INTRODUCTION:

The main aim of the project is to build a coin based mobile charger which provides a unique service to both urban/rural public where grid power is not available for partial/full time and source of revenue for site providers for establishment.

The coin-based mobile battery charger can be quickly and easily installed outside any business premises and solar energy is one of the abundant sources of energy which is freely available in the nature. In this solar panel system is mainly used to harness that energy in order to use it as power supply for charging the mobile. In the event of unpredictable grid power and availability of abundant solar power, A coin based mobile charger is designed and developed. This device is like a vending machine for battery charging at kiosks and the user has to plug the phone into one of the adapters and insert a coin for charging at a constant current for a definite duration. Charging can be increased by inserting more number of coins, the RFID is also used for the people who don’t have a coin and can also requires for long time period of charging.

Solar chargers convert light energy into DC current for a range of voltage that can be used for charging the battery. They are generally portable but can also be mounted. In this design of coin based mobile charger, a fixed solar panel of size 635x550x38mm, 37WP is used to charge the battery up to maximum 2.0 amp in bright sun light.

OBJECTIVES:

- The main purpose of this project is to reactivate a low or dead battery once your phone’s battery has been drained somewhere in public. Coin based mobile charger will be very useful to public due to its technical machinery that recharges the mobile phone and bring it back to life once it died in public places.
- Inserting the coin using charger for your mobile phone in public places.
- Source for charging is grid supply and solar power supply.
- Different type of mobiles can be charged.
- To implement the simple and hand efficient mobile charger which helps the user, to charge their phone during urgent needs.
- To reduce the wastage of Electrical power which often arises due to negligence of the user.
- To provide a unique service where grid power is not available, so we can use coin based mobile charger using radio frequency identification (RFID) or solar energy.
To provide power supply regularly, we use Solar Panel, DC Power Supply and Battery. Solar Panel provide DC power supply which is given to charge the rechargeable battery of 12V and power supply which is obtained from the Grid provides 12V DC to the system. Means here we use two standby power supplies. Now, this voltage is given to a voltage regulator to obtain a pure constant DC voltage. Implemented method of coin and RFID based mobile charger using solar panel and RFID is as shown in figure.

The mobile battery charger starts charging a mobile connected to it, when a coin is inserted at the coin insertion slot at the input stage. The type of coin and the size will be displayed at the LCD display for the user, so as to ensure correct coin insertion. Any other coin, if inserted in the slot will be returned to refund box. A mechanical slot is attached with electrical triggering in coin insertion slot, if the correct coin is inserted it sends a pulse to the control unit authorizing the start of charging the mobile battery connected to the device. Then the coin insertion slot accepts the coin into the battery charging unit and start charging the mobile battery for a specific period controlled by the software of the microcontroller. The RFID is also used for the people who not have a coin and can also requires for long time period of charging. RFID verification acquires it transmit and receives the signal. Both the coin and RFID signals are sent to the micro controller.

When the microcontroller receives the input signal the locking mechanism activates and the servomotor rotates and opens the window of the charging system to place the mobile for charging and after several seconds the motor rotates and closes the window for security purpose.

The LCD displays all the information to the customer as and when required. When the mobile battery is connected, it displays “Insert Coin”. While charging it displays “Charging” and at the end of charging cycle it displays “Charge completed”. For charging continuously the coin has to be inserted when the display shows “Charge Completed”.

The power supply from the relay is given to the mobile charger by pin. By connecting the mobile phone to the mobile charger pin the number of coin insertion (or) RFID card read according to these amount the completion of charge is taken placed.

After completion of charging the servomotor rotates to unplug the mobile from charger by the user and again the motor rotates and the window gets closed.

**Results and Discussion:**

In this project a novel method of charging mobile batteries of different manufacturer using solar panel has been designed for rural and remote areas where the power supply is not at all available all the time. This project is very useful in today's life. Because nowadays the necessity of communication is very important, so every person having cell phone but every time we cannot carry charger with us. When we are going for long travel we may forget to carry cell phone charger. This project is used to help the people by coin-based charger.

The supply to the System is given either from grid or by solar energy in case of non-availability of grid power. Coin is inserted in the coin module, where the coin detection takes place. If the coin inserted is valid then relay gets open to start charging the mobile phone and if the coin is not valid coin comes out of the module. When coin is valid, Microcontroller Sends Command to Close Relay and Relay Gives Supply to Charge the Mobile. After completion of charging time user can now take out his mobile phone. All this process is carried out by the programmed micro controller.


The supply to the system is given either from grid or by solar energy in case of non-availability of grid power. When user swipe RFID card in the RFID reader, the communication between RFID tag and RFID reader takes place and sends resultant signal to Microcontroller and relay gets close to start charging the mobile phone. User has to plug the phone to one of the pins. If RFID card is invalid than RFID reader will not read the tag. After completion of charging time user can take out his mobile phone. All this process is carried out by the programmed micro controller.

Scope For Future Work:

As this is an open source project the market potential for it makes no sense. On the flip side the popularity of this project is expected to be huge. To make sure we have plenty of energy in the future, it’s up to all of us to use energy wisely. We must all conserve energy and use it efficiently. It’s also up to those who will create the new energy technologies of the future.

This idea can be used for many purposes instead for charging the mobile. It is used for buying foods in the restaurant, snacks in the stores, by inserting the required amount of money to that particular product. By this idea, queue can be reduced at the tickets buying places in the trains, and buses in the fast-moving society. This project can also install in hilly areas, where wind power can be implemented to charge and store power in the battery.

The project can be used in the following areas
1. Railway station: this type of project is used in railway station for public when they are in need.
2. Shops: it can be installed in many shops and earn easy money.
3. Rural areas: this project can be installed in rural areas where the power grid is not available at partial/fulltime.
4. Home appliances: like mobile phone this system can also be used for television in future.
5. Public place: this project is very useful when mobile phone battery dies in public places.

Charging slot can be increased for more no of user.
Laptop and camera can be charged using this system.
Also used theft proof coin based and RFID based charging system.