AI Briefing (November 24)

AI - The Cerebral Disruption

Predictive AI

LOGIC

PROBABILITIES

PATTERNS

PREDICTIONS

Algorithms that can study Patterns, categories, assign probabilities and support decision making

Generative AI

CREATIVITY

GENERATIVITY

Algorithms that can create content like text and images of human like quality in response to prompts or requests for synthesis

Hacking knowledge of the world and yours through conversations

History of AI

Artificial Intelligence

Machine Learning

Deep Learning

Generative AI

1950s

Artificial Intelligence
the field of computer science that seeks to create intelligent machines that can replicate or exceed human intelligence.

1959

Machine Learning
subset of AI that enables machines to learn from existing data and improve upon that data to make decisions or predictions.

2017

Deep Learning
a machine learning technique in which layers of neural networks are used to process data and make decisions.

2021

Generative AI
create new written, visual, and auditory content given prompts or existing data.

Quick Recap of the AI field

Artificial intelligence
in its broadest sense is a range of techniques to enable software to approximate human thinking and behaviours.

Machine learning
is a subset of AI and uses advanced algorithms to detect patterns in large datasets to allow software to learn and adapt.

Neural networks
are machine learning programs that process input and generate outputs through interconnected nodes or artificial neurons. These nodes loosely model the neurons in a brain.
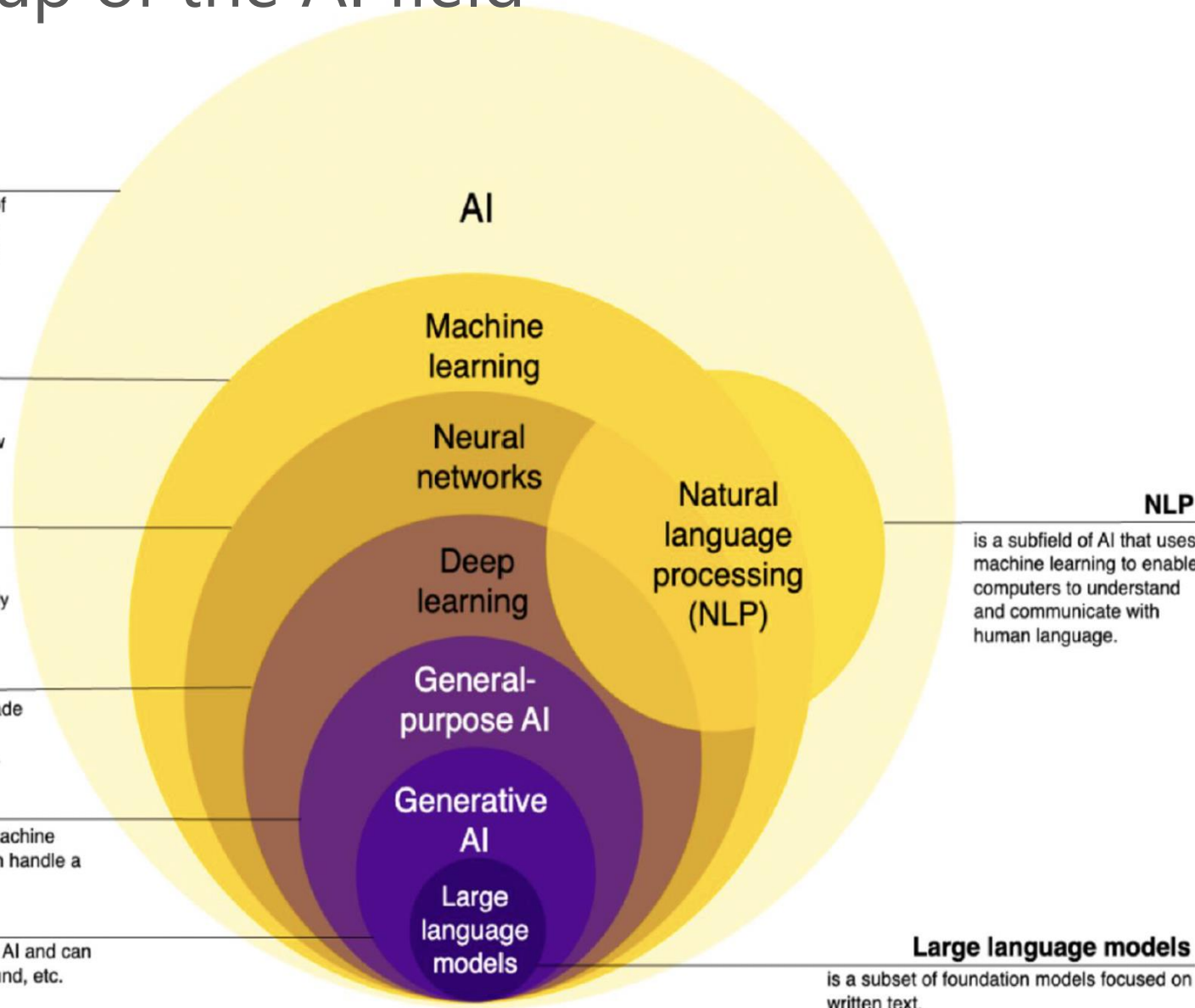
Deep learning
All deep learning systems are made of neural networks. They can recognise complex data patterns.

General-purpose AI
operates on the foundations of machine learning and deep learning. It can handle a broad range of tasks.

Generative AI
is one subset of general purpose AI and can generate text, images, video, sound, etc.
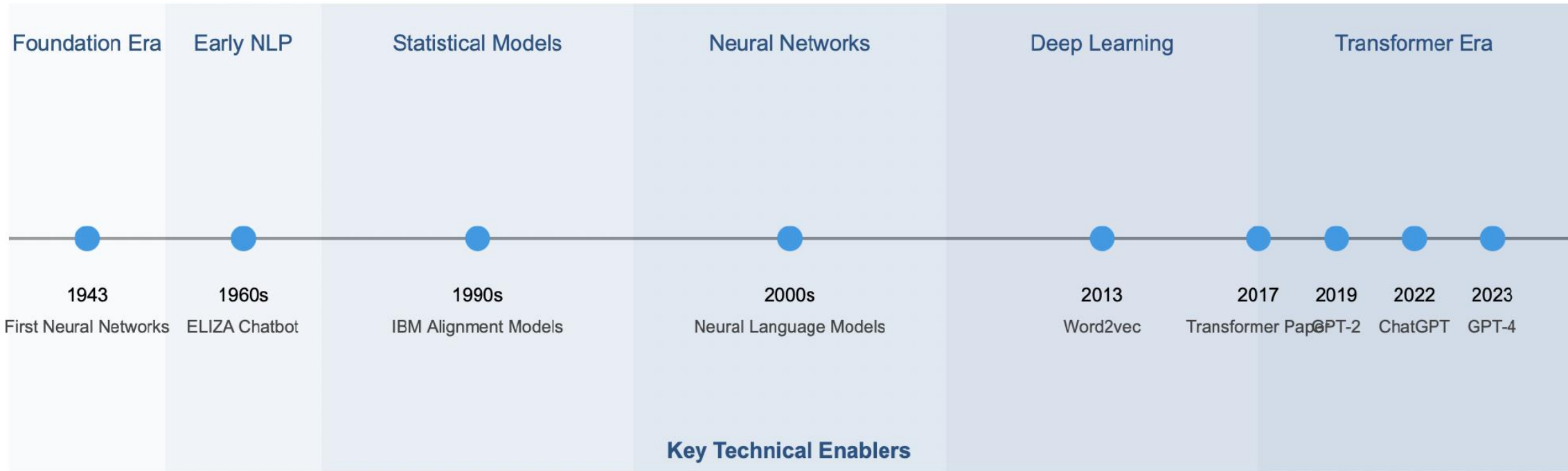
NLP
is a subfield of AI that uses machine learning to enable computers to understand and communicate with human language.

Large language models
is a subset of foundation models focused on written text.

Within diagram:
AI
Machine learning
Neural networks
Natural language processing (NLP)
Deep learning
General-purpose AI
Generative AI
Large language models

Timeline of key events

Foundation Era	Early NLP	Statistical Models	Neural Networks	Deep Learning	Transformer Era
1943	1960s	1990s	2000s	2013	2017 · 2019 · 2022 · 2023
First Neural Networks	ELIZA Chatbot	IBM Alignment Models	Neural Language Models	Word2vec	Transformer Paper · GPT-2 · ChatGPT · GPT-4

Key Technical Enablers

Word Embeddings • Attention Mechanisms • Transformer Architecture • LSTM Networks • Neural Networks
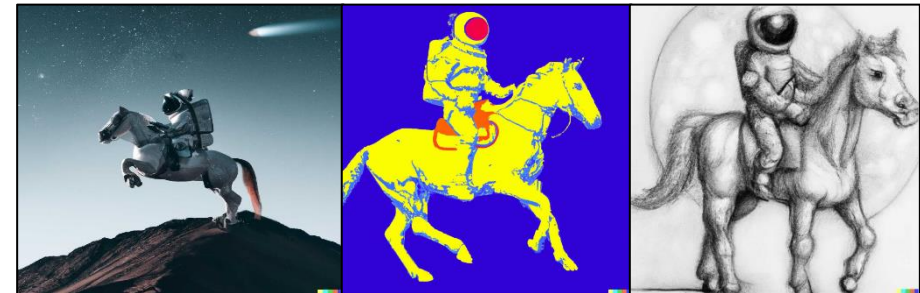
AI is already changing the way we live, evidenced by impressive capabilities it can already accomplish

Converse like a human on a variety of topics | ChatGPT
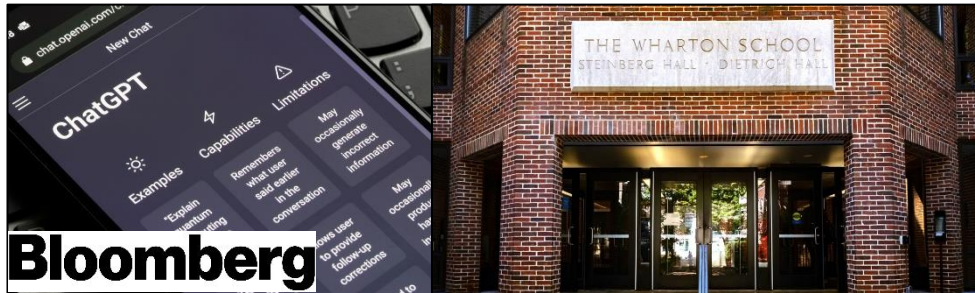
Chat GPT passes a Wharton MBA exam

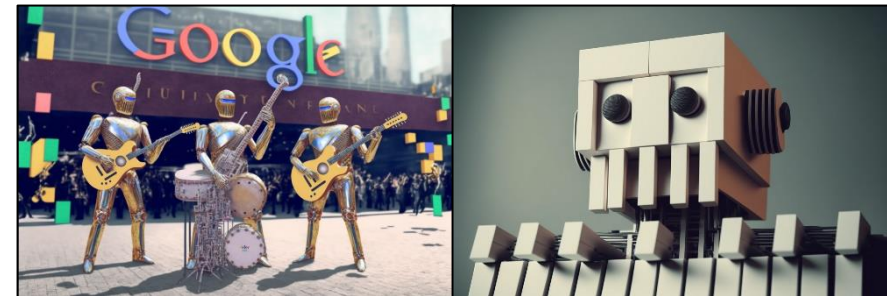## Create images of different styles from text | DALL·E 2

E.g., an astronaut riding a horse

Generate high-quality video clips | Meta Make-A-Video

E.g., a confused grizzly bear in calculus class

Compose music across instruments & genres | Google MusicLM

E.g., fast-paced and upbeat arcade game soundtrack

Closing the AI Agent Gap

- Require strong supervision
- Execute simple tasks
- Static behavior

AI Agents

- Act autonomously
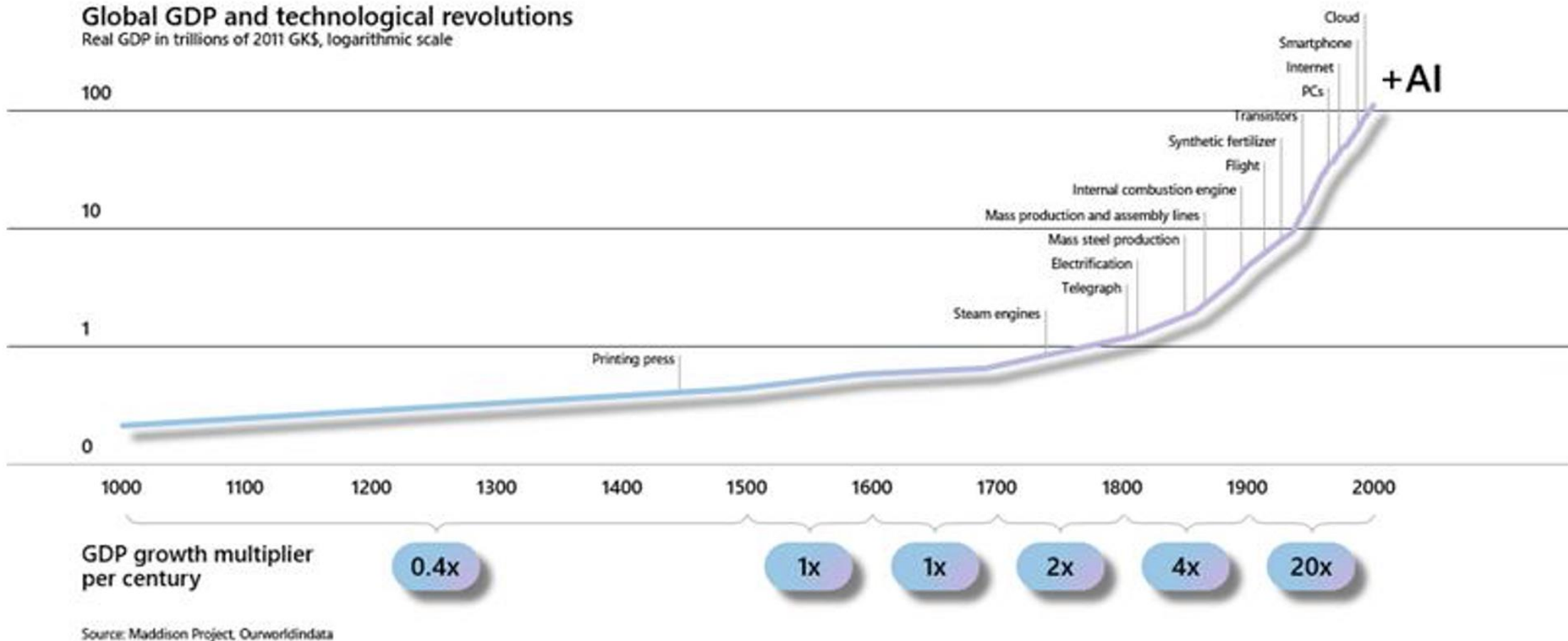- Execute complex goals
- Adaptable behaviour

Current AI Systems

Future AI Systems

Source: Gartner
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Gartner.

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OpenAI Imagines our AI Future

Stages of Artificial Intelligence

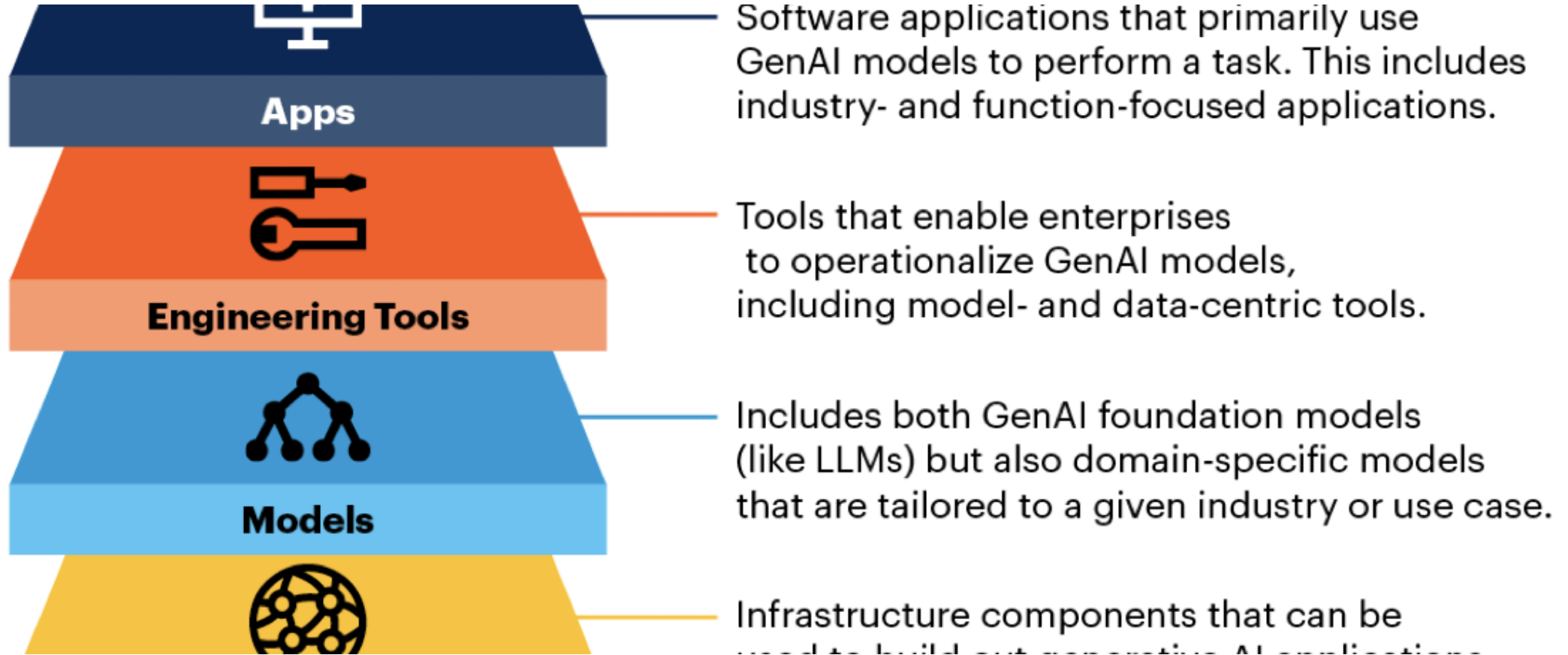|	
Level 1	Chatbots, AI with conversational language
Level 2	Reasoners, human-level problem solving
Level 3	Agents, systems that can take actions
Level 4	Innovators, AI that can aid in invention
Level 5	Organizations, AI that can do the work of an organization

Source: Bloomberg reporting

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Technology's Impact on GDP Growth is Accelerating

Global GDP and technological revolutions
Real GDP in trillions of 2011 GK$, logarithmic scale

Cloud
Smartphone
Internet
PCs
+AI
Transistors
Synthetic fertilizer
Flight
Internal combustion engine
Mass production and assembly lines
Mass steel production
Electrification
Telegraph
Steam engines
Printing press

GDP growth multiplier per century: 0.4x 1x 1x 2x 4x 20x

Source: Maddison Project, Ourworldindata

Microsoft Confidential

AI Tech Stack

Apps

Software applications that primarily use GenAI models to perform a task. This includes industry- and function-focused applications.

Engineering Tools

Tools that enable enterprises to operationalize GenAI models, including model- and data-centric tools.

Models

Includes both GenAI foundation models (like LLMs) but also domain-specific models that are tailored to a given industry or use case.

Infrastructure components that can be used to build out generative AI applications.

GenAI Strategy
ROI vs Maturity

Harder to show ROI

For Technology Mature Organisations

For Any Technology Maturity

Easier to show ROI

Knowledge Chat

- Internal policies chat
- IT & HR support chat
- Legal Documents retrieval system
- Industrial chat for engineering documents

Personal Productivity

- Document Summarisation & Insights
- Content Creation (emails, images)
- Enhanced Learning & Research

Client facing chatbots

- Banking / Financial Advisors
- Customer Support
- Insurance claim assistants
- Travel booking assistants

Prospect Facing Chatbots

- Lead qualification bots
- Product discovery & recommendation bots
- Event & Demo scheduling bots

Agentic Workflows

- Financial Reporting & Compliance Audits
- End to End customer support resolution
- Preventive maintenance planning
- Marketing campaign management
- Customer onboarding
- Sales proposal generation & customisation

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"If you are still at the POC stage, then you're already 18 months behind"

-- Panel discussion at The Association of Banks in Singapore (September 2024)

Beyond personal experiences, AI has been leveraged to improve development outcomes across topics

AI advancements are changing how DMCs approach development challenges

1 ### Climate
Lighthouse project: GIS-enabled Coastal Embankment
Bangladesh **mitigated climate hazards for ~400K people** by using a geographic information system (GIS) platform

2 ### Agriculture
Lighthouse project: Smart IoT & AI-based Agri-Solution
Smart agriculture in India **increased yield by 7%** and **reduced costs by 8%**

3 ### Energy
Lighthouse project: Smart Power Grid Improvement
Laos **reduced electricity losses from 24% to 14%** with smart metering and grid improvements

4 ### Finance
Lighthouse project: Digital Currencies
Bahamas **increased payment card usage by 203%** with a digital currency

5 ### Trade
Lighthouse project: AI-enabled National Single Window
Bangladesh **simplified 8M transactions annually** from automated customs clearance

6 ### Education
Lighthouse project: EVOKE blockchain-learning
Increased course completion rates from 10-40% with blockchain-assisted learning

7 ### Healthcare
Lighthouse project: CDC Data Modernization
Analytics and electronic reporting **saved 160K staff hours** from real-time disease surveillance and data modernization

8 ### Transport
Lighthouse project: AI Road Asset Management
Georgia **reduced road maintenance costs by 60%** with AI road asset management

9 ### Urban Development
Lighthouse project: Virtual Singapore
Singapore **saved 3000 resource days and costs** from creating a digital twin

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AI transformation will play a key role in supporting these 4 shifts

Select examples; non-exhaustive

Climate Change

Private Sector

Solutions

Ways of Working

AI transformation

- Develop AI-powered assistant in analyzing and recommending climate financing solutions
- Support modeling of climate scenarios, risks, and impact

- Create pitch books for private sector clients
- Create technical designs for future infrastructure projects
- Highlight areas to review initial customized contracts

- Support research & publications to establish thought leadership across sectors & themes
- Support economic analyses and modeling (e.g., LLM for inflation forecasts)

- Build on-demand support chatbot
- Conduct research from internal database and retrieve most relevant documents
- Synthesize real-time meeting transcripts into key points

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AI Opportunities in Health Care and Social protection

Medical image interpretation & fraud detection

Automatic medical **image interpretation**, providing **medical advisory** to doctors and detects any **fraud or overtreatment** which could trigger on-site investigation
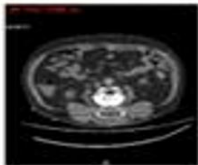
Source: HIRA

Wound imaging, assessment and monitoring

AI-enabled tool on mobile application will **automatically measure, assess, and monitor wounds** within a second.

Source: Tetsuyu

Automatic Grievance Redress System in Philippines
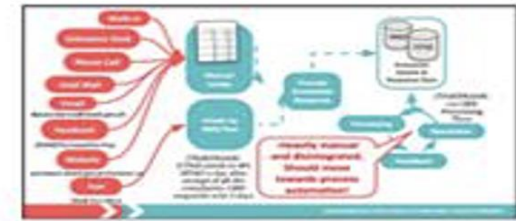
Automated grievance handling and classification, offering **personalized support and audio-to-text filing** via mobile phone for accessible use by illiterate individuals.

Source: Department of Social Welfare and Development of Philippines, ADB

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AI Opportunities in Climate and Disaster Risk management
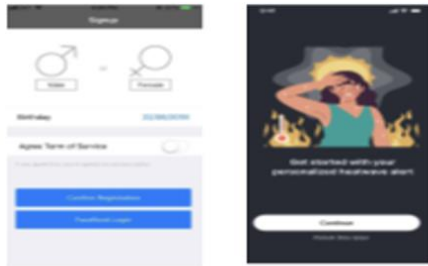
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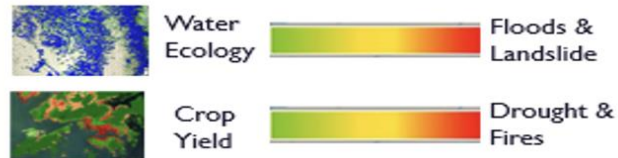
AI Opportunities in Education

Explore EVA by visiting: https://www.learnfromeva.com/
Available from 2nd Dec 2024