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Battery Share: A New Revolution of Sharing Your Smartphone Battery Power

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Abstract: ***The majority of individuals in the globe nowadays struggle with their mobile phone's batteries dying while they are out and about. The concept to create a system that allows consumers to transfer battery life from one phone to another was born to address this problem.***
In a cell phone battery, an electric charge is chemically stored. Batteries for mobile phones have a static charge that is stored. This concept is centred on the usage of a technology, which transforms static electric charge into data packets and transmits them from source to destination (i.e., from one mobile to another mobile) via a wireless network (much like sharing using file sharing applications utilising Wi-Fi) using a technology called Wi-Fi Direct. To connect with another device, it makes use of the Wi-Fi card in the smartphone. It establishes a secure link between the two devices so that data may be sent at fast rates without interruption and is converted back to static energy to extend battery life.
This is not the one same as the existing wireless charging technology in which phone has to be kept on a charging pad and it starts charging. Instead, here in this proposed technology the electric charge will be converted in form of data packets and transfer them over a wireless communication channel like, Wi-Fi.
Keywords: electric charge, Wi-Fi Direct, wireless network, data packets, transfer battery life

I. INTRODUCTION

The phone batteries, which are a crucial component of mobile phones, must be charged after being discharged. In a cell phone battery, an electric charge is chemically stored. The charge that is kept in the batteries of mobile phones is static. This paper focuses on the technology that transport static electric charge from source to destination (i.e., from one mobile to another mobile) through a network using Wi-Fi Direct. The main topic of this paper is how mobile phones transfer batteries between one device and another.
Any device needs a battery to function. Once it drains, it has to be recharged. Mobile phone battery drain is a challenge that we now face. In this study, Wi-Fi Direct is used to transmit battery power across mobile phones. A power source is stored as an electric charge in a mobile phone battery, causing the battery to charge and discharge. Recently, wireless charging became available. It also goes under the name of inductive charging. In wireless charging, signals are sent across short distances from one device to another with the use of a transmitter. But at a great distance, it is not feasible. Instead of transmission signals, the method described in this paper sends a data packet.

II. LITERATURE SURVEY

The technique that permits a power source to communicate electromagnetic energy to an electrical load over an air gap without linking cables is known as wireless power transfer and is used for wireless charging. Due to its simplicity and improved user experience, this technology is attracting a wide range of applications, from low power toothbrushes to high power electric automobiles.
A practical, safe, and dependable means of powering and charging the billions of electrical gadgets worldwide is wireless charging. Wireless charging, which does away with physical connections and cables, has a number of advantages over the conventional charging cord in terms of effectiveness, affordability, and safety [4].
A well-liked technique that permits device to device communication in Wireless LAN is Wi-Fi Direct, commonly known as Wi-Fi P2P. Wi-Fi Direct-capable devices can use this feature to dynamically negotiate and choose one of the mobile devices to serve as the group owner. In Wi-Fi infrastructure mode, the Group Owner takes on the function of an Access Point. The Wi-Fi Direct protocol was first made available to instantly link Wi-Fi-enabled devices. However, because of the improved capabilities, the protocol can potentially be used for a number of purposes, including file sharing, resource sharing, online gaming, alert distribution, social networking, etc [1].

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The Wi-Fi Alliance has developed a new technology called Wi-Fi Direct that will improve direct device-to-device communication via Wi-Fi. As a result, this technology is anticipated to have a big influence given the large number of devices having Wi-Fi capabilities and the ability to be fully implemented in software instead of using conventional Wi-Fi radios. We give a full overview of the unique features described in Wi-Fi Direct in this paper and present an experimental evaluation that shows the performance to be anticipated in practical situations [2].

Analog-to-Digital Converters (ADCs) are essential parts of biomedical, communications, and signal processing systems. They are used to convert real-world signals to digital signals for processing and have low power requirements and high conversion efficiencies. This study explores a variety of cutting-edge ADCs, including experimental converters, while keeping in mind the needs of the applications. These ADCs have also been compared, giving an understanding of their flaws while accounting for other performance criteria including power consumption, resolution, and sampling rate [3].

In comparison to dedicated wireless charging solutions, combining NFC and wireless charging into a single implementation will result in portable device charging interfaces that are more cost-effective and compact, a more widespread infrastructure for charging devices in the future, and the ability to incorporate NFC-based services into charging applications [6].

A. Summary of Literature Survey

On your android device, Wi-Fi Direct may transfer data 10 times more quickly than conventional Bluetooth. Because of this, Wi-Fi Direct is the better option for commercial applications that demand device-to-device data transfer.

Analog signals may be converted into digital signals, which are then utilised to create data packets, using an analog-to-digital converter. As opposed to, for the purpose of converting incoming data packets back into analogue signals from which electric charge may be generated, digital-to-analog converters can be utilised.

Transducers are devices that change one form of energy into another, or, to put it another way, they change a signal from one type of energy to another.

III. WORKING

The next step in the development of this technology is to bundle the discrete signals' numbers into a data packet and send it, much like data-sharing apps like Xender, Google Share, Shareit, etc.

This process has two sides:

A. Transmission Side

Newton's law of electricity states that energy cannot be generated or destroyed. Simply said, it is transformed from one form to another. Power is portable thanks to batteries. Energy will be stored in the form of chemical energy in our mobile batteries, which will have an electric charge to charge or discharge the batteries. Electrical energy is created from this chemical energy.

Chemical energy is converted to electrical energy by batteries. The positive electrode (cathode), the negative electrode (anode), and the electrolyte, which separates these two terminals, are the three fundamental parts of practically all batteries. When a device is connected to a battery, where the positive and negative electrodes are connected so that electrons (electricity) can flow between them, chemical reactions take place at the electrodes. The electrolyte is a chemical medium that allows the flow of electrical charge between the cathode and anode.

These processes cause the anode to release additional electrons, which go to the cathode. A flow of electrical energy to the device is produced by chemical reactions that take place between the electrolyte and the cathode and the electrolyte and the anode. The three components are made of various materials depending on the kind of battery.

We now possess electrical energy in the form of electrical charge. With the use of a tool called a "Transducer," analogue electrical signals are produced from electrical energy. An apparatus that changes one kind of energy into another is called a transducer. Typically, a transducer transforms electrical impulses into and out of other physical quantities by converting them from one kind of energy to another.

We now have analogue signals produced by transducers, and an ADC converter transforms an analogue signal into a digital signal with a digital format. A device known as an analog-to-digital converter transforms a continuous physical quantity, often voltage, into a digital number (0s and 1s), which reflects the amplitude of the amount. Sampling and quantization are the two operations that make up an ADC. A discrete voltage signal is created via sampling (sequence of real numbers). For storage and processing by numerical techniques, the process of quantization entails converting a limited collection of discrete values into a real number with an approximation.

A signal that has a digital form is one that displays a series of discrete numbers. an arbitrary bit stream is described by a digital signal with just two potential values. A physical quantity known as a digital signal, alternates between a distinct group of waveforms. A digital signal may also be thought of as a series of codes that this physical amount represents. We create discrete values of 0 and 1 for electrical charge with the aid of the ADC. Anything other than this is thrown away.

These distinct values have now been combined into a data packet that will be sent through Wi-Fi Direct to another mobile device. Comparable to how a smartphone sends and receives data, a data packet is made up of integers that represent distinct signals.

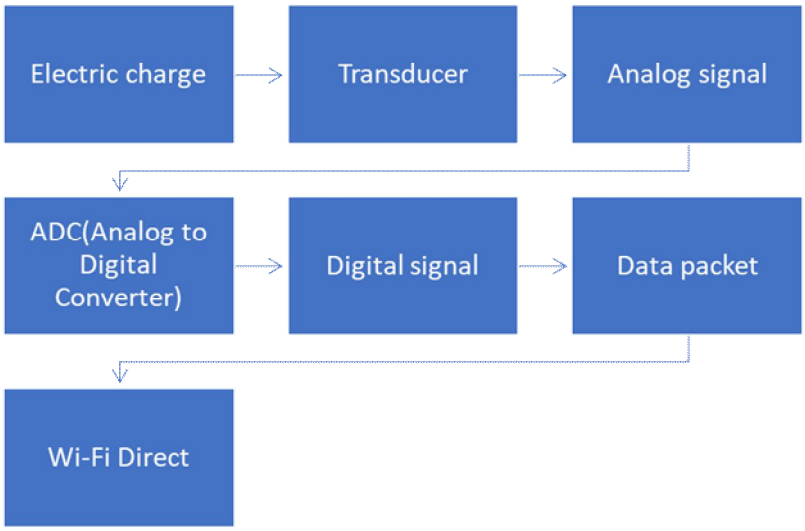


Fig. 1 Transmission Side

B. Receiving Side

A receiver will gather data packets containing discrete values; these packets are subsequently translated by DAC converters into analogue signals, from which we obtain an analogue signal.

A function known as a digital-to-analog converter transforms digital data, which is often binary, into an analogue signal, such as current, voltage, or electric charge. Digital data, in contrast to analogue signals, may be transported, altered, and stored without suffering any loss of quality. Using a transducer device, these signals are now turned into electrical energy.

Finally, electrical energy has been transformed into chemical energy, and charge, which is made up of discrete values, has also been transformed into chemical energy and is kept in a different mobile phone's battery.

A discharge occurs when the anode undergoes an oxidation process, releasing electrons to the negative terminal and ions into the electrolyte. The cathode further absorbs electrons at the positive terminal. The electrolyte brings the various chemicals of the anode and cathode into touch with one another, allowing the chemical potential to balance as stored chemical energy is converted into usable electrical energy. The ions transfer current through the electrolyte as the electrons travel in the external circuit and produce an electric current in tandem with these two processes. and charge your phone's battery.

Therefore, one mobile phone uses the network to deliver a specific quantity of battery (electric charge) in the form of data packets to another mobile phone.

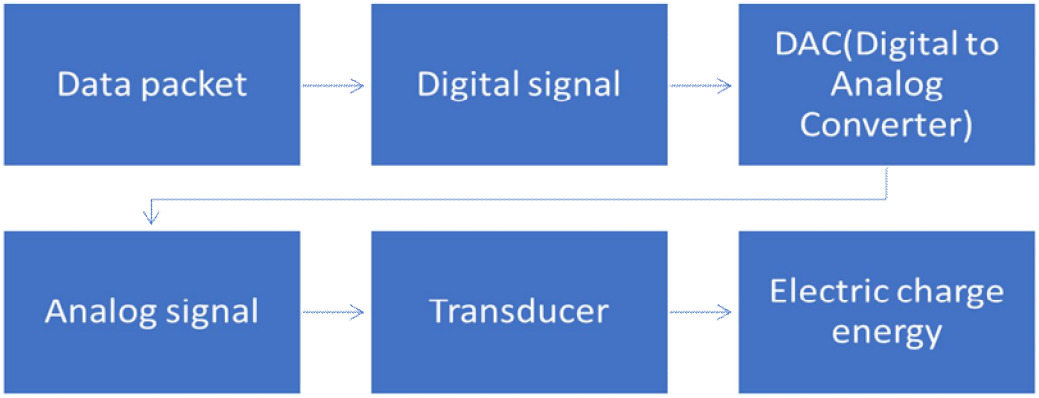


Fig. 2 Receiving Side

IV. CONCLUSIONS

From the above discussed idea, it can be concluded that:

1) Using this technology people would be able to transfer the mobile battery power in form of the data packets
2) Transfer of these data packets will take place via wireless medium through Wi-fi Direct which comes integrated in now a days smartphones
3) The process would be same as we share the files or images via file sharing apps like: Xender, Shareit, etc.

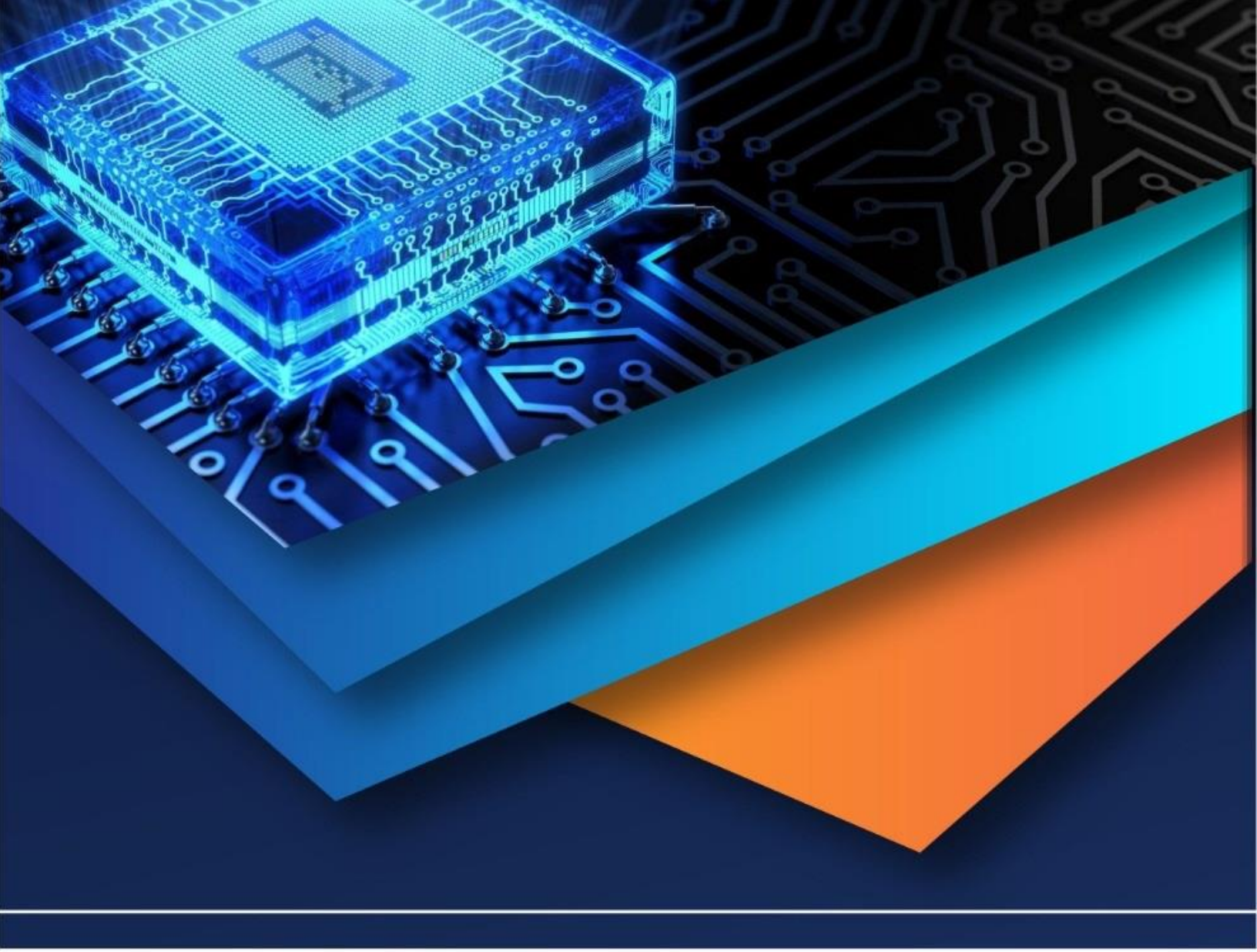
V. ACKNOWLEDGMENT

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