GUARDIAN ANGELS: HARNESSSING RFID FOR ENHANCED SECURITY AND EFFICIENCY IN NEWBORN-CARE

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INTRODUCTION

The safety of newborns in healthcare facilities is a critical concern, with 337 cases of newborn abductions reported in U.S. healthcare settings between 1964 and 2022, nearly half occurring in hospitals, and medication errors affecting 1.3 million people annually, as highlighted by the World Health Organization. Addressing these issues, the "Guardian Angels" project proposes an RFID-based system to enhance infant security, minimize prescription errors, and streamline hospital operations. By improving tracking and data management, this solution aims to optimize newborn care procedures through an intuitive interface and innovative modules, offering safer and more efficient healthcare services.

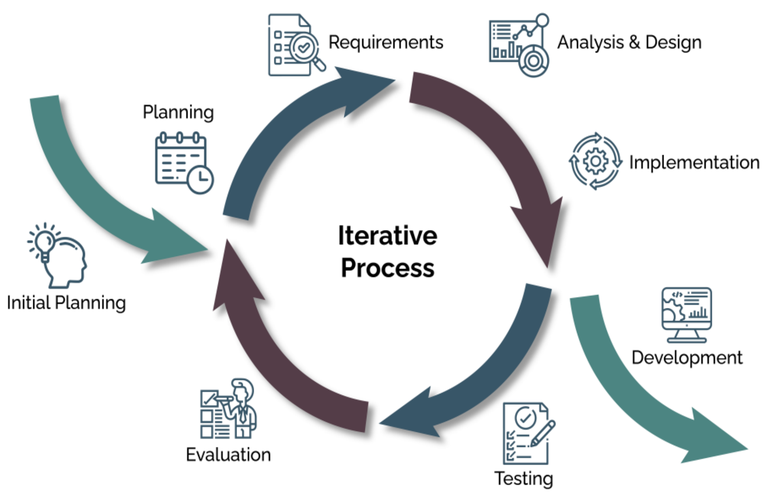
PROBLEM STATEMENT

- Medication errors are a significant global health risk, requiring technological solutions for accurate delivery and monitoring.
- Inefficiencies in traditional newborn monitoring methods increase the risk of errors and infant abductions.
- Infant abductions highlight the urgent need for secure and reliable tracking systems in healthcare settings.
- The "Guardian Angels" project proposes RFID technology to enhance security and accuracy in newborn care.
- The system aims to prevent abductions, reduce medication errors, and safeguard vulnerable patients.

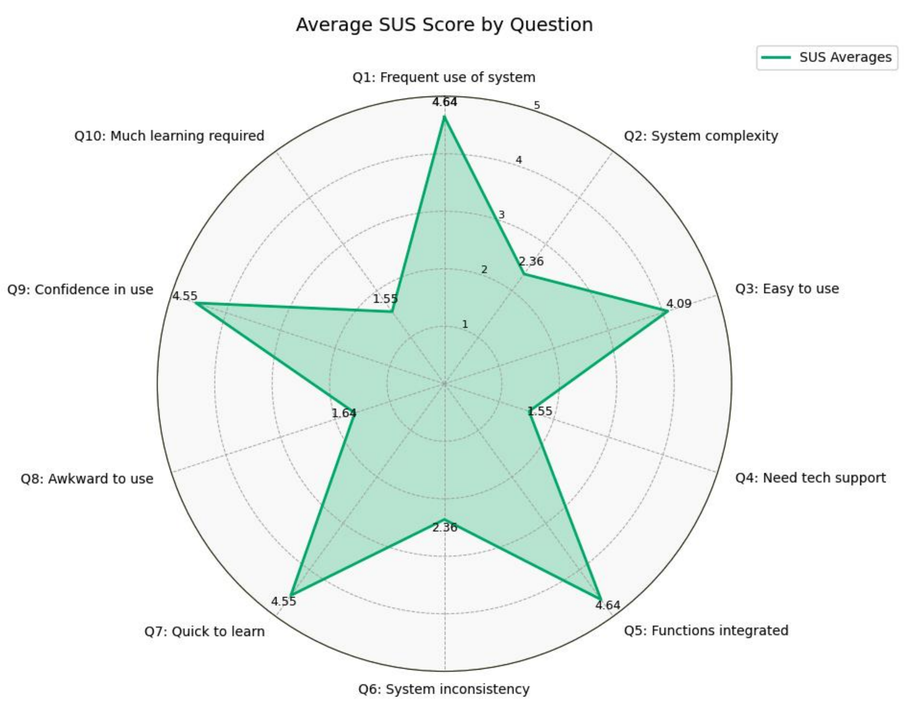
OBJECTIVE

- To design a RFID system prototype tailored for newborn care, focusing on a user-friendly interface by developing an initial system design that incorporates user-friendly interfaces for both healthcare providers and administrators.
- To implement the designed RFID system in a simulated hospital environment using Raspberry Pi Pico, RFID tags, and readers.
- To conduct tests within the simulated environment to evaluate the RFID system's performance by using User Acceptance Testing (UAT).

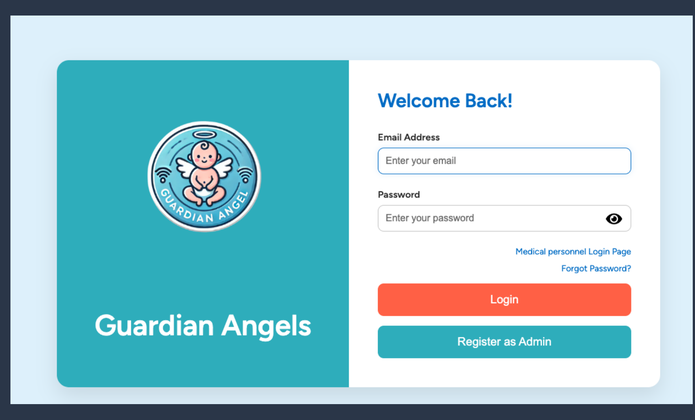
METHODOLOGY



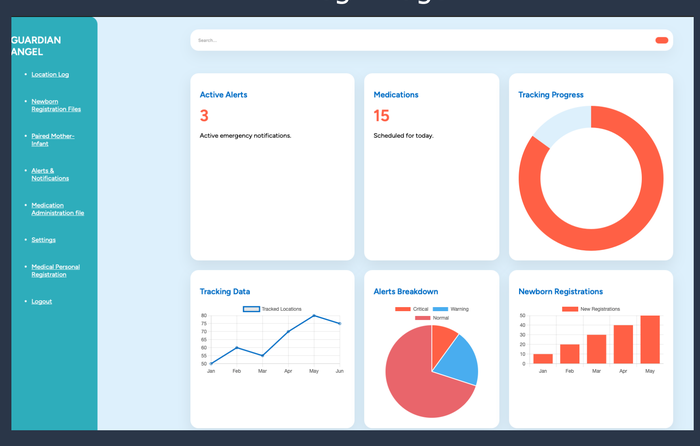
SYSTEM VALIDATION



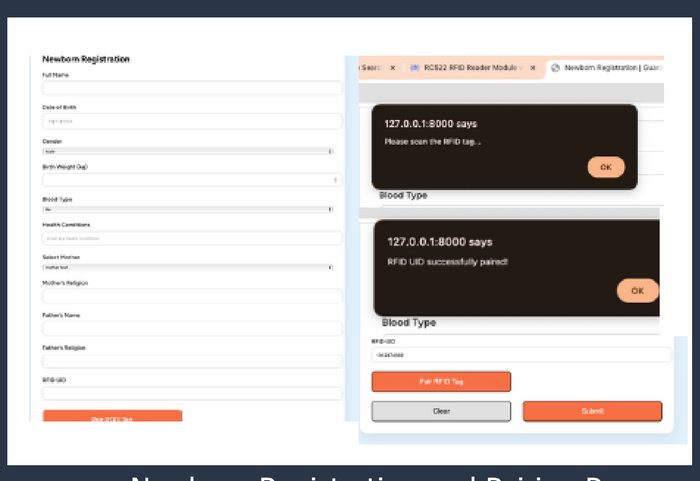
SYSTEM SCOPE & DESIGN



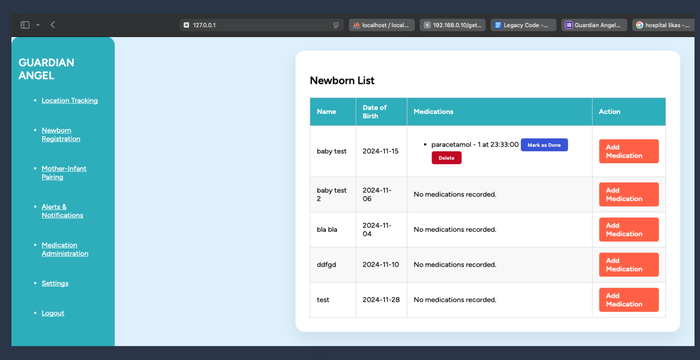
Login Page



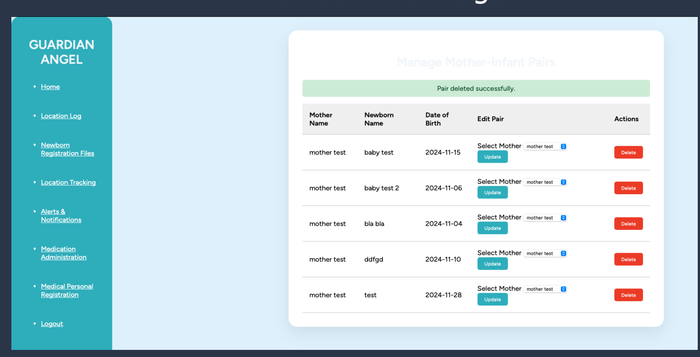
Dashboard



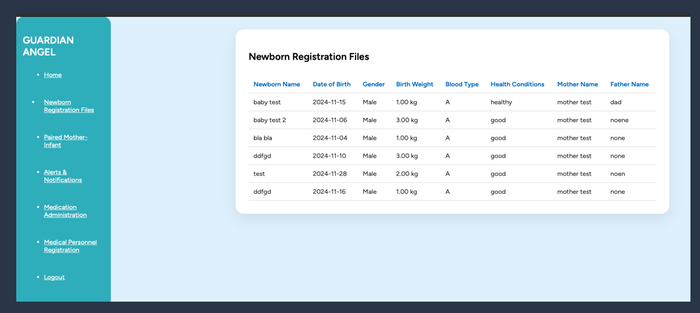
Newborn Registration and Pairing Page



Newborn List Page



Mother and Newborn Paired List Page



Newborn Registration Files

MAIN REFERENCE

1 Chia, L. C. (n.d.). Hospital inpatient tracking system using RFID technology. Bachelor's thesis.

2. GreenM.io. (2020). RFID Technology in Healthcare: Benefits, Challenges, Opportunities. Retrieved from https://greenm.io/rfid-technology-in- healthcare/

3. ASHP Foundation. (2022). Advancing Medication Safety Through Technology Innovations: Focus on Radio-Frequency Identification Technology. American Society of Health-System Pharmacists. Retrieved from https://www.ashpfoundation.org