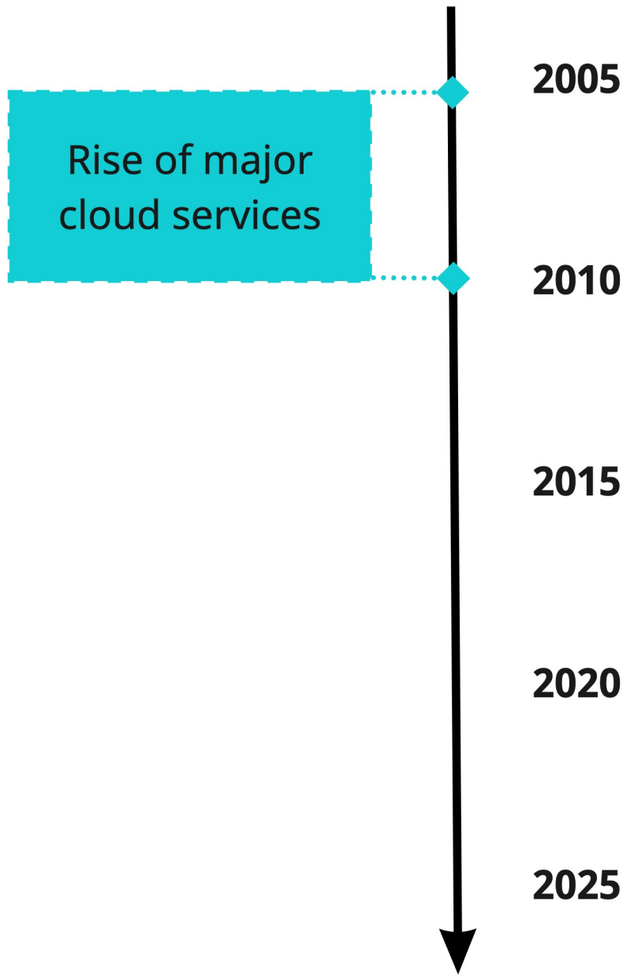
A landscape of innovation

- Business and technology
- Built on previous successes



The impact of the cloud

- Store big data in one place
- Immense computing power

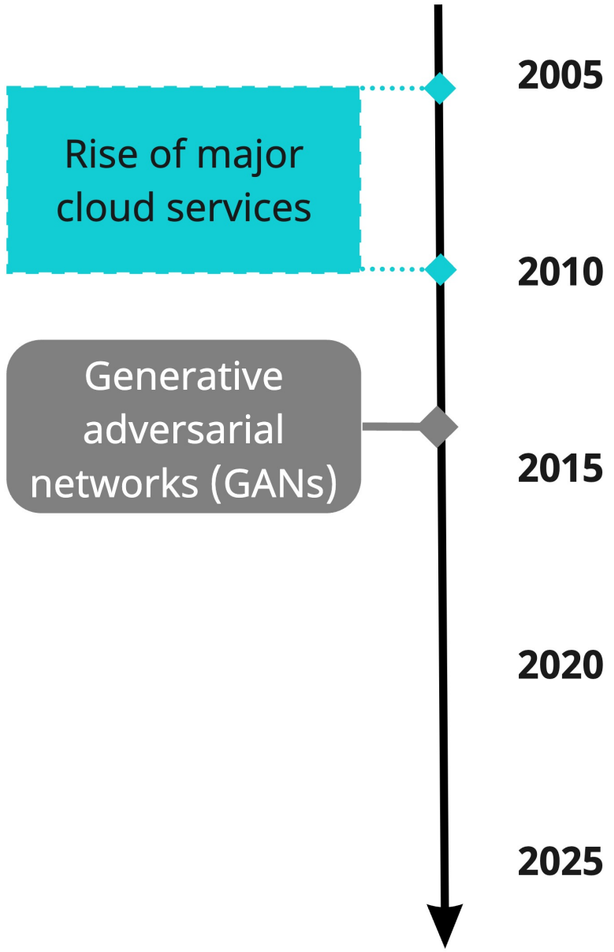


GANs - Generative adversarial networks

- Competing models
- Photo-realistic image generation
  - "Face aging" was a popular application



- Revolutionized product design

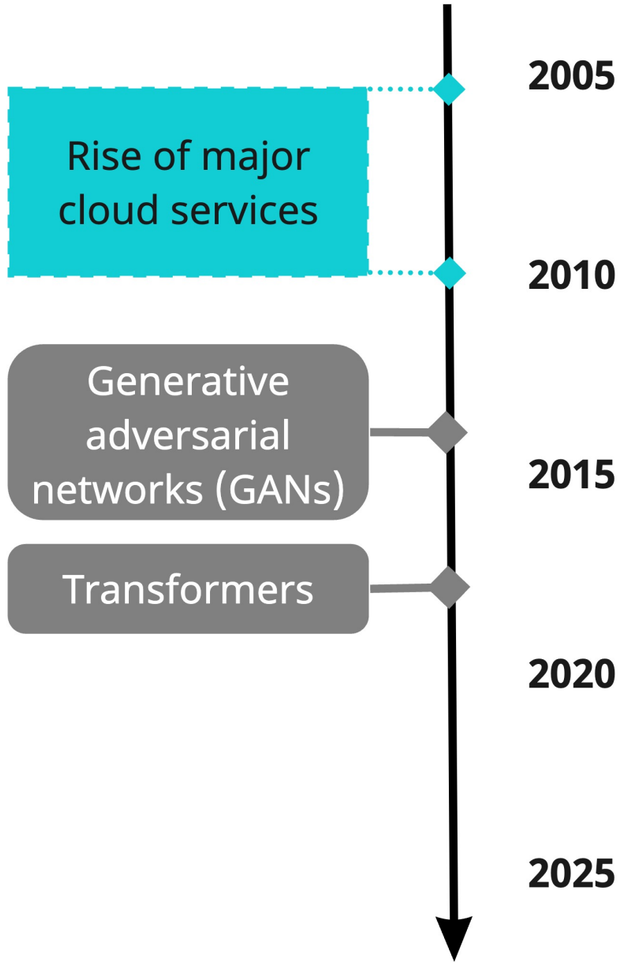


[1] https://www.boredpanda.com/old-age-filter-photos-faceapp/

Transformers

- Published by researchers at Google
- Understand words and their relationships
- Rise of the chatbots

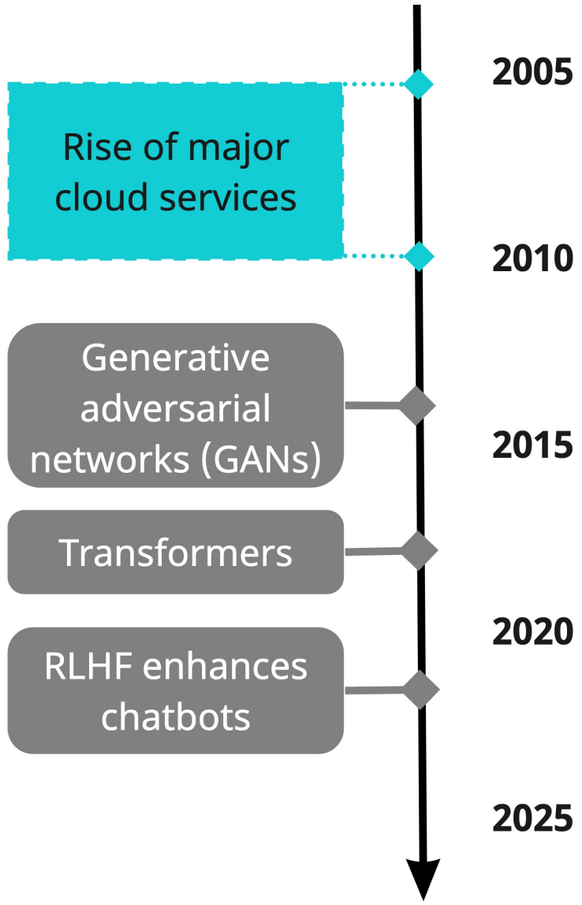




RLHF: Reinforcement Learning with Human Feedback

- Next level chatbots
- Chatbots learning from a human

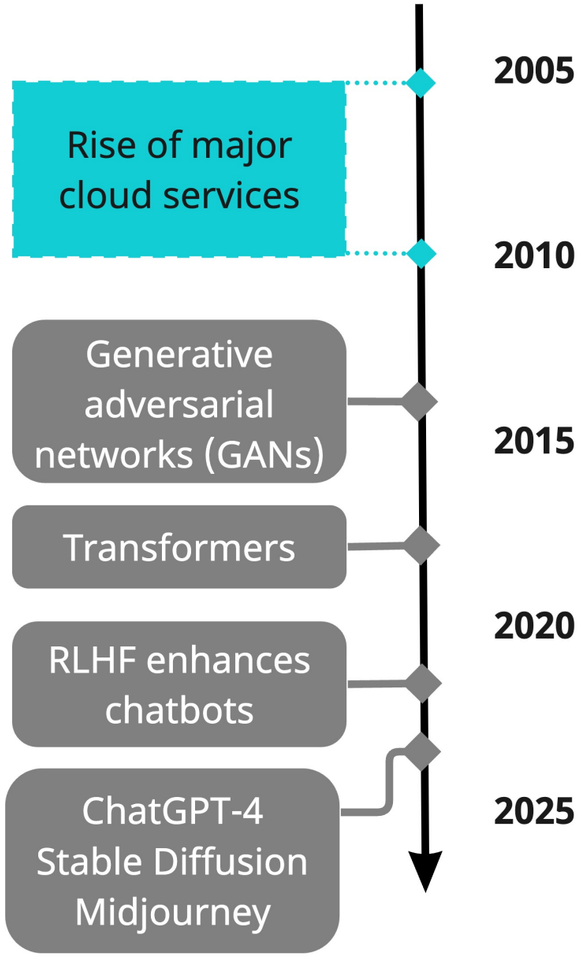




The age of creative machines

- ChatGPT-4 knows multiple languages
- Midjourney uses stable diffusion to create images from text
  - Prize-winning art!

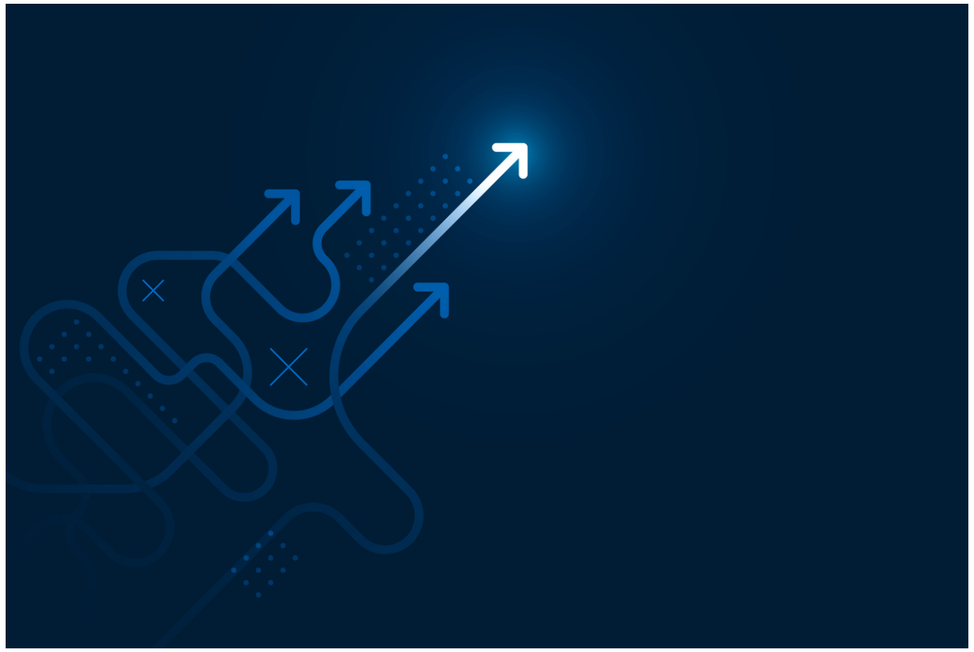




[1] https://www.nytimes.com/2022/09/02/technology/ai-artificial-intelligence-artists.html

The journey of generative AI

- Testament to human creativity
- Collaboration
- Business acumen



The stage is set



Let's practice!

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The progress of generative AI

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The key players

Universities



Government



Companies



Open-source communities

HuggingChat

PyTorch

stability.ai

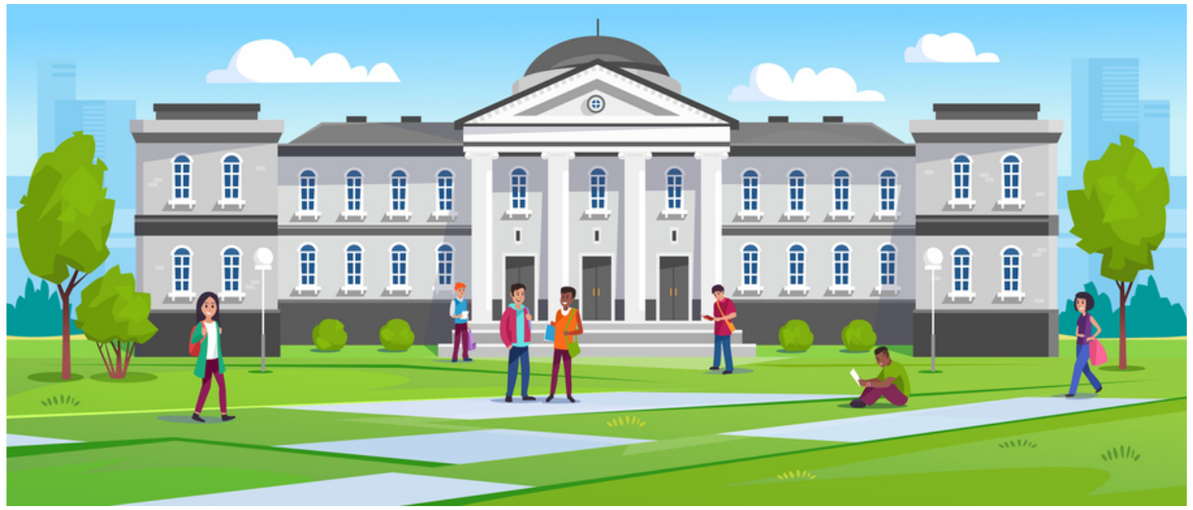
LangChain

Stanford Alpaca

TensorFlow

Universities

- Production center of research and theory
  - GANs were developed at University of Montreal
- Training and inspiring researchers
- Collaboration with industry and government

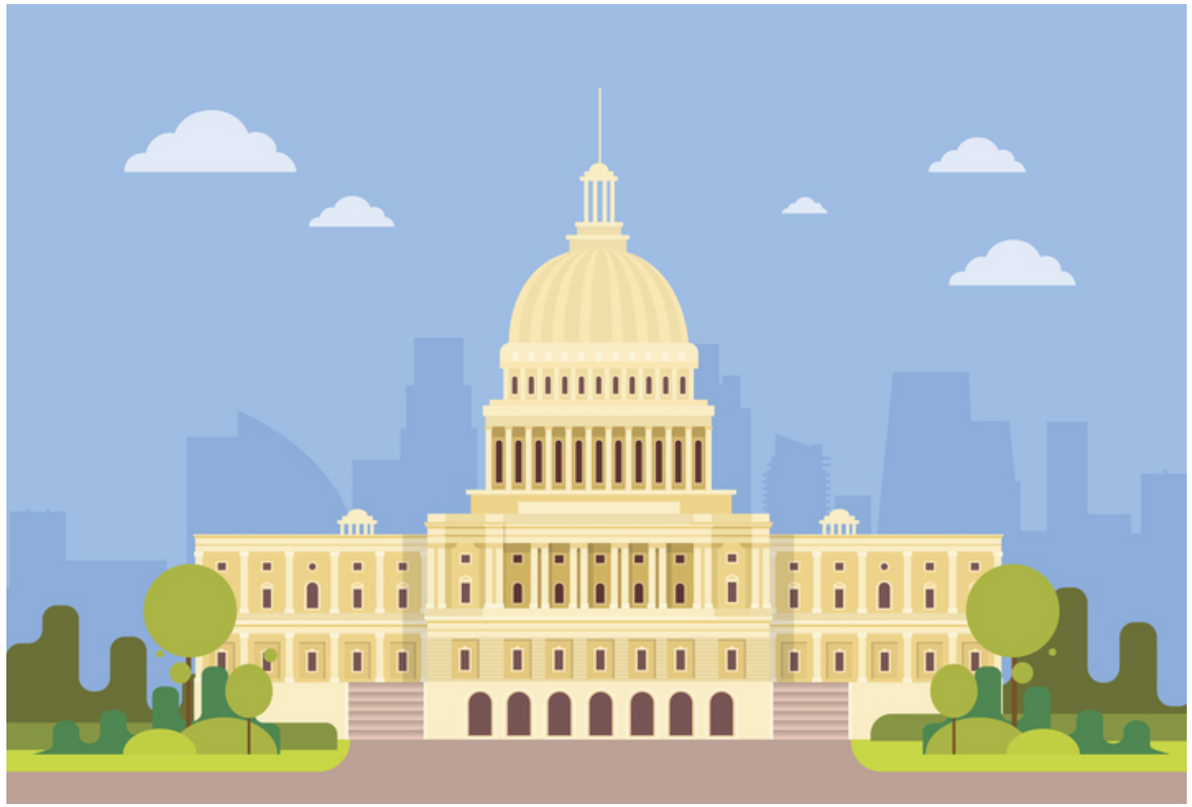


Generative Adversarial Nets

Ian J. Goodfellow, Jean Pouget-Abadie[*], Mehdi Mirza, Bing Xu, David Warde-Farley, Sherjil Ozair[†], Aaron Courville, Yoshua Bengio[‡]
Département d'informatique et de recherche opérationnelle
Université de Montréal
Montréal, QC H3C 3J7

Government and civic institutions

- Governments regulate and fund the industry
  - DARPA funds research into making AI explainable
- Civic institutions provide resources for independent projects
  - CIFAR-10 image dataset



Companies (large and small)

- Generative AI is rapidly adopted
  - to gain market advantage
  - to attract more funding



- Big tech companies specifically
  - produce research
  - develop hardware and infrastructure
  - acquire startups

Open-source community

- Provide open access
- Lower barrier to entry
- Risks:
  - Projects cannot be maintained indefinitely
  - Malicious use













Companies and open-source

Wins

- Developer support
- Talent acquisition
- Feedback from a wide community



Challenges

- Loss of competitive edge
- Misuse of research/technology



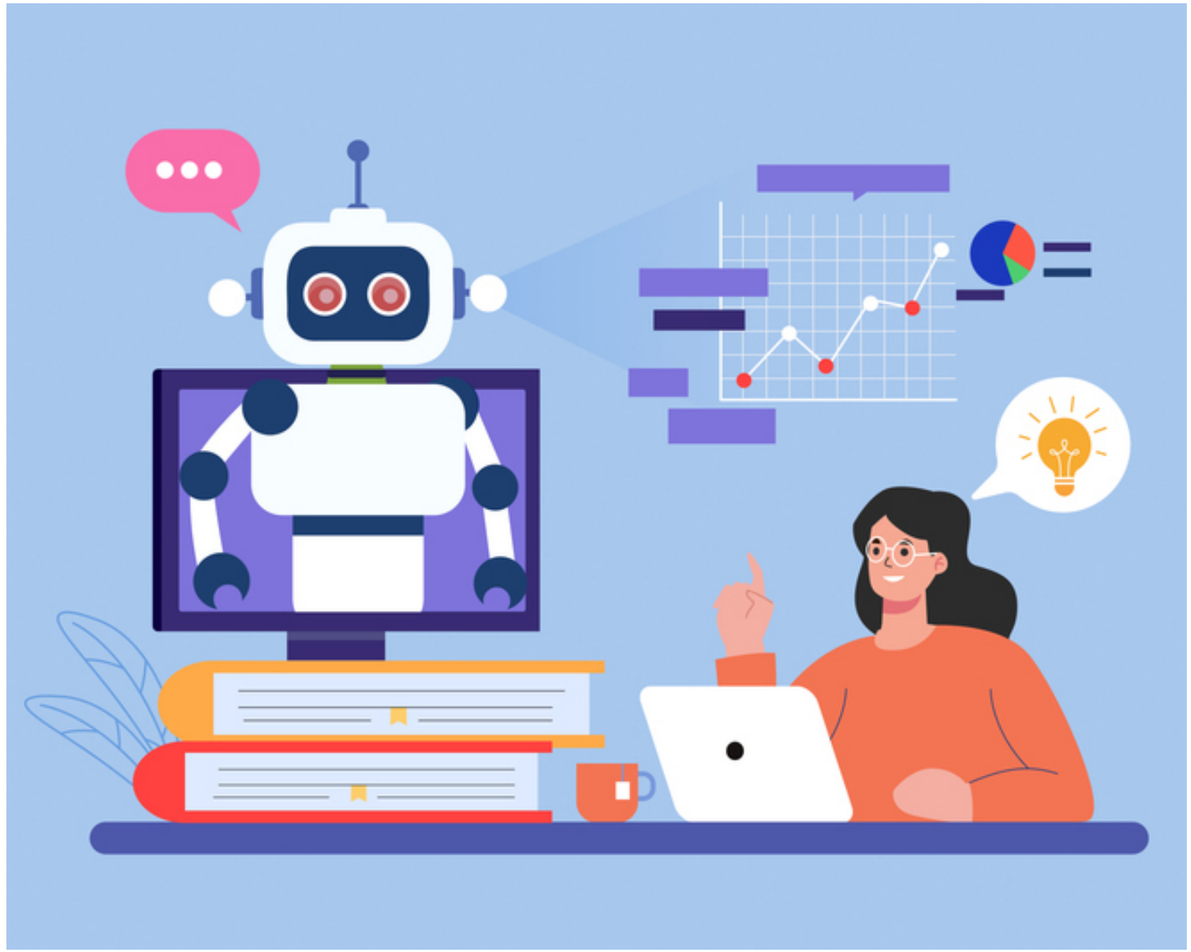
Going forward

Accelerators:

- Lower costs of hardware
- Research and development
- Market competition

Decelerators:

- Technological limits
- Regulation
- Lack of funding or talent



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