

# ReAct Prompting

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# Definition

- **ReAct Prompting** is a method that combines thinking and action, boosting language models' problem-solving abilities.



# How Does it Work

- **Integrated Reasoning:** It blends internal reasoning and actionable steps, improving task execution.
- **Strategic Interaction:** Plans and adapts actions, including engaging with external information sources like websites.
- **Human-Like Reasoning:** Aims for a natural problem-solving approach by preventing guesswork and encouraging logical progression.

# ReAct Prompting: Example

## (1) Hotspot QA

**Questions:** Aside from the Apple Remote, what other device can control the program Apple Remote was originally designed to interact with?

### (1 a) Standard

Answer: ipod



### (1 b) CoT ( Reason only)

**Thought:** Let's think step by step. Apple Remote was, originally designed to interact with Apple TV. Apple TV can be controlled by iPhone, iPad, and iPod Touch.

**Answer:** iPhone, iPad, iPod Touch.



### (1 c) Act-only

**Act 1:** Search ( Apple Remote )  
**Obs 1:** The Apple Remote is a remote control

**Act 2:** Search ( Front Row )  
**Obs 2:** Could not find (Front Row ).  
Similar: ....

**Act 3:** Search ( Front Row (software))  
**Obs 3:** Front Row is a discontinued media center software....

**Act 4:** Finish ( Yes )



### (1 d) ReAct ( Reason +Act)

**Thought 1:** I need to search Apple Remote and find the program it was originally designed to interact with.

**Act 1:** Search (Apple Remote )

**Obs 1:** The Apple Remote is a remote control introduced in October 2005 by Apple.... originally designed to control the Front Row media center program....

**Thought 2:** Apple Remote was originally designed to control the Front Row media center program. I need to search Front Row next and find what other device can control it.

**Act 2:** Search (Front Row )

**Obs 2:** Could not find (Front Row ). Similar: ('Front Row seat to Earth', 'Front RowMotorsports', 'Front Row (Software'.))

**Thought 3:** Front Row is not found. I need to search Front Row (Software).

**Act 3:** Search (Front Row (Software))

**Obs 3:** Front Row is a discontinued media center software....

**Thought 4:** Front Row (Software) is controlled by an Apple Remote or the keyboard function keys. So the answer is Keyboard function keys.

**Act 4:** Finish (Keyboard function Keys).



# ReAct Promoting: Example with Human-in-the-loop

## Alfworld

You're in the middle of a room. Looking quickly around you, you see a armchair 1, a cabinet 4, a drawer 5, ..., a drawer 1, a dresser1, a garbage can 1, a safe 1, a shelf 12, ..., a sidetable 1, and a sofa 1.  
Your task is to : put two keychain in safe.

## ReAct

.....  
Obs 16: You open the drawer 4. The drawer 4 is open. In it, you see a keychain 3, and a watch 2.  
Act 17: Think [ Now I find the first keychain (3). Next, I need to take it. I can find the second keychain (2) later in drawer 4.]  
Act 18: Take keychain3 from drawer 4  
Obs 18: You pick up the keychain 3 from the drawer 4.  
.....  
Act 22: Put keychain 3 in/on the safe 1.  
Obs 22: You put the keychain 3 in/on the safe 1.  
Act 23: Think [Now I put the first keychain in safe. Next, I need to find the second keychain. I can directly go to drawer 4.]  
Act 24: Go to drawer 4  
Obs 24: The drawer 4 is open. In it, you see a watch 2.  
Act 25: Think [Now I find the second keychain (2). Next, I need to take it.]  
Act 26: Take keychain 2 from drawer 4  
Obs 26: Nothing happens.

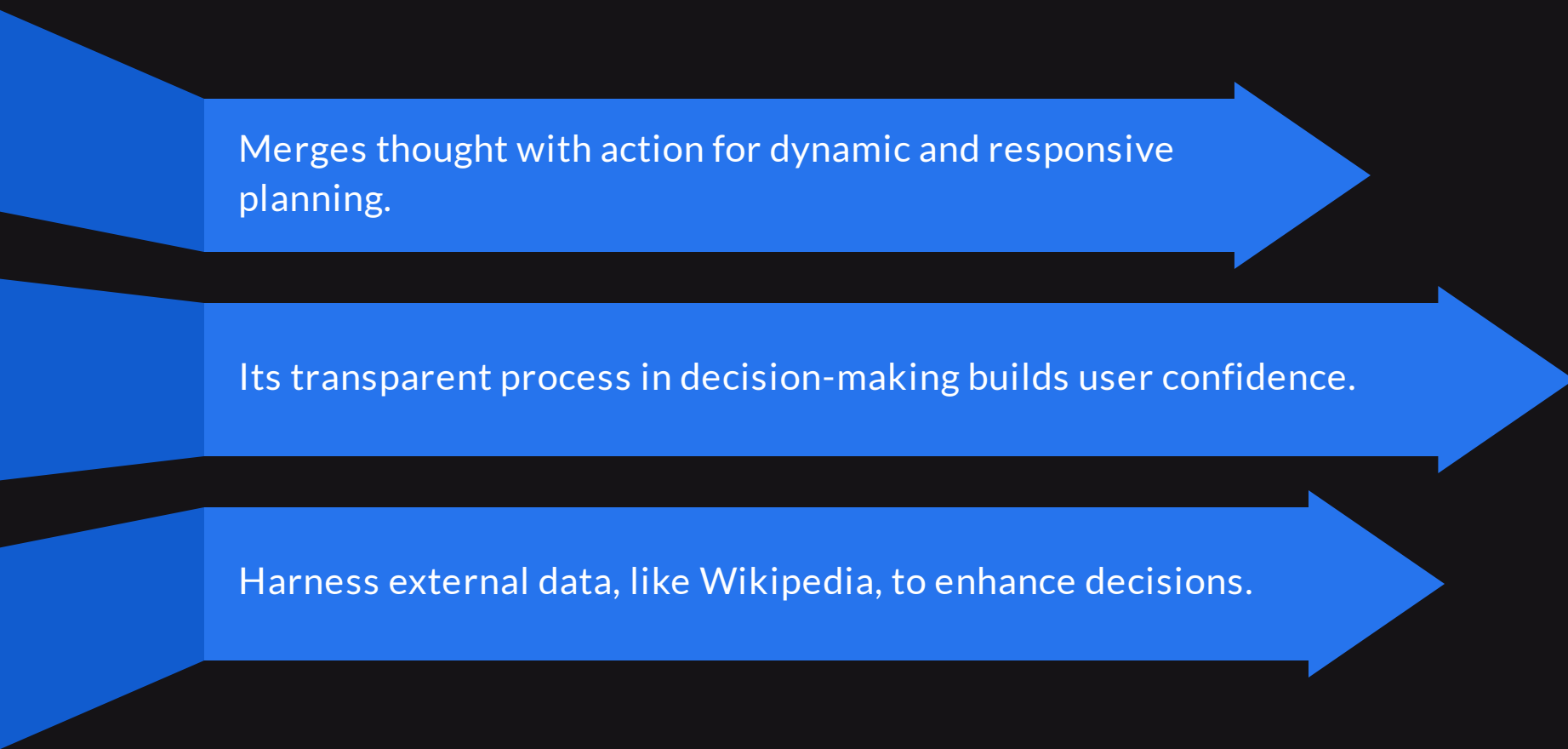


## (1 d) ReAct ( Human Thought Edit)

.....  
Obs 16: You open the drawer 4. The drawer 4 is open. In it, you see a keychain 3, and a watch 2.  
Act 17: Think [Now I find the first keychain (3). Next, I need to take it.  
Act 18: Take keychain 3 from drawer 4  
Obs 18: You pick up the keychain 3 from the drawer 4.  
.....  
Act 22: Put keychain 3 in/on safe 1  
Obs 22: You put the keychain 3 in/on the safe 1.  
Act 23: Think [Now I put the first keychain in the safe. Next, I need to find the second keychain, which is more likely to appear in the dresser (1), garbage can (1), safe (1), side table (1), sofa (1), and shelf (1-12).]  
  
Act 24: Go to dresser 1  
Obs 24: On the dresser 1, you see a box 1, a credit card 1, a keychain 2, a keychain 1, and a laptop 1...  
  
Act 25: Think [Now I find the second keychain (2). Next, I need to take it.]  
  
Act 26: Take keychain 2 from dresser 1  
Act 27: Think [Now I take the second keychain (2). Next, I need to put it in/on safe 1.]  
  
Act 28: Go to safe 1  
obs 28: The safe 1 is open. In it, you see a keychain 3, a statue 2, and a watch 3.  
  
Act 29: Put keychain 2 in/on safe 1  
Obs 29: You put the keychain 2 in/on the safe 1.



# Pros: ReAct Prompting

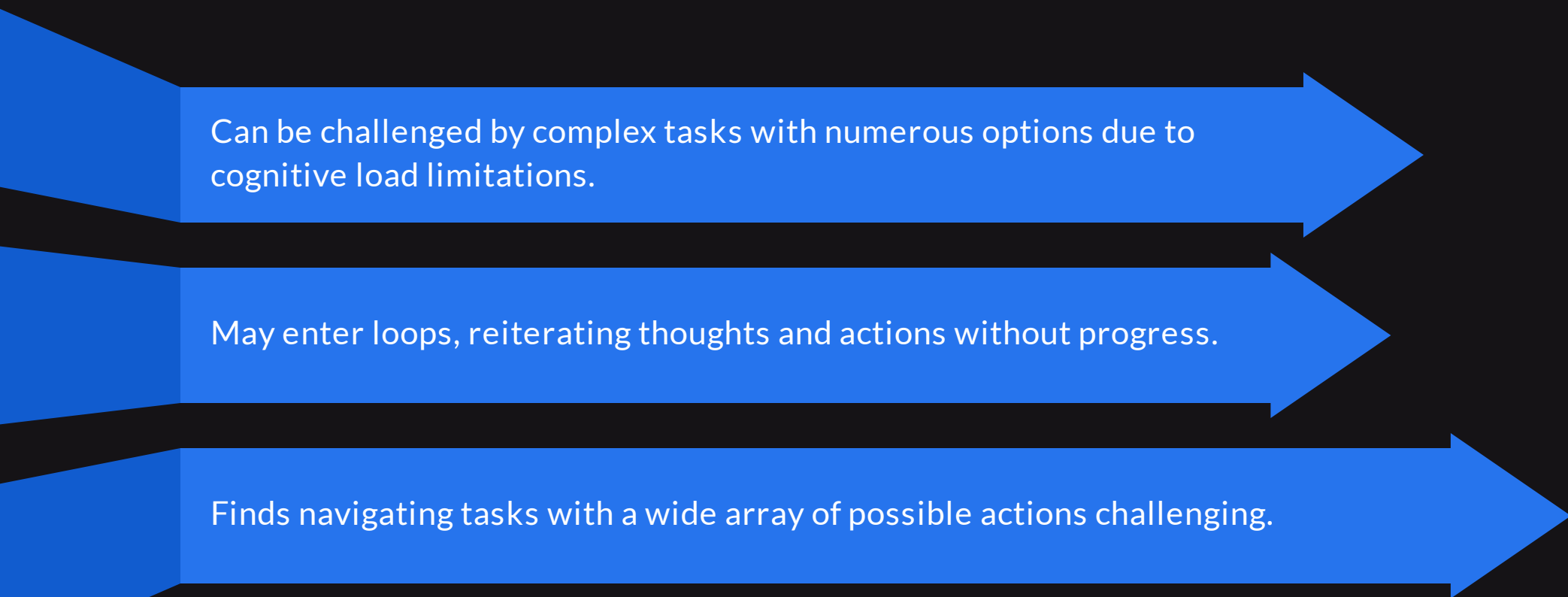


Merges thought with action for dynamic and responsive planning.

Its transparent process in decision-making builds user confidence.

Harness external data, like Wikipedia, to enhance decisions.

# Cons: ReAct Prompting



Can be challenged by complex tasks with numerous options due to cognitive load limitations.

May enter loops, reiterating thoughts and actions without progress.

Finds navigating tasks with a wide array of possible actions challenging.

# Thank You

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