

Your Next Teammate Has Arrived

Our Story & Reflections on Building AI Coding Assistant for Clinical Insights Generation

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Roche



Agenda



**Journey of Building Our Own
AI Coding Assistant**

Reflections



What's Next?



Journey of Building Our Own AI Coding Assistant

Reflections



What's Next?

Journey of Building Our Own AI Coding Assistant

A Recap of Why - Perspectives from Q3 2023

New platform

Migrating all clinical studies from entimICE to OCEAN



entimICE



OCEAN

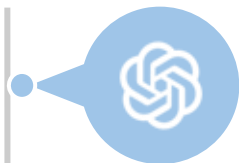
**Migration is now complete.
How did GenAI help us along the way?**

Git workflow, GitLab, R packages for SDTM/ADaM/TLG

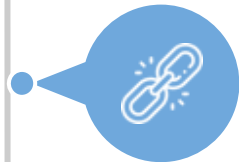


- ➔ **Significant efforts & resources required for change management & user support**
- ➔ **Steep learning curve on new tools, despite the documentation & training materials**

Journey of Building Our Own AI Coding Assistant



Feasibility Test with GPT4 Code Interpreter
Aug'23



LangChain w/ GPT4 API + Package Docs & Code Examples
Sep'23 ~ Mar'24



Fine-tuning w/ Llama3 + More Curated Training Materials
Apr'24 ~ Jul'24



Multi-Agent System w/ Gemini2.5 + MCP + IDE Integration
Dec'24 ~ Jul'25



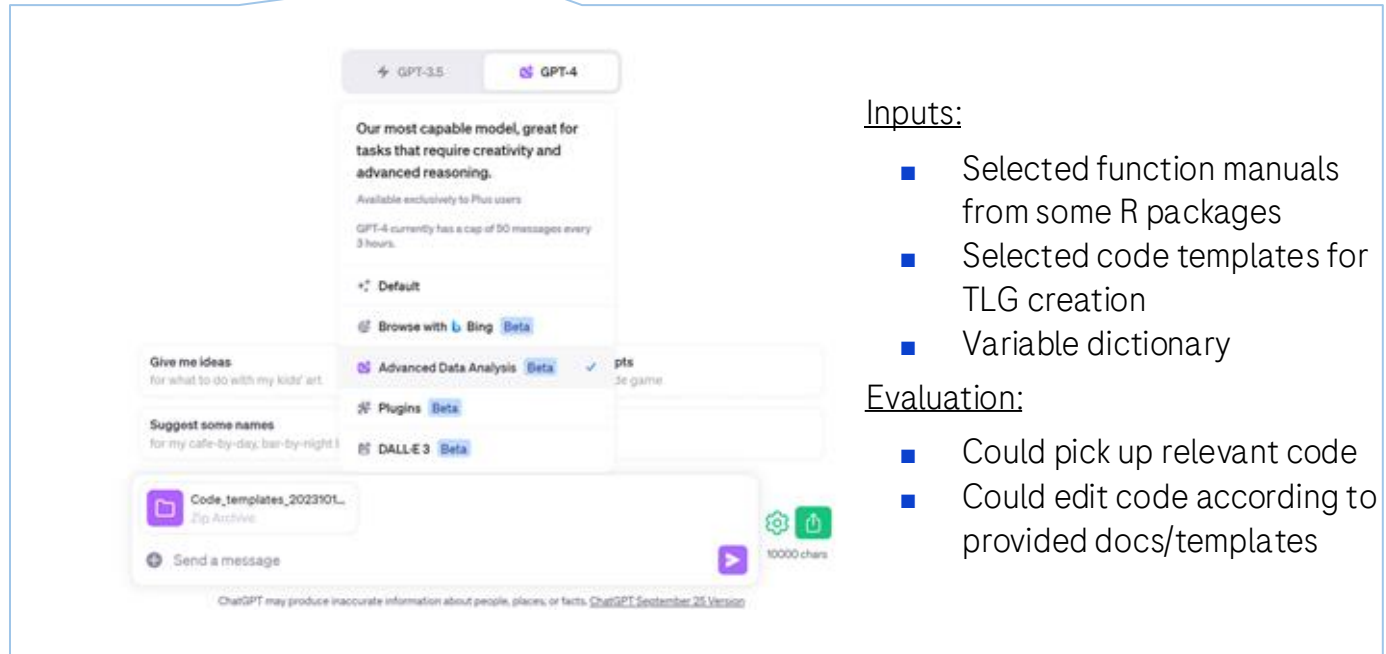
Customized Instructions w/ Established Coding Agent Tools
Dec'25 ~ Now



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Feasibility Test with GPT4 Code Interpreter Aug'23



Inputs:

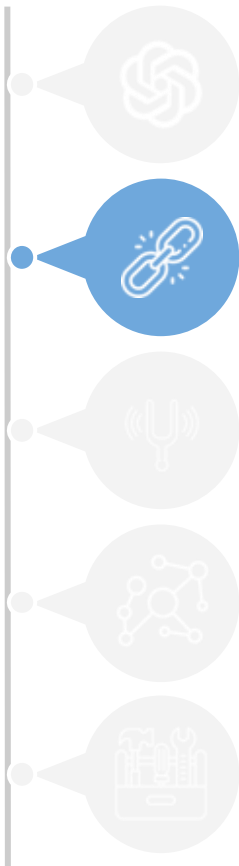
- Selected function manuals from some R packages
- Selected code templates for TLG creation
- Variable dictionary

Evaluation:

- Could pick up relevant code
- Could edit code according to provided docs/templates

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LangChain w/ GPT4 API + Package Docs & Code Examples
Sep'23 ~ Mar'24



NEExpert 1.0

Here is my table. I only want to keep rows that have a number > 10% in any of the columns.

```
result <- basic_table() %>%
  split_cols_by("TEXT01P", split_fun = add_overall_level("Total", first = FALSE)) %>%
  analyse_vars("BASE", .stats = "count_fraction", na_str = NA_character_) %>%
  build_table(addl)
```

result

To keep only the rows where the count fraction is greater than 10% in any of the columns, you can use the `prune_table` function with the `has_fraction_in_any_col` condition. Here's how you can modify your code:

```
result <- basic_table() %>%
  split_cols_by("TEXT01P", split_fun = add_overall_level("Total", first = FALSE)) %>%
  analyse_vars("BASE", .stats = "count_fraction", na_str = NA_character_) %>%
  build_table(addl)
```

```
# Prune the table to keep only rows with count fraction > 10% in any column
row_condition <- has_fraction_in_any_col(atleast = 0.10)
result <- prune_table(result, keep_rows(row_condition))

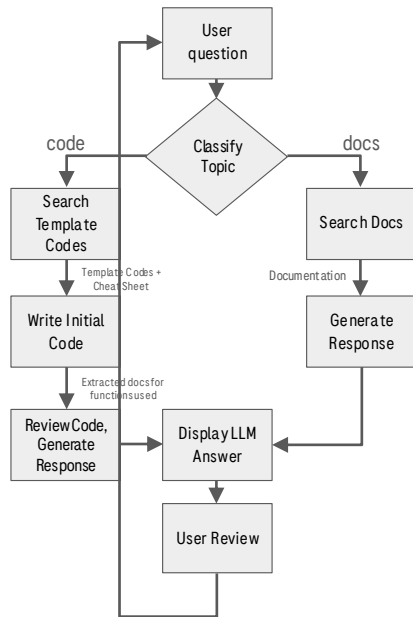
result
```

This code will filter the table to include only those rows where the count fraction exceeds 10% in any of the treatment columns.

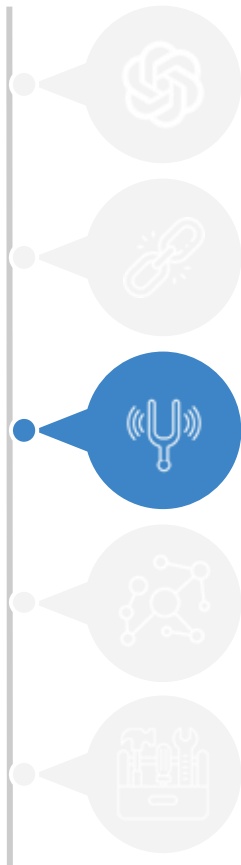
Like this answer?

☐ YES ☐ NO

Ask your questions here



Journey of Building Our Own AI Coding Assistant



Fine-tuning w/ Llama3 + More Curated Training Materials

Apr'24 ~ Jul'24



NExpert 2.0

NExpert 

Demo Video
(From chatbot to RStudio)

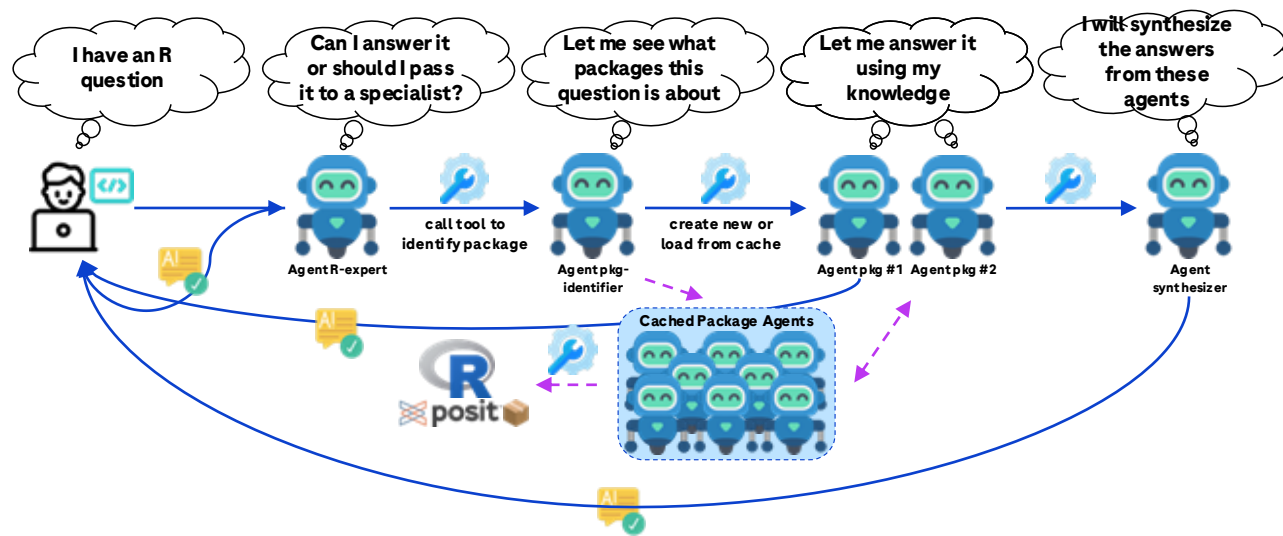
Journey of Building Our Own AI Coding Assistant

Multi-Agent System w/ Gemini2.5 + MCP + IDE Integration

Dec'24 ~ Jul'25



AIR Multi-Agent Design



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Multi-Agent System w/ Gemini2.5 + MCP + IDE Integration

Dec'24 ~ Jul'25



AIR Chatbot



AIR

AI assistant for R programming

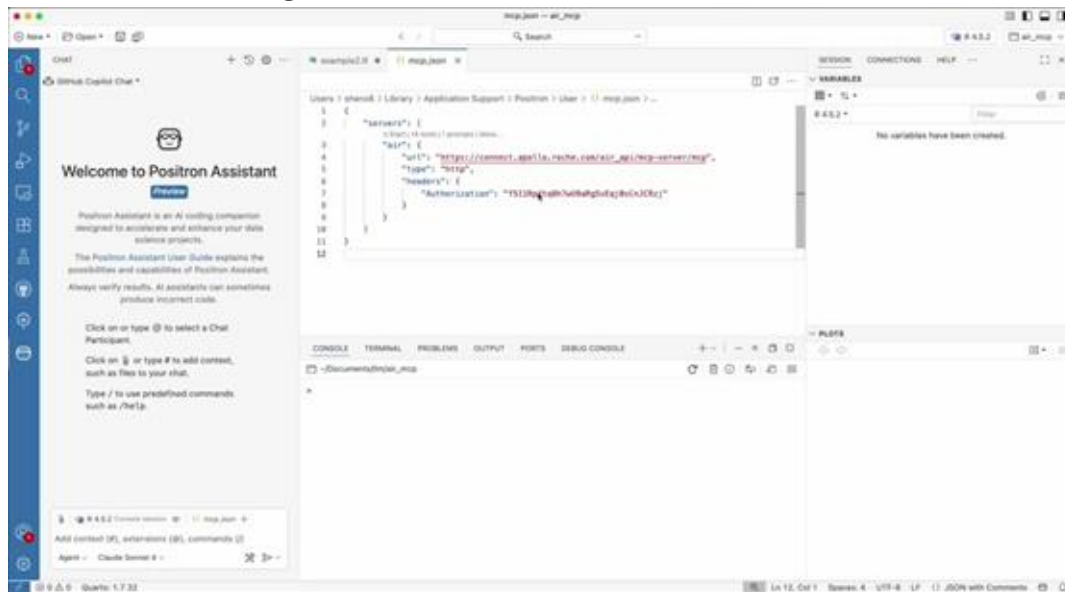
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AIR MCP + IDE Integration



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Customized Instructions w/ Established Coding Agent Tools
Dec'25 ~ Now



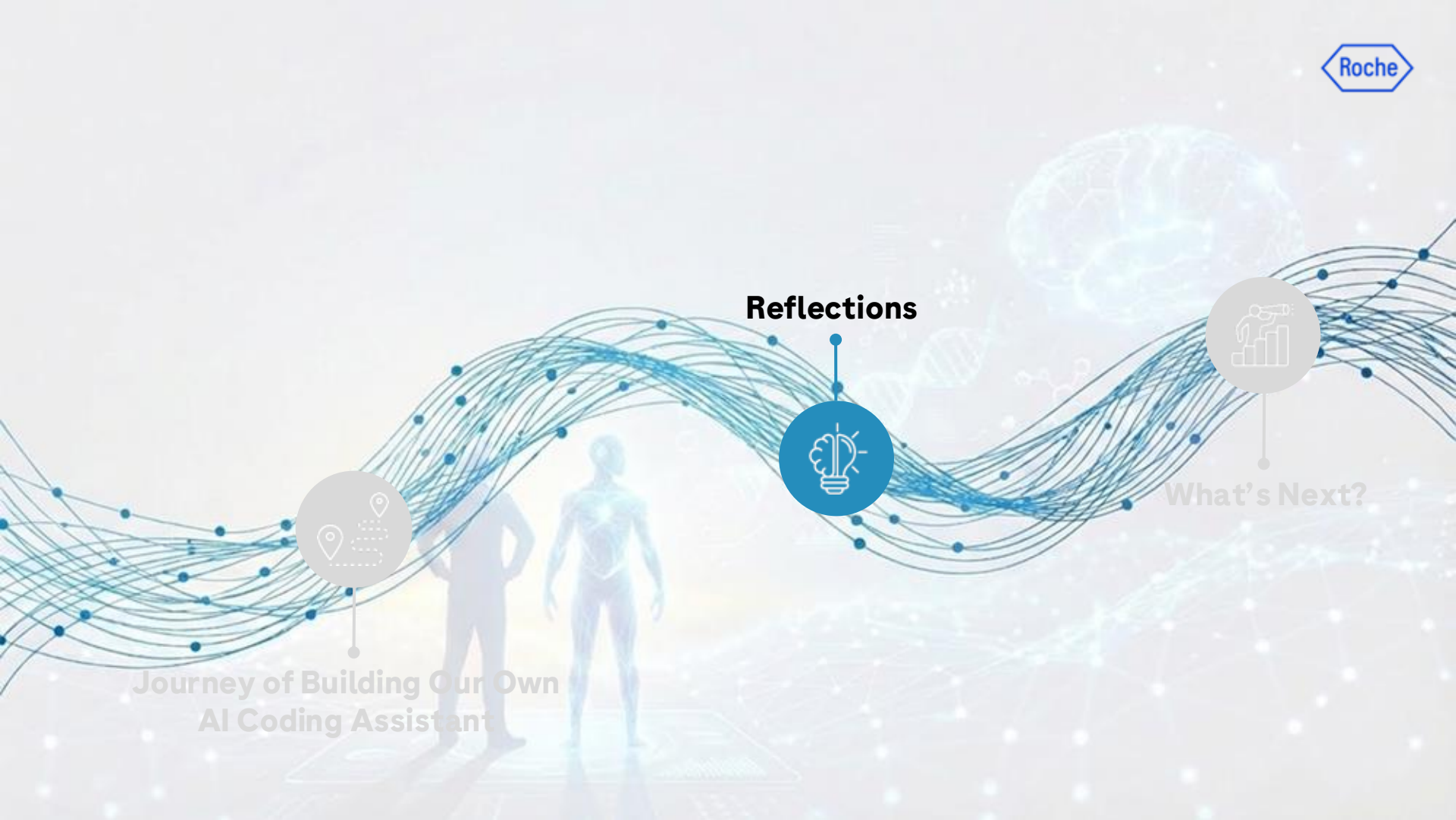
Claude Code “Skills”

Live Demo / Demo Video

Reflections

What's Next?

Journey of Building Our Own
AI Coding Assistant



Reflections

From Developing Our Own AI Coding Assistant To Enriching Established Ones



Public GPT4



LangChain +
LLM API



Fine-Tuning +
LLM API



LangGraph +
LLM API + MCP



"Skills" in
Claude Code

Our Dev Effort Spent



User Satisfaction



Reflections

Comparing to Our Transformation Efforts to R/Open-Source for Clinical Insights Generation



Originality



Time Spent



Rate of Change



**Adoption Efforts
Required**



**Impact on
Efficiency**

Open-Source
Transformation

Within industry

9 years since the
very first {teal} PoC

Relatively stable,
regularly updated

A lot but
manageable

Significant

GenAI Coding Assistant
Transformation

Outside of
industry

2.5 years since our
first feasibility test

Quickly evolving,
often disruptive

Manageable for users,
challenging for
IT/Legal/Quality teams

Unprecedented

Reflections

Evolution of the Role for an AI Coding Assistant



Helpdesk

Debugging

Code Explanation

Training



Service Provider

Code Suggestion

Code Optimization

Code Execution



Data Science Partner

Understanding Business
Problem

Generating Actionable
Insights

Understanding Clinical
Insights



Reflections

What's Next?

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AI Coding Assistant

What's Next?

Which State Are You In? Which State Is Your Company At?

