

Phase 1A: Project Description

Designing a Patient-Centered Appointment and Medication Management System for the UM-Flint Heart Clinic Team Member: Leticia Aderhold, Wendy Boateng, Rafique Agyare, Mohammed Awal Saeed

Project Motivation: This project emerged following a visit to the University of Michigan-Flint Heart Clinic, during which our team observed clinic workflows and engaged in conversation with clinic administrators and patients. These discussions revealed that many appointment-related tasks such as booking, scheduling and managing missed appointments are still handled by manual or semi-manual processes.

Administrators highlighted challenges including scheduling errors, double bookings and difficult tracking no-shows, while patients particularly older adults and those recovering from cardiac procedures expressed frustration with rescheduling appointments and remembering medication instructions. These observations demonstrated a clear need for a patient-centered digital solution that supports both clinic operations and patient self-management.

Problem Definition: In a study of manual data transfer, 85.5% of completed forms contained one or more "critical errors" (such as incorrect patient information or appointment times), which can lead to delayed or denied payments. Manual systems often lead to high rates of double bookings or missing patient information. In one analysis, 36%–40% of appointment blocks were not scheduled correctly regarding the needed time. Poor scheduling practices—often driven by manual processes, result in no-show rates ranging from 5% to 30%. Patient Impact: 61% of patients report skipping appointments due to scheduling difficulties. These errors can cause a loss in revenue and waste valuable operational time. Medication errors are common, with studies showing high rates in homes (2-33%) leading to millions of emergency department visits and hospitalizations annually, especially in older adults. Errors often involve wrong doses, missed doses, or wrong meds, frequently linked to complex regimens, poor communication, and low health literacy, with significant impacts including serious harm or death, costing billions in healthcare. Missing doses or taking too little of medication reduce the effectiveness of the medication or cause the medication not to be effective at all. Low health literacy, multiple health conditions (comorbidities), complex drug regimens (polypharmacy), prescription changes, and poor patient-provider communication are all factors in prescription errors.

Proposed Solution: To design an app that will help the medical professionals at U of M-Flint Heart Clinic to set appointments, reschedule appointments, and cancel appointments while also tracking their patients' appointments and providing reminders when the patient should take their medication and what dosage they should be taking. This app will allow patients to book an appointment with the clinic, reschedule an appointment, or cancel an appointment. It will also allow the medical staff to enter a patient's prescriptions, time to be taken, and dosage to send reminders to the patient that they need to take their medications.

References

Siwicki, Bill. "Calendars Don't Lie: How Health Systems Can Improve Provider and Patient Scheduling." *Healthcare IT News*, 18 Aug. 2023, www.healthcareitnews.com/news/calendars-dont-lie-how-health-systems-can-improve-provider-and-patient-scheduling. Accessed 20 Jan. 2026.

Tariq, Rayhan A., et al. "Medication Dispensing Errors and Prevention." *StatPearls Internet*, StatPearls Publishing, 12 Feb. 2024, *NCBI Bookshelf*, National Library of Medicine, www.ncbi.nlm.nih.gov/books/NBK519065/. Accessed 20 Jan. 2026.

Phase Managers:

Phase 1b: Rafique

Phase 2: Wendy

Phase 3: Mohammed

Phase 4: Leticia

Phase 5: Rafique

Phase 6: Wendy

Phase 7: Mohammed