**Software Requirement Specification**

for

**Quản Lý Dừng Ngắn Với QR CODE**

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1. **Introduction**

1. Title and Introduction

- Project name: QR code management system in manufacturing (MFG) by web.

- Document purpose: Provide a detailed description of the functional and non-functional requirements for the system. This document will serve as a reference for the development team.

2. Project scope

- Objective: Build a QR code management system used to manage production processes (IN/OUT) in the factory, capable of scanning and storing QR code data into the system.

Develop website for device management, QR codes, and incident recording.

The system includes equipment management, error recording, reporting and maintenance management functions.

* Main users: Factory administrator, maintenance staff and technicians(kĩ thuật viên)
* Deployment environment: Web application runs on a browser platform, Android

1. **Overall Description**

## Product Perspective

* Current environment and context

Short stop management system with QR Code will be an important part of the production process at the factory. Each device in the factory will be assigned a unique QR code, helping managers easily scan and record information about the device's operating status or errors. The system will be developed to work in concert with existing maintenance and incident management procedures.

* Factory equipment: Each piece of machinery in the factory will have its own QR code, attached to the device for easy scanning and identification.
* Current maintenance process: The system will integrate into the current maintenance management process, where equipment errors are recorded, repaired and status updated.

**2.2 Limits and constraints**

- Mobile devices/QR readers: The system requires technical staff to use mobile devices with integrated QR code scanning function or QR readers to collect information from the device.

- Network connection: The system requires a stable network connection to synchronize real-time data between the device management system and the central database.

**2.3 Objectives and importance**

The short stop management system with QR code helps improve equipment management and maintenance processes in the factory by:

* Automate the error recording process: Instead of manually recording errors, employees just need to scan the QR code, helping to reduce time and avoid errors.
* More accurate tracking and reporting: The system will store the device's error s. history, making it easier to monitor the status of each device, while also supporting preventive maintenance planning.
* Respond faster: With instant error recognition and access to maintenance history, engineering can respond more quickly when problems occur, thereby reducing downtime.

**2.4 Scope of operation**

The system will operate in a factory environment with the following requirements:

* Large scale: The factory can include hundreds to thousands of devices, each device will be tracked and managed through its own QR code.
* Harsh environments: QR code scanning equipment and software need to operate reliably in environments that may contain dust, high temperatures, or less than ideal conditions.

**2.5 User Classes and Characteristics**

**1. Production management**

- Role: Monitor production activities, monitor equipment status and make maintenance decisions.

- What to do:

* View device error reports.
* Plan maintenance based on fault history.
* Requirements: Easy-to-use interface, detailed report display.

**2. Maintenance technician**

- Role: Check and repair equipment when problems arise.

- What to do:

* Scan the QR code to record device errors.
* Select an error from the list or enter a new error.
* Record time and error status, update when completed.
* Requirements: Simple interface, fast operation, suitable for working directly on machines.

**3. Production planning staff**

- Role: Manage production schedule and plan maintenance.

- What to do:

* View device status and downtime.
* Adjust production plans when problems arise.
* Requirements: Detailed interface, easy to monitor and quick report output.

**4. System Administrator (IT Admin)**

- Role: Manage and maintain software systems.

- What to do:

* Manage users and assign access rights.
* Ensure data security and stable system operation.
* Requirements: Powerful administration interface, ensuring data security.

**III.System Features and Requirements**

1. **Functional Requirements**

1. Login Screen (Login)

- Purpose: Allows users to log in to the system to access management features.

- Function:

* Enter your username and password.
* Verify login information.
* Redirect users to the home screen after successful login.
* Error message if login fails.

2. Màn hình Quản lý Thiết bị (Device Management)

- Purpose: Display a list of devices in the factory and manage information of each device.

- Function:

* Displays a list of devices with information such as: Device name, QR code, Current status.
* Search and filter devices based on name or QR code.
* Add, edit or delete device information.
* Generate QR codes for each device.
* Print the QR code to paste on the device.

3. Màn hình Quét mã QR (QR Code Scanning)

- Purpose: Allows scanning the device's QR code to get information and record

errors.

- Function:

* Scan the QR code and display the corresponding device information.
* Autofill device information based on scanned QR code.
* Redirect the user to the error recording screen after a successful scan.

4. Error Logging screen

- Purpose: Record device errors after scanning the QR code.

- Function:

* Displays a list of errors that have ever appeared on this device (based on the database provided by the management).
* Allows the user to select an error from a list of existing errors.
* If the error is not in the list, please select “Other” and note additional information about the new error.
* Record information: error type, error description, error detection time, recorder.
* “Save” button to record error information to the database.

5. Device Error History

- Purpose: Displays a history of errors that have occurred on a specific

device.

- Function:

* Displays a list of errors recorded for this device, including: error date and time, error type, repair status.
* Search and filter error history by time period or error type.
* Display details of each error when the user clicks on each item in the list.
* Importing error information from Excel files into the system

6. Maintenance Management

- Purpose: Manage equipment maintenance activities.

- Function:

* Displays a list of devices that are waiting for maintenance or have been maintained.
* Add new maintenance information for the device (maintenance time, fixed errors, maintainer).
* Update device status after maintenance (fixed, under repair, not repaired).
* Search and filter maintenance information.

7. Màn hình Báo cáo và Thống kê (Report & Statistics)

- Purpose: Provide reports on equipment status, error frequency and repair

effectiveness.

- Function:

* Displays a statistical chart of the most common errors over time.
* Report the number of error occurrences by equipment type and number of maintenance times.
* Performance statistics of each device based on error-free uptime.

8. User Management

- Purpose: User management of the system, including access to management

functions.

- Function:

* Add, edit, or delete user accounts.
* User permissions (managers, maintainers, regular users).
* Reset password.

1. **Implementation process and time**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Function** | **Describe** | **Estimate (MD)** | **Prioritize** | **Start date** | **End date** | **Note** |
| Login | Allows users to log in to the system to access management features. |  | High |  |  |  |
| Device Management | Manage device information and lists | 5 | High | [Start Date] | [End Date] |  |
| QR Code Management | QR code generation and management | 3 | High | [Start Date] | [End Date] |  |
| Record device errors | Error recording after scanning QR code | 7 | High | [Start Date] | [End Date] |  |
| Maintenance Management | Equipment maintenance tracking | 4 | Medium | [Start Date] | [End Date] |  |
| Reports and statistics | View device error reports | 6 | Medium | [Start Date] | [End Date] |  |
| User Management | Account management and authorization | 3 | Low | [Start Date] | [End Date] |  |

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### ****5. Quy trình phát triển****

**Giai đoạn 1: Phân tích yêu cầu**

* Thu thập và phân tích yêu cầu từ người dùng, quản lý nhà máy.
* Xác định các trường hợp sử dụng chính của hệ thống.

**Giai đoạn 2: Thiết kế**

* Thiết kế cơ sở dữ liệu, giao diện người dùng, và các API cần thiết cho hệ thống.
* Lập sơ đồ luồng dữ liệu và luồng xử lý.

**Giai đoạn 3: Phát triển**

* Phát triển từng chức năng theo danh sách chức năng đã nêu.
* Kiểm tra và đảm bảo hệ thống hoạt động ổn định.

**Giai đoạn 4: Kiểm thử**

* Kiểm thử chức năng để đảm bảo hệ thống hoạt động đúng và không có lỗi.
* Thực hiện kiểm thử hiệu năng với số lượng dữ liệu lớn.

**Giai đoạn 5: Triển khai**

* Đưa hệ thống vào sử dụng.
* Đào tạo người dùng về cách sử dụng hệ thống.

1. User Case

