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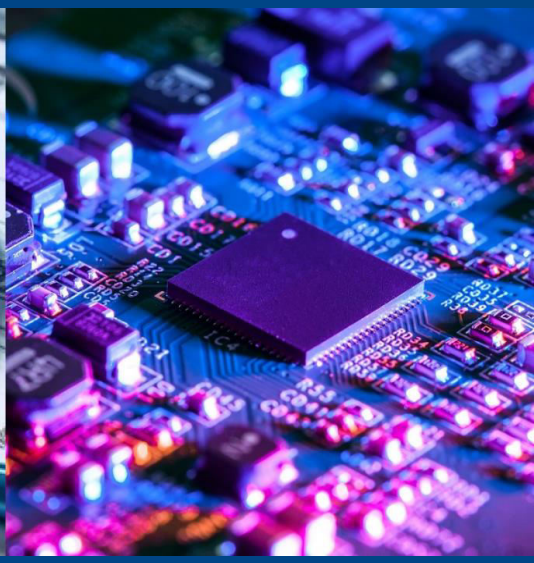

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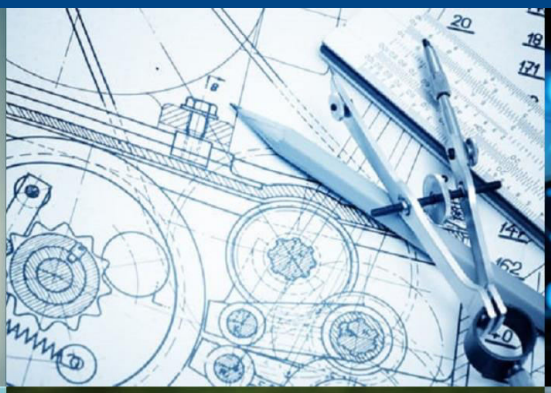

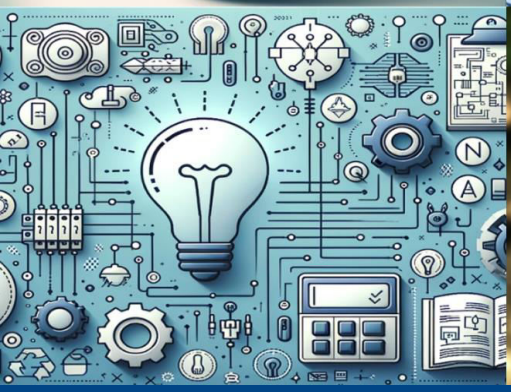

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Coin based Mobile Charging System

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ABSTRACT: In today's fast-paced digital era, the mobile phone has become an indispensable part of life. A major challenge faced by users is maintaining sufficient battery power while away from home or office, especially in public places.This project introduces a **Coin-Based Mobile Charging System**, a practical and user-friendly solution for mobile charging in emergency situations. By inserting a coin, users can access a limited period of mobile charging through a controlled system powered by a microcontroller and sensor modules. The system is designed for use in public areas such as railway stations, bus stops, rural zones, and educational institutions. It is equipped with a coin recognition module, power supply, and control mechanism to ensure regulated charging based on user input. This innovation not only aids individuals in times of need but also presents a business opportunity for public vendors and municipalities looking to offer essential utilities.

I. INTRODUCTION

Mobile phones are an essential communication tool in both urban and rural communities. However, keeping them charged on the go, particularly in public areas, is often a challenge. Traditional charging solutions are either unavailable or require users to carry power banks.

The **Coin-Based Mobile Charging System** addresses this issue by offering a pay-as-you-use charging facility in public places. It functions by detecting coin input, validating its authenticity, and then triggering a controlled power supply to the mobile device.

This system makes use of components such as a coin detector, microcontroller, power regulator, and timer. The primary objective is to provide an affordable, easily accessible, and secure method for mobile charging using minimal hardware and user interaction. In this project, Arduino and other electronics modules collaborate to deliver a reliable service, thereby ensuring convenience for users without compromising efficiency or safety.

II. FABRICATION AND ANALYSIS

The fabrication process of the Coin-Based Mobile Charging System involves both electronic assembly and structural design. The main components include:
Coin Recognition Module: Identifies and validates legitimate coins inserted into the system.
Microcontroller (Arduino): Acts as the central processing unit, controlling the entire process based on the input received from the coin sensor.
Relay Module: Enables and disables the power supply to the mobile device.
Power Supply Circuit: Converts the AC input or solar energy into a stable 5V DC required for charging mobile phones.
Display Unit (LCD): Shows the duration of charging available after coin insertion.
Casing/Enclosure: Made of plastic or metal to protect the circuitry and provide user interface access.

The analysis phase involved testing various coin types, power durations, and phone compatibility. Accuracy in coin recognition and efficiency in energy delivery were key benchmarks.

Various scenarios were evaluated to test durability, coin rejection handling, and time-controlled cutoff to avoid overcharging.

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With successful simulation and physical testing, the system showed reliability in diverse environments, especially where power supply is inconsistent.

III. PROPOSED METHODOLOGY

The working of the Coin-Based Mobile Charging System follows a simple yet efficient flow:

Coin Insertion: A user inserts a valid coin into the slot.
Coin Validation: The coin recognition module identifies if the coin is genuine and of the accepted denomination.
Signal Processing: Upon validation, the sensor sends a signal to the microcontroller.
Relay Activation: The microcontroller processes the input and activates the relay, allowing current to flow to the charging port.
Power Supply: A regulated 5V DC supply is provided for a fixed time (e.g., 5 minutes per coin).
LCD Notification: Charging time left is displayed on the screen.
Auto Cutoff: Once the time is over, the microcontroller cuts off the power, ensuring fair usage and energy conservation.

This methodology ensures minimal human supervision, reliable automation, and fair usage.
The system is scalable and can incorporate enhancements such as solar input, wireless charging pads, and mobile payment integration.

In our vibration alarm system, we will be having Infra-Red sensor Amplifiers, Comparator and Relay The Infra-Red sensor is used in this circuit. If there is any interrupt between the IR LEDs, the sensor senses and sends the corresponding electrical output signal to amplifier circuit.

The amplifier circuit results in further amplification of signals. The amplified signal is given to comparator. The comparator compares the incoming signal with reference. If the incoming signal is more, it operates the relay

IV. COMPARISON

The proposed system has been compared against existing mobile charging systems and technologies:

Feature	Traditional Chargers	Power Banks	Solar Chargers	Coin-Based System
Portability	High	High	Medium	Low
Usability in Public Places	Low	Medium	High	High
Energy Efficiency	Medium	Medium	High	High
Cost for End User	Free (if available)	High	Medium	Very Low
Payment Integration	No	No	No	Yes
Maintenance	Medium	Low	Medium	Medium

V. RESULTS AND DISCUSSION

Upon completing the design and development of the system, a series of tests were conducted under real-time conditions. The results are summarized as follows:

Accuracy: Coin recognition showed 95% success in detecting valid coins and rejecting invalid ones.
Power Output: Consistent delivery of 5V DC with minimal fluctuation.
User Experience: Easy to operate, with clear instructions and responsive interface
Compatibility: Worked with a variety of mobile devices with USB charging ports.
Durability: The system sustained multiple operational cycles without fault or damage.

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The key discussion point is the system's relevance in both urban and rural settings. While urban users may use it for convenience, rural users where electricity is intermittent can benefit significantly. The system's scalability allows it to be implemented in high-traffic areas with added features like multiple ports, fast charging, or wireless support. Challenges such as vandalism, coin theft, or environmental wear were considered and can be addressed through enhanced security and weatherproof casings.

VI. CONCLUSION / DISCUSSION

The Coin-Based Mobile Charging System represents a thoughtful blend of engineering, electronics, and public utility. It addresses the everyday challenge of mobile charging in a unique and accessible way.

The integration of microcontroller-based control and coin recognition makes the system intelligent and manageable. Furthermore, the model has immense potential for future improvements including solar charging, wireless modules, and integration with digital payment systems like UPI or NFC.

Such systems can empower communities, support emergency needs, and open small business opportunities.
Overall, the project not only serves a technical purpose but also contributes meaningfully to social convenience and digital accessibility.

REFERENCES

[1]Nethravathi, P.S., Aithal, P.S., Sonia Soans, & Nayana Yadav,(2021). Coin-Based Mobile Charger using Solar Tracker. International Journal of Applied Engineering and Management Letters (IJAEML), 5(2), 68-77.
[2] P. Goyal and P. S. Sharma, "Coin Detection based Mobile Charging System," 2019 6th International Conference on Computing for Sustainable Global Development (INDIACom), New Delhi, India, 2019, pp. 60- 63.
[3] G. Chhabra, S. Kumar and P. Badoni, "Automatic gadget charger using coin detection," 2015 1st International Conference on Next Generation Computing Technologies (NGCT), Dehradun, India, 2015, pp. 950-954, doi: 10.1109/NGCT.2015.7375261.
[4] A. U. Tajane, J. M. Patil, A. S. Shahane, P. A. Dhulekar, S. T. Gandhe and G. M. Phade, "Deep Learning Based Indian Currency Coin Recognition," 2018 International Conference On Advances in Communication and Computing Technology (ICACCT), Sangamner, India, 2018, pp. 130-134, doi: 10.1109/ICACCT.2018.8529467

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