Habitat for Humanity LA Database System

Technical Design Document

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1. Project Overview

Habitat for Humanity Los Angeles (Habitat LA) is a nonprofit organization focused on building affordable housing for low-income families in the Los Angeles area. The proposed relational database aims to help Habitat LA manage volunteers, projects, and donations through a structured, efficient, and normalized schema.

2. System Scope and Objectives

The database will centralize and streamline operational processes:

- Manage volunteer registration, availability, assignment, and service tracking
- Track project details, volunteer involvement, and financial allocations
- Record and manage donations, donors, and how funds are used

The goal is to improve resource allocation, organizational transparency, and reporting.

3. Entities and Relationships

3.1 Volunteers

- **Volunteer**: Stores personal and contact information.
- **VolunteerAvailability**: Captures day and time availability per volunteer.
- **Role**: List of predefined roles volunteers can perform.

- **VolunteerAssignment**: Links volunteers to projects with specific roles.

- **ServiceReports**: Tracks hours and contributions per assignment.

3.2 Projects

- **Project**: Describes a project including name, location, description, start and end dates.

3.3 Donations

- **Donor**: Stores donor identity and contact info.

- **Donation**: Records donation events, amounts, and dates.

- **DonationProject**: Allocates donation funds to specific projects.

4. Detailed Entity Descriptions

Volunteer

- VolunteerID (PK): Unique identifier
- Email (Unique, NOT NULL)
- Name (NOT NULL)
- Location, PhoneNumber

VolunteerAvailability

- AvailabilityID (PK)
- VolunteerID (FK to Volunteer)
- Day (ENUM: Mon–Fri)
- TimeSlot (ENUM: Morning, Afternoon)

Role

- RoleID (PK)
- RoleName (NOT NULL)

VolunteerAssignment

- AssignmentID (PK)
- VolunteerID, ProjectID, RoleID, AvailabilityID (All FK)

ServiceReports

- ReportID (PK)
- AssignmentID (FK to VolunteerAssignment)
- Hours (NOT NULL)

Project

- ProjectID (PK)
- Name, Location (NOT NULL)
- Description, StartDate, EndDate

Donor

- DonorID (PK)
- Name (NOT NULL), PhoneNumber

Donation

- DonationID (PK)
- DonorID (FK), Date (NOT NULL), Amount (NOT NULL, > 0)

DonationProject

- DonationProjectID (PK)
- DonationID, ProjectID (FK)
- AllocationAmount (NOT NULL, > 0)
- Purpose

5. Normalization Notes

All entities are in at least **3NF**:

- No redundant or derived attributes
- Every non-key attribute is fully functionally dependent on the primary key
- Associative entities (e.g., VolunteerAvailability, VolunteerAssignment) prevent many-to-many relationship anomalies

6. Business Rules

Volunteers

- Each volunteer must have a unique email
- A volunteer can be assigned to multiple projects if availability allows
- Service hours are tracked per assignment

Projects

- Each project must have a unique name and location
- Projects can receive multiple donations
- Each project can have multiple volunteers assigned in various roles

Donations

- Each donation must be linked to a donor
- Allocation amount must be less than or equal to the donation total
- Donations can be split across projects with specific purposes

7. Functional Requirements Matrix

Function	Volunteer	Project	Donation
Volunteer Registration	X		
Availability Tracking	X		
Role Assignment	X	X	
Service Hour Tracking	X	X	
Project Registration		X	
Volunteer Assignment	X	X	
Donation Entry			X
Donor Management			X
Allocation to Projects		X	X
Financial Reporting		X	X

8. Future Enhancements

- Build web-based front-end interface for CRUD operations
- Automate financial summaries and other reports
- Add dashboards or visual summaries

9. Appendix

- **Project Summary**: See **docs/** folder
- **Data Migration**: See **data_migration/** folder
- **ER Diagram**: See **docs/diagrams** folder
- **SQL Scripts and Sample Queries**: See **`sql/`** folder
- **Demo of Data Migration and Queries:** See **demo/** folder