



elastic





GenAI Secure Dynamic Queries for Bank-Scale Data (experiment)

Ario Afrashteh

Tue 26 Nov, 2024

Ario Afrashteh

SE & Java Chapter Lead @ Rabobank

github.com/coditori

linkedin.com/in/coditori

twitter >> 404



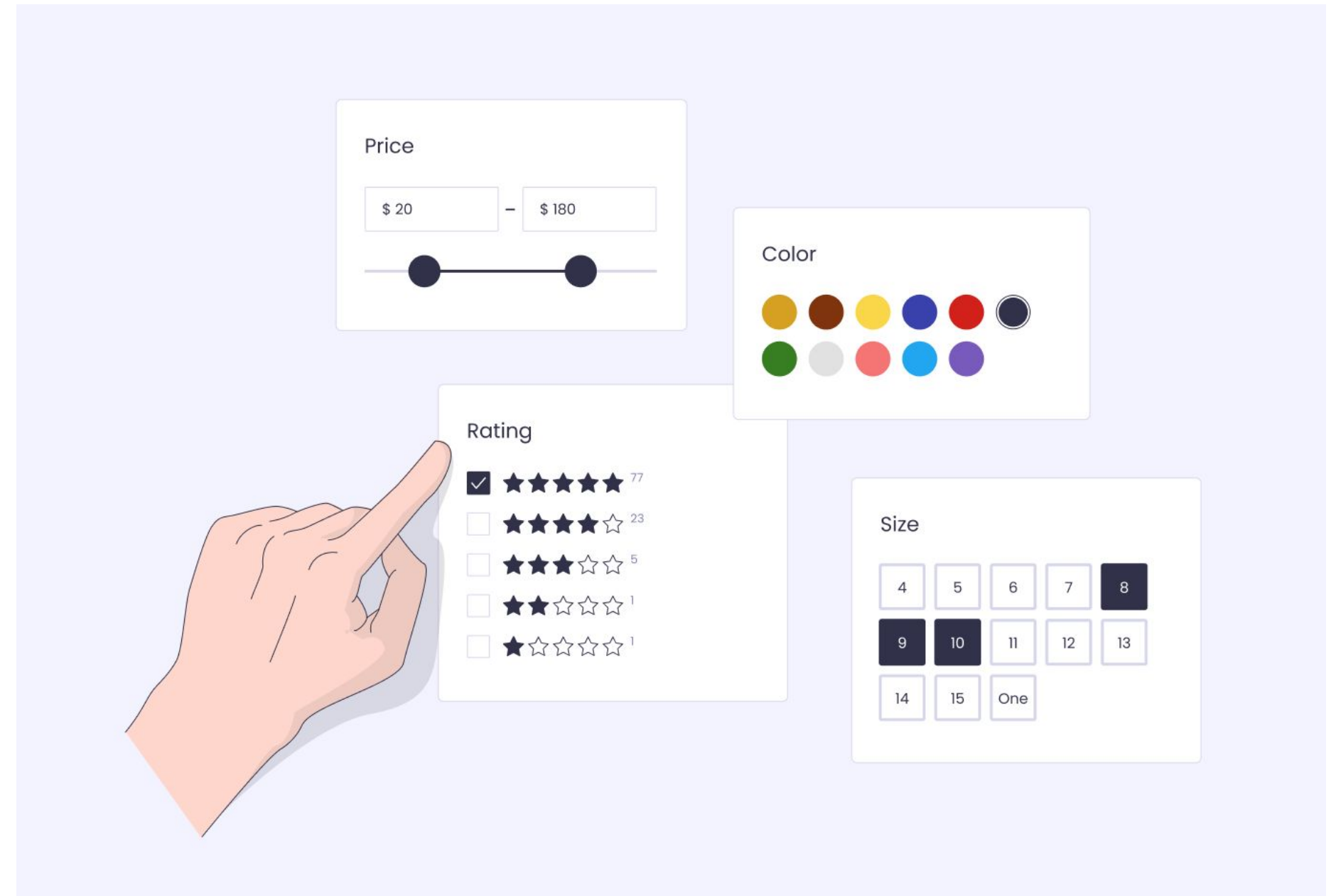
The problem!

Imagine a 16 years old customer, Sarah wants to see her average spendings...



Traditional Search – The Problem

Converting complex financial queries into structured database queries is challenging and often lacks intuitive user experience



The problem!

She is too young to use
spreadsheets!

I am old but she is not



Is it safe?

How safely we can help her?

Sarah: I want to see the average spending for this account number IBAN.....





GenAI & Elastic templates



How much did I spend in the last 3 months for groceries?

What's my monthly average for dining out?

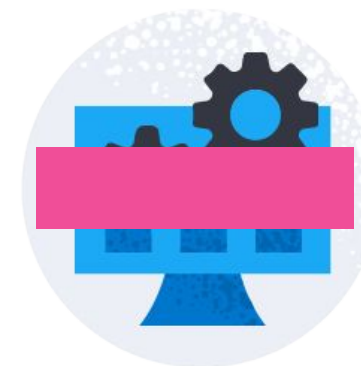


Outline



Rabobank

Size of transaction data



Modern Search with Elastic and GenAI

Integrate LLMs with Elastic Templates



Solution for Secure, AI-Driven Queries

How we use templates

Data Scale – How Much Data Do We Have?

20TB

35 billion records

20 TB stored data and 35 billion of records in different indices

8+y

Transaction History

8+ years of transaction data

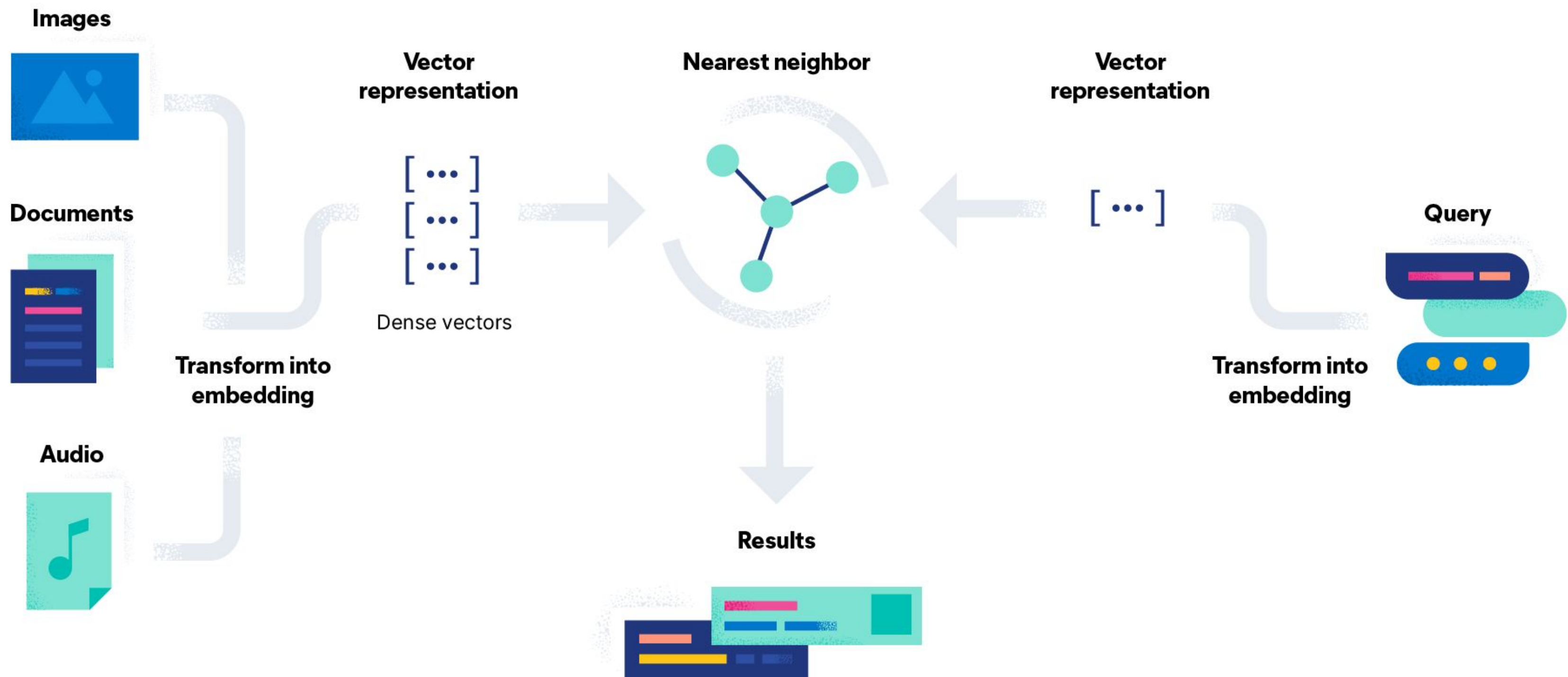
1k

Writes & Queries

1000 writes and 1000 queries per sec

Modern Search...

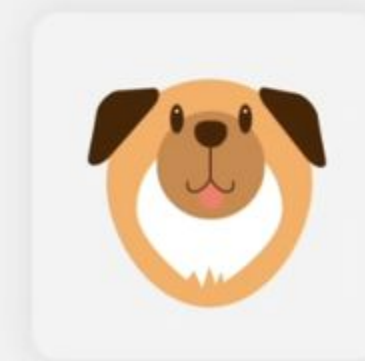
Vector Search



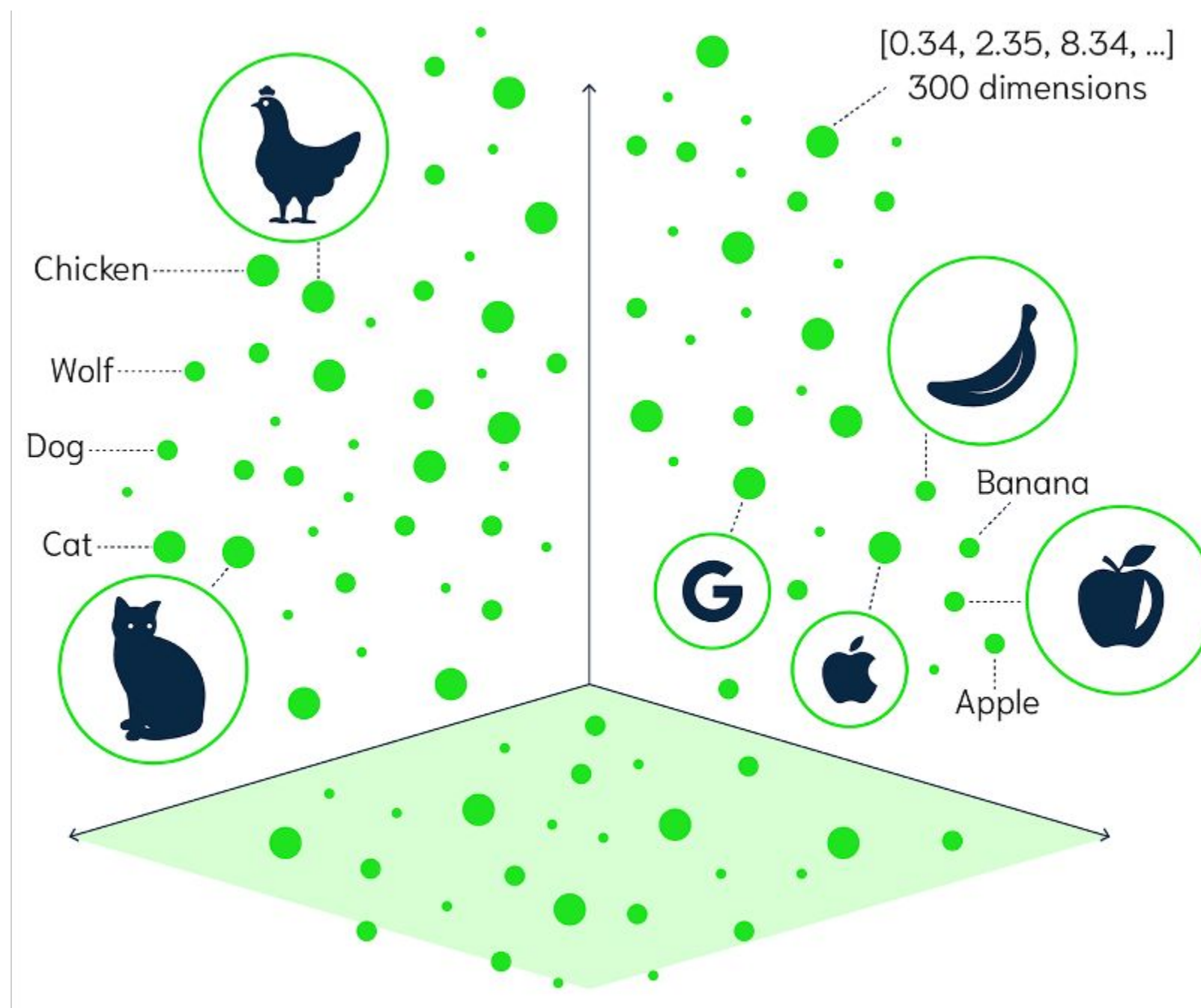
Introduction to Vectors!

$$\begin{pmatrix} 2 \\ 3 \end{pmatrix} \begin{pmatrix} \hat{x} \\ \hat{y} \end{pmatrix} = \begin{pmatrix} -2 \\ -3 \end{pmatrix} \begin{pmatrix} \hat{x}' \\ \hat{y}' \end{pmatrix} =$$

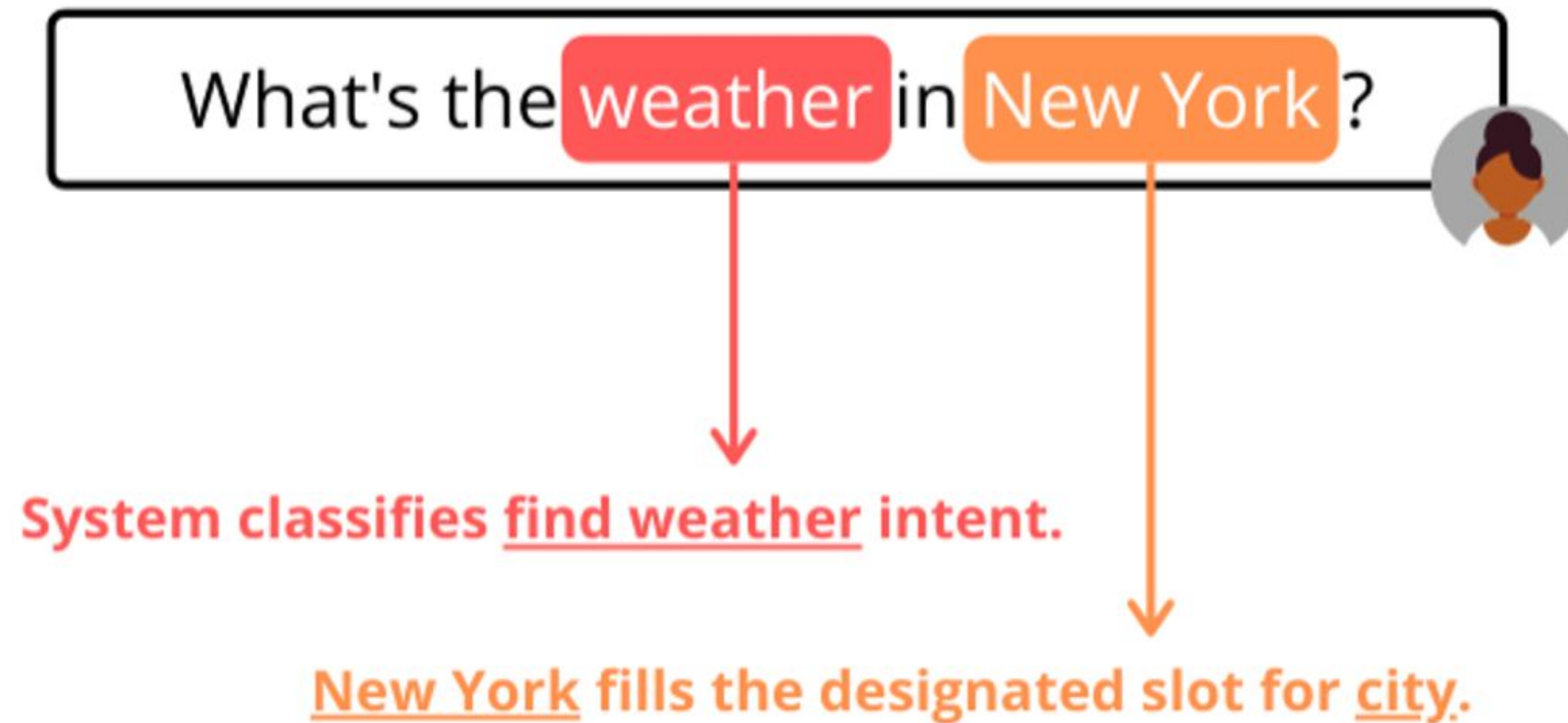

$$\begin{aligned} &(\text{dog})(\text{🇬🇧}) \\ &= \\ &(\text{perro})(\text{🇪🇸}) \\ &= \end{aligned}$$



Vector Space



NLP techniques (Intent, Entity, ...)



Solution...

Solution – Search Query

User provides a search query to the system



Solution – Intent

Analyze the query to identify intent



Solution – Extraction

Extract relevant parameters (Data, Terms)



Solution – Template Selection

Match the query to the correct search template
based on metadata



Solution – Search on Elastic

Populate the template with extracted parameters and perform the search



Elastic Templates (reusable with parameters)

```
PUT _scripts/my-search-template
{
  "script": {
    "lang": "mustache",
    "source": {
      "query": {
        "match": {
          "message": "{{query_string}}"
        }
      },
      "from": "{{from}}",
      "size": "{{size}}"
    }
  }
}
```

Demo Time...



Elastic & GenAI in Action

Enter your query:

how much did I spend in albert heijn last 2 months?

Submit

Streaming Response:

```
{
  "query": {
    "query_id": "total_spending_by_category",
    "params": {
      "category": "groceries",
      "start_date": "2024-09-21",
      "end_date": "2024-11-21"
    }
  },
  "summary": "Total spending in groceries over the last two months.",
  "following-queries": [
    "What was my total spending on groceries last month?",
    "How does my spending at Albert Heijn compare to other supermarkets?",
    "What is the average transaction amount at Albert Heijn?"
  ]
}
```

Parsed Response: Total spending in groceries over the last two months.

Total Spending: 1334.7500004768372

Recap

Extract intent from queries

Match the query with template

Execute template-based search

Recap

Extract intent from queries

Match the query with template

Execute template-based search

Recap

Extract intent from queries

Match the query with template

Execute template-based search

Conclusion

Elastic templates enable secure, reusable queries for safe insights. AI does not have the upper hand!



Questions

Thank you all for your attention! Does anyone have any questions?