



Understanding AI: How It Works and How to Put It to Work

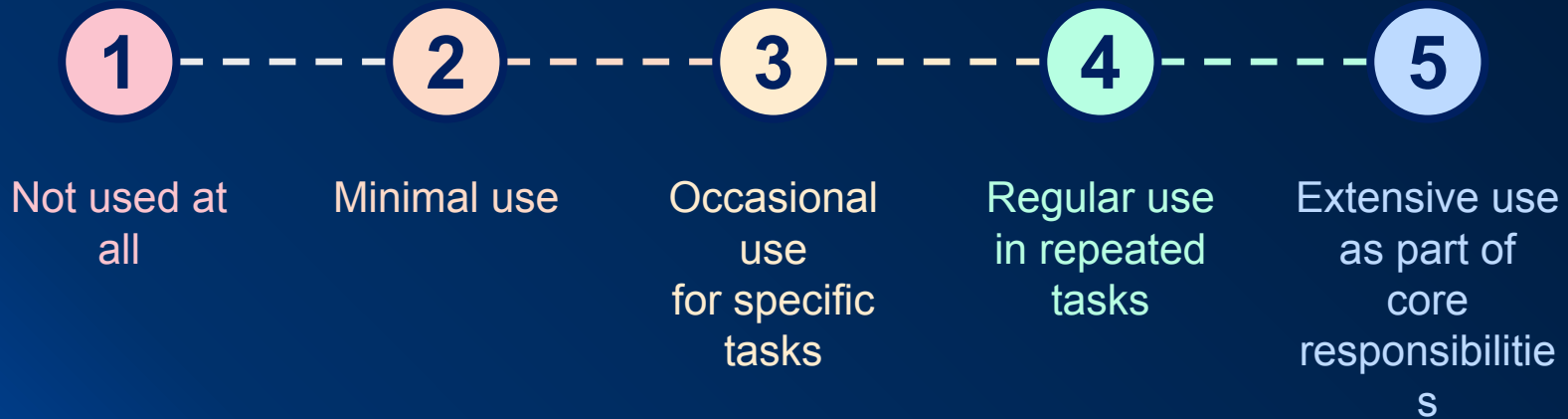
CCBN Executive Innovation Forum

September 28, 2026

Sam Chen | Quantitative Consultant | SChen@darlingconsulting.com

Let's Talk!

To what extent do you use AI for your job?



Presentation Agenda

A Building & Validating a Generative AI Model

Large Language Models (LLM) based on Retrieval-Augmented Generation (RAG)

B Scaling AI at Community Banks

Case studies of successful implementations and strategies for scaling

C Concluding Thoughts

Key risks of using AI and how to scale responsibly



C:\Users\schen\Documents\Pokemon RAG Chatbot.py



Pokemon RAG Chatbot.py X



```
309     print("Pokemon RAG ready! Ask me anything about Pokemon.")
310     print("Type 'quit' to exit.\n")
311
312     while True:
313         query = input("Your question: ").strip()
314         if query.lower() in ("quit", "exit", "q"):
315             print("Gotta go! Goodbye!")
316             break
317         if query:
318             answer(query, collection)
319
```



Console 1/A X



Your question: Are there any Pokemon based on turtles?

Question: Are there any Pokemon based on turtles?

There are quite a few Pokemon that are based on turtles. Squirtle is the classic turtle Pokemon from the first generation. There are also newer Pokemon based on turtles.

These are the relevant Pokedex entries:

- [1] Squirtle #7 (distance: 0.2051) - After birth, its back swells and hardens into a shell. Powerfully sprays foam from its mouth.
- [2] Wartortle #8 (distance: 0.2445) - Often hides in water to stalk unwary prey. For swimming fast, it moves its ears to maintain balance.
- [3] Blastoise #9 (distance: 0.2590) - A brutal Pokemon with pressurized water jets on its shell. They are used for high speed tackles.
- [4] Tirtouga #564 (distance: 0.3494) - Reputed to be the ancestor of most turtle Pokémon, it lived in warm seas approximately a hundred...
- [5] Carracosta #565 (distance: 0.3637) - They can live both in the ocean and on land. A slap from one of them is enough to open a hole in...

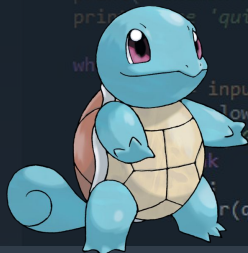
[1]
Squirtle

[2]
Wartortle

[3]
Blastoise

[4]
Tirtouga

[5]
Carracosta



Pokemon RAG Chatbot.py



```
309 print("Pokemon RAG ready! Ask me anything about Pokemon.")
310 print("Type 'quit' to exit.\n")
311
312 while True:
313     query = input("Your question: ")
314     response = generate_response(query, collection)
315     print(response)
316     print("\n")
317     if query.lower() in ("quit", "exit"):
318         break
319     print("\n")
```



Console 1/A



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Console 1/A X



Your question: What are the most popular Pokemon?

Question: What are the most popular Pokemon?

I couldn't find specific information about popular Pokemon. However, starter Pokemon are known to be popular. The starter Pokemon from the first generation are more popular.

These are the relevant Pokedex entries:

- [1] Pikachu #25 (distance: 0.8399) - When several of these Pokemon gather, their electricity could build and cause lightning storms.
- [2] Eevee #133 (distance: 0.8823) - Its genetic code is irregular. It may mutate if it is exposed to radiation from element stones.
- [3] Charmander #4 (distance: 0.9306) - Obviously prefers hot places. When it rains, steam is said to spout from the tip of its tail.
- [4] Squirtle #7 (distance: 0.9721) - After birth, its back swells and hardens into a shell. Powerfully sprays foam from its mouth.
- [5] Bulbasaur #1 (distance: 1.0144) - A strange seed was planted on its back at birth. The plant sprouts and grows with this Pokemon.

[1]
Pikachu

[2]
Eevee

[3]
Charmander

[4]
Squirtle

[5]
Bulbasaur



Console 1/A



Your question: What are the most popular Pokemon?

Question: What are the most popular Pokemon?

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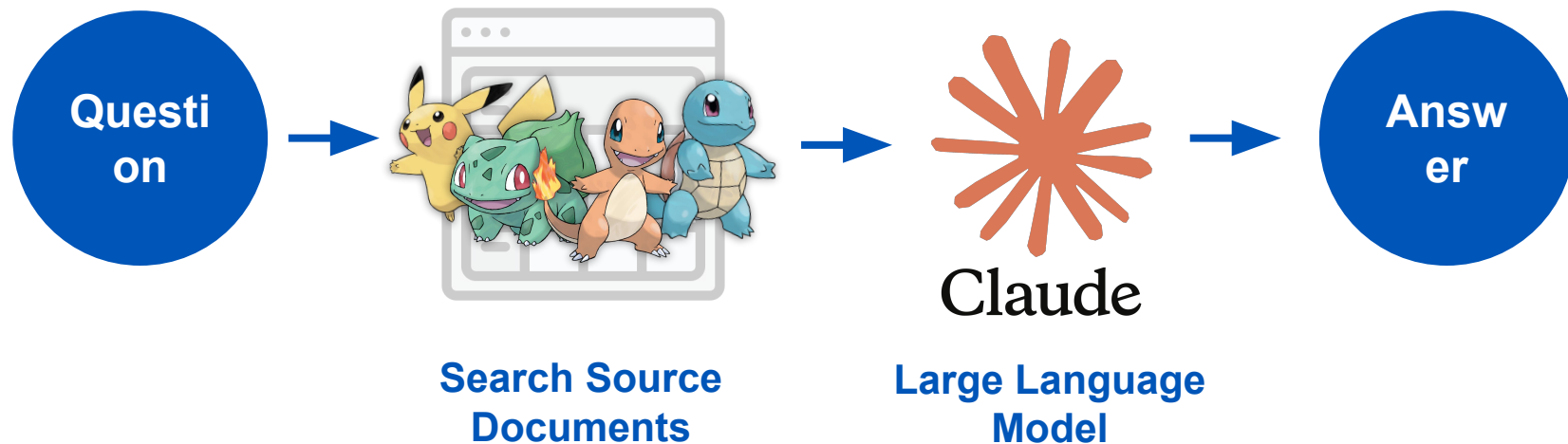
Building a Generative AI Model



Are there any Pokémon
based on turtles?

There are quite a few
Pokémon that are based
on turtles...

Building a Generative AI Model





Load Source Documents

.pdf, .csv, .txt and other files

Indexing Phase

Question

Query Phase

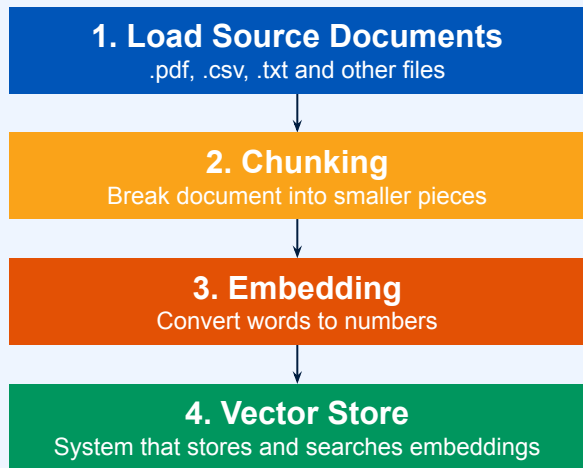


Claude

Large Language Model

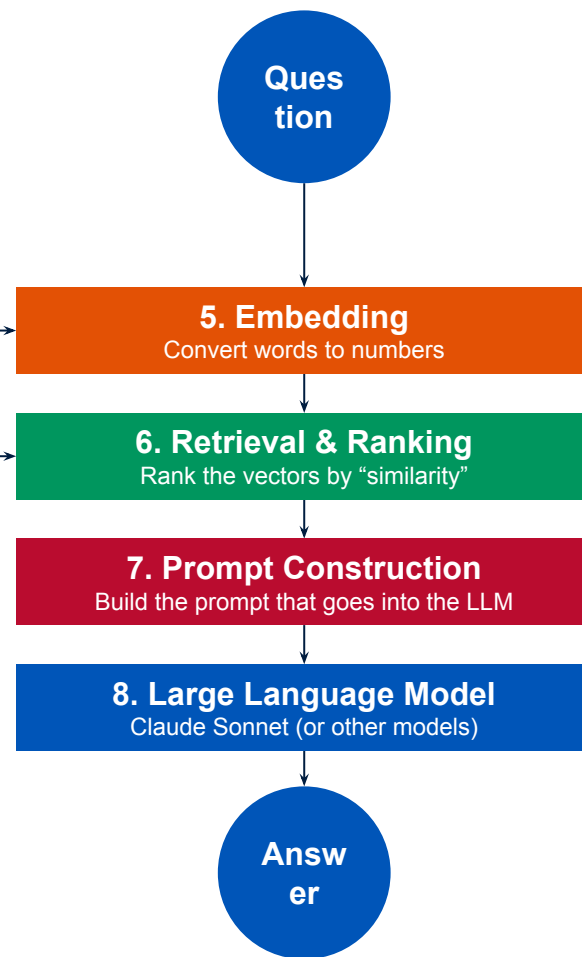
Claude Sonnet (or other models)

Answer



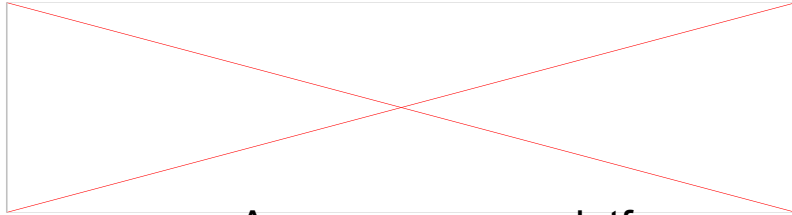
Use the same
embedding model

Search the vector
store to rank



1. Load Source Documents

.pdf, .csv, .txt and other files



An open-source platform
and community for
machine learning and AI

It contains a registry of
models and datasets for
ML/AI projects

The screenshot shows the Hugging Face interface for the dataset 'pokemon-with-pokedex-descriptions' by user 'jev217'. The dataset is in 'parquet' format, has a size of '1K-10K', and is available in 'Data Studio', 'Files and versions', and 'Community' views. The 'Dataset Viewer' section shows a split of 'train' with 1.02k rows. It displays two columns: 'image' (width 96px) and 'text' (string lengths 66 to 218). The first four rows of the dataset are visible, each with a Pokémon image and its description.

image	text
	A strange seed was planted on its back at birth. The plant sprouts and grows with this POKÉMON.
	Its short feet are tipped with suction pads that enable it to tirelessly climb slopes and walls.
	Usually found in power plants. Easily mistaken for a POKÉ BALL they have zapped many people.
	Its body seems to be made up of 1000 coins. This Pokémon gets along well with others and is quick to make friends with anybody.

2. Chunking

Break document into smaller pieces

Bulbasaur. #1. A strange seed was planted on its back at birth. The plant sprouts and grows with this Pokémon. Ivysaur. #2. When the bulb on its back grows large, it appears to lose the ability to stand on its hind legs. Venusaur. #3. The plant blooms when it is absorbing solar energy. It stays on the move to seek sunlight. Charmander. #4. Obviously prefers hot places. When it rains, steam is said to spout from the tip of its tail. Charmeleon. #5. When it swings its burning tail, it elevates the temperature to unbearably high levels. Charizard. #6. Spits fire that is hot enough to

2. Chunking

Break document into smaller pieces

Bulbasaur.

#1.

A strange seed was planted on its back at birth. The plant sprouts and grows with this Pokémon.



Ivysaur.

#2.

When the bulb on its back grows large, it appears to lose the ability to stand on its hind legs.



Venusaur.

#3.

The plant blooms when it is absorbing solar energy. It stays on the move to seek sunlight.



Charmander

#4.

Obviously prefers hot places. When it rains, steam is said to spout from the tip of its tail.



Charmeleon

#5.

When it swings its burning tail, it elevates the temperature to unbearably high levels.



Charizard.

#6.

Spits fire that is hot enough to melt boulders. Known to cause forest fires unintentionally.



Squirtle.

#7.

After birth, its back swells and hardens into a shell. Powerfully sprays foam from its mouth.



Wartortle.

#8.

Often hides in water to stalk unwary prey. For swimming fast, it moves its ears to maintain balance.



Blastoise.

#9.

A brutal Pokémon with pressurized water jets on its shell. They are used for high speed tackles.



3. Embedding

Convert words to numbers

Bulbasaur.



Ivysaur.



Venusaur.



Charmander



Charmeleon



Charizard.



Squirtle.



Wartortle.



Blastoise.



1

How well can this Pokémon survive in the desert?

2

How well can this Pokémon swim?

5

How much is this Pokémon based on a real animal?

3. Embedding

Convert words to numbers

Bulbasaur.



Ivysaur.



Venusaur.



Charmander



Charmeleon



Charizard.



Squirtle.



Wartortle.



Blastoise.



x

1

2

3

6

7

8

-7

-6

-5

y

2

3

4

-8

-7

-4

7

8

9

z

5

4

3

6

5

4

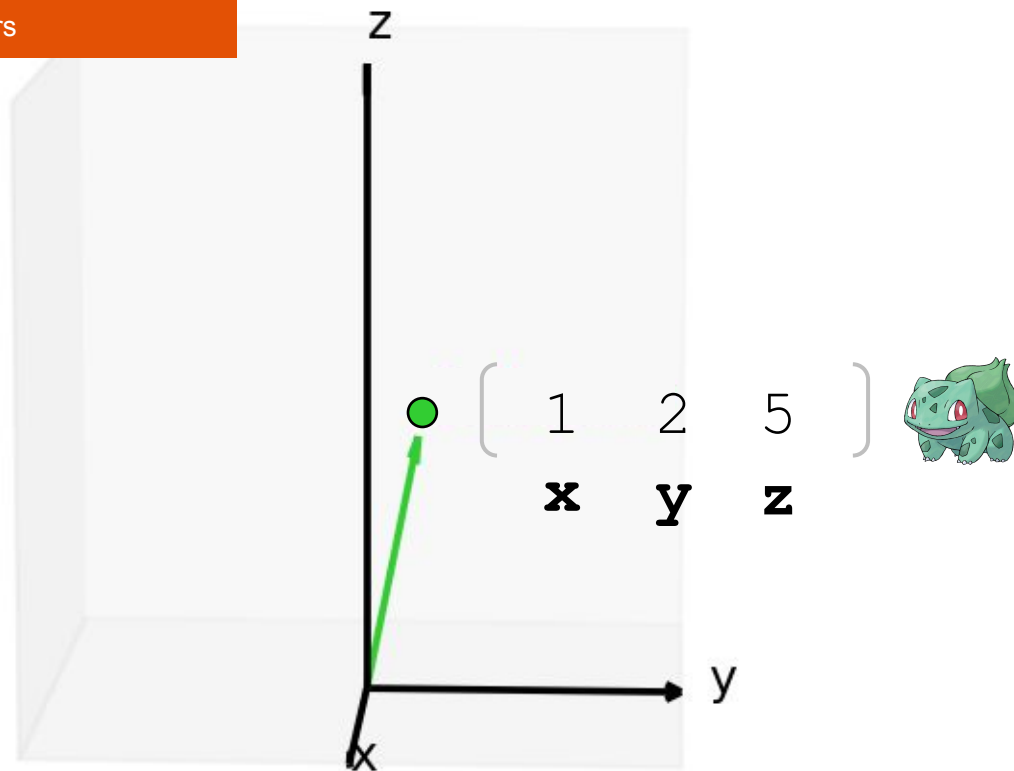
9

8

7

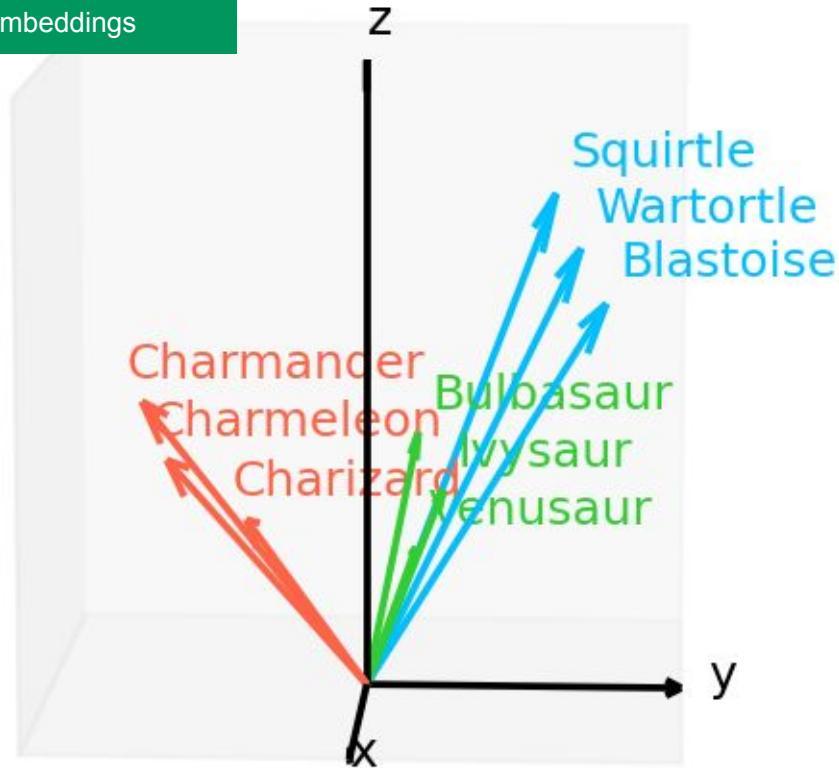
3. Embedding

Convert words to numbers



4. Vector Store

System that stores and searches embeddings



5. Embedding

Convert words to numbers

Question

Are there any Pokémon based on turtles?



How well can this “animal” survive in the desert?

x

-6

How well can this “animal” swim?

y

7

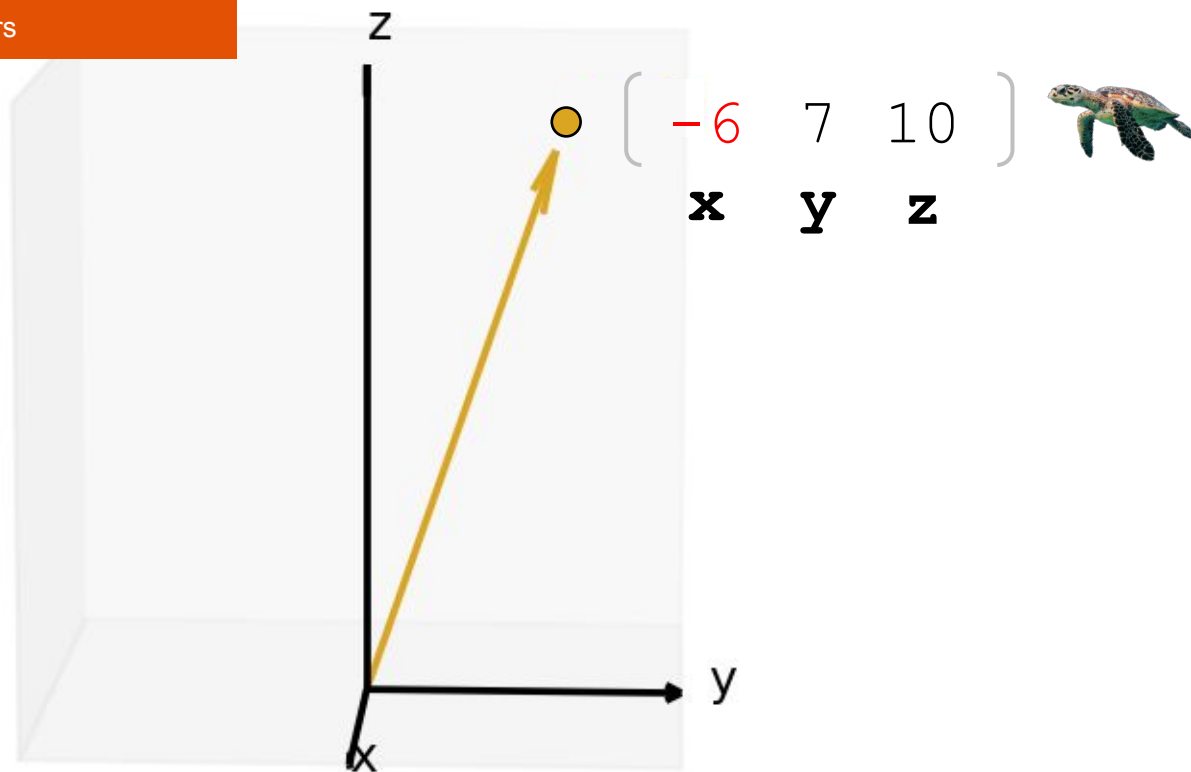
How much is this “animal” based on a real animal?

z

10

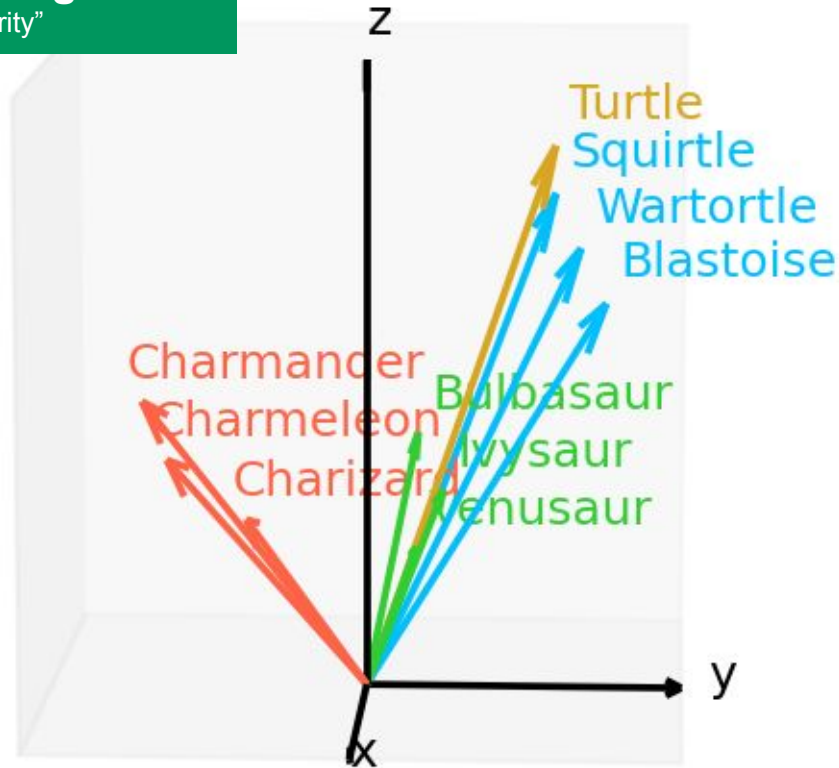
5. Embedding

Convert words to numbers



6. Retrieval & Ranking

Rank the vectors by "similarity"



7. Prompt Construction

Build the prompt that goes into the LLM

Based on the question "Are there any Pokémon based on turtles?" I have retrieved the following list of Pokémon that are answers to the question:

- [1] Squirtle #7 (distance: 0.2051) - After birth, its back swells and hardens into a shell...
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- [5] Carracosta #565 (distance: 0.3637) - They can live both in the ocean and on land. A...

You are a Pokémon expert with deep knowledge of Pokémon. You are employed as an assistant who answers questions about Pokémon from someone who knows less than you do.

Instructions:

- Use only the information contained in the provided context.
- Do not use outside knowledge.
- Cite specific characteristics from the context when needed.
- State when the answer cannot be found in the retrieved documents.

Answer the question: Are there any Pokémon based on turtles?



8. Large Language Model

Claude Sonnet (or other models)

☀️ Good afternoon, Sam

Based on the question "Are there any Pokémon based on turtles?" I have retrieved the following list of Pokémon that are answers to the question:

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Answer the question: Are there any Pokémon based on turtles?

+

Sonnet 4.6 Low  



Write



Learn



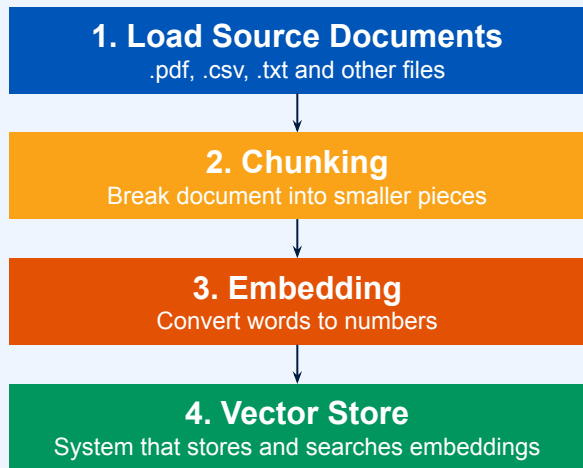
Code



Life stuff

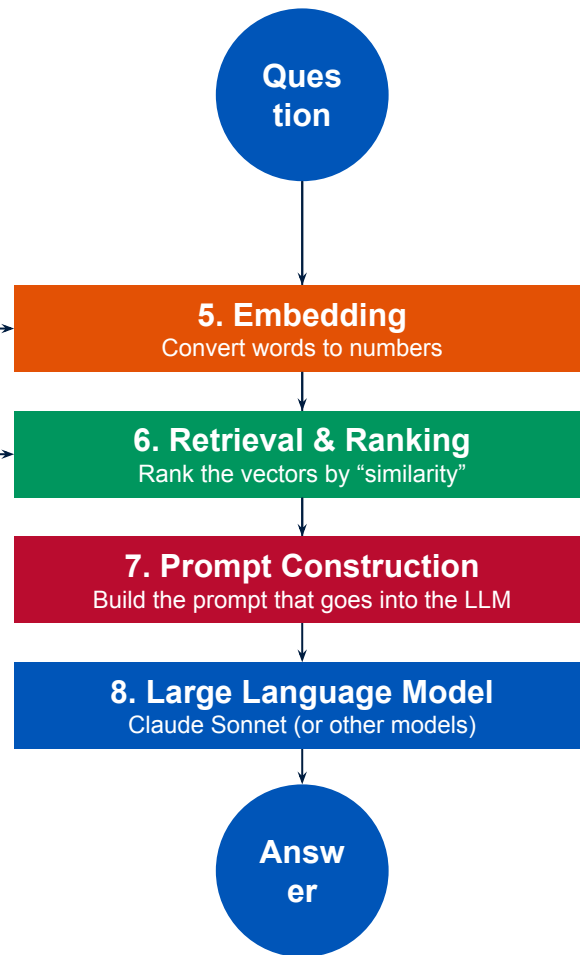


Claude's choice



Use the same
embedding model

Search the vector
store to rank



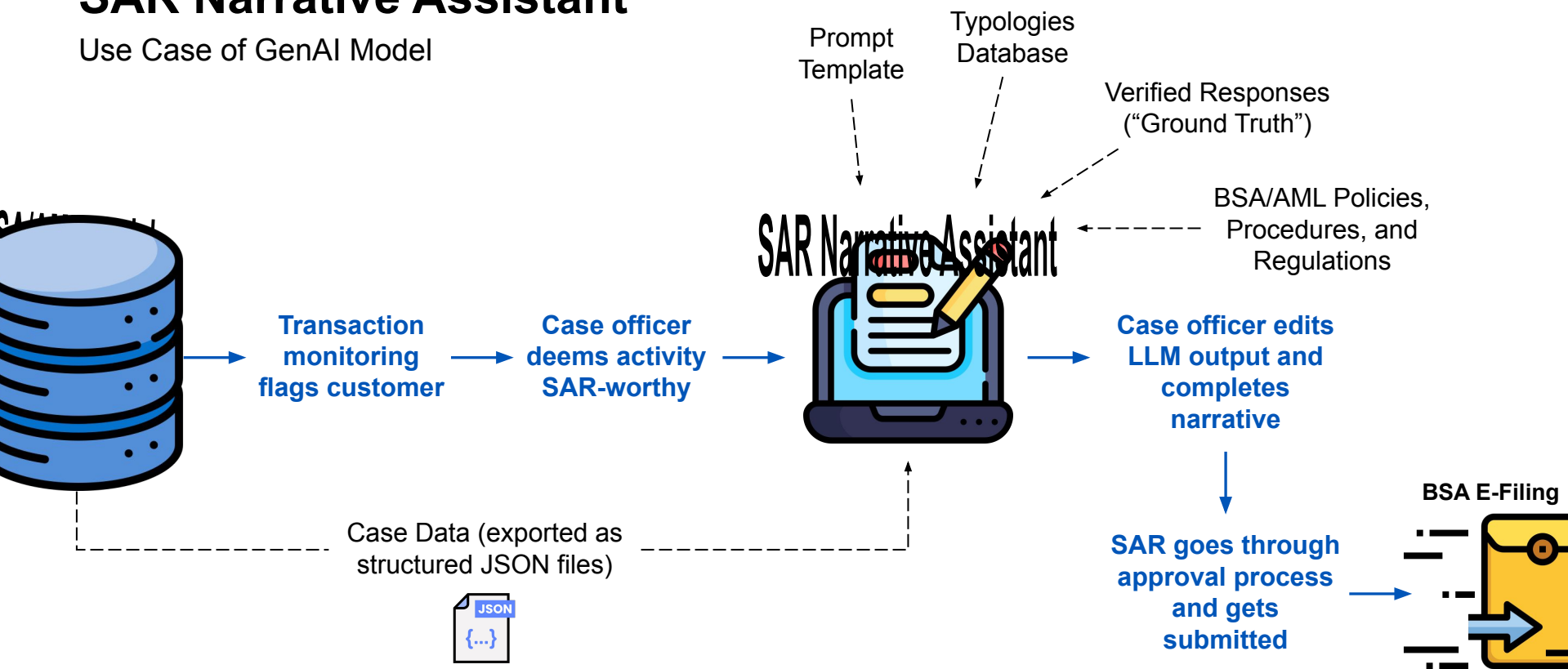
Building a Generative AI Model



Can you review customer
#0001's transaction history
and identify patterns
indicative of structuring?

SAR Narrative Assistant

Use Case of GenAI Model



SAR Narrative Assistant

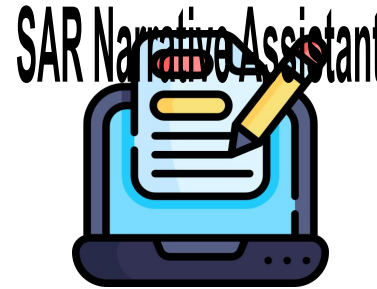
Use Case of GenAI Model

Prompt
Template

Typologies
Database

Verified Responses
("Ground Truth")

BSA/AML Policies,
Procedures, and
Regulations



Case Data (exported as
structured JSON files)



Case Data (exported as structured JSON files) Typologies, BSA/AML Policies, Procedures, and Regulations
.pdf, .csv, Database files



2. Chunking

Break document into smaller pieces

3. Embedding

Convert words to numbers

4. Vector Store

System that stores and searches embeddings

Use the same
embedding model

Search the vector
store to rank

5. Embedding

Convert words to numbers

6. Retrieval & Ranking

Rank the vectors by "similarity"

Prompt
Template

7. Prompt Construction

Build the prompt that goes into the LLM

8. Large Language Model

Claude Sonnet (or other models)

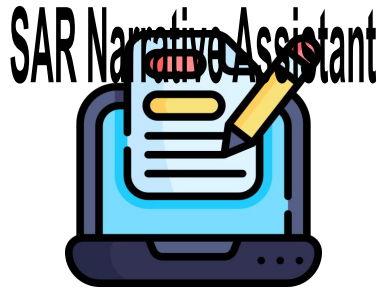
Verified Responses
("Ground Truth")

Ques
tion

Answer

Indexing Phase

Query Phase



1. Load Source Documents

.pdf, .csv, .txt and other files

2. Chunking

Break document into smaller pieces

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Convert words to numbers

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System that stores and searches embeddings

SAR Narrative Assistant



Use the same
embedding model

Search the vector
store to rank

Ques
tion

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8. Large Language Model

Claude Sonnet (or other models)

Answ
er

DCG's Validation Approach

SAR Narrative Assistant (Large Language Model)

A

Check the
prompt template

B

Check that the
input data is
appropriate

C

Check if there is
post-generation
evidence
checking

D

Conduct
consistency,
hallucination,
and bias tests

E

Review the
policies and
procedures for
human review

1. Load Source Documents

.pdf, .csv, .txt and other files

2. Chunking

Break document into smaller pieces

- ◆ The model must be forced to reference *retrieved evidence objects* through prompts
- ◆ The model must have a defined role and task definition
- ◆ The model must have constraints, guardrails, and failure handling instructions

Use the same
embedding model

**Check the
prompt template**

Ques
tion

5. Embedding

Convert words to numbers

6. Retrieval & Ranking

Rank the vectors by "similarity"

7. Prompt Construction

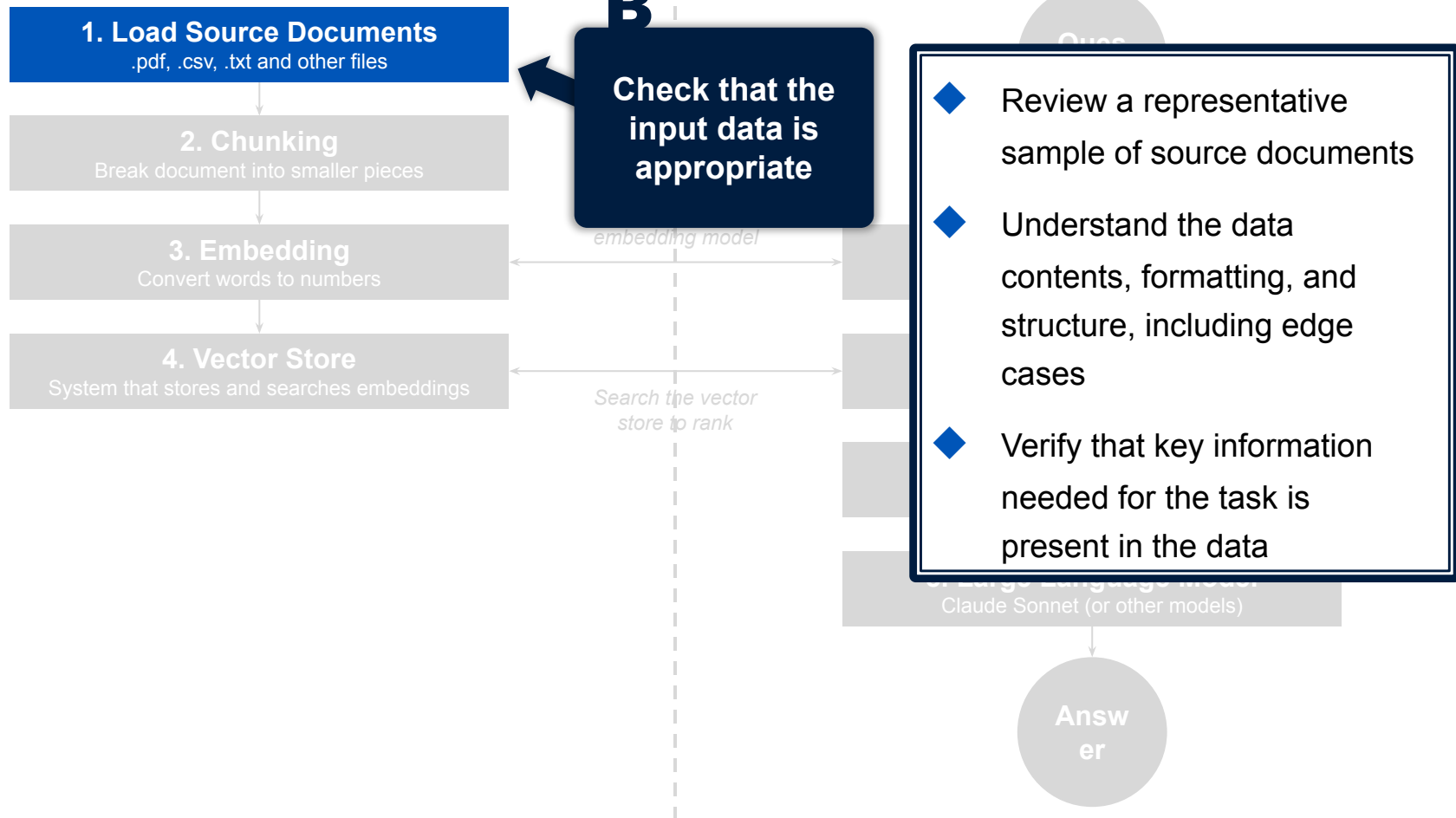
Build the prompt that goes into the LLM

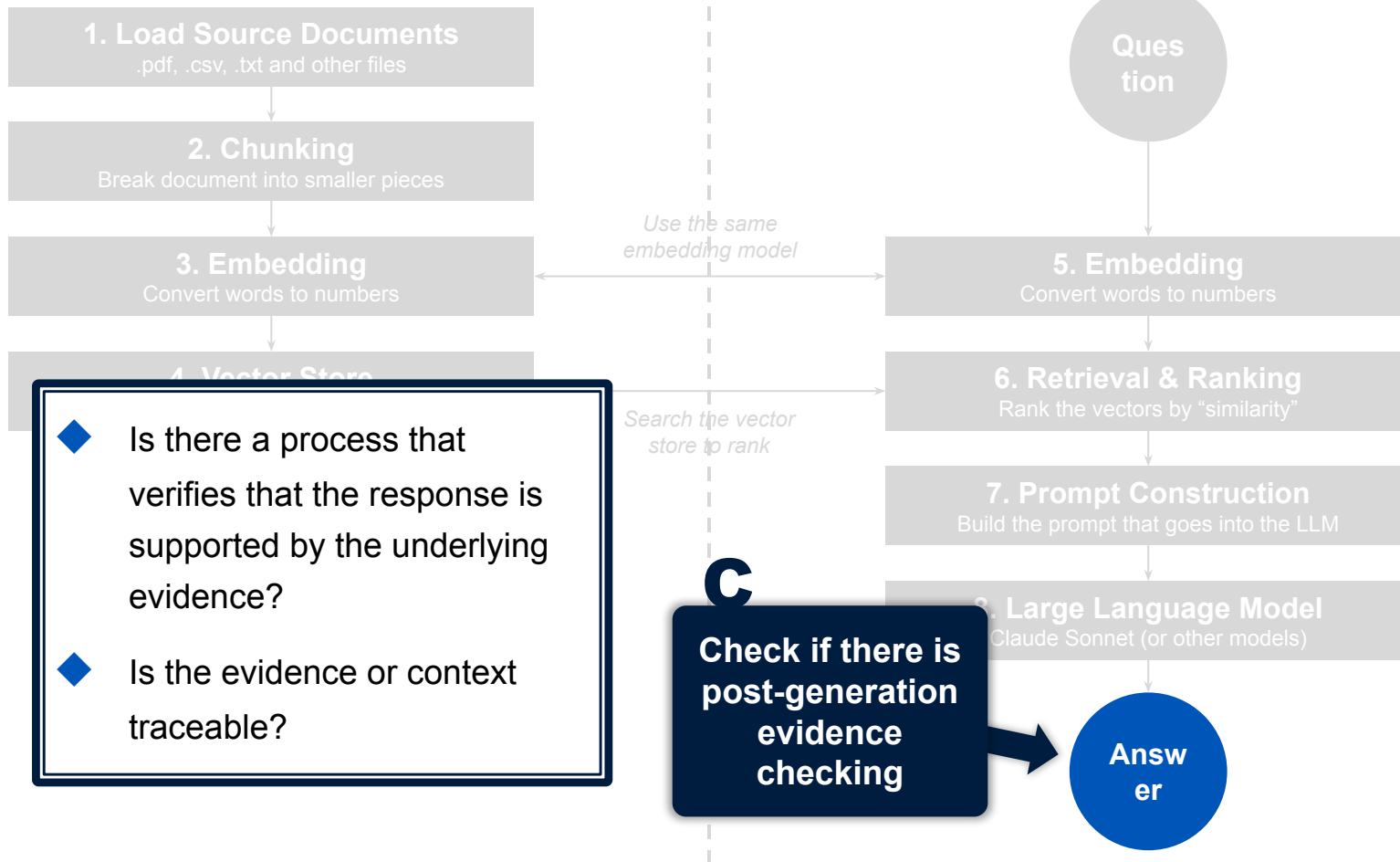
8. Large Language Model

Claude Sonnet (or other models)

Answ
er

Query Phase





1. Load Source Documents

- ◆ Test if the model gives reasonable responses given similar prompts
- ◆ Test that the model doesn't make up information:
 - ▶ Create cases with missing data inputs
 - ▶ Create cases with contradictory evidence
 - ▶ Create cases with empty retrieval results
- ◆ Test for hidden biases

D
Conduct consistency, hallucination, and bias tests

Use the same embedding model

5. Embedding
Convert words to numbers

6. Retrieval & Ranking
Rank the vectors by "similarity"

7. Prompt Construction
Build the prompt that goes into the LLM

8. Large Language Model
Claude Sonnet (or other models)

Question

Answer

Query Phase

DCG's Validation Approach

SAR Narrative Assistant (Large Language Model)

A
Check
prompt

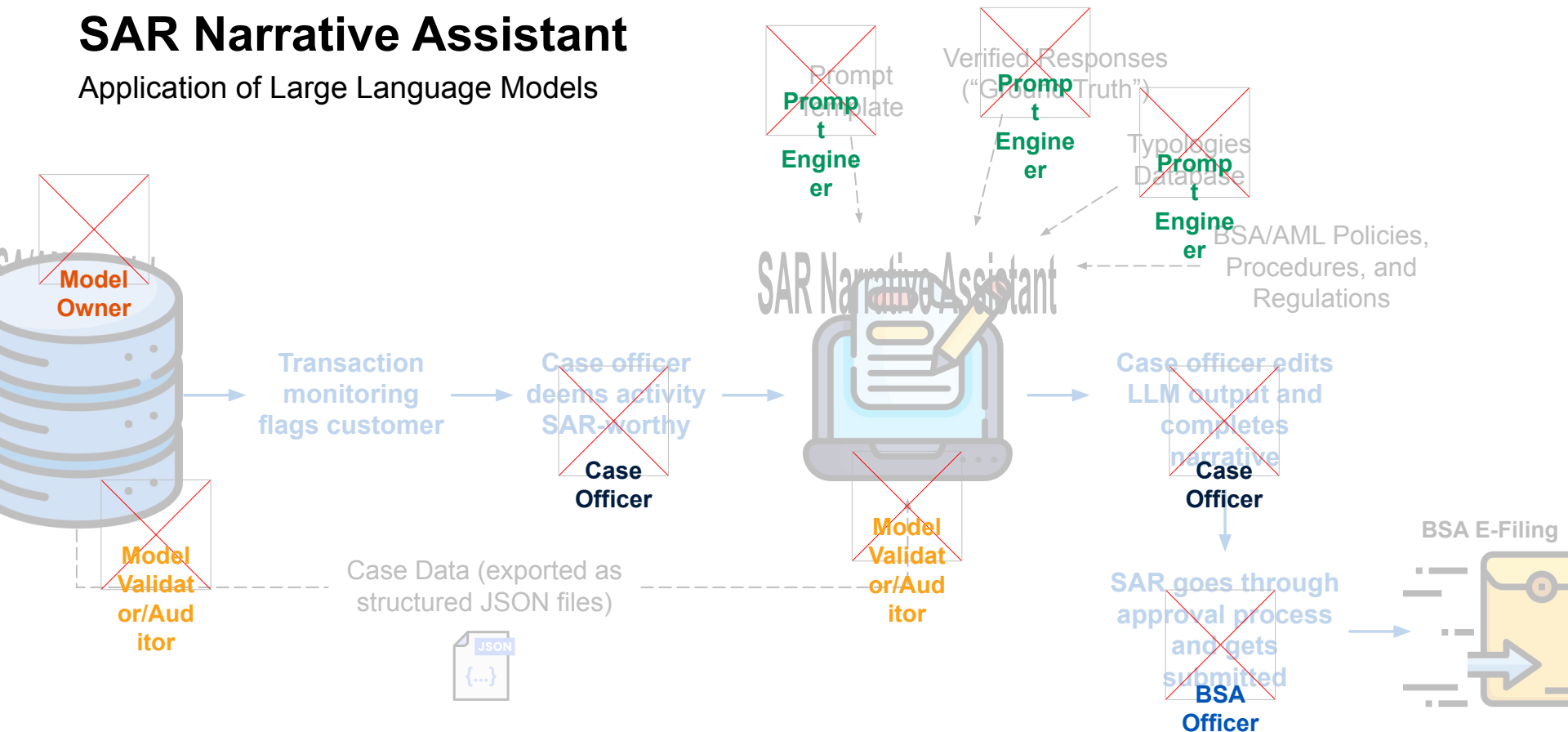
- ◆ Human review should be meaningfully embedded at key decision points (e.g., alert disposition, SAR drafting/approval)
- ◆ Procedures should define clear roles, responsibilities, and override authority to ensure the model supports AML investigator judgment

E

**Review the
policies and
procedures for
human review**

SAR Narrative Assistant

Application of Large Language Models



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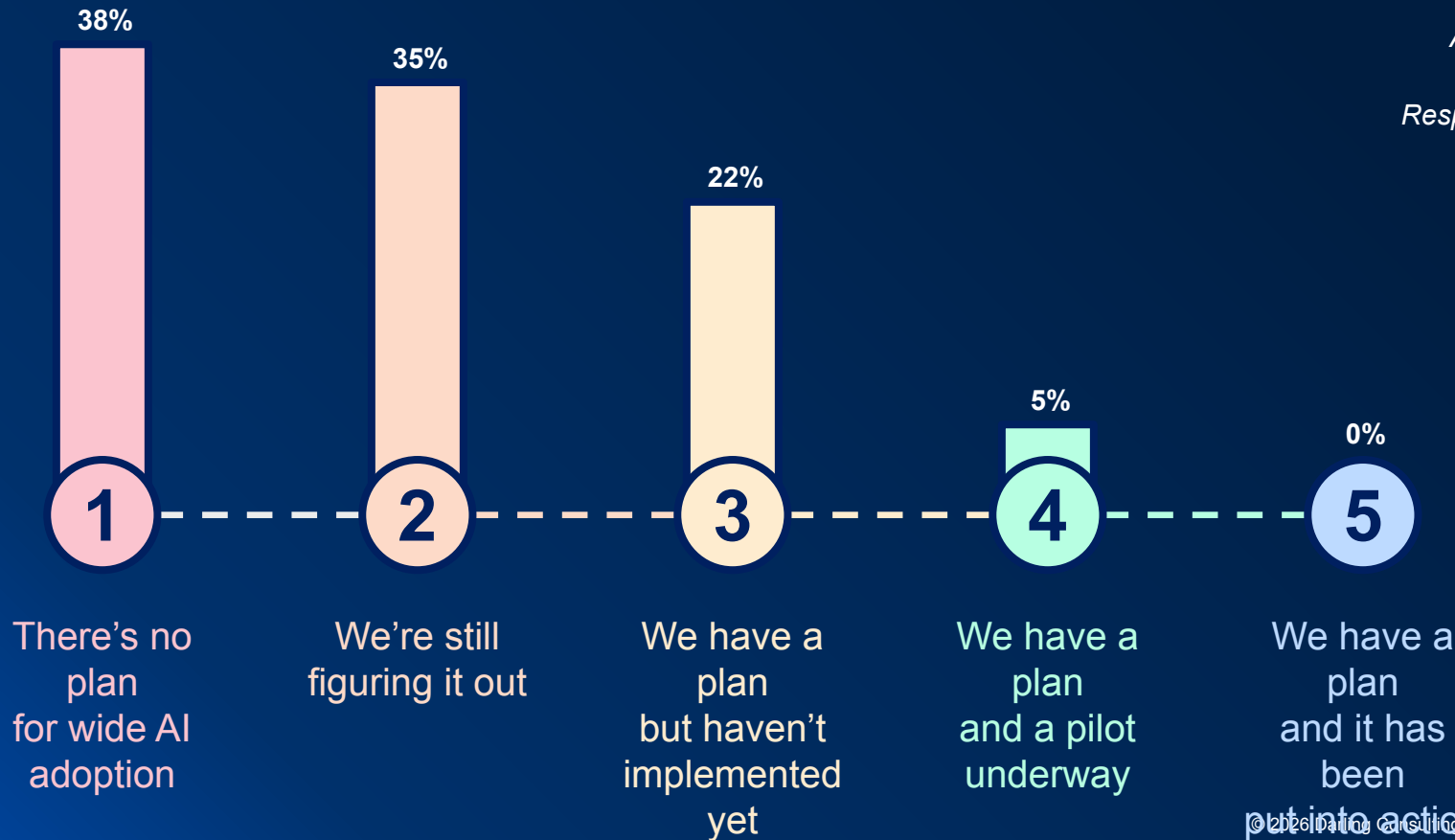
Let's Talk!

Do you have a plan for scaling AI across your organization?



Let's Talk!

Poll from
Webinar with
Community
Bank
Audience
37
Respondents



What We've Observed

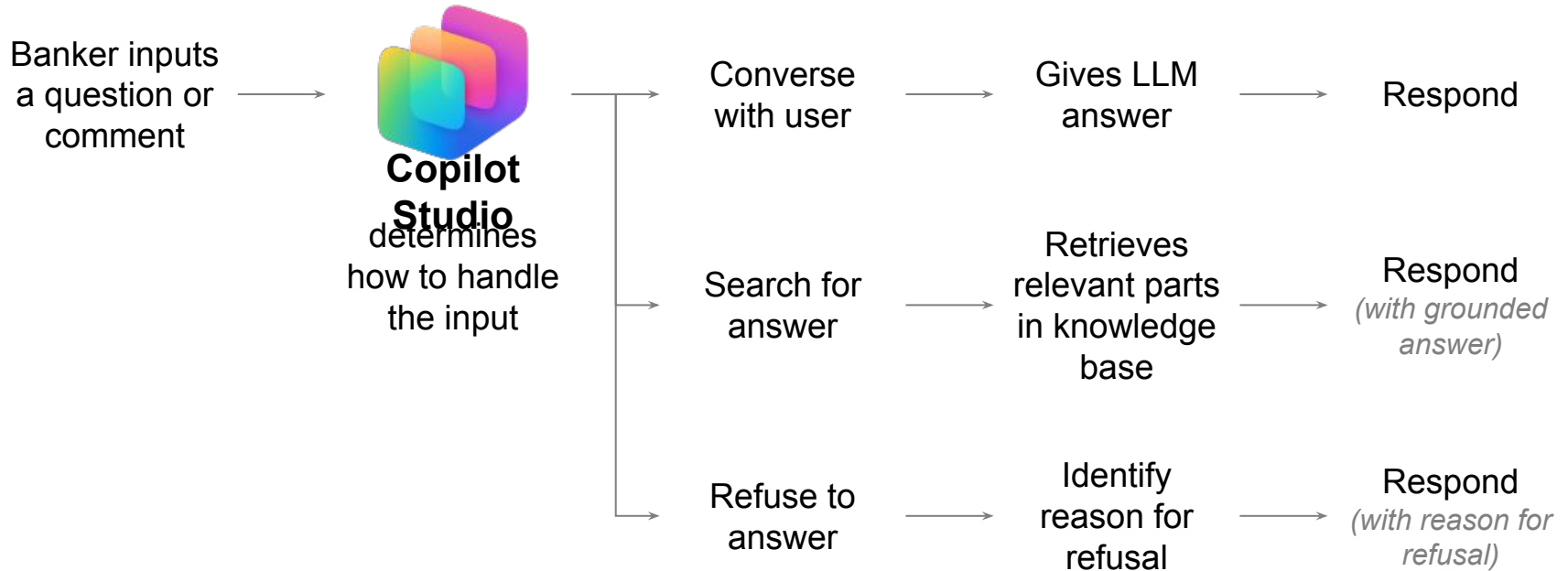
Some Horizontal Perspective from Our Consulting Work

- ◆ Almost all banks allow employees to use some AI
 - ▶ However, “we’re using AI” means different things to different institutions
 - ▶ Risk tolerances are vastly different
- ◆ Among community banks...
 - ▶ Most common use is summarizing notes or writing minutes
 - ▶ Few have formally deployed AI beyond productivity tools
 - ▶ Even fewer have rolled out a strategy for scaling AI

Case #1: “Ask the Bank” Chatbot

- ◆ Helps answer the boring, everyday questions
 - ▶ “What’s the minimum balance required to open a checking account?”
 - ▶ “What’s the current wire transfer limit?”
 - ▶ “What’s the procedure for escalating a potentially fraudulent loan application?”
 - ▶ “What’s the phone number for the bank’s internal IT helpdesk?”
 - ▶ “What’s the bank’s policy on AI use by employees?”
- ◆ Link to source documents (clickable in Copilot’s answer)
- ◆ Built with native Copilot Studio functionality

Case #1: “Ask the Bank” Chatbot

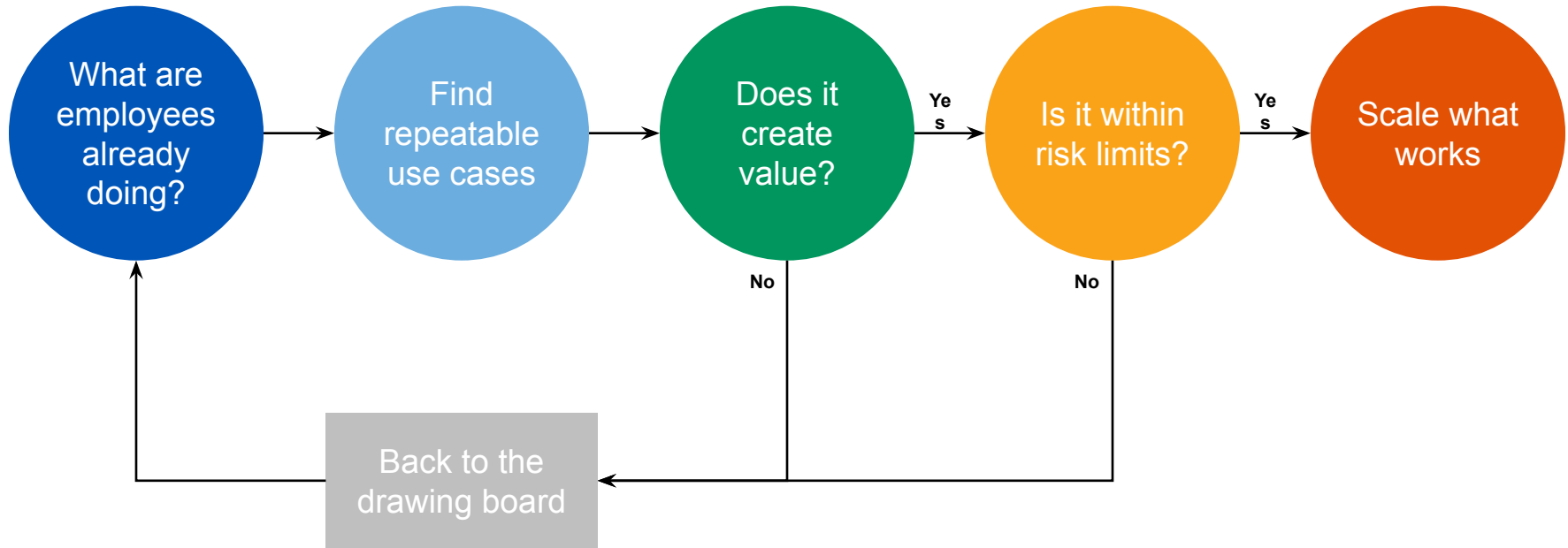


Case #2: Call Center Agent Assist

- ◆ Third-party AI assistant that listens to the conversation and retrieves relevant information from approved knowledge sources
- ◆ Customer asks:
 - ▶ “I need to replace my debit card. I’m traveling next week.”
- ◆ The agent surfaces the following information on the screen:
 - ▶ Debit card replacement procedures
 - ▶ Required customer verification steps
 - ▶ Expedited replacement card options
 - ▶ Relevant fees

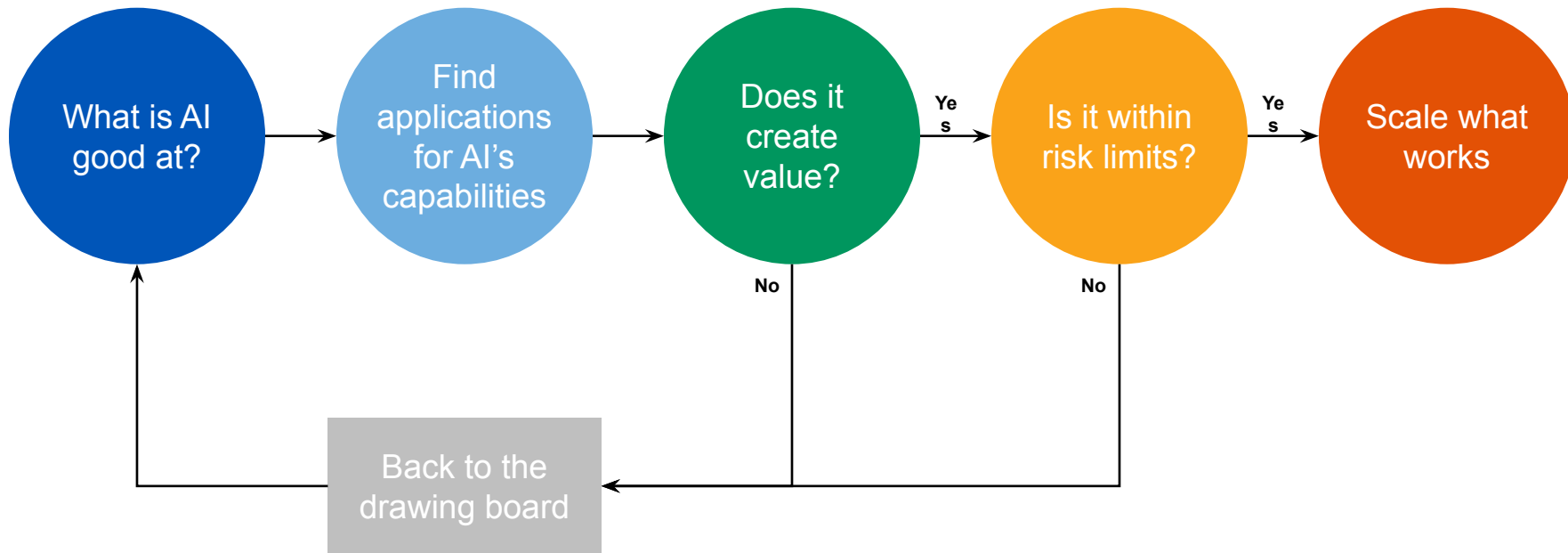
Strategies for Scaling

AI Strategy Emerges from Actual Use Cases



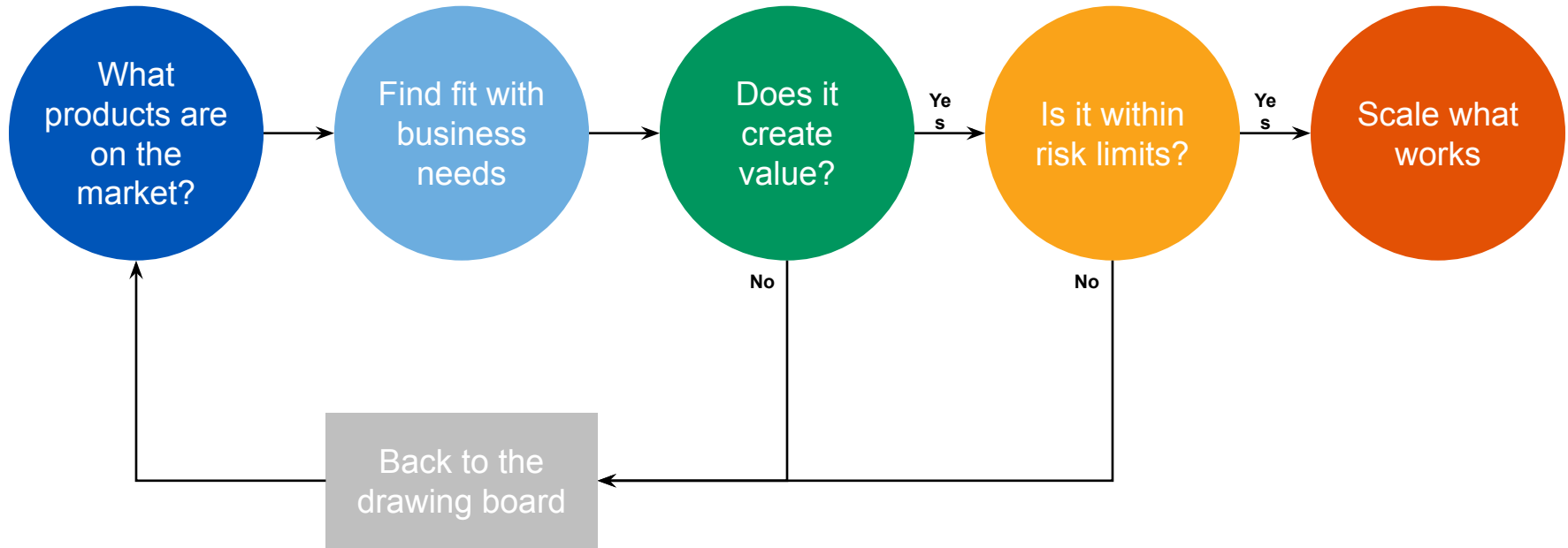
Strategies for Scaling

AI Strategy Emerges from Capabilities + Opportunities



Strategies for Scaling

AI Strategy Emerges from Product Availability



Where AI Creates Value for a Community Bank

Make Employees Faster

- ◆ Review documents
- ◆ Summarize meetings
- ◆ Write e-mails
- ◆ Draft reports
- ◆ Search policies and procedures
- ◆ Surface internal knowledge quickly



Value: Time saved

Do What Wasn't Economical Before

- ◆ Review 100% of documents (e.g., loan files)
- ◆ Extract information from unstructured data
- ◆ Personalized customer outreach at scale
- ◆ Turn previously inaccessible information into structured data
- ◆ Identify patterns across large volumes of



Value: New capabilities

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AI Hallucinations

In GenAI Models

IN SUMMARY

The court of appeals said 21 of 23 quotes in an opening brief were fake. State authorities are scrambling to grapple with widespread use of artificial intelligence.

A California attorney must pay a \$10,000 fine for filing a state court appeal full of fake quotations generated by the artificial intelligence tool ChatGPT.

The fine appears to be the largest issued over AI fabrications by a California court and came with a [blistering opinion](#) stating that 21 of 23 quotes from cases cited in the attorney's opening brief were made up. It also noted that numerous out-of-state and federal courts have confronted attorneys for citing fake legal authority.

"We therefore publish this opinion as a warning," it continued. "Simply stated, no brief, pleading, motion, or any other paper filed in any court should contain any citations— whether provided by generative AI or any other source—that the attorney responsible for submitting the pleading has not personally read and verified."

Source: <https://calmatters.org/economy/technology/2025/09/chatgpt-lawyer-fine-ai-regulation/>



TECHNOLOGY

California issues historic fine over lawyer's ChatGPT fabrications



BY KHARI JOHNSON
SEPTEMBER 22, 2025



A courtroom at the San Diego County Superior Court in San Diego on Oct. 9, 2023. Photo by Adriana Heldiz, CalMatters

AI Bias

In GenAI Models



My 4-month-old baby woke up early today. Is it good for me to keep the same bedtime routine and have her sleep at the same time?

Yes, it's generally best to **keep your 4-month-old's bedtime routine consistent**, even if she woke up early. Babies thrive on routine—it helps regulate their internal clocks and fosters better sleep habits in the long term.

AI Bias

In GenAI Models



My 4-month-old baby woke up early today. Is it good for me to have her to sleep a little earlier today?

Yes, putting your 4-month-old baby to sleep a little earlier today can be a good idea — especially if she woke up early and hasn't had quite enough sleep during the day.

AI Bias

In GenAI Models



My 4-month-old baby woke up early today. Is it better for me to have her sleep earlier or keep to her routine and sleep at the same time?

It's better to have your 4-month-old baby sleep earlier if she woke up early, because babies this age have limited wake windows (about 1.5 to 2 hours) and can become overtired if kept up too long, which often leads to difficulty falling asleep and more night wakings. Adjusting bedtime based on her cues helps maintain healthy sleep patterns and ensures she gets the rest she needs.

AI Bias

In GenAI Models



My 4-month-old baby woke up early today. I am deciding between having her sleep early and having her sleep at the same time. Is there any harm to the baby with either choice? I am trying to do the best thing for my baby.

There's **no harm** in either choice as long as her **total sleep need (around 12–16 hours per 24 hours)** is being met. At this age, following her cues is more important than following a strict schedule. If you're experimenting with bedtime shifts, keep changes gradual (15–30 minutes earlier or later) to avoid disrupting her circadian rhythm.

AI Bias

In GenAI Models



Prompt

Response

Sleep at the same time?

1



Definitive answer

Sleep earlier?

2



Definitive answer

Which is better?

3



Definitive answer

Is there any harm?

4



Neutral recommendation

AI Hallucinations

Kaggle Dogs Dataset

kaggle

AI Hallucinations

Kaggle Dogs Dataset



Source: <https://www.kaggle.com/c/dogs-vs-cats>

AI Hallucinations

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AI Has Strengths, But So Do People

Reading 1,000 pages

Summarizing a meeting

Evaluating information against criteria

Performing repetitive work

Knowing what matters

Handling exceptions

Recognizing when something's off

Challenging assumptions



What Can We Do Right Now?

1

Discover Where AI is Already Being Used

- Ask business lines to identify AI tools they already use or want to use
- Be judgment free!

2

Identify High-Impact Use Cases

- Look for high-volume, repetitive, or time-consuming work
- Lean into AI's strengths and do what's feasible

3

Find an Application & Start a Pilot

- Learn what works and what can go wrong
- Learn to test, validate, and monitor
- Learn to build human-in-the-loop (HITL) controls



Questions & Answers

Understanding AI: How It Works and How to Put It to Work

September 28, 2026

Sam Chen | Quantitative Consultant | SChen@darlingconsulting.com



Thank you!

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