2. OPERATING DIGITAL DEVICES

LEARNING OUTCOMES

By the end of the module, the learner would be able to:
- Understand the Basic Features of a Computer Operating System
- Understand the Mobile Phone Operating System and its Features
- Understand the Tablet Operating System and its Features

LESSON PLAN

I. Basic Features of a Computer Operating System
II. Mobile Phone Operating System and Features
III. Tablet Operating System and Features

I. BASIC FEATURES OF A COMPUTER OPERATING SYSTEM

What is Operating System?

Operating System is a program that helps us to interact with other computer programs. The computer is useless without an operating system. There are various types of operating systems available today.

Computers use a different language than us; this language is made up of digits. The operating system acts as an interpreter. It helps us talk to the computer. In simple language we can say that the operating system is an interface between user and computer. The Operating System also enables you to effectively use the system resources and access other programs. All other programs need operating system to start them, but the operating system starts by itself. This is why when we switch on a computer we see the respective operating systems screen. The operating system starts the computer automatically when power is turned on.

What are the functions of an Operating System?

The major functions of the Operating System are:

- It controls and coordinates the operation of a computer
- It eases the interaction between you and the computer
- It controls input and output devices
- It controls execution of computer programs
- It manages the use of the main memory of Computer
- It helps you to manage and manipulate files.

Classification of Operating System

Operating system can be user friendly with many icons and images or it can be just text or character based. The Operating System can be classified into 2 types: Character User Interface and Graphical User Interface.

Character User Interface: Look at both the images below. The first one does not have any icons or images; it has only text and characters. Hence it is called Character User Interface (CUI). We perform any task on CUI by giving commands in texts such as re-name, CLS, CD, MD and DIR or directory. Example of CUI is Disk Operating System (DOS).

Graphical User Interface (GUI): The second image has a background picture as well as many icons. Hence we call it a Graphical User Interface (GUI). Examples of GUI are Windows XP, Windows NT, Windows 7, Ubuntu, etc.

Popular Operating Systems

There are number of operating systems available today. Some famous ones are:

i. Unix
ii. Linux
iii. Windows 9x
iv. Windows XP
v. Windows NT
vi. Windows 2000
vii. Windows 7
viii. Windows 8
ix. Android
x. Macintosh OS
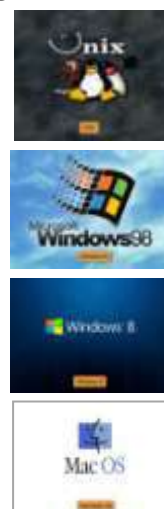
All these operating systems have some unique features. Android and Windows 8 are also used in mobile phones. Windows and Linux are the most widely used operating systems and in this module we will learn more about these two in detail.

1.1 WINDOWS OPERATING SYSTEM

Microsoft Windows is a series of graphical interface operating systems developed, marketed, and sold by Microsoft. Most of the computers that we use come with pre-installed operating system of Microsoft Windows. In case you have a computer system without the Windows operating system you can buy a licensed software from an authentic seller of the software. An alternative method of obtaining the software could be through online websites such as Microsoft's website.

More about GUI of Windows 7

This interface makes it easy to interact with the applications that you want to use. It also helps you to use programs and keep them organised. Windows are a WYSIWYG kind of GUI, which means, 'What You See Is What You Get'. If the Operating System in your computer is Windows, the first screen that appears after switching on your computer is the Desktop. You can use the windows desktop to keep all the applications and utilities organised in the computer.

The desktop is divided into 2 areas - Main Area or the Desktop and the Task Bar. The narrow strip at the bottom is called the Task Bar. The task bar contains a start button that you can use to access all the programs of the computer. You can also pin the various programs to the task bar as icons to be used as quick access to the programs. The task bar also has a clock at the right side bottom of the desktop. The desktop has a background, which is called Wallpaper.

FILE AND FOLDER MANAGEMENT

The first screen that you get when you start and log on to your computer is called a Desktop. The small pictures on the desktop are called desktop icons. These icons represent shortcut for files, programs and folders which could be quickly and easily accessed.

Task Bar

The horizontal bar at the very bottom of the screen is called the Task Bar. The task bar also contains many icons and shortcuts. A task is any work that you perform on a computer. Windows 7 is a multi tasking operating system which means it can help you to do multiple tasks at a time, in other words it helps you to run more than one program simultaneously.

The task bar displays all the running applications and programs as icons. It also helps you access many applications and programs in the computer through these icons. The task bar provides an easy way to switch between multiple programs running on the computer. If a number of applications are running and there is not enough space available on the task bar to keep all the icons, then similar types of icons can also be grouped together.

Start Button

Through the Start button, you can access programs and other system utilities. When you click on the start button, the start menu appears listing various programs installed the computer. You can use Control Panel in the start menu to change various hardware and software settings in your computer. You can also use Help and Support menu item in the start menu to get any help you need while working with Windows. With the help of start menu you can shut down your computer with a click only. You can also log off from the computer, switch between users, restart the computer and lock the computer using the start menu.

Changing System Date and Time

To change the system date and time, click on the date and time present on the right side of the task bar. After this, a clock and a calendar appear. Following are the steps to change the system date and time:

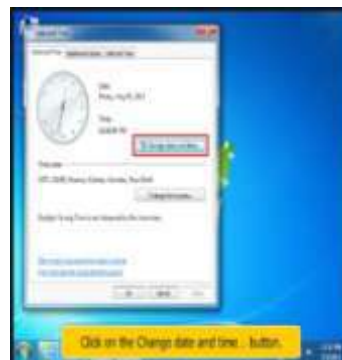Step 1: Click on the date and time on the taskbar
Step 2: Click on the change date and time settings link
Step 3: Click on the change date and time button
Step 4: Set date and time
Step 5: Click OK to save changes and return to the date and time dialog box
Step 6: Click OK on the date and time dialog box to save changes and close the dialog box.

Desktop and its Display Settings

Desktop is the display area that you see when you log onto your computer. You can change the appearance and personalisation or the way the desktop behaves. The picture behind the icons is called Wallpaper or the desktop background.

Just like you decorate your room and desk with pictures, you can decorate your desktop too by changing the wallpaper or desktop background. When you keep the computer idle for some time or if you do not work for a while on the computer, an animation of pictures or text appears on the screen. This is called a Screen Saver. You can set a screen saver of your choice or can even set a password and assign timing for the screen saver. Once you set the timing, the screen saver starts by itself when the computer

is left idle. Assigning a password to your screen saver locks your screen, therefore, no one can access your desktop if you are away from your computer for a long time. You can also change the theme of your Windows appearance and can customise it as 'My theme'. You can also change the colour of Windows by using the Windows colour icon.

Changing Desktop Background

You can change your computers wallpaper or desktop background with images and pictures of your choice.

How to change a desktop background?

When you right click on the empty space on the desktop, a popup menu appears. Click on the 'Personalize' option from the menu; personalization window appears on the screen.

This window has options for changing the display settings.

When you click on the desktop background link it shows a number of pictures which can be set as a background. You can choose a picture and set it as your desktop background. You can also browse pictures and set one as your desktop background. Click on the 'Save Change' button to save the changes. The background of the desktop will change. Minimise the personalisation window to check and verify the change of the desktop background.

Steps to Change the Desktop Background

Step 1: Right click on the empty space on the desktop
Step 2: Click on the personalize option from the menu
Step 3: Click on the desktop background link
Step 4: Choose a picture and set it as your desktop background
Step 5: Click on the save changes button to save the changes.

Setting a Screen Saver

Step 1: Right click on the empty space on the desktop
Step 2: Click on the personalize option
Step 3: Click on the screen saver link
Step 4: Click on the screensaver dropdown menu and select a screen saver from the list
Step 5: Set the time for the screen saver to start by selecting number of minutes from wait combo box
Step 6: Click on the preview button preview the screen saver
Step 7: Click on the apply button to apply the screen saver

Step 8: Click on the OK button to save the changes.

You can create folders in a computer to store computer files.

What is a computer file?

In a computer any self contained piece of information that is available to the operating system and individual programs is called a file. A file can be a document, an image, music or a movie. To keep several files at one place, you create a folder.


Windows explorer on your computer window helps you to manage and view the hierarchy of folders on your computer. You can create a file or folder in any of the drives in the computer. You can create a file or folder on the desktop too. After creating a file or folder, you can either rename, copy, paste or simply move it from one location to the other. You can also delete a file or a folder if you do not require it. If you manage your files and folders well, it saves you a lot of time and helps you to work more efficiently. To manage files and folders, you need to be able to work with files and folders.


How to create a folder in a drive?

The following steps need to be followed to create a new folder in the drive:

- Click on the start button to show the start menu.
- Click on the 'Computer' to display the computer window or windows explorer.
- Click on the 'Local Disk (D:)' icon to view the content in drive D.
- Click on the new folder in the menu bar to create a new folder. You can give name to the new folder and press enter or if you do not want to name the folder at that point of time, you can just press enter, which creates a folder with default name as 'New folder'.
- Alternatively, right click on the empty space on the right panel of the selected drive, a popup menu appears. Point the mouse to the 'New' option and then click 'Folder'. Press enter to create folder with default name as 'New folder'.
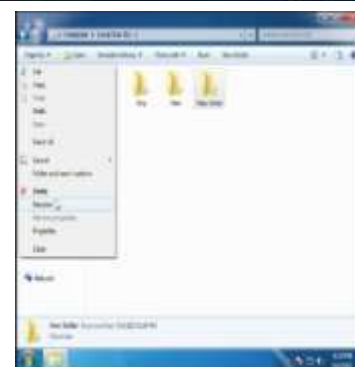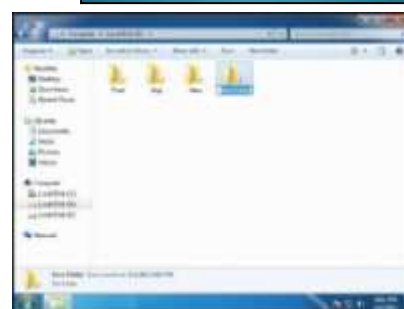
- To rename the new folder, select the folder, click on the organize dropdown menu in the menu bar, select rename form the menu, type 'Chetna' and press enter.
- The new folder has been renamed to 'Chetna'. A file or folder name cannot contain any of the following characters / \ : " * ? < > |
- You can create a folder within a folder which is called as a sub-folder. Select and open the folder. Right click on the empty space in the folder and select 'New' > 'Folder' in the pop-up menu.
- To create a new file, right click in the empty space in a folder. From the new pop-up, select the type of file that you wish to open.
- Click on it and a new file will open.
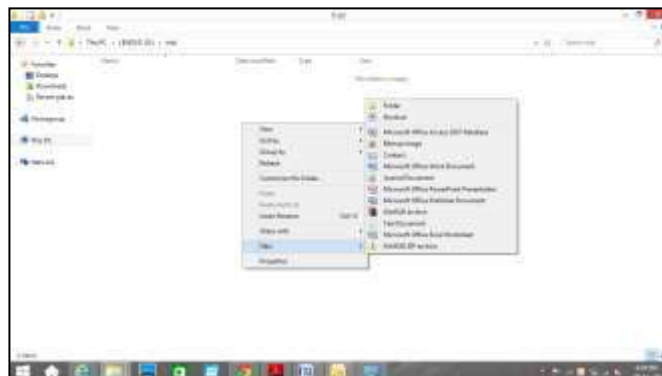
How to open a File/ Folder
- Click on the start button to show the start menu.
- Click on the 'Computer' to display the computer window or windows explorer.
- Click on the 'Local Disk (D:)' icon to view the content in drive D.
- Double-click on the folder that you wish to open.
- Within the folder, double-click on the file or sub- folder if you wish to open them.

How to Save or Rename a File/Folder

- When you create a folder/ sub-folder/ file in the Local Disk (D:), it is saved automatically in the D drive as 'New folder'/ 'New Text document' etc.
- To rename the file/ folder, right click on the file/ folder. In the new pop-up, click on 'Rename'.
- Type a new name and click 'Enter'.
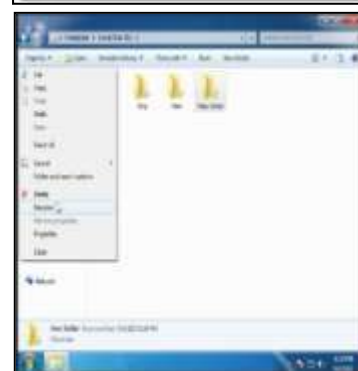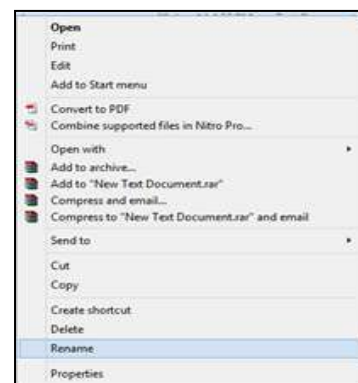
Using Accessories

Introduction
Under this section, you will learn how to use various accessories of Windows such as Paint, Calculator and Notepad. To access these accessories in a computer, you need to follow these steps:
- Click on the start button on the task bar
- Point the mouse to 'All programs'

- Click on 'Accessories'
- The various accessories are listed here
- Click on an accessory to access it.

Paint

You can use paint to create drawings on a blank drawing area or in existing pictures. Paint is used to create, edit and view pictures. You can use self created pictures as our desktop background. You can also copy and paste a paint picture to any other document.

Using Paint

To run paint, click on the start button; point the mouse to all programs, click on accessories and select paint. The paint window appears. Or you can type paint in the search programs and files textbox in the start menu.

The paint window is divided into 4 major areas: Paint button, Quick Access toolbar, Drawing area and Ribbon.

Paint button: With the paint button you can perform various actions. The various options in the paint button are: Open, New, Save and Print.

Quick Access toolbar: It helps you quickly access frequently used tools such as save, redo and undo. You can also customise the quick access toolbar by selecting items from the drop down list.
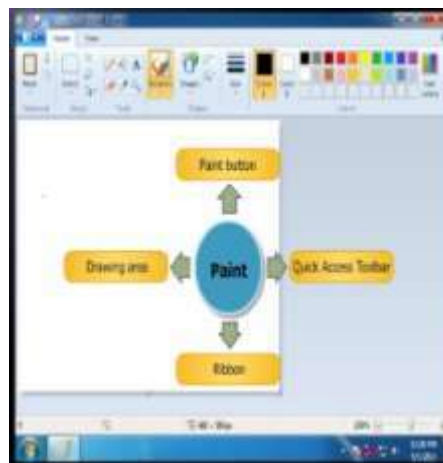
Ribbon: A Ribbon contains two tabs - Home and View.

Home tab: The home tab provides tools that help in creating and editing images. It provides many options that are majorly categorised into various sections like Clipboard, Image, Tools, Brushes, Shapes and Colours.

- **Clipboard:** It consists of three options - Cut, Copy and Paste. By using these option you can cut, copy or paste a selected object in paint. These options help you use one object many times in a picture.
- **Image:** In this section, the various options that help you in selecting and editing objects are - Select, Crop, Resize and Rotate.

- **Tools:** It provides various tools that you can use to draw and edit a picture. These tools are Pencil, Fill with Colour, Text, Eraser, Colour picker and Magnifier.
- **Brushes:** This drop down menu helps you choose different kinds of brushes to draw a picture.
- **Shapes:** It provides various shapes that you can use in your picture. It also provides the line and curve tools to draw a straight line and a smooth curved line respectively.
- **Colours:** It provides a variety of colours to choose from while drawing a picture.

What is a Notepad?

You can write names and numbers or any textual detail or information on a Notepad. It is a text editing program. You can view and edit text files using a Notepad.

How to open a Notepad file?

- Click on the start button
- Point the mouse to all programs and click on accessories and then Notepad.
- The Notepad window appears or you can type Notepad in the search programs and files textbox in the start menu. The notepad window has a blank space where you can write, edit and view text.
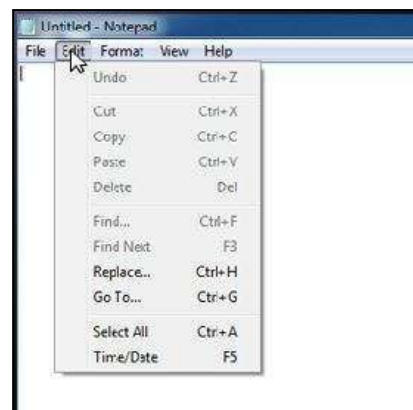
Components of Notepad

The menu bar of the Notepad file contains various items such as File, Edit, Format, View and Help.
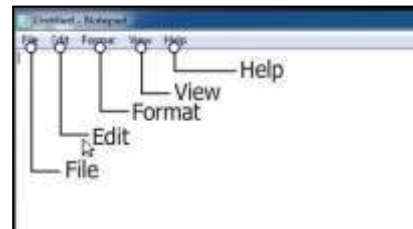
The **File** menu provides various options like New, Open, Save, Save As, Page Setup, Print and Exit.
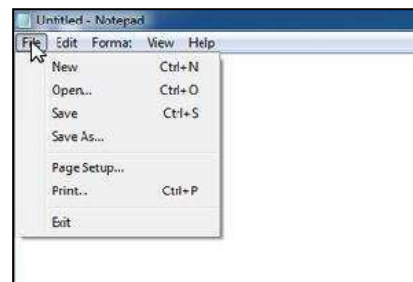
The **Edit** menu helps us edit text. It provides various options that are Undo, Cut, Copy, Paste Delete, Find, Find Next, Replace, Go to, Select All, Time/Date.
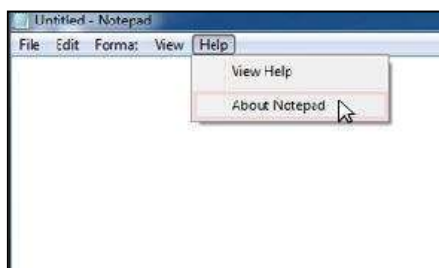
The **Format** menu helps you format all the text in the document; it has two options; Word wrap and Font.

The **View** menu helps you view the status bar at the bottom of the notepad window.

The **Help** menu provides two options View Help and About Notepad.

How to use a Notepad?

The steps to create a text file using Notepad are as follows:

Step 1: Open the Notepad window.

Step 2: Write text.

Step 3: Select the text you want to copy.

Step 4: Click the edit menu and select copy.

Step 5: Put the cursor at the place where you want to paste the copied text.

Step 6: Click on the edit menu and select paste.

Step 7: Click on the edit menu and select Time/Date.

Step 8: Click on the format menu and select Font.

Step 9: Select the desired font type, style and size in the font dialog box.

Step 10: Click on OK to save changes and close the font dialog box.

Step 11: Click on the file menu and select save.

Step 12: Select the desired location and folder, write the file name in the file name combo box.

Step 13: Click save to save the file.

How to insert current date and time?

To insert date and time click on the edit menu and select Time/Date. You can now apply the desired font. To set the font, click on the format menu and select font. The font dialog box appears; select the desired font type, style and size in the font dialog box. Click OK to save the changes and close the font dialog box.Now to save this file, click on the file menu and

select save. The 'Save As' dialog box appears. Now, select the desired location and folder and write the file name in the file name combo box. Now click Save to save the file.

1.2 LINUX OPERATING SYSTEM

Linux is one of the most popular versions of UNIX operating System developed by Linus Trovalds. An operating system is a computer software that helps user access applications and performs different functions on the computer such as Linux. Linux is very similar to other operating systems, such as Windows and Mac OS X.

The software is free for everybody and can be downloaded from internet. For using any application/ function of LINUX the operating system sends instructions to the computers processor which performs the task and sends the results back to the application through the operating system.

The LINUX kernel runs on numerous platforms including Intel and Alpha platform and is available under the General Public License (GNU).

The unique point of LINUX is that it is very dynamic i.e. the users are free to develop, modify or expand the software. This enables them to integrate new functions, find and eliminate programming bugs quickly.

How to obtain LINUX

Linux may be obtained in two different ways – Free Download and Using Distribution.
Free Download: All the necessary components can be downloaded free of charge from the Internet.
Distribution: An alternative way is to use a Distribution which is offered by various companies and includes a wide variety of applications and installation programs that simplify the installation of Linux. In Linux language, a distribution is a version of the operating system that has the Linux kernel as its foundation. Linux offers a variety of different *distros*. Most of them are free and have communities of users who provide each other with guidance and support.

1. A kernel is the fundamental component of any operating system. It acts as the mediator between software and hardware. It is a set of computer instructions that enable communication between software applications and the data processing done at the hardware level.
2. FLOSS is the acronym for Free/Libre Open-Source Software. FLOSS software is different from proprietary or commercial software as it is free to use; free to share, and free to develop.

Linux is successfully being used by several millions of users worldwide. One of the most popular Linux distributions is called Ubuntu which is being distributed by a company named Canonical. It is an example of a commercial project based on the Linux kernel.

ABOUT UBUNTU

Ubuntu is one of the most popular Linux based operating system and it is free, easy to install and simple to use. It is an open source software platform that runs everywhere from the smartphone, the tablet and computer. The source code of Ubuntu's operating system is freely available, so you can examine the program and make changes as per your specific requirements.

Ubuntu has a GUI, making it similar to other popular operating systems like Windows, Mac OS and Android. Its applications are represented as icons or menu choices that can be selected by using keyboard commands or a mouse. Unlike Linux, there is no need to learn a library of commands or terms. A user, who has used any other operating systems that rely on a GUI, can navigate through Ubuntu easily.

Menu

All GUI-based operating systems use a desktop environment, which defines the look and feel of the system, lay-out of the desktop and navigation mechanism of the desktop.

In Linux distributions, a number of desktop environments are available. Ubuntu (Version 12.10) uses Unity as the default desktop environment. The Unity desktop consists of the desktop background and two bars.

a. Menu bar: It is a horizontal bar located at the top of the desktop.
b. Launcher: It is a vertical bar located at the far left.

The Desktop Background

Below the menu bar, there is an image that covers the entire desktop. This is the default desktop background, or wallpaper, which belongs to the default Ubuntu 12.10 theme known as *Ambiance.*

Menu Bar

The menu bar encompasses common functions used in Ubuntu 12.10. The icons on the far-right of the menu bar are called the *indicator area*. Each version of Ubuntu includes slightly

different types and quantities of icons based on type of hardware, available peripherals and a number of other factors. The most common indicators (from left to right) are as follows:


Keyboard indicator: It allows you to select the keyboard layout and change the keyboard preferences.

Messaging indicator: It incorporates all social applications which include the instant messenger client, the email client, microblogging applications and other similar applications.
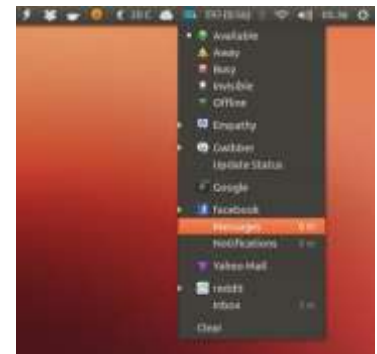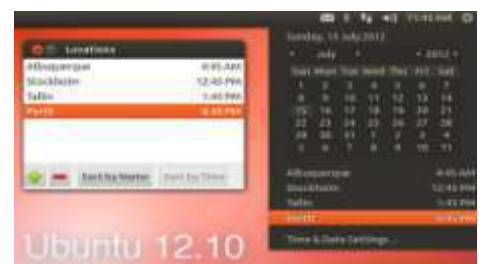

Network indicator: It allows you to manage network connections and connect easily to a wired or wireless network.
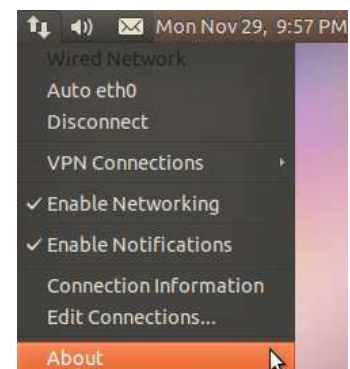
Sound indicator: It provides an easy way to adjust the sound volume as well as access your music player and sound settings.


Clock: It displays the current time and provides an easy way to access calendar, time and date settings.

User menu: It allows you to switch between different users and access online and user accounts.

Session indicator: It provides an easy way to access system settings, software updates, printers, and session options for locking the device; logging out of a session; restarting the computer; or shutting down completely.
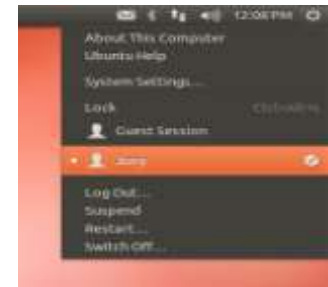
The application menu: It is the system where different actions, such as Edit, View, etc., can be performed in an application. Unlike other GUI environments, the application menu in Unity is located in the left area of the menu bar. To view a specific application, you can move the mouse to the application icon on the desktop's menu bar using the pointer. This will enable the application to superimpose itself in the desktop's menu bar so that the application could be seen and used by you. Once the mouse is moved away from the menu bar, the desktop reappears. This feature of Unity which shows the application's menu only when needed is beneficial for netbook and laptop users as it provides more free work space.

Launcher

The vertical bar of icons on the left side of the screen is called the Launcher. It offers easy access to applications by placing active icons on the Launcher while it is being run. Some of the important applications appear on the Launcher by default. These include LibreOffice and Firefox, the workspace switcher lens, any mounted devices, and the Trash lens at the bottom of the Launcher. It works like the *Taskbar* in Windows. The first icon at the top of the Launcher is the Dash, a key innovation and core element of Unity.

USING THE LAUNCHER

Running applications

To run an application from the Launcher or make an already-running application to appear, click on the application's icon. Running applications have one or more triangles on the left side of the icon, which signify the number of application windows that are open for an

application. The application in the foreground is indicated by a single white triangle on the right side of its icon. You can also run an application through the Dash.

Adding and Removing applications from the Launcher

There are two ways to add an application to the Launcher:

- Open the Dash, find the application to add and drag and drop it to the Launcher.

- Run the application (when it starts, its icon will appear on the launcher), right-click on the application's icon on the Launcher, and select 'Lock to Launcher'.

- To remove an application from the Launcher, right-click on the application's icon, then select 'Unlock from Launcher'.

About Dash

Dash is a tool to help you locate and access applications and files on the computer quickly. It works like the *Start Menu* of Windows and Mac OS X.

- To explore Dash, click on the top-most icon on the Launcher; the icon has the Ubuntu logo on it.

- After selecting the Dash icon, another window will appear with a search bar on the top as well as collection of recently used applications, files and downloads.

- The search bar provides dynamic results on providing the search terms. You can locate and open a file by clicking on the file name in Dash.

- Lenses act as specialized search categories in Dash. There are eight lenses at the bottom, namely, *Home* lens, *Applications* lens, *Wikipedia* lens, *Files and Folders* lens, *Social* lens, *Music* lens, *Photo* lens and *Videos* lens.

Dash allows you to search for information, both locally (installed applications, recent files, bookmarks, etc.) as well as remotely (Twitter, Google Docs, etc.). This is done by utilizing one or more lenses, each responsible for providing a category of search results for Dash.

Two main features of Dash

1. Finding files/folder

- Type in the name of the file or folder and results will appear in Dash.
- The *Files* lens can also help in finding files or folders. The *Files* lens shows the most recent files accessed as well as recent downloads.
- *Filter results* button in the top-right corner of the Dash can be used to filter results to find a file or folder by modification times, file type (.odt, .pdf, .doc, .tex, etc.) or by size.

2. Finding applications

- The *Application lens* automatically categorizes installed applications under "Recently Used," "Installed," or "Apps Available for Download."
- User can enter a name of the application or a part of it in the search bar in Dash and the names of applications matching the search criteria will appear.
- Even if you do not remember the name of the application at all, you can type a keyword that is relevant to that application and Dash will find it.

External search results

- In addition to finding applications and files on the local computer using Dash's search bar, the search criteria is also passed to the Internet, and results relevant to the search criteria are shown in Dash.

- Use the "kill switch" provided in the privacy section of the System Settings to disable all online search results.

Workspaces

Workspaces are also known as virtual desktops. These separate views of the desktop allow you to group applications together, and by doing so, help to reduce clutter and improve desktop navigation. Ubuntu has four workspaces by default.


Switching between workspaces

To switch between workspaces, click on the workspace switcher located on the Launcher. This function allows you to navigate through the workspaces and choose the requisite one.

Managing Windows

When opening a program in Ubuntu (such as a web browser or a text editor) a *window* appears on the desktop. A window is the box that appears on the screen when a program is started. The windows in Ubuntu are very similar to those in Microsoft Windows or Mac OS X. In Ubuntu, the top part of a window (the *titlebar*) will have the name of the application to the left (most often, the title will be the name of the application).

A window will also have three buttons in the top-left corner. From left to right, these buttons represent *close*, *minimize* window and *maximize* window. Other window management options are available by right-clicking anywhere on the title bar.
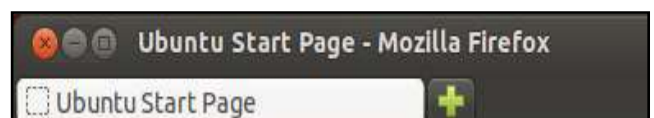
Closing, Maximizing, Restoring and Minimizing Windows

- To close a window, click on the cross button in the upper-left corner of the window, which is the first button on the left-hand side.
- The button immediately to the right of this button is the *minimize* button which removes the window from the visible screen and places it in the Launcher. This button does not close the application; it just hides the application from view. When an application is minimized to the Launcher, the leftside of the icon in the Launcher will display a triangle showing you that the application is still running. Clicking the icon of the application that is minimized will restore the window to its original position.

Close, Minimize and Maximize

- The right-most button is the *maximize* button, which makes the application window fill the entire screen. Clicking the *maximize* button again will return the window to its original size. If a window is maximized, its top-left buttons and menu are automatically hidden from view. To make them appear, just move your mouse to the *menu bar*.

Moving and Resizing Windows

- To move a window around the workspace, place the mouse pointer over the window's titlebar, then click and drag the window while continuing to hold down the left mouse button.
- To resize a window, place the pointer on an edge or corner of the window so that the pointer turns into a larger, two-sided arrow, known as the resize icon. Click and drag to resize the window.
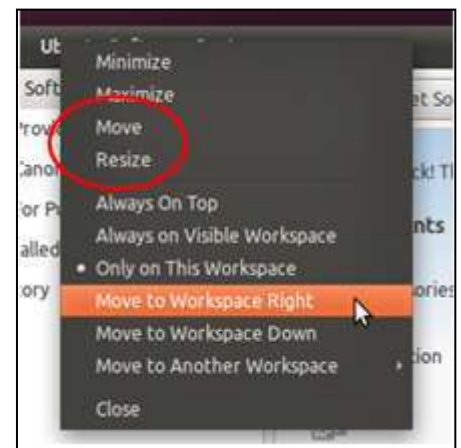

Switching between open windows

In Ubuntu there are many ways to switch between open windows:

- If the window is visible on the screen, click any portion of it to raise it above all other windows.
- Use Alt+Tab to select a window. Hold down the Alt key and keep pressing Tab until the desired window appears in the popup.
- Click on the corresponding icon on the Launcher.
- Move the mouse to the left side of the screen to show the Launcher and right-click on the application icon.

- If the application has multiple windows open, double click on the icon in order to select the desired window.

Moving a window to different workspace

- Make sure the window is at its original size.
- Right-click on the window's titlebar and select:

‣ Move to Workspace Down - To move the window to the workspace below

‣ Move to Workspace Right - To move the window to the right workspace

‣ Move to Another Workspace, and then choose the workspace you wish to move the window to.
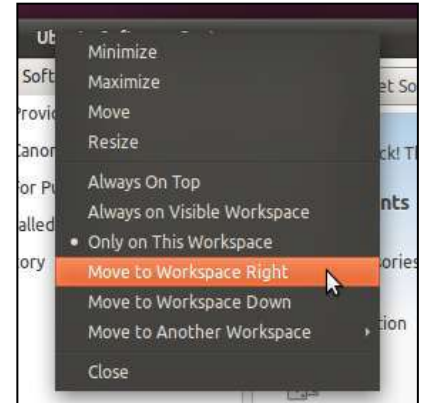
Browsing files on your computer

There are two ways to locate files on the computer:
- Search for a file or access it directly from the folder in which it is placed via Dash in the Launcher.
- Use the Files and Folders tool to access commonly used folders (such as Documents, Music, Downloads), as well as most recently accessed files.

Go

The Go menu holds a list of commonly used folders (such as Documents, Music, Downloads, and the Home Folder).
- To access Go, move your mouse over the top bar and select Go.
- Browse the files on your computer by clicking Computer in this menu.
- If you set up a home network, you will find a menu item to access shared files or folders.
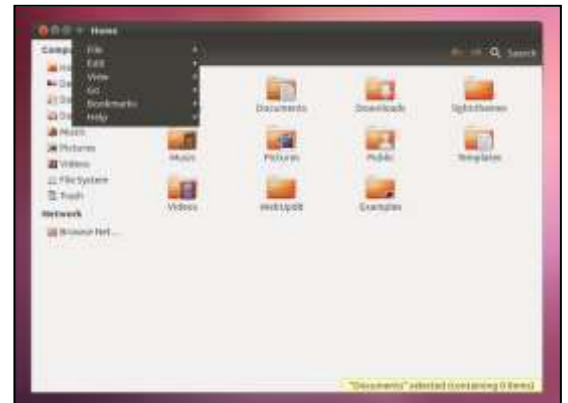
Home Folder

The Home folder is used to store personal files. It matches the users login name. It contains a number of more folders inside, which are created automatically during the installation process. It includes Desktop,

National Digital Literacy Mission

Downloads, Music, Documents, Pictures, Public, Templates, and Videos. If you wish to add more files and folders here, it can be done easily at any time.

Nautilus file manager

Just as Windows has Windows Explorer and Mac OS X has Finder to browse files and folders, Ubuntu uses the Nautilus file manager by default.

The Nautilus file manager window

In the Home Folder shortcut in the Launcher, click on a folder in Dash, or double-click on a folder on the desktop, the Nautilus file manager window opens. The default window contains the following features:

a. *Menu bar:* The menu bar is located at the top of the screen. These menus allow you to modify the layout of the browser, navigate with ease, bookmark commonly used folders and files, and view hidden folders and files.

b. *Titlebar:* The titlebar shows the name of the currently selected folder. It also contains the Close, Minimize, and Maximize buttons.

c. *Toolbar:* The toolbar contains tools for navigation. On the right is the search icon (which looks like a magnifying glass). Click on this icon to open a field to search for a file or folder by name. Below the toolbar, there is a representation of your current browsing. This is similar to the history function in most browsers.

d. *Left pane:* The left pane of the file browser has shortcuts to commonly used folders. When a folder is bookmarked, it appears in the left pane. No matter what folder is open, the left pane will always contain the same folders. This left pane can be changed to display different features (such as Information, Tree, History, etc.) by clicking the down arrow beside "Places" near the top.

e. *Central pane:* It is the largest pane in the middle which shows the files and folders in the directory that you are currently browsing.

> If you start typing a location in the toolbar starting with a '/' character, Nautilus will automatically change the navigation buttons into a text field labeled *Location*. It is also possible to convert the navigation buttons into a text field by pressing Ctrl+L.

Navigating Nautilus

- To navigate between folders, use the bookmarks in the left pane of the Nautilus file manager.
- To go back, click on the name of a folder in the path bar.
- Double-clicking on a visible folder will help you to navigate to it.

Open files

- To open a file, either double-click on its icon or right-click the icon and select one of the *Open With* options. (Ubuntu decides which application to use for the file being opened, and mostly, Ubuntu chooses correctly.)
- Choose *Open With Other Application* if the file has to be opened using another application.
- A selection of installed applications will appear.
- Make the selection and the file will open in the selected application.

Create and Save New Folders

- To create a new folder from within Nautilus, click *File ‣ Create New Folder.*
- Name the folder that appears by replacing the default "Untitled Folder" with the desired label. It saves the file in Nautilus.
- To create a new folder, press Ctrl+Shift+N or right-click the file browser window and select Create New Folder from the popup menu.

Hidden Files and Folders

- To hide certain folders or files, place a dot (.) in front of the name (*e.g.*, ".School Documents").
- To view hidden files, click *View ‣ Show Hidden Files* or press Ctrl+H

Copying and Moving Files and Folders

- Click Edit ‣ Copy or right- click on the item and select Copy from the popup menu. When using the Edit menu in Nautilus, make sure you have selected the file or folder you want to copy first (by left-clicking on it once).
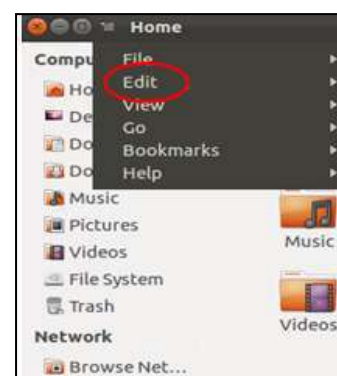
- Multiple files can be selected by left-clicking in an empty space (*i.e.*, not on a file or folder) holding the mouse button down and dragging the cursor across the desired files or folders. This "click-drag" move is useful when you are selecting items that are grouped closely together.
- To select multiple files or folders that are not placed next to each other, hold down the Ctrl key while clicking on each item individually. Once multiple files and/or folders are selected, you can use the Edit menu to perform actions just like you would for a single item.
- When one or more items have been "copied," navigate to the desired location then click Edit ‣ Paste (Ctrl+V) to copy them to the new location.
- The *Copy (*Ctrl+C*)* command is used to make a duplicate of a file or folder in a new location.
- The *Cut (*Ctrl+X) command is used to move files and folders around.

Using Multiple Tabs and Multiple Nautilus Windows

Opening multiple Nautilus windows can be useful for dragging files and folders between locations. The option of *tabs* (as well as *panes*) is also available in Nautilus.


- To open a second window when browsing a folder in Nautilus, select File ‣ New Window or press Ctrl+N. This will open a new window, allowing you to drag files and/or folders between two locations.
- To open a new tab, click File ‣ New Tab or press Ctrl+T. A new row will appear above the space used for browsing your files containing two tabs.
- To open a second pane, click View ‣ Extra Pane, or press F3 on your keyboard. This helps you to see two locations at once on the screen without having to switch between tabs or windows.
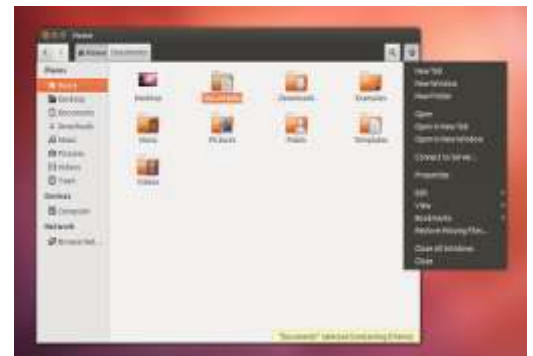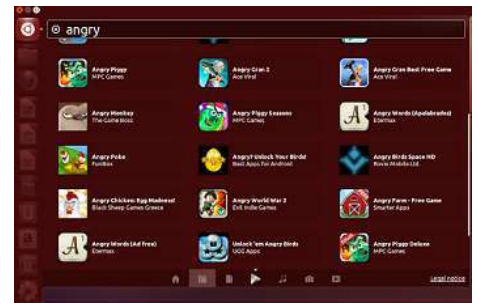
Search for files and folders on the computer

You can search for files and folders using the Nautilus or Dash.
- In Nautilus, Click Go ‣ Search for Files or press Ctrl+F and then type what you want to find.
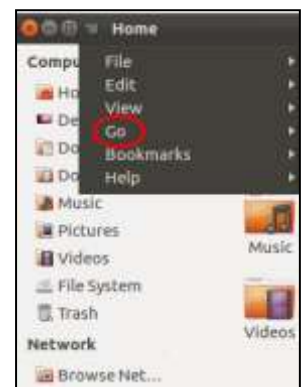
- In Dash, simply type your search terms in the search bar at the top of the Dash.

Customize the Desktop

- Go to the Session Indicator.
- Select 'System Settings' to open the System Settings application window.
- Dash, desktop appearance, themes, wallpapers, accessibility and other configuration settings are available here.

Appearance

- Open Appearance by either right-clicking on the background and selecting Change Desktop Background; Or
- Select Session Indicator ‣ System Settings ‣ Appearance.

Theme

Themes control the appearance of your windows, buttons, scroll bars, panels, icons, and other parts of the desktop.
- The "Appearance" window displays the current selected background wallpaper and theme.
- The *Ambiance* theme is used by default. Other themes can be chosen by clicking on any of the listed themes.

Desktop background

- Under Background, a drop-down box will appear on the right. You can choose from Wallpapers, Pictures Folder and Colors and Gradients.
- When 'Wallpaper' is selected, Ubuntu's default selection of wallpapers appears.
- To change the background, simply click the picture you

would like to use.

- To use one of your own pictures, click the +… button and navigate to the image you want to use and double-click the image. This image will be saved to the list of available backgrounds.

Office Suite

In Ubuntu, a user may choose among many office suites. The most popular suite in Ubuntu, which is installed by default, is the LibreOffice (formerly OpenOffice). It provides the same functionality as Microsoft Word, Excel and PowerPoint, except that LibreOffice is free open source software. All these applications can be accessed through the Launcher. LibreOffice can open, edit and create files compatible with Microsoft Office. It includes the following components which are found in other operating systems by different names:

- Writer - Word processor
- Calc – Spreadsheet
- Impress -Presentation Manager
- Draw - Drawing Program
- Base – Database
- Math - Equation Editor

II. MOBILE PHONE OPERATING SYSTEM AND FEATURES

An operating system is an interface between hardware and user. It controls hardware and software resources of the system. An operating system which manages mobile devices is called Mobile Operating System. They are simple and deal with the wireless versions of broadband and local connectivity. The original mobile operating system used to be fairly basic as the capacity of the phones then was limited. Modern smartphones have added many features of a full-fledged computer to the mobile phones thereby making it necessary for mobile operating system to evolve over time.

Modern mobile operating system combines the features of a personal computer's operating system with other features, including touch-screen, cellular, Bluetooth, Wi-Fi, GPS mobile navigation, camera, video camera, speech recognition, voice recorder, music player and other features. Most common operating systems for Mobiles and Tablets are Android, Windows, iOS and Symbian. In this section, we will discuss some of the basic features of a mobile phone.

USING MOBILE PHONES

2.1 How to make a call

Step 1: Type in the phone number on the keypad.
In case of a smartphone, find the 'Phone' icon on the home screen and tap on it. You will see a number pad on the screen. Type the digits that you wish to dial.

Step 2: Press the green button/ answer key on the left.
In case of a smartphone, tap on the green button. The screen will show that the number is dialling/ connecting.
(Select which SIM to use in case of dual-sim phone).
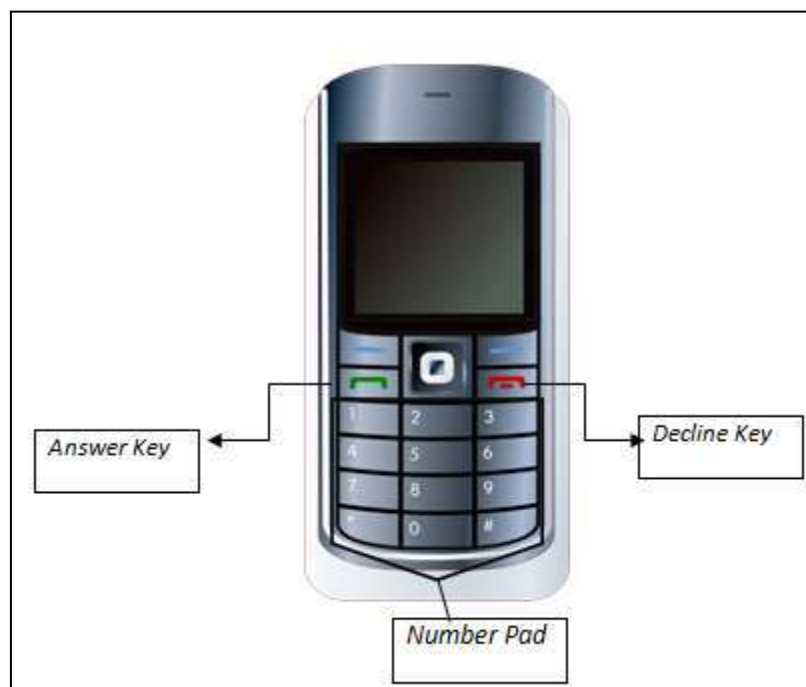
Step 3: To end the call, press/tap the red button/decline key on the right.

2.2 How to answer/decline a call

• When your phone rings, press the green button to answer your phone. In case of a smartphone, swipe from left to right to answer the call.
• To decline a call, press the red button on the right. In case of a smartphone, swipe from right to left to decline the call.

2.3 How to call the last dialled number

Step 1: On the home screen, press the green button on left. It will display a list of recently dialled numbers. In the case of a smartphone, tap on the 'Phone' icon. It will show all calls (dialled, received and missed).

Step 2: Select the number and then press the green button again. Simply tap on the number in a smartphone. It will start dialling the number.

2.4 How to view Call History

Step 1: Press 'Menu' in Standby mode. Tap on the 'Phone' icon in a smartphone.

Step 2: Select 'Call Register'/ 'Call History'/ 'Call Log'. It will appear like this icon

Step 3: It will show three tabs namely 'Received calls', 'Dialled calls' and 'Missed calls'.

Step 4: Click on the tab you wish to see. It will show you a list of calls along with the date and time of the call. In a smartphone, all calls can be seen in one single list. A green arrow denotes received calls; a blue arrow denotes dialled calls and a red arrow denotes missed calls.

Step 5: You may call the phone number, save the number in 'Contact book' or send a message to the number.

2.5 How to adjust the volume

Step 1: Press the Menu button from the main screen on phone.

Step 2: Click on Settings from the options menu.

Step 3: Select the Sounds or Audio option from the Settings menu.

Step 4: Locate the volume option in the Sounds menu. The volume controls are found under Ringer or Ringtone.

Step 5: Click on the Speaker option and press Up or Down on the keypad to adjust the volume to the desired level.

Note: On your smartphone, there is a Volume control button on the outside, simply press it on either side to increase or decrease the volume level.

2.6 How to add new contacts

Step 1: When the phone is in Standby mode, press Menu. In a smartphone, tap the 'Phone' icon.

Step 2: Under Menu, go to the Phone book of your cell phone. It is depicted on the home screen by a picture of a phone or the words Phone/ Phone Book/ Contacts.

Step 3: Select 'Add New Contact' from the available options.

Step 4: Enter the phone number for the contact you wish to add, including the area code, in the form that appears onscreen. In a smartphone, type the digits in the number-pad. Tap on 'Add to Contacts' > 'Create new contact'.

Step 5: Enter your contact's first and last name in the appropriate area in the form.

Step 6: Make sure to press/ tap 'Save' or 'Add to Contacts' button to save the information.

Note: To edit contact details of already stored numbers, select the name of the contact. Press/ tap 'Edit', type in the correct information and press/ tap 'Save'.

2.7 How to send a message

Step 1: In Standby mode, press Menu.

Step 2: Choose Messaging > Text messages > Create message. In a smartphone, find the 'Messaging' icon on home screen. Tap on the icon. You will see a list of messages.

Step 3: Select Create message/ Writing text. In a smartphone, tap on 'Write message' icon

Step 4: Write your message in the text box.

Step 5: To add a picture or an attachment, select Options > Insert object.

Step 6: Scroll down to the desired picture/ object, press 'View' > 'Insert'.

Step 7: Type the recipient's phone number in the designated area or click 'Phone book' if you wish to send the message to a saved contact. Select the contact and click OK. In a smartphone, type the first few letters of the recipient's name in the 'To' column. You will see a list of names from your Contact book. Tap on the required name.

Step 8: Click/ tap 'Send' to send your text message. Press/ tap 'End'/ 'Cancel' to return to the main screen.

2.8 How to read a received message

Step 1: When you receive a message, you will see icon on top of the home screen. You will also see a box with '1 message received' on the screen.

Step 2: If you have received multiple messages (for eg. 8 messages), the screen will show '8 messages received'.

Step 3: Press 'Show' to view the new message. To view it later, press 'Exit'.

Step 4: Read the message.

2.9 Viewing the message later

Step 1: Press 'Menu' in Standby mode.

Step 2: Select 'Messages' > 'Text Messages' > 'Inbox'.

Step 3: Click on the message you wish to read.

Step 4: Read the message.

2.10 How to listen to the radio

Step 1: In the Standby mode, press 'Menu' > 'Media' > 'Radio'. In case of a smartphone, tap on the 'radio' icon in the menu.

Step 2: Connect your phone to a compatible headset. It acts as an antenna.

Step 3: Search for the radio channel you wish to listen to by choosing 'Automatic' or 'Manual' tuning. Save the channels by pressing / tapping 'Save channel' under 'Options'.

Step 4: To adjust the volume, scroll up or down.

Step 5: To turn the radio off, press/ tap 'Options' > 'Switch off'.

2.11 How to play a song

Step 1: Select Menu on the Standby mode. In case of a smartphone, find the default music player from the menu.

Step 2: Open your phone's multimedia menu to display available applications on your mobile device. The music application might show as 'Media' / 'Gallery'.

Step 3: Select 'Music'/ 'Sound'.

Step 4: Browse the songs available within your media player application (as shown on the right) and select one to play it on your device.

Step 5: To pause or resume playing, press/ tap the 'Play'/ 'Pause' key. (The same button acts as play and pause)

Step 6: To exit the music player, press the red button on right. In case of a smartphone, tap on the 'Pause' icon.

Note: You will need a memory card to store music on your phone.

2.12 How to take a photo

Step 1: From the Standby mode, press 'Menu'.

Step 2: Choose 'Media' > 'Camera'. In your smartphone, find and tap on the 'Camera' icon.

Step 3: Use the display on screen as a viewfinder.

Step 4: Scroll up and down to 'Zoom in' and 'Zoom out'. In a smartphone, use your fingers to pinch in and pinch out the size of the display.

Step 5: Take the picture by pressing 'Select' /'OK' button. In a smartphone, you need to tap on the 'Camera' icon to capture the picture.

Step 6: Press 'Save' to save the picture on your device. It is saved automatically in 'Album'/'Gallery' in a smartphone.

2.13 How to record a video

Step 1: Select Menu > Photos > Video camera. In case of a smartphone, tap on 'Camera' icon.

Step 2: Use the display on screen as a viewfinder.

Step 3: Scroll up and down to 'Zoom in' and 'Zoom out'. In a smartphone, use your fingers to pinch in and pinch out the size of the display.

Step 4: To start recording the video, select Record**.** In case of a smartphone, you need to tap on the small red icon located on the screen.

Step 5: To stop recording, press Stop. In a smartphone, tap on the red icon again.

Step 6: Press 'Save' to save the video on your device. The video is saved automatically in 'Album'/'Gallery' in a smartphone.

2.14 How to use Calculator

Step 1: Press 'Menu' in standby mode.

Step 2: Select 'Organiser' > 'Calculator'. In a smartphone, find the 'Calculator' icon in the menu and tap on it.

Step 3: Type in a number using the number pad on your phone.

Step 4: Choose 'Add', 'Subtract', 'Multiply' or 'Divide' function (+, -, ×, ÷).

Step 5: Type in the second number.

Step 6: Press/ tap the 'Equals' (=) button to get the result.

III. TABLET OPERATING SYSTEM AND FEATURES

Tablets are smaller, lighter and more manageable variants of computers. They are wireless and portable devices that make use of 'touch' as input to access or process information. Tablets include operating systems that provide a GUI and can run applications. The most popular operating systems of tablets include Android, Windows and iOS.

Tablets can be broadly classified into two types- with call facility and without call facility. A tablet with call facility would include a SIM card slot. You will need a SIM card and a

connection to a mobile network to make and receive calls and send and receive text messages. A tablet without call facility will not have a SIM card slot though all the other features would be similar to a tablet with call facility. You would still be able to make calls through Internet.

FEATURES OF TABLET

Most tablets can be used for following uses:

1. Making and receiving phone calls
2. Sending and receiving messages
3. Listening to music
4. Taking a picture/ video
5. Watching videos
6. Reading E-books.
7. Sending and receiving E-mails (Needs Internet connectivity)
8. Sharing music, images and videos with others. (Needs Bluetooth or Internet connectivity).

3.1 How to listen to Music

Step 1: Go to application menu.
Step 2: Tap on "MUSIC" to enter the music playback interface. (Only music files that are stored inside the device will be shown in the file list.)
Step 3: You can classify the music file list by: RECENT, ALBUMS, ARTISTS, SONGS, PLAYLISTS or GENRES by selecting the appropriate option.
Step 4: Tap the song for 1 second, the option menu will pop up.
Step 5: Select Play, Add to playlist and Shop for Artist, Delete or Search.
Step 6: Tap "Play" to enter the playback interface and start music playback or tap the song name directly.
Step 7: On the playback interface, tap on the function bar to adjust the playback time, backward, forward, play, pause, shuffle, or repeat.

3.2 Using Camera

Most tablets have built-in camera which allow you to take photos and make videos.

3.2.1 How to take a photo

Step 1: In the application menu, tap the camera icon to enter the camera interface.
Step 2: Select photo mode by tapping the preferred icon in photo mode.

Step 3: Drag the slider beside Touch capture to the right.

Step 4: Point the camera towards the subject.

Step 5: To activate auto focus, touch and hold a spot on the screen. When the focus frame turns colour (as per specifications), lift your finger to take the photo.

Note: You can also take a photo by tapping the on-screen camera button.

3.2.2 How to record a video

Step 1: In the application menu, tap the camera icon to enter the camera interface.

Step 2: Select video mode by tapping the preferred icon in photo mode.

Step 3: Point the camera towards the subject.

Step 4: Tap to start recording.

Step 5: Tap to stop recording.

Note: You may exit the Camera interface by pressing the back button to return to the application menu.

3.2.3 How to delete a photo or recorded video

Step 1: Browse to the photo or video that you want to delete.

Step 2: Tap the screen to make appear the 🗑 icon.

Step 3: Tap on it to delete the photo or video.

3.2.4 How to view photos and videos

Step 1: Find and tap Album.

Step 2: Tap a photo or video to view it.

Step 3: Flick left to view the next photo or video or flick right to view the previous photo or video.

3.2.5 How to play a video

Step 1: Open the 'Pictures' or 'Album' tab from the menu.

Step 2: Using grid view or list view, locate the video that you want to open.

Step 3: Tap Movies if you wish to view a pre-installed or downloaded video clip.

Step 4: Tap the video that you want to play.

Step 5: If the playback controls are not displayed, tap the screen to display them.

3.2.6 How to pause a video

Step 1: When a video is playing, tap the screen to display the controls.
Step 2: Tap the play/pause icon to pause or restart the video.

3.2.7 How to fast forward and rewind a video

Step 1: When a video is playing, tap the screen to display the controls.
Step 2: Drag the progress bar marker left to rewind or right to fast forward.

3.3 How to read an e-Book

Step 1: Go to the default book reader installed in the tablet.
Step 2: Tap on the icon of the book reader.
Step 3: Choose the book you wish to read from among the pre-installed books.
Step 4: Tap on the book's icon to start reading.

3.4 Using E-mail

The tablet can be used to send and receive e-mails from almost any POP or IMAP e-mail address by using the specific application installed in the tablet. You can set up and use this feature by following the instructions when you open the e-mail application.

3.4.1 How to write an email

Step 1: In the Menu, go to the 🔵 icon.
Step 2: Click on it. A window will appear with a horizontal bar on the top.
Step 3: Type in the URL of the e-mail service provider you wish to visit. For example www.gmail.com
Step 4: Type in your username and password in the space provided. Tap 'Sign in'.
Step 5: On this page, find and tap 'Compose'/ 'Write new'.
Step 6: In the new window, type the recipient's e-mail Id in 'To' field. For example, abc@gmail.com
Step 7: Type the subject in the 'Subject' field. For example, 'Delivery on time'.
Step 8: On the blank space in the centre, type your message.
Step 9: You can attach any file (image, document, music etc.) by tapping on 'Attach'
Step 10: Tap on 'Send'. Your e-mail is sent.
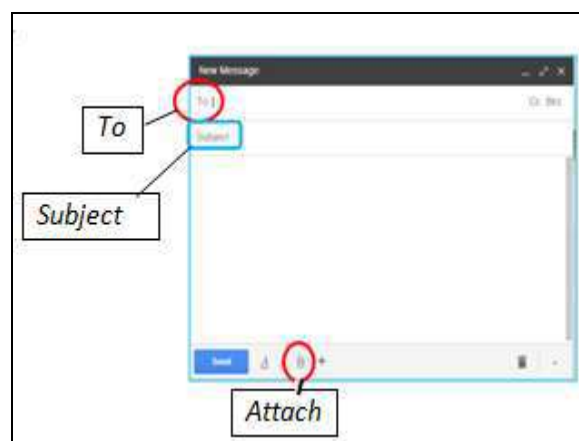
3.4.2 How to read a received e-mail

Step 1: When you receive an e-mail, an icon (usually an envelope) appears on the top of the screen.

Step 2: Drag down the screen to view the icon. Alternatively, go to the e-mail client's icon in the menu.

Step 3: Tap on the icon.

Step 4: Your mail Inbox will open on the screen.

Step 5: Tap on the e-mail and read it.

3.5 How to locate a file

There are two ways to locate/ search for a file or folder on your Tablet. You can either use 'File Manager' installed on your phone. You can locate any image, video, e-book, document or song by using this. Another way is to use the 'Online search engine' which is located on the Home screen. It helps you locate information and facts on the Internet.

a. By using the 'File Manager'

Step 1: On the Home screen, find the 'File Manager' / 'File Browser' app. (It is usually pre-installed on your tablet)

Step 2: Tap on it. It will open another window which looks like the image on right. It shows 'My files' on top.
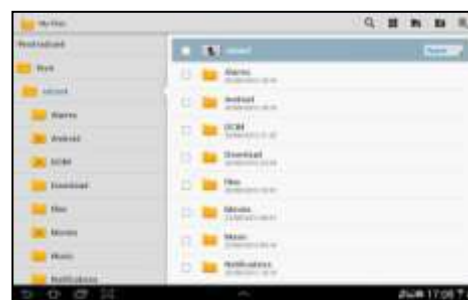
Step 3: From the list, locate the folder/file that you wish to open. Tap on it to open it.

Step 4: You can also see the 'Search' icon at the top which looks like a magnifying glass

Step 5: Tap on it. Type in the name of file/folder you wish to see.

Step 6: Search results will be shown on the screen. Tap on the requisite one to open it.

b. By using the online Search Engine

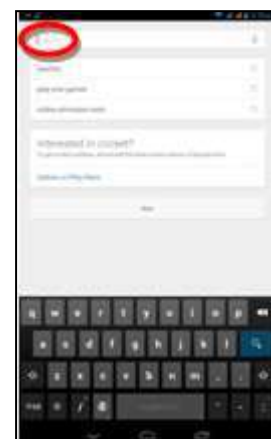Step 1: On the home screen, locate the 'Search' icon which looks like a magnifying glass.

Step 2: Tap on it, a new window will appear.

Step 3: You will see a horizontal tab with 'Search' written in it.

Step 4: Type in the 'Keywords' of the information that you wish to locate.

Step 5: Online search results will be shown on the screen. Tap on the requisite one to open it.

3.5.1 Open a file

Step 1: Search for a file using the 'File Manager' or locate it on the Home screen
Step 2: Tap on it to read or view it.

3.6 Messaging

3.6.1 How to send a message

Step 1: On the home screen, find the Messaging icon which could look like or
Step 2: If you do not find it on the Home screen, tap on the 'Menu' icon to view all the applications on the phone.
Step 3: Tap on the 'Messaging icon'. You will see a list of received messages.
Step 4: Find the 'Write new' icon on the screen, denoted by either an envelope and plus symbol or a pencil and plus symbol.

Step 5: Tap on it. Type the first few letters of the recipient's name in the 'To' column. You will see a list of names from your Contact book. Tap on the required name. It will be inserted in the 'To' column.
Step 6: Tap on 'Write message' and start typing your message.
Step 7: You can attach a file, document, image or music file by tapping on the relevant icon and inserting the desired file.
Step 8: Tap on 'Send'. Your message is sent.

3.6.2 How to read a received message

Step 1: When you receive a new message, you will be able to see a messaging icon on the top of the screen. Alternatively, you will see a number written on the 'Messaging' icon on the home screen denoting the number of new messages received.
Step 2: Tap on it. It will open the messaging window with a list of received messages.

Step 3: Tap on the message you wish to read.

3.7 How to make/ receive calls

Using the Tablet as a phone

Some tablets can also work as phones, that is, they can be used to make and receive phone calls. You can speak either through speakerphone or headset connections. You need to

insert a valid GSM SIM card into the SIM card slot while the device is powered off. Dialing, disconnecting and contact lists in a Tablet function like a standard mobile phone.

3.7.1 To make a call

Step 1: On the home screen, tap the 📞 icon.

Step 2: Press the digits of the phone number you wish to dial.

Step 3: Tap the 📞 icon.

Step 4: Start talking once it connects.

3.7.2 To make a call from Phonebook/ Contact list

Step 1: Go to phonebook/ Contact list on your tablet.

Step 2: Search the name you wish to contact.

Step 3: Tap on the contact name.

Step 4: Tap on the contact number.

Step 5: Start talking once it connects.

3.7.3 To receive/ decline a call

Step 1: Slide your finger from left to right to attend the call.

Step 2: Slide the finger from right to left to disconnect the call.

Other Features:

a. Set Language

Step 1: From the application menu, tap on "Settings" and select "Language & Input" from the list.

Step 2: Tap on "Language" and you can see a list of compatible languages.

Step 3: Tap on the language that you want and it will be set instantly.

Step 4: In the same area, you can also set the language of the keyboard that you would like to use when you need to input language on screen.

b. Set Date and Time

Step 1: From application menu, tap on "Settings" and select "Date & Time" from the list.

Step 2: Tick on "Automatic" and the date and time will be set automatically by using network- provided values or untick "Automatic" to set the date and time manually.

Step 3: You can also adjust the time zone, set it to 24-hour time format and/or adjust the date format by tapping the appropriate options provided.

**c.   Install and Manage Application on your Tablet**

Applications or Apps are one of the key features of Tablet which can really enhance the way you access various services. Now many services are available through applications or apps like Facebook, YouTube, redBus, IRCTC, etc.

Steps to get new apps on your Tablet are as follows:

Step 1: Go to 'Menu' option on your Tablet.

Step 2: In Menu, tap on 'Play Store' option. You can discover apps and content by navigating the on-screen menus which include Apps, Books, Movies and Games.

Step 3: Click on one of the displayed options. For example, if you have clicked on Apps tab, it will open the following section having various sub-sections like Categories, Home, Top Paid, Top Free, Top Grossing, Top New Paid, Top New Free and Top Trending.
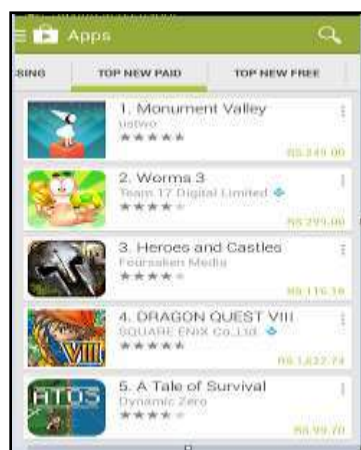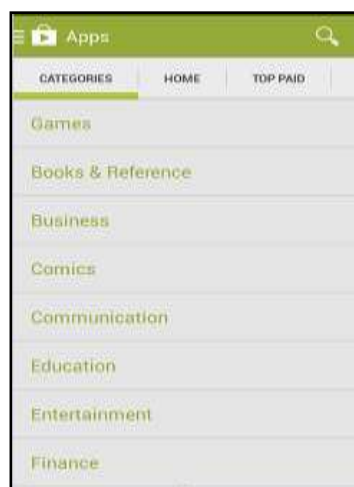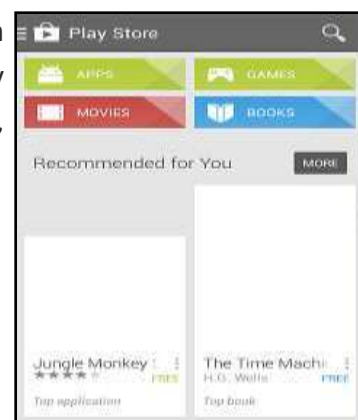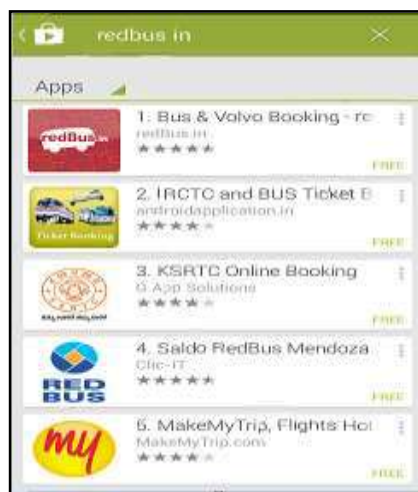
Step 4: Enter a search query. For example, if you are looking for redBus app then type the same in search bar.

Step 5: When you have entered a search term (i.e. redbus), you can tap one of the searches which will appear in the section below the search bar.

Step 6 (a): If the app is free, you can simply tap the 'Install' button and your phone will download and install the app automatically – it may, at this point, ask you to review what parts of your tablet the app can access and double check for you to confirm if you want to install the app.

(b): If the app has a price you will instead see a 'Buy' button – tapping this will bring up a confirmation box asking you if you definitely want to buy the app; to confirm press 'OK'. You will then have to enter your payment details with credit or debit card information – follow the onscreen instructions.