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Ethical by Design

About Bronson

- Bronson is the oldest independent Management Consulting firm in Ottawa. We have been helping the Public Sector in Canada since 1991.
- About 80% of our revenues attributed to the Public Sector. Over 1,000 projects delivered to around 100 Organizations.
- Focussed on Data and Data Analytics since 2014, but continue to run our Management Consulting practice
- Our largest project was a $25M contract to deliver the TRC document collection exercise; this had a large Cloud managed service component with Highly Confidential data
- Recent and current clients include City of Ottawa, CRTC, NAVCanada, ISC, IESO, NRCan, DND, Polar Canada, Ottawa Airport, Farm Boy, Bank of Canada and a Canadian University
- We have 18 FTE's and augment with contract Resources as required
- We have all the central procurement vehicles available to us and frequently win other Standing Offers / Supply Arrangements

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CELEBRATING 30 YEARS PROUDLY CANADIAN

BRONSON CONSULTING
1000 PROJECTS
TRUSTED ADVISORS

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How AI and GenAI will change our World

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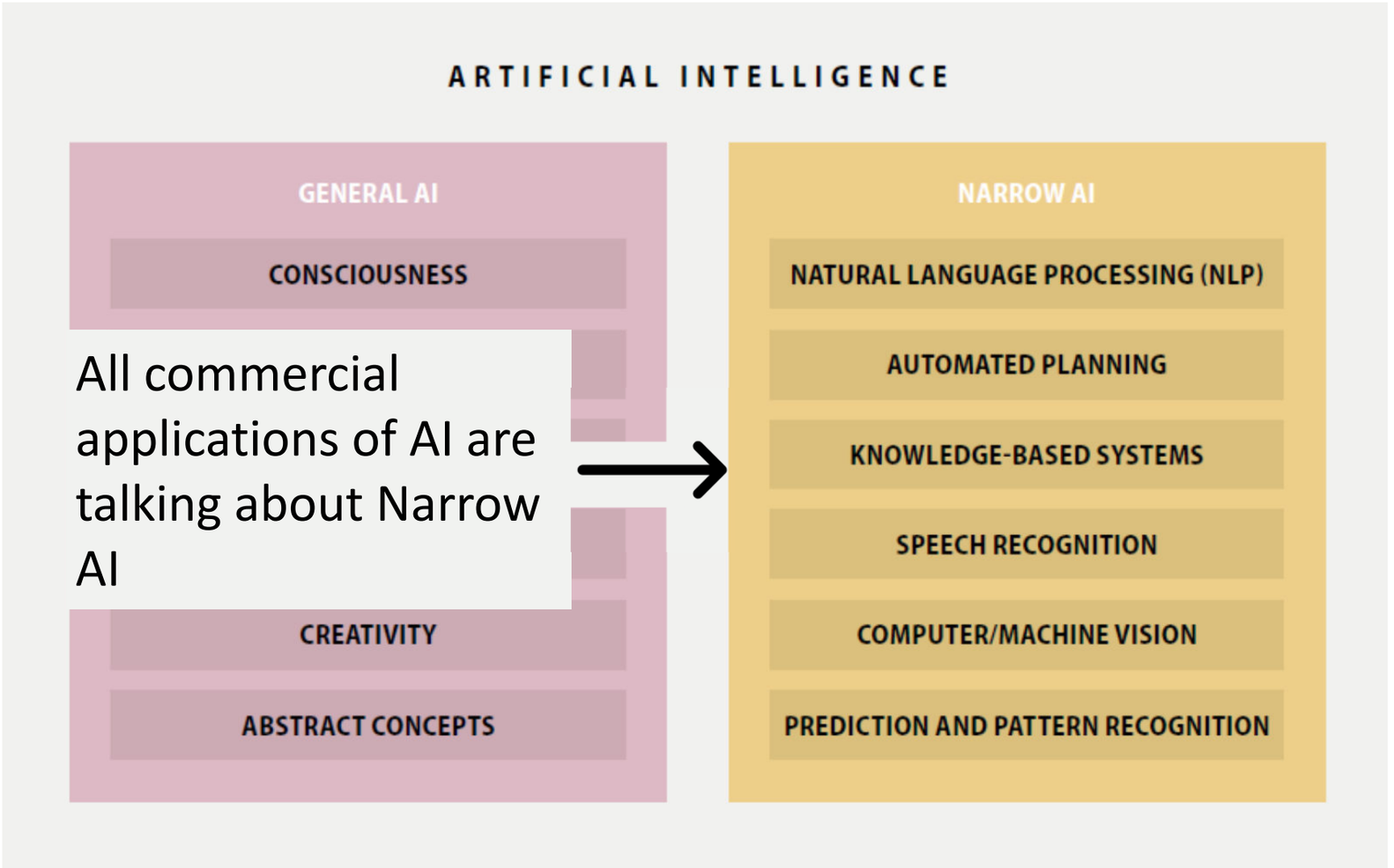
Courtesy of Lensa

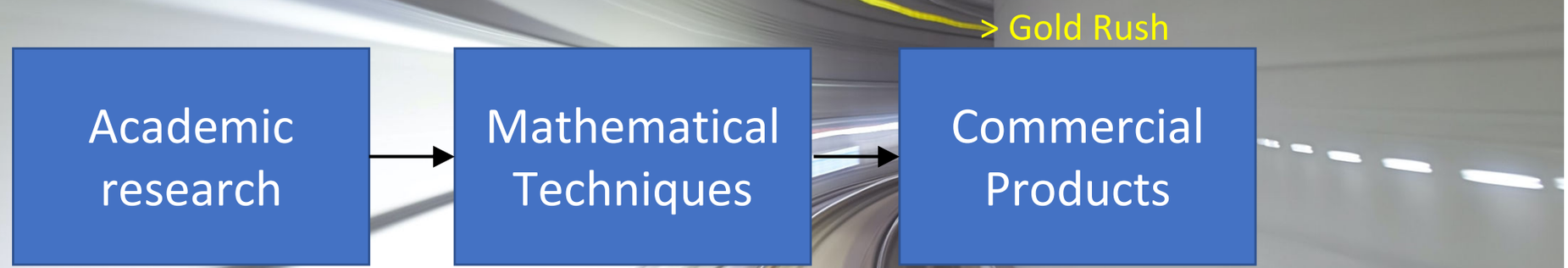
What is AI?

General AI vs. Narrow AI Summary



All commercial applications of AI are talking about Narrow AI

AI research is accelerating at an extraordinary rate



IMPORTANT POINT: *Almost* all products are using the same underlying techniques

Types of commercial AI/ML

- Classification
- New Regression techniques
- Time Series problems
- Natural Language / Text Processing
- Image / Video Processing (deep fakes)
- Autonomous Vehicles
- Machine2Machine learning
- Chatbots / Knowledge base searches
- GenAI (LLMs, Images etc.)

How to find Use Cases?

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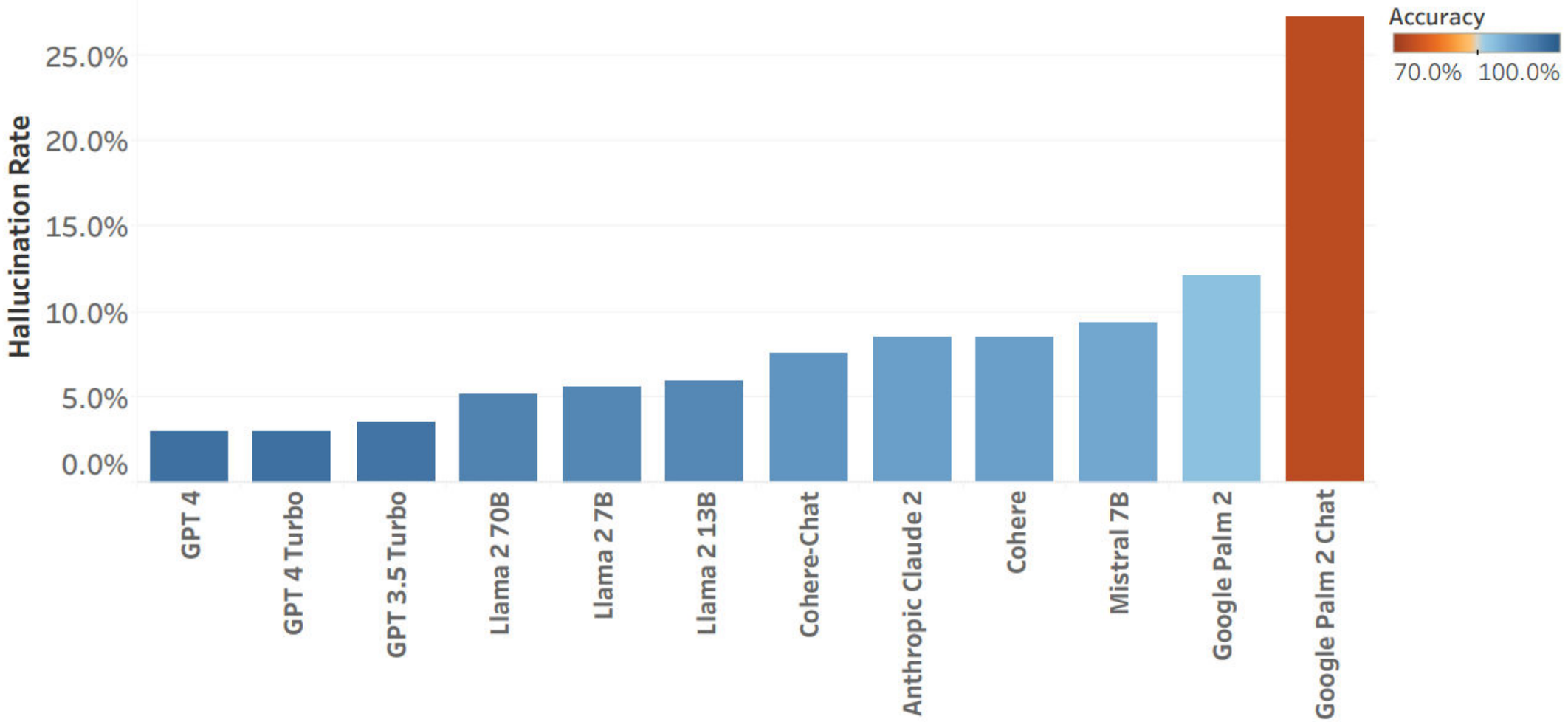
Why are LLMs so transformative?

- New Human –> Computer Interface
- Versatility & Shear Power
- Unlike predictive AI/ML technologies, the use cases appear unlimited and easy to implement

But like humans they get things wrong

Hallucination Rate by LLM Model

Lower hallucination rate is better



Hallucination Rate for each Model. Colour shows Accuracy.

https://github.com/vectara/hallucination-leaderboard

Introducing Retrieval Augmented generation (RAG)

Retrieval-augmented generation (RAG) is an AI framework that retrieves data from other sources of knowledge to improve the quality of LLM responses.

https://www.rungalileo.io/hallucinationindex

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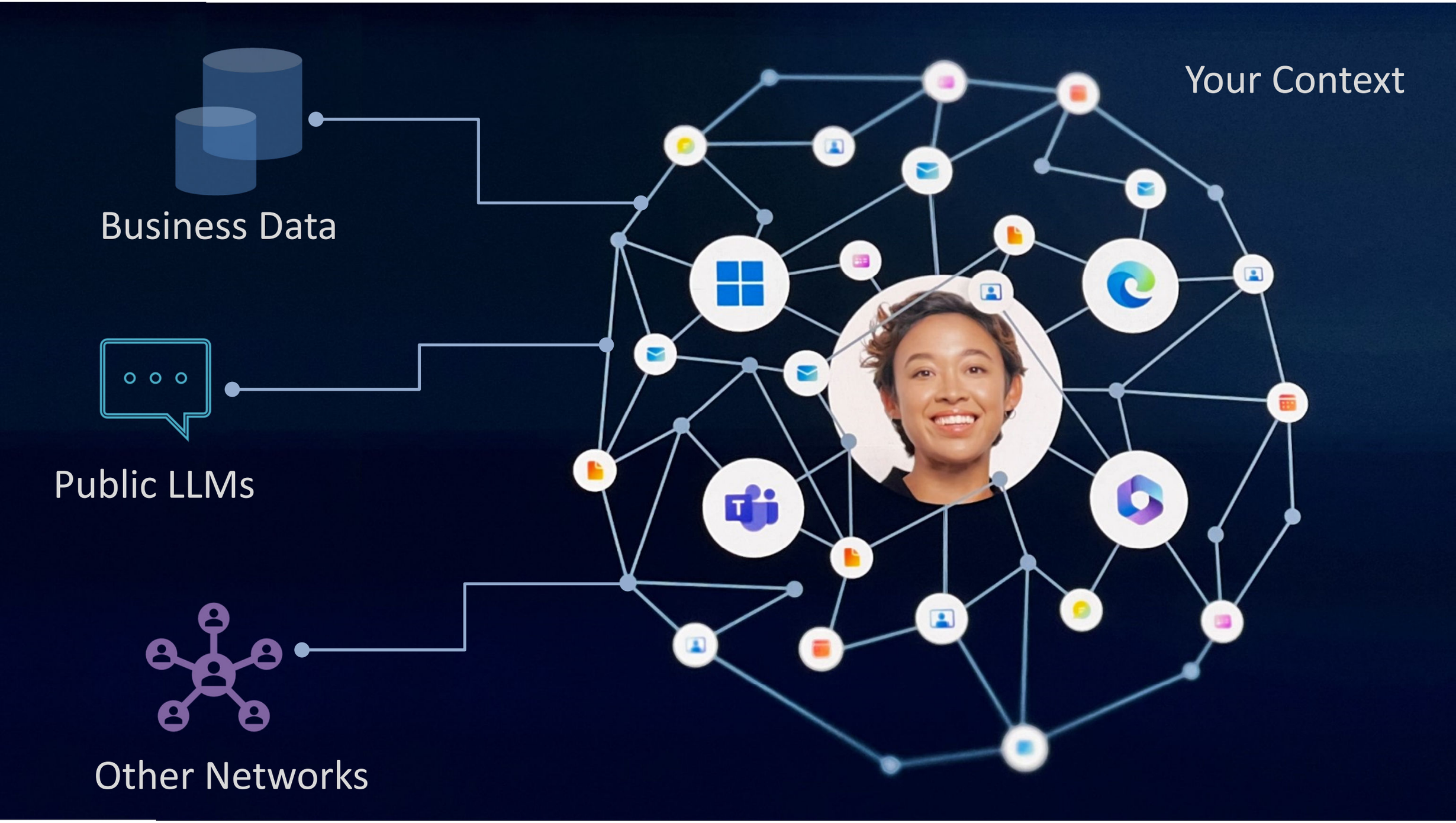
Business Data
Public LLMs
Other Networks
Your Context

New Opportunities are Innumerable

- Office life – personal agent helping with everything, just pay the GPU and Provider bill!
- Public Services – efficiencies in service delivery, automate the mundane to free up strategic time, test policies out before implementing, spatial and demographic analytics
- Healthcare – most of us will no longer have a single primary care provider … “AI will be the saviour of healthcare in Canada”
- Education – personal tutors and optimized learning for the individual
- Science & Mathematics – solve currently unsolvable problems, find new treatments …
- Customer Service and Sales – decision support and automation
- Cyber Security – make sense of the masses of data in real-time, stop cyber crime

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This is the greatest Transformative Opportunity in Human History

Good News / Bad News

- If you missed the last 15 years of technology progression, now is the time to invest
- You need to be on the cloud for massive GPU power
- Computer power can be costly
- If your data governance and storage are lacking, you need to fix that first
- We need to deal with the elephant in the room – ethical AI / Bad actors

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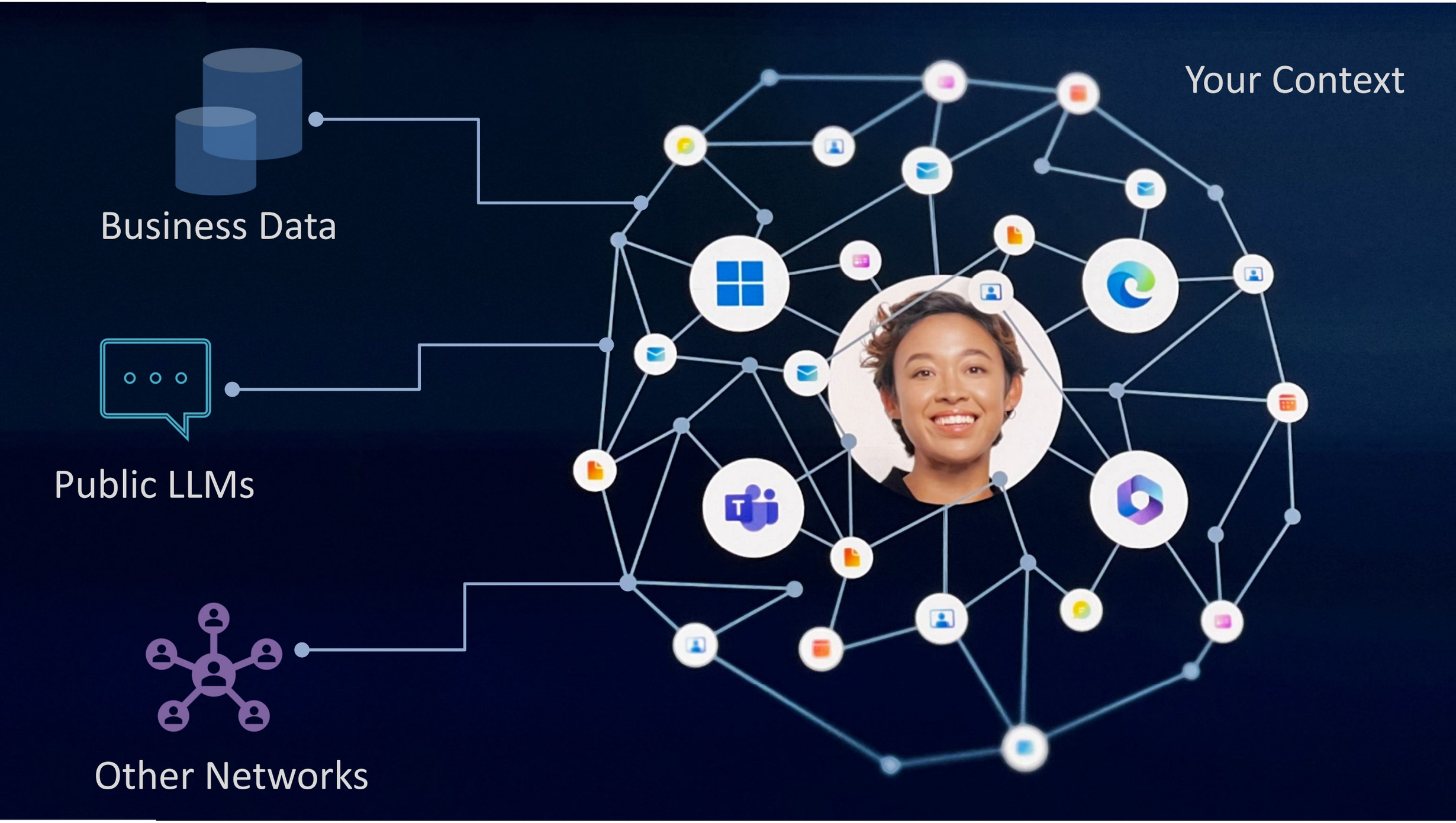
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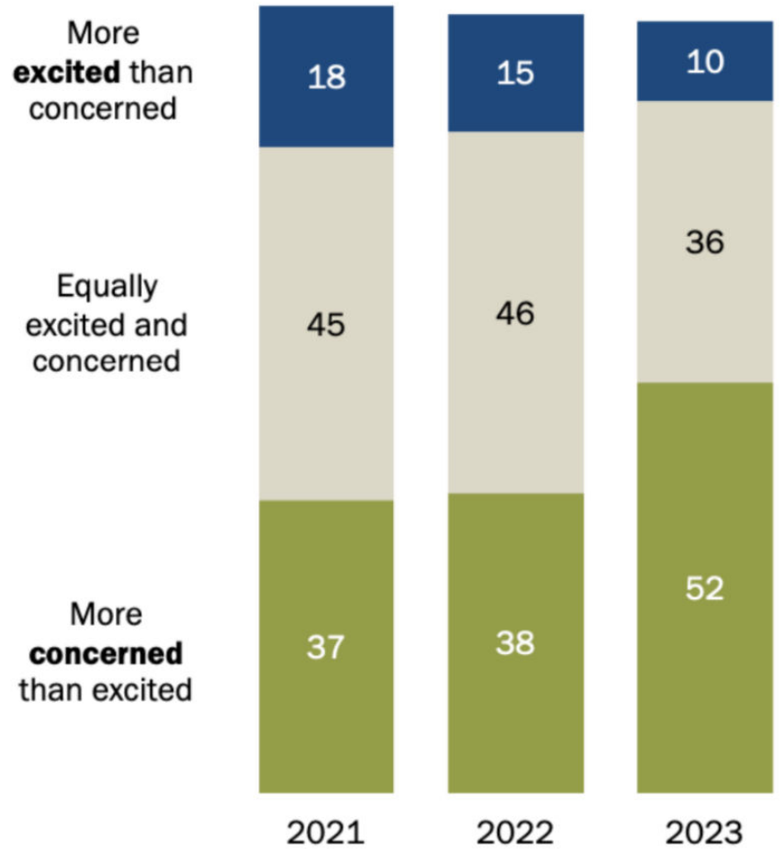
Predictive AI
Digital Twin
Simulation

Concern about artificial intelligence in daily life far outweighs excitement

% of U.S. adults who say the increased use of artificial intelligence in daily life makes them feel ...



Note: Respondents who did not give an answer are not shown.
Source: Survey conducted July 31-Aug. 6, 2023.

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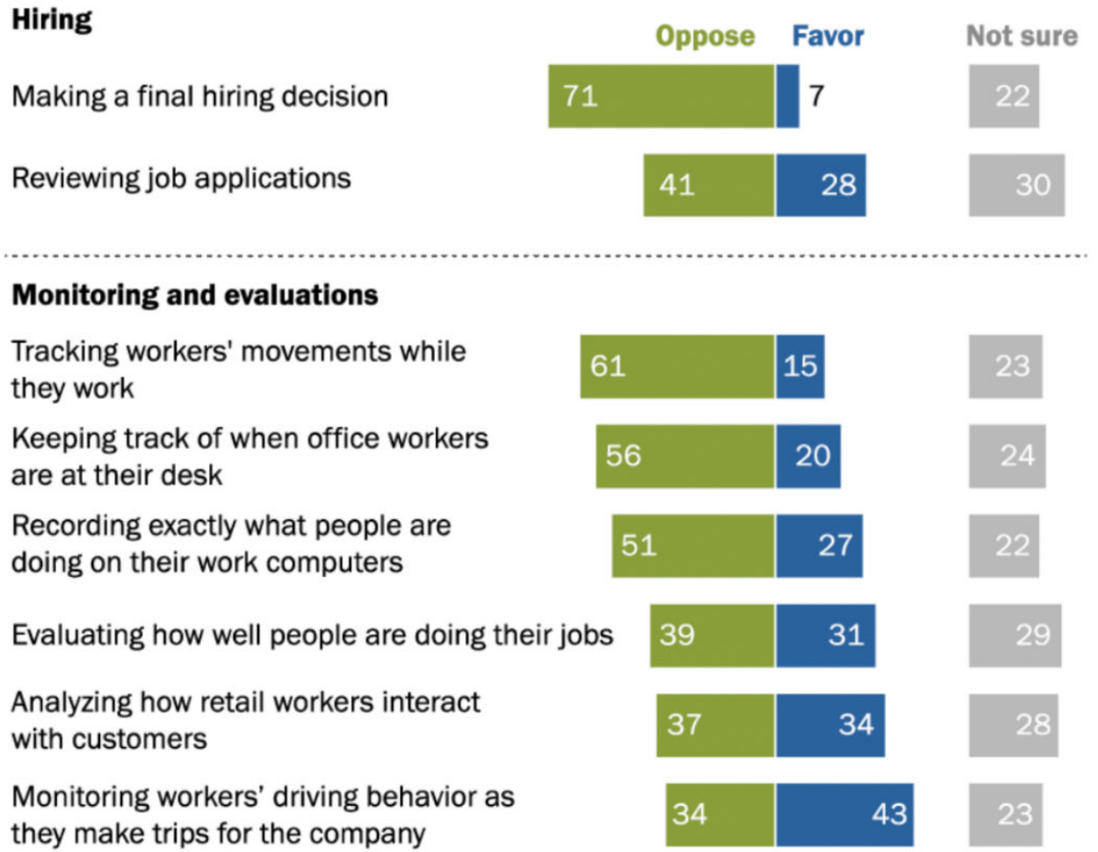
Views of AI in the workplace

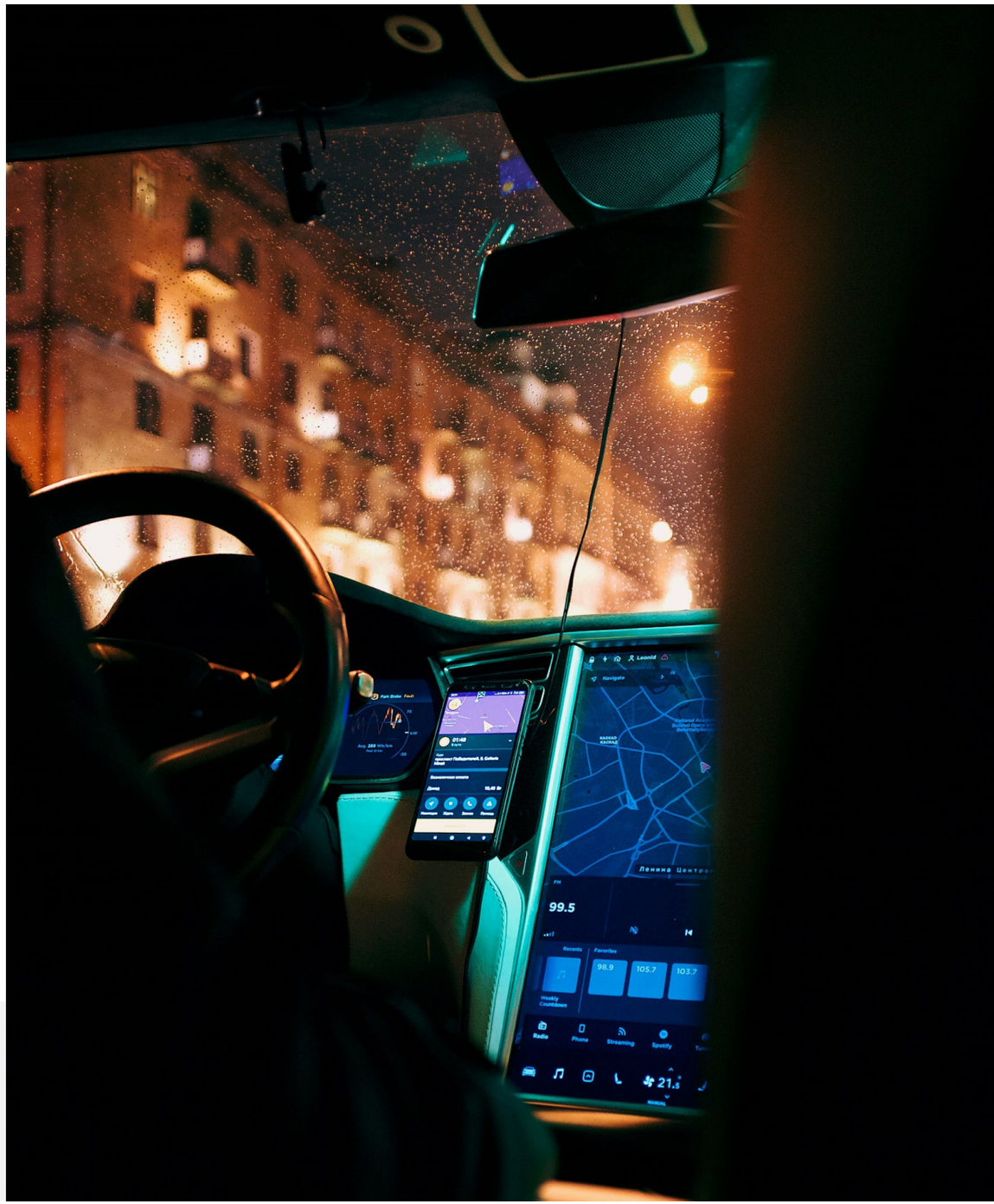
Americans widely oppose employers using AI to make final hiring decisions, track workers' movements while they work, and analyze their facial expressions

% of U.S. adults who say they ___ employers' use of artificial intelligence for each of the following



AI as Decision Support

- GPS and Satellite Navigation is a great example where we get great benefit without concern (likely a significant error rate)
- Key point - the tool doesn’t make the decision itself
- We used to marvel at how magnificent these small devices were; now we take them for granted



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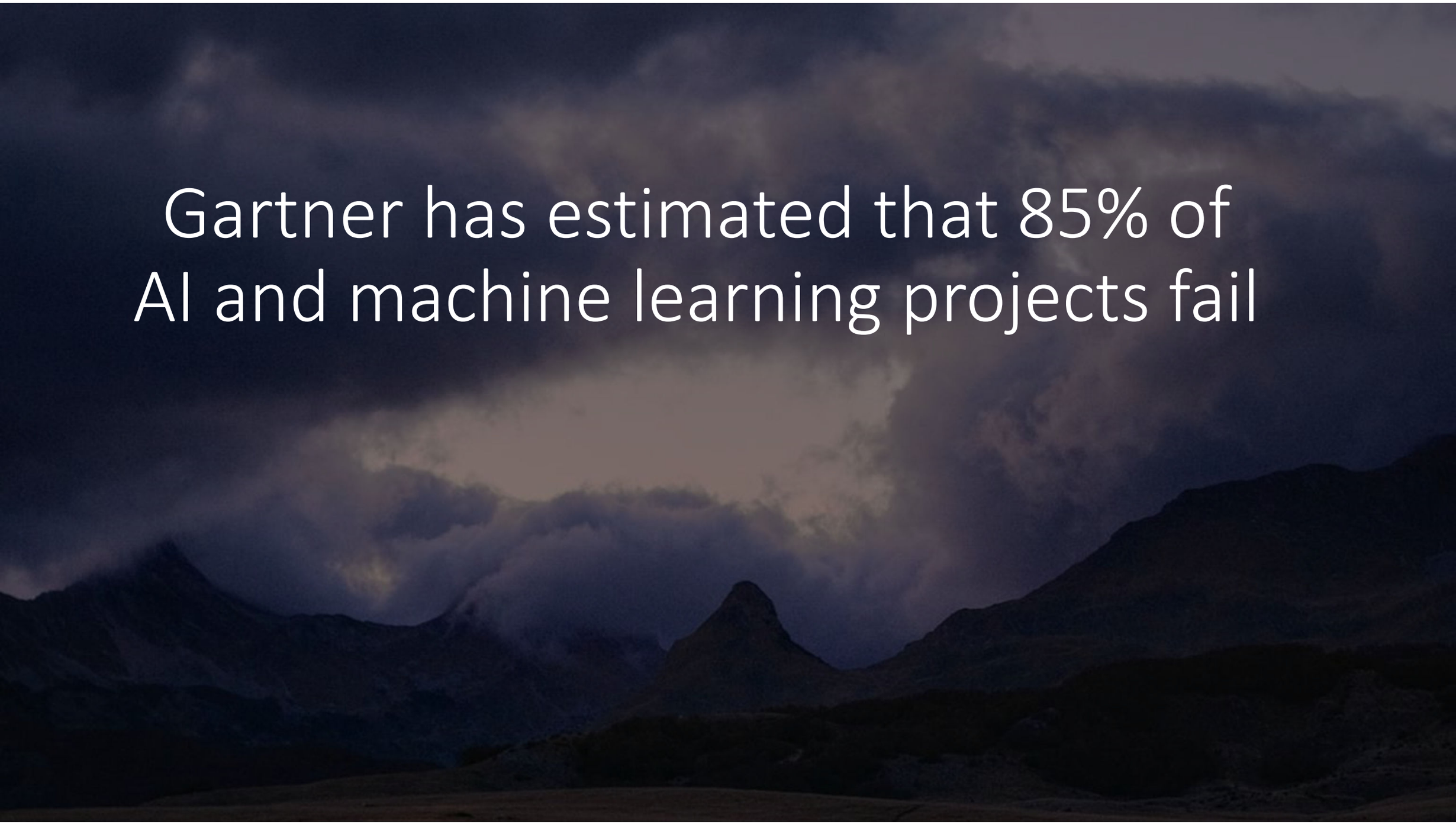
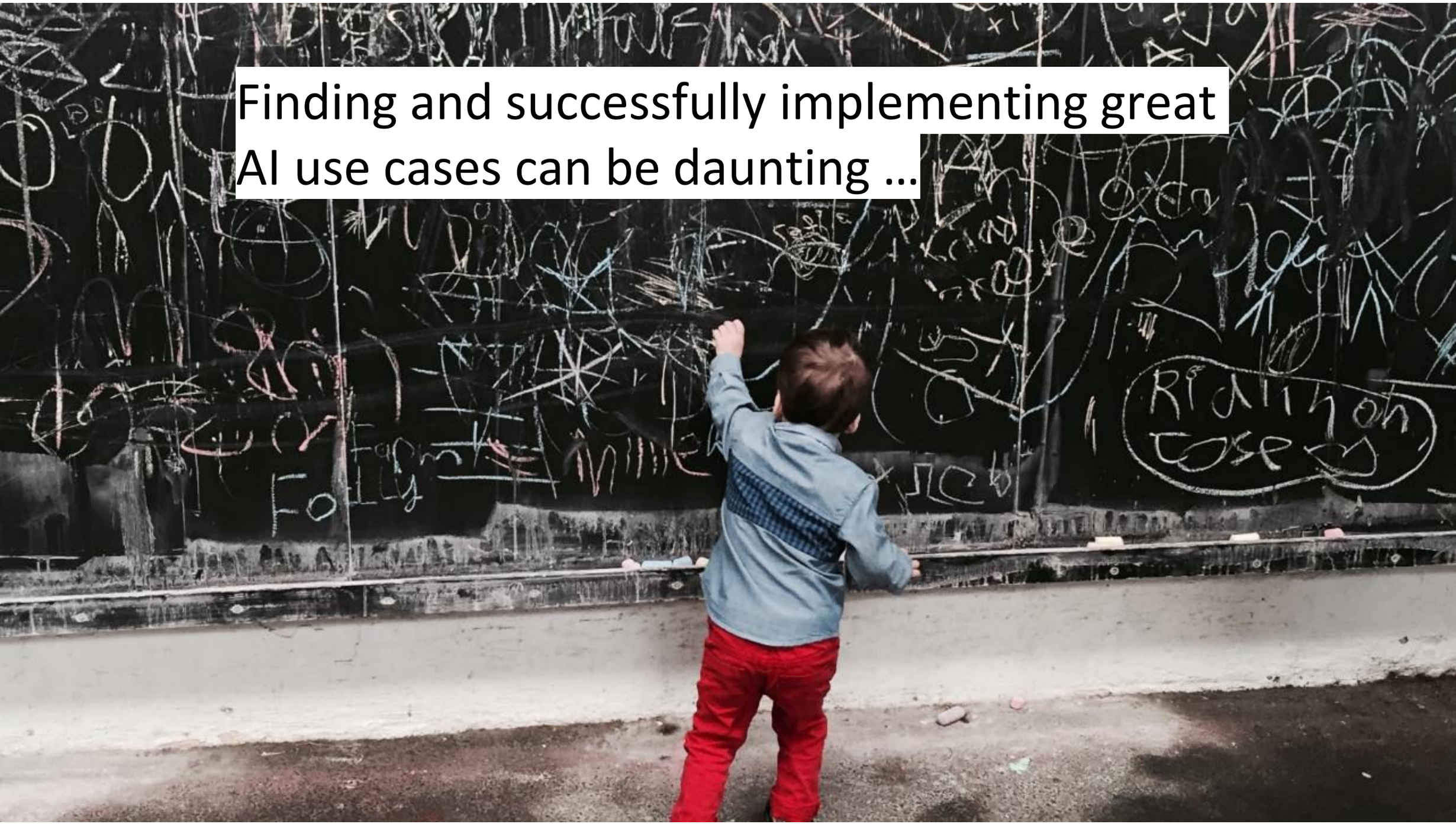

Gartner has estimated that 85% of
AI and machine learning projects fail

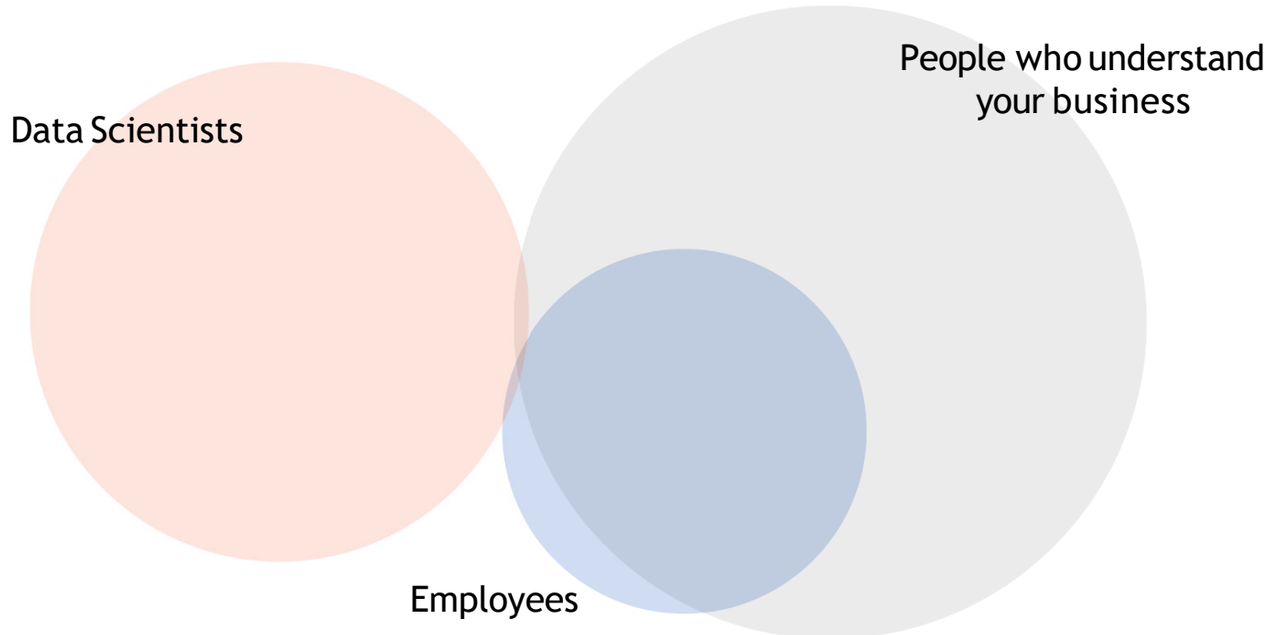
You need well managed data first
Machine Learning and AI
Traditional Predictive Analytics
Operational Dashboards and Data Visualization
Structured and Managed Data

Appendix

How to find AI use cases


Finding and successfully implementing great
AI use cases can be daunting …

Everyone needs to know how to spot opportunities



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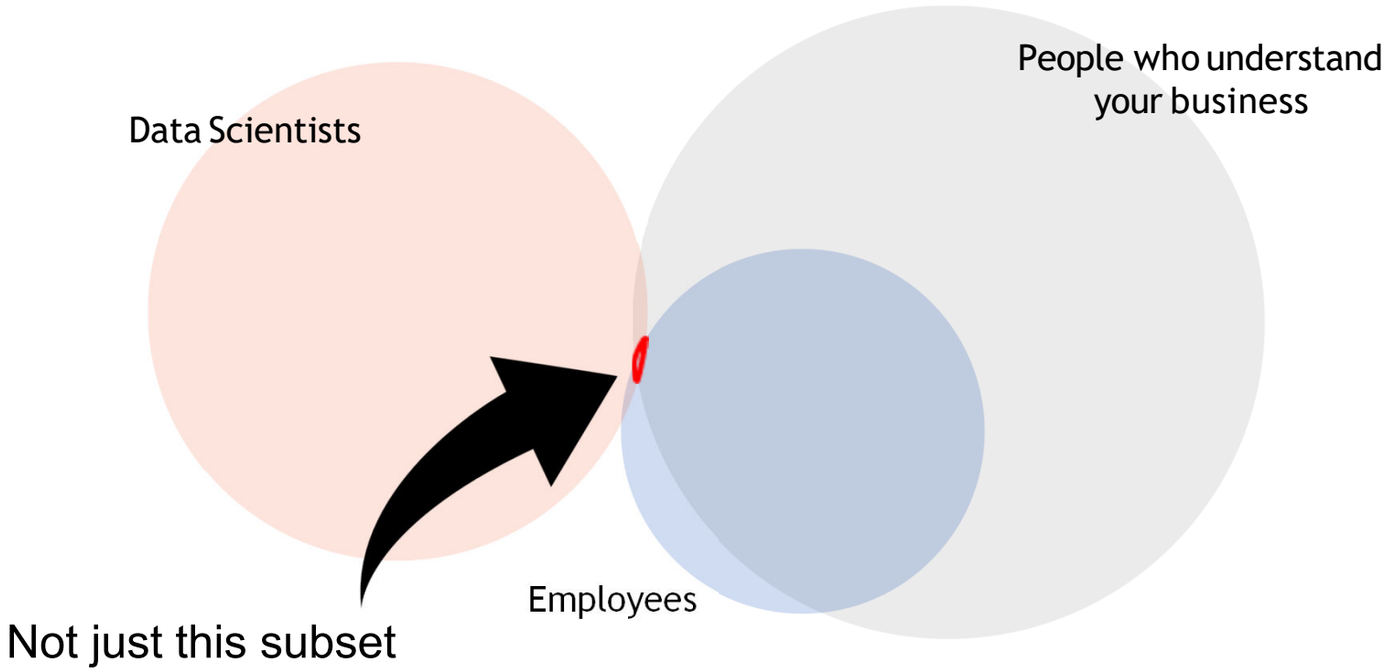
Everyone needs to know how to spot opportunities



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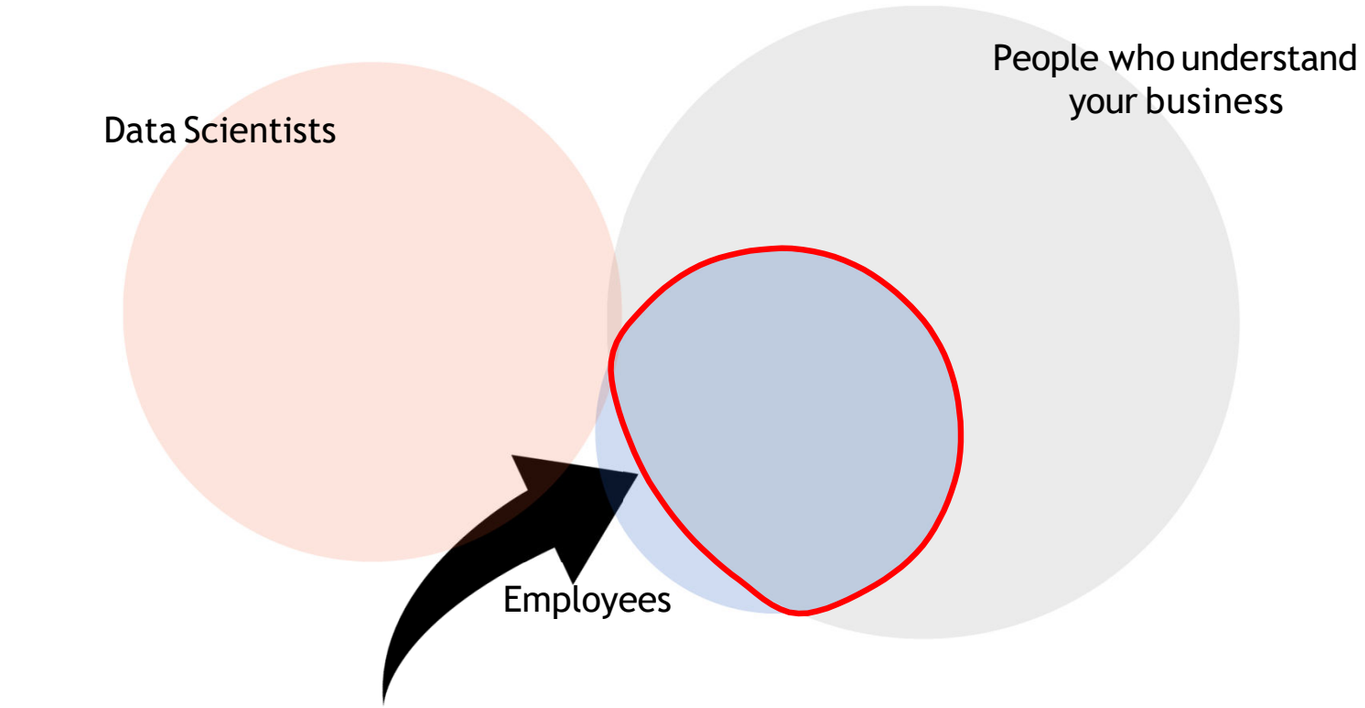
Everyone needs to know how to spot opportunities



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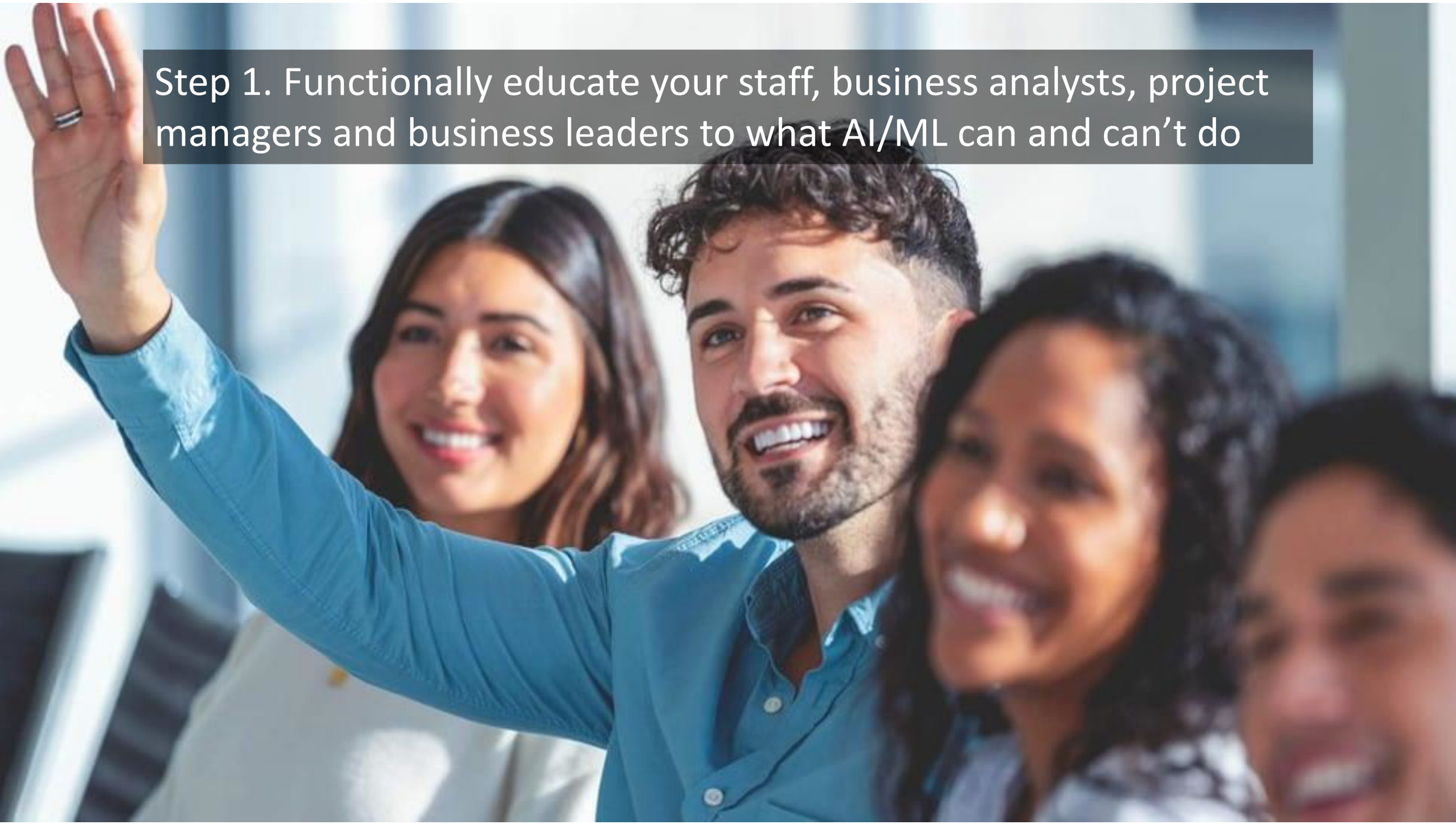
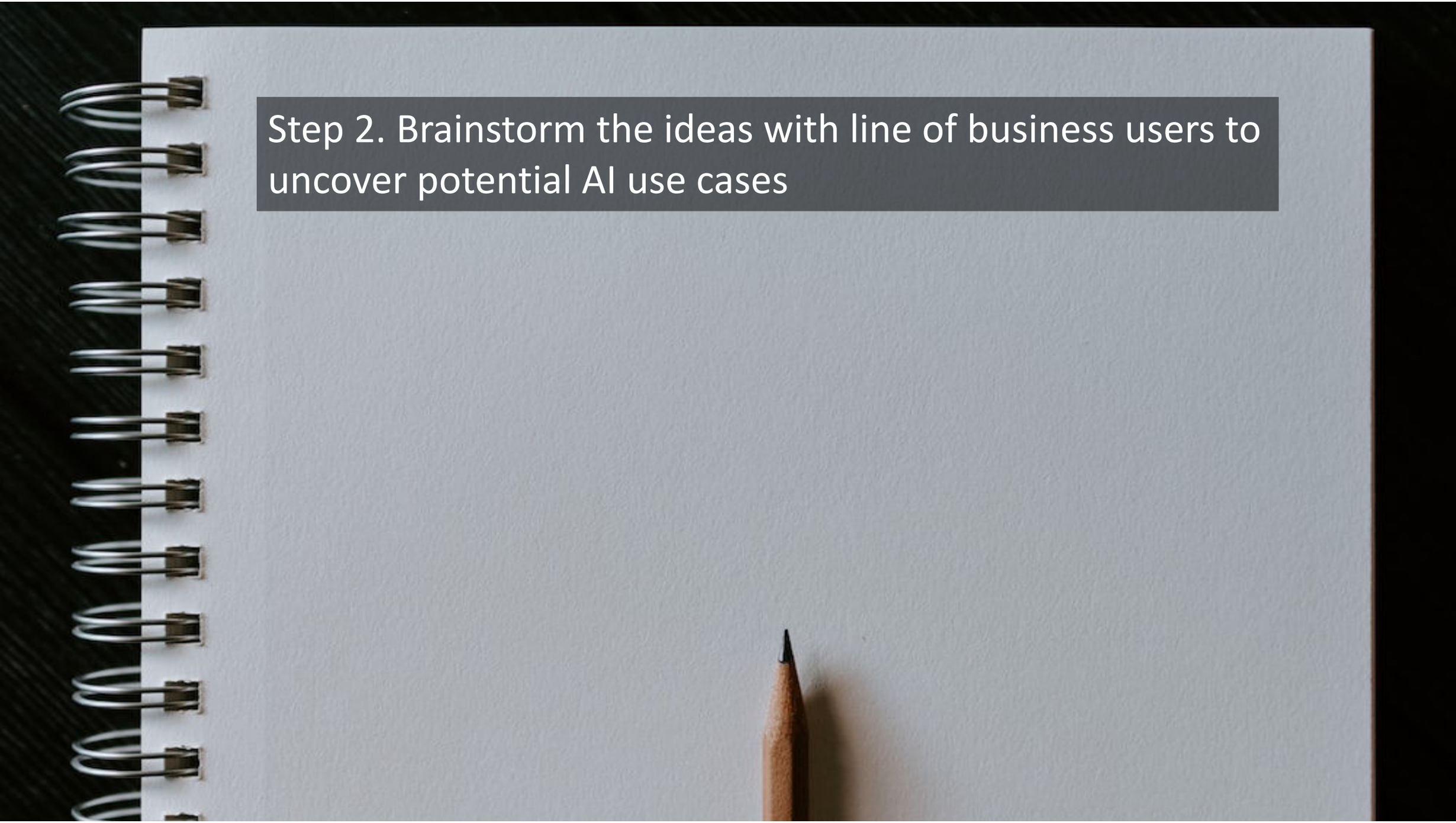
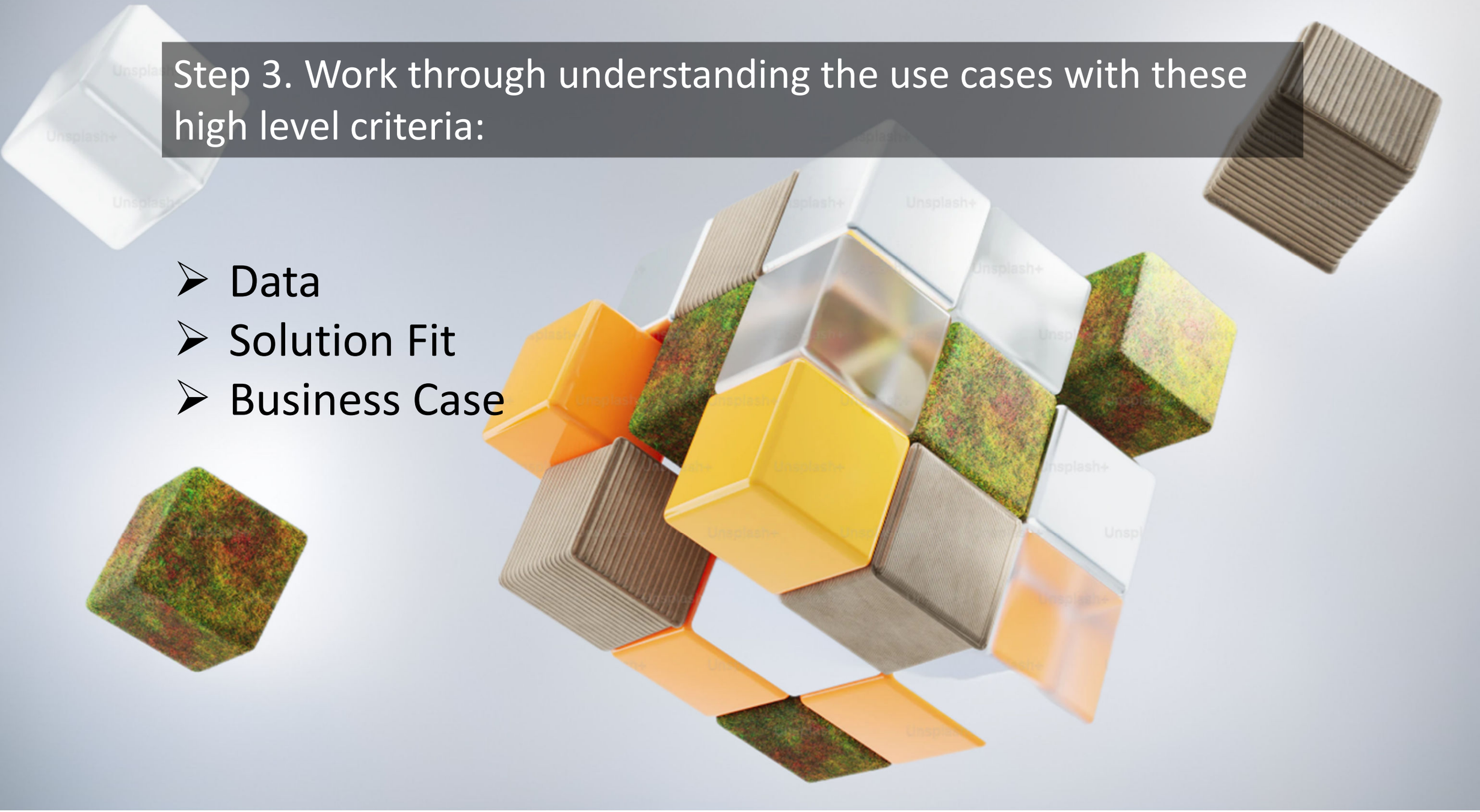

Step 1. Functionally educate your staff, business analysts, project managers and business leaders to what AI/ML can and can’t do


Step 2. Brainstorm the ideas with line of business users to uncover potential AI use cases

Step 3. Work through understanding the use cases with these high level criteria:

- Data
- Solution Fit
- Business Case



You need well managed data first
Machine Learning and AI
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Data related questions to ask

- Do you have sufficient historical data?
  - Never aggregate initially! You lose the ability to predict fast.
- Is data readily available
  - Could it be available well within the timeframe you need to make the prediction?
  - Do you have it in a current process, or data pipeline
- Is the data Free of Bias?
- Are you sure traditional methods wouldn’t work?
  - Simulation can sometime be a better predictor when the past is no indication of the future
  - Conversely if you have an open system with lots of noise then sometimes AI is better
- Assuming you can align everything, are you confident Insights can be actionable?
- Can I augment the data I have with external data e.g. weather data

Solution fit questions to ask

- Is the database and system for capturing the raw data already in place?
  - MLOps could easily feed from those if it is
- What is the solution and how mature is the AI technology?
  - No need to be bleeding edge
  - Classification problems are very mature … automatic driving of vehicles less so
- Does the Organization have the capacity to implement and run with the solution
  - Has leadership given the go-ahead
- Understand and acknowledge the risk of implementing a solution **and** also the risk of not acting
- Has the solution been vetted for Ethical considerations

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Business Case questions to ask

- Intangible
  - Reduction of Organizational or Systemic Risk
  - Reduction of Environmental damage
  - More timely insights allow faster decisions
  - Can saves lives
- Tangible $'s
  - Costs
    - Have you estimated the cost of the new systems? E.g. Compute $'s, External Professional Services
    - FTE related costs to support
  - Benefits
    - Service Level improvement
    - Cost Avoidance
    - Enabler for new capabilities
    - Revenue generating

AI will not solve all problems and is undoubtably overhyped for some applications

- Poorly governed, organized, structured or dirty data is the number one problem from a data science perspective
- History is often not a good predictor of the future

  Simulation techniques can sometime be a better fit
- It is estimated that 30-40% of data science projects don't have a mathematical solution
- Executive buy-in often the biggest barrier from a project success stand point

I believe many operational decisions will remain intuition based for a long time to come – but that's not to say we can't use these techniques as decision support

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