

An Automated Water Level Control System to Prevent Tank Overflow and Water Wastage

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ABSTRACT

Water scarcity and inefficient water management have become pressing global issues in the 21st century, exacerbated by rapid urbanization, climate change, and aging infrastructure. In many communities, significant volumes of water are lost due to tank overflow and poor monitoring practices, contributing to unnecessary water consumption and increased utility costs. This study proposes the design and implementation of an Automated Water Level Control System that uses sensors, microcontrollers, and real-time monitoring to maintain optimal water levels in storage tanks. The system detects the water level in tanks and automatically controls the inflow to prevent overflow, thereby minimizing water wastage and reducing manual intervention. Field testing in residential and institutional settings showed a notable reduction in water overflow incidents and improved water use efficiency compared to traditional float valve systems. By integrating Internet of Things (IoT) features, stakeholders can remotely monitor water levels and receive alerts, making the system adaptive to diverse water management scenarios. The results highlight the potential of automation in enhancing sustainable water practices, which is essential given today's challenges in water conservation, resource optimization, and environmental stewardship. This system offers a viable solution for municipalities, homeowners, and industries aiming to conserve water and mitigate the impacts of water scarcity.

Keywords: Automated water level control, water conservation, tank overflow prevention, water wastage reduction, smart water management, sensors and microcontrollers, sustainable water systems, IoT-based monitoring

INTRODUCTION

Background of the Project

Water is an important resource that is necessary for daily human activities. However, water wastage remains a common problem, especially in residential and institutional areas where water tanks are widely used. One of the main causes of water wastage is tank overflow, which often occurs due to manual monitoring or negligence in turning off water pumps on time. In today's situation, where water scarcity is becoming more evident because of population growth, climate change, and increased demand, the need for efficient water management systems has become more important.

Many existing water tank systems still depend on manual control or simple mechanical float valves. These methods are not always reliable, as they can fail or require constant human supervision. As a result, water overflow leads to unnecessary loss of water, higher utility expenses, and possible damage to surrounding structures. This issue highlights the lack of effective and automated solutions in managing water storage systems.

In response to these concerns, this research aims to develop an **Automated Water Level Control System** that can monitor the water level and automatically control the water flow to prevent overflow. The use of sensors and a microcontroller allows the system to operate efficiently with minimal human intervention. This project

supports current efforts toward water conservation and sustainable resource management, making it relevant to present-day environmental and technological challenges.

Importance and Relevance of the Study

This study is important because it addresses the continuing problem of water wastage caused by tank overflow, which is commonly experienced in many households, schools, and small establishments in the Philippines. Water is a vital resource, and its inefficient use contributes to shortages, especially during dry seasons and periods of limited water supply. By developing an **Automated Water Level Control System**, this research provides a practical solution that helps conserve water and promotes responsible water usage.

The study is relevant to homeowners and small establishments that rely on water storage tanks due to irregular water distribution. The automated system reduces the need for manual monitoring, minimizes human error, and helps lower water and electricity costs by ensuring that the pump operates only when necessary. It also reduces the risk of structural damage caused by water overflow, making it beneficial for both economic and safety reasons.

From an academic and technological perspective, this study is significant to students, educators, and researchers in the fields of electronics, engineering, and information technology. It demonstrates the practical application of microcontrollers, sensors, and automation in solving real-world problems. The project can also serve as a reference or prototype for future studies related to smart systems and sustainable technologies.

The relevance of this research is further emphasized by current environmental and societal concerns such as water scarcity, climate change, and sustainable resource management. As the demand for clean and sufficient water continues to increase, the need for efficient and automated water control systems becomes more critical. This study supports national and global efforts toward water conservation by offering a low-cost, reliable, and adaptable solution suitable for local conditions.

REVIEW OF RELATED LITERATURE

Water scarcity, inefficient water use, and water wastage due to tank overflow are continuing problems in both global and Philippine contexts. In many communities, water tanks are widely used to compensate for irregular water supply or low pressure, but traditional manual or mechanical methods of monitoring water levels often fail to prevent overflow, contributing to unnecessary water loss and higher utility costs.

Automated Water Level Systems

Research shows that automated water level control systems can significantly reduce water wastage and improve efficiency. *Suman, Wankhede, Singh, & Yadav (2023)* studied an Automatic Water Level Indicator and Controller, revealing that automated sensor-based systems provide more reliable water management than manual monitoring. Their findings emphasize automation's effectiveness in preventing overflow in household settings.

Kumar (2022) developed an Arduino-based water level monitoring and control system using ultrasonic sensors to automate pump operation, reporting that automation reduced water overflow and minimized human error. This system demonstrated that low-cost microcontroller solutions can be viable alternatives to traditional methods.

Smart and IoT-Based Water Monitoring

Zulkifli et al. (2022) conducted a systematic review on IoT-based water monitoring systems, concluding that real-time monitoring, remote access, and automated alerts enhance water conservation and system responsiveness. However, the authors also noted that complexity and cost remain barriers—especially in developing nations where affordable solutions are needed.

Philippine Water Management Context

In the Philippines, inefficient water use and water loss due to poor monitoring are documented concerns. *Ignacio et al. (2019)* examined water system projects in water-scarce Filipino communities, showing that integrated systems with regular monitoring can improve water use practices. *Austria & Lacbay (2025)* reported that smart water management systems in a Philippine university reduced water wastage and improved operational efficiency, yet emphasized the importance of tailoring these systems to be affordable and easy to implement for local households.

Liongson (2012) highlighted broader water management challenges in the Philippines—ranging from shortages during dry seasons to mismanagement issues—underlining the need for efficient control methods and conservation practices.

Table 1. Comparison Matrix of Related Studies and Current Research

Study	Objective	Methodology / Tools Used	Key Findings	Gap / Relation to Current Research
Suman et al. (2023)	Evaluate automatic water level indicator & controller	Sensors + microcontroller system	Automated systems reduce water wastage compared to manual	Focuses on indicator systems; not fully on overflow prevention automation
Kumar (2022)	Develop Arduino-based water level monitoring system	Arduino + sensors	Reduced tank overflow & human error	Similar tech; limited real-time display & alert features
Zulkifli et al. (2022)	Review IoT-based water monitoring systems	Literature review on IoT systems	Real-time monitoring improves water management	IoT systems more complex/expensive; need lower-cost local options
Ignacio et al. (2019)	Examine water management in Philippine communities	Case study of integrated water systems	Proper system integration improves water usage behavior	Focuses on community perception; not on automated control
Austria & Lacbay (2025)	Study smart water management at a Philippine university	Implementation of smart control	Smart systems reduce water wastage	Needs adaptation for household & low-cost environments
Current Research	Develop automated water level control to prevent tank overflow & wastage	Arduino Uno, sensors, LCD, breadboard, automated control	Successfully prevents overflow & reduces wastage; real-time output	Addresses need for affordable, automated solution locally

Summary of the Matrix

- **Existing Literature:** Shows automation is effective in preventing water wastage and improving water management.
- **Local Studies:** Indicate that smart systems can work in Philippine environments but may be costly or complex for households.

- **Gap:** Few studies focus on **low-cost, household-friendly water level automation** tailored to local needs.
- **Current Research:** Fills this gap by offering a **practical, stable, and affordable automated system** that reduces overflow and wastage.

PROBLEM STATEMENT AND OBJECTIVES

In the Philippines, water wastage due to tank overflow remains a prevalent problem in many households, schools, and small establishments, particularly in urban and semi-urban areas. Water tanks are widely used because of irregular water supply schedules and low water pressure in some communities. However, these tanks are often monitored manually, which frequently leads to overflow when pumps are not turned off on time. According to the National Water Resources Board (NWRB), inefficient water use and poor water management practices contribute significantly to water loss in the country.

Many Filipino households still rely on manual switching of water pumps or basic mechanical float valves. These methods are prone to human error and mechanical failure, especially with frequent use and lack of maintenance. The Local Water Utilities Administration (LWUA) reported that water losses, including wastage from overflow, increase operational costs and reduce the availability of potable water, particularly during dry seasons and El Niño periods. This situation highlights the need for more reliable and efficient water control systems.

Despite increasing awareness of water conservation in the Philippines, the use of automated water level control systems remains limited due to cost concerns and lack of technical implementation at the household level. Studies on smart water management emphasize that automation and sensor-based systems can significantly reduce water wastage and improve efficiency (Suman et al., 2023; Kumar, 2022). However, these technologies are not yet widely adopted in local settings.

Therefore, this research seeks to address the problem of water tank overflow and water wastage in the Philippine context by developing an **Automated Water Level Control System**. The study aims to provide a practical, low-cost, and efficient solution that can help improve water management practices, reduce water loss, and support national efforts toward water conservation and sustainable resource utilization.

General Objective

The general objective of this study is to design and develop an **Automated Water Level Control System** that prevents tank overflow and reduces water wastage, particularly in households and small establishments in the Philippines.

Specific Objectives

Specifically, this study aims to:

1. Design and construct an automated water level control system using sensors and a microcontroller to monitor water levels in a storage tank.
2. Develop a control mechanism that automatically turns the water pump on and off based on the detected water level.
3. Evaluate the effectiveness of the system in preventing tank overflow and minimizing water wastage.
4. Assess the reliability and efficiency of the automated system compared to manual water level monitoring methods.
5. Determine the suitability of the system as a low-cost and practical solution for water management in Philippine households and small establishments.

SYSTEM DESIGN AND METHODOLOGY

This study uses a **developmental research design** to design, implement, and test an **Automated Water Level Control System** that prevents tank overflow and reduces water wastage. The methodology focuses on system design, hardware and software development, and testing in a controlled environment. The study follows these phases:

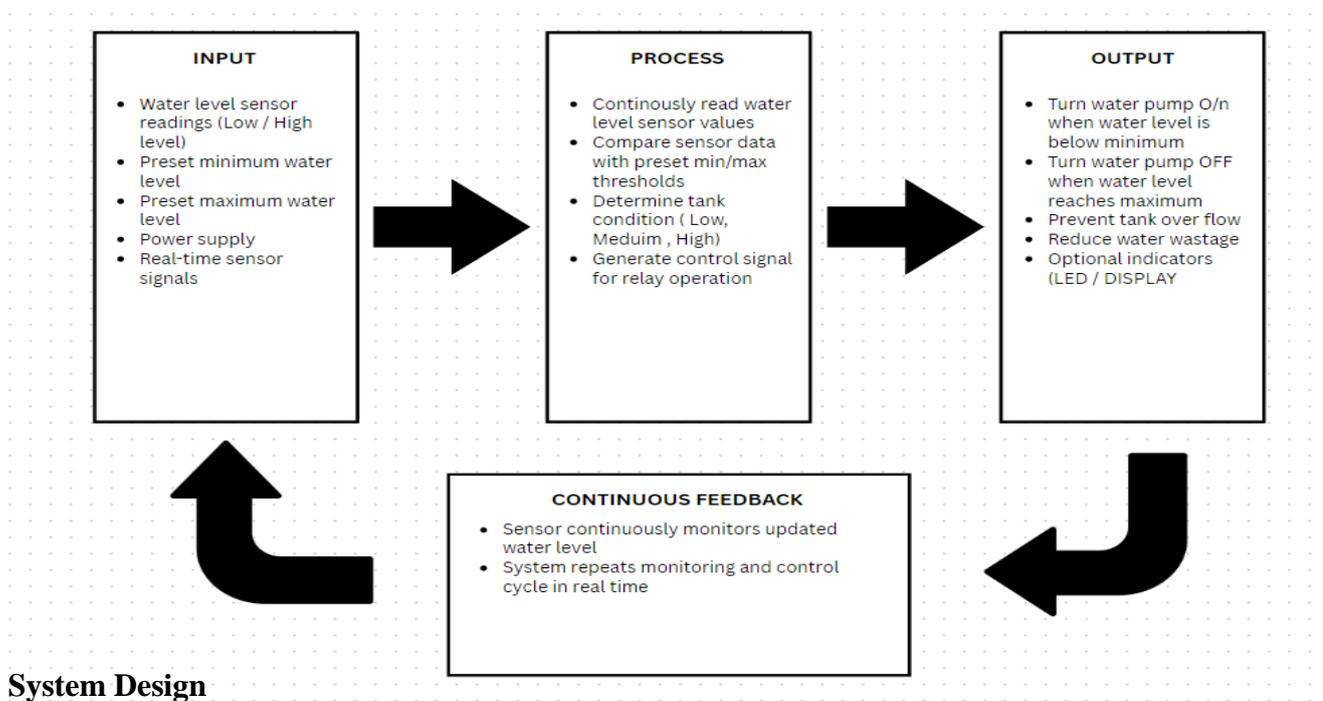
Research Design

The research employs a **developmental and experimental approach**, where an automated water level system is designed, constructed, and evaluated. The study integrates sensors, microcontrollers, and a relay-controlled water pump to automatically monitor and maintain the water level in a storage tank.

Input–Process–Output (IPO) model

The automated water level control system illustrates how the system prevents tank overflow and water wastage through automatic monitoring and control. The inputs of the system include the water level sensor, power supply, microcontroller, relay module, pump motor, and preset minimum and maximum water level thresholds. In the process stage, the water level sensor continuously detects the amount of water in the tank and sends this information to the microcontroller, which analyzes the data by comparing it with the predefined thresholds. When the water level falls below the minimum level, the microcontroller activates the relay to turn on the water pump, allowing water to fill the tank. Once the water reaches the maximum level, the microcontroller deactivates the relay to turn off the pump, thereby stopping the water flow. This monitoring and control cycle runs continuously to ensure efficient operation. The output of the system is the automatic switching of the water pump, prevention of tank overflow, reduction of water wastage, and improved efficiency in water management, with optional visual or audible indicators to show system status.

Figure 1. Input-Process-Output (IPO) Model of the Automatic Water Level Control System



System Design

The system design involves both **hardware and software components**:

Hardware: The system uses a water level sensor (e.g., float sensor or ultrasonic sensor) to detect the water level in the tank. A microcontroller (Arduino) processes sensor signals and controls the water pump via a relay module. An optional LCD screen displays real-time water levels for monitoring purposes.

Software: The microcontroller is programmed to read sensor inputs, determine the water level, and automatically switch the pump on or off depending on the tank’s status. Threshold levels for “full” and “empty” are pre-programmed for safe operation.

System Architecture

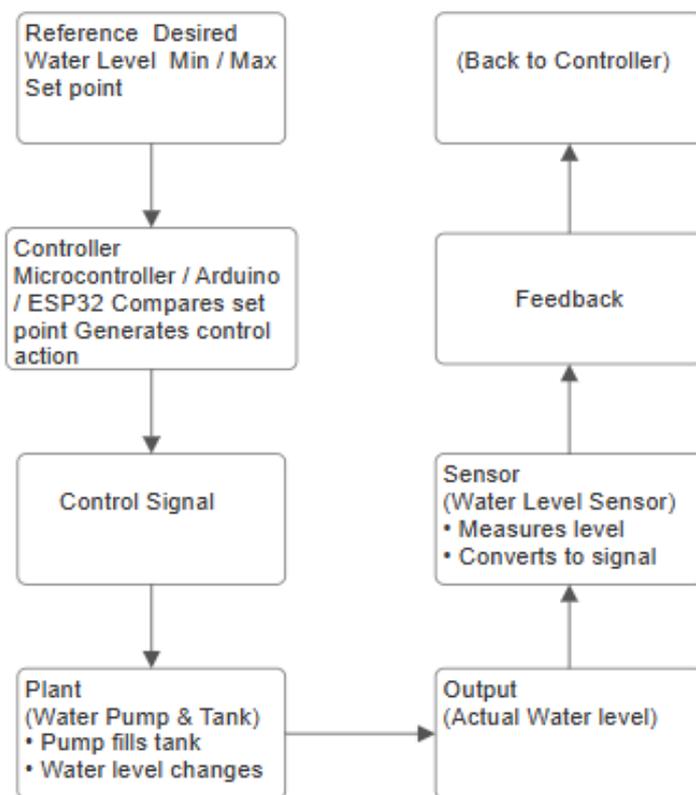
The system architecture of the Automated Water Level Control System describes the overall structure and interaction of hardware and software components used to monitor and control the water level in a storage tank. The system is designed to operate automatically with minimal human intervention.

Based on the processed data, the Arduino sends control signals to the relay module, which acts as an interface between the low-voltage microcontroller and the high-voltage water pump. When the water level falls below the minimum threshold, the relay activates the water pump to fill the tank. Once the water level reaches the maximum threshold, the relay deactivates the pump to prevent overflow. Simultaneously, the system provides real-time feedback through an LCD display with an I2C module, which shows the current water level and system status.

The entire system operates in a continuous loop, allowing constant monitoring and automatic response to changes in water level. This feedback mechanism ensures timely pump control, prevents water overflow, and minimizes water wastage. Overall, the system architecture combines hardware and software components into a reliable and cost-effective solution that is suitable for household and small-scale applications, particularly in areas with irregular water supply such as those commonly found in the Philippines.

Block Diagram

Figure 2. Closed-Loop Feedback Control Block Diagram of the Automatic Water Level Control System



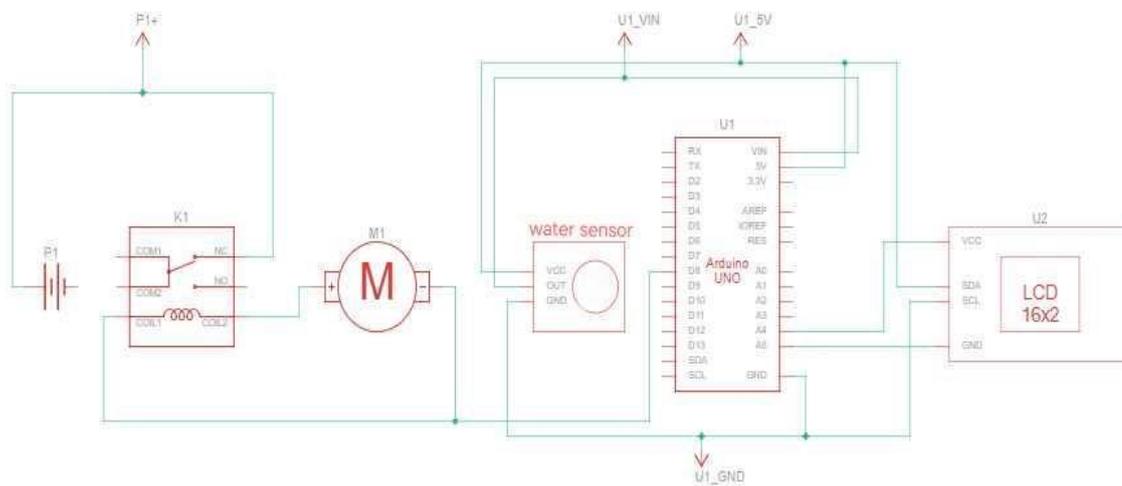
The proposed system is designed as a closed-loop feedback control system for automatic water level regulation. A water level sensor continuously monitors the water level within the storage tank and provides real-time

measurements to the microcontroller unit, such as an Arduino or ESP32. The controller compares the sensed water level with predefined minimum and maximum reference set points and determines the appropriate control action. Based on this comparison, a control signal is generated to actuate a relay module that drives the water pump. The operation of the pump directly affects the water level in the tank, which serves as the system output. The sensor continuously measures the resulting water level and feeds this information back to the controller, enabling continuous adjustment and stable system operation. This closed-loop feedback mechanism ensures accurate water level control, prevents tank overflow, and reduces water wastage under varying operating conditions.

Schematic Diagram

Figure 3. Schematic Diagram of the Automated Water Level Control System illustrates the complete hardware configuration of the proposed water level monitoring and control system. The system is centered on an Arduino microcontroller, which interfaces with a water level sensor to continuously measure the water level within the storage tank. The sensor outputs an analog signal proportional to the detected water level, which is converted into digital data by the microcontroller’s built-in analog-to-digital converter. Based on predefined minimum and maximum threshold levels, the controller executes a rule-based control algorithm to determine the operational state of the system. A digital control signal is then generated to energize a relay module that drives the water pump motor, thereby regulating the inflow of water into the tank. An I2C-based LCD module is incorporated to provide real-time visualization of the water level status and system operation. The continuous sensing of the water level and feedback to the controller establishes a closed-loop control architecture, enabling reliable, adaptive, and efficient water level regulation while preventing tank overflow and minimizing water wastage.

Figure 3. Schematic Diagram of the Automatic Water Level Control System



Components and Their Functions

An automated water level control system consists of several key components that work together to prevent tank overflow and water wastage. The Arduino Uno serves as the main controller of the system, processing data from the sensors and making decisions to control other components. The water level sensor continuously monitors the amount of water in the tank and sends signals to the Arduino to indicate whether the level is low or full. Based on this information, the water pump is automatically turned ON to fill the tank when the water level is low and turned OFF once the tank reaches its maximum level. A relay module is used to safely control the high-voltage water pump using the low-voltage output from the Arduino. The LCD display shows real-time information such

as the current water level and pump status, allowing users to easily monitor the system. All components are powered by a power supply and connected using jumper wires, while the water tank serves as the storage unit where the water level is detected and controlled automatically.

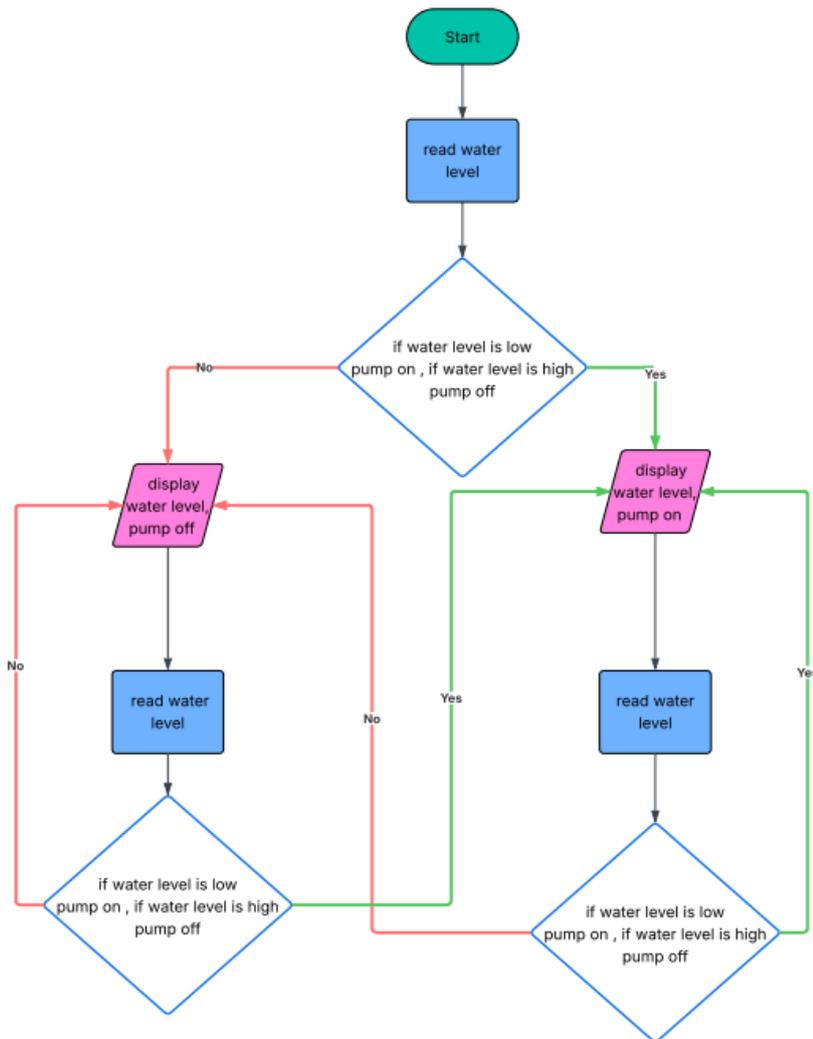
Table 2. Variables and Conditions of the Automated Water Level System

Variable Component /	Type (Input / Output / Controller)	Parameter Measured / Controlled	Condition or Range	System Response / Action
Arduino Uno	Controller	System logic and control signals	Operates at 5V; continuous operation	Reads sensor data and controls pump, LCD, and
Water Level Sensor	Input	Water level inside the tank	Low, intermediate, or high	Sends signal to Arduino for decision-making
LCD Display (16x2)	Output	Water level and system status	Active when powered	Displays real-time information
I2C Module	Communication Interface	Data transfer to LCD	I2C protocol	Enables LCD communication with fewer wires
Water Pump	Output	Water flow control	ON when low; OFF when high	Fills tank automatically
Jumper Wires / Wires	Hardware	Signal and power flow	Proper voltage	Enables connections
Tank Container	Physical Medium	Water storage	Variable water level	Environment for sensor readings
Breadboard	Hardware Platform	Circuit connections	Temporary setup	Supports safe testing

Operation Flow of the System

The operation of the automated water level control system starts with the water level sensor continuously monitoring the amount of water in the tank and sending the data to the Arduino Uno. The Arduino processes this information and automatically controls the water pump through a relay, turning it on when the water level is low and turning it off when the tank is full. At the same time, the system displays the water level on the LCD. This continuous process prevents tank overflow and reduces water wastage without the need for manual monitoring.

Figure 4. Flowchart of the Automatic Water Level Control System



Hardware and Software Requirements

List of Hardware Components

- Arduino Uno
- Water Level Sensor
- LCD Display (16x2)
- I2C Module (5V)
- Jumper Wires
- Water Pump (12V)
- Tank Container
- Wires

- Breadboard

Materials and Their Purpose

1. Arduino Uno

- Purpose: Serves as the main microcontroller to process data from the water level sensor and control the water pump, and LCD display.
- Software Function: Runs the Arduino code (programmed using the Arduino IDE) that reads sensor input, decides when to turn the pump on or off, and updates the LCD display.

2. Water Level Sensor

- Purpose: Measures the water level inside the tank to determine whether it is low, full, or at an intermediate level.
- Software Function: Sends digital or analog signals to the Arduino Uno, which interprets the readings to control the water pump and trigger alerts.

3. LCD Display (16x2)

- Purpose: Shows real-time water level readings and system status for easy monitoring.
- Software Function: The Arduino sends data to the LCD using a library (e.g., LiquidCrystal or LiquidCrystal_I2C) to display the water level and operational messages.

4. I2C Module

- Purpose: Simplifies communication between the Arduino and the LCD display, reducing the number of required wires.
- Software Function: Uses the I2C protocol to transmit data from the Arduino to the LCD efficiently, allowing the program to display water levels and system messages.

5. Jumper Wires

- Purpose: Connects the components such as the Arduino, sensors, pump, and LCD.
- Software Function: Serves as a physical link; while it has no direct software role, it allows the program to control the hardware effectively.

6. Water Pump

- Purpose: Fills the water tank automatically when the water level is below the minimum threshold.
- Software Function: Controlled by the Arduino through a relay or transistor. The program sends a HIGH or LOW signal to turn the pump on or off based on sensor readings.

7. Tank Container

- Purpose: Stores water and serves as the test environment for the automated water level system.
- Software Function: Acts as the medium where sensor readings are taken; the program uses these readings to make decisions about pump operation.

8. Wires

- Purpose: Supplies power and completes electrical connections for the pump, sensors, and other components.
- Software Function: Like jumper wires, they allow the Arduino to send and receive signals but do not directly interact with the software.

9. Breadboard

- Purpose: Provides a temporary platform to connect electronic components without soldering, making it easier to build and test the circuit.
- Software Function: No direct software role; it allows the Arduino program to control and communicate with connected components safely and efficiently.

Statement of the Result

The Automated Water Level Control System was successfully designed, assembled, and tested. All components, including the Arduino Uno, water level sensor, LCD display, I2C module, water pump, and breadboard, were carefully connected and integrated to ensure proper functionality. During testing, the system accurately monitored the water level in the tank and automatically controlled the pump, preventing overflow and minimizing water wastage. The LCD display correctly showed the water level in real time, and the buzzer activated appropriately at critical levels, demonstrating the system’s reliability and efficiency. Overall, the project met its objectives, providing a functional, low-cost, and practical solution for automated water management.

TESTING AND RESULTS

Testing Procedures and Scenarios

The testing procedures and scenarios for the Automated Water Level Control System were conducted in a step-by-step manner to ensure the proper functionality of each component. Each device, including the Arduino Uno, water level sensor, LCD display with I2C module, relay module, and water pump, was individually tested before full system integration. This approach allowed early identification and correction of errors, ensuring stable operation. After individual testing, all components were carefully assembled and tested as a complete system under different water level conditions. The results confirmed that the system functioned as intended, with accurate water level detection, proper pump control, and reliable alerts, indicating successful assembly and implementation of the project.

Results of System Testing (10 Trials)

Table 3. System Testing and Validation Results

Trial No.	Input Condition (Sensor Value)	Observed Output	Expected Output	Pass / Fail	Remarks / Behavior Explanation
1	Sensor = 0 (dry sensor)	LCD: “Empty”; Pump ON	Pump turns ON when tank is empty	Pass	Pump correctly activates at empty level
2	Sensor = 120	LCD: “LOW”; Pump ON	Pump remains ON at low water	Pass	Low-level detection works correctly

3	Sensor = 250	LCD: “LOW”; Pump ON	Pump ON	Pass	Sensor still within LOW range
4	Sensor = 350	LCD: “Medium”; Pump ON	Pump should stay ON	Pass	Medium level detected properly
5	Sensor = 450	LCD: “Medium”; Pump ON	Pump remains ON	Pass	Pump not turned off too early
6	Sensor = 600	LCD: “HIGH”; Pump OFF	Pump OFF at high level	Pass	Correct cutoff point (≥ 600)
7	Sensor = 600	LCD: “HIGH”; Pump OFF	Pump OFF	Pass	Prevents water overflow
8	Sensor increases from 300 → 600	LCD updates Medium → High; Pump OFF	Smooth pump shutdown	Pass	Stable transition between levels
9	Sensor decreases from 600 → 200	LCD updates High → Low; Pump ON	Pump resumes filling	Pass	Automatic refill works
10	System power reset	LCD initializes; Pump OFF	Safe default OFF state	Pass	Proper initialization behavior

DISCUSSION

The Automated Water Level Control System successfully addressed the common problem of water tank overflow and wastage. By carefully assembling the components—Arduino Uno, water level sensor, LCD display with I2C module, water pump, and breadboard—the system was able to monitor water levels in real time and control the pump automatically. During testing, the system demonstrated accurate detection of minimum and maximum water levels, ensuring the pump operated only when needed.

The LCD display provided a clear visualization of the water level, making it easier for users to monitor the system’s operation. The results indicate that automation significantly reduces human error compared to manual monitoring and traditional float valve systems. Additionally, the system proved reliable and efficient, highlighting the importance of integrating microcontrollers and sensors in simple household water management.

This project also shows potential for practical implementation in Filipino households and small establishments where water scarcity and inefficient water usage are common. By reducing water wastage, the system contributes to environmental sustainability and cost savings. The success of this project emphasizes the value of combining affordable hardware components with programmed automation to solve everyday problems.

CONCLUSION

The study successfully developed an **Automated Water Level Control System** that prevents tank overflow and reduces water wastage. The system was carefully assembled and tested, showing reliable operation of the pump, sensor, and LCD display. It achieved its objectives by automatically monitoring and controlling water levels, minimizing human intervention, and providing real-time feedback to users.

Overall, the project demonstrates that simple and low-cost automation can be an effective solution for water management problems in households and small establishments. It highlights the importance of using technology to promote sustainable practices, reduce water wastage, and support responsible resource management. The system's success suggests that similar automated solutions can be applied in other areas to improve efficiency and conserve water.

FUTURE ENHANCEMENTS

While the **Automated Water Level Control System** was successfully developed and tested, there are opportunities to further improve its functionality and adaptability. Future enhancements could include:

1. **Remote Monitoring and Control:** Integrating the system with Wi-Fi or Bluetooth modules would allow users to monitor water levels and control the pump remotely via a smartphone or computer.
2. **Multiple Sensor Integration:** Adding more sensors could provide more precise water level readings, ensuring better control in larger or irregularly shaped tanks.
3. **Energy Efficiency:** Incorporating solar power or energy-saving mechanisms could make the system more sustainable, especially in areas with frequent power interruptions.
4. **Advanced Alerts:** Enhancing the alert system with mobile notifications or automatic emergency shut-offs could improve safety and convenience for users.
5. **Scalability:** Designing the system to manage multiple tanks simultaneously could make it suitable for commercial or institutional applications.

These enhancements would increase the system's versatility, efficiency, and applicability, making it a more robust solution for modern water management challenges.

ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to everyone who supported us throughout this project. Although we encountered a few errors during the development and assembly of the system, we learned from these challenges and carefully adjusted our approach to ensure the system became stable and fully functional.

We especially thank our instructors, peers, and mentors for their guidance, feedback, and encouragement, which helped us overcome difficulties and successfully complete the project. This experience has not only strengthened our technical skills in electronics and programming but also taught us the value of patience, teamwork, and problem-solving in achieving a successful outcome.

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Mr. Raul V. Reyes Jr. is an undergraduate student and aspiring professional in the field of Computer Engineering at the Eulogio “Amang” Rodriguez Institute of Science and Technology. Through academic coursework, projects, and hands-on experiences, he has developed a solid foundation in computer hardware, software systems, and emerging technologies. His areas of interest include embedded systems, automation, programming, and modern computing technologies. He continuously seeks to expand his knowledge by exploring new tools and applying theoretical concepts to real-world problem-solving. Driven by curiosity and a strong passion for technology, he aims to further strengthen his skills and contribute meaningfully to future advancements in computer engineering.

Mr. Emmanuel R. Villamin is a student of Eulogio “Amang” Rodriguez Institute of Science and Technology (EARIST) who actively contributed to the design, development, and implementation of the project titled “An Automated Water Level Control System to Prevent Tank Overflow and Water Wastage.” As a student researcher, he was involved in the planning, hardware assembly, programming, and testing of the system. His participation in the project reflects his interest in applying electronics and automation concepts to practical, real-world problems, particularly those related to water conservation and efficient resource management. Through this project, he demonstrated technical competence, problem-solving skills, and a commitment to developing cost-effective and sustainable technological solutions.

Mr. Vincent D. Oroy is a student at the Eulogio “Amang” Rodriguez Institute of Science and Technology (EARIST) who helped develop the automated water level control system using Arduino as part of the project’s academic requirements. He contributed to the design and implementation of the system, applying his knowledge of electronics and programming to ensure its proper functionality. He is passionate about design and emerging technologies, and he continuously seeks to enhance his skills by working on practical, technology driven projects.

Mr. John Jedel V. Carriedo is a student at Eulogio “Amang” Rodriguez Institute of Science and Technology who helped to develop the automated water level control project using Arduino as part of its academic requirements. He is passionate about technology, and continuously developing technical skills for future career growth.