

Generative AI, Emerging Technology and Accounting/Finance Transformation



With you today



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1

Knowledge
Redefined

Generative AI is...

a subset of Deep Learning that involves training a model to generate new data that is like the training data it was given. This type of AI can be used to create art, music, text and even entire virtual worlds, among other applications.



Definitions

Artificial Intelligence

Artificial Intelligence

the field of computer science that seeks to create intelligent machines that can replicate or exceed human intelligence.

Machine Learning

Machine Learning

subset of AI that enables machines to learn from existing data and improve upon that data to make decisions or predictions.

Deep Learning

Deep Learning

a machine learning technique in which layers of neural networks are used to process data and make decisions.

Generative AI

Generative AI

a capability of using prompts to create, improve, and interact with text, images, video, and sound using large trained models

What CFOs say...

52%

are prioritizing the use of technologies such as GenAI and advanced analytics to build predictive models and strengthen scenario analysis capabilities

89%

say striking the right balance between cost cutting and investing for growth is a top challenge

37%

of CFOs are planning to revise enterprise risk management practices

45%

of CFOs plan to invest in GenAI in the next 12 to 18 months

55%

of respondents say their company invested in AI — it was a top-3 investment priority — in the last 12 months, more than any other technology listed

47%

said that emerging technologies are already delivering enhanced stakeholder trust

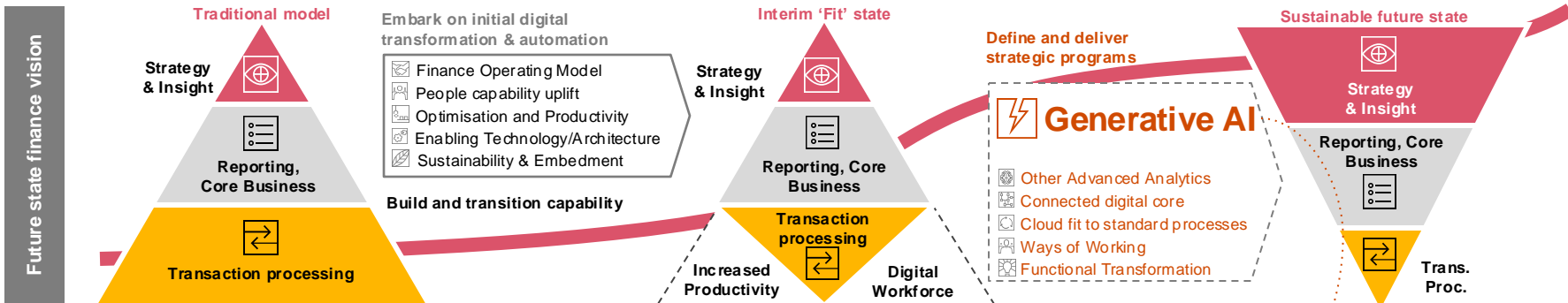


“We often hear from our clients a desire to add value to the business through forward looking insights

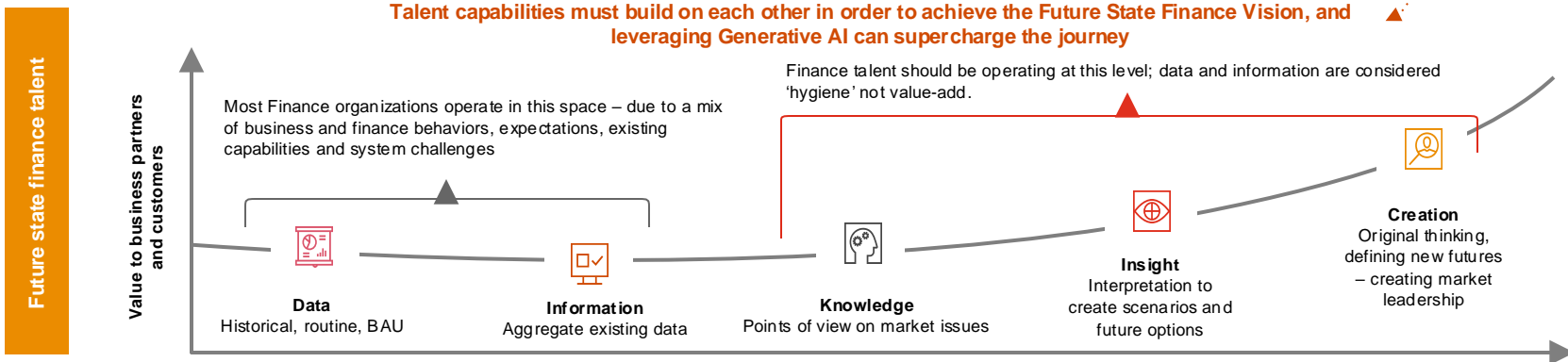
- “How can we improve our data quality?”
- “Can we integrate our systems and data sources?”
- “How do we reduce the number of reports and spreadsheets and move to self service reporting?”
- “How do we start using more consistent and relevant metrics that are aligned to strategy?”
- “How do we create forward looking insights leveraging advanced analytics, Machine Learning and AI?”
- “What’s the role of a Finance CoE when it comes to data, analytics and decision support?”

Generative AI can supercharge the evolution of the Finance Function

In transforming and adopting a very different way of operating, the Finance function will become significantly more efficient and have the opportunity to actively contribute to business performance and drive real value creation.

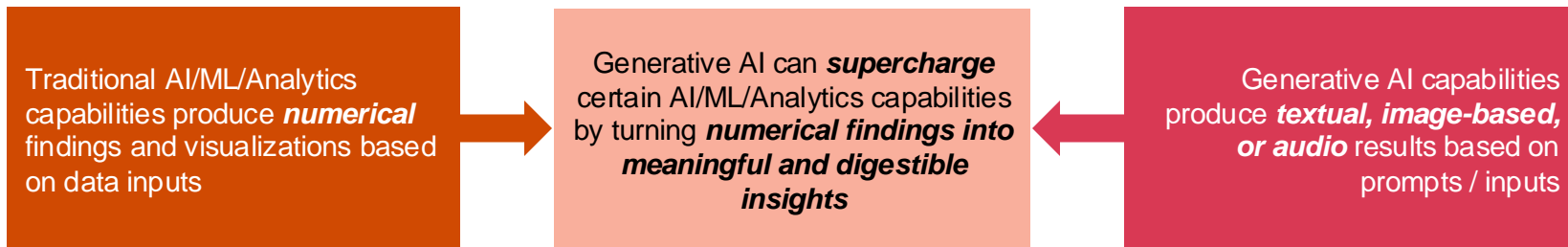
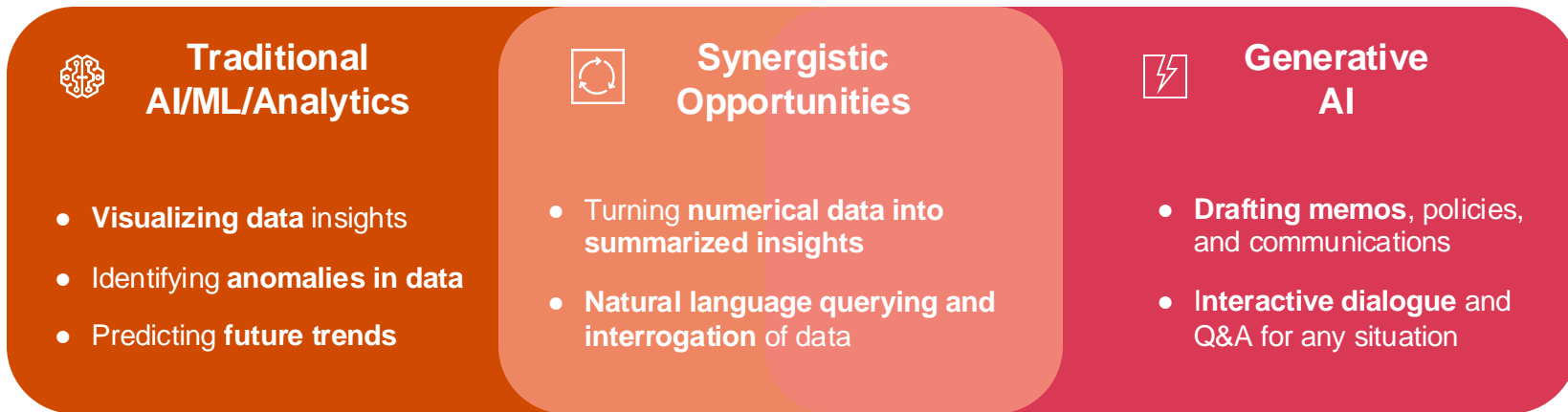


Talent capabilities must build on each other in order to achieve the Future State Finance Vision, and leveraging Generative AI can supercharge the journey



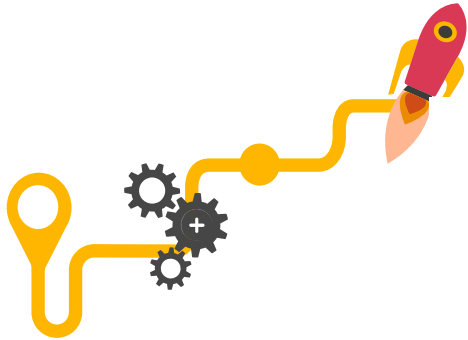
The interrelationship between Gen AI and traditional AI/ML/Analytics

Generative AI and traditional AI/Analytics can augment each other to unlock new capabilities, but do not always require the other in order to make an impact on a process



Generative AI will transform every business...

- ✓ Scale further
- ✓ Work faster
- ✓ Reduce Costs
- ✓ Enable new business models



... Allowing innovation- minded organizations to...

Scale without resource constraints

Enable your workforce to focus on higher value transactions

Enable workers to have access to the best possible knowledge

Enhanced customer experience: Convert the unique knowledge of your business into new services you can provide to customers

Improve the speed and quality of all text and coding work

Improve the speed and quality of decisions







Automate for efficiency and lower costs

Accelerate time to realize value

2

The Impact to
Accounting & Finance

Generative AI models are being applied to initial use cases now with the potential to reset the boundaries of Finance Digital Transformation.

Task	Description	Finance Example(s)
 Summarization/synthesis	Summarizing an abbreviated form of a given document, coded program, or other body of data	<ul style="list-style-type: none"> Summarize key insights from accounting pronouncements, financial reports, financial news that impact policies, processes and reporting
 Deep Retrieval	Extract key information from large amount of unstructured data	<ul style="list-style-type: none"> Analyze large amount of contract, POs, invoices, and provide insights and extract key information relevant for financial reporting
 Content transformation	Transforming one piece of data into another, such as image style transfer, text translation, or personalization of text	<ul style="list-style-type: none"> Format code according to best practices Update contract language based on a select style Translate content from one language to another
 Content augmentation	Expanding upon existing data or information, such as auto-complete or synthetic data creation	<ul style="list-style-type: none"> Impute missing data values with synthetic data Generate sentiment analysis
 Q&A (Dialogue)	Generating an answer to a question or prompt	<ul style="list-style-type: none"> Customer service chatbot responses Query a document/training content by asking questions
 Net-new content creation	Creating net-new content based on existing reference content	<ul style="list-style-type: none"> Generate journal entries Generate code from textual description and legacy system data model parameters

Generative AI is increasingly effective at performing these tasks across a variety of different mediums:



Text



Coding



Generative Interfaces



Speech & Audio














Visual Media

Generative AI has the ability to impact a significant variety of processes across the Finance and Accounting landscape

Record to Report	Order to Cash	Procure to Pay	Acquire to Retire	FP&A
Financial Reporting	Manage Sales Orders	Supplier On-Boarding & Maintenance	Manage Project Setup	Develop Long-Range Plan / Program Plan
Statutory Reporting	Customer Billing	Purchase Requisition Processing	Acquire Externally Procured Assets	Prepare for Capital Plan
Regulatory Reporting Policy & Guidelines	Manage and Process Collections and Disputes	Purchase Order Processing	Tag Assets	Perform standard product profitability analysis and reporting
Account Reconciliations & Certifications	Manage and Process Deductions	Invoice Processing	Track Assets	M&A Acquisition Support
Policies and Controls	Maintain A/R Ledger and Apply Cash	Payment Processing	Manage Period-End Activities for Assets	Board of Directors Material Preparation and Support
Master Data Management	Credit Management	Expense Reimbursement Processing		
Intercompany Accounting	Revenue Recognition & Assurance	Query Management		

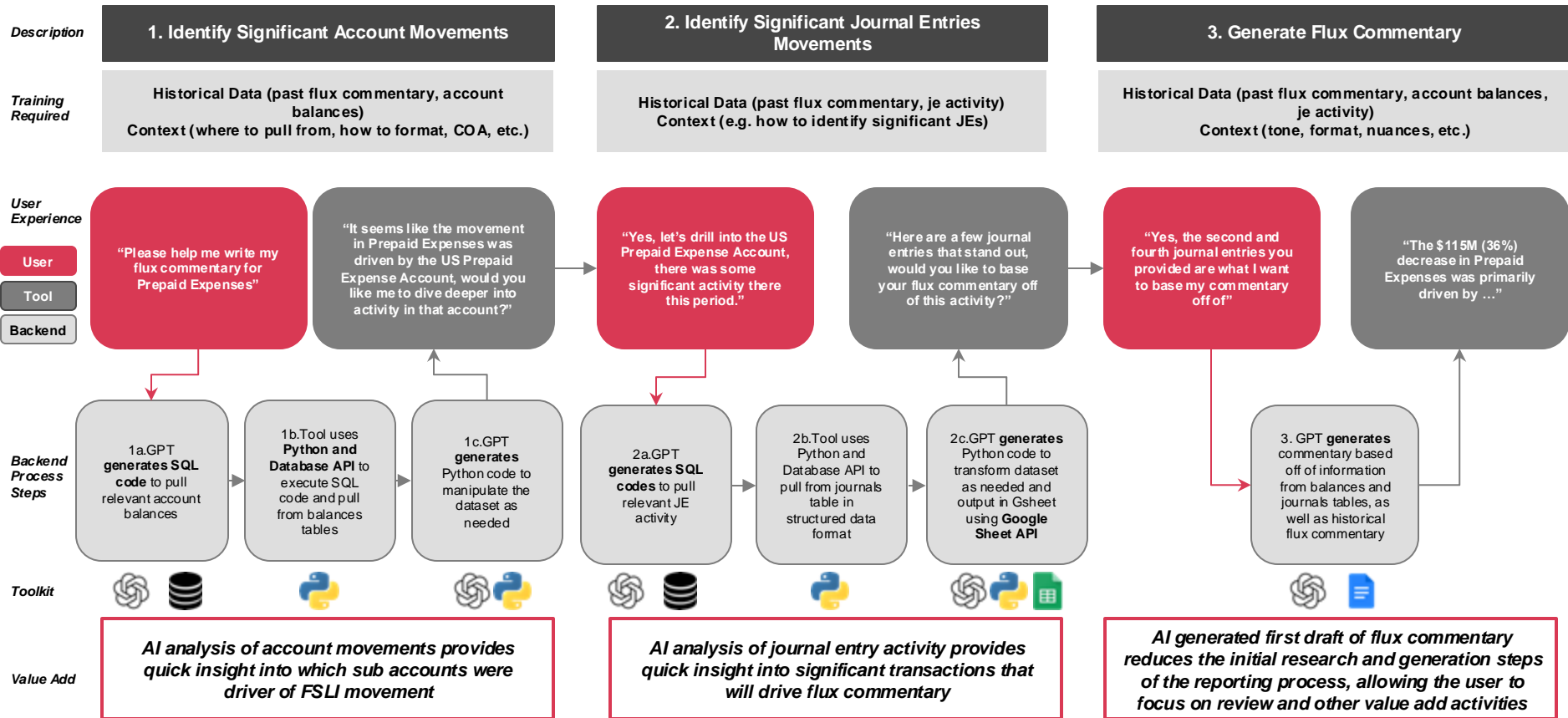
Since everyone loves use cases and case studies, here's a couple

Use Case	Variance Analysis and Commentary Generation	Contract Review and Key Term Processing	Journal Entry Creation
Current State	<ul style="list-style-type: none"> Manually review and analyze data to produce commentary Significant time spent drafting correct wording 	<ul style="list-style-type: none"> Manually search large volume of texts for key terms with financial and accounting implications Manually create tracking documents 	<ul style="list-style-type: none"> Manually analyze various data sources (e.g. POs / invoices / bills) to determine journal amount
What Can Gen AI Do?	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Transform numerical data into text</p> </div> <div style="text-align: center;">  <p>Produce written commentary</p> </div> <div style="text-align: center;">  <p>Uncover new insights</p> </div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Identify key terms within contracts</p> </div> <div style="text-align: center;">  <p>Summarize key terms and implications</p> </div> <div style="text-align: center;">  <p>Transform text into structured data</p> </div> <div style="text-align: center;">  <p>Create tracking doc / new drafts</p> </div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Extract relevant activity from the period</p> </div> <div style="text-align: center;">  <p>Summarize key information</p> </div> <div style="text-align: center;">  <p>Transform numerical data into text and vice versa</p> </div> <div style="text-align: center;">  <p>Creation of journal entry</p> </div> </div>
Key Benefits	<ul style="list-style-type: none"> Reduction in effort to produce commentary, flux, etc. Deep insights for strategic decision making 	<ul style="list-style-type: none"> Reduction in effort and time to review contracts for key terms Structured tracking and ability to generate new drafts 	<ul style="list-style-type: none"> Requires less manual effort to generate journal entry Faster review and eventual JE booking

AI Assisted Generation of Flux Commentary



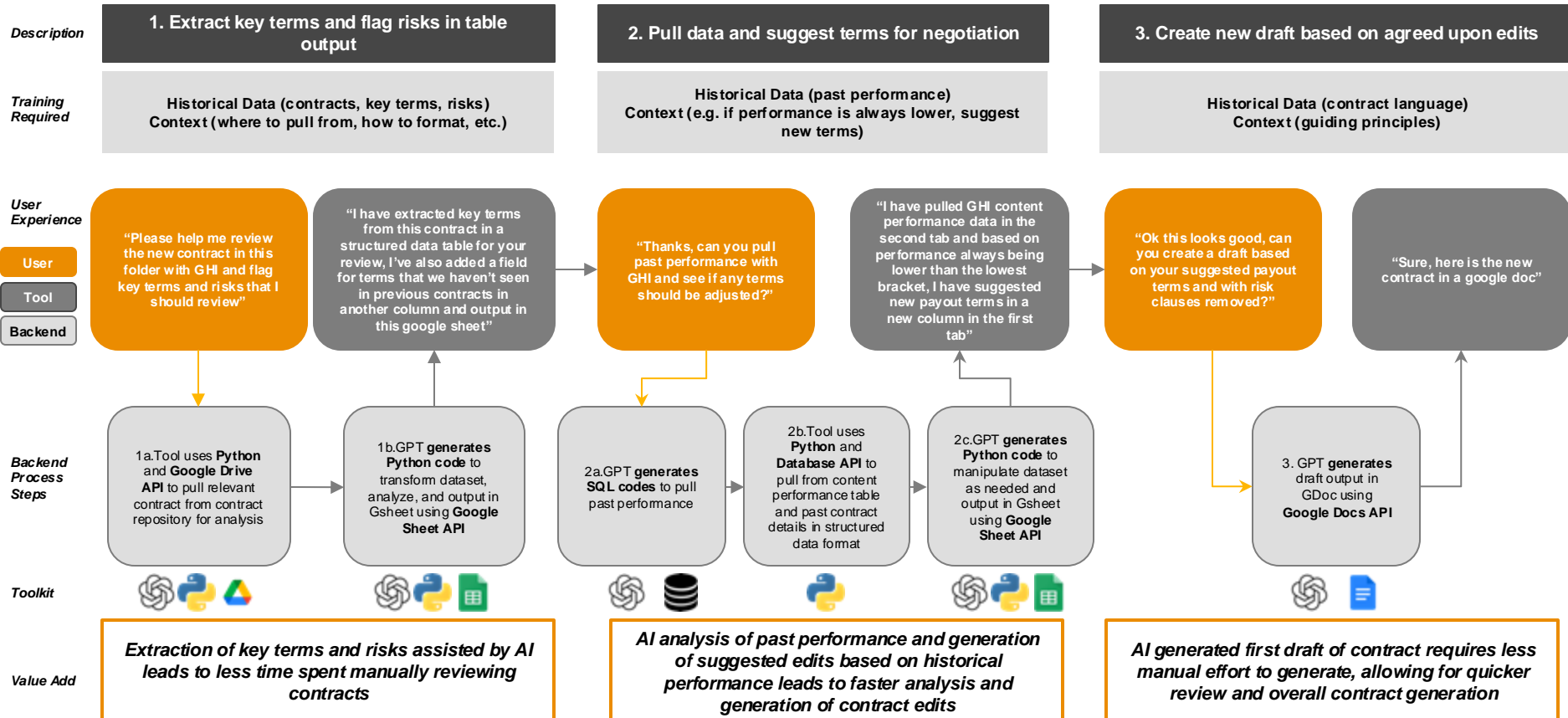
Example of what the user experience may look like with a tool that helps generate flux commentary using a LLM and potential steps to develop the application



AI Assisted Contract Review and Generation



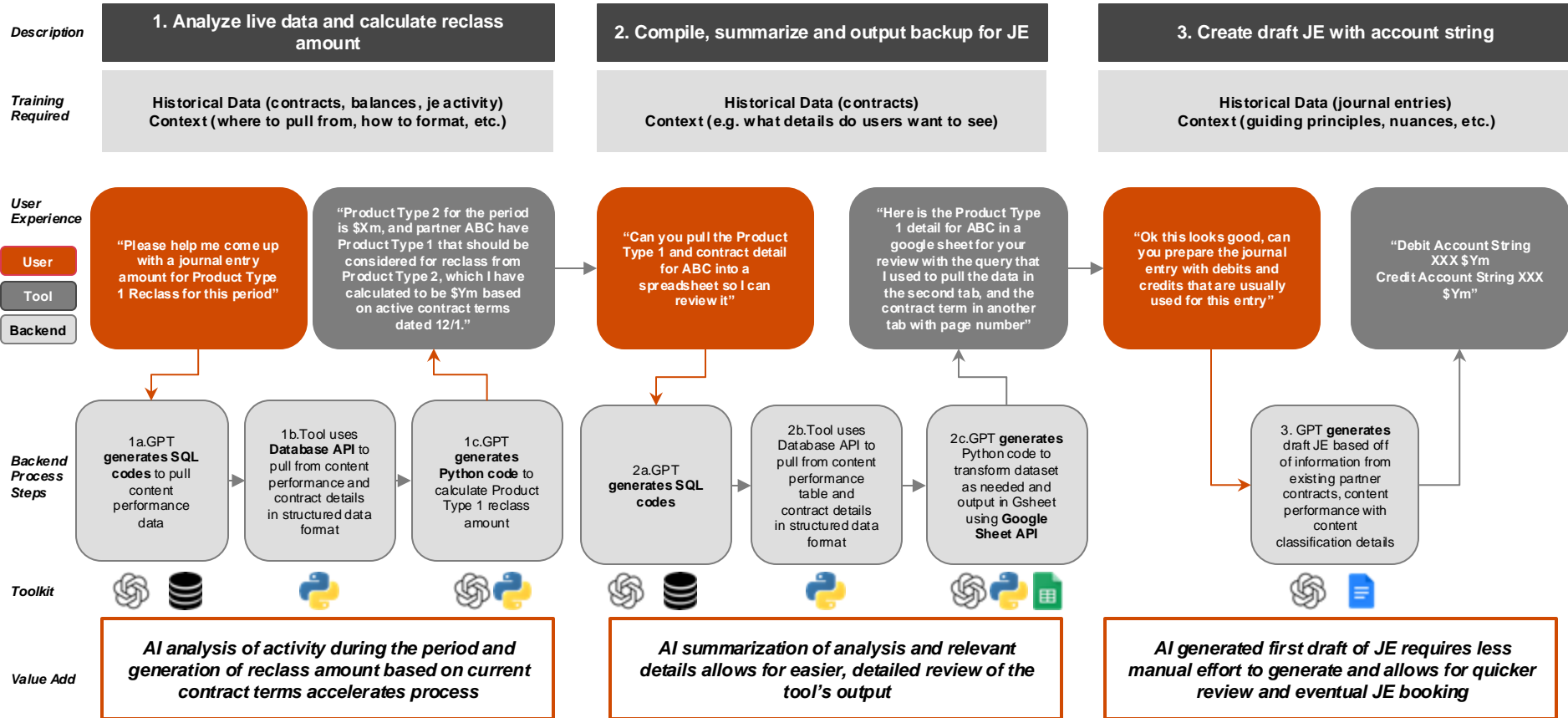
Example of what the user experience may look like with a tool that helps generate contract terms using a LLM and potential steps to develop the application



AI Assisted Generation of Reclass JEs



Example of what the user experience may look like with a tool that helps generate reclass journal entries using a LLM and potential steps to develop the application



3

Risk and
Governance

What is **the risk?**

Rapid progress and complexity of generative AI solutions is prompting discussions on regulations - each implementation must consider the risks with the rewards



DALL-E 2 Generated image with prompt "digital art - robot making a mistake in calculation and is sad"

Some of the known risks

Unintended bias

Models can inadvertently learn and perpetuate biases present in their training data

Intellectual property and plagiarism

Generative AI may produce code that closely resembles existing copyrighted code, leading to intellectual property disputes

Dependency on AI-generated solutions

Over-reliance on AI-generated code may reduce the adaptability and resilience of software development teams, as they become more dependent on such tools

Security vulnerabilities

Generative AI tools can be exploited to automatically generate and inject malware or other security threats into software applications

Strategic Considerations...

Automate tasks **NOT Decisions**

Code or other executables must follow strict **human review procedures**

Automation must be used strategically - some repetitive tasks train staff for more complex activities

Evaluate larger **economical implications** as the technology gets broadly rolled out

Strategically protect creative fields (art as well as science)

In the face of increased regulatory & consumer scrutiny, **organizations must consider the appropriate governance and risk framework**

Organizations considering or actively adopting Generative AI must think through the appropriate governance and risk framework that weighs the following benefits:



Ensuring Safety and Security: Recognition of risks associated with the safety of systems, privacy of users, and data security can protect the business from adverse business implications and can foster public trust in the business and technology



Maintaining Regulatory Compliance: Close monitoring and alignment with evolving regulations will reduce the risk of regulatory fines and litigation



Accelerating Innovation: Effectively defining governance in parallel with technology planning will cultivate the creation and development of new Generative AI innovations without elevating the risk of financial, regulatory, or reputational implications



Creating Cultures of Accountability & Transparency: Organizations can increase trust and encourage ethical applications of AI by promoting transparency for regulators and customers towards how AI is utilized and what risks exist that could create conflicts or the need for accountability

What should you be thinking about today?

How will you approach these AI governance topics?

- Roles, responsibilities and accountability
- Policies and procedures
- AI data usage and AI learning procedures
- Monitoring, testing of the tool and sampling
- Issue identification, management and escalation procedures
- Training of AI staff and development of training materials
- Segregation of duties during AI development, implementation and usage
- Tech risk management capabilities
- Cyber security and data privacy
- Regulatory and internal reporting

Governance Program

- What will your organizations AI governance function and framework look like?
- Who will take ownership of the various aspects of AI usage and development, and how will the owner be accountable?
- How will you keep up to date with regulatory changes, new legal requirements to make adequate changes to AI?

AI System Inventory

- How will your organization keep track of all the AI technology being used across the company?
- How will you stay ahead of new technological developments and the implementation of them into the business?
- How will you manage the usage of AI by third parties which affect your business?

Implementation Into “Business as Usual”

- What parts of your value chain will be affected by the rise of AI?
- How will you determine if AI should replace legacy systems or if it will be a good fit into your business processes?
- Are there parts of your business where AI implementation is too high risk, or likely subject to regulatory scrutiny?

Unintended Consequences

- How will your organization mitigate the risk posed by unintended consequences of AI usage?
- What kind of processes will be implemented to ensure AI systems are using approved assumptions and data?
- How do you ensure AI bias is accounted for in the development and implementation of AI systems?

Development and/or Procurement of AI

- How will you determine if AI programs will be developed internally or by other parties?
- What channels at the organization will take part in the procurement process?
- How do you ensure the ethical and appropriate development of procured AI technology?

Data Privacy & Security

- How do you ensure data used to teach AI, and data used by AI in business processes complies with anti-discrimination laws and regulations?
- What kind of ITGC controls are required to ensure the security and privacy of customer data is maintained?
- How do you mitigate bias in the type of data used by AI?

4

Beyond AI
The New Essential 8

The Essential Eight

In 2016, we first identified the Essential Eight — settling on the crucial shortlist after **analyzing more than 250 technologies in our labs.**

Since then, much has changed.

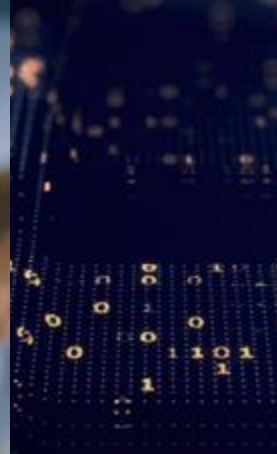
To help businesses assess where to direct strategic investments, we've updated the Essential Eight and organized them into three categories:

Essential to Expand

Essential to Evaluate

Essential to Experiment

Publication: [The New Essential Eight technology trends](#)



THE ESSENTIAL EIGHT

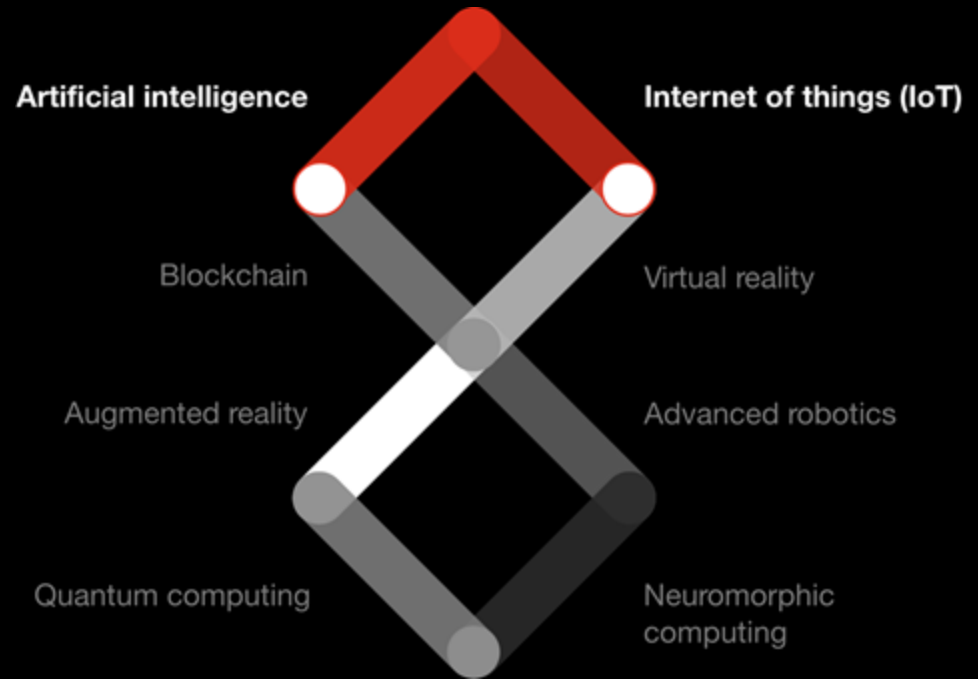
Artificial Intelligence • IoT • Blockchain • Augmented Reality • Virtual Reality • Advanced Robotics • Quantum Computing • Neuromorphic Computing



Essential to **Expand**

These technologies are **used at scale in many enterprises**, and many companies are ready to expand further.

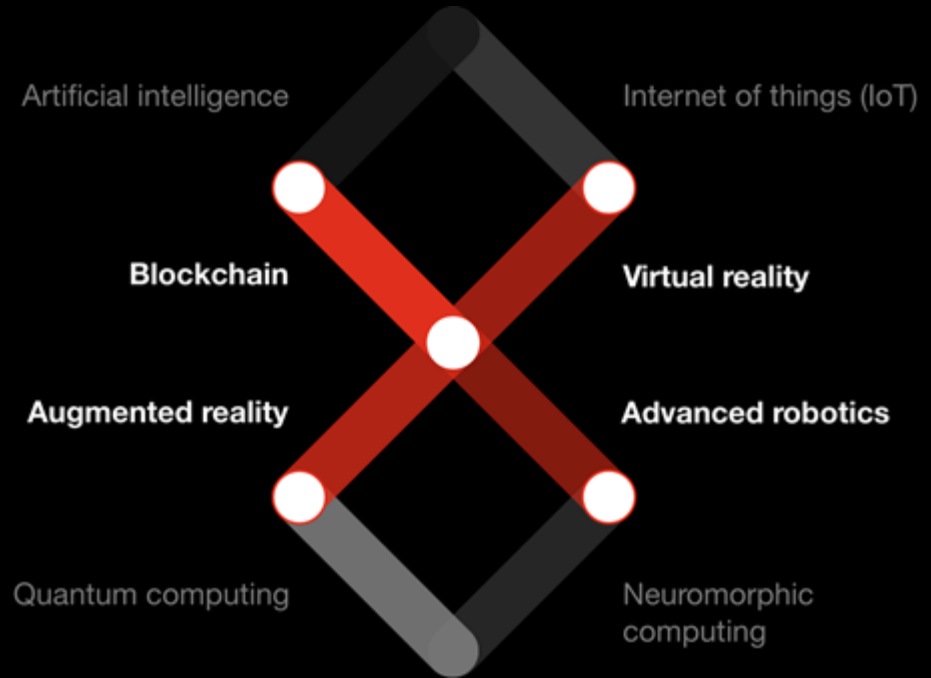
If you're not looking at **more widespread implementation**, you should be.



Essential to **Evaluate**

These technologies are deployed for a growing number of use cases but **may have been back-burnered at some companies.**

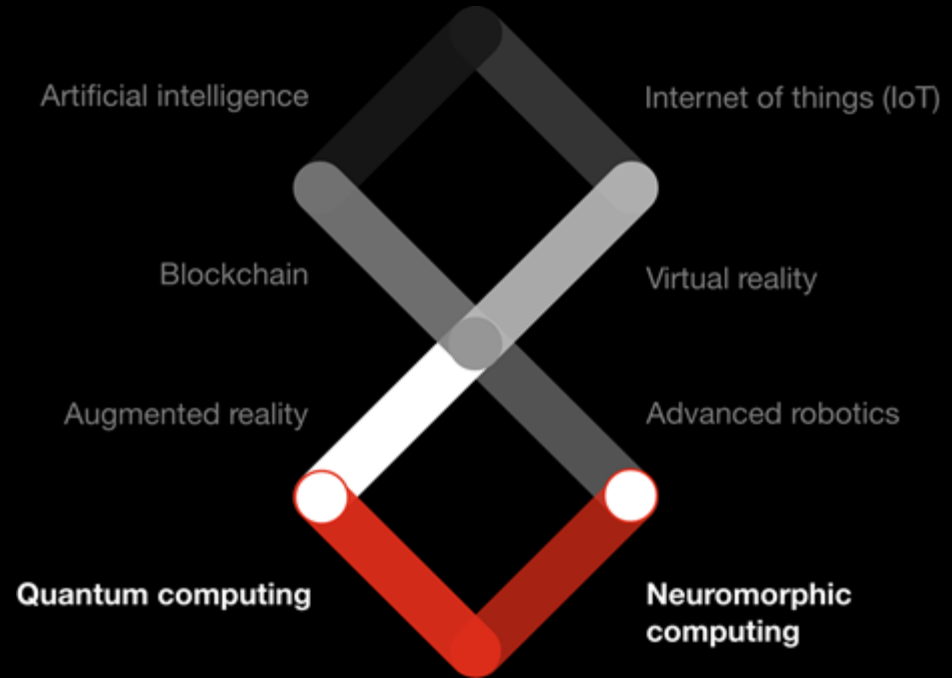
You may want to **reevaluate their fit** within your business strategy given recent advancements.



Essential to **Experiment**

These technologies are highly promising and rapidly advancing but **not yet mainstream**.

It's important to **begin exploration** and consider how your business or industry could be **impacted** by them in the coming years.



2023 Emerging Technology Survey



Between August 16, 2023, and September 13, 2023, we surveyed **1,026 executives in the United States** (468 in business roles, 558 in technology roles) on topics related to emerging technologies.

Respondents are from companies across industries that have **at least \$500 million in revenue**.

This survey shows that a few companies — very few — are getting the proper value out of emerging technologies.

The EmTech Accelerators

Only 7% of survey respondents say they are consistently getting value from their emerging technology investments.

We call this group the **“EmTech Accelerators”**, and they **report significantly higher benefits from emerging technologies in general**, and from GenAI in particular, than their peers.

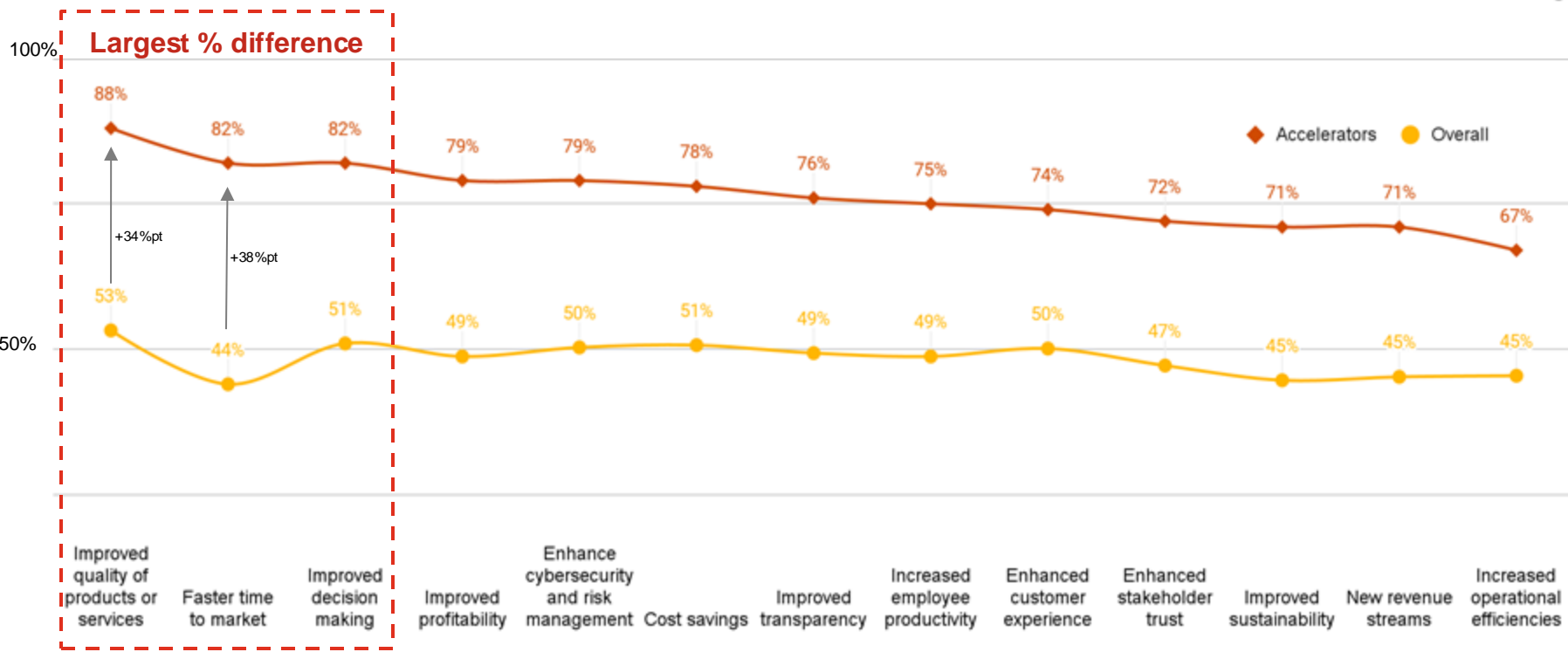
74% of EmTech Accelerators use emerging technology to **expand into new markets**.

72% of EmTech Accelerators strongly agree their company's emerging technology strategy is **integrated with their business strategy**.

They are more likely to be **training their employees on emerging technologies**

Report **higher levels of integration** across the emerging technologies their company has or plans to invest in.

EmTech Accelerators are achieving **greater value** from their emerging tech investments



Q18. Which, if any, of the following benefits has your company achieved or expects to achieve from the use of emerging technologies? Base: All Respondents (1026)
 PwC: US Emerging Tech Survey 2023

5

AI in Classroom

How can you think about using AI as a professor

Between-classes/sections

First time teaching a concept

Excellent students highlight deficiencies

Generating examples



i need a professor who is standing in front of a whiteboard with accounting and/or math formulas written on the board. However, there is also a computer with an AI logo on it that is next to the blackboard, and the point of the image is to make the reader of the slide understand the concept that a professor can actually do her job better when using generative AI in the classroom

How can you think about using AI as a professor

I am an undergraduate professor in a business school teaching advanced accounting. I am teaching students how to understand and analyze a complex business combination. How can I link this to a previous topic about exercising professional judgment when reviewing assumptions used in goodwill valuation?

How can you think about using AI as a professor

Searched 6 sites

Recent guidance and developments in the areas of goodwill valuation and business combinations highlight significant updates from regulatory bodies and standard-setters:

F/ Key Points for Linking to Goodwill Valuation

- In
pr
as
re
- IA
1. **Measurement Period Adjustments:** Under ASC 805, during the measurement period, adjustments to provisional amounts must be recognized in the period they are determined, impacting goodwill valuation and other financial statement elements. This emphasizes the need for accurate initial assumptions and professional judgment (”).
 2. **Disclosure and Transparency:** Both FASB and IASB stress the importance of transparency in disclosures related to business combinations and goodwill. Enhanced disclosure requirements help users of financial statements understand the underlying assumptions and judgments made by management, reinforcing the need for professional judgment in these areas (”) (”).

Th
th
se
fr:

By integrating these recent updates into your teaching, you can help students understand the evolving landscape of business combination accounting and the critical role of professional judgment in the valuation of goodwill. This connection underscores the importance of ethical and informed decision-making in the field of accounting.

financial statements.

vital for their future careers in accounting and finance.

- **Case Studies and Examples:** Use re valuation played a crucial role. Disc

By linking the concepts in this structured manner, students will better understand the practical application of professional judgment in various accounting scenarios and appreciate the interconnected nature of these advanced topics.



How can you think about using AI as a professor

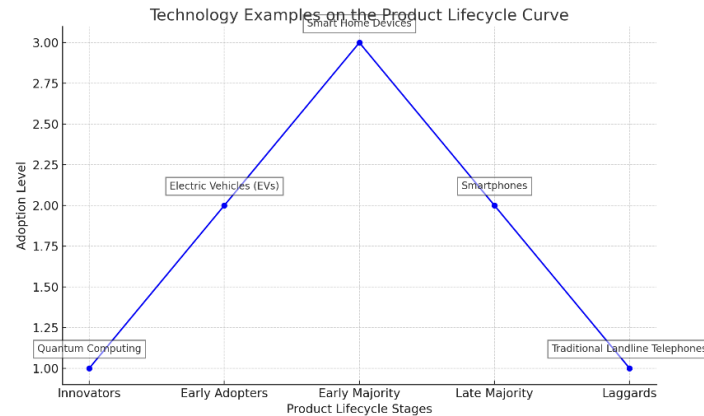
i am a professor in an undergraduate business strategy class. i am teaching about the technology adoption curve and the product maturity lifecycle. can you provide me with 5 examples of technologies at different points on the technology adoption curve or lifecycle? My textbook is from 2010, so the examples included for the students have largely become irrelevant

How can you think about using AI as a professor

going back to the first set of examples you provided, can you make me a nice visual showing those products on a product lifecycle graphic?



Technology Examples on the Product Lifecycle Curve



Here's a visual representation of the technology examples plotted on the product lifecycle curve. This should help illustrate their positions within the different stages of the technology adoption curve for your students. If you need any adjustments or additional details, feel free to let me know! [🔗](#)



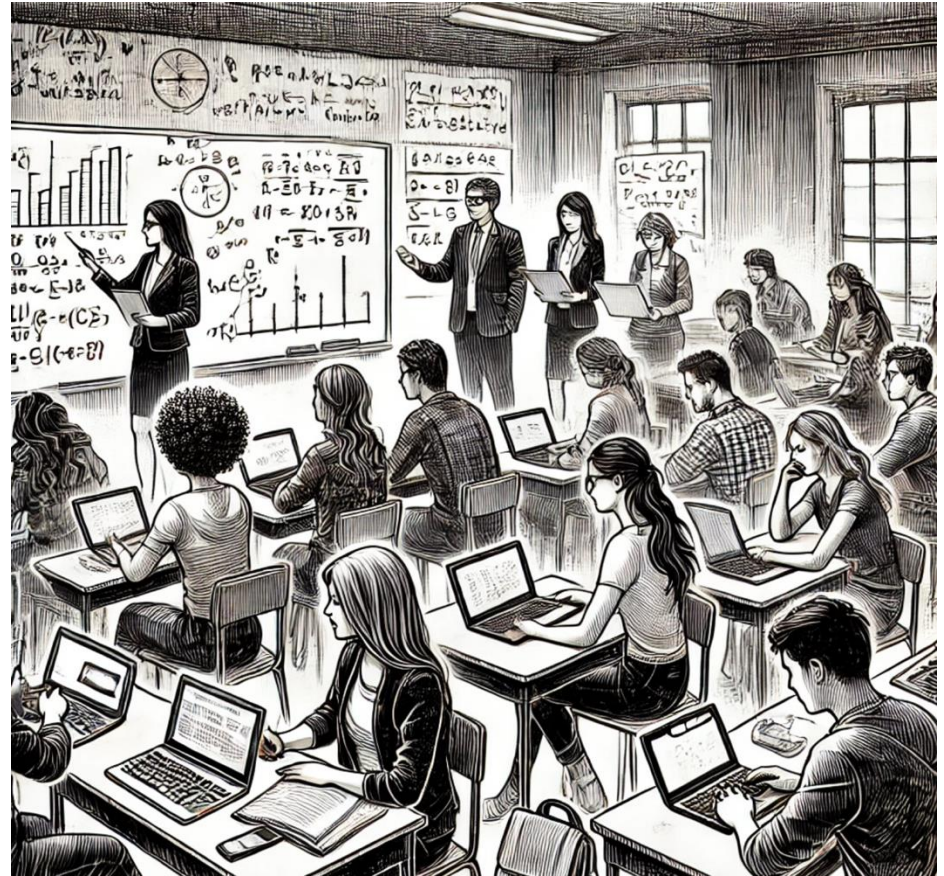


How can you think about using AI as a professor

- Save time consuming creation tasks for known content
- Increase creativity, variety, and/or diversity of examples
- Could it reduce colleague interaction?

How can you help your students appropriately use the technology?

- Prompting
- Writing
- Sounding off



Prompting

Standard Prompting

Model Input



Question: James writes a 3-page letter to 2 different friends twice a week. How many pages does he write a year?



Answer: 624



Question: James has 30 teeth. His dentist drills 4 of them and caps 7 more teeth than he drills. What percentage of James' teeth does the dentist fix?

Model Output



Answer: 37.5%



Chain-of-Thought (CoT)

Model Input



Question : James writes a 3-page letter to 2 different friends twice a week. How many pages does he write a year?



Explanation: He writes each friend $3*2=6$ pages a week So he writes $6*2=12$ pages every week. That means he writes $12*52=624$ pages a year.



Question: James has 30 teeth. His dentist drills 4 of them and caps 7 more teeth than he drills. What percentage of James' teeth does the dentist fix?

Model Output



Explanation: The dentist fixes a total of $4 + 7 = 11$ teeth. To find the percentage, we divide the number of teeth fixed by the total number of teeth and multiply by 100: $11/30 \times 100 = 36.67\%$



Contrastive Chain-of-Thought

Model Input



Question : James writes a 3-page letter to 2 different friends twice a week. How many pages does he write a year?



Explanation: He writes each friend $3*2=6$ pages a week. So he writes $6*2=12$ pages every week. That means he writes $12*52=624$ pages a year.



Wrong Explanation: He writes each friend $12*52=624$ pages a week. So he writes $3*2=6$ pages every week. That means he writes $6*2=12$ pages a year.



Question: James has 30 teeth. His dentist drills 4 of them and caps 7 more teeth than he drills. What percentage of James' teeth does the dentist fix?

Model Output



Explanation: The dentist drills 4 teeth, so there are $30 - 4 = 26$ teeth left. The dentist caps 7 more teeth than he drills, so he caps $4 + 7 = 11$ teeth. Therefore, the dentist fixes a total of $4 + 11 = 15$ teeth. To find the percentage of teeth the dentist fixes, we divide the number of teeth fixed by the total number of teeth and multiply by 100: $15/30 \times 100 = 50\%$





Writing

“And so, I'm a believer that the future is going to be for the folks who can go one level above the generative AI and be even a better writer so that they can edit the AI and they can refine it, be creative enough so that they don't depend on the AI, but they can riff with the AI and then their combined creativity is gonna be that much better.”

Sal Khan, Interview, *ReThinking with Adam Grant*, 15 Aug. 2023

Writing

An example from the classroom...

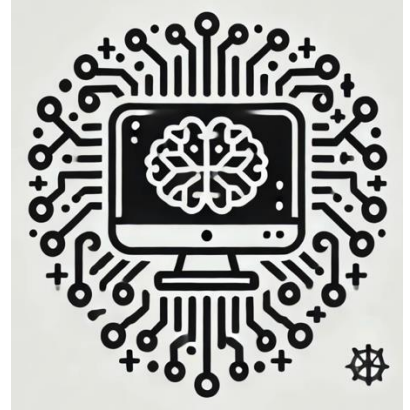
Find an earnings call, listen to the entire transcript, answer some key questions, and write a recommendation to buy or sell the stock.

- Work in pairs (get them to submit the prework)
- Take contrasting points of view
- Answer questions based on those perspectives
- Work collaboratively with AI to develop the memo

Synthesize multiple data points from two perspectives

Experiment with different angles and points of view

Choose which version best captures a single, cohesive point



1. Develop your prompt

- **Give the A.I. a persona.** “Act like...”
- **Give it a task.** “Write a memo...”
- **Insert what you know.** “Include these points...”
- **Specify parameters.**
- **Specify chain of thought.** “Follow these steps...”

Act like a cautiously optimistic investor. Write a memo to your boss advising on whether to buy stock in [company you chose]. Use only the following points: [your top takeaways from the 8 Key Questions]. Do not add information beyond those points. Include the following steps: 1. Write the outline. 2. Revise the outline. 3. Write the memo....

2. Experiment, interact, adjust

Ask the A.I. to...

- a. Expand a point
- b. Incorporate new points
- c. Restructure
- d. Try a new angle, persona, tone...

Example: Rewrite the memo, expanding on the company's operational challenges. We believe that these changes most likely will not make enough of an impact on future profits to outweigh their current shortcomings, so we advise to sell the stock.

Example: Rewrite the memo expanding on all key points, ensuring that each has sufficient analysis. No one point is more important than any other. Continue to emphasize how we believe that the company's efforts will not mitigate current concerns.

3. Return to “Manual” Mode

- Once you’re satisfied with the output, copy the text and all prompts into a separate document
- Work with your partner to shape it into a properly formatted memo
 - Add headings
 - Add opening/closing paragraph, BLUF/TL;DR
 - Add prompt scenarios
 - Add citations
 - etc

4. Document your AI collaboration

- Include in your submission, in this order:
- Revised earnings memo
- Initial AI prompt and all subsequent prompts
- Your working copy (i.e. the “best” or “final” AI output before you went back into manual mode.
- A reflective paragraph about lessons and learnings from collaborating with AI

What actually happened

AI Underperformed at Rhetoric

- Tone
- Slant
- Stress
- Emphasis
- Contextual Awareness

AI mirrored students' ability at Synthesis

- Organizing Data
- Distilling Key Points
- Generating counterpoints
- Linking points together

What actually happened

When it was fed the entire call transcript, it further fell apart

- Critical thinking
- Pattern recognition
- Forming generalizations
- Taking a position based on facts
- Reading its own work (unless instructed)

Takeaways

- AI doesn't write the same way as humans...
Co-develop chain of thought with students
- What students can teach, the AI can carry out...
Train students in skills they need to articulate for AI
- Writing with AI is a fundamentally different, although not necessarily easier, process...
Foreground useful frictions as central to learning and rhetorical awareness

Sounding off

Higher performing students

I asked Chat GPT what the most effective way to fine-tune a DecisionTreeClassifier from Sklearn. It suggested to first start out with a base model evaluation to see initial performance. I **previously had always just jumped straight into tuning parameters**, and **I had never taken the time to actually get a initial performance metric from a model tree, so Chat GPT was very helpful there.**

When asking ChatGPT how I can find the best testing accuracy, it proceed to give me **specific codes on how I would be able to do that**. As well **I could simply copy and past the code** into python then I would be able to insert my own data into the code given. It told me to preform hyperparameter tuning using GridSearchCV.

ChatGPT essentially **expanded my coding toolkit, allowing me to leverage techniques that I understand conceptually**, but do not have the technical ability to code myself.

Sounding off

Higher performing students

This reminds me of **The Professor**, but with less humor!

If I could represent ChatGPT through a metaphor, it would be **my dad** when I need to know how do to my taxes.

I would also describe ChatGPT as congruent with a **smart friend** who likes to withhold information. It knows all of the answers that you are seeking, but sometimes you really have to pry into it (i.e. ask several follow-up questions) in order to get relayed the information that you are looking

If I were to represent ChatGPT through a metaphor it would be this: **a lighthouse in the storm, but a compass gone haywire in calm waters**. ChatGPT provides a very good starting point for idea generation or problem solving (hence the lighthouse in a storm), but when you actually start to attempt to implement ChatGPT solutions or use its ideas without editing them first, you are in trouble (compass gone haywire in calm waters).

Sounding off

Lower performing students

ChatGPT explained things in ways that I didn't fully understand, and after trying to adopt the method it told me to use when I asked how to complete this assignment, **I couldn't fully comprehend how to modify any of the things it was asking me to do, so it made it harder to personalize their suggestions to my liking.**

I started off by provided ChatGPT with the model I was using and the parameters I was using for each model. I would then follow its recommendations for parameter tuning. I found this **moderately helpful as it still took a good amount of trial and error on my end** when it came to tuning the parameters.

I didn't get much use out of ChatGPT. I spent about 90 minutes on this assignment with maybe **10 minutes dedicated to talking to ChatGPT. I basically just used it to explain the different parameters of the DecisionTreeClassifier function.** It offered a **surface level explanation** of how I could improve my performance but was **fairly non-specific**

Sounding off

Lower performing students

If I represented ChatGPT as a metaphor, it would be a **faster and more direct Google**, but it is nowhere near the quality of an actual professor or human.

I envision ChatGPT as an **absent-minded** professor who knows a lot of the theory behind what it is teaching but has little real-world experience with what it is teaching.

It's like a student who **only listens to lectures and reads the textbook but does not think outside of what the teacher teaches or information fed to them.**

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Questions and
Thanks!