

A Conversational AI Platform for Educating and Supporting Behavioral Change in Pregnant Women Diagnosed with Gestational Diabetes Mellitus

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Objectives

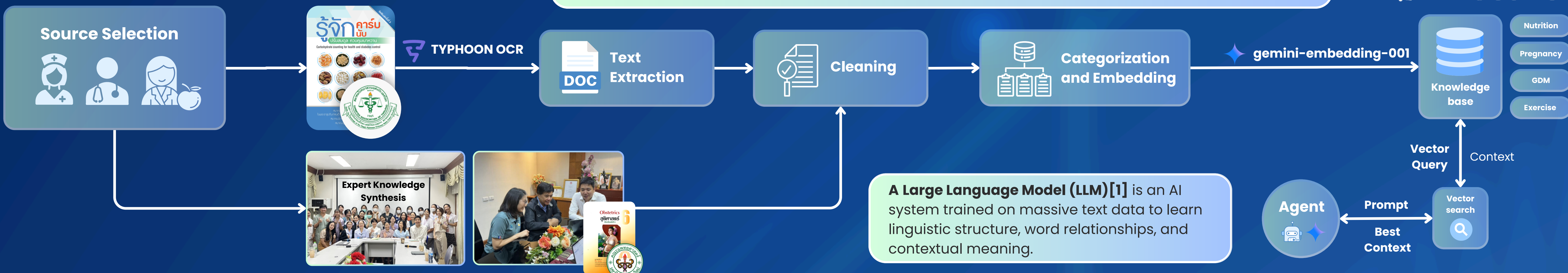
- 1 develop a **Multi-Agent platform** that provides education and supports behavioral change for pregnant women diagnosed with gestational diabetes mellitus
- 2 develop a **Passive Conversational Agents** that provides accurate and reliable health and nutrition information for pregnant women diagnosed with gestational diabetes mellitus
- 2 develop an **Active Conversational Agents** that supports behavioral self-management by calculating carbohydrate intake from meals and sending reminders for blood glucose monitoring.

Methodology

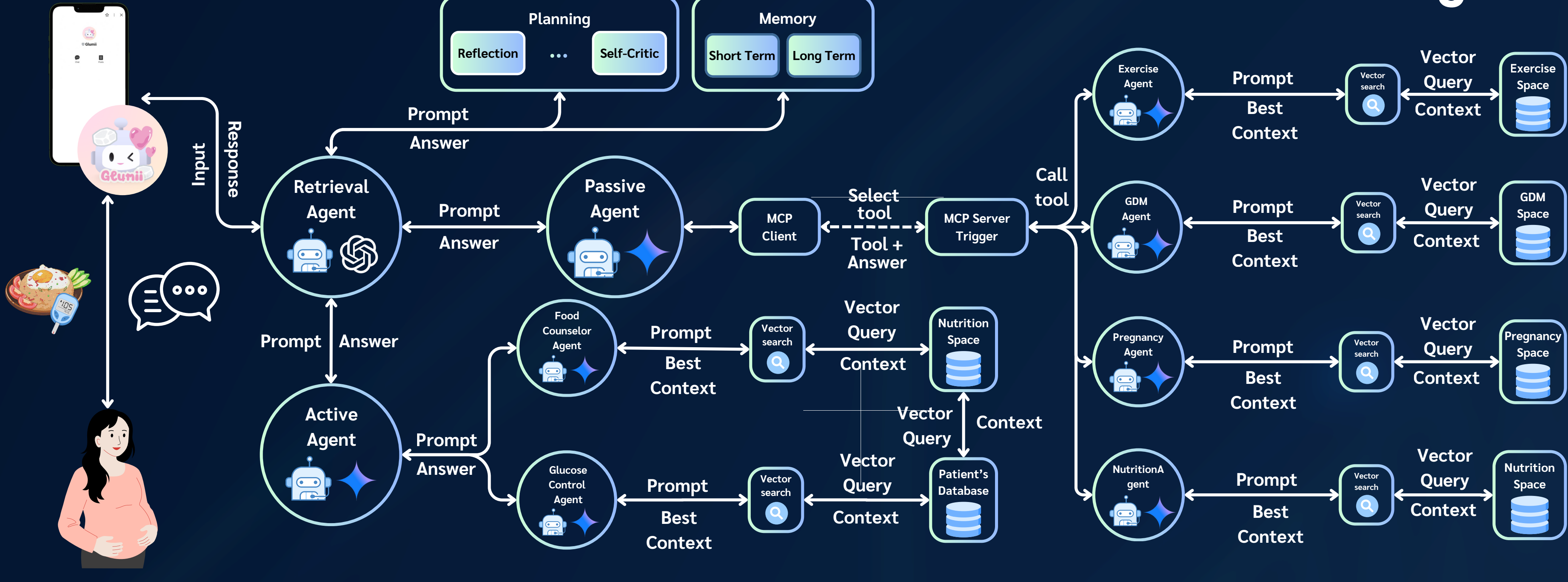


Knowledge Base Preparation

Retrieval-Augmented Generation (RAG)[2] is a technique that enhances LLM accuracy by retrieving relevant information from external knowledge sources before generating responses, helping reduce hallucination and improve factual reliability.



Conversational Agents



Result

Passive Conversational Agents			
Method 75 questions 3 topics x 25 each Accuracy Check True False Evaluators 10 experts health care worker & nutritionists	topics	Accuracy Check	Accuracy percentage
	GDM	25/25	100%
	Pregnancy	25/25	100%
	Nutrition	21/25	84%

Active Conversational Agents		
Menus	Glumii (Carb)	Actual values (Carb)
Rad Na Moo	3.1	3.1
Kanom Babin	8	8
Khao Kha Moo	3.22	3.6
Seafood Suki	1.6	1.6
MSE		0.0361

Passive Education and guidance



Active Behavior change



Persuasive Technology (PT)[3] refers to interactive technology that is specifically designed with the goal of changing users' attitudes or behaviors. Its core principle is to influence without coercion or deception.

Glumii provides recommendations using **Real-time feedback and coaching techniques**.

Glumii suggests dietary behavior modifications and encourages the mother using **Positive Reinforcement techniques**.

If the mother's blood sugar levels are significantly higher than appropriate thresholds, Glumii employs **Loss Aversion and Risk Communication techniques**. Glumii alerts her with relevant statistics about complication risks that may occur to motivate her to make suitable dietary behavior changes.

Discussion and Conclusion

Passive Conversational Agents

- GDM & Pregnancy: 100% accuracy
- Nutrition 84% accuracy → diverse food items and preparation methods beyond the current scope of the knowledge base

Active Conversational Agents

- Carbohydrate estimation MSE = 0.0361 → small estimation error

Next steps

- Add source attribution
- Analyze retrieval difficulty to guide database expansion

References

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[2] Naveed, H., Khan, A. U., Qiu, S., Saqib, M., Anwar, S., Usman, M., Akhtar, N., Barnes, N., & Mian, A. (2024). *A Comprehensive Overview of Large Language Models*. (No. arXiv:2307.06435). arXiv. <https://doi.org/10.48550/arXiv.2307.06435>

[3] B.J. Fogg. (2003). *Persuasive Technology*. Elsevier. <https://doi.org/10.1016/B978-1-55860-643-2.X5000-8>