Raspberry Pi report

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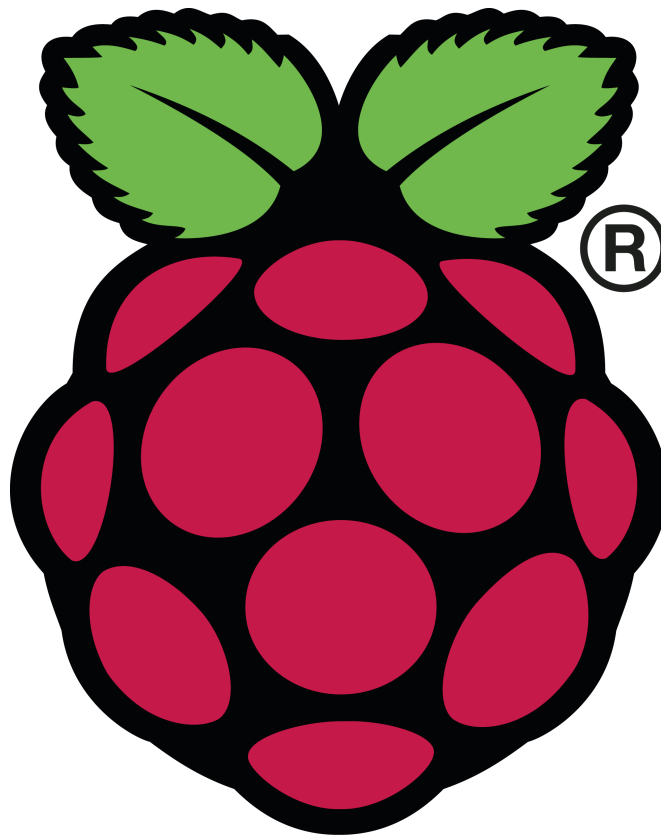

Figure 1: The official Raspberry Pi Foundation Logo

Raspberry Pi is a trademark of the Raspberry Pi Foundation.

Contents

1   The Raspberry Pi

The Raspberry Pi is a low-cost general purpose computer made to allow easy access into computing for students and children, as well as being a great tool for projects that require a more complex computing platform than for example an MCU like the Atmel AVR yet still being easy to use unlike an FPGA. (Foundation, 2021)

2   The need for a low-cost general purpose computer

The Raspberry Pi was started because the creator felt there was a need for a cheap computer that people could learn with, similar to the BBC micro in the eighties. The Raspberry Pi is the brainchild of Eben Upton. Inspired by the computer of his childhood, the BBC Micro, he felt there was a need for a similar solution for students and children of today.

> "Dr Upton and colleagues at the Cambridge Computer Laboratory had been concerned at the declining figures for young people interested in computer science."

So he set out to make a general purpose computer that would be easy to use and also be low cost, as to be available to developing countries too. To aid in his design for his computer he consulted teachers, computer hobbyists and academics and put together a group aimed at devising his dream to inspire children to get into computing.
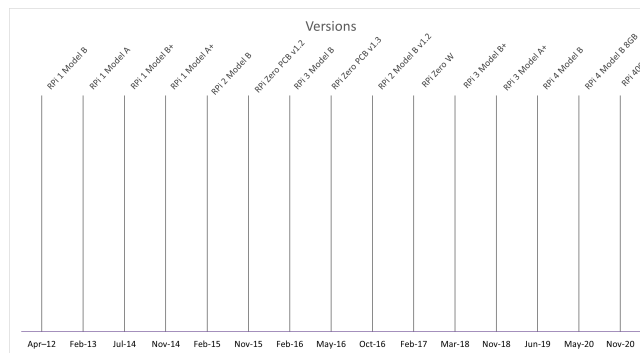
3   The history of the Raspberry Pi

Figure 2: Timeline of the Raspberry Pi versions

4   The operating systems of the Raspberry Pi

You can put any operating system that compiles for ARMv6-32 RPi1 bit or
ARMv7-32 bit RPi 2 v1.1 ARMv8-64 bit RPi 2 v1.2 and latter models. The
offical operating system for the Raspberry Pi is Raspberry Pi OS (formerly
Rasbian). According to the website distrowatch.com the top 3 distributions for
the Raspberry Pi by popularity are MX Linux, Manjaro Linux and openSUSE.

5   Raspberry Pi MSRPs

These are the recommended prices for the various Raspberry Pi models as set
by the Raspberry Pi Foundation (Upton, 2013)

Model	Price
Raspberry Pi Model A	$25
Raspberry Pi Model A+	$20
Raspberry Pi 3 Model A+	$25
Raspberry Pi Model B	$35
Raspberry Pi Model B+	$25
Raspberry Pi 2 Model B	$35
Raspberry Pi Model B v1.2	$35
Raspberry Pi 3 Model B	$35
Raspberry Pi 3 Model B+	$35
Raspberry Pi 4 Model B	$35†
Raspberry Pi Zero PCB v1.3	$5
Raspberry Pi Zero W	$10
Raspberry Pi 400	$70

†Prices vary for different RAM configurations $35 (2GB RAM), $55 (4GB
RAM), $75 (8GB RAM)

6   Differences between the Raspberry Pi and other integrated circuitry

The Raspberry Pi is a general purpose computer, meaning that it is designed
to be plugged into various human input and output devices and be directly
influenced by a human being. And that it runs an operating system that you
can install software on. Microcontrollers (MCUs) on the other hand are more
bare-bone and need a pre-compiled software image flashed directly on to the
chip. Or it needs a boot-loader so that it can boot up and read its program from
a storage device. Examples are the Micro:Bit and Arduino microcontrollers. A
microprocessor is similar to a microcontroller in the fact that it needs a program
to be pre-compiled anytime you want it to run differently, but microprocessors
also lack many features that MCUs have. Like integrated RAM, various I/O

devices. Microprocessors are designed to be used in conjunction with other discrete integrated circuits.

7 Raspberry Pi use cases

Raspberry Pis can be used for anything from a Personal Computer to a lightswitch. Many people use the Raspberry Pi as an arcade game emulator and build them into tabletop arcade machines or arcade controllers. Another popular use for the Raspberry Pi is in robotics as its generious GPIO headers allow for many sensors and motors to be controlled. Personally I have used my Raspberry Pi as a security camera with Raspbian and the software Motion (Heenan, 2018) Some uses for the Raspberry Pi I found in my research was this paper (Khatri, Gupta, & Gupta, 2019) that proposes a hardware platform to be made that uses the Raspberry Pi, to monitor and report water quality in real time. In Greenhills School, Michigan, USA, they have Raspberry Pi kits available for students to check out of the library to use for projects in the classroom or at home (Toth-Chernin, 2015)

8 Best use case for a Raspberry Pi

In my opinion the best use of a Raspberry Pi is in teaching young people computing. As PCs today are a behemoth of abstraction over unfathomably complex electric circuitry. As Greenhills School discovered when they added Raspberry Pi kits to their library as items to check out. And they saw students were able to intuitively understand what they were doing to the point where they were teaching and collaborating with other students. (Toth-Chernin, 2015)

References

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