

Database Relationships & Comprehensive Attribute Analysis

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Entities & Primary Keys

- **users** (PK: id)
 - **attendances** (PK: id, FK: user_id → users.id, FK: schedule_id → shiftschedules.id nullable)
 - **leave_requests** (PK: id, FK: user_id → users.id)
 - **shiftschedules** (PK: id, FK: user_id → users.id)
 - **personal_access_tokens** (PK: id, polymorphic tokenable)
 - **password_reset_tokens** (PK: email)
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Relationships (Cardinality + Verbs)

users 1 — M attendances

- **Verb:** User **HAS** many attendances; Attendance **BELONGS TO** one user
- **FK:** attendances.user_id → users.id (ON DELETE CASCADE)
- **Optional FK:** attendances.schedule_id → shiftschedules.id (ON DELETE SET NULL)
- **Unique:** (user_id, date) ensures at most one attendance per user per day
- **Indexes:**
 - (user_id, date) - for daily lookups
 - (user_id, date, status) - for reporting
 - Partial index on status = 'present' - for present-only queries
- **Purpose:** Track daily attendance records (clock in/out times, status)

users 1 — M leave_requests

- **Verb:** User **HAS** many leave requests; Leave request **BELONGS TO** one user
- **FK:** leave_requests.user_id → users.id (ON DELETE CASCADE)
- **Constraints:**
 - status ∈ {0, 1, 2} (0=Pending, 1=Approved, 2=Rejected)
 - end_date ≥ start_date
- **Indexes:**
 - user_id - for user's leave history
 - status - for filtering by approval state
 - type - for filtering by leave type
 - (user_id, status) - composite for user's pending/approved leaves
 - Partial index on status = 0 - for pending requests dashboard
- **Purpose:** Manage leave applications (annual, sick, emergency)

users 1 — M shiftschedules

- **Verb:** User **HAS** many shift schedules; Shift schedule **BELONGS TO** one user
- **FK:** shiftschedules.user_id → users.id (ON DELETE CASCADE)
- **Unique:** (week_start, day, shift_type) enforces one assignee per shift slot per day
- **Indexes:**
 - (user_id, day) - for user's daily schedule
 - (user_id, week_start) - for user's weekly schedule
- **Purpose:** Assign staff to specific shift slots (morning/evening) per day

shiftschedules 1 — M attendances (optional link)

- **Verb:** Schedule **HAS** many attendances; Attendance **BELONGS TO** one schedule
- **FK:** attendances.schedule_id → shiftschedules.id (nullable, ON DELETE SET NULL)
- **Usage:** Links attendance to specific shift slot; enables shift-specific reporting
- **Purpose:** Track which shift schedule an attendance was for; enforce clock-in only when scheduled

users 1 — M personal_access_tokens (polymorphic)

- **Verb:** User **OWNS** many tokens; Token **BELONGS TO** a tokenable (user)
- **Polymorphic:** tokenable_type/tokenable_id pair points to users
- **Purpose:** API authentication via Laravel Sanctum

Comprehensive Attribute Details

Table: users

Domain: Staff/Employee records Objective: Central registry of all system users (staff members)

Attribute	Type	Constraint	Domain Values	Objective	Usage
id	bigint	PK, auto-increment	1..∞	Unique identifier	Primary key for all user operations
name	varchar(255)	NOT NULL	Any valid name	Employee's full name	Display in UI, reports, schedules
email	varchar(255)	UNIQUE, NOT NULL	Valid email format	Login credential & contact	Authentication, notification
phone	varchar(255)	UNIQUE, NOT NULL	Phone number	Contact information	Uniqueness validation, contact
national_id	varchar(255)	UNIQUE, NOT NULL	National ID number	Government ID	Uniqueness validation, records
password	varchar(255)	NOT NULL	Hashed password	Authentication credential	Login security (bcrypt)

					hashed)
email_verified_at	timestamp	NULL	Timestamp or NULL	Email verification status	Laravel aut email verification
remember_token	varchar(100)	NULL	Token or NULL	Session persistence	"Remember me" login feature
userRole	varchar(255)	NOT NULL, default 'staff'	'owner', 'admin', 'staff'	Authorization level	Role-based access control (replaced Spatie)
annual_leave_balance	int	>= 0, default 15	0..∞	Remaining annual leave days	Leave approval validation (future)
sick_leave_balance	int	>= 0, default 10	0..∞	Remaining sick leave days	Leave approval validation (future)
emergency_leave_balance	int	>= 0, default 5	0..∞	Remaining emergency leave days	Leave approval validation (future)
hired_on	date	NULL	Valid date	Employment start date	Tenure calculation: reports
address	text	NULL	Any address	Employee's address	HR records payroll
bank_acc_no	varchar(255)	NULL	Bank account number	Payroll deposit account	Salary payments (future)
deleted_at	timestamp	NULL	Timestamp or NULL	Soft delete marker	Data recovery audit trail
created_at	timestamp	NOT NULL	Timestamp	Record creation time	Audit trail
updated_at	timestamp	NOT NULL	Timestamp	Last modification time	Audit trail

Removed Attributes: `normalized_name` (unused), `payroll_day`, `salary` (unused, removed in migration 2025_10_13_162211)

Table: attendances

Domain: Daily attendance records **Objective:** Track employee clock-in/out times and attendance status

Attribute	Type	Constraint	Domain Values	Objective	Usage
id	bigint	PK, auto-increment	1.. ∞	Unique identifier	Primary key for attendance records
user_id	bigint	FK → users.id, NOT NULL	Valid user ID	Employee being tracked	Links attendance to specific user
schedule_id	bigint	FK → shiftschedules.id, NULL	Valid schedule ID or NULL	Shift slot reference	Links attendance to assigned shift
date	date	NOT NULL, UNIQUE with user_id	Valid date	Attendance date	Which day the attendance is for
status	varchar(255)	NOT NULL	'on_time', 'late', 'missed', 'present'	Attendance status	Performance tracking, reports
sign_in_time	time	NULL	HH:MM:SS	Clock-in time	Calculate working hours, lateness
sign_off_time	time	NULL	HH:MM:SS	Clock-out time	Calculate working hours
notes	varchar(255)	NULL	Any text	Additional context	Admin notes, reasons for manual entry
is_manually_filled	boolean	default false	true/false	Entry method indicator	Distinguish manual vs self clock-in
deleted_at	timestamp	NULL	Timestamp or NULL	Soft delete marker	Data recovery, corrections

created_at	timestamp	NOT NULL	Timestamp	Record creation time	Audit trail
updated_at	timestamp	NOT NULL	Timestamp	Last modification time	Audit trail

Removed Attributes: None (all current attributes are used)

Table: leave_requests

Domain: Leave applications **Objective:** Manage employee leave requests (annual, sick, emergency)

Attribute	Type	Constraint	Domain Values	Objective	Usage
id	bigint	PK, auto-increment	1.. ∞	Unique identifier	Primary key for leave requests
user_id	bigint	FK → users.id, NOT NULL	Valid user ID	Employee requesting leave	Links request to specific user
type	varchar(255)	NOT NULL	'Annual Leave', 'Sick Leave', 'Emergency Leave'	Leave category	Determines which balance to deduct from
start_date	date	NOT NULL, <= end_date	Valid date	Leave start date	Defines leave period start
end_date	date	NULL, >= start_date	Valid date or NULL	Leave end date	Defines leave period end (NULL = single day)
message	text	NULL	Any text	Employee's reason	Context for admin approval decision
status	smallint	NOT NULL, default 0, IN (0,1,2)	0=Pending, 1=Approved, 2=Rejected	Approval state	Workflow tracking, notifications
admin_response	text	NULL	Any text	Admin's feedback	Communicate rejection reasons
deleted_at	timestamp	NULL	Timestamp or NULL	Soft delete marker	Data recovery, corrections

created_at	timestamp	NOT NULL	Timestamp	Request submission time	SLA tracking
updated_at	timestamp	NOT NULL	Timestamp	Last status change time	Approval timestamp

Removed Attributes: `is_seen` (unused, removed in migration 2025_10_13_162211)

Table: shiftschedules

Domain: Weekly shift assignments **Objective:** Assign employees to specific shift slots (morning/evening) each day

Attribute	Type	Constraint	Domain Values	Objective	Usage
id	bigint	PK, auto-increment	1.. ∞	Unique identifier	Primary key for schedule assignments
user_id	bigint	FK → users.id, NOT NULL	Valid user ID	Assigned employee	Who is working this shift
shift_type	varchar(255)	NOT NULL, UNIQUE with (week_start, day)	'morning', 'evening'	Shift slot type	Determines shift timing (morning 06:00-15:00, evening 15:00-00:00)
week_start	date	NOT NULL, UNIQUE with (day, shift_type)	Monday date	Week identifier	Groups shifts into weeks
day	date	NOT NULL, UNIQUE with (week_start, shift_type)	Valid date	Specific day	Which day this shift is for
submitted	boolean	default false	true/false	Week finalization status	Locks schedule editing for the week
deleted_at	timestamp	NULL	Timestamp or NULL	Soft delete marker	Data recovery, corrections
created_at	timestamp	NOT NULL	Timestamp	Assignment creation time	Audit trail
updated_at	timestamp	NOT NULL	Timestamp	Last reassignment time	Audit trail

Removed Attributes: `start_time` , `end_time` (unused, hardcoded in UI, removed in migration 2025_10_13_162211)

Table: `personal_access_tokens` (Laravel Sanctum)

Domain: API authentication tokens **Objective:** Manage API access tokens for authenticated users

Attribute	Type	Constraint	Domain Values	Objective	Usage
<code>id</code>	<code>bigint</code>	PK, auto-increment	1..∞	Unique identifier	Primary key
<code>tokenable_type</code>	<code>varchar(255)</code>	NOT NULL	'App\Models\User'	Polymorphic model type	Identifies which model owns token
<code>tokenable_id</code>	<code>bigint</code>	NOT NULL	Valid user ID	Owner ID	Which user owns this token
<code>name</code>	<code>varchar(255)</code>	NOT NULL	Any name	Token description	Identifies token purpose
<code>token</code>	<code>varchar(64)</code>	UNIQUE, NOT NULL	64-char hash	Access credential	Authentication bearer token
<code>abilities</code>	<code>text</code>	NULL	JSON array or NULL	Token permissions	Scope-based access control
<code>last_used_at</code>	<code>timestamp</code>	NULL	Timestamp or NULL	Last usage time	Inactivity tracking
<code>expires_at</code>	<code>timestamp</code>	NULL	Timestamp or NULL	Expiration time	Token validity period
<code>created_at</code>	<code>timestamp</code>	NOT NULL	Timestamp	Token creation time	Audit trail
<code>updated_at</code>	<code>timestamp</code>	NOT NULL	Timestamp	Last update time	Audit trail

Table: `password_reset_tokens` (Laravel Auth)

Domain: Password reset requests **Objective:** Manage password reset token lifecycle

Attribute	Type	Constraint	Domain Values	Objective	Usage
<code>email</code>	<code>varchar(255)</code>	PK	Valid email	User's email	Identifies who requested reset

token	varchar(255)	NOT NULL	Hashed token	Reset credential	Secure reset link validation
created_at	timestamp	NULL	Timestamp	Request creation time	Token expiry calculation (60 min)

Integrity Constraints & Validations

Database-Level Constraints

1. CHECK Constraints:

- `users.annual_leave_balance >= 0`
- `users.sick_leave_balance >= 0`
- `users.emergency_leave_balance >= 0`
- `leave_requests.status IN (0, 1, 2)`
- `leave_requests.end_date >= start_date` (when both present)

2. UNIQUE Constraints:

- `users.email` , `users.phone` , `users.national_id`
- `attendances(user_id, date)` - one attendance per user per day
- `shiftschedules(week_start, day, shift_type)` - one assignee per shift slot
- `personal_access_tokens.token`

3. Foreign Key Constraints:

- `attendances.user_id → users.id` (ON DELETE CASCADE)
- `attendances.schedule_id → shiftschedules.id` (ON DELETE SET NULL)
- `leave_requests.user_id → users.id` (ON DELETE CASCADE)
- `shiftschedules.user_id → users.id` (ON DELETE CASCADE)

4. Soft Deletes:

- Enabled on: `users` , `attendances` , `leave_requests` , `shiftschedules`
- Purpose: Data recovery, audit trail, historical reporting

Application-Level Validations

1. Schedule Assignment (ScheduleController):

- Block assignment if employee has approved leave on that day
- Prevent duplicate assignments via DB unique constraint

2. Attendance Creation (AttendanceServices):

- Block if employee has approved leave on that date
- Require a valid schedule for that date
- Auto-set `schedule_id` when creating attendance

3. Leave Balance Reconciliation (Migration):

- Count actual days of approved leave (not just request count)
- Deduct from appropriate balance based on leave type

Indexes & Performance

Primary Indexes (Auto-created)

- `users.id` , `attendances.id` , `leave_requests.id` , `shiftschedules.id` , `personal_access_tokens.id`

Unique Indexes (Enforce constraints)

- `users_email_unique` , `users_phone_unique` , `users_national_id_unique`
- `attendances_user_id_date_unique`
- `shiftschedules_week_start_day_shift_type_unique`
- `personal_access_tokens_token_unique`

Foreign Key Indexes (Join performance)

- `attendances_user_id_index`
- `attendances_schedule_id_index`
- `leave_requests_user_id_index`
- `shiftschedules_user_id_index`

Composite Indexes (Reporting queries)

- `attendances_user_id_date_status_index` - dashboard attendance reports
- `leave_requests_user_id_status_index` - user's pending/approved leaves
- `shiftschedules_user_id_day_index` - daily schedule lookup
- `shiftschedules_user_id_week_start_index` - weekly schedule view

Partial Indexes (Filtered queries)





- `leave_requests_status_pending_index` WHERE `status = 0` - pending requests dashboard
- `attendances_status_present_index` WHERE `status = 'present'` - present-only reports

Single-Column Indexes (Filter/sort operations)






- `leave_requests_status_index` , `leave_requests_type_index`
- `attendances_date_index` , `shiftschedules_day_index` , `shiftschedules_week_start_index`

Summary of Changes from Initial State






Removed (Cleanup)

-  `users.normalized_name` (orphaned logic)
-  `users.payroll_day` , `users.salary` (unused)
-  `leave_requests.is_seen` (never implemented)
-  `shiftschedules.start_time` , `shiftschedules.end_time` (hardcoded in UI)

Added (Enhancement)

-  `attendances.schedule_id` FK for explicit shift linkage
-  Soft deletes on all core tables
-  CHECK constraints for data integrity
-  Composite and partial indexes for performance
-  Unique constraint on `shiftschedules(week_start, day, shift_type)` for slot uniqueness

Fixed (Corrections)

-  Renamed `employees` → `users` , `requests` → `leave_requests` , `schedules` → `shiftschedules`
-  Fixed leave balance reconciliation to count days, not requests
-  Dropped duplicate/legacy indexes and sequences
-  Added missing indexes on frequently queried columns
-  Application-level validations to prevent conflicts (leave vs schedule/attendance)

Last Updated: 2025-10-13 after migration

`2025_10_13_162211_remove_unused_columns_from_tables.php`