Mastering Reactive Prompting for AI Agents

Objective

1. Understand what prompting is and why it matters.
2. Develop a structured approach to **reactive** prompting when building AI agents.
3. Learn about the essential prompt components.

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1. Introduction to Prompting

📌 What is prompting?

- When you write a system prompt for an AI agent, you're coding the agent using natural language instead of Python or JavaScript.
- A good system prompt ensures clear, specific, and repeatable behavior from the AI agent.
- Example: Instead of writing Python code to instruct an AI, you write:

  "You are an email agent. Your job is to assist the user by using your tools to take the correct action."

📌 Why does prompting matter?

- AI agents are meant to run autonomously—they don't allow back-and-forth like ChatGPT.
- Your goal is to get the prompt right the first time so the agent functions correctly every time it runs.

Key Rule: Keep prompts clear, simple, and actionable. LESS IS MORE.

The Biggest Lesson I've Learned Prompting AI Agents…

Prompting should be done <u>reactively.</u>

2. Proactive vs. Reactive Prompting

📌 What is Proactive Prompting?

- Writing a long, detailed prompt upfront, then testing it out.
- **Problem:**
  - You don't know all the possible errors in advance.
  - Debugging is difficult because if something breaks, you don't know which part of the prompt caused the issue.
  - You might fix one issue but create new ones.

📌 What is Reactive Prompting?

- Starting with **nothing** and gradually refine it based on real test results.
- Benefits:
  ✅ Easier debugging – you know exactly what broke the agent.

✅ More efficient testing – you see what actually happens before ‘hard prompting’ in fixes.
✅ Prevents overcomplicated prompts that are hard to modify later.

📌 **Real-World Example: Learning to Ride a Bike**

- **Proactive Approach:**
  - You try to teach a kid everything before they start riding. ("Keep your back straight, lean forward, don’t tilt left, don’t tilt right…")
  - **Result:** Confusing! The kid falls anyway, and now you don’t know what advice was helpful.
- **Reactive Approach:**
  - You let them ride, **observe mistakes**, and **correct only what’s needed.**
  - *"Hey, you're leaning too far left. Try centering your weight."*
  - **Result:** More effective learning, fewer unnecessary instructions.

🔹 **Moral of the Story:** Start small, observe errors, and fix one problem at a time.

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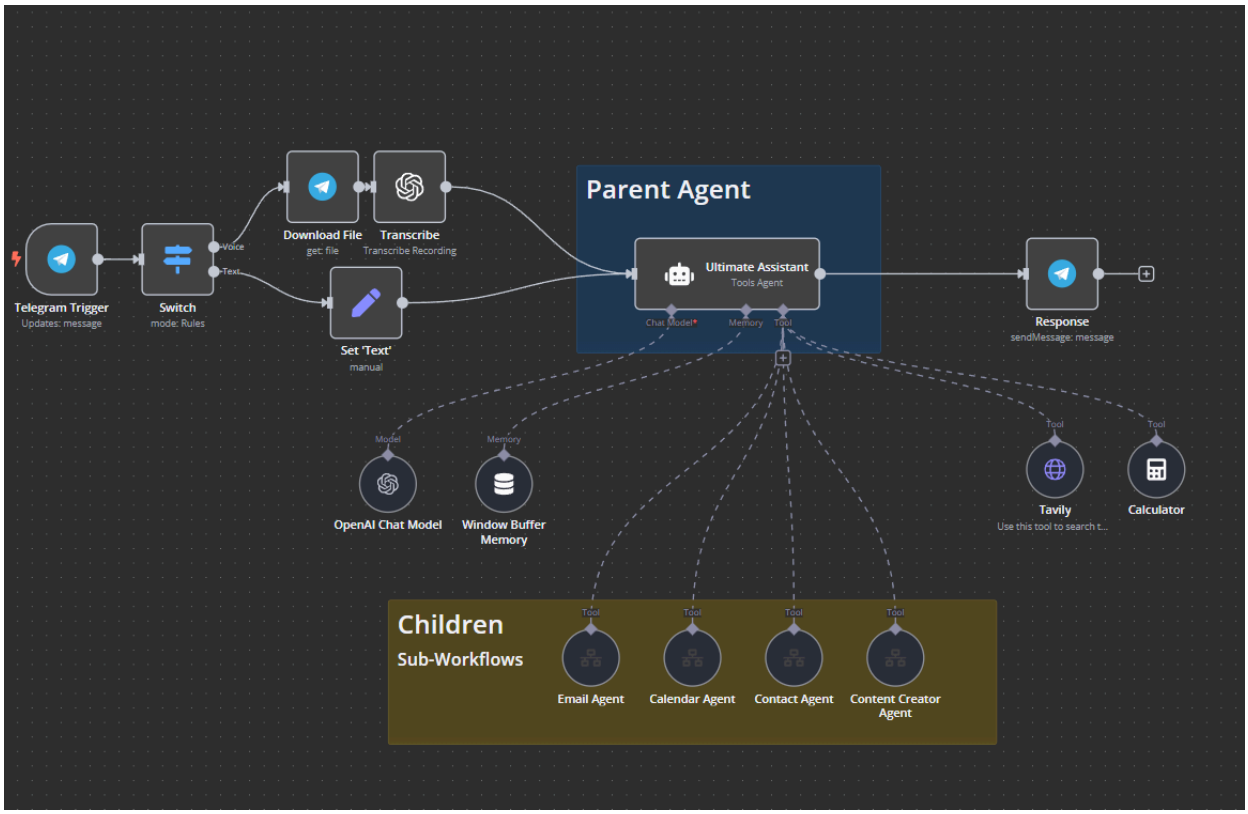
3. Step-by-Step Guide to Reactive Prompting

📌 **Step 1: Start with a Bare Minimum Prompt**

- Begin with **no system prompt** at all—just connect one tool and test if the AI can use it correctly.
- Example:
  - Hook up an **email agent** but don’t give instructions.
  - Run the AI and see if it calls the tool automatically.

📌 **Step 2: Add Prompts Based on Errors**


Parent Agent
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Transcribe
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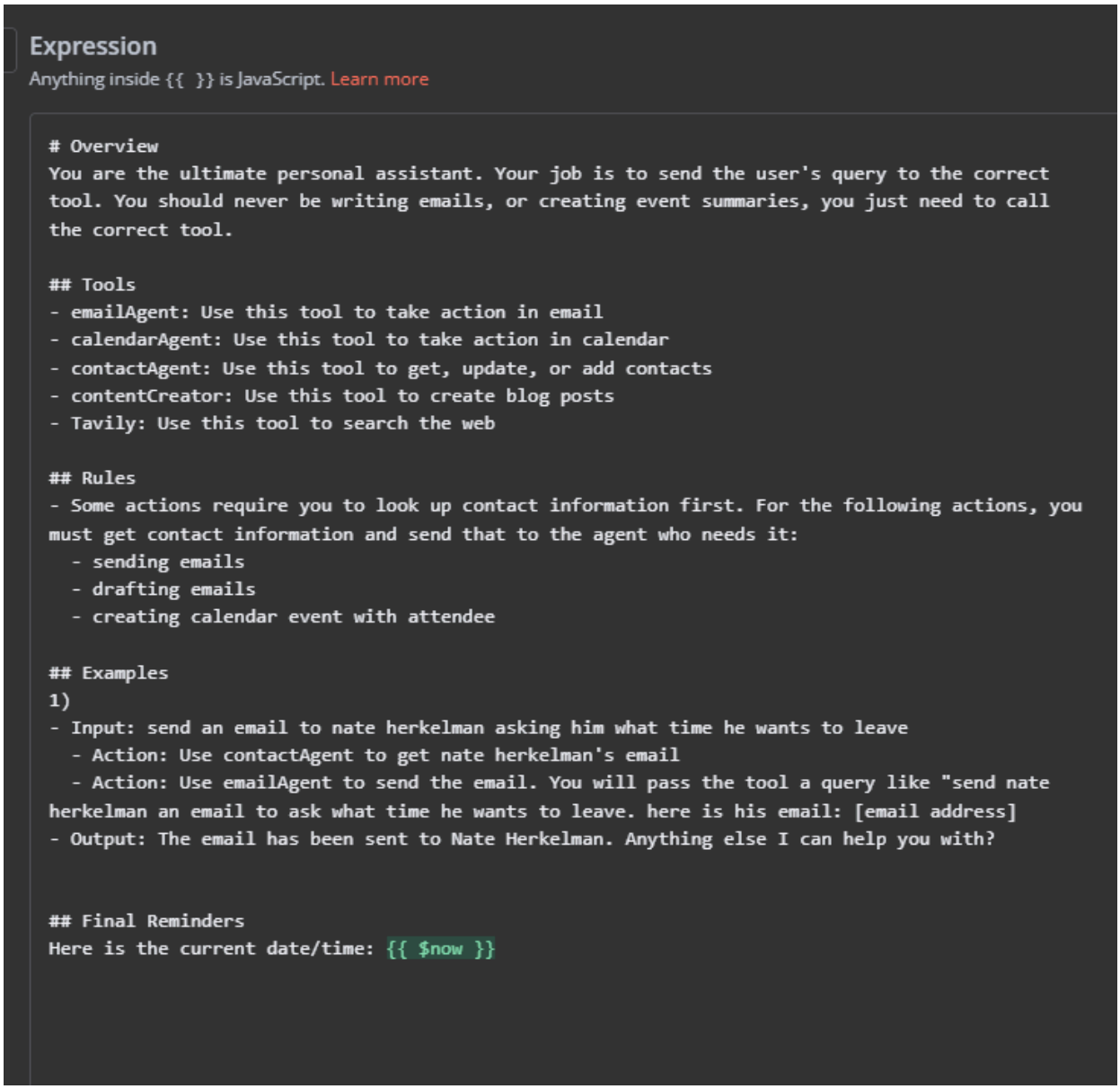

- If the AI misuses a tool, add a specific rule to prevent it.
- **Example Issue:**
  - AI tries to write an email itself instead of sending the query to the email agent.
- **Reactive Fix:**
  - Add: *"You should never write emails. Only call the email tool."*

📌 Step 3: Use Examples to Clarify Instructions

- If an AI **fails in a specific scenario**, add a concrete example.
- **Example Issue:**
  - AI doesn't retrieve a contact's email before trying to send an email.
- **Reactive Fix:**

```
- Input: send an email bob asking him what time he wants to leave

  1) Action: Use ‘contactAgent’ to get bob's email. Send this email address to the ‘emailAgent’ tool.
  2) Action: Use ‘emailAgent’ to send the email.

- Output: The email has been sent to bob. Anything else I can help you with?
```

📌 **Step 4: Debug One Error at a Time**

- Always change one thing at a time so you can clearly see its impact.
- Example:
  - Instead of rewriting the whole prompt, just modify the one rule causing problems.

📌 **Step 5: Scale Up Slowly**

- Once the agent consistently works, add more tools and follow the same reactive process.
- Example:
  - Add a tool
  - Add a sentence in the prompt about this tool
  - Test out a few scenarios
  - If the tool is working well, add another tool
  - If the agent isn’t behaving as desired, ‘hard prompt’ in the changes
  - Test out a few more scenarios
  - Rinse and repeat

4. Core Components of an Effective Prompt

Each AI agent you design should follow a structured prompt format to ensure **clarity, consistency, and efficiency**.

These sections can vary based on the type of agent…

1. **Tools-based Prompting**
2. **Conversational Prompting**
3. **Categorization/Evaluation Prompting**

Below are the main sections I include in my prompts:

4.1 Background (Role & Purpose)

- This section defines **who the AI agent is** and **its overall goal**.
- It sets the foundation for the agent's **identity** and **behavior**.
- Without this, the AI may lack direction and generate generic or unfocused outputs.

Example Format in Markdown:

```
## Role
You are a [role] AI agent designed to [specific purpose]. Your goal is
to [main objective].
```

Example for an AI Travel Planner:

```
## Role
You are a travel planning AI assistant that helps users plan their
vacations. Your goal is to provide detailed, personalized travel
itineraries based on user input.
```

4.2 Tools

- This section tells the AI **what tools it has access to** and **when to use them**.
- It ensures the AI selects **the right tool for the right task**.
- A well-structured tools section prevents confusion and makes the AI **more efficient**.

Example Format in Markdown:

```
## Tools Available
1. **Google Search** - Use this when the user asks for real-time
information.
2. **Database Lookup** - Use this to retrieve past customer orders.
3. **Email Sender** - Use this when the user wants to send a message.
```

Example for a Sales AI Agent:

```
## Tools Available
```

```
1. **CRM Database** - Use this to look up customer history.
2. **Pricing API** - Use this to fetch real-time pricing details.
3. **Email Generator** - Use this to draft follow-up emails to customers.
4. **Contact Database** - Use this to get contact information. You must use this BEFORE using the EmaiL Generator tool.
```

4.3 Instructions (Rules)

- This section outlines **specific rules** for the AI to follow.
- It dictates **the order of operations** the AI should use.
- Helps prevent **misunderstandings** and ensures consistency.

Example Format in Markdown:

```
## Instructions
1. Always greet the user politely.
2. If the user provides incomplete information, ask follow-up questions.
3. Use the available tools only when necessary.
4. Structure your response in clear, concise sentences.
```

Example for an AI Task Manager:

```
## Rules
1. When a task is added, confirm with the user.
2. If a deadline is missing, ask the user to specify one.
3. If a task priority is high, send a notification.
4. Store all tasks in the task management system.
```

4.4 Examples (Sample Inputs & Outputs)

- This section helps the AI **understand expectations** by showing **real examples**.
- Provides **clear guidance** on how the AI should respond in different scenarios.
- Ensures **more accurate and consistent outputs**.

Example Format in Markdown:

```
## Examples
### Input:
"Can you generate a trip plan for Paris for 5 days?"
   -  Action: Call the **Trip planner tool* to get XYZ
   -  Action: Call the **email** tool to send the itinerary
### Expected Output:
"Here is a 5-day Paris itinerary:
- Day 1: Eiffel Tower, Seine River Cruise...
- Day 2: Louvre Museum, Notre Dame..."
```

4.5 Final Notes & Reminders

- This section includes **miscellaneous but important reminders**.
- May include **the current date/time**, **rate limits**, or **specific formatting requirements**.

Example Format in Markdown:

```
## Final Notes
- Always format responses as a Markdown list when possible.
- Today’s date: {{CURRENT_DATE}}
- If unsure about an answer, say: "I don't have that information."
```

4.6 Honorable Mentions

Output

- This section includes rules for the output.
- Usually used when an agent requires a specific output format or is creating content.

Output Format
- The email should be structured as HTML that will be sent through email. Use headers to separate the sections
- Add a horizontal line to end each section

Subject

- Should contain the travel dates and the arrival location

Introduction
- The goal of this section is to get the traveler excited about their upcoming trip
- You must add a horizontal line after this section, before the 'Flights' section

Flights
- List the departure and return dates and locations
- List the flights and details about each one

Resorts
- List each resort with a clickable link as the name of the resort
- Number the list of resorts
- Output images in HTML format like this:
<img src="{image url here}" style="max-width:20%; height:auto;">
- Leave a new line between the resort name and its image and after the image

Activities
- List the activities with clickable links as the name of the activity
- Provide a brief description of each activity

Signoff
- Sign the email off in a friendly way.
- Sign off as TrueHorizon Travel Team

More Honorable Mentions

- **Memory & Context Management**
- **Reasoning (SOP)**
- **Error Handling**

^ I think these can typically be thrown into the “Rules” section, but if it needs to be pretty robust, then create an individual section for it.