Developing an Interactive Dashboard for BloomCatch's AI System.

A Professional Readiness Experiential Program (PREP) Project Effort

----- ***Authors / Student Project Team Members*** -----

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Interested in being an Industry Participant and or PREP Sponsor? Please reach out to bngac@gmu.edu, Thanks!

---- Client Testimonial ----

"The student team brought a strong client-centric mindset from day one. They took the time to understand BloomCatch, asked thoughtful questions, and consistently showed professionalism and initiative. Their work ethic was excellent and they approached each stage of the project with genuine curiosity and care. The final recommendations were well researched and highly relevant, giving us fresh insights and reinforcing areas of our strategy. Their contribution made a meaningful impact and I believe the skills they demonstrated will serve them well as they enter the workforce."

- Ray Magee | Founder & CEO | BloomCatch

Introduction

BloomCatch is a plant-care startup that is in its early-stages working to help and inform users with its expert knowledge through its AI assistant Bloomie. While Bloomie had already been live, the system had accuracy issues, inconsistent responses, and a simple system for structuring data. Our team was introduced to this project to help BloomCatch understand how Bloomie was performing and to create the required tools to diagnose said problems, track progress, and improve reliability.

When beginning to work on this project, our team divided responsibilities across dashboard development, research, and prompt engineering. Together, we focused on working with the data (four months of unstructured Q&A interactions) to transform it into a clear, organized solution for BloomCatch to use as a foundation to evaluate Bloomie's performance and guide it the correct way moving forwards. The goal was to build a functional dashboard, however we took it a step forwards and created a repeatable system for BloomCatch to use for understanding user behavior, AI accuracy, and increased data quality going forwards.

Business Challenge

BloomCatch's primary challenge stemmed from limitations within Bloomie's existing AI system, including frequent hallucinations, inconsistent accuracy, and a lack of reliable historical data. With only four months of Q&A interactions and many answers being incomplete or incorrect, the system did not have a strong foundation to learn from or improve. Additionally, because user questions and Bloomie's performance were stored in a simple Excel file with no indicators of accuracy, category tagging, or trend tracking, BloomCatch lacked visibility into what users were asking, where Bloomie struggled, and how the AI was performing over time. These issues made it difficult to differentiate real user patterns from noise, diagnose common failure points, or establish any measurable standard AI performance.

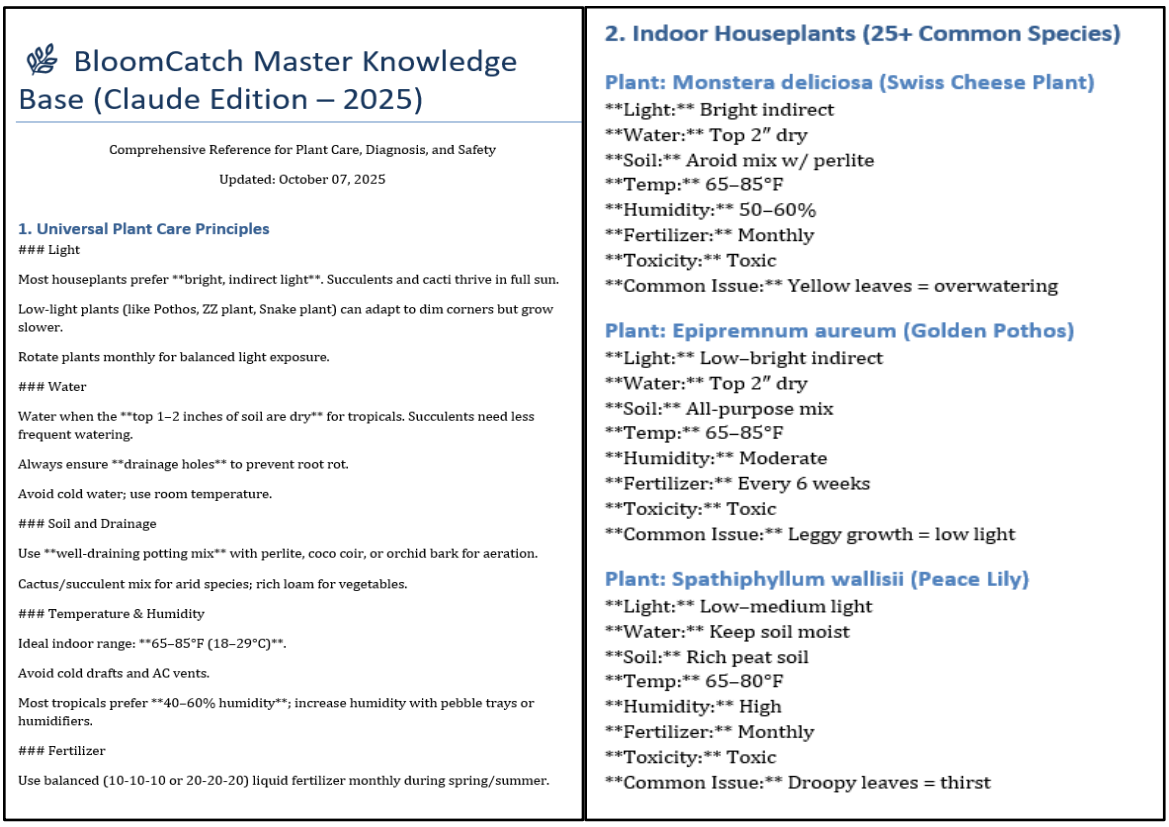
These challenges significantly affected the team's ability to design an effective dashboard and build meaningful metrics. Hallucinations from Claude during early prototypes reinforces the need for cleaner input data and a more structured process, as inaccurate outputs risked misleading the client and damaging trust in the system, The absence of an organized knowledge base prevent Bloomie from tailoring answers to specific products, regions, or store level information, leading to generic or incorrect responses for real customers. Altogether, these gaps created operational blind spots for BloomCatch and made it clear that the AI system required both stronger data foundations and a more reliable evaluation framework before it could truly scale.

Activities Done to Address the Business Challenge

To address BloomCatch's primary challenges as well as the challenges we were facing, our team first identified the key AI performance metrics BloomCatch needed, such as total questions, accuracy patterns, errors, category trends, question analysis, etc., and built these into a visual dashboard that went through multiple iterations. We created many early prototypes, tested each version, and refined it based on client feedback until we landed on a layered dashboard

structure that moved from high-level KPIs to deeper insights on user behavior and Bloomie's performance. To reduce hallucinations and inconsistent outputs, we trained Claude through targeted prompting and step-by-step refinement, which helped create cleaner and more reliable metrics and outputs.

Additionally, we met with one of BloomCatch's real clients, Pots & Plants, to better understand what information was most valuable for their daily operations and incorporated that perspective into the dashboard's design. We also created an organized knowledge base from scratch, breaking the information into clear, reliable categories that Bloomie can reference going forward. Together, all of these actions strengthened the data foundation BloomCatch was missing and created a more reliable system for evaluating and improving Bloomie's performance.



BloomCatch Master Knowledge Base (Claude Edition – 2025)

Comprehensive Reference for Plant Care, Diagnosis, and Safety

Updated: October 07, 2025

1. Universal Plant Care Principles

Light

Most houseplants prefer **bright, indirect light**. Succulents and cacti thrive in full sun.

Low-light plants (like Pothos, ZZ plant, Snake plant) can adapt to dim corners but grow slower.

Rotate plants monthly for balanced light exposure.

Water

Water when the **top 1–2 inches of soil are dry** for tropicals. Succulents need less frequent watering.

Always ensure **drainage holes** to prevent root rot.

Avoid cold water; use room temperature.

Soil and Drainage

Use **well-draining potting mix** with perlite, coco coir, or orchid bark for aeration.

Cactus/succulent mix for arid species; rich loam for vegetables.

Temperature & Humidity

Ideal indoor range: **65–85°F (18–29°C)**.

Avoid cold drafts and AC vents.

Most tropicals prefer **40–60% humidity**; increase humidity with pebble trays or humidifiers.

Fertilizer

Use balanced (10-10-10 or 20-20-20) liquid fertilizer monthly during spring/summer.

2. Indoor Houseplants (25+ Common Species)

Plant: Monstera deliciosa (Swiss Cheese Plant)
Light: Bright indirect
Water: Top 2″ dry
Soil: Aroid mix w/ perlite
Temp: 65–85°F
Humidity: 50–60%
Fertilizer: Monthly
Toxicity: Toxic
Common Issue: Yellow leaves = overwatering

Plant: Epipremnum aureum (Golden Pothos)
Light: Low–bright indirect
Water: Top 2″ dry
Soil: All-purpose mix
Temp: 65–85°F
Humidity: Moderate
Fertilizer: Every 6 weeks
Toxicity: Toxic
Common Issue: Leggy growth = low light

Plant: Spathiphyllum wallisii (Peace Lily)
Light: Low–medium light
Water: Keep soil moist
Soil: Rich peat soil
Temp: 65–80°F
Humidity: High
Fertilizer: Monthly
Toxicity: Toxic
Common Issue: Droopy leaves = thirst

Figure 1 & 2. *Sections of the organized knowledge base created for BloomCatch. The information is categorized for accuracy and easy reference so that Bloomie can guarantee returning more reliable responses.*

Results & The Positive Impact

Our final dashboard gave BloomCatch a clear and accurate picture of how Bloomie is performing in the real world. Instead of digging through a long Excel file, the team can now see key trends in one place, like which topics users ask about the most, where Bloomie gives strong answers, and where it provides incorrect answers. Eventually once Bloomie and the dashboard connect directly to a cleaned data and knowledge base structure, it can be continuously

updated as new questions come in. This means the dashboard will stay useful over time instead of a one-time use.

This new visibility helps BloomCatch make smarter decisions about how to improve Bloomie. The team can quickly spot patterns, such as categories with low accuracy or high hallucination risk, and then target those areas with better training data or more precise prompts. This ultimately leads to a more reliable AI that gives answers that are grounded in the knowledge base, which builds more trust with both internal users and paying clients. It also makes it easier to test changes, since the team can see how updates impact performance on the dashboard instead of guessing.

Overall, the project added real value by turning messy, hard to use information into a structured system that supports growth. BloomCatch now has a repeatable way to track AI performance, find gaps in the knowledge base, and measure whether new changes are actually helping. This creates a foundation BloomCatch can reuse for future dashboards, new AI features, and new products as the company grows.

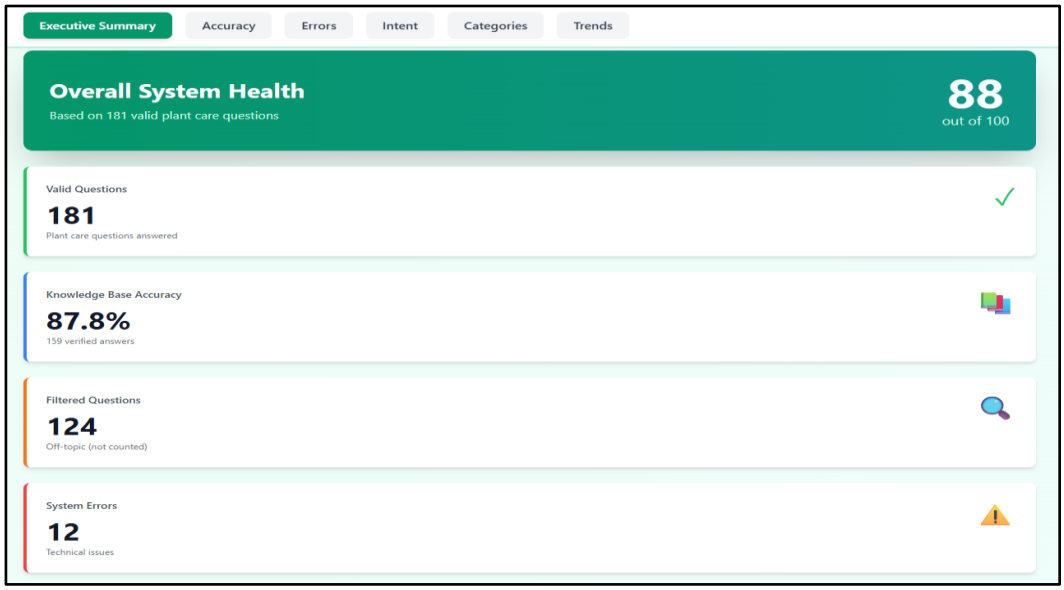


Figure 3: *This is the dashboard's starting view, giving a quick snapshot of Bloomie's overall system health. It summarizes the key metrics such as valid questions, accuracy, filtered questions, and system errors, so users can immediately see how the AI is performing before exploring further. The tabs at the top (Accuracy, Errors, Intent, Categories, and Trends) allow users to dive into each area for a deeper and detailed analysis.*

Conclusion

The main challenge from the beginning was working with limited, messy, and unstructured data while working on trying to ameliorate Bloomie, who was struggling with accuracy and hallucinations. After organizing the data, creating a knowledge base, and changing our prompting approach, we were able to work through the issues and give BloomCatch a much better foundation for future analytical endeavors.

The finished dashboard now provides BloomCatch with a clear picture of what the user is asking, how well Bloomie can respond to the question, and where the system still needs to be improved. Most importantly, Bloomie's progress over time can now be measured instead of guessing based off of scattered information. These changes brought to light a clearer data structure, visibility into accuracy, and a process for highlighting surfacing problem areas. BloomCatch is now in a stronger position to keep updating Bloomie as the company grows.

Overall, the main takeaway was that reliable AI starts with reliable data. By working with Bloomie to improve inputs and outputs, we helped BloomCatch move from uncertainty to reliable insights. This project was the foundation for the dashboard, and we are certain that BloomCatch will use this in their future decisions, knowledge base updates, and new features moving forwards.

PREP Student Reflection

Alex's student reflection:
Throughout this project, I learned how challenging and rewarding it can be to develop an AI system that is both accurate and reliable, especially when working with limited historical data and inconsistent responses. Analyzing Bloomie's interactions helped me understand where hallucinations occurred and why a strong knowledge base is essential for improving accuracy. Building the performance dashboard pushed me to think critically about which metrics truly matter and how to present insights clearly without relying on unsupported data. Although parts of the project felt overwhelming, especially when our early prototypes weren't aligning with real numbers, the feedback we received helped me refine my work and gain confidence in my ability to solve real client problems. Overall, this experience strengthened my technical skills, my understanding of AI workflows, and my ability to communicate and iterate effectively, leaving me feeling more prepared for future roles in analytics and AI development.

Arun's student reflection:
Working on this project really taught me how much interaction and collaboration goes on behind the scenes between a client and the team actually building the solution. We were not just plugging things into Claude and hoping for the best, but actually had to learn how the AI processed inputs and how different wording styles, structures, and phrases changed the quality of the answers we got back. Small tweaks in how I asked a question could make Claude more focused, accurate, or even fail, and give something completely off track. Building the process flow charts took that even further, because I had to think through every path a question could take, not just the ideal one. Each step in the process could lead to multiple outputs, and all of those needed to be clearly explained and understood so the flow stayed efficient and made sense to someone looking at it for the first time. Overall, this helped me see how careful design, clear prompts, and detailed mapping all work together to create an AI system that people can actually trust and use. In the end I am truly happy to see that what we made is going to make an impact in some way for the company.

Shreya's student reflection:
This project showed me how challenging and how much work truly goes into building a dashboard and delivering something meaningful for the client, especially when you're not given perfect data or clean inputs to start with. A lot of the process involved working around errors, fixing issues and inconsistencies, and figuring out how to make sense of information that wasn't always complete or reliable. It taught me the importance of being consistent, patient, and willing to refine things repeatedly until they finally come together. I found the entire project extremely valuable, from the early stages where we were just learning how to navigate Claude and the raw data, to the end where we were able to deliver a complete dashboard and knowledge base that BloomCatch integrated into their system. Seeing everything come together made the effort feel meaningful, and gaining confidence working with AI along the way is something I know I will carry into future roles and projects.

Suleyman's student reflection:
This project showed me how challenging it can be to build something useful when the data is messy and the tools are something you have never used before. At the start, our main challenge was that we didn't know where to start but experimenting with it and slowly figuring out how Claude responded pieced it all together. Meeting with the client and getting direct feedback on the work you have been doing was the most valuable part. It gave me guidance on what needed to be done, and coincidentally, gave me insight into the world of startups, especially after being invited to an investors conference. Our team worked very well throughout the project, and the only thing I would change would be spending more time in the beginning to learn the system together instead of figuring it out separately. Overall, this experience made me more confident and proficient in working with clients, AI workflows, and working as a group to take on a challenge.