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# SOFTWARE DATABASE DESIGN SPECIFICATION

for

## INTERNSHIP MANAGEMENT SYSTEM

Version 1.0

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# 1 Introduction

## 1.1 Purpose

This Software Database Design Specification (SDDS) document provides a detailed database architecture and schema design for the Internship Management System (IMS) developed for WEBEL. It outlines the entity-relationship model, normalized table structures, and key constraints to support the system's functionality, ensuring data integrity and scalability across the internship lifecycle.

## 1.2 Scope

The SDDS covers the design of a relational database to manage users, organizations, internship programs, mentors, problems, applications, progress, and certificates. It addresses the needs of multiple user roles (Super Admin, Department Coordinators, Mentors, and Applicants) and supports workflows such as application processing, task assignment, and certification issuance.

## 1.3 Overview

This document includes a detailed ER diagram, comprehensive table schemas with primary and foreign keys, normalization details, and additional attributes to handle edge cases and exceptions. It aligns with the system's architectural requirements as specified in the Software Design Specification.

## 2 Database Design

### 2.1 Database Schema Overview

Table Name	Primary Key	Description
User_Master	user_id	Stores user details for all system users
Organization_Master	org_id	Stores organization information
Internship_Program_Master	int_prog_id	Stores internship program details
Internship_Mentor_Master	int_mentor_id	Stores mentor-specific information
Internship_Problem_Master	int_problem_id	Stores problem statements and assignments
Internship_Application_Master	applicant_id	Stores applicant information and status
Internship_Master	intern_id	Tracks active internship assignments
Internship_Progress_Master	progress_id	Tracks intern progress and milestones
Certificate_Master	certificate_id	Stores certificate details and status

Table 2.1: Database Schema Overview

### 2.2 Detailed Table Structures

#### 2.2.1 User\_Master Table

Column Name	Data Type	Null	Key	Description
user_id	INT	NO	PK	Auto-increment primary key
user_name	VARCHAR(100)	NO		Full name of the user
user_email	VARCHAR(150)	NO	UNI	Unique email address
user_password	VARCHAR(255)	NO		Encrypted password
user_type	ENUM	NO		'ADMIN', 'COORDINATOR', 'MENTOR', 'STUDENT'
user_org_id	INT	YES	FK	Reference to Organization_Master
user_phone	VARCHAR(15)	YES		Contact phone number
user_status	ENUM	NO		'ACTIVE', 'INACTIVE', 'SUSPENDED'
created_at	TIMESTAMP	NO		Record creation timestamp
updated_at	TIMESTAMP	NO		Last update timestamp

Table 2.2: User\_Master Table Structure

#### 2.2.2 Organization\_Master Table

Column Name	Data Type	Null	Key	Description
org_id	INT	NO	PK	Auto-increment primary key
org_name	VARCHAR(200)	NO		Organization name
org_address	TEXT	YES		Organization address
org_contact_email	VARCHAR(150)	YES		Official contact email
org_contact_phone	VARCHAR(15)	YES		Official contact phone
org_website	VARCHAR(255)	YES		Organization website URL
org_status	ENUM	NO		'ACTIVE', 'INACTIVE'
created_at	TIMESTAMP	NO		Record creation timestamp
updated_at	TIMESTAMP	NO		Last update timestamp

Table 2.3: Organization\_Master Table Structure

### 2.2.3 Internship\_Program\_Master Table

Column Name	Data Type	Null	Key	Description
int_prog_id	INT	NO	PK	Auto-increment primary key
int_prog_name	VARCHAR(200)	NO		Program name
int_prog_description	TEXT	YES		Program description
int_org_id	INT	NO	FK	Reference to Organization_Master
int_coordinator_user_id	INT	NO	FK	Reference to User_Master
prog_start_date	DATE	NO		Program start date
prog_end_date	DATE	NO		Program end date
prog_duration_weeks	INT	NO		Duration in weeks
prog_max_applicants	INT	NO		Maximum number of applicants
prog_status	ENUM	NO		'DRAFT', 'ACTIVE', 'CLOSED', 'COMPLETED'
created_at	TIMESTAMP	NO		Record creation timestamp
updated_at	TIMESTAMP	NO		Last update timestamp

Table 2.4: Internship\_Program\_Master Table Structure

### 2.2.4 Internship\_Mentor\_Master Table

Column Name	Data Type	Null	Key	Description
int_mentor_id	INT	NO	PK	Auto-increment primary key
int_mentor_user_id	INT	NO	FK	Reference to User_Master
int_mentor_organization	INT	NO	FK	Reference to Organization_Master
mentor_expertise	VARCHAR(500)	YES		Areas of expertise
mentor_experience_years	INT	YES		Years of experience
mentor_max_interns	INT	NO		Maximum interns per program
mentor_current_load	INT	NO		Current number of interns
mentor_status	ENUM	NO		'ACTIVE', 'INACTIVE', 'UNAVAILABLE'
onboarding_date	DATE	NO		Mentor onboarding date

Column Name	Data Type	Null	Key	Description
created_at	TIMESTAMP	NO		Record creation timestamp
updated_at	TIMESTAMP	NO		Last update timestamp

Table 2.5: Internship\_Mentor\_Master Table Structure

### 2.2.5 Internship\_Problem\_Master Table

Column Name	Data Type	Null	Key	Description
int_problem_id	INT	NO	PK	Auto-increment primary key
problem_title	VARCHAR(300)	NO		Problem statement title
problem_description	TEXT	NO		Detailed problem description
int_prog_id	INT	NO	FK	Reference to Internship_Program_Master
int_mentor_1_id	INT	NO	FK	Primary mentor reference
int_mentor_2_id	INT	YES	FK	Secondary mentor reference
problem_difficulty	ENUM	NO		'BEGINNER', 'INTERMEDIATE', 'ADVANCED'
problem_duration_weeks	INT	NO		Expected duration in weeks
problem_max_interns	INT	NO		Maximum interns for this problem
problem_status	ENUM	NO		'DRAFT', 'ACTIVE', 'ASSIGNED', 'COMPLETED'
created_at	TIMESTAMP	NO		Record creation timestamp
updated_at	TIMESTAMP	NO		Last update timestamp

Table 2.6: Internship\_Problem\_Master Table Structure

### 2.2.6 Internship\_Application\_Master Table

Column Name	Data Type	Null	Key	Description
applicant_id	INT	NO	PK	Auto-increment primary key
applicant_name	VARCHAR(150)	NO		Applicant full name
applicant_email	VARCHAR(150)	NO		Applicant email address
applicant_phone	VARCHAR(15)	YES		Contact phone number
prog_id	INT	NO	FK	Reference to Internship_Program_Master
preferred_problem_id	INT	YES	FK	Reference to Internship_Problem_Master
applicant_resume	VARCHAR(500)	YES		Resume file path
applicant_cover_letter	TEXT	YES		Cover letter text
application_date	TIMESTAMP	NO		Application submission date
application_status	ENUM	NO		'SUBMITTED', 'REVIEWED', 'ACCEPTED', 'REJECTED'
review_comments	TEXT	YES		Reviewer comments
reviewed_by	INT	YES	FK	Reference to User_Master (reviewer)
reviewed_at	TIMESTAMP	YES		Review timestamp

Column Name	Data Type	Null	Key	Description
created_at	TIMESTAMP	NO		Record creation timestamp
updated_at	TIMESTAMP	NO		Last update timestamp

Table 2.7: Internship\_Application\_Master Table Structure

### 2.2.7 Internship\_Master Table

Column Name	Data Type	Null	Key	Description
intern_id	INT	NO	PK	Auto-increment primary key
org_id	INT	NO	FK	Reference to Organization_Master
prog_id	INT	NO	FK	Reference to Internship_Program_Master
problem_id	INT	NO	FK	Reference to Internship_Problem_Master
mentor_id	INT	NO	FK	Reference to Internship_Mentor_Master
applicant_id	INT	NO	FK	Reference to Internship_Application_Master
intern_start_date	DATE	NO		Internship start date
intern_end_date	DATE	NO		Internship end date
intern_status	ENUM	NO		'ASSIGNED', 'ACTIVE', 'COMPLETED', 'TERMINATED'
completion_percentage	DECIMAL(5,2)	NO		Completion percentage (0.00-100.00)
final_grade	CHAR(2)	YES		Final grade (A, B, C, D, F)
created_at	TIMESTAMP	NO		Record creation timestamp
updated_at	TIMESTAMP	NO		Last update timestamp

Table 2.8: Internship\_Master Table Structure

### 2.2.8 Internship\_Progress\_Master Table

Column Name	Data Type	Null	Key	Description
progress_id	INT	NO	PK	Auto-increment primary key
intern_id	INT	NO	FK	Reference to Internship_Master
prog_id	INT	NO	FK	Reference to Internship_Program_Master
mentor_1_id	INT	NO	FK	Primary mentor reference
mentor_2_id	INT	YES	FK	Secondary mentor reference
problem_id	INT	NO	FK	Reference to Internship_Problem_Master
progress_week	INT	NO		Week number of the program
progress_description	TEXT	YES		Weekly progress description
deliverables_submitted	TEXT	YES		List of submitted deliverables
mentor_feedback	TEXT	YES		Mentor feedback on progress

Column Name	Data Type	Null	Key	Description
progress.status	ENUM	NO		'ON_TRACK', 'DE- LAYED', 'COMPLETED', 'NEEDS_ATTENTION'
progress.percentage	DECIMAL(5,2)	NO		Week-wise progress percent- age
submission.date	TIMESTAMP	NO		Progress submission date
last.updated	TIMESTAMP	NO		Last update timestamp
created.at	TIMESTAMP	NO		Record creation timestamp

Table 2.9: Internship\_Progress\_Master Table Structure

### 2.2.9 Certificate\_Master Table

Column Name	Data Type	Null	Key	Description
certificate.id	INT	NO	PK	Auto-increment primary key
intern.id	INT	NO	FK	Reference to Intern- ship_Master
mentor.1.id	INT	NO	FK	Primary mentor reference
mentor.2.id	INT	YES	FK	Secondary mentor reference
certificate.number	VARCHAR(50)	NO	UNI	Unique certificate number
certificate.type	ENUM	NO		'COMPLETION', 'EXCEL- LENCE', 'PARTICIPATION'
issue.date	DATE	NO		Certificate issue date
certificate.file.path	VARCHAR(500)	YES		Generated certificate file path
certificate.status	ENUM	NO		'PENDING', 'ISSUED', 'RE- VOKED'
issued.by	INT	NO	FK	Reference to User_Master (is- suer)
verification.code	VARCHAR(100)	NO	UNI	Unique verification code
created.at	TIMESTAMP	NO		Record creation timestamp
updated.at	TIMESTAMP	NO		Last update timestamp

Table 2.10: Certificate\_Master Table Structure



## 2.3 System Entity Relationship Diagram

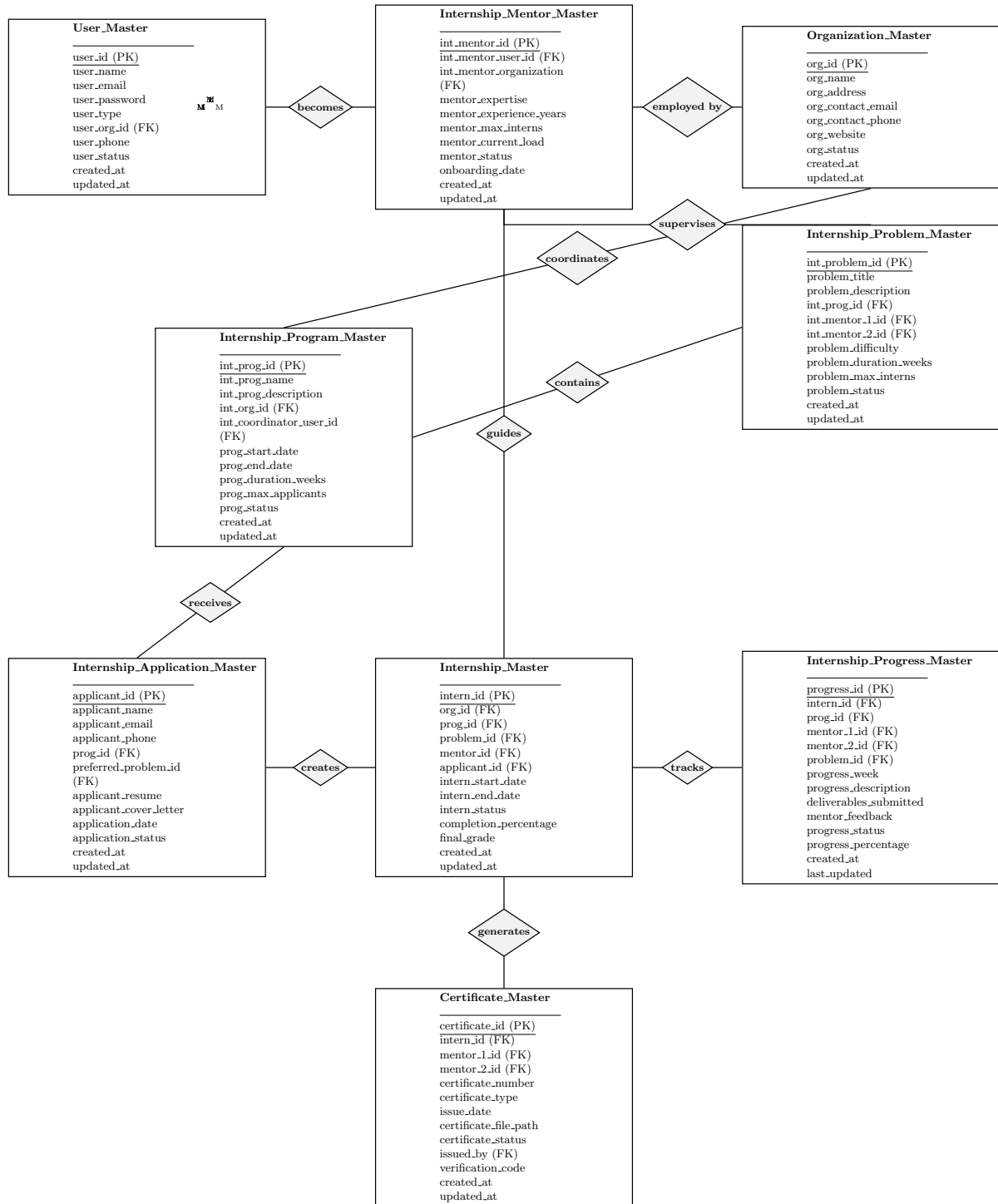


Figure 2.1: Enhanced Entity Relationship Diagram for Internship Management System

## 3 Conclusion

This Software Database Design Specification provides a comprehensive and robust foundation for the Internship Management System's database layer. The design incorporates:

- A fully normalized relational database schema with nine interconnected tables.
- Comprehensive data integrity constraints including primary keys, foreign keys, and unique constraints.
- Detailed table structures with appropriate data types and null constraints.
- Performance optimization strategies including indexing and partitioning recommendations.
- Security measures for data protection and access control.
- Exception handling mechanisms for common edge cases.
- Scalability considerations for future growth.

The database design aligns with modern best practices and supports all functional requirements of the Internship Management System. It provides a solid foundation for WEBEL's internship management needs while ensuring data integrity, security, and performance.

Future enhancements may include advanced analytics tables, notification tracking, and integration with external systems. Regular review and optimization of the database structure will ensure continued performance and reliability as the system evolves.