

Project Proposal: Water Meter Digitization in Rwanda

Currently, water distribution in Rwanda relies on traditional mechanical water meters, with agents from the Water and Sanitation Corporation (WASAC) manually recording readings house by house. This process is time-consuming, prone to errors, and often inconvenient for residents due to scheduling conflicts and privacy concerns.

To address these challenges, we propose a project to digitize water meters, leveraging modern technology to streamline the process and enhance efficiency. Our solution entails the following components:

- 1. Automated Reading System:** A camera mounted on each water meter captures images of the meter readings at predefined intervals. These images are then processed using an OpenCV model to extract the readings as text. The extracted readings are inserted into a centralized database, where they are compared with previous readings to calculate water usage accurately.
- 2. Billing Automation:** Upon calculating the water usage, the system automatically generates bills for each household based on their consumption. Notifications containing bill details are sent to residents via email or SMS, providing them with transparent and timely information about their water usage and charges.
- 3. Reinforcement Measures:** To encourage timely payment and discourage water wastage, an actuator is integrated into the system to enforce reinforcement measures. If a consumer fails to pay their bill by a specified deadline, the actuator can automate the closure of water flow, thereby incentivizing prompt payment and responsible water usage.

By implementing this digitization project, we aim to achieve the following benefits:

- **Enhanced Efficiency:** Automated readings and billing streamline the water distribution process, reducing the time and resources required for manual interventions.
- **Improved Accuracy:** By eliminating manual data entry and processing, the system minimizes errors and ensures precise measurement of water usage.
- **Increased Convenience:** Residents benefit from hassle-free billing and transparent communication, with timely notifications delivered directly to their preferred channels.
- **Water Conservation:** Reinforcement measures incentivize responsible water usage and prompt payment, contributing to sustainable water management practices.

To conclude, this project represents a significant step towards modernizing water distribution in Rwanda, aligning with national efforts to leverage technology for socio-economic development and environmental sustainability.