**Artifact 1.6 FURPS+ Analysis and Check-Off List**

**FURPS+ Analysis**

**Functionality**

* **Authentication**:
  + Implement secure user authentication using **PHP** and **MySQL** with **bcrypt hashing** for passwords.
  + Provide password reset functionality via **SMTP protocol** using PHPMailer with a 15-minute validity for reset links.
* **Reservations**:
  + Enable real-time table availability checks with **AJAX calls to a RESTful API**.
  + Book and modify reservations with notifications sent via **SMTP** within 5 seconds.
* **Order Management**:
  + Add orders with indexed database fields to improve query performance and real-time updates via **WebSocket connections**.
  + Update order statuses in real-time to synchronize kitchen and waitstaff workflows.
* **Inventory**:
  + Monitor inventory levels with **SQL SELECT queries** and alert management on low stock via **email notifications** within 3 seconds.
  + Generate daily usage reports using **SQL AGGREGATE functions** and provide them as downloadable PDFs.
* **Scheduling**:
  + Allow staff to submit schedule requests and managers to approve/deny them using **role-based access control (RBAC)** and CRUD operations on schedules.

**Usability**

* User interfaces (e.g., Login, Reservations, Orders) must be intuitive and responsive for desktop and mobile devices.
* Notifications for reservations, orders, and inventory should be clear and actionable.
* Provide mobile-friendly access for waitstaff and management.

**Reliability**

* Ensure real-time updates are processed with minimal latency (within 2–3 seconds).
* Log all system events with time stamps for auditing.

**Performance**

* Support up to **50 concurrent users** with efficient database operations like indexing and connection pooling.
* All CRUD operations (e.g., Login, Order Input) must complete within 2–5 seconds.
* Use caching for frequently accessed data to optimize response times.

**Supportability**

* Provide clear documentation for setup, usage, and troubleshooting.
* Use a modular design for ease of maintenance and feature enhancements.
* Schedule inventory updates hourly using **cron jobs**.

**+ (Extensions)**

* **Security**:
  + Encrypt all communication using **SSL/TLS** with server-side validation.
  + Protect sensitive data with **bcrypt hashing** and session management via **HTTP-only cookies**.
* **Scalability**:
  + Optimize database queries for future expansion and increased data loads.
* **Compliance**:
  + Ensure compliance with GDPR for secure and transparent data handling.

**Check-Off List: Technical Requirements and Good Requirements Characteristics**

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| --- | --- | --- | --- |
| **Characteristic** | **Explanation** | **Example** | **Met?** |
| **Complete** | Covers all necessary functionality and edge cases. | "Real-time order updates via WebSocket connections." | YES |
| **Correct** | Aligns with stakeholder needs and goals. | "Low-inventory alerts sent to management within 3 seconds." | YES |
| **Feasible** | Achievable within the project's technical and operational constraints. | "Support up to 50 concurrent users using database connection pooling." | YES |
| **Atomic** | Focuses on a single requirement or functionality. | "Password reset emails sent via SMTP with a 15-minute validity." | YES |
| **Unambiguous** | Clearly defined with no room for misinterpretation. | "Inventory reports must generate as downloadable PDFs." | YES |
| **Modifiable** | Can be updated without impacting the rest of the system. | "Adjustable password complexity requirements." | YES |
| **Testable** | Can be validated through testing or observation. | "Login validation must complete within 2 seconds." | YES |
| **Traceable** | Linked to stakeholder needs or system objectives. | "Role-based dashboards for managers to approve or deny schedule requests." | YES |
| **Understandable** | Easily understood by stakeholders and developers. | "Order statuses must update to 'In Progress' within 2 seconds of entry." | YES |
| **Concise** | Avoids unnecessary details and focuses on the requirement. | "Support 200 reservations daily." | YES |
| **Consistent** | Does not conflict with other requirements or system goals. | "Only management-level accounts can access inventory modification forms." | YES |
| **Verifiable** | Requirements can be verified through testing or demonstration. | "System logs must store time-stamped entries for user actions." | YES |