

COIN-BASED MOBILE CHARGING SYSTEM

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Abstract: The Coin-Based Mobile Charger System is an innovative solution for public mobile charging, allowing users to charge their devices by inserting coins. This literature survey provides an overview of existing research and developments in coin-based mobile charging systems, focusing on their design, implementation, and security features. The survey covers various aspects, including coin detection mechanisms, solar tracking systems, and user interface designs. It also discusses the benefits and limitations of these systems, as well as their potential applications in rural and urban areas. The survey aims to provide a comprehensive understanding of the current state of coin-based mobile charger systems, identifying areas for future research and development. By exploring the existing literature, this survey contributes to the advancement of secure, efficient, and user-friendly public mobile charging solutions.

Keywords: Mobile charging, coin-operated system, portable charger, user convenience, public spaces,, security measures.

I. INTRODUCTION

The coin-based mobile charger system is a public charging system that accepts coins as payment for charging mobile devices for particular amount of time. It's a convenient and secure way to charge your phone or other devices when you're travelling very long distance. Now a day's students and many other people use the public transportation, people who are making very long journey in order attend business conventions, conferences, or for any private purpose don't know their battery level is low and they often forget their charger.

Many critics argued that long distance travelling vehicles provides power points. Even through one or two power points are provided at a particular place in the vehicles it is not all sufficient for all passengers, therefore need to provide a public charging service is essential and coin based mobile charging are designed to solve these problem.

RFID Based Mobile Charging System: The RFID technology based mobile charging system is developed in this project. The system can be quickly and easily installed outside any business premises. In this, RC522 RFID module to read the RFID tag. In real time, the system can be integrated with the server. We are here making a prototype to demonstrate mobile charging using RFID. When a valid RFID Tag is shown to the reader, it gives logic signal to microcontroller. The microcontroller used here is from AVR family Atmega328 (Arduino UNO). It activates relay to provide power supply for the load. It also displays count down time on 16x2 LCD. When count down time gets finished, it automatically cuts off supply of the electrical load. In our project, electrical load is mobile charger. It also uses 7805 regulator IC to get constant +5V voltage for the peripherals. And also uses regulated power supply which is given to all the units.

II. LITERATURE REVIEW

1. LITERATURE SURVEY ON AUTOMATIC GADGET CHARGER USING COIN DETECTION

A literature survey on automatic gadget charger using coin detection reveals several relevant studies and projects
Research Conducted: A research conducted in the field of energy alternative resources focuses on developing a coin-based mobile battery charger that uses an alternative source as energy for charging mobile batteries ³.
Project Development: A project developed by Gunjan Chhabra, Sunil Kumary, and Pankaj Badoni presents an automatic gadget charger using coin detection, which was showcased at the 1st International Conference on Next Generation Computing Technologies (NGCT-2015) in Dehradun, India. Author Expertise: Dr. Gunjan Chhabra, an assistant professor, has expertise in algorithms, image processing, and machine learning, and has published several research papers and patents. Conference Papers: Conference papers on this topic are available, including "Automatic Gadget Charger using Coin Detection" presented at the NGCT-2015 conference. These studies and projects demonstrate the growing interest in developing innovative solutions for automatic gadget charging using coin detection.

2. *Literature Survey on Coin Insertion Based Smart Mobile Charger Using LDR*

A literature survey on coin insertion based smart mobile charger using LDR reveals several relevant studies and projects, including: Coin-Based Mobile Charger Using Solar Tracker ¹: This study presents a coin-based mobile charger that uses solar power and an IR transmitter and receiver to detect coin insertion. The system is designed to provide a convenient and efficient way to charge mobile phones in public places. Solar Powered Coin Insertion Based Smart Mobile Charger ²: This project uses an LDR to enable solar tracking and optimize charging efficiency. The system is designed to be used in public places and provides a smart and efficient way to charge mobile phones. Mobile Charging By Using Coin Insertion Module And Renewable Resource ³: This study presents a coin-based mobile charger that uses renewable resources and ensures maximum utilization of solar energy. The system is designed to be used in public places and provides a convenient and efficient way to charge mobile phones

3. *Coin-Based Mobile Battery Charger with High Security Literature Survey*

Here is a literature survey on coin-based mobile battery chargers with high security: Coin-Based Mobile Charger using Solar Tracker ¹: This charger uses solar power and a coin-based system for public mobile charging. It features an IR transmitter, IR receiver, and a microcontroller-based circuit for secure coin detection. The system also uses a stepper motor for accurate sun tracking and MATLAB coding for coin image processing. Mobile Charging Based on Coin Insertion. This paper discusses a coin-insertion-based mobile charging system. It highlights the need for secure and efficient mobile charging solutions in public areas. Mobile Charging by Using Coin Insertion Module and Renewable Resource: This study explores the use of coin insertion modules and renewable resources for mobile charging. It emphasizes the importance of secure and sustainable mobile charging solutions. Coin-Based Mobile Charger using Solar Panel: This paper presents a coin-based mobile charger using a solar panel. It discusses the design and implementation of a secure coin-based mobile charging system. These studies demonstrate the growing interest in developing secure and efficient coin-based mobile charging solutions, particularly in public areas where access to electricity or traditional charging methods is limited.

4. *Here is a literature survey on the Automatic Coin-Based Solar Tracking System Cell Phone Charger:*

Coin-Based Mobile Charger using Solar Tracker: This system allows users to charge their mobile phones by inserting a coin in public places. It uses an IR transmitter, IR receiver, and a microcontroller-based circuit for secure coin detection. The system also uses a stepper motor for accurate sun tracking and MATLAB coding for coin image processing. This system is designed to provide a completely different service to people staying in rural areas. It uses solar power as solar energy and generates more energy for free of cost. This system also uses external grid power in the absence of solar energy which will be helpful in the rural areas since villages face load shedding most of the time. Mobile Charger based on Coin by using Solar tracking System: This system uses a solar tracking system to charge mobile phones. It allows users to charge their phones by inserting a coin. The system uses a solar panel to generate energy

III. PROBLEM STATEMENT

- The constant use of the mobile phone (other electronics devices) often leads to the need for frequent charging.
- This becomes particularly challenging for individuals embarking on long journeys or residing in areas with unreliable grid power.
- To address these challenges, the proposed solution is a **mobile charging system based on coin**.

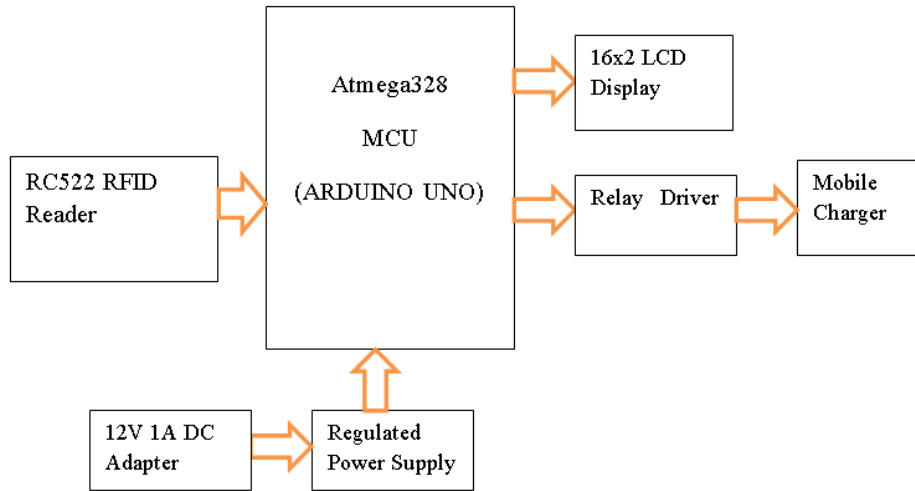
IV. OBJECTIVES

The objective of the Coin-Based Mobile Charger project is

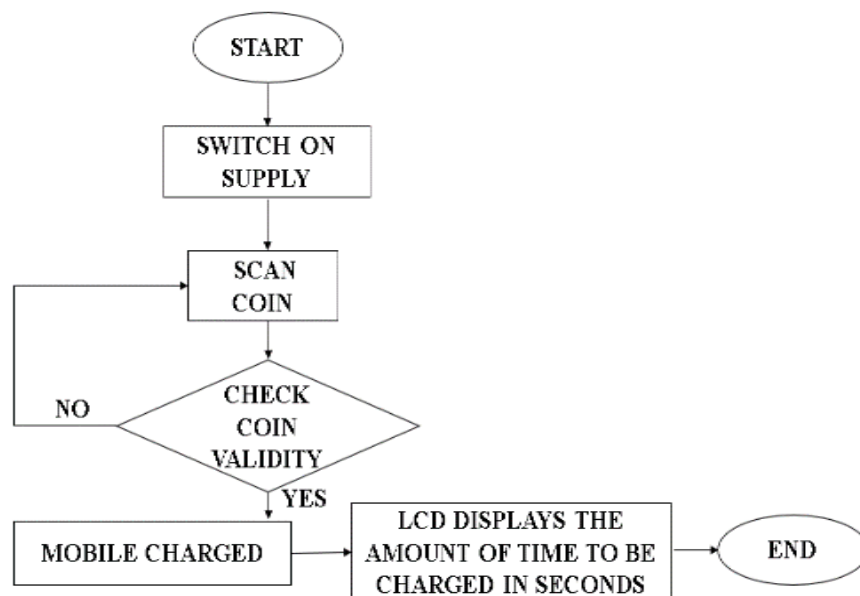
- To create a sustainable and cost-effective solution for mobile device charging.
- To enhance user experience through clear feedback mechanisms such as LCD displays for real-time charging status updates and location selection.
- To demonstrate the feasibility and benefits of sustainable technology applications while contributing positively to community accessibility.
- To develop the system in the areas where access to grid power is limited or intermittent.

V. METHODOLOGY

- The goal of the project is to create a mobile phone charging service that operates using coins. Users will be able to charge their low or dead phone batteries by scanning a specific coin into the charging station.
- The charging station is designed using a Arduino uno, which will handle the countdown timing for a predetermined period of time. An LCD display will show users how much time is left until their phone is fully charged

BLOCK DIAGRAM:**WORKING:**

- Upon startup, the Arduino initializes the pins for RFID reader, buzzer and relay, and sets the initial state of the relay to LOW (off).
- The LCD displays a startup message indicating the system's purpose. The system waits for a user to scan
- If the coin is valid the charging process begins, and the relay is turned on to supply power to the charging device.
- The LCD displays the charging status, updating for every 3 minutes.
- After 3 minutes, the charging process is completed, the relay is turned off, and the system returns to the initiate state

FLOWCHART:

VI. THE VARIOUS COMPONENTS USED ARE**1) HARDWARE COMPONENTS**

- Arduino Uno
- Relay
- Power supply
- Coin detection Sensor (RFID Reader)
- LCD
- Buzzer

2) SOFTWARE COMPONENTS

- ARDUINO IDE

1) ARDUINO UNO:

- Arduino Uno is an open-source microcontroller board based on the processor ATmega328P.
- There are 14 digital I/O pins, 6 analog inputs, a USB connection, a power jack, an ICSP header, and a reset button.
- It contains all the necessary modules needed to support the micro controller.
- It Just needs to plug a computer with a USB cable or power it with an adapter to get started.

2) RELAY:

- A 2-channel relay is a type of relay module that contains two independent relay switches. Each relay switch can be controlled individually, allowing you to turn on/off, or switch between two devices or circuits.
- Low power consumption: Typically uses low voltage and current
- High switching capacity: Can handle high currents and voltages.

3) LIQUID CRYSTAL DISPLAYS(LCD):

- Liquid crystal displays (LCDs) have materials, which combine the properties of both liquids and crystals.
- Typically operates on 5V or 3.3V

4) COIN DETECTION SENSOR (RFID READER):

- The RC522 RFID Reader/Writer Module (Transceiver) is based on a highly integrated reader/writer IC MFRC522. It is used for contactless multi-communication at 13.56 MHz's.
- This module uses electromagnetic waves in radio frequency to transfer data.
- It can read/write all types of Transponders (RFID card tags and key fob tags) which having 1KB memory and compatible with 13.56 MHz frequency.
- This is a low-voltage, low-cost, small-sized module.

5) BUZZER:

- A buzzer is an electronic device that produces a sound, typically a beep or a buzz, when an electric current passes through it.

6) REGULATED POWER SUPPLY

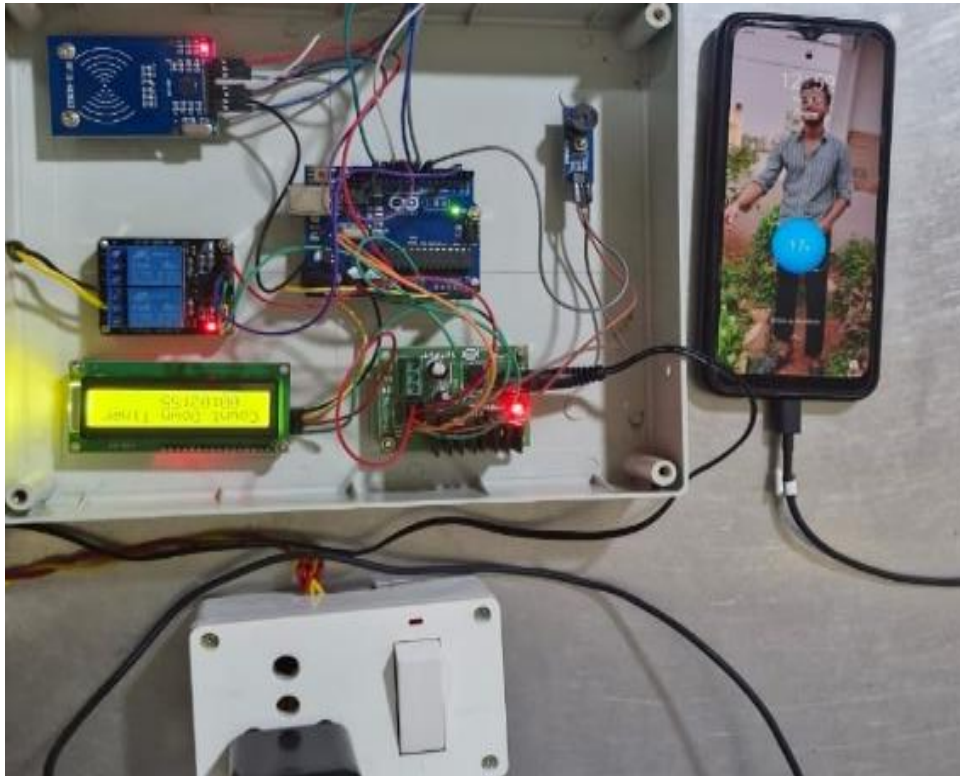
- It is most common voltage regulator that is still used in embedded designs.
- LM7805 voltage regulator is a linear regulator. With proper heat sink these LM78xx types can handle even more than 1A current.
- They also have thermal overload protection, short circuit protection.
- This will connect at the output of rectifier to get constant dc supply instead of ripple voltages

ARDUINO IDE:

- The Arduino Integrated Development Environment (IDE) is a cross-platform application that provides a comprehensive environment for writing, compiling, and uploading code to Arduino boards.
- It's a software tool that simplifies the process of programming Arduino microcontrollers, making it accessible to beginners and experienced developers alike.

VII. RESULTS

LCD is displaying the remaining charging time, then automatically cut off power upon completion.



VIII. SUMMARY

The Coin-Based Mobile Charger System is an innovative solution designed to meet the growing demand for convenient mobile device charging in public spaces. This system combines a coin-operated mechanism with multiple charging ports, allowing users to securely charge their devices while minimizing the risk of theft.

Key features include compatibility with various mobile devices, making it versatile for different users. The coin-based payment model not only provides a cost-effective charging option but also supports a sustainable business approach. By placing these charging stations in high-traffic areas such as cafes, airports, and shopping malls, the system enhances user convenience and promotes responsible device usage.

Overall, the Coin-Based Mobile Charger System aims to revolutionize the charging experience, ensuring greater accessibility and satisfaction for users while addressing the challenges associated with mobile device power needs in today's fast-paced environment.

IX. APPLICATIONS

- Public charging stations.
- Rural or underserved areas
- Emergency charging
- Tourist attractions.
- Transportation hubs.
- Events and festivals

X. CONCLUSION AND FUTURE SCOPE

Conclusion :

A system for charging mobile phones or laptop using coin-based technology is proposed. The system is proposed for commercial places for the purpose of revenue. The system can be provided with the power backup facility using UPS or inverter. The solar based power supply can be used for rural areas. This project is very useful at such locations where people are facing power crisis. Since, Communication is very important now days, cell phone charging is one of the problems faced by users. The proposed system shall provide a source of charging the cell phone in emergency conditions.

Future scope :

- We can further implement the system by RFID card tag integration with the real time database and server in future. In that case, user can maintain amount balance by recharging the card for a specific amount as per the requirements.
- Fast charging: upgrading to rapid charging capabilities for quicker top-ups.
- Wireless charging: implementing wireless charging technology for added convenience.

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