




Mercy James Pediatric Surgery Scheduling System

Andre A. Muelenaer¹ | Bennet Kankuzi² | Arthur Nathaniel Mwang'onda² | Clever Sibale^{*2} | Victoria Kasoti² | Catherine Malizani² | Chinsinsi Kabukonde² | Lindsey Brilliant³ | Carly Daffan³ | Joe Mathews³ | Mia Saad³ | Joyce Mwenisungu⁴ | Penny Muelenaer⁵

BACKGROUND




TEAM Malawi

-  An interdisciplinary and multi-institutional collaboration
-  Addresses challenges of community, health, and quality of life
-  Works with partners in the United States of America to develop projects in technology and medicine

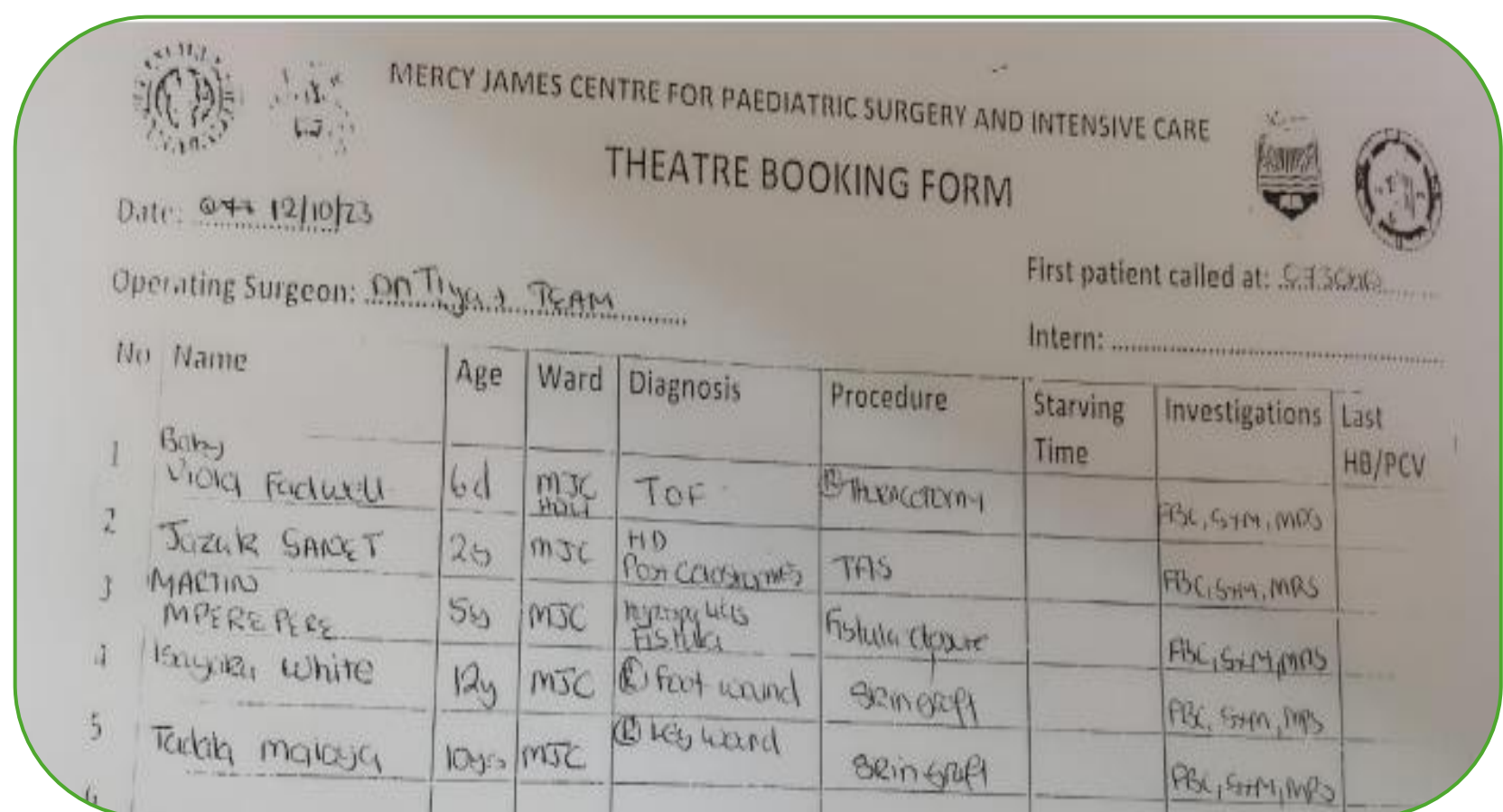
The Mercy James Centre



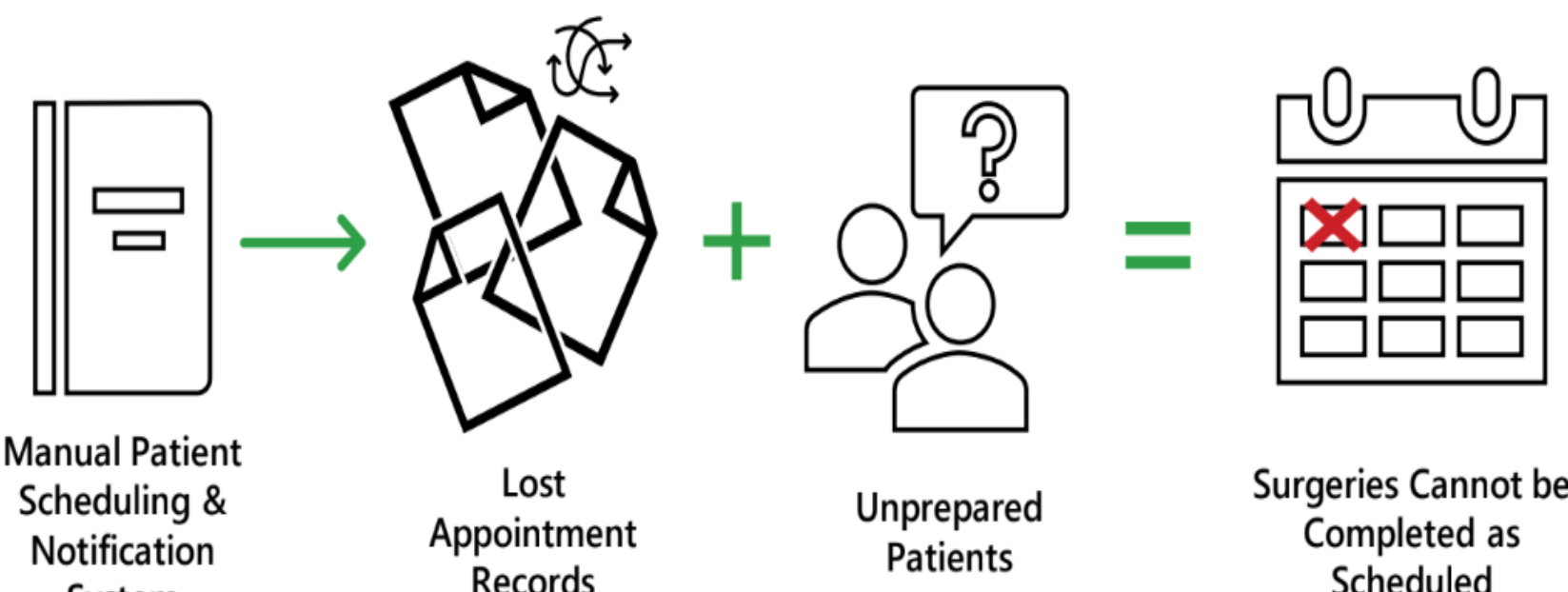
The Mercy James Centre, Blantyre, Malawi.

-  Uses a fully manual scheduling system.
-  Appointments are recorded in paper notebooks, and operating theatres are booked on paper.
-  Staff assignments for surgeries are written on a whiteboard.

PROBLEM



The current manual patient scheduling & notification process at the Centre leads to



IMPACT OVER 3 YEARS

\$215,467

Increased Revenue from Saved Operating Theatre Minutes

\$275.18

Saved on paper cost



Higher staff morale



Improved patient satisfaction

Expected Benefits

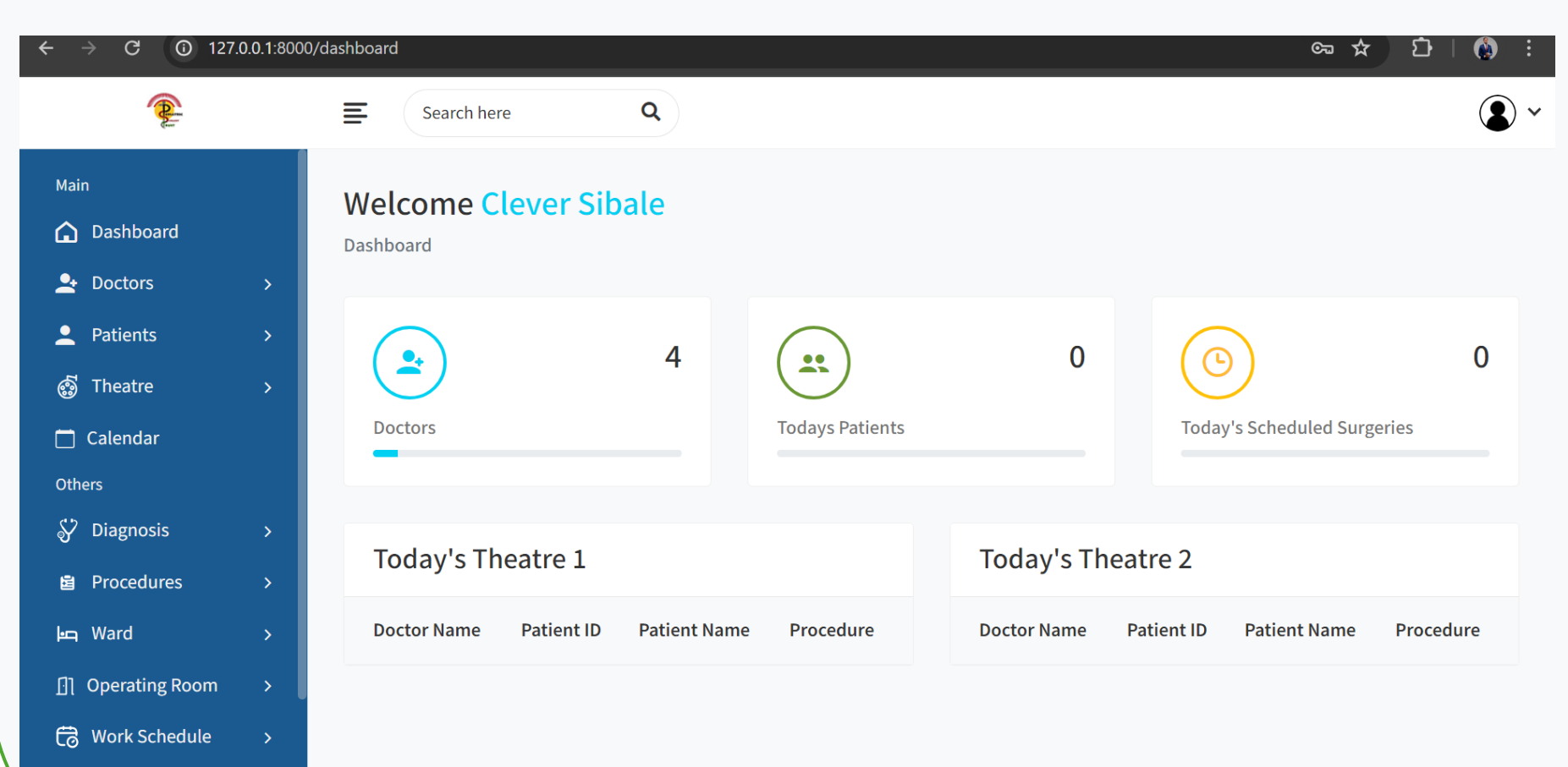
1. Reduced errors while ensuring real time organization
2. Maximizes theatre and staff use.
3. Automated reminders keep patients on time, preventing patient unpreparedness and missed surgeries.
4. Centralized view of schedules and resources.

SOLUTION

The team collaborated with Industrial Systems Engineering students from Virginia Tech, who proposed the project to develop a digital scheduling system.

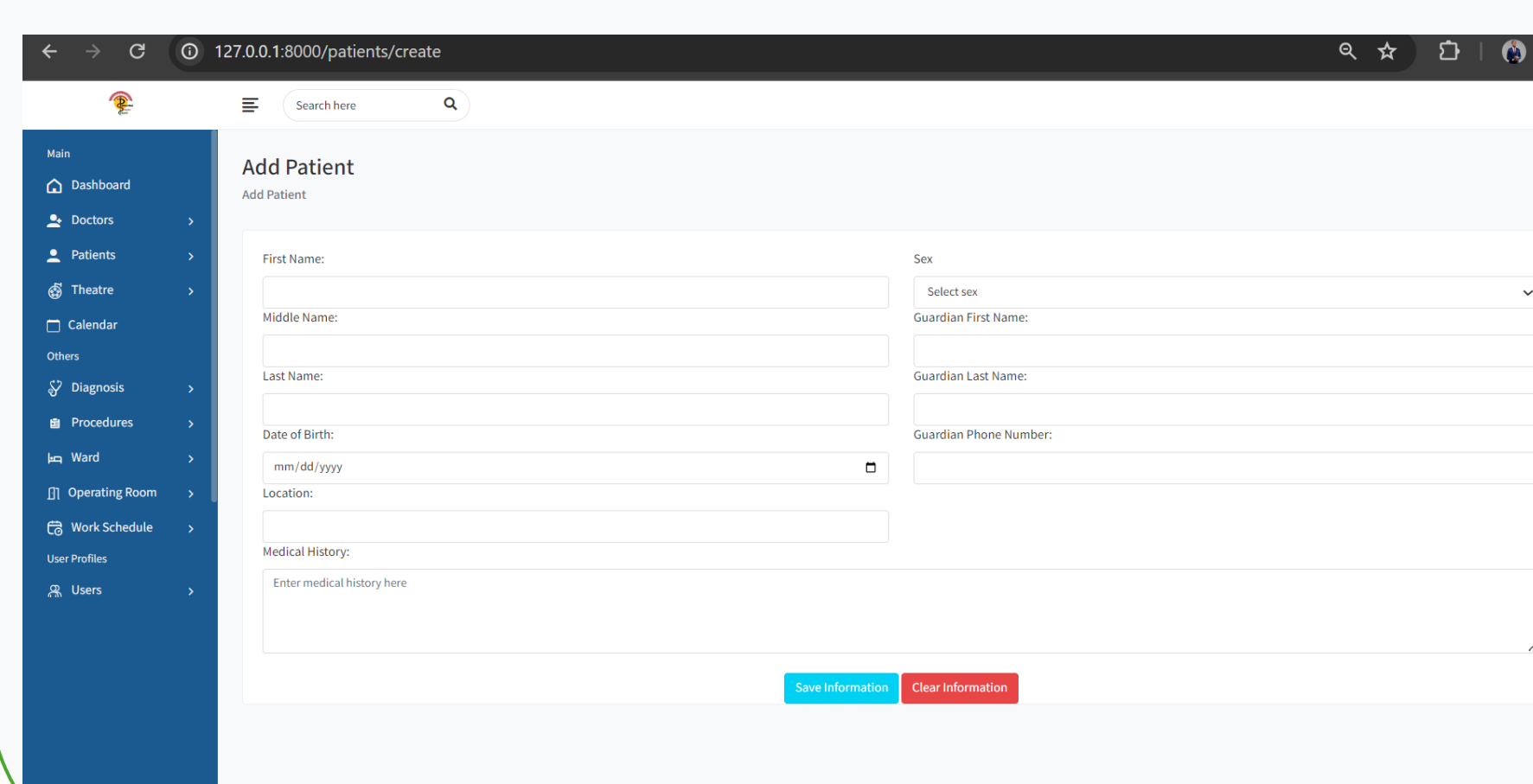
Dashboard Tab

Display Completed & Upcoming Procedures



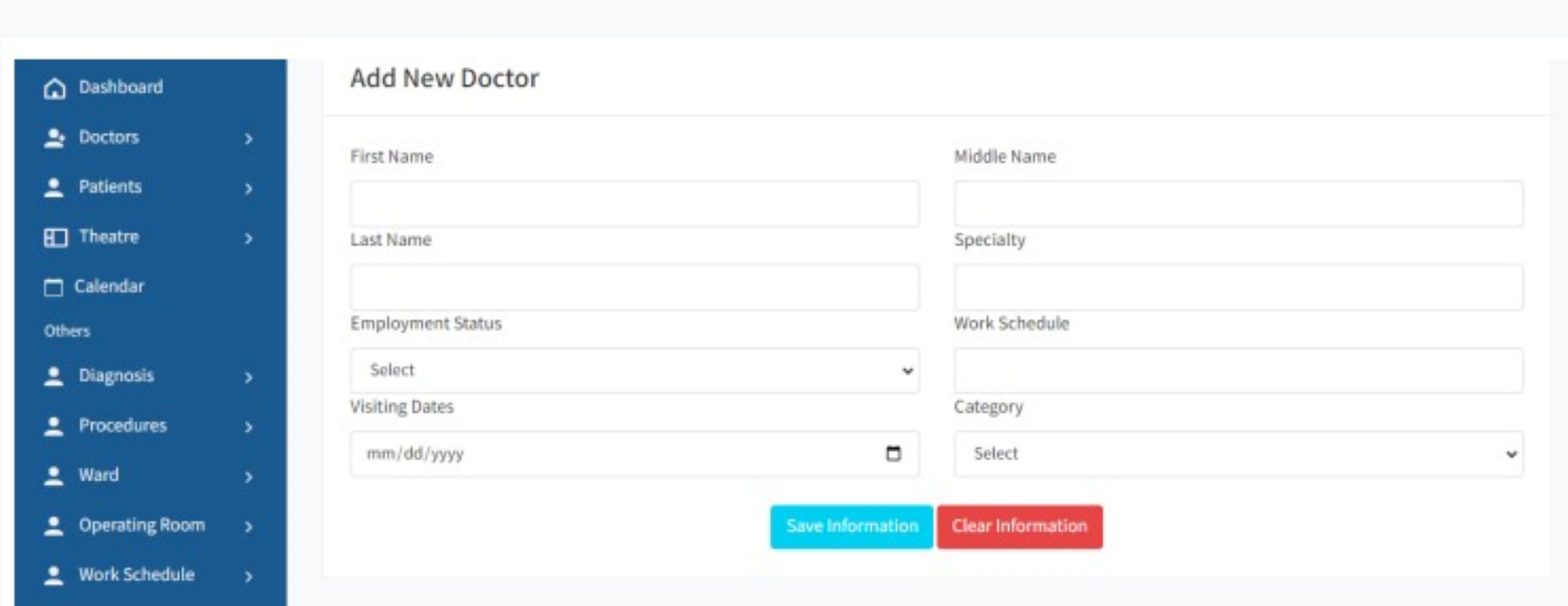
Patient Tab

Log, Store, & View Patient Information



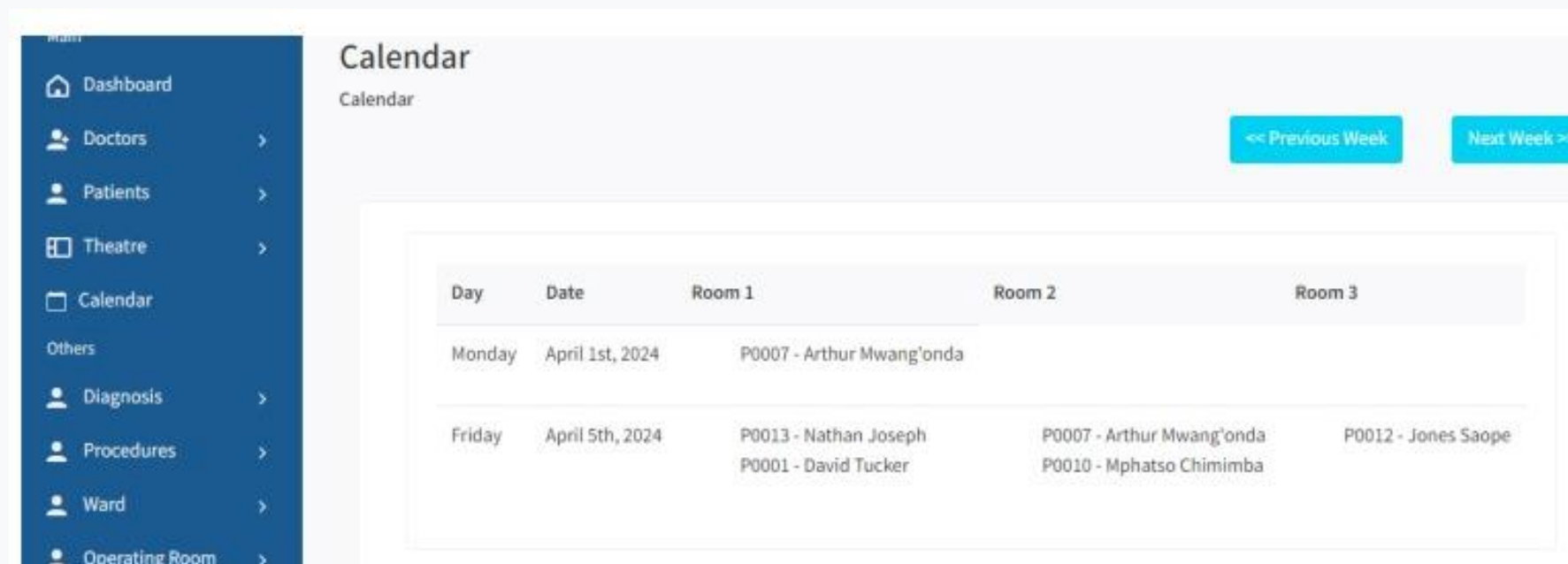
Doctors Tab

Log, Store, & View Doctor Information



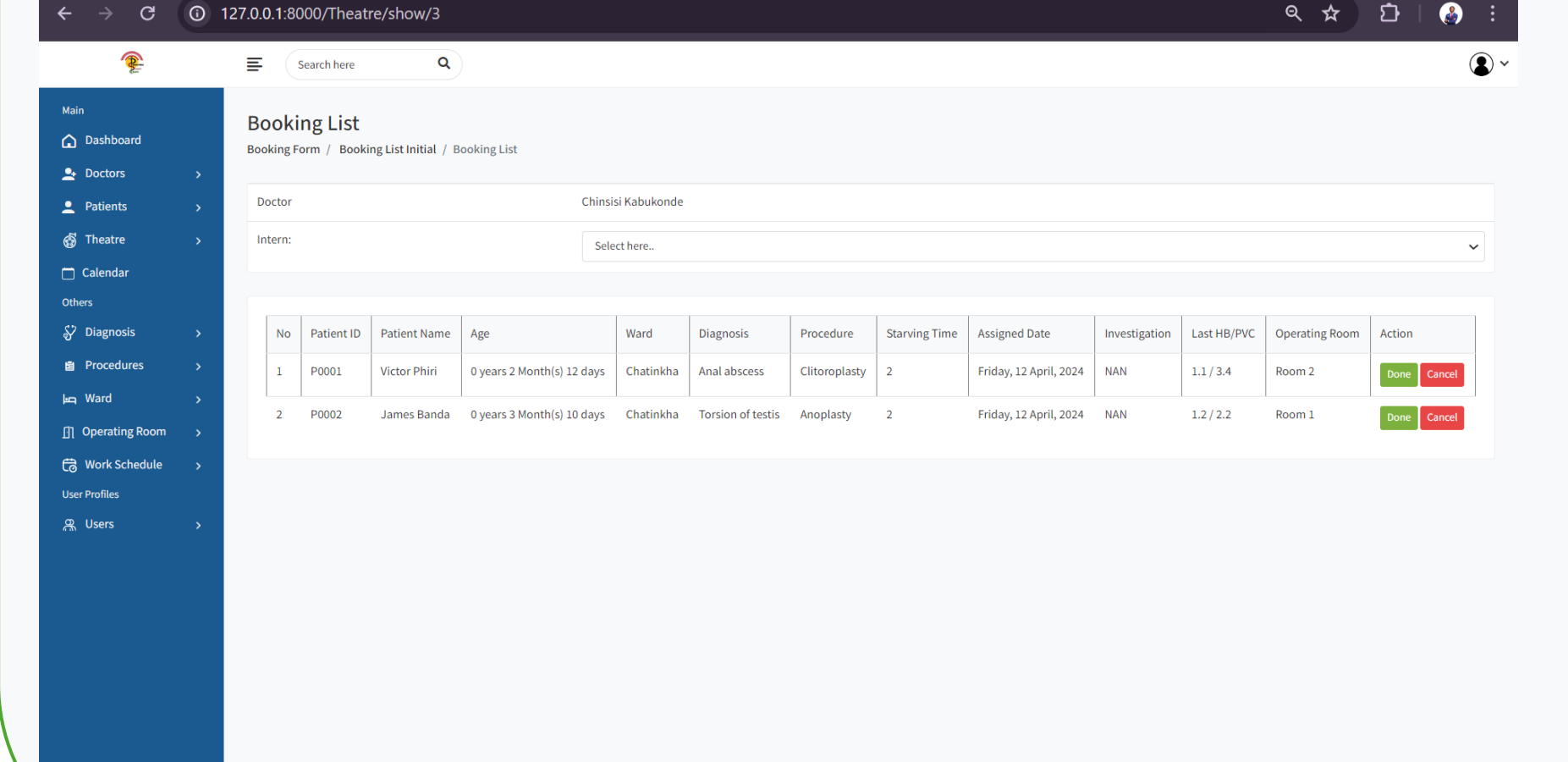
Calendar Tab

Book Patients to Theatres and Dates





Theatre Booking Tab

Display Completed & Upcoming Procedures



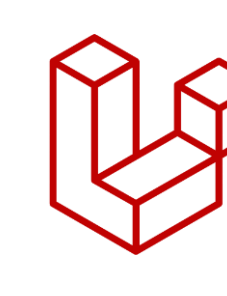
Additional Deliverables

-  Standard Operating Procedures for each tab, with detailed instructions on system use.
-  Process flow charts describing intended system use alongside current Centre practices

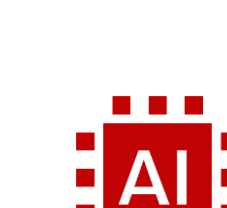
TECHNOLOGY STACK







-  **Web-based Architecture** optimized for handheld android devices.

-  **Laravel Framework** this has been used for seamless integration of frontend and backend functionalities.

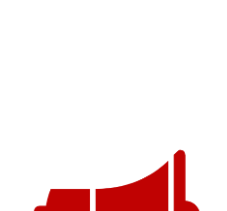



-  **MySQL Database** used for efficient data management and storage.

-  **AI and automation** features will be implemented to further improve scheduling accuracy and reduce administrative workload.

Security & Data Protection Used

-  Data encryption at rest and in transit
-  Regular data backups to safeguard against cyber attacks and system failure
-  Role based access control
-  Employed failover mechanisms to prevent downtime i.e. redundant servers.

CHALLENGES & FUTURE WORK

-  Ensuring hospital staff embrace the new system through awareness and support.
-  Training medical and administrative staff for smooth integration and effective use.
-  System optimization, pilot testing, and expansion to other hospitals.
-  Seeking partnerships and funding to support system deployment, scalability, and long-term sustainability.