

**Revolutionizing  
Industries:**

**Exploring Generative AI's  
Impact on Business  
Strategies**

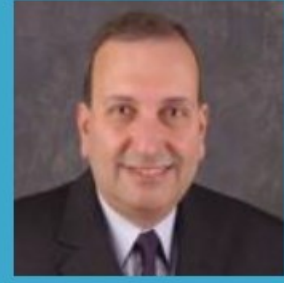
**Oct 31<sup>st</sup> 2023 10:30 AM CST  
(US & Canada)**





**Dr Tilak Agerwala**  
Panelist

IBM Vice President (Retired),  
Adjunct Associate Professor,  
Pace University-New York



**Dr Darukhanavala**  
Panelist

Industry Advisor, Energy &  
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**John Rowe**  
Panelist

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**Dr Omprakash Gnawali**  
Panelist

Associate Professor, Dept of  
Computer Science, University of  
Houston



Section	Topic	Speaker/s
Introduction	Insights on Gen AI	Dr Tilak Agerwala
Context	Brief History of Digital/AI with what's taken place in AI, Use Case examples	John R
Panel Discussion - Future Workforce	More Use cases, Workforce training & looking at the future	Dr Omprakash
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Key Takeaways	Webinar Summary and Takeaways	Dr Tilak and Murthy

# Artificial Intelligence and Generative AI

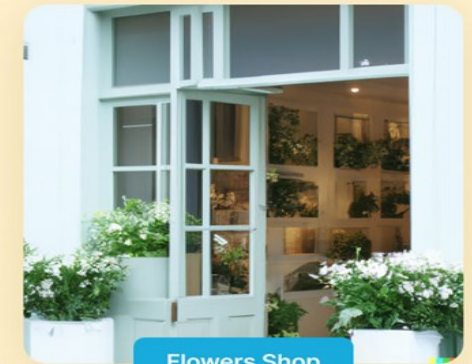
1. **Artificial Super Intelligence:** Greatly exceeds the cognitive performance of humans in virtually all domains of interest.
2. **Artificial General Intelligence:** Ability to accomplish any cognitive task as well as humans
3. **Artificial Narrow Intelligence:** Ability to accomplish a narrow set of tasks, e.g., play chess or drive a car.

## Artificial Narrow Intelligence:

- **Statistical learning:** **Statistical correlation not causal**  
Deep Learning: Most widely used AI technique.
- **Enables Natural Language Processing, Speech Recognition, Object Detection, Face Recognition**
- **Large Language Models and Generative AI:** **ChatGPT**

**Generative AI is a technology that uses pre-existing text, audio files, or images to produce something new in response to a prompt entered by a human. The output could include poetry, a physics explanation, an image, or even new music and videos**

- #1. Healthcare
- #2. Art and Animation
- #3. Marketing and Sales
- #4. Software Prog
- #5. Manufacturing
- #6. Entertainment



“A photo of a quaint flower shop storefront with a pastel green and clean white facade and open door and big window”

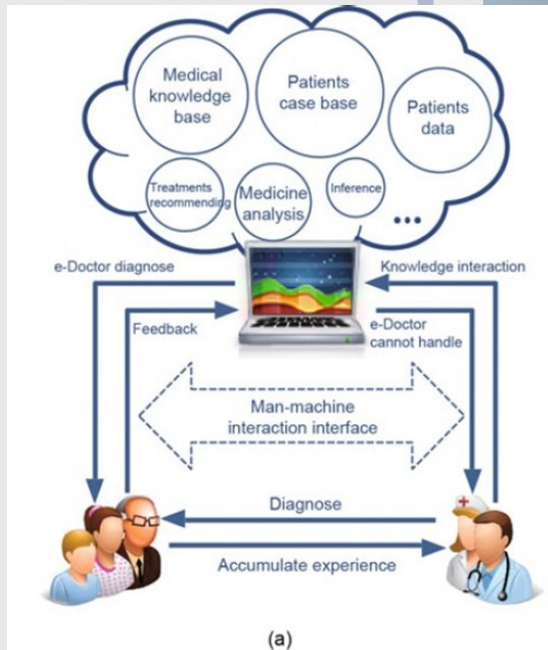
# ChatGPT/Generative AI Pros and Cons

## PROs

Increasing productivity by automating or speeding up tasks.

Potential to significantly impact the future of collaboration in various domains.

Humans and computers that interact in natural ways and refine insights through dialog, can solve increasingly complex, important problems over time, more effectively than humans or computers acting alone.



## CONs

**Hallucination:** The tendency for certain AI models to generate nonsense or errors that do not correspond to fact or real-world or common-sense logic.

## Copyright Issues

## Ethical Issues addressable by Ethical Design

(Fairness, Bias, and Inclusivity, Privacy and User Data Rights, Safety and Security, ...)

## Legal and regulatory issues

## Energy consumption

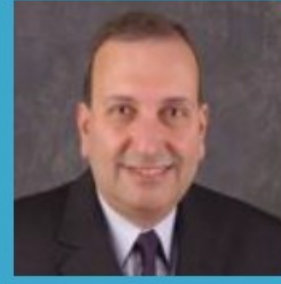
Very rapid deployment and democratization of AI technology amplifies concerns about ethical use and misuse, and impact on jobs and people.  
100 Million Users: Telephone 75 years. ChatGPT: 2 months





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# A Brief Look Back – Digital/AI History

## 1980s

## 1990s

## 2000s

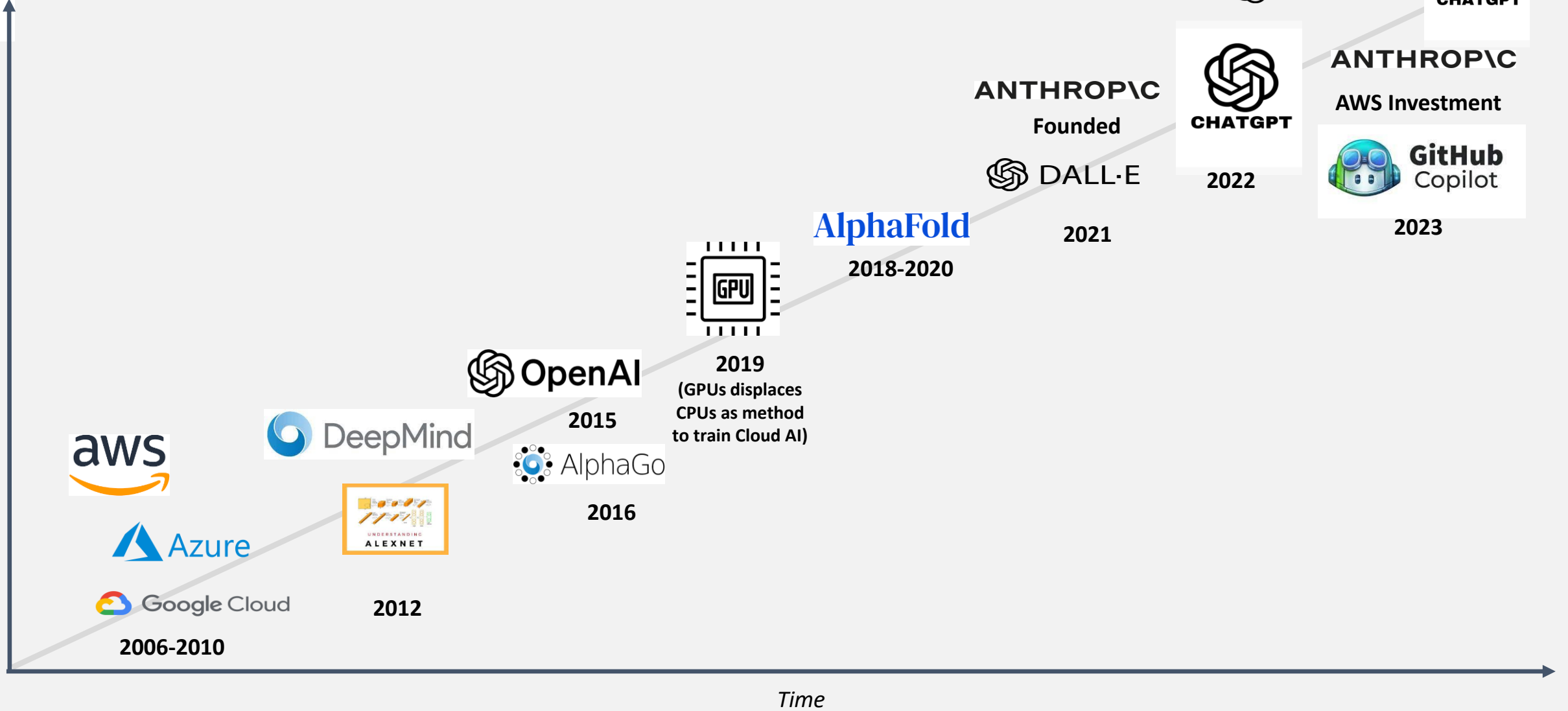
## 2010s

## 2020s

MS-DOS released; IBM releases their first PC. Microsoft Windows released in 1985 with a graphical user interface.	Enterprise Resource Planning (ERP) is a hot technology projected to change the corporate landscape.	Agile Manifesto written in 2001 by seventeen independent-minded software practitioners	Google's Deep Mind founded in 2010; Deep Mind's purpose was to solve for intelligence. Deep learning system wins image classification contest in 2012	Generative Artificial Intelligence (GenAI) gains notoriety as AI capable of generating text, images, and other media using generative models.
PCs are able to perform calculations and compute at a fraction of the cost of mainframes; some vendors shifted their development efforts to the PC.	<b>Re-engineering The Corporation</b> written by Hammer & Champy ushers in a corporate frenzy of business process re-engineering	AWS, Microsoft Azure and an early version of GCP made available, GCP not formally launched until 2011	IBM's Watson wins Jeopardy 2011	Open AI announces GPT-3 in 2020; a free preview in 2022 which gain 100 million subscribers within 2 months.
Graphical User Interfaces were made popular by Apple Macintosh in 1984	IBM's Deep Blue chess machine defeats world champion chess player, Gary Kasparov in 1997	First conference entitled <b>DevOps Days</b> held in Belgium	Google's Deep Mind defeats Alpha Go Champion in 2016, the modern day transformer proposed in 2017 in paper, "Attention Is All You Need"	DALL-E, a transformer-based pixel generative model, marked the emergence of high-quality artificial intelligence art from natural language
Relational databases such as Oracle, IBM's DB2 and Microsoft's SQL server became popular.	World Wide Web developed by Time Berners-Lee released to Internet in 1991	Broad band adoption in homes democratizing information access	Open AI founded in 2015 with a later \$1 billion investment in 2019	Microsoft introduces Copilot and Github Copilot to improve Office and programmer coding productivity
TCP/IP protocol was adopted as the defense standard in 1983 laying the groundwork for the modern internet	During the 1990s there was a massive optical fiber communications expansion driven in part by the dot-com boom (problems ensued with the subsequent dot-com bust).	Facebook launched in 2005 ignited a frenzy of social media companies; Twitter (now X) founded in 2006	Space X achieves a successful landing & recovery of a first stage rocker in December 2015	Coca-Cola launched an AI-powered campaign, Masterpiece, which follows a Coca-Cola bottle as it travels through some of the world's most iconic paintings and sculptures.
The 1980s marked the beginning of IT departments in many businesses and institutions	Nvidia founded on the notion that the next wave of computed was accelerated computing	Development of iPhone began in 2004 and launch in 2007	Alphafold, an artificial intelligence program, used generative neural networks in 2018 to predict how proteins might fold based on their DNA.	JPMorgan Chase has filed a patent application for a gen AI service that can help investors select equities.

# Big Steps In AI Evolution

Innovation Acceleration



# Gen AI Changes The Human + Machine Paradigm

*It's also becoming clearer that, in a world where everyone will have access to "intelligent" content, the ability to competitively differentiate yourself will increasingly depend on proprietary data and execution capabilities.*

*--Rewired, 2023*

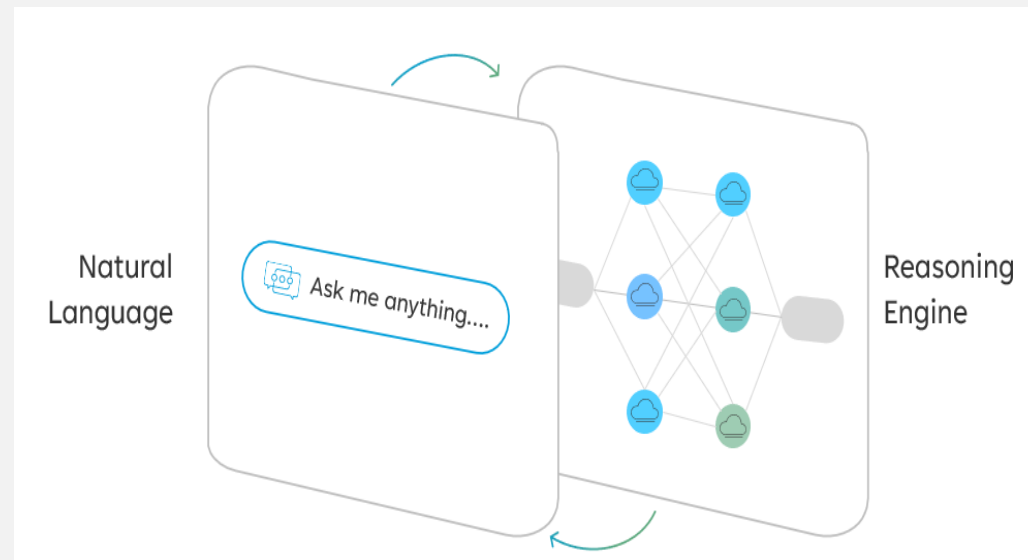


Image Source: 2023 Microsoft Inspire



# Eight Areas Required To Prepare For Digital/AI Deployments

## Eight Strategic Areas Needed For the Next Era of Digital/AI

Identify key business domains ripe for business transformation and/or new engineer new business model(s)

Organizations have to get serious about tech talent

An advanced Agile Operating Model is necessary for success

Engineer tech architecture for digital/AI

Get savvy on how to reasonably implement artificial intelligence & its use cases

Place priority on managing & governing quality data sources

Zero Trust Security is a must!

New tech requires a world-class tech adoption program & organizational talent who are life-long learners

## Example Use Cases

Customer Service

Art & Advertising

Equipment Maintenance

Precision Medicine

Financial Advisory

Software Development

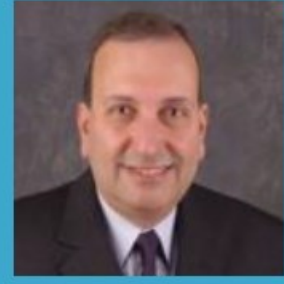
Data Transformation

Clinical Summary



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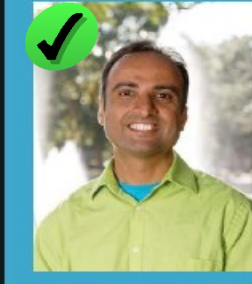
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# **OPPORTUNITIES FOR SMALL BUSINESSES, EDUCATION AND RESEARCH DIRECTIONS**

Prof. Omprakash Gnawali  
University of Houston

# Small Businesses

- Easy-to-use tools available for small organizations or organizations without extensive technology team
- Content creation
  - Marketing, Fundraising, Instructions, documentation
- Automation in customer service
- Data analysis
  - Natural interface to data

# Marketing email - 1

**“write a marketing email about a thermometer targeting women customers with young children”**

Subject: Keep your little one safe with a reliable thermometer

Body:

Dear Mom,

As a mom of young children, you know that their health is your top priority. That's why it's important to have a reliable thermometer on hand to check their temperature at any time of day or night.

Our thermometer is the perfect choice for busy moms. It's easy to use and provides accurate readings in seconds. Plus, it's durable and safe, so you can use it with confidence.

Here are just a few of the benefits of using our thermometer:

- **Accurate readings in seconds:** Our thermometer uses the latest technology to provide accurate readings in just seconds. So you can spend less time checking your child's temperature and more time keeping them comfortable.
- **Easy to use:** Our thermometer is easy to use, even with one hand. Simply place it under your child's tongue and wait for the beep. The temperature will then be displayed on the large, easy-to-read screen.
- **Durable and safe:** Our thermometer is made with durable materials and is safe for use with children of all ages. It's also water-resistant, so you can easily clean it after use.

Plus, our thermometer is backed by a 100% satisfaction guarantee. So if you're not happy with your purchase for any reason, simply return it for a full refund.

Order your thermometer today and give yourself peace of mind knowing that you have a reliable way to check your child's temperature.

Click here to order now: [\[link to product page\]](#)

Sincerely,

The [Company Name] Team

PS: Don't forget to check out our other products! [MOM10](#) - [100% Satisfaction Guarantee](#)



# Marketing email - 2

**“make it shorter to send in whatsapp text”**

Sure. Here is a shorter version of the email that is under 160 characters, and suitable for sending in a WhatsApp text:

Hi [Customer Name],

Need a reliable thermometer for your little one?

Order the [Thermometer Name] today! It's fast, easy to use, and accurate.

Click here to order now and get 20% off with code MOM20: [link]

Thanks,

The [Thermometer Name] Team

# Data Analysis

date	product	payment method	sale price	cost	
3/2/23	book	credit card	100	90	
4/2/23	movie	bank	123	50	
4/23/23	book	ach	114	110	
6/5/23	book	credit card	150	140	
7/2/23	movie	bank	110	50	
7/20/23	movie	bank	123	20	
7/25/23	book	bank	110	100	

I copied the above data to a Gen AI system and asked the following questions:

1. based on the data, calculate monthly revenue
2. what was the revenue by product?
3. how many books were sold?
4. how much payment was processed using different payment methods?

based on the data, which product is more profitable?

Based on the data you provided, the movie is more profitable than the book.

Here is a breakdown of the data by product:

Product	Total Sales	Total Cost	Total Profit	Profit Margin
Book	\$474	\$440	\$34	7.2%
Movie	\$356	\$120	\$236	66.3%

In which month were most movies sold?

Based on the data you provided, the most movies were sold in July.

Here is a breakdown of the data by month:

Month	Movies Sold
April	1
July	2

# Academia

- Enhance teaching
  - Syllabus
    - Suggest textbooks, emphasize certain topics or approach
  - Content
    - Draft of lecture content, project ideas
- Enhance learning
  - Easy access to content on specific to broad aspect of topics covered in the course
  - 24/7 interactive tutor that can provide feedback on writing, make suggestions
- Cheating detection tools

# Workforce Training

- Near term
  - Gen AI tools to increase productivity
  - Software development, marketing, ...
  - Limitations
- Long term
  - Automation
  - Applications

# Gen AI Research from Industry+Universities

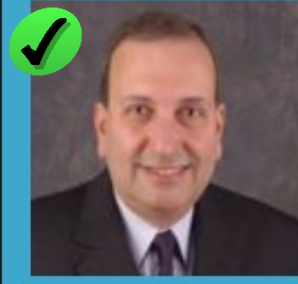
- New Applications
- Q&A / Dialogue / Interactive Sys
- Multilingualism
- Multimodal
- Ethics
- Interpretability
- Infringement/rights/monetization
- Performance
- Human Centered
- Social/cultural/language analytics
- Education
  - What is *learning* and *grading* in this new era?





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# Applied Gen AI

## Examples of AI based Use Cases in the Energy Industry

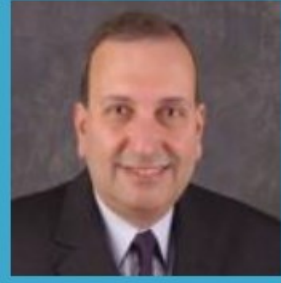
- **Exploration** – Seismic interpretation – turning AI loose on masses of seismic data to discover undiscovered pockets of hydrocarbon deposits.
- **Drilling** – Optimal drilling profiles to avoid stuck bits in real-time.
- **Well design and completion strategies** – Using AI with 80 years of real-life data to generate the best well designs and completion techniques for a particular geological formation.
- **Effective Corrosion Management** by using AI-driven inspection regimes.
- **Reservoir Optimization** on a Full field basis using AI-Augmented Data-Physics
- **Offshore Platform Configurations** and component designs using generative design techniques.
- **AI-assisted molecular modeling** of Lubricant compounds.
- **AI-generated trading strategies** for trading oil and gas cargos in real-time.
- **Using AI to develop training videos** for newly hired operators. Providing support tools for rookie operators.

- ✓ While the use cases may be in large corporations, small companies and consultants can participate in developing innovative apps for these use cases, based on the latest AI technologies.
- ✓ Because the oil and gas industry involves high-risk operations, human oversight usually moderates AI-based solutions before deployment.
- ✓ Availability of a long history of qualitative notes about past operating challenges helps the AI models learn from previous human experience and build upon that experience to propose innovative solutions. This is particularly relevant for LLMs.



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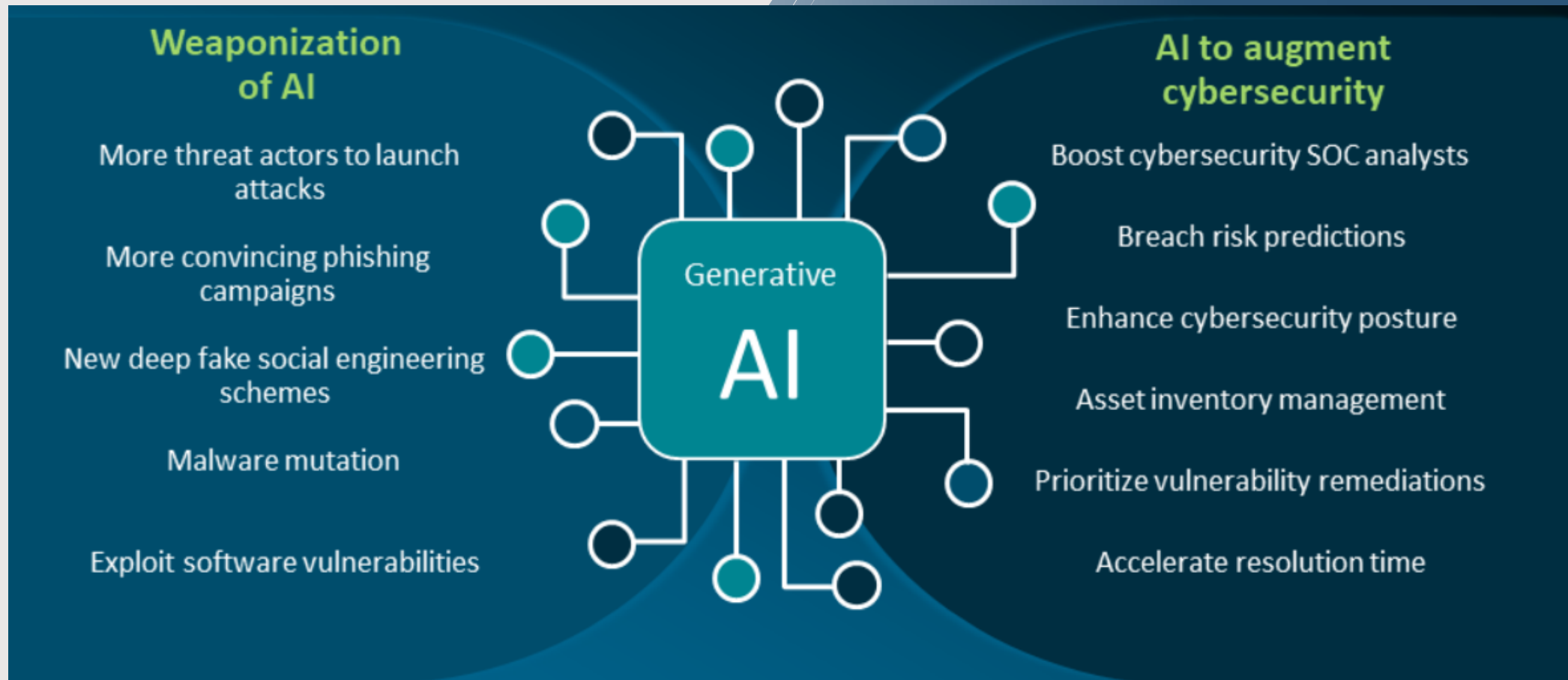
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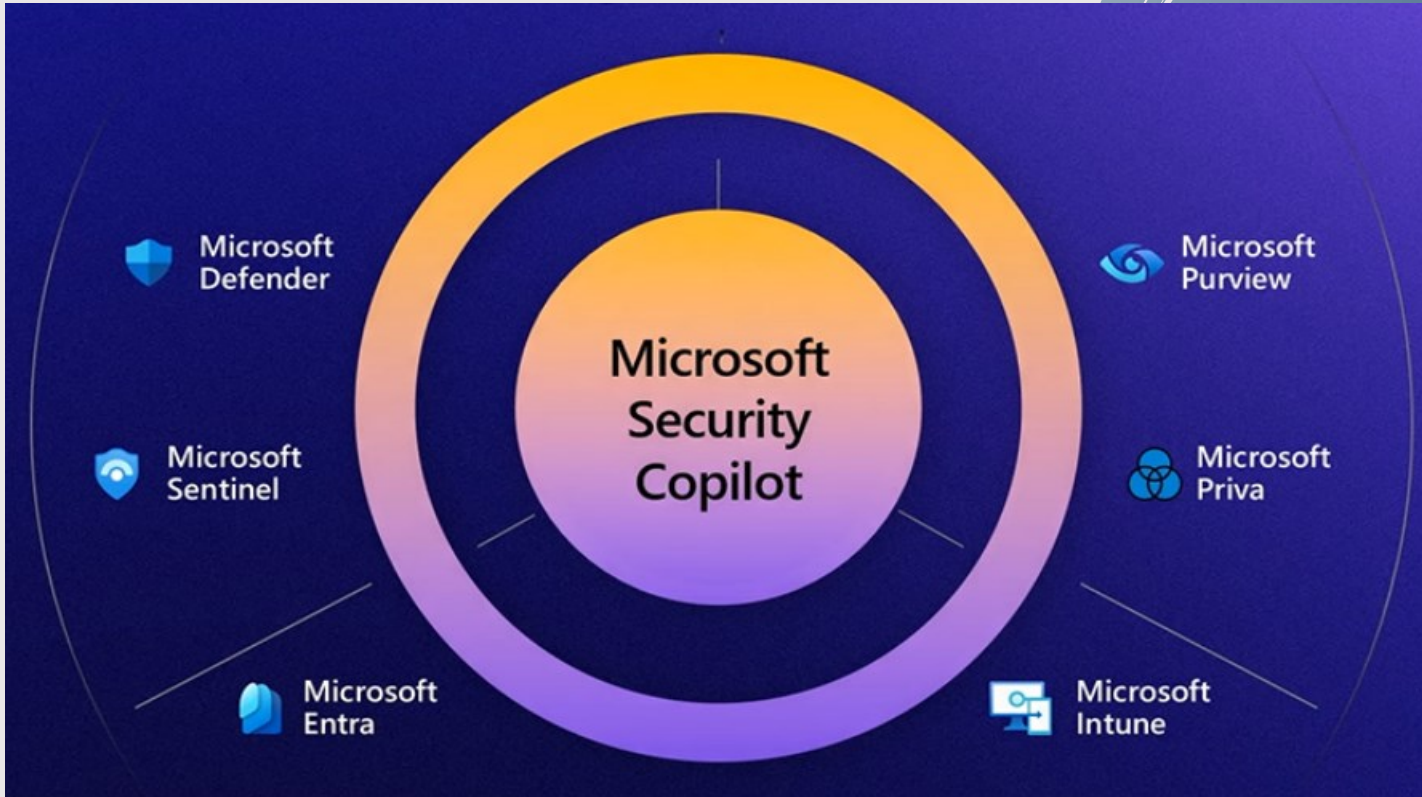
# Embedding Gen AI into Cybersecurity



Generative AI's potential must be balanced with its risks, including the reality that attackers are exploring how to use it to plan and launch attacks that hit multiple threat surfaces simultaneously.  
Source: Canalys Forums 2023: "Generative AI is a game-changer in the cybersecurity ecosystem"



# Gen AI Platform Example



Security Copilot combines the power of OpenAI's GPT-4 generative AI advanced large language model (LLM) with a security specific model developed by Microsoft.

This allows a Security Operations Centre (SOC) analyst to prompt Security Copilot like you would prompt ChatGPT. You ask a question, and the tool returns an AI-generated response that answers the security related inquiry.





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## Panel Discussion with Key Takeaways

# Thank you



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