

Development of indoor navigation system for patient & visitors for improving whole experience at CK Birla Hospital, Jaipur

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HOSPITAL PROFILE

BRIEF HISTORY

An Endless Journey:
It was the first private hospital with the cutting-edge facility in healthcare in Kolkata.

The journey to serve the community took a new direction with the establishment of a super specialty cardiac hospital-BM Birla Heart Research Center. It is the first hospital in India to receive the National Accreditation Board of Hospital award.

In 2016, the group launched the most progressive center of the clinical care at Jaipur-The Rukmani Birla Hospital.

BRIEF DISCRIPTION

The CK Birla group has different chains which include hospitals in Gurugram (CK Birla), Jaipur (RBH), Kolkata (CMRI), and Kolkata (BM Birla Heart Research Centre).CK Birla Hospital is a 230-bedded multi-specialty hospital in Jaipur. RBH has 24-hour specialized healthcare departments with highly trained doctors and nurses.

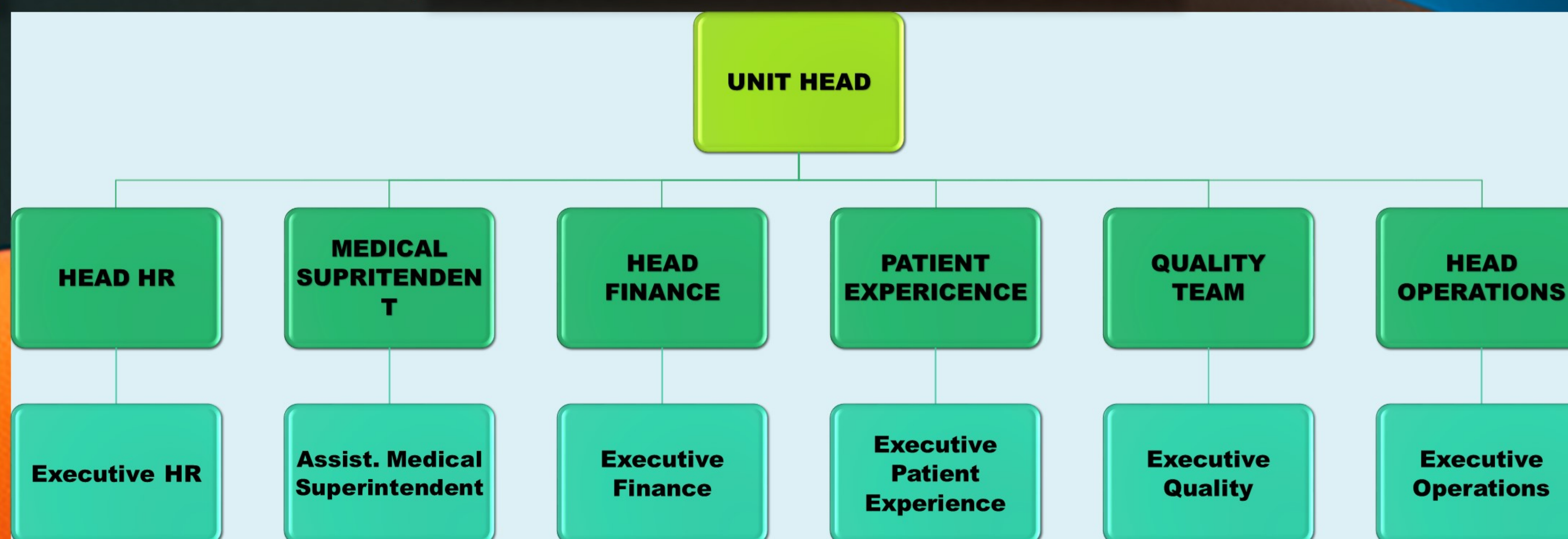
VISION

- ❖ To provide the highest level of patient care and clinical excellence

MISSION

- ❖ To create Clinical Centres of Excellence on a strong backbone of research, academics and evidence-based medicine for best clinical and patient outcome.

ORGANIZATION STRUCTURE



THEORETICAL VS PRACTICAL EXPOSURE

- Gained essential knowledge about hospital services in my coursework and had the opportunity to apply this knowledge practically during my internship.
- Identified module of communication was helpful in terms of communicating with the patients and simultaneously with business heads.

OBJECTIVES

- To identify the challenges of indoor navigation inside the hospital.
- To design indoor navigation application for hospital.

LEARNING

- ❖ Overview of technologies involve in development of indoor navigation.
- ❖ Identified unique need of hospital navigation system.
- ❖ Impact of new technology on user experience.
- ❖ Practical implementation of AR indoor navigation system.
- ❖ Indoor Positioning Systems (IPS): Learnt about different IPS technologies such as Wi-Fi, Bluetooth, RFID, UWB, and more.

ACTIVITIES DONE

Development was conducted by using multiple assets from GitHub

- ❖ Technologies Used in Indoor Navigation: Bluetooth beacons, Wi-Fi triangulation, RFID, Ultra – wideband (UWB), and AR and computer vision.
- ❖ Developing AR navigation application: Using AR SDK and tools and other plugins.

PROJECT FINDINGS

- **Hardware** based indoor navigation system was costly for installation and maintenance, also require device setups in several meters by using wires which impacted hospital operations while setting up.
- **Augmented Reality** based application requires Google AR core in android phone and AR Kit in IOS supported device.
- **Sensor Fusion** is a technology which exist in augmented reality with low level sensors and camera inputs are process on frame per second using point cloud.
- **Rendering** of data require specific pipeline which is affected by Graphical Processing Unit.
- Understand the principles of digital mapping, pathfinding algorithms (e.g., A*, Dijkstra's), and how to create efficient routes

SUGGESTIONS

- Frequently auditing of blueprint
- Improve navigation or signage of hospital

USEFULNESS

- Hospital industry exposure.
- Opportunity to conduct prototyping in hospital.
- Helped to create networking with hospital member.
- Opportunities to improve MVP.

SWOT ANALYSIS

STRENGTH

- High-Quality Care and Services
- Comfortable and Safe Environment
- Patient-Centric Approach

WEAKNESS

- Inconsistent service quality
- Limited space leading to overcrowding

OPPORTUNITIES

- Technological Advancements
- Expansion of facilities and services
- Building stronger relationships with local communities

THREAT

- Environmental and infrastructure challenges
- Recruitment and retention of skilled healthcare professionals
- Competitors like EHCC

CHALLENGES

- Adjusting to Dynamic Hospital environment

