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Standardizing Annual Faculty Governance and REF Analysis for a Leading Academic Medical Center

Digitizing institutional compliance and effort validation for tenure-track faculty using a secure, multi-tenant TypeScript application featuring SAML SSO integration and migration-driven database lifecycles.

Overview

We developed Academic Excellence Commission (AEC), an enterprise-grade, full-stack TypeScript web application to centralize institutional governance.

- Replaced fractured, spreadsheet-reliant review practices with automated workflows for annual faculty effort validation and scientific research tracking.
- Integrated secure SAML Single Sign-On (SSO) across development, sandbox, staging, and production clusters to safely handle multi-departmental administrative roles.

Client Profile

This prominent US academic health system operates multiple inpatient facilities and specialized outpatient centers. Driven by a large workforce of healthcare professionals, researchers, and educators, the organization leverages technology-driven innovation to establish cutting-edge benchmarks for medical workflows and patient-centered hospitality.

Challenges: Fragmented Evaluations and Compliance Risks

Managing annual faculty performance reviews across autonomous departments created massive administrative friction:

- **Lack of Institutional Standardization:** Individual departments utilized distinct evaluation approaches, making centralized institutional data normalization impossible.

- **Opaque Effort Validation Tracks:** Tracking and auditing the precise split of clinical, educational, and laboratory efforts for tenure-track faculty lacked structural rigor.
- **Complex Research Funding Metrics:** The administration lacked an institutional system of record to execute precise REF analysis against research baselines.
- **Role Incoherence & Security Holes:** Academic files involve sensitive data, requiring a highly regulated access control matrix for central administrators, department coordinators, and chairs.
- **Operational Continuity Friction:** Manual platform build methods and brittle database schema updates routinely risked data drift during fiscal-year application rollovers.

Solution: Centralized Governance & Workflow Engine

We engineered the AEC platform as a highly structured, scalable software tool that unifies the annual review lifecycle. Built on a modernized TypeScript stack using a Node.js backend and an intuitive React frontend, the system functions as the authoritative institutional system of record.

The platform architecture optimizes operational workflows across three technical layers:

1. Hierarchical, Role-Based Workflow Engine

We mapped out and digitized distinct, role-aligned permission sets to automate the review lifecycle cleanly across institutional hierarchies:

- **Central Academic Administration:** Accesses a global oversight dashboard to manage institutional benchmarks and verify multi-department compliance.
- **Department Administrators:** Utilize a specialized workspace to input granular data records, update timelines, and handle operational coordination.
- **Department Chairs:** Interact with an executive evaluation panel to review validated effort metrics and sign off on final career progress decisions.

2. Analytical REF & Effort Validation Module

Programmed data computation engines that automatically cross-examine reported faculty timesheets against formal institutional expectations. The platform introduces native REF analysis capabilities, enabling administrators to instantly weigh a faculty member's progress against research funding mandates and grant metrics.

3. Migration-Driven Database Foundation & SAML Security

To safeguard data integrity across multi-year cycles, we constructed a robust MySQL database architecture governed by strict migration-driven lifecycle management scripts. For identity assurance, the system integrates standard SAML-based SSO authentication, backed by clear environment-aware configuration mappings across developer, sandbox, and live production endpoints.

Key Features and Technical Highlights

- **Full-Stack TypeScript Composition:** Strong type-safety boundaries reduce execution errors across frontend React modules and backend Node.js endpoints.
- **Automated Data Lifecycle Migrations:** Scripted model generation and migration execution patterns guarantee consistent, non-destructive schema evolutionary paths.
- **SAML-Compliant Federated Security:** Enterprise identity integrations protect clinical and academic portfolios from unauthorized traversal.
- **Standardized Build Automation:** Utilizes unified make files and integrated npm scripts to execute automated testing, continuous integration (CI), and application runtime operations smoothly.
- **Dynamic Content Presentation:** Styled with optimized, modular SCSS layouts to deliver a clean, highly scannable web console for busy administrative chairs.

Impact

- **Standardized Institutional Governance:** Established a uniform, defensible mechanism for auditing annual faculty evaluations across all medical sub-departments.
- **Eradicated Administrative Friction:** Centralizing decentralized communication channels into one system dropped manual coordination overhead for operational coordinators.
- **Hardened Data Integrity:** The structured system of record significantly improved the repeatability and reliability of tenure-track faculty effort validations.
- **Data-Driven Funding Decisions:** Delivering automated REF analysis features provided executive leaders with absolute visibility into institutional research goals and funding benchmarks.
- **Enterprise-Grade Security Baseline:** Environment-aware SAML configurations aligned the new platform with strict organizational cybersecurity directives, ensuring compliant data access across thousands of active profiles.