Pro



## Changelog Table:

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| --- | --- | --- |
| Version | Author | Description |
| v1.0 | Nicholas Thong Meng Shui | * Created this document |
| V1.1 | Nicholas Thong Meng Shui | * Added information and content to 1.3.1 Product Perspective |
| V1.2 | Muhammad Anas bin Khairul Azman | * Added information and content to 1.3.2 Product Functions * Drafted content for 1.3.4 Product Limitations |

## 1.3 Product Overview

### 1.3.1 Product Perspective

The Wellness Platform is a system that integrates the university health centre’s appointment system and campus recreation facility management software. Its primary role is to support student wellness through personalized health resources and wellness goals, integration with university medical appointment records, and interaction with recreational facilities.

As such, this system communicates and interoperates with several other components of the university's infrastructure. These include the university authentication system, electronic health record (EHR) system, recreation portal, and health portal. The system utilizes these interfaces to authenticate users, retrieve health data, enable health appointment scheduling, enable fitness class scheduling, and provide wellness recommendations.

1. **System Interfaces**

* **Authentication System**: The system relies on the university's login infrastructure to authenticate student users securely.
* **EHR System**: Interfaces with the university's medical records system to retrieve relevant health data and sync updates.
* **Recreation Portal**: Interfaces with the university’s recreation facility management software to enable fitness class booking and data sharing.
* **Health Portal**: Interfaces with the university’s health centre’s appointment system to allow students to schedule health appointments.

1. **User Interfaces**
   1. Wellness Platform website shall make use of white (RGB Hex code: #FFFFFF) for its overall background and navigation bar font colour.
   2. Wellness Platform website shall always have a black (RGB Hex code: #000000) for non-navigation bar font colour.
   3. Wellness Platform website shall always have a blue (RGB Hex code: #000EBF) navigation bar present at the top of the page.
2. **Hardware Interfaces**

The system supports standard student devices such as personal computers and mobile phones. No specialized hardware is required.

1. **Software Interfaces**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Mnemonic** | **Specification Number** | **Version** | **Reference** |
| University Electronic Health Record System | UNIV\_EHR\_SYS | FHIR R4 | v1.0 | [EHRYourWay FHIR API Documentation](https://www.ehryourway.com/content/fhir-api-documentation.pdf) |
| University Health Portal | UNIV\_HEALTH\_PORT | N/A | Current | [University Health Patient Portal](https://www.universityhealth.com/patient-visitor-resources/patients/patient-portal) |
| University Recreation Portal | UNIV\_REC\_PORTAL | N/A | Current | [Columbia University Recreation Portal](https://perec.columbia.edu/content/member-portal-resources) |
| OAuth 2.0 Authentication Framework | OAUTH2 | RFC 6749 | Latest | [OAuth 2.0 Specification](https://tools.ietf.org/html/rfc6749) |
| JSON Web Token Standard | JWT | RFC 7519 | Latest | [JWT Specification](https://tools.ietf.org/html/rfc7519) |
| RESTful API Interface | REST\_API | OpenAPI 3.0 | Latest | [OpenAPI Specification](https://swagger.io/specification/) |

**Interfaces:**

* **University Electronic Health Record System**
  + **Purpose**: To retrieve and update electronic medical data for students.
  + **Interface Definition**: Supports HL7 FHIR R4-compliant REST endpoints; handles appointment history, prescriptions, and immunizations. Uses OAuth 2.0 for secure access.
  + **Reference**: EHRYourWay FHIR API Documentation
* **University Health Portal**
  + **Purpose**: To allow students to manage medical appointments and view personal health records.
  + **Interface Definition**: Web-based interface; provides scheduling, messaging, and medical record access. Integration through RESTful API.
  + **Reference**: University Health Patient Portal
* **University Recreation Portal**
  + **Purpose**: To enable scheduling and tracking of fitness classes and recreational activities.
  + **Interface Definition**: Booking and facility access information exchanged over REST API. Includes user authentication via SSO.
  + **Reference**: Columbia University Recreation Portal
* **OAuth 2.0 Authentication Framework**
  + **Purpose**: To authenticate students securely across university systems.
  + **Interface Definition**: Standard OAuth 2.0 protocol to handle login tokens and authorization. Interfaces with the university’s identity provider.
  + **Reference**: OAuth 2.0 Specification
* **JSON Web Token (JWT)**
  + **Purpose**: To transmit session data securely between frontend and backend systems.
  + **Interface Definition**: Encodes claim-based tokens using standard JWT format (RFC 7519), embedded in HTTP headers.
  + **Reference**: JWT Specification
* **RESTful API Interface**
  + **Purpose**: To facilitate integration between the wellness platform and external systems such as EHR, health portal, and recreation systems.
  + **Interface Definition**: Uses HTTP(S) with standard methods (GET, POST, PUT, DELETE). Data formatted as JSON. Described using OpenAPI Specification.
  + **Reference**: OpenAPI Specification

1. **Communication Interfaces**

* HTTPS protocol is used for secure communication with internal university systems.
* Authentication via OAuth 2.0 and JWT for cross-system data sharing.

1. **Memory Constraints**

The system is lightweight and web-based, requiring minimal local memory. All user data is stored and processed in cloud or university-hosted servers.

1. **Operations**

The Wellness Platform is intended to function under both user-driven and automated operations. The following operational requirements are identified:

**1) Modes of Operation**

* **User-Initiated Mode**: Students interact with the web application to:
  + Set and view wellness goals.
  + Book or cancel health centre or fitness appointments.
  + View personalized health resources.
* **Admin Mode**: Authorized staff access logs or analytics reports through secure dashboards.

**2) Periods of Interactive and Unattended Operations**

* **Interactive Operations**:
  + Occur during active user sessions.
  + Includes booking appointments, viewing data, or modifying goals.
* **Unattended Operations**:
  + Background data syncing with EHR and Recreation systems.
  + Periodic refresh of user statistics (e.g., step counts, appointment reminders).
  + Runs on a scheduled basis (e.g., nightly or hourly intervals).

**3) Data Processing Support Functions**

* **Data Aggregation**: Collects fitness and medical data from multiple systems and consolidates it in the student dashboard.
* **Data Validation**: Ensures data accuracy and compliance with privacy regulations (e.g., HIPAA).
* **Error Logging**: Logs failures during API communication or user actions for diagnostics.
* **Monitoring**: System health checks and logging for server uptime and performance metrics.

1. **Site Adaptation Requirements**

The system requires configuration of university-specific endpoints (e.g., EHR API URLs, class schedule formats) during deployment. It also requires institution-specific policy parameters (e.g., data retention limits, HIPAA compliance flags).

1. **Interfaces with Services**

Integrates with:

* University SaaS-based portals (e.g., health appointment scheduling)
* Cloud storage services (if enabled)

## 1.3.2 Product functions

### Health Centre Appointment System Integration

* The wellness platform needs to integrate with the health centre’s appointment system.
* Schedule appointments with the health centre.
* Cancel scheduled appointments.

### Campus Recreation Facility Integration

* The wellness platform also integrates with the campus recreation facility’s software.
* Book fitness classes.
* Book campus sport facilities. (basketball court, football court etc.)

### University Health Portal Integration

* Track personal wellness goals.
  + Calories burnt per day.
  + Calories burnt per week.
  + Steps moved per day.
  + Steps moved per week.
  + Workouts.
* Received tailored health resources.
  + Receive health articles based on personal interests.

## 1.3.4 Limitations

The campus wellness portal system that we designed has a few limitations. This is mostly due to its close integration and dependency on