Hotel Management System - Schema Documentation

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Data Dictionary (Tables, Columns, Data Types, Constraints)

1.ROLES

Column	Type	Constraints
role_id	INT	PK, AUTO_INCREMENT
role_name	VARCHAR(50)	UNIQUE, NOT NULL
description	TEXT	—
permissions	JSON	—
created_at	TIMESTAMP	DEFAULT NOW()

2.USERS

Column	Type	Constraints
user_id	INT	PK, AUTO_INCREMENT
username	VARCHAR(50)	UNIQUE, NOT NULL
email	VARCHAR(100)	UNIQUE, NOT NULL
password_hash	VARCHAR(255)	NOT NULL
full_name	VARCHAR(100)	NOT NULL
phone	VARCHAR(20)	—
role_id	INT	FK → roles(role_id)
branch_id	INT	FK → branches(branch_id)

is_active	BOOLEAN	DEFAULT TRUE
created_at	TIMESTAMP	DEFAULT NOW()
last_login	TIMESTAMP	—

3.BRANCHES

Column	Type	Constraints
branch_id	INT	PK, AUTO_INCREMENT
branch_name	VARCHAR(100)	NOT NULL
branch_code	VARCHAR(10)	UNIQUE, NOT NULL
address	VARCHAR(255)	NOT NULL
city	VARCHAR(50)	NOT NULL
state	VARCHAR(50)	—
country	VARCHAR(50)	NOT NULL
postal_code	VARCHAR(20)	—
phone	VARCHAR(20)	NOT NULL
email	VARCHAR(100)	—
manager_id	INT	FK → users(user_id)
is_active	BOOLEAN	DEFAULT TRUE
opening_date	DATE	—
created_at	TIMESTAMP	DEFAULT NOW()

4.ROOM_TYPES

Column	Type	Constraints
room_type_id	INT	PK, AUTO_INCREMENT
type_name	VARCHAR(50)	NOT NULL
description	TEXT	—
base_price	DECIMAL(10,2)	NOT NULL, CHECK > 0
max_occupancy	INT	NOT NULL, CHECK > 0
amenities	JSON	—
created_at	TIMESTAMP	DEFAULT NOW()

5.ROOMS

Column	Type	Constraints
room_id	INT	PK, AUTO_INCREMENT
branch_id	INT	FK → branches(branch_id)
room_type_id	INT	FK → room_types(room_type_id)
room_number	VARCHAR(20)	NOT NULL
floor_number	INT	—
status	ENUM	DEFAULT 'available'
is_active	BOOLEAN	DEFAULT TRUE
last_maintenance	DATE	—
created_at	TIMESTAMP	DEFAULT NOW()

Table Constraint:

- UNIQUE(branch_id, room_number)

6.GUESTS

Column	Type	Constraints
guest_id	INT	PK, AUTO_INCREMENT
first_name	VARCHAR(50)	NOT NULL
last_name	VARCHAR(50)	NOT NULL
email	VARCHAR(100)	UNIQUE
phone	VARCHAR(20)	NOT NULL
date_of_birth	DATE	—
nationality	VARCHAR(50)	—
id_type	VARCHAR(50)	—
id_number	VARCHAR(100)	—
address	VARCHAR(255)	—
city	VARCHAR(50)	—
country	VARCHAR(50)	—
loyalty_points	INT	DEFAULT 0
total_stays	INT	DEFAULT 0
created_at	TIMESTAMP	DEFAULT NOW()
updated_at	TIMESTAMP	ON UPDATE NOW()

7.RESERVATIONS

Column	Type	Constraints
reservation_id	INT	PK, AUTO_INCREMENT
guest_id	INT	FK → guests(guest_id)
branch_id	INT	FK → branches(branch_id)
room_id	INT	FK → rooms(room_id)
check_in_date	DATE	NOT NULL
check_out_date	DATE	NOT NULL, CHECK(check_out_date > check_in_date)
actual_check_in	TIMESTAMP	—
actual_check_out	TIMESTAMP	—
num_adults	INT	NOT NULL, CHECK > 0
num_children	INT	DEFAULT 0, CHECK ≥ 0
status	ENUM	DEFAULT 'pending'
total_amount	DECIMAL(10,2)	NOT NULL, CHECK ≥ 0
created_by	INT	FK → users(user_id)
created_at	TIMESTAMP	DEFAULT NOW()
updated_at	TIMESTAMP	ON UPDATE NOW()

8.INVOICES

Column	Type	Constraints
invoice_id	INT	PK, AUTO_INCREMENT
reservation_id	INT	FK → reservations(reservation_id)
invoice_number	VARCHAR(50)	UNIQUE, NOT NULL
subtotal	DECIMAL(10,2)	NOT NULL, CHECK ≥ 0
tax_amount	DECIMAL(10,2)	NOT NULL, CHECK ≥ 0
discount_amount	DECIMAL(10,2)	DEFAULT 0, CHECK ≥ 0
total_amount	DECIMAL(10,2)	NOT NULL, CHECK ≥ 0
payment_status	ENUM	DEFAULT 'unpaid'
issue_date	TIMESTAMP	DEFAULT NOW()
due_date	DATE	—

9.PAYMENTS

Column	Type	Constraints
payment_id	INT	PK, AUTO_INCREMENT
invoice_id	INT	FK → invoices(invoice_id)
amount	DECIMAL(10,2)	NOT NULL, CHECK > 0
payment_method	ENUM	NOT NULL
payment_date	TIMESTAMP	DEFAULT NOW()
transaction_id	VARCHAR(100)	—
processed_by	INT	FK → users(user_id)
status	ENUM	DEFAULT 'completed'

10.SERVICES

Column	Type	Constraints
service_id	INT	PK, AUTO_INCREMENT
service_name	VARCHAR(100)	NOT NULL
category	VARCHAR(50)	NOT NULL
description	TEXT	—
base_price	DECIMAL(10,2)	NOT NULL, CHECK ≥ 0
is_active	BOOLEAN	DEFAULT TRUE
created_at	TIMESTAMP	DEFAULT NOW()

11.RESERVATION_SERVICES (JUNCTION)

Column	Type	Constraints
reservation_service_id	INT	PK, AUTO_INCREMENT
reservation_id	INT	FK → reservations(reservation_id)
service_id	INT	FK → services(service_id)
quantity	INT	NOT NULL, CHECK > 0
unit_price	DECIMAL(10,2)	NOT NULL, CHECK ≥ 0
total_price	DECIMAL(10,2)	NOT NULL, CHECK ≥ 0
service_date	TIMESTAMP	DEFAULT NOW()

12.HOUSEKEEPING_TASKS

Column	Type	Constraints
task_id	INT	PK, AUTO_INCREMENT
room_id	INT	FK → rooms(room_id)
assigned_to	INT	FK → users(user_id)
task_type	ENUM	NOT NULL
priority	ENUM	DEFAULT 'medium'
status	ENUM	DEFAULT 'pending'
scheduled_date	DATE	NOT NULL
completed_date	TIMESTAMP	—
created_at	TIMESTAMP	DEFAULT NOW()

Index Specifications + Rationale

Index Name	Table	Columns	Rationale
idx_users_email	users	email	Fast login / lookup
idx_users_role_branch	users	(role_id, branch_id)	Role-based access queries
idx_branches_code	branches	branch_code	Fast branch lookup
idx_branches_city	branches	(city, country)	Geo-based search
idx_rooms_branch_status	rooms	(branch_id, status)	Available rooms per branch
idx_rooms_type	rooms	room_type_id	Filter rooms by type
idx_guests_email	guests	email	Guest search
idx_guests_phone	guests	phone	Guest search
idx_guests_name	guests	(last_name, first_name)	Front desk search
idx_reservations_guest	reservations	guest_id	Guest booking history
idx_reservations_dates	reservations	(check_in_date, check_out_date)	Availability checks
idx_reservations_status	reservations	status	Operational dashboards
idx_reservations_branch_dates	reservations	(branch_id, check_in_date, check_out_date)	Branch occupancy

idx_invoices_number	invoices	invoice_number	Invoice lookup
idx_invoices_status	invoices	payment_status	Accounting
idx_payments_invoice	payments	invoice_id	Payment history
idx_payments_date	payments	payment_date	Reporting
idx_services_category	services	category	Service filtering
idx_res_services_reservation	reservation_services	reservation_id	Service history
idx_res_services_service	reservation_services	service_id	Service analytics
idx_housekeeping_room_date	housekeeping_tasks	(room_id, scheduled_date)	Cleaning schedules
idx_housekeeping_assigned	housekeeping_tasks	(assigned_to, status)	Staff workload

User Role Definitions (RBAC)

Role Name	Description
Admin	Full system access, configuration, user management
Manager	Branch-level operations, reporting, staff oversight
Receptionist	Reservations, check-in/check-out, guest management
Housekeeping	Cleaning tasks, room status updates

Constraints Summary

Primary Keys: All tables use INT PK with AUTO_INCREMENT

Foreign Keys:

- users → roles
- users → branches
- branches → users (manager)
- rooms → branches
- rooms → room_types
- reservations → guests
- reservations → rooms
- reservations → branches
- reservations → users
- invoices → reservations
- payments → invoices
- payments → users
- reservation_services → reservations
- reservation_services → services
- housekeeping_tasks → rooms
- housekeeping_tasks → users

UNIQUE Constraints:

- roles.role_name
- users.username
- users.email
- branches.branch_code
- rooms(branch_id, room_number)
- invoices.invoice_number
- guests.email

CHECK Constraints:

- room_types.base_price > 0
- room_types.max_occupancy > 0
- reservations.check_out_date > check_in_date
- reservations.num_adults > 0
- reservations.num_children ≥ 0
- invoices.amounts ≥ 0
- payments.amount > 0
- services.base_price ≥ 0