

Pharmaceutical Stability Test Management Tool

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/ Introduction

/ Product Space

This project aimed to help pharmaceutical team leaders and respective scientists (analysts) create a new process of managing their stability tests.

Stability tests are scientific tests that test how a medical product (e.g. drug, medical device) changes over time under different environmental conditions (e.g. temperature, humidity).

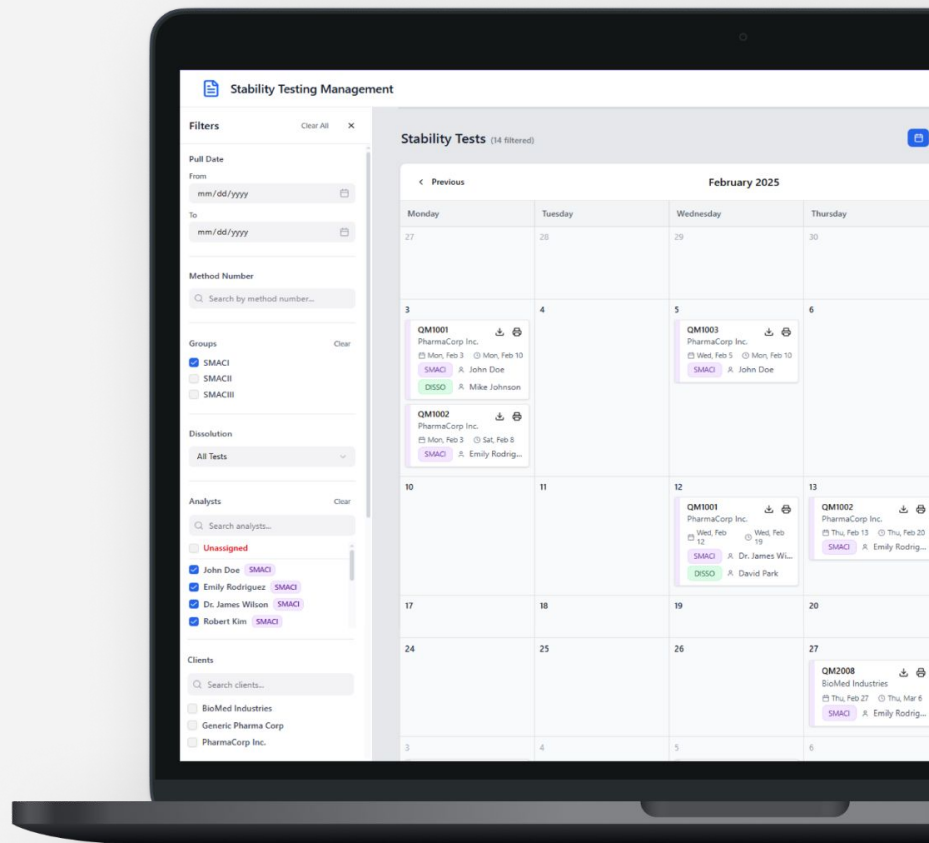


/ Executive Summary

Define the future state experience for managing stability tests.

My top achievements on the project include:

- Prototyping a fully functional prototype via vibe coding
- Improving redesigned system usability score by 74%
- Documenting vibe coding learnings and best practices for our design team



/ Problem Discovery

/ Current State Problems

Conducted a **Problem Framing Workshop** to align on the problem to be solved

- Highly manual process of creating testing calendars
- Scavenger-hunt-like process of finding respective testing documents for each test
- New analysts need to search through documentation twice. Once to find what equipment to use for the test, and once when they need to execute the test.



TOP VOTED PROBLEM STATEMENT

Scientists at [redacted] are experiencing inefficiencies when creating or maintaining, or using different team calendars. This occurs during collaborative planning phases, where each team has developed its own method for managing calendars, and when using paperwork described by the testing in the calendar. As a result, this manual process creates inefficient workflows, which undermines the company's patient-first priority and achieving quality test results to clients in a timely fashion.

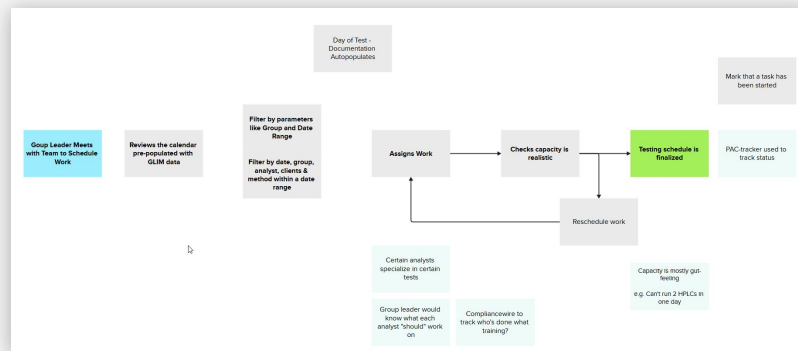
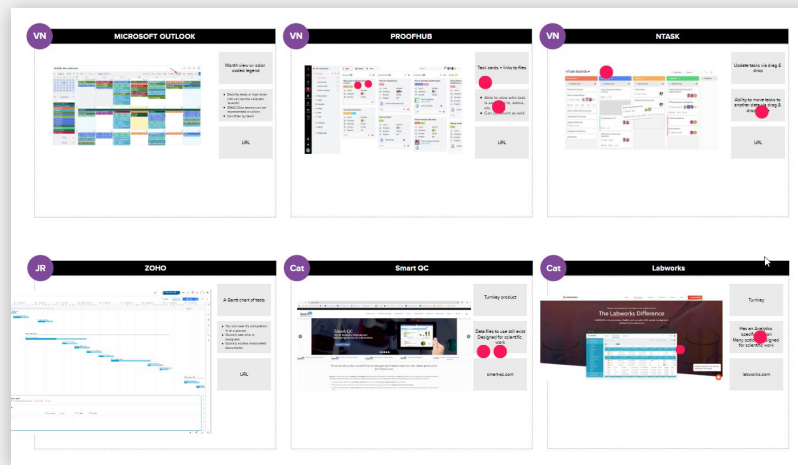
It's important to solve this problem because scientists are spending too much time in administrative duties and not able to fully prioritize the patient and spend more time in meaningful tasks.

How might we improve the scheduling calendar experience using artificial intelligence so that Scientists can reduce calendar creation time from 30–60 minutes to zero and not have to manually search for documentation—enabling faster, more consistent collaboration?

/ Future-State Discovery

Conducted a condensed **Design Sprint** to ideate on solution to the problem, including how AI can help

- Use AI to read through documents and identify IDs to required testing paperwork
- Collaborated with our Solution Architect to explain capabilities of AI
- “Lightning demos” to provide participants inspiration
- Focused on fleshing out future state user flow to avoid confusion during prototyping

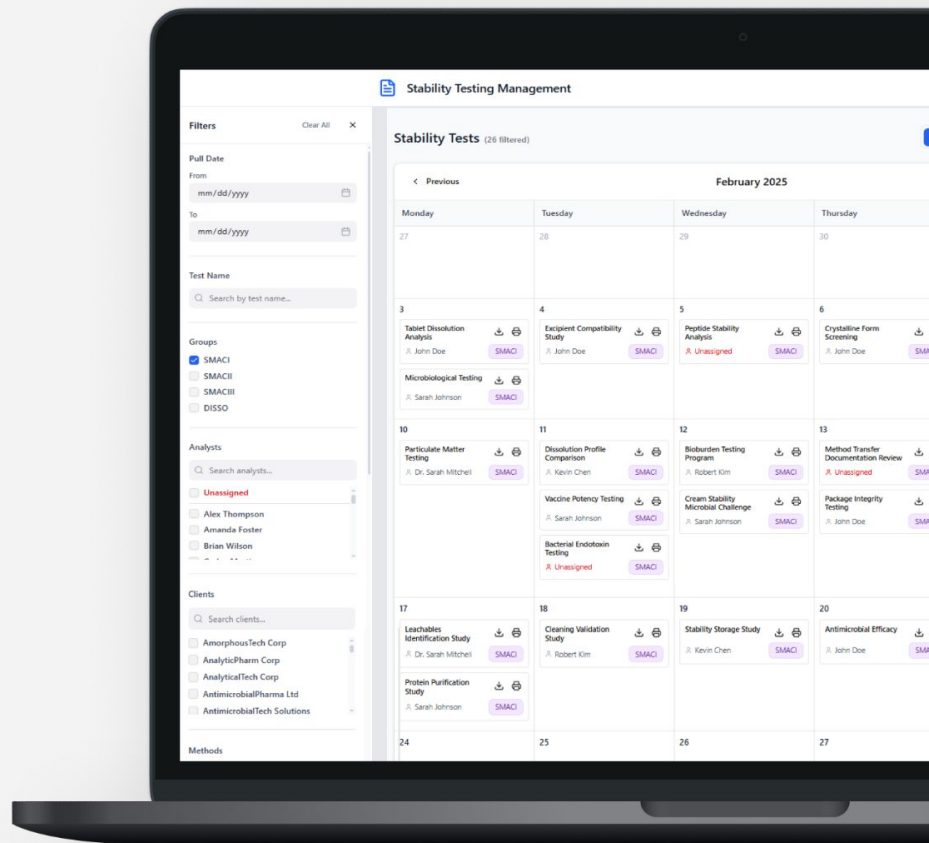


/ Prototype Creation & Testing

/ Design Execution

- Created a rough paper sketch to put a visual to the user test flow
- Utilized Figma Make to create a fully functional prototype
- Hosted fast-follow feedback sessions to receive stakeholder approval prior to user testing

Prototype →



Manage Assignments

Done

Search analysts...

SMACI SMACI SMACB DISO From mm/dd/yyyy To mm/dd/yyyy Sort by Alphabetical

Unassigned (3 tasks)

Peptide Stability Analysis
1 Week, Feb 3
AnalisPharma Inc.

Method Transfer Documentation Review
17th, Feb 13
TransferTech P...

Bacterial Endotoxin Testing
13th, Feb 11
Endotoxin Lab...

Dr. Alex Thompson (2 tasks)

Extraction Testing Analysis
13th, Feb 10
PharmTest Sol...

Method Transfer Validation
13th, Feb 11
MethodTrans...

Dr. James Wilson (2 tasks)

Protein Aggregation Kinetics
13th, Feb 9
ProteinKinetics...

Formulation Development Study
13th, Feb 10
FormulationDev...

Dr. Sarah Mitchell (2 tasks)

Particulate Matter Testing
13th, Feb 10
ParticulateM...

Leachables Identification Study
13th, Feb 11
LeachablesId...

Emily Rodriguez (2 tasks)

Cell Viability Community...
13th, Feb 10
CellViability...

Stability Testing Validation
13th, Feb 11
StabilityTest...

Bacterial Endotoxin Testing

View and manage stability test details, documents, and assignments.

Task Details

Team
SMACI

Assigned To
Unassigned

Full Date

Required Documents [Add Document](#)

[Download All](#)

Document Name Actions

Endotoxin Testing Protocol ET-05

Required Equipment [Add Equipment](#)

[View Equipment Directory](#)

Equipment Name Actions

LAL Reagent System

Stability Tests (26 Billed)

Manage Assignments

February 2025				
Monday	Tuesday	Wednesday	Thursday	Friday
27	28	29	30	31
3	4	5	6	7
Tablet Dissolution Analysis 1. John Doe	Excipient Compatibility Study 1. John Doe	Peptide Stability Analysis 1. Unassigned	Crystalline Form Screening 1. John Doe	
Microbiological Testing 1. Sarah Johnson				
10	11	12	13	14
Particulate Matter Testing 1. Dr. Sarah Mitchell	Dissolution Profile Comparison 1. Kevin Chen	Robustness Testing Program 1. Robert Kim	Method Transfer Documentation Review 1. Unassigned	Extractables Testing Analysis 1. Alex Thompson
	Vaccine Potency Testing 1. Sarah Johnson	Cleanability Method Challenge 1. Sarah Johnson	Package Integrity Testing 1. John Doe	
	Bacterial Endotoxin Testing 1. Unassigned			
17	18	19	20	21
Leachables Identification Study 1. Dr. Sarah Mitchell	Cleaning Validation Study 1. Robert Kim	Stability Storage Study 1. Kevin Chen	Antimicrobial Efficacy 1. John Doe	Method Transfer Validation 1. Alex Thompson
24	25	26	27	28

Stability Tests (26 Billed)

Manage Assignments

February 2025

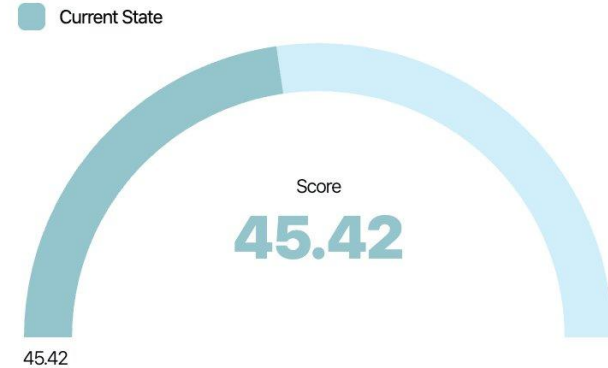
Test Name	Assigned To	Full Date	Team	Client	Method	Actions
Tablet Dissolution Analysis	1. John Doe	13th, Feb 3	SMACI	PharmaCorp Inc.	USP Dissolution Method	
Microbiological Testing	1. Sarah Johnson	13th, Feb 4	SMACI	SterilePharm Inc.	USP Microbiology Testing	
Excipient Compatibility Study	1. John Doe	13th, Feb 4	SMACI	ExcipientTech Ltd.	DSC Compatibility Testing	
Peptide Stability Analysis	1. Unassigned	13th, Feb 5	SMACI	PeptidePharma Corp.	Peptide Stability Testing	
Crystalline Form Screening	1. John Doe	13th, Feb 6	SMACI	CrysalForm Technologies	Polymer Analysis	
Cell Viability Cytotoxicity Assessment	1. Emily Rodriguez	13th, Feb 8	SMACI	CytoSafe Technologies	MTT Cytotoxicity Assay	
Protein Aggregation Kinetics	1. Dr. James Wilson	13th, Feb 9	SMACI	ProteinKinetics Ltd.	SEC-HPLC Aggregation	
Particulate Matter Testing	1. Dr. Sarah Mitchell	13th, Feb 10	SMACI	ParticulateTest Industries	USP Particulate Testing	
Dissolution Profile Comparison	1. Kevin Chen	13th, Feb 11	SMACI	GenexPharma Corp.	Dissolution Profile Compar...	
Vaccine Potency Testing	1. Sarah Johnson	13th, Feb 11	SMACI	VaccineTech Industries	Vaccine Potency Assay	
Endotoxin Testing	1. Unassigned	13th, Feb 11	SMACI	Endotoxin Safety Corp.	LAL Endotoxin Testing	
Moisture Content Determination	1. Robert Kim	13th, Feb 12	SMACI	BioClean Pharmaceuticals	Microwave Filtration	
Stability Microbial Challenge	1. Sarah Johnson	13th, Feb 12	SMACI	DermalSafe Sciences	Microbial Enumeration	
Method Transfer Documentation Review	1. Unassigned	13th, Feb 13	SMACI	TransferTech Pharmaceuticals	MPIC Method Transfer Valid...	
Package Integrity Testing	1. John Doe	13th, Feb 13	SMACI	PackageTech Industries	Package Integrity Testing	
Extractables Testing Analysis	1. Alex Thompson	13th, Feb 14	SMACI	PackageTech Solutions	GC-MS/MS Extractables	

/ User Testing

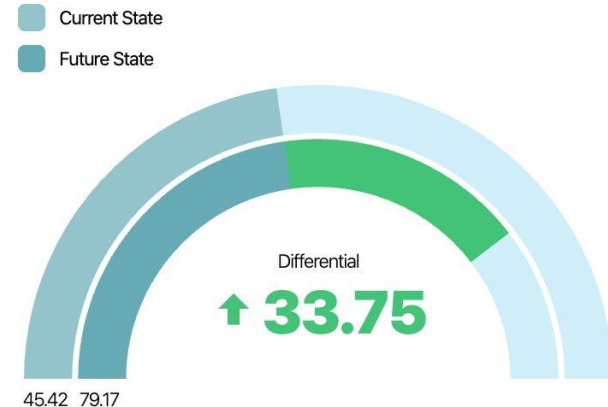
- Drafted and conducted a moderated user testing session with 6 participants to validate our design approach.
- Used the [System Usability Score](#) methodology to benchmark our success.
 - 45.42 (F) to 79.17 (A-)
- Analyzed and documented the results into a report that is easily shareable with stakeholders.

[User Testing Artifacts](#) →

Previous System (F)

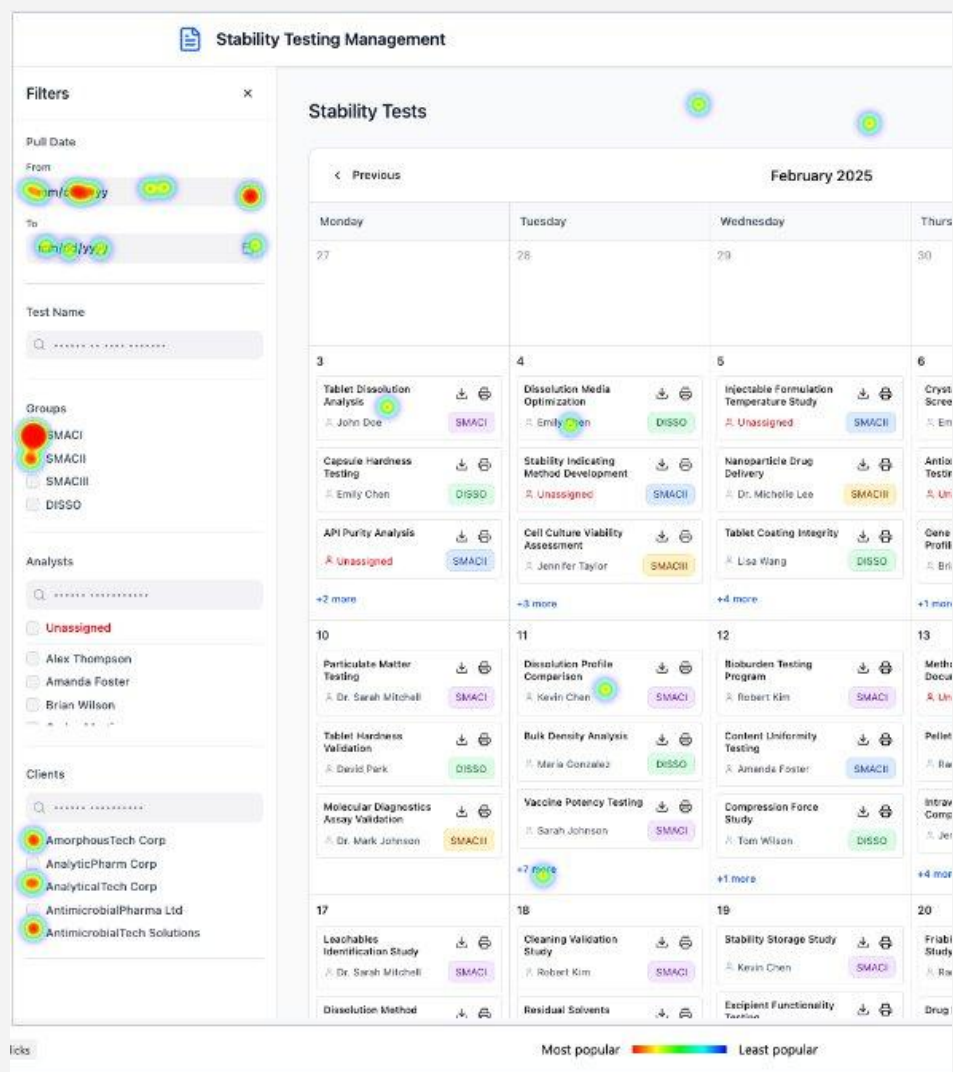


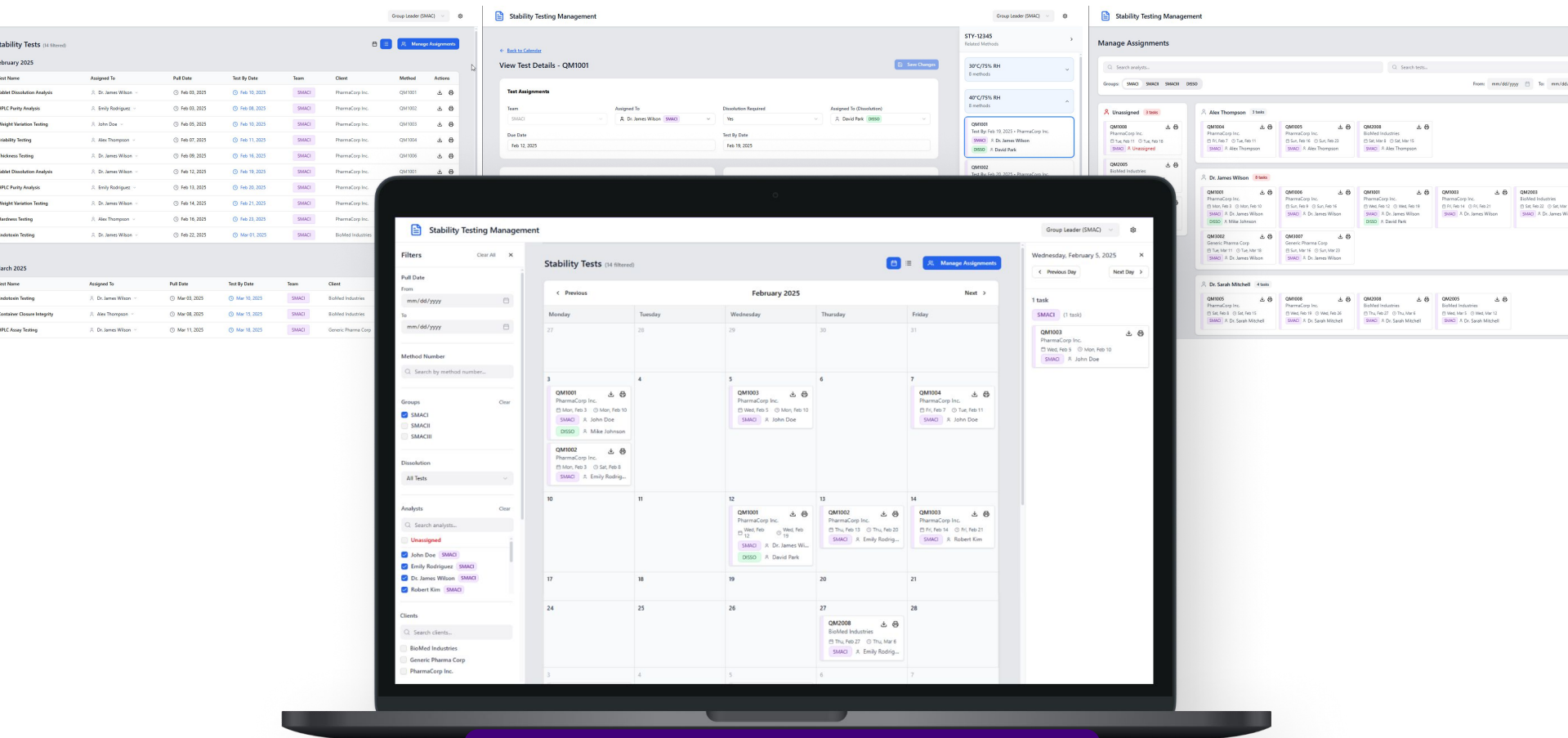
New System (A-)



/ Experiments with Microsoft Clarity

- Utilized Microsoft Clarity to track click events, heatmaps, etc.
- Experimented with techniques to track smart events in Clarity via the code in the Figma Make Prototype
- Discovered information in Clarity would be more valuable with a higher quantity of users over time, but this was still a great learning experience.





Prototype →

/ Project Learning

/ Vibe Coding Learnings

- Provide app description, persona and user flow contexts in the initial prompt
- Avoid giving too much contextual information (e.g. company info) as the AI will get confused. Human interpretation of this information and using it as guidance is still required (at least for now)
- Chain requests together to save on credits
- Utilize toolbar features (e.g. “magic cursor”, margin / padding settings) to make more nuanced changes

Project Tzolk'in V2

- Removed the complex date string that previously showed "Pull Date • Test By • Client"
- Now only shows the client name in a clean, simple format
- Improved readability by removing redundant information

5. Consistent Implementation

- Updated TestCard.tsx for regular calendar/list view cards
- Updated DragAndDrop.tsx for draggable cards in ManageAssignments view
- Maintained visual consistency across both components
- Used the existing date utility functions for consistent formatting

6. Technical Improvements

- Added TooltipProvider wrapper for proper tooltip functionality
- Imported necessary icons (Calendar, Clock) from lucide-react
- Used formatDateShort for more compact date display
- Maintained all existing functionality while improving the layout

The test cards now have a cleaner, more organized layout where users can quickly scan the pull dates and test-by dates with clear visual indicators, while tooltips provide additional context when needed. The client information is now prominently displayed without the clutter of repeated date information.

Ask for changes

+ 📄 ⚙️

⬆️

Stability Testing Management

Filters

Clear All

Pull Date

From

mm/dd/yyyy

To

mm/dd/yyyy

Method Number

Search by method number...

Groups

Clear

☒ SMACI

☐ SMACII

☐ SMACIII

Dissolution

All Tests

Analysts

Clear

Search analysts...

div

Unassigned

☒ John Doe SMACI

☒ Emily Rodriguez SMACI

☒ Dr. James Wilson SMACI

☒ Robert Kim SMACI

☒ Alex Thompson SMACI

Client

Stability Tests (14 filtered)

< Previous

Monday	Tuesday
27	28
3	4
<div>QM1001 PharmaCorp Inc. Mon, Feb 3 Mon, Feb 10 SMACI John Doe DISSO Mike Johnson</div>	
<div>QM1002 PharmaCorp Inc. Mon, Feb 3 Sat, Feb 8 SMACI Emily Rodrig...</div>	
10	11
17	18
24	25

/ Documenting Learnings

- Created an “input prompt vs vibe coded output” case study document
- Created a best practices document listing learnings for the design team’s reference

Case Study - Tzolkin

Share

Iteration Prompt

✦ Arrange the cards in a month view where the columns are Monday - Friday. Include a section to go between months, and only show one month at a time

Output

Stability Testing Management

Group Leader

Stability Tests

All Teams

Add Tests

< Previous

February 2025

Next >

Monday	Tuesday	Wednesday	Thursday	Friday
27	28	29	30	31
3 Tablet Dissolution Analysis John Doe SMAC1 Progress	4	5 Capsule Content Uniformity SMAC1 pending	6	7 Injectable Sterility Testing Sarah Chen SMAC2 pending
10 Cream Viscosity Assessment Mike Johnson DIS completed	11	12 pH Buffer Validation SMAC1 pending	13	14 Tablet Weight Variation Jennifer Liu SMAC2 Progress
17	18	19	20	21

Iteration Prompt

✦ If a task is unclaimed, use the same person icon paradigm as the other ones, except replace the person's name with "Unclaimed" in red text

✦ Add icon buttons to download and print the relevant documents for the task. Also, remove the status tags and make the person icon red as well if the task is unclaimed

/ Conclusion

The project is currently still in progress with development starting in the coming weeks.

Throughout this process, I learned some valuable key lessons:

- Regularly check for understanding
- Don't be afraid to pivot if something isn't working
- Vibe coding is a powerful tool to master, even if it's constantly changing
- AI is ultimately a tool that should be intentionally utilized to solve a relevant problem (vs shoehorning it into every project)



/ Q&A

Thank you.