

Designing the Enphase AI Assistant Experience

From Rigid Systems to LLM-Powered Conversations

Conversational UX

AI Powered Assistant

Gen AI

0-1 Product

Product Design for Enphase Support

Background

In mid-2024, Enphase set out to leverage Artificial Intelligence to enhance its customer support experience. The goal was to streamline support operations, reduce manual agent workload, and improve the speed and efficiency of handling customer queries.

Goals

Enhance Customer Satisfaction

Improve customer satisfaction by providing timely, accurate, and efficient support.

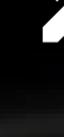
Reduce Support Costs

Minimize the volume of support tickets and call volume to the customer support team by automating routine inquiries and troubleshooting.

Increase User Engagement

Encourage users to interact with the platform more frequently by providing valuable insights and personalized recommendations.

TEAM



Design

UX Designer (1)

that's me

Head of Design (1)



Engineering

AI/ML engineers (2)

UI Developer React(1) +
Respective teams for each
product for integration



PLM

Respective Product Managers
for each product : ENHO, ITK,
ENLM, Website, Support and
Service Manager



CS

Execs (2)

Representatives (2)



Timeline

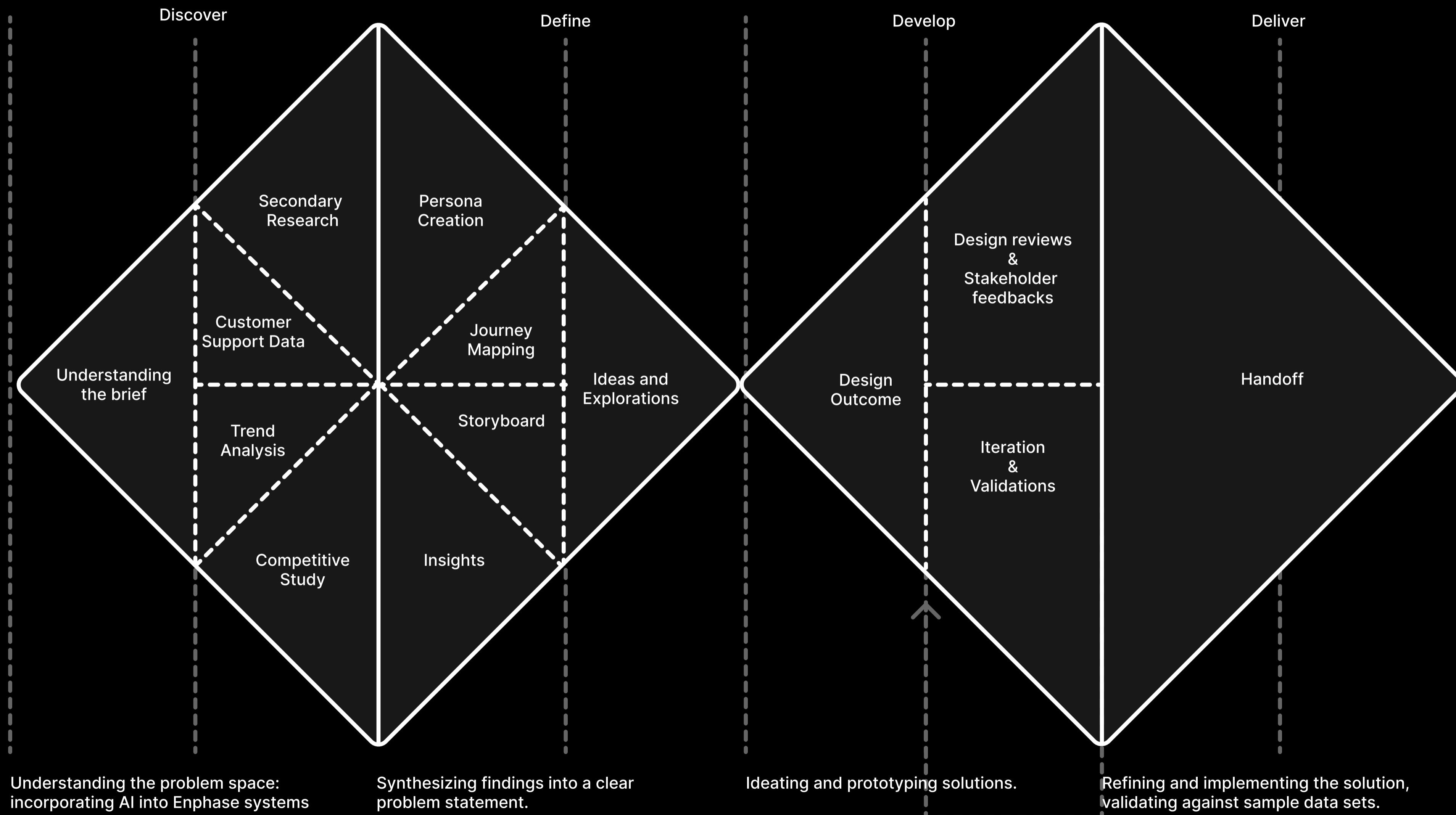
6 months

My Role

As the UX owner of this project, I was responsible for the end to end experience of the AI assistant.

- 👉 Collaborating with developers and AI engineers to understand technical limitations in the existing Salesforce UI, LLM capabilities, and define the project scope.
- 📝 Mapping intent journeys and designing smart, modular conversation flows aligned with real customer needs.
- 🧠 Analyzing customer support data to identify key pain points and recurring issues faced by different user groups.
- 🛠️ Designing the navigation structure and interactions for a more intuitive, flexible chat experience.
- 👉 Conducting prompt QA and visual design reviews to shape consistent and helpful LLM-generated responses.
- 🛠️ Prototyping and validating flows through cross-team testing, including internal reviews and QA-led feedback loops.
- 💬 Introducing the Chat + Case History feature, grounded in support logs and user behavior, to bring memory and continuity into the support experience.

Design Process



1. WHAT needs to be solved?

20,000 calls weekly!

Enphase currently receives approximately 20,000 support calls weekly. This high volume of calls presents significant challenges

Increased customer support costs: High volume of calls necessitates a large support team, leading to increased operational expenses.

Slow response times: Manual analysis delays the identification and resolution of common issues, impacting customer satisfaction.

Customer frustration: Enphase customers often face challenges in troubleshooting technical issues, accessing real-time energy data, and getting timely support

2. WHY need it?

Secondary research

Studied customer support data for a given period of time to understand what are the major issues faced by HO and installers for reaching out, listed top 30% cases to build solution for high impact use cases.

Insights

2000 calls on a weekly basis

Roughly 10k from HO and 10K from installers

Top 30% HO calls

My Enphase Site status check (11.90%)

Why is the bill high, System not producing up to the mark, Specific error messages, Check site status

Gateway connectivity (9.90%)

Gateway not reporting, Email alerts

IQ Battery issues (4.80%)

Battery discharging, Battery not charging

System access issues (3.30%)

Login / Add maintainer company / Access control

Top 30% Installer calls

Microinverter: PLC issue (8.27%)

Micros not reporting, micros do not communicate even after replacing

Site Status check (6.80%)

Post commissioning checks before they leave site, Need email confirmations

Network / Wi-Fi (4.90%)

Issues connecting Gateway to customer's wifi

Envoy Replacement (4.85%)

Replacing old GW with new one in enlightened, check status if all the microinverters started talking to new gateway, if not need help to provision them

Stuck Booting (4.67%)

Gateway LEDs keep flashing red

15-18% repeat calls

Asking for status updates on open cases

Average wait time for each call : 7.1 minutes

Average time spent on call : 22 minutes

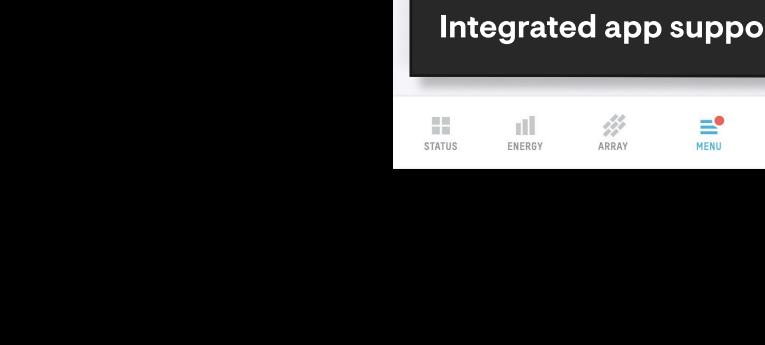
Average number of chat sessions in a week : 3,500 (NA Region)

Existing touch points

- Available troubleshooting resources - integrated topics in ENHO app, support website, redirection to support agent, installer information.
- Communication channels for support (e.g., phone, email, chat).



Service manager (CS cases)



Contact Enphase

Integrated app support

Primary research

Discussion with Homeowners, Installers and CS Agents regarding their approach for when they face errors, gathering insights based on it. Key discussions that carried out were in the lines of :

- When you see a system alert, what's your first instinct?
- How do you feel about getting guided steps versus immediately talking to support?
- If a virtual assistant could solve your problem faster, would you use it? Why or why not?

"I get scared when I see an error, especially when I don't know what it means."

Opportunity: Reduce fear by simplifying alerts and offering assistance.

HOMEOWNER

"If there's a quick fix, I'm okay doing it myself – but I don't want to guess."

Opportunity: Offer structured, step-by-step guided help with safety nets.

HOMEOWNER

"When I'm on-site, I don't have time to read long documents. I need quick answers."

Opportunity: Provide concise, situation-based AI help ("Quick Fix mode").

INSTALLER

"Most customers describe problems vaguely – a bot could guide better questions before they reach me."

Opportunity: AI can pre-triage user problems by gathering structured information.

CS AGENT

"The first 5-10 minutes of every call is just me pulling up information – that could be automatic."

Opportunity: AI should prefetch account + system information before the agent connects.

CS AGENT

"Lot of our calls are actually repeat calls, just to check on their open cases"

Opportunity: Share with them the status and latest comments on their open case. Let the user comment on the same ticket.

CS AGENT

Problem space

High support burden

HO and Installers reaching out to CS agents for trivial issues

Switching between apps and support articles

To find relevant help and support

Independence and self reliability

Low user confidence in resolving small issues independently

Opportunities

Simplify

Answer questions in plain English

Guide

Through tasks like configuration, diagnostics, savings optimization

Proactive

Preemptively alert and resolve issues

Contextual

Personalize insights based on historical data

3. WHO are we solving for?

Based on the emotions, pain points and opportunities identified, building out the personas for the Homeowner, Installer and CS Agent.



Homeowner

Want peace of mind, not raw metrics.
Appreciate when things “just work.”
Don’t know where to look for troubleshooting.



Installer

Need fast, efficient help.
Want intelligent tools for installation and post-install service.



Customer Support

Struggles with repetitive questions.
They need tools that can handle common questions, give quick summaries, and help with repetitive tasks automatically.

4. Customer Journey Map

Mapping the experience Homeowners and Installers face at each stage of the support cycle.

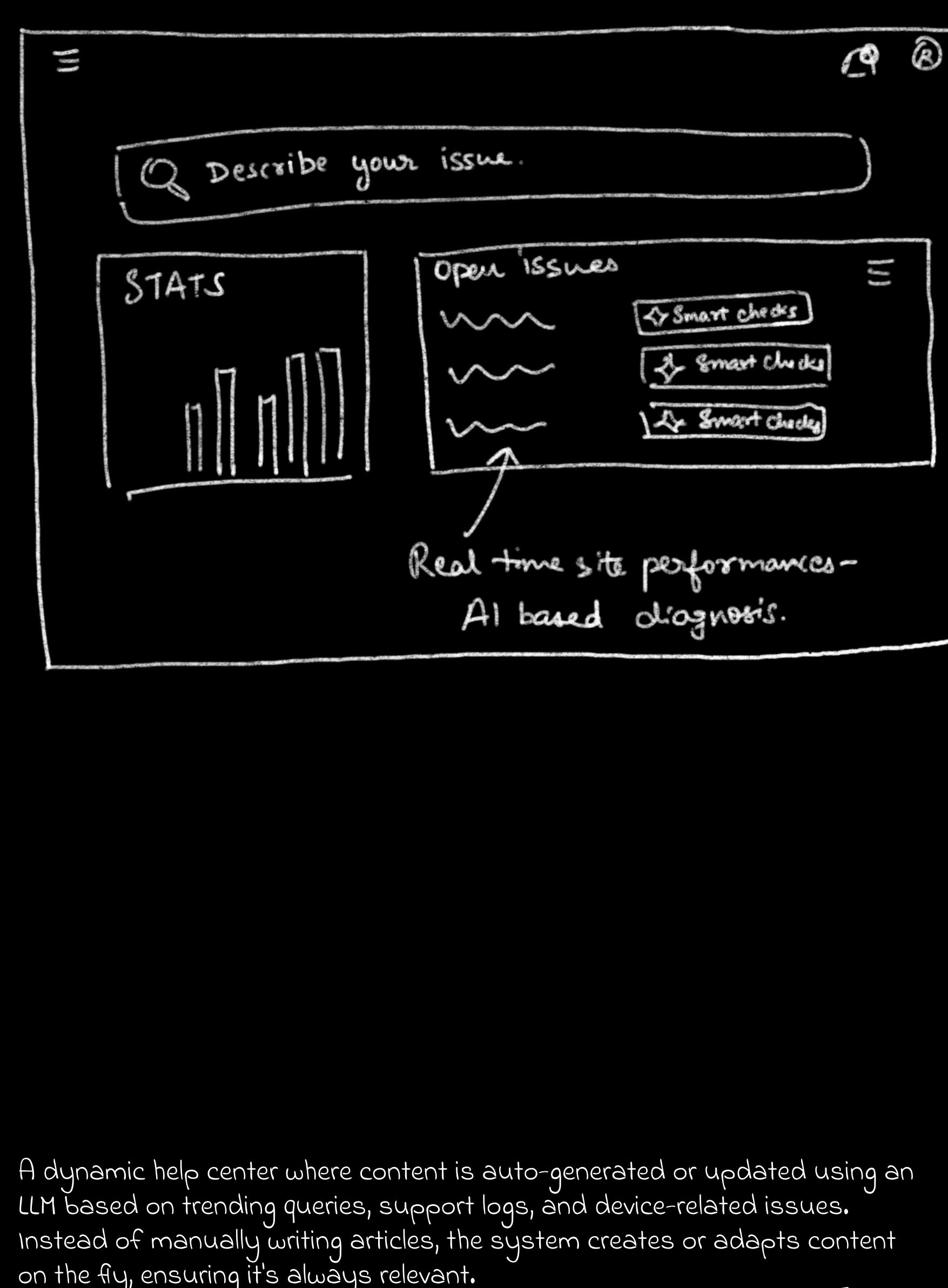
HOMEOWNER JOURNEY				
Stage	Action	Emotion	Pain Points	Opportunities
Notice an Issue	User checks app and sees micros not reporting error	🤔 Confused, anxious	Unable to understand the cause of issue	AI-powered friendly alerts, explain in simple language
Seeks Help	Navigates to 'Support' or 'Help' sections inside the app.	😊 Slight frustration	Hard to find quick answers; uncertainty about next steps	"Ask En-Bot" button — instant access to troubleshooting
Tries to Self-Resolve	Reads FAQs or tries restarting the system herself.	👉 Hopeful, cautious	Instructions are often too technical	Step-by-step guided troubleshooting, In-app redirections
Contacts Support	Starts a manual chat/call with support.	😢 Worried	Wait times, repeating issue history to agent	AI pre-fills system info + auto-shares error details
Interacts with Support	Discusses the issue with a human agent.	😊 Hopeful if fast 😢 Upset if slow	Delays in getting solutions, waiting time due to transferring call to the right support agent	Friendly AI nudges: "We're reviewing your system" or "Here's what we're checking next"
Resolution	Issue is resolved or ticket is created.	😊 Relieved if resolved 😢 Nervous if pending	Lack of visibility into ticket status or updates, need to call again to ask for update	Proactive ticket tracking updates
Post-Resolution	Reflects on the support experience.	😊 Calm 😢 Disappointed	If process was complex, may lose trust	Thank-you nudges from En-Bot + feedback collection for AI improvement

INSTALLER JOURNEY				
Stage	Action	Emotion	Pain Points	Opportunities
System issue detected	User notices site issues Enlighten or ITK	🤔 Worry, confusion	No clear cause, technical terms confusing	Proactive smart alerts, simplified messaging
Seeks Help	User tries to find support via app, agent chat, or support web	😊 Frustration	Support channels feel overwhelming or slow	Easy-to-find help (upfront support), "Start Chat" CTA
Connects to Support	User contacts Enphase support manually (chat/phone)	👉 Hopeful but anxious	Wait times, repetitive questions	Early self-service options
Support Interaction	Troubleshooting begins (manual agent support)	😊 Relieved if help is quick 😢 Frustrated if slow	Lack of system context shared with agent	Automated context sharing, case history surfacing
Issue Resolution	Problem solved or ticket raised	😊 Satisfaction 😢 Disappointment	Delayed resolutions impact brand perception	Smart handoff between AI and human agents
Post-Support Follow-up	User receives case updates	👉 Calm, satisfied	Resolution notes could sometimes be too technical	Friendly summaries, proactive case status updates

5. Ideas and Explorations

Based on the primary and secondary research, ideated couple of solutions to integrate AI within Enphase systems and to leverage the power of AI and reduce manual support load, we explored multiple solution ideas ranging from smart diagnostics tools to proactive support nudges, and even an AI-generated help center. Each concept was evaluated based on feasibility, implementation effort, scalability, and potential impact on support volume and user experience.

Smart Diagnostics Tool



A CS or installer-facing tool that allows you to describe a problem in natural language (or select symptoms), and then uses AI to automatically run backend diagnostics, cross-check device data (like energy production, connectivity, device status, etc.)

Installer sees list of issues in their fleet with AI-based resolution recommendations.

Pros:

- Provides fast support with minimal manual intervention
- Works well for repeatable issues like offline status, underproduction, battery not charging, etc.

Cons:

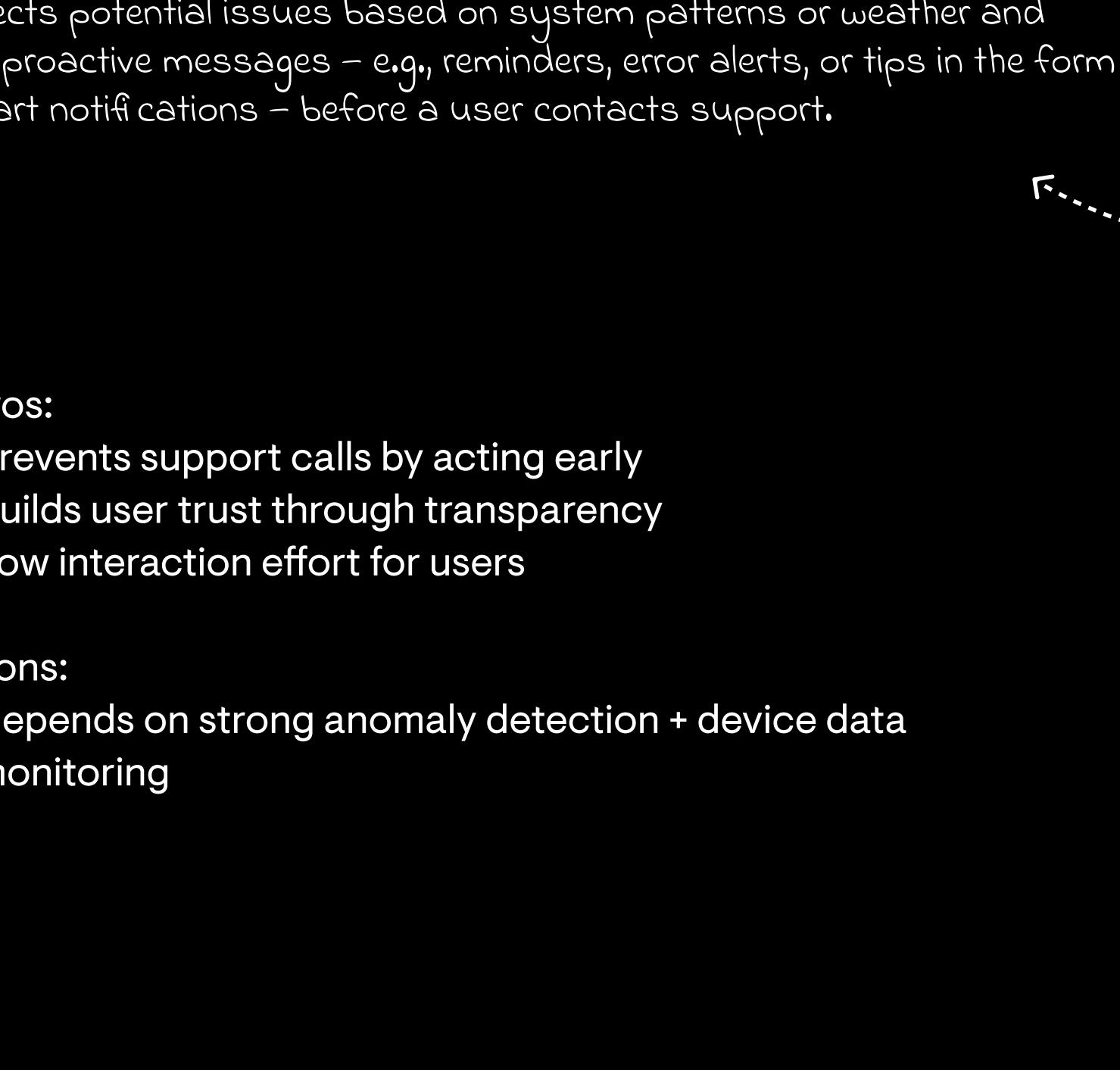
- Requires tight backend integration with system/device data (API access)
- Needs well-maintained data mapping
- The overall idea is to reduce customer support calls, installer-facing tool will aid

A dynamic help center where content is auto-generated or updated using an LLM based on trending queries, support logs, and device-related issues. Instead of manually writing articles, the system creates or adapts content on the fly, ensuring it's always relevant.

AI-Generated Help Center



Conversational AI Assistant / Energy buddy



A user-facing AI chat assistant integrated into support channels (like the app or website). It understands customer intent, handles common

questions, surfaces relevant articles, and offers contextual support – reducing human dependency. Having a character like a genie, energy pal, or bot buddy can make assistant feel more warm, memorable, and trustworthy.

Pros:

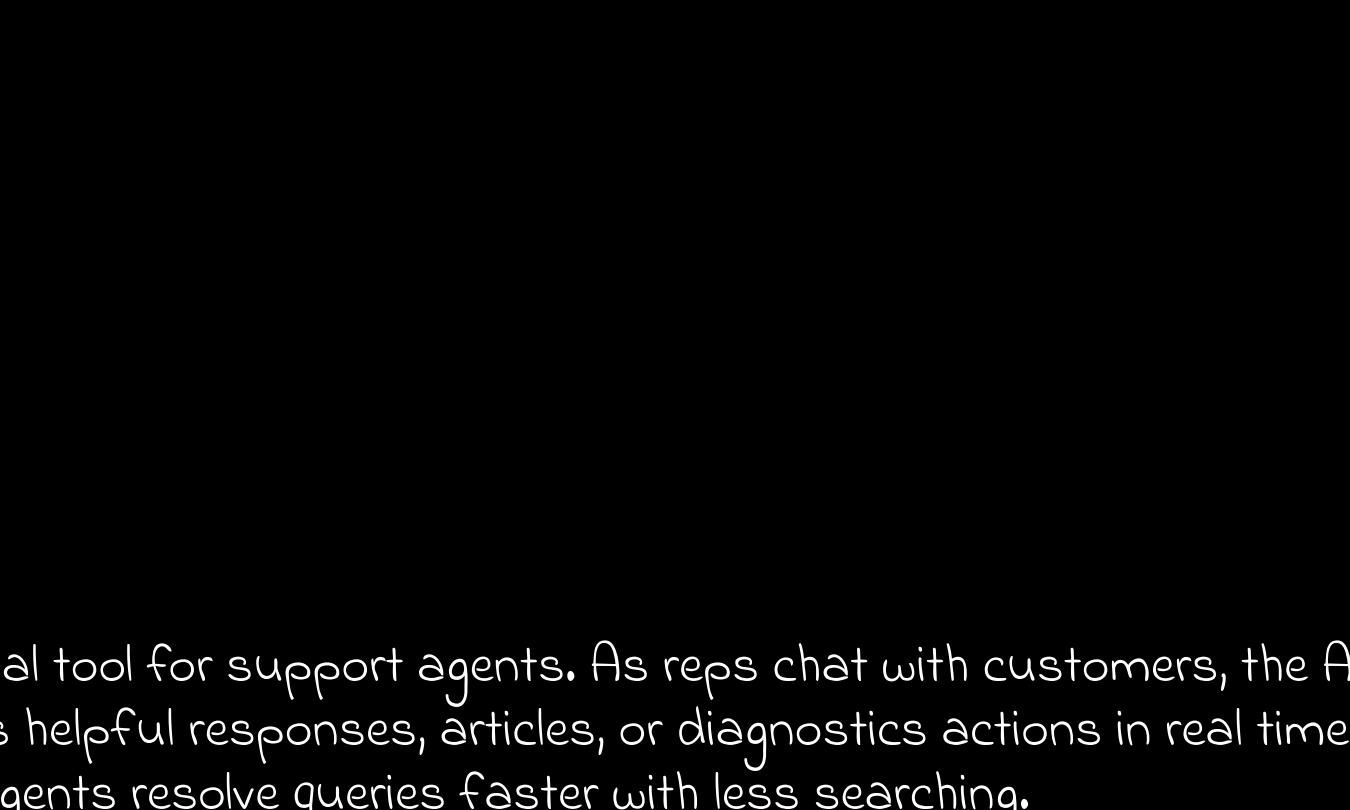
- Makes the assistant feel less robotic and more approachable
- Builds emotional trust

Cons:

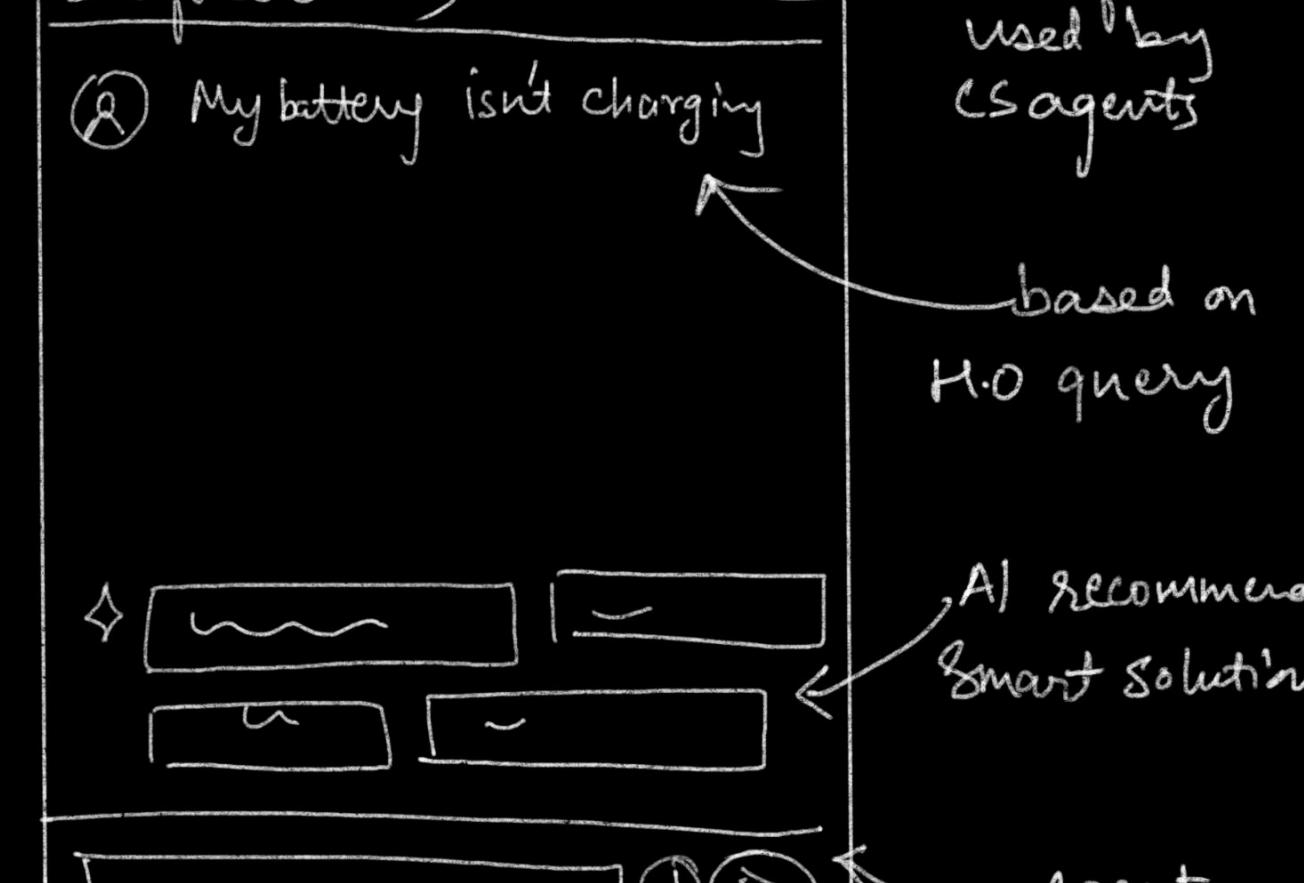
- Enphase as a brand has a very sophisticated design style, as it is used by a large user group, mostly elder age group. Playful elements are not highly encouraged.

AI detects potential issues based on system patterns or weather and sends proactive messages – e.g., reminders, error alerts, or tips in the form of smart notifications – before a user contacts support.

Proactive Support Nudges



Agent Co-Pilot Assistant



Pros:

- Prevents support calls by acting early
- Builds user trust through transparency
- Low interaction effort for users

Cons:

- Depends on strong anomaly detection + device data monitoring

Pros:

- Boosts agent productivity
- Ensures consistent tone and accuracy

Cons:

- No direct impact on user-facing experience
- Adds complexity to the agent tool UI
- Doesn't solve the problem of customer calls

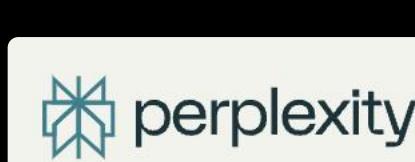
6. Key Stakeholders

When designing an AI assistant, it's crucial to identify and engage with key stakeholders. These stakeholders can be internal or external to the organization and will have varying levels of interest and influence in the project.



7. Solution Space

Benchmarking

 mySigen by Sigenergy	mySigen by Sigenergy: Conversational tone , instruct to manage devices, personalized support.
 Digital Energy	Digital Energy by Streebo : Energy and Utilities AI Assistants Powered by Microsoft Copilot and GPT, preset touch-points, multilingual support, clear chat, transcript and save message features
 perplexity	Perplexity : Conversational, discoverable topics, popular topics, personalization, focus areas, access past chats.
 ChatGPT	ChatGPT : Conversational, discoverable topics, popular topics, personalization, focus areas, access past chats.

Designing the conversation

Conversation design - approach / guidelines (ref: [Conversation Design, Google](#))

Clear & Approachable Tone of voice	Provides definitive answers with supporting data
Uses plain language, avoids jargon	

Supportive & Empowering Empathy	Professional Yet Engaging
Guides users, never shames them for not knowing	Friendly tone, light personality—no over-the-top emojis or slang

Example:
Instead of "Error"

Say "I'm having trouble finding that.
Can you try rephrasing your
request?"

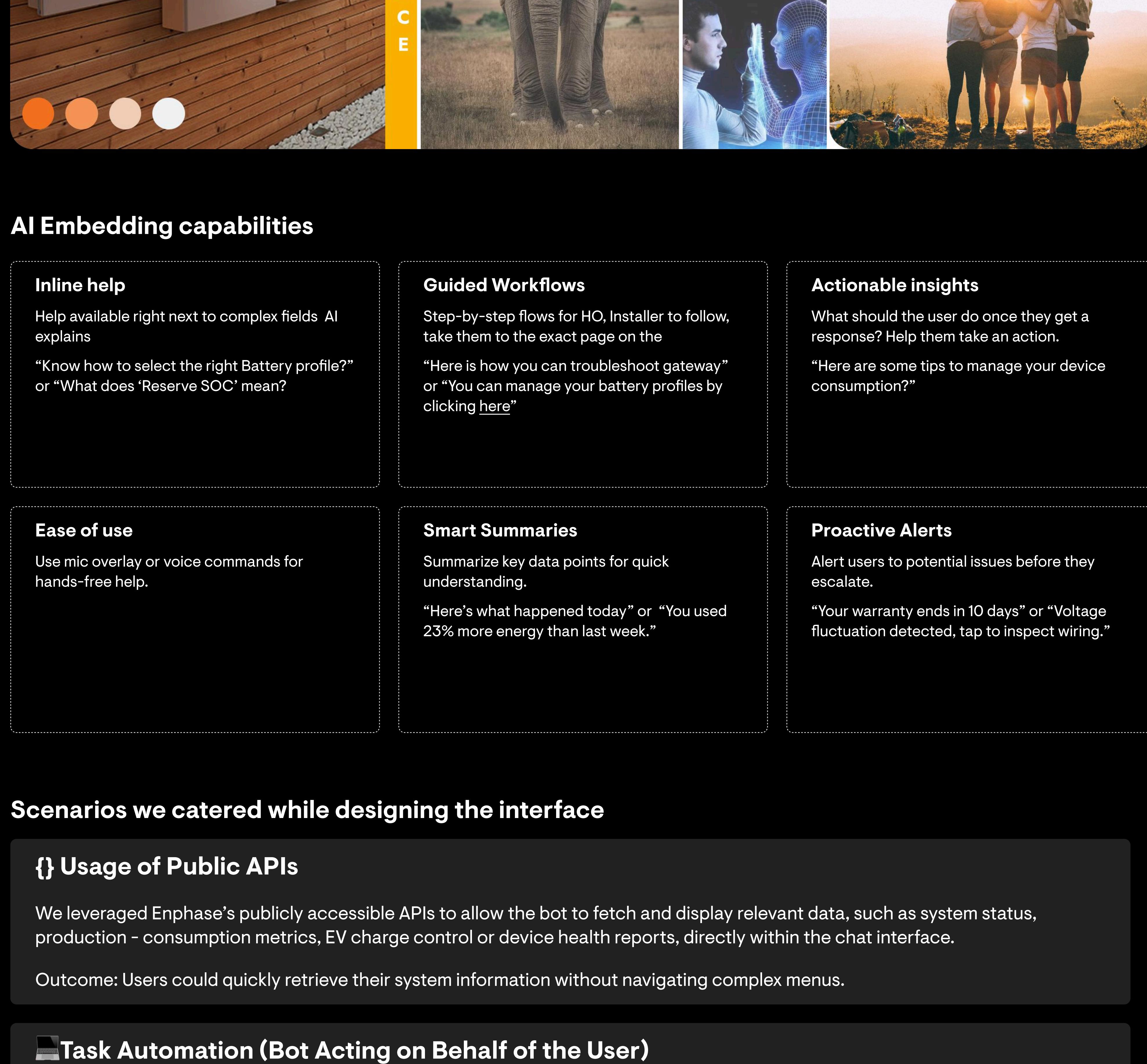
Example:
Instead of "Your energy production
for the past 24 hours was 12.5
kilowatt-hours. This is slightly lower
than your average daily production
of 14.2 kilowatt-hours."

Say "Your energy production
yesterday was 12.5 kWh, which is a
bit lower than usual."

Example:
Instead of "Your system is offline"

Say "Your system is currently offline.
Would you like me to check for
common causes of this issue, such
as network connectivity problems?"

Moodboard



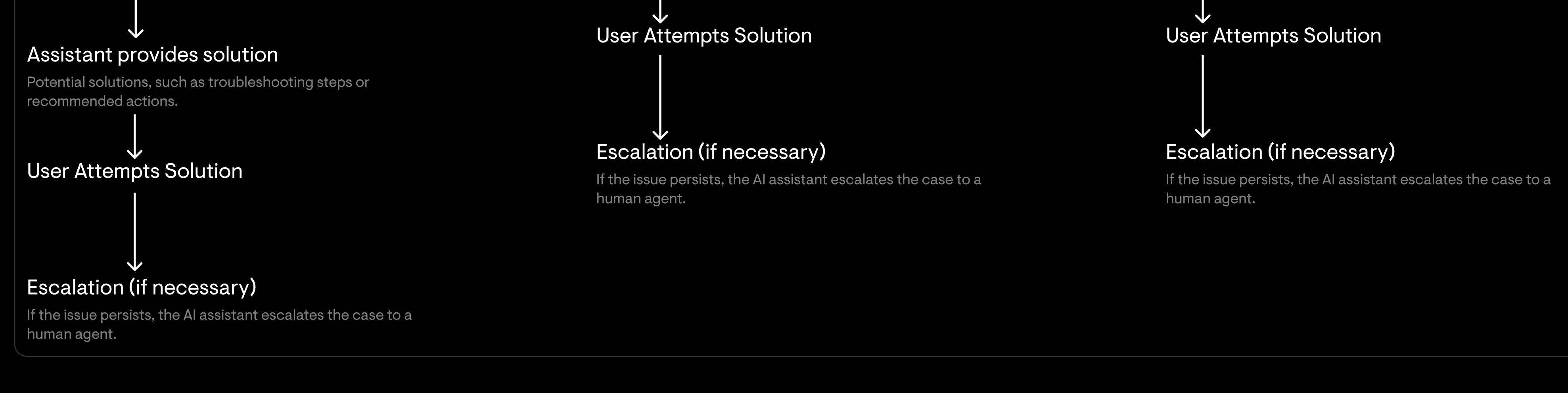
AI Embedding capabilities

Inline help Help available right next to complex fields. AI explains "Know how to select the right Battery profile?" or "What does 'Reserve SOC' mean?"	Guided Workflows Step-by-step flows for HO, Installer to follow, take them to the exact page on the "Here is how you can troubleshoot gateway" or "You can manage your battery profiles by clicking here "	Actionable insights What should the user do once they get a response? Help them take an action. "Here are some tips to manage your device consumption?"
Ease of use Use mic overlay or voice commands for hands-free help.	Smart Summaries Summarize key data points for quick understanding. "Here's what happened today" or "You used 23% more energy than last week."	Proactive Alerts Alert users to potential issues before they escalate. "Your warranty ends in 10 days" or "Voltage fluctuation detected, tap to inspect wiring."

Scenarios we catered while designing the interface

Usage of Public APIs We leveraged Enphase's publicly accessible APIs to allow the bot to fetch and display relevant data, such as system status, production - consumption metrics, EV charge control or device health reports, directly within the chat interface. Outcome: Users could quickly retrieve their system information without navigating complex menus.	Task Automation (Bot Acting on Behalf of the User) For specific support actions – like restarting a device, re-triggering production data sync, or checking case statuses – the bot was designed to trigger backend workflows on behalf of the user after confirmation. Outcome: Reduced manual effort for users and faster task resolution.	Restricted Content Access + In-App Redirection For sensitive actions (e.g., billing queries, warranty claims) that required higher authentication or external portal access, the bot provided controlled guidance. <ul style="list-style-type: none">It presented secure links within the app.Redirected users safely to relevant sections or support portals. Outcome: Maintained data security while still helping users complete complex workflows.
Step-by-Step Guidance for Specific Tasks For tasks like troubleshooting communication failures, reconnecting to Wi-Fi, or updating account details, the bot offered clear, stepwise instructions through conversational flows. <ul style="list-style-type: none">Each step was visually broken down.Users could ask for clarifications or repeat steps if needed. Outcome: Empowered users to self-resolve issues without feeling overwhelmed.		

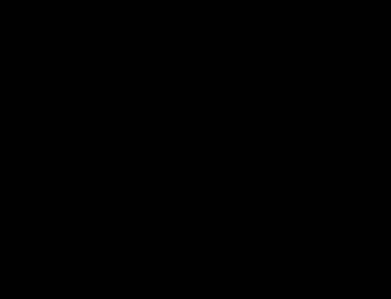
How HO or Installer would access the AI Assistant (potential touch points)



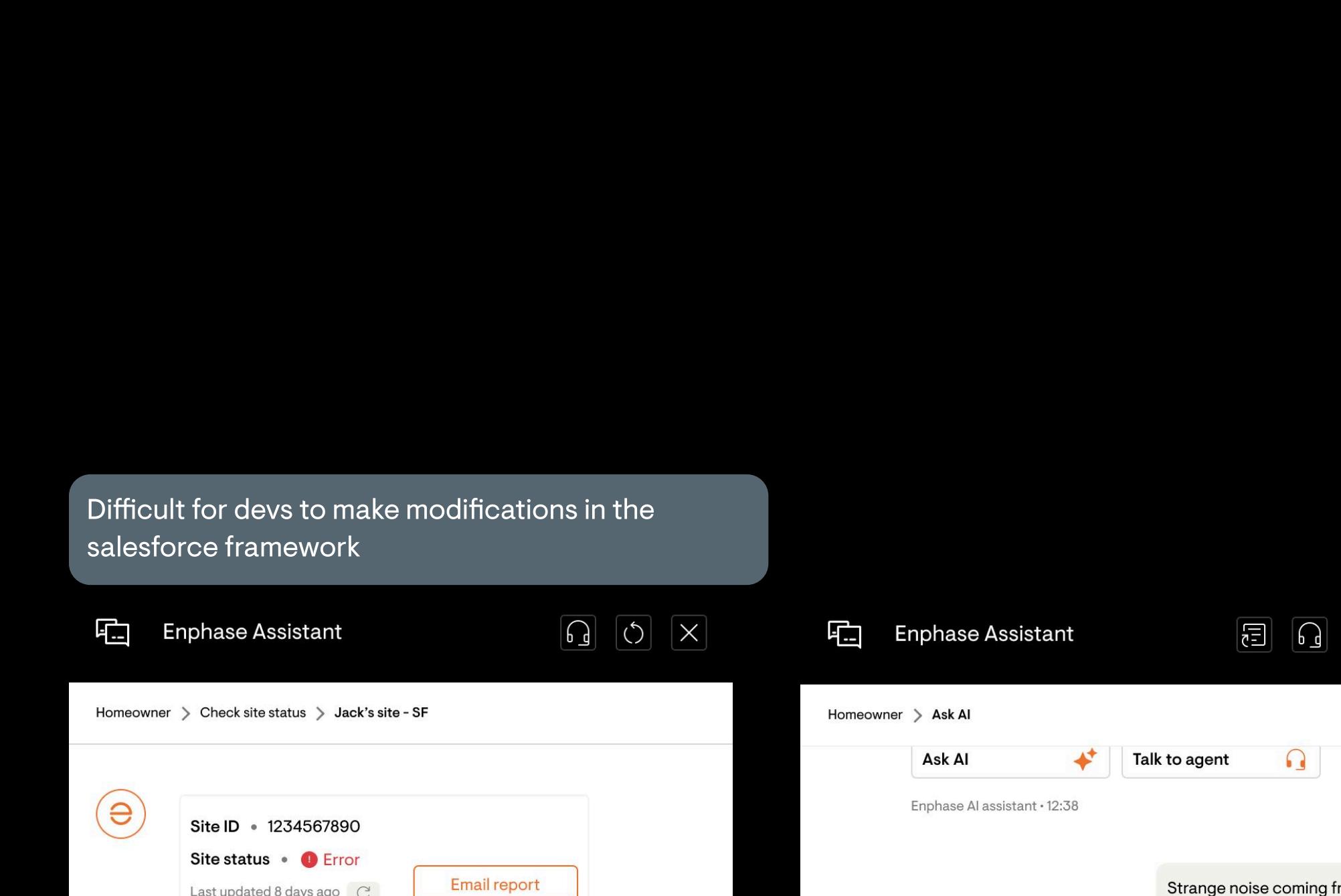
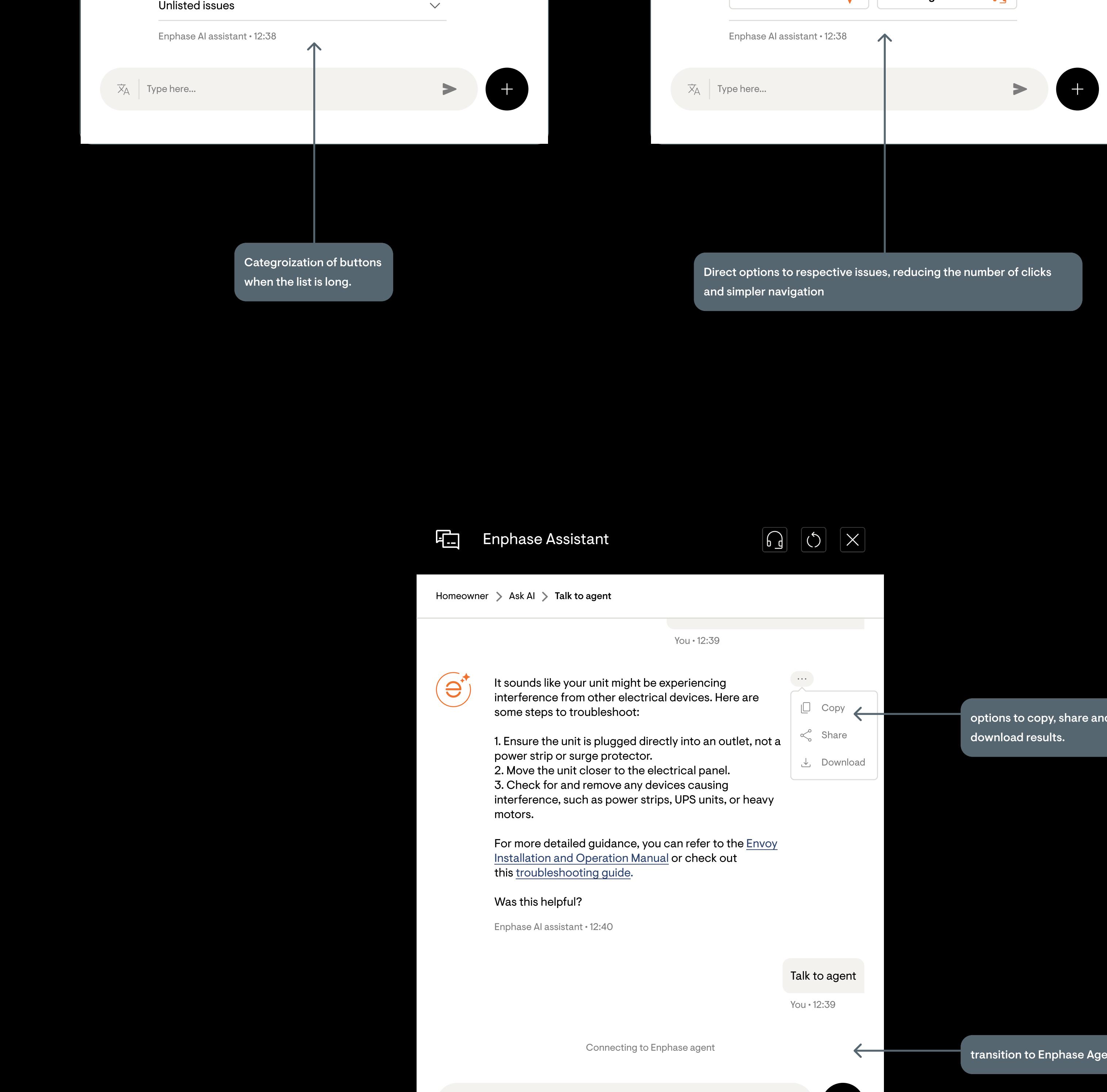
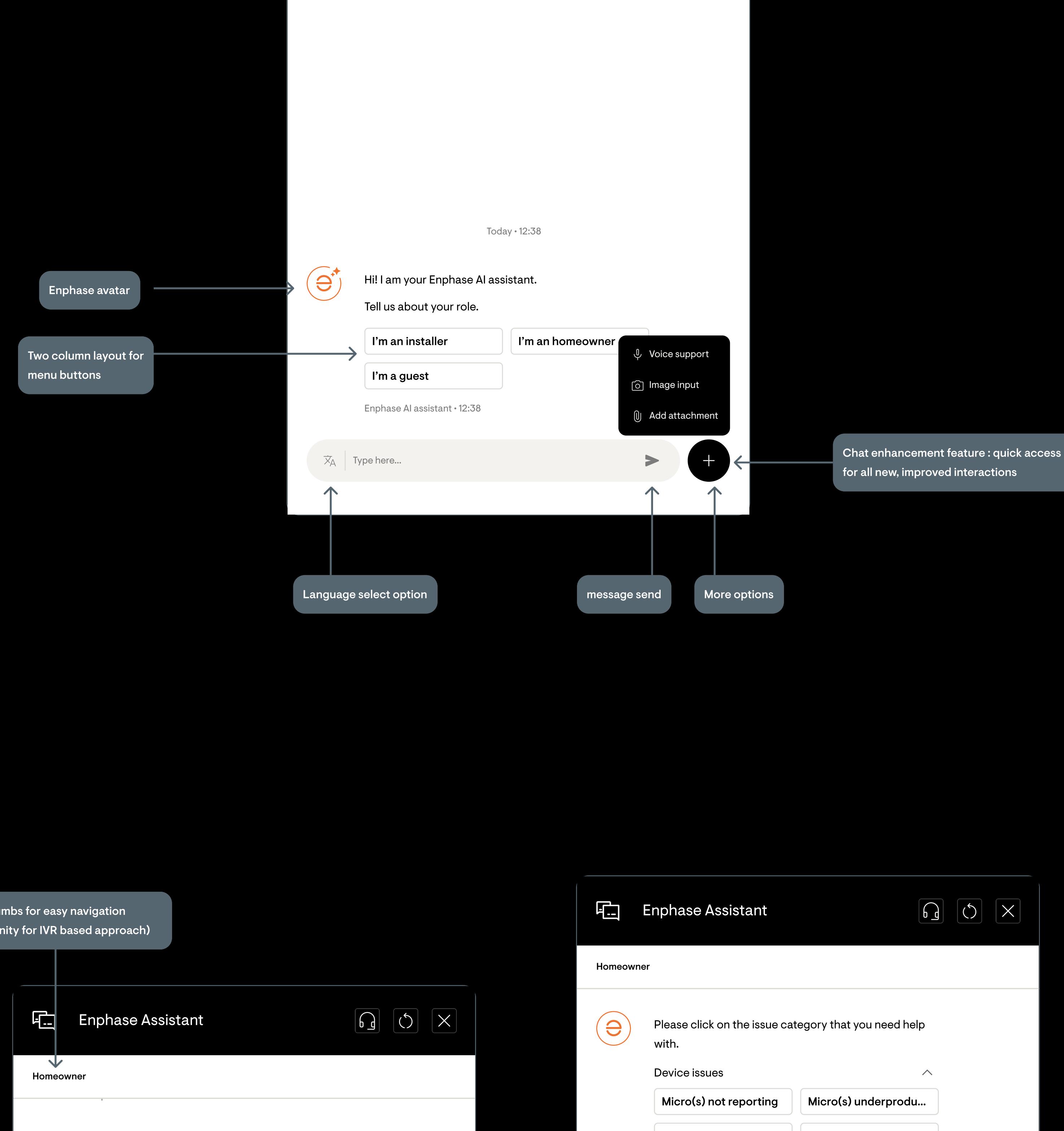
8. Phase 01

Guiding principle: Salesforce based chat interface so that easily implemented by tweaking in the existing chatbot used by CS agents. To be integrated only on the website.

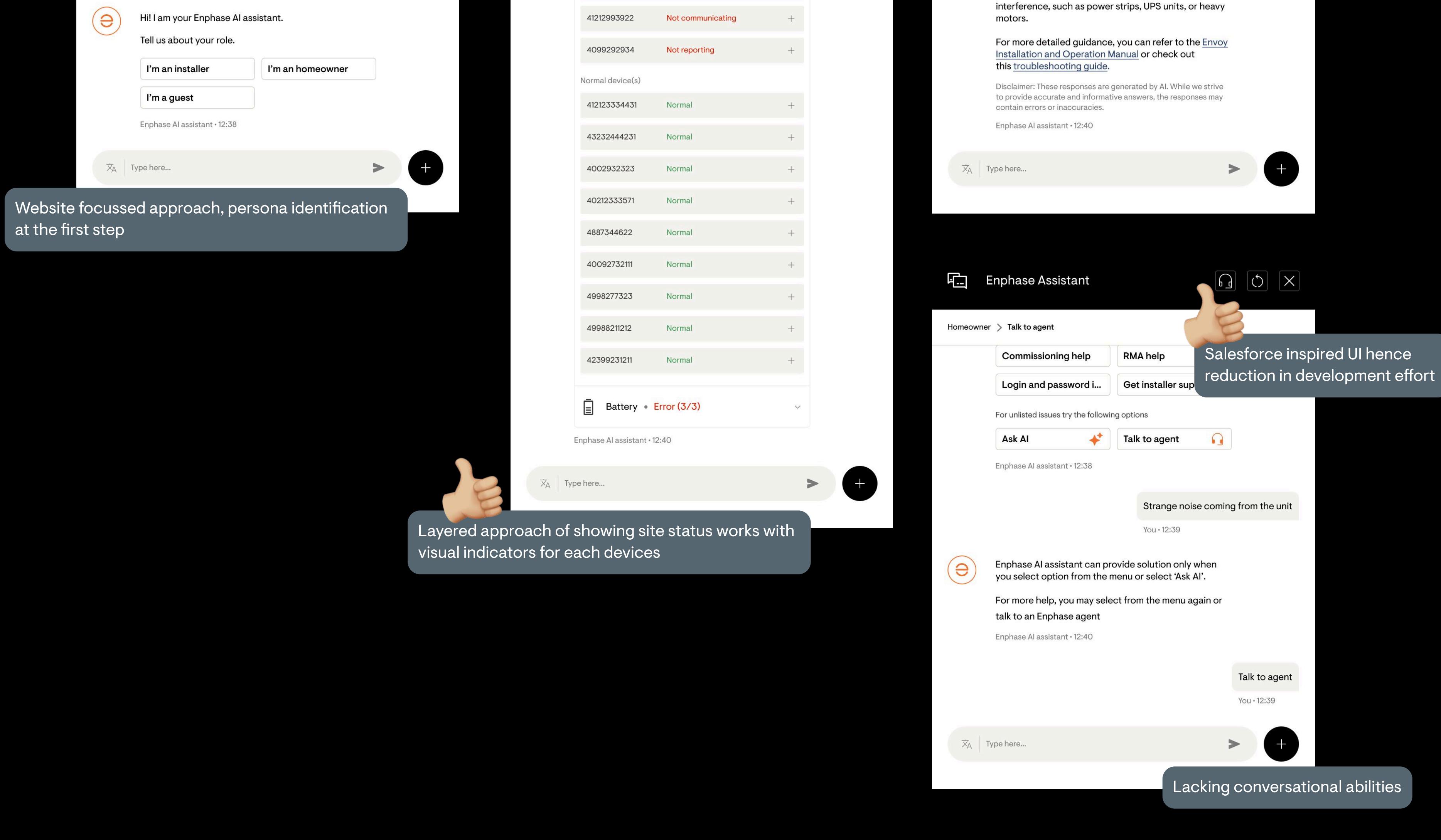
Key features:



Avatar for AI response, agent response



Feedback

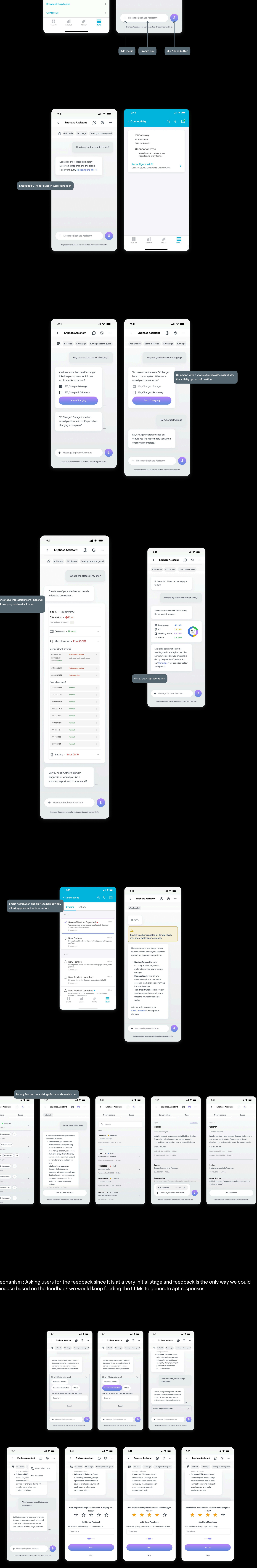


9. Phase 02

Guiding principle: New UI with well defined interactions, to be integrated and used across all Enphase products (Assistant UI in alignment with upcoming ENLOne UI)

Key features:

Chat ingress from support section

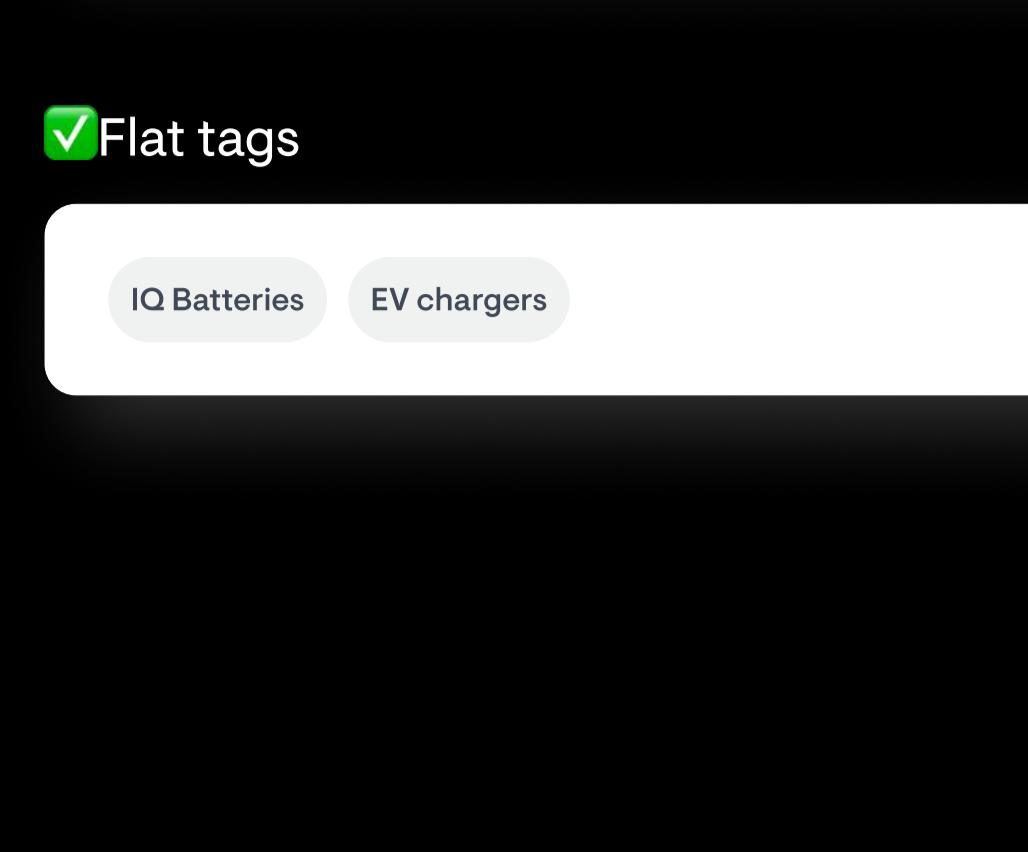


Lead Generation Flow (Guest Users)

10. Concept validations

Validating UI design ideas with internal teams.

1. Topic and subtopic generations



Explainer:

We explored two approaches for topic and subtopic navigation:

1. Flat Tags – Just surface-level topic filters.
2. Nested Tags – Show a topic first and generate related subtopics dynamically.

Purpose:

Help users quickly find related conversations without feeling lost, while keeping the UI lightweight.

Feedback:

- Nested Tags made the experience feel more organized.
- Flat tags felt hard to scan when the list got long.
- Although the nested topics were a good experience, but the users were not referring to past chat in context of Enphase products as much as they would for regular AI chat interfaces (Users are not coming here to chat per say, but to resolve issues)
- Not worth development efforts

2. Full image view vs Snapshot view

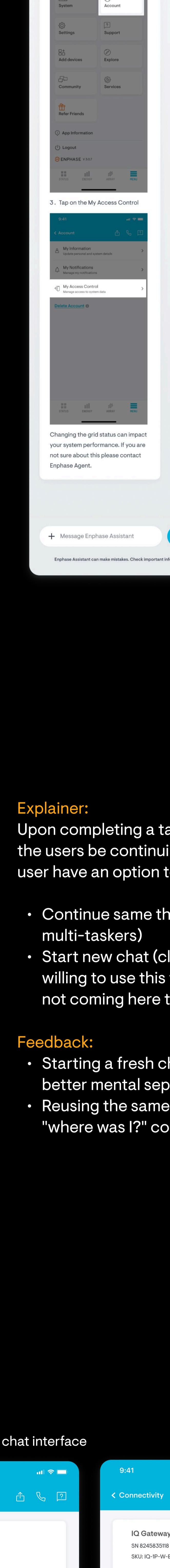
Explainer:

- Full Image View: Show the entire step-by-step visual instruction at once.
- Snapshot View: Show a condensed version with expandable sections to avoid visual overload.

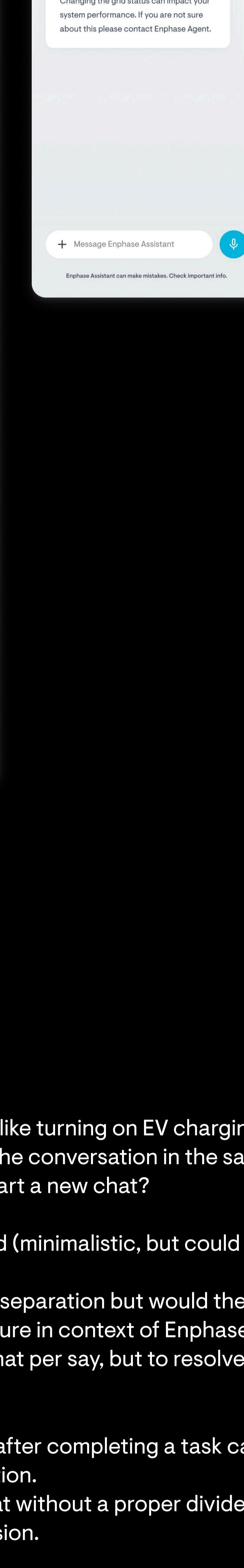
Feedback:

- Full Image View helped with context clarity but overwhelmed mobile users and added a lot of scroll on the page.
- Snapshot View made it easier to skim and encouraged faster action.

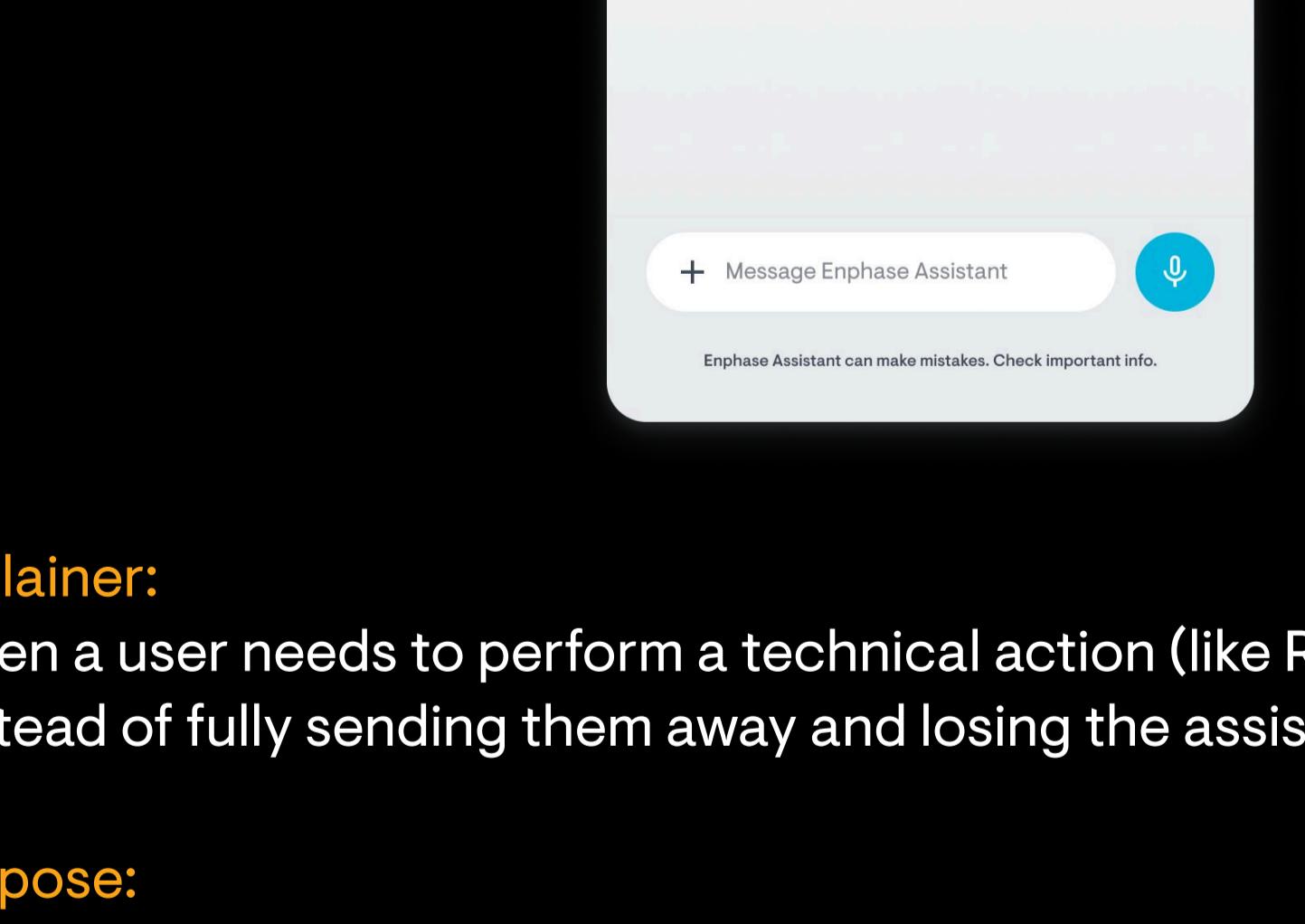
Full image view



Snapshot view



3. Need for new chat button



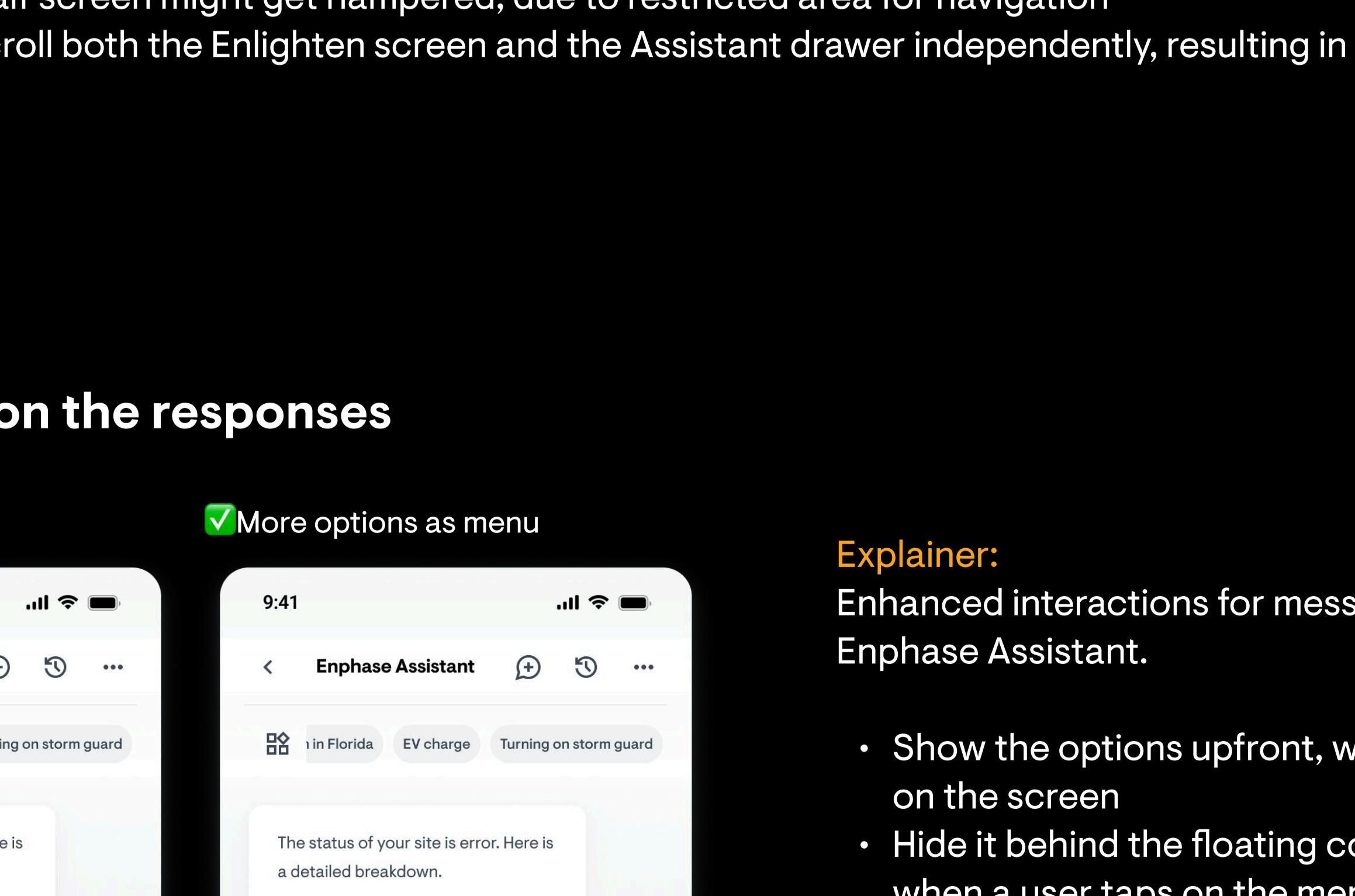
Explainer:

Upon completing a task (like turning on EV charging), should the users be continuing the conversation in the same thread or user have an option to start a new chat?

- Continue same thread (minimalistic, but could confuse multi-taskers)
- Start new chat (clear separation but would the user be willing to use this feature in context of Enphase? Users are not coming here to chat per say, but to resolve issues)

Feedback:

- Starting a fresh chat after completing a task can imply a better mental separation.
- Reusing the same chat without a proper divider led to "where was I?" confusion.



Explainer:

When a user needs to perform a technical action (like Reconfigure Wi-Fi), they are redirected to the Enlighten App. Instead of fully sending them away and losing the assistant conversation, we explored a half-and-half screen experience.

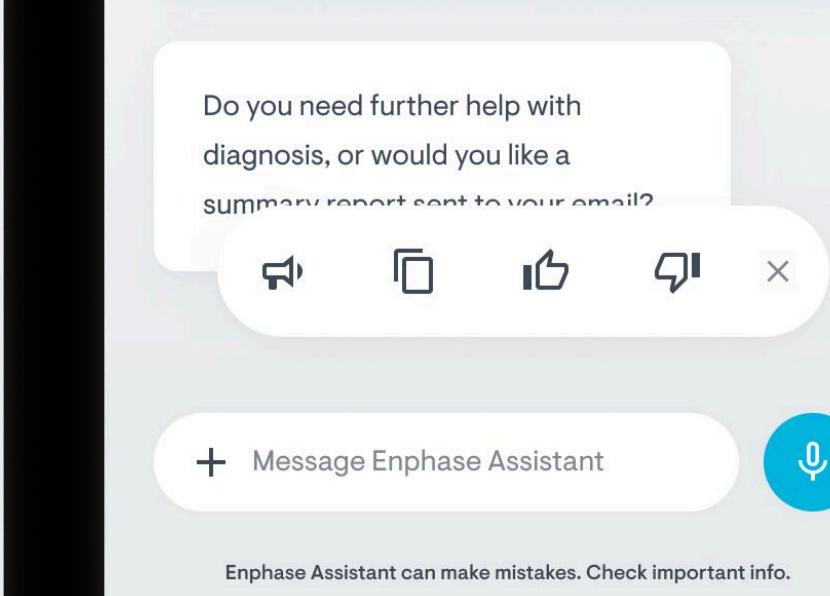
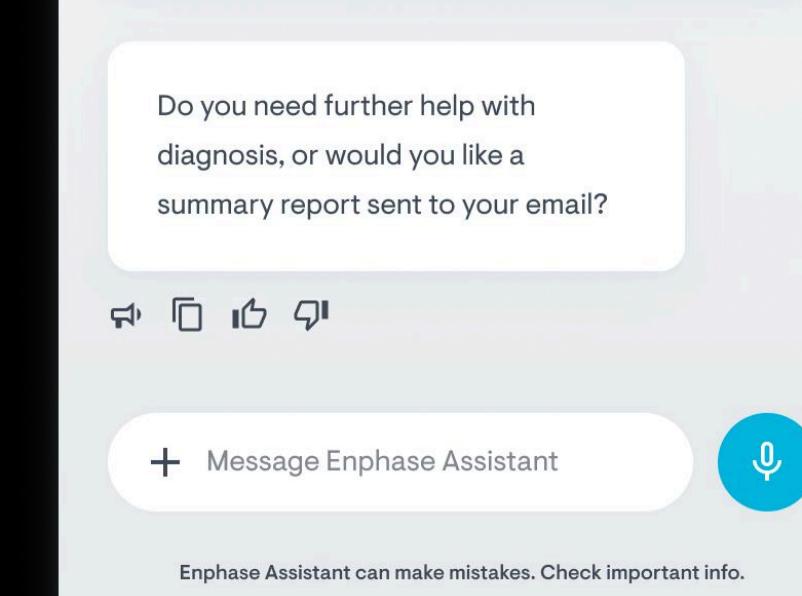
Purpose:

The idea is to make sure the user doesn't forget the instructions while navigating the technical page.

Feedback:

- The usability in the half screen might get hampered, due to restricted area for navigation
- Users may need to scroll both the Enlighten screen and the Assistant drawer independently, resulting in interaction complexity

5. More options on the responses



Explainer:

Enhanced interactions for message-level actions inside the Enphase Assistant.

- Show the options upfront, which is occupying lot of space on the screen
- Hide it behind the floating contextual menu that appears when a user taps on the menu icon

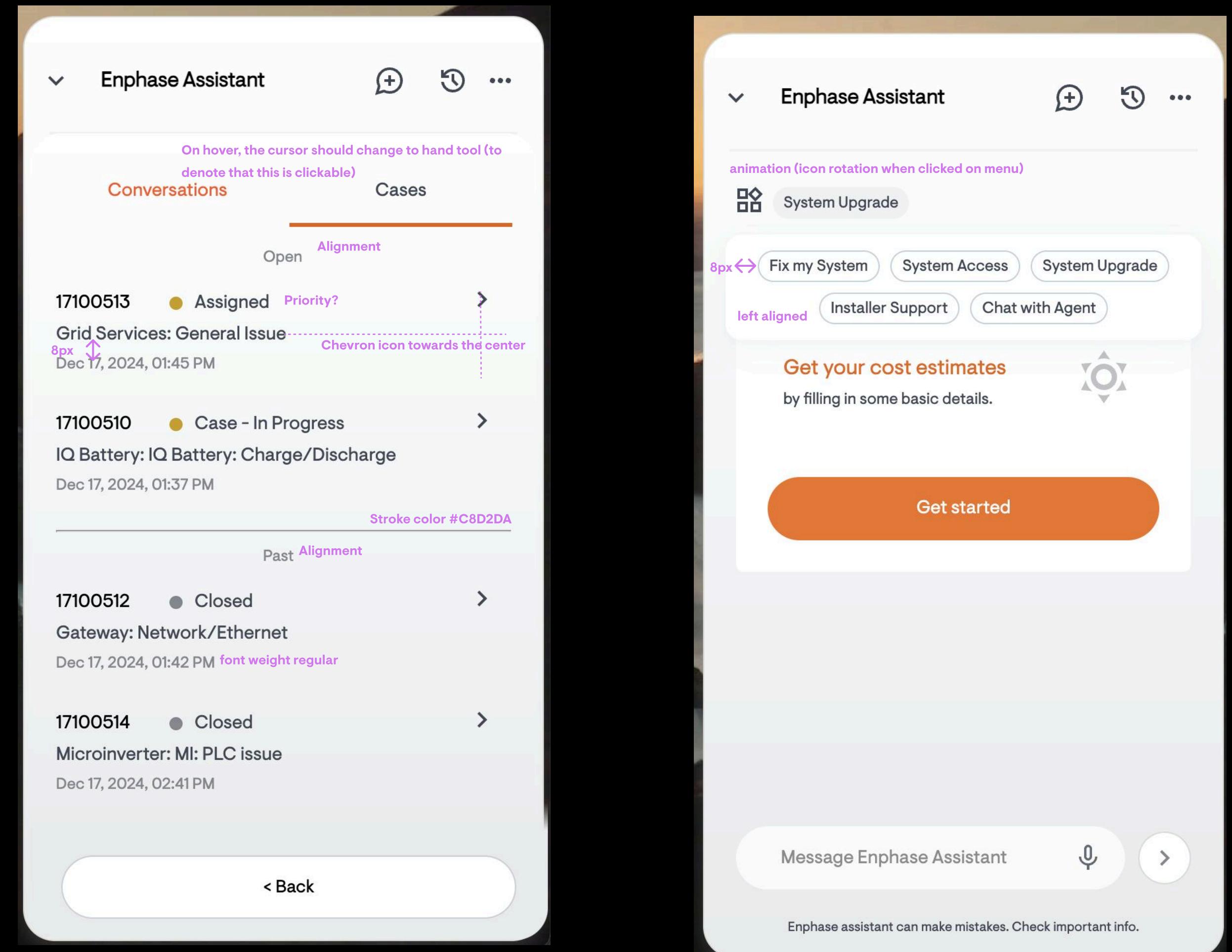
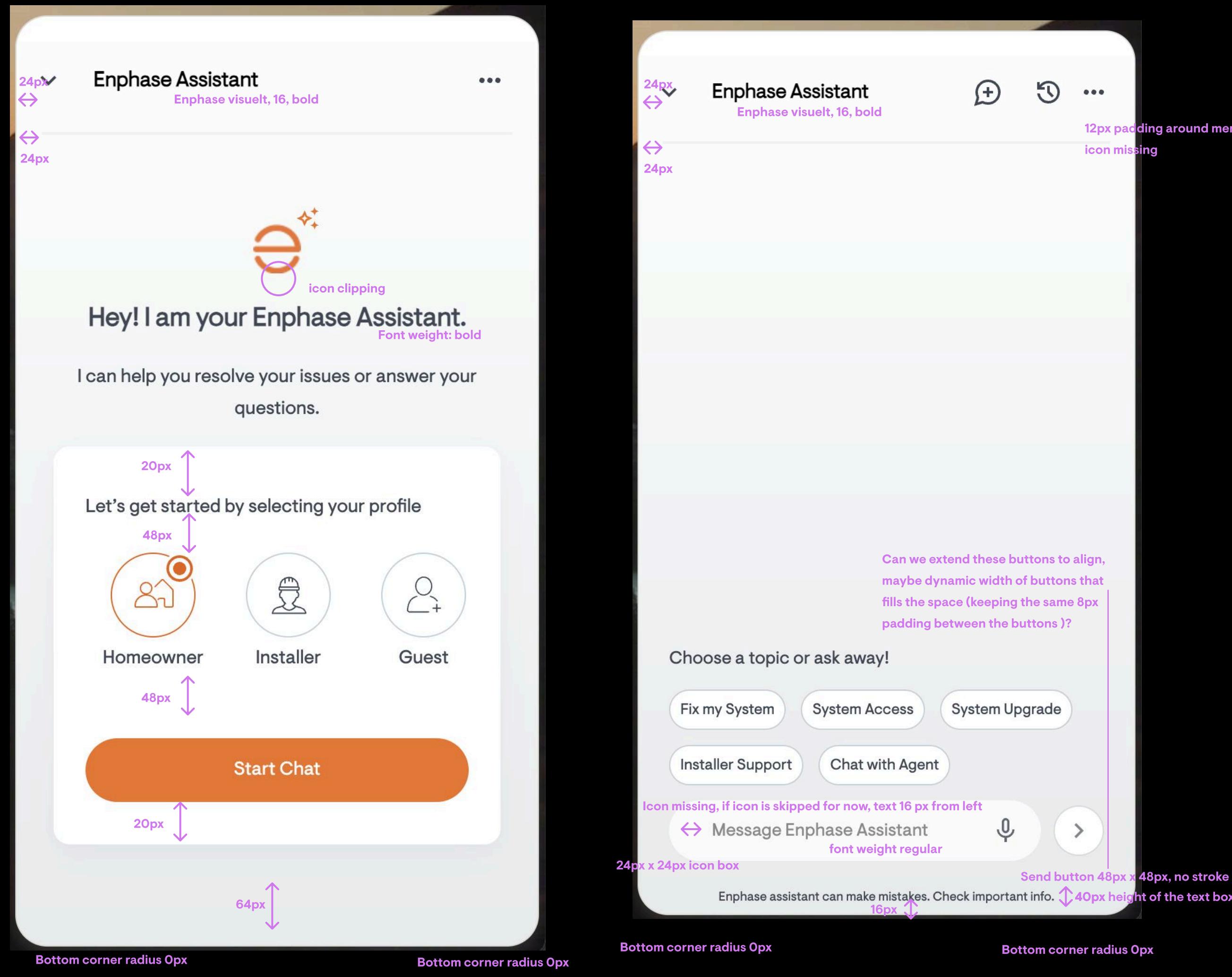
Feedback:

- Hiding interactions behind a menu icon might have discoverability issues and added layer of interaction.

- On smaller phones especially, the clickable area for the icons is too less on the first screen, hence, more options screen is preferred.

11. Design QA

Performing Design QA to align visually with the developed versions.



12. Potential Impact

Estimated **30-40% reduction** in Tier 1 support tickets through AI-powered self-resolution.

24/7 availability - Covers **100% of support hours**, including weekends and holidays.

13. Future Scope

Further integration with Enlighten Admin, Service Manager, Enphase website, ITK app, at a deeper level not just as an add-on conversational interface.