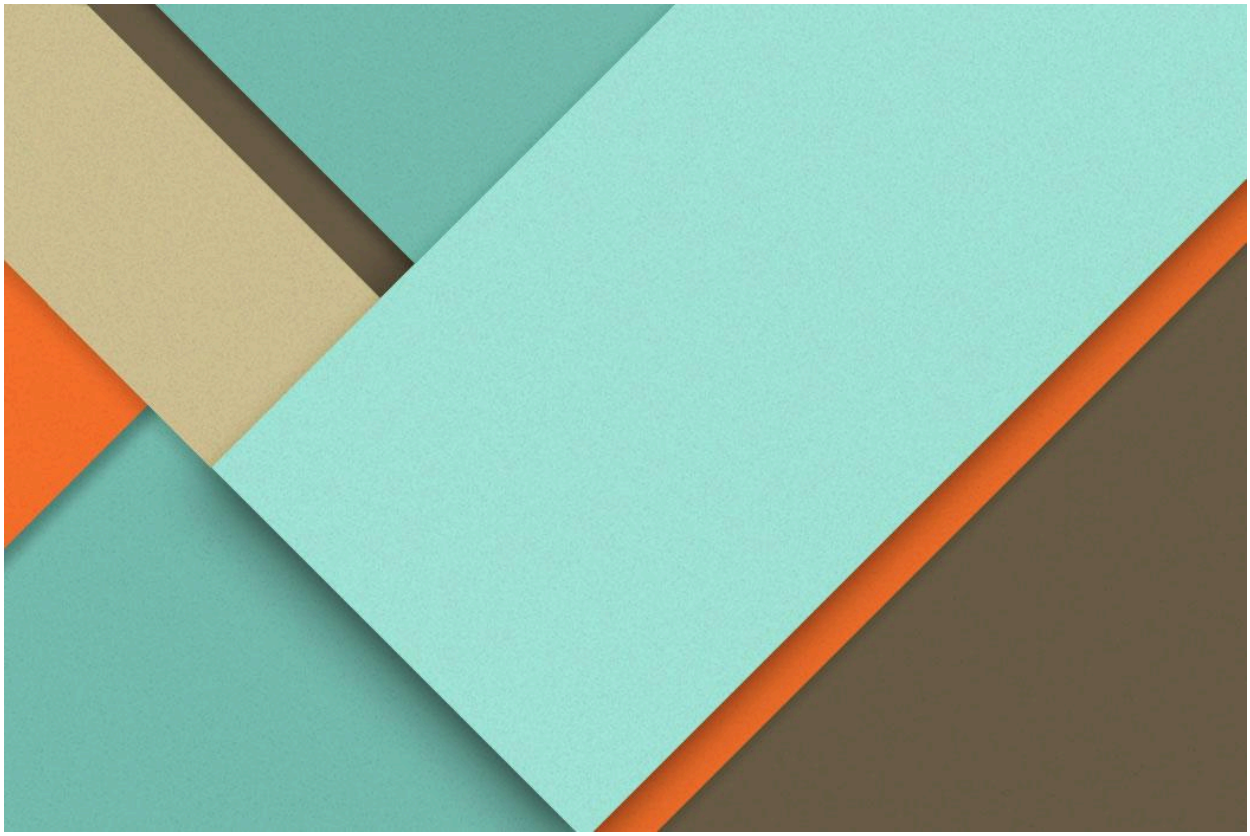

web-based UI application that can track shopfloor workers in real time

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Overview

This project aims to design and implement a **real-time web-based monitoring system** to track and analyze shop floor workers as they assemble mobile phones, ensuring adherence to the defined **Standard Operating Procedure (SOP)**.

Background & Challenges

Manufacturing shop floors have traditionally operated as "black boxes" with little to no visibility into real-time operations. Key challenges include:

- **Lack of real-time performance tracking** for individual workers.
- **Supervisors manage 100+ workers**, making manual monitoring inefficient. **Limited diagnostic tools** to identify inefficiencies or bottlenecks in the assembly line.

Goals

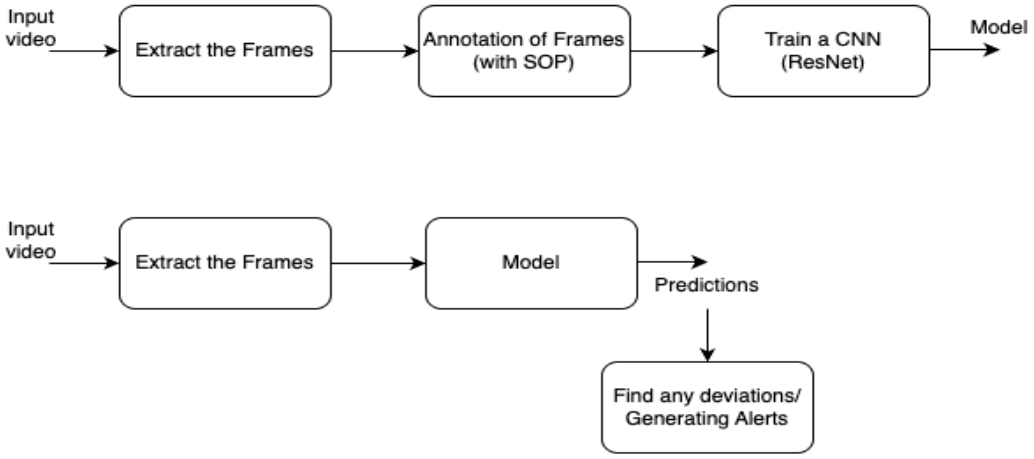
The goal is to build a system that increases **transparency, accountability, and operational efficiency** by enabling supervisors to:

1. **Monitor SOP adherence** by workers during mobile phone assembly.
2. **Track and record cycle time** for each task in real-time.
3. **Visualize worker efficiency** through a web-based dashboard.
4. **Identify deviations** and inefficiencies in the process.
5. **Trigger alerts** for anomalies such as prolonged cycle time, incorrect task sequences, or worker inactivity.
6. **Compare performance** across shifts and workstations to surface patterns and improvement areas.
7. **Log historical data** for ongoing analysis and process optimization.

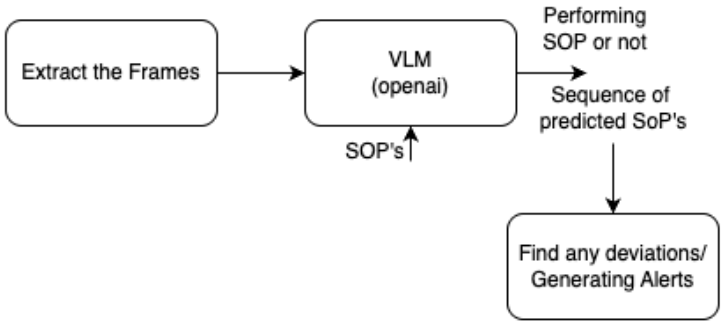
Approaches

Came up with different approaches like (can use Computer vision based or Gen AI based) given below.

Approach 1: (Using CV)



Approach 2: (Using LLMs)



Measures from the project

This application allows users to upload a video file and automatically detects actions based on a predefined **Standard Operating Procedure (SOP)** using a trained YOLO model. It

analyzes the video frame-by-frame and tracks the progress of the SOP in real-time, identifying.

Tracked Metrics & Outputs

Metric	Description
Number of Cycles	Number of times the complete SOP sequence is successfully performed
Time Taken (per cycle)	Time taken to perform a complete SOP sequence
Total Time Taken	Cumulative time across all cycles
Number of Deviations	How many times an action was performed out of expected order
Current SOP Step	The expected step based on current progress
Completed Steps	Real-time visual status of SOP steps
Alerts	Warnings when deviations occur
Output Video	Annotated version of the original video with detected actions

Future Works

- The entire project can be automated even with the annotation of train data for training the Detection model.
- Can include more measures to analyze the efficiency of the worker.
- Log the data which can be useful for future enhancements.