ISMIMS

International Student Mobility & Internship Management System

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Team Member :

Member 1_Guochang Su

Member 2_Zhizhi Li

Member 3_Kairui Ouyang

Member 4_Jiayi Yang

Problem Statement

Current Challenges

International students navigate a fragmented landscape when pursuing study abroad opportunities. The process involves coordinating with multiple institutions—home universities, host universities, visa authorities, and corporate partners—each operating in isolation with their own systems and procedures.

Manual coordination leads to inefficiencies, delays, and errors. Students lack real-time visibility into application status, financial aid processing remains disconnected from visa workflows, and credit transfer after program completion involves cumbersome paper-based processes. Multi-party decision making happens without transparency, creating frustration for all stakeholders.

Our Solution

ISMIMS is a unified digital ecosystem that connects Home Universities, Host Universities, Government Visa Agencies, and Corporate Partners into a seamless platform. The system streamlines the complete international student mobility lifecycle—from initial application through credit transfer upon program completion.

> **Value Proposition:** The collaborative effort of all enterprises delivers greater value than individual entities operating independently. Real-time data synchronization, automated workflows, and transparent tracking create efficiency gains that benefit every stakeholder.

Ecosystem Architecture

ISMIMS is built on a sophisticated multi-enterprise architecture that mirrors the real-world complexity of international student mobility. The platform serves as a single ecosystem containing one global academic network that connects four distinct enterprise types.

Home University
Northeastern University

Manages student applications, financial clearances, and final credit transfers

Host University
Oxford University

Handles admissions decisions, course enrollment, and transcript issuance

Visa Government
Immigration Authority

Processes visa applications, conducts background verification, and issues travel documents

Corporate Enterprise
Partner Companies

Provides internship opportunities and manages student placements

System Scale
- 8 Organizations across enterprises
- 10 Unique Roles + System Admin + Auditor
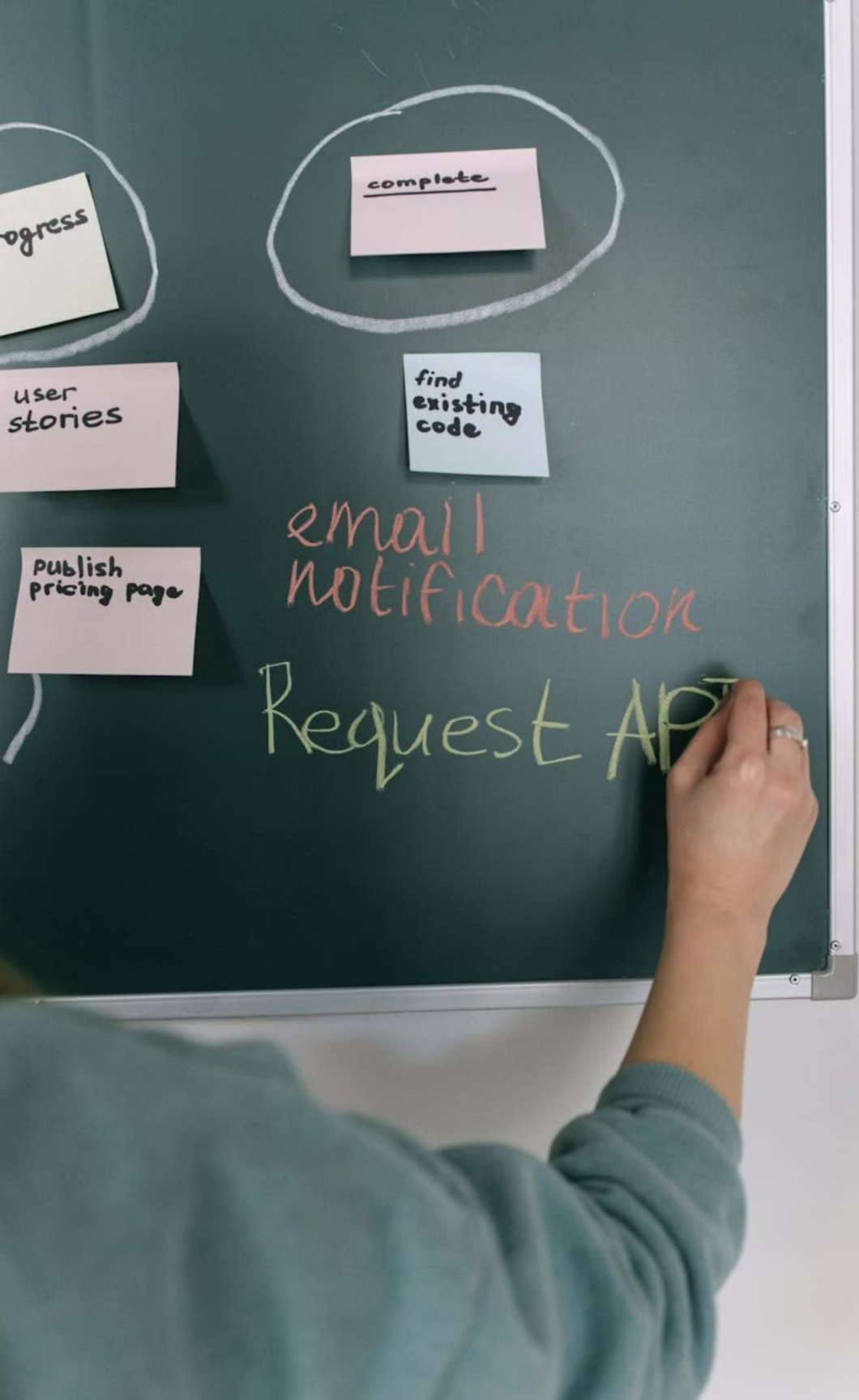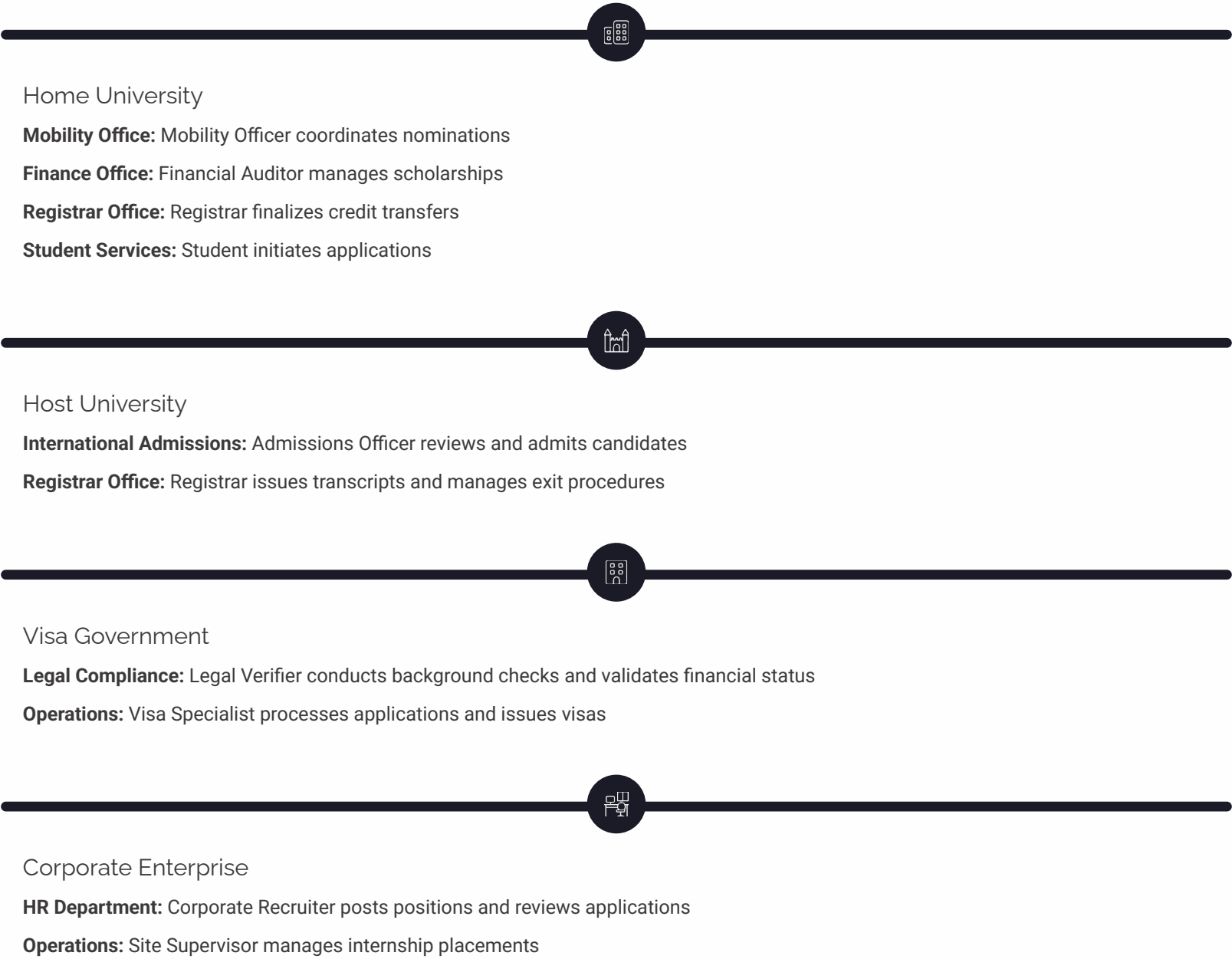- 6+ Work Request Types

Design Patterns
- Factory Pattern for role creation
- Singleton Pattern for ecosystem
- MVC Architecture throughout

Integration
Real-time data synchronization ensures all enterprises operate with current information, eliminating delays and miscommunication.

Stakeholders & Organizations

Each enterprise within ISMIMS comprises specialized organizations staffed by professionals with distinct responsibilities. This organizational structure ensures clear accountability while enabling seamless cross-enterprise collaboration.

Home University

Mobility Office: Mobility Officer coordinates nominations

Finance Office: Financial Auditor manages scholarships

Registrar Office: Registrar finalizes credit transfers

Student Services: Student initiates applications

Host University

International Admissions: Admissions Officer reviews and admits candidates

Registrar Office: Registrar issues transcripts and manages exit procedures

Visa Government

Legal Compliance: Legal Verifier conducts background checks and validates financial status

Operations: Visa Specialist processes applications and issues visas

Corporate Enterprise

HR Department: Corporate Recruiter posts positions and reviews applications

Operations: Site Supervisor manages internship placements

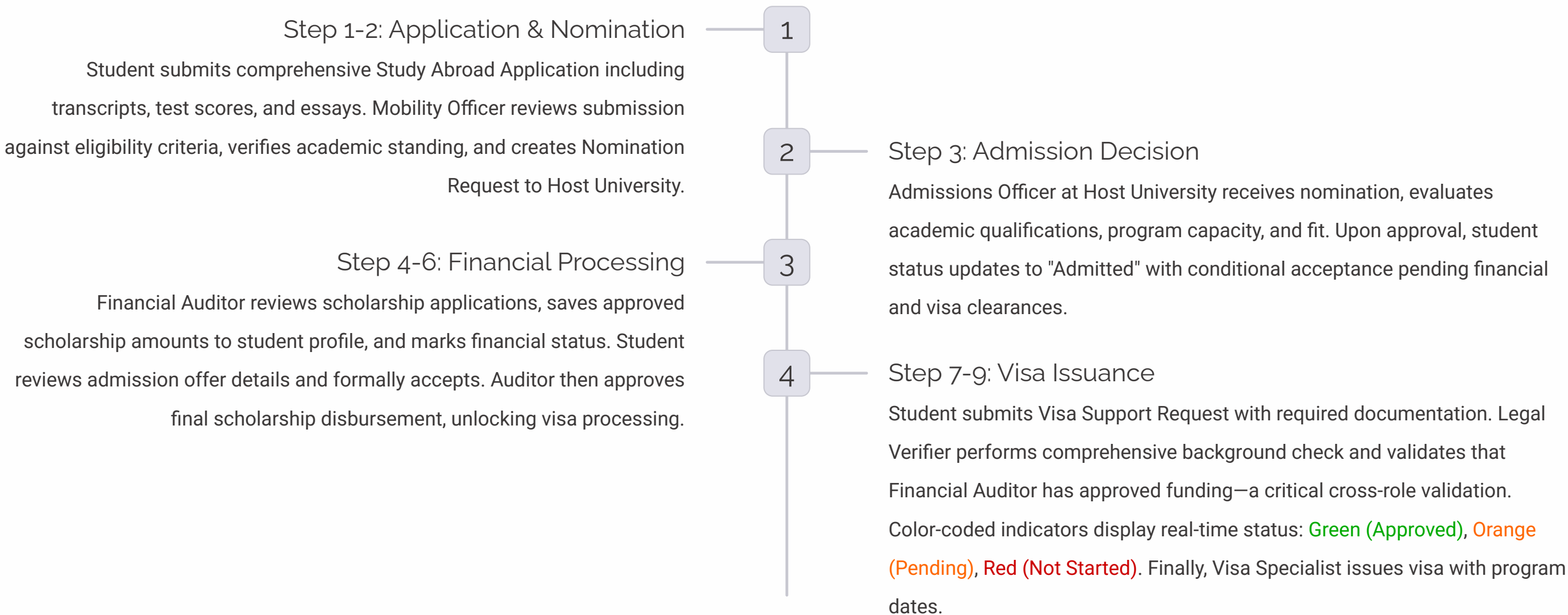# End-to-End Student Journey

Complete Lifecycle in 5 Phases

ISMIMS manages the entire international student experience through five distinct but interconnected phases. Each phase involves specific stakeholders and generates work requests that flow seamlessly between enterprises.

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1 Application Phase

Student submits Study Abroad Application with academic records, motivation statement, and program preferences. Mobility Officer reviews the application, verifies eligibility, and nominates qualified candidates to the Host University.

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2 Admission Phase

Host University Admissions Officer receives nomination request, evaluates academic fit, and makes admission decisions. System generates real-time notifications to all parties upon status changes.

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3 Financial & Acceptance

Financial Auditor at Home University reviews scholarship eligibility, saves approved amounts to student records, and approves funding. Student receives admission offer and formally accepts, triggering the next phase.

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4 Visa Processing

Student requests visa support through the platform. Legal Verifier conducts background checks and validates financial clearance status. Upon approval, Visa Specialist issues visa with validity dates and travel permissions.

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5 Post-Program Credit Transfer

Host Registrar issues official transcript with grades and credit hours. Course Transfer Request is sent to Home University where Registrar validates equivalencies and finalizes credit transfer to student's permanent record.

> 🗋 **Cross-Enterprise Integration:** Nomination Requests flow from Home to Host University, Visa Support Requests connect Students to Government, and Course Transfer Requests complete the academic cycle from Host back to Home University.
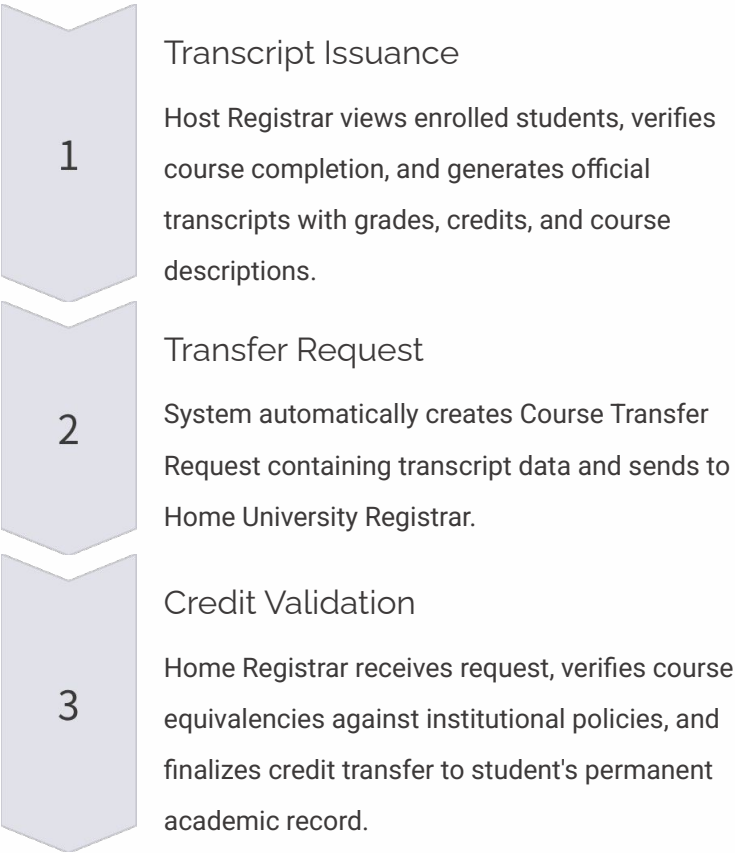
Application to Visa Workflow

Phases 1-4: Detailed Process Flow

1 Step 1-2: Application & Nomination

Student submits comprehensive Study Abroad Application including transcripts, test scores, and essays. Mobility Officer reviews submission against eligibility criteria, verifies academic standing, and creates Nomination Request to Host University.

2 Step 3: Admission Decision

Admissions Officer at Host University receives nomination, evaluates academic qualifications, program capacity, and fit. Upon approval, student status updates to "Admitted" with conditional acceptance pending financial and visa clearances.

3 Step 4-6: Financial Processing

Financial Auditor reviews scholarship applications, saves approved scholarship amounts to student profile, and marks financial status. Student reviews admission offer details and formally accepts. Auditor then approves final scholarship disbursement, unlocking visa processing.

4 Step 7-9: Visa Issuance

Student submits Visa Support Request with required documentation. Legal Verifier performs comprehensive background check and validates that Financial Auditor has approved funding—a critical cross-role validation. Color-coded indicators display real-time status: Green (Approved), Orange (Pending), Red (Not Started). Finally, Visa Specialist issues visa with program dates.

Key Integration Point: The Legal Verifier's ability to check Financial Auditor approval status in real-time demonstrates sophisticated cross-enterprise data synchronization. This prevents visa processing for students lacking financial clearance, ensuring compliance and reducing processing errors.

Post-Program & Internship Workflow

Phase 5: Credit Transfer

1 Transcript Issuance

Host Registrar views enrolled students, verifies course completion, and generates official transcripts with grades, credits, and course descriptions.

2 Transfer Request

System automatically creates Course Transfer Request containing transcript data and sends to Home University Registrar.

3 Credit Validation

Home Registrar receives request, verifies course equivalencies against institutional policies, and finalizes credit transfer to student's permanent academic record.

This separation of duties between Admissions (entry) and Registrar (exit) ensures academic integrity while maintaining clear accountability throughout the student lifecycle.

Internship Management

1 Position Posting

Corporate Recruiter creates internship opportunities with detailed job descriptions, requirements, and application deadlines.

2 Student Application

Students browse available positions, filter by industry and location, and submit applications with resumes and cover letters.

3 Selection Process

Corporate Recruiter reviews applications, conducts interviews, and makes placement decisions. Site Supervisor manages day-to-day internship activities.

Class Design Overview

UML Architecture & Relationships

ISMIMS implements object-oriented design principles through a carefully structured class hierarchy. The architecture balances flexibility with maintainability while supporting complex cross-enterprise workflows.

Core System Classes

EcoSystem (Singleton): Single instance managing NetworkList

Network: Contains EnterpriseDirectory

Enterprise: Abstract base with 4 concrete implementations

Organization: 8 specialized types with WorkQueue and EmployeeDirectory

User & Role Management

UserAccount: Authentication and profile data

Employee: Personal and professional information

Role: 10 unique types, each implementing createWorkArea() for custom UI panels

Work Request Hierarchy

WorkRequest (Abstract Parent) with 7 concrete implementations:

- StudyAbroadApplication
- NominationRequest
- FinancialClearanceRequest
- VisaSupportRequest
- CourseTransferRequest
- InternshipApplication & Placement

Design Relationships

Composition: Enterprise contains Organizations (strong ownership)

Association: UserAccount links to Employee and Role

Inheritance: All Enterprises extend Enterprise base class

Polymorphism: WorkRequest subclasses enable flexible request handling

Factory Pattern Implementation

The Role hierarchy uses Factory Pattern for dynamic work area creation. Each role's createWorkArea() method instantiates role-specific UI panels, enabling extensibility without modifying core system code.

Advanced Features

ISMIMS incorporates sophisticated functionality that extends beyond basic workflow management, demonstrating enterprise-grade software engineering practices.

✓ Cross-Role Data Validation

The Legal Verifier performs real-time validation of Financial Auditor approval status before processing visa applications. This cross-enterprise validation uses color-coded indicators—Green (Approved), Orange (Pending), Red (None)—providing instant visual feedback. The feature prevents downstream processing errors and ensures compliance with financial prerequisites.

JavaFaker Integration

Automated test data generation creates realistic demo environments with 20 students, 5 companies, and multiple work requests. The system generates authentic-looking names, GPAs, majors, passport numbers, and addresses. This capability enables rapid testing, comprehensive demonstrations, and stress testing without manual data entry.

Reporting Dashboard

System Auditor role provides comprehensive analytics through aggregated statistics and JTable-based reports. Dashboard displays request counts by status (Pending, Approved, Rejected) and by enterprise, with real-time data refresh. Auditors gain system-wide visibility for monitoring performance, identifying bottlenecks, and ensuring compliance.

Complete Academic Lifecycle

The system manages students from entry (Admissions) through exit (Transcript issuance). Cross-enterprise credit transfer validation ensures academic integrity. Separation of duties between Admissions Officer and Registrar provides checks and balances throughout the academic journey.

Form Validation & Security

Comprehensive input validation using regex patterns for email addresses, student IDs, and GPA ranges. Role-based authentication prevents unauthorized access to sensitive functions. Input sanitization and null checks protect against errors and security vulnerabilities. All user actions are validated before database persistence.

Implementation Details

Technology Stack

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Core Technologies

- Java 17 (LTS)
- Java Swing for UI
- NetBeans GUI Builder
- JavaFaker 1.0.2
- Git/GitHub version control

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UI Components

- JTree for hierarchy visualization
- JTable with DefaultTableModel
- CardLayout for panel navigation
- JOptionPane for user dialogs
- Custom panels for each role

Code Quality Standards

The codebase adheres to professional software engineering practices ensuring maintainability, reliability, and scalability.

Error Handling: Comprehensive null checks and exception handling throughout all classes prevent runtime crashes and provide meaningful error messages to users

Naming Conventions: Consistent camelCase for variables and methods, PascalCase for classes, promoting code readability

Modular Design: Each role implemented as separate panel component, enabling independent development and testing

CRUD Operations: Complete Create-Read-Update-Delete functionality for all entities with proper data persistence

Code Organization: Logical package structure separating business logic, UI components, and data models

Team Contributions
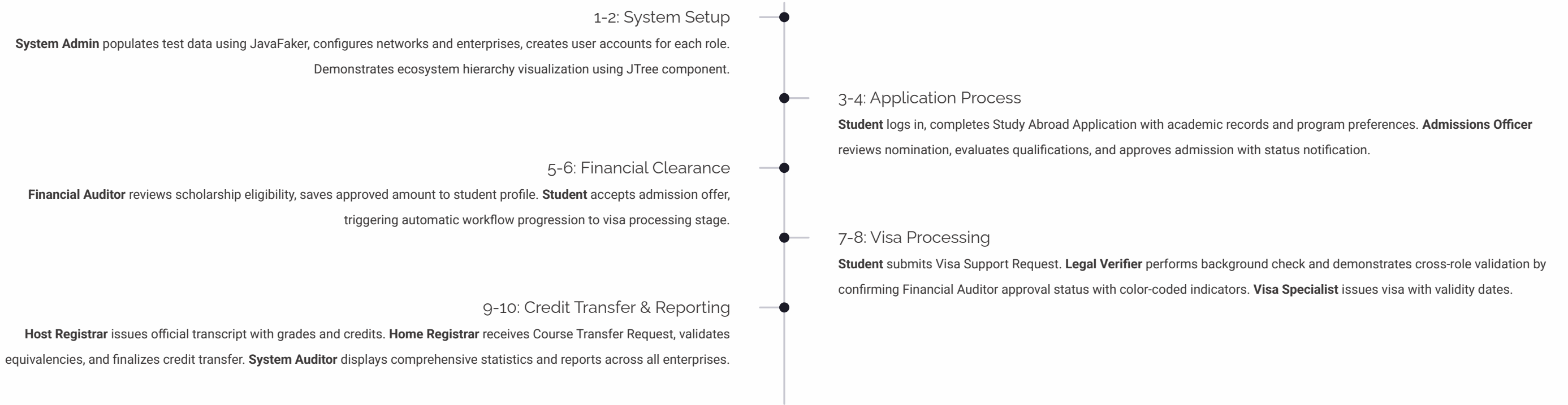
Collaborative Development Approach

The team divided responsibilities by enterprise and cross-cutting concerns, enabling parallel development while maintaining system cohesion through regular integration and code reviews.

Member 1: Home University Enterprise
- Developed Home University enterprise structure with three organizations
- Implemented Student role including application submission forms and status tracking
- Created Mobility Officer workflow for reviewing applications and generating nominations
- Designed StudyAbroadApplication work request class with validation logic

Member 2: Host University Enterprise
- Built Host University enterprise with Admissions and Registrar organizations
- Implemented Admissions Officer role with candidate evaluation interface
- Developed Host Registrar workflow for transcript generation and course management
- Created CourseTransferRequest work request enabling cross-enterprise academic data exchange

Member 3: Corporate Enterprise & Finance
- Designed Corporate Enterprise with HR and Operations organizations
- Implemented Financial Auditor role with scholarship approval workflows
- Created internship management system with posting, application, and placement features
- Developed InternshipApplication and InternshipPlacement work request classes

Member 4: Government & System Administration
- Built Visa Government enterprise with Legal Compliance and Operations organizations
- Implemented System Admin role for ecosystem initialization and configuration
- Created System Auditor role with comprehensive reporting dashboard
- Integrated JavaFaker for automated test data generation across all enterprises
- Developed Legal Verifier workflow with cross-role financial validation

Live Demo

20-Minute Comprehensive Walkthrough

The demonstration showcases the complete student mobility lifecycle from initial application through final credit transfer, highlighting cross-enterprise collaboration and real-time data synchronization.

1-2: System Setup

System Admin populates test data using JavaFaker, configures networks and enterprises, creates user accounts for each role. Demonstrates ecosystem hierarchy visualization using JTree component.

3-4: Application Process

Student logs in, completes Study Abroad Application with academic records and program preferences. **Admissions Officer** reviews nomination, evaluates qualifications, and approves admission with status notification.

5-6: Financial Clearance

Financial Auditor reviews scholarship eligibility, saves approved amount to student profile. **Student** accepts admission offer, triggering automatic workflow progression to visa processing stage.

7-8: Visa Processing

Student submits Visa Support Request. **Legal Verifier** performs background check and demonstrates cross-role validation by confirming Financial Auditor approval status with color-coded indicators. **Visa Specialist** issues visa with validity dates.

9-10: Credit Transfer & Reporting

Host Registrar issues official transcript with grades and credits. **Home Registrar** receives Course Transfer Request, validates equivalencies, and finalizes credit transfer. **System Auditor** displays comprehensive statistics and reports across all enterprises.

Test Accounts

Pre-configured accounts for each role:

- sysadmin (System Administrator)
- student (Student applicant)
- admissions (Admissions Officer)
- finance (Financial Auditor)
- legal (Legal Verifier)
- visa (Visa Specialist)
- registrar (Home & Host Registrar)
- recruiter (Corporate Recruiter)
- auditor (System Auditor)

Key Demo Highlights

- Real-time status updates across enterprises
- Cross-role data validation in action
- Seamless workflow transitions
- Comprehensive error handling
- Intuitive user interfaces for each role
- System-wide reporting capabilities

Thank You

ISMIMS: Transforming International Education

ISMIMS successfully demonstrates a comprehensive solution for managing the complete student mobility lifecycle—from initial application through final credit transfer. The system showcases sophisticated multi-enterprise ecosystem collaboration, seamless cross-organization workflow management, and real-time data synchronization.

Key architectural achievements include separation of duties between entry and exit processes, comprehensive role-based access control protecting sensitive operations, and advanced features like cross-role validation that ensure data integrity and compliance.

System Capabilities

- Complete academic lifecycle management
- Four-enterprise ecosystem integration
- Ten specialized user roles
- Real-time cross-enterprise synchronization
- Automated workflow progression
- Comprehensive audit and reporting

Questions & Answers

We welcome your questions about system architecture, implementation details, workflow design, or future enhancement opportunities.

GitHub Repositor