

Introduction

Our client is an individual employed at a warehouse automation company that focuses on maintenance management, and is interested in improving its workflow by using a more efficient Computerized Maintenance Management System (CMMS). Currently, they use QR codes to track maintenance but due to limited automation are struggling to manage work orders, inventory and performance monitoring. This project aims to design a specific CMMS solution that can help improve the flow of maintenance tracking, assets, and inventory control, as well as real-time updates, auto scheduling, and KPI (Key Performance Indicators) analysis. The system will therefore increase efficiency, reduce downtime and overall operations.

Client Requirements

Front End (User Interface)

In order to use this new system efficiently, the supervisor would need to utilize Kronos, an existing payroll and scheduling (human capital management) system, to create work orders and assign them to the employees based on their trade type, certification, experience and availability. Kronos would make it faster to assign work orders to employees as a result of the system providing the most suitable people for the job based on that information. This would be very helpful in reducing the time consumed in organizing work orders hence allowing the company to function efficiently under a large demand of service orders.

This system would be aided by the automated sector and database of the CMMS by acquiring the KPI feedback and getting the maintenance schedule, as well as the inventory notifications to be used in analysis, scheduling and improvement of work orders and inventory management.

Employees assigned with work orders will be able to document the time of completion that will be useful in determining the next maintenance period of the equipment as well as the time the machinery is ready to be operational. While fulfilling their tasks, workers will have quick access to checklists and manuals required to complete their work safely and in a timely manner. There will also be a place for them to catalog the parts replaced, parts that may need repair soon and any other notes they may have about the task or equipment.

Back End (Automation and Database)

A key aspect of the CMMS will be to seamlessly integrate with the existing Kronos database so that it can access relevant employee data for the purpose of supporting scheduling features. Alongside this, there should be a secondary database that will hold important CMMS focused data such as asset info, parts inventory and location data, task lists, machine manuals and other useful reference data. Additionally, the CMMS will be required to include some automatic features as part of its implementation. The automated features should be able to provide continuously updated KPI feedback as well as estimated predictive maintenance timelines

based on historical repair data. Lastly, the software should be able to issue automatic notifications to personnel such as the Maintenance Planner regarding asset efficiency or notify the Inventory Controller in the case that parts stock is below a certain threshold.

Constraints

Regarding the possible setbacks of the CMMS system, there are a variety of different considerations we must take into account when designing the infrastructure required for the client's project. Cost and time constraints will play a major role in the development of the CMMS, as we must navigate between the client's budget limitations and long-term sustainment. This may include licensing costs aligning with the client's intended budget, integration costs such as adapting the CMMS to work with existing IoT devices and implementation setbacks that will require the importing of company and user data into the new system. This may necessitate the consultation of manufactures and vendors, delaying availability and requiring further expenditure towards the system. Furthermore, employee training will be required to familiarize with the CMMS user interface for effective use by technicians. Delays and cost increases may arise due to industry limitations and requirements such as compliance requirements, regulatory mandates, operational requirements and approval constraints which can setback full implementation of the CMMS according to the client's time requirements and further complicate scheduled enactment of the system.

Summary of Client's Problem

The problem experienced by the client is the significant delays in scheduling repairs and upkeep due to late part ordering and the inability to track which machine has already been updated, which leads to a considerable amount of time wasted checking each machine. When ordering inventory parts, the client often forgets which inventory items to prioritize (different priority due to the task having a higher priority) and schedules the item's arrival date later than the needed date, leading to work orders not being fulfilled in time due to items not arriving in time. Due to the large number of work orders, the client takes a while to consider which employees should be sent to fulfill the work order based on their trades, skills, and availability.

Preliminary Process Map:

