Smart Hospitals -IoMT Empowering Healthcare with IoT & 5G

By

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STEMZ- CORE SERVICE OFFERINGS

Government Immigration Services

Assessing fitness for immigration as per destination country mandates.

Preventive Healthcare

Curative Healthcare

Oncology Services*

Furnishing comprehensive medical care through network of cancer hospitals and consultation centres.

Radiology & Diagnostic Services

Providing a wide array of radiology and diagnostic services through outsourcing models and proprietary diagnostic centres.
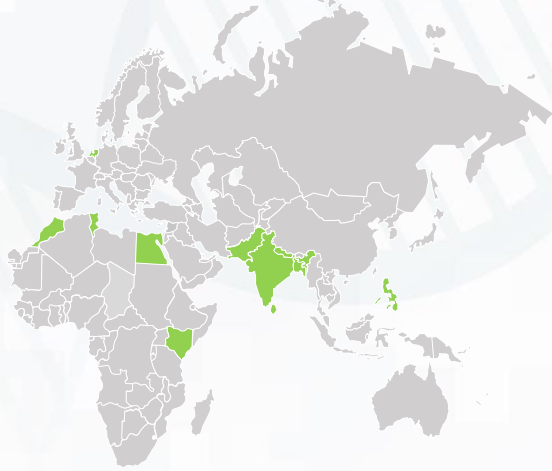
Healthcare Technology

Integrated Healthcare Network

Health care delivery through hospital and lab outsourcing services

AI-Assisted Diagnosis

Enabling artificial intelligence-assisted decision-making for practitioners and patients.
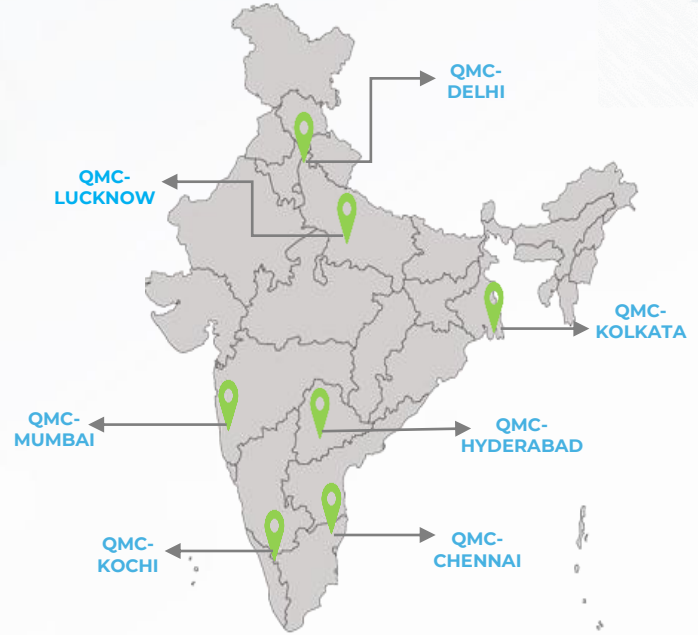
OUR GLOBAL EXPANSE

Presence Across 3 Continents
Asia | Africa | Europe

Bangladesh | Ethiopia | India | Kenya |
Nepal | Netherlands | Philippines | Sri
Lanka | Tanzania | Kenya

8+
Countries

14
Centres

2k+
Daily
Footfall

400+
Global
Staff
Strength

Accreditations

OUR PRESENCE IN INDIA

QMC-
DELHI

QMC-
LUCKNOW

QMC-
KOLKATA

QMC-
MUMBAI

QMC-
HYDERABAD

QMC-
KOCHI

QMC-
CHENNAI

7
Centres

750-1K
Daily
Footfall

250+
Staff
Strength

Accreditations

STEMZ
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HOW HOSPITALS HAVE EVOLVED OVER THE DECADES

Hospital 10 Years Ago

- Traditional focus on in-person diagnosis and treatment

- Patients diagnosed through physical examinations and interpretation of tests

- Limited automation in hospital workflows

- Reliance on manual data entry and record keeping

- Slower communication and collaboration among healthcare professionals

- Manual workflows leading to slower treatment initiation

Hospitals Today – AI & Automations

- Increased use of automation in tasks like medication dispensing and lab analysis

- Integration of AI for image analysis, risk prediction, and personalized treatment plans

- Improved communication and collaboration through digital platforms

- Rise of minimally invasive surgical techniques and robotic surgery

- Data analysis tools integrated with the HIS systems leading to data driven decision making and support

Hospitals of the Future – IoMT + 5G

- Widespread adoption of IoMT devices for real-time patient monitoring

- 5G technology for seamless data transfer and remote consultations

- AI-powered diagnostics and personalized medicine approaches

- Smart hospital infrastructure for automated workflows and patient comfort

- Focus on preventative care through wearable health trackers and AI-based risk management

- Clinicians will conduct clinical trials with patients in the comfort of their homes

KEY DESIGN PRINCIPLES FOR HOSPITAL OF THE FUTURE

Care Beyond Walls
Care will be provided remotely through things like video chats and wearable health monitors focusing on preventive care

Hybrid Care Teams
Hospital staff will be equipped with a wider range of skills to better care for a patient's overall health and well-being

Flexible Space
Hospitals will have flexible rooms that can be easily changed to suit different needs

Automation & AI
AI will be widely used in clinical and non-clinical tasks, freeing up doctors for more complex work

Hyper-Connectivity
Hospitals will have super-fast internet, hyper collaborative environment powered by 5G and reliable systems

Optimized Service Lines
Different departments will work together effectively, and ensuring the hospital meets all the necessary standards

Smart Spaces
Rooms will be equipped with smart technology to streamline care delivery
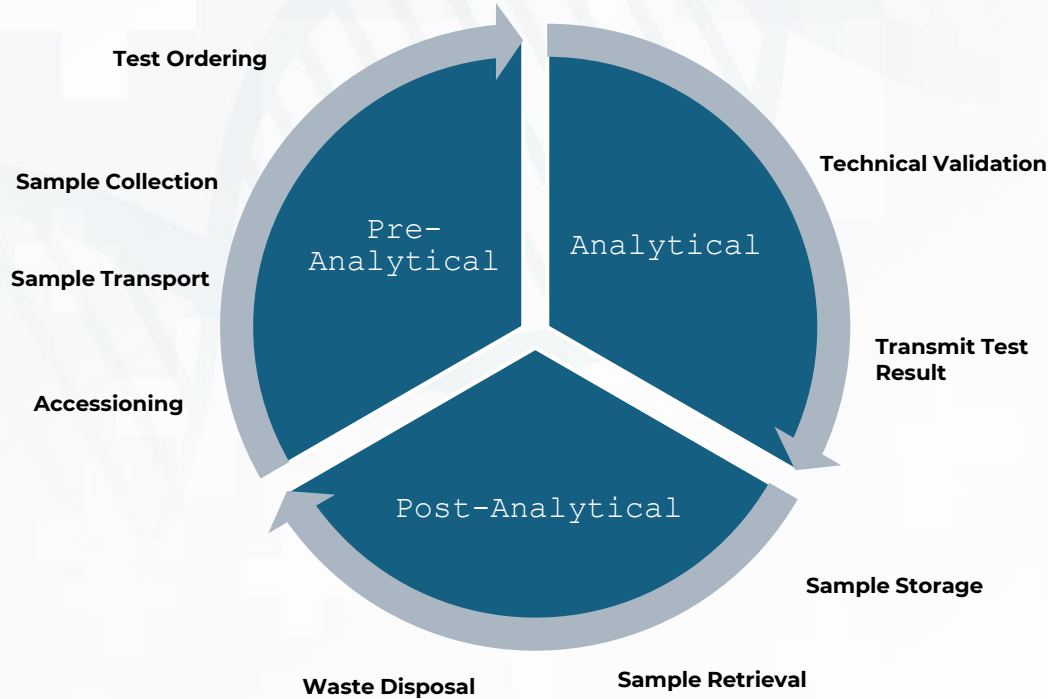
Standardization
Consistent ways of doing things across different parts of the hospital for better quality and safety

Eco-Friendly Practices
Hospitals will be designed with minimal impact on the environment with paperless thus reducing carbon footprint

AUTOMATED DIAGNOSTICS LABORATORY

Pre-Analytical
- Test Ordering
- Sample Collection
- Sample Transport
- Accessioning

Analytical
- Technical Validation
- Transmit Test Result

Post-Analytical
- Sample Storage
- Sample Retrieval
- Waste Disposal

ADVANTAGES

Automation in Quality Management System (QMS)

Automated monitoring of QC – rule-based equipment selection and sample testing

EQAS samples : Monitoring, RCA & CAPA

Automated Quality indicator monitoring for all phases of lab testing (sample rejections , CV%, TAT etc.)

Audit tracking and trend analysis

INTERNET OF MEDICAL THINGS (IoMT)

The Internet of Medical Things (IoMT) encompasses the interconnected network of medical devices and applications that collect and transmit health data, enabling real-time monitoring and analysis by healthcare providers to deliver improved care.

IoMT Four-System Architecture
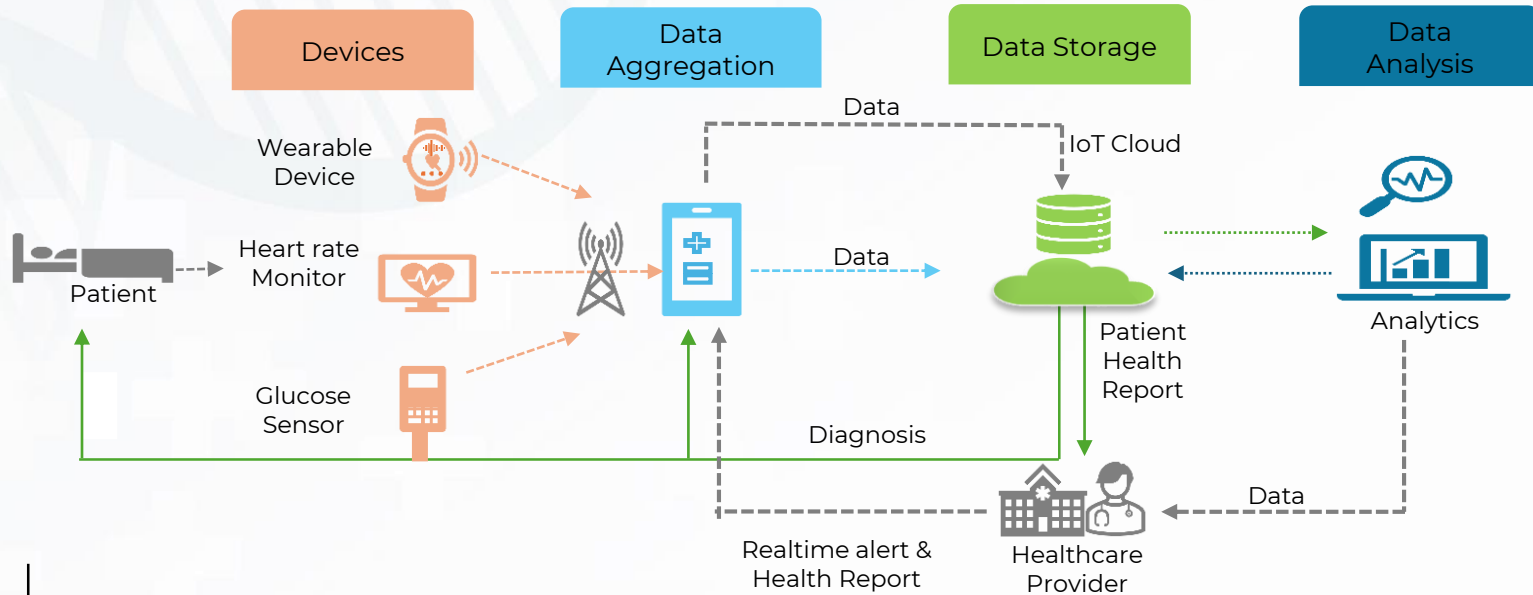
HEALTHCARE CHALLENGES IN INDIA

CORE PROBLEMS

Staff shortage and overworked professionals

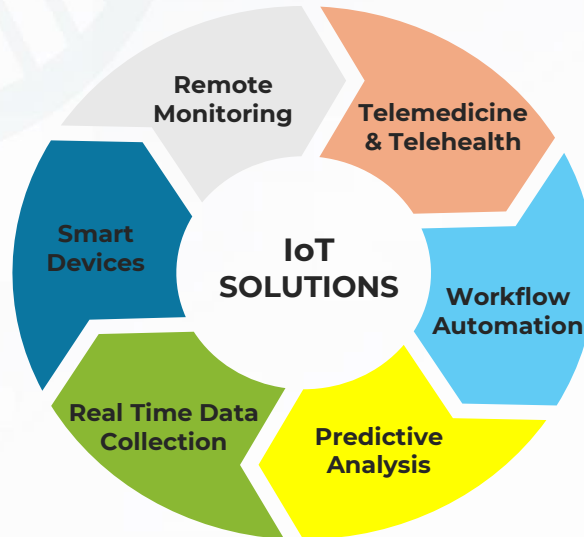Infrastructure and Equipment Deficiencies

Data Management Challenges

Accessibility and healthcare disparities

Quality of Healthcare

- Rural healthcare management
- Crowd Management
- Inefficient patient care
- Medical process Errors
- Recordkeeping
- Lack of emphasis on preventive healthcare

IoT SOLUTIONS

- Remote Monitoring
- Telemedicine & Telehealth
- Workflow Automation
- Predictive Analysis
- Real Time Data Collection
- Smart Devices

- Operational Inefficiencies
- Supply chain management
- Security Challenges
- Sanitization and Hygiene

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IoT & 5G CONNECTIVITY IN HEALTHCARE OPERATIONS EXCELLENCE

Healthcare Operations and Workflow Management

- RFID-enabled asset tracking systems
- Environmental & sanitization monitoring sensors
- Connected medical devices.
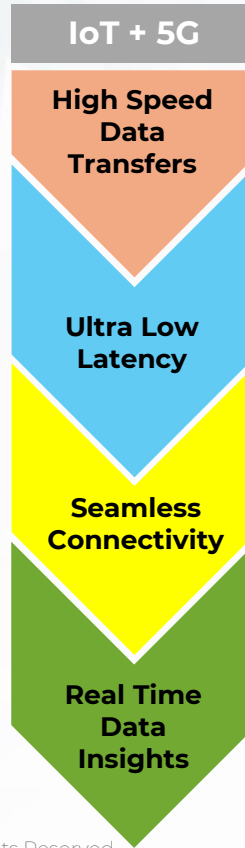- RTLS (Real Time Locations Systems) for patient flow & bed occupancy.

Inventory management and Supply Chain optimization

- IoT devices track consumables, reagents.
- Equipment utilization,
- Predictive analytics optimize stock levels reducing wastage and minimizing delays.

Data Analytics

- Generated healthcare data can help to recognize patterns, and correlations
- Better illness management
- Public health initiatives
- Research projects.

IoT + 5G

- High Speed Data Transfers
- Ultra Low Latency
- Seamless Connectivity
- Real Time Data Insights

Remote Patient Monitoring

- Real time remote monitoring of Vital signs
- Chronic Disease Care
- reducing the need for frequent hospital visits

Smart Medical Devices

- smartwatches, fitness trackers, and biosensors, can track activity levels, sleep patterns, and even detect abnormal heart rhythms

Telemedicine and Telehealth

- virtual consultations
- Tele ICU
- Electronic Prescribing
- improving access to healthcare, particularly in underserved areas

INNOVATIONS AT STEMZ HEALTHCARE

- Facial and Iris scans supported with fingerprint, voice and geolocation data
- Compatible with e-passports and virtual passports

- Faster TAT based on testing protocol and risk potential

- AI-driven decision support systems for adjudicators in the health departments
- Bots to reduce human interaction at centres

Advanced Biometrics

Patient Centric

Emerging Technologies

Innovation

Eco-Friendly

Data Analytics

- Completely paperless processes
- Focus on low carbon footprint

- Integration of big data analytics and machine learning algorithms to enhance diagnostic accuracy and efficiency
- Prediction of downstream health needs of successful patients

ADOPTION OF IoT & 5G AT STEMZ

The adoption of IoT enabled us to streamline workflows, optimize our resource allocation, and reduced time-consuming manual tasks.

It contributed to the efficient management of our assets, inventory, and staffing, ultimately improving productivity and cost-effectiveness.

Crowd Management

- Online Appt. Scheduler
- GRO Kiosk
- RFID Wristband
- Mobile App
- Chatbot in Website

IoMT to Enhance TAT

- Digital Height / Weight / BP Kiosk
- Digital Stethoscope
- Vision Screeners
- Digital BP Machine Linked to System

Enhanced Security Measures

- AI CCTV Camera
- Occupancy Detector
- Smart Access Control

Data Privacy & Confidentiality

- Biometric Authenticated Staff's IT Credentials
- Biometric verified Patient Profile
- Digital Signature

Clinical Laboratory Optimization

- Automated Barcode Labelers
- Automated Lab QC Module
- Sample Transport Robot
- AI Assisted Sample Testing
  *Under Validation

STEMZ VISA MEDICAL CENTER

Overall Layout

1	RECEPTION
2	WAITING AREA
3	VACCINATION ROOM
4	CONSULTANT ROOM
5	MEDICAL DIRECTOR ROOM
6	X-RAY ROOM
7	TOILETS

FLOOR PLAN

Reception

Waiting Area

X-Ray Room

Futuristic Medical Centres

Vaccination Room

Consultant Room

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THANK YOU