



Project Title:

OBN Smart IT Infrastructure Management System

Key Features & Advantages:

❖ **Documentation Upload**

Network engineers can upload configuration files and documentation for each device.

❖ **Prevent Knowledge Loss**

Helps retain device and network configuration history during staff turnover.

❖ **Configuration & Maintenance History**

Maintains detailed records for each device, including updates, issues, and maintenance logs.

❖ **Faster Problem Solving**

Quick access to device history and logs helps in resolving issues efficiently.

User Roles:

A. Admin

- Add, edit, delete, and view users and network equipment.
- Fill all basic device information at creation time.

B. Network Engineer

- Update device status, IP address, and maintenance logs after installation/configuration.
- Cannot delete or add users/devices.

C. Viewer (e.g., New Staff)

- Can only view device lists and details. No edit access.

Device Information Fields:

- Device Name
- Device Type (e.g., Switch, Router)
- Model Number
- MAC Address
- Serial Number
- Physical Location (building, floor, room)
- Status (Active, Faulty, Replaced, Reserved)
- Installation Date and Installer Name
- Maintenance Log
- IP Address (filled later by engineer)

IP Address Management:

- Assign static IPs only (for routers, servers, switches).
- Keep records of:
- Used and free IPs
- Subnet information
- Detected conflicts (manually checked or validated)
- IPs are filled during actual configuration by engineers.
- Host devices (e.g., PCs) that get dynamic IPs are **not tracked**.

Attachments and Diagrams:

- Upload configuration files (.txt, .pdf, .docx)
- Upload annotated network diagrams (images like .png, .jpg)
- Optional: visualize topologies using simple viewers (Mermaid, SVG)

Change Tracking Log:

- System logs every change made to a device (status, location, IP, etc.)

Logs include:

- What changed
- Who made the change
- When the change occurred

Technician Activity Log:

- Each technician logs daily work into their account
- Includes:
- Date & time
- Device worked on
- Problem solved
- Action taken

Export & Backup:

Admin can export:

- Device lists
- Maintenance logs
- IP usage data
- Formats: .csv, .pdf, .docx

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Dashboard:

System dashboard shows:

- Total devices
- Number of working/faulty devices
- Number of used/free IPs
- Upcoming maintenance dates
- Devices flagged for replacement
- Technician activities summary

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Report Generator:

One centralized dashboard generates multiple reports:

- **Equipment Report** – device info, type, status, and location
- **Maintenance Report** – devices fixed, needing maintenance or replaced
- **IP Report** – IPs used, available, and assigned
- **Technician Activity Report** – tasks done by each technician
- **Change History Report** – who changed what and when

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Helpdesk Feature:

- Any OBN department can submit IT issues (internet, printer, PC, etc.)
- User describes the issue → Admin assigns a technician
- Assigned technician gets notified and resolves the issue
- Issue logs are stored for future reference

Maintenance Reminder System:

- Devices with known expiry or service dates can trigger automatic alerts
- Useful for replacements, battery life, or scheduled checks

QR Code Generator:

- Every device gets a unique QR code upon creation
- QR links to that device's info page (IP, config, status, logs)
- QR is printed and attached to the physical device
- Technician scans using mobile and gets instant access to details

DATABASE NAME: `obn_itmgmt_system`

1. users (for login and role-based access)

Column	Type	Rules / Notes
user_id	INT	PK, AUTO_INCREMENT
username	VARCHAR(100)	UNIQUE, NOT NULL
password	VARCHAR(255)	Hashed, NOT NULL
fullname	VARCHAR(150)	NOT NULL
role	ENUM	admin, engineer, viewer
email	VARCHAR(100)	OPTIONAL
created_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP

2. devices (core device info)

Column	Type	Notes
device_id	INT	PK, AUTO_INCREMENT
device_name	VARCHAR(100)	e.g., Router #3
device_type	VARCHAR(50)	e.g., Router, Switch, Server
model_number	VARCHAR(100)	
mac_address	VARCHAR(50)	UNIQUE
serial_number	VARCHAR(100)	OPTIONAL
location	VARCHAR(200)	Building, floor, room
status	ENUM	active, faulty, replaced, reserved
date_installed	DATE	
installed_by	INT	FK → users(user_id)
created_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP

3. ip_addresses (IP tracking per device)

Column	Type	Notes
ip_id	INT	PK, AUTO_INCREMENT
device_id	INT	FK → devices(device_id)
ip_address	VARCHAR(45)	IPv4/IPv6
subnet_mask	VARCHAR(45)	e.g., 255.255.255.0
assigned_by	INT	FK → users(user_id)
assigned_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP
is_conflict	BOOLEAN	TRUE if duplicate manually detected

4. maintenance_logs

Column	Type	Notes
log_id	INT	PK, AUTO_INCREMENT
device_id	INT	FK → devices(device_id)
description	TEXT	What was fixed or checked
resolved_by	INT	FK → users(user_id)
resolved_at	TIMESTAMP DEFAULT CURRENT_TIMESTAMP	

5. change_history

Column	Type	Notes
change_id	INT	PK, AUTO_INCREMENT
device_id	INT	FK → devices(device_id)
changed_by	INT	FK → users(user_id)
field_changed	VARCHAR(100) e.g., status, IP, location	
old_value	TEXT	
new_value	TEXT	
change_time	TIMESTAMP DEFAULT CURRENT_TIMESTAMP	

6. config_files (uploads)

Column	Type	Notes
file_id	INT	PK, AUTO_INCREMENT
device_id	INT	FK → devices(device_id)
file_path	TEXT	Relative or full file path
uploaded_by	INT	FK → users(user_id)
uploaded_at	TIMESTAMP DEFAULT CURRENT_TIMESTAMP	

7. network_diagrams

Column	Type	Notes
diagram_id	INT	PK, AUTO_INCREMENT
title	VARCHAR(100)	Optional
image_path	TEXT	Uploaded .png/.jpg
uploaded_by	INT	FK → users(user_id)
uploaded_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP

8. technician_logs

Column	Type	Notes
log_id	INT	PK, AUTO_INCREMENT
technician_id	INT	FK → users(user_id)
device_id	INT	FK → devices(device_id)
task_description	TEXT	Summary of what was done
task_date	DATE	
created_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP

9. reports (optional table to cache/generated reports)

Column	Type	Notes
report_id	INT	PK, AUTO_INCREMENT
report_type	ENUM	equipment, maintenance, ip, technician, change
generated_by	INT	FK → users(user_id)
generated_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP
file_path	TEXT	Stored report (PDF/CSV path)

10. tickets (helpdesk requests)

Column	Type	Notes
ticket_id	INT	PK, AUTO_INCREMENT
submitted_by	INT	FK → users(user_id)
issue_type	VARCHAR(100)	e.g., Internet, Printer, PC, etc.
description	TEXT	Problem detail
status	ENUM	open, in_progress, resolved
assigned_to	INT	FK → users(user_id), Nullable
created_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP
resolved_at	TIMESTAMP	Nullable

11. qr_codes

Column	Type	Notes
qr_id	INT	PK, AUTO_INCREMENT
device_id	INT	FK → devices(device_id)
qr_path	TEXT	File path or URL to the QR image
created_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP

-- Create Database

```
CREATE DATABASE IF NOT EXISTS obn_itmgmt_system;  
USE obn_itmgmt_system;
```

-- Table 1: users

```
CREATE TABLE users (  
  user_id INT AUTO_INCREMENT PRIMARY KEY,  
  username VARCHAR(100) UNIQUE NOT NULL,  
  password VARCHAR(255) NOT NULL,  
  fullname VARCHAR(150) NOT NULL,  
  role ENUM('admin', 'engineer', 'viewer') NOT NULL,  
  email VARCHAR(100),  
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP  
);
```

-- Table 2: devices

```
CREATE TABLE devices (  
  device_id INT AUTO_INCREMENT PRIMARY KEY,  
  device_name VARCHAR(100),  
  device_type VARCHAR(50),  
  model_number VARCHAR(100),  
  mac_address VARCHAR(50) UNIQUE,  
  serial_number VARCHAR(100),  
  location VARCHAR(200),  
  status ENUM('active', 'faulty', 'replaced', 'reserved'),  
  date_installed DATE,  
  installed_by INT,  
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
  FOREIGN KEY (installed_by) REFERENCES users(user_id)  
);
```

-- Table 3: ip_addresses

```
CREATE TABLE ip_addresses (  
  ip_id INT AUTO_INCREMENT PRIMARY KEY,  
  device_id INT,  
  ip_address VARCHAR(45),  
  subnet_mask VARCHAR(45),  
  assigned_by INT,  
  assigned_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
  is_conflict BOOLEAN DEFAULT FALSE,  
  FOREIGN KEY (device_id) REFERENCES devices(device_id),  
  FOREIGN KEY (assigned_by) REFERENCES users(user_id)  
);
```



```

-- Table 4: maintenance_logs
CREATE TABLE maintenance_logs (
  log_id INT AUTO_INCREMENT PRIMARY KEY,
  device_id INT,
  description TEXT,
  resolved_by INT,
  resolved_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  FOREIGN KEY (device_id) REFERENCES devices(device_id),
  FOREIGN KEY (resolved_by) REFERENCES users(user_id)
);

-- Table 5: change_history
CREATE TABLE change_history (
  change_id INT AUTO_INCREMENT PRIMARY KEY,
  device_id INT,
  changed_by INT,
  field_changed VARCHAR(100),
  old_value TEXT,
  new_value TEXT,
  change_time TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  FOREIGN KEY (device_id) REFERENCES devices(device_id),
  FOREIGN KEY (changed_by) REFERENCES users(user_id)
);

-- Table 6: config_files
CREATE TABLE config_files (
  file_id INT AUTO_INCREMENT PRIMARY KEY,
  device_id INT,
  file_path TEXT,
  uploaded_by INT,
  uploaded_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  FOREIGN KEY (device_id) REFERENCES devices(device_id),
  FOREIGN KEY (uploaded_by) REFERENCES users(user_id)
);

-- Table 7: network_diagrams
CREATE TABLE network_diagrams (
  diagram_id INT AUTO_INCREMENT PRIMARY KEY,
  title VARCHAR(100),
  image_path TEXT,
  uploaded_by INT,
  uploaded_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  FOREIGN KEY (uploaded_by) REFERENCES users(user_id)
);

-- Table 8: technician_logs
CREATE TABLE technician_logs (
  log_id INT AUTO_INCREMENT PRIMARY KEY,
  technician_id INT,
  device_id INT,
  task_description TEXT,
  task_date DATE,
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  FOREIGN KEY (technician_id) REFERENCES users(user_id),
  FOREIGN KEY (device_id) REFERENCES devices(device_id)
);

-- Table 9: reports
CREATE TABLE reports (
  report_id INT AUTO_INCREMENT PRIMARY KEY,

```

```
report_type ENUM('equipment', 'maintenance', 'ip', 'technician', 'change'),
generated_by INT,
generated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
file_path TEXT,
FOREIGN KEY (generated_by) REFERENCES users(user_id)
);
```

-- Table 10: tickets

```
CREATE TABLE tickets (
ticket_id INT AUTO_INCREMENT PRIMARY KEY,
submitted_by INT,
issue_type VARCHAR(100),
description TEXT,
status ENUM('open', 'in_progress', 'resolved') DEFAULT 'open',
assigned_to INT,
created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
resolved_at TIMESTAMP NULL,
FOREIGN KEY (submitted_by) REFERENCES users(user_id),
FOREIGN KEY (assigned_to) REFERENCES users(user_id)
);
```

-- Table 11: qr_codes

```
CREATE TABLE qr_codes (
qr_id INT AUTO_INCREMENT PRIMARY KEY,
device_id INT,
qr_path TEXT,
created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
FOREIGN KEY (device_id) REFERENCES devices(device_id)
);
```