



# NATIONAL BOARD FOR TECHNICAL EDUCATION FEDERAL MINISTRY OF EDUCATION

## PROJECT BLUEPRINT

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### Quality Assurance Management Systems (QAMs)

“Chain of Integrity”

Personnel; QAAs, IQAMs & EQAMs Operations.

#### Project Highlights:

- Digital Quality Assurance Management System (DQMS)
- QAM Personnel Data Pool
- Chain of Integrity Workflow
- Personnel Deployment Engine
- Role Based Access Control
- Geotagging & Offline Compatibility
- Cross Platform Development
- User Guide & Operations Manual

Integration:  
NBTE Intelligent Dashboard

Version:  
2.2.1 (Spatial tracking enabled)

Supported by:  
Kimia Technology Services Ltd

 [www.kimia.com.ng](http://www.kimia.com.ng)



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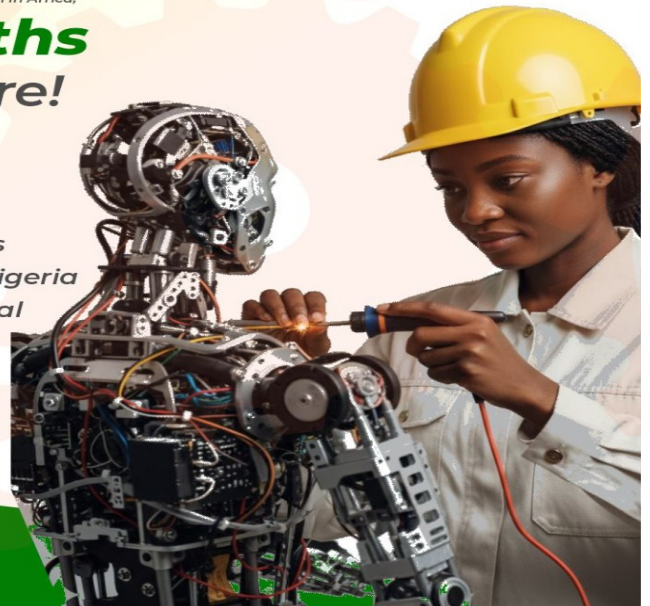
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## 1. CONCEPTUAL OVERVIEW

The QAMs Module is a high-integrity, geospatial management layer integrated into the existing NBTE Intelligent Dashboard. It automates the tracking, deployment, and workflow of quality assurance personnel across Nigeria's TVET centers.

The system is built on a "Chain of Integrity", a sequential validation process that ensures every skill certified at a training center is verified by three distinct levels of authority.

### \* **The three-tier hierarchy (personnel)**

The platform manages three primary resource roles, each with a specific scope of authority:

| Role | Level | Supervision Scope |

| QAA | Assessor | Trade Level: Assesses specific student activities (e.g., Welding, Hardware Repair). |

| IQAM | Internal Manager | Program Level: Supervises a specific trade/course within a single Training Center. |

| EQAM | External Manager | Center Level: Supervises the Center's entire output, including the IQAM and QAAs. |

## 2. CORE PLATFORM STRUCTURE

The module leverages the Existing Institutions Database already on the Intelligent Dashboard and adds the following layers:

### A. Spatial Placement Engine

- \* **Geolocation Tracking:** Real-time tracking of QAAs and IQAMs via mobile GPS metadata.
- \* **Deployment Mapping:** Admins can view a map of all Training Centers and "Drag-and-Drop" available QAAs to centers based on proximity.
- \* **Audit Trail:** Logs the exact time and location of an assessor to prevent "ghost" assessments (assessing from home).

## B. The Chain of Integrity Workflow

- \* **Stage 1 (QAA)** Records student competency and uploads video/digital evidence.
- \* **Stage 2 (IQAM):** Reviews the QAA's work for that specific trade.
- \* **Stage 3 (EQAM):** Performs the final center-wide audit and provides the "Seal of Quality."

## C. Unified Management Dashboard

- \* **Admin View:** Full bird's-eye view of all placements, current movement of personnel, and "Chain" health.
- \* **User View:** Personalized task-list for QAAs/IQAMs showing their assigned centers and trade focus.

## 3. PRIMARY USE CASES

- \* **Automated Accreditation:** Replacing manual paper trails with a digital chain of evidence.
- \* **Personnel Logistics:** Identifying the nearest certified "Hardware Repair" QAA to a center in need of assessment.
- \* **Anti-Fraud Monitoring:** Using GPS and timestamping to ensure quality managers are physically present at the training centers.
- \* **Skills Gap Analytics:** Visualizing which trades (e.g., Welding) have the most active assessments across the country.

## 4. DEVELOPMENT TEAM

**Lead Firm:** Kimia Technology Services Ltd

- NBTE Department of Quality Assurance
- NBTE Data Management Unit
- NBTE TVET Center of excellence

## 5. PROJECT VISION

By digitizing the QAMs, the National Board for Technical Education is not just building a database; we are building Trust. The "Chain of Integrity" ensures that every certificate issued by the NBTE is backed by a verifiable, geo-tagged, and multi-supervised assessment process.

### TECHNICAL FEATURES LIST:

To finalize the QAMs Mobile Interface, we focus on the "Field" experience. Since the QAA and IQAM are mobile by nature, the interface must prioritize location accuracy, low-bandwidth video uploads, and task-based navigation.

Below is the technical feature list and UI/UX requirements for the mobile version of the "Chain of Integrity."

#### QAMs Mobile: "The Field Assistant" (Technical Feature List)

##### 1. Geospatial & Presence Integrity

The "Chain of Integrity" relies on proof of presence. The mobile module will include:

- \* **Geofencing Lock:** The "Begin Assessment" button only activates when the user's GPS coordinates are within 100 meters of the assigned Training Centre.
- \* **Background Breadcrumbs:** Periodic pings to the server to verify the user stayed on-site for the duration of the assessment.
- \* **Timestamped Media:** Every photo or video captured is embedded with Exif Metadata (Time, Date, Latitude, Longitude) to prevent the use of old or external media.

##### 2. The Trade Assessment Workflow (QAA/IQAM)

- \* **Active Assignment Toggle:** A list view of all Centres assigned to the user. Tapping a centre reveals the specific trades (e.g., Welding) requiring assessment.

- \* **Binary Competency Matrix:** A simple "Competent" vs. "Not Yet Competent" toggle for each student, reducing data entry time in workshop environments.
- \* **Evidence Quick-Uploader:** A specialized tool to record short 60-second video clips of practical tasks. The app will auto-compress these for the NBTE Intelligent Dashboard to save data.

### 3. Real-Time Synchronization

- \* **Offline Mode:** If a centre (e.g., in a remote area) has poor connectivity, the app stores assessments locally and auto-syncs to the Kimia server once back in a 4G/Wi-Fi zone.
- \* **Push Notifications:** Instant alerts when a director or EQAM flags an assessment for review, allowing the QAA to address it while still at the centre.

### 4. Admin/Logistics View (Mobile)

#### For the IT Manager or NBTE Directors:

- \* **Map "Pulse":** A live map showing dots representing every QAA/IQAM currently in the field.
- \* **Placement Shortcut:** Tap a centre on the map to see the nearest available (idle) resource person and assign them instantly.

## TECHNICAL DEVELOPMENT REQUIREMENTS (FOR KIMIA BACKEND TEAM)

| Feature | Tech Implementation | Requirement |

| Location Tracking | expo-location or Geolocation API | High accuracy (GPS) enabled. |

| Storage | Supabase Storage / S3 Bucket | Optimized for video "Portfolio of Evidence." |

| Mapping | Mapbox SDK | Integration with existing Intelligent Dashboard Center coordinates. |

| Auth | JWT / Role-Based | Hard-coded role validation for QAA/IQAM/EQAM. |

## EXECUTION STRATEGY: THE "Y4WADY" MILESTONE

To ensure this is ready for the January 27th Onboarding:

- \* **Frontend Team:** Create the "Mobile Responsive" shell in using the instructions provided.
- \* **Backend Team:** Link the Location\_Logs table to the Institutions table so that a user's distance from a center can be calculated in real-time.
- \* **Data Team:** Ensure all 5,000 legacy records have correct GPS coordinates so the placement engine functions accurately from day one.

## PLATFORM FUNCTIONALITIES & NAVIGATION GUIDE

The QAMs module is organized into six core functional pillars. Users can navigate these via the "Chain of Integrity" sidebar on the main dashboard.

### 1. QAM Placement Map (National Visual Display)

This is the "Command Center" of the platform. It provides a real-time geospatial visualization of all Quality Assurance activities across Nigeria.

- \* **Functionality:** Interactive map toggles showing active assessments, center density, and personnel distribution.
- \* **Navigation:** Filter by State, Zone, or Trade (e.g., "Show all Welding assessments in Kaduna").
- \* **Insight:** Icons change color based on status (Green for "Completed," Amber for "Ongoing," Red for "Flagged").

## 2. QAM Personnel Pool (Registry)

The centralized directory of all certified human resources available for the QAMs framework.

- \* **Functionality:** Searchable list of all registered QAAs, IQAMs, and EQAMs. Includes their trade specializations, NBTE certification numbers, and historical performance ratings.
- \* **Navigation:** Use the "Search" bar to find specific personnel or filter by "Availability Status."

## 3. Spatial Placement Engine (Deployment Tool)

The engine used by Admins to move personnel from the "Pool" to the "Centers."

- \* **Functionality:** Bridges the gap between the Personnel Pool and the existing Centers list. It calculates the proximity of a QAA to a Center and handles the official Letter of Deployment.
- \* **Navigation:** Select a Center , Click "Assign Personnel", Choose from the proximity-sorted list.

## 4. Chain of Integrity (Activity Workflow)

The heart of the digital audit. This feature enforces the three-step validation sequence.

### **Functionality:**

- \* QAA Upload: Interface for field entry and video evidence.
- \* IQAM Assessment: Interface for trade-level supervision and feedback.
- \* EQAM Approval: The final "Seal of Quality" for the entire center.

Navigation: Follow the vertical progress stepper: Entry, Supervision, Approval.

## 5. Workflow Oversight (Admin Monitor)

A specialized view for the IT Manager (Kimia Tech) and NBTE Directors to monitor the "health" of the workflow.

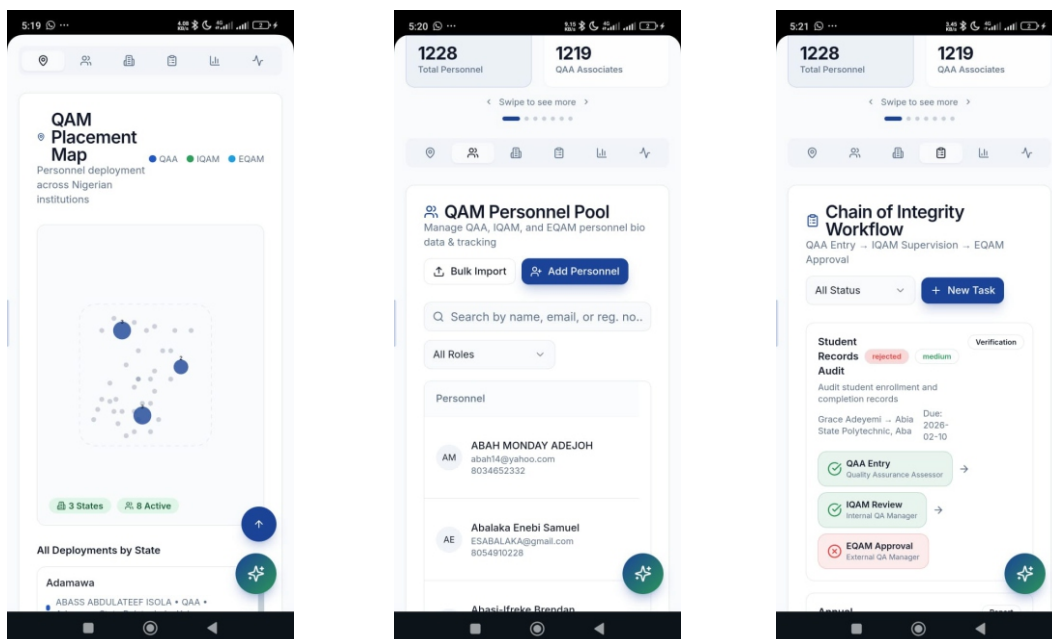
- \* **Functionality:** Identifies bottlenecks. If a record is stuck at the IQAM level for more than 48 hours, it is flagged here for administrative intervention.
- \* **Navigation:** View the "Bottleneck List" to see which centers are lagging in approvals.

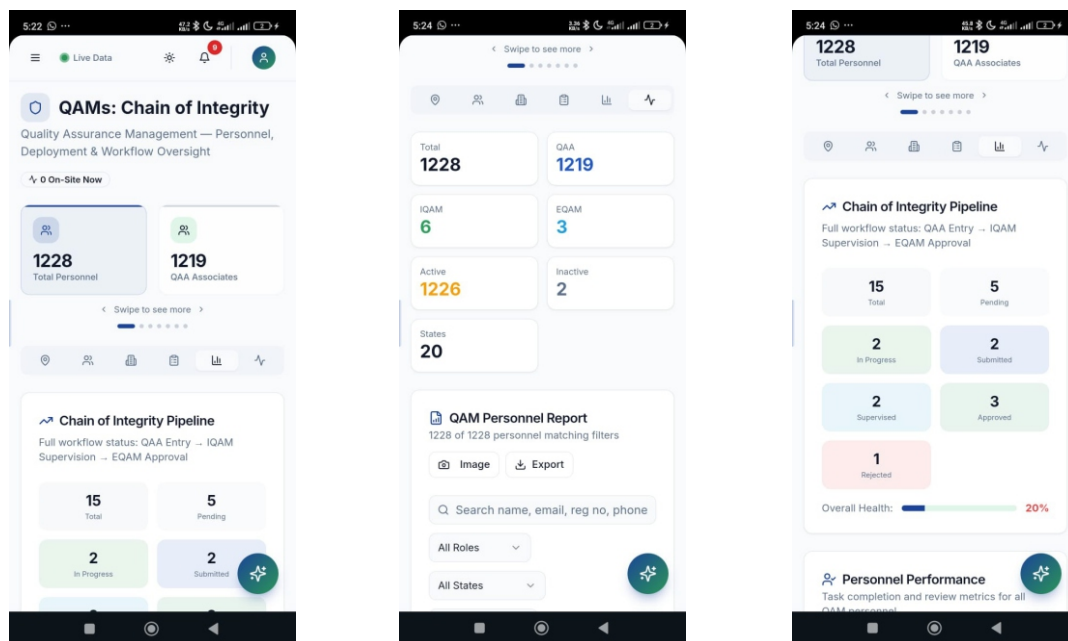
## 6. Reports & Analytics

The data-output engine used for high-level decision-making and briefing the ES.

- \* **Functionality:** Generates automated PDF/Excel reports on the 70:30 Ratio, personnel efficiency, and national competency trends.
- \* **Navigation:** Select "Generate Report", Choose Date Range, Export.

## DASHBOARD PREVIEW (INTERFACE SCREENSHOTS)





To ensure the QAMs Module is not only functional but legally resilient, we must integrate a Data Governance & NDPA Compliance page. This is critical because you are handling sensitive professional data, including GPS locations, biometric-linked certifications, and video evidence of Nigerian citizens.

Below is the structure for the new module page, aligned with the Nigeria Data Protection Act (NDPA) 2023.

## DATA GOVERNANCE & NDPA COMPLIANCE GUIDE

This page serves as the "Legal Shield" for the platform, ensuring all activities by Kimia Technology Services and NBTE meet national privacy standards.

### 1. Data Processing Principles (NDPA Section 24)

The platform is built on the following legal pillars:

- \* **Lawfulness & Fairness:** Data is collected solely for the purpose of TVET quality assurance as mandated by the NBTE Act.
- \* **Purpose Limitation:** QAA/IQAM location data is only tracked during active deployment hours and is never used for non-official surveillance.

- \* **Data Minimization:** We only collect the specific fields required for the "Chain of Integrity"—no unnecessary personal information is stored.

## 2. The "Chain of Custody" for Privacy

| Entity | Legal Role (NDPA) | Responsibility |

| NBTE | Data Controller | Owns the data and decides why it is collected.  
|

| Kimia Tech | Data Processor | Manages the warehousing, cleaning, and security of the data. |

| QAA/IQAM/EQAM | Data Subjects | Have the right to access their data and request corrections. |

## 3. Security Measures (Technical & Organizational)

To comply with the Act's requirement for "appropriate technical measures," the platform employs:

- \* **Encryption at Rest & Transition:** All records and video evidence are encrypted using AES-256 standards before being stored on the NBTE server.
- \* **Role-Based Access Control (RBAC):** A QAA cannot see the personal files of another QAA. Access is strictly "Need-to-Know."
- \* **Audit Logging:** Every time a record is viewed, edited, or approved, the system logs the User ID, IP Address, and Action. This provides a forensic trail for the "Chain of Integrity."

## CONSENT & RIGHTS MANAGEMENT

- \* **Privacy Notice:** Upon first login (Jan 27 Onboarding), every team member and QAM personnel must click "Accept" on a Privacy Policy that explains how their location and professional data will be used.
- \* **Right to Rectification:** Users can flag errors in their profiles (e.g., wrong specialization) via a "Data Correction Request" button, which routes to Ahmed (Lead Data Auditor).

## IMPLEMENTATION FOR THE DEVELOPMENT TEAM

To make this page "Live," the Backend Team must implement the following:

- \* **Retention Policy Logic:** Records must be "Archived" after 5 years and "Purged" after 10 years, unless active litigation or board policy requires otherwise.
- \* **Data Portability API:** A feature allowing users to download their professional "Portfolio of Evidence" (PoE) in a machine-readable format (JSON/PDF).
- \* **Breach Notification Trigger:** An automated alert system that notifies the IT Manager and the NBTE Digital Assistant if unauthorized access is detected.

**QAMs Platform: EULA & Data Privacy Consent**  
**Version: 1.0 (NDPA 2023 Compliant)**  
**Effective Date: January 27, 2026**

### 1. Acceptance of Terms

By clicking "I ACCEPT," you (the "User") enter into a legally binding agreement with Kimia Technology Services Ltd and the NBTE. You agree to use the QAMs module solely for official Quality Assurance purposes.



Scan this code to install

## 2. Monitoring & Geospatial Tracking (The "Chain of Integrity")

You explicitly consent to the following:

- \* **Real-time Tracking:** The platform will access your device's GPS to verify your presence at assigned Training Centers.
- \* **Proof of Work:** Any media (photos/videos) uploaded will include metadata tags (time/location) to validate the "Chain of Integrity."
- \* **Session Logs:** Your IP address and activity will be logged to prevent unauthorized data manipulation.

## 3. Data Confidentiality (Non-Disclosure)

As a team player or QAM personnel, you will have access to "Classified National Data" (Student records, Institutional SSQs, etc.).

- \* You shall NOT download, screenshot, or share any data outside the QAMs platform.
- \* Unauthorized disclosure of data is a criminal offense under the Nigeria Data Protection Act (NDPA) and may lead to prosecution.

## 4. Code of Conduct

- \* **No Proxy Entry:** You shall not share your login credentials. Every entry must be tied to your unique ID.
- \* **Integrity of Entry:** Falsifying an assessment (e.g., marking a trade "Competent" without physical review) will result in immediate termination of your platform access and reporting to the NBTE Board.

## BACKEND TEAM: "THE COMPLIANCE GATE"

To implement this on the NBTE Intelligent Dashboard, the development team must configure the following logic:

| Feature | Technical Implementation |

| Consent Log | Create a User\_Consent table in the database that stores the User\_ID, Timestamp, and IP Address of the "I ACCEPT" click. |

| Access Block | Direct all traffic to this EULA page. Disable all other 6 features (Map, Pool, Engine, etc.) until consent is logged. |

| PDF Export | Allow users to download a signed copy of their consent for their personal records. |

## Quality Assurance Management System (QAMs)

### THE CHAIN OF INTEGRITY

National Board for Technical Education (NBTE) | QAMs Digitization & Automation

Developed by: Kimia Technology Services Ltd ([www.kimia.com.ng](http://www.kimia.com.ng))

Status: In Development (Onboarding: Jan 27 | Y4WADY: Early Feb 2026)

#### 1. PROJECT OVERVIEW

The Quality Assurance Management System (QAMs) is a high-integrity, geospatial automation module integrated into the NBTE Intelligent Dashboard. It transitions TVET quality monitoring from manual paper-based processes to a "Chain of Integrity"—a multi-tier digital workflow that ensures every technical skill certified in Nigeria is verified by location-tracked, certified personnel.

#### 2. THE WORKFLOW HIERARCHY

QAA (Quality Assurance Associate): Frontline trade-level assessment and evidence upload.

IQAM (Internal QA Manager): Institutional/Program-level supervision and validation.

EQAM (External QA Manager): National/Board-level final audit and quality approval.

#### 3. CORE PLATFORM FEATURES

The platform is navigated through six (6) distinct strategic pillars:

- **QAM Placement Map:** A national visual display using geospatial data to show real-time QAM activities, assessment density, and center-level status updates across the federation.
- **QAM Personnel Pool:** A centralized registry of all certified personnel. Admins can view specializations, certification status, and performance history of all QAAs, IQAMs, and EQAMs.
- **Spatial Placement Engine:** A smart deployment tool that leverages the existing list of NBTE Centers to assign personnel based on trade expertise and proximity to the center.
- **Chain of Integrity Workflow:** The heartbeat of the system. Enforces a strict linear sequence: Field Data Upload (QAA) → Verification (IQAM) → Final Approval (EQAM).
- **Workflow Oversight:** An administrative monitor to track the "health" of assessments, identifying bottlenecks and ensuring no record is delayed beyond the 48-hour SLA.
- **Reports & Analytics:** A data engine providing instant insights into the 70:30 Technology-to-Management ratio, national competency trends, and personnel efficiency.

#### 4. DATA GOVERNANCE & COMPLIANCE (NDPA 2023)

The platform is built on a "Privacy-by-Design" framework, fully compliant with the Nigeria Data Protection Act:

- **Proof of Presence:** Uses GPS geofencing to ensure personnel are physically on-site.
- **Data Security:** All student and institutional data is encrypted (AES-256) and stored on secure NBTE servers.
- **Auditability:** Every action—from upload to approval—generates a forensic timestamped log.

#### 5. DEVELOPMENT TEAM (KIMIA TECH)

- **Management:** IT Manager & Systems Analyst.
- **Data Transformation:** KimiaTech Team.
- **Engineering:** Dedicated Frontend (React Native) and Backend (Supabase/API) teams.

# QAM DASHBOARD

## USER GUIDE & OPERATIONS MANUAL

Technical & Vocational Intelligent Dashboard (TVID)

National Board for Technical Education (NBTE)

Version 1.0 | February 27, 2026 | Classification: Official Use

### 1. Introduction & Strategic Purpose

The Quality Assurance Management (QAM) Dashboard is a core module of the NBTE Technical & Vocational Intelligent Dashboard (TVID). It serves as a centralized digital platform for recruitment, deployment, supervision, and performance monitoring of Quality Assurance personnel across all accredited TVET institutions in Nigeria.

This revised executive version provides a condensed operational guide highlighting governance structure, workflow integrity, analytics capabilities, and compliance standards.

#### **Key Objectives:**

Standardize quality assurance processes nationwide.

Maintain a transparent and auditable chain of integrity.

Enable real-time monitoring of personnel and institutional coverage.

Support evidence-based oversight at state and national levels.

### 2. Governance Structure & Roles

The QAM module operates under a structured hierarchical workflow ensuring accountability and oversight across all operational levels.

#### **Quality Assurance Assessor (QAA):**

Front line assessor deployed to institutions conducts assessments, submits reports with attachments, collects learner bio-data, and performs check-in/check-out verification.

#### **Internal Quality Assurance Manager (IQAM):**

Supervises QAAs within a state and trade specialization. Reviews submissions, provides comments, forwards approved tasks to EQAM, and monitors personnel coverage.

#### **External Quality Assurance Manager (EQAM):**

Provides final approval authority at state level, oversees IQAM placements, monitors regional chain-of-integrity health, and generates state-level reports.

#### **Director & Deputy Director:**

Provide national-level oversight, cross-state visibility, recruitment supervision, strategic analytics, and overall QAM policy direction.

### **3. Core System Operations**

#### **3.1 Personnel & Recruitment Management**

The Personnel Manager maintains a searchable registry of QAAs, IQAMs, and EQAMs. The Recruitment Pipeline manages onboarding through six stages: Application, Screening, Training, Examination, Certification, and Deployment.

#### **3.2 Assignment Engine**

The Assignment Engine governs deployment workflows: EQAMs place IQAMs within their state; IQAMs assign QAAs based on trade match. Assignments include trade, qualification, institution, date range, and status indicators (Placed/Unplaced).

#### **3.3 Task Workflow & Chain of Integrity**

Tasks progress through a structured pipeline: QAA Submission → IQAM Supervision → EQAM Approval. Status transitions (Pending, In Progress, Submitted, Supervised, Approved/Rejected) are timestamped and user-attributed, ensuring full accountability.

#### **3.4 Placement Map & Coverage Monitoring**

An interactive state-level placement map provides geographic visualization of personnel deployment. Color-coded density indicators highlight coverage gaps and unserved institutions.

#### **3.5 Analytics & Reporting**

The Analytics module provides performance dashboards, task completion metrics, personnel growth trends, and state distribution analysis. Reports are exportable in CSV, Excel, PDF, and Word formats with official NBTE watermarking.

### **4. Data Governance & Compliance Framework**

The QAM Dashboard aligns with NBTE digital governance principles to ensure data accuracy, security, confidentiality, and accountability.

#### **Data Standards & Validation:**

Personnel records require complete identity, contact, state, role, trade specialization, and qualification details. Real-time validation prevents incomplete submissions, while duplicate detection safeguards database integrity during bulk imports.

#### **Access Control & Role-Level Security (RLS):**

QAAs access only their assignments. IQAMs access state-level QAA data. EQAMs have state-wide approval rights. Directors and Administrators have cross-state oversight. All database queries are filtered server-side to enforce security policies.

#### **Audit & Accountability:**

All data edits, task transitions, assignment updates, check-in/check-out events, and imports are logged with user ID and timestamp. Escalations and disputes are fully recorded for traceability.

## **Confidentiality & Export Controls:**

Exports support CSV, Excel, PDF, and Word formats. Field-level selection minimizes data exposure. All exported reports include watermarking and generation timestamps. Personnel contact information is treated as sensitive data.

## **5. Operational Workflow Summary**

1. Recruitment and on boarding via structured pipeline.
2. Deployment through Assignment Engine.
3. QAA task submission with documentation.
4. IQAM supervisory validation.
5. EQAM final approval.
6. Analytics integration for monitoring and reporting.
7. Escalation to Director level where required.

## **6. Support & Contact**

For technical issues, contact the NBTE IT Department, the UNESCO-UNIVOC Centre of Excellence, or designated TVID System Administrator. For governance and policy matters, contact the QAM Directorate.

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