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Team PS

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Problem Statement

FARMERS IN GHANA STILL MANUALLY OPERATE POULTRY COOP DOORS AND HEAT LAMPS. THIS CREATES CHALLENGES:

- LABOR INEFFICIENCY → FARMERS MUST ALWAYS BE PHYSICALLY PRESENT TO OPEN/CLOSE DOORS AND MANAGE HEAT.
- SECURITY RISKS → FORGETTING TO CLOSE THE COOP EXPOSES POULTRY TO THEFT OR PREDATORS.
- NO REMOTE MONITORING → FARMERS LACK REAL-TIME CONTROL OVER COOP CONDITIONS.

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Functionality /Solution

Our project introduces a **Smart Gate System** designed to automate and simplify poultry farm management in Ghana.

- **Time-based automation**: The gate opens and closes at scheduled times, ensuring poultry get the right exposure without constant farmer supervision.
- **Weather-based control**: Integrated weather data prevents poultry from being exposed to heavy rain or , improving animal welfare.
- **Location-based adjustment**: The system adapts to the farmer’s environment, making it practical for rural and urban poultry setups.
- **Remote monitoring & control**: Farmers can operate the gate from anywhere using a **dashboard**, reducing unnecessary travel.
- **Manual override**: A button allows the farmer to operate the gate manually when nearby, ensuring flexibility in all conditions.

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Physical Components

- Raspberry Pi , 4
- Bread board
- Jumper wires
- Servo Motor
- LED Lights
- Cardboard Model

Tech Stack

- Python
- Flask
- GPIO
- Bootstrap
- JS
- Flask Mail

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Demo Flow

LOGIN → VIEW STATUS (WEATHER, GATE, HEAT LAMP) → DASHBOARD CONTROL (REMOTE OR MANUAL: GATE & HEAT LAMP) → GATE ACTION / LAMP ACTION

- LOGIN – THE FARMER SECURELY LOGS INTO THE SYSTEM.
- VIEW STATUS – THE FARMER CHECKS:
  - CURRENT WEATHER CONDITIONS
  - GATE STATE (OPEN/CLOSED)
  - HEAT LAMP STATE (ON/OFF)
- DASHBOARD CONTROL –
  - GATE: FARMER CAN REMOTELY OPEN/CLOSE OR SET AUTOMATIC OPERATION (E.G., WEATHER/TIME CONDITIONS).
  - HEAT LAMP: FARMER CAN MANUALLY SWITCH IT ON/OFF USING THE DASHBOARD (NO AUTOMATION).
- GATE ACTION / LAMP ACTION –
  - GATE: OPENS/CLOSES AUTOMATICALLY BASED ON CONDITIONS OR FARMER'S INPUT.
  - LAMP: SWITCHES ON/OFF ONLY WHEN THE FARMER PRESSES THE CONTROL.

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Future Improvements

1 Ability to create an account for the dashboard and make it easily accessible

2 Integration of automated feed system

3 Voice Assistant Control

4 Rain drop sensors

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