CEBU INSTITUTE OF TECHNOLOGY
UNIVERSITY

IT317-G7 PROJECT MANAGEMENT

ENTITY RELATIONSHIP DIAGRAM (ERD)

Project Title: CampusLink

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1. Introduction

The CampusLink database serves as the central data repository for the university opportunity management platform, facilitating connections between students and campus organizations. Its primary purpose is to:

- Centralize Opportunity Management: Store and organize all campus opportunities including assistantships, volunteer work, leadership roles, and sports tryouts in a single accessible location.
- Enable User Management: Maintain comprehensive user profiles for students, organizations, and administrators with appropriate role-based access controls.
- Support Application Processing: Track student applications to opportunities, enabling organizations to review, accept, or reject candidates efficiently.
- Facilitate Organization Verification: Manage the verification process for campus organizations, ensuring only legitimate groups can post opportunities.
- Enable Real-time Communication: Support notification systems and messaging between students and organizations.

Scope

The database encompasses all core functionalities required for the CampusLink platform:

User Management

- Student profiles with academic and skill information
- Organization profiles with contact details and verification status
- Administrator accounts with moderation capabilities
- Authentication and session management

Opportunity Management

- Creation, modification, and deletion of opportunity postings
- Categorization of opportunities by type (assistantship, volunteer, etc.)
- Deadline tracking and status management
- Location and requirement specifications

Application Processing

- Student application submissions with cover letters and resumes
- Application status tracking (submitted, reviewed, accepted, rejected)
- Communication history between applicants and organizations

Verification Systems

- Organization verification requests and documentation
- Verification status tracking (pending, verified, rejected)
- Administrative review records

Reporting and Analytics

- Usage statistics and platform metrics
- Opportunity popularity tracking
- Application success rates

2. Database Overview

The CampusLink platform uses a modern, cloud-hosted database backend to manage campus opportunities, streamline student-organization connections, and support real-time collaboration within the university community. The system ensures secure, reliable handling of student applications, organization profiles, opportunity postings, and verification processes. Key capabilities include:

● **Real-time Opportunity Management**: Supports live updates across organizations—such as new opportunity postings, application submissions, verification status changes, and profile updates—ensuring students always see the most current opportunities.

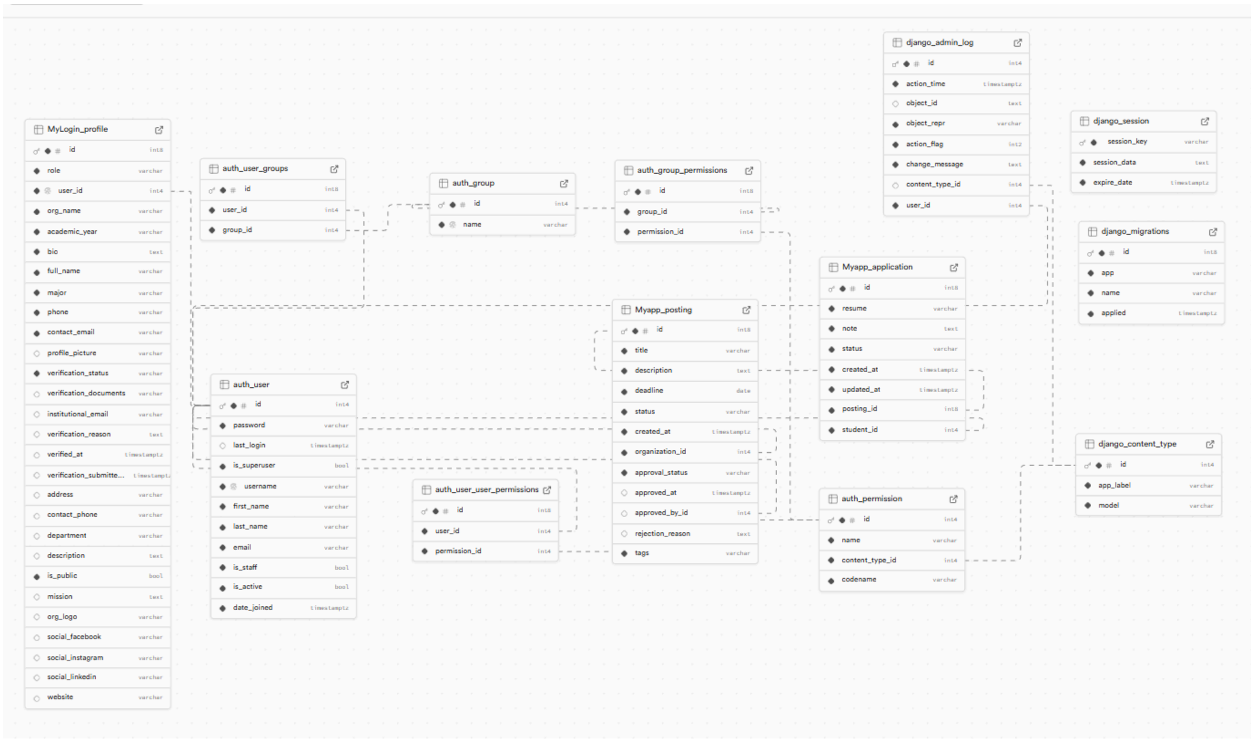
● **Data Integrity**: Maintains strong relational consistency using foreign key constraints linking students, organizations, opportunities, applications, and verification records. This ensures accurate, connected records throughout the platform.

● **Concurrent Access**: Allows admins, organization representatives, and students to use the system simultaneously with clearly defined role-based permissions controlling who can post opportunities, submit applications, verify organizations, or manage profiles.

● **Audit and Activity Tracking**: Captures essential logs such as opportunity creation, application submissions, verification requests, profile updates, and admin actions—providing transparency and accountability across all platform activities.

● **Cloud-Hosted Reliability**: Powered by Supabase with secure authentication, structured relational storage, and robust API support, ensuring fast response times, reliable uptime, and seamless access for all users. The system operates with session-based connection pooling to optimize resource usage while maintaining performance.

3. Entity-Relationship Diagram (ERD)



4. Database Schema

- MyLogin_profile
- Auth_user

- Auth_group
- Auth_user_groups
- Auth_permission
- Auth_group_permissions
- Auth_user_user_permissions
- Myapp_posting
- Myapp_application
- Django_admin_log
- Django_session
- Django_content_type
- django_migrations

5. Table Definitions

1. **auth_user Table**

Standard Django user authentication table storing basic user account information.

Columns:

- **id** (Integer, Primary Key): Unique identifier for each user
- **password** (Varchar): Hashed user password
- **last_login** (DateTime): Timestamp of last successful login
- **is_superuser** (Boolean): Superuser status
- **username** (Varchar): Unique username for login
- **first_name** (Varchar): User's first name
- **last_name** (Varchar): User's last name
- **email** (Varchar): User's email address
- **is_staff** (Boolean): Staff status for admin access
- **is_active** (Boolean): Account activation status
- **date_joined** (DateTime): Account creation timestamp

2. **MyLogin_profile Table**

Extended profile information for all user types in the CampusLink system.

Columns:

- **id** (Integer, Primary Key): Unique identifier for each profile
- **user_id** (Integer, Foreign Key): References auth_user(id)
- Organization-specific fields (org_name, department, description, contact information)
- Profile visibility settings (is_public)
- Verification status fields (verification_status, verification_submitted_at, verified_at, verification_reason)
- File paths for logos and profile pictures (org_logo, profile_picture)

3. **Myapp_posting Table**

Stores opportunity postings created by organizations.

Columns:

- id (Integer, Primary Key): Unique identifier for each posting
- Organization/owner reference
- Title and description fields
- Location and deadline information
- Team name (as required by specifications)
- Posting type classification
- Status flags
- Creation and modification timestamps

4. **Myapp_application Table**

Tracks student applications to opportunities.

Columns:

- id (Integer, Primary Key): Unique identifier for each application
- Student/user reference
- Posting reference
- Application status
- Submission timestamp
- Cover letter/resume fields
- Review/update timestamps

5. **django_session Table**

Django's session management table for maintaining user sessions.

Columns:

- **session_key** (Varchar, Primary Key): Unique session identifier
- **session_data** (Text): Serialized session data
- **expire_date** (DateTime): Session expiration timestamp

6. **django_migrations Table**

Tracks which database migrations have been applied.

Columns:

- **id** (Integer, Primary Key): Unique migration record identifier
- **app** (Varchar): Django app name
- **name** (Varchar): Migration name
- **applied** (DateTime): When migration was applied

7. **auth_permission Table**

Stores permission definitions for the Django authentication system.

Columns:

- **id** (Integer, Primary Key): Unique permission identifier
- **name** (Varchar): Human-readable name of the permission
- **content_type_id** (Integer, Foreign Key): References django_content_type(id)
- **codename** (Varchar): Machine-readable permission code name

8. **django_content_type Table**

Tracks content types for Django models and permissions.

Columns:

- **id** (Integer, Primary Key): Unique content type identifier
- **app_label** (Varchar): Django application label
- **model** (Varchar): Model name

9. **auth_group Table**

Stores user group definitions for permission grouping.

Columns:

- **id** (Integer, Primary Key): Unique group identifier
- **name** (Varchar): Group name

10. **auth_group_permissions Table**

Many-to-many relationship table between groups and permissions.

Columns:

- **id** (Integer, Primary Key): Unique relationship identifier
- **group_id** (Integer, Foreign Key): References auth_group(id)
- **permission_id** (Integer, Foreign Key): References auth_permission(id)

11. **auth_user_groups Table**

Many-to-many relationship table between users and groups.

Columns:

- **id** (Integer, Primary Key): Unique relationship identifier
- **user_id** (Integer, Foreign Key): References auth_user(id)
- **group_id** (Integer, Foreign Key): References auth_group(id)

12. **auth_user_user_permissions Table**

Direct user-to-permission assignments table.

Columns:

- **id** (Integer, Primary Key): Unique relationship identifier
- **user_id** (Integer, Foreign Key): References auth_user(id)
- **permission_id** (Integer, Foreign Key): References auth_permission(id)

13. **django_admin_log Table**

Logs admin actions in the Django admin interface.

Columns:

- **id** (Integer, Primary Key): Unique log entry identifier
- **action_time** (DateTime): When the action was performed
- **object_id** (Text): ID of the affected object
- **object_repr** (Varchar): String representation of the object
- **action_flag** (Integer): Type of action (add, change, delete)

- **change_message** (Text): Details of the change
- **content_type_id** (Integer, Foreign Key): References django_content_type(id)
- **user_id** (Integer, Foreign Key): References auth_user(id)

6. Relationships and Constraints

- **MyLogin_profile.id**
  Uniquely identifies each user profile record.
- **auth_user.id**
  Uniquely identifies each Django user account.
- **auth_group.id·**
  Uniquely identifies each user group.
- **auth_permission.id**
  Uniquely identifies each permission entry.
- **auth_user_groups *(composite key: user_id + group_id)***
  Uniquely identifies each user–group assignment.
- **auth_group_permissions *(composite key: group_id + permission_id)***
  Uniquely identifies each group–permission mapping.
- **auth_user_user_permissions *(composite key: user_id + permission_id)***
  Uniquely identifies each direct user–permission assignment.
- **Myapp_posting.id**
  Uniquely identifies each posting created by an organization.
- **Myapp_application.id**
  Uniquely identifies each student application to a posting.
- **django_admin_log.id**
  Uniquely identifies each admin audit log entry.
- **django_content_type.id**
  Uniquely identifies each Django model type.
- **django_migrations.id**
  Uniquely identifies each installed migration.
- **django_session.session_key**
  Uniquely identifies each user session.

FOREIGN KEY RELATIONSHIPS

MyLogin_profile Table

user_id → auth_user.id
Relationship: One-to-One / Many-to-One
Constraint: *ON DELETE CASCADE*
Meaning: When a Django user is deleted, their associated profile is removed.

auth_user_groups Table

user_id → auth_user.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*
Meaning: All group memberships of a user are deleted when the user is deleted.

group_id → auth_group.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*
Meaning: If a group is removed, all related user memberships are also removed.

auth_group_permissions Table

group_id → auth_group.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*

permission_id → auth_permission.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*

Meaning: When a group or permission is deleted, the mapping disappears automatically.

auth_user_user_permissions Table

user_id → auth_user.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*

permission_id → auth_permission.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*

Meaning: Direct user permissions are automatically removed when a user or permission is deleted.

Myapp_posting Table

organization_id → MyLogin_profile.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*
Meaning: If an organization profile is deleted, all their postings are also removed.

approved_by_id → auth_user.id
Relationship: Many-to-One
Constraint: *ON DELETE SET NULL*
Meaning: If an approving admin is deleted, the posting remains but approved_by becomes NULL.

Myapp_application Table

posting_id → Myapp_posting.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*
Meaning: Deleting a posting removes all student applications tied to it.

student_id → MyLogin_profile.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*

Meaning: If a student profile is deleted, their applications are removed as well.

django_admin_log Table

user_id → auth_user.id
Relationship: Many-to-One
Constraint: *ON DELETE SET NULL*
Meaning: If an admin user is deleted, log entries remain but the user reference becomes NULL.

content_type_id → django_content_type.id
Relationship: Many-to-One
Constraint: *ON DELETE SET NULL*
Meaning: Log entries persist even if the content type is removed.

django_permission Table

content_type_id → django_content_type.id
Relationship: Many-to-One
Constraint: *ON DELETE CASCADE*

Meaning: If a model type is deleted, all permissions tied to that model are also removed

7. Indexing Strategy

User Authentication Indexes:

- **Username Index**: Speeds up login queries and ensures fast duplicate username validation during registration.

- **Email Index**: Accelerates authentication lookups and prevents duplicate email registrations.

Profile Filtering Indexes:

- **Role Index**: Optimizes queries that filter users by role (Student, Organization, Admin) for dashboard displays.
- **Verification Status Index**: Improves performance when filtering organizations by verification status (pending, verified, rejected).

Opportunity Management Indexes:

- **Posting Type & Status Composite Index**: Accelerates filtering of opportunities by type (assistantship, volunteer, etc.) and active status. Deadline Index: Enhances sorting and retrieval of opportunities by deadline for time-sensitive displays.
- **Organization-Posting Relationship Index**: Speeds up queries linking postings to their originating organizations.

Application Processing Indexes:

- **Student-Opportunity Composite Index:** Optimizes application lookups, preventing duplicate submissions and speeding up verification of "Has this student already applied?"
- **Application Status Index**: Improves filtering of applications by status (submitted, reviewed, accepted, rejected).
  Submission Date Index: Enhances sorting and retrieval of recent applications.

Session Management Indexes:

- **Session Expiry Index:** Accelerates cleanup of expired sessions and validates active user sessions.

Composite Indexes on Common Query Patterns:

User Dashboard Queries:

- (user_id, role) - For loading role-specific dashboard content
- (verification_status, date_joined) - For admin verification dashboards

Opportunity Discovery:

- (posting_type, is_active, deadline) - For filtered opportunity listings
- (organization_id, is_active) - For organization-specific opportunity displays

Application Tracking:

- (student_id, submitted_at) - For student application history
- (posting_id, status) - For organization application review panels

A**dministrative Functions:**

- (content_type_id, object_id) - For admin log queries
- (user_id, action_time) - For user activity audits

8. Security Considerations

Authentication & Authorization

Password Security

- Password Hashing: Django's PBKDF2 + SHA256 algorithm for secure password storage
- Password Policy: Minimum 8 characters with mixed case and numbers
- Account Protection: Lockout after 5 failed attempts with progressive backoff
- Password Reset: Time-limited, single-use tokens sent to registered email

Role-Based Access Control (RBAC)

- System Admin: Full access to all system functions including user management and configuration
- Organization Representative: Manage organization profile, postings, and applicant reviews
- Student: Apply to opportunities, view public organization information
- Fine-Grained Permissions: CRUD operations restricted per role and enforced server-side

Account & Identity Verification

- University Affiliation: Email domain validation for student accounts
- Email Confirmation: Required before account activation
- Organization Verification: Document submission and admin approval process

Database Security

Access Control

- Principle of Least Privilege: Application database user has minimal required permissions
- Separation of Duties: Different database users for application and reporting functions
- Encrypted Connections: All database communications use SSL/TLS

Credential Management

- Environment Variables: Database credentials stored in .env files, not in source code
- Network Restrictions: VPC and IP whitelisting for administrative access
- Session Management: Automatic database session timeouts for admin functions

Data Protection & Privacy

Sensitive Information Handling

- Protected Fields: Personal information including names, emails, contact details, and passwords
- Encryption Standards: HTTPS-only communication with HSTS enforcement
- Password Storage: Salted hashes only, no plaintext storage

Privacy Compliance

- Data Minimization: Collection limited to essential fields only
- Retention Policy: Configurable data retention with automatic purging
- Legal Compliance: Adherence to Philippine Data Privacy Act RA 10173
- User Rights: Consent workflows, data export, and deletion capabilities

Audit & Logging

Activity Tracking

- Comprehensive Logs: User actions, login attempts, role changes, and data modifications
- Log Details: User ID, IP address, timestamp, and action specifics
- Tamper Protection: Write-once or append-only storage for audit logs
- Anomaly Detection: Alerts for suspicious activities including repeated failed logins

Backup & Recovery

Data Protection

- Encrypted Backups: Daily AES-256 encrypted database and file storage backups
- Retention Schedule: 7 daily, 4 weekly, 3 monthly snapshots
- Disaster Recovery: Cross-region backup copies for business continuity
- Access Control: Limited backup access with audit trails
- Recovery Testing: Quarterly restore drills to verify backup integrity

SQL Injection & Input Protection

Query Safety

- ORM Usage: Exclusive Django ORM usage with parameterized queries
- Input Validation: Strict server-side validation for all data inputs
- Raw Query Protection: Prepared statements for any necessary raw SQL
- File Sanitization: Validation and sanitization of uploaded file metadata

Session & API Security

Session Management

- Secure Cookies: HttpOnly, SameSite, and Secure flags enforced
- Timeout Policies: 30-minute inactivity timeout with absolute session limits
- CSRF Protection: Mandatory for all state-changing operations

API Security

- Token Authentication: JWT or opaque tokens with refresh mechanisms
- Rate Limiting: Per-IP and per-account throttling for abuse prevention
- CORS Controls: Restricted to approved university domains only

File Upload & Storage Security

Storage Protection

- Access Control: Signed URLs for secure file downloads
- Content Validation: File type and size limitations
- Filename Sanitization: Normalized and obfuscated uploaded filenames
- Metadata Separation: File metadata stored separately from content

Monitoring & Incident Response

System Oversight

- Real-time Monitoring: Performance metrics and anomaly detection
- Automated Alerts: Notifications for security events and unusual activities
- Regular Audits: Quarterly security assessments and vulnerability scanning
- Incident Response: Defined process for detection, containment, and recovery

Deployment & Operational Security

Infrastructure Security

- Infrastructure as Code: Peer-reviewed configuration changes
- CI/CD Security: Automated testing and security gates in deployment pipeline
- Secrets Management: Vault storage with regular credential rotation
- Administrative Access: Minimal access via jump hosts with MFA requirements

Third-Party & Integrations

Vendor Security

- Service Vetting: Compliance and data handling evaluation for all third-parties
- API Security: Least-privilege keys with usage monitoring
- Legal Agreements: Data processing agreements where required

Developer & Testing Practices

Secure Development

- Source Control: No secrets or credentials in repositories
- Test Data: Parameterized testing without production data
- Security Integration: Automated security checks in CI pipeline
- Training: Secure coding guidelines in developer onboarding

9. Team

Name	Role
Francis Kyle Mahinay	Lead Developer
John Joshua L. Meñez	Developer
Nicco Victor P. Maldo	Developer

10. Approval Sign-off

	Full Name	Signature	Date
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