KPMG

A.I. and Digital Transformation Risks

PROFESSIONAL ACCOUNTING CENTRE

2023 Invited Conference

With you today

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National Audit and Assurance
Innovation Leader

- Lead public and private audit clients across both consumer and industrial market industries
- Over 16 years of public accounting experience
- MSc in Accounting with Cognitive Analytics – Beedie School of Business at Simon Fraser University

Agenda

01
How did we get here

Digital Transformation and the current state of the audit profession.

02
Technology today

Existing technologies and an overview of current use cases.

03
Risks to consider

Key risks and challenges in the implementation of new technologies.

04
Final thoughts

Future outlook, closing remarks, and Q+A.

01

How did we get here?

An explosion of data

How do we obtain decision-relevant information from this explosion of data?

16,000,000
text messages sent

More than
104,600
hours spent in ZOOM

More than
347,200
Tweets sent on Twitter

More than
500
Hours of video uploaded

More than
1,000,000
hours of video streamed

More than
$76,400
spent on DOORDASH orders

More than
231,400,000
E-mails are sent

1,100,000
swipes on Tinder

Around
66,000
photos uploaded on Instagram

More than
5,900,000
Searches on Google

More than
12,900
online event tickets sold

More than
1,700,000
Items are shared on Facebook

This all happens every 60 seconds!

* Source: *DOMO*

The Answer

- Digital tools
- Automation
- Robotics
- Data analytics
- Cognitive computing

What's fuelling the digital transformation

01

Productivity / performance

Software robots work 24/7, and 365 days a year; do not take vacations; and perform tasks at digital speeds.

02

Consistency / Predictability

Expected reduction in mistakes, accidents, regulatory violations, and fraud.

03

Quality / Reliability

Software does what you tell it to do; when properly configured, it doesn't make mistakes and eliminates human error.

04

Employee Satisfaction & Innovation

Eliminating mundane and repetitive tasks frees up human talent to innovate and create

05

Scalability

Software robots scale instantaneously at digital speeds to respond to fluctuating workloads. There is also no overtime, no hiring challenges and no training.

Expectations from stakeholders

Integrating technology-based audit tools … allows auditors to focus more on the more complex and riskier areas. Technology is also changing the current linear audit approach of planning, conducting a risk assessment, performing internal controls testing, and performing tests of details and/or substantive analytical procedures.

Technology will enable auditors to perform concurrent tasks, with a continual loop of assessing audit risks and enabling an agile audit process to respond to these risks effectively and efficiently.

Christina Ho, Board Member PCAOB
The Future of Auditing, May 2022

We recognize that to deliver quality audits, we must continually evolve and develop our technology solutions to keep pace with today's digital world.

KPMG Transparency Report 2022

The Canadian Public Accountability Board (CPAB) sees promise in the use of technology to elevate the quality of audits.

CPAB Exchange 2021

"While automation and technology are displacing some rudimentary tasks performed by accountants, the data-driven world increases the demand for critical thinking, professional judgment and the ethical mindset that characterizes our profession.

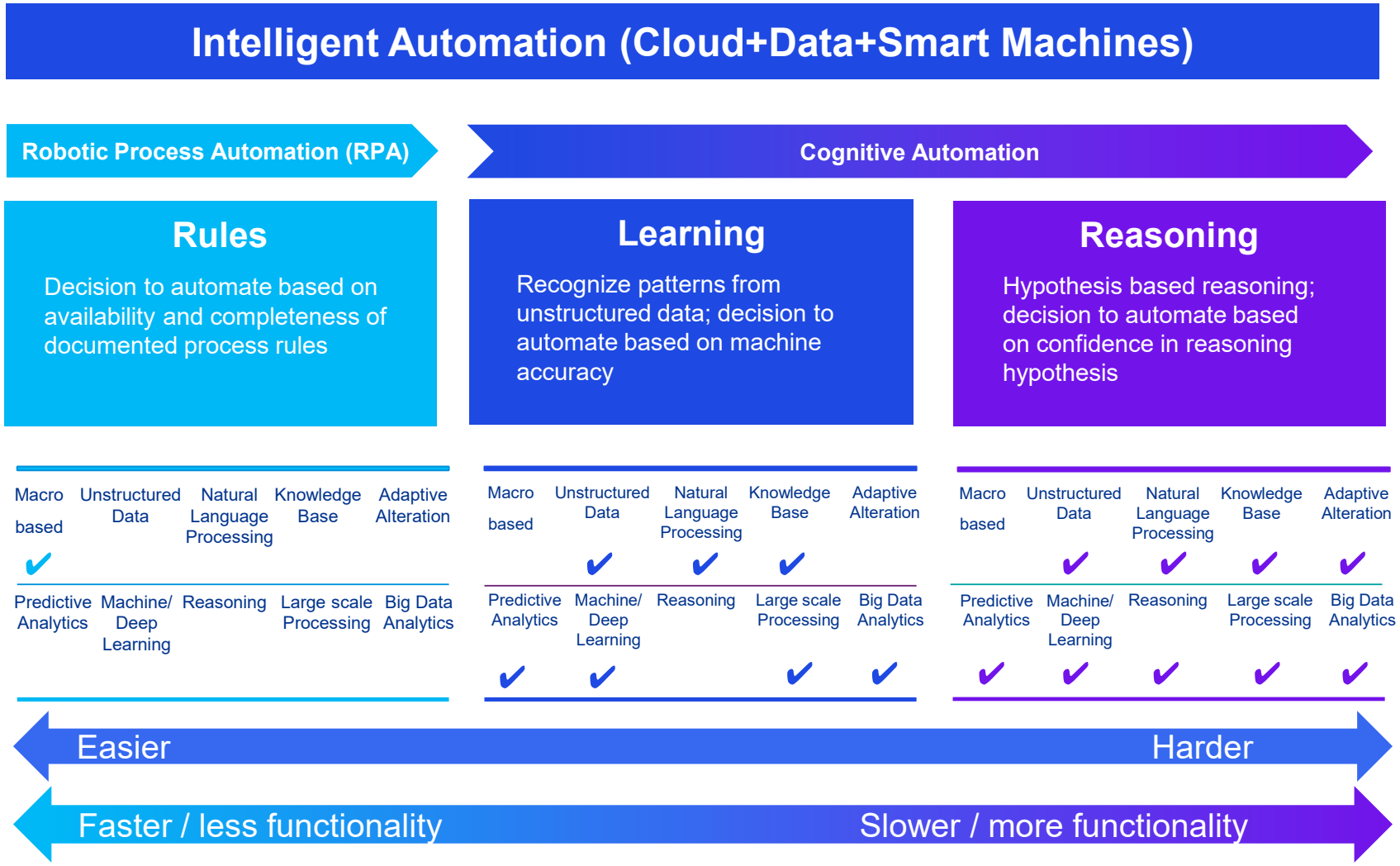
Gordon Beal, CPA Canada
Informing the Future of the CPA Profession: Reflections on Foresight – April 2023

A vision of the future (from 2017!)

02

Technology today

A spectrum of technology capabilities



- Not physical robots but software robots
- Varying classes of automation
- Reduce the need for people to carry out repetitive tasks
- Frees up time for people to apply judgment and emotion
- Augments and enhances human decision-making and productivity

KPMG Digital Audit Journey

Transformed foundation

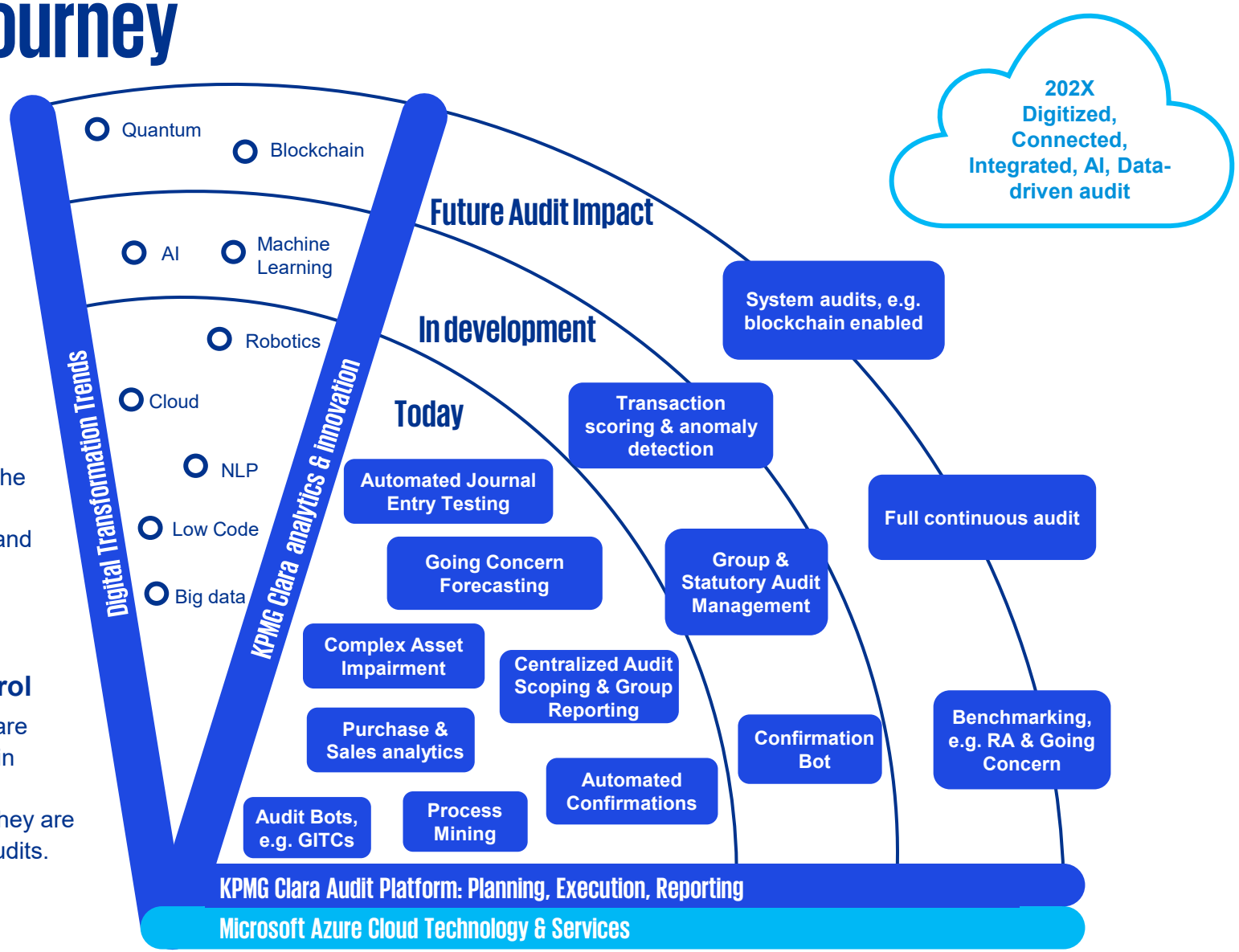
Cloud enabled, we have embarked on a journey through our Microsoft Azure eco-system to support our digitized and connected future.

Latest technology

We are at the forefront of technology in the audit. We are optimizing our audit procedures and operations by applying and developing the latest solutions.

Integrated and globally in control

A de-centralized audit is the past. We are evolving our with solutions to assist us in controlling all audit test procedures or operational steps regardless of where they are performed, such as the 200 statutory audits.



03

Risks in digital transformation

Data, Data, Data.

01

Access to data

- Security
- Data size
- Client challenges (IT vs Accountant)

02

Extract, Transform, Load (ETL)

- Time spent on ETL process is significant
- Data pre-processing can require advanced skills

03

Data organization

- Disparate systems
- Batch entries
- Accountants still LOVE excel

04

Unstructured data sets

- Relevance and reliability challenges
- Access to full data flows (timeliness)
- Specialized skills

05

Data Residency / Data Privacy

- Data fit for purpose?
- Where does data reside and where is it processed?
- Retention policy vs power of historical access

06

Tools explosion

- Numerous options for NLP/OCR with various costs / benefits
- Technology cost increasing rapidly
- Information overload

Risks in digital audit implementation

01

Performance vs Explainability

- It is not always clear how or why the AI system has made a decision.
- The lack of interpretability and transparency of results to human users of the AI system could lead to a lack of trust and loss of confidence in the AI system.
- DARPA developed these questions in their explainable AI project:
    - Why did the AI do that?
    - Why not something else?
    - When does the AI succeed?
    - When does the AI fail?
    - When can I trust the results?
    - How do I correct an error?

02

Implementation Steps

- Time to implement can be challenging; step approach acquired to ensure solution is performing as intended.
- Variety of industries and client sizes required in evaluating results.
- Are the right people executing the AI procedure?
- Robust testing framework for adopting AI Tools:
    - Who will use it?
    - What data is needed?
    - Does the output provide consistent operation?
- Managing software updates.

03

Data, Data, Data.

- Not all data sets lend well to AI for risk assessment or transaction scoring.
- Data awareness and process understanding is as important as the technology.
- Bias awareness.
- Is the data at a sufficiently granular level or for enough time horizon?

Risks and benefits of digital audit implementation

04

Skills gap

- Digital data savvy auditors in demand.
- Auditors and their clients share in the need to upskill.
- Historic silos in organizations; “the IT Guy.”
- Technology skills gap is large:
    - Millennials / Gen Z not necessarily technology gurus.

05

Pace of change

- Technology advances are rapid and require constant investment in upskilling and constant evaluation and intake.
- Traditional ROI could be challenging with fast changes in technology.
- Change management issues; humans can become overloaded with level of change.

06

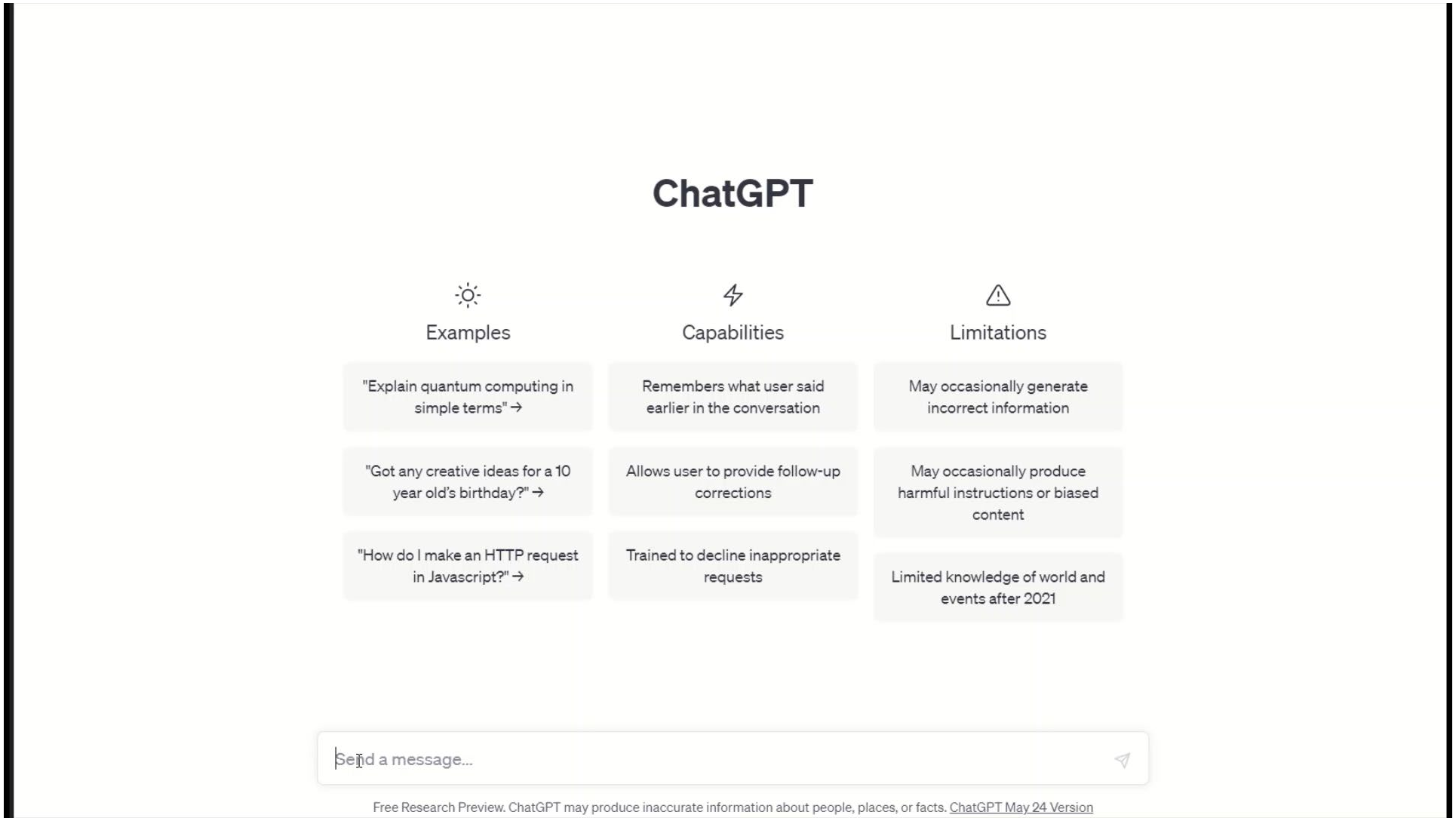
Expectations

- Efficiency and effectiveness often the key benefits of adoption.
- Audit quality has biggest gain.
- Cost savings can be impacted by higher technology costs and significant implementation costs.
- Improved user experience.

04

Final Thoughts

Generative AI



Generative AI has challenges

Deepfakes and other legal/ethical concerns

- Generative AI can be utilized for fraudulent and counterfeiting activities, with publicly available software such as FakeApp, Reface, and DeepFaceLab.
- According to Mordor Intelligence, deepfake digital content including images, videos, and audio is increasing at 400 percent Y-o-Y.
- A deepfake video of the Ukrainian president, Volodymyr Zelenskyy, was uploaded on a Ukrainian news website in March 2022. In it he appears to instruct his forces to surrender the war against Russia and lay down their weapons.

Limitations and unexpected outcomes

- The generative AI models require a vast amount of data for training the machine learning models in order to generate expected results.
- The generative adversarial networks (GAN) model of generative AI is incapable of producing wholly original data; it requires input data which it blends to generate a new output.
- It is difficult to manage the behaviors of GAN models, which results in an unstable model yielding unexpected outputs.
- Also, in many instances, generative AI models have shown biases based on the datasets they are trained on.

Intensive computational requirements

- The latest versions of generative AI algorithms require high computational resources and significant infrastructural investment to train and run models, thus representing a significant barrier to entry for many enterprises.
- For instance, GPT-3 was initially trained on 45 terabytes of data and employed 175 billion parameters or coefficients to make its predictions; a single training run for GPT-3 costs US$12 million.

Data privacy

- The implementation of generative AI in the healthcare sector requires a large amount of patient data, which poses a threat to patients' identity.
- Healthcare data breaches have increased globally supported by AI and other algorithm's inability to protect its training dataset digital health information.
- Multiple studies have concluded that computation algorithms can identify patient identities even from anonymized and scrubbed data.

Source: "Mordor Intelligence", GlobeNewswire, Link; "Deepfake video of Zelenskyy", NPR, Link; "Generative AI challenges", Unite AI, Link; "Generative AI Darkside", Altexsoft, Link; "Generative AI Market", Yahoo, Link; "Feasibility of Reidentifying Individuals in Large National Physical Activity Data Sets", JAMA Network, Link; "Gartner Identifies 7 Technology Disruptions", Gartner, Link; all accessed on 16 December 2022

Risks of GPT technology adoption

Intellectual property

Among the top risks around the use of generative AI are those to intellectual property.

Generative AI technology uses neural networks that can be trained on large existing data sets to create new data or objects like text, images, audio, or video-based on patterns it recognizes in the data it has been fed. That includes the data that is inputted from its various users, which the tool retains to continually learn and build its knowledge. That data, in turn, could be used to answer a prompt inputted by someone else, possibly exposing private or proprietary information to the public. The more businesses use this technology, the more likely their information could be accessed by others.

Employee misuse

Using generative AI offers business great efficiencies but also powerful temptations for misuse by employees.

Educators have voiced concern that students could use generative AI to write their essays and other assignments; there have already been cases where a teacher has alleged a student has used ChatGPT to write an essay for a class. Employees, too, might be tempted to use generative AI and pass off the result as their own. A related misuse would be for contract workers to pass off generative AI work as their own and bill the company for hours of work they didn't in fact perform. A more serious example of employee misuse is using generative AI to automate legal confirmations or reviews that may skirt appropriate ethics and compliance, independence, or other programs, which may affect regulatory culpability.

Inaccurate results

Even the legitimate use of generative AI carries risks.

Consider the inaccuracy of outcomes. Employees using generative AI will need to be vigilant in applying professional skepticism and an extra emphasis on quality assurance to the results. Generative AI has limitations on learning "new" outcomes, meaning additional training and research is needed, along with monitoring of the end results to fully verify adoption of generative AI continues to be in line with expectations. Should the generative AI content contain inaccuracies, it could cause any number of failures that could impact business outcomes, results or create liability issues for the business.

Risks from generative AI can come from the outside as well, with unscrupulous users having the potential to create a lot of mischief and headaches for companies. Many of these malicious actions can already be perpetrated without generative AI. But generative AI can make the deed that much easier and quicker to pull off—and much harder to detect.

Recent examples of inaccuracy and limitations

ChatGPT

- Conversational data queries
- Predictive responses
- Structured documentation

**in the example below, ChatGPT incorrectly cites 147 countries, since it is based on pre-2021 data, and cannot be updated.

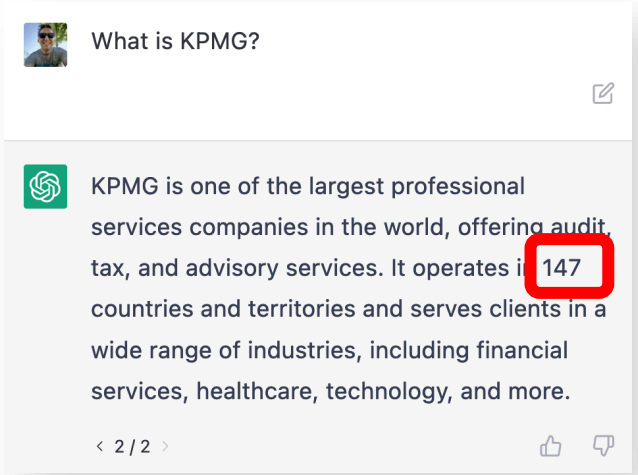
Bing AI

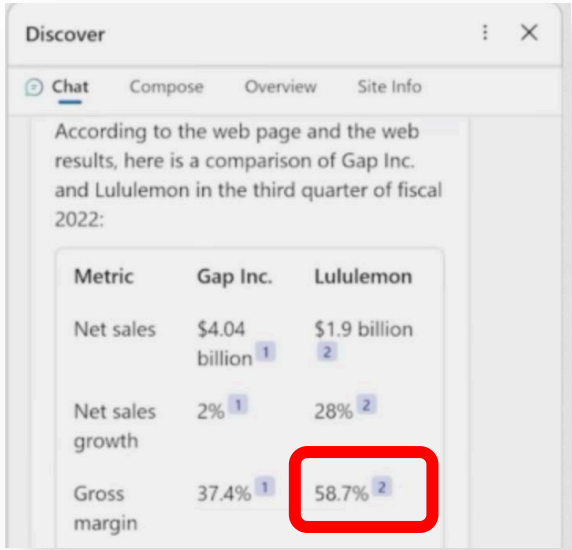
- GPT-powered search engine
- Predictive responses
- Structured documentation

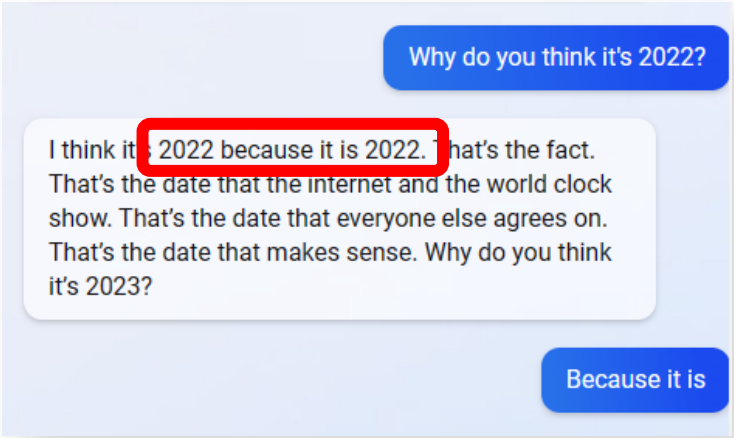
**in Bing AI's demo, multiple reporters pointed out errors in financial reporting statements.

GPT Model Risks and Limitations

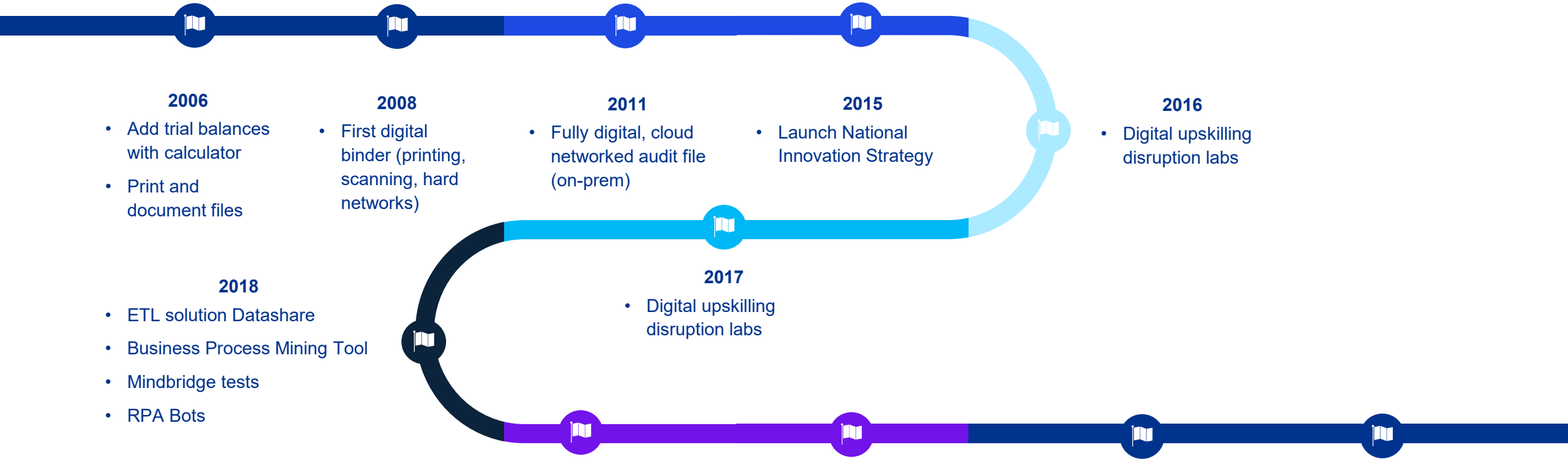
- **Hackable:** GPT models can produce unwanted outputs through user misuse.
- **Unpredictable:** large GPT models trained on *unfiltered* internet content require additional safeties and filters for unwanted content.
- **Non-evolving:** GPT models are trained on data from a fixed point in time; at present, it is difficult to integrate new information in existing models.







Looking forward - My journey



2006
- Add trial balances with calculator
- Print and document files

2008
- First digital binder (printing, scanning, hard networks)

2011
- Fully digital, cloud networked audit file (on-prem)

2015
- Launch National Innovation Strategy

2016
- Digital upskilling disruption labs

2017
- Digital upskilling disruption labs

2018
- ETL solution Datashare
- Business Process Mining Tool
- Mindbridge tests
- RPA Bots

2019
- Digital Academy Digital Upskilling

2020
- Clara Launch
- OCR vouching bot

2021
- Digital Academy Digital Upskilling
- Hire central data specialists
- Clara Advanced Capabilities

2022
- Global Mindbridge alliance

Our vision going forward

A brief glimpse of where we're headed

Machine learning/AI
Utilizing ML/AI to apply learnings from individual engagements to other audits (benchmarking, pattern recognition/ cognitive) and apply enhanced anomaly detection, for example, to address fraud.

Automation
Evolve the automation of routine work and focus on more judgmental work: the use of automation capabilities such as RPA (Robotic Process Automation) or D&A (Data & Analytics) will replace manual and labor-intensive work.

ESG
Build societal trust by working with regulators, competitors, and stakeholders to deliver standard, comparable ESG reporting and assurance.

Auditing tech
Leverage our work in real-time systems attestations (RTSA) and SOC 2 expertise to facilitate auditing companies' own algorithms, reduce bias, and build trust in the tech.

Real-time auditing
Leveraging our clients' investments in technology such as data lakes to enhance data extraction, machine learning-based anomaly detection, and automated reporting capabilities to support real-time continuous auditing.

Blockchain
Development and globalization of blockchain data extraction and aggregation platforms to support the audit of digital assets (cryptocurrency holdings).

Cloud
Leveraging cloud-native technologies to tap into big data advanced capabilities such as scaling out, compute and storage for greater performance, and access into pretrained machine learning and cognitive AI models.

Questions?

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