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Office of the Vice Chancellor for Academic Affairs

UniFit: An Integrated Web-Based Uniform Ordering and Inventory System for the RGO

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This project emphasizes system integration: UniFit connects external services — online payments, SMS OTPs, and email notifications — with the application and database to enable reliable order processing, clear customer communication, and accurate inventory updates. These integrations are central to the system’s functionality and scope.

General Objectives

1. Provide students with an online portal to place and track uniform orders.
2. Implement real-time inventory management with automatic stock updates.
3. Provide an admin dashboard for RGO staff to approve/decline orders, manage inventory, and generate reports.
4. Replace the Google Docs process with a centralized, auditable platform.
5. Minimize order errors, payment reconciliation delays, and manual consolidation tasks.
6. Improve transparency through notifications and status updates for students.
7. Produce reliable reports to support RGO decision-making (sales, stock, refunds).
8. Demonstrate integration of ordering, inventory, notifications, and payment modules in accordance with SIA principles.

Integration Analysis

This section evaluates how UniFit connects to external services (GCash for payments, an SMS gateway for OTPs/alerts, and an Email provider for notifications), what data is exchanged, and how reliability, security, and error-handling are managed to ensure consistent order processing and accurate inventory updates.

Components:

- **Email Notifications (SendGrid / Gmail SMTP or similar):** Sends detailed notifications such as low-stock alerts and replenishment notices.
- **Pre-order / Backorder Queue (Application Component):** Keeps a queue of student pre-orders when an item is out of stock/replenished; triggers notifications (Email).
- **Payment Gateway (GCash):** Processes student payments using order reference numbers or QR codes.
- **SMS OTP Service (e.g., Twilio, SemaphorePH, or Globe Labs):** Sends one-time passwords via SMS for secure login and verification.

Integration Patterns:

- **Payments:** The system generates an order reference number and amount, which the student pays via GCash. The transaction reference is validated by RGO staff or through a simple API call.
- **OTP:** During login, the system generates a 6-digit OTP and stores it temporarily in the database. Using an SMS API, the code is sent directly to the student’s registered phone number. The login is completed only if the entered OTP matches and is not expired.
- **Pre-orders:** If stock is unavailable, the student can place a pre-order. The system records this request and processes it in a first-come, first-served sequence when stock is replenished.

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- Email Notifications (SendGrid/Gmail SMTP): Sends only low-stock and replenishment notices to students, triggered by stock_low and stock_replenished events

Agile Methodology

Agile Scrum is an iterative, customer-focused development method that delivers the system in small, testable increments (sprints). It emphasizes frequent stakeholder feedback, continuous integration of features, and adaptive planning. For UniFit, Scrum allows us to integrate and test payment and notification services early, show working increments to RGO frequently, and quickly handle integration issues.

1. Requirements (first and primary step)

What we do: Elicit and document functional and non-functional requirements from stakeholders (RGO staff, end-users/students, and the instructor).

Methods: interviews, questionnaires, review of existing SIA and processes (e.g., current Google Sheets workflow).

Deliverables: Requirements specification (functional list: order/checkout, pre-order, OTP login, notifications;

non-functional: security, performance, availability), acceptance criteria, prioritized product backlog items.

Notes: Each requirement should have clear acceptance criteria (example: “OTP login must expire after 5 minutes).

2. Product Backlog & Sprint Planning

What we do: Convert requirements into user stories and backlog items, prioritize by value/risks (payments and OTP high priority). In sprint planning, pick a small set of user stories for the upcoming sprint.

Deliverables: Product backlog, sprint backlog (selected user stories with tasks), estimated effort (story points), Definition of Done (DoD).

Tools: Trello / GitHub.

3. Design (Architecture & UI/DB design)

What we do: Design system architecture (presentation, application, data layers), ERD for MySQL, API contract sketches for GCash/SMS/Email, and UI mockups for Student Portal and Admin Dashboard.

Deliverables: ERD, sequence diagrams for payments/pre-orders, UI mockups, API integration.

Notes: Keep integration details in design docs.

4. Implementation (Development & Integration)

What we do: Code features in short increments. Implement core flows first: order creation, payment integration (GCash), OTP via SMS API, pre-order queue, and Email notification for stock events. Securely store provider credentials and follow coding standards.

Deliverables: Working increments pushed to the repository.

Integration detail: Test external services using their available test accounts or trial features to make sure payments, SMS, and email all connect properly.



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5. Testing (Unit, Integration, UAT)

What we do:

- **Unit tests** for business logic (order totals, stock decrement).
- **Integration tests** that check if payment, SMS, and email services work correctly with the system.
- **User Acceptance Testing (UAT)** with RGO: verify the complete order → payment → inventory → notification process.

Deliverables: Test cases, test execution reports, bug/issue list and fixes.

Acceptance: A feature is accepted when it meets the acceptance criteria and passes UAT.

6. Deployment (Staging → Production)

What we do: Deploy first to a trial environment for final testing (XAMPP for local/development; production could be on a university server or cloud). Once tested, move the system to its official environment.

Deliverables: Deployment checklist, environment configuration, backup/restore procedure.

Notes: Ensure the system uses secure connections (HTTPS) and that credentials are kept safe.

7. Review & Retrospective (End of each sprint)

What we do: Demonstrate completed features to stakeholders (RGO, instructor), collect feedback, and run a team retrospective to identify improvements. Update backlog accordingly.

Deliverables: Sprint demo notes, retrospective actions, updated backlog priorities.

8. Maintenance & Monitoring

What we do: After deployment, monitor the system for issues (e.g., payment errors, SMS or email not delivered), perform regular backups, fix bugs, and handle change requests (e.g., new notification templates). Rotate credentials when necessary.

Deliverables: Monitoring setup (basic alerts), backup schedule (e.g., daily database backup), incident log.

Short procedure summary:

1. **Requirements** → gather and write the needed features and set priorities.
2. **Backlog & Plan** → list tasks (user stories) and plan the sprint.
3. **Design** → create database design (ERD), system diagrams, and UI sketches.
4. **Implement** → develop features and connect the system with payment, SMS, and email services.
5. **Test** → check each feature, test the integrations, and conduct user acceptance testing (UAT).
6. **Deploy** → move the system from testing to the official server or environment.
7. **Review** → present finished features to stakeholders and gather feedback.
8. **Maintain** → monitor the system, back up data, fix bugs, and apply improvements.

The project adopts the Agile Scrum framework. We begin with Requirements as the first activity to gather and prioritize functional and non-functional needs, then convert these into a product backlog. Work is delivered in short sprints (2–3 weeks): Sprint Planning selects backlog items for the sprint; Daily Stand-ups provide quick progress updates and unblockers; Sprint Review demonstrates completed features to stakeholders; and Sprint Retrospective identifies process



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improvements for the next cycle. This iterative approach ensures flexibility, early testing of integrations (payments, SMS, email), and continuous improvement.

1. Functional Requirements:


- Students can:
 - Register and log in using SMS OTP verification.
 - Browse available products (uniforms, laces, pins).
 - Place orders and pre-orders if items are out of stock.
 - Pay via **GCash** and provide transaction reference.
 - Track the status of their orders.
- Admin (RGO staff) can:
 - Approve or decline orders.
 - Confirm and verify GCash payments.
 - Update inventory stock.
 - Manage pre-orders (auto-process on stock replenishment).
 - Generate reports (sales, inventory, payment records).

2. Non-Functional Requirements:

- **Security:** Login with SMS OTP; passwords stored securely (hashed).
- **Reliability:** Database backup to prevent data loss.
- **Performance:** System can handle multiple simultaneous orders during peak periods.
- **Usability:** Responsive design accessible via desktops and smartphones. □
- **Maintainability:** Easy to update product catalog and reports.

User and System Requirements (Hardware and Software)

1. Hardware Requirements:

Hardware	Specifications
 Processor (CPU)	Intel Core i3, 6th Gen or higher (Dual-Core, 2.0 GHz+)



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	4GB DDR4 2400MHZ – 8GB DDR4 (2666–3200 MHZ) KINGSTON
	DDR4 support, 4 RAM slots, LAN, audio, USB 3.0 ports.
	21.5" LED, Full HD resolution (1920×1080), HDMI/VGA support
	Standard QWERTY, 104 keys, USB connection



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	Optical type, 3 buttons (left, right, scroll), USB connection
	Inkjet or Laser printer, supports A4 size, USB/Wi-Fi connection
	Stable broadband connection, 25 Mbps download / 15 Mbps upload



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	Intel Core i5 (10th Gen or higher) Quad-Core, 3.5 GHz or higher, 8GB DDR4, 256GB SSD, 14" Full HD (1920×1080), 6 hours minimum runtime , 2× USB, 1× HDMI
	Android 10.0+ or iOS 13+, 3GB, 32GB internal, 6.0" HD+ or higher , 4G LTE / Wi-Fi 3000 mAh

Table 1.1 1.0 Hardware Devices

Processor (CPU): Intel Core i3, 6th Generation or higher, Dual-Core, 2.0 GHz base clock speed or better. This processor provides enough performance for handling system tasks such as running the web server, database, and admin dashboard smoothly.

Memory (RAM): 4 GB DDR4 (2400 MHz) up to 8 GB DDR4 (2666–3200 MHz) Kingston. This ensures stable performance for multitasking, enabling the system to run the UniFit application alongside other processes without slowing down.

Motherboard: DDR4-supported motherboard with 4 RAM slots, integrated LAN, audio, and USB 3.0 ports. Provides compatibility with modern components and allows for memory expansion and reliable connectivity.

Monitor: 21.5-inch LED monitor with Full HD resolution (1920×1080), HDMI and VGA support. Delivers clear and sharp visuals for RGO staff when managing inventory, viewing reports, and processing orders.

Keyboard: Standard QWERTY keyboard with 104 keys and USB connection. Designed for everyday administrative tasks and reliable data entry.

Mouse: Optical USB mouse with three functional buttons (left, right, scroll). Provides precise navigation and ease of use for interacting with the system interface.

Printer: Inkjet or Laser printer, supports A4 paper size, with USB or Wi-Fi connection. Used to generate official documents such as receipts, reports, and inventory logs for RGO.

Router / Internet Connection: Stable broadband router with at least 25 Mbps download and 15 Mbps upload speed. Ensures smooth access to online transactions, SMS OTP delivery, email notifications, and payment gateway services.



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Laptop: Intel Core i5, 10th Generation or higher, Quad-Core, 3.5 GHz or faster, with 8 GB DDR4 RAM and 256 GB SSD storage. Includes a 14-inch Full HD (1920×1080) display, at least 6 hours of battery runtime, and essential ports (2× USB, 1× HDMI). Provides RGO staff and students a portable option to access the UniFit system anywhere.

Mobile Phone: Android 10.0+ or iOS 13+ device with at least 3 GB RAM and 32 GB internal storage. Features a 6.0-inch HD+ display, 4G LTE or Wi-Fi connectivity, and a 3000 mAh battery. Enables students to access the UniFit portal, receive SMS OTPs, and email notifications reliably.

Software Requirements

Software	Specifications
	Windows 10 (64-bit) or Ubuntu 20.04 LTS and above
	Version 8.0 or higher
	HTML5 (latest standard)



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	CSS3 (latest standard)
JavaScript 	ES6 (ECMAScript 2015) or newer
	Version 8.0.0 or higher (includes Apache, PHP, MySQL)
	Version 8.0 or higher
	Latest stable release (1.90 or above)



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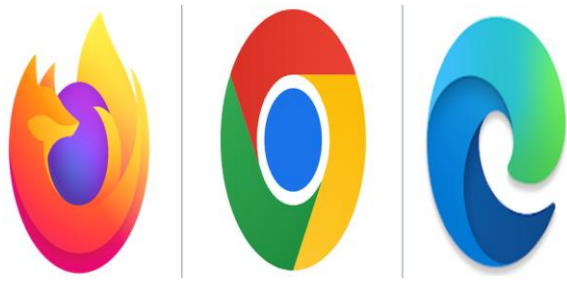
	Google Chrome (v100+), Mozilla Firefox (v100+), or Microsoft Edge (v100+)

Table 1.2 Soft Requirements

Operating System (OS): Windows 10 (64-bit) or Ubuntu 20.04 LTS. Provides a stable and widely supported environment for running XAMPP, MySQL, and PHP.

PHP: Version 8.0 or higher. The primary back-end language used to build server-side logic and integrate payment, SMS, and email services.

HTML (HTML5): Used to structure web pages and form the backbone of the student and admin interfaces.

CSS (CSS3): Used to style and format the user interface, ensuring a clean and user-friendly design.

JavaScript (ES6+): Provides interactivity, input validation, and dynamic content updates for the system’s front end.

XAMPP: Version 8.0.0 or higher. A local development environment that bundles Apache (web server), PHP, and MySQL for building and testing the system before deployment.

MySQL: Version 8.0 or higher. Relational database management system used to store student records, inventory, orders, and transactions.

Visual Studio Code (VS Code): Latest stable release (v1.90+). A lightweight and user-friendly code editor for writing and debugging PHP, HTML, CSS, and JavaScript code.

Web Browser: Google Chrome (v100+), Mozilla Firefox (v100+), or Microsoft Edge (v100+). Required for accessing and testing the UniFit system’s web-based interfaces.



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System model and diagram

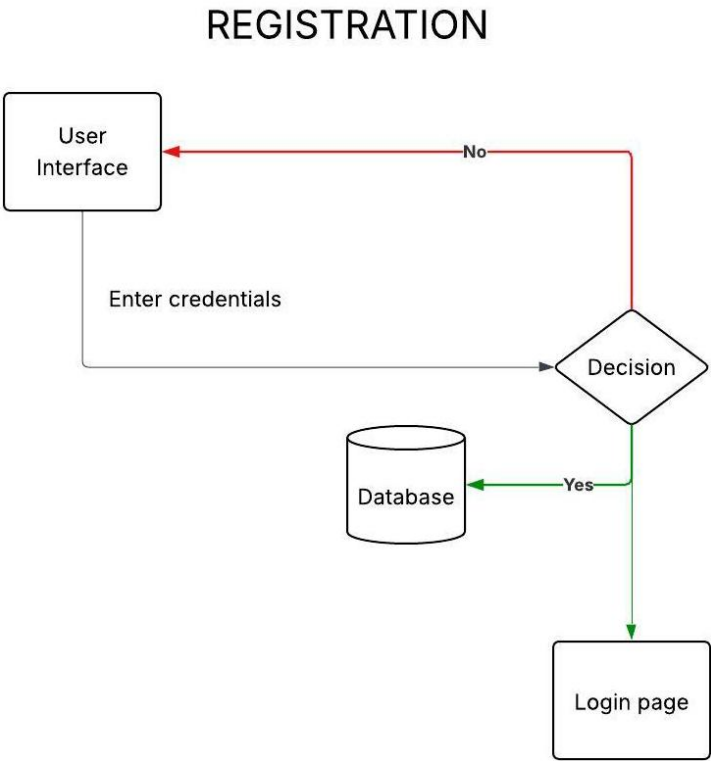
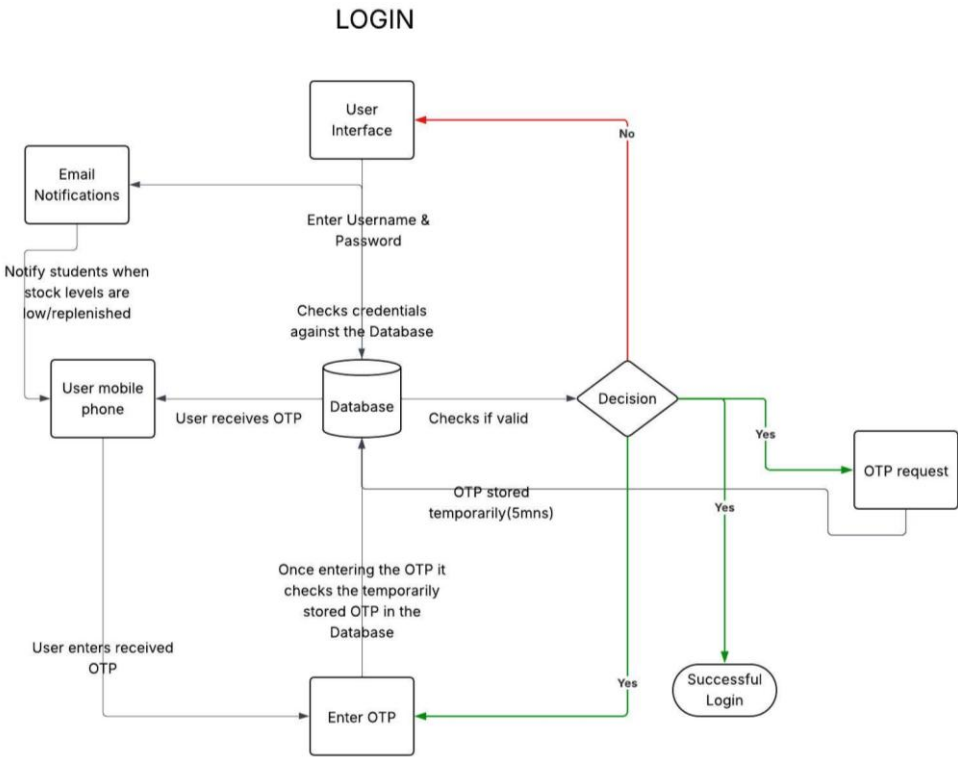


Figure 1.1 1.0 Registration page

Registration Page: The user enters their username, password, email, and phone number. The system validates the inputs; if errors are found, the user re-enters the details. Once valid, the information is saved in the database, and the user is redirected to the login page.





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Figure 1.2 Login Page

Login Page: the user enters their credentials. If incorrect, they must try again. When correct, the system generates an OTP, stores it temporarily, and sends it via SMS. The user inputs the OTP, which is checked in the database. If invalid or expired, they retry. If valid, access is granted to the UniFit shop.

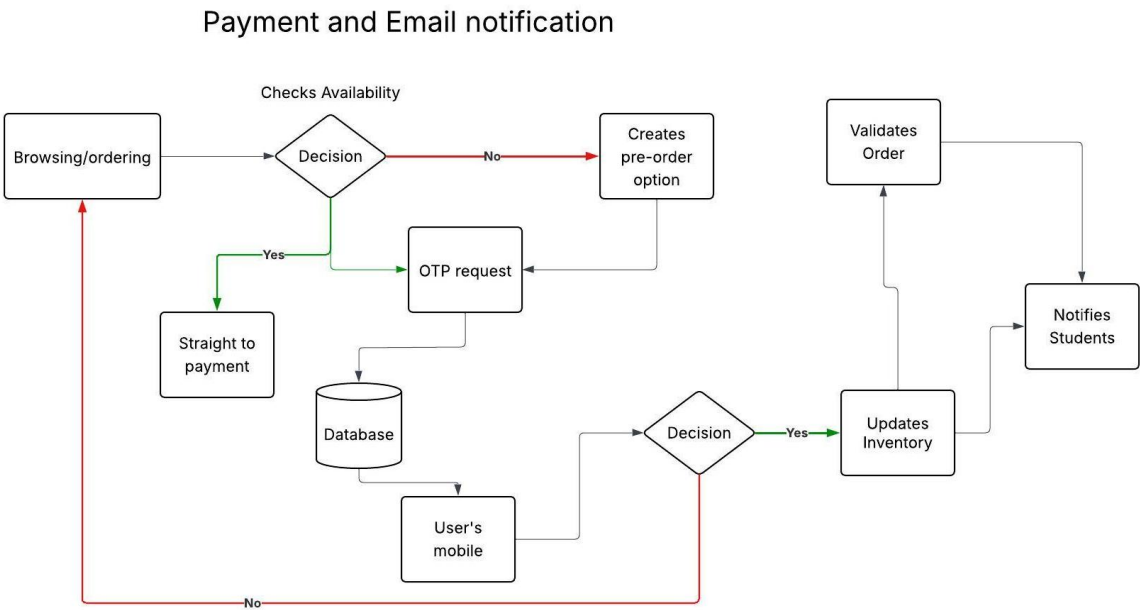


Figure 1.3 Payment and Email Notification

Payment and Email Notifications: when a user pays, the system checks the inventory. If stock is available, payment proceeds and an OTP is sent for confirmation. After OTP validation, the order status is updated (pending → processed) and the student is notified when it is ready. If stock is unavailable, the user is offered a pre-order option, then follows the same payment and OTP process. The inventory also triggers email notifications to students when stock is low or replenished.