



## D01: Project Specification

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# Usage of AI Tools & Technologies Declaration

I acknowledge the use of ChatGPT to assist in the preparation of this Project Specification.

The AI tool was used to assist with revising and refining written content for clarity, coherence, and structure, as well as to help rephrase sections in accordance to the Magnificent Seven quality model.

The AI tool was also used to support high-level reasoning related to requirements structuring and documentation organisation. All final content, interpretations, and decisions presented in this report reflect my own understanding and judgement, and I take full responsibility for the accuracy and integrity of the work submitted.

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# 1 Company Overview

## 1.1 Company Name and Background

EduCore Learning Institute Pte Ltd is a Singapore-based private education provider operating in the Education and Training Services sector. The institute offers diploma-level and professional certification programmes in computing, information technology and applied sciences.

## 1.2 Mission and Vision Statement

**Mission:** To empower education through smart technology by leveraging digital systems to improve academic operations, enhance administrative efficiency, and ensure consistent service quality.

**Vision:** To become a scalable technology-enabled education provider, capable of supporting institutional growth while maintaining operational accuracy, reliability and transparency.

## 1.3 Core Business and Services

EduCore Learning Institute's core business includes:

- Delivery of structured diploma and professional certification programmes.
- Academic timetable planning and personnel distribution.
- Management of student enrollment and attendance.
- Academic administration and reporting.

## 1.4 Key Initiatives

EduCore has been experiencing steady growth in terms of student enrollment and course offerings over the past years. However, with the expansion of operations, the use of manual and spreadsheet-based approaches to scheduling and attendance management became inefficient. This is because the approaches led to conflicts, inconsistencies in data and a higher administrative burden. As part of its digital transformation project, EduCore is commissioning a mobile-based system to streamline staff scheduling and attendance management to support scalable institutional growth.



## 2 Project Overview

### 2.1 Project Name

EduFlow Staff Scheduling Mobile App

### 2.2 Context

EduCore currently uses manual and semi-digital methods to manage staff and course schedules, and student attendance. These methods in large-scale educational institutes are expensive, prone to human error, inconsistent and difficult to scale. As student intake and course variety grow, the lack of a centralised system has led to scheduling conflicts and has increased administrative burdens.

### 2.3 Goals

The goal of this project is to:

- **Centralise staff scheduling and attendance management**  
Deliver a single mobile-based system that replaces manual and spreadsheet-based scheduling and attendance processes across all academic programmes within EduCore by the end of the project lifecycle.
- **Improve accuracy and reliability of attendance records**  
Achieve 99% accuracy in attendance recording (defined as less than 1% discrepancy between QR scan records and manual verification) and 99.9% system availability during scheduled class hours from the first full academic term following system deployment.
- **Reduce administrative effort and human error**  
Reduce manual administrative effort related to scheduling coordination and attendance tracking by providing automated system support for these activities upon system go-live.
- **Support timely attendance-taking during teaching sessions**  
Enable teaching staff to conduct attendance-taking efficiently during scheduled sessions using the mobile application, without disrupting normal classroom operations, upon system deployment.
- **Support scalable academic operations**  
Ensure the scheduling and attendance process can support increases in student enrolment, staff numbers, and programme offerings over the next academic cycles without requiring fundamental changes to operational workflows.



## 3 Requirements Tree

The Requirements Tree is used to progressively granularise high-level requirements into clearer and more concrete requirement groupings using a simple “has-a” (composition) decomposition. This provides a structured view of how the system is realised and helps stakeholders visualise the scope and boundaries of the solution. In this Project Specification, the Requirements Tree is intentionally limited to Level 0 and Level 1 only, as it is used primarily as a traceability tool to map Business Operations Requirements and Technical Requirements to the appropriate system realisation level.

### L0 - Mobile Device Platform

This level represents the mobile environment on which the system operates. It encapsulates the use of commercial off-the-shelf (COTS) Android and iOS mobile devices as the platform for system access, together with the high-level assumptions, operational constraints, and applicable regulations that govern system use. This level establishes the boundary within which all system interactions take place.

### L1 - Application Components

This level is decomposed from Level 0, Mobile Device Platform, and represents the user-facing application components that support interaction with the system.



## 4 Business Operation Requirements

This section defines the Business Operations Requirements (Biz Ops) for the EduFlow Staff Scheduling Mobile App. Biz Ops requirements describe the primary business purpose of the system, the organisational responsibilities involved in its use, and the operational rules under which the system is expected to operate. These requirements are expressed at an abstract level and avoid implementation detail.

Each Biz Ops requirement is explicitly linked to either a Level 0 or Level 1 node in the Requirements Tree to ensure traceability between business intent and system realisation

### 4.1 L0 - Mobile Device Platform

#### **REQ-BIZ-L0-01: Mobile Device Platform Operation (Essential)**

The system shall operate on commercial off-the-shelf Android and iOS mobile devices as the primary operational platform for scheduling and attendance-related activities

##### **Constraints:**

- System usage is limited to academic scheduling and attendance operations
- Access is restricted to authorised users

##### **Assumptions:**

- Users possess compatible Android or iOS smartphones
- Users are able to install and operate mobile applications

##### **Regulations:**

- Personal Data Protection Act (PDPA)

#### **REQ-BIZ-L0-02: Mobile Attendance Interaction (Essential)**

The system shall support attendance interactions through the mobile platform during scheduled teaching sessions

##### **Constraints:**

- Attendance interactions occur only during authorised teaching sessions
- Attendance interactions are limited to institutional use

##### **Assumptions:**

- Teaching staff are able to present attendance taking methods (e.g. QR codes) via institutional display methods (e.g. projectors)
- Students possess mobile devices capable of participating in attendance taking interactions

##### **Regulations:**

N/A



## 4.2 L1 - Application Components

### **REQ-BIZ-L1-01: Entry Representation (Essential)**

The system shall present a visible application entry point on the mobile device that allows users to launch the application

### **REQ-BIZ-L1-02: User Authentication (Essential)**

The system shall present an authentication interface to users prior to granting access to system functions

### **REQ-BIZ-L1-03: Scheduling and Timetable Presentation (Essential)**

The system shall present scheduling and timetable information relevant to the authenticated user.

### **REQ-BIZ-L1-04: Attendance Interaction Interface (Essential)**

The system shall present an interface that allows authorised users to initiate and conduct attendance interactions during scheduled sessions.

### **REQ-BIZ-L1-05: Attendance Information Display (Essential)**

The system shall present attendance-related information to users for viewing and reference purposes.



## 5 Technical Requirements

This section defines the Technical Requirements for the EduFlow Staff Scheduling Mobile App. These requirements specify the technical configuration, platform compatibility, software environment, security management, and operational characteristics necessary to implement and support the system. The requirements are defined within the boundary established by the Level 0 and Level 1 nodes of the Requirements Tree.

### 5.1 L0 - Mobile Device Platform

#### **REQ-TCR-L0-01: Mobile Operating System Compatibility (Essential)**

The system shall be compatible with commercial off-the-shelf Android and iOS operating systems.

##### **Constraints:**

- Support is limited to mobile operating systems officially supported by device manufacturers.

##### **Assumptions:**

- Users operate devices running supported Android or iOS versions.

#### **REQ-TCR-L0-02: Cross-Platform Application Framework (Essential)**

The system shall be implemented using a development framework or approach that supports deployment to both Android and iOS platforms.

##### **Constraints:**

- Platform-specific implementations shall not prevent functional parity across supported platforms.

##### **Assumptions:**

- A single development approach can be adopted to support both platforms.

#### **REQ-TCR-L0-03: Programming Language and Tooling (Essential)**

The system shall be developed using industry-supported programming languages and development tools suitable for mobile application development.

##### **Constraints:**

- Unsupported or deprecated languages and tools shall not be used.

##### **Assumptions:**

- Development tools selected are compatible with the institution's IT environment.



### **REQ-TCR-L0-04: Hosting and Server Environment (Essential)**

The system shall rely on an institution-managed or vendor-managed server environment to support application services and data storage.

#### **Constraints:**

- Hosting solutions must be compatible with the institution's existing IT infrastructure.

#### **Assumptions:**

- Server and network infrastructure are provisioned outside the project scope.

### **REQ-TCR-L0-05: Data Security Management (Essential)**

The system shall implement technical measures to protect personal and attendance-related data during storage and transmission.

#### **Constraints:**

- Security controls must be applied consistently across mobile and server components.

#### **Assumptions:**

- Users access the system through trusted personal or institutional devices.

#### **Regulations:**

- Personal Data Protection Act (PDPA)

### **REQ-TCR-L0-06: Browser and Device Constraints (Acceptable)**

The system shall not require browser-based access and shall be optimised for mobile device usage only.

#### **Constraints:**

- Desktop or browser-only access is outside the system scope.

#### **Assumptions:**

- Mobile devices are the primary access method for users.

### **REQ-TCR-L0-07: Documentation Availability (Acceptable)**

The system shall be supported by appropriate technical and user documentation to facilitate deployment, operation, and maintenance.

#### **Constraints:**

- Documentation scope is limited to system usage, configuration, and maintenance guidance.

#### **Assumptions:**

- Documentation is intended for institutional IT staff and end users.



## 5.2 L1 - Application Components

### **REQ-TCR-L1-01: Authentication and Access Control Mechanism (Essential)**

The system shall implement technical mechanisms to enforce authenticated and authorised access to application components.

### **REQ-TCR-L1-02: QR-Based Attendance Support (Essential)**

The system shall support technical generation of attendance taking methods, such as QR codes, for use during scheduled sessions.

### **REQ-TCR-L1-03: Performance Expectations (Desirable)**

The system shall be designed to provide response times of less than 3 seconds for common user interactions under normal operating conditions

### **REQ-TCR-L1-04: Session Continuity (Desirable)**

The system shall maintain user sessions for a minimum of 8 hours without requiring re-authentication, and shall preserve unsaved attendance data for up to 15 minutes in the event of temporary network disconnection, allowing users to complete interactions without data loss.

### **REQ-TCR-L1-05: Maintainability and Update Support (Acceptable)**

The system shall support maintenance activities, including updates and defect resolution, without disrupting core application usage.



## 6 Financial Requirements

### 6.1 Overview

This section outlines the financial requirements for the EduFlow Staff Scheduling Mobile App. The financial requirements define the funding structure, funding source, expected project cost structure ([refer to Appendix A](#)), and payment schedule ([refer to Appendix B](#)) associated with the delivery of the system.

The purpose of this section is to provide a transparent financial framework to support vendor evaluation, contract negotiation, and project governance, while avoiding unnecessary disclosure of sensitive commercial details in the released version of this specification.

### 6.2 Funding Source

The project shall be funded through EduCore Learning Institute's internal project budget, allocated specifically for outsourced system development. All development, testing, and deployment activities are assumed to be performed by the selected vendor, while existing institutional IT infrastructure (e.g. server environment and network connectivity) is provided by EduCore and does not form part of the vendor's cost responsibilities.

### 6.3 Post-Deployment Support

The selected vendor shall provide a minimum 3-month post-deployment support period to address critical (Priority 1) defects and stabilisation issues to address critical defects and stabilisation issues identified after the system is live. The scope and duration of this support period shall be defined during the contract negotiation and is included within the overall project cost.

### 6.4 Assumptions & Cost Redaction

The following assumptions apply to the financial requirements:

- EduCore Learning Institute provides an existing, operational server environment and network infrastructure.
- No additional hardware procurement is required as part of this project.
- No third-party system integration beyond those defined in the Project Specification is required.
- All cost figures included in the internal version of this document are redacted in the released version for confidentiality and procurement integrity.



## 7 Delivery Requirements

### 7.1 Goals Delivery Schedule

The project is planned over a duration of approximately 10 months (43 weeks), following a phased delivery approach. Each phase produces deliverables that progressively support the achievement of the project goals, including centralised staff scheduling, attendance management, and administrative oversight.

- **Month 1: Project Initiation and Planning**  
Project kick-off, stakeholder engagement, and detailed planning activities
- **Months 2-3: Requirements and Design Elaboration**  
Finalisation of the Software Requirements Specification (SRS), system architecture design, and user interface design.
- **Months 4-6: System Development**  
Development of core system modules, including administrative management, staff scheduling, and attendance-taking functionality.
- **Months 7-8: Testing and Validation**  
System integration, functional testing, defect resolution, and preparation for User Acceptance Testing (UAT)
- **Month 9: Deployment and Training**  
Production deployment of the system and provision of user guidance or familiarisation sessions for administrative and teaching staff.
- **Month 10: Stabilisation and Project Closure**  
Post-deployment stabilisation, final issue resolution, and formal project closure.

### 7.2 Gantt Chart

Refer to [Appendix C](#) for the project Gantt Chart. Detailed scheduling and weekly execution planning remains as the responsibility of the selected vendor during delivery.

### 7.3 Major Delivery Milestones

The major delivery milestones for the project align directly with the cost structure and payment milestones ([refer to Appendix B](#)) defined in Section 5, Financial Requirements. Each milestone represents a tangible project deliverable and is subject to formal review and acceptance prior to progression to the next phase.

### 7.4 Progress Reporting

The vendor shall provide regular progress updates throughout the project lifecycle. Progress reporting shall include milestone completion updates, identified risks, and mitigation actions. Reporting frequency and format shall be agreed during project initiation.



## 8 Sign Off

### 8.1 Sign-off Statement

This Project Specification has been reviewed and agreed in principle by the relevant stakeholders. Sign-off indicates acknowledgement of the scope, requirements, assumptions, and constraints defined in this document and serves as the baseline for subsequent project phases, including vendor bidding and detailed requirements elaboration.

Final contractual terms, detailed schedules, and cost figures shall be confirmed during vendor engagement and Software Requirements Specification (SRS) finalisation.

### 8.2 Sign-off Table

Role	Name	Signature	Date
<b>Authenticator</b>			
Project Lead	Samuel Mok		1/29/2026
<b>Designated Approvers</b>			
Chief Operating Officer	Bryan Lee	<u>Signed</u>	1/30/2026
Operations Director	Lee Yu Xuan	<u>Signed</u>	1/30/2026
Academic Director	Alex Tay	<u>Signed</u>	1/30/2026
Vendor Representative			

## 9 Addendum

### Appendix A: Project Cost Structure

Cost Component	Description	Cost Allocation (%)
Requirements Analysis & Design	Requirements clarification, scope confirmation, system architecture and design	<b>15%</b>
Application Development	Development of mobile application including Admin and Staff modules	<b>40%</b>
System Integration & Testing	Integration of system components, functional testing, and defect resolution	<b>15%</b>
User Acceptance Testing (UAT)	Support during acceptance testing by administrative and teaching staff	<b>10%</b>
Deployment & Handover	Production deployment, source code handover, and delivery of documentation.	<b>10%</b>
Post-Deployment Support	Limited stabilisation support after system goes live.	<b>10%</b>
<b>Total</b>		<b>100%</b>



## Appendix B: Payment Schedule & Milestones

Milestone	Description	Payment (%)	Payment (\$)
Project Initiation & Kick-off	Contract signing and stakeholder alignment	10%	\$ [REDACTED]
Requirements Finalisation	Approval of SRS and scope baseline	15%	\$ [REDACTED]
System Design Confirmation	Approval of system architecture and UI mockups	15%	\$ [REDACTED]
Core Development Completion	Completion of Admin and Staff application modules	30%	\$ [REDACTED]
System Integration & Testing	Successful completion of integration testing and defect resolution	15%	\$ [REDACTED]
User Acceptance Testing (UAT)	Formal acceptance by administrative and teaching staff	9%	\$ [REDACTED]
Executive Sign-off & Governance Milestone	Final endorsement prior to production go-live	1%	\$ [REDACTED]
Deployment & Handover	Production release and documentation delivery	5%	\$ [REDACTED]
<b>Total</b>		<b>100%</b>	\$ [REDACTED]



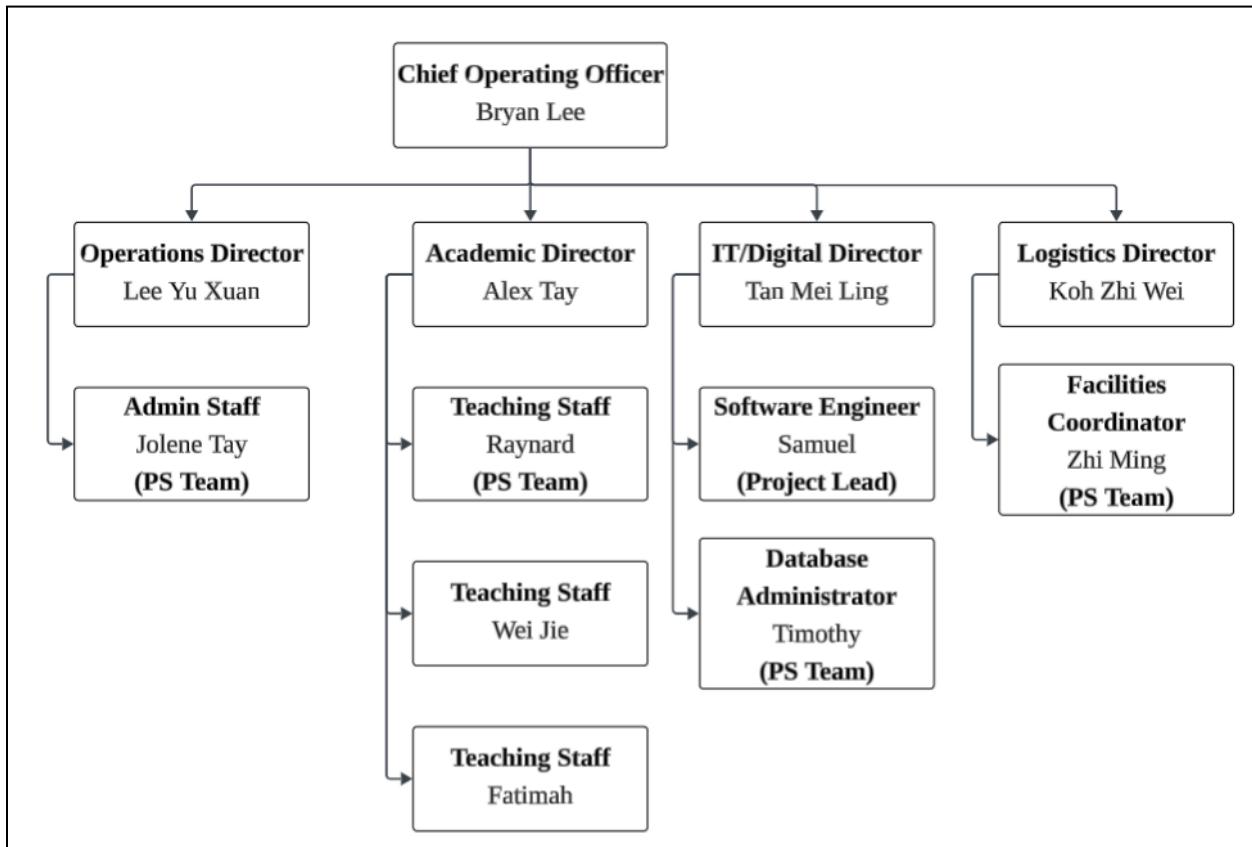
## **Appendix C: Project Delivery Gantt Chart**

## Appendix D: Data Dictionary

Entity	Data Field	Description	Format	Example
Staff	Staff_ID	Unique identifier	Alphanumeric	S1234
	First_name	Staff's given name	Text	John
	Last_name	Staff's last name	Text	Doe
	Email	Staff's email	Email	name@domain.com
Student	Student_ID	Unique identifier	Alphanumeric	ST1234
	Full_name	Student's full name	Text	John Doe
	Email	Student's official email	Email	name@domain.com
	Course_ID	Course the student belongs to	Alphanumeric	C111
Course	Course_ID	Unique identifier	Alphanumeric	C111
	Course_name	Title of the course	Text	Degree in ICT/SE
Module	Module_ID	Unique identifier	Alphanumeric	ICT4444
	Module_name	Title of the module	Text	SoS
	Course_ID	Course the mod belongs to	Alphanumeric	C111
Timetable	Timetable_ID	Unique identifier	Alphanumeric	TT9001
	Module_ID	Module scheduled	Alphanumeric	ICT4444
	Staff_ID	Staff assigned to teach	Alphanumeric	S1234
	Class_date	Date of class	Date	2026-02-02
	Start_time	Start time	Time	09:00
	End_time	End time	Time	11:00
	Location	Location of class	Text	E2-05-05
Attendance	Attendance_ID	Unique identifier for attendance record	Alphanumeric	TT9001-01
	Timetable_ID	Timetable slot being attended	Alphanumeric	TT9001

	Student_ID	Student who scanned	Alphanumeric	ST1234
	Attendance_status	Attendance result	Text (Enum)	Present/late
	Scan_time	Time QR was scanned	DateTime	2026-02-02 09:15

## Appendix E: Organisation Chart





## 10 Exhibit

The following exhibit provides supporting elicitation evidence

### Exhibit 1: Elicitation Survey Instrument

1) What mobile device operating system do you primarily use?

- iOS (iPhone/iPad)
- Android
- Both
- Other: \_\_\_\_\_

2) What is your device's operating system version? (Optional but useful)

- iOS 15 or later
- iOS 14 or earlier
- Android 11 or later
- Android 10 or earlier
- Don't know

3) How comfortable are you with installing and using mobile applications?

- Very comfortable
- Somewhat comfortable
- Need assistance
- Not comfortable

4) What authentication method would you prefer?

- Username and password
- Biometric (fingerprint/face recognition)
- Email verification link
- Single Sign-On (SSO)
- Two-factor authentication (2FA)

5) How concerned are you about the security of your data in this system?

- Very concerned
- Somewhat concerned
- Not very concerned
- Not concerned at all

6) What is an acceptable response time when you interact with the app (e.g., opening timetable, marking attendance)?

- Less than 1 second
- 1-3 seconds
- 3-5 seconds
- More than 5 seconds is fine

7) How long should you remain logged in before needing to re-authenticate?

- Until I manually log out
- 1 day
- 1 week
- Each time I open the app

8) What is your preferred method for recording student attendance during teaching sessions?

- QR code scanning (students scan to mark attendance)
- Manual entry
- Combination of both methods