SYSTEM ANALYSIS PROJECT REPORT

Reducing prescription Errors in EHR Systems

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Introduction

This document provides an in-depth analysis of the current Electronic Health Record (EHR)-driven prescription process, highlighting inefficiencies such as fragmented communication, alert fatigue, and manual error resolution. It proposes an innovative solution incorporating AI-driven dashboards, real-time communication tools, and structured feedback loops to streamline workflows, improve collaboration, and enhance patient safety.

1. Executive Summary: Outlines solutions to address inefficiencies and errors in the EHR-driven prescription process by leveraging AI-driven automated highlight alerts on dashboard, real-time communication, and structured feedback mechanisms to enhance collaboration, streamline workflows, and improve patient safety.

1.1 Current System: The old system relies on an Electronic Health Record (EHR)-driven prescription process that is fragmented and lacks real-time communication tools. Prescription errors such as incorrect dosages, incomplete patient information, and potential drug interactions are flagged by the EHR, but resolving these issues requires manual communication between pharmacists and prescribing physicians. This process is slow and inefficient, as it often depends on reactive communication methods, which result in delays and increased workload for healthcare providers.

1.1.1 Problems with the old system:

- **Communication Delays:** There is no real-time communication between pharmacists, physicians, and other stakeholders, causing delays in addressing flagged prescriptions.
- **Fragmented Workflow:** The prescription process is disjointed, requiring manual checks, phone calls, and follow-ups, leading to inefficiency and administrative burden.
- **Error Recurrence:** Without integrated feedback mechanisms, recurring issues are not adequately addressed, resulting in repeated prescription errors.
- **Alert Fatigue:** Over-reliance on EHR alerts, often without clear prioritization, leads to alert fatigue, where important issues may be overlooked or delayed in response.

These inefficiencies not only increase the chances of errors but also negatively impact patient safety, clinician workload, and the overall quality of care.

1.2 Method of Investigation and Design: To understand the challenges within the current EHR prescription process and design effective solutions, we utilized a multi-faceted approach, including direct interviews with key stakeholders and the development of two analytical models to map out inefficiencies. The primary objective was to identify specific areas of improvement in communication, workflow, and error resolution within the EHR system.

1.2.1. Stakeholder Interviews: We conducted in-depth interviews with critical stakeholders involved in the prescription process, including:

- **Amy D. Sauls**, Director of Pharmacy, to understand the pharmacist's perspective on prescription issues, workflow challenges, and patient safety concerns.
- **Dr. Wasonga**, prescribing physician, to gain insights into the physician's experience with the EHR system, prescription entry, and collaboration with pharmacy staff.
- **Rose Constance**, Epic EHR representative, to provide a technical perspective on the current EHR capabilities and identify potential areas for system improvement.

1.3 Description of the New System: The proposed new system introduces key changes to address the inefficiencies and communication breakdowns identified in the existing EHR-driven prescription process. These improvements aim to streamline workflows, enhance collaboration, and ultimately improve patient safety by resolving prescription errors more efficiently.

1.3.1. Recommendations for New System:

- Designating a Pharmacy Technician for Flagged Prescriptions: A pharmacy technician will be assigned the responsibility of managing flagged prescriptions. This role will include real-time communication with prescribing physicians to resolve issues as soon as they are flagged by the EHR system.
- Creating Feedback Mechanisms: A structured feedback loop will be implemented, enabling pharmacists and physicians to report ongoing issues directly to the EHR provider,
- Creating an AI-Designed highlighted Dashboard: The introduction of an AI-driven dashboard to highlight critical prescription errors, such as incorrect dosages, potential drug interactions, and missing patient information.

1.4 Anticipated benefits: The anticipated benefits of the new system include improved workflow efficiency, enhanced communication and collaboration, faster resolution of prescription errors, and increased patient safety.

- **Enhanced Workflow Efficiency**: By assigning specific roles to pharmacy technicians, creating feedback loops, and introducing AI-driven tools, the system improves the efficiency of the prescription process.
- **Ongoing System Optimization**: Continuous feedback from healthcare providers ensures that the EHR system evolves and improves over time, leading to a more reliable tool.
- **Improved Communication and Collaboration**: Real-time communication and structured feedback mechanisms foster better collaboration among pharmacists, physicians, and the EHR system provider, ensuring faster issue resolution.

2. Draft Models

2.1 Sequence Model Narrative Description

The current system for handling electronic health records (EHR) in the prescription process involves multiple stages, from manual entry by healthcare providers to verification by pharmacies. This workflow is essential for ensuring that patients receive the correct medications in a timely manner. However, this process is fraught with challenges that can lead to prescription errors, resulting in delays in patient treatment and potential health risks. Our analysis reveals that the existing system lacks streamlined communication, adequate verification mechanisms, and comprehensive training for healthcare providers, contributing to an increased likelihood of errors.

2.1.1 Current System

1. **Organizational Environment:**
    a. The healthcare organization operates with a decentralized EHR system where different departments (e.g., primary care, specialty clinics, and pharmacies) use varying software solutions.
    b. High staff turnover rates in clinical and pharmacy settings lead to inconsistent training and adherence to EHR protocols, increasing the risk of errors.
    c. Limited interdepartmental communication exacerbates misunderstandings and delays in the prescription process.
2. **Technical Environment:**
    a. The EHR system in use has multiple layers, including data entry interfaces for providers and verification interfaces for pharmacies. However, these systems are not always integrated, causing fragmentation in the data flow.
    b. Manual entry of prescriptions increases the risk of human error, such as incorrect dosages, medication names, or patient information.
    c. Existing alert systems for potential drug interactions or allergies may be ineffective due to alert fatigue among providers, leading to ignored warnings.

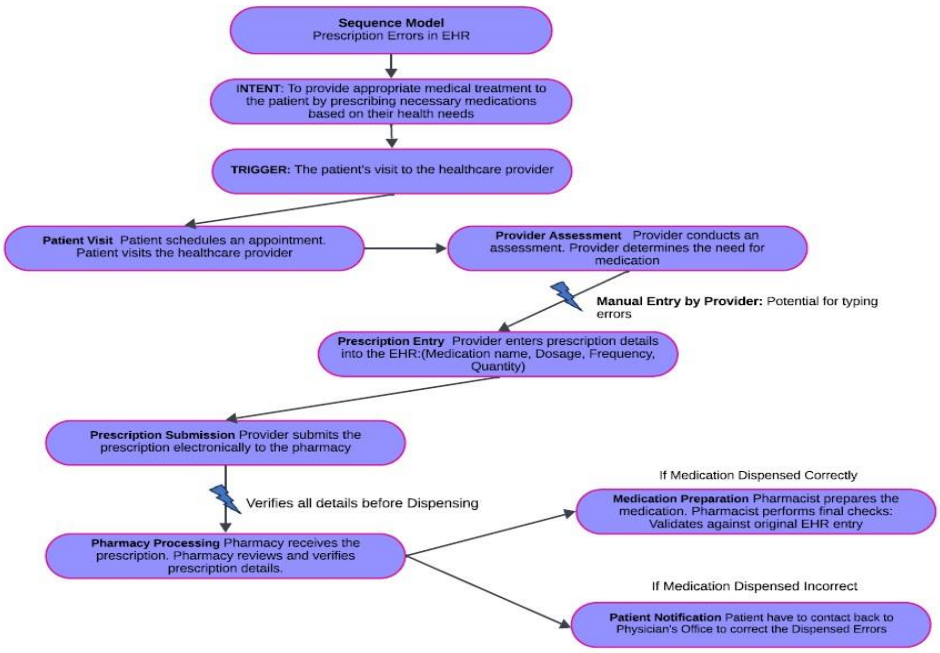
2.1.2 Identified Problems and Symptoms

- **High Error Rates:** Prescription errors occur at multiple points, from data entry by providers to verification by pharmacies. This can result in patients receiving incorrect medications or dosages.
- **Delays in Treatment:** Errors lead to delays as prescriptions may need to be re-verified or corrected before they can be filled, directly impacting patient care and treatment timelines.
- **User Fatigue:** Healthcare providers experience alert fatigue from excessive notifications, which may cause them to overlook critical alerts, thereby increasing the likelihood of errors.
- **Lack of Training:** New staff may not receive adequate training in the EHR system, leading to inconsistent practices and higher chances of mistakes.

2.1.3 Needs and Requirements

To address the identified problems, the following needs and requirements are essential for improving the EHR prescription process:

1. **Integration of Systems:** A unified EHR system that connects providers and pharmacies would streamline the flow of information, reducing the likelihood of errors due to miscommunication.
2. **Enhanced Verification Processes:** Implementing a dialogue box for verification after prescription entry could help ensure that providers double-check their entries before finalizing prescriptions.
3. **User Training Programs:** Regular training sessions for staff on EHR usage and best practices would help mitigate errors stemming from inexperience and lack of familiarity with the system.
4. **Improved Alert Systems:** Redesigning alert systems to prioritize critical notifications while minimizing non-essential alerts could reduce alert fatigue and enhance user engagement with important warnings.



2.2 *Persona Model Narrative Description:*

Amy D. Sauls, the Director of Pharmacy at UNC Campus Health, plays a pivotal role in ensuring medication safety and operational efficiency within the pharmacy. Her responsibilities include reviewing flagged prescriptions for potential errors, such as incorrect dosages or drug interactions, counseling patients about their medications, and collaborating with healthcare professionals. However, Amy faces systemic challenges, including a fragmented EHR system, excessive alerts causing fatigue, and delays in communication with prescribing physicians. These issues impact

the overall efficiency and safety of the medication management process, leading to increased workload and potential risks to patient care.

2.2.1. Current System

The current system involves physicians entering prescriptions into the EHR, which flags potential errors for manual review by pharmacists, often requiring communication with physicians before dispensing and counseling patients. Workflow and data flow diagrams can help visualize bottlenecks and inefficiencies in information exchange and prescription handling.

Problems Faced by Amy D. Sauls

- **High Prescription Error Rates**: The errors lead to delays in dispensing medications, requiring significant manual intervention by Amy and her team.

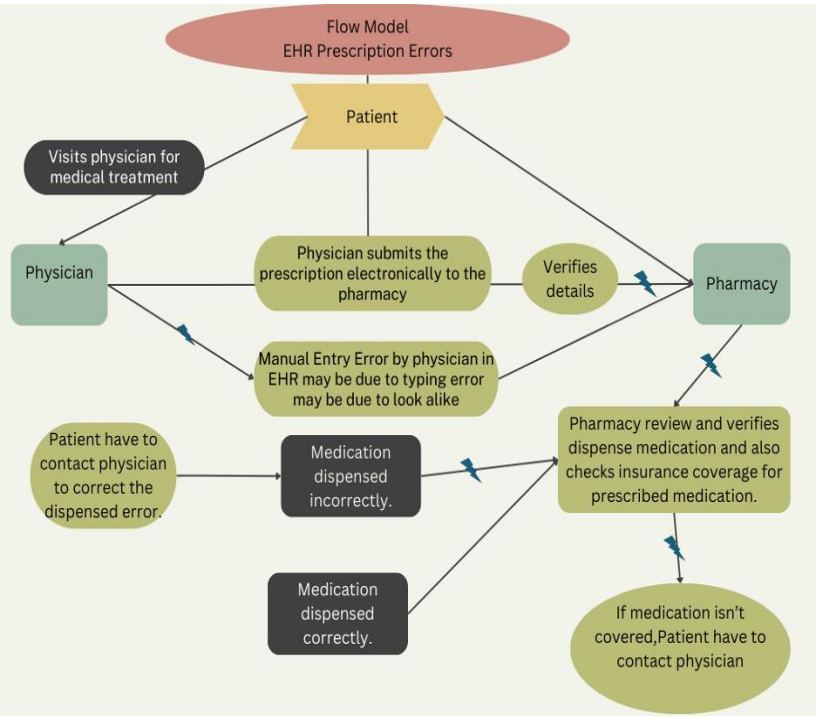
- **Alert Fatigue:** The excessive volume contributes to cognitive overload for Amy and her staff, increasing the risk of overlooking important alerts.

2.3. ***Flow Model Narrative Description:*** Illustrates the flow of EHR prescription processing, from a patient visiting a physician for medical treatment to medication being dispensed by a pharmacy. After the physician enters the prescription into the EHR system and submits it electronically to the pharmacy, potential manual entry errors may occur due to typing mistakes or look-alike drug names. The pharmacy reviews and verifies the prescription, ensuring accuracy and checking insurance coverage for the medication. If errors are identified, communication between the pharmacy and the physician may be required to correct them. If the medication is not covered by insurance, the patient may need to contact the physician for an alternative prescription. The process either results in correct medication dispensing or errors that require patient follow-up for resolution.

2.3.1. Current System: The current system processes prescriptions through an EHR, starting with physicians entering medication orders, which are then reviewed by the pharmacy for potential errors or insurance coverage issues. Manual follow-ups with physicians or patients are often required to resolve flagged discrepancies, causing delays. The process concludes with the medication being either dispensed correctly or incorrectly based on the resolution of these issues, with communication inefficiencies creating bottlenecks.

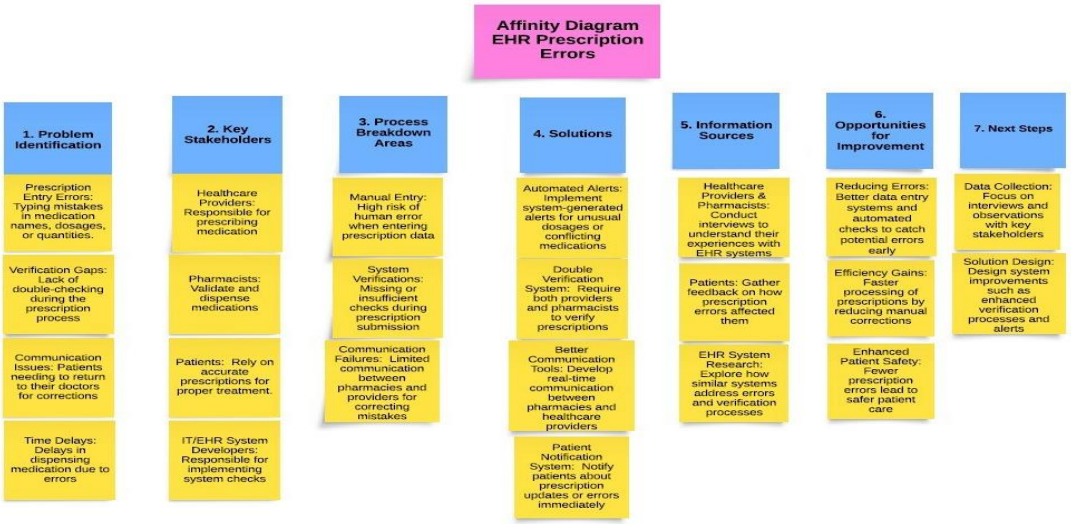
2.3.2. Identified Problems and Symptoms

- **Lack of Seamless Communication**: Inefficient communication between physicians and pharmacies delays resolution of flagged prescriptions, slowing down the entire workflow.
- **Insurance Coverage Issues**: When medications are not covered by insurance, the process requires additional time and steps, often involving back-and-forth communication.
- **Fragmented System Processes**: The model reveals gaps in integration between EHR systems, pharmacies, and insurance systems, leading to bottlenecks and inefficiencies.



2.4 Affinity Model

Affinity diagram can help organize ideas and insights from the EHR prescription error project by grouping related information together for clarity and problem-solving



3. Description of Current System

3.1. Day in life Model Narrative Description:

Amy D. Saul's, as the Director of Pharmacy at UNC Campus Health, manages a critical role in maintaining medication safety and optimizing pharmacy operations. Her daily activities involve reviewing previous pharmacy operations to identify and address unresolved prescription issues. She supervises pharmacy staff, counsels patients, and collaborates with healthcare professionals to ensure efficient workflows and patient satisfaction.

A significant part of her routine includes counseling patients, ensuring they understand their medications, discussing potential side effects, and addressing concerns about their treatment. These fosters trust and reassure patients about their care.

Despite her proactive efforts, Amy faces systemic challenges due to the fragmented EHR system. These include inefficiencies in resolving high priority flagged prescriptions, such as those with incorrect dosages or drug interactions, and delays caused by the lack of seamless communication with prescribing physicians. These limitations not only slow down her workflow but also impact the overall safety and efficiency of the medication management process.

3.1.1 Current System Environment:

Amy D. Saul's begins her day with her morning routine. After arriving at UNC Campus Health, she meets with her team of pharmacy technicians to review the previous day's pharmacy operations, focusing on identifying any discrepancies or unresolved issues in prescriptions. As the Director of Pharmacy, she plays a pivotal role in ensuring medication safety and operational efficiency.

Her responsibilities encompass a wide range of activities, including direct patient care, supervising pharmacy staff, addressing system inefficiencies, and collaborating with other healthcare

professionals. Counseling patients is a significant part of her daily routine. She ensures that patients understand their medications, discusses potential side effects, and addresses any concerns they may have about their treatment plans. This direct interaction not only reassures patients but also fosters trust in the care they receive.

Amy carefully evaluates high-priority prescriptions flagged for errors, such as incorrect dosages, potential drug interactions, or incomplete patient information. She often reaches out to prescribing physicians to clarify or resolve these issues, a process made more time-consuming by inefficiencies in the fragmented EHR system, which lacks seamless communication features.

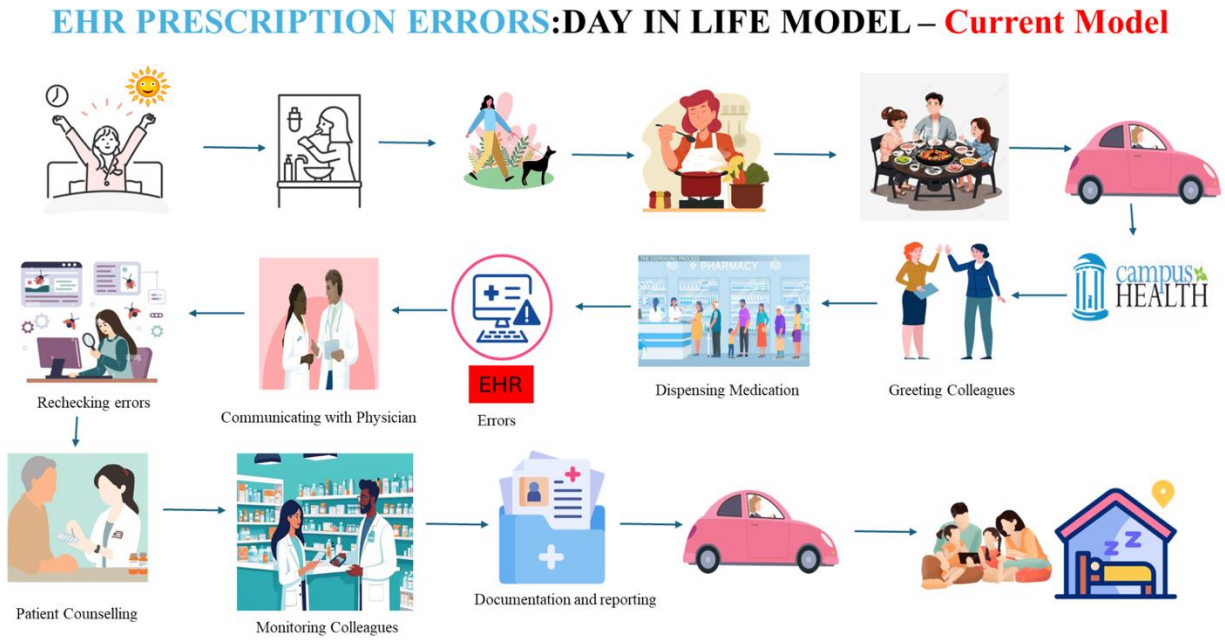
3.1.2 Identified Problems and Symptoms

High Prescription Error Rates: Entry of prescriptions by physicians leads to frequent errors in drug names, dosages, or patient details. Amy regularly encounters flagged prescriptions that require clarification or correction, delaying medication dispensing.

Fragmented EHR System: The EHR system lacks integration across departments, resulting in inefficient workflows. Amy spends considerable time resolving issues caused by missing or inconsistent prescription information.

Delayed Communication: Communication between pharmacists and prescribing physicians is slow and often reliant on manual follow-ups. Amy faces delays in clarifying ambiguous prescriptions, impacting patient treatment timelines.

Alert Fatigue: The current EHR system generates a high volume of excessive alerts, overwhelming pharmacists and creating alert fatigue.



3.2 Relationship and Collaboration Current Model

The current model suffers from fragmented communication and a lack of feedback loops between the key stakeholders—**patients**, **physicians**, **pharmacists**, and the **EHR system**. Each stakeholder operates in isolation with limited or no interaction with others, leading to delays, inefficiencies, and an increased risk of prescription errors.

3.2.1 Narrative Description for Current Relationship and Collaboration: The current system operates with a fragmented communication framework that creates significant challenges among patients, physicians, pharmacists, and the EHR provider. Communication is isolated, with minimal feedback loops, resulting in delayed clarifications and unresolved prescription errors. Physicians and pharmacists interact sporadically, often only when pharmacists seek clarification for unclear prescriptions, while patients remain largely disconnected from updates or changes to their medications. The EHR system serves primarily as a record-keeping tool with limited integration, offering little support for real-time error detection or usability feedback. This lack of coordination leads to frequent errors, inefficient workflows, and compromised patient safety, highlighting the urgent need for a more cohesive and interactive system.

3.2.2 Communication Dynamics in the Current Model

1. **Patient ↔ Pharmacist**

Patients often rely on pharmacists for medication instructions or clarifications. However, pharmacists lack tools to update patients on changes or corrections made to prescriptions. This leads to misunderstandings and potential non-adherence.

2. **Patient ↔ Physician**

Patients have minimal interaction with physicians regarding prescription clarifications. Errors or changes in prescriptions are not communicated to patients in real-time, creating a trust gap and possible health risks.

3. **Pharmacist ↔ Physician**

Communication is sporadic and reactive, occurring only when pharmacists identify unclear or incorrect prescriptions. There is no streamlined system for real-time clarifications, resulting in delays in resolving issues.

4. **Pharmacist ↔ EHR System**

Pharmacists use the EHR primarily for accessing prescriptions but cannot provide structured feedback about system usability or prescription errors. The EHR does not facilitate real-time notifications or error tracking for pharmacists.

5. **Physician ↔ EHR System**

Physicians interact with the EHR system to input prescriptions, but the system often lacks error detection tools or fails to provide actionable alerts. Feedback from pharmacists or patients is not integrated into the system for continuous improvement.

6. **Patient ↔ EHR System:** Patients have little to no interaction with the EHR system. They are not notified about prescription changes or updates, leaving them uninformed and disconnected from the process.

3.2.3 Identified Problems and Symptoms in the Current Model

- **Fragmented Communication:**

Each stakeholder operates in silos, resulting in poor coordination and a lack of real-time collaboration.

- **No Feedback Mechanism:**

There is no structured process for stakeholders to provide or receive feedback, leading to unresolved issues and recurring errors.

- **Delayed Issue Resolution:**

The lack of streamlined communication channels delays the resolution of prescription errors, affecting patient care and satisfaction.

- **Lack of Patient Engagement:**

Patients are the most impacted but remain disconnected from the system, with little access to updates or clarifications.

4. Recommendations for New System

4.1.1 ***Proposed Model of Day in life Model***: The new system establishes a structured process for Amy to report her daily challenges and complex cases directly to the Epic, EHR system provider. This feedback mechanism fosters continuous improvement, ensuring that recurring issues are resolved, and the system evolves to meet user needs. Enhanced real-time communication tools, such as secure messaging and video consultations, are also integrated into the EHR, allowing seamless collaboration between pharmacists and prescribing physicians. This direct communication reduces delays in resolving ambiguities, thereby minimizing prescription errors and improving patient safety.

By streamlining error management, incorporating a feedback loop, and improving communication, the new system significantly reduces the burden on pharmacists like Amy, increases operational efficiency, and enhances the overall reliability of the EHR system. These changes collectively aim to address the critical pain points of the current model, reducing the errors and delays while fostering a more efficient and supportive work environment.

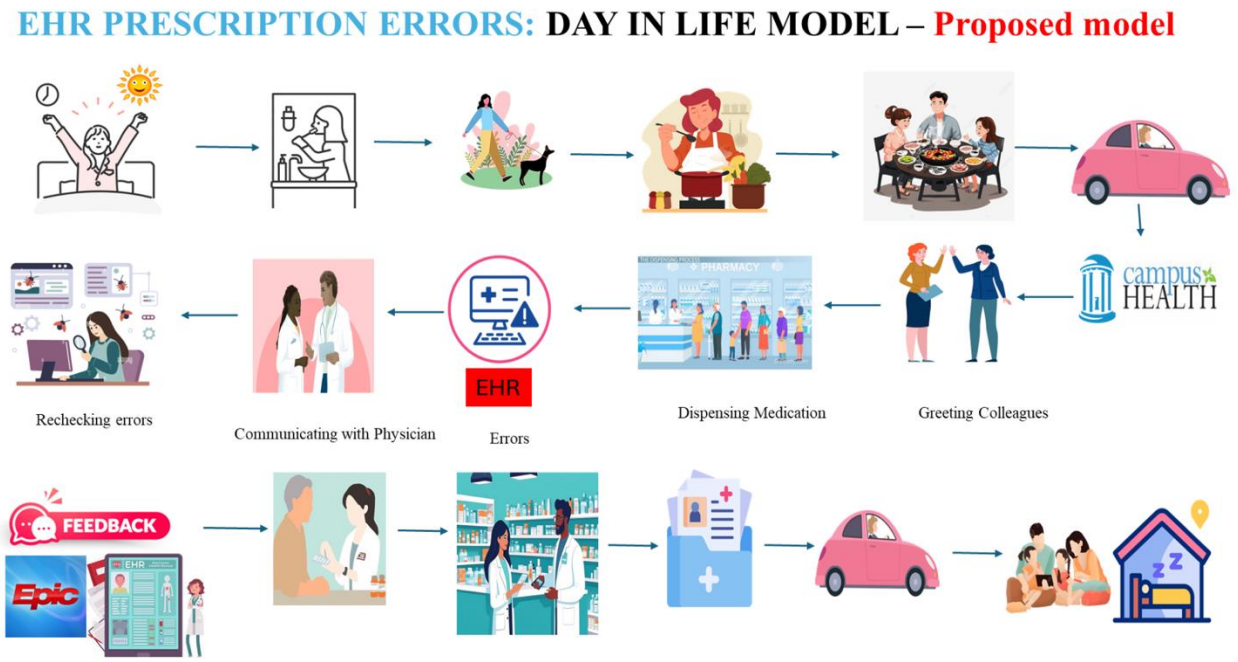
4.1.2 Key Enhancements in the Proposed Model

AI-Highlighted Dashboard for Alerts: Implement an AI-driven dashboard that highlights critical alerts, such as drug interactions and contraindications. Include visual cues and risk severity levels to help pharmacists quickly identify and address urgent issues.

Designated Employee for Prescription Corrections: Assign a dedicated pharmacist or team member responsible for managing and resolving flagged prescriptions. Provide this employee with direct access to prescribing physicians to expedite clarifications and corrections.

Enhanced Communication Tools: Facilitate real-time collaboration between pharmacists and prescribing physicians. Integrate secure, real-time messaging and video consultation features within the EHR system for quick prescription clarifications.

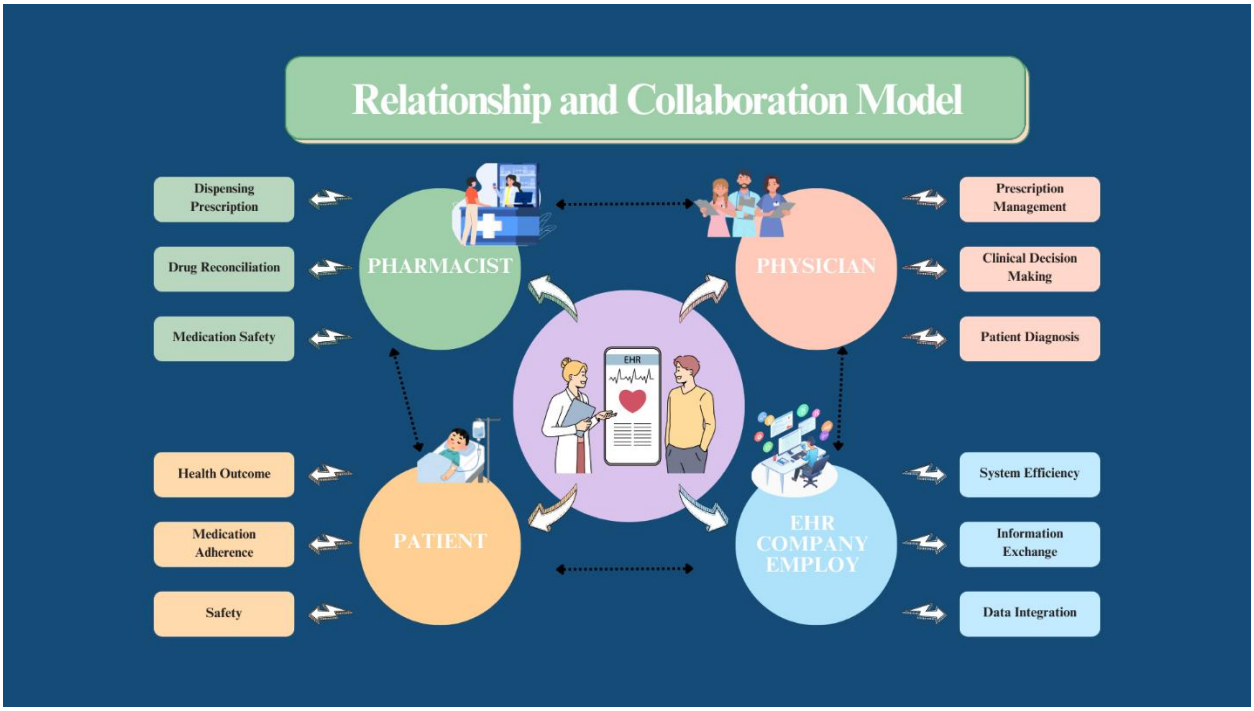
Feedback Mechanism: Establishing a feedback process where pharmacists can report recurring issues or inefficiencies to the Epic EHR system.



4.2 Proposed Model of Relationship & Collaboration

The **Proposed Model** creates a fully integrated communication system where all stakeholders—patients, physicians, pharmacists, and the EHR system—are connected through centralized feedback loops and real-time communication.

4.2.1 Descriptive Summary of Proposed Relationship and Collaboration Model: The new system introduces a centralized, fully integrated EHR platform that connects patients, physicians, pharmacists, and the EHR provider through real-time communication channels and feedback loops. Key enhancements include AI-driven tools for error detection and prescription verification, reducing alert fatigue and minimizing errors, along with structured patient engagement via a user-friendly portal for updates and clarifications. Pharmacists and physicians can collaborate seamlessly to resolve ambiguities, while patients are kept informed of prescription changes, fostering transparency and adherence. Additionally, regular feedback between the organization and the EHR provider ensures continuous system improvement, supported by enhanced usability and staff training programs to streamline workflows and improve healthcare delivery.



4.2.3 Communication Dynamics in the Proposed Model

1. **Patient ↔ Pharmacist**

Patients can directly communicate with pharmacists for updates on medications, clarifications, and adherence advice. Pharmacists can notify patients of prescription corrections or adjustments made in real time.

2. **Patient ↔ Physician**

Patients are engaged directly through the EHR system and can communicate their concerns or feedback about prescriptions. Physicians can update patients promptly about prescription changes or adjustments.

3. **Pharmacist ↔ Physician**

A structured, real-time communication channel is established between pharmacists and physicians via the EHR system. Pharmacists can flag unclear prescriptions, and physicians can provide immediate clarifications.

4. **Pharmacist ↔ EHR System**

Pharmacists interact with the EHR to log feedback on prescription issues, track clarifications, and access enhanced AI-driven alerts for potential errors.

5. **Physician ↔ EHR System**

Physicians input prescriptions and receive real-time feedback from pharmacists and the EHR's AI tools, which preemptively flag potential errors. This enhances prescription safety and accuracy.

6. **Patient ↔ EHR System** Patients are actively involved through the EHR's patient portal, where they can view updates, receive notifications about prescription changes, and communicate their concerns or feedback.

4.2.4 Key Enhancements in the Proposed Model

- **Integrated Feedback Loops:**

Feedback from patients, pharmacists, and physicians is logged and tracked in the EHR, ensuring transparency and accountability.

- **Real-Time Notifications:**

Stakeholders receive immediate alerts and updates, reducing delays and improving responsiveness.

- **AI-Driven Error Detection:**

The EHR system uses AI tools to flag potential issues in prescriptions, such as incorrect dosages or drug interactions, for review by stakeholders.

- **Patient Engagement:**

Patients are no longer passive recipients but active participants in the communication network, improving adherence and trust.

5. Implementation Plan for New System

The implementation plan focuses on integrating an AI-enhanced dashboard to improve error detection, communication, and patient safety, while streamlining workflows. The project is designed with an estimated cost of $45,000–$65,000.

5.1. Key Activities

System Setup: Customizing the EHR system to integrate AI-driven error-checking, improved communication tools, and a patient portal, which is expected to take 2–3 months.

Data Migration: Transferring patient data to the new system and connecting it with existing hospital systems, requiring 1–2 months.

Training: Providing one month of training for staff, including physicians, pharmacists, and other users, to ensure they can effectively use the new system.

Pilot Testing: Testing the system with a small group of users over 1–2 months to identify and resolve issues before full deployment.

Full Rollout: Launching the system across the organization, expected to take 2–3 months.

Ongoing Support: Providing post-launch support and regular updates to ensure smooth operations, with ongoing efforts as needed.

5.2 Timeline

- **Total Time:** 1.5-4 months

5.3 Resources Needed

1. **Personnel**
    a. **Project Manager (1):** Leads the project.
    b. **IT Team (2–4):** Customizes and sets up the system.
    c. **Training Team (2–3):** Trains staff.
    d. **Support Team (2–3):** Provides post-launch support.
2. **Equipment and Software**
    a. **Hardware:** Servers, computers, and workstations.
    b. **Software:** EHR system, AI tools, patient portal software.
3. **Costs**

a. **System Setup & Customization:** $25,000–$40,000
b. **Hardware Costs:** $5,000–$10,000
c. **Software Costs:** $10,000–$15,000
d. **Training Costs:** $5,000–$7,500
e. **Ongoing Support (annual):** $5,000–$7,500

Total Estimated Cost: $45,000–$65,000

5.4 Feasibility

The plan is feasible within the budget of **$45,000–$65,000**, aligning with the organization's goals of improving patient safety and communication. The project is scalable, and with the resources available, it should be prioritized to enhance healthcare delivery and streamline operations.

6. Client Appendix

6.1 Glossary of Terms

6.1.1. EHR (Electronic Health Record):

An EHR is a digital system that stores a comprehensive and real-time record of a patient's medical history. It includes critical data such as:

- Patient demographics (e.g., age, gender, contact information)
- Medical history (e.g., past diagnoses, surgeries, chronic conditions)
- Medications (current and past prescriptions, dosage information)
- Immunization records
- Lab and imaging results
- Treatment plans and clinical notes

EHRs facilitate better coordination between healthcare providers, improve clinical decision-making, and enhance patient care by providing a centralized, easily accessible data repository.

6.1.2. AI (Artificial Intelligence):

AI refers to the use of machine learning algorithms and data-driven models to simulate human intelligence in computer systems. In healthcare, AI is used for:

- **Predictive Analytics:** Forecasting potential health risks or disease progression based on patient data.
- **Clinical Decision Support:** Assisting healthcare providers in making accurate diagnoses and treatment plans.

- **Automation:** Streamlining administrative tasks, such as scheduling and billing.

In the context of EHR prescription systems, AI can enhance accuracy by providing real-time medication suggestions, auto-completing medication names, and flagging potential errors such as drug interactions or incorrect dosages.

6.1.3. Prescription Errors:

Prescription errors are mistakes made during the process of prescribing medication. These errors can occur at various stages, including:

- **Selection Errors:** Choosing the wrong medication from a dropdown menu or typing an incorrect medication name.
- **Dosage Errors:** Prescribing an incorrect dosage based on the patient's age, weight, or condition.
- **Drug Interactions:** Failing to identify potential harmful interactions with other medications the patient is taking.
- **Allergy Oversights:** Prescribing a medication that the patient is allergic to, due to incomplete or overlooked records.

Such errors can lead to adverse drug events (ADEs), patient harm, or even life-threatening complications. Minimizing prescription errors is critical for patient safety.

6.1.4. WakeMed:

WakeMed is a leading healthcare organization based in North Carolina, providing a wide range of services including primary care, emergency services, surgical care, and specialized medical treatments. The organization is committed to improving community health through innovative solutions, quality care, and patient safety. Primary care physicians at WakeMed, like Dr. Wasonga, rely on EHR systems for managing patient records and ensuring accurate prescriptions.

6.1.5. Primary Care Physician:

A primary care physician (PCP) is often the first point of contact for patients seeking medical attention. PCPs provide comprehensive care by:

- Diagnosing and treating common illnesses and conditions
- Managing chronic diseases such as diabetes, hypertension, and asthma
- Offering preventive care and health education
- Coordinating with specialists for advanced care when necessary

PCPs play a crucial role in the prescription process, and any improvement to EHR systems can significantly enhance their ability to deliver safe and effective care.

6.1.6. Director of Pharmacy:

The Director of Pharmacy is a senior healthcare professional responsible for overseeing all aspects of pharmacy operations, including:

- **Medication Safety:** Ensuring that prescriptions are accurate, appropriate, and safe for patients.
- **Regulatory Compliance:** Adhering to healthcare laws and regulations, including those related to controlled substances.
- **Inventory Management:** Maintaining an adequate supply of medications and reducing waste.
- **Pharmacist Supervision:** Leading a team of pharmacists and pharmacy technicians to provide high-quality service.

At UNC Campus Health, Amy D. Sauls serves as the Director of Pharmacy. With over 16 years of experience, she ensures medication safety protocols are followed and provides insights into improving the accuracy and efficiency of prescription processes.

6.2. Technical Overview of Proposed AI Solution

AI Integration in EHR for Prescription Support:

6.2.1. Predictive Text and Autosuggestions:

The AI system will provide real-time suggestions as physicians begin typing the medication name, reducing manual entry errors. For example:

- Typing “Amox” would auto-suggest “Amoxicillin,” the correct medication name.
- The system could also suggest appropriate dosages based on the patient’s age, weight, and medical history.

6.2.2. Context-Based Recommendations:

AI will analyze the patient’s medical records to recommend medications that align with their condition and avoid contraindications. This feature will consider:

- **Patient Diagnosis:** Suggesting the most effective medications for specific conditions.
- **Allergy Information:** Automatically flagging medications that the patient is allergic to.

- **Drug Interaction Checks:** Alerting the physician if the prescribed medication interacts negatively with existing medications.

6.2.3. Real-Time Alerts and Notifications:

If a potential prescription error is detected, the AI system will provide a real-time alert, prompting the physician to review and confirm. Examples include:

- **Incorrect Dosage:** "The prescribed dosage exceeds the recommended limit for this patient's age and weight."
- **Allergy Alert:** "This patient is allergic to penicillin. Please review the prescription."
- **Duplicate Therapy:** "This medication duplicates an existing prescription."

6.3 Potential Benefits of AI Integration

1. **Improved Accuracy:** Reduces manual entry errors and ensures prescriptions are aligned with clinical guidelines.
2. **Increased Efficiency:** Streamlines the prescription process, saving time for both physicians and pharmacists.
3. **Enhanced Patient Safety:** Minimizes the risk of adverse drug events (ADEs) by providing real-time checks and alerts.
4. **Better Workflow Coordination:** Facilitates seamless communication between physicians and pharmacists, reducing prescription delays.

7. Team Appendix

This section is intended for academic review and provides insights into our internal project processes, reflections on our performance, and considerations for future improvement. It includes models used for internal analysis, lingering concerns, plans for presenting our proposal to the client, and lessons learned throughout the project.

7.1. Internal Models and Competing Solutions

During our project, we explored several models and potential solutions before finalizing the proposed AI integration for minimizing prescription errors. Some of the alternative models and frameworks we considered include:

A. Manual Verification Model:

This model would have required a human pharmacist or a designated healthcare professional to verify each prescription manually before it is finalized.

- **Advantages:**
    - Human oversight can capture nuances or contextual information that AI might overlook.
    - Provides a safety net for physicians who may rely too heavily on technology.
- **Challenges:**
    - Increased workload for pharmacists and potential delays in processing prescriptions.
    - Limited scalability, especially in busy healthcare environments.

Why We Chose AI Integration:

While the alternative models had their merits, we selected AI integration because it offers real-time support, reduces manual workload, and enhances accuracy by leveraging patient data to provide intelligent recommendations.

7.2. Lingering Issues and Concerns

While our proposed solution has significant potential, we identified a few lingering concerns:

- **Data Privacy and Security:** Integrating AI into EHR systems requires access to sensitive patient data. Ensuring that this data is protected and complies with healthcare regulations (such as HIPAA) will be critical.
- **User Adoption:** Physicians and pharmacists may be resistant to adopting new technology, particularly if it disrupts their existing workflow. Comprehensive training and a user-friendly interface will be necessary to encourage adoption.
- **System Reliability:** The accuracy and reliability of AI suggestions depend on the quality of the underlying data. Incomplete or inaccurate patient records could lead to incorrect recommendations, posing a risk to patient safety.
- **Ongoing Maintenance:** The AI system will require regular updates to stay aligned with evolving clinical guidelines, medication databases, and regulatory requirements.

7.3. Plans for Presenting the Proposal to the Client

We plan to present our proposal to the client through a structured, interactive presentation that highlights the key aspects of our solution:

- **Introduction:** Brief overview of the project's objective and the importance of reducing prescription errors in healthcare.
- **Current System Analysis:** Outline the limitations of the existing prescription process and the need for improvement.
- **Proposed Solution:** Demonstrate the AI integration model, focusing on how it enhances accuracy, efficiency, and patient safety. This will include:

    - A live or simulated demonstration of the AI-assisted prescription process.
    - Explanation of how the system provides real-time suggestions and alerts.
- **Benefits to the Client:** Highlight the advantages of the proposed solution, such as improved workflow, reduced prescription errors, and enhanced patient outcomes.
- **Addressing Client Concerns:** Discuss any anticipated challenges, such as data privacy and user adoption, and present strategies to mitigate these issues.
- **Q&A Session:** Allow the client to ask questions and provide feedback, ensuring that their concerns are addressed and that they see the value in the proposed solution.

7.4. Lessons Learned: Reflecting on this project, we have identified several key lessons and takeaways:

Team Performance

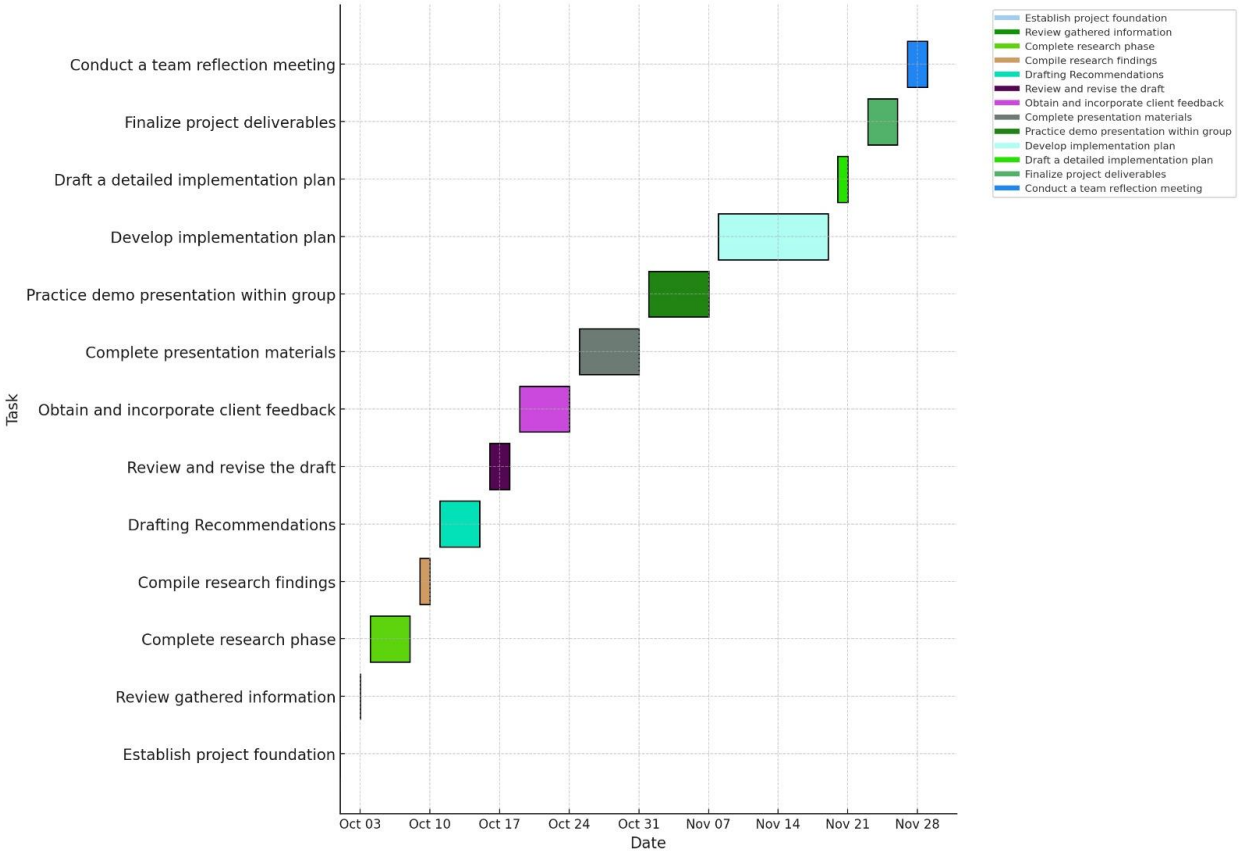
As a team, we worked collaboratively to achieve the project goals, leveraging each member's strengths:

- **Swathi Pabba:** Led project management and client communication, ensuring that timelines were met and client feedback was incorporated.
- **Suguna Kotte:** Managed meeting logistics and quality assurance, ensuring that project deliverables met high standards.
- **Yasaswi Suneera Rayana:** Oversaw document management and team communications, ensuring that all team members stayed informed and aligned.

ROLE	RESPONSIBLE	TASKS
Project/Team Management	SWATHI	Oversees the overall project, tracks progress, and ensures deadlines are met.
Document Management	SUNEERA	Responsible for organizing, updating, and storing all project documents and reports.

Meeting Management	SUGUNA	Schedules team meetings, prepares agendas, and keeps track of meeting minutes.
Team Communications	SUNEERA	Manages communication between team members, ensuring everyone stays informed.
Client Contact - Physician	SWATHI	Acts as the main point of contact with Physician.
Client Contact - Pharmacist	SUGUNA	Acts as the main point of contact with Pharmacist
Client Contact - Epic	SUNEERA	Acts as the main point of contact with Epic Manager.
Quality Assurance	SUGUNA	Reviews all documents and project deliverables to ensure quality and consistency.

TIME LINE


Conduct a team reflection meeting
Finalize project deliverables
Draft a detailed implementation plan
Develop implementation plan
Practice demo presentation within group
Complete presentation materials
Obtain and incorporate client feedback
Review and revise the draft
Drafting Recommendations
Compile research findings
Complete research phase
Review gathered information
Establish project foundation
Task
Oct 03
Oct 10
Oct 17
Oct 24
Oct 31
Nov 07
Nov 14
Nov 21
Nov 28
Date
Establish project foundation
Review gathered information
Complete research phase
Compile research findings
Drafting Recommendations
Review and revise the draft
Obtain and incorporate client feedback
Complete presentation materials
Practice demo presentation within group
Develop implementation plan
Draft a detailed implementation plan
Finalize project deliverables
Conduct a team reflection meeting

Strengths:

- **Effective Communication:** Regular team meetings and clear communication helped us stay on track and resolve issues quickly.
- **Adaptability:** We were able to pivot and refine our solution based on client feedback and new insights.
- **Collaboration:** Each team member contributed valuable perspectives and skills, leading to a well-rounded solution.

Areas for Improvement:

- **Time Management:** While we met all deadlines, some tasks could have been completed more efficiently with better time allocation.
- **Data Collection:** Gaining access to real-world data and more extensive client interviews earlier in the process could have improved our system analysis.

What We Would Do Differently:

- Start the data collection and client interviews earlier to gain deeper insights into the existing system and potential pain points.
- Allocate more time for testing and refining the proposed solution to ensure it is user-friendly and reliable.
- Incorporate more user feedback during the development process to tailor the solution more closely to client needs.

Lessons for Future Projects

- **Importance of User-Centered Design:** Understanding the end users' needs and workflow is critical for designing effective solutions.
- **Value of Iterative Development:** Iterative testing and refinement lead to more reliable and user-friendly systems.
- **Significance of Collaboration:** Effective teamwork and leveraging diverse skill sets contribute significantly to project success.
- **Continuous Learning:** Systems analysis requires continuous learning and adaptation to new technologies, regulations, and client needs.

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