Personalized Meal Recommendation System Based on Dietary Restrictions

Gyeom Hwangbo GSAI, 20262549

Eunchan Jo GSAI, 20262947

Chaewon Park IME, 20220052

Sanghyung Lee IME, 20262555

Groups of People who has Dietary Restrictions.

Digestive Issues



Religion



Diet



Patients with Digestive Issues.

Elimination Diet dietary approach that excludes symptom-triggering foods.

Constraints

- Is this food safe for me to eat?
- Are there any hidden ingredients in the sauces or broths that I should avoid?
- What is my current physical condition today?

↓

End up eating the same old things!

Why is This Important?

1

Not just a minor inconvenience for one, but a daily reality for many.

Halal or vegetarian diets driven by religion or personal beliefs; peanut or lactose restrictions triggered by allergies or intolerances; and dietary management tailored for weight loss or fitness.

[1] The number of patients with Crohn's disease has increased 36% over last 4 years, and over half of them are in their 20s-30s.

2

Even a single mistake comes with a heavy price.

This can lead to worsening of symptoms, violation of religious taboos, allergic reactions.

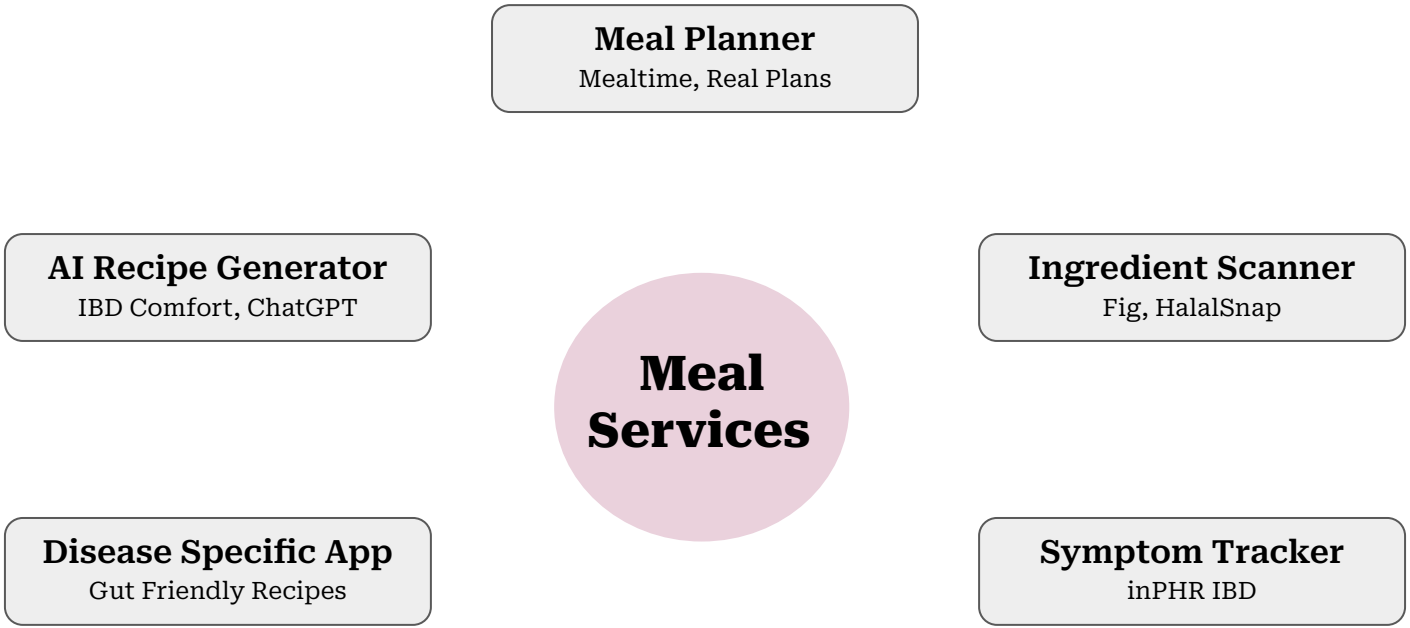
3

This process repeats every single meal, every single day.

This is identical to about a 1000 times a year.

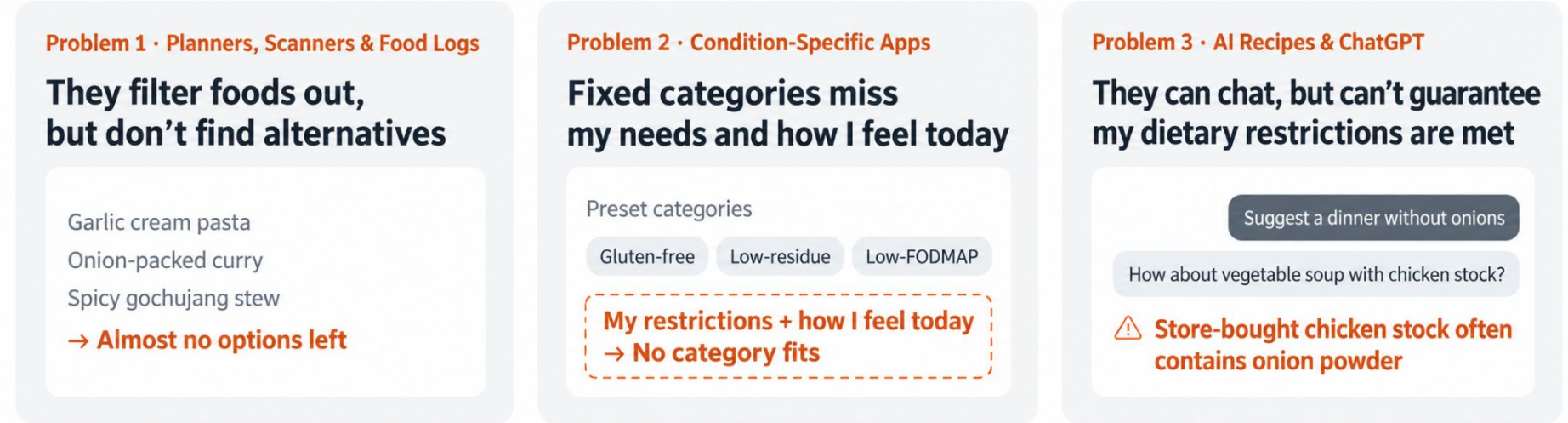
[1] Segye Ilbo (2026, March 27). Data from the Health Insurance Review and Assessment Service. https://www.segye.com/newsView/20260327505764

Existing Similar Services.



Limitations of Existing Services.

There are plenty of diet apps, but none of them find what I can actually eat.

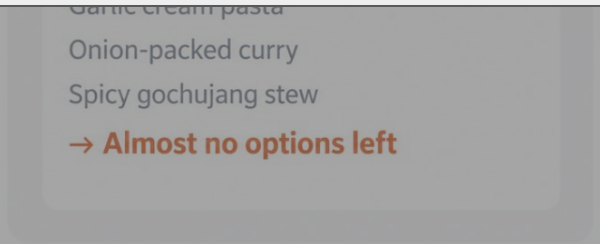


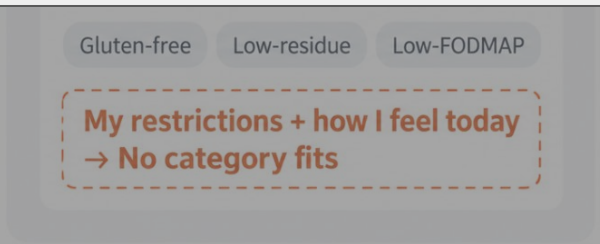
Limitations of Existing Services.

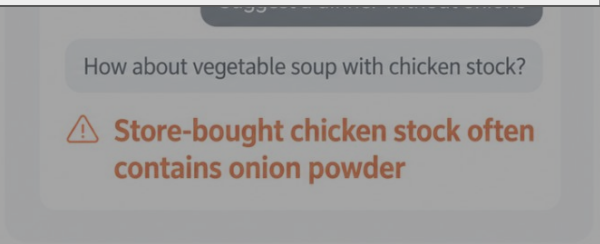
There are plenty of diet apps, but none of them find what I can actually eat.

What We Need:

remembers your dietary restrictions, strictly respects them, and finds the right food for you.

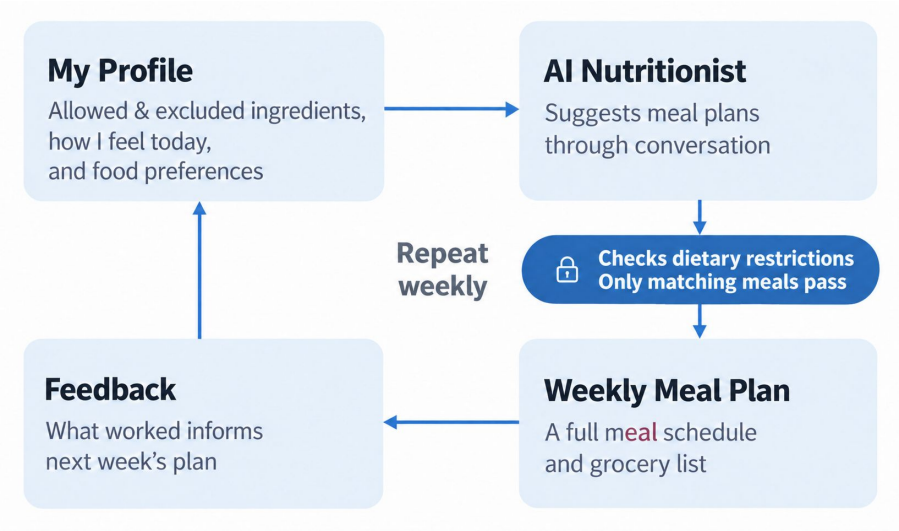


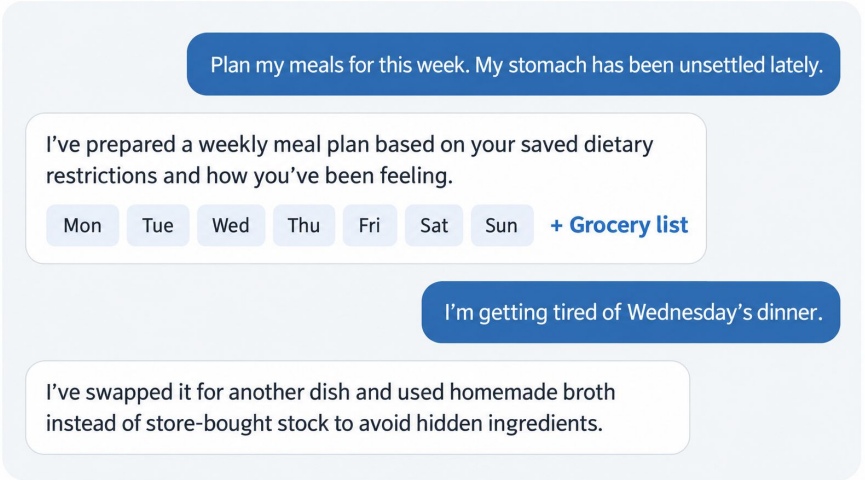




A Personalized AI Nutritionist Aware of Dietary Restrictions.

A system that faithfully enforces your restrictions; a conversation discovers your taste.



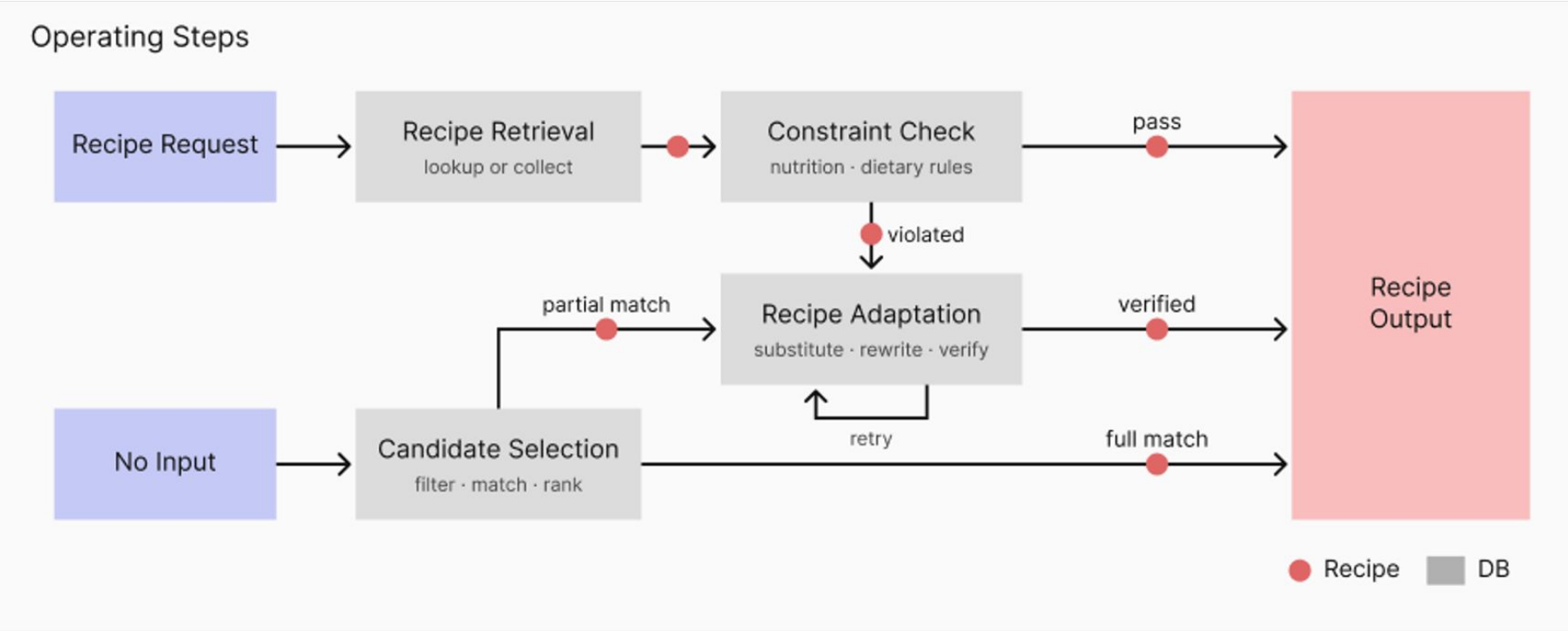


Filter restrictions, Find alternatives

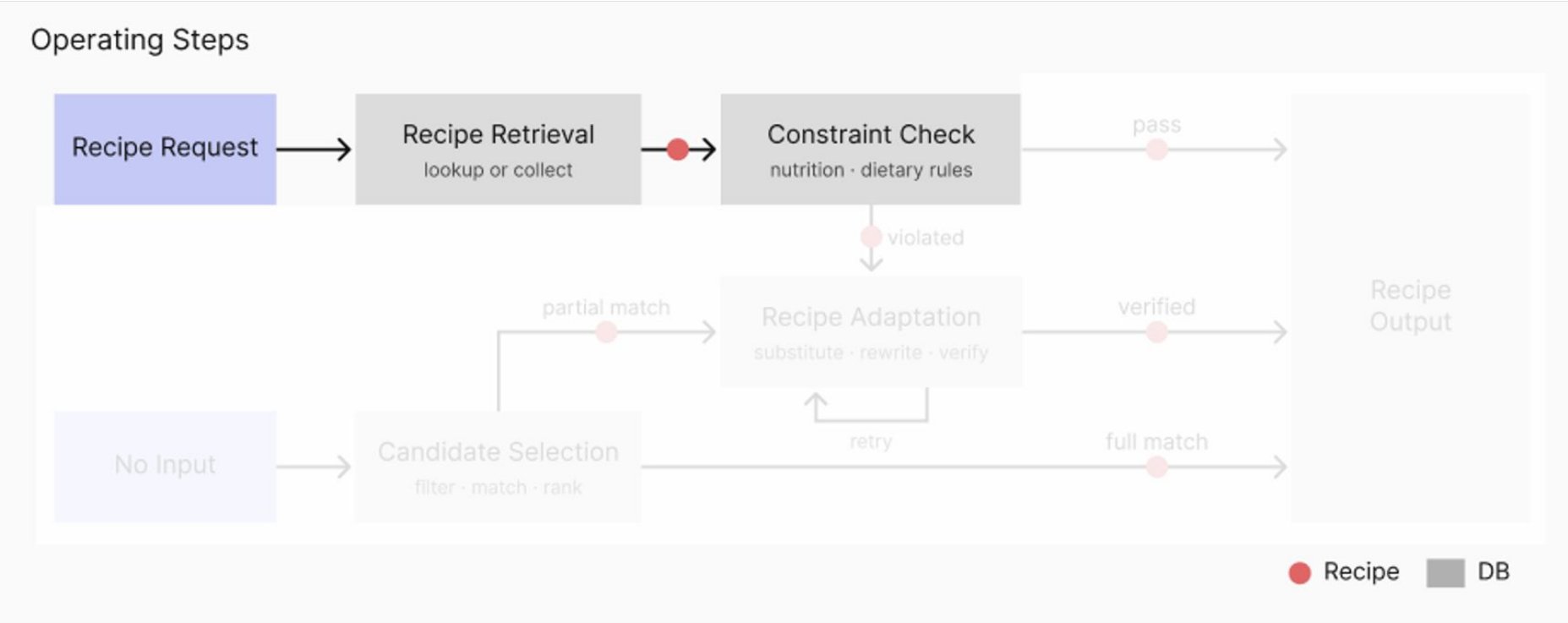
Add any category of restrictions

Guarantees that restrictions are met.

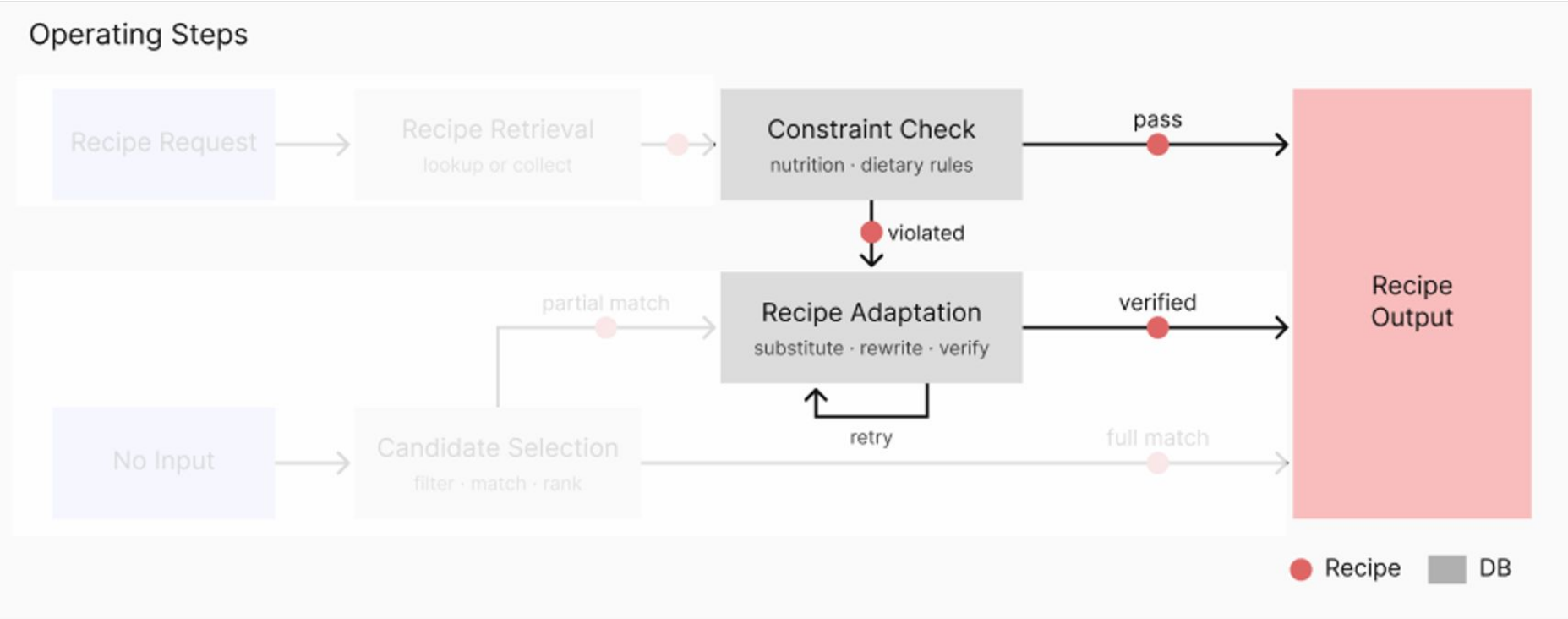
Abstract System Overview.



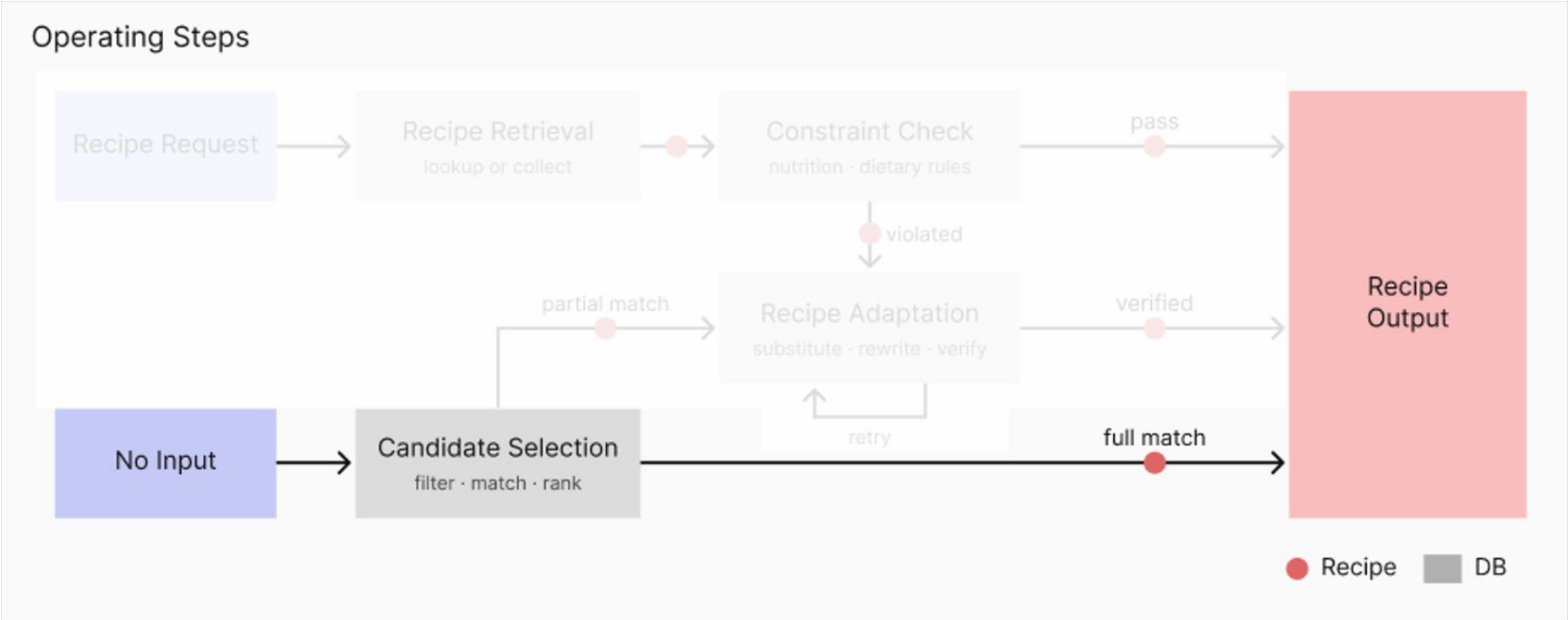
Abstract System Overview.



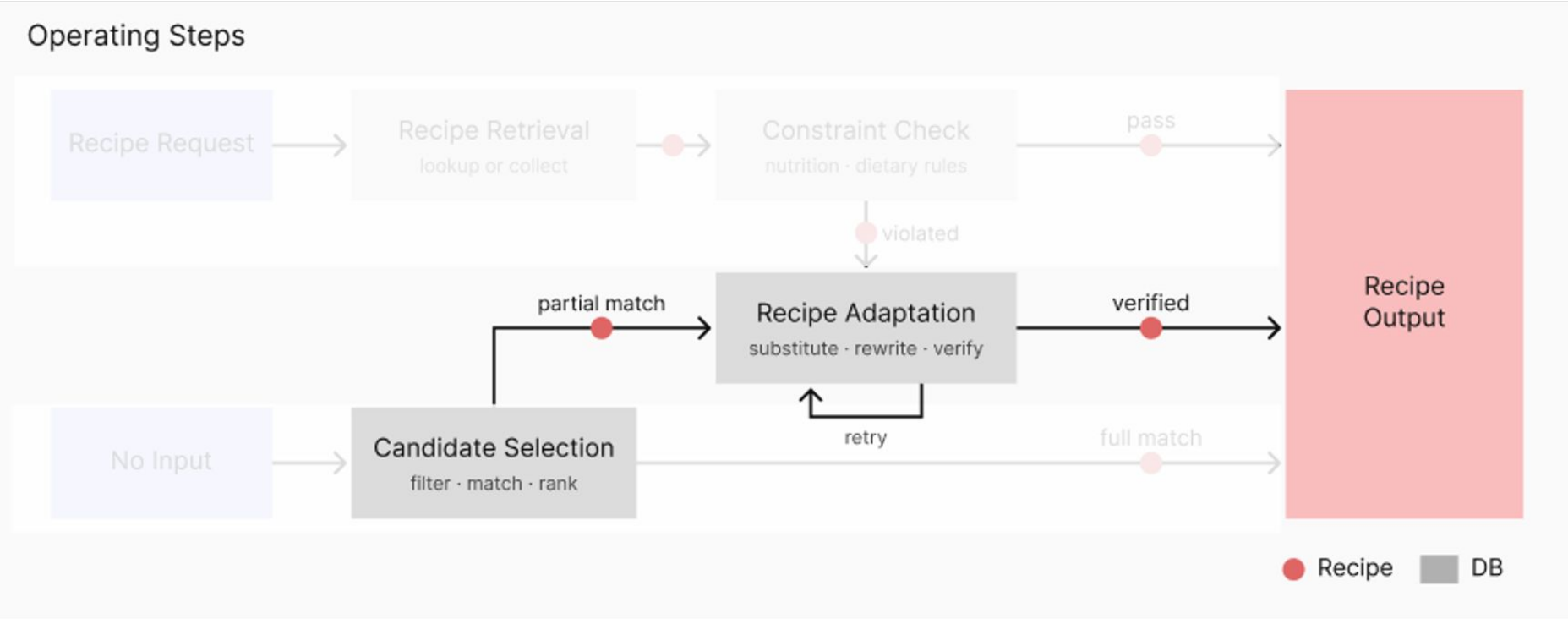
Abstract System Overview.



Abstract System Overview.



Abstract System Overview.



Database Design.

Recipe & Ingredient Databases

Recipe DB

DB TYPE **SQL / relational**

Linked ingredients · ordered steps

RECIPE	Shrimp tofu egg custard
INGREDIENT	Soft tofu · 75 g Shrimp · 20 g
COOKING STEP	Blanch shrimp

PRE-PROCESSING

Split ingredient text into structured rows.

SOURCE

Ministry of Food and Drug Safety

Ingredient DB

DB TYPE **SQL / relational**

Canonical names · nutrition joins

INGREDIENT	Soft tofu
ALIAS	Silken tofu
NUTRITION	Per 100 g
PROTEIN	5 g
SODIUM	10 mg

PRE-PROCESSING

Match aliases to a standard ingredient name.

SOURCE

Ministry of Food and Drug Safety

Database Design.

Dietary Rules & User Profile Databases

Dietary Rules DB

DB TYPE **SQL / relational**

Exact checks · rule versions

RULE TYPE	CONDITION
EXCLUDE	Milk
SUGAR LIMIT	20 g per serving
APPLIES TO	Current user

PRE-PROCESSING

Normalize each limit to a unit and scope.

SOURCE

Ministry of Food and Drug Safety

User Profile DB

DB TYPE **NoSQL / document**

Flexible fields · daily state

```
{
  "allergy": "milk",
  "today": {"digestion": "sensitive"},
  "flavorPreference": "mild"
}
```

PRE-PROCESSING

Validate the current profile fields.

Thank You!

Gyeom Hwangbo GSAI, 20262549

Eunchan Cho GSAI, 20262947

Chaewon Park IME, 20220052

Sanghyung Lee IME, 20262555