**KNUST University Nomination System Documentation**

**1. Project Overview**

The KNUST University Nomination System is a web-based platform designed to streamline and manage the process of nominating individuals for various academic positions, awards, and recognitions within the university. This system will allow for user-initiated nomination requests, admin-controlled access, and a comprehensive nomination submission and review process.

**2. Core Features**

**2.1 User Authentication and Authorization**

 Implementation of NextAuth for secure user authentication

 Role-Based Access Control (RBAC) for different user types:

 Public Users

 Nominators

 Reviewers

 Administrators (with multiple tiers)

 Secure login process with password hashing

 Session management using JWT (JSON Web Tokens)

**2.2 Nomination Management**

 User-initiated nomination requests

 Admin review and approval of nomination requests

 Dynamic, category-specific nomination forms

 Supporting document upload functionality

 Draft saving and auto-save features

 Nomination editing window post-submission

 Nomination withdrawal option

**2.3 Admin Control Panel**

 Comprehensive dashboard for system management

 Creation and management of nomination categories

 User role management and assignment

 Oversight of the entire nomination process

 Reporting and analytics tools

**2.4 Reviewer System**

 Assignment of reviewers to nominations

 Conflict of interest checks

 Review submission interface

 Scoring and feedback mechanisms

**2.5 Notification System**

 Email notifications using Resend

 Real-time updates using Pusher

 Customizable notification preferences

 Automated reminders for deadlines and pending actions

**2.6 Reporting and Analytics**

 Generation of CSV and PDF reports

 Data visualization for nomination trends

 Performance metrics and system usage statistics

**2.7 User Support**

 In-app help system with tooltips and guides

 FAQ section with search functionality

 Ticket-based support system for user inquiries

**3. Technical Architecture**

**3.1 Frontend**

 Next.js framework for server-side rendering and routing

 React for building user interfaces

 Tailwind CSS for styling and responsive design

 Zustand for global state management

 React Hook Form for form handling

 Zod for form and data validation

**3.2 Backend**

 Next.js API routes for server-side logic

 Server Actions for form submissions and data mutations

 MongoDB database for data storage

 Prisma ORM for database operations and migrations

**3.3 Authentication and Security**

 NextAuth for authentication management

 JWT for secure, stateless authentication

 RBAC implemented through NextAuth sessions and middleware

 CSRF protection for all forms

 Input validation and sanitization

**3.4 External Services**

 Resend for email notifications

 Pusher for real-time updates

 Vercel for deployment and hosting

**4. Detailed Process Flow**

**4.1 User Registration and Authentication**

 Users access the public landing page

 New users can request an account or nomination access

 Admins review account requests and approve or deny

 Approved users receive account credentials via email

 Users log in using NextAuth authentication

**4.2 Nomination Process**

 Logged-in users view available nomination categories

 Users initiate a nomination request for a specific category

3. System performs automated eligibility pre-check

 Admins review and approve nomination requests

5. Approved nominators receive access to the nomination form

 Nominators fill out the category-specific form, with ability to save drafts

 Nominators can upload supporting documents

 Upon submission, a short editing window is provided

 Nominators can track the status of their submission

**4.3 Review Process**

 Admins assign reviewers to submitted nominations

 System checks for conflicts of interest

 Assigned reviewers are notified

 Reviewers access and evaluate assigned nominations

 Reviewers submit scores and feedback

6. System aggregates review data for admin decision-making

**4.4 Admin Management**

 Admins access the control panel dashboard

 They can create and manage nomination categories

 Admins review and approve nomination requests

 They can assign and manage reviewer roles

 Admins can generate reports and analyze nomination data

 They can manage user roles and permissions

**4.5 Result Notification**

 After the review process, admins finalize decisions

 System generates result notifications

 Nominators receive results via email and in-app notifications

 Public announcements are made for successful nominations (if applicable)

**5. User Roles and Permissions**

**5.1 Public Users**

 View public information about nomination categories

 Request nomination access or account creation

**5.2 Nominators**

 Submit nomination requests

 Access and submit nominations in approved categories

 Upload supporting documents

 Track nomination status

 Edit submissions within the allowed window

 Withdraw nominations before the deadline

**5.3 Reviewers**

 Access assigned nominations

 Submit reviews, scores, and feedback

 View personal review history

**5.4 Administrators**

 Tiered access levels (e.g., Super Admin, Category Admin)

 Manage nomination categories and criteria

 Review and approve nomination and account requests

 Assign reviewers and manage conflicts of interest

 Generate reports and analyze data

 Manage user roles and permissions

 Configure system settings

**6. Data Management and Privacy**

**6.1 Data Storage**

 All data stored in MongoDB database

 Use of Prisma ORM for data operations

 Regular automated backups

**6.2 Data Privacy and Security**

 Encryption of sensitive data in transit and at rest

 Strict access controls based on user roles

 Regular security audits and updates

**6.3 Data Retention and Deletion**

 Clear policies on data retention periods

 Secure data deletion processes for expired nominations

**7. System Integrations**

**7.1 Email Integration (Resend)**

 Sending of notification emails

 Delivery of access links and credentials

**7.2 Real-time Updates (Pusher)**

 Instant notifications for status changes

 Live updates in admin and reviewer dashboards

**8. Reporting and Analytics**

**8.1 Standard Reports**

 Nomination statistics by category

 User engagement metrics

 Review process timelines

**8.2 Custom Report Generation**

 Ability to generate CSV and PDF reports

 Customizable parameters for data extraction

**8.3 Data Visualization**

 Graphical representation of nomination trends

 Performance dashboards for admins

**9. User Support and Help System**

**9.1 In-app Guidance**

 Context-sensitive help tooltips

 Guided tours for new users

**9.2 Knowledge Base**

 Searchable FAQ section

 User guides and documentation

**9.3 Support Ticket System**

 User-initiated support requests

 Admin interface for managing and responding to tickets

**10. Performance and Scalability**

**10.1 Performance Optimization**

 Efficient database queries and indexing

 Caching strategies for frequently accessed data

 Optimized API routes and server actions

**10.2 Scalability Measures**

 Designed to handle increasing numbers of users and nominations

 Ability to add computational resources as needed

**11. Testing and Quality Assurance**

**11.1 Testing Strategies**

 Unit testing with Jest

 Integration testing for API routes and server actions

 End-to-end testing with Cypress

 User acceptance testing protocols

**11.2 Continuous Integration**

 Automated testing via GitHub Actions

 Pre-deployment checks and validations

**12. Deployment and DevOps**

**12.1 Deployment Process**

 Continuous deployment using Vercel

 Staging and production environments

 Environment-specific configurations

**12.2 Monitoring and Logging**

 Error tracking and logging

 Performance monitoring

 Automated alerts for system issues

**13. Future Enhancements**

**13.1 Potential Features**

 Multi-language support

 Advanced analytics and machine learning for nomination trends

 Integration with other university systems

**13.2 Scalability Plans**

 Strategies for handling university-wide scaling

 Plans for potential multi-institution deployment

**14. Project Timeline and Milestones**

**14.1 Development Phases**

 Phase 1: Core system development (user auth, basic nomination flow)

 Phase 2: Advanced features (review system, reporting)

 Phase 3: Optimization and additional integrations

**14.2 Key Milestones**

 Initial prototype completion

 Beta testing with limited user group

 Full system launch

 Post-launch evaluation and improvements

**15. Maintenance and Support**

**15.1 Ongoing Maintenance**

 Regular security updates

 Performance optimizations

 Bug fixes and minor enhancements

**15.2 User Support Plan**

 Tiered support system

 Response time commitments

 Continuous improvement based on user feedback

This comprehensive documentation provides a detailed overview of the KNUST University Nomination System, covering all aspects from core features to future planning. It serves as a guide for development, stakeholder communication, and ongoing system management.