SmartMed:

Smarter Care with RFID

ENGINEER 2PX3 - Communications & Social Impact (Winter 2025)

Group 96

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Introduction

The Mission

We are a team of engineering students focused on:

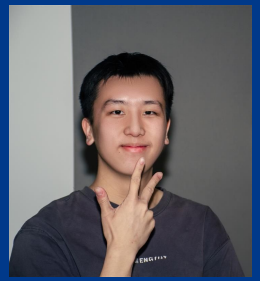
1. **Creating** practical solutions to everyday healthcare challenges
2. **Improving** current infrastructures to boost efficiency
3. **Enhancing** the quality of care for patients and hospital staff
4. **Designing** systems that bridge the gap between healthcare and technology
5. **Driving** innovation and real-world impact through learning

The Team

Shiv Patel
Comp II

Luke Smith-Dwyer
Civil II

Rushil Saha
Tron II



Ryan Wang
Tron II

Sammy Abbas
Comp Mgmt II

2

Background

Background

- Hospitals face significant challenges in patient triage, tracking, and workflow efficiency, leading to delayed treatment, overcrowding, and inefficient resource allocation.

- Current systems rely heavily on manual processes and fragmented data management, making real-time prioritization difficult and increasing the risk of human error.

Manual check-ins

Static prioritization

Paper record-keeping

3

Context

Context

Reduce operating cost by automating procedures & Using reusable RFID WristBands.

Information Gathering & Distribution:

Ensures that critical patient information is accurate, up-to-date, and easily accessible by staff

SmartMed WristBand

Radio-Frequency Identification

4
Solution

Problems to Address

Inefficient Patient Tracking & Prioritization

Manual processes make it difficult to accurately track patient status, leading to delays in care.

Manual Systems

Relying on paper records and verbal updates increases human error and miscommunication.

Slow Triage

Without an automated system, non-urgent patients may remain in the queue longer than necessary, adding to congestion.

Increased Stress

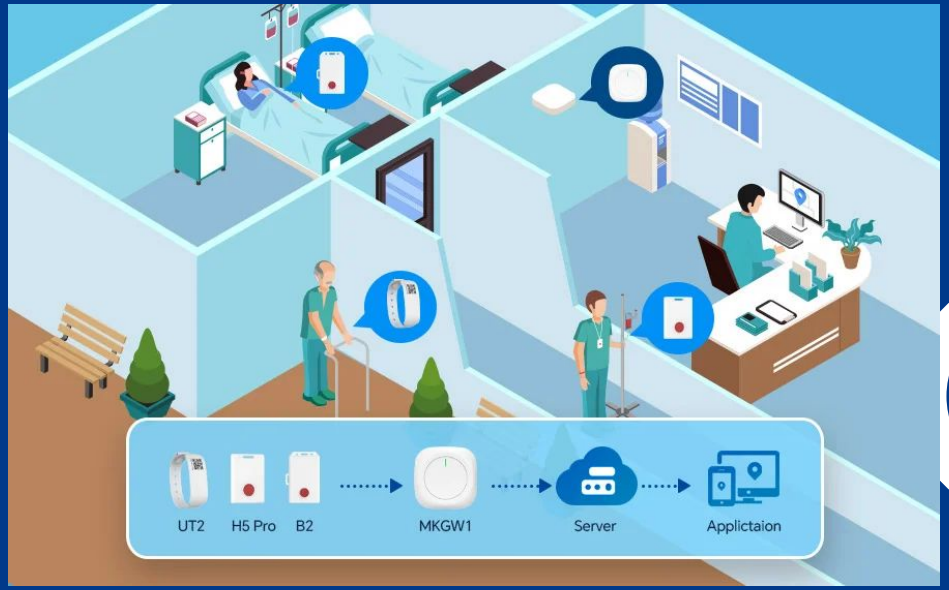
Doctors and nurses must constantly juggle patient prioritization manually, adding pressure to an already high-stress environment.

Opportunities to Address

1. **RFID technology can automate and streamline patient tracking**
    - RFID-enabled wristbands provide real-time data on patient movement, reducing reliance on manual record-keeping.
2. **Reducing human errors and improving treatment response time**
    - Automated tracking ensures that critical patients receive timely care by minimizing miscommunication.
3. **Dynamic patient queue updates ensure critical patients are prioritized**
    - Real-time data allows staff to adjust patient priority levels based on changing conditions, improving triage efficiency.

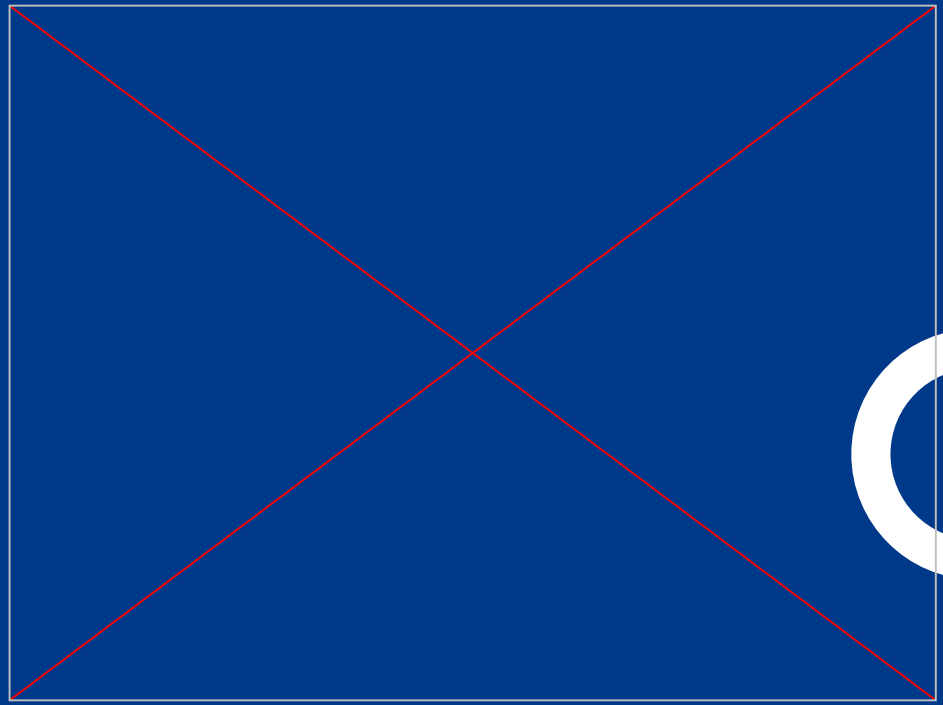
Prototype Overview

- RFID-enabled wristband for patient tracking & prioritization.
- Automated system to enhance triage efficiency.
- Web-based dashboard for real-time patient status monitoring.

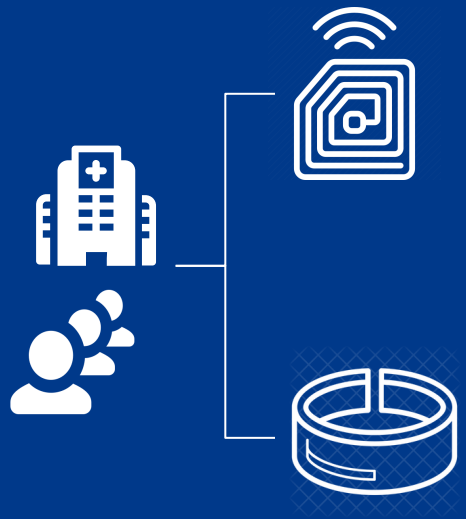


Prototype Overview

- Low-fidelity prototype of a potential dashboard for hospital staff
- Link to prototype: https://shiv-sp.github.io/2px3sprint3/



How It Works?



- **Check-in & Wristband Issuance:**
  - Patients receive color-coded RFID wristbands based on priority.
  - Linked to medical records via RFID readers.
- **Real-Time Patient Flow Management:**
  - RFID scanners track patient movement within hospital zones.
  - Alerts ensure no patient is overlooked.
- **Dynamic Queue Updates:**
  - Staff can update priority based on worsening conditions.
  - Helps optimize doctor-patient distribution and hospi resources.

Why SmartMed?

- **Tailored for Healthcare** - Other RFID tech companies focus on asset management. Our system is built specifically for hospitals, addressing industry-specific challenges.
- **Limited Adoption in Canada** - RFID in Canadian healthcare is underutilized [1]; we aim for widespread implementation in hospitals.
- **Data Security First** - Tackles privacy concerns and compliance issues uniques to healthcare.
- **Scalable** - Expands into a comprehensive hospital management ecosystem beyond patient tracking.

Navigating Constraints

- **Integration** - Proven tech but faces privacy & data access hurdles in Canada [2] [3]. Needs API access & standardized health care to reach full potential.
- **Feasible Within Five Years** - Phased rollout ensures quick implementation.
- **Security & Compliance** - A core value of our project, using state-of-the-art encryption to protect patient data. RFID contains no private information.
- **Cost-Effectiveness** - RFID tags cost as little as $0.20 to print [4]. The system aims to reduce admin workload and improve overall efficiency, leading to long-term savings

Achieving Goals

Our product seeks to improve hospitals struggling with patient information inefficiencies and to relieve the strain on doctors and nurses caused by burdening administrative workload.

SmartMed RFID achieves our goals by:

- ✓ **Being Cost-Effective** - Low hardware and maintenance costs; reduces administrative labour expenses.
- ✓ **Improving Efficiency** - Prevents bottlenecks by improving patient flow.
- ✓ **Reducing Staff Workload** - Less time spent on admin tasks, more time for patient care.

Critical Path & Duration of Tasks

Phase 1: Planning & Research

- Conduct research, feasibility studies, define the project scope, gather requirements, and meet with stakeholders

Phase 2: Design & Prototyping

- Develop system architecture, and draft and finalize UI/UX

Phase 3: Development

- Build the core system, integrate the key features, and develop the database

Phase 4: Testing & Integration

- Perform system testing, security checks, and integrate all components

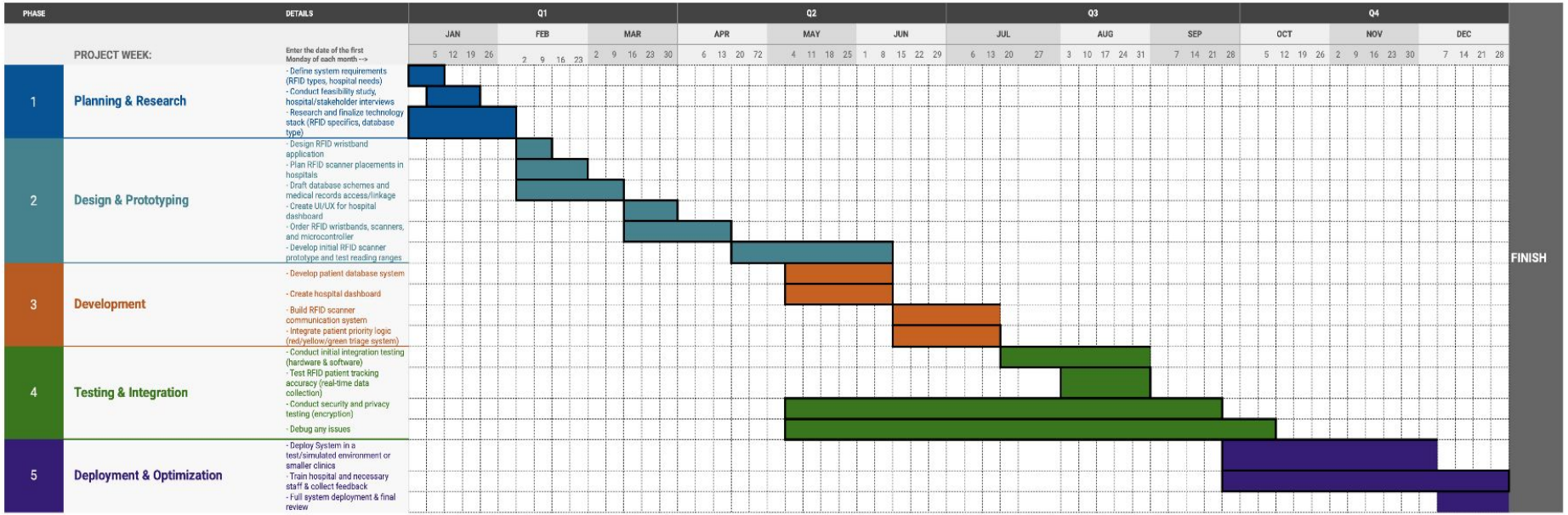
Phase 5: Deployment & Optimization

- Launch the system for simulations, monitor performance and feedback, and refine for stability for final launch

Critical Path & Duration of Tasks

[SAMPLE] Project Timeline/Gantt C

PROJECT TITLE	SmartMed	COMPANY NAME	2PX3Technologies
PROJECT MANAGER	Group 96	DATE	1/1/26



Thank you!

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References

[1] Accessed: Apr. 01, 2025. [Online]. Available: https://www.impinj.com/library/customer-stories/north-york-general-hospital-improves-operatio

[2] “High-tech tracking heading for hospitals,” CBC News, Jan. 23, 2008. Accessed: Apr. 01, 2025. [Online]. Available: https://www.cbc.ca/news/science/high-tech-tracking-heading-for-hospitals-1.758413

[3] “Unlocking the power of health data,” Competition Bureau Canada. Accessed: Apr. 01, 2025. [Online]. Available: https://competition-bureau.canada.ca/en/unlocking-power-health-data

[4] “The Cost of An RFID System: An Estimated Budgeting Breakdown,” RMS Omega. Accessed: Apr. 01, 2025. [Online]. Available: https://rmsomega.com/the-cost-of-an-rfid-system/