

Open Call For Ideas

Intelligent Perioperative Scheduling & Resource Optimisation

(Use Case by NTFGH)

1. Background

Operating theatres are complex environments that require coordination across multiple stakeholders, systems, and resources. Every surgical case depends on the timely availability of manpower, operating rooms, instrument sets, equipment, consumables, beds, and clinical support services.

Today, decisions regarding case sequencing and resource deployment are often made within individual workstreams, with limited visibility of downstream operational impacts across the perioperative ecosystem. As surgical demand continues to grow, there is an opportunity to leverage innovative ideas and technologies to improve coordination, optimise resource utilisation, and support better decision-making.

2. Challenge Statement

How might we enable intelligent, real-time coordination and optimisation of perioperative resources to improve surgical scheduling, maximise resource utilisation, and reduce delays, cancellations, and operational inefficiencies across the perioperative journey?

3. Current State

Operating theatres depend on multiple stakeholders to make coordinated decisions regarding case sequencing and deployment of manpower, facilities, equipment, consumables, instrument sets, beds, and clinical support services.

However, these decisions are frequently made within individual departments or workstreams, resulting in limited visibility of resource constraints and downstream impacts. Issues such as instrument shortages, staffing gaps, equipment conflicts, Central Sterile Services Department (CSSD) bottlenecks, and bed availability challenges may only be identified shortly before surgery, leading to delays, schedule changes, inefficient resource utilisation, and increased workload for clinical and operational teams.

4. Desired Future State

We envision an intelligent perioperative ecosystem that supports data-driven planning and allocation of operating theatre capacity. Proposed solutions should enable forecasting of surgical demand, optimisation of session allocation, and balancing of competing priorities such as utilisation, waiting times, lead times, manpower availability, resource constraints and equitable access across specialties.

Following session allocation and surgical listing, the system will assess resource readiness across manpower, operating theatre, instrument sets, equipment, consumables, beds and supporting services.

This enables perioperative teams to anticipate issues earlier, improve coordination across departments, and optimise both patient flow and resource utilisation.

5. Key Design Requirements

Proposed ideas should:

- Provide integrated visibility and coordination across perioperative resources, including manpower, facilities, instrument sets, equipment, consumables, beds, CSSD operations, and support services.
- Enable predictive and data-driven decision-making through forecasting, optimisation, scenario planning, and proactive identification of bottlenecks, conflicts, and resource constraints.
- Support seamless operational workflows through real-time alerts, actionable recommendations, system integration, and secure, user-friendly interfaces for perioperative stakeholders.

6. Expected Outcomes

a. Improved Perioperative Efficiency

- Optimise utilisation of manpower, facilities, instrument inventories, equipment, beds, and support services while reducing surgical delays, cancellations, and operational bottlenecks through proactive planning and coordination.

b. Improved Workforce Productivity

- Reduce manual coordination, administrative burden, and last-minute operational firefighting through real-time visibility and decision support.

c. Scalable and Data-Driven Innovation

- Enable predictive planning and enterprise-wide resource optimisation through a scalable platform that can be expanded across specialties, institutions, and healthcare settings.

7. Invitation to Pitch

We welcome ideas from startups, technology providers, healthcare innovators, and multidisciplinary collaborators who can help transform perioperative scheduling and resource management.

This challenge is intentionally solution-agnostic, allowing participants to propose innovative ideas, approaches and emerging technologies to create a smarter, more connected, and more efficient perioperative ecosystem.