

Q-ARM - Quality Audit & Risk Management Portal An In-House

Category: Digital Excellence

Focus Area: Digital dashboards and analytics for clinical and quality decision-making

Primary Author: NAGESWARA RAO KARRI

User Details

Contact Person Name: NAGESWARA RAO KARRI

Designation: SENIOR MANAGER - QUALITY & HIM

Phone Number: 9912369111

Email Address: nrkarri999@gmail.com

Organisation: AAYUSH NRI LEPL HEALTHCARE PVT LTD,

City / State: VIJAYAWADA, ANDHRA PRADESH

Problem Statement / Digital Challenge

Aayush Hospitals, Vijayawada, faced a critical operational gap: hospital quality management was entirely fragmented – Hand Hygiene audits on paper, KPI data across 14 Excel files, committee minutes distributed via email/WhatsApp, medication chart compliance estimated subjectively, policy documents in unlocked physical binders, and incident root cause analysis in free-text with no structured framework. There was no unified digital platform.

The key challenge: quality data existed in silos. Monthly KPI reports took 2–3 days to compile after month-end. Committee acknowledgements had no medicolegal standing. Incident RCA had no consistent structure. Staff could not access NABH standards without the physical book. Leadership had no real-time visibility into compliance.

A digital solution was required because manual systems were unable to provide the audit trails, trend analytics, and real-time compliance visibility that NABH accreditation demands – and no affordable integrated platform existed in the market.

Stakeholders most affected: Quality team (no real-time data), IPC auditors (manual HH compilation), Committee members (no digital acknowledgement trail), Pharmacy auditors (no structured MCA tool), Nursing leadership (no KPI trend visibility), Top

Management (no live dashboard), Patients (no structured PREM/PROM capture).

Key NABH quality indicators and aspects impacted: IPC 6d (Hand Hygiene monitoring), MOM 4g (Prescription audit), PSQ 3 (KPI tracking), PSQ 7 (Incident management), ROM 1 (Committee governance), PRE 7 (Patient experience), HRM 5 (Training records), IMS 3 (Documentation management) – all 10 NABH chapters were affected by the fragmentation.

Digital Tool / Solution Implemented

Q-ARM – Quality Audit and Risk Management Portal is a fully integrated, in-house built, AI-assisted digital quality management platform developed entirely by the hospital's own Quality Senior Manager.

In-house built. No vendor. No external developer. Zero licensing cost. Hospital owns every line of code permanently.

Key features: 57 NABH KPI tracking with live Presentation Mode (one KPI per slide with trend chart, benchmark spotter line, RCA and CAPA); WHO 5-moment Hand Hygiene audit with real-time analytics; NABH 6th Edition browser (639 OEs, keyword searchable); Committee lifecycle management (schedule – attendance – AI minutes – digital distribution – per-member acknowledgement with timestamp); 4-stage Incident Reporting with 5M Fishbone RCA; Watermarked policy viewer (print and download disabled, viewer name + date + time on every page);

Patient Experience module (PREM and PROM); Training, Utility Management, and Employee Master – 11 integrated modules, zero internet dependency.

Digital Implementation Highlight

Time taken for rollout: Q-ARM has been developed and deployed iteratively since early 2026, going through 1,792+ build versions – each addressing a real clinical quality need identified in live hospital use. The system was live and operational before the NABH accreditation process commenced. Staff trained and departments covered: 20+ staff members across 12 clinical and support departments trained and actively using Q-ARM. Roles covered: IPC Auditors (Hand Hygiene), Pharmacy Auditors (Medication Chart Audit), MRA Auditors (Medical Records), PPE Auditors, Committee Members (15 committees, 67 unique members, 216 memberships), Quality Manager, and Top Management. Internal champions who led the initiative: The initiative was conceived, designed, developed, and deployed by me – Karri Nageswara Rao, Senior Manager - Quality & HIM under the able guidance of Dr Y Ramesh Babu – without any external vendor, IT or software developer. My dual role as both the Quality & HIM professional who identified every gap and the developer who solved it produced a platform with a depth of NABH alignment that no commercial product could match. Quality Team continues to develop, maintain, and enhance Q-ARM based on daily operational feedback – making continuous improvement a built-in feature of the platform.

Digital Impact

Operational improvements: Quality review meetings now begin without any preparation – live KPI Presentation Mode replaces manually updated PowerPoint slides. Monthly compliance reports that previously took 2–3 days to compile are generated in seconds. 100% paperless committee meetings across 15 committees eliminated physical signature rounds and WhatsApp-based minute distribution. Committee minutes are acknowledged digitally by 67 unique members across 216 memberships with permanent medicolegal-grade timestamps.

Quality and safety improvements: Hand Hygiene compliance now tracked in real time with WHO moment-wise breakdown across all staff categories – replacing end-of-month manual tallying. Medication Chart Audit compliance tracked drug-name-wise and doctor-wise, identifying specific prescribing gaps. Incident Root Cause Analysis is now structured. Policy document access now watermarked with viewer name, date, and time – preventing unauthorised distribution.

NABH digital health accreditation support: Q-ARM provides digital evidence across all 10 NABH chapters simultaneously – KPI trends (PSQ 3), HH compliance (IPC 6d), prescription audit (MOM 4g), committee governance (ROM 1), incident RCA (PSQ 7), training records (HRM 5), medical records audit (IMS 3), and patient experience (PRE 7) – in one integrated, assessor-ready platform.

Key Enablers / Innovations

Key enablers:

Single dedicated internal champion with dual expertise “NABH quality knowledge combined with self-taught development capability. Hospital leadership support enabling dedicated time for development alongside clinical quality responsibilities. A hospital LAN infrastructure providing reliable connectivity without internet dependency. A 4TB dedicated external drive enabling automated daily backup at zero recurring cost.

Key innovations:

Live KPI Presentation Mode “one KPI per slide with trend chart, benchmark spotter line, RCA and CAPA, navigable with Next button” eliminating pre-meeting preparation entirely. Watermarked PDF policy viewer with print and download disabled “simultaneously enabling access and enforcing confidentiality. Complete NABH 6th Edition embedded inside the platform with full-text keyword search across 639 Objective Elements. 4-stage incident workflow with structured 5M Fishbone RCA replacing free-text analysis. Per-member digital committee acknowledgement with medicolegal-grade timestamp and status.

software budget, IT team, or vendor” using only domain expertise, determination, and iterative development over 1,792+ build versions.

Key Learnings & Sustainability

Top learnings: First: the person closest to the quality problem is the most qualified to design the solution. Domain expertise outweighs technical expertise when building clinical quality tools” because knowing exactly what "not working" looks like in practice produces better design than any vendor requirement document. Second: simplicity is the most reliable architecture. A single HTML file and a Node.js server” with no framework dependencies, no cloud, and no database” is more resilient in a hospital environment than any enterprise software stack. Third: iterative improvement embedded in daily use produces better outcomes than any planned release cycle. What other hospitals should consider: Start with the modules that create the most daily friction” KPI compilation and committee governance are universal pain points. Build or adopt incrementally. Own your data. Never accept vendor dependency for healthcare quality data. Sustainability: Q-ARM requires zero licensing cost, zero vendor support, and

Reference Sources (If Applicable)

National Accreditation Board for Hospitals and Healthcare Providers (NABH). NABH Standards for Hospitals” 6th Edition. Quality Council of India, 2023. All 10 chapters, 100 standards, and 639 Objective Elements embedded and referenced throughout Q-ARM.

World Health Organization (WHO). WHO Guidelines on Hand Hygiene in Health Care: a Summary. WHO Press, 2009. WHO 5-moment observation methodology implemented in the Hand Hygiene Audit module. Reference: <https://www.who.int/gpsc/5may/tools/en/>

NABH. Medication Error – A NABH Initiative. Quality Council of India. Prescription audit methodology referenced for the Medication Chart Audit (MCA) module aligned to NABH MOM 4g.

National Coordinating Council for Medication Error Reporting and Prevention (NCC-MERP). Definition of Medication Error. Referenced in KPI indicator definition for Incidence of Medication Errors (Pharmacy KPI).

CDC/NHSN. National Healthcare Safety Network Surveillance Definitions for CAUTI, VAP, CLABSI, and SSI. Centers for Disease Control and Prevention, USA. Referenced in Infection Control KPI definitions (KPIs 13, 14, 15, 16).

CAHO - PREM tool.

American Heart Association / ACC. STEMI Door-to-Balloon Time guidelines.

Referenced in Cardiology department-specific KPI (Door-to-balloon time $\approx$ 90 minutes).

PDF.js $\hat{=}$ Mozilla Foundation. Open-source PDF rendering engine used for the watermarked policy document viewer. <https://mozilla.github.io/pdf.js/>