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# Computer independent USB to USB transfer

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***Abstract:*** *Portable data storage devices that use the universal serial bus(USB) for data transfer are widely used. Therefore, it is necessary to design a device which will provide quick method to transfer data from one storage device to another without the need of computer. This device stays clear of viruses and malware which can harm the computer. It is a user friendly and compact and optimum data transfer speed.*
***Keywords -****pendrive, USB, RaspberryPi, portable*

## I. INTRODUCTION

Transferring data from one pen drive to another is a common process in recent times. We use the computer as an intermediate master device if we want to copy or move data from one mass storage device to another. When copying data is your only requirement, it is overkill to use a fully-fledged computer to do something so ordinary as to transfer data. The computer is not portable and even though notebook computer systems are portable they are time consuming. This is because the computer systems use an operating system (OS) which requires a certain boot loading time. The OS is prone to many viruses like Trojan, malware, rootkits and many more types. Moreover, if a person wants to send data instantly within seconds it is not achieved with the current computer and notebook systems.Although the OTG pen drives have gained some popularity but still 90% of people have the standard pen-drives. Thus in the current scenario, a person is unable to transfer data while traveling, while in a remote location or whenever inaccessible to a master device.

## II. SYSTEM ARCHITECTURE

### 2.1 Hardware

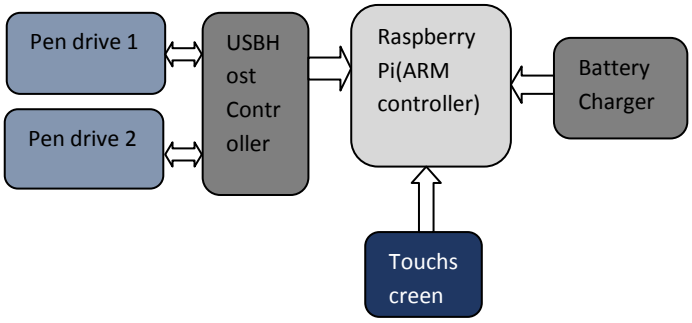


***Fig. 1***

#### 2.1.1 Raspberry Pi(ARM Controller):

The hardware description of the project is as follows: The Raspberry Pi is a small computer about the size of a credit card. It was developed in the UK by the Raspberry Pi Foundation with the hope of inspiring a generation of learners to be creative and to discover how computers are programmed and how they function. The device uses the ARM processor which does most of the hard work to run the Raspberry Pi. The reason for this is that ARM processors are extremely efficient and fast when used in small devices. This makes the ARM processor the obvious choice for the Raspberry Pi. Even though the Raspberry Pi is a computer it does not have a hard drive like traditional computers, instead it relies on the SD card for the starting up and storing of information. For the Raspberry Pi the SD card does the same job as a hard drive does in a traditional computer. The SD card must contain the operating system, programs and the data needed to run the Raspberry Pi. The operating system tells the Raspberry Pi how to function, how to handle any input from the user and how to manage programs when they are running.

**2.1.1.1** Micro USB power port: -The micro USB power port is used to power the Raspberry Pi device.

**2.1.1.2** HDMI Port: -The HDMI output is used to plug into a modern television or monitor.

**2.1.1.3** Ethernet port: -The Ethernet port is used to connect the raspberry Pi to the internet or a local network.

**2.1.1.4** USB port: -USB 2.0 ports are used to plug in a keyboard, mouse, external hubs etc.

**2.1.1.5** Audio output: -The audio output can be used to plug into an external amplifier or an audio docking station.

**2.1.1.6** GPIO headers: -The GPIO headers are used to connect the Raspberry Pi to other hardware device. For example, they can be used to connect to LED'S, motors and other electronics components**.**

**2.1.1.7** RCA video output: -The video output is used to connect to an older type television.

**2.1.1.8** ARM processor: -The ARM processor can be thought of as the brains of the Raspberry pi.

**2.1.1.9** USB port:Ease of use was a major design goal for USB, and the result is an interface that's a pleasure to use for many reasons.USB is versatile enough for just about any standard PC peripheral function. Instead peripheral function, one interface serves many of having a different connector and cable type for each

**2.1.1.10** Automatic configuration: -When a user connects a USB device to a PC, the operating system detects the device and loads the appropriate software driver. The first time the device connects, the operating system may prompt the user to insert a disc with driver software, but other than that, installation is automatic. Users don't need to reboot before using the device.

**2.1.1.11** Easy to connect: -A typical PC has multiple USB ports, and hubs make it easy to add ports.

**2.1.1.12** Wireless options: -USB originated as a wired interface, but technologies are now available for wireless communications with USB devices.

### 2.1.2 Touch Screen Display

The touch screen used is 10″ tablet with high quality IPS screen, a great 1280×800 resolution, capacitive multi-point touch screen and uses Raspberry as a heart. The contents of the mass storage device are displayed on the touch screen. This helps the user to view and select the files or folders of interest from the USB device. Also, the options like select, copy for data transfer are put on to the touch screen. It displays the start and finish of the data transfer.

### 2.1.3 USB host Controller

Universal Serial Bus (USB) is a master- slave device which is made up of many slaves and a single master. The slaves are called the peripherals and the master is the host. Only the host has the ability to begin data transfer. The slaves cannot initiate data transfer. They only respond to the master's instructions. The bidirectional communication between the USB is dependent on logical channels – called as 'pipes'. It connects the host controller to the device endpoint. The endpoint is a logical entity which resides onto the device. The connections established has the pipe like structure which we used in connection-oriented data transfer. A USB device can have 32 connections- two of which are reserved for giving Ack. So, a total of 30 are present for normal use for the data transfer in bidirectional manner. The data transfer is having four types:

**2.1.3.1** Interrupt transfers: For the devices needing quick but guaranteed response. For the files up to 20 KB this type of data transfer will take place. (e.g. small text file)

**2.1.3.2** Isochronous transfers: For some fixed data rate but data loss may take place. For the files between 20 KB and 1024 KB this type of data transfer will take place

**2.1.3.3** Control transfers: used for simple status check.

**2.1.3.4** Bulk transfers:uses available bandwidth with no fixed data rate. For the files more than 1024 KB this type of data transfer will take place (e.g. file transfer).

## 2.2 Software

### 2.2.1 Linux

Linux was originally developed as a free operating system for Intel x86-based personal computers. It has been ported to more computer hardware platforms than any other operating system. It is always a leading operating system on servers and other big systems such as mainframe computers and supercomputers. Linux supports a vast variety of hardware devices, more than any other OS. Linux supports a huge variety of applications and networking protocols. Linux is scalable, from small consumer-oriented devices to large, heavy-iron, carrier-class switches and routers. Linux can be deployed without the royalties required by traditional

proprietary embedded operating systems. Linux has attracted a huge number of active developers, enabling rapid support of new hardware architectures, platforms, and devices.

### 2.2.2 Raspbian Operating System

Raspbian is an operating system based on Debian optimized for the Raspberry Pi hardware. An operating system is set of programs that make your Raspberry Pi run. Raspbian provides more than a pure OS: it comes with over 35,000 packages; pre-compiled software bundled in a format for easy installation on your Raspberry Pi. The initial build of over 35,000 Raspbian packages, optimized for best performance on the Raspberry Pi, was completed in June of 2012.However, Raspbian is still under development with an emphasis on improving the stability and performance of as many Debian packages as possible. The Raspberry Pi primarily uses Linux kernel-based operating systems Raspbian (recommended) –Maintained independently of the Foundation; based on ARM hard-float (armhf)-Debian 7 'jessie' architecture port.

## III. FLOWCHARTS

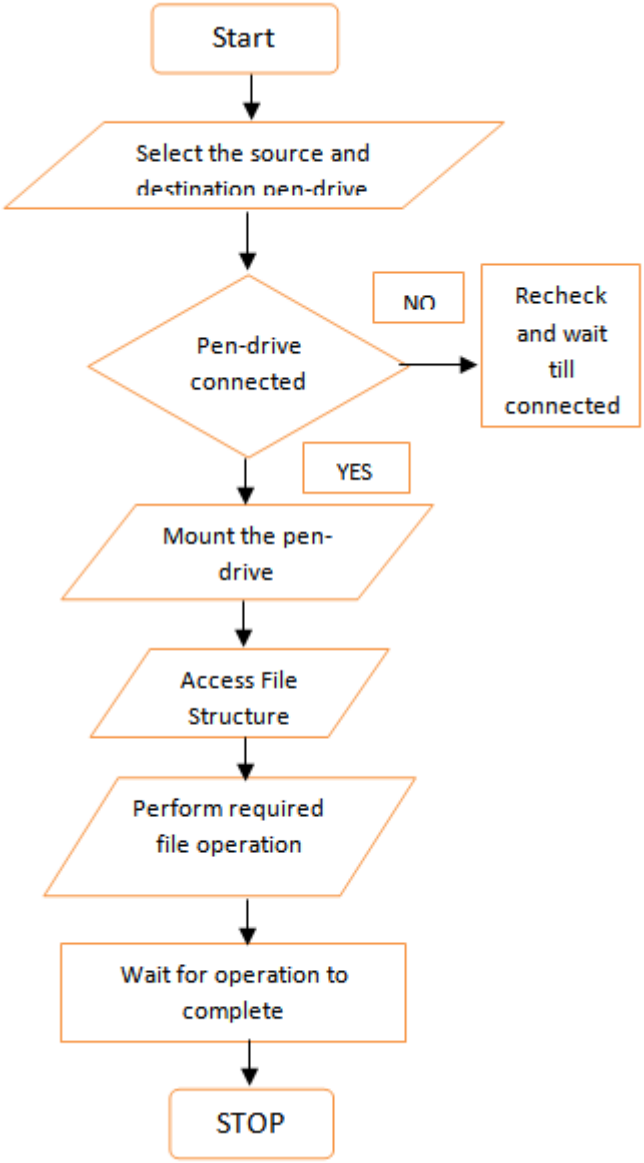


***Fig. 2***

## IV. ADVANTAGES

### 4.1 Battery Operated

As the whole system is very low power consuming so the system can be made to operate on the battery.

### 4.2 Portable

The proposed system can be made portable by means of making it a standalone platform. The processor along with the peripherals makes it to work independent of PC. One can carry out the data transfer anywhere and anytime.

### 4.3 Power optimization

As both the processor and the USB2.0 specifications are designed to keep the lowest possible power consumption, the power optimization is done by using it only when it is necessary.

## V. CONCLUSION

The problem for transferring the data if u doesn't have laptopor computer quite extensive. It is affordable to purchase a USB data drive than purchasing a laptop or PC. Therefore, we came up with a portable and handheld battery operated affordable device which can transfer the data between two USB data drives without the help of PC or laptop. The main advantage of this device is that it is battery operated so there is no need of power supply connection and data transfer can be done at any place.

## VI. FUTURE SCOPE

The following are the further developments that can be done based on the project.

**6.1`** USB to printer interface.
**6.2** Wireless connectivity using Bluetooth
**6.3** It can be embedded into various devices like TV, DVD player, etc.

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