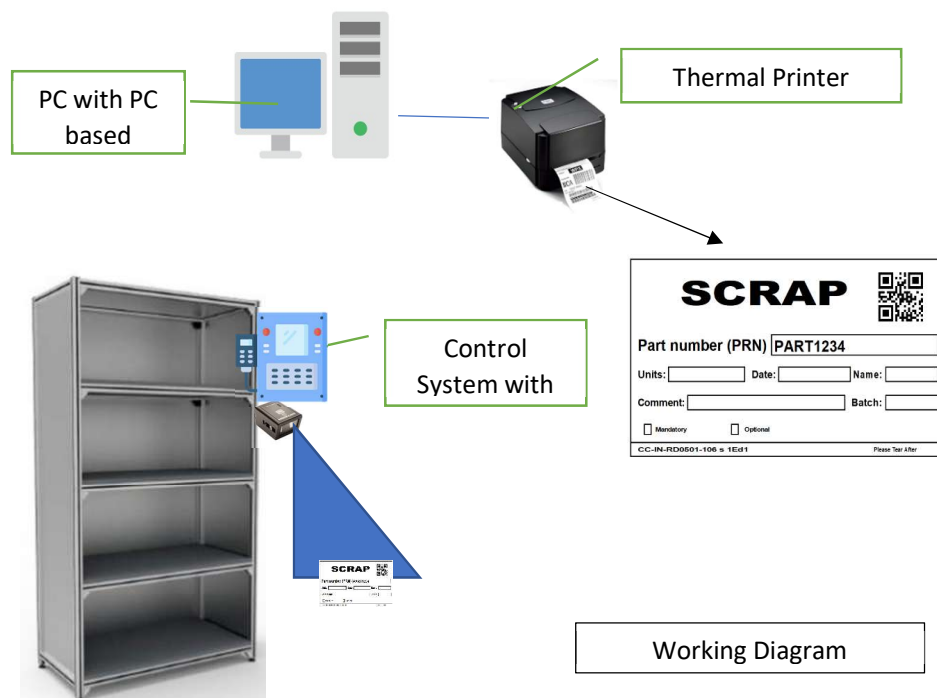


Project Name: QRTrack: Smart Material Placement System**Project Duration: 2 Weeks**

This project aims to develop a PC-based application for generating and printing scrap and blocked labels for assembly parts. The system will store label data in a database and generate a unique QR code on each label. This QR code will be used during the scanning process to open a secure storage gate, enabling a seamless material placement process for multiple storage locations. The system will integrate with SmartHub and a Control Box for communication. An admin bypass code will be available to grant special access to the storage gate using a unique QR code. The entire process will be automated, efficient, and secure, ensuring smooth material placement and tracking.

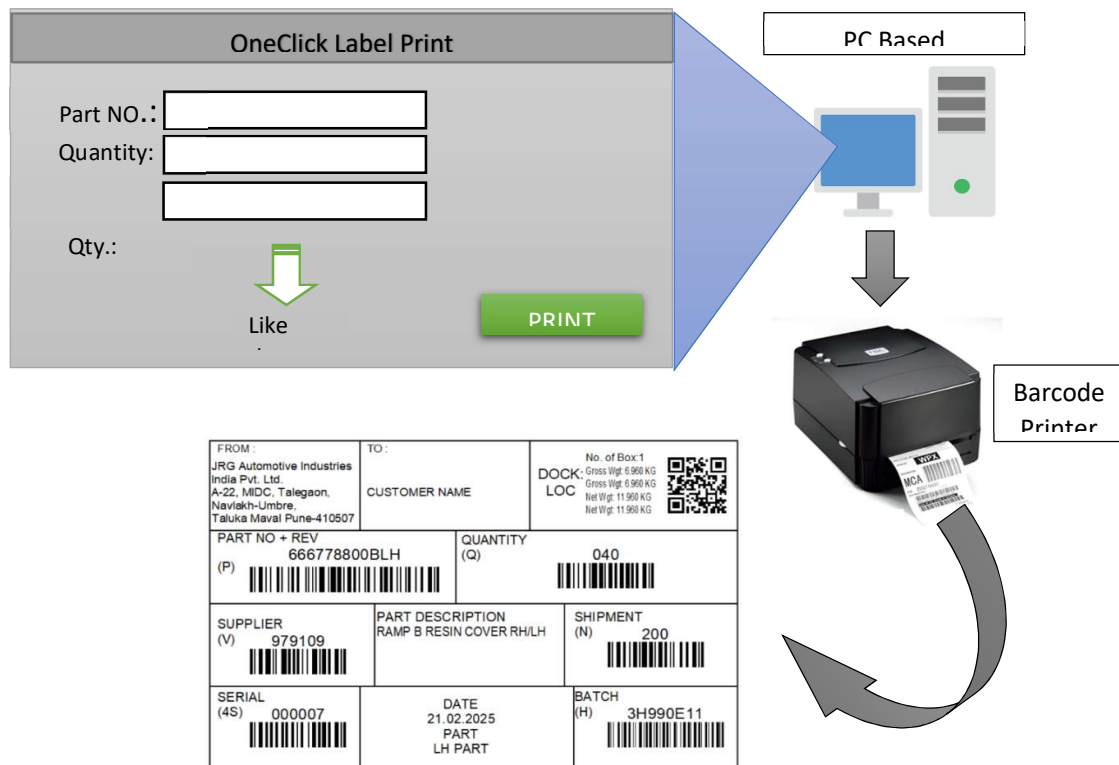
**Application Flow:**

- 1. Label Generation:** User inputs assembly part details in the PC application. System prints a scrap or blocked label with a unique QR code. The label data is stored in the database.
- 2. Material Placement:** User scans the QR code at the storage unit scanner. System verifies the QR code and opens the storage gate. Material is placed securely in the designated area.
- 3. Storage & Access Control:** The system logs the material placement in the database. If an admin needs access, they can enter a bypass code, generating a special QR code for unlocking the gate.
- 4. Seamless Operations:** SmartHub and Control Box manage communication between PC, scanner, and storage unit. Multiple storage areas function simultaneously without conflict.

Project Name: OneClick Label Print

Project Duration: 2 Weeks

This is a PC-based application designed for seamless printing with an existing **TSC Barcode Printer**. The software is tailored for a **single user on a single PC**, ensuring a simple and efficient workflow. Users must log in to access the application, where they can design and print dispatch labels. The software allows adding or deleting lines in the label design as needed. Printing is performed directly without a preview. Additionally, a **report page** is available for reviewing printed data, along with sample images stored in date-wise folders.

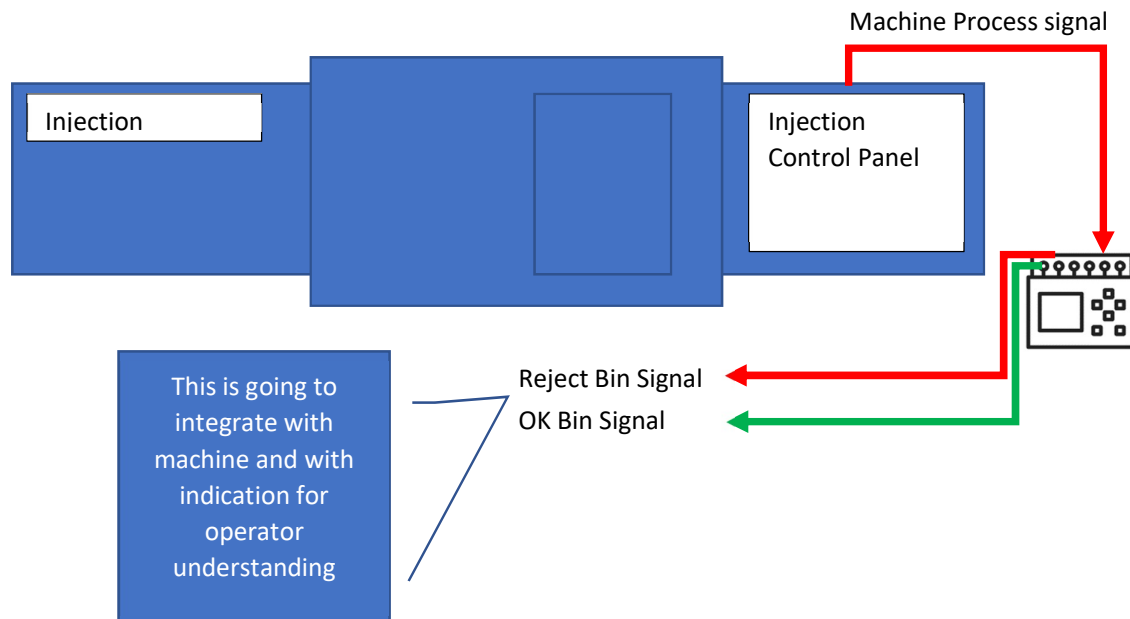


Application Flow:

- **Login Page** – User enters credentials to access the software.
- **Main Page (Label Design)** – A single interface for designing the dispatch label.
 - Add/delete lines as per label requirements.
 - Input necessary text/data for printing.
- **Printing Process** – Direct print command sends the label to the TSC Barcode Printer without preview.
- **Report Page** – Displays a log of printed labels with sample images.
 - Data is stored in date-wise folders for easy retrieval.
 - Allows users to verify printing history.

Project Name: Start-up Rejection machine control**Project Duration: 2 Weeks**

The Start-up Rejection Control System for injection moulding machines is a pivotal tool in optimizing production processes by minimizing rejected parts during start up, changeover, and idle periods. It operates like a vigilant overseer, allowing operators to set parameters for rejected part counts during start up or changeover, as well as idle time thresholds during production. By continuously monitoring machine status and part quality through sensors, the system automatically triggers the rejection process when predefined conditions are met, ensuring only high-quality parts are produced. This capability not only reduces waste but also enhances productivity by preventing unnecessary downtime. Overall, the system plays a crucial role in maintaining efficiency, improving product quality, and bolstering the bottom line of manufacturing operations

**Application Flow:**

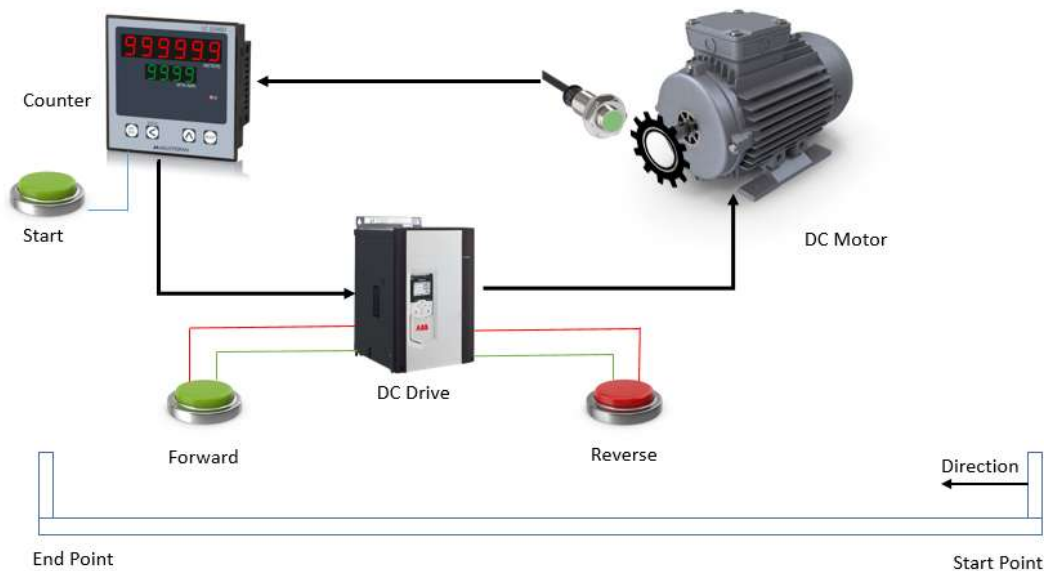
Device control Interface: The logical control device will consist of a physical interface with buttons, display for user interaction. The control device will feature an intuitive interface for operators to set parameters such as rejected part counts and idle time thresholds.

Hardware Integration: The control device will be seamlessly integrated into the injection moulding machine's control panel, ensuring physical compatibility and ease of installation.

Compatibility Testing & Trial: Thorough testing will be conducted to ensure compatibility between the control device and the machine panel, including verification of communication protocols and data exchange.

Project Name: Precision Farm Roof Control**Project Duration: 2 Weeks**

The project involves the development of an automated farm roof control system that utilizes a DC motor, a counter, and a motor drive. This system is designed to facilitate the seamless opening and closing of a farm's roof, ensuring precise control and safety. When the farm roof reaches its end edge, the motor will automatically stop, and the same principle applies when it starts from the other edge. The key features, benefits, and a suggested name for the project are outlined below.

**Application Flow:**

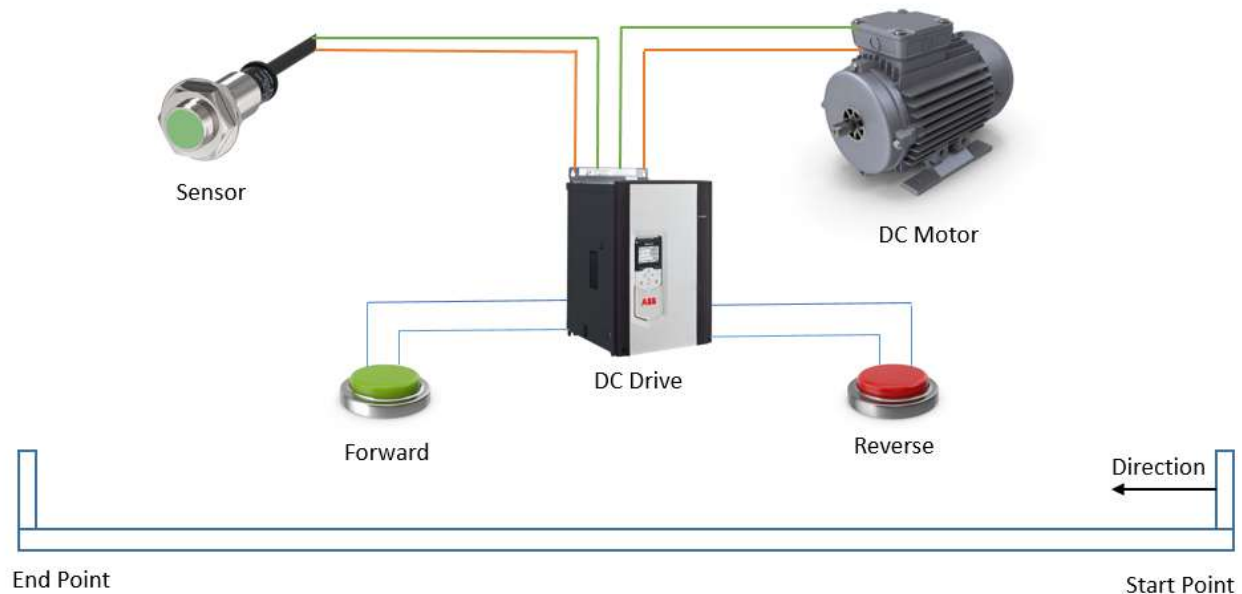
The system operates in both directions, allowing users to open and close the farm roof as needed. Here's a step-by-step explanation of how it works:

1. **Starting Operation:** When the user initiates the process of opening or closing the farm roof, the DC motor is activated in the corresponding direction.
2. **Counter Monitoring:** Simultaneously, the counter keeps track of the roof's position. It counts the rotations or movements of the motor, effectively gauging how far the roof has moved.
3. **Automatic Stop:** Once the farm roof reaches its designated end edge, the system's intelligent programming detects this through the counter's data. It automatically stops the DC motor, ensuring the roof doesn't overshoot its position.
4. **Bidirectional Control:** The system can perform the same process in reverse when the user wants to close the farm roof. It is capable of stopping precisely at the desired starting and ending points in both directions.

Project Name: Automated Farm Roof Control

Project Duration: 2 Weeks

The project aims to automate the operation of a farm roof using a DC motor, a proximity sensor, and a motor drive system. The system is designed to safely open and close the farm roof and halt the motor's operation when the roof reaches either end. This automation enhances the convenience and efficiency of managing the farm roof.



Application Flow:

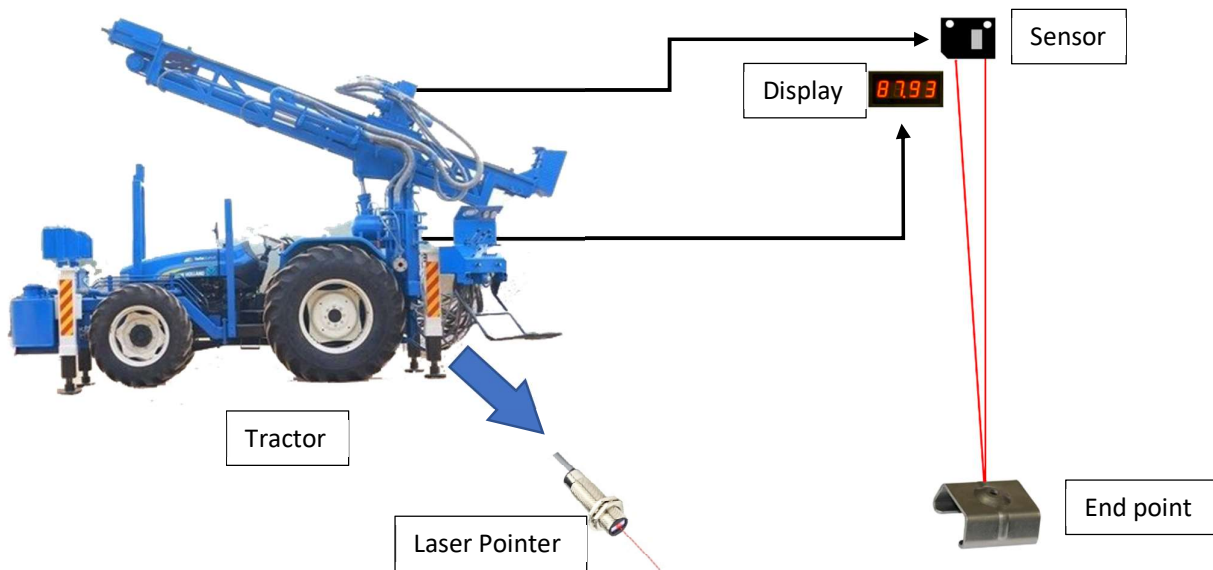
In short, the application flow for the "Automated Farm Roof Control System" involves these key steps:

1. User commands the farm roof using a control interface.
2. The system interprets the command and controls the DC motor.
3. A proximity sensor continuously monitors the roof's position.
4. The motor operates in the specified direction.
5. When the roof reaches an end, the system automatically stops the motor.
6. Safety mechanisms are in place to prevent accidents and respond to obstructions.
7. User receives feedback on the roof's status.
8. Optional remote control and emergency stop capabilities may be available.
9. Regular monitoring and maintenance are recommended for optimal performance.

Project Name: Tractor Mounted Drilling Rig Automation

Project Duration: 3 Weeks

A tractor-mounted drilling rig automation system is a cutting-edge technology designed to enhance drilling operations, making them more efficient and accurate. This system is typically attached to a tractor, allowing it to be easily transported to various drilling sites. It incorporates advanced automation and control features to improve depth accuracy, reduce manual labor, and enhance drilling performance.



Application Flow:

1. Site Preparation: The tractor-mounted drilling rig is transported to the drilling site and set up.
2. Depth Measurement: Operators input the desired depth into the automation system, which will be used as a reference point.
3. Drilling Start: The system initiates drilling, and automation takes over key drilling parameters, including the rotation speed and drill feed rate.
4. Remote Monitoring: Operators can monitor the drilling progress remotely through a control interface, ensuring everything is proceeding as planned.
5. Emergency Shutdown: In case of emergencies or deviations from the plan, operators can trigger an emergency shutdown to halt drilling.
6. Data Logging: The system logs drilling data, providing a record of the drilling operation for future analysis.
7. Completion: Once the desired depth is reached, the system can automatically retract the drill and shut down the rig.
8. Post-Drilling Analysis: The collected data can be analysed to assess the drilling's success, soil composition, and other relevant parameters.
9. Transportation: The tractor-mounted drilling rig can be transported to the next drilling site, ensuring flexibility and mobility.

Project Name: Asset Management System**Project Duration: 4 Weeks**

AssetPro is a comprehensive Asset Management System designed to streamline and optimize the management of assets within organizations. It offers a centralized platform that enables businesses to efficiently track, maintain, and optimize their assets, whether they are physical equipment, digital resources, or intellectual property. AssetPro simplifies asset management, providing real-time insights and control over assets' lifecycles.

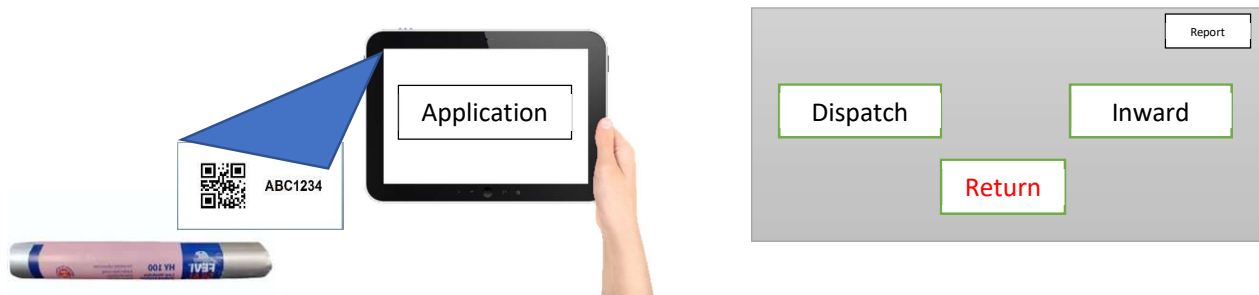
**Application Flow:**

1. **Asset Registration:** Add new assets to the system, inputting details such as asset type, cost, and purchase date.
2. **Asset Assignment:** Assign assets to specific departments or employees, recording responsible parties and locations.
3. **Maintenance and Alerts:** Schedule routine maintenance, receive alerts for upcoming tasks, and record maintenance history.
4. **Tracking and Monitoring:** Continuously monitor asset locations, status, and performance in real-time.
5. **Depreciation and Financial Reporting:** Calculate and manage asset depreciation for financial reporting purposes.
6. **Reports and Analytics:** Generate reports and utilize analytics to gain insights into asset performance and utilization.
7. **Asset Retirement:** Retire or dispose of assets when they reach the end of their lifecycle, recording relevant data.
8. **Integration:** Seamlessly integrate AssetPro with other systems for data synchronization.

Project Name: TrackTab: Smart Material Inventory System

Project Duration: 2 Weeks

The "Tablet-Based Inward and Outward Process with QR Code Scanning" project aims to streamline material management operations by automating the inward, outward, and return processes using QR code technology. By utilizing a tablet interface for scanning QR codes linked to an Excel database, the system ensures accurate tracking and real-time updates of inventory movements. This automation reduces manual errors, minimizes manpower requirements, and enhances operational efficiency.



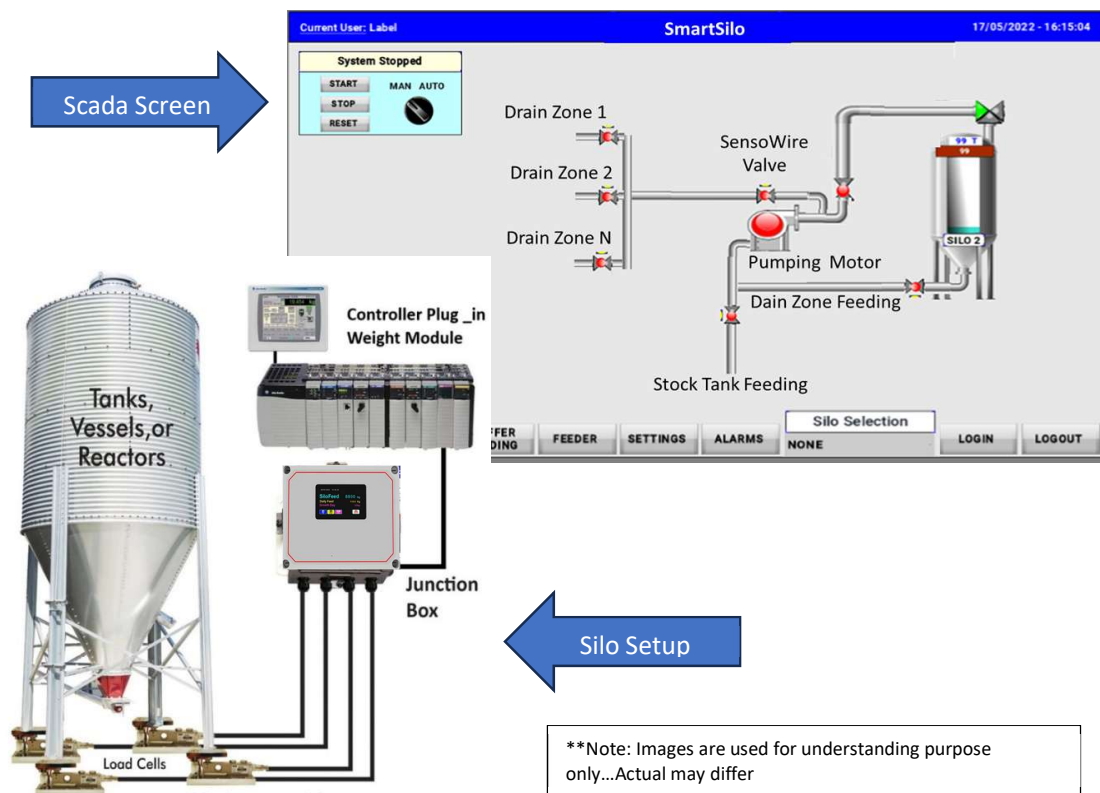
Application Flow:

1. **Login:** User logs into the system using secure credentials.
2. **Inward Process:** User scans the QR code on incoming material, and the system updates the inward record in the database.
3. **Outward Process:** User scans the QR code for outgoing material, and the system logs the outward movement.
4. **Return Process:** User scans the QR code for returned material and enters remarks; the system updates the return log.
5. **Real-Time Sync:** All scanned data is updated instantly in the Excel database.
6. **Reporting:** Users can generate detailed reports for inward, outward, and return transactions.
7. **Audit Check:** Admin reviews transaction logs for verification and analysis.

Project Name: SmartSilo Management: system for precise control over chemical dispensing and Refilling in its production process

The Concept

Eftec India Pvt. Ltd. aims to implement **Eftec SmartSilo Management**, an automated system for precise control over chemical dispensing and refilling in its production process. This system will **automate the draining and refilling** of a high-viscosity base chemical stored in a silo, ensuring accuracy, efficiency, and seamless integration with **SCADA** for real-time monitoring and historical data recording.



System Functionality

1. Chemical Dispensing Process:

- zone wise control panel where Operator selects drain value which is required
- Sets the required chemical quantity (in kg) to be dispensed.
- Pump and motor activate to drain chemical until the target weight is reached.
- Weight sensor ensures precision, and the system automatically stops when the set value is met.

2. Auto-Filling Process:

- A buffer level sensor continuously monitors the silo's chemical level.

- If the level falls below the minimum threshold, the system triggers the refilling pump.
- The silo is refilled from the stock tank up to a pre-set maximum level.
- Once filled, the pump automatically stops, preventing overflow.

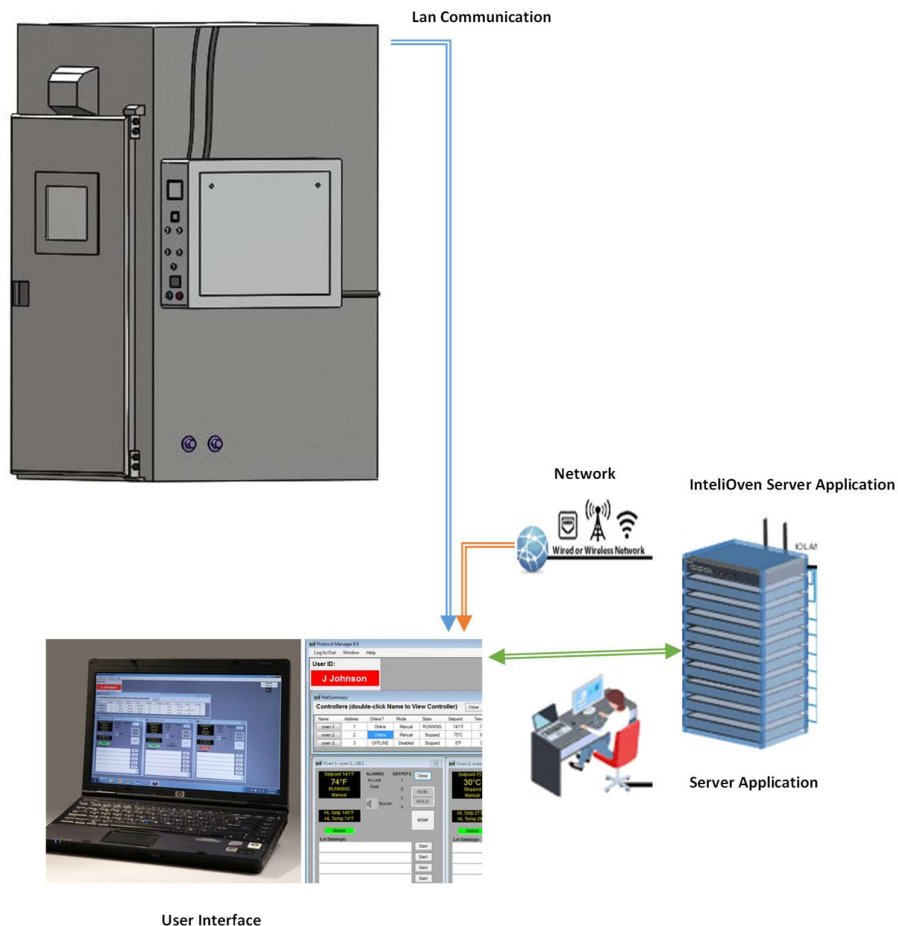
3. SCADA Integration & Data Logging:

- SCADA system records zone wise when, where, and how much chemical is dispensed.
- Auto-filling events are logged, capturing refill time and quantity.
- Live monitoring of weight, buffer levels, pump status, and motor performance.
- Alarms & notifications for low levels, pump failures, or anomalies.

Project Name: Industrial Oven control & Monitoring App

Project Duration: 3 Weeks

The objective of this project is to design, develop, and implement an advanced Industrial Oven Control and Monitoring System (IOCMS) that enables precise temperature and time control, as well as real-time process monitoring for industrial ovens. The system aims to enhance operational efficiency, product quality, and safety in industrial processes that involve ovens.



Key Objective:

- **Improved Precision:** Achieve precise temperature control with minimal deviations to ensure consistent product quality and reduced energy consumption.
- **Efficiency Enhancement:** Increase operational efficiency by automating the temperature and time control processes, reducing manual intervention, and minimizing downtime.
- **Real-time Visibility:** Provide real-time monitoring and data visualization to enable better decision-making and process optimization

- **Remote Management:** Enable remote access for supervisors, allowing them to monitor and control ovens even when not physically present on the factory floor.
- **Data-Driven Insights:** Utilize historical process data for analysis to identify trends, optimize recipes, and ensure compliance with quality standards and regulations.
- **Safety Assurance:** Implement safety measures to prevent accidents, minimize product waste, and protect personnel.
- Implement a **role-based access control system** that ensures appropriate access to data functionalities based on user roles and responsibilities
- Develop data **storage system to archive historical production data** over time
- Create **customisable report and analytics** for performance trends, production insights, and potential areas of improvement
- Develop an intuitive and **user-friendly interface** that requires **minimal training for users** to navigate and utilize the system effectively.
- **User Credentials & Error Logs:** Implement role-based access control and maintain error logs to track system usage and identify issues.
- **Cycle Time Start Condition:** Ensure that the oven cycle time begins only after the set temperature is reached. In case of interruptions, the curing time will restart from the last recorded temperature and time.
- **Temperature Alarm:** Set up alarms to notify operators if the temperature exceeds the allowed range during the cycle.
- **Oven Health Indication:** Provide a visual indication of oven health status on the SCADA screen, showing operational and maintenance alerts.
- **Recipe List:** Share a comprehensive recipe list with Kalia Solutions, specifying the number of buttons needed for curing temperature and cycle time programming.
 - **Detailed Reporting:**
 - **Include detailed reports containing:**
 - **Part number**
 - **Quantity**
 - **Start time and end time**
 - **Total cycle time**
 - **Set and actual temperatures**
 - **Recorded abnormalities (e.g., emergency press, power failure, door interruptions)**

Project Name: Leak Testing & Data Monitoring

Project Duration: 2 - Weeks

The Concept

The proposed leak testing system is a comprehensive, web-based solution designed to facilitate manual data logging for leak testing processes. The system will enable operators to input relevant testing data through an intuitive user interface, ensuring accurate and efficient tracking of testing activities. The implementation of an Andon display will further enhance the system by providing real-time visibility into testing progress and results, fostering a culture of transparency and accountability.

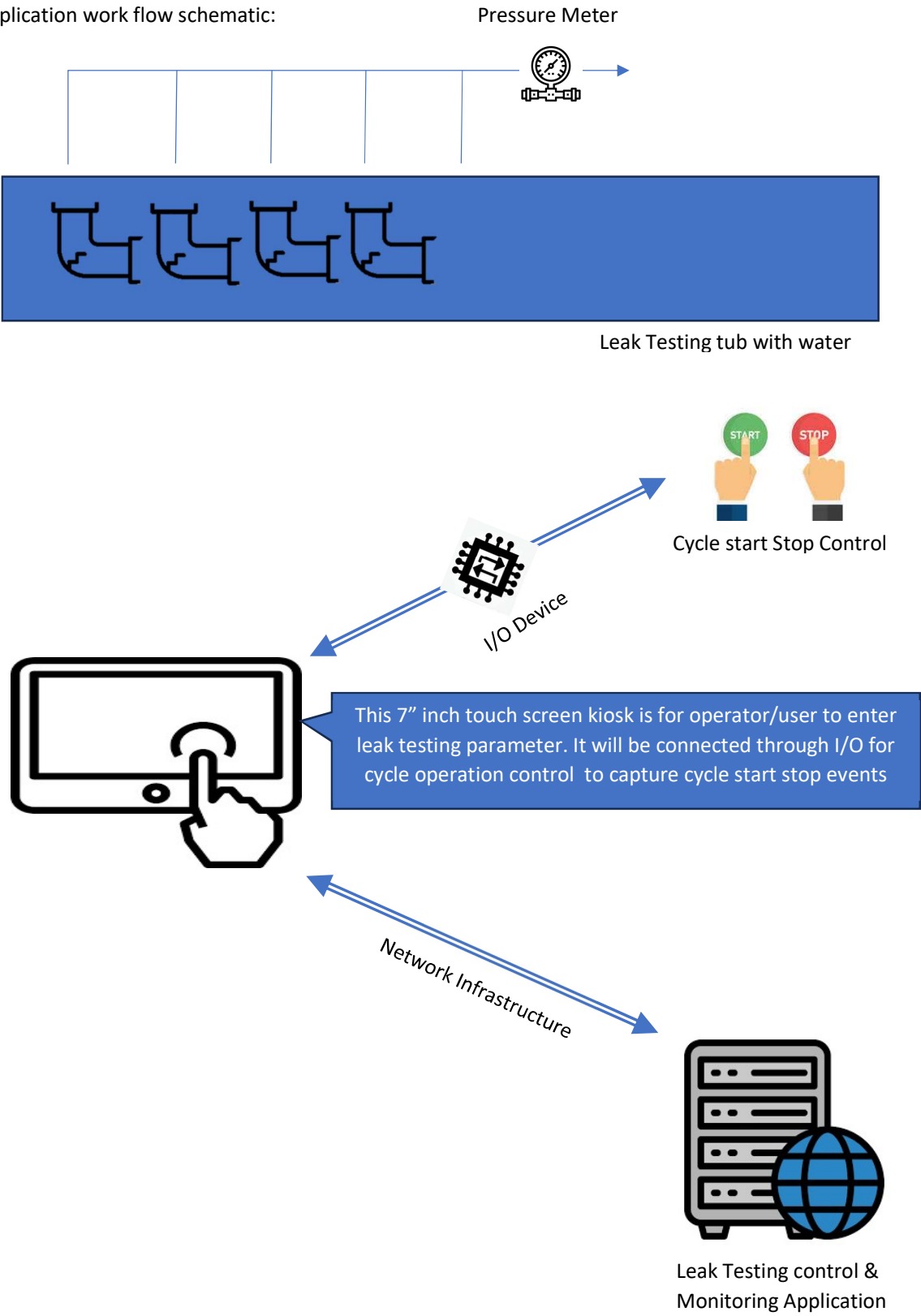
Objective:

The primary objective of the web-based leak testing system is to create a streamlined and effective data logging mechanism that enhances the manual leak testing process. Specific goals include:

- **Facilitating Manual Data Entry:** Develop a user-friendly web interface that allows operators to easily input leak testing data without extensive training.
- **Capturing Essential Data:** Implement a structured logging system that captures critical information related to each leak test, including parameters like Batch Number, Part Details, quantity, pressure, cycle start/Stop, Cycle Time, and results.
- **Enhancing Communication with Andon Displays (If required):** Integrate an Andon display to provide real-time updates on testing status and progress, ensuring that all relevant personnel are informed promptly.
- **Supporting Continuous Improvement:** Enable data analysis capabilities to generate reports, helping identify trends, issues, and areas for improvement in leak testing operations.
- **Ensuring Accessibility and Flexibility:** Design the system to be accessible from various devices, allowing for remote data entry and monitoring, thus promoting collaboration among team members.

In conclusion, the Leak Testing Application leverages advanced technology and a comprehensive data management system to facilitate efficient tracking and monitoring of leak testing operations. This solution enables real-time data entry, ensuring immediate access to accurate testing information and enhancing the overall decision-making process. By focusing on data accuracy and operational efficiency, the application supports continuous improvement in quality assurance practices.

Application work flow schematic:

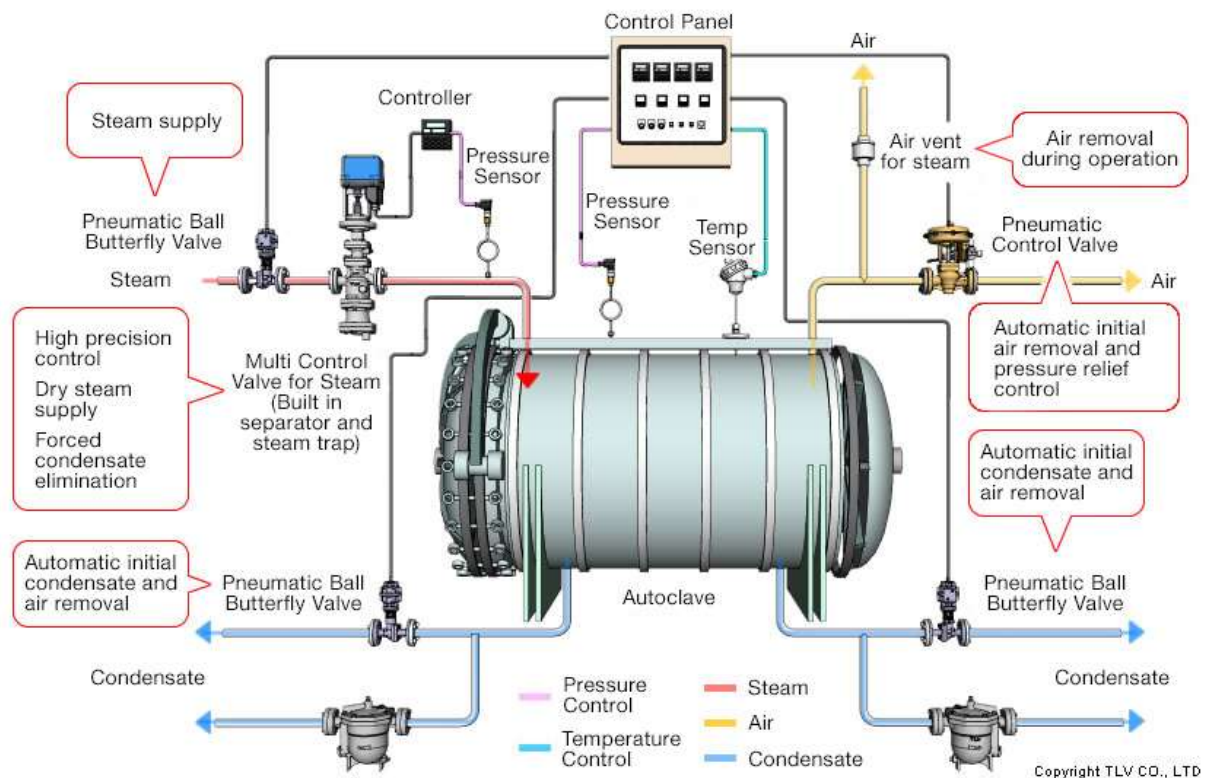


Project Name: VulcaTrack - Open-Pit Mines: Vulcanizer monitoring system:

Project Duration: 4 - Weeks

The Concept

VulcaTrack is an advanced, real-time monitoring and control system specifically designed for vulcanizer operations in industrial settings. The system integrates seamlessly with PLC-based control units, using direct plc communication to manage and track the performance of multiple vulcanizers across different production lines. Its primary goal is to optimize the efficiency, safety, and management of vulcanization processes through comprehensive data logging, live monitoring, and robust reporting features.



1. Key Components:

A) Data Acquisition Module:

This module interfaces directly with the PLC-based control systems via Modbus communication, collecting real-time operational data from each vulcanizer, such as temperature, pressure, cycle times, and status. The data is logged at 1-minute intervals during normal operations and at 1-second intervals during critical events.

B) Wired Network Infrastructure:

A robust wired network will connect the vulcanizers to the central server. This ensures stable and reliable communication, minimizing the risk of data loss or latency associated with wireless connections. The network will support high bandwidth for real-time data transfer and control commands.

C) Central Server Based Application:

The central server hosts the **VulcaTrack** application and manages data processing and storage functions. It utilizes **TimescaleDB**, an extension of PostgreSQL optimized for time-series data, to store and manage the high-frequency logging of vulcanizer operations. This allows for efficient querying, reporting, and data analysis.

D) Web-Based Interface:

Users will access **VulcaTrack** through a web-based interface, enabling them to monitor and control vulcanizers directly from their browsers. The interface will provide real-time visualizations of operational data, controls for initiating or stopping cycles, and alerts for any critical events.

E) Dynamic Dashboard:

The dynamic dashboard displays live trends and operational statuses for each vulcanizer. It is designed to provide real-time insights into performance metrics, cycle times, and alerts, updating every second during critical events.

F) Reporting Module:

This module generates comprehensive reports based on the logged data, utilizing **Timescale DB's** powerful time-series capabilities. The reporting functionality includes seven pre-designed PDF templates, enabling users to generate detailed performance reports, operational summaries, and historical data analyses on demand.

G) Dynamic Dashboard:

The dynamic dashboard displays live trends and operational statuses for each vulcanizer. It is designed to provide real-time insights into performance metrics, cycle times, and alerts, updating every second during critical events.

H) Andon Display:

The web-based Andon display provides a visual representation of the status of each vulcanizer across the plant floor. It utilizes color-coded indicators to convey real-time information about operational states, such as running, idle, or in alarm, helping operators quickly identify issues.

Project Name: Web-based Reporting Application using SQL Database and Display Line

Status

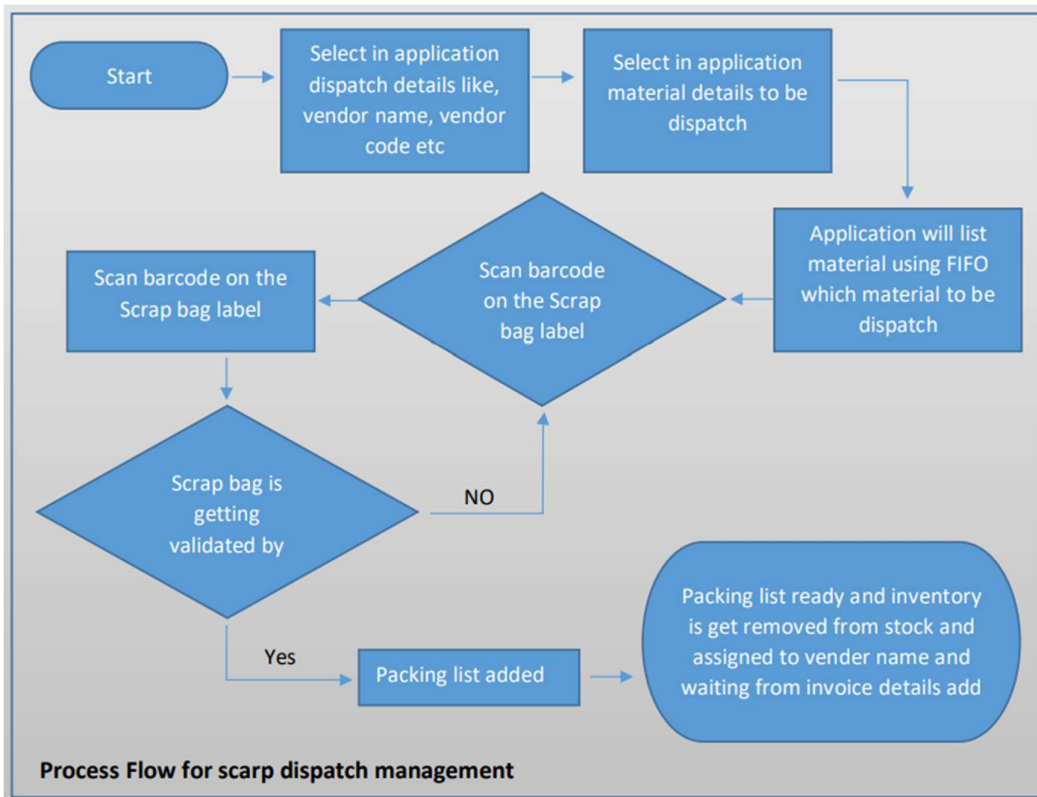
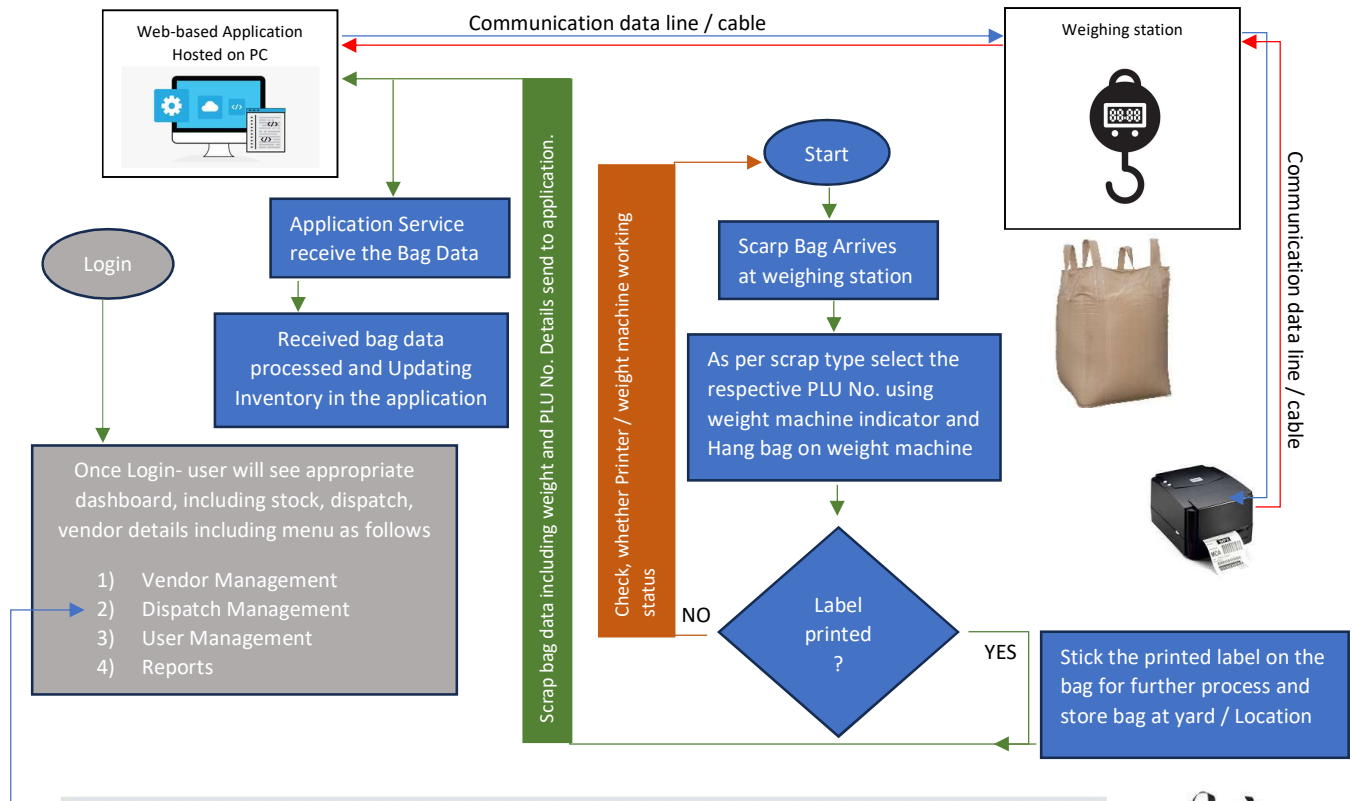
Project Duration: 2 weeks

This project involves the developments of web-based reporting application that utilizes an SQL database as the backend. The application aims provide users with user-friendly interface for generating and viewing reports based on data stored in the database. The key objective and deliverables are as follows:

Deliverables:

1. **User Interface:** Develop a responsive web-based user interface that allows users to interact with the reporting application. The interface should be intuitive, visually appealing, and provide seamless navigation. (if required: It should incorporate authentication and authorization mechanisms to ensure secure access to the application)
2. **Report Generation Module:** Implement a module that retrieves data from the SQL database based on user-user defined criteria and generate reports. The module export report in Excel or PDF form documents, depending on the specific requirements of the project.
3. **Performance Optimization:** optimizing the performance by fine-tuning SQL quires, implementing caching mechanisms, and employing best practices for database performance. This ensures that the application can handle large datasets and generates reports efficiently even with increasing amount of data.

Block diagram for Scrap Label Printing & Management:





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