



Data Literacy
Association

Impact of Generative AI in Supply Chain

Dr Toa Charm

Founding Chairman
Data Literacy Association

Sep 18, 2023





Dr. Toa Charm

Founding Chairman Data Literacy Association

- Former Senior Management: Cyberport, HSBC, IBM, Oracle, Kingdee & Jardine
- Associate Professor of Practice in Innovation & Technology, Business School, Chinese University of Hong Kong
- Chairman of A Portfolio of Asia's Tech Companies
- Chief Judge, FinTech Award, HKICT Awards (since 2019)
- Independent Non-Executive Director, Transunion
- Advisor: Cyberport, HKSTP, ASTRI, HK Tech300, FHKI, GS1, Consumer Council, Digital Asset Society
- Publication: Book (數碼力大提升), Cases (HSBC, CTF, AAHK)



POWERED BY Data Literacy Association

7.12 WED 10:00-11:00 Session in Cantonese

BUSINESS GOV VIRTUAL Hong Kong EXPO & CONFERENCE 2023.7.12-14 HKCEC, Wanchai

領袖高峰對話：AI 應用及未來趨勢

Moderator

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Our Mission – Data Literacy Association
Empower Everyone to Speak Data

www.dalahk.org

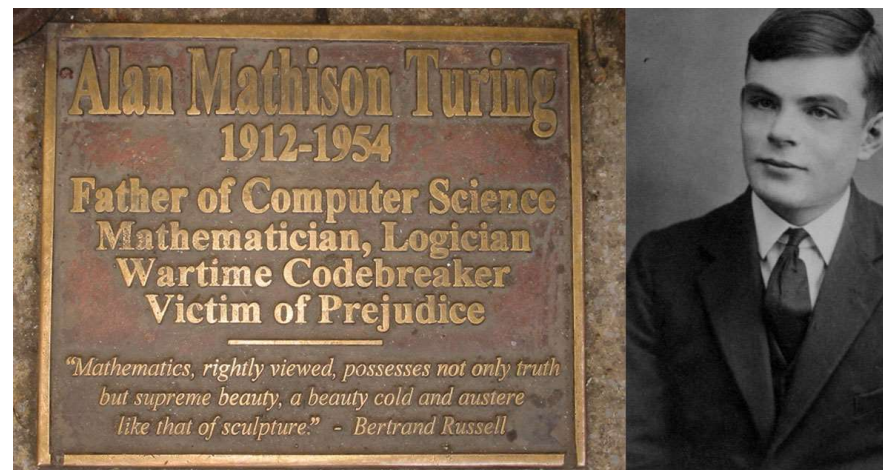
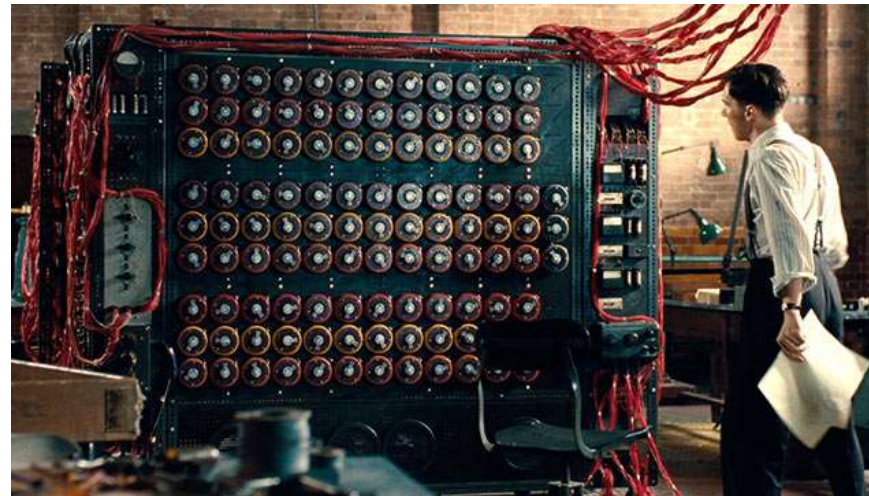
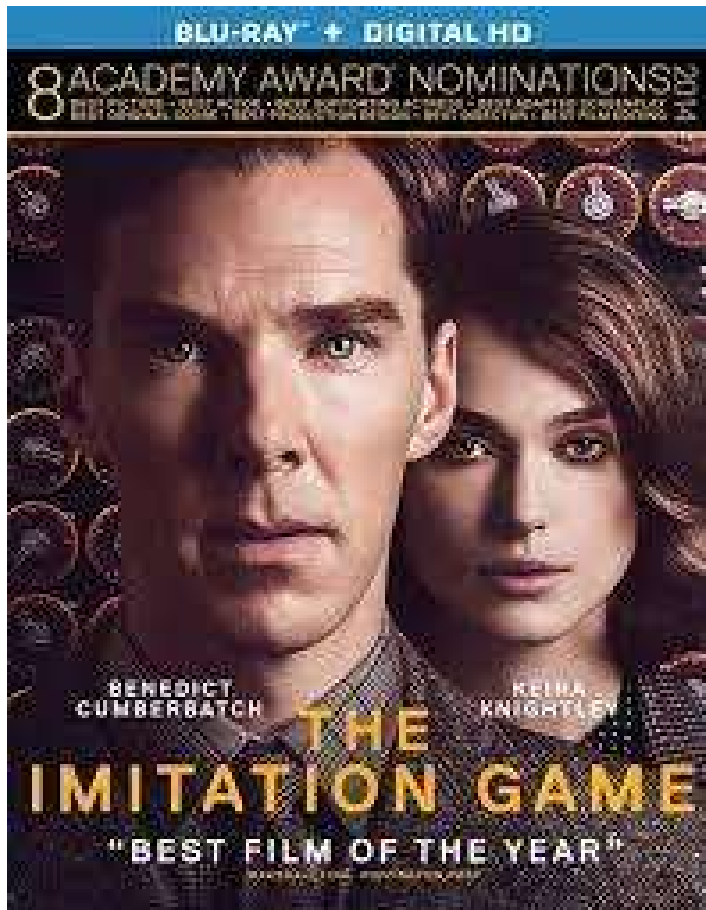




1. What is AI? What is *Generative AI* like ChatGPT?

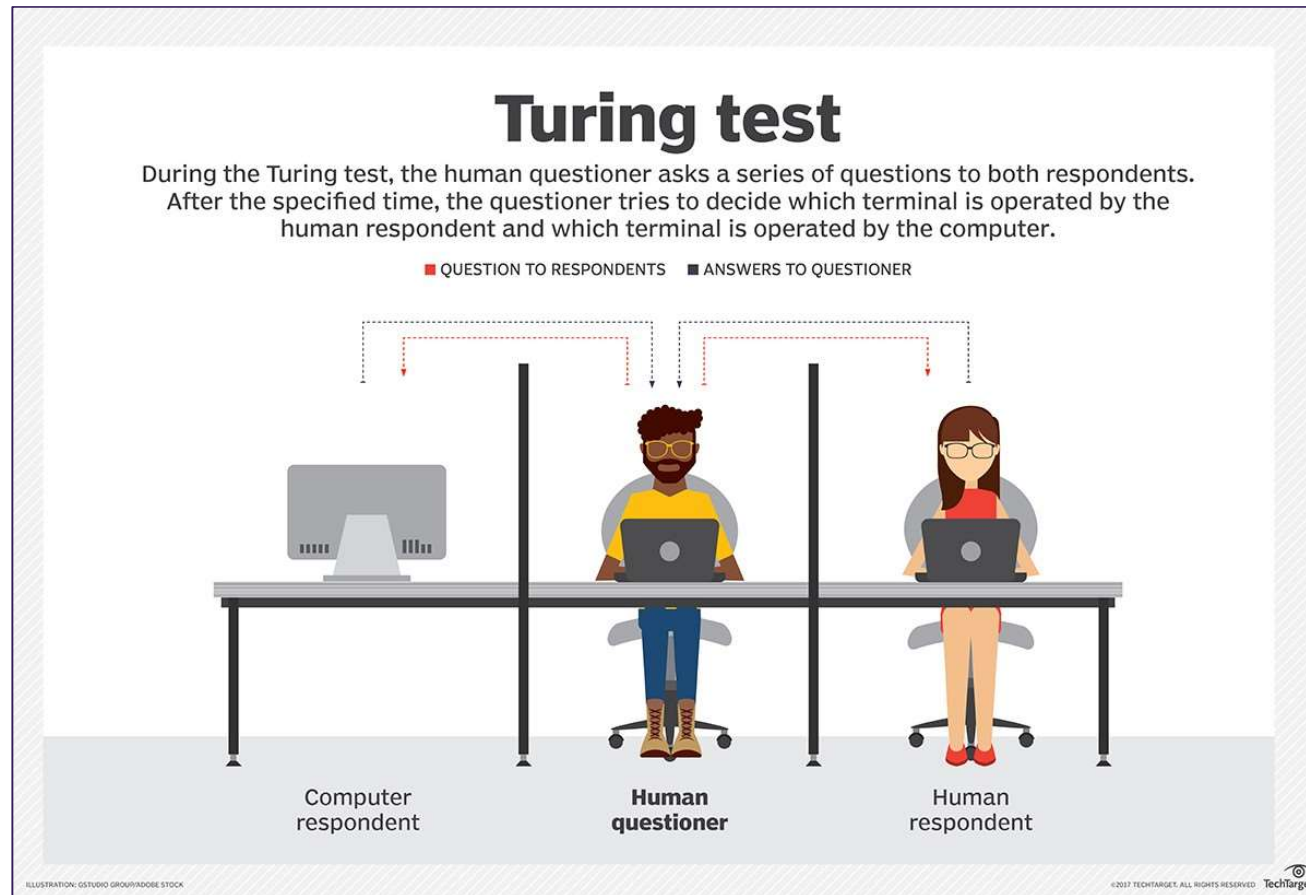
The Father of Computer Science

– Alan Turing

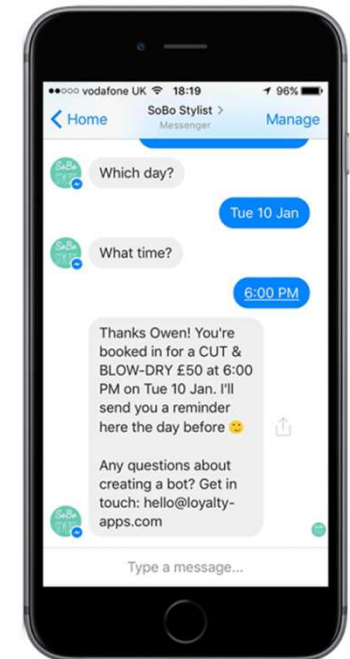
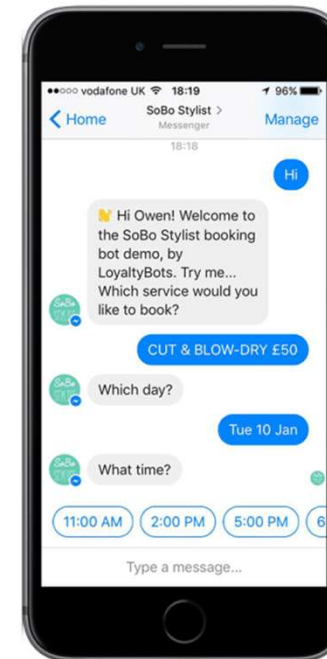
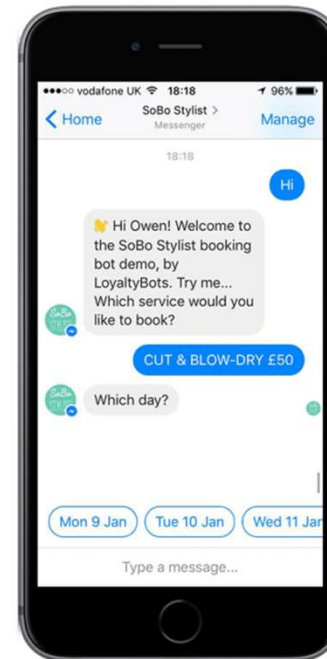
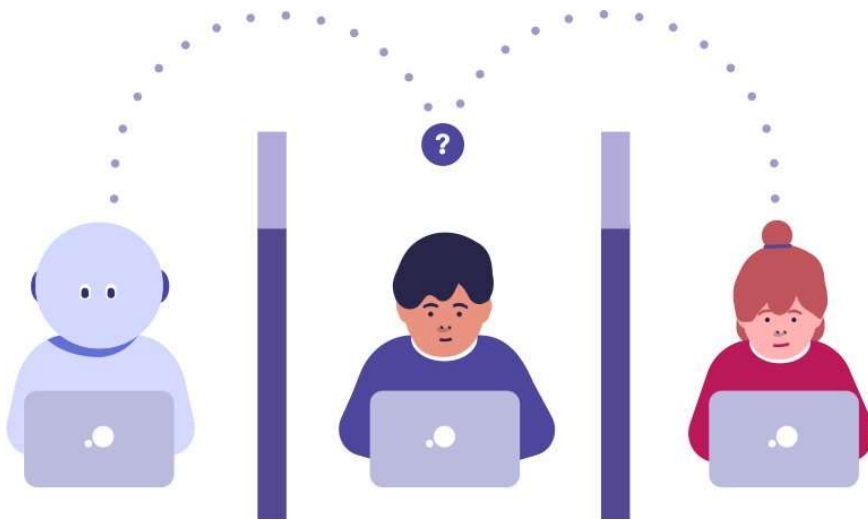


What is AI?

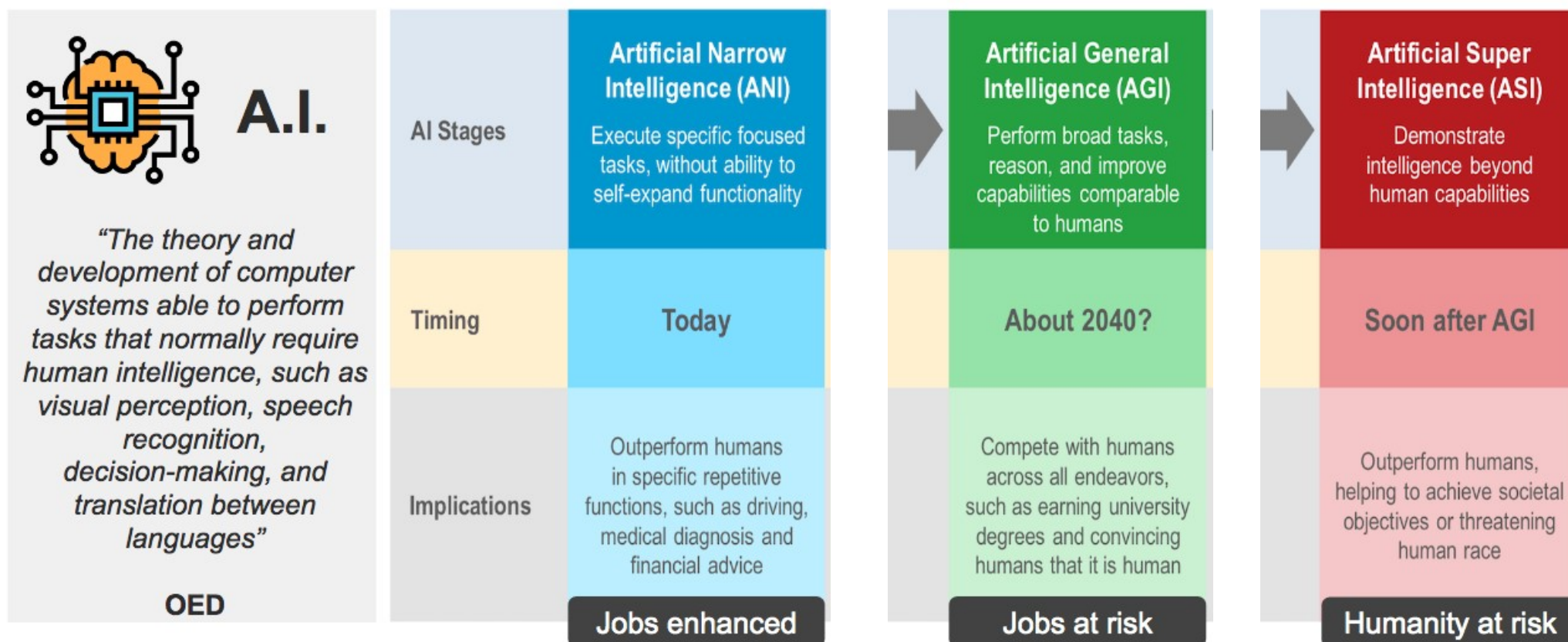
Can the robot pass the “Turing Test”?



Can you tell the operator is a chatbot or a human being?

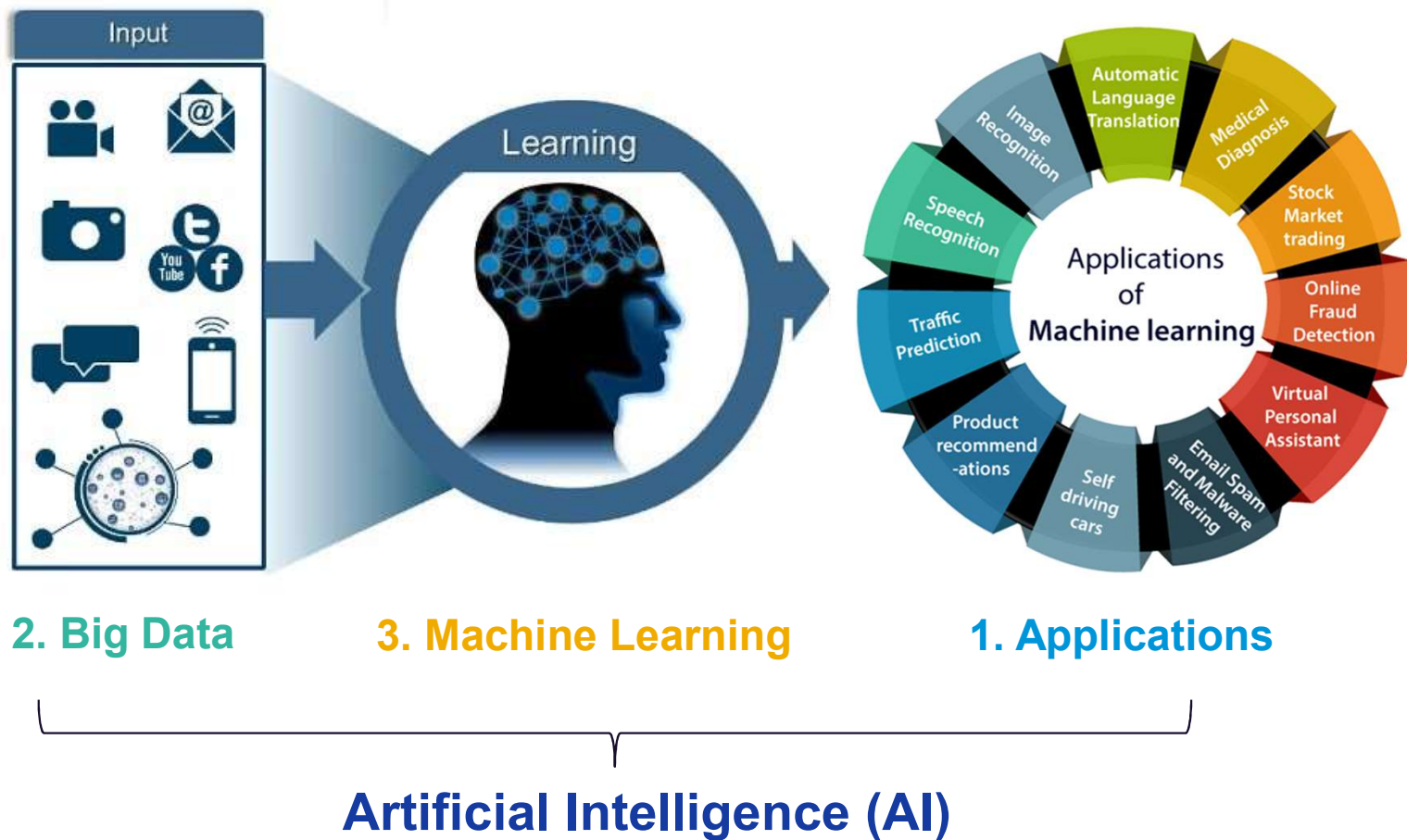


Strong AI (AGI) vs Weak AI (ANI)



Typical AI

Machine Learning is the Core of AI



Analytical AI (ANI) for Business

Are Being Used in Almost All Industries All Functions

- Predictive maintenance or condition monitoring
- Warranty reserve estimation
- Propensity to buy
- Demand forecasting
- Process optimization
- Telematics

Manufacturing



- Predictive inventory planning
- Recommendation engines
- Upsell and cross-channel marketing
- Market segmentation and targeting
- Customer ROI and lifetime value

Retail



- Alerts and diagnostics from real-time patient data
- Disease identification and risk stratification
- Patient triage optimization
- Proactive health management
- Healthcare provider sentiment analysis

Healthcare and Life Sciences



- Aircraft scheduling
- Dynamic pricing
- Social media – consumer feedback and interaction analysis
- Customer complaint resolution
- Traffic patterns and congestion management

Travel and Hospitality



- Risk analytics and regulation
- Customer Segmentation
- Cross-selling and up-selling
- Sales and marketing campaign management
- Credit worthiness evaluation

Financial Services



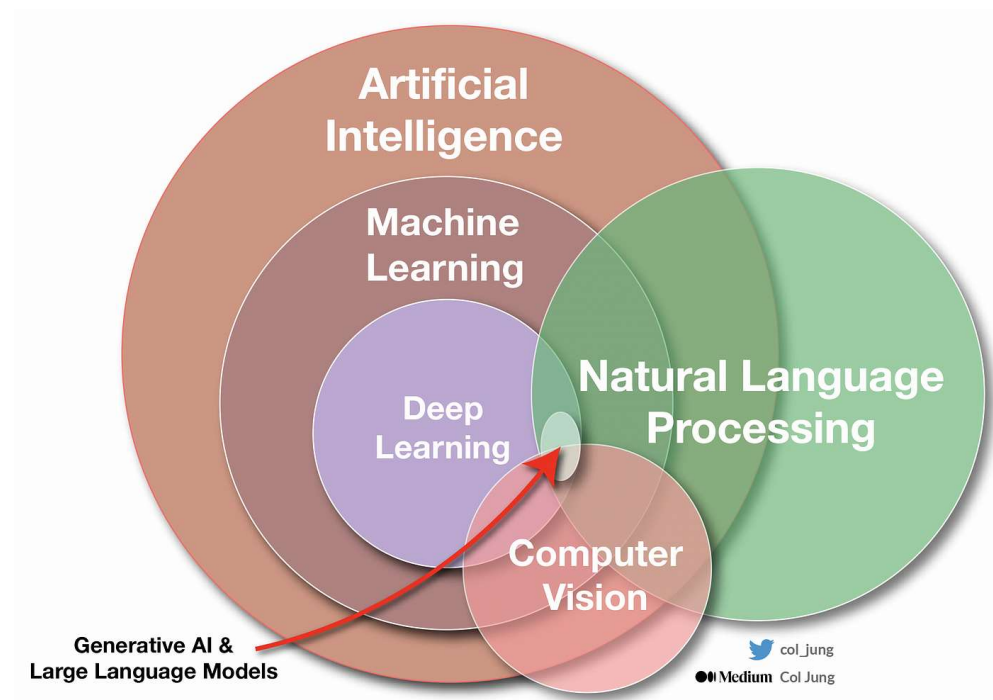
- Power usage analytics
- Seismic data processing
- Carbon emissions and trading
- Customer-specific pricing
- Smart grid management
- Energy demand and supply optimization

Energy, Feedstock, and Utilities



What is Generative AI?

- ◆ **Generative AI**, also referred to as **GenAI**, allows users to input a variety of **prompts** to generate new content, such as text, images, videos, sounds, code, 3D designs, and other media. It “learns” and is trained on documents and artifacts that already exist online
- ◆ Generative AI evolves as it continues to train on more data. It **operates on AI models and algorithms that are trained on large unlabeled data sets**, which require complex math and lots of computing power to create. These data sets train the AI to predict outcomes in the same ways humans might act or create on their own.
- ◆ The rise of generative AI is largely due to the fact that people can **use natural language to prompt AI** now, so the use cases for it have multiplied. Across different industries, AI generators are now being used as a **companion** for writing, research, coding, designing, and more.





Generative AI is a type of artificial intelligence (AI) that uses machine learning algorithms to create new and original content like images, videos, text, and audio.

1 Forming a Database

A neural network, consisting of various information or media files like images, text, data, sounds, etc., forms the basis of artificial intelligence.



2 Inputting a Prompt

The user provides the AI with a description or sample of the desired content...



Prompts can be any user-submitted material, like words, numbers, or photos.



3 Generating Content

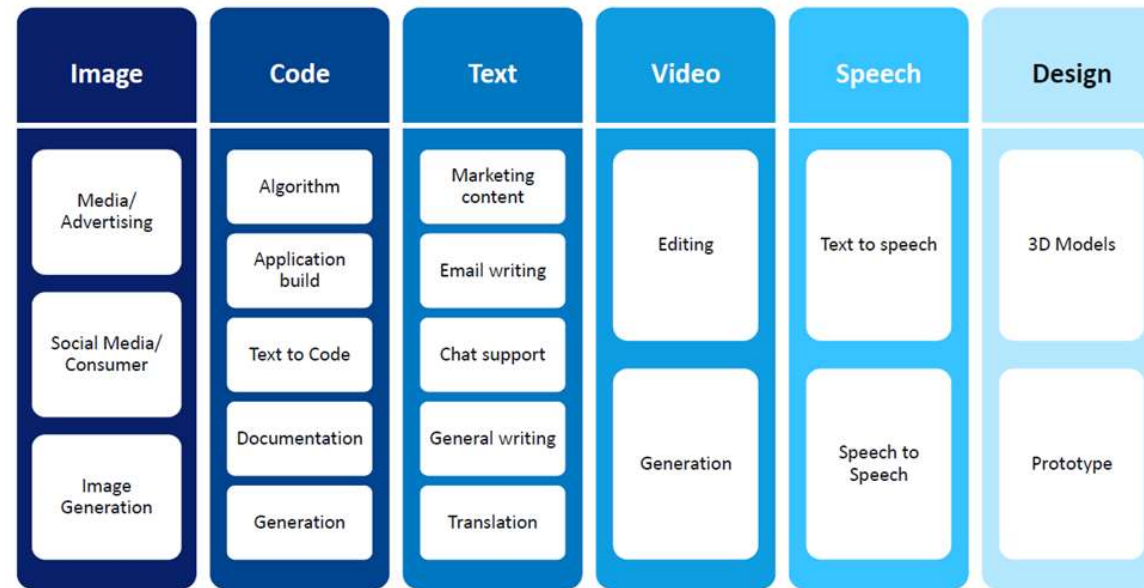
...and the AI uses its neural network to generate new examples that are similar to the ones it has trained from.



This image was created on MidJourney using the following text prompt:

a technical illustration of a woman sitting behind a desktop computer on a long table, isometric view, 3D rendering, realistic, 4k

Major Types of Contents GenAI Can Generate



| | PRE - 2020 | 2020 | 2022 | 2023? | 2025? | 2030? |
|---------------------------|--|------------------------------------|--------------------------------------|---|---|---|
| TEXT | Spam detection Translation Basic Q&A | Basic copy writing First drafts | Longer form Second drafts | Vertical fine tuning gets good (scientific papers, etc) | Final drafts better than the human average | Final drafts better than professional writers |
| CODE | 1-line auto-complete | Multi-line generation | Longer form Better accuracy | More languages More verticals | Text to product (draft) | Text to product (final), better than full-time developers |
| IMAGES | | | Art Logos Photography | Mock-ups (product design, architecture, etc.) | Final drafts (product design, architecture, etc.) | Final drafts better than professional artists, designers, photographers) |
| VIDEO / 3D / GAMING | | | First attempts at 3D/video models | Basic / first draft videos and 3D files | Second drafts | AI Roblox Video games and movies are personalized dreams |

Large model availability: ● First attempts ● Almost there ● Ready for prime time

GenAI's Growth

ChatGPT Sprints to One Million Users

Time it took for selected online services to reach one million users

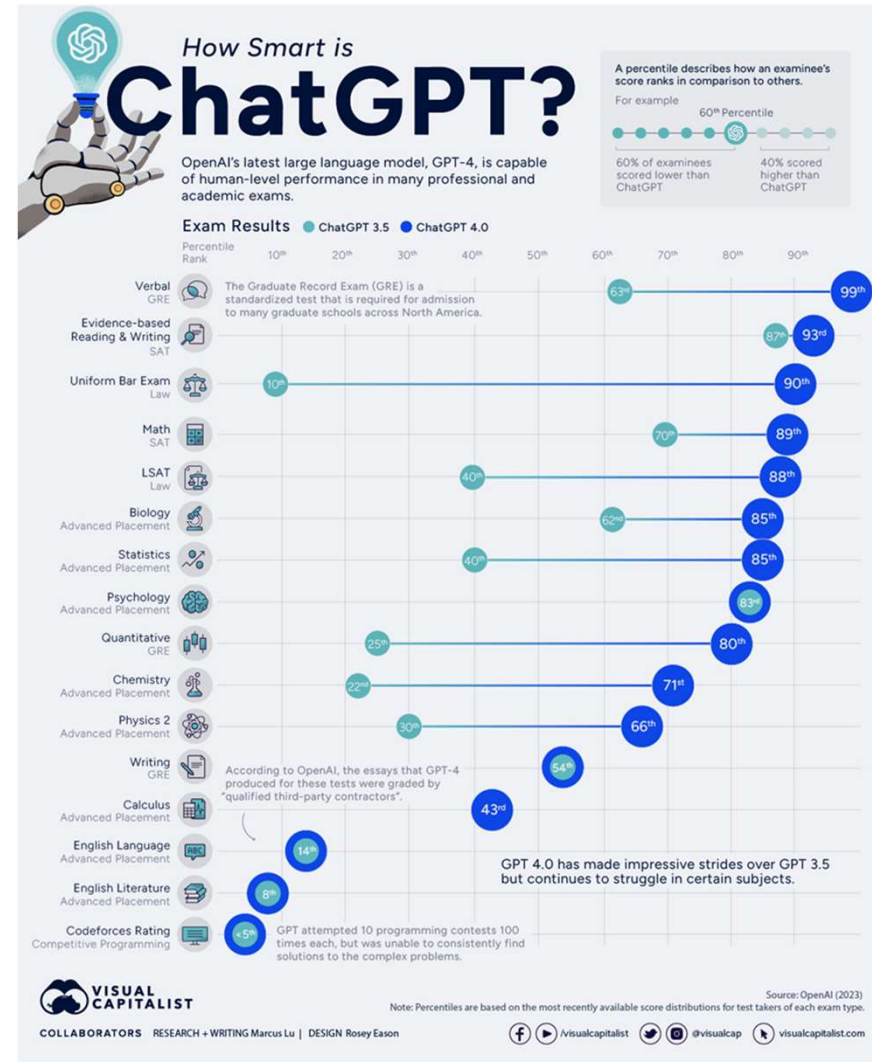


* one million backers ** one million nights booked *** one million downloads

Source: Company announcements via Business Insider/LinkedIn

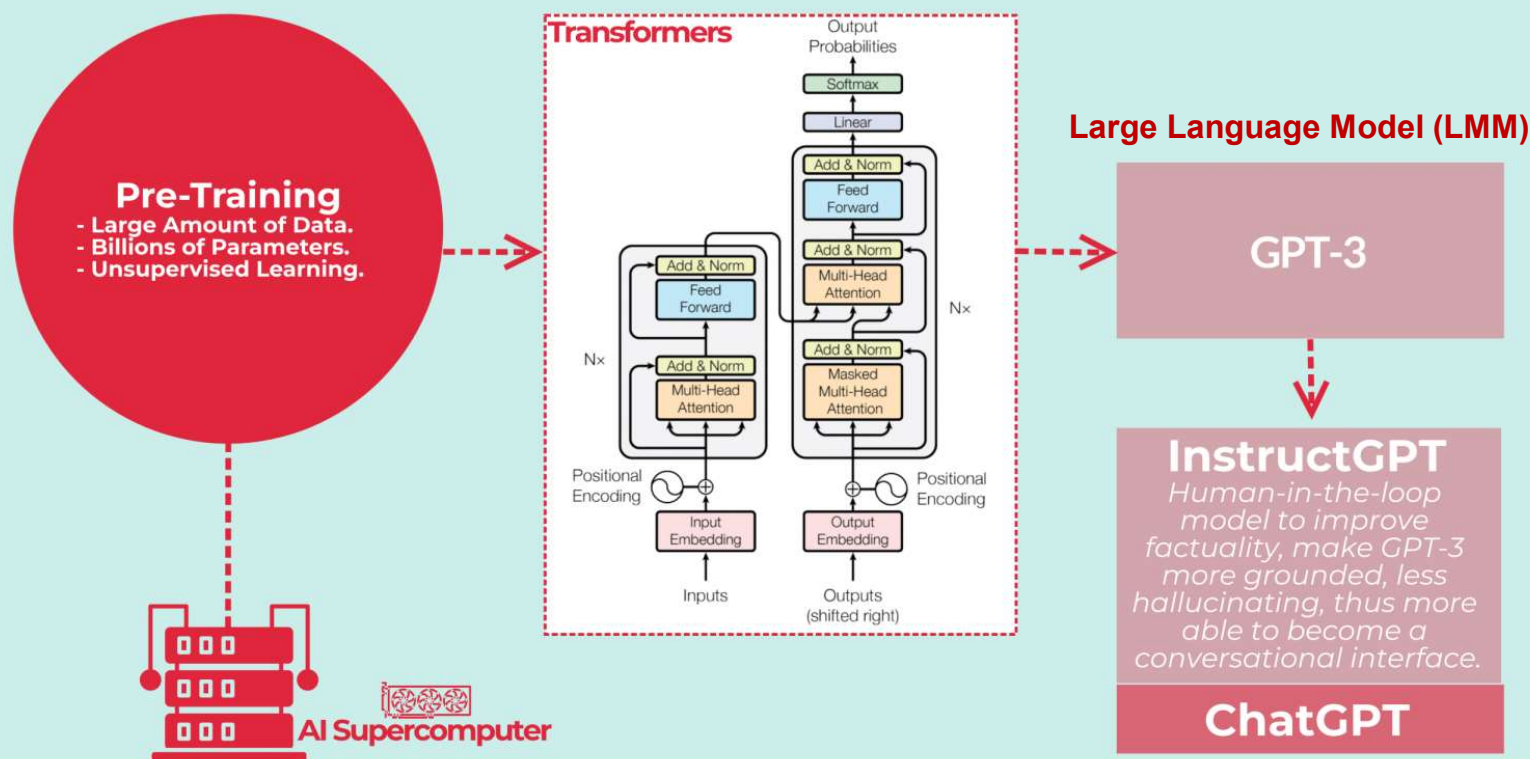


statista



Generative AI

Generative AI represents a set of new large machine learning models trained on vast amounts of data, with billions of parameters, which through scale, and sheer computing power via AI supercomputers, can, by performing text-to-text predictions, become general-purpose engines, able to perform a wide set of tasks, from natural language understanding to coding, speech recognition and much more.



FourWeekMBA

ChatGPT is Just one of the GenAI Chatbots based on GPT Large Language Model (LLM)

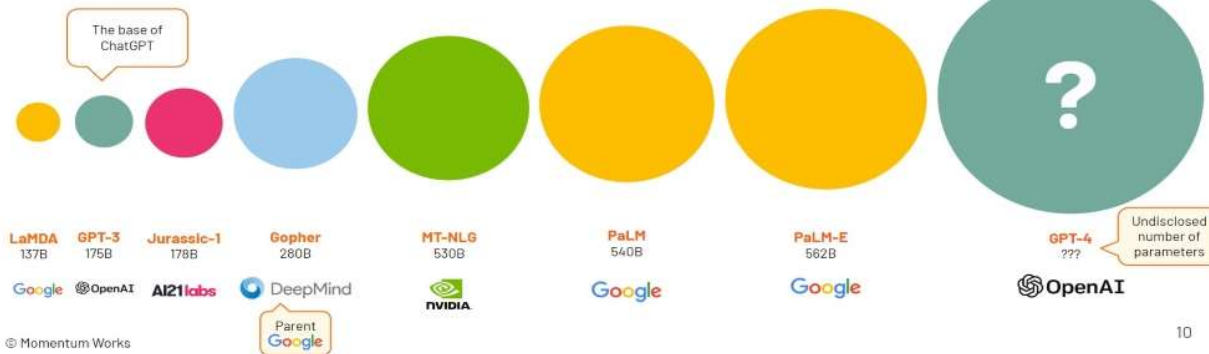
Large Language Models are becoming very large indeed

MW

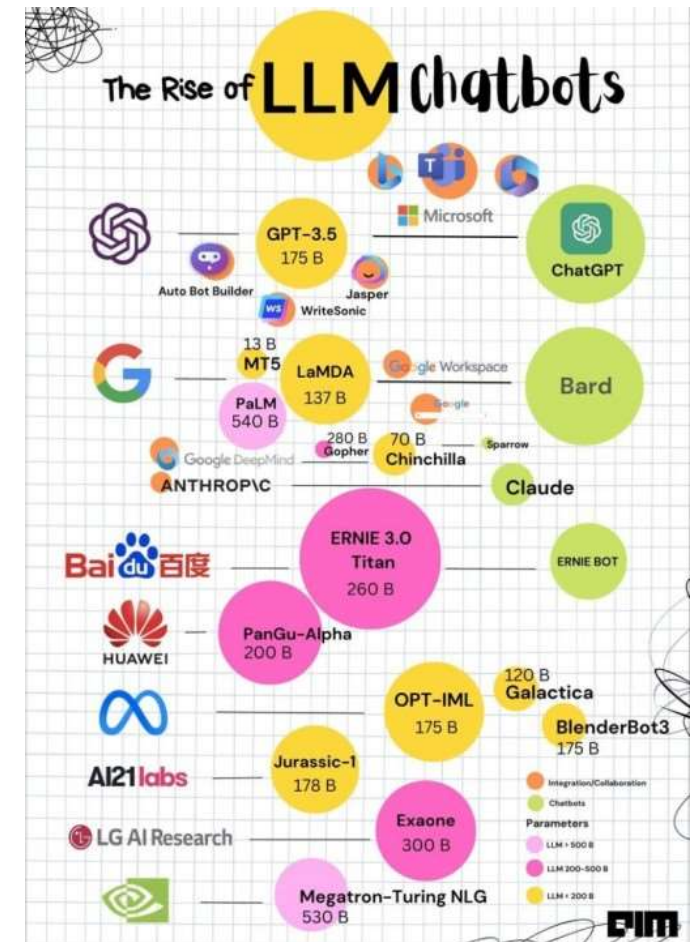
Small models (<= 100b parameters)



Large models (>100b parameters)



10





2. GenAI Applications in Biz & Supply Chain

Examples of Generative AI Technology



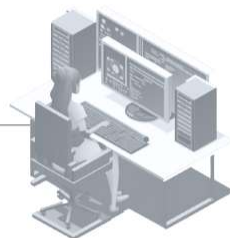
ChatGPT
text generation AI



INPUT PROMPTS



"Write a limerick about
data taking over the world.
Include the word: egg"



OUTPUT

"Data taking over the world, it's true
It's growing like an egg that's due
It's everywhere we go
It's taking over slow
But it's the future, there's nothing we can do."

Real-Life Applications of this Platform

- communications, journalism, publishing, creative writing, writing assistance



MidJourney
image generation AI



INPUT PROMPTS



- a rabbit wearing a sunhat
- Santa Claus in a blue outfit
- a watercolor of a red bicycle in front of a waterfall



OUTPUT



Real-Life Applications of this Platform

- advertisements, published illustrations, corporate visuals, novel image generation



Codex
computer coding generation AI



INPUT PROMPTS



"Write script to change a website's background color in Python"



OUTPUT

Here's an example script that uses the "requests" and "BeautifulSoup" libraries in Python to change the background color of a website:

```
import requests
from bs4 import BeautifulSoup

# send a GET request to the website
response = requests.get("https://yourwebsite.com")

# parse the HTML content
soup = BeautifulSoup(response.content, 'htmlparser')

# locate the element you want to change the background color of
element = soup.find('body')

# add a new style attribute to the element
element['style'] = 'background-color: pink;'

# print the modified HTML
print(soup.prettify())
```

Real-Life Applications of this Platform

- web design, software development, coding/scripting, technology



RESEARCH, WRITING AND DESIGN Mark Belan



/visualcapitalist



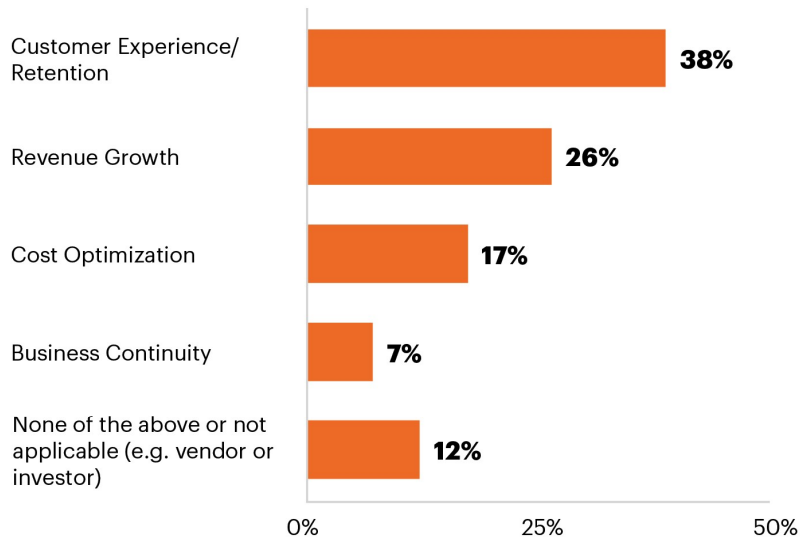
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Generative AI (AGI) for Business Focus and Impact

Primary Focus of Generative AI Initiatives

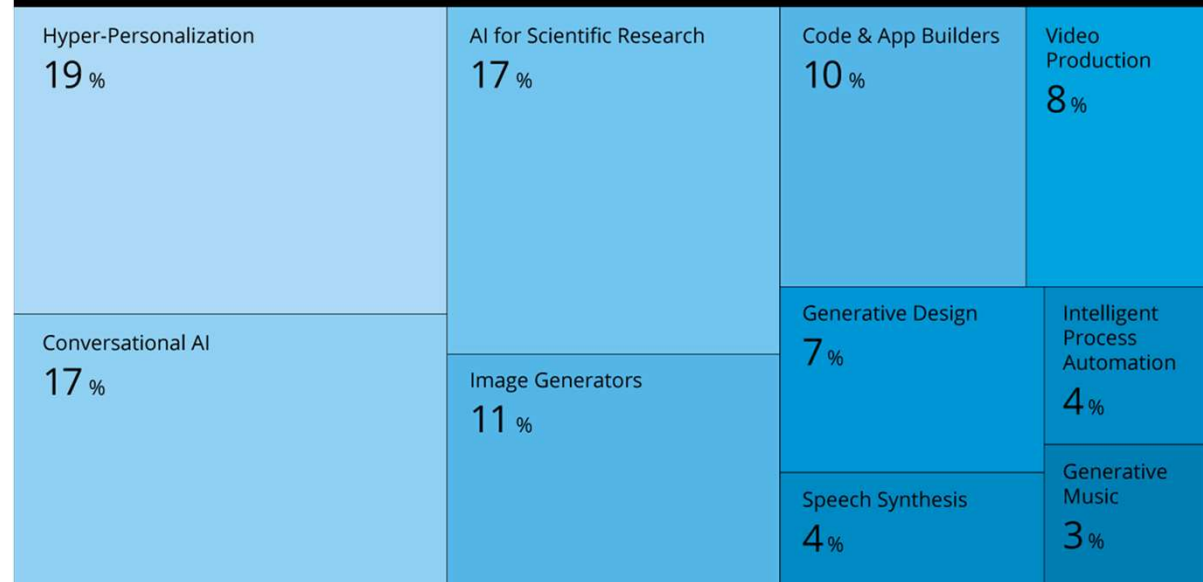


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Impact of Top 10 Generative AI Trends



This tree map illustrates the top 10 innovation trends & their impact on Generative AI

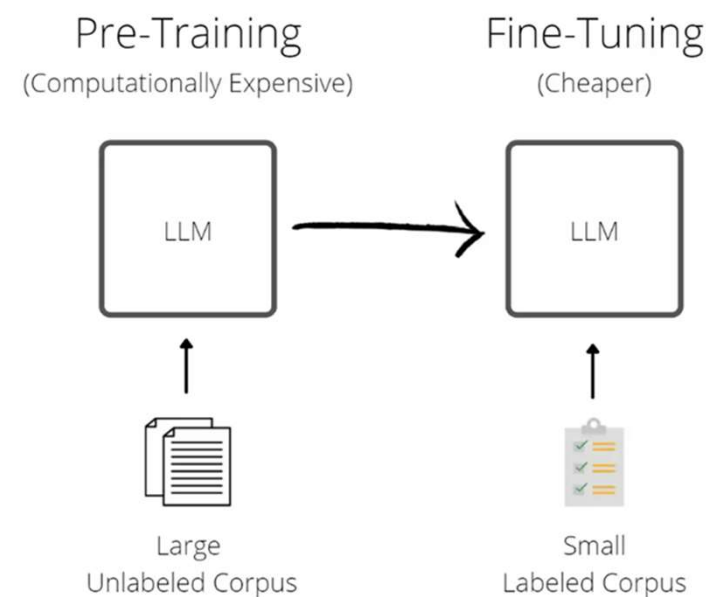
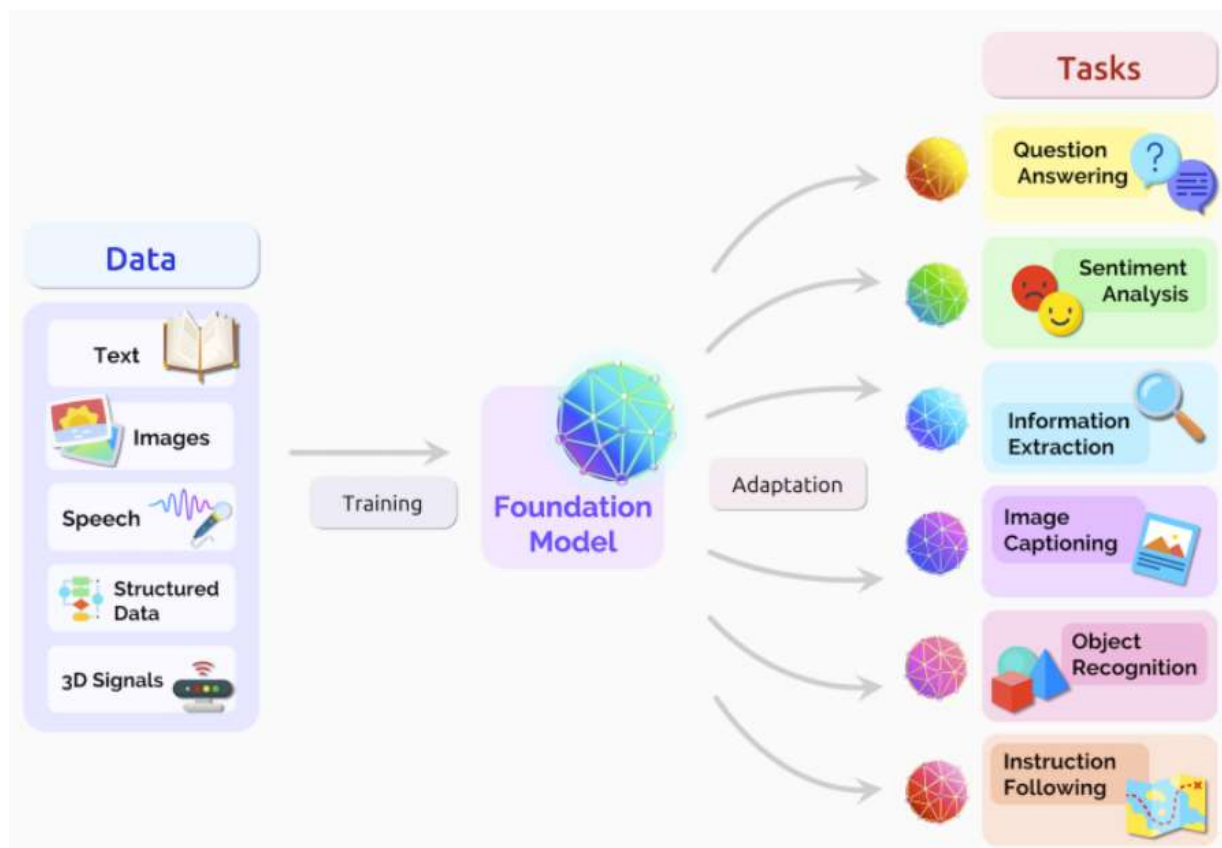
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April 2023

Generative AI Applications

| | | | | |
|---|--|---|---|---|
| Customer care <ul style="list-style-type: none"> • Assist agents • Personalize customer interactions • Analyze interaction sentiment • Generate personalized content • Record call center transcripts | Digital labor <ul style="list-style-type: none"> • Summarize content • Assist knowledge search • Analyze and report • Develop contracts • Create content | Retail <ul style="list-style-type: none"> • Summarize sales • Hyper-personalize products • Classify products • Assist computer vision • Optimize prices | Healthcare <ul style="list-style-type: none"> • Provide prior authorization • Administer benefits • Facilitate regulatory reporting • Assist real-world analysis • Explain claims and benefits • Summarize history | Public and government <ul style="list-style-type: none"> • Translate government forms • Research policy • Explain citizen benefits • Summarize cases • Facilitate regulatory compliance |
| IT operations <ul style="list-style-type: none"> • Write technical documentation • Act as coding copilot • Develop test cases • Monitor compliance • Optimize network | Cybersecurity <ul style="list-style-type: none"> • Provide error log and root cause analysis • Analyze external threats • Respond to incidents • Generate reports • Reference documents for compliance | Industrial <ul style="list-style-type: none"> • Write technical documentation • Assist industrial design • Optimize production • Identify product recall risks • Assist business-to-business back-office AI | Banking and financial services <ul style="list-style-type: none"> • Maintain know-your-customer data • Manage regulatory changes • Provide wealth management advice • Summarize earnings • Personalize emails | Telco <ul style="list-style-type: none"> • Personalize offers • Optimize networks • Explain bills • Assist business-to-business back-office AI |

Large Language Model (LLM) Can be Adapted for Many Applications e.g. ChatGPT



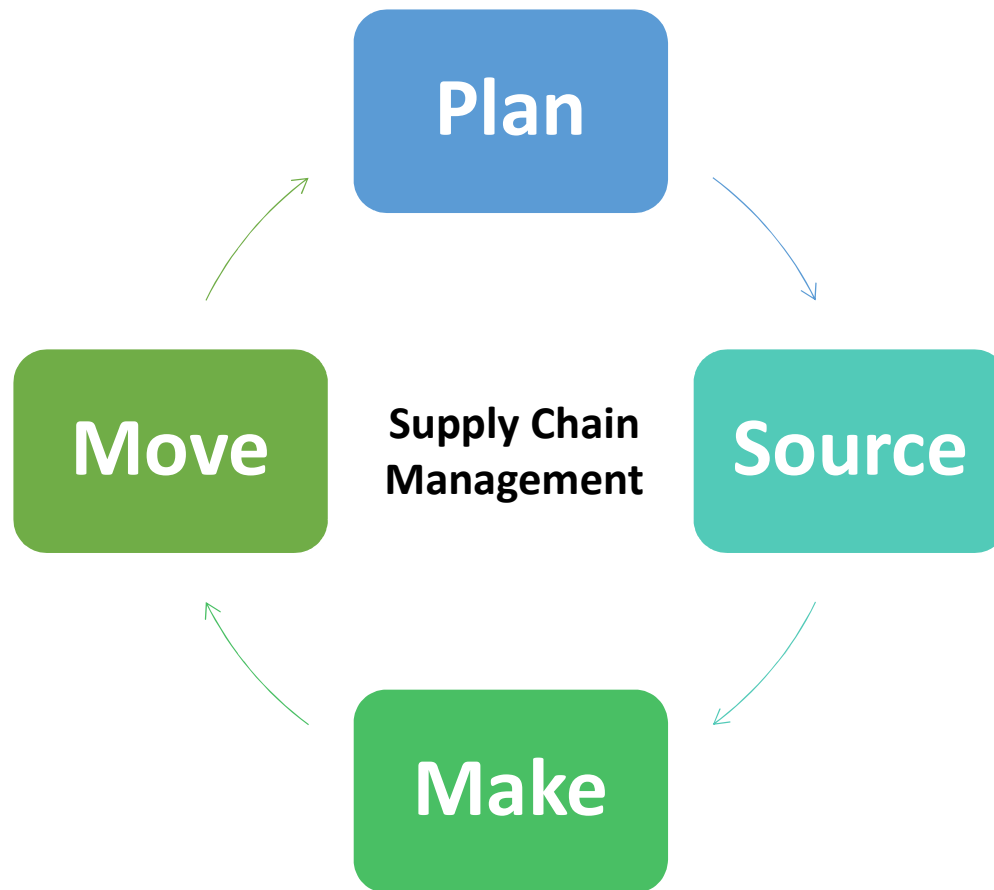
Cost and Purchasing Terms

How Do you Negotiate with Vendors? GenAI?

- One leading US retailer built bots **using generative AI to negotiate cost and purchasing terms with vendors in a shorter time frame**, noting that this early effort has already **reduced costs by bringing structure to complex tender processes**.
- The technology presents **the opportunity to do more with less**, and when vendors were asked how the bot performed, **over 65% preferred negotiating with it instead of with a human at the company**. We have also seen instances where companies are using generative AI tools to negotiate against each other!
- Beyond negotiations, generative AI presents an **opportunity to improve supplier relationships and management, with recommendations on what to do next**. These tools are useful to quickly extract information from large contracts and help you better prepare for renewal discussions, for example.

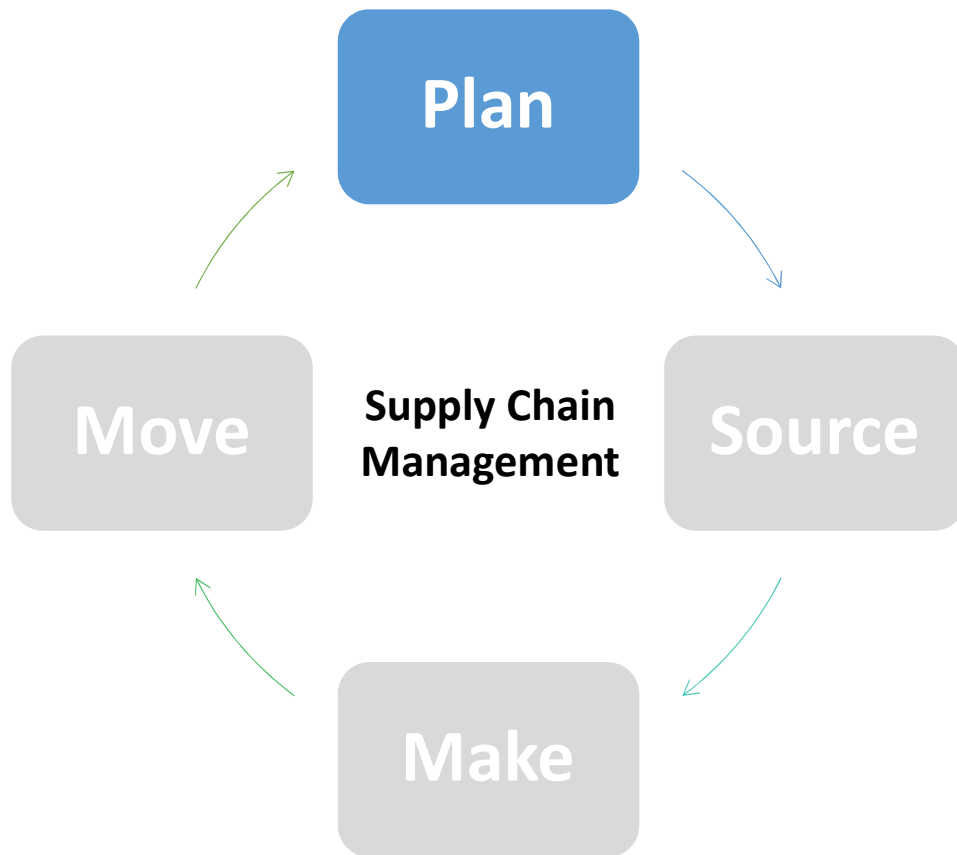


Supply Chain Management * GenAI



**Generative AI
aims to be
an agile co-advisor
and multiplier in
strengthening
supply chains**

Plan * GenAI



Demand Forecasting

Many organizations are using AI to analyze large historical sales data sets, market trends and other variables to create real-time demand models. With generative AI, optimal inventory levels, production schedules and distribution plans can be created to meet the customer demand efficiently.

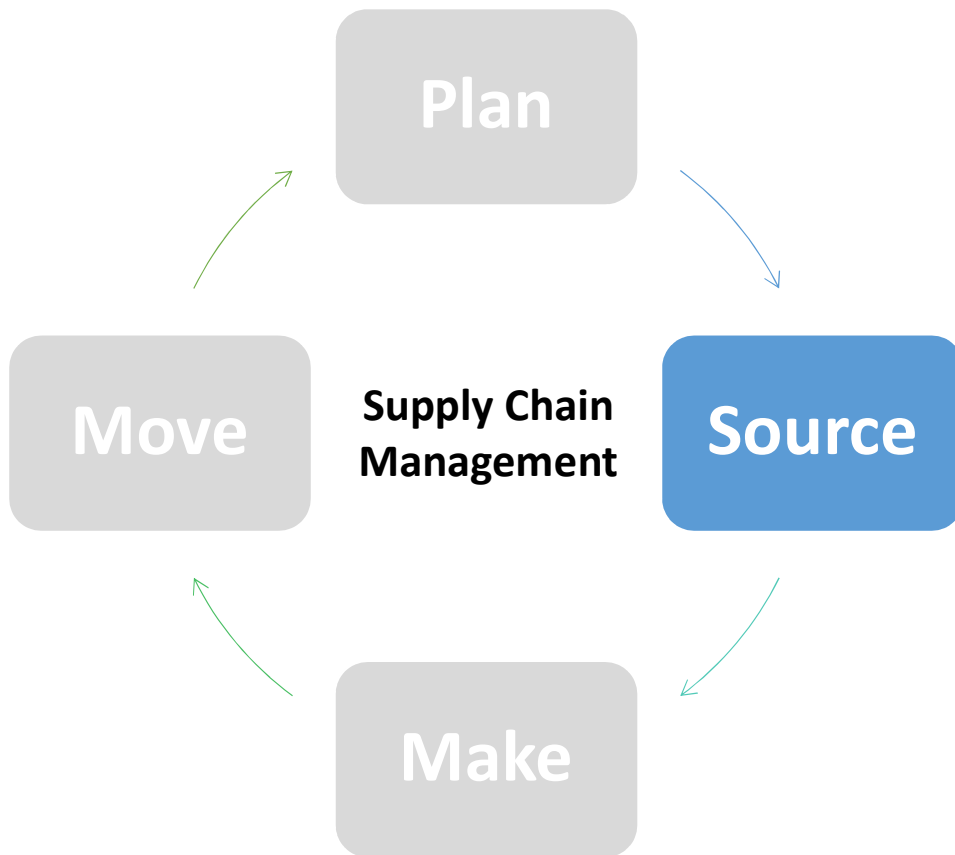
Production Planning

AI helps with plan production and scheduling by considering factors such as customer changes, production capacities, resource availability and order priorities. Similar to its demand forecasting capabilities, generative AI can make production plans, schedule sequences and allocate resources effectively to minimize bottlenecks and optimize production efficiency.

Risk Management

Today, AI can be harnessed to analyze historical data, market conditions, weather patterns and geopolitical events, among other data sources, to identify potential supply chain risks. But instead of prepopulated dashboards, for example, generative AI can be prompted to produce risk assessments, scenario simulations and mitigation strategies on demand to help planners manage and mitigate the risks proactively.

Source * GenAI



Supplier Management

Leverage natural language processing to gain insights from supplier communications and data points. Support, monitor and analyze supplier interactions; identify potential issues; and improve supplier relationships.

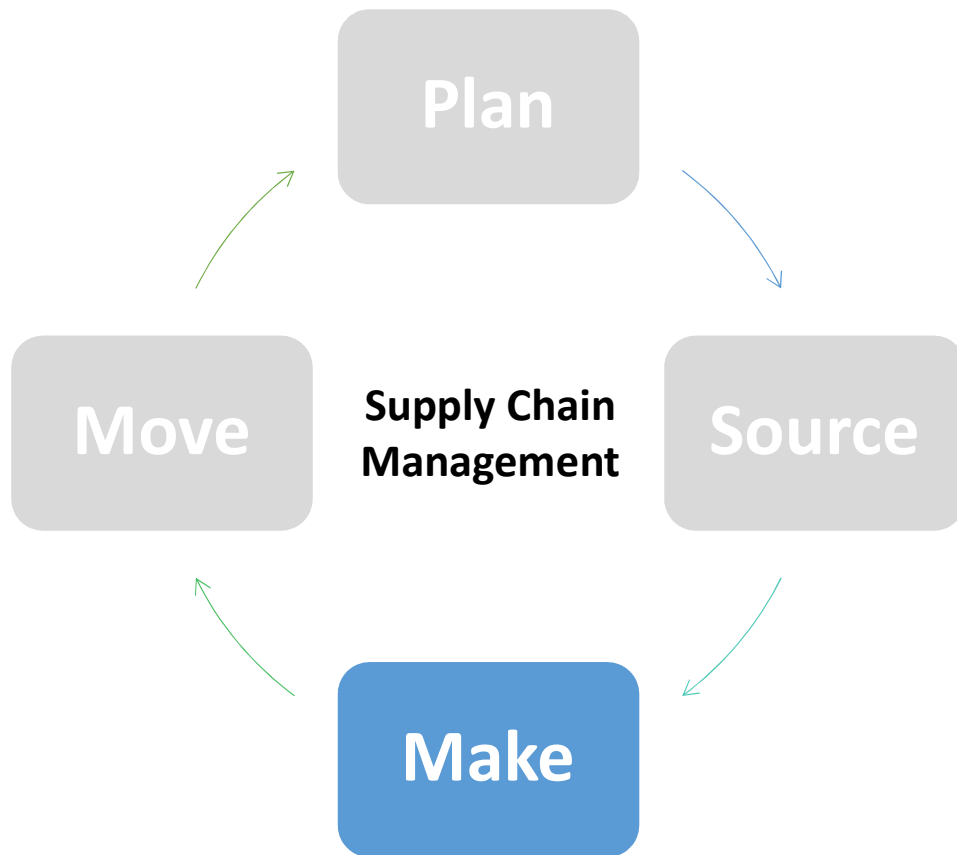
Sourcing

Support the supplier selection process by analyzing a wide range of supplier data and generating insights. By considering factors such as supplier performance, capabilities, pricing and risk profiles, generative AI algorithms can provide recommendations or rankings for making informed decisions.

Contract

Contract analysis is aided by automatically extracting key information from contracts and generating summaries or insights. Review and compare contract terms, identify risks and help ensure compliance. Contract negotiations and renewals are supported by providing data-driven recommendations.

Make * GenAI



Product Design

Rapidly generate and evaluate hundreds of alternative designs based on predefined criteria, significantly speeding up the innovation process. This could be used for everything from designing new parts for machinery to creating consumer products that are more efficient, durable or aesthetically appealing.

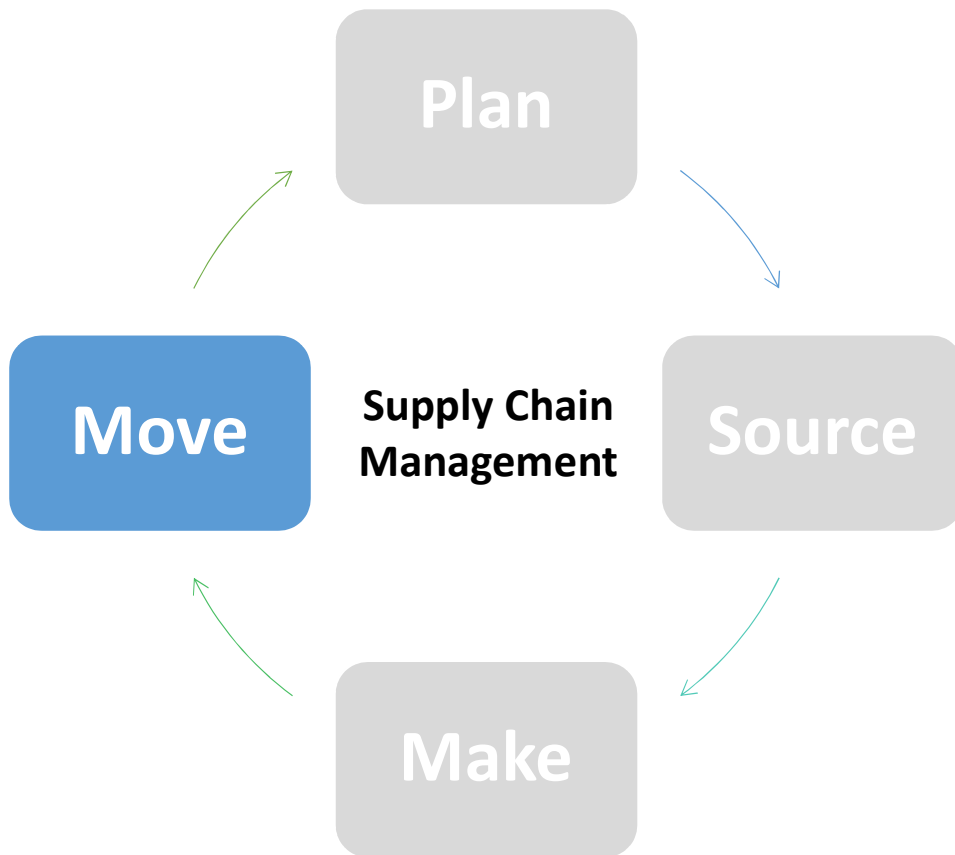
Predictive Maintenance

By learning from data collected from machines on the factory floor, generative AI models can create new maintenance plans to correlate with the time that equipment is likely to fail. This allows manufacturers to adjust their maintenance schedules to only when it is necessary, reducing downtime and costs while also extending the life of their equipment.

Material Science and Engineering

Generative AI can be used to discover new materials and optimize existing ones. By processing vast amounts of data on material properties and iterating on different combinations, it can propose new materials with desired properties or suggest optimizations for existing ones. This could lead to the creation of more efficient, sustainable or durable materials in manufacturing.

PLAN * GenAI



Global Trade Optimization

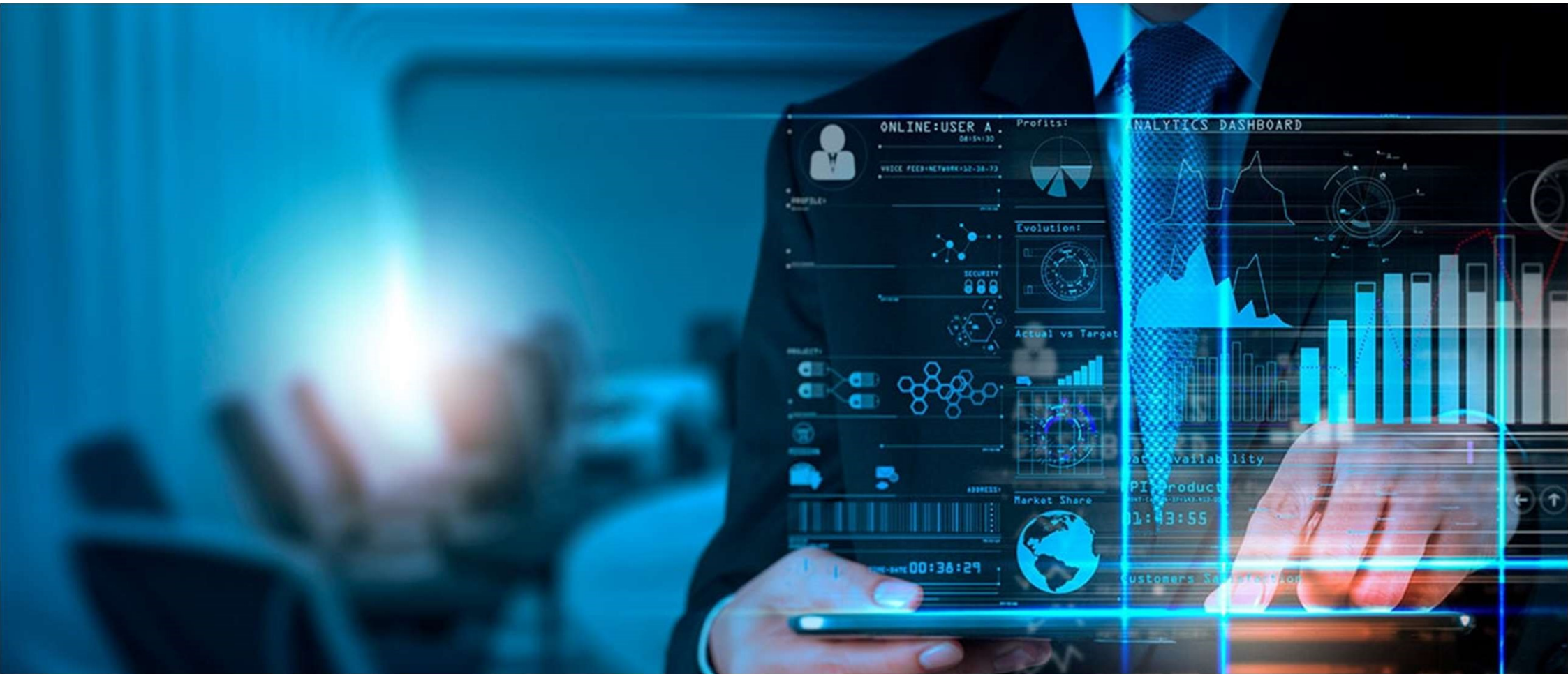
Analyze the myriad variables, including tariffs, customs regulations, trade agreements and shipping costs, to suggest the most efficient and cost-effective trade routes and strategies. This aids companies in navigating complex international trade networks, helping ensure compliance while minimizing costs.

Logistic Network Design

Optimize the design of logistics networks considering factors such as warehouse locations, transport links and demand patterns to generate the most efficient configuration. This leads to reduced delivery times, lower costs and improved service levels.

Last Mile Dynamic Route Optimization

For logistics operations, one of the major challenges is routing in real time. Generative AI can continually update and optimize delivery or pickup routes based on changing factors like traffic conditions, weather and the priority of deliveries. This leads to increased efficiency, reduced fuel consumption and improved customer satisfaction.



3. Recommendation

Challenges in Implementing GenAI

Data Availability
and Quality

Model Training and
Optimization

Interpretability
and Explainability

Real-time
Adaptation and
Dynamic
Environments

Ethical and Legal
Considerations

Deployment and
Scalability



Start experimenting

Deepen understanding
of GenAI's capacity
to redefine operating
models and blueprints



Seek game-changing outcomes

Identify and prioritize
use cases that will become
a source of competitive
advantage through GenAI



Establish an enterprise-wide model

Develop an architecture
and working model that also
considers the professional
identity of employees



Implement responsible AI guidelines

Establish a framework
for addressing ethical,
legal, and technological
considerations related to GenAI

Source: BCG experience.

THANK YOU



Contact Us:
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