The Prophets Speak …..

Sundar Pichai, CEO Alphabet
“I’ve always thought of A.I. as the most profound technology humanity is working on—more profound than fire or electricity”

Bill Gates
“the most important advance in technology since the graphical user interface”

Satya Nadella, CEO Microsoft
“I have not seen something like this since I would say 2007-2008, when the cloud was just first coming out,”

Sam Altman, CEO OpenAI
“I think AI is going to be the greatest force for economic empowerment and a lot of people getting rich we have ever seen”

Henry Kissinger
“We must expect AI to make mistakes faster and of greater magnitude than humans do”

Elon Musk
“it [AI] has the potential of civilization destruction”

Geoffrey Hinton (pioneer in Deep Learning)
“It’s hard to see how you can prevent the bad actors from using it for bad things”

Romesh Wadhwani, Chairman SymphonyAI
“We’ve heard enough from the prophets, where are the policy makers?”

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Generative AI Use Cases Across Industries

**Defense**
- Autonomous Combat Systems
- Cyber Threat Detection
- Intelligent Surveillance
- Counter Propaganda Analysis
- Intelligent Decision Support
- AI-Enabled War Gaming

**Life Sciences & Healthcare**
- AI-Drug Discovery
- Clinical Trials Optimization
- Personalized Medicine
- Clinical Assessments
- Administrative Process Automation
- Patient Assistants

**Legal**
- AI-Legal Research
- Automated eDiscovery
- Contract Analysis, Generation, & Negotiation
- Intellectual Property Mgmt

**Entertainment**
- Generative Media Creation
- AI Game Development
- Personalized Recommendation Systems
- Virtual Reality Storytelling
- AI-Talent Scouting

**Retail**
- Product Promotions
- AI-Inventory Mgmt & Supply Chain
- Generative Product Descriptions & Images
- Dynamic Pricing

**Education**
- Personalized Adaptive Learning
- Content Generation
- Plagiarism Detection
- Faculty Assistant
- AI-Exam Proctoring
- Career Counseling
- Learning Analytics

**Manufacturing**
- Generative Product Design
- Predictive Maintenance
- Workforce Safety
- AI-Process Optimization
- Automated Quality Assessment

**Financial Services**
- Financial Crime Detection
- Regulatory Change Mgmt
- AI-Financial Planning
- AI Risk Assessment
- Intelligent Trading Systems
- AI-Insurance Underwriting

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Emergent Properties of Generative AI

1. Common Sense Reasoning
   - Apply general knowledge about the world, often unstated or assumed, to make sensible predictions or decisions, much like a human would.

2. Physical Intuition
   - Predict or understand the physical properties of objects and their interactions in the world, similar to how humans intuitively understand gravity, momentum, or solidity.

3. Metacognition (Theory of Mind)
   - Attribute mental states such as beliefs, emotions, desires, intentions, and knowledge to others, and understand how they affect behavior and communication.

4. Logical Deduction
   - Apply rules of logic to arrive at conclusions based on given facts or premises.

5. Causal Judgement
   - Understand cause-and-effect relationships and use this understanding to make predictions or decisions.

6. Mathematics
   - Understand and apply mathematical concepts, perform complex calculations, and solve mathematical problems.

7. Software Development
   - Write, debug, document, explain, and optimize code, contributing to the process of creating or improving software.

8. Tool Invocation
   - Interact with other software services via their APIs, enabling it to take actions as well as fetch, manipulate, and use data from these services.
What Will Gen AI Do Next?

- **Multi-Modal Models** (Text, Image, Audio)
- **Gen1 Copilot Platforms**
- **AI App Ecosystems**
- **Gen1 Autopilots**
- **Physical Embodiment**
- **AI-Contract Negotiation**
- **Personalized TV Shows**
- **50%+ Drug Development**
- **Artificial General Intelligence**
- **Edge Models**
- **Gen2 Autopilots**
- **Agriculture Climate Change Adaptation**
- **Autonomous Production Lines**
- **AI-Driven Research**
- **Autonomous Combat**
- **70%+ New Product Development**

Future

- **Security & Robustness**
- **Deep Domain Models** (e.g. Proteins)
- **AI-Regulatory Compliance**
- **Cyberthreat Detection**
- **50%+ Software Code**
- **Multi-Modal Models** (Video)
- **Gen2 Copilots** (Collaboration Enabled)
- **AI-War Gaming**
- **Protein Design**
- **AI-Portfolio Management**
- **Clinical Diagnostics**
- **AI-Suveillance**

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Gen AI Impact On Society

Benefits

Improved Efficiency: Generative AI can automate and optimize many processes, improving efficiency in various sectors like manufacturing, entertainment, logistics, services, etc.

Healthcare Innovation: AI can lower healthcare costs, improve diagnosis and treatment, enhance drug development, automate back-office processes, and accelerate disease detection.

Personalized Education: AI can personalize education, adapting to in real time to each student’s progress, strengths, and weaknesses thus improving learning outcomes.

Personal Productivity: AI can automate routine tasks, freeing people up to focus on more complex, satisfying and creative tasks, increasing overall productivity.

Scientific Discovery: accelerate scientific research to drive advances in various fields (e.g. physics, chemistry, biology, etc.) leading to solutions for pressing global challenges.

Risks

Job Displacement: Automation of tasks could lead to significant job losses, particularly in sectors that involve knowledge work and routine tasks and deepen income inequality.

Privacy Erosion: Generative AI can process vast amounts of personal data, potentially eroding privacy and enabling surveillance.

Biased AI: AI systems can perpetuate and amplify existing biases (e.g. gender, race, etc.), leading to unfair treatment and outcomes.

Dependence on AI: Over-reliance on AI systems could devalue human creativity and lead to diminished human skills and capacities.

Social Manipulation: AI could be used to spread misinformation and manipulate people's behavior through personalized propaganda and other malicious schemes.
Gen AI Potential Impact on Jobs and Unemployment – one scenario

$60K+ Jobs

50.1M
As of Dec, 2022

Annual $60K Job Creation

1.2M
Assumption based on data from 2019

Automation Job Losses

30% - 35%
Of $60K+ jobs will be automated by GenAI in the next 5 years

$60K+ Jobs Projection (2023 – 2027)

Normal Rate of Job Creation

6M

Jobs Lost to GenAI

16M

Net Jobs Lost

10M

“40% of working hours across industries can be impacted by Large Language Models (LLMs)

Source: Accenture 2023 Study - A new era of generative AI for everyone
Gen AI Impact On US Government & National Security

**Benefits**

- **Improved Public Services**: AI can make public services more efficient and user-friendly, improving people’s quality of life, as well as reducing delays and bureaucracy.

- **Enhanced Decision Making**: AI can reason over vast amounts of data to aid in decision-making for domestic policy, infrastructure planning, national security, and foreign policy.

- **Efficient Resource Allocation**: AI can optimize resource allocation in various government departments, ensuring resources are directed where they are most needed.

- **Advanced Military Capabilities**: AI can enhance military decision-making, optimize logistics, and enable autonomous systems, contributing to national defense.

- **Improved Cybersecurity**: AI can strengthen national cybersecurity by detecting and responding to cyber threats more quickly and accurately than humans.

**Risks**

- **Disinformation**: AI-generated fake content can be used to manipulate public opinion, create false narratives, and undermine trust in institutions.

- **Bias & Discrimination**: AI systems may inadvertently perpetuate or exacerbate bias and discrimination in government policies and actions.

- **Al Arms Race**: The rapid development of AI military capabilities could lead to an international arms race, increasing geopolitical tensions.

- **Espionage & Surveillance**: AI can be used for advanced espionage and surveillance techniques, potentially undermining national security.

- **AI Accidents & Misalignment**: Safety measures may be neglected leading to accidents. AI could also pose an existential risk if it acts against human interests.
Gen AI Will Begin to Level the Playing Field for our Geopolitical Adversaries

**Unparalleled Strengths**
- Nuclear Weapons
- Missiles
- Aircraft Carriers
- Biggest Economy
- Innovation
- Democracy
- Open Society
- Global Influence

Gen AI will enable any other government to find and hack weaknesses in our IT and physical infrastructure and auto-generate hacking algorithms.

**Disinformation Campaigns**
Gen AI will enable any hacker anywhere to create compelling, disruptive fake texts, images and videos, served up through TikTok, Twitter and multiple other social channels, almost impossible to block.

**Cybersecurity Threats**
Gen AI will enable other governments to find and hack weaknesses in our IT and physical infrastructure and auto-generate hacking algorithms.

**Military Risks**
Gen AI will enable other governments to create novel autonomous weapons and surveillance systems.

**Economic Competition**
Gen AI will likely destroy millions of jobs and enable far more globalization of knowledge work putting severe pressure on high paying knowledge jobs in the US. These changes will create extraordinary political and social tensions.
China’s AI Strategy: Dominant Leadership in AI by 2030

**AI Initiatives Commitment**

- **Chinese Government**
  - $150B+
- **Top Chinese Companies**
  - $100sB+

**Government AI**
National NLP Platform for algorithms for content monitoring (“censorship”); millions of cameras and AI for facial recognition in public spaces; financial regulation; & much more

**Military AI**
National NLP Platform for algorithms for content monitoring (“censorship”); millions of cameras and AI for facial recognition in public spaces; financial regulation; & much more

**Academic AI** (key academic institutions committed to dominate AI research)
China is now the leader in AI research publications: ~43,000 papers in 2021 of which ~7,400 are highly cited, approx. 70-100% more than US in both categories

**Internet AI**
Highly personalized, semi-addictive news and social networks (eg TikTok); all content tightly controlled by China Cyberspace Administration

**Education AI**
AI in all classrooms for personalized learning and tutoring; language proficiency; detection of plagiarism

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Risk Assessment: Accelerate or Decelerate?

Accelerating GenAI

- **Job Losses and Income Inequality**
The automation of tasks by AI could lead to significant job losses; benefits could accrue to a small group further exacerbating income inequality.

- **Amplification of AI Misuse**
Hasten the use of AI for malicious purposes (e.g., to spread misinformation) or for criminal activities like fraud, theft, and cyberattacks.

- **AI Arms Race**
Nations could accelerate the development of autonomous weapons and drive new forms of warfare.

- **AI Accidents & Alignment Risks**
Safety measures may be neglected leading to accidents. In addition, without proper safeguards, we could lose control and AI could pose an existential risk if it acts against human interests.

Decelerating GenAI

- **National Security Risks**
USA’s national security could be compromised if other countries advance in Generative AI more rapidly to build new categories of autonomous weapons or engage in new forms of cyber warfare.

- **Loss in Global Competitiveness**
Advances in Generative AI can drive automation & several efficiencies. USA could fall behind other countries in technology, services, manufacturing and several other sectors impacting its economic strength and geopolitical influence.

- **Missed Healthcare & Educational Innovations**
Slow progress in AI could hinder advances in personalized medicine, early disease detection, and other healthcare innovations. Similarly, we will miss opportunities within education leading to a lower quality of life.

- **Slower Scientific Discovery**
Generative AI can accelerate scientific research and discovery. Without advances in Generative AI, progress in science could be slower.

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Regulatory Landscape: Where is the US?

Status
CAC issued draft guidelines for public comment on Generative AI on April 11th, 2023

Key Excerpts
• Content generated must adhere to Socialist Core Values and not include harmful, false, or socially disruptive information.
• Prevent discrimination / bias in algorithm design, training data, model generation, optimization, and service provision.
• Ensure training data’s veracity, accuracy, objectivity, and diversity
• Respect privacy, intellectual property rights and commercial ethics

Implications
• Chinese companies will struggle to assemble enormous datasets critical for the success of GenAI models
• Content liabilities & restrictions will further stifle innovation and companies will lag behind their US counterparts

Status

Key Excerpts
• Testing and analysis of models to identify and mitigate reasonable risks to health, safety, fundamental rights, environment, democracy, and the rule of law.
• Models also require appropriate levels of performance, predictability, interpretability, correctability, safety, and cybersecurity throughout their lifecycles, including data governance measures to examine possible bias and appropriate mitigation measures.

Implication
• EU’s AI Act is attempting to put together a risk-based regime to address the highest-risk outcomes of AI — while striking a balance so the laws do not clamp down on innovation.

Status
• US approach is highly distributed across multiple federal agencies, White House, Congress, & individual States
• White House unveiled a Blueprint for an AI Bill of Rights in October, 2022

Statutory Gaps
• Weak or no statutory support for the use of data by Generative AI algorithms.
• Patent framework needs to be updated to accommodate for Generative AI
• Copyright and Trademark laws need to accommodate Generative AI complexities

Implication
• Lack of a coherent statutory framework has led to a legal minefield with several open cases relating to copyright & trademark infringement, privacy, defamation, patent, and contract law
Thank You