Artificial Intelligence in Insurance

EY

Building a better working world

Agenda

What is Artificial Intelligence (AI)?

Why the hype now?

Where are insurers using AI?

Far reaching implications
    The problem of decision making – morality and ethics

Risks of AI

Regulators take interest

Conclusion

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What is Artificial Intelligence (AI)?

Artificial Intelligence: Encompasses various techniques and approaches to mimic human intelligence in machines.

Machine Learning and Deep Learning: Involves statistical methods that allow AI systems to learn from data and improve their performance over time.

Generative AI: Complex learning methods to create new data, such as generating images, music, or text.

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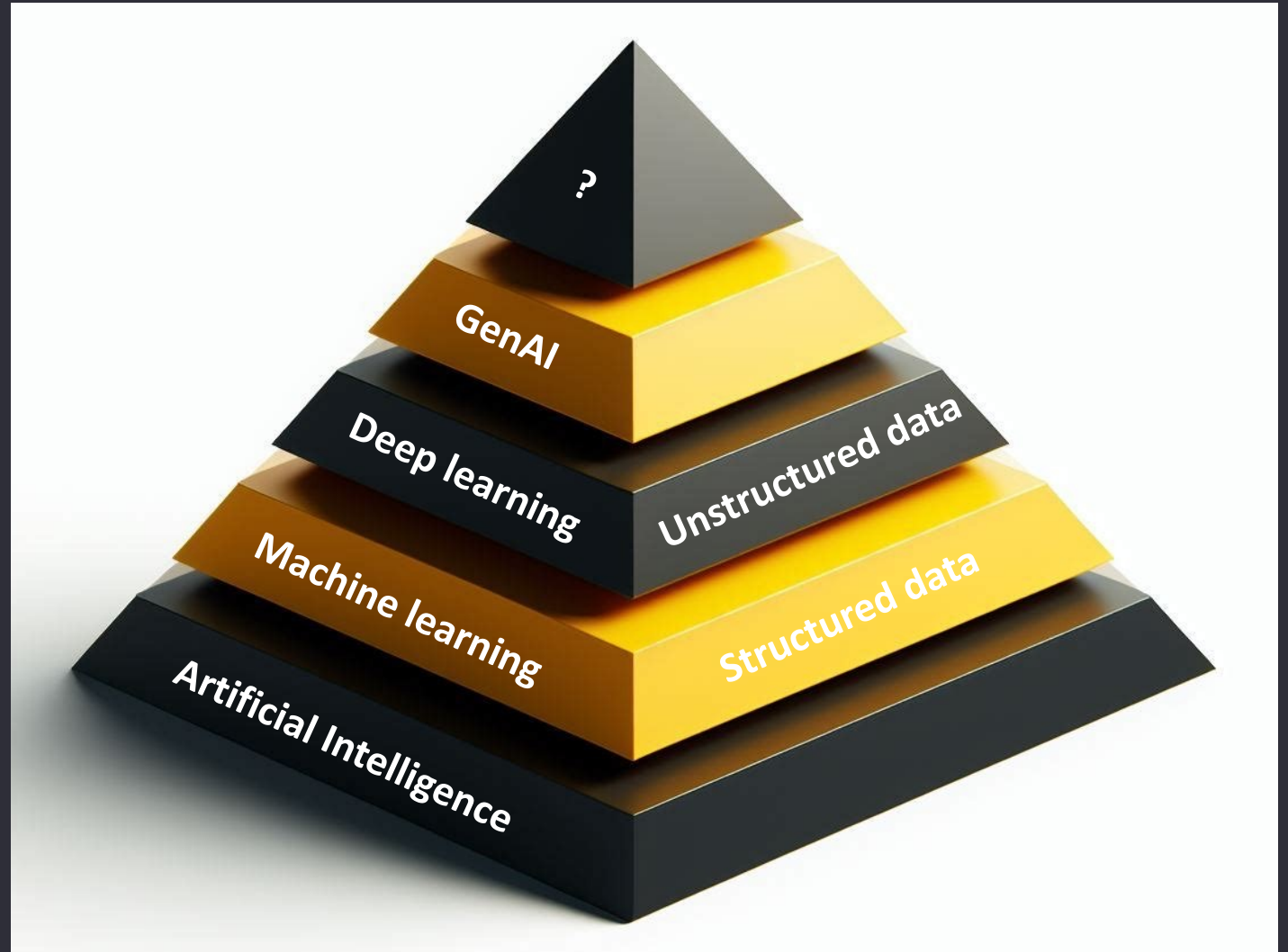
What is AI continued

| AI Model	Input	Output	Use Cases
Machine Learning	Structured data	Pattern detection and prediction	Detecting anomalies
Deep Learning	Unstructured Data	Pattern detection and prediction	Recognition (writing, image or voice)
Generative AI	Structured and unstructured	New content (text, images, sound, etc.)	Chatbots, image creation and synthetic data*
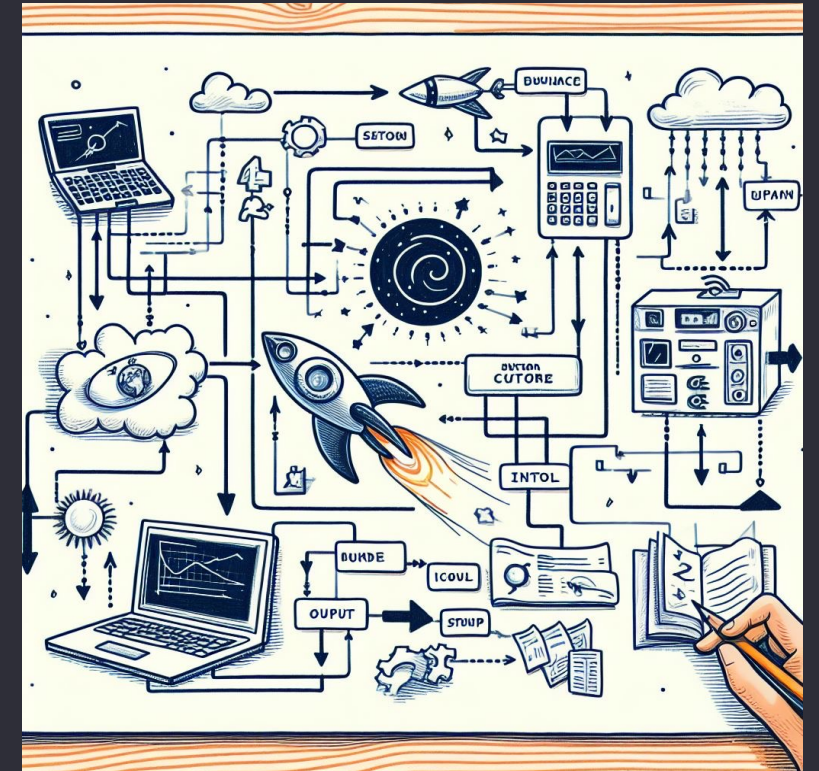
*__Synthetic data__ is information artificially generated rather than occurring from real world events. This allows for mimicking real world events at a much larger scale for significantly reduced cost. It also allows for deidentifying data sets to protect privacy and comply with regulatory requirements.*

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What is AI continued

To understand GenAI we must first understand the fundamentals of large language models (LLMs).

An AI tool scans a piece of content (book, website, etc.) and evaluates how often one letter appears after another – from this we create a probability table, which letter is most likely to occur.

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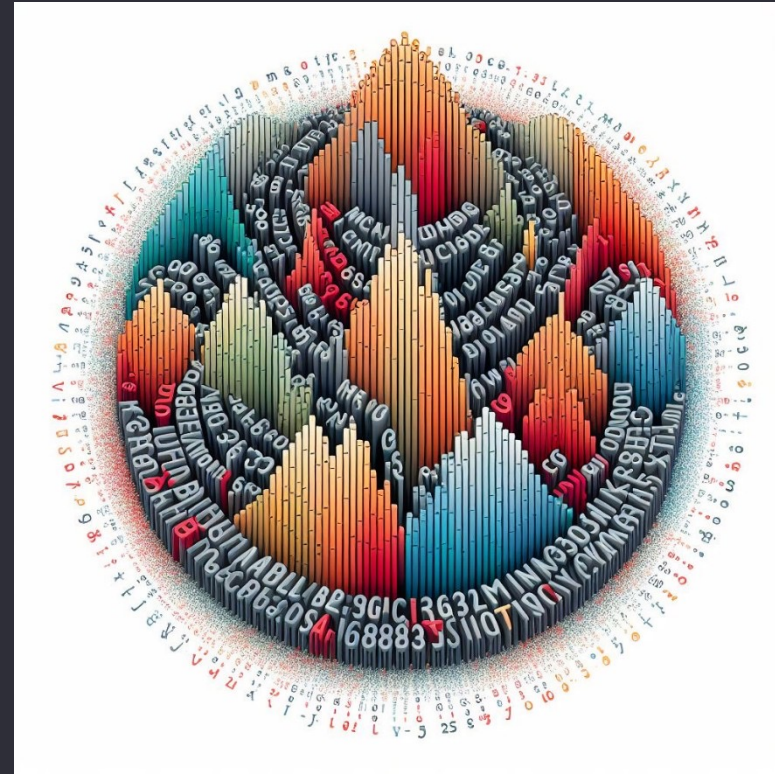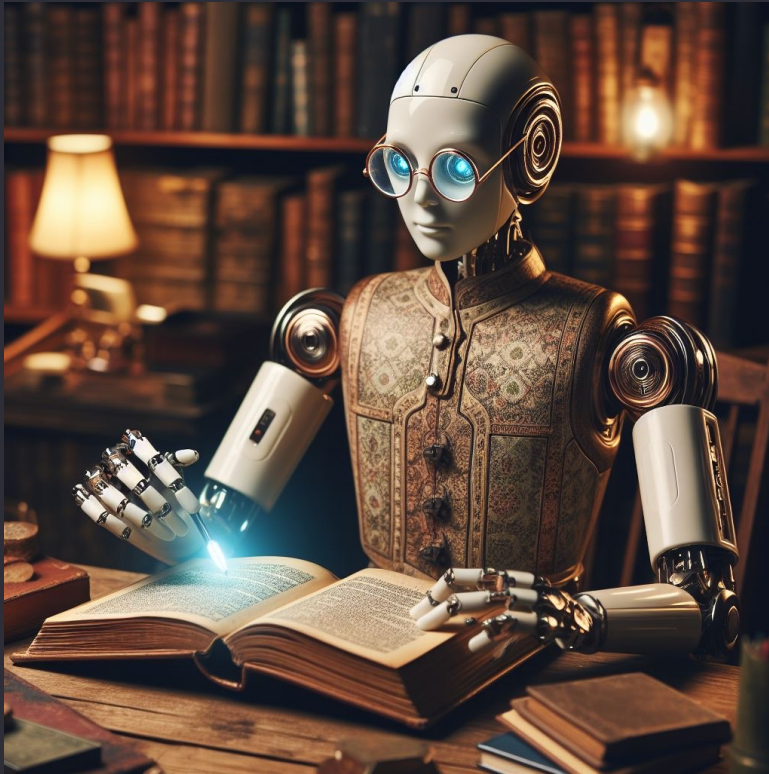
What is AI continued

Using just a book or small data set produces subpar results. So instead, we change two items:

1) Rather than using the last letter, we instead look at all the preceding letters/words/data before using a neural net.
2) Instead of predicting the next letter, you predict the next word, fragment etc. - this is referred to as a "token"

The more data and the larger the neural net, the better the prediction:

MLK once said "I have a _____"
Gandhi once said "Be the change you wish to see in the _____"
Roosevelt once said "The only thing we have to fear is _____ _____"

Houston, we have a _____
The name is Bond. _____ _____
You had me at _____

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What is AI continued

Model	Provider	Open Source	Size (Parameters)	Capabilities	Fine Tunability
GPT-4	OPEN AI	No	Up to 175B	Generative language model	No
GPT-3	OpenAI	No	Up to 175B	Generative language model	Yes
Claude	Antrhopic	Yes	52B	Generative language model	No
BERT	Google Research	Yes	110M	Bidirectional contextual embeddings	Yes
XLNet	Google/CMU	Yes	340M	Transformer-based model	Yes
RoBERTa	Facebook AI	Yes	355M	Improved BERT architecture	Yes
T5	Google Research	Yes	220M	Text-to-text transfer learning	Yes
ELECTRA	Google Research	Yes	134M	Pre-training with adversarial training	Yes
CTRL	Salesforce Research	Yes	110M	Conditional language model	Yes
BART	Facebook AI	Yes	140M	Denoising autoencoder for text generation	Yes
Megatron	NVIDIA	Yes	Up to 8.3B	Parallel training on multiple GPUs	Yes

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Why the hype now?

There are two distinct items to be aware of regarding any new technology:
1) The actual technology itself, and then more importantly,
2) The impact of that technology on shaping society
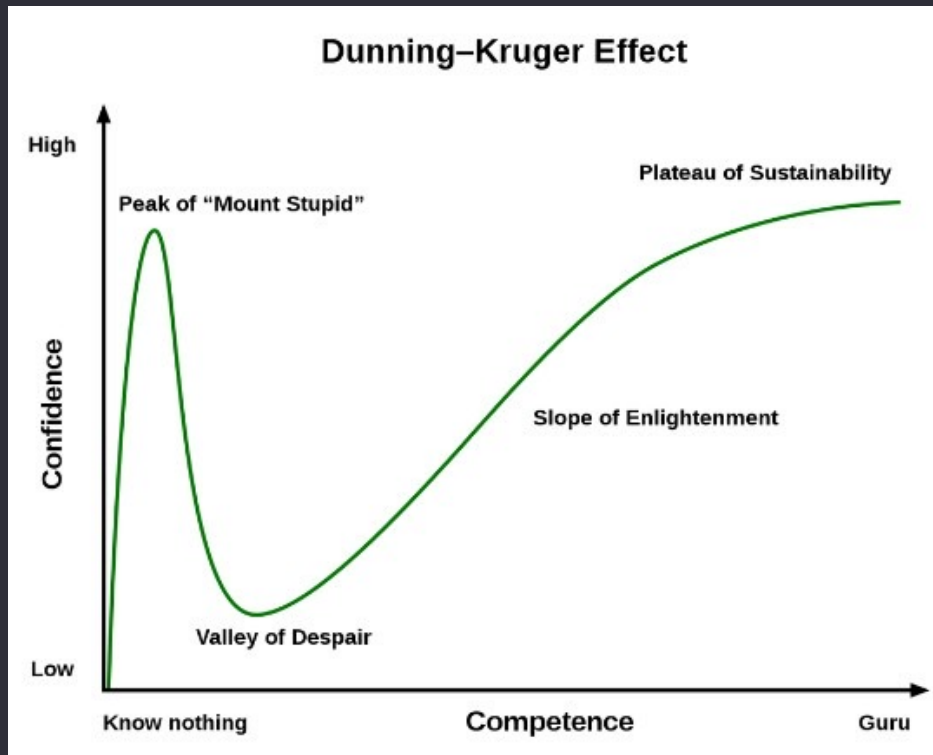
Where are we:
1) The adoption of the internet
2) Understanding the impact of social media
3) The impact of AI on us?

Asking in 2024, what is the impact of AI on society is like asking in 1989 what is the impact of the internet?

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Why the hype now?

Four main reasons (1) Bigger data sets, (2) faster GPUs, (3) open source frameworks and (4) data scientists

DATA

In 2020 the total amount of data created, captured, copied, and consumed globally reached 59 zettabytes (ZB) in 2020. One zettabyte is equivalent to 8,000,000,000,000,000,000,000 bits. Data is predicted to reach a staggering 175 ZB in 2025.

GPU Processing Power - nVidia

Where are insurers using AI?

RUN

Engineering and IT

Marketing and distribution

Policy admin and Customer experience

Value axis

Claims   Underwriting

Finance, Legal and Tax

HR and People

Low   High

WALK   Risk axis

Strategy

Cybersecurity

CRAWL

High

Low
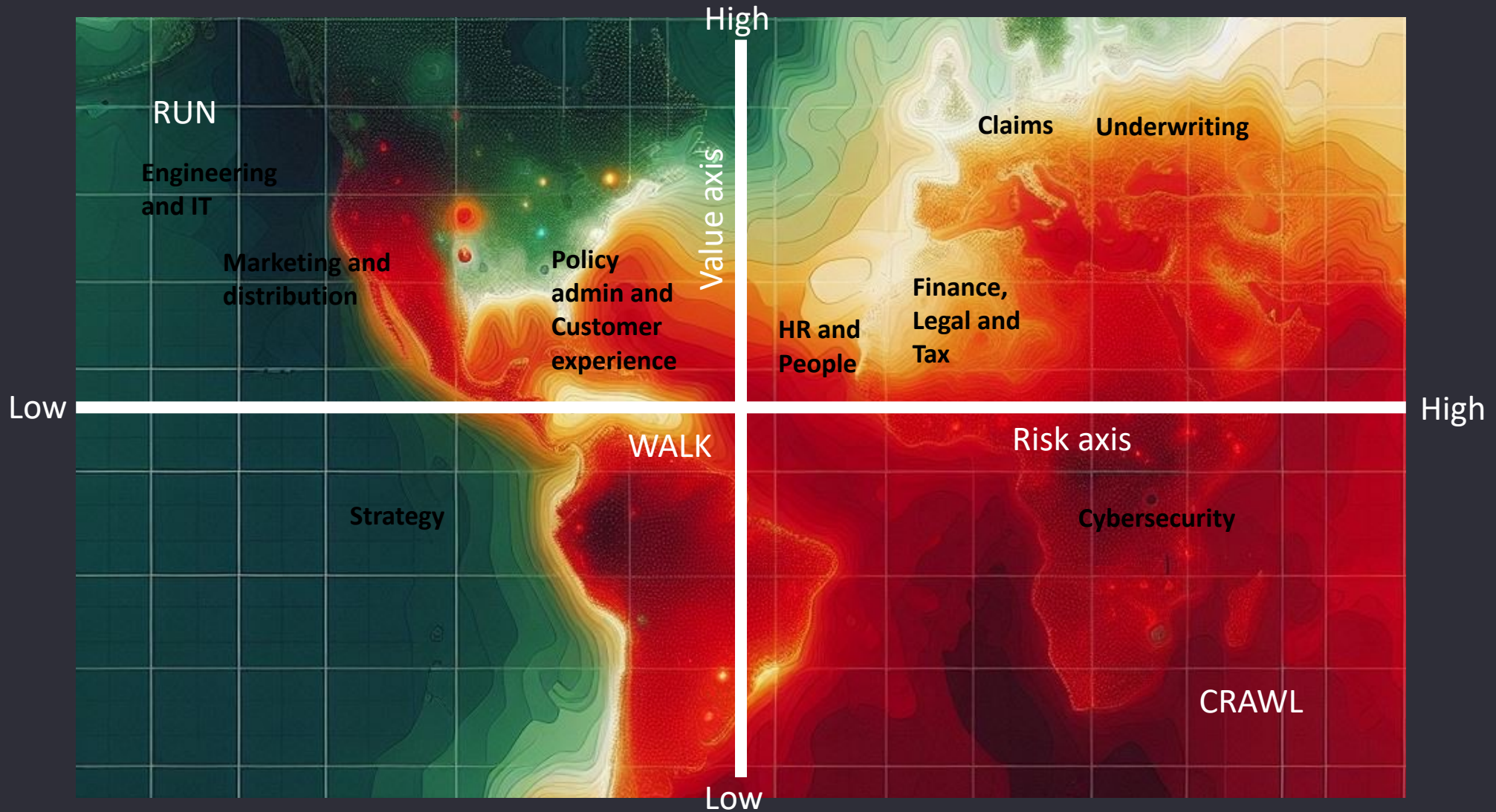
Where are insurers using AI?

Insurers are focusing on lower-risk, internal use cases (e.g., process automation, customer analysis, marketing and communications).

Actuarial and underwriting: streamlining the ingestion and integration of data

Claims: automating first-notification-of-loss processes and enhancing fraud detection efforts

Information technology: strengthening cybersecurity by analyzing operations data for attempted fraud, monitoring for external attacks; generating code and documenting infrastructure and software upgrades

Marketing and customer service: capturing customer feedback, analyzing behavioral patterns and conducting sentiment analysis; tailoring interactions with virtual sales and service representatives; strengthening chatbots' credibility and ability to resolve complex issues

Finance and accounting: real-time analysis and summarization of documents; monitoring investment trends and producing more granular insights into financial and operational performance

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Where are insurers using AI?

Organizations, including insurers, will be impacted by AI in the following ways:

1. The impact of AI across individual functions (as discussed on previous slides).

2. As more functions are automated or performed by AI, governance of decision making becomes a critical function – organizationally we will see the rise of a "chief decision" maker that governs AI. Adoption of AI will change organizational structure. Think of digitization and how IT now interacts with business.

3. Societal implications and cultural impact of this technology

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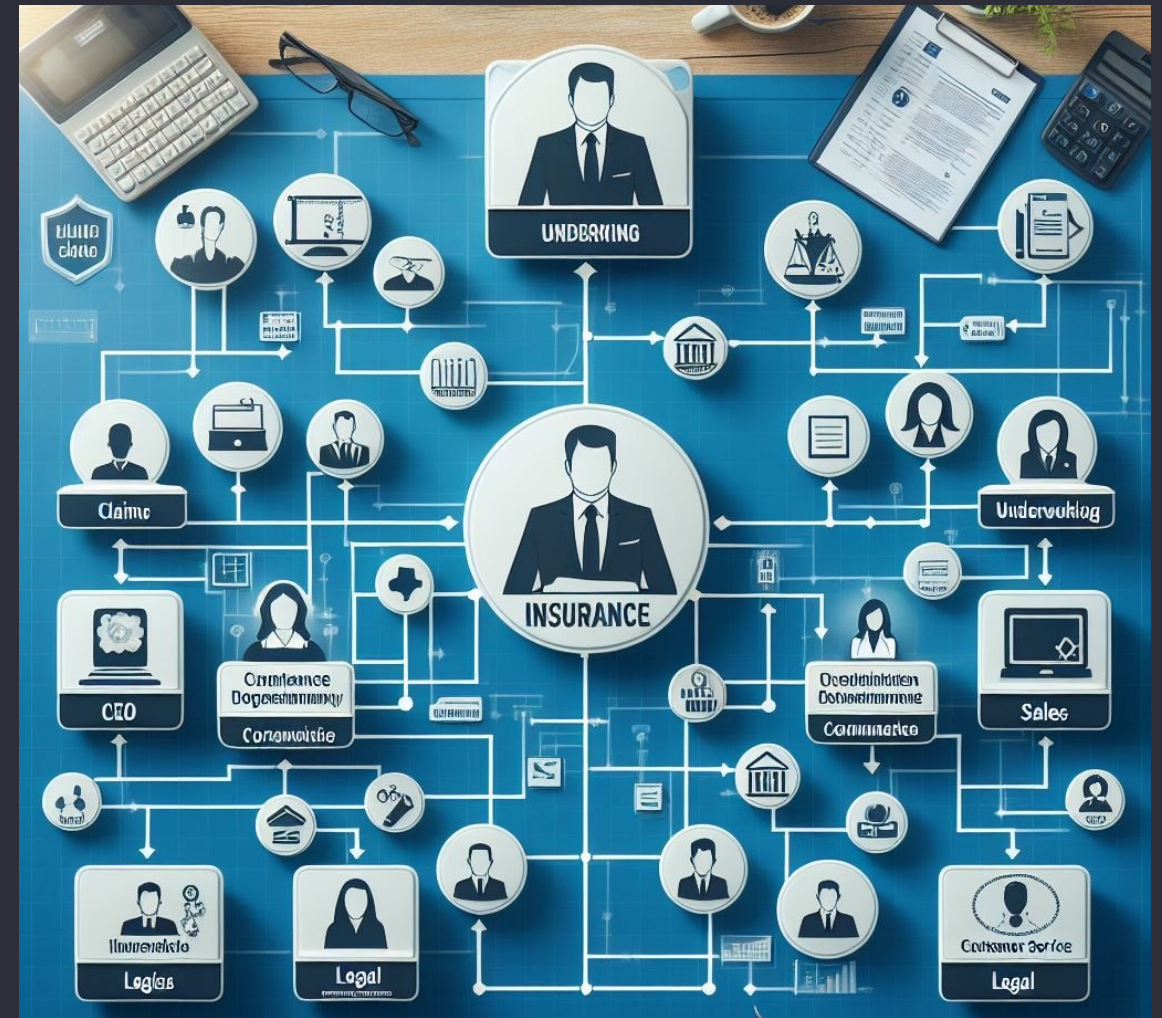
Far reaching implications

People and organizations are focused on surface level changes to their business.

Completely overlooking the cultural impact technology

We have, and continue to, underestimate technology's immense impact in co-creating our society.
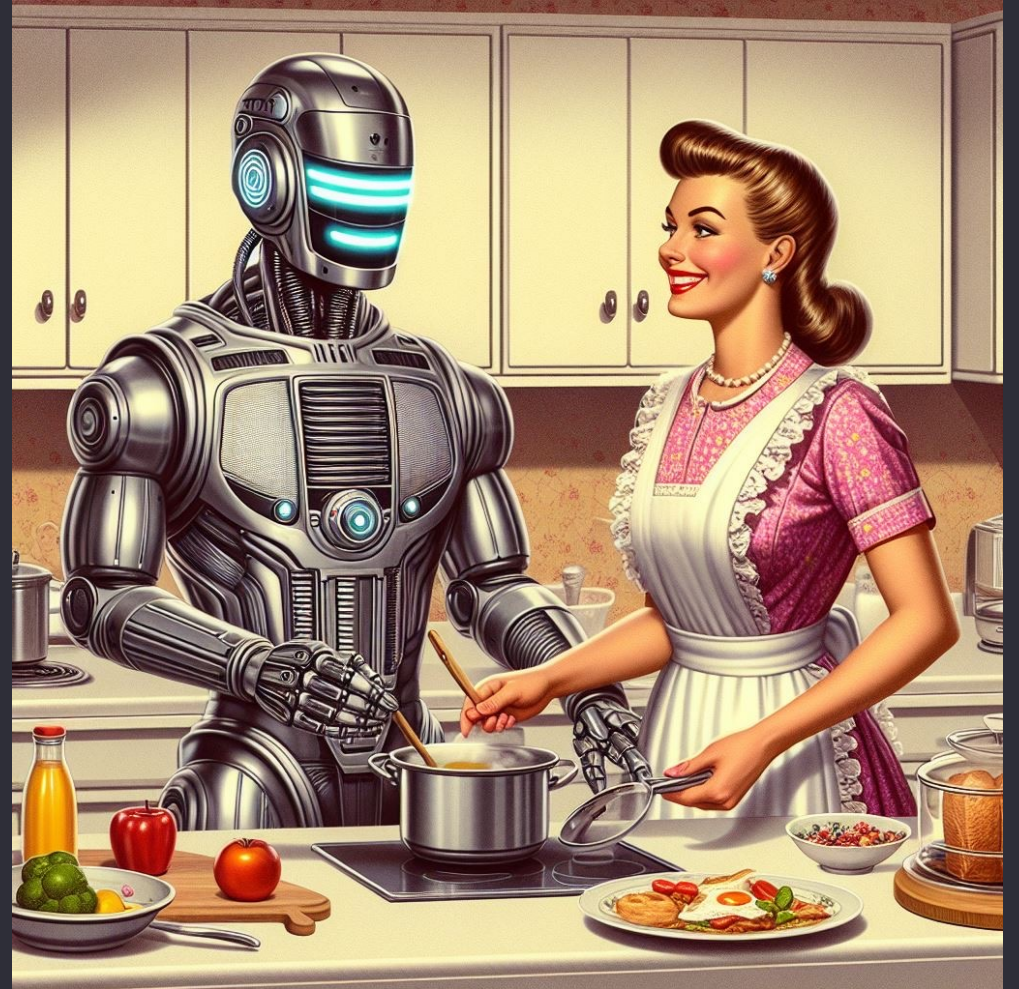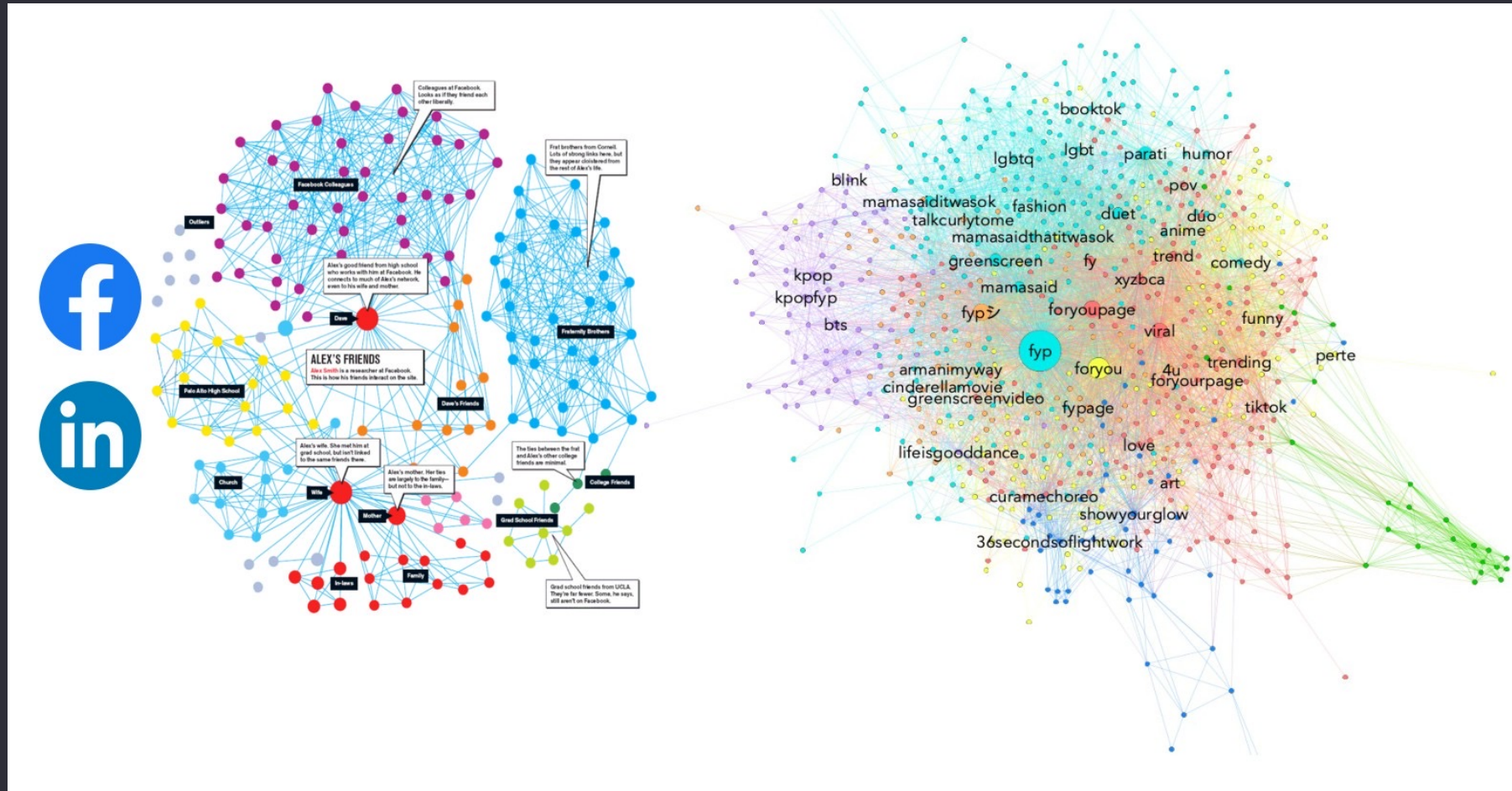
Do you know where your view of the world coming from?

Show of hands who knows what FYP is?

The AV Trolley Problem
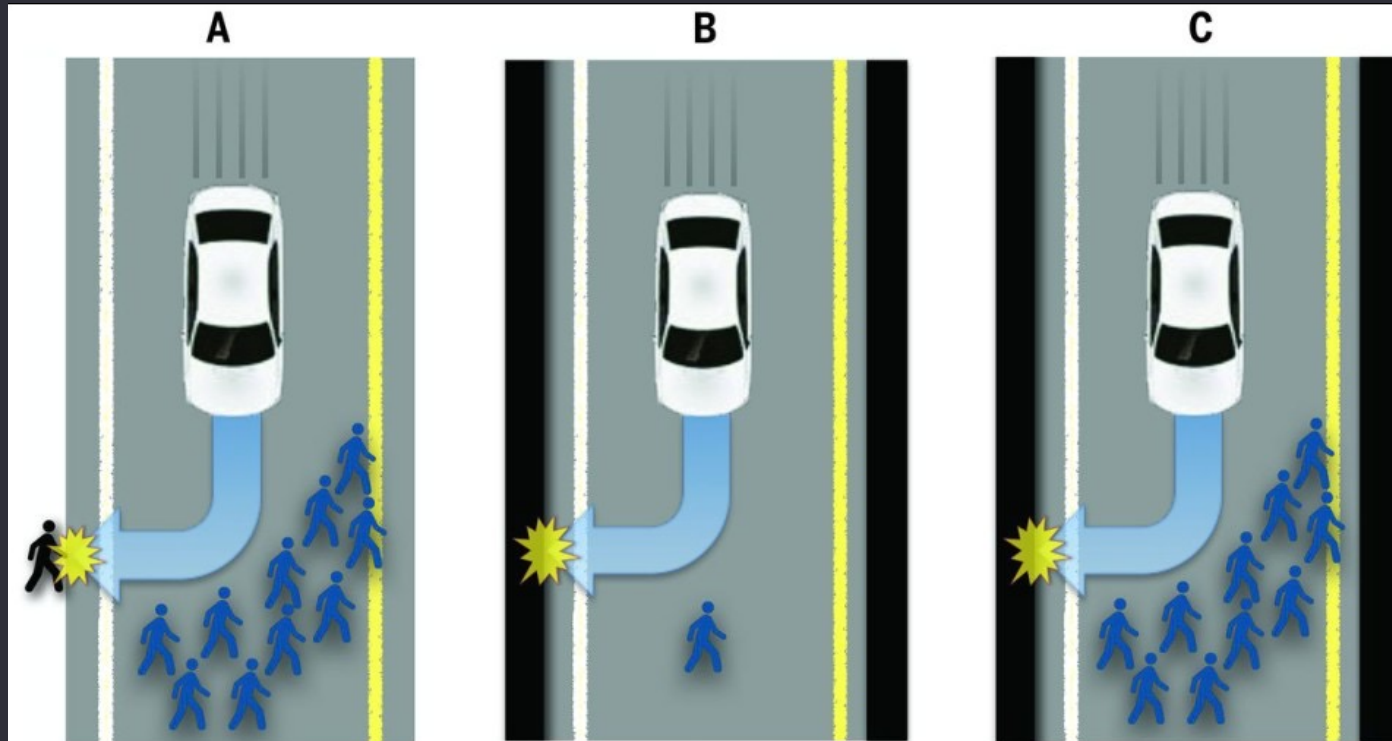
The Social Dilemma of Autonomous Vehicles

Participants approve of autonomous vehicles that might sacrifice passengers to save others [but] would prefer not to ride in such vehicles"

-Bonnefon et al, Science 2016

The problem of decision making – morality and ethics

Anything > Cat

Female Exec > Male Exec

Dog > Criminal

Athletes > Elderly

b Preference in favour of sparing characters

Stroller, Girl, Boy, Pregnant, Male doctor, Female doctor, Female athlete, Executive female, Male athlete, Executive male, Large woman, Large man, Homeless, Old man, Old woman, Dog, Criminal, Cat

−0.2   −0.1   No change   +0.1   +0.2
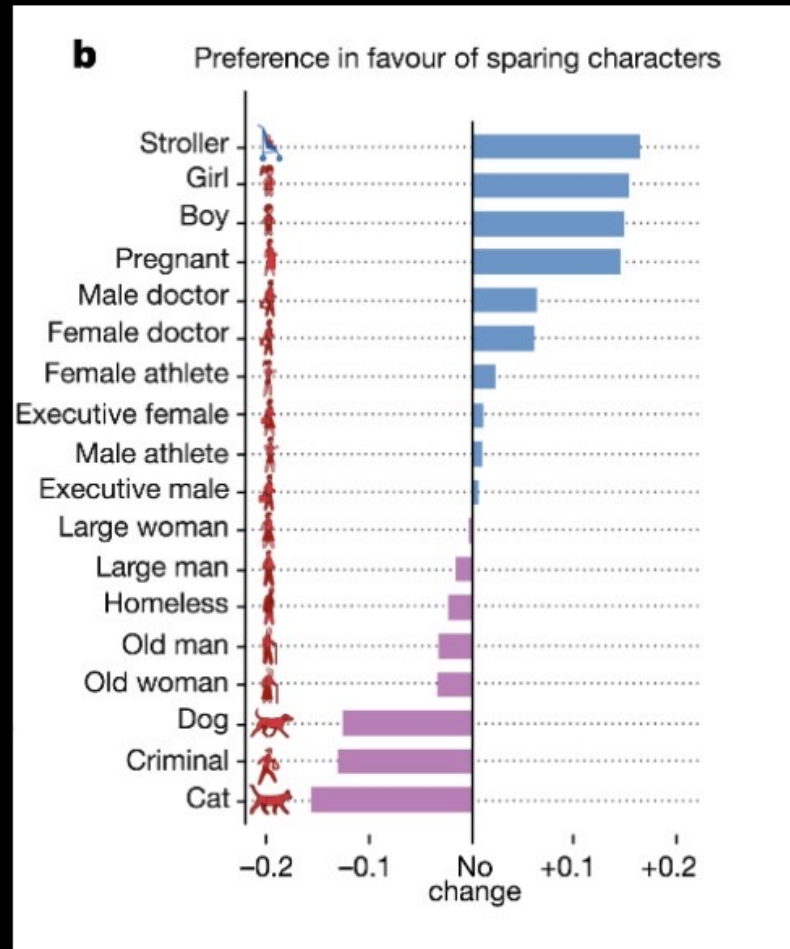
Source: The Moral Machine Experiment, 2018

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Proliferation of a technology is the democratization of [x]

Industrial revolution was the democratization of production capabilities

Internet was the democratization of information

AI is the democratization of advanced knowledge

"Every human is a use case for AI"

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Search by occupation:

○ 100 K ○ 1M ○ 3M ○ 5M

Average annual wage

Best paid, least vulnerable

Best paid, most vulnerable

220K
200K
180K
160K
140K
120K
100K
80K
60K
40K
20K
0

Physicians & Surgeons
Chief Executives
Dentists
Computer & Information Systems Managers
Lawyers
Financial Managers
General & Operation Managers
Judges
Economists
Pharmacists
Personal Financial Advisors
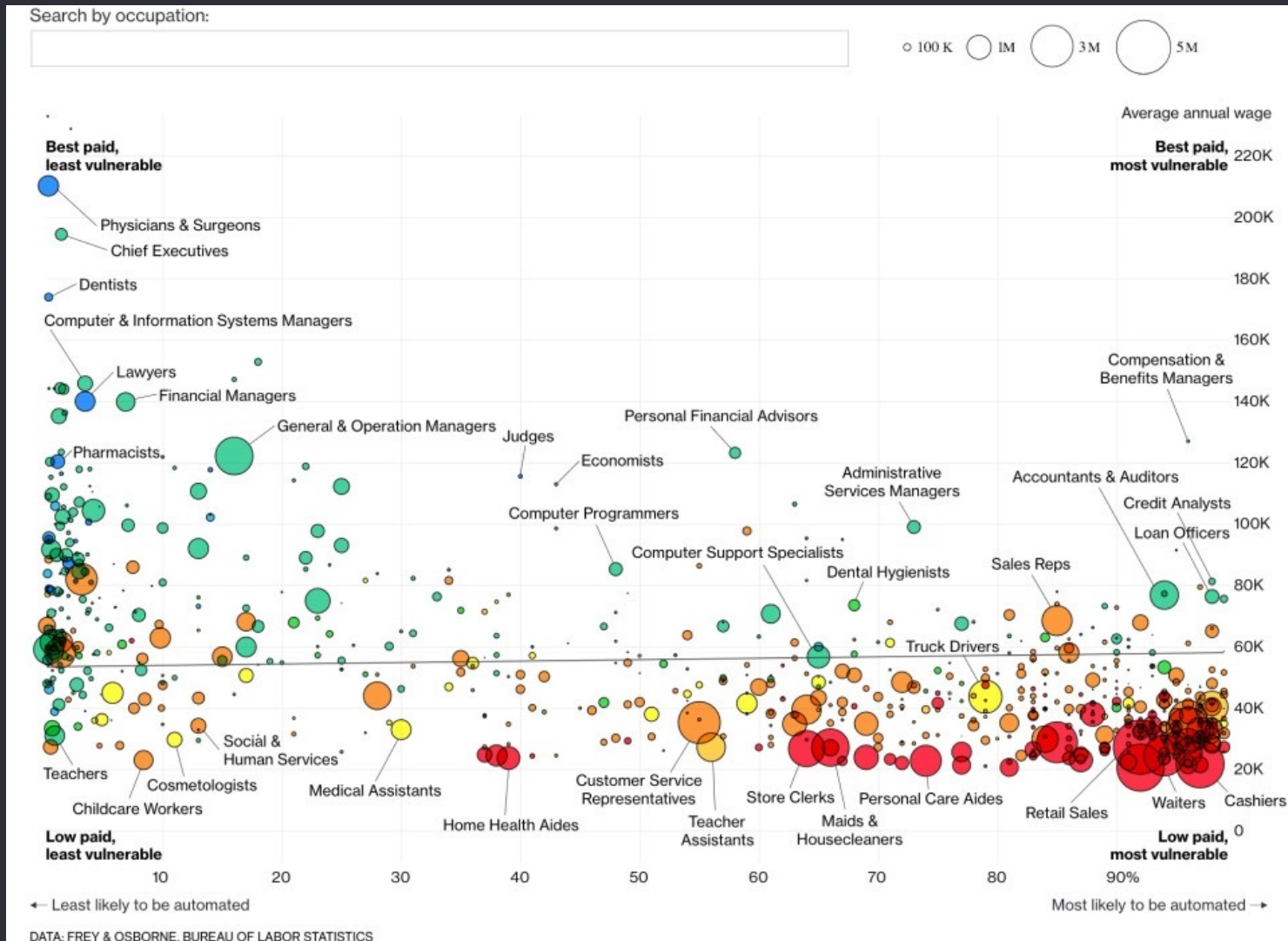Compensation & Benefits Managers
Administrative Services Managers
Accountants & Auditors
Credit Analysts
Loan Officers
Computer Programmers
Computer Support Specialists
Dental Hygienists
Sales Reps
Truck Drivers
Social & Human Services
Teachers
Cosmetologists
Childcare Workers
Medical Assistants
Home Health Aides
Customer Service Representatives
Teacher Assistants
Store Clerks
Maids & Housecleaners
Personal Care Aides
Retail Sales
Waiters
Cashiers

Low paid, least vulnerable

Low paid, most vulnerable

10   20   30   40   50   60   70   80   90%

← Least likely to be automated   Most likely to be automated →

DATA: FREY & OSBORNE, BUREAU OF LABOR STATISTICS

"You won't be replaced by AI, but you may be replaced by someone who knows how to use AI"

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AI far reaching implications

Everyday risk factors of using AI:

(1) Errors (hallucinations)
(2) Bias
(3) Privacy/security
(4) Sensitivity

Google Left in 'Terrible Bind' by Pulling AI Feature After Right-Wing Backlash

what is the world record for crossing the english channel entirely on foot

The world record for crossing the English Channel entirely on foot is held by Christof Wandratsch of Germany, who completed the crossing in 14 hours and 51 minutes on August 14, 2020. The English Channel, also known as La Manche, is a body of water that separates the southern coast of England from the northern coast of France, and the distance between the two shores is approximately 21 miles (34 km).
Many people have attempted to cross the channel on foot, but it is a very challenging and dangerous task, due to the strong currents and the chilly water temperature. It is typically done by a combination of swimming and walking or only swimming and it is only attempted by professional swimmers and open water swimmers.

Forbes

FORBES > INNOVATION > SOCIAL MEDIA

Putin's Deepfake Doppelganger Highlights The Danger Of The Technology

Peter Suciu Contributor

Dec 15, 2023, 01:27pm EST

Russian President Vladimir Putin gestures during his annual news conference in Moscow, Russia, ... [+] COPYRIGHT 2023 THE ASSOCIATED PRESS. ALL RIGHTS RESERVED

Vanderbilt University apologizes for using ChatGPT to write mass-shooting email

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Specifically in insurance:

Convincing images (medical documents), and videos (damage to property)

Deep fakes – generate familiar voices and videos

Increased professionalism for fraud schemes (language improvement)

Regulators take interest

he National Association of Insurance Commissioners (NAIC) has released for comment guidelines for the use of artificial intelligence system (AIS) programs by insurers.

The bulletin encourages implementing AIS programs to prevent biased and unfair decisions that impact consumers across four main areas:

1. Governance: AIS programs should be board-approved with senior management responsible for development, implementation, monitoring and oversight. Risk assessments should identify risk exposures related to using AISs.
2. Risk management: AIS programs should document and address the AI development approval process, data practices, accountability procedures and management oversight of algorithms and predictive models.
3. Third-party AISs: Third-party AISs should address the insurer's standards for third-party risk assessment, due diligence, contractual provisions and performance audits to monitor for compliance.
4. Regulatory oversight and requests for information: State regulators can request documentation about insurers' AISs, including policies, procedures, due diligence materials, algorithm and predictive model inventory, contracts with third-party AISs and regulatory commitments.

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Regulators take interest

In the US: Emphasis on applying pre-existing laws and enforcement mechanisms (e.g.; anti-discrimination laws) and sector specific regulations (e.g., health, IT) paired with voluntary guidelines (e.g.; NIST AI Risk Management framework) and public commitments from industry.

Countries approach to AI Regulation
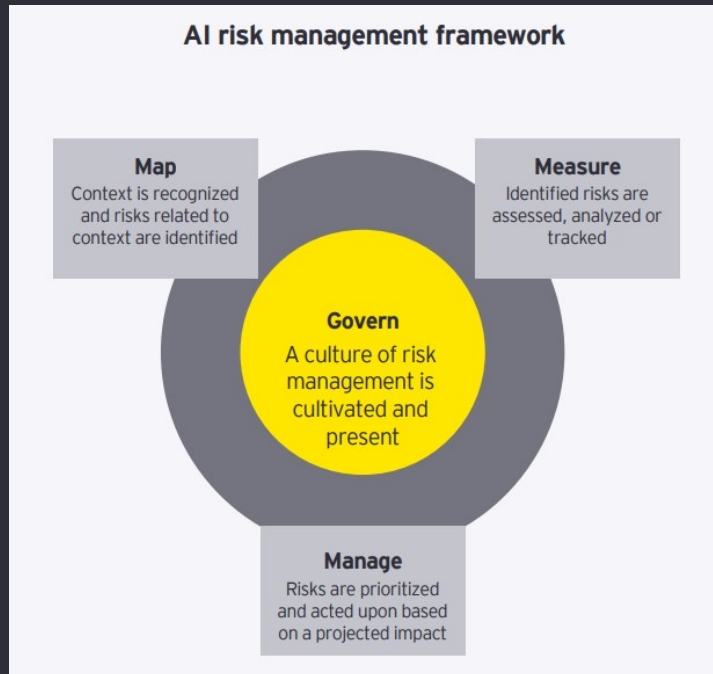
US NIST AI Risk Management Framework Overview

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Conclusion

<u>AI will improve aspects of our lives</u> – reducing human error, advancing the practice of medicine, increasing productivity and democratizing knowledge previously reserved for a small portion of society.

We have historically **<u>underestimated the impact of technology on culture and society</u>**. We miss the big picture focused on the tactical implications or use cases.

AI enhances the risk that we lose the **<u>mastery of thinking</u>**.

We are transitioning from **<u>"searching" to "generating"</u>** and this greatly impacts how we learn and think.

We all should spend more time considering the impact of technology on the next generation(s) and what that means for society.

One example from the last 20 years: shift from auditory to visual communication

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