



City of Seattle

AI Potential with Service Requests and Incidents

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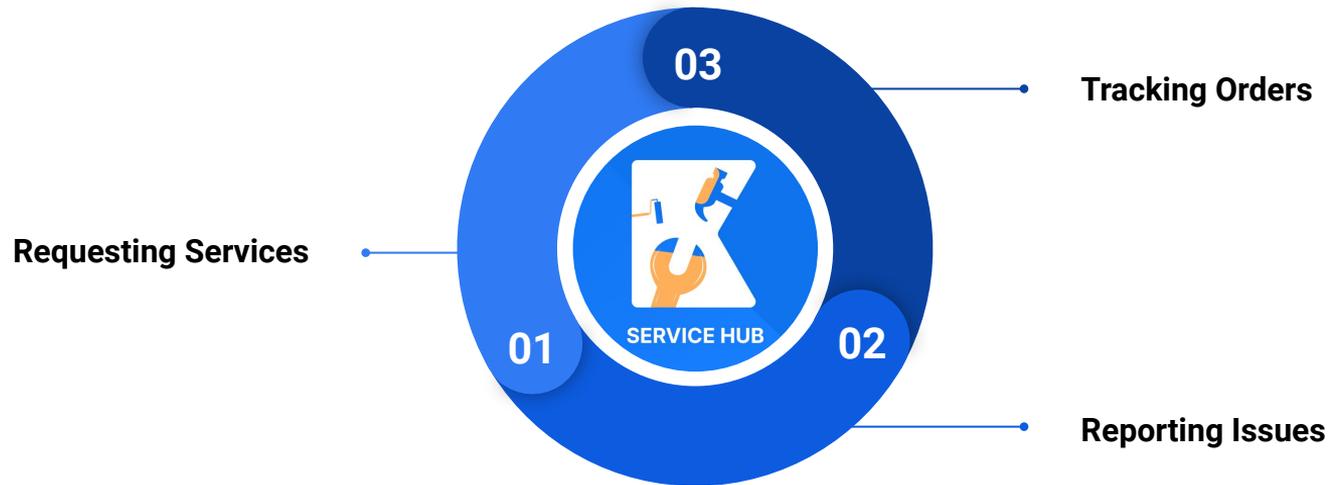


Evan Curtis
Enterprise Architect
Client Engagement Team



Background: What is the Seattle IT Service Hub?

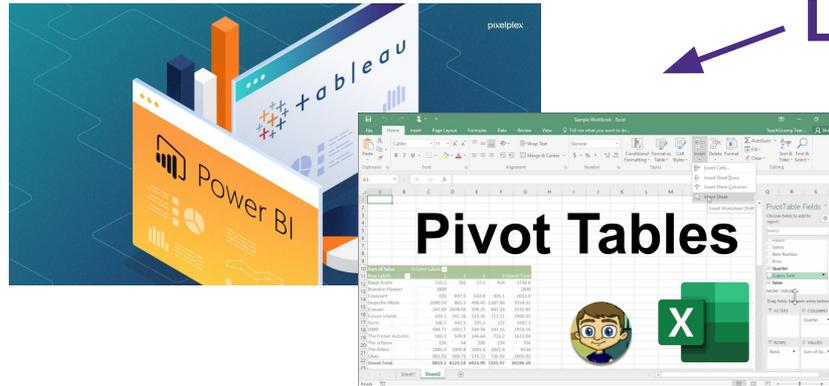
The Service Hub provides clients with a one-stop shop service for **requesting services**, **reporting issues** and **tracking orders**, making it easier and faster to engage with Seattle IT



Problem

😞 Hard to retrieve valuable information from **large dataset**

😞 Analytical difficulties arising from the **complexity** of the dataset.



Limitations

Potential Solution?



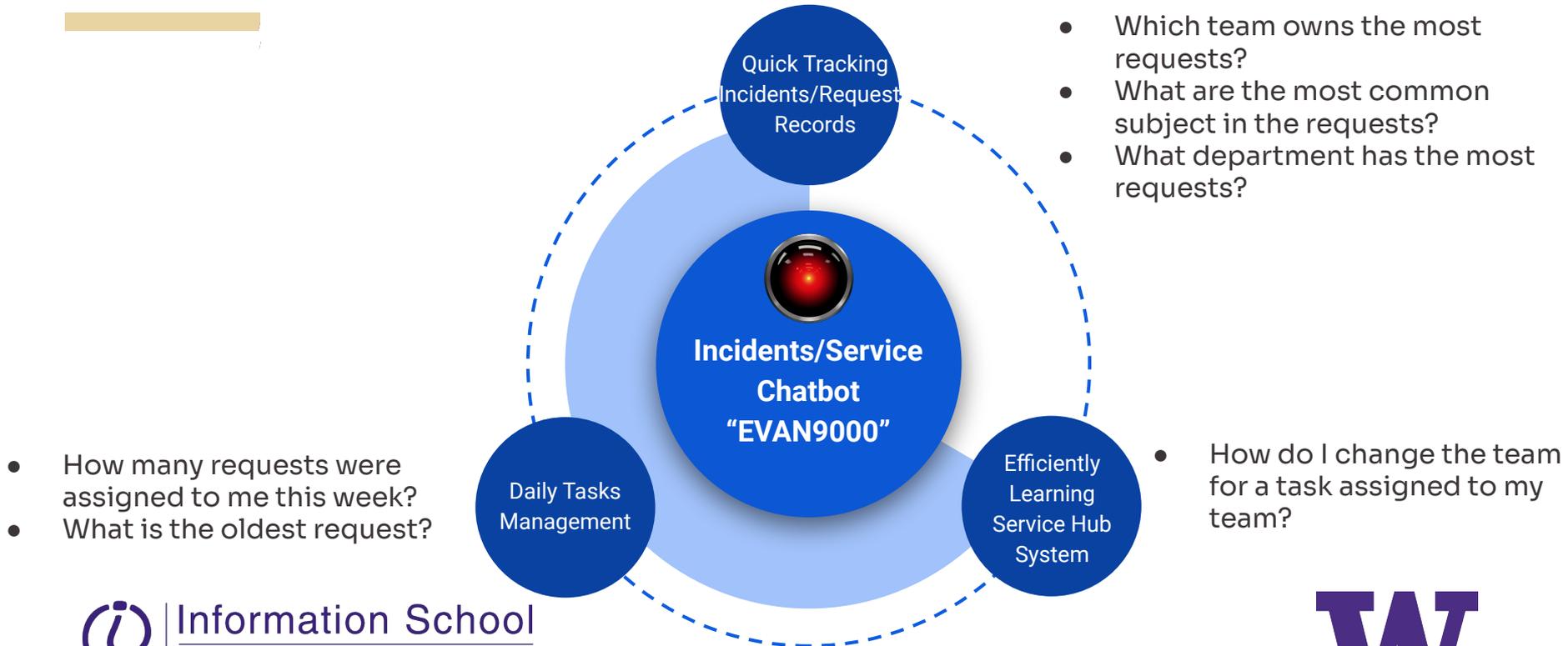
Data is not the thing I lack, but information is what will help me to be successful.



What if the information could be accessed through conversation?

What if have a modern interface to get information at the speed of thought?

Objective: Transforming Organizational Management



Opportunity: Large Language Model Applications



Gemini



Large language models (LLMs) are models trained on **immense amounts of data**, making them capable of **understanding and generating natural language** and other types of content to perform a wide range of tasks.



LLAMA 2

Action: Ollama + Langchain + Streamlit = Local Chatbot



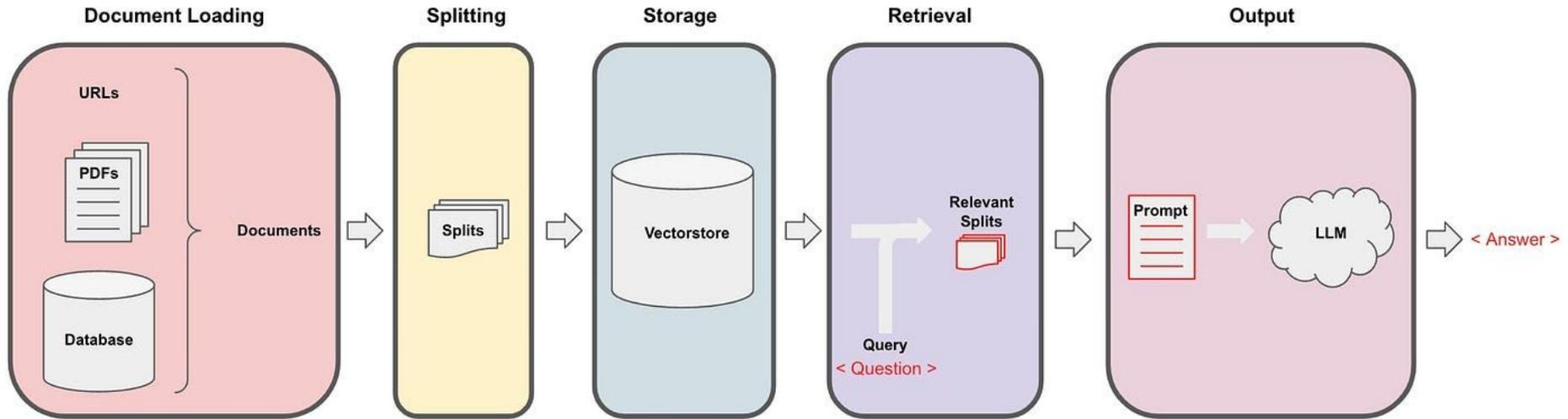
- Enhanced data privacy
- Customization and Control
- Compatible with existing frameworks



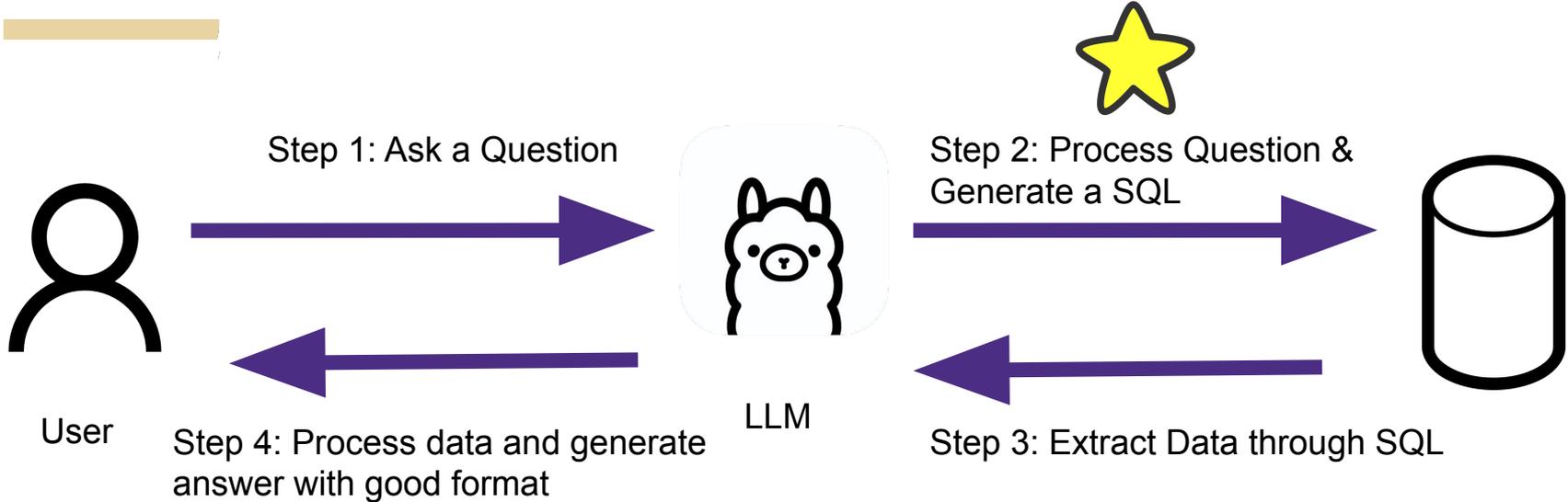
What is Langchain?



How does Langchain work?



How does Evan 9000 work?



Prototype



Give me the oldest request?



The oldest request is:

"Mobile App Intake - Bose Connect" requested by on October 11, 2023.



Which client has made the most requests?



The client who has made the most requests is '' with 9 requests.



Performance of Evan 9000



“Straight Forward” Questions:

How many requests from VIP clients were breached?

Accuracy Above 90% 

Complex Questions:

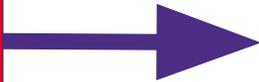
Which team has the most workload?

Accuracy around 20%

Challenges & Solutions in Techs

How to face the Challenges and improve performance?

Lack of background information



Hallucination Problem

Limitations of LLM



Incorrect SQL

Fine-Tune Model

Better Performance Model

Prompt Engineering

....



Prompt Engineering: Elevating ability in generating complex SQL

Provide background information in prompt to optimize AI model performance

Before prompt engineering: incorrect SQL

```
ProgrammingError: (psycopg2.errors.SyntaxError) syntax error at or near "\"" LINE 1: SELECT subject, count(*) as num\_breaches ^ [SQL: SELECT subject, count(*) as num\_breaches FROM requestinfo WHERE isbreached = true GROUP BY subject ORDER BY num\_breaches DESC;] (Background on this error at: https://sqlalche.me/e/14/f405)
```

After prompt engineering



What kind of requests are the most likely to be breached?



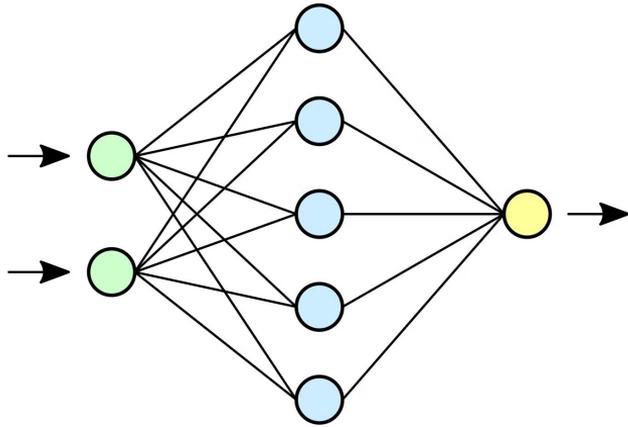
Based on the given table schema, question, SQL query, and SQL response, here is a natural language answer:

"Of the requests that have been breached, the most common types are:

1. Purchase Hardware or Software (3 requests)
2. Consulting for IT Services (2 requests)
3. New or Update Service Hub Request Offering (1 request)
4. Mobile App Intake (1 request)
5. Software/Application Access and License Management (1 request)"



Benefits: Next Steps of LLMs



Our project is an **experiment** of the **industry/organizational level applications** of large language models (LLMs), focusing on exploring promising **use cases**.

Smart Agents



Automate

Leverage LLM technologies to streamline repetitive tasks and boost productivity.



Tech-Savvy Tasks

Enable employees to leverage cutting-edge technologies with ease.



Empower Employees

Free employees to concentrate on high-impact, strategic initiatives.



Upgraded Workflow



Seamless Experience

Provide a user-friendly, intuitive interface that simplifies complex tasks.



Accessible Data

Enhance data retrieval, empowering employees with independent analysis.



Increased Efficiency

Streamline workflows and boost productivity through smart automation.



Balancing LLM Strengths and Weaknesses?

Using AI? \implies Collaborating with AI!

Enterprise Application: Use Case



What department submits the most requests?



Which department submits most requests?



Based on the table schema provided, here is the SQL query that would answer the user's question:

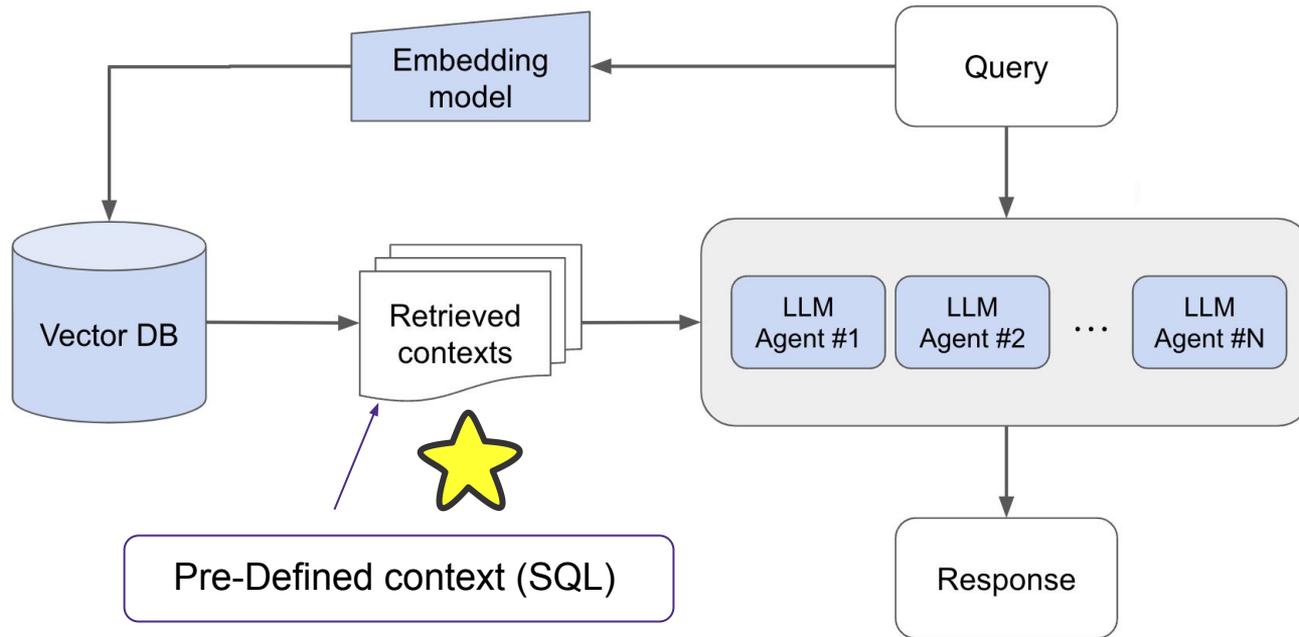
```
SELECT client_department FROM tblrequestinfo GROUP BY client_department ORDER BY COUNT(*) DESC;
```

And here is the natural language answer to the user's question:

"Based on the requests in the table, the department that submits the most requests is 'Finance and Administrative Services', followed by 'Seattle Information Technology', 'Seattle Department of Transportation', 'Seattle Department of Construction and Inspections', and 'Human Services Department'."



Enterprise Application: Customized Business Context



Industry Commercial Efforts

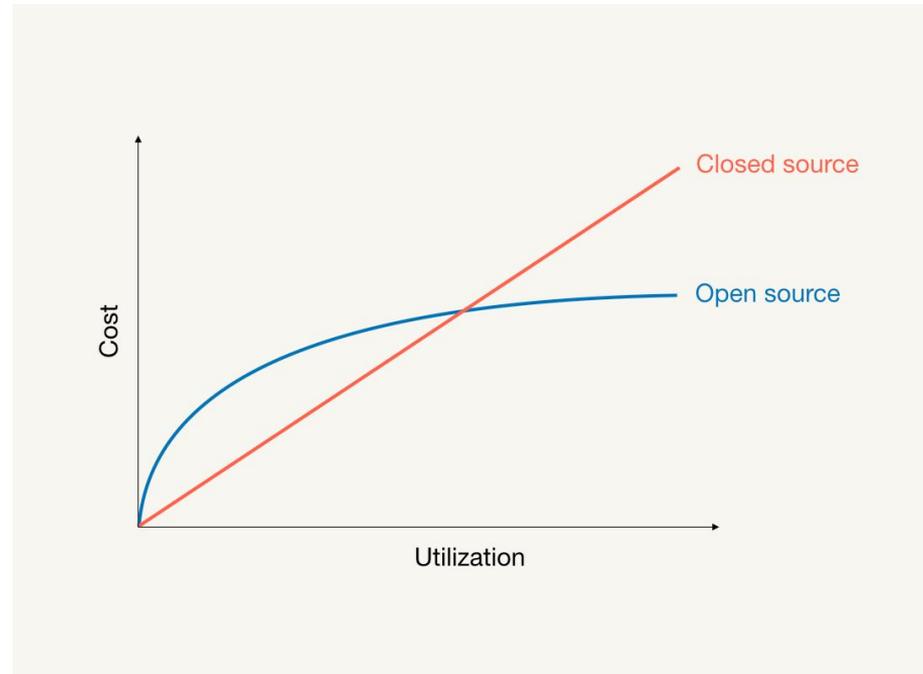
The screenshot shows the Snowflake Copilot interface. On the left, a worksheet titled 'My Worksheet' contains a SQL query: `select col from table where created = :date_range`. The Copilot panel on the right displays a warning: 'Please note there are some limitations: I may sometimes generate inaccurate responses. It may take a few seconds to complete a response.' Below this, a selected table 'CYBERSYN_US_PATENT_GRANTS.CYBERSYN' is shown. A user prompt asks: 'Show me the names of the top 5 contributors with the most patents'. The Copilot response explains the process: 'To find the names of the top 5 contributors with the most patents, we need to join three tables: uspto_patent_contributor_relationships, uspto_contributor_index, and uspto_patent_index. We'll use the join paths mentioned earlier to connect these tables. First, we'll join uspto_patent_contributor_relationships and uspto_contributor_index using the 'contribut'.

The screenshot shows the 'Business Beta' page on the City of New York website. The page title is 'How to open a business?'. It provides a list of steps for starting a business in NYC:

1. Develop your business idea: Start by turning your idea into a business plan. You can take advantage of free courses and resources to help you create a comprehensive plan.
2. Seek out business advice: Get feedback on your business idea and plan by seeking advice from experts. Small Business Services (SBS) offers hands-on, intensive instruction for developing your business plan.
3. Register your business: Choose the legal structure for your business and register it accordingly. Corporations, limited liability companies, and limited partnerships register with New York State, while general partnerships and sole proprietorships register with the appropriate county clerk.
4. Apply for an Employer Identification Number (EIN): An EIN is a unique nine-digit number assigned by the IRS that businesses use for tax filing and reporting purposes. In some cases, sole proprietors may be able to use their Social Security Number instead.
5. Register as a sales tax vendor: If you plan to sell products or services, you need to register as a sales tax vendor with the NYS Department of Taxation and Finance.
6. Research required insurance: Determine the necessary insurance types for your business, such as workers' compensation, liability, and disability insurance. These insurances are essential not only for securing permits and licenses but also for protecting your business against losses, fines, and legal actions.
7. Determine financing needs: Assess how much money or capital you will need to start your business successfully.
8. Identify incentive programs: Explore programs that can help lower the cost of doing business in NYC through energy cost savings, tax credits, or other incentives offered by Small Business Services (SBS).
9. Find a location zoned for your type of business: Use the location where you want to operate is properly zoned according to NYC regulations.

Customization is All You Need

- Data Privacy
- Cost
- Small Business
- Architecture Platform





**The limits of my languages mean
the limits of my world.**

— Wittgenstein, 1922



Thank you!

Q & A

Contact: infvisiongroup@gmail.com

Visit Project Website