LAPTOP COMPUTER

SELECTION, MAINTENANCE AND SAFETY

DR. VIMAL KUMAR V.

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Laptop Computer

Selection, maintenance, and safety

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“Any sufficiently advanced technology is
indistinguishable from magic.”
Arthur C. Clarke

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PROLOGUE

Unlike traditional desktop computers, the advent of portable laptops was a technological revolution. Laptop computers have become an integral part of our lives. From students to professionals, every sphere of life uses laptops. This book welcomes you to the world of the laptop computer. This book covers the basics of laptop technology, selection, and maintenance.

Members of the Mahatma Gandhi University academic community and friends often asked me for advice on purchasing a laptop, which inspired me to write this book. Ordinary people need a clear idea before choosing a laptop computer. Undoubtedly, if the information about laptop computers is published as a book, it will be helpful for everyone.

This book introduces you to the basics of using a laptop, from what laptops are to how they work. The book covers the functions of various laptop parts, tips on choosing and buying laptops, and maintenance steps to keep your computer in good condition. This book is designed to be useful for laptop beginners, students, and professionals alike.

I do not claim completeness regarding the content. However, the content can be further improved after listening to the readers' comments. Please send valuable comments and suggestions regarding this book via email, vimalibre@gmail.com, or WhatsApp (+91 9846496323).

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Changanassery

Vimal Kumar V., PhD

In loving memory of

Sri. N. Parameswaran

Former Deputy Librarian,

University of Kerala,

whose unwavering mentorship continues to inspire.

This book is dedicated to his legacy.

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A brief history of laptop computers

Introduction

Laptop computers have become indispensable for learning, research, work, and entertainment. Laptop computers are integral to daily work, business, trade, study, research, entertainment, and activities for students and professionals. The main advantage is that it is convenient to use in the office, at home, and while travelling. Laptop computers are personal computers that are smaller and lighter than desktop computers and are designed to be carried around. Efforts to develop laptop computers began in the early 1970s. Early versions of laptop computers became widely available in the 1980s. The use of laptops became more widespread in the first quarter of 2000. The spread of the Internet, online learning, employment, and the development of wireless technologies such as Wi-Fi and Bluetooth have accelerated the popularity of laptops. This chapter examines the history and evolution of laptop computers.

The rise of laptop computers

In the 1960s, Alan Kay, a technologist, pioneered the idea of a laptop computer. He designed the prototype of a portable computing device suitable for children weighing less than one kilogram, called the "DynaBook". Although the Dynabook never went on sale, it inspired the imagination of engineers worldwide.

The 1970s saw the first attempts to build portable computers. Early forms of portable computers were large in size. There are no batteries, so it can only be used when plugged in. In 1975, the IBM company introduced the first portable computer to the market, the IBM 5100. The development of portable computers has hastened the emergence of laptop computers.

In April 1981, the Osborne I, a portable computer developed by Adam Osborne, was recognised as the first laptop computer. It weighed 11 kg and had a 5-inch display. The same year, Epson released the first laptop-sized notebook computer, called the HX-20.

The Radio Shack Company released the TRS-80 Model 100 portable computer in the United States in 1983. It was the first portable computer with a liquid-crystal display (LCD).

The 1980s saw significant advances in the development of portable computers. Companies like IBM, Compaq, and Apple introduced smaller, lighter computers. The use of hard drives and 3.5-inch floppy discs began during this period.

In 1984, the Commodore company released the Commodore SX-64, the first portable computer model with a colour display.

In 1986, IBM launched the company's first laptop, the PC Convertible. It weighed 5.4 kg.

Compaq released their first laptop computer in 1988, the Compaq SLT/286. It was the first battery-powered laptop with a video graphics adapter (VGA) and an internal hard drive.

Technological advancements in the 1990s increased the use and popularity of laptops. Laptops of this era featured lighter and more efficient lithium-ion batteries, Intel processors, touch pads, liquid crystal displays, thinner and higher-capacity hard disc drives, internal modems, and ports. In 1997, optical disc drives became commonplace in laptops; initially, CD-ROM drives, CD-R drives, and later DVD and Blu-ray drives became popular. The invention of Wi-Fi in the late 1990s ushered in a new era of Internet connectivity, empowering the laptop to become an integral part of learning, work, industry, and entertainment. Since 2011, the popularity of internal optical drives has declined; by 2022, they will almost disappear.

Technological changes in this field after 2020 focused on usability. Notable changes are:

- Efficient processors without consuming much of the laptop battery.
- The weight and size of laptops have been significantly reduced to make them more portable.
- Higher-resolution displays such as OLED are becoming commonplace.
- Processors accelerate Artificial Intelligence and Machine Learning applications.
- Better connectivity systems for faster Wi-Fi internet and 5G.
- Revolutionary changes are visible in the form and structure of the laptop. The foldable, detachable display and two-in-one (tablet PC cum laptop) dual-use configurations became popular.

History of laptop computers in India

Laptop computers came to India in the late 1980s. Foreign companies like IBM and Compaq introduced laptops to the Indian market. In the initial stages, significant customers are companies and government institutions.

In the 1990s, laptop brands of Indian companies such as Wipro, Hindustan Lever, and HCL became available in the Indian market. Laptops with multimedia and Internet connectivity features arrived in the last quarter of the 1990s.

Since 2000, the laptop market in India has seen significant growth. This resulted from the Internet's popularisation and increased use of computers in education and industry. Since this time, laptops have become essential tools for education and entertainment. This era saw the introduction of more affordable netbooks aimed at students. A netbook is a lightweight version of a laptop. Lightweight, limited processing capacity, and high battery life are key features. Netbooks are ideal for travellers, students, and anyone who needs a computer on a budget.

Netbooks typically have a 10-12 inch screen, low resolution, low-power processors, low RAM, and small hard drives.

In 2010, the arrival of smartphones impacted the laptop market. However, the need for laptops for online education and work continued. During this period, laptops were introduced in new forms, such as touchscreen and 2-in-1 laptops.

In 2020, the COVID-19 pandemic significantly impacted the laptop market. As online classes and work at home became more common, the demand for laptops increased. During this period, there was significant growth and sales in laptop categories such as gaming laptops and Chromebooks.

India is one of the largest growing laptop markets. Many global brands, like Dell, HP, Lenovo, ASUS, and Acer, are active in the Indian market. Government initiatives like Digital India and Make in India have helped ensure better availability and affordability of laptops. The growing importance of online education and work will also create more demand for laptops. The laptop industry in India is expected to continue to grow in the coming years.

Conclusion

If laptops were bulky in the 1970s, they are small and compact today. As a result of constant research in this field, laptops are becoming smaller, compact, lighter, and have more computing power. The increased processing power has enabled laptops to do activities such as video editing and gaming that require high computing power. Laptops today are available at an affordable price that can meet various needs.

Laptop computer components

Introduction

A computer is a combination of hardware components and software. Laptop manufacturing is a complex process involving various stages of production. Laptop computers integrate many electronic and computer components, such as processors, different types of storage, chips, connectors, displays, keyboards, speakers, webcams, etc., on the motherboard. After assembling the components, the laptop goes through various tests to ensure everything is working smoothly. Laptop computers have all the components a regular desktop computer has, but the difference is only in shape and size. The main difference is that the necessary modifications have been made to fit the computer components into the compact form of a laptop computer. In this chapter, we will learn about a laptop computer's various components and features.

Motherboard

The motherboard is often called the heart of a computer. It is a circuit board that interconnects all the significant components of the computer system. It is usually made of plastic or fibreglass. A motherboard contains the central processing unit (CPU), RAM, graphics card, storage drive, chipsets, buses, and connectors.

The main components of the motherboard are:

CPU socket: Slot for mounting the processor.

RAM slots: Slots for attaching RAM.

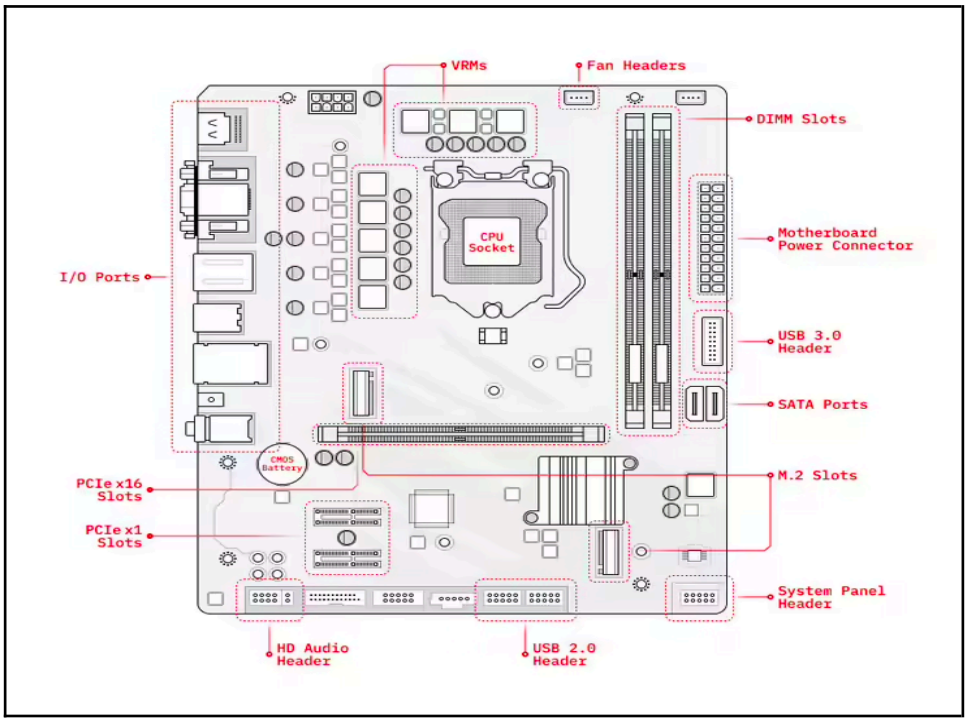
Expansion slots: Slots for installing components like graphics cards, network cards, and sound cards.

Chipset: Controls communication between the CPU, RAM, and other components.

BIOS (Basic Input/Output System): This system software handles the boot process and stores hardware settings.

Battery: A small battery that powers the memory of CMOS (Complementary Metal-Oxide-Semiconductor). Used to save BIOS (Basic Input/Output System) settings. CMOS memory stores information such as the computer's time and date, hardware device settings, and which operating system to load when the computer starts up.

Ports: Connectors for adding devices with USB, HDMI and Ethernet interfaces. For example, connectors are needed to add and use devices like flash drives (e.g., Pendrive), display devices, printers, and network cables.



Components of the motherboard
Image courtesy: computer.howstuffworks.com

The motherboard controls the data transfer between the CPU, memory, storage, and other components. The motherboard also ensures that all the elements are correctly supplied. The motherboard checks the BIOS hardware components and loads the operating system when the computer turns on.

Processor

The processor is called the thinking centre of the computer. The role of the processor is to apply the instructions given by the computer programs. The better the processor, the better the performance of the laptop computer.

Many factors determine the performance of the processor. Here are the prominent ones:

Clock speed: A measure of how often instructions are carried out per second. Clock speed is measured in Gigahertz (GHz), which means billions of frequencies per second. The higher the clock speed, the faster the processor can carry out the instructions. For example, a processor with a clock speed of 3.0 GHz will have 3 billion instructions per second.

The processor clock speed is the factor that influences the overall performance of the computer. Processors with higher clock speeds can handle instructions faster than those with lower clock speeds. A higher clock speed helps application software run faster, files load faster, and computer games play at better frame rates.

Number of cores: A core is a mini processor inside the processor. Each core has its own processing unit, which is capable of reading and performing instructions. A processor with more cores can handle more programs and operations simultaneously. Older computers had only one core per processor, meaning they could only work on one task simultaneously.

The core working inside a processor is similar to a horse cart. Imagine the horses as the core. A cart pulled by four horses will be faster than a cart pulled by one horse.

More cores are beneficial in multitasking situations. For example, you can edit a video and work with another software while having a web browser open. A processor with more cores can also speed up each task. Not all software can utilise all cores equally. A single core is enough for some application software, so having more cores makes little difference in performance. However, having more cores is very beneficial for tasks like video editing, 3D rendering, and complex calculations.

A processor with how many cores are needed can be a confusing question for an ordinary person. A dual-core processor is sufficient for basic computing tasks such as web browsing, email, and word processing. However, more performance-intensive functions like gaming, video editing, and complex data processing require a processor with more than four cores.

Thread: A processor core is divided into sections called threads to handle the instructions of multiple programs simultaneously. A core can handle up to two threads. For example, a dual-core (2-core) processor will have four threads. Threads allow a processor to perform multiple tasks at the same time. Let's take the operation of a web browser as an example. When a web page opens, the browser uses multiple threads simultaneously. One thread downloads the letters, another downloads the images, and another builds the page layout. Since all these operations run simultaneously, the webpage loads faster.

Cache: The cache is the fastest memory inside the processor. It stores the information and instructions received by the processor. The higher the amount of cache memory, the better the processor. Cache memory is faster than RAM. If the processor has the data or instructions it needs in the cache, it can grab it much faster than reading from RAM. Cache memory increases the overall working speed of the processor.

There are three types of cache memory:

Level 1 Cache: A smaller and faster cache memory inside the processor. The L1 cache stores the most recently accessed data and instructions.

Level 2 Cache: The L2 cache is larger and slower than the L1 cache. It is located outside the processor, near the processing unit. L2 cache can store more data and instructions.

Level 3 Cache: Some processors may have a third level of L3 cache. The L3 cache is larger and slower than the L2 cache.

Intel and AMD are two major computer processor manufacturers in the world. Most computer devices have different types of processors from both companies. Choosing a laptop becomes easier if you are familiar with the processor models released by the Intel and AMD companies.

Intel processors

The Intel company manufactures many series of processors for different uses. The major processor ranges are:

Pentium, Celeron

The Pentium and Celeron series are entry-level processors that can handle basic computing needs. Pentium and Celeron processors are suitable for light and basic computing needs such as online learning, web browsing, media playing, and office work. Pentium and Celeron series processors are ideal for thin and light devices. These processors, built for low-cost computers, use smartphones, tablets, netbooks, and desktop computers. Devices have more extended battery backup due to lower power consumption. Pentium and Celeron processors are not suitable for high-performance computing tasks.

There are two variants in the Pentium range, namely Gold and Silver. The Pentium Gold processor performs better than the Silver model.

The Core N-Series was recently introduced to replace the Pentium and Celeron processors. The N-Series was promoted as a high-performance processor in entry-level laptop and desktop computers.

Core Series

The Intel Core processor range includes Core 3, 5, 7, and 9 editions. Mainly, processors are meant for desktop and laptop computers. Several generations of Intel Core processors have been released. As processor technology advances, each new generation brings better performance and new features than its predecessors. The 14th generation of processors in the Core series were launched in October 2023. Each generation has a code name. The 14th-generation processors are codenamed Raptor Lake. Expect longer battery life, higher clock speeds, and more connectivity options as each generation of processors is released.

Particular indicators are used to mention the characteristics of processors. Among the many indicators used with laptop processors, the prominent ones are:

H - High performance.

HX - High performance and unlocked. An unlocked processor can adjust power, voltage, core, and memory factors. It helps to improve performance and speed up the operation of components.
P - Designed for thin and light laptops.
U - Energy efficient and offers extended battery backup.
G1-G7 - Indicates the graphics level.

Let's examine what uses each processor in the Core series is suitable for:

Core i3: Processors for desktop and laptop computers. Core i3 processors are launched with home and office uses in mind.

Core i5: Processors for mid-range desktops and laptops. Adequate for gaming and multimedia editing purposes.

Core i7: Processors for tasks that require high performance, such as gaming and video editing.

Core i9: Processors for tasks that require high computing power.

Processors in the Intel Core series differ in clock speed, number of cores, number of threads, and size of cache memory.

AMD processors

Another major computer processor manufacturer is AMD (Advanced Micro Devices). It is an American multinational semiconductor company that designs and manufactures computer processors, graphics processing units (GPUs), and other integrated circuits. AMD is known for producing high-performance processors at a low budget. AMD releases processors in different series like Ryzen and Athlon. Many models of AMD processors are available at lower prices and perform better than similar Intel processors. The processor series released by AMD are:

Athlon: Athlon series processors are for basic computing needs. Suitable for light use, such as web browsing, word processing, and streaming media.

Ryzen: Ryzen series processors are designed for desktop and laptop computers. The processors are available in series like Ryzen 3, Ryzen 5, Ryzen 7 and Ryzen 9.

Ryzen 3: It is the entry-level processor in the Ryzen series. Suitable for basic tasks such as web browsing, word processing, etc.

Ryzen 5: Processors in this series are suitable for daily home and office work, including multi-tasking, gaming, and word processing.

Ryzen 7: Ryzen 7 is a high-performance video editing, 3D rendering, and gaming processor.

Ryzen 9: Ryzen is the series's best and most efficient processor in terms of speed and performance.

Each processor model differs in clock speed, number of cores, and cache memory size. According to various benchmarking studies, AMD Ryzen processors offer better value than Intel's Core series of processors. AMD processors have more cores and threads than similar Intel models. More cores and threads help you excel in tasks that require multi-threading, like video editing, 3D modelling, code compiling, and multitasking. AMD's 7nm and 5nm Zen architectures produce less heat and consume less power. In processor architecture, nm stands for nanometer. The smaller the form factor, the more transistors can be added to the processor chip, increasing processing power.

A drastic change in computer technology is evident day by day. Accordingly, manufacturers are bringing faster processors to the market. According to Moore's Law, the number of transistors in a microchip doubles every two years. Accordingly, the development of computer technology is accelerating.

Selection of processor

Different models are available for the same processor series. For example, the Intel Core i3 processor series has several models with different clock speeds, cores, and cache size. If you plan to buy a laptop with an Intel Core i3 processor, you must understand what kind of model it is and what the differences are.

When choosing a laptop computer, make sure that the processors are new. Online shops provide detailed product information along with component details. If we can find the year of manufacture, the components' age can be easily understood. Only buy if the manufacturing date is at most two years old. A laptop computer with an Intel Core i3, a 10th-generation processor, will likely be sold in 2024 for less. According to the internet, the Intel Core i3, a 10th-generation processor, was released in 2020. Intel's new processors are the 14th generation. A laptop with a three-year-old processor is obsolete. Regardless of the company's processor, after knowing the model number, you can search the web to find out the year of release and the performance. For example, if the processor of the laptop you want to buy is an Intel Core i3-1315U, you can find the following details by searching on Google:

Series: Intel Raptor Lake-U, 6 Cores, 8 Threads, Speed up to 4.5 GHz, 10 Mb Cache, L1 Cache 544 KB, L2 Cache 5 MB, L3 Cache 10 MB.

Local computer shops may provide less information about laptops than online shopping sites. The laptop's performance can be identified by checking the benchmarking websites. Such websites offer information on the performance of processors by comparing them with those of their competitors. If you Google the laptop processor model number, you can find websites that offer pros and cons, comparisons, and pros.

RAM (Random Access Memory)

RAM (Random Access Memory) acts as temporary storage when the CPU processes data. When the computer runs, necessary information is stored in RAM and read as needed. Data in RAM is lost when the computer is turned off. Personal computers come in RAM sizes ranging from 4 GB to 32 GB. RAM speed and quantity play an essential role in the best performance of computers. Especially for multitasking and games, RAM with storage capacity is required. RAM is necessary for the operating system and applications to run quickly. Laptops should have enough RAM for smooth operation.

DDR (DDR - Double Data Rate) type of RAMs are popular today. DDR RAM also has different generations. The most important of them are DDR-3 and DDR-4.

DDR-3 RAM, released in 2007, was widely used in computers. DDR-3 generation is characterised by higher speed and lower power consumption than DDR-2 RAM. DDR-3 RAMs, operating at voltages ranging from 1.5V to 1.65V, were available from 1066 MHz to 2133 MHz. In addition, DDR-3 memory modules were also available that could store up to 8 GB of data.

DDR-4 RAM, released in 2014, is mainly used today. DDR-4 RAMs running at lower voltages (1.05V to 1.2V) are more energy efficient. Also, the speed is much faster than DDR-3 (2133 MHz minimum speed). Memory modules that can store up to 32 GB of data are available in DDR-4. DDR-4 RAM is included in new-generation laptops.

The maximum amount of RAM a laptop can support depends on the hardware and operating system. For example, most laptops available today can use 16 GB of RAM, but high-end gaming laptops can use up to 32 GB. The maximum amount of RAM that can be used in a laptop is indicated with the product. If you install more RAM than your computer's motherboard can support, your computer will not be able to use it.

Soldered RAM

Such RAM is fixed directly on the motherboard. Solid-state RAM cannot be upgraded or replaced later than standard RAM. While buying a laptop with soldered RAM, you should anticipate the future and ensure you have enough memory because adding more RAM later is impossible. Some laptops have RAM soldered, and a slot is provided for the convenience of adding more RAM. If the soldered-on RAM is damaged, the entire motherboard may need to be replaced, and it is expensive. Most new-generation laptops have soldered RAM.

The size of the RAM depends on the nature of the tasks it is used for. In today's scenario, laptops for office purposes should have a minimum 8 GB of RAM for better performance. 32 GB of RAM is required for gaming and multimedia editing tasks.

Storage

The storage capacity and speed of computer storage are increasing day by day. The storage capacity of modern computers is usually measured in Gigabytes (GB) and Terabytes (TB). Two types of storage are popular: Hard Disc Drives (HDD) and Solid-State Drives (SSD). Both types of storage differ in technology and speed. Laptop users need to understand features and differences between different kinds of storage.

Hard Disc Drives

Hard disc drives are an ageing storage technology. Data is stored on magnetic discs mounted on a spindle. A needle-like element (Head) is used to add and retrieve information. Information is collected in different parts (Tracks and sectors) of the magnetic disc. The magnetic disc spins as information is read and written. Information is added and retrieved by moving the head over the surface of the rotating disc. Hard disc drives are relatively affordable. The main drawback is the weight. With the popularity of Solid State Drives, hard disc drives are becoming less relevant.

Solid State Drives

Flash-based solid-state drives (SSD) were introduced in the 1990s and have recently become popular in the market. Solid State Drives are a technology that is different from hard disc drives. Here, flash memory is used to store data. The same technology is used in USB flash drives, including pen drives.

There are no mechanical parts so data can be captured and recorded quickly. The advantages of solid-state drives are speed, lightweight, and small size.

Different types of solid-state drives

Solid State Drives are available in two varieties, 2.5-inch and M.2. SSDs are available to connect both SATA and PCIe interfaces. SATA and PCIe are interfaces that connect to a computer's motherboard. In computing, an interface is a shared boundary where two or more components of a computer system exchange information. M.2 is the form factor of various computer components, including the storage that can be attached to the PCIe interface. The terms NVMe and M.2 are often confusing to the general public and are used interchangeably when referring to storage systems.

NVMe is an Open data storage protocol. NVMe has faster data transfer than SATA SSDs. NVMe stands for Non-Volatile Memory Express. NVMe SSDs use an interface called PCIE (Peripheral Component Interconnect Express), which speeds up data transfer speeds compared to standard SATA SSDs. The data transfer speed of SATA SSD is 600 MB per second. The data transfer speed of the new generation of NVMe storage drives is 5000 MB per second. NVMe SSDs are used in newer computers. Slower SATA SSDs are vacating the field. Storage type is often noted on laptop computer details (e.g., NVMe M.2). New generation laptops are available with the support of NVMe M.2 storage.

Generation indicators are also used to indicate changes in NVMe SSD storage technology. NVMe SSD generations 3, 4, and 5 are available in the market. The new generation of NVMe SSD storage will improve efficiency and performance. It can be checked whether the NVMe SSD included in the laptop is the latest generation.

Cloud storage

The traditional way of storing information in computer storage itself is changing. Cloud storage is a method of computer data storage. Information is stored on remote servers and retrieved and used when needed with the help of the Internet. Information is stored in data centres owned by companies. Cloud storage services are offered both for free and for a subscription fee.

Cloud services can be used for personal purposes in two ways. One is storing personal files (photos, documents) in cloud storage; the other is storing files using cloud-based software. Software services are becoming cloud-based. Instead of installing software on a computer, using software installed on cloud servers through a web browser is becoming increasingly popular. Google Docs and Microsoft 365 are cloud-based word-processing software. Files created in Google Docs are stored in Google's cloud storage.

Display

The display is one of the most used components on a laptop computer. The user should choose a laptop with a suitable screen size and resolution.

Laptop screens are available in many sizes. The screen size is measured diagonally. The most popular screen size is 15.6 inches, and laptops with sizes ranging from 11 to 17 inches are available. The large screen is perfect for gaming, watching movies, and editing photos or videos. Most laptop buyers think little about screen size. Laptops with 15.6-inch screen sizes will be primarily available in the sales outlets. Laptops with a screen size of 15.6 inches are suitable for people who use them only in one place regularly and only travel a little. The smaller the screen size, the lighter the laptop. Laptops with smaller screen sizes are lighter and easier to carry in a bag. Laptops with a screen size below 14 inches are helpful for people who travel a lot.

Screen resolution

Screen resolution refers to the number of pixels displayed on a screen. Pixels are small squares that make up a complete image. Screen resolution is a measure of clarity. The higher the screen resolution, the clearer and better the visual experience. HD Ready, Full HD, and 4K are the most common screen resolutions currently available. Screen resolution is measured in terms of pixel count. It considers the number of pixels that occupy the horizontal and vertical screen surfaces. Popular displays with different screen resolutions are:

HD - HD Ready: Display with 1366x768 pixel count. Entry-level laptops will have such a display. Such a display is sufficient for essential computer use such as web browsing, watching videos, and word processing.

Full HD: Display with 1920x1080 pixel count. Full HD provides a higher resolution visual experience than an HD Ready screen.

Ultra HD and 4K: Display with 3840x2160 pixel count. Provides four times the resolution of Full HD.

As the clarity and resolution of the screen increase, so does the price. A laptop with a Full HD screen that combines the best visual experience, price, and battery life is the best buy right now.

Touch screen

Laptops with touch screens are available, and Two-in-One laptops currently have this facility. These laptops are expensive.

Refresh rate

The refresh rate is the number of times an image is changed per second on a laptop screen. It is measured in Hertz or Frame Per Second (FPS). A typical refresh rate for laptops is 60 Hz. Multimedia and gaming activities require a high refresh rate. The screen cannot provide the best visual experience if the refresh rate is low.

NITS

The NITS level plays a vital role in the visual experience. NITS is a unit to measure the brightness of digital displays. Understanding what NITS are is necessary to compare the brightness levels of different displays, from LED displays to mobile devices. NITS measures light intensity per square meter of a display surface. Higher NITS means a brighter screen.

The required NITS value varies according to use. 200 NITS of brightness is sufficient for everyday use, such as web browsing, word processing, and watching movies. 300 NITS of brightness is required for tasks that require precision, such as photo editing, video editing, and gaming. 300 NITS is adequate for indoor laptop use. A 400-700 NITS is required for the best viewing experience in daylight. 1000 NITS of brightness is essential for use in direct sunlight. Along with the laptop specifications, it will also mention how many NITS of brightness the display has.

Bezel

Bezels are the black plastic edges around the laptop screen. It helps to protect the screen from damage caused by bumps and knocks. Laptops without bezels are also available. Reducing the width of the bezel increases the size of the screen. The bezel can protect the screen as a protective shield.

Matte and Glossy display

Glossy displays are standard in laptops. The matte display is ideal for using the computer without eye strain as it is non-reflective. Premium laptops usually have a matte display.

Camera

A camera is required to participate in online meetings and record videos. Laptops often come with a camera.

The camera on the laptop has the following features:

Video Resolution: For the best image quality, the camera has a resolution of at least 720 pixels, or 1080p.

FPS (Framerate Per Second): It should have a high frame rate; frame rates between 30 and 60 per second will provide smooth video playback.

Auto Focus: This helps keep the image sharp as you move closer or further away from the camera.

Low-light performance: If the camera is used in dimly lit areas, a camera with a low-light feature will provide better images.

Microphone: The webcam will have a built-in microphone.

Often, the cameras on entry-level laptops are of poor quality. If so, buying an external web camera is a good option.

Graphics card

A graphics card, or graphics processing unit, is a hardware component required for visual quality. It is placed on the computer's motherboard. Photo and video editing software, design software like AutoCAD, and most modern games require a dedicated graphics card to run smoothly. The higher the capacity of the graphics card, the higher the visual quality. NVIDIA and AMD are the leading manufacturers of graphics cards.

There are two main types of graphics cards:

Integrated Graphics: This type of graphics card is integrated with the CPU and is sufficient for everyday computing. Suitable for computers with basic graphics needs such as casual gaming, web browsing, and office work.

Discrete Graphics: This graphics card type is not part of the CPU. It has its own memory and processing power. These are ideal for computers used for tasks such as gaming, video editing, and 3D modelling.

When choosing a graphics card, there are several factors to consider:

- The type and model of the graphics card will influence the overall performance.

- If the graphics card has more memory, it can run games and other applications at a higher resolution.
- The interface that connects the graphics card to the motherboard is PCIExpress.
- Graphics cards require more power to run.

A laptop with a dedicated graphics card is worth buying only if you need to do many graphics-intensive activities.

Keyboard

The world's most popular keyboard is based on the QWERTY layout. The QWERTY layout gets its name from the first six letters on the top row of the keyboard. The QWERTY keyboard is the most popular layout for many English-speaking countries, such as the US, UK, Canada, and Australia. It is used in many parts of Europe. The QWERTY keyboard is also used in India.

Backlit keyboards are necessary if you need to work in a low-light environment. The illumination is provided by the LED lights placed below the keyboard. It makes it easy to see the letters on each key. The intensity of the light can be increased or decreased. The keyboard light can also be turned off if not required. A backlit keyboard consumes very little power and does not significantly impact a laptop's battery life.

Battery

Laptop computers use lightweight, energy-efficient lithium-ion batteries. The capacity of laptop batteries is usually measured in mAh (MilliAmpere-Hour) units. A battery with a higher mAh rating can keep the laptop running longer. The lifespan of laptop batteries is generally calculated based on how many times they can be charged. A charging cycle is the process by which a battery is fully charged and discharged. The average lifespan of laptop batteries is 300-500 charge cycles.

How many cells the battery has will be mentioned in the laptop description. A battery can be seen as a set of cylinders (Cells) that store electricity. A battery is a container that holds them together. A three-cell battery will have three cylinders.

Laptop battery life depends on usage patterns and charging habits. The laptop should be charged below 80% to keep the battery healthy by plugging it in. The operating system's quality and the application software's nature are also factors that influence the energy efficiency of a laptop computer battery.

Connectivity

Various ports and connectivity systems are required to attach devices like pen drives, projectors, printers, mouse, keyboards, speakers, headphones, and phones to the laptop. Make sure that the laptop you are going to buy has ports to connect the extra devices.

USB Type-A: To connect a flash drive, printer, mouse, and mobile phone. There are 2.0 and 3.0 USB generations. The current generation's USB 3.0 data transfer speed is faster than the previous generations.

USB Type-C: USB Type-C is a port with higher data transfer speed. The size is small and compact. Type C ports are widely used in phones and computers.

Card Reader: Used to transfer data from microSD and SD cards. It is useful for transferring photos from digital cameras to laptops.

HDMI: This port is used to connect to TVs and projectors.

Thunderbolt: Thunderbolt is a combination of a Type C connector and display port. Using a single port, it can be used as a charger, connected to other devices, and displays.

VGA: Used to connect to TVs, computer monitors, and projectors. VGA is obsolete and not available on new-generation laptops.

Form factor

The form factor of the laptop is diverse. Laptops are made available in various forms with different uses in mind.

Basic laptops

Basic laptops have a traditional clam-type design, which is the most popular and affordable. It has a screen that folds over the keyboard and mousepad. Generally less expensive than touchscreen and 2-in-1 laptops.

Thin and lightweight laptops

Basic laptops are heavier and tend to be inconvenient while travelling. Laptops are becoming thinner and lighter due to advances in technology. Lightweight laptop cases, bezel-less screens, SSD storage, and features such as drives and RAM mounted directly on the motherboard make laptops lighter and lighter.

2-in-1 laptops

2-in-1 laptops can be used as both a laptop and a tablet PC. 2-in-1 laptops are available in two variants: detachable and convertible. The convenience of a detachable laptop is that you can detach the screen and use it like a tablet PC. A convertible laptop can be used like a tablet PC by folding the screen and keyboard to one side. It is also convenient to write on the screen using the stylus pen.

Material

The outer part of the laptop is made of thin construction materials such as plastic or aluminium. Budget laptops tend to have low-quality plastic casings. Premium laptops are made from

aluminium or premium plastics. Laptops are manufactured under the label of premium military-grade plastic. No matter what material they are made of, laptops cannot withstand impact beyond a specific limit.

Laptop customisation

Only recently have laptop consumers in India been able to purchase a laptop with the required hardware components assembled. It was only to buy a laptop computer made in other countries. Laptop manufacturing components such as processors, motherboards, RAM, chipsets, and storage are manufactured by various companies in Vietnam, Korea, Malaysia, and China. Manufacturing components are transformed into laptops at assembly units in multiple countries. China was at the forefront of assembling and shipping laptops to other countries. More companies have been active in India by announcing tax breaks on electronic and computer equipment assembly. Companies such as HP, Dell, Acer, and Lenovo have started manufacturing laptops in India. Lenovo and Dell companies offer the facility to build laptops by selecting the components that suit the customer's needs. Processor, RAM, graphics card, storage, and web camera can be selected and ordered through the company's website.

Conclusion

By choosing the proper hardware, we can increase our laptop's performance, battery life, and lifespan. So, before buying a laptop computer, it is better to understand our needs, compare different options, and make the most suitable choice. When purchasing a new laptop computer, it is essential to consider various factors, including processor clock speed, cache, and cores. Make sure that the laptop's components are up-to-date. Since the functioning of computer components is interrelated, all components should be given equal importance.

Watch this video to learn how to build a laptop computer.
https://www.youtube.com/watch?v=O9vO_CVNXlg

Operating systems

Introduction

An operating system makes the computer hardware work for the user. The operating system manages the hardware and software and provides an interface for users to operate the computer. Windows is the most popular operating system for personal computers. Mac OS is an operating system designed exclusively for Apple computers. Linux-based operating systems are suitable for computing devices such as personal computers, servers, tabs, and mobile phones. This chapter introduces the operating systems and their features.

Windows

Windows is the most popular operating system among beginners and professionals. Windows operating system is preloaded on most laptop computers. Laptops come with two versions of Windows: Home and Pro. The home version is intended for general computer use. This version is available with security features like Defender antivirus software, a firewall, Windows Firewall, parental controls, and device encryption. Windows Pro places more emphasis on data privacy and security. Windows Pro is designed for business organisations and power users. For generic purposes, laptops come with the Windows Home edition. Windows 11 Home Edition is priced at around Rs. 10,000. The laptop computer's total cost includes the operating system's cost. The Microsoft Office package is also available with the Windows operating system. The Windows operating system is available with the laptop at a lower price due to the mutual agreement between computer manufacturers and the Microsoft company.

The Windows operating system that comes installed on a laptop computer will be the OEM (Original Equipment Manufacturer) version. The OEM license is usually written into the computer's motherboard and, therefore, cannot be transferred to another computer. Windows operating system will only run on the computer with the particular OEM version assigned. If the Windows operating system is disabled or deleted for any reason, reinstalling it may not be possible. At the same time, the Windows retail version will have a license key. Even if the operating system is lost, it can be activated with the key after reinstallation. The OEM version of the Windows operating system is cheaper than the retail version.

If you plan to use newer versions of the Windows operating system, choose a laptop with better performance. At least 8 GB of RAM capacity is required.

FreeDOS

FreeDOS is a minimal free operating system. Visual Desktop is not available for this operating system. There are minimal things that can be done with FreeDOS. FreeDOS comes preloaded on computers that come without other popular operating systems.

Linux

Laptops are also available with Linux-based operating systems. Although hundreds of Linux-based operating systems are available, the Ubuntu operating system is preloaded with Linux laptops. Since Ubuntu is free software, the laptop's price will also decrease. Ubuntu offers better speed and performance compared to other operating systems, like Windows. At the same time, Ubuntu is easy for beginners to use. Software for various uses is available in Ubuntu. Ubuntu is more secure than Windows, but there are fewer virus and malware attacks in Ubuntu.

Laptops are also available without an operating system. After purchasing such a laptop, the customer can install and use their own Linux-based operating system. There are various editions of the Ubuntu operating system available. They are Xubuntu, Kubuntu, Lubuntu, and Ubuntu Cinnamon. Xubuntu and Lubuntu are lightweight Ubuntu-based operating systems suitable for laptop computers with low processing power. Windows operating system makes slow, low-performance laptops.

Android operating system

Android is a Linux-based operating system developed for mobile devices. Initially, the Android operating system was not suited for laptop computers. However, some Netbook computers use a modified Android operating system. Android operating system can work better on low-performance computers. Prime Book is a Netbook that uses an Android-based operating system. Prime Book is an Indian enterprise. The operating system they developed is called Prime OS.

MacOS

MacOS is an operating system developed by Apple for computers. MacOS has been included in Apple computers since 2002, and it is designed specifically for Macintosh computers. It is known for being a stable and secure operating system. Applications are available for browsing, word processing, and professional photo, video, and music editing. MacOS is only available to users of Apple computers, including laptops. Apple's laptop is known as the MacBook. Apple's computers and peripherals are expensive, so only a small segment of customers use them in the Indian market.

ChromeOS

ChromeOS is a Linux-based operating system developed by Google. The first edition was released in 2009. Suitable for use on laptops, tablets, and desktop computers. Chrome OS is proprietary software.

Unlike traditional operating systems, it has no desktop interface and is browser-centric. Chrome OS has a simple and fast interface. Chrome OS is ideal for using cloud-based software services. ChromeOS is used on laptops in the Chrome Book category. As it is a Linux-based operating system, there are fewer threats from viruses and malware.

Conclusion

As per the statistical sources, Microsoft Windows has a 73% market share in computer operating systems by 2024. Most laptops come preloaded with the Windows operating system. Laptop companies support the Windows operating system because it is familiar to most users and easy to use. The price of the Windows operating system is included in the laptop price. Linux-based operating systems are not so popular among users; only limited models come with operating systems like Ubuntu.

Different types of laptops

Introduction

Laptops can be divided into different types based on several factors, such as components, price, performance, and usage. The diversification of laptops is mainly due to their different uses. Common people need to be made aware of the various laptop segments. Most people choose laptops based on price alone. Laptop categories help customers make selection easier as they are made for different purposes.

Laptops for entry-level users and students

Entry-level/student laptops are designed for beginners' use. Affordable laptops fall into this category. Entry-level laptops are suitable for various tasks, such as browsing, writing, presentations, etc., to fulfil daily needs. Often, these laptops come with the Windows operating system and Microsoft Office software. The performance of a laptop computer mainly depends on its processor, RAM, and storage. Laptops for basic tasks like web browsing and word processing are built using basic-purpose processors like Intel i3 and AMD Ryzen 3. An entry-level laptop may not be adequate for activities like video editing or 3D rendering. The components of student laptops are not necessarily of the highest quality to provide a low price tag.

Major laptop manufacturers are launching products in the entry-level/student laptop range. Dell Inspiron, Lenovo IdeaPad, and Acer Aspire are entry-level laptops in the student laptop category.

Business laptops

These are laptops designed for business professionals. It is more durable than standard laptops and has features suitable for long-term use. They will excel in battery life, processing capacity, and an extended warranty period. It will include features (e.g., biometric and fingerprint login) and software (e.g., firewall and anti-virus) to protect information and prevent unauthorised access. Business laptops also have design features that can be taken with frequent travellers, such as being lightweight and having a small screen size. Business laptops are also priced higher than entry-level laptops.

All the major laptop computer manufacturers make business laptops: Dell Latitude, HP EliteBook, Lenovo ThinkPad, and Apple MacBook Pro are popular business laptop ranges.

Netbook

A netbook computer is a small and lightweight laptop. They are cheaper and smaller in size than regular laptops. They generally have a screen size of up to 11.6 inches and a weight of 1 kg to 1.5 kg.

Netbooks are mainly used for basic tasks such as internet browsing and document editing due to their low processing power, RAM, and storage size. They need a more powerful processor or discrete graphics card. Therefore, they are unsuitable for playing games or tasks requiring more computing power, such as video editing.

Netbooks are very convenient for students, professionals, and travellers. Being small and light, they can be easily carried and stored in a bag. Netbooks are a budget-friendly option as they are cheaper than laptops. The popularity of netbooks has declined with the advent of mobile phones and tablet PCs.

Gaming laptops

Laptops for gaming purposes require high performance. Gaming laptops are characterised by high-performance processors like Intel Core i7 or AMD Ryzen 7, dedicated graphics cards, high RAM capacity, fast SSD storage, a high refresh rate, and a high-quality display. Gaming laptops with screen sizes up to 17 inches are available.

Leading brands of gaming laptops include Asus ROG, MSI Raider, Dell Alienware, HP Victus, Acer Nitro, and Predator.

Laptops for creative professionals

Laptops need more performance for tasks like multimedia editing and 3D rendering that require high computing power. Otherwise, multimedia tasks will drag. High-performance laptops such as the Apple MacBook Pro series, MSI Prestige, HP ZBook, and Lenovo ThinkPad range are used to handle multimedia creation.

Chromebook

Chrome Book is a laptop that runs on the ChromeOS operating system developed by Google. ChromeOS runs on the Chrome web browser. Chromebook is designed to be ideal for using web-based applications and services. Chromebooks cost less than traditional laptops. Less computing power means more battery backup. It doesn't have the same performance as conventional laptops because it uses processors like the Intel Celeron, which are less capable. The Chromebook will be a better choice for people who use many web-based services.

Chromebooks from HP, Acer, Asus, and Lenovo are available.

Tablet laptops

They are also known as two-in-one laptops. A tablet is a computer that combines the features of a PC with those of a laptop. The key feature is a touchscreen display that can be detached from the keyboard. It can be used in multiple ways, such as for conventional laptops or as a tablet for browsing the web or reading e-books. Two-in-one laptops belong to the premium category and are priced higher than entry-level laptops.

Tablet laptops are helpful for those who want a computing device that can be used for both work and leisure. It is convenient for students to take notes in class and write assignments at home.

Conclusion

Different types of laptops are made with varying uses in mind. Laptops built with high-quality components last longer. The quality of components like a speaker, battery, keyboard, web camera, casing, and display is higher for business laptops than entry-level laptops. A durable business laptop should be chosen if long-term, trouble-free use is intended. Laptops in the Netbook and Chromebook categories are ideal for light, web-based uses. Choosing a laptop computer with a mid-range processor is also suitable for tasks that do not require much computing power. After professional use, two-in-one laptops can be converted to tablet pc for social media use. Choose a laptop computer that suits the customer's needs and budget.

Planning to buy a laptop computer

Introduction

Everyone decides to buy a new laptop when the current laptop computer is unusable, for a new job, for joining a course, or when the device is lost. Instead of buying any laptop in haste, do some research and buy one that suits your needs and budget. This chapter describes how to plan and review a laptop computer purchase.

Assess needs

The user needs a clear idea of what they intend to use the laptop for. Only then can a decision be made regarding computing capacity, size, price, etc. The user knows his priorities, such as office work, entertainment, and web browsing. A computer suitable for office work cannot run high-end games. There is no need to buy a high-end, expensive computer for basic computing purposes.

What is the budget?

Laptops for general use are relatively inexpensive. For gaming, video editing, etc., laptops in the premium segment are more expensive. When new laptops are launched, there is a high chance that old-model laptops will decrease. As new models are released with the support of new technologies, existing models' prices decrease. Dealers tend to sell old models as soon as possible by reducing prices. If you don't have enough money to buy a laptop, consider buying an older one instead of the latest model. If a computer with an Intel i3 generation 13 processor is the latest on the market in 2024, laptops with an older model Intel i3 generation 11 processor can be found for less. Older models of premium computers are available for purchase at low prices.

Which factors are most important?

When buying a laptop to watch movies, buy a model with components that provide the best visual experience; for example, the Ultra HD 4K display will provide a better viewing experience. Those who need to use it for gaming can choose a model with a dedicated graphics card. Laptops with less thickness and screen size are available for frequent travellers.

Compare prices

You can compare prices by visiting various shops and online shopping sites. Prices on shopping websites are constantly changing. There are alert services to help you understand how far the price goes down and whether a further price drop is possible. Such services provide notification mechanisms when the customer falls below the target price. One such service that can be used is https://compare.buyhatke.com. You can see the price differences in real time by using the Buy Hatke service's mobile app and Chrome browser extension.

Read online reviews

Checking the reviews of laptop buyers on online shopping sites will help you understand the real pros and cons of the product. The same laptop models will be available on different shopping sites; check the reviews of at least two places. No matter how good a laptop is, at least a few users may have a bad experience. So, at least some of the customers must have recorded a bad experience.

Computer magazines often do reviews and comparisons of laptops. Reviews can be found on magazines' websites. YouTube channels, online portals, and blogs can also provide videos and articles introducing and reviewing laptops.

Showroom visit

Visit the computer showrooms and take a look at the laptops on display. The downside is that only a limited number of models are available in showrooms. The details of the models available in the showrooms can be searched online to find out whether they are good.

Exchange

It is worth asking about the store offering the exchange of old, used laptops. Online and local stores offer the option of exchanging a used laptop for a new one. The price of the exchanged laptop is reduced by a discount on the cost of the new laptop. The price depends on the age, condition, model, and laptop components. The advantage of the exchange method is that the old laptop can be sold without liability.

You can check online shopping sites to determine how much a used laptop costs. Along with the details of the laptop model to be purchased, it will also mention whether there is an exchange. Know the laptop's brand, model, year of manufacture, processor, RAM, and storage capacity. This information is crucial in determining the exchange price of an old laptop. Hiding information about the current status of the laptop computer will result in rejection.

Before handing over the old laptop, check for any minor damages or repairs needed. Fix the damages and problems before planning the exchange; otherwise, it will affect the valuation. Back up the data and keep it in a safe place. Format the storage and ensure that no personal information is left behind. Keep the original accessories that came with the laptop, such as the charger. The accessories need to be handed over, along with the laptop computer. Some sellers

will only take the old laptop for exchange after checking it thoroughly and ensuring there are no problems.

Let's also see what happens to the laptop being exchanged. A laptop computer is sold as a used or refurbished laptop after renovations such as cleaning, replacing damaged parts, and reinstalling the operating system. Many companies sell refurbished, used laptops.

If the exchanged laptop is too old or in poor condition to be reused, metals and plastics are extracted and recycled.

Conclusion

Instead of buying a laptop with the latest technical features, buy a model with technical features that suit your needs. Consider factors such as processor speed, RAM capacity, size of storage, and the display that best suits your usage. By prioritising the essential features that meet the user's requirements, it is easy to find a laptop that suits the budget.

Leading laptop manufacturing companies

Introduction

The first portable computer was the IBM 5100, released by IBM in September 1975. The first portable computer weighed 25 kg. Portable computers paved the way for the development of laptops. Companies such as IBM, Zenith, Compaq, HP, Toshiba, and Apple were instrumental in developing early forms of laptop computers. All the major companies involved in laptop manufacturing today are research-focused as well. By assimilating technological changes, laptop manufacturers can constantly release new models incorporating the latest features and technologies into their laptops. As laptop manufacturing is outsourced to other companies, it is possible to focus on research. This chapter explains brands with a global presence and the various laptop series they launch.

Lenovo

Lenovo is a Chinese multinational Information Technology company. The company's products include desktop computers, laptops, tablet computers, smartphones, workstations, servers, supercomputers, and electronic storage devices. According to statistics, Lenovo's computers are the most sold globally.

Laptop models are launched to meet the needs of different types of customers. Various laptop models include:

Idea Pad: This is an entry-level laptop range. The laptop series is suitable for daily use, such as web browsing, streaming video, and writing.

Think Book: A laptop range for small business customers. The Think Book series has fewer premium features than the Think Pad series of business laptops.

Think Pad: Think Pad is a range of high-performance laptops for business users. The Think Pad range has different types, like E, L, T, X, Z, and P.

Legion: Legion is a range of laptops for gaming customers. Gaming laptops are characterised by a powerful processor, graphics card, and other peripherals that help with gaming.

Yoga: Yoga is a range of two-in-one laptops and tablets. The Yoga series machines are built so that they can be converted into a laptop computer or a tablet.

HP

HP (Hewlett-Packard) is an American multinational information technology company that manufactures laptops. Apart from laptops, they manufacture desktop computers, tablets, headphones, printers, and scanners.

Laptops are launched in various ranges to suit users like students, business professionals, gamers, etc.

HP's laptop series is as follows:

Pavilion: Pavilion is HP's budget laptop range. It is built for basic computing purposes such as browsing the Internet, checking email, and office needs.

ENVY: ENVY is a mid-range laptop series with stylish designs and good performance. These laptops are popular with creative professionals, students, and gamers.

Spectre: Spectre is HP's premium laptop range. The Spectre series features a great design, a long battery life, and can be used like a tablet PC.

OMEN: OMEN is HP's laptop range for gamers.

Chrome Book: The HP Company also manufactures Chrome Books.

Dell

Dell is an American multinational company that manufactures a variety of computers and accessories, including laptops. Dell Company was founded in 1984 by Michael Dell.

Inspiron: An affordable laptop range for entry-level customers. The appeal of the Inspiron series of laptops lies in their attractive low prices and features suitable for everyday tasks.

Vostro: The Vostro series consists of laptops designed for the needs of small and medium business customers.

Latitude: This series includes models designed for business users. Latitude series laptops are characterized by enhanced security and quality construction.

XPS: XPS is a premium model laptop series. This series is aimed at different types of users, such as gaming, creative professionals, and business users.

Apple

Apple Inc. is an American company that manufactures computers, mobile phones, and tablets. The company was founded in 1976 by Steve Jobs, Steve Wozniak, and Ronald Wayne.

Apart from products like Mac computers, iPhone, iPad, and iPod, Apple also developed operating systems like iOS and macOS. Apple's products emphasise good design, usability, and user experience.

Laptops manufactured by Apple are called Macs. Mac laptops are characterised by great design, high performance, and ease of use.

Key features of Mac laptops are:

macOS: macOS is an operating system developed by Apple. Ease of use and stability are key features.

Retina Display: The Retina Display is a high-resolution display developed by Apple that provides a better viewing experience.

Trackpad: It is a large and smooth touchpad.

Built-in Security: Mac laptops come with excellent security features.

There are two main Mac laptop models:

MacBook Air: The MacBook Air is an entry-level laptop range. Suitable for daily work and student use.

MacBook Pro: MacBook Pro is a laptop with more computing power. It is suitable for tasks like video editing, graphics design, and programming.

ASUS

ASUS is a Taiwan-based multinational computer hardware and consumer electronics company founded in 1989. Asus is one of the leading motherboard manufacturers.

Vivo Book: The Vivo Book series includes models that can be used for everyday work.

ZenBook: The Zenbook series consists of lightweight and compact laptops.

ProArt Studiobooks: These are laptops made for professional use.

ROG and TUF: Two series of laptops for gaming.

Chrome Book: Asus has partnered with Google to launch Chrome Book computers.

Acer

Acer is a Taiwanese multinational company founded in 1976. Apart from laptops, it also manufactures various electronic devices like desktops, tablet PCs, and monitors.

Acer company has launched several laptop series to suit different needs and budgets. The various laptop series from Acer are:

Aspire: Aspire is an entry-level series designed for general use, such as students, offices, and homes.

Swift: Swift is a series of laptops designed for people who need to travel a lot. These laptops are characterised by a lightweight, sleek design and a long-lasting battery.

Travel Mate: A laptop series aimed at business users. The Travel Mate series will have more safety features.

Nitro: The Nitro series is a laptop range for gamers.

Predator: The Predator series is designed for gamers and graphic designers who need high performance and speed.

Chrome Book: Acer has launched a long line of Chrome Book laptops.

Samsung

Founded in 1938, Samsung is a South Korean multinational consumer electronics company. Samsung company is also active in the laptop market. The laptop series is known as the Samsung Galaxy Book. Following are the various laptop computer models:

Galaxy Book 3 Ultra: A premium laptop with high performance.

Galaxy Book 3 Pro: The Galaxy Book 3 Pro is a thin and light laptop.

Galaxy Book 3 Pro 360: A two-in-one laptop with a touchscreen display. It can be used as a tablet PC or laptop computer.

Galaxy Book 3: A mid-range laptop suitable for general use and multitasking.

Galaxy Book 3 360: The touchscreen version of the Galaxy Book 3.

MSI

MSI (Micro-Star International) is a Taiwanese tech company founded in 1986. The MSI company is known for its premium gaming laptops and professional workstations. Their main products are laptops, desktops, graphics cards, and motherboards. The laptop ranges are:

Modern: Thin and light entry-level laptops suitable for daily tasks and students.

Summit: Laptop series for institutions and business users.

Gaming: Raider, Vector, Katana, and Titan are popular gaming laptop models of MSI.

Prestige: Designed for creative work such as video editing and 3D animation.

Workstation: Workstations that offer high performance for professionals in fields such as engineering and architecture.

MSI laptops are sold in India through Flipkart, an online seller.

Fujitsu

Fujitsu is a Japanese multinational information technology and communications company. Established in 1935, the company's field of activity is vast. The company is in various sectors, such as computer hardware, software, semiconductors, cloud computing, telecommunications, data storage, and consumer electronics. Fujitsu is the world's sixth-largest IT service provider and Japan's largest. 2017 Fujitsu and Chinese company Lenovo merged their personal computer division businesses. As a result of the merger, Lenovo owns 51% of Fujitsu's computer division, the Development Bank of Japan owns 5%, and Fujitsu owns 44%.

UH series: This series consists of lightweight and slim laptops. UH series laptops weigh only 1 kg.

Life Book: Life Book is a laptop series designed for business professionals. Several models of laptops are available in this series with distinguished features.

Celsius: Celsius is a range of laptops suitable for tasks that require high computing power. Laptops in this category have powerful processors and graphics cards.

LG

LG Electronics is a South Korean multinational company. LG is a leading manufacturer of electronic devices. They are leaders in manufacturing appliances such as televisions, refrigerators, washing machines, and mobile phones.

LG Gram: LG Gram is a range of thin and light laptops. These laptops weigh less than a kilogram. Suitable for the needs of both students and professionals. There are three laptop models in this category: LG Gram, LG Gram Two-in-One, and LG Gram Style.

LG UltraGear: A laptop category designed for gaming purposes. These include processors with high computing power, graphics cards, excellent display and cooling systems optimised for gaming needs.

LG laptops are not readily available in computer shops. One can buy an LG laptop directly from online shops and the company's website.

Conclusion

All the major laptop manufacturers are releasing great products. The same company has launched several models to diversify into products for different computing needs. They have also set up a service network to reach all parts of the country. Make sure there is a service centre in your area or nearby to decide which laptop brand you want. Naturally, some of the laptops sold are damaged. If the damage occurs before the warranty period ends, the problem will be solved by approaching the service centre. If the company offers a warranty for an extended period, buying is advisable. The company's service centre or other centres that provide better service can be approached to solve the issues that arise after the warranty period.

Where to buy a laptop

Introduction

Once upon a time, everyone used to buy laptops from local shops. Online stores are also active today. It is also possible to buy directly from the laptop manufacturer online. Regardless of where to buy it, the price of a laptop can vary depending on various factors. Due to fierce competition, there is little price difference between online and local shops. However, laptop prices come down a lot during sales fairs and special occasions. This chapter mentions the features of laptop sales outlets.

Online shops

The advantage of online shopping sites is that most laptop manufacturers's products will be available. The attractiveness of online shopping sites is due to the best offers, discounts, and availability of all payment methods. Online shopping sites provide an opportunity to buy laptops at great discounts using credit and debit cards. It is also possible to buy laptops with attractive discounts on interest-free installments.

Technical details of the laptop, user reviews of the computer, comparison of different models, and the opportunity to ask the sellers and users questions make online shopping sites more attractive.

Online retailers can sell laptops at lower prices as the operating costs are lower than in local shops.

Customers are worried about the warranty, bill, and after-sales service. For all products, it is the responsibility of the manufacturer to provide a warranty. In case of damage, just approach the company's service centre. Service centres can understand sales and warranty information from the product's serial number without submitting the bill. The merchant will not be held responsible for any damage after selling the product. The customer has to approach the service centre for troubleshooting. Products purchased from online shopping sites are eligible for return and exchange if damaged.

Direct purchases from manufacturers

All laptop manufacturers sell the products directly through their websites. All kinds of sales promotions on online shopping sites, like offers, discounts, and clearance sales, are also

available when buying directly from the companies. Companies have also provided the facility to purchase products on installment terms. Some companies offer special discounts when students buy laptops.

Retail shops

Local shops also offer lower prices, attractive offers, and various financing options to compete with online shopping sites. Some customers visit local retail shops to see the laptop, try it on, and buy it. Such customers may approach retail shops with a good sales track record. Retailers with showrooms in different locations buy laptops in bulk and can sell them at lower prices. You can compare the cost of the model laptop available in the local shop with the online price. You can also ask for a discount. If the model you want to buy is unavailable in the laptop shop, you can also ask if it can be brought from other sources.

Used or refurbished laptops

You can buy a used laptop if you don't have enough money to buy a new one. You can get used laptops for sale through shops. Shops sell used laptops that are locally available and imported from abroad. Old laptops are available for sale after upgrading. They are rejuvenating an old laptop by replacing HDD storage with SSD storage and increasing RAM capacity. Shops that sell used laptops also offer warranties for a limited time. Refurbished laptops can also be bought from online shopping sites like Amazon. Customers can buy a refurbished laptop by spending a quarter of the price of a new laptop.

Check the warranty

Laptops are expensive to repair and replace. There are two types of laptop warranties: standard manufacturer warranty and extended warranty.

Standard warranty

This is a warranty that comes along with the sale of the laptop by the manufacturer. There is usually a warranty period of one to three years. The warranty period varies depending on the model of the laptop computer. The standard warranty is sufficient to cover hardware issues, including those incurred during manufacture.

Extended warranty

An extended warranty is a way to protect a laptop even after the standard warranty period. Additional warranties can be purchased through manufacturers or other companies. Additional warranty plans are also available to cover losses not covered by the standard warranty.

Along with the standard warranty, an extended warranty can be used to cover laptop damage cost-effectively. You can also buy a laptop from shops and online shopping sites for an extended warranty.

Conclusion

A decision should be made on where to buy a laptop only after checking at various outlets. After learning about offers, discounts, and special sale days, you can save more money if you wait and buy. You can also subscribe to online alerts and newsletters from laptop manufacturing companies and online shopping sites to get instant updates on new offers, discounts, and sales. It is important to know when the sales days are coming on the shopping sites. The arrival of new technologies can have a significant impact on laptop prices. New and latest models that come with advanced features will cost more. It's natural for current-model laptops to drop prices when new models come out. Check whether your needs require a new model with the latest technology or if you can take advantage of discounted older models.

Laptop upgrade

Introduction

The capacity of currently used laptop components will need to be upgraded over time. The capacity of the computer components needs to be increased when a new version of the operating system and application software is introduced. For example, Windows 11 requires at least 8 GB of RAM and high-speed storage to run smoothly. Even if the laptop is a bit old, it can be made usable by modifying the components. It is important to understand which laptop components need to improve performance.

RAM upgrade

Whether it is possible to increase the RAM capacity of a laptop can be known from the company website or by searching on Google. If so, you will also know how much RAM capacity can be increased to its maximum. The Dell Inspiron 14-3467 model laptop has 4 GB of RAM. The RAM capacity can be increased to 16 GB in the same model. The same model with 4 GB of RAM can be upgraded to 8 GB by buying a new one and installing it on the laptop. The RAM capacity can be increased to 16 GB by buying two RAMs with an 8 GB capacity and installing them on the laptop computer. There are slots for installing RAM on the motherboard. Usually, there are two slots for installing RAM. Each piece of RAM can be installed in both slots on the motherboard.

Newer laptops have soldered RAM. It is not possible to add more RAM to such laptops. Placing RAM on the motherboard in a non-upgradable way can make laptops lighter, significantly reduce weight, and provide more battery backup.

Storage upgrade

Replacing the traditional hard disc drive with SSD storage can improve laptop performance. If you approach laptop service centres, they will install SSD storage. Some local service centres charge high prices for SSD storage. Computer components are relatively cheap in online shops. SSD storage can be bought from online shops and handed over to service centres or technicians. Tutorial videos are available on YouTube if you want to do the technical stuff yourself. Search by laptop model name, and you'll find videos on replacing components like storage, RAM, and keyboard yourself. A laptop unlocking tool kit can also be purchased from online shopping sites.

Battery upgrade

The health and lifespan of a battery depend on many factors, including type, age, and usage patterns. A laptop battery can last for 2 to 5 years, or 300-500 times of charging. However, battery performance can also vary depending on factors such as how often the laptop is used, the applications you run, and power management settings.

The battery should be replaced if it cannot hold the charge. It is worth investigating if the exact model of laptop battery is available from the company. If the original battery is unavailable, you can buy another one that is compatible with the laptop model. The quality and power backup of the original battery cannot be expected from other batteries.

Operating system upgrade

Laptop performance can be improved by upgrading to a newer version of the existing operating system. e.g., upgrade from Windows 10 to Windows 11.

If the laptop hardware is too old to upgrade to a new Windows operating system, it can be revived by installing a Linux-based operating system. For such usage, a lightweight Linux based operating system can work well with old hardware. e.g., Xubuntu and Lubuntu.

Conclusion

Upgrading laptop components is a great way to improve performance, extend your laptop's life, and save money in the long run. Things like increasing RAM capacity and adding faster SSD storage can dramatically increase the speed and responsiveness of an older laptop. RAM and SSD storage components are cheaper. Instead of buying a new laptop, upgrading can give new life to your current laptop. By upgrading the laptop components, users can save money and extend the machine's life.

Upgrading a laptop does not work well in certain contexts. Some laptops, especially slim models, are designed so that components cannot be upgraded. The cost and effectiveness of the upgrade should be checked in advance. Upgrading older laptops with very outdated components is likely to be pointless.

Laptop computer security

Introduction

Individuals and organisations heavily depend on computers to do their daily transactions. Personal, financial, and business information are stored on computers. An unsecured computer can cause many problems, such as data loss, identity theft, and financial fraud. Proper awareness of security threats helps to secure the information and enhance the laptop's performance.

How to secure a laptop computer

Keeping the laptop safe ensures smooth operation and can be used for a long time. The following will help preserve the physical condition of the laptop computer:

Keep it in a safe place

Store the laptop in a clean, well-ventilated place to protect it from dust, cold, and heat. Keep the laptop computer out of the reach of small children.

Use case/bag

Use a sleeve and bag to protect the laptop from bumps and knocks. Be careful not to drop the laptop from your hand.

Protect from dust

Keep the laptop closed when not in use. This will help prevent dust from entering the keyboard and cooling fan.

Control the temperature

Be careful not to overheat the laptop. Do not use the laptop near flammable materials such as bedding or cloth. Use the laptop on a sturdy surface, such as a table. Use a laptop stand if you want to use your laptop in bed or on your lap. Consult the service centre if the laptop overheats.

Keep food and drink away from the laptop computer

Avoid keeping and consuming food and drinks near the laptop. Proximity to food items can attract ants, and they may find their way inside the laptop. If a laptop stand is used, it can be raised from the surface to stay away from food and water spills.

Software and data protection

Proper maintenance of the software will keep the data secure. Software updates and data backups ensure the internal security of the laptop.

Update the software

Regularly update your operating system, applications, and anti-virus software to get the latest packages and security updates. Many programs will notify you when an update is available. Otherwise, you can check for updates directly by visiting the program's settings.

Use password

Enter a password that others cannot guess.

Regular backup

Backup files regularly. In the event of any kind of failure, the data can be recovered. External hard drives, cloud storage, and pen drives can be used to store files. It is also a good idea to keep multiple backups.

The importance of data backup

Backup is creating copies of important files, data, or the entire system on a computer, keeping them safe, and restoring them in case of data loss, hardware failure, or other unexpected events.

It provides additional protection against various risks like accidental data deletion, hardware problems, malware attacks, and natural disasters.

The different types of backups are:

Full Backup: It creates a complete copy of all selected files and folders.

Incremental Backup: It backs up only the changes made since the last backup, so it takes less time to take a backup.

Differential Backup: It backs up all the changes since the last full backup.

Mirror Backup: Keeps an exact copy of selected files and folders without compressing or encrypting them.

How often to back up depends on the importance of the data and how often the content changes. Data should be backed up daily, weekly, or monthly. Backups should be taken more frequently to avoid frequent data loss of relevant files.

The backup data should be stored somewhere other than on the computer. Offline and online storage systems such as external hard drives, network-attached storage (NAS), and cloud storage services can be used.

Cloud-based storage services are convenient to use for backup purposes. Cloud-based backup services have the advantages of being available from anywhere, increasing storage size if needed, and handling backup operations automatically. Cloud-based storage has security features such as encryption, passwords, two-factor authentication, and storing copies of backups in different locations.

Backups can be automated using various tools and software. Many backup solutions offer scheduling options that allow you to set up automatic backups at specific times or intervals. This ensures that backups are performed regularly without the intervention of the computer user.

3-2-1 Backup Rule

The 3-2-1 backup rule is a backup method that helps ensure data protection. There should be at least three copies of the data on two different storage media. Two of these three copies should be kept on separate storage media. For example, one backup can be stored on an external drive, and another can be stored on cloud storage. One of the three copies should be kept in a separate location. For example, you can keep a hard drive at home.

Information on a laptop computer can be secured by connecting it to cloud storage. Windows operating system users can use Google Drive cloud storage for backup. After installing the Google Drive client software, you can connect to the storage on the laptop computer. One copy of data will be safe on the laptop, and another copy will be stored on Google Drive. Other cloud storage services, like Dropbox and PCloud, can also be used to store backups in the cloud.

Ubuntu with GNOME desktop users can easily connect to multiple online cloud-based storage services using the Online Accounts feature.

Antivirus software

The main job of antivirus software is to detect and remove dangerous software and programs by scanning files, monitoring activities on the computer, and comparing them with malware databases.

Antivirus software can detect and remove potentially unwanted programs. They are programs that are not malicious at first glance but affect the computer's performance or invade privacy.

Free antivirus software may not work effectively in critical situations. It is also advisable to pay for the best antivirus software to ensure complete security, such as firewall security, secure online banking, parental controls, etc.

In addition to using antivirus software, data backups should also be taken regularly. Antivirus software cannot prevent data loss due to hardware damage, unexpected data loss, and other reasons.

Antivirus software should ensure that updates are installed regularly to work effectively and prevent new attacks.

A computer user should be aware of how to identify and avoid threats such as phishing scams, fraudulent websites, and social engineering attacks.

Windows operating system has its own security system. The security system will run on a licensed Windows operating system. Linux-based operating systems like Ubuntu are also safe from security-challenging software.

Software piracy

Software piracy is the act of illegally copying or distributing software in violation of copyright law. This is done by individuals and organisations alike. Unauthorised software can often contain malware or harmful programs that can put your computer and data at risk.

According to 2023 statistics, India ranks fourth in illegal software usage. Some computer shops and individuals install unauthorised versions of expensive software on new computers at the request of customers. Customers also think that software is available for free. Laptops are loaded with a lot of necessary and unwanted software.

If the customer gets the operating system and Office suite preloaded with the laptop, buy it. Preloaded operating systems and office suites can be cheaper than buying them outside. Otherwise, purchase software from authorised retailers. If you find it difficult to buy expensive software for various purposes, you can find and use free software suitable for the same purposes. Free software can be installed and used not only on Linux but also on Windows operating systems.

Conclusion

Computing devices such as laptops become non functional at any moment, so make arrangements to back up data. Consider the case of a research student's completed thesis being irrecoverably lost due to computer damage. A completed thesis is the result of many years of study. Having to rewrite the thesis due to missing data can be disastrous. Keeping multiple backups, using licensed operating systems and software, and using good anti-virus software can increase the security of laptops.

Laptop accessories

Introduction

Laptop accessories are needed to enhance functionality, increase usability, ease of use, and ensure protection. This chapter indicates which laptop accessories are helpful.

Laptop bag

A laptop bag helps carry and store a laptop computer safely. There will be a pad on the inside to protect it from impacts and friction. In addition, the bag also includes pockets for storing accessories such as chargers, mice, and pen drives.

Laptop bags are available in many sizes and shapes, such as backpacks, cross-body bags, and briefcase-shaped ones. Choose a bag suitable for the size of the laptop. Laptop manufacturing companies themselves manufacture and sell bags. You can buy laptop bags from online shopping sites and local retail shops.

Laptop Sleeve

A laptop sleeve is a cover used to protect a laptop computer. The sleeves are made of soft materials. Protects the laptop from scratches and dust during travel and daily use. Buy sleeves that are suitable for the size of the laptop computer. Popular laptop screen sizes are 11.6, 12, 13.3, 14, 15.6, and 17 inches.

Silicon Keyboard Protector

A silicone keyboard protector helps to protect the laptop keyboard from dust, dirt, moisture, etc. The silicone protector prevents food and drink residue from falling inside the keyboard. It also helps to keep the screen from squishing under pressure when the laptop is closed.

Wireless Mouse

A wireless mouse is ideal for use with a laptop. There is a risk of entanglement when using a wired mouse.

Wireless mice work in two ways. Radiofrequency mouse are connected to a computer with a tiny USB receiver. Communication between this receiver and the mouse takes place through radio waves.

Mouse that work with Bluetooth technology can be connected directly via Bluetooth without needing a separate receiver.
DPI (Dots Per Inch) is important when choosing a mouse. How fast the cursor moves on the screen depends on the DPI rate. Gaming and graphics designing require a mouse with a high DPI rate.

Choose a mouse with a longer battery life. If you look at the online product review, you can know if the battery lasts long.

Choose a mouse with a size and grip that fits comfortably in the hand.

External Storage

It is helpful to take a backup using an external hard drive to avoid the possibility of laptop storage corruption or accidental data loss. An external hard drive is a storage device that can be connected to the outside of computers. It can be connected to the laptop via a USB cable.

Choose an external hard drive with appropriate storage capacity, depending on how much data is backed up.

Check if the external hard drive's connectivity options, such as USB 2.0, USB 3.0, or USB-C, are available. The USB 2.0 data transmission rate is 480 Mbps. USB 3.0 provides a data transmission rate of approximately 4800 Mbps.

External Keyboard

External keyboards are helpful for those who need to do more typing work. Overloading laptop keyboards can lead to reduced lifespans and faster wear and tear. External keyboards provide a more comfortable typing experience than a laptop's keyboard. External keyboards help keep your eyes away from the laptop screen and allow more accurate typing.

There are two types of external keyboards available: wired and wireless. Wired keyboards are cheaper. Wireless keyboards are convenient, less expensive than wired keyboards, and run on batteries.

Small external keyboards suitable for use with laptops are available for purchase. When choosing an external keyboard, consider the keyboard's size, texture, design, and type of keys (membrane or mechanical).

Headset, Earphone

Headsets and earphones are two different types of audio devices. Both of these are used to listen to the sound from the laptop and speak through the microphone.

Headset: The headset has two earpieces and a mic. It used to listen to the sound from the computer and speak through the microphone. The headset is very useful while attending online classes and video conferences.

Earphone: The earphone has only two small speakers. It is used for listening only. Those who enjoy music, movies, and games need earphones.

Laptops have a 3.5mm headphone jack to connect a headset or earphone. Just drop the headset or earphone plug into this jack. Some laptops can also connect a headset or earphone via a USB-C port.

The headset or earphone can also be connected wirelessly via Bluetooth. Advanced headsets and earphones can enhance sound quality by cancelling out surrounding noises.

Laptop Stand

A laptop stand is a device that raises the laptop and makes it work more comfortably. It reduces stress on the neck and back of the laptop user and helps maintain better posture.

Using a laptop stand helps the laptop computer screen be at eye level, reducing neck pain and shoulder stress.

The laptop on the stand has more airflow, and the computer heats up less.

The height and tilt can be adjusted according to the user's needs. When needed, it can be folded and stored away. Care should be taken when selecting the stand according to the size of the laptop.

Cooling Pad

A cooling pad is a laptop stand with fans to throw out heat. The cooling pad does not allow the laptop to heat up.

USB Hub

A USB hub is a device used to increase the number of USB ports available on a computer. This increases the convenience of connecting more USB devices to the computer.

A USB hub connects to a single USB port on a computer via a USB cable. The hub will have several USB ports (usually 2 to 10). Devices with USB ports, like printers, scanners, hard drives, and flash drives, can be connected to these ports.

Webcam

If the laptop's built-in camera is not good enough, need to purchase a webcam and use it. The external webcam is attached to the laptop's top bezel. Webcams are available in various resolutions: for example, 720p and 1080p. The higher the resolution, the better the video quality.

Here are some things to consider when choosing a webcam:

Resolution: A higher resolution (720p or 1080p) video improves visual quality.
Frame rate: A higher frame rate (30 FPS or more) provides smoother video.
Microphone: Webcams with microphones are available. There is no need for a separate microphone when meeting online.

Tool kit

A set of screwdrivers comes in handy if you need to unscrew laptop components. The laptop screw is very small, so it needs a suitable screwdriver set. Screwdriver sets are available for purchase at online shopping sites.

Conclusion

The need for accessories will depend on the individual needs of the user and the way the laptop is used. The choice of accessories depends on factors such as budget, the purposes for which the computer is mostly used, and the essential features used.

Laptop Computer Maintenance

Introduction

Like any electronic device, a laptop needs proper maintenance. The lifespan of laptops depends on the quality of their manufacturing components, usage, and maintenance. However, a laptop can perform well for 3 to 5 years. Daily maintenance is essential to keep the laptop functioning correctly. Proper maintenance can prevent hardware failures and software problems. This avoids maintenance and extends the lifespan of the laptop computer.

Cleaning of the laptop

The laptop's exterior can be cleaned using a soft, slightly damp cloth.

A microfiber cloth can be used to clean the screen. Do not pour cleaning spray directly on the screen. Instead, spray the cleaning solution on a cleaning cloth and wipe the screen.

You can buy a cleaning kit to clean the laptop. The kit includes a brush, microfiber cloth, and cleaning solution.

Cleaning should be done after turning off the laptop and disconnecting the power cable.

Be careful not to spill food or drink on the keyboard. A brush and air blower can be used to remove the dust and dirt accumulated between the buttons. The keyboard should be cleaned by holding the laptop upside down with the screen open. Otherwise, the dust and dirt that are stirred up during cleaning will fall inside the laptop.

Clean the laptop's air intake grills with a compressed air duster. The heat generated during operation will clean the air duct.

Install the latest updates of the operating system and software. It improves the security and performance of the laptop.

Scan your laptop regularly with a good antivirus program.

Delete downloaded files and unused programs frequently. This will save hard drive space and provide better performance.

Avoid obstructing air circulation while using the laptop. Cleaning the fan and placing the laptop on a cooling pad will help reduce heat.

Using lower power settings (e.g., brightness) will increase battery life.

Make regular backups of files and data. This prevents data loss in the event of a hard drive failure.

How to extend battery life

Here are some things to keep in mind to extend the lifespan of a laptop battery:

Original charger

It is important to use the charger that comes with the laptop to ensure safe and efficient charging. The charger provided by the company is designed to provide the correct voltage and amperage for the specific laptop model. This prevents damage and accidents to the battery. When the charger that comes with the laptop is damaged, avoid using chargers made by other companies as much as possible because they don't necessarily meet safety standards or provide enough power for the laptop.

Laptop charging

The laptop should be plugged into a maximum power cord plug. Everyone thinks that overcharging the laptop battery is bad. When the battery reaches full charge, the laptop has a mechanism to disconnect itself from the power supply.

Do not allow the battery to charge after it is fully used. Charging after full discharge is harmful to battery health. When the battery charge reaches 20%, it should be charged.

Leaving the laptop battery in a fully discharged state for long periods of time can damage the battery cells. Make sure the laptop is charged to at least 40% if it will not be used for a while.

Reduce the brightness

The higher the laptop screen's brightness, the more battery will be used. Increase brightness only when needed. Most laptops can adjust the brightness using the function keys.

Use battery saver mode

Like Android phones, laptops also have a battery-saving mode. Automatically turns on when the battery is low; this mode minimises background activity and stops things like email and calendar syncing. This will help increase battery life. If you go to the settings of the operating system, you can check whether the battery-saver mode is turned on.

Close unnecessary applications

Running unused programs can drain battery power. You can close them from the taskbar or stop them from running through the task manager.

Disable programs that start running on startup

There may also be programs that run when the laptop starts up. All of these will be using battery power in the background. Unnecessary startup programs can be disabled by going to the operating system settings.

Turn off Wi-Fi and Bluetooth

Turn off wireless connections such as Wi-Fi and Bluetooth when not in use.

Disconnect external hard drives

Unused external hard drives and other devices plugged in can cause battery usage. Disconnect them after use.

Reduce heat

Overheating the laptop can affect battery life. Clean the air vents to ensure proper air circulation.

Conclusion

Avoid placing the laptop in damp, hot, or direct sunlight. Keep the laptop away from dust, smoke, etc. Use both hands when opening and closing the laptop. Do not place books, chargers, newspapers, or heavy objects on the laptop. Stress builds up, and the laptop case is prone to bending and cracking. The top part of the laptop may be pressed against the keyboard, and the screen may get scratched or broken. A silicone keyboard protector can help protect the laptop screen from scratches due to the keyboard pressing tight on the screen. It can also protect the keyboard from spills. Use a padded bag when travelling or carrying a laptop. Create a clean and safe environment for using the laptop. It's an investment for those who work with laptops. They will last longer if properly cared for.

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Appendix

Appendix 1: List and website of laptop manufacturers.

Apple: https://www.apple.com/mac
Dell: https://www.dell.com/en-in
HP: https://www.hp.com/in-en/shop/laptops-tablets.html
Lenovo: https://www.lenovo.com/in/en/pc
ASUS: https://www.asus.com/in
Acer: https://store.acer.com/en-in
MSI: https://in.msi.com
Zebronics: https://zebronics.com/pages/zebronics-laptop
Samsung: https://www.samsung.com/in/computers/all-computers

Appendix 2: List of online laptop review sources.

Indian websites that provide laptop reviews.

Gadgets 360: https://www.gadgets360.com/laptops/reviews
Digit: https://www.digit.in/
Smartprix: https://www.smartprix.com/laptops_computers
Cashify: https://www.cashify.in/laptop-reviews
91mobiles https://www.91mobiles.com/hub/category/laptops-pc/
HT Tech: https://tech.hindustantimes.com/laptops-pc/reviews
Laptop Media: https://laptopmedia.com/in/

Foreign websites that provide laptop reviews.

TechRadar: https://www.techradar.com/computing/laptops
Tom's Guide: https://www.tomshardware.com/laptops
CNET: https://www.cnet.com/tech/computing/laptops/
Wirecutter: https://www.nytimes.com/wirecutter/reviews/best-laptops/
PC World: https://www.pcworld.com/
PCMag: https://me.pcmag.com/en/laptops
The Verge: https://www.theverge.com/laptop-review

Appendix 3: Websites that provide reviews of hardware components.

Anand Tech: https://www.anandtech.com/
CPU Benchmarks: https://www.cpubenchmark.net/singleCompare.php
CPU Expert: https://cpux.net/cpu-benchmark-online
CPU Monkey: https://www.cpu-monkey.com/en/
Nano Review: https://nanoreview.net/
Technical City: https://technical.city/en
User Benchmark: https://cpu.userbenchmark.com/
Versus: https://versus.com/en/cpu

Appendix 4 : List of Linux-based operating systems.

Ubuntu
Most popular user friendly Linux based operating system. With a modified GNOME desktop.

URL: : https://ubuntu.com

Linux Mint
Operating system based on Ubuntu with beautiful Cinnamon desktop.

URL: : https://linuxmint.com

Pop!_OS
Ubuntu based operating system. GNOME desktop software is characterized by its well-customized interface.

URL: : https://pop.system76.com

Fedora
The operating system comes with the latest features.

URL: : https://getfedora.org

Manjaro
A user-friendly, rolling release based operating system based on Arch Linux.

URL: : https://manjaro.org

Elementary OS
A Linux-based operating system with a design inspired by MacOS.

URL: https://elementary.io

Xubuntu
A lightweight Ubuntu based operating system. XFCE desktop is used. Suitable for laptops with low processing power.

URL: https://xubuntu.org