

# Handheld Device for Data Transfer between Two USB Supported Devices

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**Abstract** - In the propelled world the usage of the Universal Serial Bus (USB) stockpiling gadget is greatly colossal. Regardless, USB gadget needs a host controller (eg. PC) to begin and intervene interchanges among USB stockpiling gadgets. It isn't generally conceivable to convey such an expansive size gadget to the specific area for simply the purpose of data transfer. So the gadget is designed which is compact and easy to hold anywhere. In this project, we can exchange the information as well as observe the exchange of the specific document which we need to send by utilizing touch screen show. The Raspbian system give a message whenever the USB device is inserted in any hub of the kit. Using 3.5" inch TFT LCD touch screen with display which provide copy, copy all, move, move all, delete, and quit option, user can perform any of this operation depending on his requirement. This may put off the requirement of computer and also saves electricity. The project aim is to develop an intelligent data transfer system which doesn't require any support from laptop. This gadget may be very value effective.

**Keywords** - USB devices such as Pen drives, Digital cameras, Mobiles; ARM11; Python; handy; power saving; fast data transfer.

## I. INTRODUCTION

Presently a days in the speediest advanced world USB gadgets have turned into the prominent decision for all as a compact gadget to convey the computerized information. USB devices boost the capacity and the speed of information exchange from one place to the next. But the drawback of these devices is being a portable device, however to copy or paste information from one USB device to other is not possible without the host, for example, PC[1].

Normally we preferred computer/Laptop as an intermediate device to copy or move data from one USB support device to a different one. This indicates this device can also transfer information between digital cameras, phone memories and other comparable devices. Consider a Pen drive in which there is a huge amount of information that user want to transfer in another Pen drive. This can be done without any hesitation stored and the need to copy this data into another using this gadget.

The Proposed System is going to be executed on a pure Raspbian Jessie operating system. System will be developed using an Open Source front end GUI software i.e tkinter, through which we can run the program as an application and will identify the Pen drives connected and allow the user to

select individual file or complete transfer of the data from one device to the other.

More-over, exchanging information by means of a PC includes a considerable measure of power to be wasted. The little size and simplicity of transportability makes it an option for the information exchange.

The Touch Screen displays the list of data files from the storage device and does the choice of the operations to be performed. Hence, the client will be able to exchange information among various capacity gadgets at wherever. To give the Graphical User Interface, the framework require a 3.5"inch TFT(Thin Film Transistor) LCD screen. Every one of the substance and the activities of USB stockpiling gadgets are appeared on this screen.

## II. REVIEW OF LITERATURE

All the considerable number of techniques results the fundamental precept that involves the utilization of any third medium called USB controller among those USB devices[1].

The possibility of this undertaking was taken, by watching the issues of trading computerized information looked in day by day life. Also, trading data by methods for a PC includes a great deal of energy is squandered. There are various kinds of information documents, for instance, video records, PDF document, picture, content record, sound document, introduction record and so on., that are being

helped out through these gadgets. Anyway to work these gadgets, a working framework is required which requires the hosts to be to a great degree entangled framework, in this manner getting to the gadgets requires muddled equipment, henceforth a controller that can manage the information exchange and begin the USB information transmission was sought. The thought incorporates a glimmer drive of 1GB ready to transmitting and getting information remotely amongst itself and other gadgets[2].

To maintain a strategic distance from the utilization of PC/workstation for information exchange, different frameworks have been produced like proposed framework. The framework proposed in [1] by Sukhada M. Deshmukh and R. C. Mahajans one such framework where USB have con-troller (VNC1L) alongside microcontroller ARMLPC 2138 is utilized.

Tiwari and Motghare[2] have proposed the strategy and framework for exchanging information from one USB gadget to various USB gadget. This undertaking contains VDIP2 module alongside the VNC1L [2] chip consolidated subsequently to exchange data between two USB gadgets. VNC1L chip keeps running on various programming focused firmware, out of which VDFC firmware is utilized to interface two USB gadgets to VDIP2 module, hence VDFC firmware go about as a USB have controller. USART correspondence of ATmega16 microcontroller (show) to control/charge VDIP2 module has been used. Here, screen goes about as an ace and VNC1L as a slave. The orders are sent to the module by methods for the ace by means of correspondence channel. The method of correspondence can be investigated UART, SPI or FIFO. UART is utilized here as a method of correspondence amongst screen and the VDIP2 module. In any case, there is an issue of the gadget limitation is that it must be utilized for the pen drives of 2 GB capacity[2].

Gawali and Kale [3] proposed a technique which empowers information sharing amongst mobiles and pen drives specifically without utilizing of PC or workstation. The undertaking contains a microcontroller ARM 7, USB controller gadget VNCIL [3] to interface two pen drives up to 2 GB as it were. VNCIL IC frames a scaffold between two blaze memory gadgets and ARM7 microcontroller. Here, a client needs to embed the principal pen drive in the ace USB terminal. At that point the ARM controller peruses the information from pen drive utilizing SPI convention and show substance list on 20\*4 LCD. At that point, a client needs to put another pen drive in slave USB terminal. By then, the ARM controller get to the information of this pen drive also and shows the substance on 20\*4 LCD. From the menu screen the customer can choose/duplicate/cut/glue the diverse sorts of records from the ace pen drive to the slave pen drive utilizing grid console. The feasible arrangements of the this talked about undertaking is to utilize contact screen instead of lattice keypad and LCD.

### III. SYSTEM ARCHITECTURE

A system diagram is a visual model of a system, its components, and their interactions. With supporting documentation, it can capture all the essential information of a system's design.

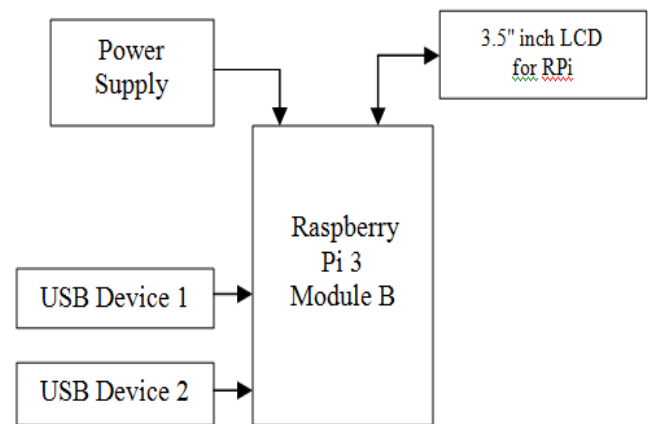


Fig: 1. System diagram

### IV. HARDWARE REQUIREMENTS

- 1) **USB Pen Drive:** USB work as a Master/Slave bus. USB have is the Master and the gadgets are the slaves. USB drives are an outer gadget which stores advanced data and causes us to exchange it starting with one PC then onto the next, they are likewise called pen drives. A USB pen drives is an information stockpiling gadget that incorporates EEPROM (Flash) memory with a Universal Serial Bus (USB) interface. USB pen drives are normally removable and rewritable, and physically substantially littler than a computerized circle. Attachment is detected and USB device is configured automatically
- 2) **ARM 11 Processor:** The ARM11 is only a Reduced Instruction Set Computer (RISC) and it consolidates the accompanying run of the mill RISC Architecture highlights, for example, it comprises of a substantial uniform enlist document. It comprises of a heap/store engineering, in which the information handling activities just work on enroll substance, yet not straightforwardly on memory substance. It comprises of uniform and settled length direction fields, to streamline guideline disentangle. It has control over both the Arithmetic Logic Unit (ALU) and sensible shifter in most information handling directions to augment the utilization of an ALU and a shifter. It is worked with auto-augmentation and auto-decrement tending to modes to upgrade program circles. It is worked with Load and Store Multiple guidelines to boost information throughput. It has restrictive execution of directions to help the execution speed. Every one of These highlights of ARM11 processors give a superior, minimum code measure, less power utilization, and little size.

- 3) Raspberry Pi Board: The Raspberry Pi is a small computer whose size can be compared with the size of a credit. It can be programmed as how it will function.

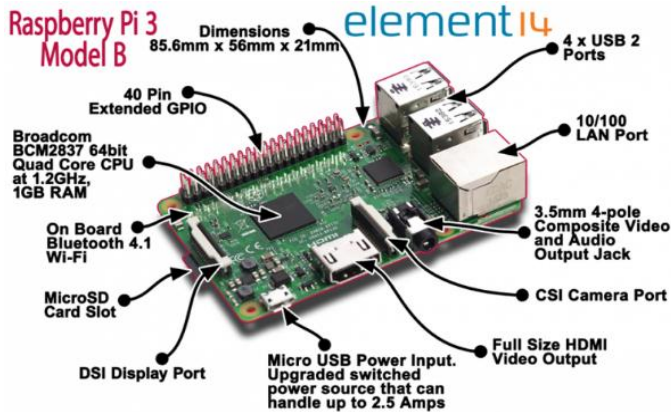


Fig.2. Raspberry Pi Board

This little PC is having highlights like astounding HD (top notch) quality sound and video playback, sports can play 3D amusements This gadget utilizes the ARM processor which does the vast majority of the diligent work in the Raspberry Pi. Hence ARM processors can be thought of as the cerebrum of the Raspberry pi. Therefore ARM processors can be thought of as the brain of the Raspberry pi[6][7]. It has four USB hub, camera port, and 40 GPIO pin which fulfilled all the requirement of this project. The 3.5" inch TFT LCD screen is mounted on 24 GPIO pin. This little PC is having highlights like stunning HD (top quality) quality sound and video playback, sports can play 3D diversions.

- 4) SD Card: A SD (Secure Digital) card is a storage device that incorporates many useful features which depends on how and where it is used. We can add the SD card to small devices such as mobile phones to extend the storage capacity for multimedia applications and other data. SD card has the function of booting the Raspberry Pi and store the operating system, drivers require to run the LCD, programming code and the libraries necessarily installed for call in program . It can creates an own preloaded card using any suitable SD card. The SD Card was always quite a large storage medium in case of model B. But the new B+ model uses an improved storage device that provides for both a more compact storage medium and a positive experience in inserting and removing the card.
- 5) 3.5 inch Touch screen:
  - a) It performs the detection in real-time.
  - b) It has TFT(Thin Film Transistor) type Display which is use for GUI(Graphical User Interface)
  - c) Touch screen display provide copy, move, copy all, move all, delete option.
  - d) The Raspberry pi display has an integrated 10 point touch screen
  - e) Serial SPI Interface

- f) It has LED backlight
- g) Screen Resolution is of 320x540 (Pixel)
- h) Low power consumption TBD
- i) Low backlight current TBD
- j) Work as a PC monitor, support win7, win8, win10 system 5 point touch (XP and older version system: single-point touch), ,free drive



Fig.2.TFT LCD Touch Screen Module

- 6) Regulated Power Supply: The Raspberry Pi 3 is controlled by a +5.1V small scale USB supply. Precisely how much present (mA) the Raspberry Pi requires is subject to what different gadgets you interface with it. Regularly, the model B utilizes between 700-1000 mA relying upon what peripherals are associated. The most extreme power the Raspberry Pi can utilized is 1 Amp. Power bank can likewise be use to control up and boot the composed framework.

## V. SOFTWARE REQUIREMENTS

A software requirements specification is a broad description of the intended purpose and environment for the proposed work under development. The software requirements specification entirely describes proposed work and also provide what is expected. The goal of the software requirement specification is to completely understand the user requirement and determine performance of system and whether it will provide the organization demands[8][9].

- Language Used: Python
- GUI Development Tool: Python 3.6
- Libraries Used: Tkinter
- Operating System Used: Raspbian Jessie

## VI. DETAILED WORKING

How the proposed system work step by step is shown in Fig.3. User will select the file which is to be transfer in another USB device. After selection of the file the ARM11 processor displays the menus copy, copy all, move, move all, delete, quit options on the touch screen LCD[10].

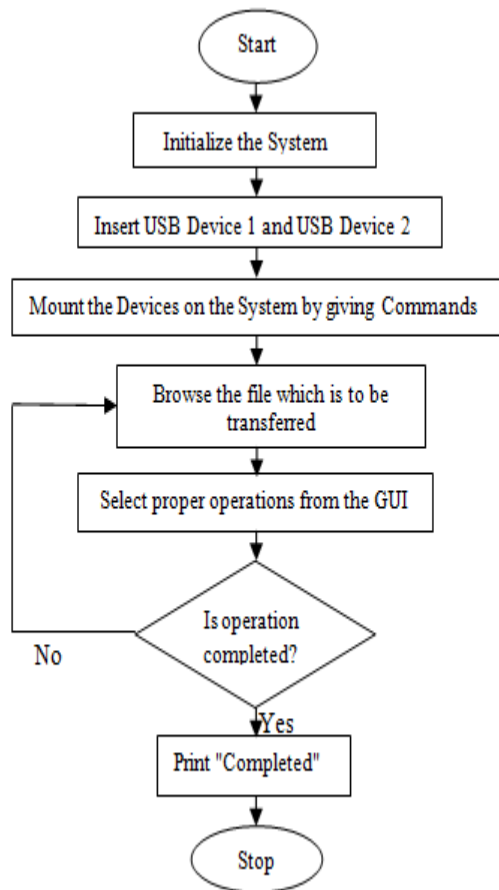


Fig. 3. Flowchart showing the workflow

### VII. ADVANTAGES

- [1] Portable: The whole system can also power up using power bank and handy, therefore can be carried anywhere, anytime.
- [2] Power optimization: The Raspberry pi and touch screen are intended to devour low power. Hence, extra power doesn't require.
- [3] Security: As the working framework utilized as a part of the proposed framework is Raspbian Jessie based, so there is finished affirmation of secure information exchange[11].
- [4] Easy to use: There are a great deal of alternatives gave on the screen to the client for exchanging information between particular stockpiling gadgets for e.g. from USB streak drives to cell phones.

### VIII. APPLICATIONS

The project made is applicable to transfer the data between

- 1) Two Flash drives.
- 2) Two digital cameras.
- 3) Two Mobile devices.
- 4) Pen drive and digital Camera.
- 5) USB flash drive and mobile.
- 6) Mobile and digital camera.

### IX. RESULT

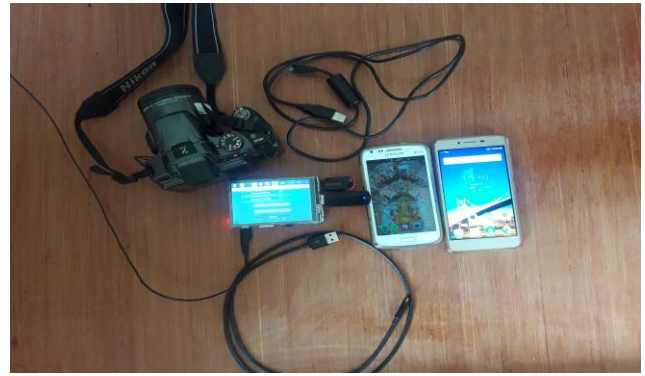


Fig.4. Experimental setup of Project

The table given below shows the comparison between the time require for transferring files in computer and by using this gadget .

Data Size	Using Computer	Using the designed System
Video(960MB)	3 minutes	4 minutes
PDF document(1.2 MB)	2 second	3 second
Text file (3 KB)	3 second	4 second
Image file(1GB)	5 minutes	7 minutes

Table. Transferring speed of designed system

Observing this table, it conclude that the transferring speed of the data is approximately same. In general the transfer speed of both system is 12Mbps.

### X. CONCLUSION

Data transfer between two USB supported devices gives a concept to study the Raspberry pi and its operating system as well as to learn python programming also the working of the USB host controller along with the processor in group.[12] An arrangement of fundamental prerequisites were characterized and utilized for configuration work of the USB information exchange idea in light of functional tests. Based on sensible tests like the ease of use, portability and handy makes it a powerful and useful tool in daily life to do the file transfer. This project is for transfer the data between two USB sticks using handheld device.

### REFERENCES

- [1] Sukhada M. Deshmukh, Prof. R. C. Mahajan, "Handheld Device for Data Transfer between Two USB Sticks",2015 International Conference on Information Processing(ICIP).
- [2] Mukesh Tiwari, Siddharta Motghare, Jimit Gada, Unmesh Barb-hate, "Flash Drive to Flash Drive Data Transfer", International Refereed Journal of Engineering and Science (IRJES) ISSN (Online) 2319-183X,(Print)2319-1821Volume 2, Issue 3(March 2013),PP.17-23

- [3] Omprakash Gawali, Ketan Pandurang Kale, Mahesh Sanjay Gund, Ganesh Balasaheb Gaware, "Communication In USBs For Data Transfer", International Journal of Engineering and Advanced Technology (IJEAT), 4(4), 2013.
- [4] Sonal N. Kawale and Rahul Dhuture, "USB to USB and Mobile Data Transfer without Connecting to PC Using ARM Processor", International Journal of Engineering Research and Applications (IJERA) and Inter-national Conference on Industrial Automation and Computing (ICIAC), 12(4), 2014.
- [5] Priyanka Bapat, Neha Lodh, Ratna Polas, Swati Pulkurte, Prof. Rupali Dalvi, "USB TO USB Data Transfer Without Connecting To PC", International Journal of Engineering Research Technology (IJERT), 2(2), 2013.
- [6] Subhash Suman, Prof. A. A. Shinde, "Research on Friendly ARM Board for Data Transfer between Two USB Devices without Com-puter", International Journal Of Engineering Sciences Research Technology (IJESRT), 2(12), 2013.
- [7] Mr.V. S. Gawali, Mr.A. M. Agarkar, "Pen Drive to Pen Drive and Mobile Data Transfer Using ARM", IOSR Journal of Electronics and Commu-nication Engineering (IOSR-JECE), 43-47.
- [8] Darshana Rarath, and Mayank Sharma, "Computer Independent Data Transfer Device", IJES-Vol. 5, No. 2, 2017
- [9] Khakal S. M., Matte P.N, Awari M. V, "Innovative Approach of USB communication", International Journal of Science and Research(IJSR).
- [10] Ms.DishaJuriasinghani, Mr.Tanay Krishna Dev, "Embedded System for USB WiFi Bridge", IJERA, ISSN: 2248-9622, Vol. 2, Issue 1, Jan-Feb 2012.