

# Introducing SolvIT

An IT SmartSupport Agent

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GPT-4 Powered App Creation and Evals Hackathon

Team Crest

# Team Crest

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# Use-Case

**Internal IT Helpdesk Chat Application to improve Employee and IT Analyst Productivity.**

## Stack:

- Pinecone
- Llamaindex
- Langchain
- Open AI models: GPT-4 and GPT-4 Vision
- TruLens Eval

**Goal:** Build Production Scale RAG Application with measurable improvements and Optimal Responses for IT Support queries.

# Target Personas



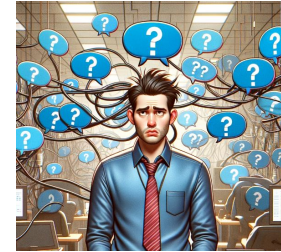
## New Employees

- How to set up everything?
- Where can I find XYZ
- I read this, but my situation is different - does this apply to me?



## Existing Employees

- Why can't I open this application?
- I am traveling, can I still access this App?
- I got an error, what do I do?



## IT Support Teams

- Repeated questions causing burnout
- Spending hours to find troubleshooting information from product documentation / Support

# Existing Solutions and its limitations

## Pain Points

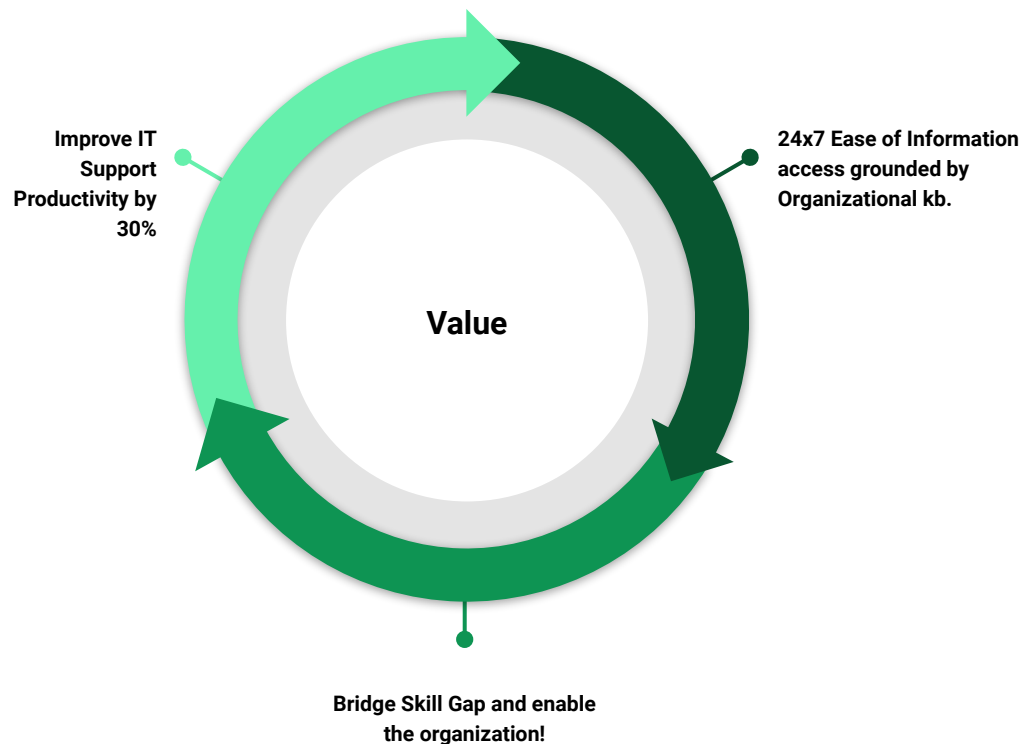
- Employees waste an average 22 minutes per day dealing with IT related issues ([Source](#))
- IT Support Teams spend >5-10 hours per week on repetitive tasks ([Source](#))
- Top 5 repetitive time wasting tasks that results in IT burnout
  - Password resets
  - IT ticket clean up
  - Onboarding/offboarding employees
  - Managing credentials
  - Software provisioning

## Existing Solutions

- Self-Help Documentation
  - IT Team needs to maintain this document and ensure there is no confusion for employees to get Self-Help
  - Employees need to spend many hours to go through documentation to find answers
  - Cannot address corner-case situations
- Outsourced IT Support
  - Additional OpEx budget needed to support
- Automation with tools
  - Integration and Data Issues to deal with
  - Added complexity

# Solution Benefits

- Answer complex “**How to**” Questions without spending hours on Product documentation / Vendor Customer support cases
- Troubleshoot **tricky IT issues** with the help of vast documentation available
- **Instant Help** to Employees seeking IT Support for common issues
- Personalize Standard Procedure of Operation (SOP's) **personalized to YOUR** organization
- Continuously improve knowledge base (kb) with a **feedback loop** that enriches and expands kb.



# Tricky IT questions



**You**

Can I use Duo Restore to restore Offline Access accounts for Windows or Mac Logon in the Duo Mobile app?



**ChatGPT**

Yes, you can use Duo Restore to restore Offline Access accounts for Windows or Mac logon in the Duo Mobile app. Duo Restore allows you to securely backup and restore your Duo-protected accounts, including Offline Access accounts, ensuring seamless access to your accounts even in offline scenarios or when switching devices.



# Ground Truth

Link:

[https://help.duo.com/s/article/5684?language=en\\_US#:~:text=No..in%20the%20cloud%20or%20iCloud.](https://help.duo.com/s/article/5684?language=en_US#:~:text=No..in%20the%20cloud%20or%20iCloud.)

## ☰ Can I use Duo Restore to restore Offline Access accounts for Windows or Mac Logon in the Duo Mobile app?

Explore other [articles](#) on this topic.

### ANSWER

No. Offline Access accounts for Windows or Mac Logon in the Duo Mobile application cannot be restored via Duo Restore. Offline authentication is designed using the principles of asymmetric cryptography, meaning we do not store any information in the cloud or iCloud. By design, it is not possible to do a web-based restore of the Offline accounts. Please see our blog for more information: [Building Windows Offline](#).

**The Offline account will need to be reactivated** when the user is presented with the Windows or Mac Logon Duo Prompt, as described in the documentation: [Windows](#) | [Mac](#)

Note that you can also choose to activate a U2F Security Key for use with Windows Logon Offline access. Security keys are not yet supported for Mac Logon.

If you still see the disconnected Windows or Mac Logon Offline Access account listed in your Duo Mobile app, you will need to [manually delete it](#).

### TRENDING ARTICLES

[Duo Mobile Privacy Information](#)

[Which versions of Android does Duo Mobile support?](#)

[What are Duo's IP ranges and data residency areas by deployment?](#)

[What do I do if I'm locked out of Instagram, Facebook, or another third-party Duo Mobile account?](#)

[How do I resolve the error "Bad request timestamp" when using Duo Authentication for Windows Logon?](#)



# Tricky IT questions



**Hallucinations**



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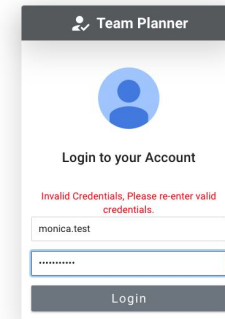
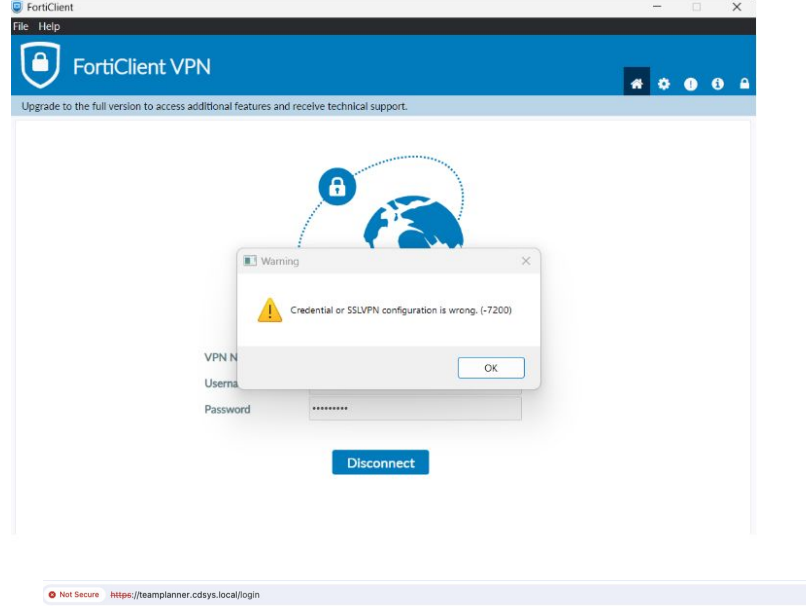
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# Common IT Issues

- Resolve Issues for Standard and Custom Applications of the Organization. (Common in Manufacturing, Healthcare sectors)
- Users may not know how to describe an Error. Screenshots / Image are used typically to demonstrate the issue faced.



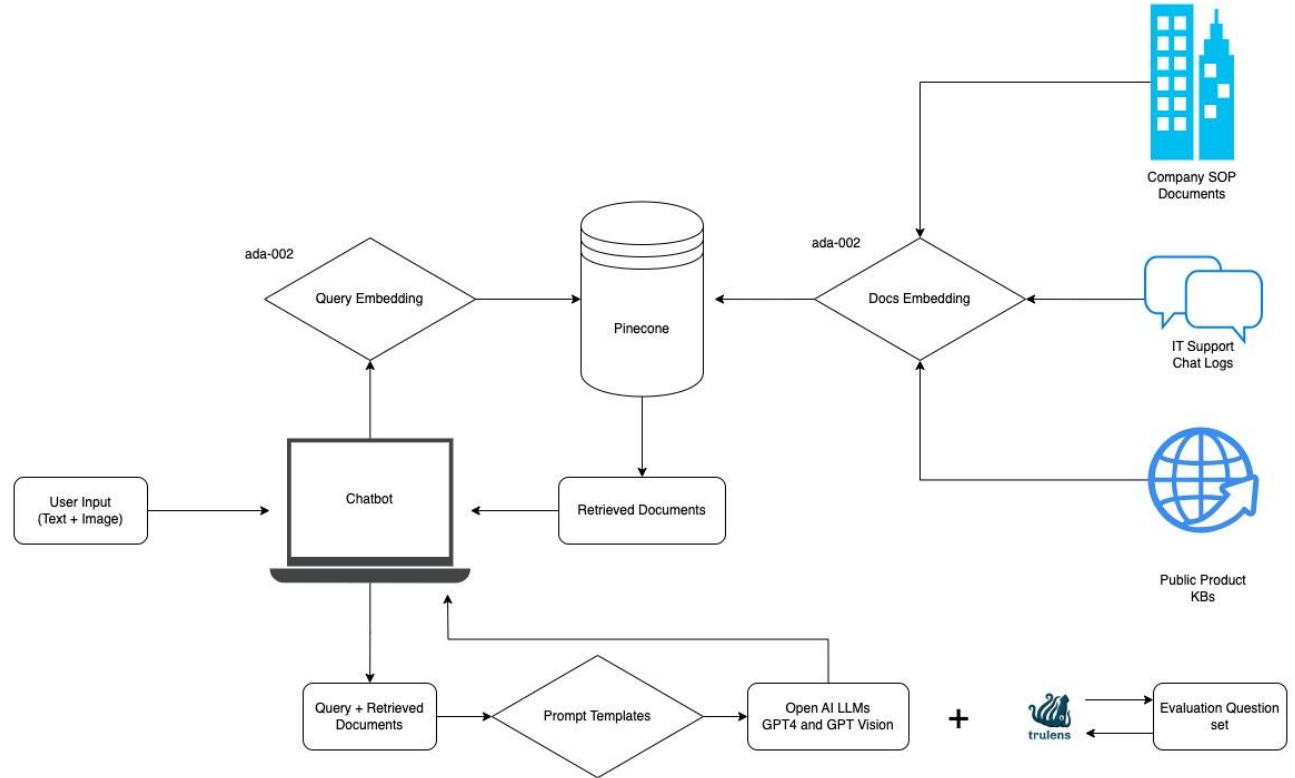
# System Design

## LLM Models:

- GPT-4
- GPT-4 Vision

## TruLens evaluation used to decide on:

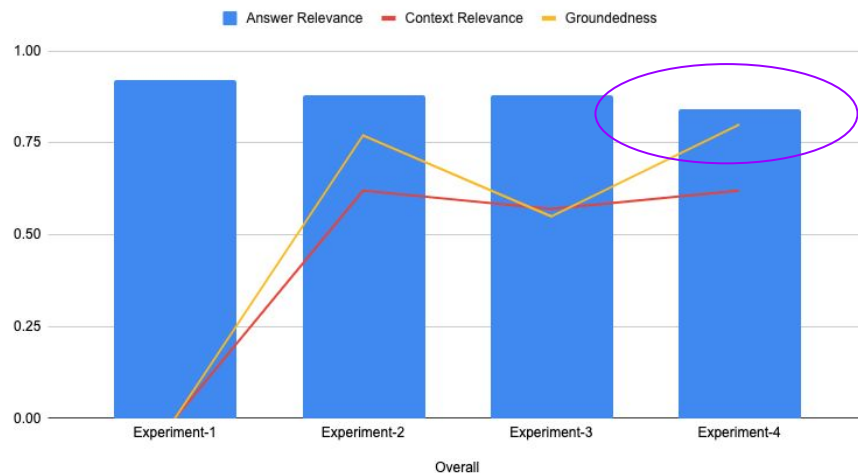
- Data Input Type and Quality
- Benchmark and improvise
  - Compare apps
  - Feedback Functions
- Performance, Cost and Latency - Evaluate Tradeoffs
- Troubleshoot ad-hoc issues



# Data Input Type and Quality

- **Experiment - 1:** Started with Baseline model (GPT-4)
- **Experiment - 2:** RAG over historical IT support chat conversations from Google Chat Spaces
- **Experiment - 3:** RAG over SOP's created by IT for common issues
- **Experiment - 4:** RAG over historical IT support chat conversations from Google Chat Spaces + SOP's

Answer Relevance, Context Relevance and Groundedness



# Benchmark and Improve

- Compare and review various App implementations against a golden dataset
- Used Stock Feedback Functions to understand how to improve Output by
  - Tuning Chunk sizes
  - Tuning Prompts used
  - Changing Embedding model
  - Etc.
- Custom Feedback Functions such as “Error detection” and “Human escalation” specific to the use-case.

## Experiment-5: Base Model

Records	Average Latency (Seconds)	Total Cost (USD)	Total Tokens	Context Relevance	Helpfulness	Groundness	Answer Relevance
5	3.6	\$0	4.32k	0.0	0.56	0.0	0.96

## Experiment-6

Records	Average Latency (Seconds)	Total Cost (USD)	Total Tokens	Context Relevance	Helpfulness	Groundness	Answer Relevance
5	3.6	\$0.01	10.33k	0.8	0.7	1.0	0.96

Error Detection = 1

	question	statement	result
0	Floor Internet is periodically disconnecting. Can someone help?	To troubleshoot periodic internet disconnections on the floor network, you can follow	1.00

Human Escalation Criterion = 0

	question	statement	result
0	Floor Internet is periodically disconnecting. Can someone help?	To troubleshoot periodic internet disconnections on the floor network, you can follow	0.00

# Evaluate Trade-Offs

- Align with Business Trade-offs

## Experiment-2: RAG over Historical Chat logs with Human IT team

Records	Average Latency (s)	Total Cost (USD)	Total Tokens	Answer Relevance	Correctness	Groundness	Comprehensiveness
28	7.25	\$0.09	158.44k	0.83 ✓ high	0.9 ✓ high	0.37 ● low	0.71 ⚠ medium

## Experiment-3: RAG over SOP

Records	Average Latency (s)	Total Cost (USD)	Total Tokens	Answer Relevance	Correctness
28	7.25	\$0.06	107.4k	0.8 ✓ high	0.87 ✓ high

## Experiment-4: RAG over Historical Chat + SOP

Records	Average Latency (s)	Total Cost (USD)	Total Tokens	Answer Relevance	Correctness	Groundness	Comprehensiveness
28	7.25	\$0.07	125.81k	0.97 ✓ high	0.87 ✓ high	0.75 ⚠ medium	0.71 ⚠ medium

# Troubleshoot Issues

- Understand why the performance may be degrading on some type of Queries.
- Helps during Development **AND** troubleshooting ad-hoc production issues.

Experiment-6 RAG over Historical Chat + SOP + Duo Knowledge base(Duo Questions) / record\_hash\_caf10f8b92c2b1d77422c53d4e3a8bb6

**record\_hash\_caf10f8b92c2b1d77422c53d4e3a8bb6**

Total tokens (#)  
**2576**

Total cost (USD)  
**0.00135**  
↑ 0.000108

Input

Input [ Select:RecordInput ]

Can I enable Instant Restore for Duo Mobile for specific groups of users?

Helpfulness = 0.2

text	result
0 No, the Instant Restore feature for Duo Mobile account recovery cannot be enabled for	0.20

**record\_hash\_0ca6db58c625c9ffa2c25eee8beaa0ed**

Total tokens (#)  
**2438**

Total cost (USD)  
**0.0012955**  
↑ 5.33e-05

Input

Input [ Select:RecordInput ]

Will Duo Mobile accounts be saved on my device if I delete the app?

Feedback Metadata

Answer Relevance = 0.4

prompt	response	result
0 Will Duo Mobile accounts be saved on my device if I delete the app?	Duo Mobile accounts may or may not be saved on your device after deleting the app,	0.40

# What's next?

- Add **Human Feedback Loop** to the System to improve Output Quality
- Try Fine-Tuning + RAG to see if we see further improvements
- Data Governance Control over information. Who can access what?
- AR (Augmented Reality) guided troubleshooting
  - Interactive visual guidance to perform the task
  - Real-time feedback: Adjusts the instructions to the user based on skill level, past data



Thank you!