

Business Applications in AI

Part II Use Cases of AI in Business

Course content

Session I – Game Theory, Decision Theory & Serious Games

Session II – Use cases of Artificial Intelligence in Business – Sectoral analysis

Session III – Big Tech and the pursuit of AI dominance – Enterprise strategies

Session IV – Ethical issues in AI applications for Business – Benefits & Risks

Agenda

1. AI use cases in Business

- Manufacturing
- Financial Services/Banking
- Logistics/Supply Chain
- Defence/Army
- Food Industry
- Medicine/Healthcare
- Education
- Law/Government

2. AI@Work

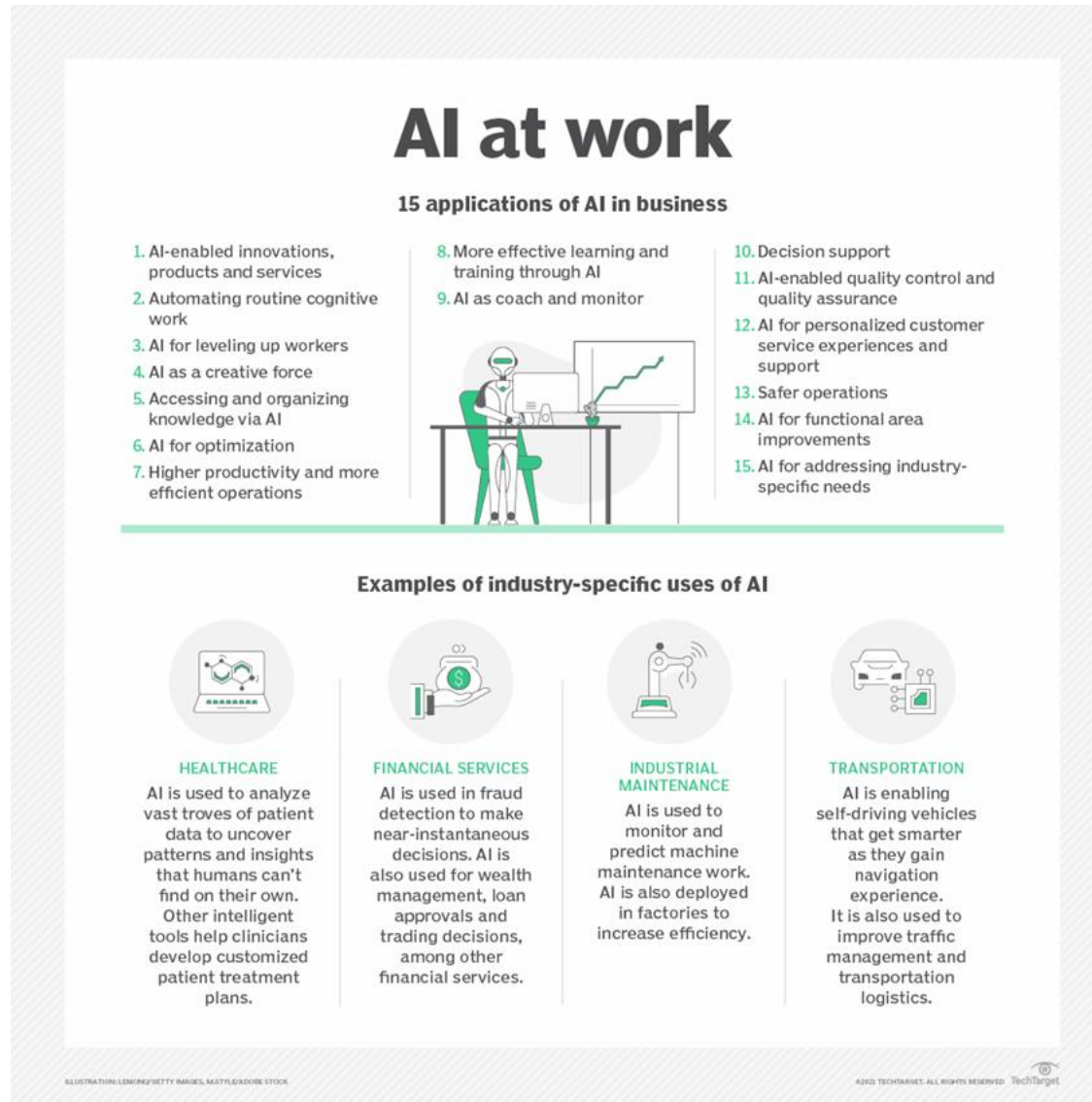
- Main applications
- Useful tools for generative AI

3. « Is Artificial Intelligence helping to solve fake news? » Case study

- Misinformation, disinformation and malinformation
- Fact checking and checking the fact checkers
- Mainstream media/Journalism and its (exemplary) role

4. Assignment: AI in Business applications (Open AI – ChatGPT)

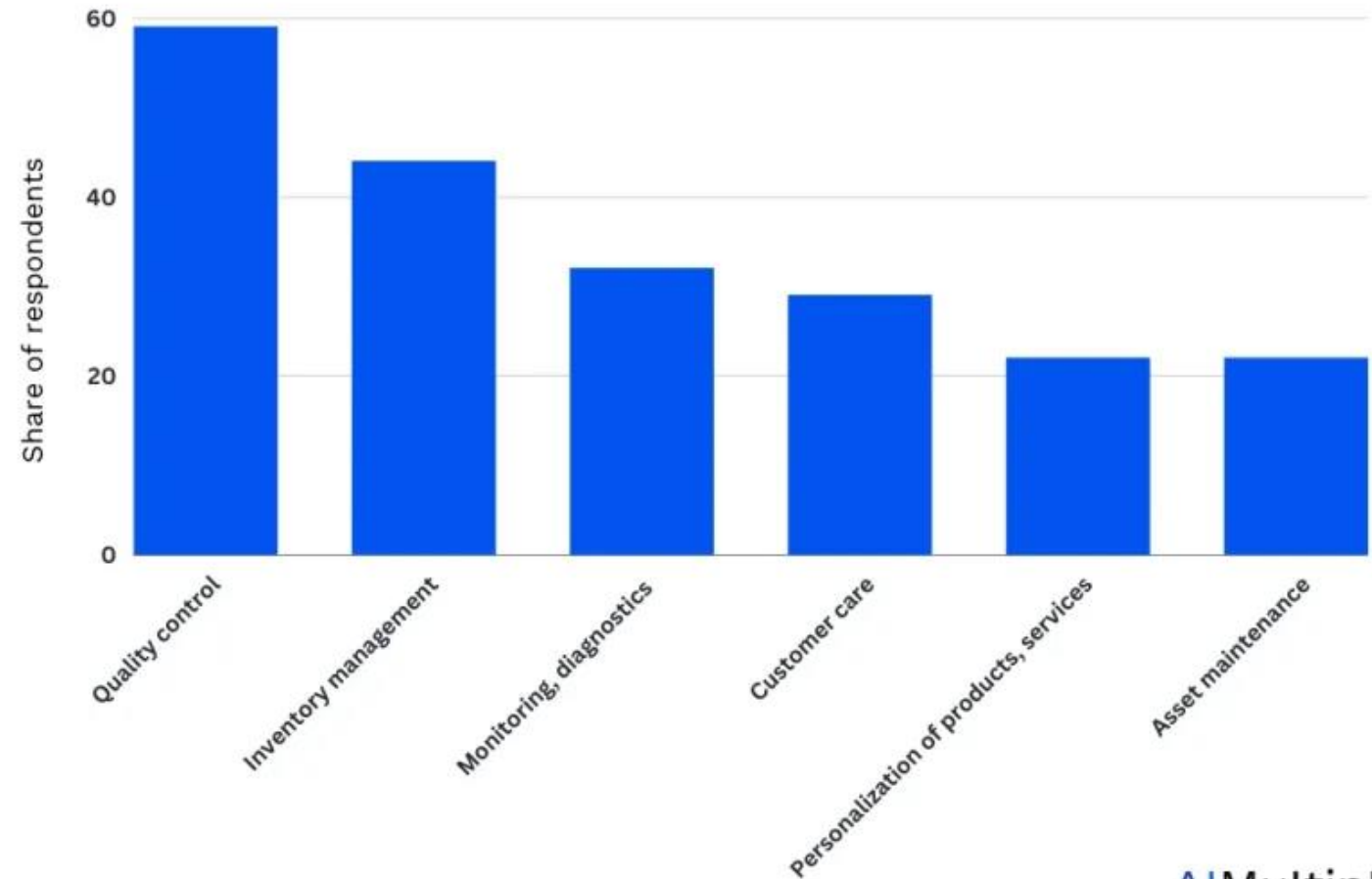
AI use cases in Business



AI use cases in Business

Manufacturing

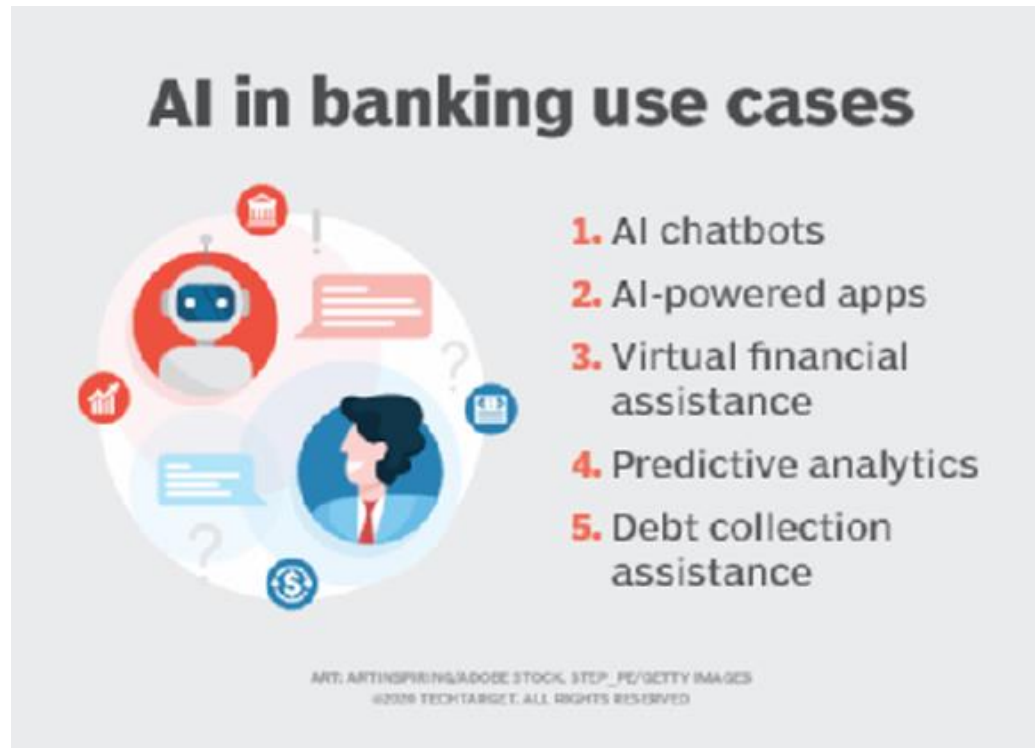
- Safety
- Operational efficiency
 - Cost reduction
 - Speed/100% uptime
- Faster decision making
- Forecasting
- Quality





AI use cases in Business

Financial services – Banking



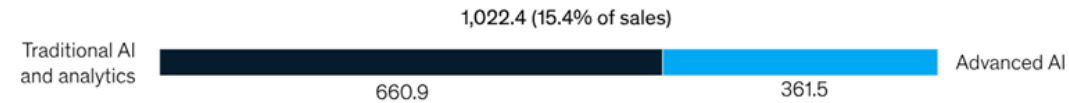
Finance automation and predictions

- Lending
 - Retail
 - Commercial
- Investment
 - Robo-advisory
 - Debt collection
 - Procure-to-pay
 - Account reconciliation
- Insurance
 - Pricing
 - Claims processing
- Audit & compliance
 - Fraud detection
 - Regulatory compliance
- Customer service
 - KYC processes
 - Customer requests
 - Customer churn prediction
- Trading
- Risk management

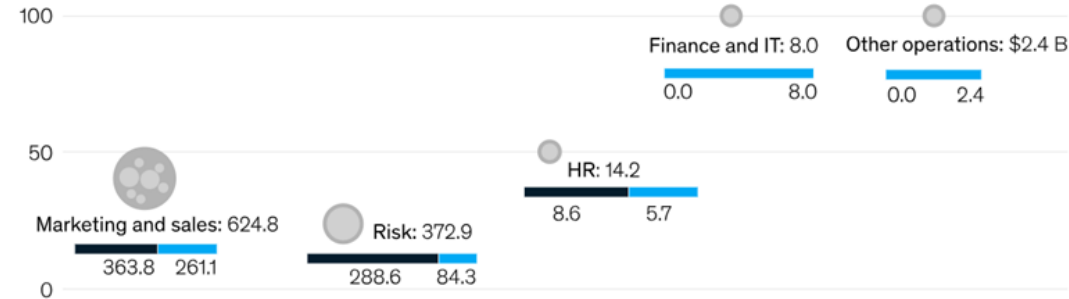
AI-bank of the future: Can banks meet the AI challenge?

Potential annual value of AI and analytics for global banking could reach as high as \$1 trillion.

Total potential annual value, \$ billion



% of value driven by advanced AI, by function

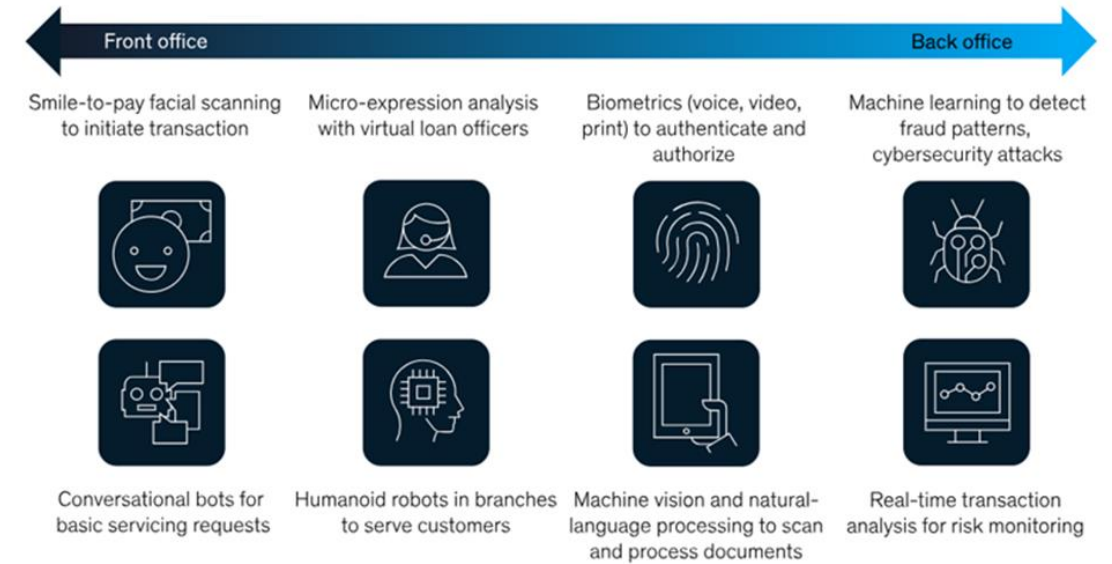


Source: "The executive's AI playbook," McKinsey.com. (See "Banking," under "Value & Assess.")

McKinsey
& Company

September 19, 2020

Banks are expanding their use of AI technologies to improve customer experiences and back-office processes.



McKinsey
& Company

AI use cases in Business

Logistics – Transportation

AI Multiple

AI Applications in Logistics

Planning

- Demand Forecasting
- Supply Planning

Analytics

- Dynamic pricing
- Route optimization

Automated Warehouse

- Warehouse robots
- Damage detection
- Predictive Maintenance

Back Office

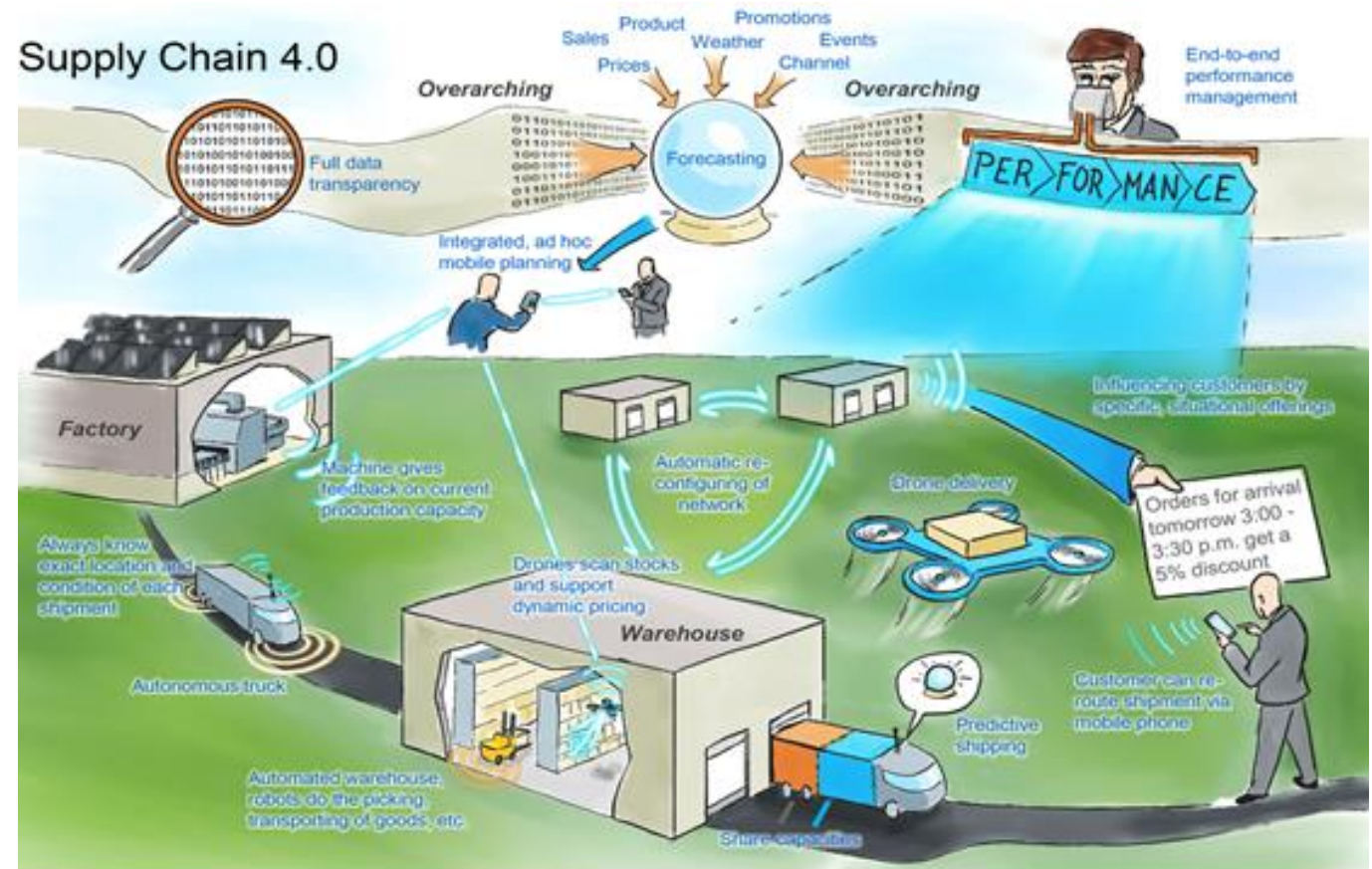
- Automating document processing
- Automating manual office tasks
- Customer service chatbot

Autonomous Things

- Self-driving vehicle
- Delivery drones

Sales & Marketing

- Lead scoring
- Automating email marketing
- Sales & marketing analytics



SOURCE: McKinsey

DHL
TRANSPORT
NETWORK
OPTIMIZER

$$\vec{j} = -\frac{i\hbar}{2m}(\psi^*\nabla\psi - \psi\nabla\psi^*) = \frac{\hbar}{m}\nabla S$$

$$\text{div } \vec{j} = \nabla \cdot \vec{j} = \frac{i\hbar\nabla^2}{m}\psi = \frac{\hbar^2}{m}\Delta S$$

$$\frac{\partial f}{\partial t} = 2\Delta \frac{\partial g}{\partial t}$$

$$E = \frac{1}{2}mv^2 = \frac{1}{2}m\left(\frac{\hbar}{m\lambda}\right)^2 = \frac{\hbar^2}{2m\lambda^2}$$

$$= \frac{\hbar^2}{2m}\Delta S$$

AI use cases in Business

Defence – Army



- Risk assessment
- Recruitment
- Training and combat simulation
- Logistics
- Target recognition
- Warfare healthcare
- Ballistics
- ...

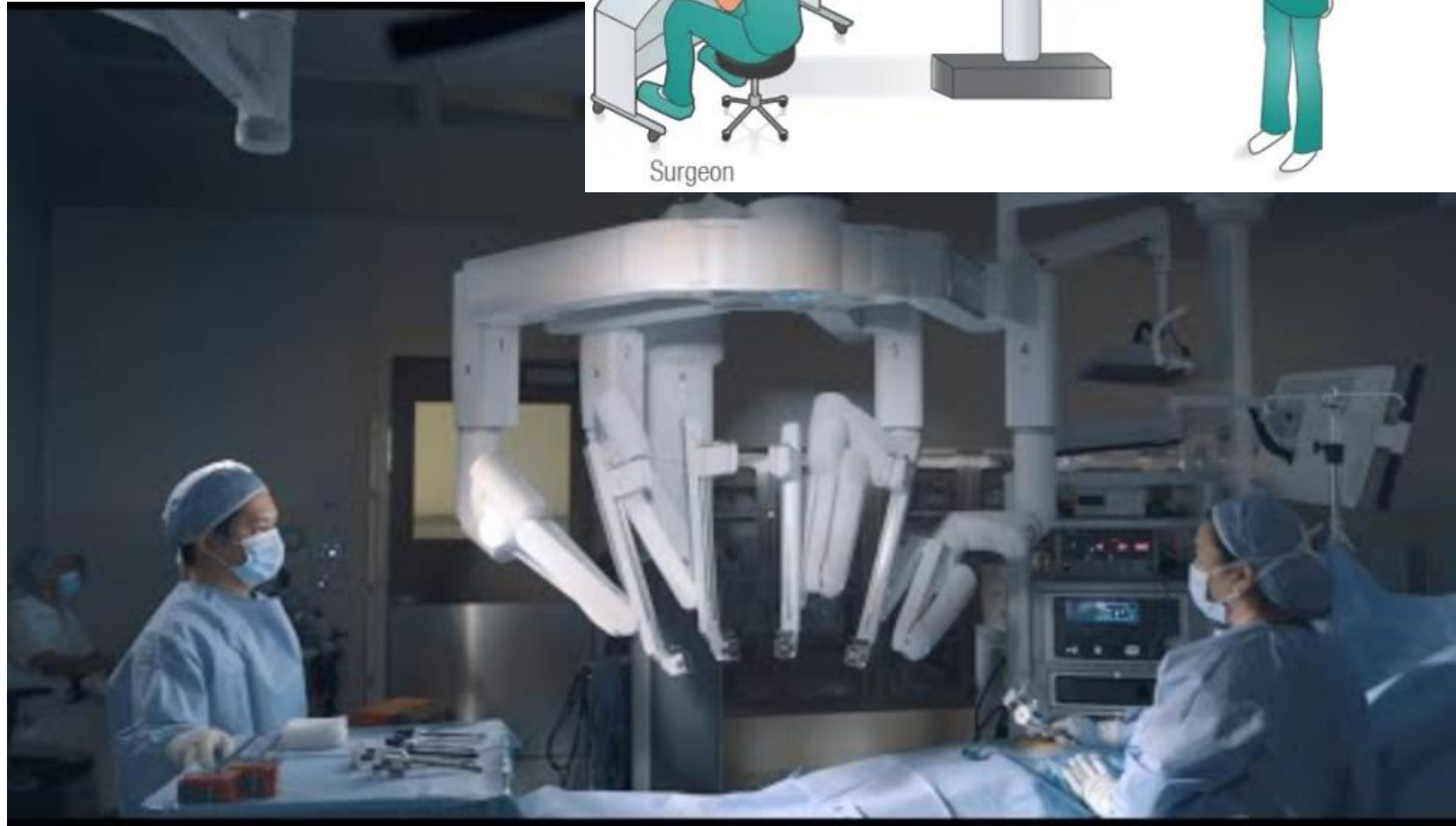
AI use cases in Business

Food Industry



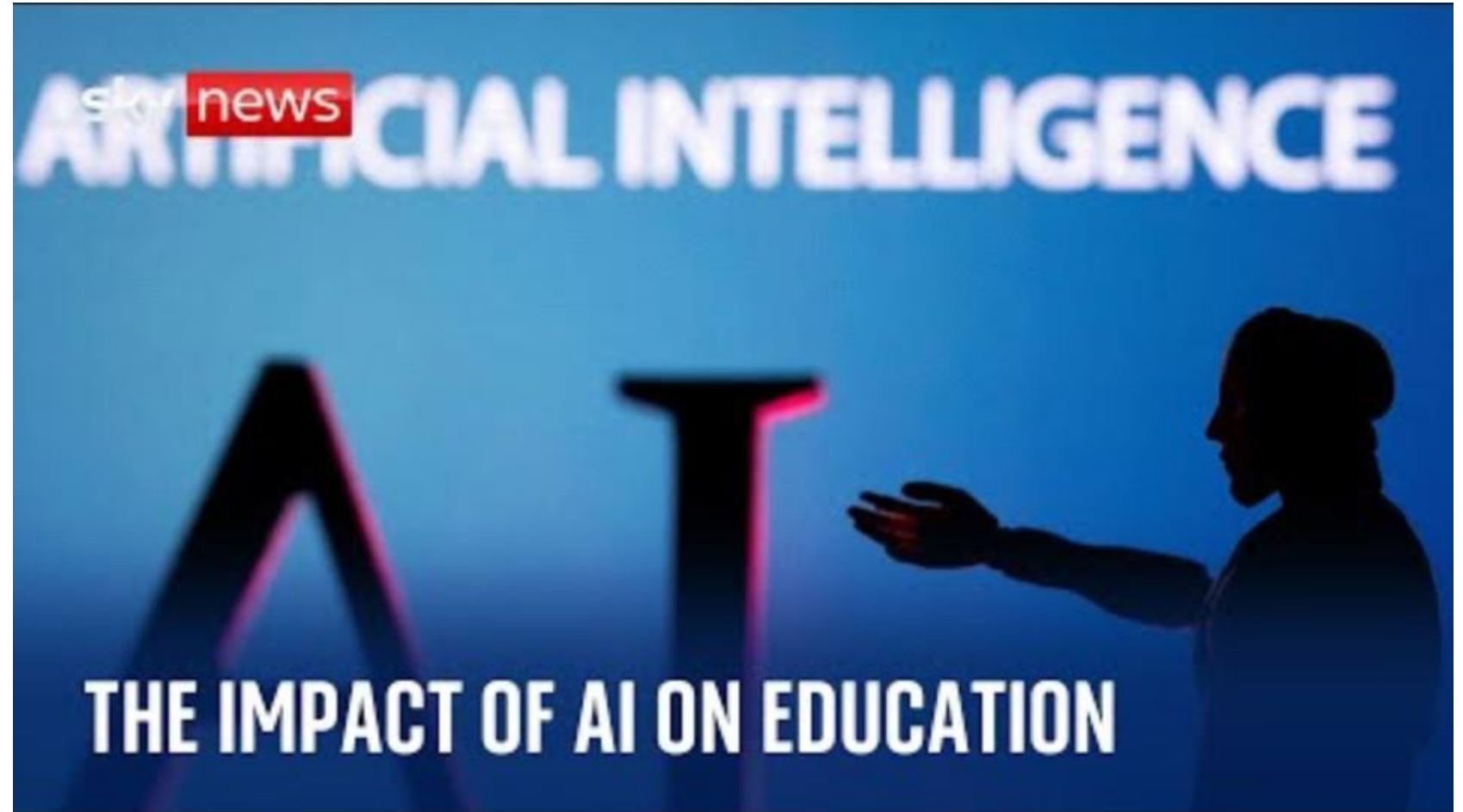
AI use cases in Business

Health Care



AI use cases in Business

Education



AI use cases in Business

Law/Government

The screenshot displays the Leah Copilot interface on a dark blue background. In the top left corner is the logo for Leah, with the text "By ContractPodAI" underneath. Below the logo, the text "Generative AI Legal Assistant" is written in a smaller font. The main heading "Leah Copilot" is prominently displayed in large white letters. To the left of the chat interface, a paragraph describes Leah's capabilities: "Leah is more than hype—she makes it effortlessly simple for you to securely harness the full power of Generative AI. Leah is designed exclusively for legal and compliance use cases." At the bottom left, there is a yellow button with the text "SEE LEAH IN ACTION". The chat interface on the right shows a conversation. A user's question, "What can Leah do?", is shown in a white bubble with a timestamp of "10:48 AM" and a small profile icon. Leah's response, "Leah can quickly surface important data.", is shown in a white bubble with a yellow "A" icon and a timestamp of "10:48 AM". Below the response is a white input field with a pencil icon and the placeholder text "Ask Leah a question", accompanied by another small profile icon.

Leah
By ContractPodAI

Generative AI Legal Assistant

Leah Copilot

Leah is more than hype—she makes it effortlessly simple for you to securely harness the full power of Generative AI. Leah is designed exclusively for legal and compliance use cases.

[SEE LEAH IN ACTION](#)

What can Leah do? 10:48 AM


Leah can quickly surface important data. 10:48 AM

Ask Leah a question

ChatGPT – A case study

 You

How is artificial intelligence used for government applications

 ChatGPT

Artificial intelligence (AI) is increasingly being utilized in various government applications to improve efficiency, decision-making processes, and service delivery. Here are some ways AI is being used in government:

1. **Smart Governance:** AI is used to analyze vast amounts of data collected by governments to improve decision-making processes. This includes predicting traffic patterns, optimizing public transportation routes, and managing energy consumption.
2. **Public Safety and Security:** AI-powered systems are used for surveillance, threat detection, and crime prevention. Facial recognition technology, for example, can help identify suspects or missing persons from video footage. AI algorithms can also analyze social media data to detect potential security threats or predict areas at risk of criminal activities.
3. **Healthcare:** Governments employ AI in healthcare for various purposes, such as analyzing medical records to identify trends, predicting disease outbreaks, optimizing healthcare resource allocation, and even assisting in diagnosis through medical imaging analysis.
4. **Fraud Detection and Prevention:** AI algorithms are used to analyze financial transactions and detect anomalies that could indicate fraudulent activities, whether in tax evasion, social security fraud, or other financial crimes.
5. **Customs and Border Control:** AI is employed in border control to streamline processes, analyze passport and visa data, and detect suspicious activities or individuals.
6. **Administrative Efficiency:** Governments use AI-powered chatbots and virtual assistants to handle citizen inquiries, automate administrative tasks, and improve service delivery across various departments.

.I.

7. **Disaster Management and Emergency Response:** AI can assist in predicting natural disasters like hurricanes, earthquakes, or floods, enabling governments to better prepare and respond to emergencies. AI-powered systems can also analyze social media data to assess the real-time impact of disasters and coordinate rescue efforts.
8. **Policy Planning and Analysis:** AI is used to model and simulate policy scenarios, predict the outcomes of legislative decisions, and analyze the potential impacts of policy changes on various sectors of society.
9. **Environmental Monitoring:** Governments leverage AI to monitor environmental data, such as air and water quality, deforestation, and climate change. AI algorithms can process satellite imagery and sensor data to track environmental changes and inform policymaking.
10. **Education:** AI technologies are utilized in education systems for personalized learning, adaptive testing, and administrative tasks such as grading and scheduling.

Overall, AI holds significant promise for enhancing the effectiveness, efficiency, and responsiveness of government operations across a wide range of domains. However, it also raises important ethical, privacy, and accountability considerations that must be carefully addressed in its implementation.

Message ChatGPT...



ChatGPT can make mistakes. Consider checking important information.



AI@Work

AI Applications

AI at work

15 applications of AI in business

1. AI-enabled innovations, products and services
2. Automating routine cognitive work
3. AI for leveling up workers
4. AI as a creative force
5. Accessing and organizing knowledge via AI
6. AI for optimization
7. Higher productivity and more efficient operations
8. More effective learning and training through AI
9. AI as coach and monitor
10. Decision support
11. AI-enabled quality control and quality assurance
12. AI for personalized customer service experiences and support
13. Safer operations
14. AI for functional area improvements
15. AI for addressing industry-specific needs



Examples of industry-specific uses of AI



HEALTHCARE

AI is used to analyze vast troves of patient data to uncover patterns and insights that humans can't find on their own. Other intelligent tools help clinicians develop customized patient treatment plans.



FINANCIAL SERVICES

AI is used in fraud detection to make near-instantaneous decisions. AI is also used for wealth management, loan approvals and trading decisions, among other financial services.



INDUSTRIAL MAINTENANCE

AI is used to monitor and predict machine maintenance work. AI is also deployed in factories to increase efficiency.



TRANSPORTATION

AI is enabling self-driving vehicles that get smarter as they gain navigation experience. It is also used to improve traffic management and transportation logistics.

Best AI Tools

Content Creation



AI Tools for Marketing & Sales



AI Proofreaders



Design Tools



HR and Business Management



Project Management & Time Management



Video Editing & Creation Tools



Transcription Tools



AI@Work

Generative AI Tools

What is generative AI?

Generative AI or generative artificial intelligence refers to the use of AI to create new content, like text, images, music, audio, and videos.

Generative AI is powered by foundation models (large AI models) that can multi-task and perform out-of-the-box tasks, including summarization, Q&A, classification, and more. Plus, with minimal training required, foundation models can be adapted for targeted use cases with very little example data.

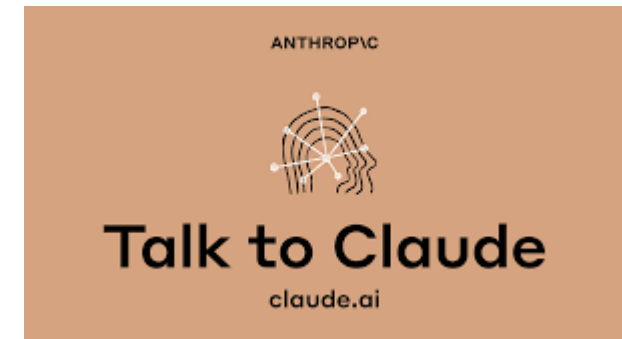
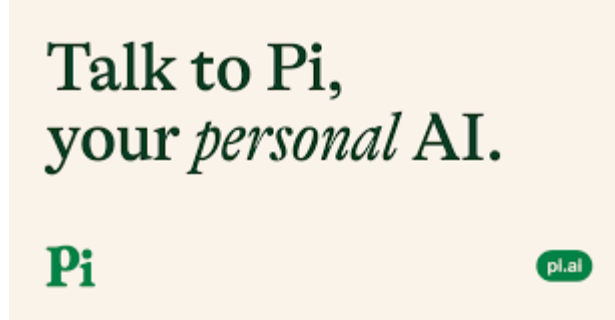
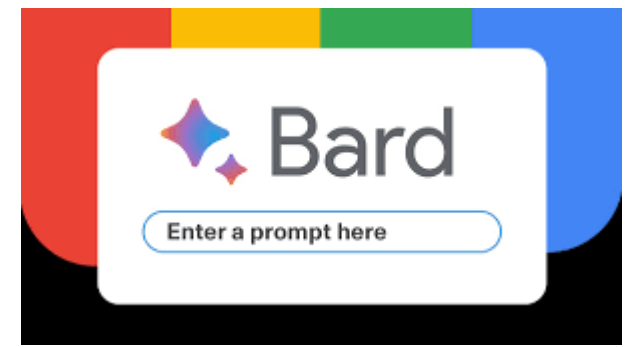
How does generative AI work?

Generative AI works by using an ML model to learn the patterns and relationships in a dataset of human-created content. It then uses the learned patterns to generate new content.

The most common way to train a generative AI model is to use supervised learning - the model is given a set of human-created content and corresponding labels. It then learns to generate content that is similar to the human-created content and labeled with the same labels.

<https://cloud.google.com/use-cases/generative-ai>

Text generation



THE BATTLE FOR AI VIBES —

"The king is dead"—Claude 3 surpasses GPT-4 on Chatbot Arena for the first time

Anthropic's Claude 3 is first to unseat GPT-4 for #1 since launch of Chatbot Arena in May '23.

BENJ EDWARDS - 3/27/2024, 5:32 PM



INTRODUCING GROK 1.5





All-In-One

ChatGPT

Claude

Bard

Bing

Perplexity

Llama 2

Gemini Pro

Mixtral



Premium



ChatGPT

Web Access



Hi

Hello! How can I assist you today?

Send to ChatGPT

Claude

Web Access



Hi

Hello! My name is Claude. How can I help you?

Send to Claude

Bard



Hi

Hi! How can I help you today?

Send to Bard

Bing



Hi

Hello! How can I help you today? 😊

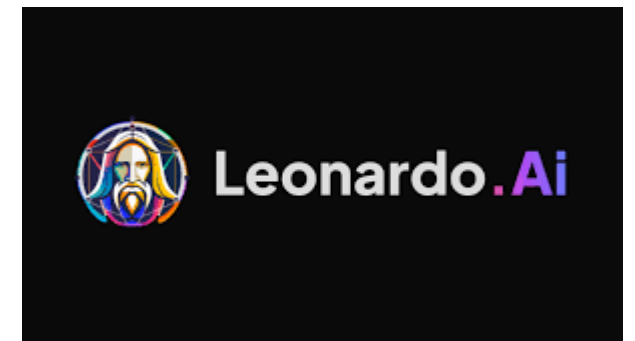
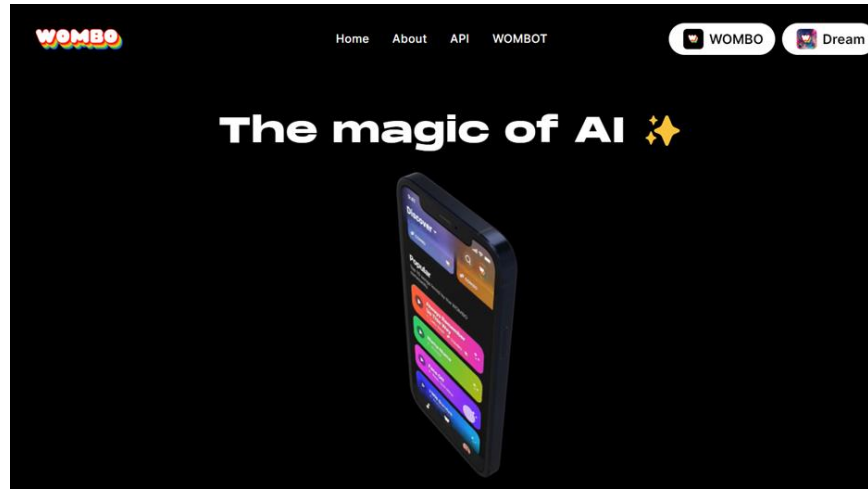
Send to Bing



Use / to select prompts, Shift+Enter to add new line

Send

Image generation



Video generation



Is Artificial Intelligence helping to solve fake news?

Is journalism in danger? What is fake news and what is fact checking?

Evaluate your source

- Read and evaluate information fully before believing or sharing it.
- Always question the trust-worthiness of your source. Consider author and organization bias, editorialization, and factuality.

Research the author and publisher

- Find out more by seeing what other trusted sources think of them.
- Investigate their credentials; educational, professional, and community affiliations.

Fact-check claims

- Find corroborating news reports from (other) trusted sources.
- Check government or organizational websites for supporting figures and related information.



TYPES OF INFORMATION DISORDER

FALSENESS

INTENT TO HARM

MISINFORMATION

Inaccurate information that is spread, regardless of intent to mislead.

E.g., mistakes such as inaccurate photo captions, dates, statistics, translations, misinterpretation of satire, author bias.

DISINFORMATION

Deliberately misleading or biased information to harm or discredit.

E.g., fake news, propaganda, hoaxes, conspiracy theories, rumours.

MALINFORMATION

Deliberate and strategic manipulation of information based in reality to inflict harm or cause advantage. Can include misuse of confidential or personal information.

E.g., political use of sensitive information, phishing, revenge porn.

**What about lack of information?
Censorship?**

A man with grey hair and glasses, wearing a dark blue sweater over a light-colored collared shirt, is shown from the chest up. He appears to be speaking, with his mouth slightly open. The background is dark and out of focus.

Who Fact Checks the FACT CHECKERS?

AIER | KATE WAND



ChatGPT – A case study

ChatGPT 3.5 ▾



How can I help you today?

Write a SQL query
that adds a "status" column to an "orders" table

Explain this code:
"cat configyaml | awk NF"

Tell me a fun fact
about the Golden State Warriors

Give me ideas
for what to do with my kids' art

Message ChatGPT...



ChatGPT can make mistakes. Consider checking important information.

Model	Accuracy	Hallucination Rate	Answer Rate	Average Summary Length (Words)
GPT 4	97.0 %	3.0 %	100.0 %	81.1
GPT 4 Turbo	97.0 %	3.0 %	100.0 %	94.3
GPT 3.5 Turbo	96.5 %	3.5 %	99.6 %	84.1
Llama 2 70B	94.9 %	5.1 %	99.9 %	84.9
Llama 2 7B	94.4 %	5.6 %	99.6 %	119.9
Llama 2 13B	94.1 %	5.9 %	99.8 %	82.1
Cohere-Chat	92.5 %	7.5 %	98.0 %	74.4
Cohere	91.5 %	8.5 %	99.8 %	59.8
Anthropic Claude 2	91.5 %	8.5 %	99.3 %	87.5
Mistral 7B	90.6 %	9.4 %	98.7 %	96.1
Google Palm 2	87.9 %	12.1 %	92.4 %	36.2
Google Palm 2 Chat	72.8 %	27.2 %	88.8 %	221.1

Error rate/hallucination rate 3-27%

5 Steps to Crafting the Best AI Prompts

01

Use clear and
concise language

02

Set the context and
provide necessary
background information

03

Include specific instructions
or guidelines

04

Incorporate example
inputs and desired
outputs

05

Anticipate potential
challenges and address
them in the prompt

Assignment 2 – ChatGPT – True or False?

Per team, describe how AI contributes (benefits and risks) to the discussed Use Cases (implementations). (+- 5 p.)

- Use **ChatGPT** to do your research.
- How did you optimize your **prompts**?
- Compare the result of your search with at least **one other AI text generative tool**.

Then, in view of the error rate, **check, document and/or challenge the result** with your own research, using relevant sources! (another +- 5 p. personal notes added in the original text).

Finally, upload your findings in the dropbox Part II and present your findings orally