組別 Team ID：202518

專題屬性 Catlegory：網站系統（Website System Design）

專題名稱 Project：消防設備檢查報告管理系統

一、指導老師 Advistor：陳怜秀教授（Prof. Ling-Hsiu, Chen）

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三、系統環境 System environment：

(一) 軟體 Software：

作業系統 Operating system：Windows 10 / Ubuntu Linux 24.04.LTS

程式語言 Programing language：Java、JSP、HTML 5、JavaScript、CSS

開發工具 Development tools：Eclipse

網頁伺服器 Web server：Tomcat 10

資料庫伺服器 Database server：MariaDB 10

(二) 硬體 Hardware：

CPU：Intel(R) Core(TM)i5-10210U CPU @ 1.6GHz 或更高規格

硬碟：475G

記憶體：8G RAM

顯示器：17 吋以上

四、簡介：

(一) 系統簡述

本系統為產學合作專題，依合作廠商需求量身打造「消防設備檢查報告管理系統」，以集中式資料庫為核心，整合檢修、審核與報表輸出等功能。系統管理員可新增客戶與設備資料，檢修人員以行動裝置即時輸入檢修結果，主管可線上審核並退回修改。通過的報告自動歸檔，供查詢與匯出使用。系統具權限控管與操作追蹤機制，以數位化流程提升檢修效率與報告品質，推動消防管理智慧化與系統化。

(二) 特色（系統的亮點）

● **數位化流程管理：**整合「檢修 → 填報 → 審核 → 歸檔 → 查詢」五大作業階段，全面取代傳統紙本流程。

● **RWD 響應式網頁架構：**採用 RWD 響應式設計架構，能根據使用裝置（電腦、平板、手機）自動調整介面比例與排版，確保使用者在不同設備上皆能獲得一致且流暢的操作體驗，適合現場檢修與辦公室審核的多情境應用。

● **企業級 Java 跨平台系統部署：**系統採用 Java EE 架構開發，具備高穩定性與可擴充性，可在多種作業系統（Windows、Linux、macOS）上運行，確保跨平台的兼容性與長期維護性，適用於企業級內部系統環境。

● **虛擬主機(VirtualBox)技術：**系統快速部屬、可備份、快速安裝、快速回復作業

● **多角色分層管理：**依照角色（檢修人員、主管、系統管理員）設定不同權限，確保職責分工明確。

● **自動格式檢核機制：**填報資料時系統自動檢查欄位格式、日期格式與必填項目，降低輸入錯誤。

● **線上審核：**主管可即時審核報告。

● **報表自動生成**：系統生成法規格式檢查報告。

● **資料查詢與追蹤**：可依日期、地點、客戶或設備類型進行快速查詢，並顯示完整歷程。

五、Introduction：

(1) System Overview

This system is an industry-academia collaboration project tailored to meet the specific needs of partner companies. The Fire Equipment Inspection Report Management System is built around a centralized database, integrating inspection, review, and report generation functions into one cohesive workflow. System administrators can create customer and equipment data, inspectors can record inspection results and upload photos in real time using mobile devices, and supervisors can review and return reports online for correction. Approved reports are automatically archived for later querying and export. The system also features access control and activity tracking to ensure data security, transparency, and traceability. By digitalizing the entire process, it enhances inspection efficiency and report quality, advancing fire safety management toward intelligence and systematization.

(2) System Highlights

● Digital Workflow Management: Integrates the five key operation stages—Inspection → Reporting → Review → Archiving → Query—completely replacing traditional paper-based processes.

● RWD Responsive Web Architecture: Utilizes a responsive web design framework that automatically adjusts layout and scale according to the device (PC, tablet, mobile), ensuring a consistent and smooth user experience across different platforms. This design supports both on-site inspection and office-based review scenarios.

● Enterprise-Level Java Cross-Platform Deployment: Developed using the Java EE architecture, offering high stability and scalability. The system can operate on multiple operating systems (Windows, Linux, macOS), ensuring cross-platform compatibility and long-term maintainability suitable for enterprise internal systems.

● Virtual Host (VirtualBox) Technology: Enables rapid deployment, easy backup, quick installation, and fast recovery operations.

● Multi-Role Hierarchical Management: Assigns different access permissions based on user roles (Inspector, Supervisor, Administrator) to ensure clear division of responsibilities.

● Automatic Format Validation: The system automatically checks field formats, date structures, and required fields during data entry to minimize input errors.

● Online Review: Supervisors can review inspection reports instantly through the web interface.

● Automated Report Generation: Automatically generates inspection reports in regulatory-compliant formats.

● Data Query and Tracking: Allows quick searches by date, location, client, or equipment type, displaying complete report history and status tracking.