WIRELESS WATER TANK LEVEL CONTROLLER USING LOAD CELL AND IOT

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ABSTRACT

- Water is one of the essential need for the survival of all human beings, animals and plants.
- The water overflow from the overhead tanks in the houses, commercial properties, educational institutions and agricultural farms increases the percentage of water wastage.
- To avoid such wastages implementation of an automatic water level controller becomes a key factor which further reduces human intervention.
- In this work, an automatic wireless water level controller using Load cell and water level monitoring through mobile application is proposed.

KEYWORDS

Water-level detector, Load cell

INTRODUCTION

- Majority of the water wastage take place because of overflowing water tanks.
- In absence of operator, water keeps on overflowing until the motor is switched off. These project can control the water level locally, operator is required to keep an eye on proper functioning.
- As a result of being in contact with water there is a high probability of rusting of material used in sensors.
- Users can directly monitor and control the working of tank through the smartphone at any place in the world.
- This project can be installed in an existing water tanks with no requirement of new tank

SOCIAL RELEVANCE

- Low cost

- Unmanned

- Accurate and Precise Monitoring and analysis

- Energy Saving

- Very Low water wastage

LITERATURE SURVEY AND ANALYSIS

1. A continuous water-level sensor based on load cell and floating pipe

Authors: Sheng-Wei Wang; Chen-Chia Chen; Chieh-Ming Wu; Chun-Ming Huang

Publication: 2018

- Analysis of Load Cell accuracy and factors affecting it
- Calibration of Load Cell
- This study mainly uses Archimedes principle, readily available PVC pipes and the load cell to measure water levels
- The results of the preliminary study show the feasibility of this method changes in the water level of 1 mm, which can be easily grasped and used to immediately control the water level

LITERATURE SURVEY AND ANALYSIS

2.Development of Alphanumeric Digital Fuel Gauge for Automotive Applications

Authors: Vijay Waghmode and Avinash Harale

Publication: 2019

- Multiple Load Cell will yield more accurate fuel level measurement
- In this design major challenge faced is about manufacturer errors like composition, hysteresis and temperature effect on zero reading. Those errors are minimized by averaging output of load cell and choosing load cell with less errors
- Shaking error can be solved by taking average of multiple Load cells

OBJECTIVES

Water Level Measurement using load cell

Tracking water Level using Mobile Application

Automatic Pump control

Alerting System

EXPECTED RESULTS

Accurate current water level status in mobile application

Alerting user when water level is empty or overflowed

Automatic Pump control

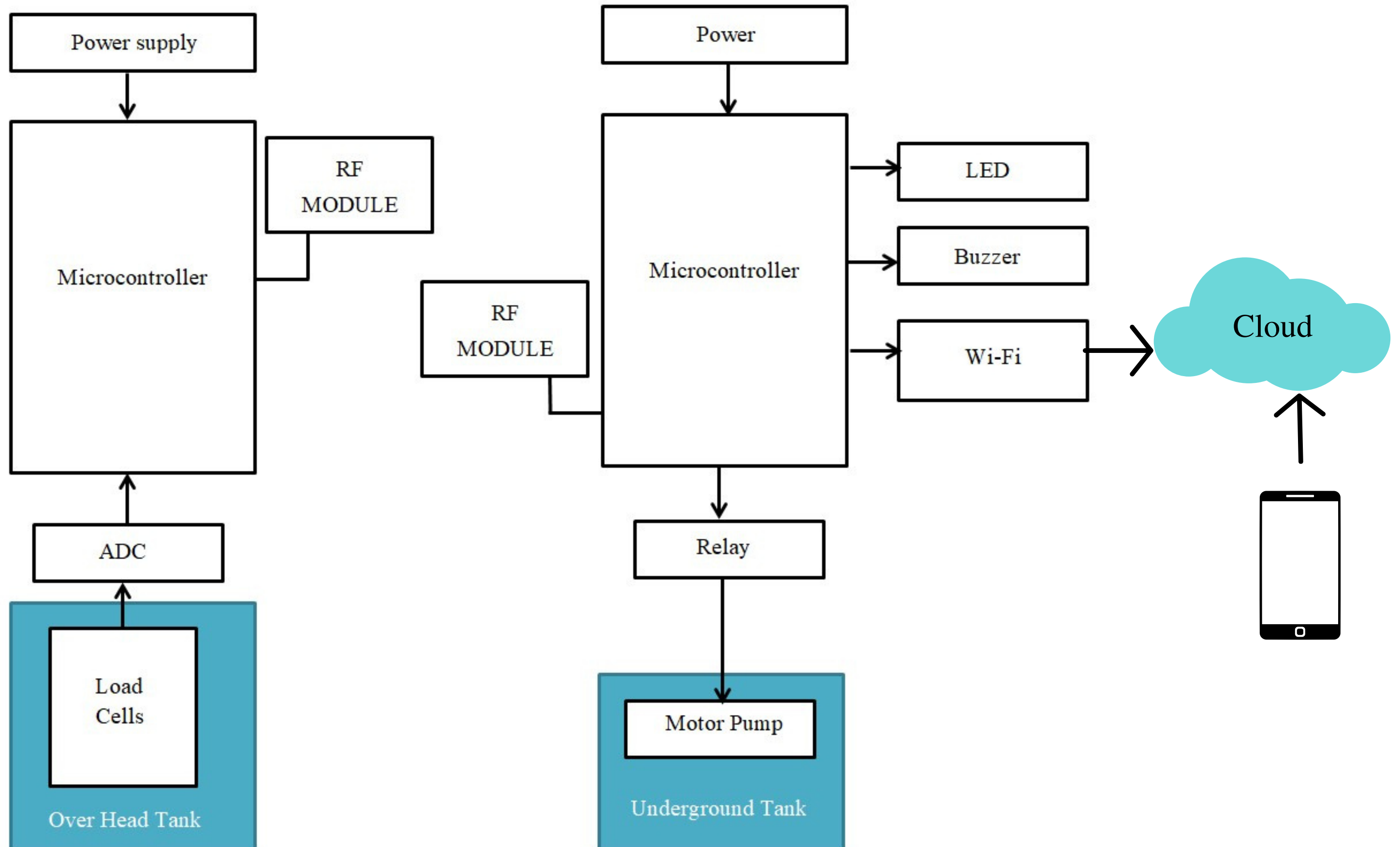Accurate water level measurement by load cell

UNIQUENESS OF PROJECT

- Low cost
- Non-contact Water Level Measuring system Using Load cell
- Accurate and Precise Monitoring and analysis
- Real time water level measurement
- Safety from electric failure

METHODOLOGY

- Wheatstone Bridge Principle
- Calibration Factor

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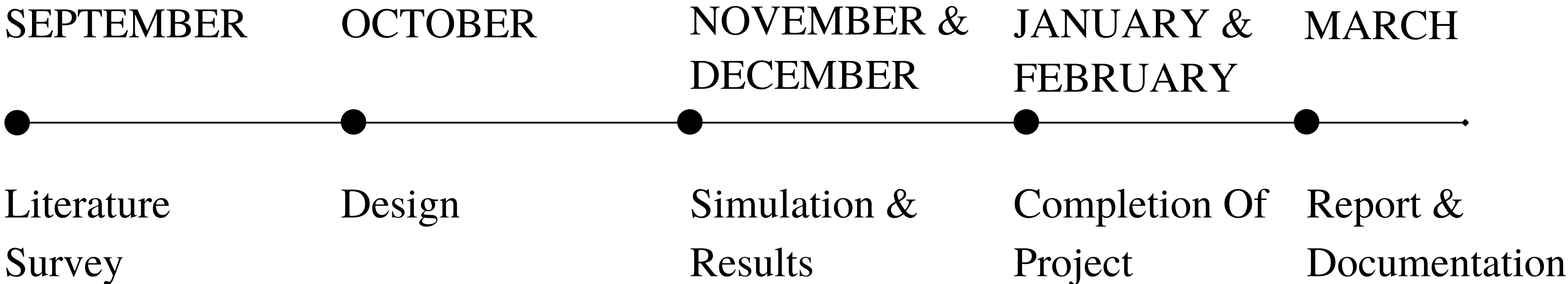
PROPOSED TOOLS FOR THE PROJECT

Hardware Components

1. STM32 Microcontroller
2. ESP8266 Microcontroller
3. Half-Bridge Load Cell
4. HX711 Analog to Digital Converter
5. 433 Hz RF Transceiver Module
6. Mini Micro Submersible Water Pump
7. Relay Module
8. LED and Buzzer Modules

Software Tools

1. Altium
2. STM32Cube IDE
3. Arduino IDE
4. Proteus
5. Kodular.io
6. Firebase

PLAN OF ACTION

SEPTEMBER	OCTOBER	NOVEMBER & DECEMBER	JANUARY & FEBRUARY	MARCH
Literature Survey	Design	Simulation & Results	Completion Of Project	Report & Documentation

REFERENCES

Base Paper:

A continuous water-level sensor based on load cell and floating pipe

Sheng-Wei Wang;Chen-Chia Chen;Chieh-Ming Wu;Chun-Ming Huang

2018 IEEE International Conference on Applied System Invention (ICASI)

Reference Papers

Development of Alphanumeric Digital Fuel Gauge for Automotive Applications

Vijay Waghmode;Avinash Harale

2019 International Conference on Communication and Signal Processing (ICCSP)

Thank You