Mobile Printer with Bluetooth Compatibility Using Raspberry PI

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ABSTRACT— This paper proposes a design of a device which directly prints the data stored inside the Mobile without the assistance of a desktop computer. The common data printing procedure has to use desktop computer as a relay medium, first receiving the data from mobile and then sending it to printer using an appropriate printing Method. This is rather cumbersome.The design compromises Raspberry pi having Debian flavor of Unix. The Common Unix Printing system installed on Raspberry Pi do the print job.

The inbuilt Bluetooth of Raspberry Pi accept file from paired Mobile and gives to RPi. The Printer driver is a program to control a printer that is connected to your system.

Index Terms— **Mobile phone, Printer, USB Printer driver, Common UNIX Printing Method, Raspberry pi.**

I. INTRODUCTION

Printing is useful stuff that helps people in day to day life. This paper proposes idea of using Mobile phone Bluetooth to print the data. For printing purpose we need some mediator between a mobile device and a printer. The adapter which helps the printer to print by selecting either of the first operation modes in which data from the data supply device is received by wireless communication and before the completion of receiving the data; a print job is issued to the printer by wired communication. In second operation mode in which data from the supply device is received by wireless

communication and after the completion of receiving the data, a print job is issued to the printer by wired communication. The data held by an data supply device gives it to the adaptor which comprising a first interface configured to communicate with the printer by a first communication protocol and a second interface configured to communicate with the data supply device by a second communication protocol

different from the first communication protocol.

The printing system being configured to operate in a first operation mode in which image data from the data supply device is received by the second interface, and before completion of receiving the data by the second interface, a print job for printing data that is received before the completion of receiving the data by the second interface is issued from the adaptor to the printer via the first interface; and a second operation mode in which image data from the image supply device is received by the second interface, and after completion of receiving the image data by the second interface, a print job for printing image data whose reception has been completed by the second interface is issued from the adaptor to the printer via the first interface; the printing system comprising: a selection unit configured to select either of the first operation mode and the second operation mode in which the adaptor issues the print job; and a switching unit configured to switch between the first operation mode and the second operation mode in accordance with a selection result of the selection unit, wherein the selection unit selects either the first operation mode or the second operation mode based on at least one of a file name, an image format type, a transfer time and accessory information of the

image data received from the image supply device. This is the process of printing the image data.

The proposed system aims at providing a means to directly send data stored in Cell phone to printing device for printing without using Computer. Sometimes it is not possible to have internet but nowadays everyone has mobile internet facility if we can directly give printing from mobile then it minimizes efforts. That is, it is impossible to directly print the data stored inside the mobile without the assistance of a notebook or desktop computer. The input to the system is data file to print and the output of the system is serial data in printing format. We can wirelessly print documents, bills and invoices (MS Office: Word, Excel, PowerPoint; PDF and text files) from device memory, SD card and even from Google Drive (Google Docs) by using the printing method. Instantly print emails from Gmail, print photos and images (JPG, PNG, GIF), also print contacts, agenda, sms/mms, call log, web pages (HTML) and other digital content directly from your device to a printer right next to you or anywhere in the world. For printing purpose we simply need to be on the device to add some Premium Features. In Prior to buying the key which is offered by some peoples highly recommend printing the test page to ensure compatibility with your printer.
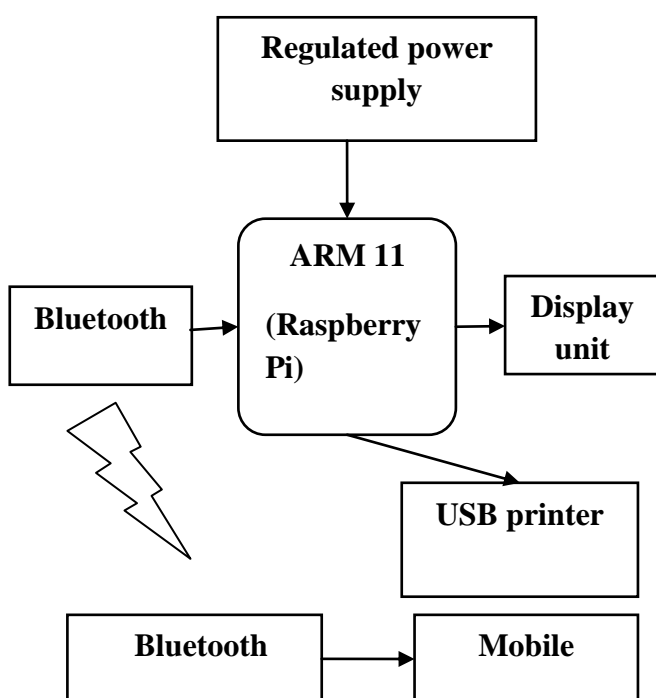
II.METHODOLOGY

Fig 1. System block diagram

A. DETAILED DESCRIPTION

The system structure is shown in Fig 1. The disclosed USB printing converter can receive data transmitted from a Bluetooth. The data can be directly sent to a printing device for printing without needing any computer device. In the following, we explain the main components and relevant devices.

1) Bluetooth transmission module- It is used to receive image data transmitted from Bluetooth electronic product such as mobile phones and PDA's.

2) Microprocessor-It is connected to the Bluetooth transmission module and contains an extraction unit, a memory unit and a compiling unit. The memory unit temporarily stores the image data for subsequent uses. The extraction unit extracts the image information to be printed from the image data transmitted by the Bluetooth electronic product. The image information to be printed can be in the OPP formats. The compiling unit converts the image information extracted from the image data into printing data according to the picture bridge protocol. The picture bridge protocol is a printing protocol development in the industry in recent years. It enables the data transmissions among different types of electronic products and printing devices.

3) USB transmission module-It is connected to the microprocessor and in electrical communications With the USB of the printing device. It can transmit the printing data provided by the microprocessor to the printing device for printing.

4) Protection unit-It is electrically coupled to the microprocessor and the USB transmission module. It is used to prevent the USB transmission module from transmitting too much electric power to the microprocessor to cause damages. A Bluetooth/USB printing conversion method, after each printing element in the printing device is confirmed to return its initial position; the data transmission mode of the printing device is initialized to get ready for receiving external information. The Bluetooth transmission module continues to detect the data transmission status of the electronic product. Once the electronic product starts to transmit data, the system receives data transmitted from the electronic product by using the Bluetooth transmission function and

temporarily stores the data in the memory unit. Afterwards, the system detects the format of the data. If the data reception is incomplete or the format is incorrect, the system returns to receive another set of data or request new transmissions. If the format of the data is correct, the extraction unit extracts the information to be printed from the data the system

B. WIRELESS CONNECTIVITY BETWEEN MOBILE AND PRINTER

Fig.1 shows the block diagram of complete architecture of BT Adapter .The Bluetooth which may be 2.4 GHz wireless module which acts as a Receiver. The Bluetooth receives the signal from mobile and gives it to the controller. The memory unit of controller saves the data temporarily and gives it to the extraction unit .The extraction unit retrieve information and the compiling unit convert it into printing format. Through USB cables it is given to the printer for printing.

C.THE REASON FOR USING RASPBERRY PI

The Raspberry Pi (or 'Raspi') is a computer about the size of a credit card, designed to cost only £16 for the cheapest model. This includes a 700MHz processor, an HD-capable graphics setup, and at least 128MB of memory; there's also a memory card slot, audio/video outputs to connect to your TV, and a USB port for your keyboard, mouse and so forth. With all that, the computer uses less power than a light bulb. It was developed by a group of Computer Science lecturers from Cambridge University, one of whom (Eben Upton) now works for computer chip designers Broadcom. The main thing about this is we can install OS and do our required stuff.

III. LITERATURE SURVEY

The present day advancement in technology before us is a result of chain of pain staking research and improvisation process. It is reflected as "sophistication" everywhere – whether it is office automation, household appliances, multimedia and entertainment gadgets or medical equipment where "connectivity" and "touch of a button" ensures the compliance of

desired process. This "sophistication" is because of the "convergence" of technologies .

Technology development should help people to do their work more easily and make them comfortable. Printer control using Mobile device is one of the Useful technology that will help people in their day to day life. The conventional printer requires Mobile as input device, LAN connection and the printer as an output device. The idea of using mobile phone to printing data using wireless technology. Mobile phone should contain Bluetooth through which user can able to print data.

IV. HARDWARE DESIGN

A. INTRODUCTION TO RASPBERRY PI PRIMER BOARD

The Primer board is specifically designed to help students to master the required skills in the area of embedded systems. Most of the students don't know how the hardware works. The kit is designed in such way that all the possible features of the microcontroller will be easily used by the students. The kit supports In system programming (ISP) which is done through serial port. We can also install any OS for getting the purpose done. The Primer Kit is proposed to smooth the progress of developing and debugging of various designs encompassing of High speed 32-bit Microcontrollers.

B. BLUETOOTH

Bluetooth is a proprietary open wireless technology standard for exchanging data over short distances from fixed and mobile devices, creating personal area networks (PANs) with high levels of security. Bluetooth technology allows electronic devices to communicate wirelessly. Most of the Mobile now has Bluetooth technology.

C. INTERFACING BLUETOOTH

Bluetooth technology handles the wireless part of the communication channel; it transmits and receives data wirelessly between these devices. It delivers the received data and receives the data to be transmitted to and from a host system through a host controller interface (HCI). The most popular host controller interface today is either a UART or a USB. We need to install

some software to configure Bluetooth dongle on device. Once it gets configured we can establish connection between them. Here, I will only focus on the UART interface; it can be easily show how a Bluetooth module can be integrated on to a host system through a UART connection.

V. USB PRINTER DRIVER DEVELOPMENT

To develop a generic printer driver for a Printer is based on ARM Processor. The entire scope is to print the transaction data from the Mobile to Printer through USB interface. The device driver is developed using Real Time Operating system. ARM compiler and debugger provided by ARM. The printer class driver handles the printer specific request. The printer class driver will be designed to support Printer. The USB Bus Driver (USBD) is involved in mediating bus access at two general times: While a device is attached to the bus during configuration, during normal transfers. When a device is attached and configured, the USBD is involved to ensure that the desired device configuration can be accommodated on the bus.

VI. RESULTS

We can print data anytime, anywhere from your Mobile device. Now you can instantly print PDF files, text files and png ,jpg format file more directly from your device to a printer. It requires an interfacing between the controller and Bluetooth dongle. The Bluetooth module accepts data and gives to controller for processing. The Printer is interfaced with Controller which receives data from Mobile and gives to the printer. The CUPs is installed in OS of Raspberry pi which converts normal data file into printing format and we get printed document.
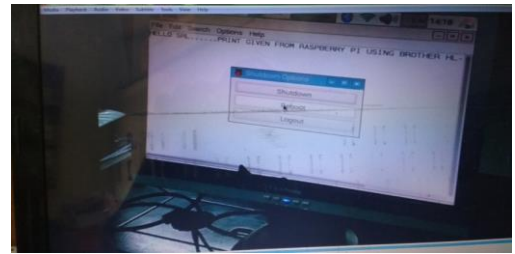

Fig3.Printer setup

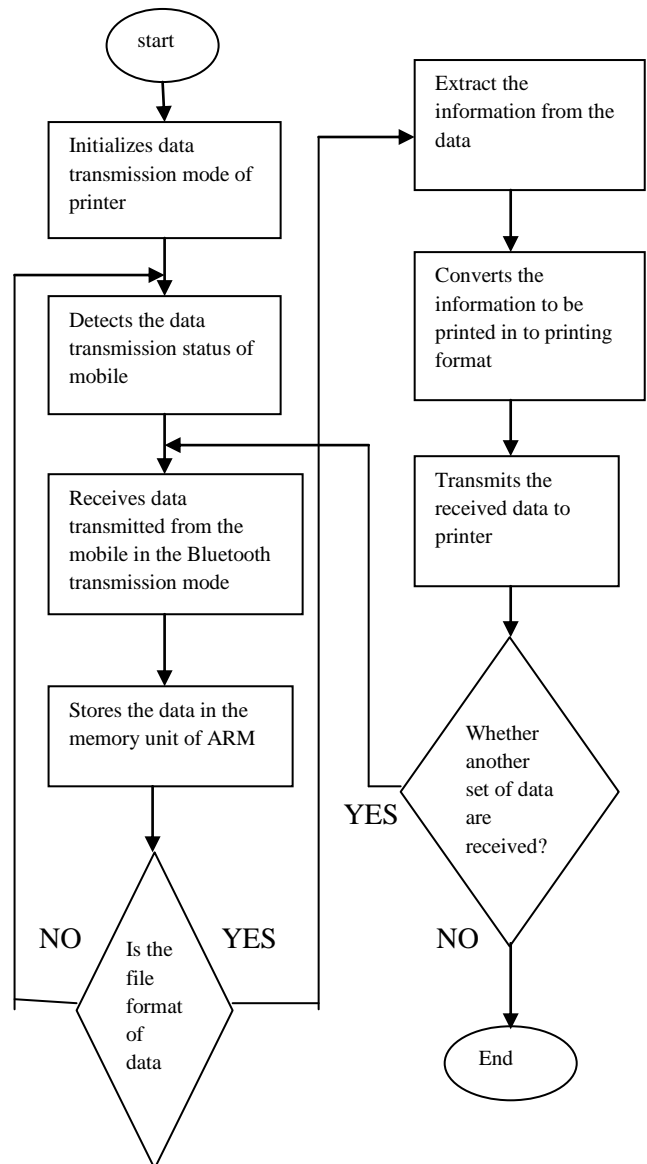Fig 4. Experimental result

VII.ALGORITHM

Fig 2. Algorithm to be designed

The Algorithm shown in Fig 2.consist of following steps -

1. Initialize the data transmission mode of printer.
2. Detect the data transmission mode of mobile.
3. Receives data transmitted from mobile.

4. Store the data in Memory unit.
5. Check the file format in the memory unit.
6. If the file format is correct then extract the information from the data, if file format is not correct then again detect the data transmission mode of Mobile phone.
7. Converts the information to be printed into printing data.
8. Transmits the received printing data to printer.
9. Stop.

VIII. CONCLUSION

In common data printing method, one has to use laptop or desktop computer as a relay medium. First receiving the data from Mobile, Copying it on computer and then sending it to printer for printing. This is time consuming process.

This paper proposed the design of a low cost Bluetooth to USB data converter, which is capable of receiving data and controlling Printer device via the Bluetooth port of Mobile. This approach can be used for time saving and it is simple and practical.

By using this approach we can more easily print data from mobile device.

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