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# **Software Requirements Specification**

**for**

## **Organ Donation Management System**

**Version 1.0 approved**

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# 1. Introduction

## Purpose

*The Organ Donation Management System, referred to as ODMS, is designed to streamline and enhance the management of organ donation processes, ensuring efficient and secure coordination between donors, recipients, medical professionals, and relevant stakeholders.*

## Intended Audience and Reading Suggestions

*This document is intended for various stakeholders, including developers, project managers, quality assurance teams, marketing staff, users, testers, and documentation writers. We recommend that readers start with the overview sections (Sections 1 and 2) to gain a comprehensive understanding of the ODMS and its context. Developers and testers should proceed to Section 3 for detailed requirements, while project managers and business analysts may find Sections 4 and 5 informative.*

## Product Scope

*The Organ Donation Management System (ODMS) is a comprehensive software solution that aims to facilitate and enhance the entire organ donation process. It includes features for donor registration, recipient matching, medical assessment tracking, communication management, and reporting. ODMS aligns with the overarching goals of increasing organ donation efficiency, saving lives, and contributing to the mission of our organization.*

# 2. Overall Description

## Product Perspective

*The Organ Donation Management System (ODMS) is a self-contained component designed to be an integral part of a larger healthcare system. It will integrate with existing health information systems and integrate with electronic health records (EHRs), clinical management systems, and other healthcare services. The ODMS will serve as a centralized hub for managing all aspects of organ donation, ensuring efficient and secure communication between stakeholders.*

## Product Features

*The major functions of the Organ Donation Management System (ODMS) include but are not limited to:*

- **Donor Registration and Information Management**
- **Recipient Matching and Organ Allocation**
- **Medical Assessment Tracking**
- **Communication and Notification Management**

- **Reporting and Analytics**

*These functions will be detailed further in Section 3.*

## **User Classes and Characteristics**

*ODMS is designed to serve various user classes, including:*

- **Donors:** Individuals or their representatives who wish to register as organ donors.
- **Recipients:** Patients in need of organ transplants.
- **Healthcare Professionals:** Medical practitioners and transplant coordinators.
- **Administrators:** System administrators responsible for managing user accounts and system configurations.

*User characteristics vary, with different levels of technical expertise and security privileges. For instance, healthcare professionals require access to medical data, while donors and recipients primarily interact with the registration and communication features.*

## **Operating Environment**

*ODMS will operate in the following environment:*

- **Hardware Platform:** Standard server hardware.
- **Operating System:** Compatible with major operating systems (e.g., Windows Server, Linux).
- **Software Components:** Interfaces with EHR systems, hospital management software, and standard communication protocols.

# **3. External Interface Requirements**

## **User Interfaces**

*The Organ Donation Management System (ODMS) offers user-friendly interfaces:*

**Login Page:** Authentication for system access with a standard login form and a password recovery option.

**Dashboard:** User-centric dashboard providing key statistics, quick links, and settings.

**Donor Registration Form:** A form to capture detailed information for potential organ donors.

**Recipient Registration Form:** A similar form tailored for organ transplant recipients.

**Search and Matching Interface:** Functionality to search for potential donor-recipient matches based on specific criteria.

**Donor Profile:** Detailed profiles of registered donors, including organ availability status.

**Recipient Profile:** Comprehensive profiles for recipients, showcasing medical needs and status.

**Request Processing Interface:** Interface for managing organ donation and transplant requests.

**Appointment Scheduling:** Tools for scheduling medical evaluations, organ harvesting, and transplant surgeries.

**Admin Panel:** Administrative interface for system administrators to manage user accounts and system settings.

**User Profile Settings:** User customization of profile information and notification preferences.

**Help and Support Center:** Resources for user assistance, including FAQs, user guides, and a contact form.

**Accessibility Features:** Ensures the system is accessible to all users, including those with disabilities, with relevant accessibility features.

## Hardware Interfaces

The Organ Donation Management System (ODMS) interfaces with hardware components as follows:

**Biometric Scanners:** Integration with biometric devices for donor and recipient identification.

**Barcode Scanners:** Compatibility with barcode scanners for tracking organ samples.

**Server Hardware:** Requirements for server infrastructure and compatibility.

**Printers:** Compatibility with printers for generating reports and labels.

**Database Servers:** Interface with database servers for data storage and retrieval.

## Software Interfaces

The Organ Donation Management System (ODMS) interfaces with specific software components:

**Operating Systems:** Compatibility with Windows, Linux, and macOS.

**Web Browsers:** Support for popular browsers like Chrome, Firefox, and Safari.

**Database Management Systems (DBMS):** Integration with databases such as MySQL, PostgreSQL, or Oracle.

**Payment Gateways:** Interface with payment processors like PayPal, Stripe, or Authorize.Net.

**Electronic Health Records (EHR) Systems:** Integration with EHR systems for medical data exchange.

**APIs:** Use of APIs for communication with external services and applications.

## 4. System Features

### **User Registration and Authentication:**

- Allow users (patients, organ donors, healthcare providers) to register and authenticate securely.
- Implement role-based access control to ensure the right users have the appropriate permissions..

### **Patient Profile Management:**

- Patients can create and manage their profiles, providing personal and medical information.
- Update their medical status, transplant preferences, and contact information.

### **Organ Donor Registration:**

- Organ donors can register, providing detailed medical history and compatibility information.
- Update their donor status and organ availability.

### **Waiting List Management**

- Maintain a waiting list for organ recipients, prioritizing them based on medical urgency and compatibility.
- Automatically update patient positions on the list as their conditions change.

### **Compatibility Assessment:**

- Implement algorithms to assess compatibility between organ donors and recipients.
- Consider factors such as blood type, tissue match, and medical urgency.

### **Notification System:**

- Notify patients and organ donors when a potential organ match is found.
- Enable real-time communication and response to match notifications.

**Reporting and Analytics:**

- Provide reports and analytics to optimize the organ allocation process.
- Generate statistics on organ transplants, waiting times, and success rates.

## 5. Other Nonfunctional Requirements

Non-functional requirements are equally important, especially considering the sensitivity of patient data. Some key NFRs include:

**Performance Requirements**

- The system should provide real-time updates and respond quickly to user requests, especially during organ allocation.
- The system should be capable of handling a large number of simultaneous users without significant degradation in performance.
- Response times for critical functions like organ allocation should be kept below a certain threshold (e.g., within 2 seconds).

**Privacy Requirements**

- Ensure that patient and donor information is kept confidential and in compliance with data protection regulations like HIPAA, etc.
- *Critical financial operations (e.g., transferring large amounts) require secondary authentication for user verification.*

**Security Requirements**

- **Data Encryption:** All data at rest and in transit should be encrypted to protect patient privacy.
- **Access Control:** Role-based access control to ensure only authorized users can access specific information.
- **Audit Trail:** Maintain a detailed audit trail to track all system interactions and changes.

**Software Quality Attributes**

- **Usability:** *The user interface should be intuitive, with a learning curve of no more than 15 minutes for new users.*
- **Availability:** *The system should aim for at least 90% uptime to ensure that organ allocation can happen promptly, especially in life-threatening situations.*



- **Reliability:** The system should be available 24/7 to handle organ allocation, even in emergency situations.
- **Compliance:** The system should adhere to legal and ethical standards related to organ donation and patient care.
- **Scalability:** The system should be scalable to accommodate a growing number of users, donors, and recipients.
- **Interoperability:** Ensure that the system can interface with other healthcare systems, electronic health records (EHRs), and national or regional organ donor registries to share and receive relevant patient information.
- **Accessibility:** Ensure that the system is accessible to even users with disabilities .