Project Roadmap — Workplace Activity Detection System

Think of this as your **battle plan**.
One phase. One goal. One outcome.

✅ Phase 1 — Planning & Environment Setup

Duration: 3–5 Days
Goal: Lock everything before touching AI.

What you will do

1. Finalize activity list:
    - Phone usage
    - Sleeping
    - Eating
    - Smoking
    - Clock in/out
2. Finalize tech stack:
    - Python
    - YOLOv8
    - OpenCV
    - MediaPipe
    - FastAPI
    - Docker
3. Setup system:
    - Create GitHub repo
    - Create virtual environment
    - Install packages:
    - pip install ultralytics opencv-python mediapipe fastapi uvicorn

4. Create project folders:
5. WorkplaceAI/
6. data/
7. models/
8. scripts/
9. backend/
10. frontend/
11. docs/

✅ **Output of this phase:**
A ready-to-code project base.

✅ **Phase 2 — Data Collection & Labeling**

Duration: 2 – 3 Weeks
Goal: Build a powerful brain using quality data.

What you will do

1. Collect data:
    - Take videos in office
    - Use public datasets
    - Client CCTV clips
2. Extract frames:
    - One image every 2 seconds (approx)
3. Label using:
    - Roboflow
    - CVAT
    - LabelImg
4. Classes to label:

5. phone
6. sleeping
7. eating
8. smoking
9. person

Minimum Target:

Activity	Images
Phone use	800
Sleeping	400
Eating	400
Smoking	300

✅ **Output of this phase:**
YOLO formatted labeled dataset.

✅ **Phase 3 — Model Training**

Duration: 2 Weeks
Goal: Teach the machine to "see".

What you will do

1. Choose base model:
    - yolov8n (for speed)
    - yolov8m (for accuracy)
2. Training:
3. yolo task=detect mode=train model=yolov8m.pt data=data.yaml epochs=50
4. Validate model:
5. yolo task=detect mode=val model=best.pt data=data.yaml
6. Save models:

- models/best.pt

✅ **Output:**
A trained AI model ready to detect actions.

✅ **Phase 4 — Activity Logic + Backend**

Duration: 1 Week
Goal: Give mind to the brain.

What you will do

1. Create detection pipeline:
    - Read video
    - Detect objects
    - Track behavior pattern:
        - Phone near face → phone usage
        - Head down + still → sleeping
        - Food near mouth → eating
2. Store result:
    - Time
    - Activity
    - Screenshot evidence
3. Build API:
    - /detect
    - /report
    - /upload-video

✅ **Output:**
Working backend detection engine.

✅ **Phase 5 — Dashboard (Optional but W)**

Duration: 1 Week
Goal: Visual power.

What you will do

1. Simple UI:
    - Live feed
    - Alerts list
    - Download logs
2. Show:
    - Violations by time
    - Employee snapshots
    - Count per activity

✅ **Output:**
A professional control panel.

✅ **Phase 6 — Testing & Deployment**

Duration: 1 Week
Goal: Make it production ready.

What you will do

1. Test:
    - Different lighting
    - Multiple angles
    - 1 to 10 people
2. Package using Docker:
3. docker build -t workplace-ai .
4. docker run -p 8000:8000 workplace-ai
5. Install on:
    - Client server

- Cloud (AWS / DigitalOcean)

✅ **Final Output:**
The complete, working AI system.

📌 **Your Weekly Flow Summary**

Week	Work
1	Setup + Plan
2–3	Data collection
4–5	Training
6	Backend
7	Dashboard
8	Testing & Deployment

Clear. Sharp. No confusion.
