

# Project Design Phase-II

## Technology Stack

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**Table 1: Components and Technologies**

The following table lists the components and technologies used in developing the ServiceNow-based Educational Organisation Management System.

Component	Technology Used	Description
Platform	ServiceNow Cloud Platform – a low-code enterprise platform-as-a-service (PaaS) that enables workflow automation, data integration, and centralized service management.	Serves as the foundational platform supporting process automation, incident tracking, and record management.
Frontend	HTML5, CSS3, JavaScript, AngularJS – used to create responsive, dynamic, and interactive web interfaces integrated with ServiceNow portals.	Develops user-friendly interfaces for forms, dashboards, and portals accessible by students and staff.
Backend	GlideScript, GlideAjax, and Script Includes – JavaScript-based ServiceNow scripting languages used for implementing server-side logic and automation.	Handles data processing, automation workflows, and server-side operations for institutional management.
Database	ServiceNow MySQL Database – a cloud-hosted relational database optimized for ServiceNow, supporting indexed queries and secure storage.	Stores academic data, course details, and institutional records ensuring high performance and scalability.
Integration	REST API, SOAP API, IntegrationHub – used for connecting ServiceNow with external applications like HRMS, email systems, and learning platforms.	Provides seamless data flow and communication between ServiceNow and third-party systems.
Automation	Flow Designer, Workflow Editor, and Business Rules – visual and code-based automation tools within ServiceNow.	Automates routine approvals, notifications, and form validations to improve efficiency.

Testing Tools	Automated Test Framework (ATF), Unit Testing Scripts – tools provided by ServiceNow for end-to-end and unit testing.	Ensures workflow accuracy and validates functionality before deployment.
Version Control	GitHub, GitLab, Git CLI – used for maintaining code repositories, versioning, and collaborative development.	Tracks modifications, enables rollback, and facilitates teamwork among developers.
Deployment	ServiceNow Update Sets and Application Repository – tools for packaging and deploying customizations between instances.	Simplifies migration of developed modules and configurations between environments.
Security	Role-Based Access Control (RBAC), Encryption, Multi-Factor Authentication (MFA).	Protects sensitive data by ensuring access control and identity verification.
Communication	Slack API, Microsoft Teams Integration, Email Notifications via ServiceNow Notification Engine.	Provides real-time communication, alerts, and task updates for staff and administrators.

**Table 2: Application Characteristics**

The application characteristics describe the key quality attributes of the Educational Organisation Management System developed using ServiceNow.

Characteristic	Description
Usability	The system offers an intuitive, role-based interface designed for staff, faculty, and students, ensuring easy navigation and efficiency.
Scalability	Built to handle increasing volumes of users, records, and processes efficiently without affecting performance.
Security	Implements encryption, RBAC, and secure authentication to protect institutional and personal data.
Maintainability	Utilizes modular scripting and ServiceNow scoped applications for easy maintenance and version upgrades.
Performance	Optimized scripts and workflows ensure low latency and high-speed process execution.
Reliability	Delivers consistent service with built-in redundancy, error handling, and data recovery features.
Availability	Ensures 24/7 uptime through ServiceNow's cloud infrastructure, enabling uninterrupted access.

Integration Capability	Seamlessly connects with academic, HR, and financial systems through REST and SOAP APIs.
Auditability	Maintains detailed logs of user actions, changes, and transactions for transparency and accountability.

**Summary:**

The technology stack for the Educational Organisation Management System leverages ServiceNow's PaaS capabilities combined with web, integration, and automation technologies. This integrated approach ensures robust workflow automation, seamless communication, and secure management of institutional data, promoting efficiency and digital transformation across the educational organisation.