



SOLAR POWERED COIN INSERTION BASED SMART MOBILE CHARGER

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ABSTRACT

The project proposes a solar-powered cell phone charging system that operates on a coin-based payment method. With the widespread use of mobile phones for personal and business communication, providing a public charging service has become a necessity. While some people argue that this may not be a profitable business since most individuals can charge their phones at home, office, or in their vehicles, it remains essential for individuals who forget their charger or are on the go. This is especially true for students, commuters, and people attending conferences. The charging system can be installed in various locations such as hotels, conference centers, leisure centers, shopping malls, internet cafes, colleges, airports, train terminals, etc., to cater to the needs of mobile phone users who require a quick recharge for a nominal fee of one rupee.

The system is designed using a Raspberry Pi, which facilitates the countdown timings for a specified period while displaying the remaining time on an LCD screen. The system is equipped with a detector sensor and an LDR (Light Dependent Resistor) that enables solar tracking. This solar tracking system helps to optimize the charging efficiency of the system by continuously adjusting the solar panel to face the direction of maximum sunlight. Additionally, a relay output is latched during the timing period, indicating that the charging process is in progress.

Keywords: Detector Sensor, LCD Display, LDR, Solar Panel, Raspberry Pi

INTRODUCTION

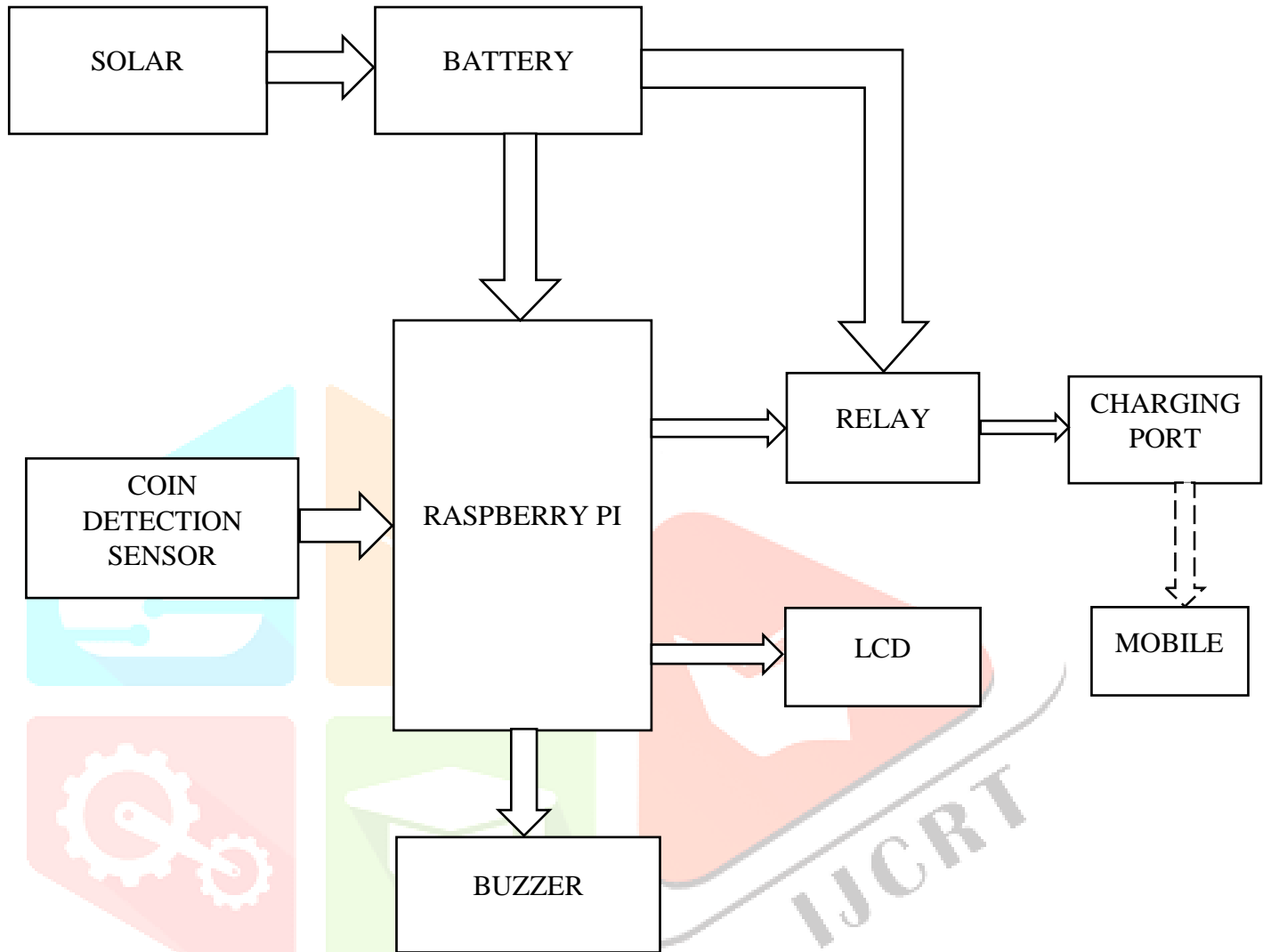
The aim of this project is to develop a coin insertion based mobile charging system that addresses the common problem of low battery issues faced by people during their daily activities and travels. Most people use smartphones that consume a significant amount of battery power, which gets drained within a few hours of usage. When this happens, users either have to turn off their internet connection or use power-saving modes. Although power banks are readily available, their availability is not always guaranteed, and they may not be sufficient for emergency situations.

The proposed coin insertion based mobile charging system offers a convenient and efficient solution to this problem. It allows users to charge their mobile devices safely and securely at reasonable rates. For instance, during emergencies when the battery is low and there is an urgent need to make a call or check an email, users can use this system to charge their phones instead of relying on power banks or searching for an electrical outlet.

Moreover, the system is user-friendly and offers a secure charging environment. For example, in places such as commercial complexes or educational institutions where mobile phones are not allowed, users can utilize this system to charge their devices without worrying about the security of their phones. They only need to select the charging duration and pay the charges using the coin insertion system. Once the phone is charged, they can safely retrieve it.

In summary, the coin insertion based mobile charging system offers a practical solution to the common problem of low battery issues faced by people. It provides a convenient, secure, and efficient way of charging mobile devices, especially during emergencies or in places where charging options are limited.

BLOCK DIAGRAM



EXISTING AND PROPOSED

Mobile phone is a basic asset owned by almost everyone in this modern world. Although mobile chargers can be carried anywhere, access to electricity is not always available, especially in rural areas and public places during summer days. To address this issue, a system has been designed to provide a public mobile phone charging service. Currently, the mobile phone business is worth billions of dollars and supports millions of phones, making it essential to provide a public charging service. Despite critics arguing that such a service is not a lucrative business because most users can charge their phones at home, in their office or cars, coin-operated mobile phone chargers have become a new business milestone. This is because many people attending business conventions forget their chargers at home or in hotel rooms, and students or individuals using public transportation who are unaware of their low battery level are prospective customers for this service. Recommended locations for coin-operated mobile phone chargers include hotels, conference centers, exhibition halls, serviced offices, exchange halls, motels, leisure centers, health clubs, training centers, golf clubs, retail outlets, shopping malls, internet cafes, universities, colleges, airports, train terminals, and more. With this service, mobile phone users can easily reactivate their low or dead battery by plugging in and charging for coins.

EXISTING SYSTEM LIMITATIONS

The current system uses embedded C code to display the remaining time and charges the mobile using an precious electricity- grounded power source. Still, it has several limitations.

- A single program can be run at a time.
- It lacks memory safety checks, which could lead to implicit issues.
- It has less number of programming languages.
- It lacks built- in peripherals.

PROPOSED SYSTEM ADVANCEMENTS

To overcome the limitations of the existing system, we propose the use of Python code, which is further user-friendly and can be dumped into a more important Raspberry Pi microprocessor. also, we've designed and installed a solar panel- grounded power generation system. The proposed system offers the following advancements

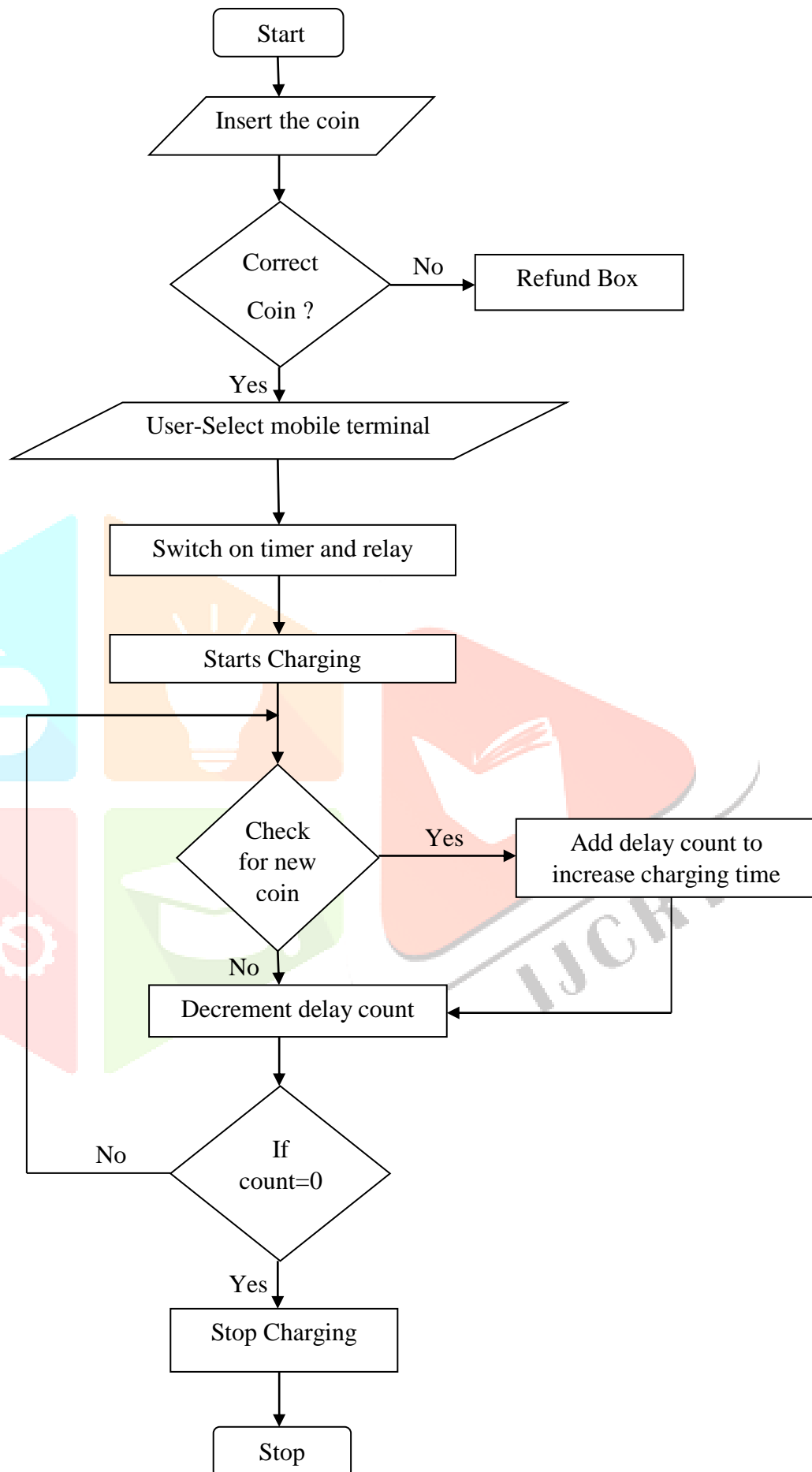
- Further built- in peripherals.
- Advanced programming features.
- The capability to multitask with ease.
- Further built- in capacities.
- Advanced safety features.

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 inserting a specific coin (e.g., a one rupee coin) into the charging station. The charging station is designed using a Raspberry Pi, 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. When the countdown period is active, a relay output will be activated, and the countdown will continue until the phone is fully charged. To summarize, the project involves creating a coin-operated mobile phone charging station with a Raspberry Pi-based countdown timer and an LCD display to show the remaining charging time.



FLOW CHART



Experimental Set-up

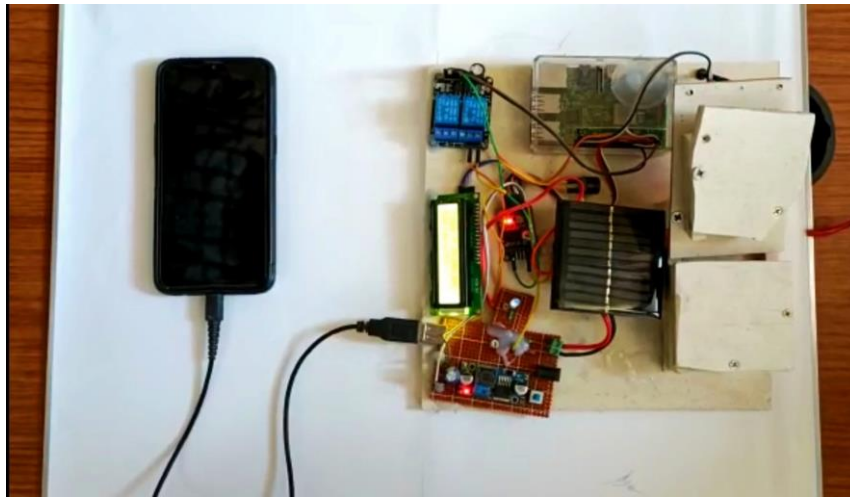


Fig. Experimental Set-up

RESULT

This project aims to charge a mobile battery using a solar panel. The charging system works based on a user input of 1-rupee coin, which corresponds to a 1-minute charging time for the mobile device. If the user inputs another coin before the end of the initial 1-minute charging cycle, the charging time is extended by an additional minute and the mobile will get charged.

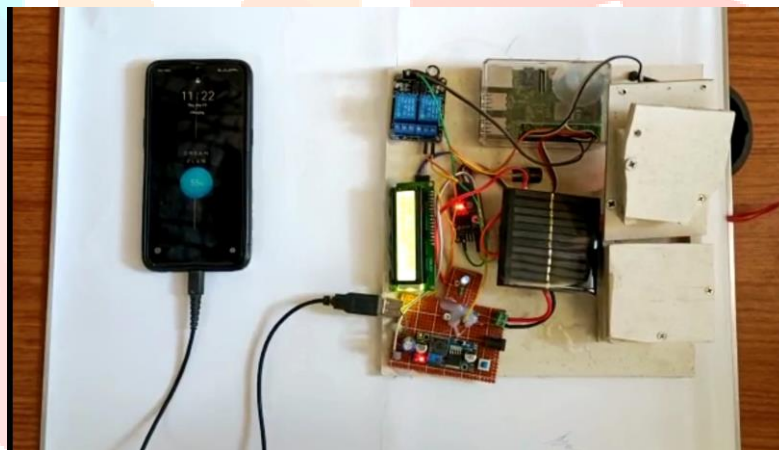


Fig. Result

ADVANTAGES

- To efficiently harness the maximum energy from the sun during Earth's rotation.
- To create a simple and convenient method that can be operated by hand.
- To design a cost-effective solution that doesn't require a large investment.
- To decrease the necessity for human involvement and lower expenses related to labor.
- To create a low-power solution that consumes minimal energy.
- To provide an emergency charging option for urgent needs.

APPLICATIONS

- This technology can be implemented in various locations such as railway stations, bus stops, rural areas, villages, and other public areas.

CONCLUSION

A proposed system that utilizes solar power to charge mobile batteries of varying manufacturers is aimed at aiding individuals living in rural and remote areas that experience irregular or insufficient power supply. The project is particularly valuable for locations where people are struggling with power shortages, and cell phone charging is a major challenge. In modern times, the need for communication is critical, and this proposed system seeks to address the issue of phone charging during emergency situations when electric supply is unavailable.

FUTURE SCOPE

This project has potential for mobile phone users in areas with limited electricity. As technology advances, the demand for portable charging solutions will increase, providing opportunities for the project's future development. Options include increasing accessibility in public areas, improving efficiency with faster charging technology, incorporating other features like wireless charging, and expanding to other regions with high demand.

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