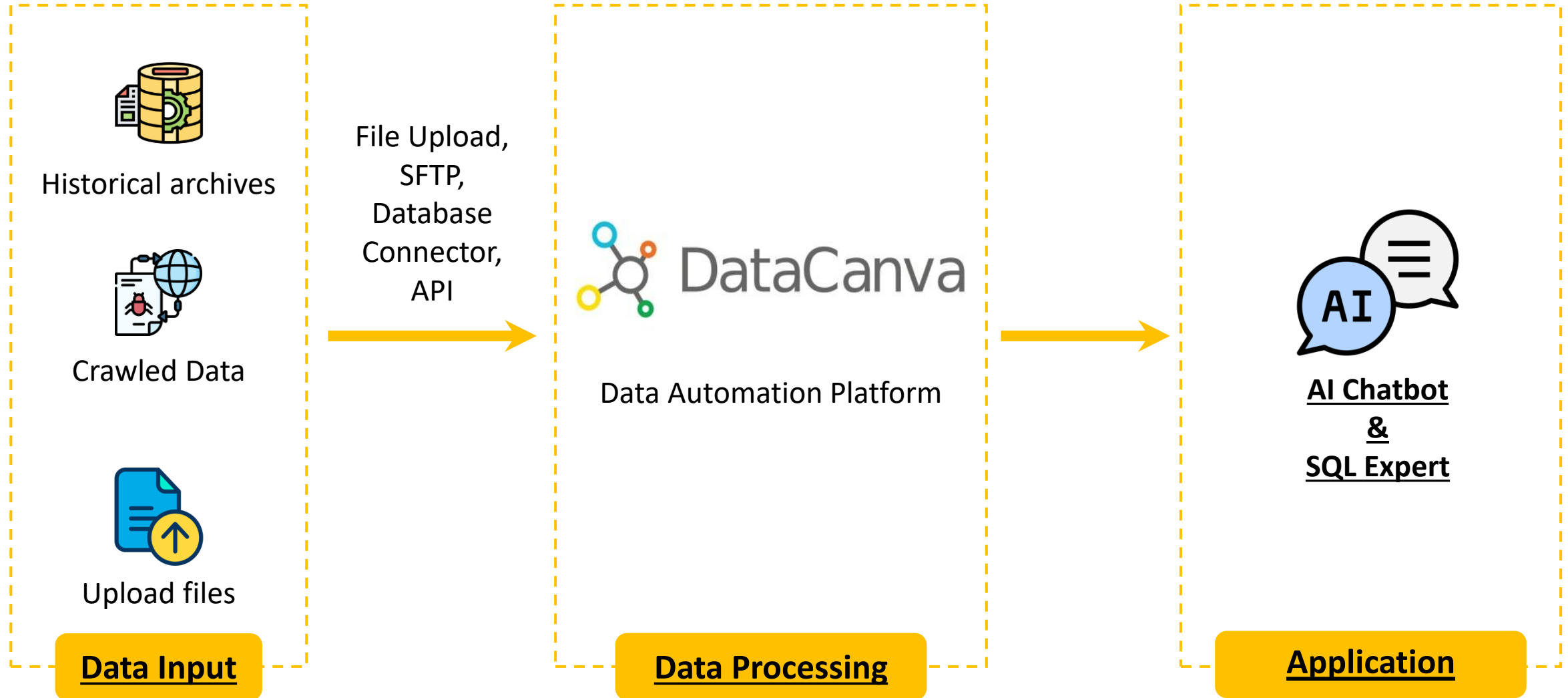




AI-powered Chatbot Solution

AI Chatbot Solution

Solution Architecture





Data Automation Platform

DataCanva – Unleash the data power

Solutions built on top of DataCanva to solve the business pain points



Disconnected Data

Customers leave data at different touch points. Data comes in different formats and from different sources.

Traditionally, there is no single repository to store the data holistically for access or for analytics

1

2

Timely customer query/segmentation

Data blending, transformation, query require a lot of technical knowledge and queries for even simple results cannot be finished timely.

Traditionally, this requires IT expert to query the data using hard-coded scripts and run the query for the business users.

Handle Real Time Update

Data arrives at every second and more timely processing of data could make a closer customer contact.

Traditionally, customer data is processed in a batch, and this creates unnecessary delays in some scenarios.

3

4

Incorporate evolving and custom programs





It becomes a common case to incorporate data from an affiliate source or from the Internet to make better business decisions.

Traditionally, only first party data can be handled with canned models.

DataCanva – Unleash the data power

The competitive advantages



DataCanva Approach	Traditional Approach
Data Repository A single repository to store data from all sources	 Data Silos Data are stored in disparate sources
Visual IDE Design Time in Minutes	 Hard-Coded Scripts Design Time in days or even months
Batch-basis + Real-time update Both basis supported with real time updates	 Batch-basis update Data update latency in days
Extensible framework Capable to run scripts in friendly language (e.g. crawlers)	 1st party data Usually only 1 st party data is used with canned models

Dashboard

- A single place to view the high-level metric about the data entities and data pipelines you have kept
- A single place to view healthy and problematic data entities and pipelines

Data Warehouse

- Connect to your various data sources and make the data synchronized to CDP
- Support various connectors like plain file upload, API, SFTP, database
- Define linking relationship between data entities
- Define the access rights of the data entities through owner, editor and viewer
- Safeguard the data integrity throughout whole life-cycle of the data entities – creation to purge

Data Pipeline

- Create flexible data pipeline to transform multiple input data entities to other ready formats via drag-and-drop user interface
- Support 20+ transformation components and custom-built modules (e.g. prediction, scripts)
- The output data entities can be saved to data warehouse or third-party systems
- Define the access rights of the data pipelines through owner, editor and viewer

Smart Query

- Create ad-hoc query across multiple data entities via drag-and-drop user interface
- Support pre-filter to filter your input data and support post-filter to further fine-tune your output data
- Create custom fields based on existing fields using multi-level formula
- Support aggregation formula towards dimensions and measures
- Define the fields to be selected as output

Admin Console

- Create user account and assign the user role to user accounts
- Create user groups for categorization of user accounts
- Create access control to define the accessible functions for different user roles

My Profile

- Allow user to view and update my profile
- Allow user to change and reset password

Web Crawler

- Configure crawlers to target specific content on internal or external websites.
- Use crawled content as a reliable data source for chatbots.
- Easily maintain crawlers with basic knowledge of HTML structure.
- Define multiple content layers (e.g., categories, headline items, and details) to streamline the crawling process.

Content Hub

- Create multiple content repositories to serve as the foundation for chatbot setup.
- Upload your own files, such as internal documents, to build content repositories.
- Incorporate crawled website content into repositories for richer data sources.
- Effortlessly use these repositories when configuring chatbots for tailored responses.

Semantic Model

- Import database schemas into the Semantic Model, including tables, data fields, data types, and constraints, and enhance them with detailed descriptions.
- Add descriptive details to the schema, providing valuable guidance for setting up a SQL Expert Assistant.

Chatbot Customize

- Set up unlimited chatbots: General Chat: Respond to natural language questions using selected content repositories; SQL Expert: Generate SQL queries from natural language questions for use in SQL Workbench, based on the Semantic Model.
- Choose from a variety of back-end LLMs to serve queries using on-premise or off-premise models

General Chat

- Access the chatbot through a user-friendly interface.
- The chatbot is trained to answer questions based on the content stored in the provided content repositories.

SQL Expert

- Interact with the chatbot via an intuitive user interface. The chatbot is designed to generate SQL queries from natural language questions provided by users.



AI-powered Chatbot

For

Internal Search

News Summarization

Writing Article

SQL Expert

AI-powered Chatbot

GPT-based and Context-aware search engine for your historical data



AI-powered Chatbot Solution is a GPT-based and Context-aware search engine.

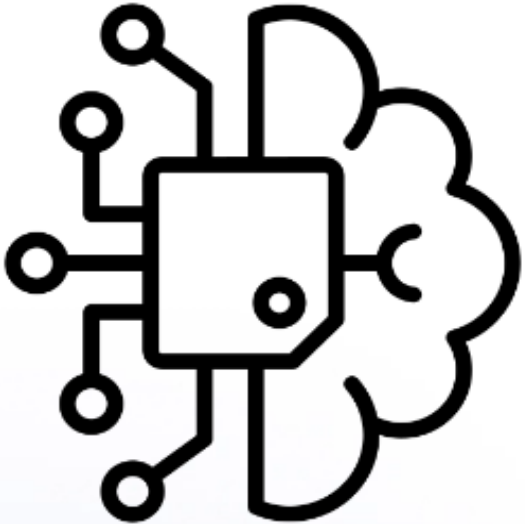
It is an innovative solution designed for internal use, aiming to enhance information retrieval within organizations. Unlike traditional keyword-based search engines, which often yield irrelevant results due to their reliance on specific terms, our context-aware search engine (Chatbot Solution) offers a more intuitive approach. By utilizing a GPT-based model, our chatbot understands the nuances of user queries and provides accurate, context-rich responses. This advanced technology not only replaces the limitations of keyword-based searches but also improves the overall efficiency of information access inside your own database.

AI-powered Chatbot

Adopted Technologies of GPT-based LLM and Retrieval-augmented generation (RAG)

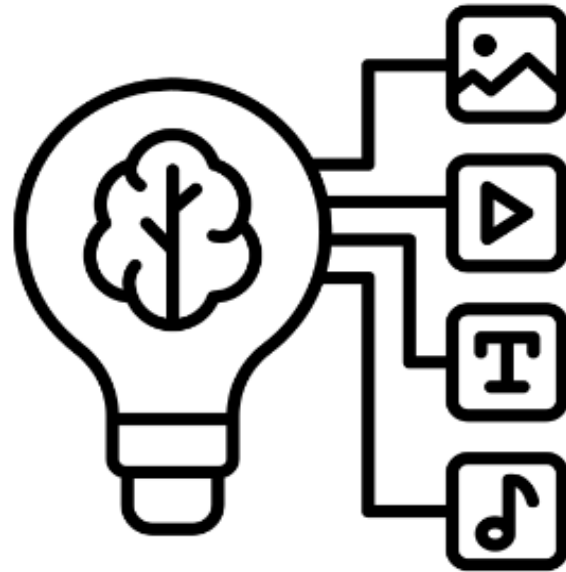
How does this Chatbot Work?

Our chatbot is designed to elevate the effectiveness of internal data search, which mainly adopted below technologies:



It utilizes a GPT-based large language model (LLM) to understand user queries contextually, providing accurate and nuanced responses, unlike keyword-based search engines.

LLMs

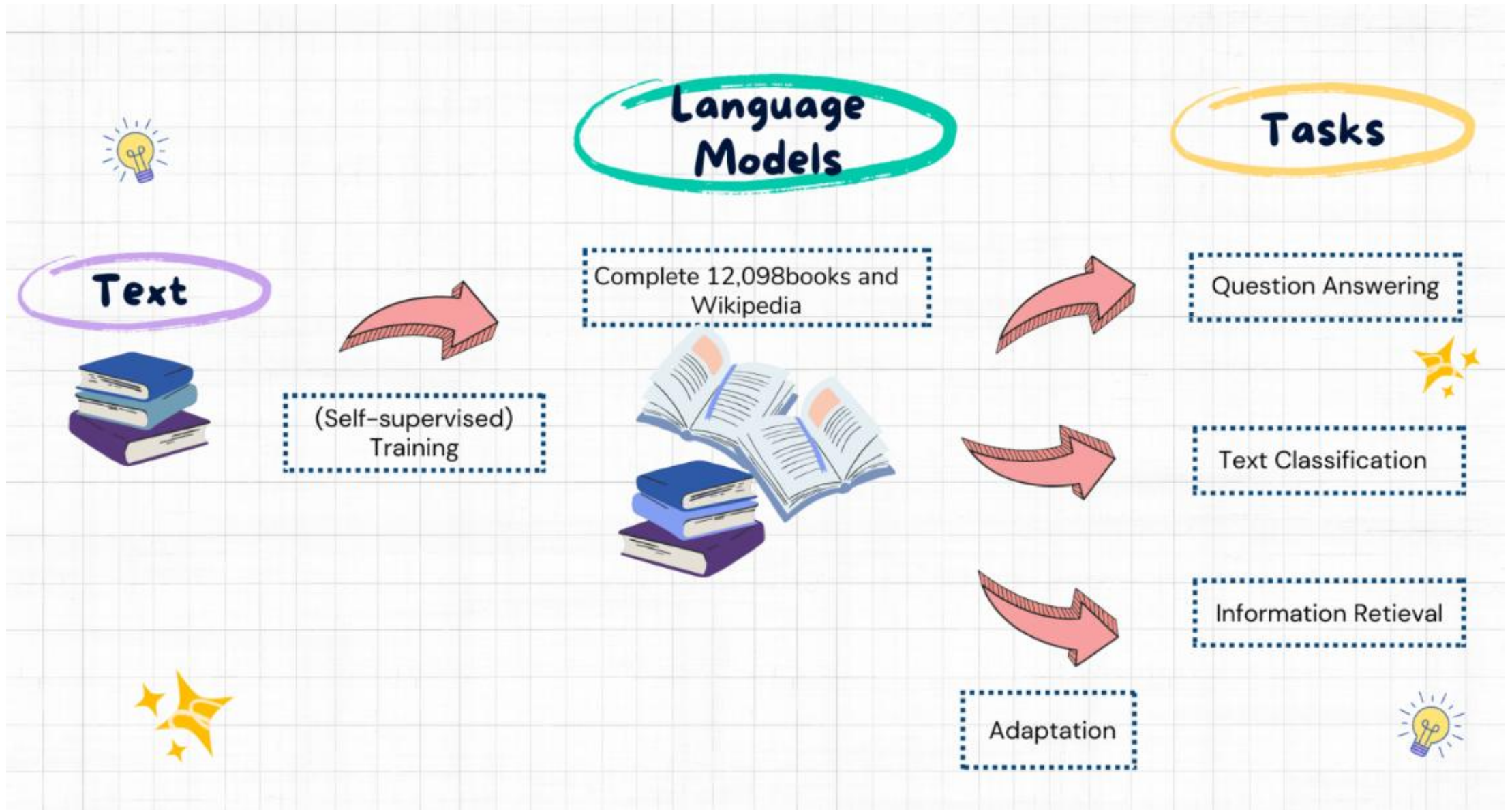


It incorporates Retrieval-Augmented Generation (RAG) technology to enhance information retrieval, improving the efficiency of accessing organizational knowledge.

RAG

AI-powered Chatbot

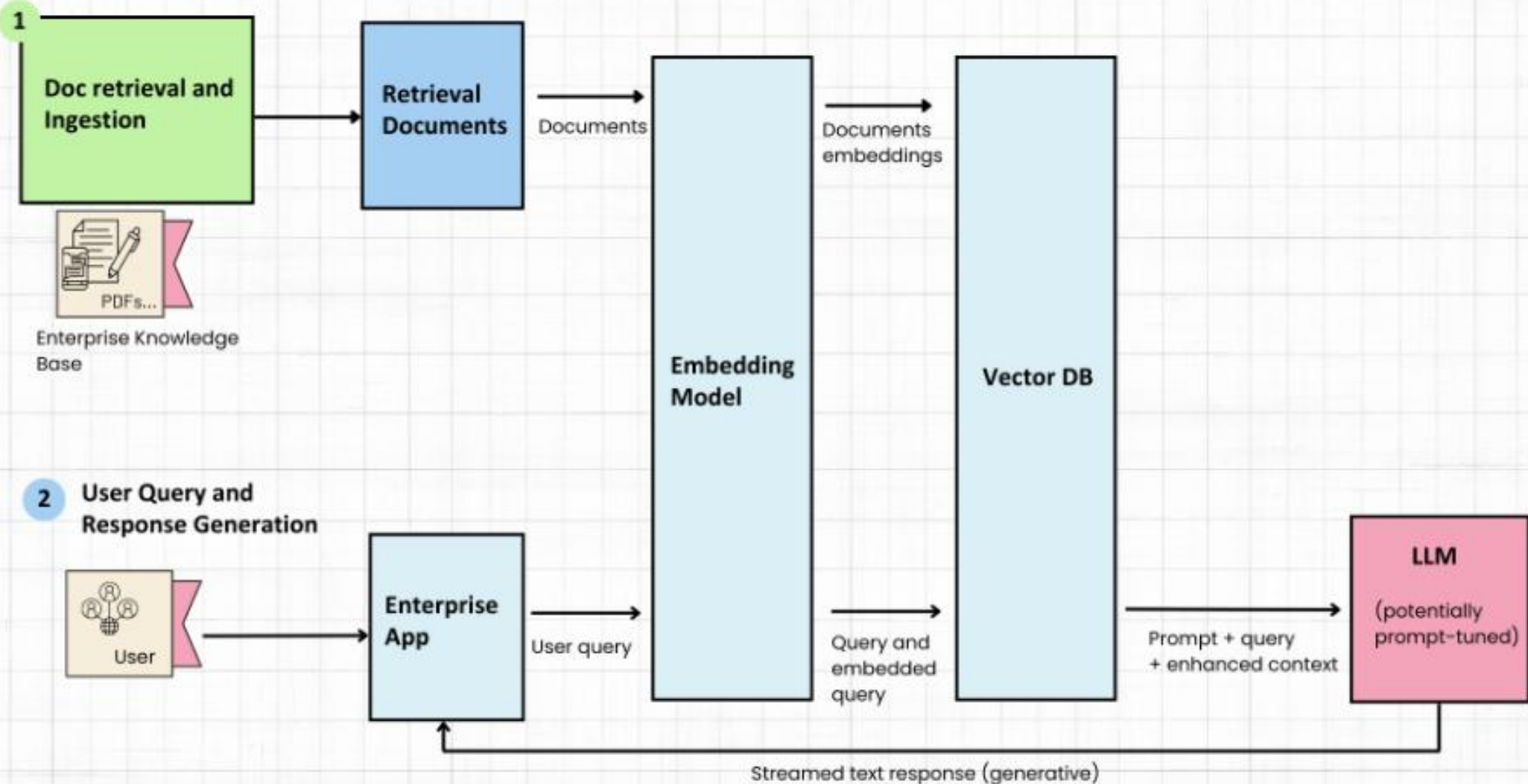
What is a Large Language Model (LLM)?



AI-powered Chatbot

What is a Retrieval-Augmented Generation (RAG)?

Retrieval Augmented Generation(RAG) Sequence Diagram



AI-powered Chatbot

Pain points

Content Overload

Organizations struggle to manage and extract value from large volumes of archived and real-time content.

Manual Content Creation

Producing high-quality, relevant content (e.g., reports, social media posts) is labour-intensive.

Inefficient Knowledge Retrieval

Employees and customers waste time searching for pertinent information across scattered documents.

Lack of Personalization

Generic responses in chatbots and content fail to engage users effectively.

Support from Tech Experts

Write SQL queries to obtain data that often requires help from technical experts, this process can be time-consuming.

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Key features

Tailorable Chatbot

- The chatbot can be trained using a chosen model of the LLM models to achieve specific customization, whether as a general chatbot or an SQL specialist.

1

Context-aware search engine

- Understands natural language queries and retrieves key information from documents, emails, and databases

2

Insight generation & summarization

- Derives actionable insights and condenses long-form content into concise summaries.

3

SQL Expert Assistant

- The Chatbot can be designed to generate SQL queries from natural language questions provided by users.

4

AI-powered Chatbot

Use Cases

1

Automated Report Generation for Analysts: Analysts can ask the chatbot to generate summaries or reports from large datasets and historical documents without manually sifting through data or writing complex SQL queries.

2

Intelligent Customer Support Chatbot: A support chatbot trained on product documentation, FAQs, and past tickets answers customer inquiries instantly with personalized responses by retrieving relevant information contextually.

3

Employee Knowledge Assistant: Employees can ask natural language questions (e.g., “What was the Q3 sales strategy?”) and get instant access to internal emails, reports, and databases without needing IT help.

4

Content Creation Assistant for Marketing Teams: Marketers receive AI-generated content suggestions, social media posts, and campaign summaries tailored to their brand voice, significantly reducing manual drafting time.

5

Self-Service Data Analytics for Non-Technical Users: Business users without SQL knowledge can query company databases using plain English (e.g., “Show me last month's top-selling products”) and get accurate results instantly.

AI-powered Chatbot

Benefits

1

Reduced Operational Costs

Automates repetitive tasks like report generation and customer support, lowering labor costs.

2

Faster Decision Making

Real-time insights and instant SQL query generation enable quicker data-driven decisions.

3

Improved Employee Productivity

Eliminates time wasted on manual searches and content creation, allowing focus on high-value tasks.

4

Enhanced Customer Experience

Personalized chatbot interactions and quick access to information increase satisfaction and engagement.

5

Scalable Knowledge Access

AI-powered search and summarization make it easier to manage growing content volumes without losing efficiency.

AI-powered Chatbot

Example of Setting Up General Chatbot

Settings - DEMO - GPO Salary

Last Training time: 2025-02-05 16:56:44


Chatbot Assistant Type

 General Chat


 SQL Expert

Attached Database

Select database to be used for this chatbot



GPO - Salary (1)



Total Entries: 1

Prompt Template

Placeholder	Description
[[question]]	Question input by the user
[[matched_content_from_database]]	Matched content from database
[[question_history]]	Question history of the user

Question [[question]]

PARAGRAPHS

Additional Information [[matched_content_from_database]]

General Chatbot set up

Within this function, users can configure the General Chat using specific data sourced from the linked database as training materials. This is illustrated in the graphic on the left.

AI-powered Chatbot

Example of Internal Data Search

DataCanva Chatbot

You Oct 31 2024, 12:10:00

What is a medical device?

Data Privacy Chatbot Oct 31 2024, 12:10:08

Medical devices generally refer to products having a medical purpose(s), and range from sophisticated equipment such as cardiac pacemakers used by health care professionals to simple products such as bandages and thermometers bought over the counter by the public.

In essence, a medical device refers to any instrument, apparatus, appliance, material or other article, excluding drugs, used for human beings for diagnosis, prevention, treatment, monitoring of disease or injuries; or for rehabilitation purposes; or for the purposes of investigation, replacement or modification of body structure or function. In addition, it includes devices used for examination of human specimens for the purposes of diagnostic, monitoring and compatibility in the forms of reagents, calibrators, control materials, specimen receptacles etc. which are categorised under in vitro diagnostic medical devices.

An accessory to a medical device is subject to the same regulations that apply to the medical device itself. However, devices designed for the treatment or diagnosis of diseases and injuries in animals are outside the scope of medical device under the Medical Device Administrative Control System.

For more details, please refer to the full definition of medical device recommended by the International Medical Device Regulators Forum (IMDRF) (previously Global Harmonization Task Force (GHTF)).

You Oct 31 2024, 12:10:41

What is the existing legislative control of medical devices?

Data Privacy Chatbot Oct 31 2024, 12:10:44

Currently, there is no specific legislation that regulates the manufacture, import, export and sale of medical devices in Hong Kong. However, depending on the nature and characteristics of the products concerned, some products may be regulated by existing pieces of legislation such as the Pharmacy and Poisons Ordinance (Cap 138), the Radiation Ordinance (Cap 303), and the Telecommunications Ordinance (Cap 106).

You Oct 31 2024, 12:10:54

Why do we need to regulate medical devices?

Data Privacy Chatbot Oct 31 2024, 12:11:01

Following are the major problems identified at present -

No pre-market control to assess the safety, performance and quality of medical devices to safeguard public health;

Type a message

DataCanva Chatbot

Data Privacy Chatbot Sep 16 2024, 11:24:16

Hello, I'm Data Privacy Chatbot. How can I assist you today?

You Sep 16 2024, 11:37:32

What are the guidelines in protecting data?

Data Privacy Chatbot Sep 16 2024, 11:37:40

To protect data effectively, here are some guidelines:

1. **Implement Strong Security Measures**: Use technical and organizational safeguards to protect personal data against unauthorized access, processing, erasure, or other misuse.

2. **Communicate Data Protection Policies**: Ensure that your organization's data protection policies, practices, and processes are clearly communicated to employees and stakeholders.

3. **Limit Data Access**: Restrict data access to authorized personnel based on the "need-to-know" principle and provide regular data privacy and security training.

4. **Data Minimization**: Enforce data minimization mechanisms and encryption to reduce the amount of personal data stored and processed.

5. **Data Lifecycle Management**: Implement robust technical and organizational safeguards throughout the data lifecycle to prevent unauthorized use, disclosure, or breaches of personal data.

6. **Privacy by Design**: Embed privacy principles into the design and lifecycle of technologies, processes, products, and services to ensure data protection from the outset.

7. **Compliance with Data Protection Laws**: Adhere to relevant data protection laws and regulations applicable to your organization's operations.

8. **Risk Assessment**: Conduct regular risk assessments that consider data protection, privacy, and ethical considerations before initiating new data processing activities.

9. **Data Subject Rights**: Respect individuals' rights over their data, including the right to access and delete their data.

10. **Data Privacy Principles**: Follow key data privacy principles to ensure compliance with data protection standards and regulations.

By incorporating these guidelines into your data management practices, you can enhance data protection, safeguard privacy, and comply with legal requirements effectively.

You Sep 16 2024, 12:09:36

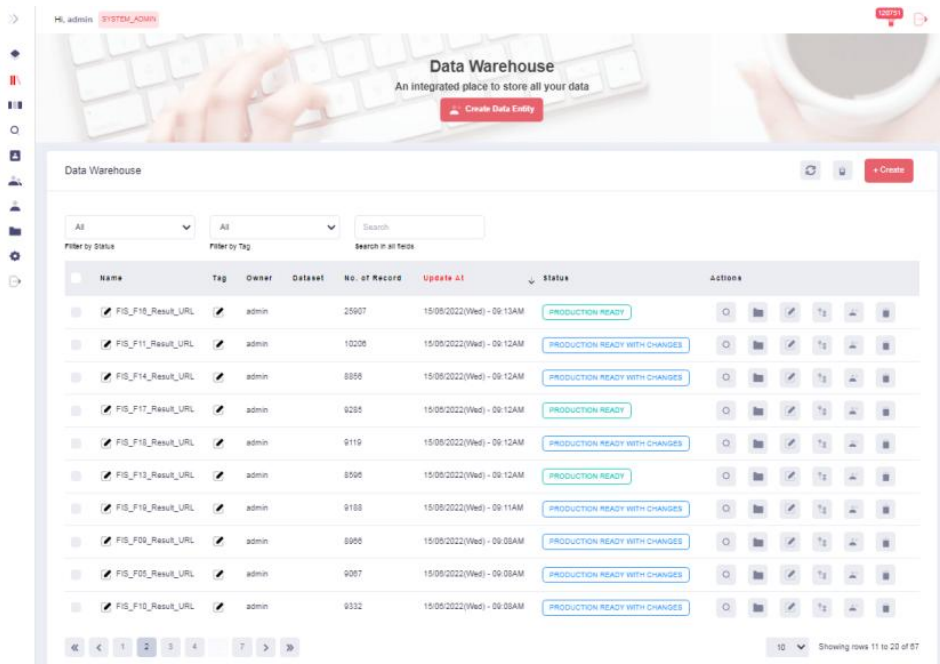
Type a message

Keyword based search and answers

The above snapshots displays the AI Chatbot responding to user questions with keyword-based search, and these answers are derived from specific databases which are used to train the General Chatbot.

AI-powered Chatbot

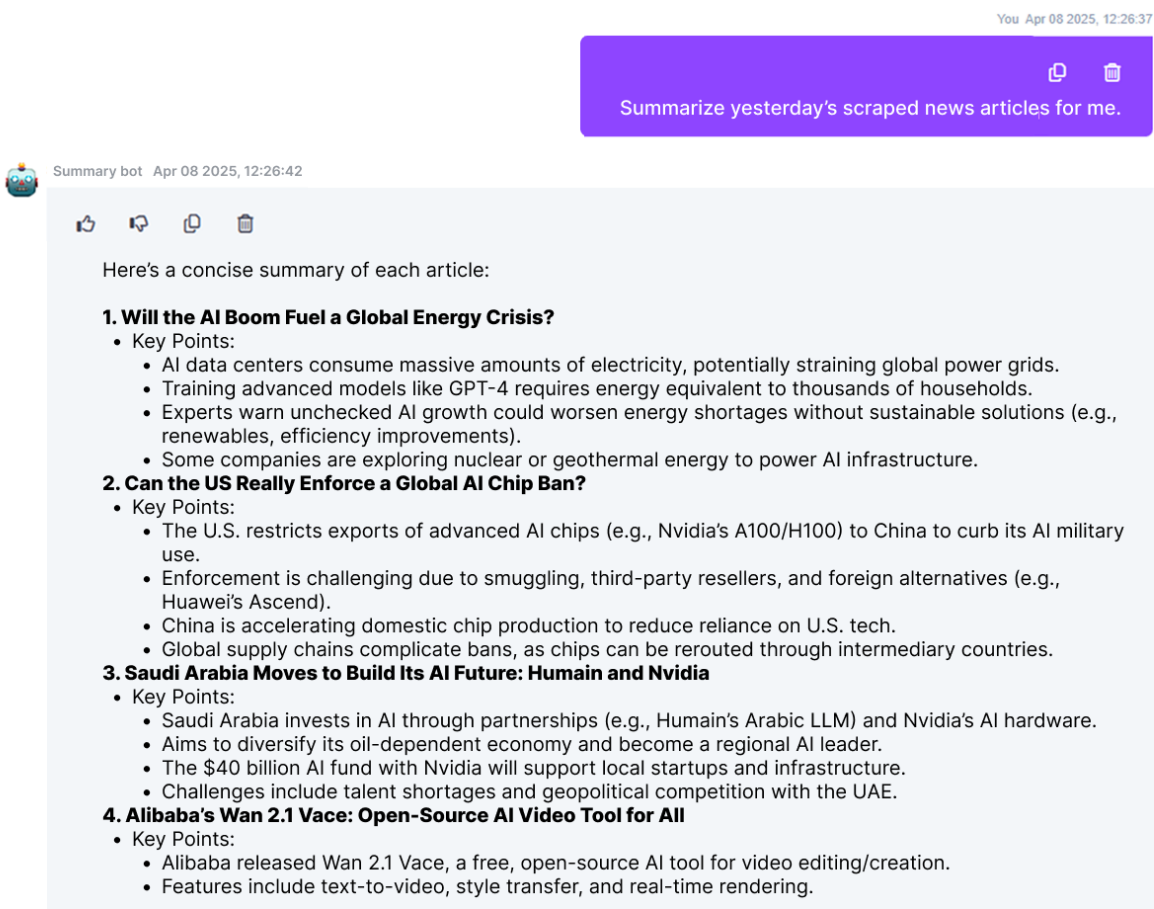
Example of Scraped News Summarization



The screenshot shows a 'Data Warehouse' interface with a header banner and a table of data. The table has columns for Name, Tag, Owner, Dataset, No. of Record, Update At, Status, and Actions. The data rows represent scraped news URLs, each with a status of 'PRODUCTION READY' or 'PRODUCTION READY WITH CHANGES'.

Name	Tag	Owner	Dataset	No. of Record	Update At	Status	Actions
FIS_F16_Result_URL		admin		25907	15/05/2022(Wed) - 09:13AM	PRODUCTION READY	[Icons]
FIS_F11_Result_URL		admin		10206	15/05/2022(Wed) - 09:13AM	PRODUCTION READY WITH CHANGES	[Icons]
FIS_F14_Result_URL		admin		8866	15/05/2022(Wed) - 09:13AM	PRODUCTION READY WITH CHANGES	[Icons]
FIS_F17_Result_URL		admin		9265	15/05/2022(Wed) - 09:13AM	PRODUCTION READY	[Icons]
FIS_F18_Result_URL		admin		9119	15/05/2022(Wed) - 09:13AM	PRODUCTION READY WITH CHANGES	[Icons]
FIS_F13_Result_URL		admin		8566	15/05/2022(Wed) - 09:13AM	PRODUCTION READY	[Icons]
FIS_F12_Result_URL		admin		9188	15/05/2022(Wed) - 09:11AM	PRODUCTION READY WITH CHANGES	[Icons]
FIS_F09_Result_URL		admin		8066	15/05/2022(Wed) - 09:08AM	PRODUCTION READY WITH CHANGES	[Icons]
FIS_F05_Result_URL		admin		9067	15/05/2022(Wed) - 09:08AM	PRODUCTION READY WITH CHANGES	[Icons]
FIS_F10_Result_URL		admin		9332	15/05/2022(Wed) - 09:08AM	PRODUCTION READY WITH CHANGES	[Icons]

Keyword-based scraping news clipping data



The screenshot shows a chatbot interface with a purple header bar containing the text 'Summarize yesterday's scraped news articles for me.' and a 'Summary bot' response dated 'Apr 08 2025, 12:26:42'. The chatbot provides a concise summary of each article, listing key points for four topics: AI Boom, US AI Chip Ban, Saudi Arabia's AI Future, and Alibaba's Wan 2.1 Vace.

Here's a concise summary of each article:

- 1. Will the AI Boom Fuel a Global Energy Crisis?**
 - Key Points:
 - AI data centers consume massive amounts of electricity, potentially straining global power grids.
 - Training advanced models like GPT-4 requires energy equivalent to thousands of households.
 - Experts warn unchecked AI growth could worsen energy shortages without sustainable solutions (e.g., renewables, efficiency improvements).
 - Some companies are exploring nuclear or geothermal energy to power AI infrastructure.
- 2. Can the US Really Enforce a Global AI Chip Ban?**
 - Key Points:
 - The U.S. restricts exports of advanced AI chips (e.g., Nvidia's A100/H100) to China to curb its AI military use.
 - Enforcement is challenging due to smuggling, third-party resellers, and foreign alternatives (e.g., Huawei's Ascend).
 - China is accelerating domestic chip production to reduce reliance on U.S. tech.
 - Global supply chains complicate bans, as chips can be rerouted through intermediary countries.
- 3. Saudi Arabia Moves to Build Its AI Future: Humain and Nvidia**
 - Key Points:
 - Saudi Arabia invests in AI through partnerships (e.g., Humain's Arabic LLM) and Nvidia's AI hardware.
 - Aims to diversify its oil-dependent economy and become a regional AI leader.
 - The \$40 billion AI fund with Nvidia will support local startups and infrastructure.
 - Challenges include talent shortages and geopolitical competition with the UAE.
- 4. Alibaba's Wan 2.1 Vace: Open-Source AI Video Tool for All**
 - Key Points:
 - Alibaba released Wan 2.1 Vace, a free, open-source AI tool for video editing/creation.
 - Features include text-to-video, style transfer, and real-time rendering.

AI chatbot summarization

As shown above, users can utilize both their personal data and web extracted data stored in the data warehouse and Content Hub to train the AI chatbot. When users request a summary of an article, the chatbot provides clear and concise summaries.





AI-powered Chatbot

Example of writing an article

You Apr 08 2025, 12:26:37

Use this comparison to frame an article on pandemic preparedness. Title: '20 years after SARS, did HK learn its lesson?'

Writing bot Apr 08 2025, 12:26:42



Sure, here is the article:

20 Years After SARS, Did Hong Kong Learn Its Lesson?

A look back through Hong Kong media coverages reveals sobering parallels between the 2003 and 2020 pandemics - and urgent lessons for the future

The Promise Unkept

In July 2003, as Hong Kong celebrated being declared SARS-free, then Chief Executive Tung Chee-hwa made a solemn vow: "We will build a system so this never happens again." The SCMP's front page that day showed exhausted healthcare workers cheering - with an editorial warning that "real victory requires lasting reform."

Seventeen years later, as COVID-19 patients filled hospital corridors and residents scrambled for masks, that unfulfilled promise came into sharp relief. Our archival investigation shows Hong Kong repeated many of SARS' mistakes - while facing new challenges in our polarized world.

Public Health: Half-Measures That Cost Lives

The 2003 SARS Commission Report recommended three critical reforms:

- 1. A dedicated infectious disease hospital*
- 2. A six-month stockpile of PPE*
- 3. Mandatory outbreak drills for all medical staff*

By 2020, none were fully implemented. Our archives reveal:

- The proposed infection center at Princess Margaret Hospital remained "in planning stages" for 15 years*
- Frontline nurses reused N95 masks during COVID's first wave*
- Hospital outbreak simulations were voluntary until 2018*

Dr. Lo Wing-lok, who helped lead SARS containment, told Media in 2020: "We wrote the playbook, but no one rehearsed the plays."

Writing articles

As illustrated on the right, when users ask the chatbot to write an article with some specific data set, it will generate based on the context.

AI-powered Chatbot

Example of SQL Expert Set-up

Settings - demo-sml

Database Connection

Database Driver

MySQL

ConnectionAuthenticationSSL/TLS

☐ Enable SSL/TLS Protocol

Database ✓

Load Database Table Schema

Table Schema

Select a table

▶ bot_model

▶ chatbot

▶ user

Semantic Model

The above graphic shows the **Semantic Model**, which can configure tables, data fields, data types, and constraints with detailed descriptions, provides valuable guidance for setting up a SQL Expert.

Settings - DEMO - GPO Salary

Last Training time: 2025-02-05 16:56:44

Chatbot Assistant Type

General ChatSQL Expert

Semantic Model

demo-sml

+

Prompt Template

Placeholder	Description
[[question]]	Question input by the user
[[table_schema]]	Database Table schema
[[question_history]]	Question history of the user

Question [[question]]

PARAGRAPHS

Additional Information [[matched_content_from_database]]

SQL Expert Set Up

When setting up the SQL Expert, selecting the Semantic Model for specific SQL Expert via an intuitive user interface. The chatbot is designed to generate SQL queries from natural language questions provided by users.

AI-powered Chatbot

Example of SQL Expert Output

DEMO- SQL Expert



DEMO- SQL Expert May 20 2025, 16:10:52



Hello, I'm DEMO- SQL Expert. How can I assist you today?

You May 20 2025, 16:15:12



Find the transaction number of all users.



DEMO- SQL Expert May 20 2025, 16:15:22



To find the transaction number of all users, we need to count the number of transactions (payments) for each user in the `payment` table. We will join the `user` table with the `payment` table on the foreign key relationship and group the results by user.

Here is the SQL query:

```
SELECT
  u.USR_id AS user_id,
  u.USR_name AS user_name,
  COUNT(p.pyt_id) AS transaction_count
FROM
  user u
LEFT JOIN
  payment p
ON
  u.USR_id = p.pyt_usr_id
GROUP BY
  u.USR_id, u.USR_name
ORDER BY
  transaction_count DESC;
```

Explanation:

1 Tables Involved:

SQL expert

The SQL Expert will answer with SQL queries when users ask with natural language questions.



AI-powered Chatbot Solution

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