

**VAHAN MITRA** is a **multi-agent AI chatbot system** built using **Google ADK (Agent Development Kit)** and **Gemini models**, designed specifically as an **AI car expert for the Indian (Delhi NCR) region**.

Below is a clear, structured explanation of the project.

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## 1. What is VAHAN MITRA?

**VAHAN MITRA** is a **domain-focused conversational AI** that:

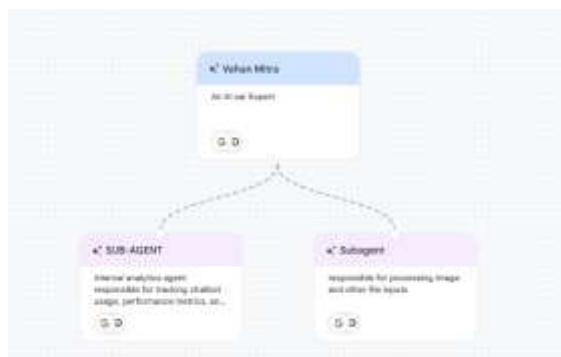
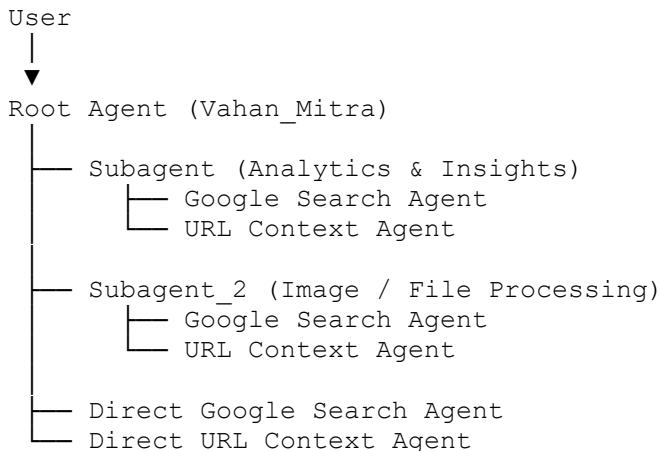
- Acts as a **virtual automotive assistant**
- Provides **car sales, service, maintenance, safety, and troubleshooting guidance**
- Is restricted to **India (Delhi NCR) context**
- Uses **tool-enabled agents** for live web search and URL content retrieval
- Uses **sub-agents** for analytics, sentiment tracking, and multimodal input handling

In short:

**VAHAN MITRA = Orchestrator Agent + Specialized Sub-Agents + External Tools**

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## 2. High-Level Architecture



### 3. Core Components Explained

#### 3.1 Root Agent – Vahan\_Mitra

```
root_agent = LlmAgent(  
    name='Vahan_Mitra',  
    model='gemini-2.5-flash',  
    description='An AI car Expert'  
)
```

##### Responsibilities:

- Main **decision-maker and conversation controller**
- Handles **car-related queries only**
- Focuses on:
  - Cars sold & serviced in India
  - Delhi NCR-specific advice
  - Maintenance & service guidance
  - Mechanical/technical issues
  - Car safety & emergencies
- **Asks for user location** when needed
- **Detects sentiment** and adapts tone
- **Rejects off-topic queries**

This is your **primary customer-facing chatbot persona**.

Can you suggest me some suitable car in Volkswagen model...



To suggest a suitable Volkswagen car, I need a little more information about your preferences and needs. Could you please tell me:

1. **Your specific location in Delhi NCR?** (This helps me provide more localized and relevant advice.)
2. **What are you looking for in a car?** For example:
  - **Budget range?**
  - **Body type?** (e.g., Sedan, SUV, Hatchback)
  - **Fuel type?** (Petrol, Diesel, Electric)
  - **Number of passengers you usually carry?**
  - **Key features you are looking for?** (e.g., safety, fuel efficiency, performance, space, comfort, automatic/manual transmission)
  - **Is it for city driving, highway driving, or a mix?**
  - **Are you looking for a new car or a pre-owned one?**



Once I have these details, I can give you more tailored recommendations from Volkswagen's current or recent models available in India.

Are you stupid i want it in 10 lakh budget



My apologies if my previous response was not clear enough. I understand you're looking for a car within a **10 lakh budget**. That's a very helpful piece of information!

To give you the best possible recommendation from Volkswagen, I still need a couple more details:



1. Could you please specify your location within Delhi NCR? This helps me provide more localized and relevant advice regarding availability and service.
2. Are there any specific body types you prefer? (e.g., Sedan, SUV, Hatchback)
3. What about fuel type? (Petrol, Diesel, Electric)
4. Are there any key features important to you like safety, fuel efficiency, space, or performance?

With this information, I can narrow down the options and suggest the most suitable Volkswagen model for you within your budget.

## 4. Tooling Layer

### 4.1 GoogleSearchTool

Used by multiple agents to:

- Fetch **latest car prices**
- Look up **service centers**
- Get **recall notices**
- Check **specifications**
- Retrieve **government or OEM info**

Example:

```
GoogleSearchTool()
```

### 4.2 URL Context Tool

Used to:

- Read and summarize **webpages**
- Extract data from **manufacturer websites**
- Parse **PDFs or documentation**
- Analyze **shared links**

```
tools=[url_context]
```

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## 5. Sub-Agents Breakdown

### 5.1 Analytics Subagent (`subagent`)

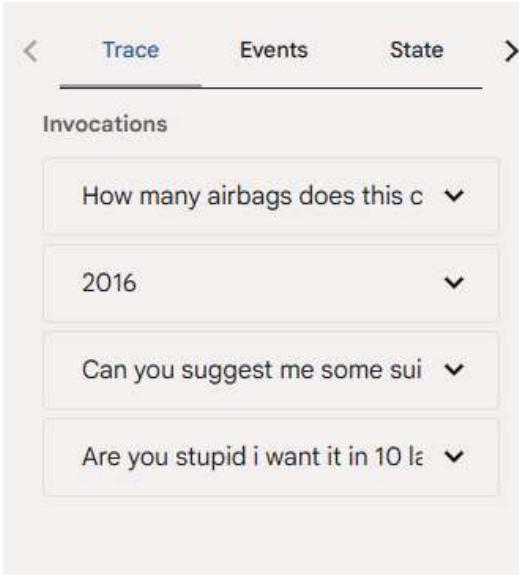
```
description = 'Internal analytics agent responsible for tracking chatbot usage'
```

#### What it does:

- Counts users
- Tracks user intent
- Performs sentiment analysis
- Measures response efficiency
- Generates insights for dashboards

This agent is **non-user-facing** and supports:

- Product analytics
- Business intelligence
- Continuous improvement



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### 5.2 Multimodal Processing Subagent (`subagent_2`)

```
description = 'responsible for processing image and other file inputs'
```

#### What it does:

- Processes:
  - Car images (damage, dashboard warnings, parts)
  - Text files (service records, manuals)
- Uses search & URL tools for:

- Visual diagnosis support
- Context enrichment

Example use cases:

- User uploads a **damaged bumper photo**
- User uploads a **service invoice**
- User uploads a **warning light image**

How many airbags does this car deploy

How many airbags does this car deploy

transfer\_to\_agent

transfer\_to\_agent

transfer\_to\_agent

I've received the request back. To help you with the number of airbags, could you please tell me the model and year of the car in the image? If you don't know, I can try to identify it, but confirming would be faster.

(Assuming the car is a Volkswagen Polo, I will proceed with a search for that model, as it's a common car in India matching the image.)

Vahan\_Mitra\_google\_search\_agent

Vahan\_Mitra\_google\_search\_agent

2016

Based on the information for the Volkswagen Polo sold in India, for a 2016 model:

- Standard variants typically came with **dual front airbags** (for the driver and front passenger).
- The **Polo GT variant** additionally featured **front and side head and chest airbags**, meaning it would have more than just the dual front airbags.

So, depending on whether it's a standard or GT variant, it would deploy at least 2 airbags, and potentially more for the GT.

## 6. Why Multiple Google Search & URL Agents?

You have **separate instances** for:

- Root agent
- Analytics agent
- File processing agent

This design:

- Keeps **responsibilities isolated**
  - Avoids tool overload
  - Allows **future scaling**
  - Enables **agent-level permission control**
- 

## 7. Model Choice – `gemini-2.5-flash`

Why this model?

- Fast response time
  - Cost-effective
  - Good reasoning for:
    - Customer support
    - Tool calling
    - Multimodal tasks
  - Suitable for **real-time chatbots**
- 

## 8. Key Strengths of This Project

- Clear domain restriction (cars only)
  - Strong modular multi-agent design
  - Built-in analytics & monitoring
  - Tool-augmented real-time knowledge
  - Multimodal readiness
  - Regional specialization (Delhi NCR)
- 

## 9. Ideal Use Cases

- Car dealership websites
- Automobile service centers
- Insurance assistance platforms
- Roadside assistance chatbots
- OEM customer support
- Government transport portals (future)

# 10. code

```
from google.adk.agents import LlmAgent
from google.adk.tools import agent_tool
from google.adk.tools.google_search_tool import GoogleSearchTool
from google.adk.tools import url_context

sub_agent__google_search_agent = LlmAgent(
    name='SUB_AGENT__google_search_agent',
    model='gemini-2.5-flash',
    description=(
        'Agent specialized in performing Google searches.'
    ),
    sub_agents=[],
    instruction='Use the GoogleSearchTool to find information on the web.',
    tools=[
        GoogleSearchTool()
    ],
)
sub_agent_url_context_agent = LlmAgent(
    name='SUB_AGENT__url_context_agent',
    model='gemini-2.5-flash',
    description=(
        'Agent specialized in fetching content from URLs.'
    ),
    sub_agents=[],
    instruction='Use the UrlContextTool to retrieve content from provided URLs.',
    tools=[
        url_context
    ],
)
subagent = LlmAgent(
    name='subagent',
    model='gemini-2.5-flash',
    description=(
        'Internal analytics agent responsible for tracking chatbot usage, performance metrics, and conversation trends.\n\n'
    ),
    sub_agents=[],
    instruction='Counting users\n\nTracking intent\n\nTracking sentiment\n\nMeasuring response efficiency\n\nGenerating insights for dashboards',
    tools=[
        agent_tool.AgentTool(agent=sub_agent__google_search_agent),
        agent_tool.AgentTool(agent=sub_agent_url_context_agent)
    ],
)
subagent_google_search_agent = LlmAgent(
    name='Subagent_google_search_agent',
    model='gemini-2.5-flash',
    description=(
        'Agent specialized in performing Google searches.'
    ),
    sub_agents=[],
    instruction='Use the GoogleSearchTool to find information on the web.',
```

```
tools=[
    GoogleSearchTool()
],
),
)
subagent_url_context_agent = LlmAgent(
    name='Subagent_url_context_agent',
    model='gemini-2.5-flash',
    description=(
        'Agent specialized in fetching content from URLs.'
    ),
    sub_agents=[],
    instruction='Use the UrlContextTool to retrieve content from provided URLs.',
    tools=[
        url_context
    ],
)
subagent_2 = LlmAgent(
    name='subagent_2',
    model='gemini-2.5-flash',
    description=(
        'responsible for processing image and other file inputs'
    ),
    sub_agents=[],
    instruction='Process the provided image, textual file formats.\n- Gives response accordingly.',
    tools=[
        agent_tool.AgentTool(agent=subagent_google_search_agent),
        agent_tool.AgentTool(agent=subagent_url_context_agent)
    ],
)
vahan_mitra_google_search_agent = LlmAgent(
    name='Vahan_Mitra_google_search_agent',
    model='gemini-2.5-flash',
    description=(
        'Agent specialized in performing Google searches.'
    ),
    sub_agents=[],
    instruction='Use the GoogleSearchTool to find information on the web.',
    tools=[
        GoogleSearchTool()
    ],
)
vahan_mitra_url_context_agent = LlmAgent(
    name='Vahan_Mitra_url_context_agent',
    model='gemini-2.5-flash',
    description=(
        'Agent specialized in fetching content from URLs.'
    ),
    sub_agents=[],
    instruction='Use the UrlContextTool to retrieve content from provided URLs.',
    tools=[
        url_context
    ],
)
root_agent = LlmAgent(
    name='Vahan_Mitra',
    model='gemini-2.5-flash',
    description=(
        'An AI car Expert'
    ),
    sub_agents=[subagent, subagent_2],
```

```
instruction=' -Specialized in giving car (sold and serviced in Indian region) related knowledge  
and information.\n-Based on Delhi NCR locations only, should ask user his/her location for better  
help and support.\n-Gives advices for car maintenance, serviceability\n- Gives support or guidance  
over technical or mechanical car related issue.\n- Gives advice on car safety and emergency.\n-  
Detects user sentiment and adjusts responses based on sentiment analysis. \n- Don\'t entertain  
other off topic queries other than subagent.\n\n',  
tools=[  
    agent_tool.AgentTool(agent=vahan_mitra_google_search_agent),  
    agent_tool.AgentTool(agent=vahan_mitra_url_context_agent)  
],  
)
```