e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:07/July-2024 Impact Factor- 7.868 www.irjmets.com

COIN/UPI BASED MOBILE CHARGING SYSTEM USING SOLAR ENERGY

Gaurav Bhosale[*1], Shreya Kolawdakar[*2], Ashwini Hapan[*3], Prof. M.M. Gargade[*4]

[*1,2,3]Electronic & Tele-Communication Engineering (Diploma), College Of Engineering, Phaltan, Maharashtra, India.

[*4]HOD, Electronic & Tele-Communication Engineering (Diploma), College Of Engineering Phaltan, Maharashtra, India.

DOI : https://www.doi.org/10.56726/IRJMETS59856

ABSTRACT

The usage of mobile phones is increasing in many folds. Hence, charging the mobile phones has become a greater task these days. Battery power is the main concern when buying new mobile phones. The main purpose of mobile charger is to reduce the wastage of electrical power which often arises due to negligence of the user. Once the coin is inserted, the coin acceptor detects whether the coin is valid or not. For each unit of price, the power is available only for a limited period. The arduino can calculate the time based on the number of coins inserted. Instead of Coin, Online payment is also applicable. Battery is charged using solar energy.

Keywords: Arduino, Solar Energy, Coin.

I. INTRODUCTION

The coin/UPI based mobile charging system charges the mobile phones when the coin is inserted. This system is used by shop owners, rural people and can be implemented in the public places like railway stations, bus stand to provide mobile charging facility. So the coin acceptor recognizes valid coins and then signals the arduino for further action. If a valid coin is found, it signals the arduino and then arduino starts the mobile charging mechanism providing a 5V supply through a power supply section to the mobile phone. The arduino starts a reverse countdown timer to display the charging time for that mobile phone. Further the user adds another coin, the arduino adds to the currently remaining time and once again decrements the countdown. This system can be used for smart mobile charging at public places. This coin based mobile charging system will supply the enough amount of charge to the mobile phone and is available on demand in public places.

The usage of mobile phones is increasing in many folds. Hence, charging the mobile phones has become a greater task these days. Battery power is the main concern when buying new mobile phones. The main purpose of mobile charger is to reduce the wastage of electrical power which often arises due to negligence of the user. Once the coin is inserted, the coin acceptor detects whether the coin is valid or not.For each unit of price, the power is available only for a limited period. The arduino can calculate the time based on the number of coins inserted.

Now a day's smart phones become an ineluctable part of human's life. The power supply is an integral part of all electronic systems. Most of the works are done through mobile phones daily, so charging is the essential requirement to operate them. Therefore, the idea is to develop a system that will provide charging on coin insertion. The important thing is that the said system will be available at public places at any time. The user has to insert the coin into the coin acceptor and plug the suitable adapter into the mobile phone. The amount of charging will be pre-defined values, as mentioned in the microcontroller. This system is easy to install and useful for everyone using a Smartphone.

The project is based on developing a coin insertion-based mobile charging system that provides an effective solution to everyone's low battery issues while travelling or during day- to-day activities. Most people use a Smartphone, which consumes tremendous battery power.

Within a few hours of usage, the mobile battery gets drained, and the users either have to switch off their net packs or use their mobile in power saving modes. At this time, users use readily available power banks, but power banks' availability is not a surety in each case. What if the mobile is switched off during the case of an emergency and there is an extremely urgent need to call someone or to check any email or respond to someone during travelling. Often, the battery becomes low in the middle of a conversation, particularly at inconvenient times when access to a standard charger is not possible. Also, at certain places such as colleges during exam

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:07/July-2024 Impact Factor- 7.868 www.irjmets.com

time and in many commercial complexes, people are asked to keep their mobile phones outside before entering the premises. This time can be an excellent utilization for charging their phones using the coin insert mobile charger, which would provide efficient charging at reasonable rates. An Arduino microcontroller is programmed for all the controlling applications. Once the coin is inserted, the coin acceptor detects for authenticity of coin. For every unit of price, the power will be available only for a limited period. Then Arduino calculates the time based on the number of coins inserted. This is how a charging system will work. The system can be installed in places like malls, cafeterias, hospitals, railway stations, restaurants, colleges, airports, and many more.

The project was ideated considering the various issues, particularly college students faced throughout their day. Based on a survey done, many students did not have any safe source for charging their phones in case of an emergency. Hence the idea of implementing this system was formed. This project has been implemented by USA by a company called “Chargetech”, wherein it is used at a public places like malls and restaurants. This system can be used to generate revenue by displaying advertisements on the cabinet.

II. METHODOLOGY

A sequence of modules is used in the architecture namely Arduino UNO board, LCD 16x2 display, transistor, resistors, power source for arduino, battery and USB Port. The Arduino can "talk", (transmit or receive data data) via a serial channel, so any other device with serial capabilities can communicate with an Arduino.

Development Tools:

1. Hardware:
2. Arduino UNO
3. Wi-Fi Module
4. Coin Acceptor
5. Solar Panel
6. Battery
7. LCD Display
8. Relay
9. Buzzer
10. Power Adapter
11. Software:
12. Arduino IDE
13. Proteus

III. MODELING AND ANALYSIS

This section describes the modules for the proposed system.

- Input stage-To accepts the valid coin.
- Controller-To control the voltage using relay.
- Power-To supply the power based on the requirements.
- Output and display-To display the output information.

1. **Input Stage:** The user inserts a coin to the coin insertion slot. The sensor is attached to the coin insertion slot and the coin is validated based on the diameter of the coin inserted. Initially the LCD display a message as “Please insert coin”. If the inserted coin is valid, the message is displayed in the LCD and signal is sent to the arduino. If the coin is not valid, it is returned back.When the coin is accepted, the arduino and relay is activated and the battery starts getting charged by the software of relay.
2. **Controller:** The system performs according to the input signal from the circuit. Based on the diameter of the coin, the coin is either accepted or rejected. If the coin is accepted, it sends signal to arduino along with LCD interface. Once the arduino receives the signal from the coin insertion slot, it sends signal to the relay. The relay generates the voltage of 5v, which in turn charges the mobile phone through the mobile USB terminal.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:07/July-2024 Impact Factor- 7.868 www.irjmets.com

3. **Output and Display:** The LCD connected displays the messages as and when required. Initially, when the mobile charger is connected the LCD displays as, "Please insert coin". When the mobile phone is charging, it displays "Charging" and the duration of charging based on the coin inserted.
4. **Power:** This coin based mobile charger draws power from the arduino through relay.The voltage is regulated based on the type of the mobile phone connected for charging. The following list describes the various mobile phones and their charging requirement.

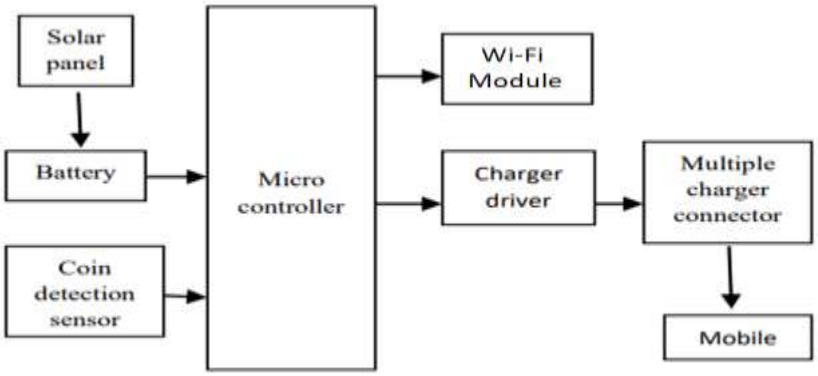

Fig 1: Block Diagram

Flow Chart:

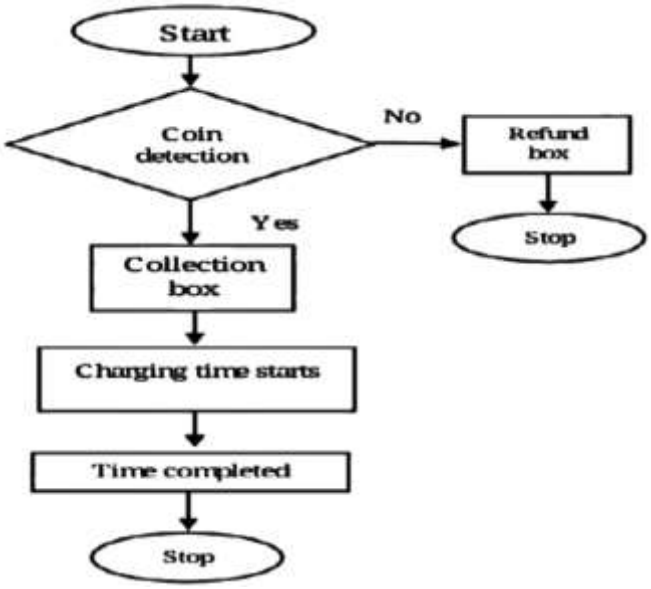

Fig 2: Working Flow chart

Circuit Diagram

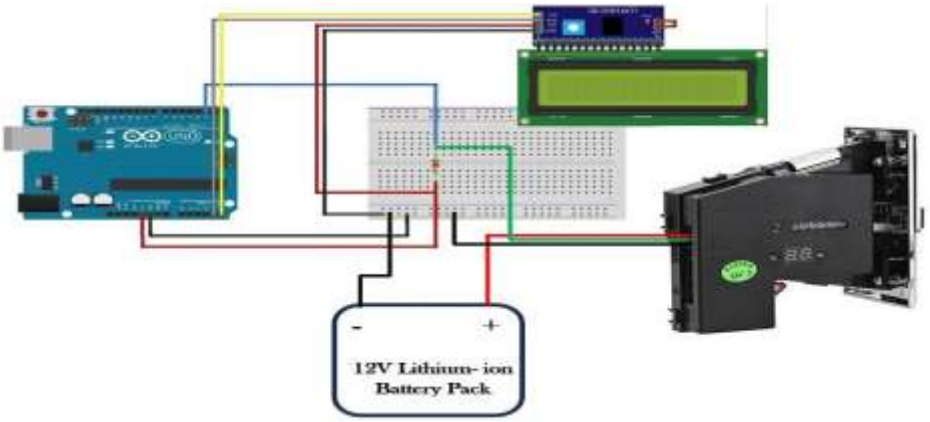

Fig 3: Circuit diagram

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:07/July-2024 Impact Factor- 7.868 www.irjmets.com

IV. RESULTS AND DISCUSSION

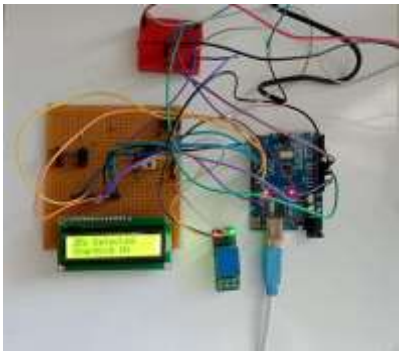

Fig 4: 1rs coin detected

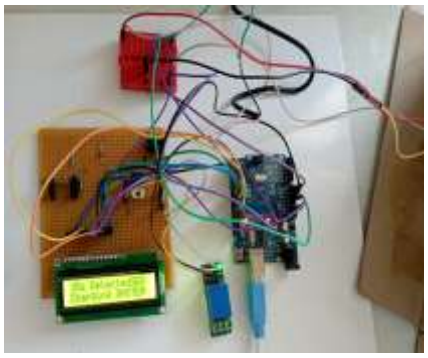

Fig 5: 2rs detected

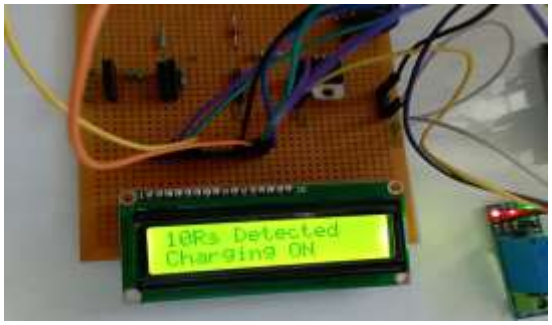

Fig 6: 10rs detected

- In the Fig: A when we are inserted 1rs coin in coin acceptor the LCD is on for 1 minute for the charging.
- In the Fig: B when we are inserted 2rs coin in coin acceptor the LCD is on for the 2 minutes for the charging.
- In the Fig: C when we are inserted 5rs coin in coin acceptor the LCD is on for the 5 minutes for the charging.

Proteus Simulation Result:

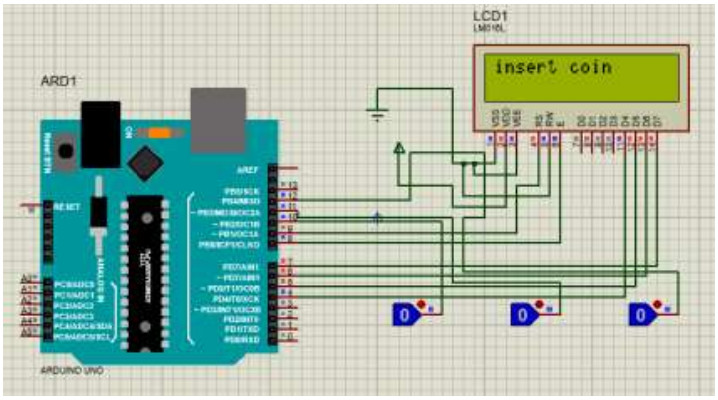

Fig 7:

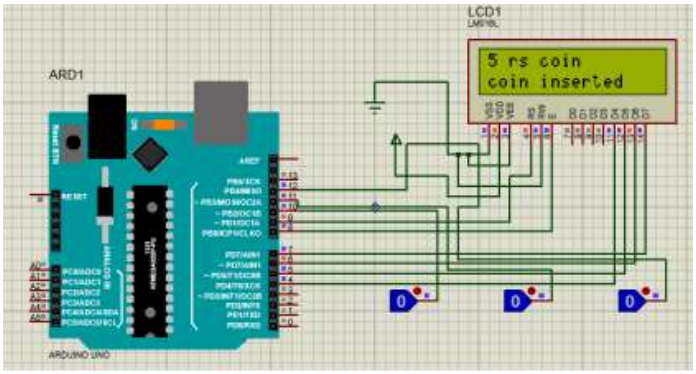

Fig 8:

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:07/July-2024 Impact Factor- 7.868 www.irjmets.com

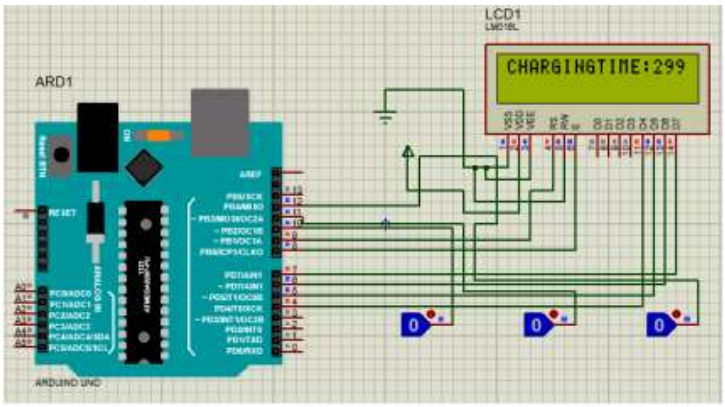

Fig 9: Proteus Simulation result

V. CONCLUSION

Our project describes the new way of providing charging services to the public. It would be of less cost because conventional grid power is used and beneficial to the long-distance travellers. This coin/UPI based mobile charging system can be installed at various public places for the convenience of mobile users.

ACKNOWLEDGEMENTS

We would like to express our heartfelt thanks to all those who were directly or indirectly involved in the making of this project. We would like to thank our principal Prof. Dr. N. G. Narve for extending his encouragement. We feel gratified to record our cordial thanks to our respected H.O.D. and Our Guide Prof. Mr. M. M. Gargade and other staff for their support when required. With profound sense of regards, gratitude I thank Prof. Ms. N. S. Bale for her valuable guidance and incessant interest and constructive suggestions during course of study. We are also thankful to the entire staff in the Computer Science Department for ensuring we got all the resources we need during completion of the project. We also thankful to our parents who providing their wishful support for our project completion successfully.

VI. REFERENCES

[1] T. Mohana Priya, Dr. M. Punithavalli & Dr. R. Rajesh Kanna, Machine Learning Algorithm for Development of Enhanced Support Vector Machine Technique to Predict Stress, Global Journal of Computer Science and Technology: C Software & Data Engineering, Volume 20, Issue 2, No. 2020, pp 12-20

[2] Ganesh Kumar and P.Vasanth Sena, "Novel Artificial Neural Networks and Logistic Approach for Detecting Credit Card Deceit," International Journal of Computer Science and Network Security, Vol. 15, issue 9, Sep. 2015, pp. 222-234

[3] Gyusoo Kim and Seulgi Lee, "2014 Payment Research", Bank of Korea, Vol. 2015, No. 1, Jan. 2015.

[4] Chengwei Liu, Yixiang Chan, Syed Hasnain Alam Kazmi, Hao Fu, "Financial Fraud Detection Model: Based on Random Forest," International Journal of Economics and Finance, Vol. 7, Issue. 7, pp. 178-188, 2015.

[5] Hitesh D. Bambhava, Prof. Jayeshkumar Pitroda, Prof. Jaydev J. Bhavsar (2013), "A Comparative Study on Bamboo Scaffolding And Metal Scaffolding in Construction Industry Using Statistical Methods", International Journal of Engineering Trends and Technology (IJETT) – Volume 4, Issue 6, June 2013, Pg.2330-2337.

[6] P. Ganesh Prabhu, D. Ambika, "Study on Behaviour of Workers in Construction Industry to Improve Production Efficiency", International Journal of Civil, Structural, Environmental and Infrastructure Engineering Research and Development (IJCSEIERD), Vol. 3, Issue 1, Mar 2013, 59-66