

<image/nation>
Future-proof Tech Skills

Specially designed for



HKU
BUSINESS
SCHOOL
港大經管學院

Masters
Programmes

2026/2027

Strengthening Gen-AI Contexts

Building Proprietary AI Knowledge Bases

by

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Founder & Master Trainer Image Nation 隨想國度

26-Year IT & New Media Experience

AI, Cloud, Blockchain, Web, Mobile, Database & IoT Applications Development

19-Year University Teaching & Tech Training

HKU / HKUSPACE / EdUHK / CityUHK

Certifications & Professional Qualifications

Microsoft Certified Azure Developer, AI Engineer & Github Copilot

AWS Certified Solution Architect, Developer, Data Engineer, Machine Learning Engineer & AI Practitioner

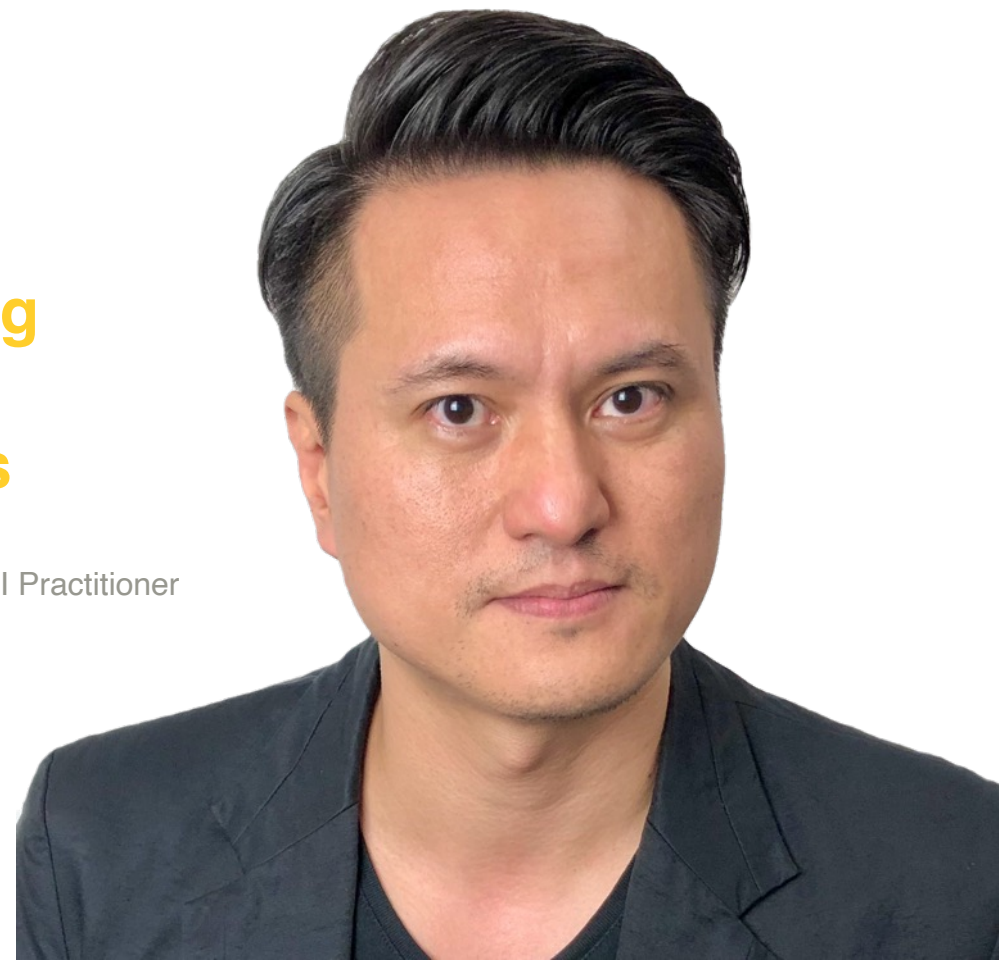
Alibaba Cloud Certified Professional in Cloud Computing

Accredited Educator for AWS Academy

Accredited Educator for Microsoft Learn for Educator (MSLE)

Accredited Educator for Oracle Academy

Accredited Educator for Cisco Networking Academy



Setup Check List

- Make sure you have a Gmail account. If you don't, create one and make sure you can log in to the following services
 - <https://gmail.com>
 - <https://gemini.google.com>
 - Access Gemini Enterprise (Optional)
- Use your HKU Portal ID and password to sign in to personal
 - <http://copilot.microsoft.com> (Personal)
 - <https://m365.cloud.microsoft/> (Enterprise)
 - <https://copilotstudio.microsoft.com> (Enterprise)

In this workshop (3 hours)

- How Does Large Language Model Works?
- Limitation of Foundation Model & Problem of Hallucination
- How Does **Context** Improves LLM Output Quality?
- Understand Knowledge Base
- Getting Familiar with GenAI Ecosystem: Gemini & Copilot
- Try Yourself: Building AI Toolkits with Custom Knowledge Base
 - Create Your Context-Strengthened Chatbots & AI Agents

To download the slides

tinyurl.com/hkin-dl



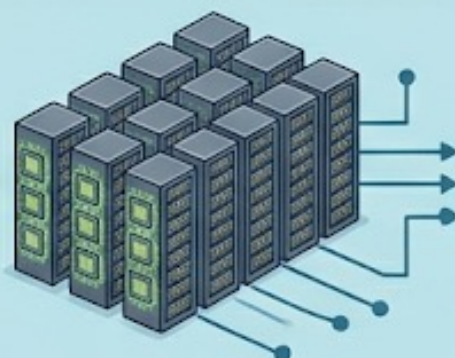
Understanding GenAI

LLM TRAINING vs. INFERRNCING: THE TWO PHASES OF AI

STEP 1: LLM TRAINING (Build the Model)



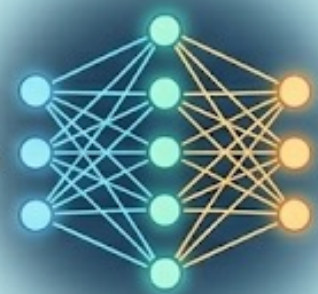
A MASSIVE TEXT CORPUS



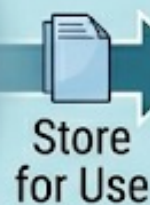
COMPUTE CLUSTER



LEARNING ALGORITHMS



TRAINED MODEL (The "Brain")

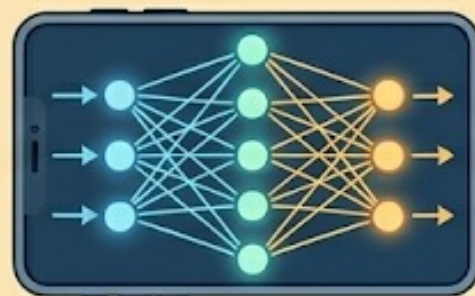


Process huge data, vast computer power, high cost, lengthy time (months)

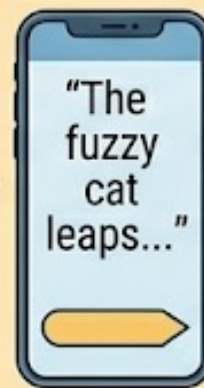
STEP 2: LLM INFERRNCING (Using the Model)



"Write a poem about a cat"



The Brain



Output Answer

Input prompt, run model, low power, near-instant results

THE RICE FACT PROMPT FRAMEWORK: CRAFTING POWERFUL PROMPTS FOR AI

RICE

ROLE / PERSONA

R



ACT AS AN EXPERT... (e.g., Scientist, Writer, Chef)
Define the identity, expertise, and perspective.

"Act as a marketing analyst..."

INSTRUCTION

I



WHAT YOU WANT THE AI TO DO
Be clear, specific, and unambiguous. List actions.

"Write a short blog post about AI in business."

CONTEXT

C

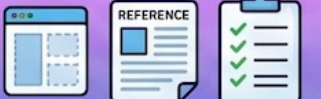


PROVIDE RELEVANT BACKGROUND
Set the scene, explain the situation, or the goal.

"This post is for small business owners who are complete beginners."

EXAMPLES

E



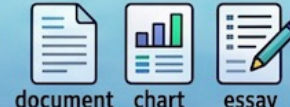
OFFER EXAMPLES OR SAMPLES
Show preferred style, structure, or content.

"Structure it like this example [Link], and use similar language."

FACT

FORMAT

F



SPECIFY THE OUTPUT FORMAT

Choose presentation (e.g., code, email, table, summary)

"Output the result in a clean bulleted list."

AUDIENCE

A



IDENTIFY THE TARGET AUDIENCE

Adapt tone, language, complexity, and approach.

"Ensure the content is understandable for a general audience."

CONSTRAINTS

C



SET LIMITS & BOUNDARIES

Mention length (words/chars), forbidden topics, style, or specific rules.

"Do not exceed 300 words. Do not use jargon."

TOPE / STYLE

T



DEFINE THE DESIRED TONE

Specify atmosphere (e.g., professional, friendly, witty, formal).

"Maintain a helpful and friendly tone."

PUTTING IT TOGETHER: A HIGH-QUALITY PROMPT

R
I
C
A

EXAMPLE: Act as a travel writer (R). Draft a 3-day itinerary (I) for Rome in October for a young couple (C). Look at this past example for inspiration (E). Present it as a table (F) for non-Italian speakers (A). Exclude religious sites and avoid overly technical historical facts (C). Use a lively and adventurous tone (T).



RESULT

RICE FACT Example

Instruction only | Prompt Quality: ★ ★ ★ ★ ★

Role

Instruction **Explain what GenAI is.**

Context

Example

Format

Action

Constraint

Tone

RICE FACT Example

Role + Instruction | Prompt Quality: ★ ★ ★ ★ ★

Role	You are a primary school teacher.
Instruction	Explain what GenAI is.
Context	
Example	
Format	
Action	
Constraint	
Tone	

RICE FACT Example

Role + Instruction + Context | Prompt Quality : ★ ★ ★ ★ ★

Role	You are a primary school teacher.
Instruction	Explain what GenAI is.
Context	The target audience are junior non-ICT students.
Example	
Format	
Action	
Constraint	
Tone	

RICE FACT Example

Instruction + Format | Prompt Quality : ★ ★ ★ ★ ★

Role

Instruction **Explain what GenAI is.**

Context

Example

Format **Use one sentence.**

Action

Constraint

Tone

RICE FACT Example

Instruction + Format | Prompt Quality: ★ ★ ★ ★ ★

Role

Instruction **Explain what GenAI is.**

Context

Example

Format **Use three bullet points.**

Action

Constraint

Tone

RICE FACT Example

Instruction+Format+Constraint | Prompt Quality: ★ ★ ★ ★ ★

Role

Instruction **Explain what GenAI is.**

Context

Example

Format **Use three bullet points.**

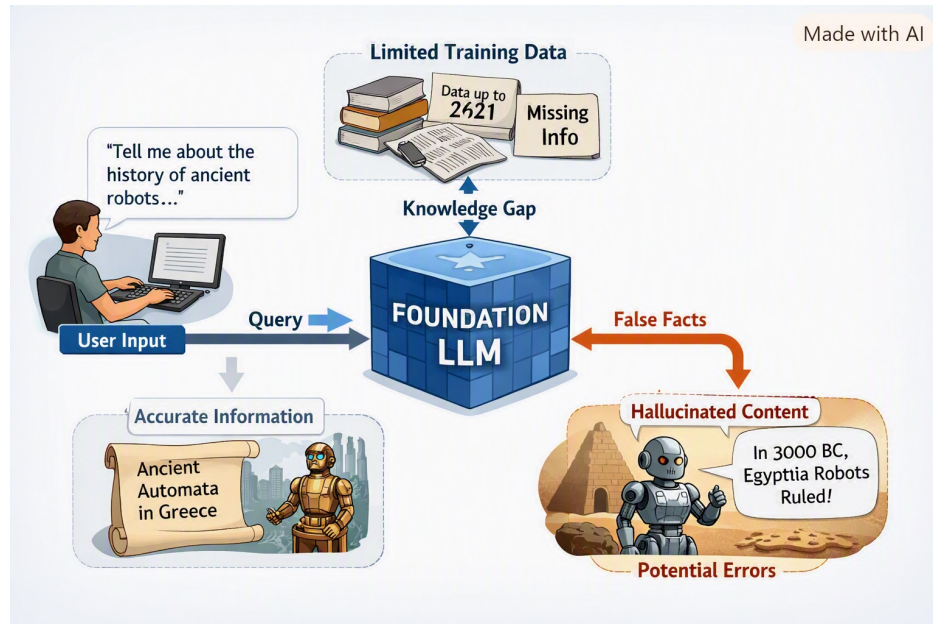
Action

Constraint **Each bullet points not more than 15 words.**

Tone

Limitation of Foundation Model

Limitation of Foundation Model



LLMs have two big limitations:

- Their knowledge is **frozen** at training time.
- They can **hallucinate** when they don't know something.

Solutions

■ In-Context Learning (ICL)

- Instead of retraining the model, you simply provide examples or context inside the prompt, and the model learns the pattern on the fly.

■ Fine-Tuning

- training a pre-existing large language model on new, domain-specific data so it learns specialized patterns beyond its original general knowledge.

■ Retrieval-Augmented Generation (RAG)

- combines a retriever (search engine + vector database) with a generator (LLM) so the model can answer questions using fresh, factual, external knowledge instead of relying only on its training data.

Trade-off Factors

There is NO perfect solution.

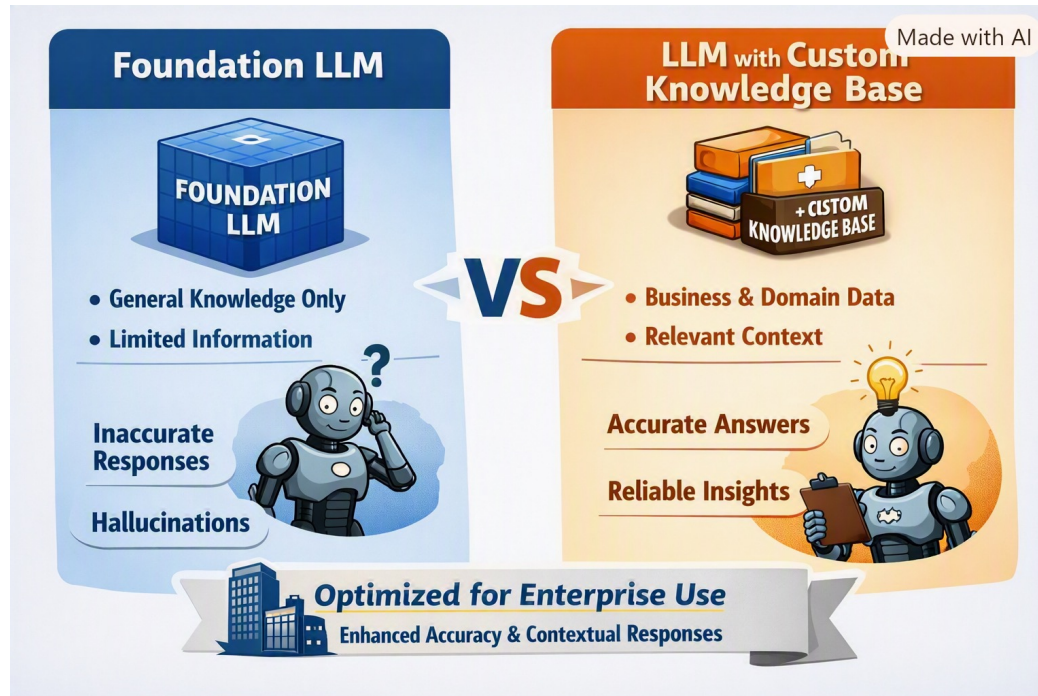
These solutions vary in the following key factors, and the importance of the factors changes depending on real-world needs.

- Cost
- Latency
- Setup Complexity
- Business Agility

Context Strengthening

Adding Proprietary Knowledge Base

Custom Knowledge Base



- In modern business environments, off-the-shelf generative AI models struggle with domain specificity, temporal latency, and factual hallucination.
- Context engineering and personal/enterprise knowledge retrieval architectures are there to fit this gap.

AI FOR BUSINESS: WHY YOUR CONTEXT IS KEY

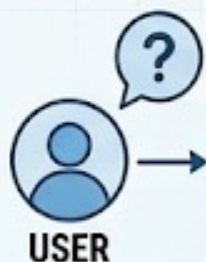
Simpler comparison: Generic AI vs. Specialized Business AI

GENERAL PURPOSE AI

1. GENERIC AI (PUBLIC KNOWLEDGE)



Uses Only Public Web Data



How to improve sales?



Focus on customers, use marketing, lower prices.

EXAMPLE: VAGUE, ONE-SIZE-FITS-ALL ADVICE



HALLUCINATION RISK

THE PROBLEM: LACKS YOUR BUSINESS KNOWLEDGE



- No Access to Company Records
- Not Up-to-Date
- Generic Answers



ENTERPRISE AI

2. SPECIALIZED AI (CUSTOM KNOWLEDGE BASE)



Uses Your Private & Real-time Data



How to improve sales?



CONTEXT DATA



Focus on APAC region based on Q3 report (Page 12); use CRM data for targeted email campaigns.

EXAMPLE: PRECISION, DATA-DRIVEN, SPECIFIC ANSWER (With Sources)



TRUSTED & SECURE

SPECIALIST
→ **TAILORED & TRUSTED**

THE SOLUTION: ADDS PRIVATE CONTEXT

- Uses Your CRM Records
- Includes Proprietary Reports
- Verified answers with source citations



	Core RAG Benefits to Students	Professional Value of Using RAG
Study (Immediate)	Coursework & Case Synthesis Engine: Ingest 500+ pages of academic papers, HBR cases, and lecture decks for closed-loop retrieval with zero hallucinations.	Accelerates literature reviews, case competition prep, and exam revision with 100% cited source backing.
Internship (Mid-term)	Corporate Onboarding & Deal Dossier Bot: A private repository parsing company 10-Ks, pitch books, and internal SOPs.	Cuts junior-analyst research time by 70%, producing verified briefing memos on day one.
Future Job (Long-term)	Enterprise Autonomous Agent: A secured Microsoft Copilot Studio agent connected to live business repositories and SharePoint graphs.	Demonstrates production-ready AI governance, knowledge orchestration, and workflow automation for corporate employers.

Getting Familiar With AI Tools

Popular Agent/Agentic Tools

- Gemini
- Gemini Spark
- Gemini Enterprise
- Microsoft Copilot (Personal Account)
- M365 Copilot (Enterprise Account)
- Copilot Studio (Enterprise Account)
- Claude
- ChatGPT
- And many more ...

Reminder #1

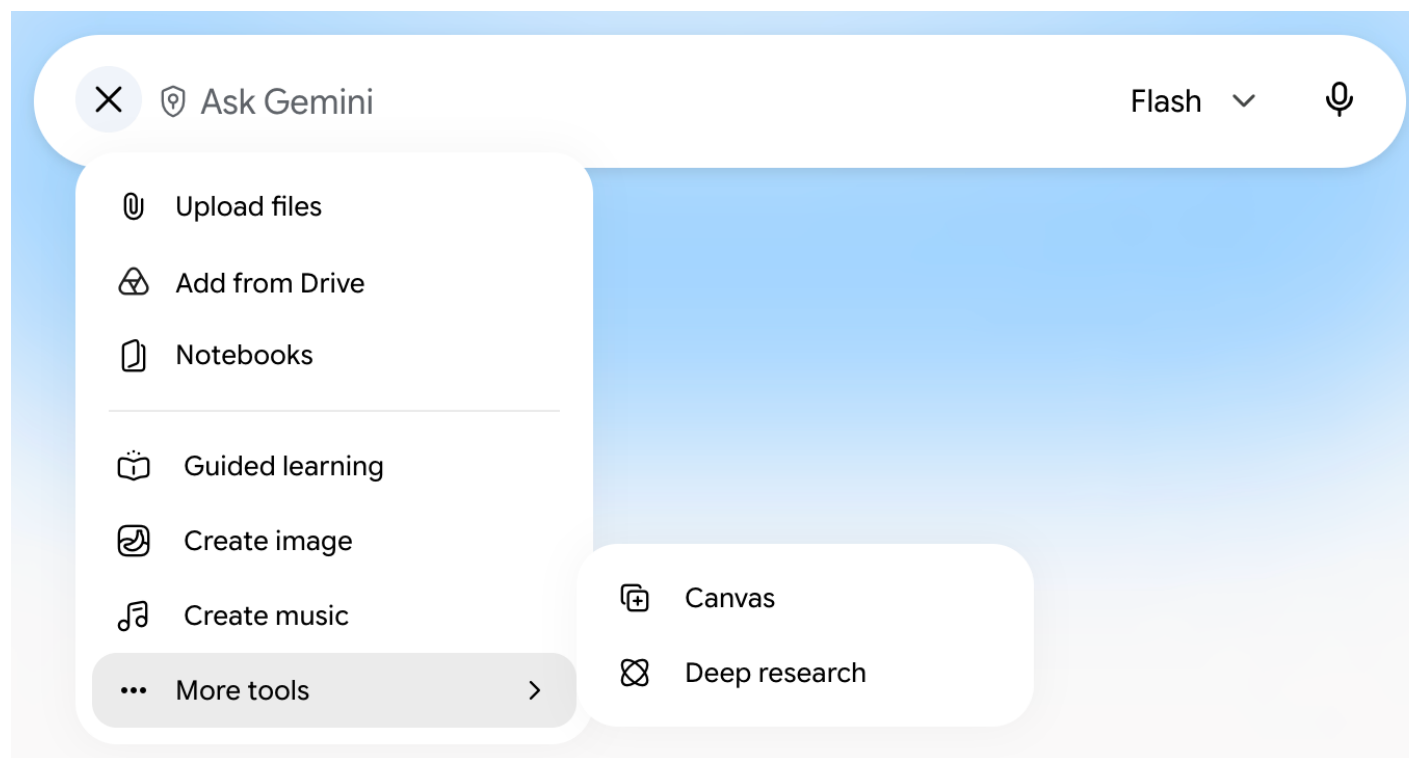
AI products evolve rapidly.
Features and UI change very often.

Reminder #2

AI is NOT always right.
AI makes things up – hallucination.
Use multiple tools for validating.

Google Gemini

<https://gemini.google.com>



Google Gemini Ecosystem

Focused on Deep Synthesis & Workspace Native AI

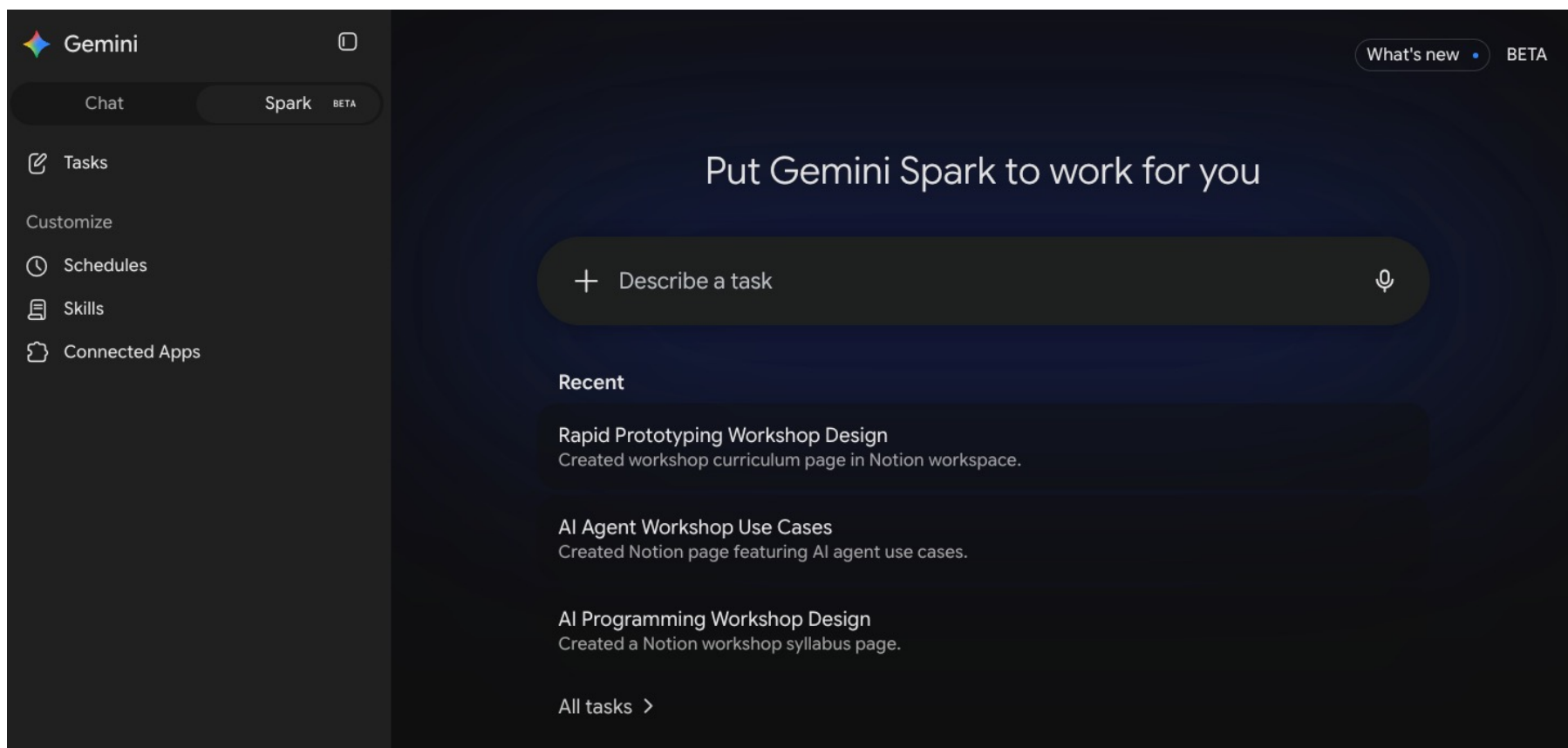
- **Custom Gems:** Tailored mini-agents configured with systemic role instructions and knowledge grounding.
- **Gemini Deep Research:** Multi-step web research agent capable of synthesizing complex industry reports.
- **Gemini Notebook** (previously NotebookLM): Context-grounded analytical engine for strict non-hallucinatory document verification.
- **Workspace Integrations:** Direct execution within Google Docs, Sheets, and Slides.

Gemin Spark

only for paid users

Gemini Spark is Google's personal AI agent designed to automate complex workflows and manage scheduled tasks across connected apps and services.

Gemin Spark only for paid users



Gemini Enterprise

- Securely access advanced Gemini models privately.
- Securely ground responses in sensitive internal data context for precision answers.
- Guarantee strict data isolation and robust enterprise-grade privacy protection.

Gemini Notebook

 Gemini Enterprise

 New chat

 Search

 Library

Agents

 Gemini Notebook

 Deep Research

 New agent

Recent

AI workshop for kindergarten teachers

VBA coding tools for data analysts

Gemini Enterprise email

AI agents and their goals

Claude skill file binary

OneDrive Word documents

Access workspace file

 Settings

ENTERPRISE

Welcome to Gemini Notebook

Create your first notebook

Gemini Notebook is an AI-powered research and writing assistant that works best with the sources you upload



Gain new understandings about any document



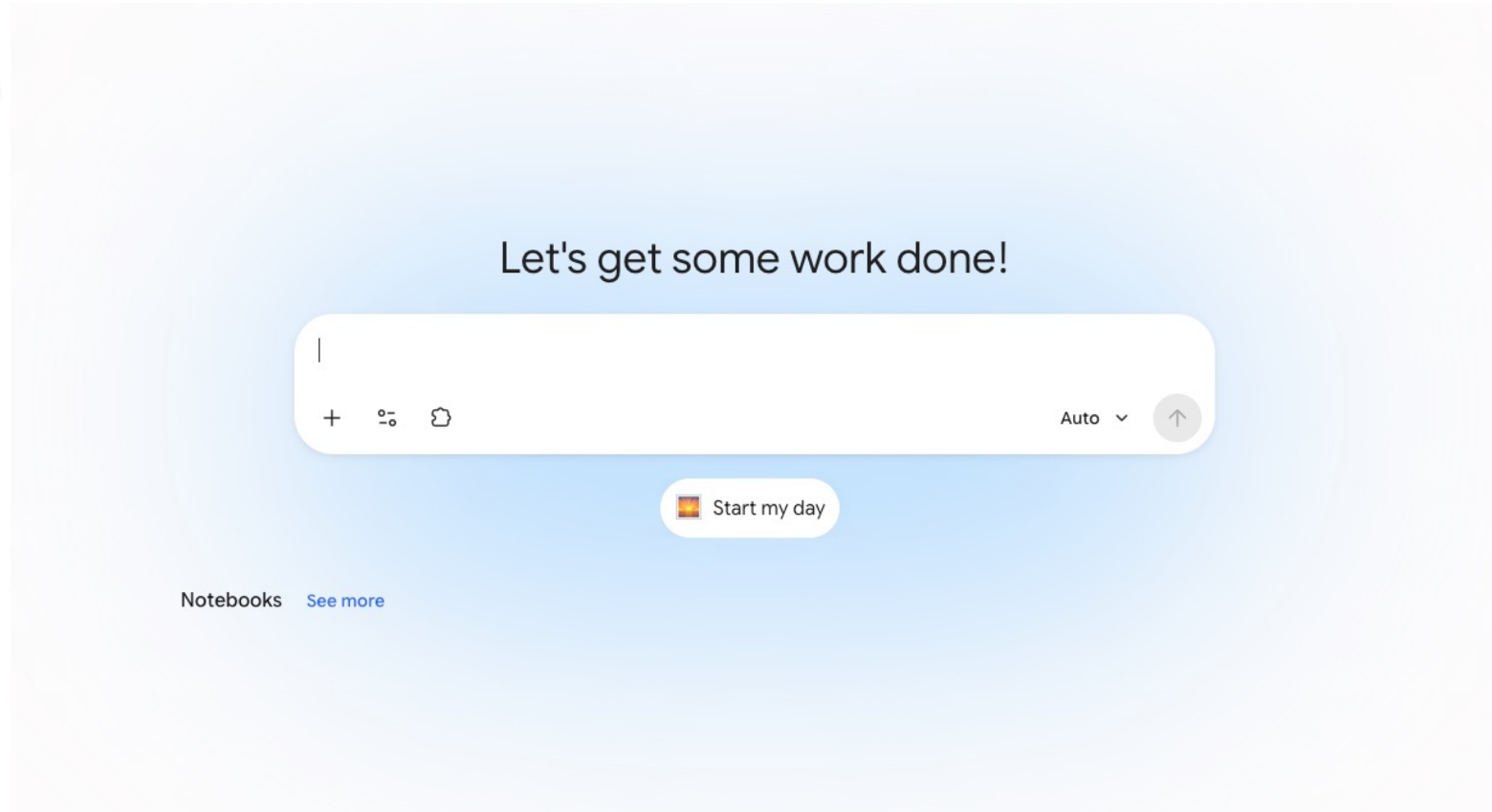
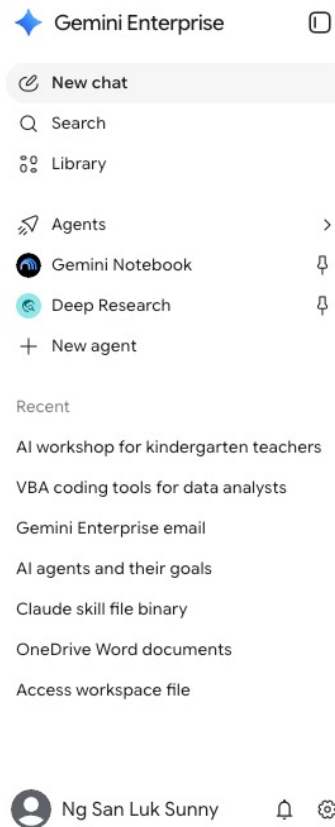
A chatbot grounded in your sources



Share your insights

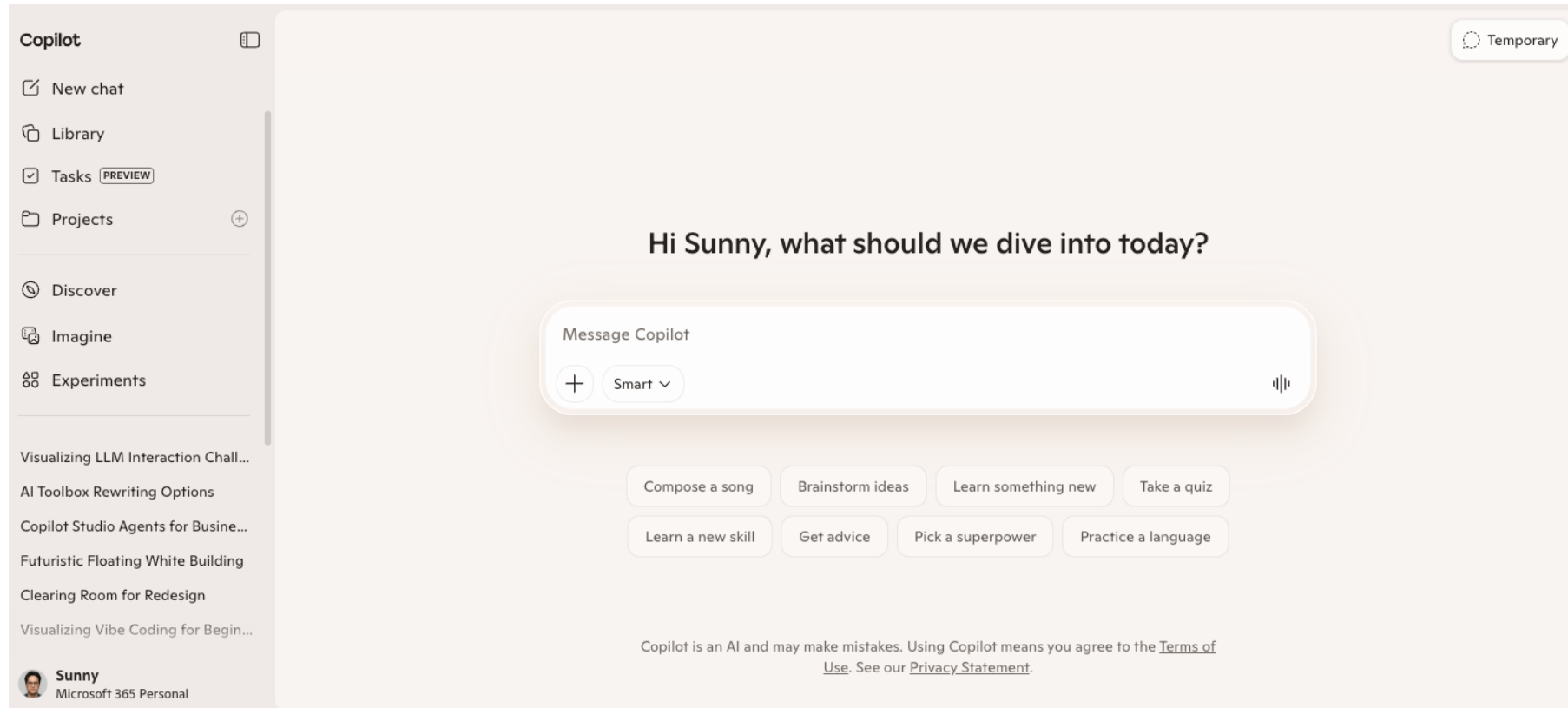
Add key resources to a notebook and share with your

Gemini Enterprise



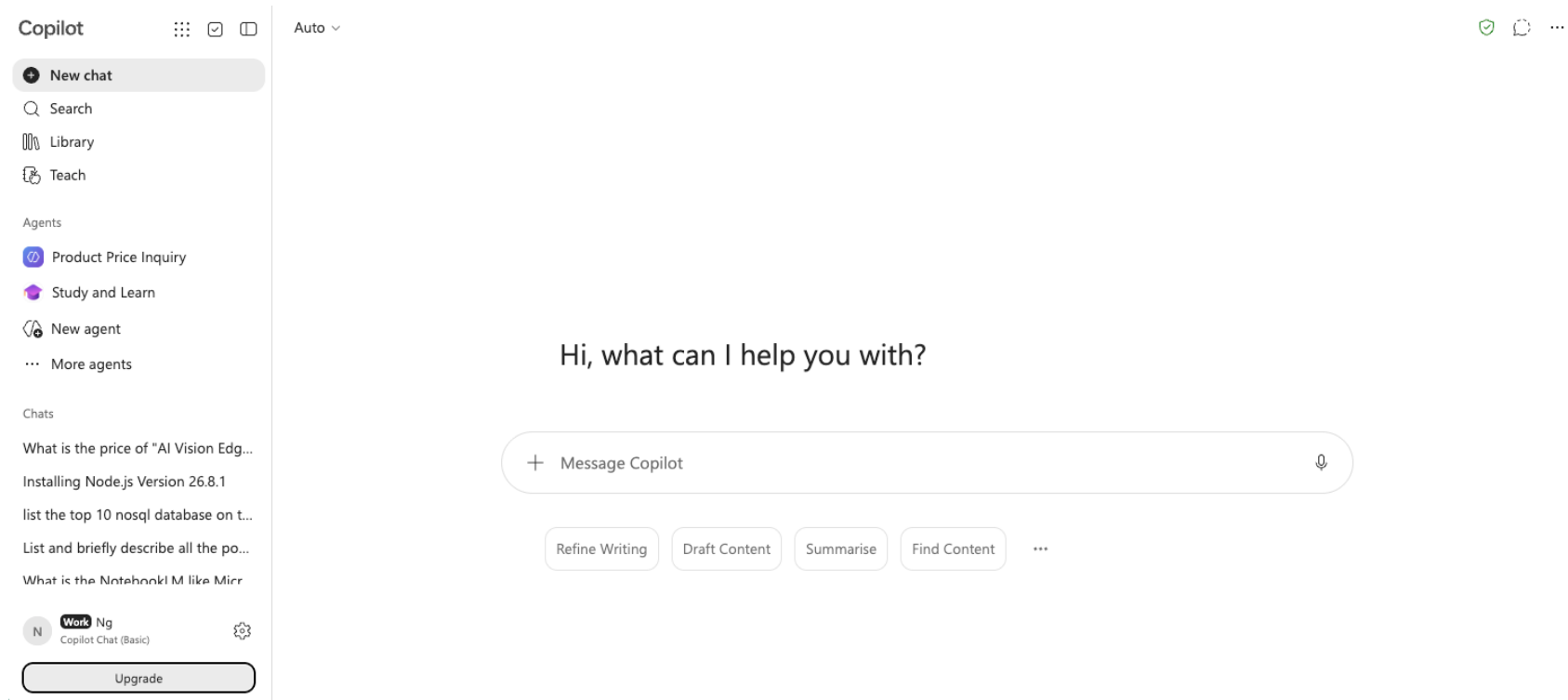
Microsoft Copilot (Personal)

<https://copilot.microsoft.com/>



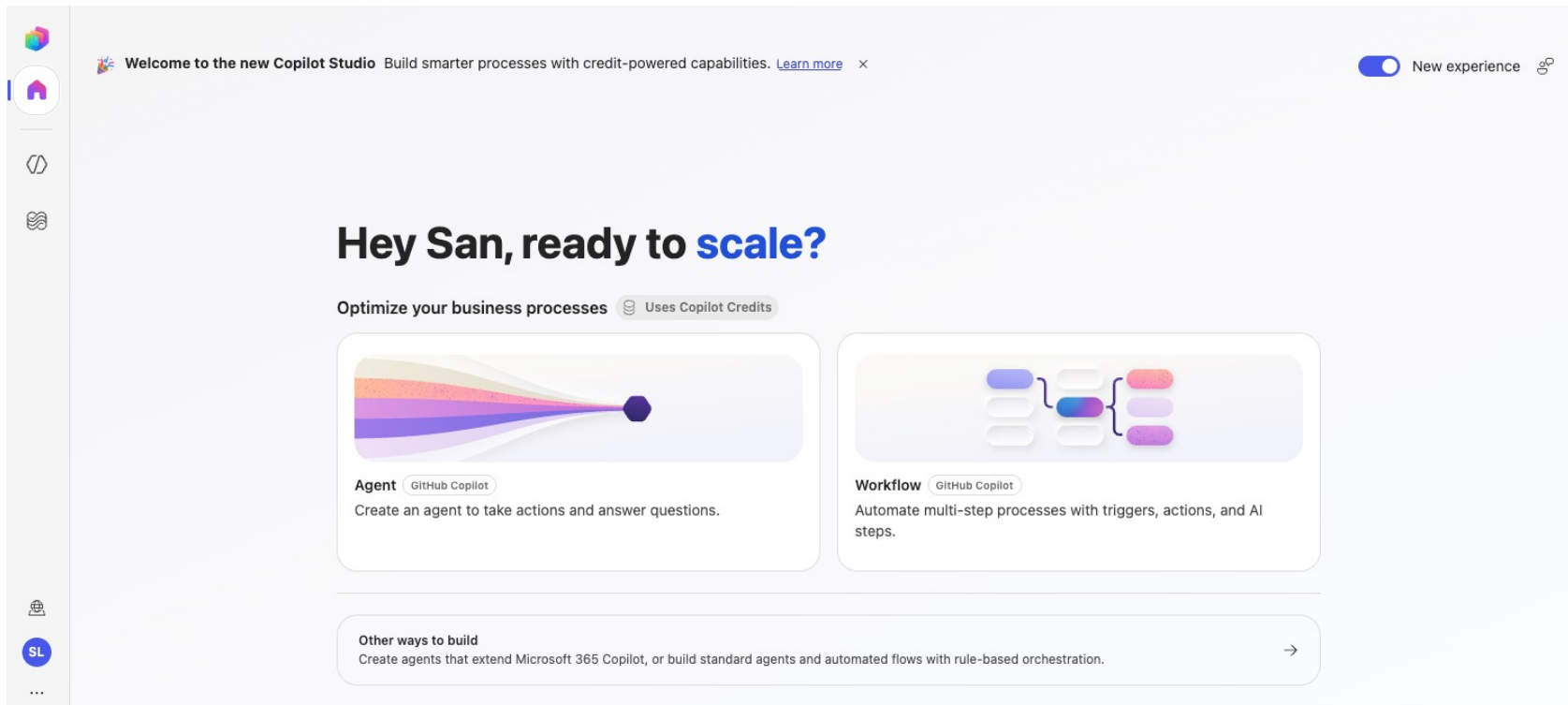
Microsoft M365 Copilot (Enterprise)

<https://m365.cloud.microsoft/chat>



Copilot Studio (Enterprise Only)

<https://copilotstudio.microsoft.com/>



Building Your AI Toolkits With Context Strengthening

AI Tools to Use

- Google Gemini Gem (Free account will do)
- Google Gemini Spark (Requires Google AI Pro Account)
- Google Gemini Enterprise
- Google Gemini Notebook (Enterprise Account)
- Copilot Projects (Personal Account)
- Copilot Agent (Enterprise Account)
- Copilot Studio (Enterprise Account)

Context Strengthening AI Toolkits Ideas

1. FAQ Agent
2. Student Handbook Inquiry
3. HR Inquiry
4. Product Price Inquiry
5. Grounded Synthesis with Gemini Notebook
6. Enterprise Knowledge Agents

And many more ...

Thank You!