

DocStock

Prototype Design Presentation

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Feedback Updates

What we updated:

Risks now use Red, Yellow, Green to denote High, Medium, Low risk levels. The colors were decided by taking the aggregate scores of probability and impact. 8+ is High, 6 to 7 is medium, 5≤ is low. Effects were also added.

Updating Risks to have ratios instead of unbound numbers. All risks are now displayed as VALUE/5. This is a middle-ground fix between representing probabilities between 0-1 while keeping the 5-point scale used in the impact column.

Adjustments to the Real World Product vs. Prototype Table. We have collectively decided that the caregiver support features are too integral to the project and must be in the prototype. We have also decided on adding partial functionality to Drug Interaction Checking via usage of predefined, curated, medications opposed to paying for access to a live database.

What we have yet to update:

Transformation of our Major Functional Components Diagram to match what we would see in something like a UML diagram.

What didn't apply to this presentation:

Adding a junction table between medications and users. This will be done, as it is simply better design, but is not displayed in this presentation.

Problem Statement

Many people who take medications regularly have difficulty managing their medication schedules, remembering doses, tracking whether medications were taken, and knowing if their supply is running low. These difficulties can lead to missed, delayed, or repeating doses of medicine already taken.

According to the Centers for Disease Control and Prevention (CDC), about one in five new prescriptions in the United States are never filled.

Approximately 50% of filled prescriptions are taken incorrectly with regards to timing, dosage, frequency, and duration.

Direct health care costs associated with nonadherence have grown to approximately \$100-\$300 billion of U.S. health care dollars spent annually. [1]

Solution Statement

DocStock is a web and mobile app that helps people and their caregivers manage prescriptions by scheduling doses, screening for drug interactions, and tracking supply, with the goal of increased medication adherence.

Users enter their medications, dosing instructions, and current supply, and DocStock organizes everything into a single, easy-to-follow schedule. It warns of known interactions when a new medication is added, sends reminders when doses are due, records each dose taken, and alerts the user before a refill is needed.

Adherence history is compiled into a report that can be exported for a healthcare provider. Caregivers can be granted access, and multiple profiles can be managed under one account.

Real World Product vs. Prototype

We want the prototype to be as close to the real thing as it can get. It is pivotal to have all the possible functionality down pat to display our current and subsequent ideas.

	Login with Password Protection	Initial Setup	Medication Schedule Management	Adherence Reminders and Reports
Real World Product	✓	✓	✓	✓
Prototype	✓	✓	✓	✓

Category	Features	RWP	Prototype	Additional Notes
Account Management	Account Creation			
	Log-in			
	Password Protection			
	Medication Schedule			
	Medication List			
	Adherence Report			
	Edit Account Information			
	Caregiver Monitoring			
	Logout			
	Account Set-Up			

Category	Features	RWP	Prototype	Additional Notes
Algorithms	Dose Schedule Generation			
	Reminder & Missed Dose Detection			
	Drug Interaction Screening		Partial	Small Interaction DB
	Supply Tracking			
	Refill Prediction			
	Adherence Calculation			
	Report Export			
	Authentication & Caregiver Access Control		Partial	No 2FA

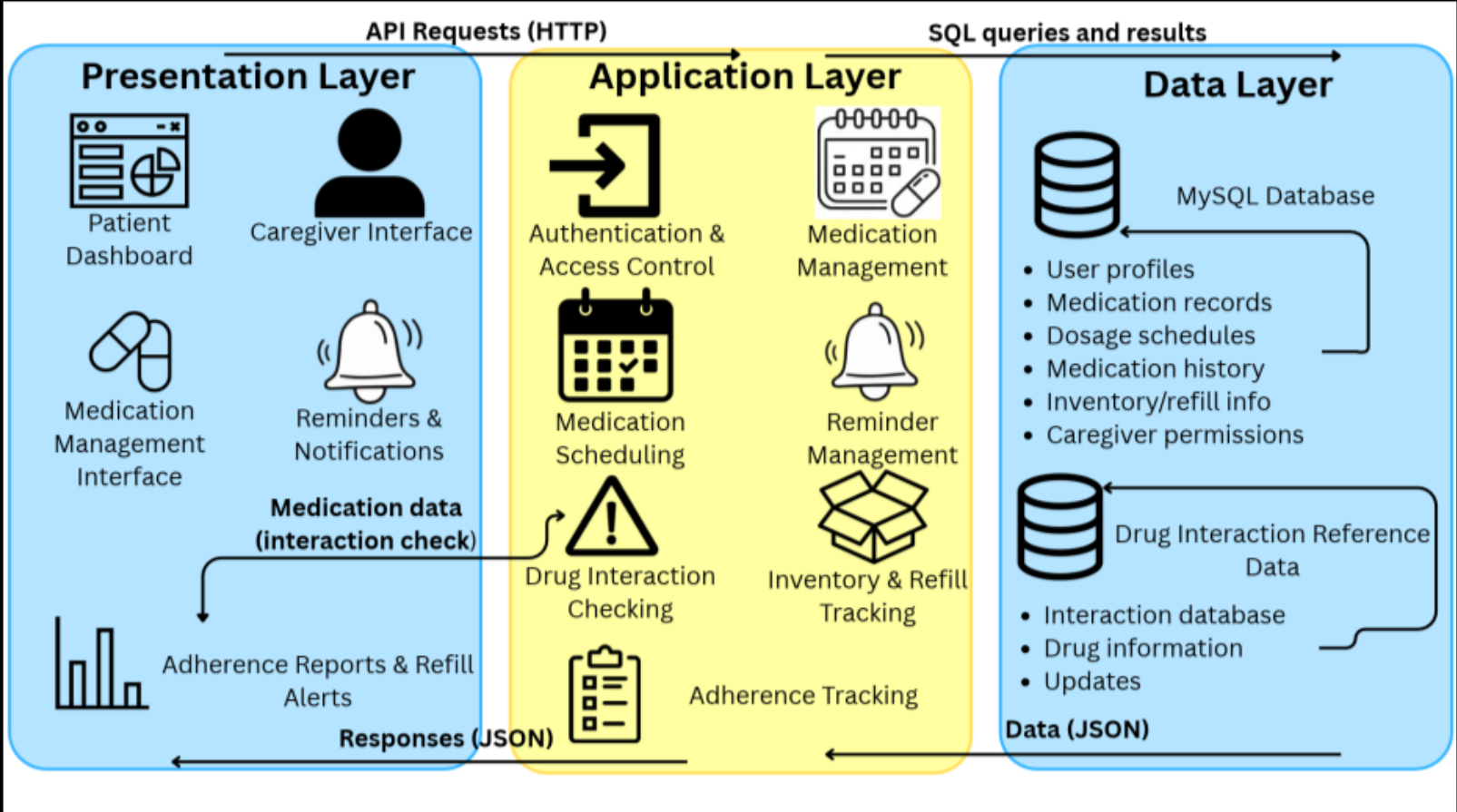
Real World Product vs. Prototype

	Refill Reminders	App and Website Support	Adverse Drug Interaction Checking	Caregiver(s) Support
Real World Product	✓	✓	✓	✓
Prototype	✓	✓	~	✓

Adverse Drug Interaction Checking will be partial.

Due to the limited development timeline, the drug interaction checking feature will be limited to a predefined, curated, set of medication interactions instead of paying to access an API or store a downloaded database.

Major Functional Components Diagram



Key Data Flows

→ User requests / system responses

↔ Data exchange between components

Tools and Technologies

IDE: Visual Studio Code. Writing and editing code.

Web Frontend: HTML, CSS, JavaScript. Website interface.

Mobile Frontend: React Native. Mobile application.

Backend: Node.js & Express. Handle server-side logic and API requests.

Database: MySQL. Store users, medications, schedules, history, etc.

Testing: React Native Testing Library. Test frontend/backend functionality.

Continuous Integration & Continuous Deployment: GitHub & GitHub Actions. Automated testing and version control.

Sprint Plan

Sprint 1 | Foundation and Technical Setup:

Goals:

1. Set up repository and task board.
2. Set up wireframes for main screens, login, schedules.
3. Define database tables.
4. Establish user roles.

Sprint 2 | Accounts and Medications:

Goals:

1. Implement account creation, login and logout.
2. Implement basic authentication.
3. Add medications with name, dosage, instructions, prescribing doctor.
4. View, Edit, Deactivate medications.

Sprint Plan Continued

Sprint 3 | Schedules:

Goals:

1. Create medication schedules.
2. Support daily and basic recurring frequencies.
3. Set dose times and date ranges.
4. Display upcoming doses.
5. Allow schedules to be edited.

Sprint 4 | Notifications and Adherence Reports:

Goals:

1. Reminders for scheduled doses.
2. Let users mark doses as TAKEN, LATE, MISSED.
3. Record when medications are taken.
4. Implement repeat reminders when medication hasn't been taken.
5. Display if medication has been taken.
6. Create basic adherence report, shows adherence score and dose history.

Sprint Plan Continued

Sprint 5 | Caregiver Support:

Goals:

1. Associate caregiver accounts with care recipient accounts.
2. Implement invitations for caregivers.
3. Support view-only and medication-management permissions.
4. Allow care recipient to change or revoke permissions of a caregiver.

Sprint 6 | Medication Supply:

Goals:

1. Store remaining medication quantities, update when medication is taken.
2. Allow manual quantities to be updated.
3. Configure refill thresholds.
4. Display low-supply indicators.
5. Trigger in-app and push notification when supply crosses the refill threshold.

Sprint Plan Continued

Sprint 7 | Drug Interactions:

Goals:

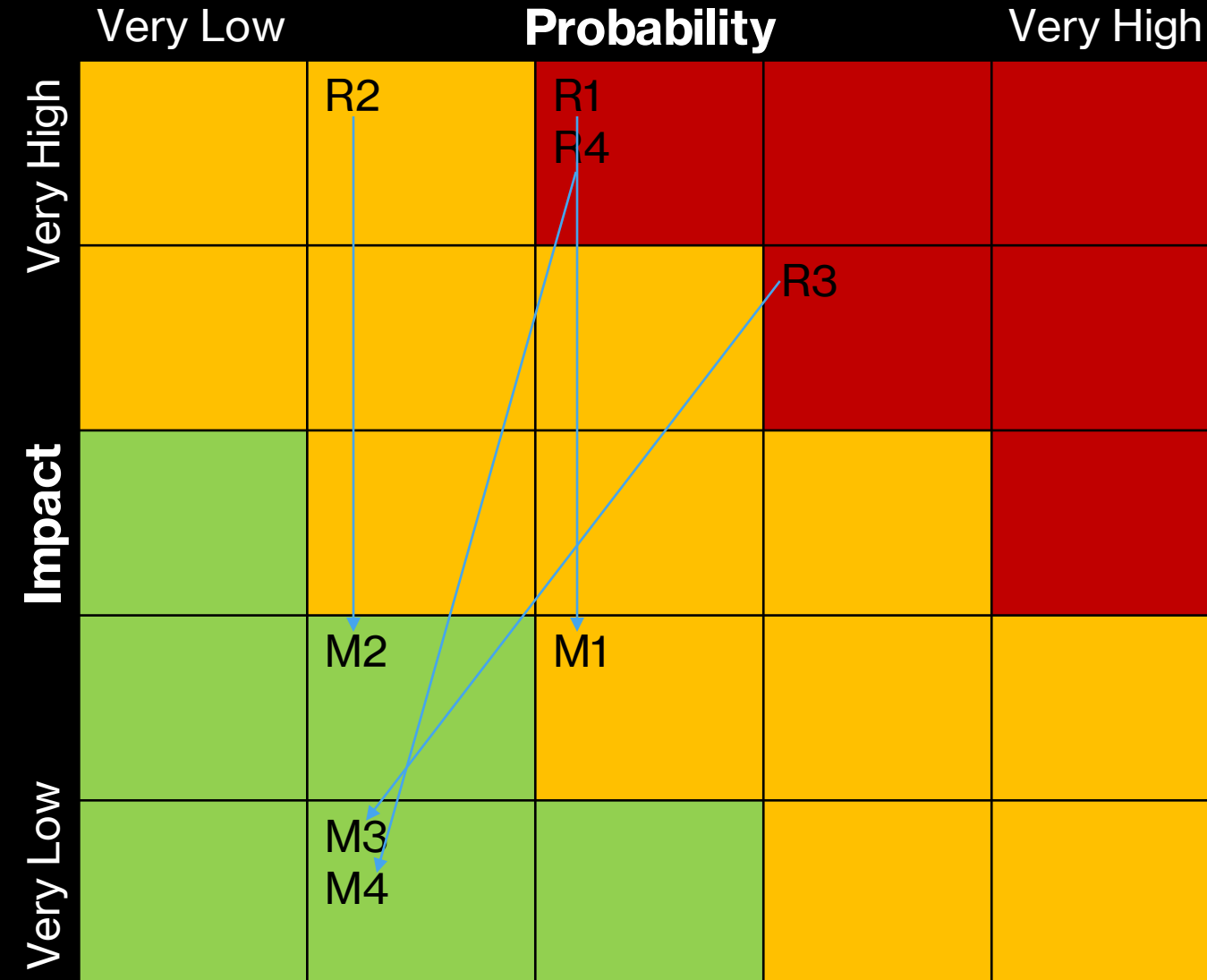
1. Connect a small drug-interaction database for the prototype.
2. Display drug-interactions when medications may interact.
3. Handle unsupported medications not in the database.

Sprint 8 | Final Touches:

Goals:

1. Test everything.
2. Fix any major bugs.
3. Validate mobile and desktop layouts.
4. Prepare sample data to demonstrate all implemented features.

Customer and End User Risks



Risks:

- R1. User forgets to enter or update their medications.
- R2. User ignores or misses medication reminders.
- R3. The app is difficult for some users to navigate.
- R4. User enters incorrect medication info.

Mitigations:

- M1. The app will use a simple set-up process with clear prompted instructions for adding and updating a medication. There will be a clearly visible button to add medication.
- M2. Provide regular notifications and an easy way to record having taken a medication.
- M3. Large text, obvious buttons, simple navigation. User testing can identify problems before actual release.
- M4. If the incorrect information is The app will require confirmation of medication details. It will clearly state that users should follow instructions provided to them by their healthcare providers.

Technical Risks

		Probability		
		Very Low		Very High
Impact	Very High		R1	R2
	Very Low			

Risks:

R1. Delayed or failed notifications

R2. Smartphone compatibility problems

Mitigations:

M1. Test notifications across supported devices. Provide in-app schedule for users to manually track. Alert users they must turn on app notifications to get them.

M2. Test the application on multiple supported devices and OS versions via emulators. Alert the user if their phone is known non-compatible.

Security Risks

		Probability			
		Very Low			Very High
Impact	Very High				
			R1 R2		
		M1		R3	
	Very Low	M3	M2		

Risks:

R1. An unauthorized user gains access to medication information.

R2. An unauthorized user gains access to user's username and password.

R3. User forgets username or password.

Mitigations:

M1. DocStock will be password-protected, server-side information will be encryption protected.

M2. App will provide users with an optional two-step security verification to add an additional layer of account security. [2]

M3. App will allow users the ability to change username and password.

Legal Risks

		Probability				
		Very Low				Very High
Impact	Very High			R1		
			R2			
		M1				
Very Low		M2				

Risks:

R1. User claims the app caused harm because they relied on a reminder.

R2. App unintentionally infringes on copyright or trademarks.

Mitigations:

M1. Communicate the app's limitations and advise users to verify medication instructions with their healthcare provider.

M2. App will use original or licensed materials with proper credit.

References

- [1] Centers for Disease Control and Prevention, "CDC Grand Rounds: Improving medication adherence for chronic disease management – Innovations and opportunities," *Morbidity and Mortality Weekly Report*, vol. 66, no. 45, pp. 1248–1251, Nov. 2017. [Online]. Available: <https://www.cdc.gov/mmwr/volumes/66/wr/mm6645a2.htm>. [Accessed: Aug. 29, 2026].
- [2] National Institute of Standards and Technology, "Multi-Factor Authentication," NIST. [Online]. Available: <https://www.nist.gov/it/smallbusinesscyber/guidance-topic/multi-factor-authentication>. [Accessed: Sep. 17, 2026].