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 [ijircce@gmail.com](mailto:ijircce@gmail.com)

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# A Review on Raspberry Pi – Mini Computer

Prajakta Sayare<sup>1</sup>, Hrushikesh Ban<sup>2</sup>, Vaishnavi Tale<sup>3</sup>, Riki Bhaware<sup>4</sup>, Dr. A. P. Jadhav<sup>5</sup>

U.G. Students, Department of Computer Science & Engineering, Jawaharlal Darda Institute of Engineering and Technology College, Yavatmal, India<sup>1,2,3,4</sup>

Assistant Professor, Department of Computer Science & Engineering, Jawaharlal Darda Institute of Engineering and Technology College, Yavatmal, India<sup>5</sup>

**ABSTRACT:** This paper offers records approximately a completely powerful, small chip length laptop Raspberry Pi. Also, it introduces the general device configuration and the layout of hardware additives diverse working structures and the way we will use raspberry pi as a private laptop into our everyday life. Raspberry pi has the scale of credit card that's invented with the wish of inspiring era of beginners to be creative. Raspberry pi has a large network throughout the world. The raspberry pi has its very own OS primarily based totally on Debian and ARCH Linux ARM distribution for download. We can set up OS into our SD card and may run working device immediately from the SD Card. Currently Windows isn't absolutely supported because of ARM Processor, however many different Linux distributors had already released their strong OS for the users. Many IoT primarily based totally tasks are primarily based totally on Raspberry pi device, because it offers GUI and may guide a couple of hardware gadgets inclusive of sensors. Raspberry pi has a guide from Linux distribution in addition to different third-party developers. Home automation, facts series inclusive of weathering statics, business facts are executed the use of raspberry pi. Raspberry Pi has a super destiny ahead, as its reasonably-priced in value and small in length all make easy to buy raspberry pi and may provide boast to their creativity in laptop technological know-how and digital field.

**KEYWORDS:** Raspberry Pi, sensor, Linux, Tiny computer, portable, small-size, computer.

## I. INTRODUCTION

Computers are definitely a part of our ordinary life. For expert art work or for the private art work we use laptop structures to ease our art work. But searching for a luxurious PC which you cannot take anywhere outside aside from art work area is pretty compromising. Even now not all the human beings must have sufficient cash get right of entry to level laptop structures. To overcome this hassle Raspberry pi modified into introduced. Raspberry pi is a small credit score rating card period virtual chip that may compute multiple responsibilities same as an everyday Pc does. Raspberry pi created by Eben Upton CEO of Raspberry Pi Foundation. It's supported by the University of Cambridge Computer Laboratory and tech business enterprise Broadcom. First generation modified into released in February 2012. Using Raspberry pi you possibly can perform challenge consisting of excel, word, PowerPoint also can movement movies without paying any luxurious amount. Raspberry pi moreover allows HD-Video Output, 3-D games, manual all the programming language as it runs on Linux OS machine. Raspberry pi does have a domestic home windows OS machine beneath its development. Popular OS systems for Raspberry pi are Raspbian – this is an expert OS machine from Raspbian especially superior for raspberry pi hardware, Ubuntu, kali, Linux, ARCH Linux and specific Linux distribution. Microsoft had moreover introduced its OS as domestic home windows 10 IOT core. Raspberry pi is a circuit art work on ~1 W power supply and can be powered by everyday mobileular charger cable. External mouse, keyboard and display required to use raspberry pi to its fullest. Raspberry pi has an ARM processor which address almost all complex multitasking. In this paper we're capable of look at detail about a define of the raspberry pi era that may be an absolutely powerful pc and the manner we can use it as a private pc. The motivation behind the raspberry modified into to make it small and cheap in rate simply so an everyday person cold offers it. Students who want to unfastened up their skills in pc programming will now no longer must wait to buy high priced pc's instead they might perform their responsibilities using raspberry pi.

## II. RELATED WORK

This segment of the associated work ultimately well-known shows a few records primarily based totally on considerate evaluation of many authors work as follows. Many running structures are to be had for Raspberry Pi, along with Raspberry Pi OS, which is bureaucratic supported running gadget, and running structures from different organizations. Raspberry Pi Imager and NOOBS installer is the short and smooth manner to put in a running gadget to a micro SD card prepared to apply together along with your Raspberry Pi. Raspberry Pi OS is the legit distribution of

Raspberry Pi Based on Debian it's far constructed at the equal philosophy, i.e., balance and performance. Many Debian programs are to be had on Raspberry Pi. Since its first launch in 2012, there were many improvements [10]. Today Raspberry Pi OS comes with the PIXEL computing device, which makes the Raspberry Pi usable as a day by day computing device computer. About the pre-established applications, we discover necessities like Chromium, Minecraft Pi, Scratch or LibreOffice [9]. Installing extra programs or an exclusive computing device surroundings is facilitated with the aid of using the presence of the APT Packet Manager. It has many advantages, inclusive of compatibility, reliability and Raspberry Pi OS works properly on any Raspberry Pi version [11]. Raspberry Pi OS is to be had at the legit website. The 1st version of raspberry pi is Raspberry Pi B released on 2012 which become very primary version having usb 4xUSB 2.0, 26-GPIO pin HDMI supported. Most famous raspberry pi version after Raspberry Pi B Are Raspberry Pi 3B+ and Raspberry Pi 4B.

### III. ARCHITECTURE AND IMPLEMENTATION

Back in 2006, even as Eben Upton, his colleagues at University of Cambridge, together with Pete Lomas and David Braben, shaped the Raspberry Pi Foundation. Early prototypes of the Raspberry Pi had been primarily based totally at the 8-bit Atmel ATmega644 on the way to lessen cost. Following prototypes applied an ARM processor much like what turned into used in the launch model of the Raspberry Pi.

#### A. Architecture

In April 2012, the unique Raspberry Pi, additionally called the version B, became launched. It provided an ARMv6 seven-hundred MHz single-middle processor, a Video Core IV GPU and 512MB of RAM, all packed in a credit card length board. The version B supported 26-pin GPIO and a SD card slot for loading the running system. Priced at \$35 in keeping with unit. Since the board has been designed through thinking about curious college youngsters in mind, it's smooth to use. The Raspberry Pi board contains a processor and pin chip, application reminiscence (RAM) and numerous interfaces, and connectors for outside devices. Raspberry Pi operates in the equal manner as a trendy PC, traumatic a keyboard used for command entry, a show unit, a strength supply. RPi use a SD Flash reminiscence card commonly utilized in virtual cameras, configured in a equal as a difficult force utilized in PC. RPi will 'load the Operating System into RAM'(boot)from this card in the equal manner as a PC 'boots up' into Windows from its difficult disk.

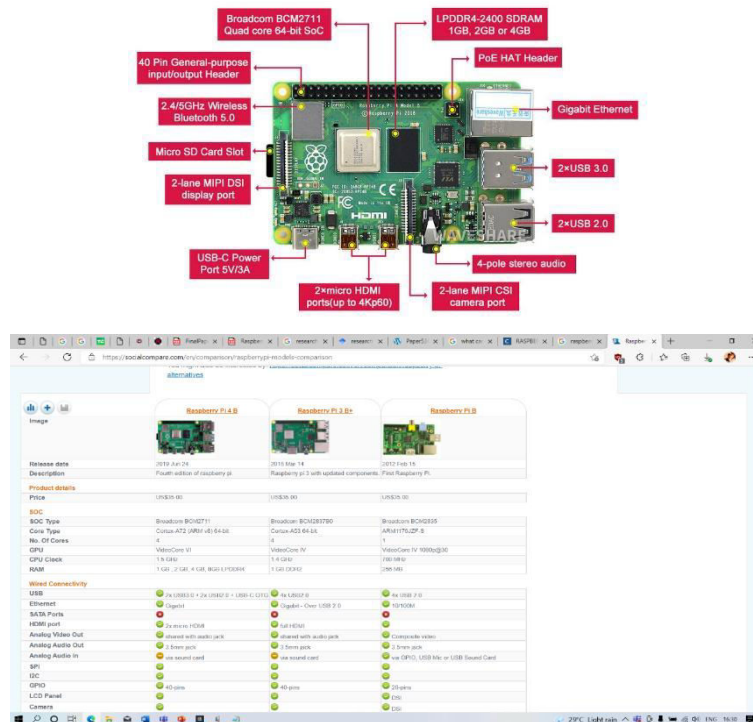
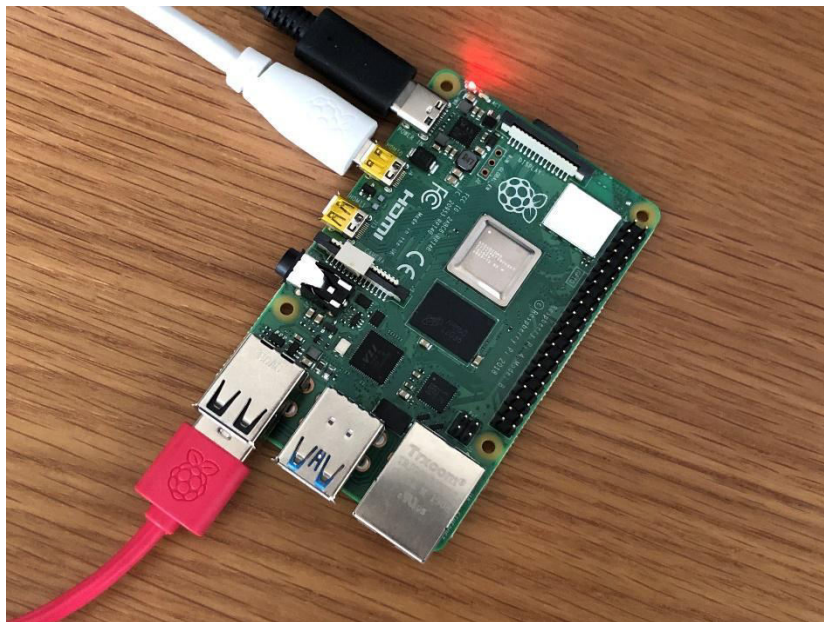


Fig 3.1 Raspberry Pi Architecture [raspberrypi.org]

#### B. Booting Process [3][4]

Since the board has been designed with curious programmers in mind, it's smooth to use. The booting approach entails the subsequent steps:

1. Download the Raspberry Pi Imager and Raspbian OS from the reliable discussion board of Raspberry Pi.
  2. Format a micro SD card.
  3. Burn the Raspbian ISO onto a micro-SD card.
  4. Inserting the card into the micro SD card slot at the Raspberry-Pi board.
  5. Plugging in keyboard, mouse and display cable onto the board and to the display.
  6. Plug in the USB electricity cable.
  7. The boot technique has now all started and a configuration window Complete Setup together with name, Username, WIFI password.
  8. Default username and passwords for first boot are: username: pi, password: raspberry.
- After the booting technique the board may be applied for any project.

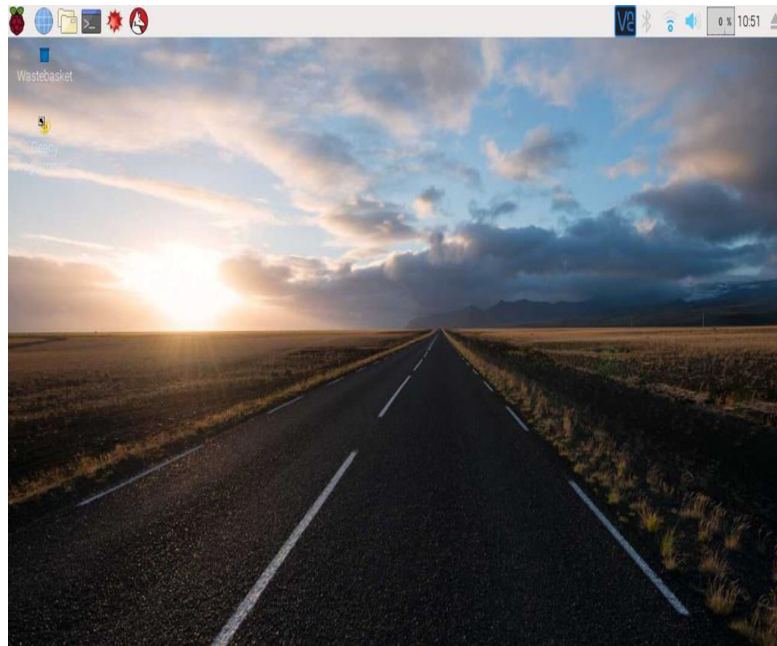


**Fig 3.2 Raspberry Pi Connection**

*C. Task can be performed*

There are many things we can perform using raspberry pi, some of them are mentioned below:

1. Stream HD
2. Remote Desktop
3. LibreOffice
4. Play Games
5. Studio Editing
6. Programming and Development



**Fig 3.3 Raspbian Desktop**

#### IV. ADVANTAGES

Some of the merits are:

- It is a cheaper tool with a without problems low priced price, everyone from teens to laptop fans can grasp a bit of Pi for themselves? Where industrial opposite numbers of positive programs of Raspberry Pi can prices loads of greenbacks Pi gives a mile cheaper, opportunity at handiest a fragment of the price.
- Raspberry Pi has the dimensions of a credit card. As all of us recognize with technology, typically the smaller it is, the better. With a small size, Raspberry Pi may be hidden nearly anywhere, at the back of tv sets, internal partitions or maybe for your wallet. [1]
- Raspberry Pi with low rate and small length do now no longer always suggest low performance. Even though you won't be successful to play the brand new hard-middle 3-D video games for your machine, Raspberry Pi lets in for High Definition (HD) video streaming and different primary laptop features like phrase processing and internet browsing. Pi became first of all supposed as a programming platform for novices and hence, it's far versatile, powerful, an all-rounder.

#### V. DISADVANTAGES

Although it has merits but it has some demerits also some of them are:

- Raspberry Pi does now no longer guide X86 working structures manner hardware boundaries do now no longer permit for Raspberry Pi to run 32-bit working structures together with Microsoft Windows, Max OS X or a few forms of Linux. This may be a large loss for now no longer-so pc pleasant give up users. For expert users; this isn't always plenty of a setback as Raspberry Pi helps some other famous working system.
- Some applications which necessitate high demands on CPU processing are off-limits such as Filmora family.

- Currently Raspberry Pi Has Low Graphical Processing Unit meaning we would face lag in excessive graphical software's and games.
- Excess Use of Raspberry Pi with complicated Multitasking will motive overheating of the system. Damage of hardware may also motive because of overheating.
- There isn't always Real Time clock related to the board, because of this that on every occasion we reboot system, time gets reset.
- The RAM is a pop bundle on top the SoC, so it's now no longer un-detachable or swappable.
- Heavy use of raspberry Pi or complicated multitasking will motive lag in performance, as its assets are limited.

## VI. CONCLUSION AND FUTURE WORK

The result is its feature indicates that in ultra-cheap cost everyone will get the opportunity to explore computer skills, unlock their potential in development in computer science.

Raspberry Pi supports various sensors, devices interface and networking interfaces that gives you everything you could possibly need for an Internet-connected Portable pc.

We can use Raspberry pi as a personal computer considering its limitation. Raspberry pi can be used for automation, reminder and security purpose.

The tool can in reality assist everybody who in reality desires to examine electronics and computers. Supporting laptop running structures like Windows 10 IOT CORE, Linux and offering easy input/output traces i.e., the GPIO makes it ideal for controlling nearly anything. Programming the GPIO is an awful lot clean and intuitive than a conventional microprocessor.

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