ICT

Practice Manual for Group A & B



DIRECTORATE OF TECHNICAL EDUCATION,

UNION TERRITORY, CHANDIGARH

Module No.	Title of the Topic	Page Nos.	Duration
A	**Computer Fundamentals** 1. Hardware 2. Software 3. Drivers 4. File Formats (Desktop, Files, Folders) 5. Printer Sharing	03 - 18	Day 1-2 (4 Hours)
B	**e-Governance Portals** 1. eHRMS Portal 2. Digi Locker 3. e-Tendering with use of Digital Signature 4. My Gov (mygov.in) 5. National Digital Library 6. GeM 7. E-office 8. PFMS 9. RTI 10. Swayam	19 - 86	Day 3-5 (4 Hours)
C	**Microsoft Office** 1. MS Word 2. MS Excel 3. MS PowerPoint 4. NIC Email (https://email.gov.in/)	87 - 124	Day 6-12 (4 Hours)
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A. COMPUTER FUNDAMENTALS

1. Hardware

A computer is an electronic machine that processes data. Information given to the computer is called data. Computer works very fast. It saves your time and energy. It does not make mistakes. It can remember a lot of things. The basic parts of a computer are shown in the picture given here (Fig A.1).



Fig. A.1: Parts of a computer

- **Input Devices**

Input devices are used to provide information to a computer, such as typing a letter or giving instructions to a Computer. Some examples of input devices are as follows:

1. **Mouse**: A standard mouse has a left and a right button. You use the left button to select items and provide instructions by clicking an active area on the screen. You use the right button to display commonly used menu items on the screen.
2. **Keyboard**: A set of keys that resembles a keyboard on a typewriter. You use the keyboard to type text such as letters or numbers into the computer.
3. **Scanner**: A device that is similar to a photocopy machine. You can use this device to transfer an exact copy of a photograph or document into a computer. A scanner reads a page and translates it into a digital format that a computer can read. For example, you can scan photographs of your family using a scanner.



Fig. A.2: Input devices

Internal Computer Hardware

Introduction

Computer Hardware is the physical part of a computer, as distinguished from the computer software that executes or runs on the hardware. The hardware of a computer is infrequently changed, while software and data are modified frequently. The term soft refers to readily created, modified, or erased. These are unlike the physical components within the computer which are hard.

When you think of the term computer hardware you probably think of the guts inside your personal computer at home or the one in your classroom. However, computer hardware does not specifically refer to personal computers. Instead, it is all types of computer systems. Computer hardware is in embedded systems in automobiles, microwave ovens, CD players, DVD players, and many more devices. In 2003, only 0.2% of all microprocessors sold were for personal computers. How many other things in your house or your classroom use computer hardware?

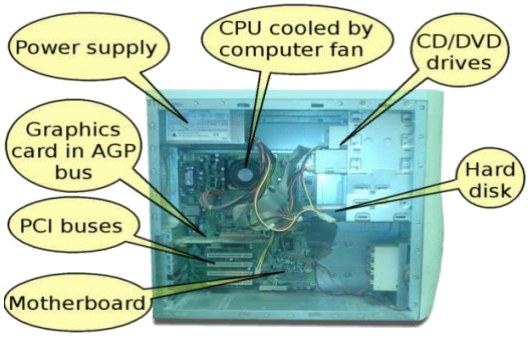


Fig. A.3: Parts of a CPU

Motherboard

The motherboard is the body or mainframe of the computer, through which all other components interface. It is the central circuit board making up a complex electronic system. A motherboard provides the electrical connections by which the other components of the system communicate. The mother board includes many components such as: central processing unit (CPU), random access memory (RAM), firmware, and internal and external buses.



Fig. A.4: Motherboard

Central Processing Unit

The Central Processing Unit (**CPU**; sometimes just called processor) is a machine that can execute computer programs. It is sometimes referred to as the brain of the computer.

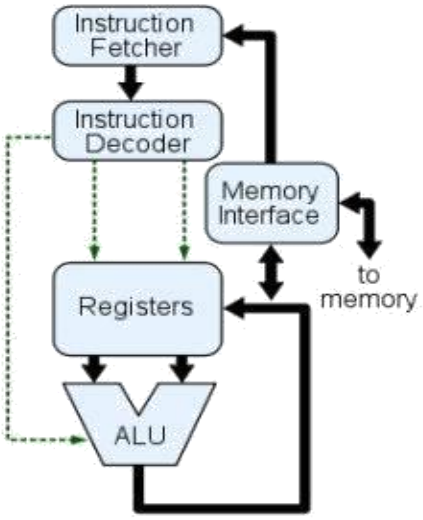


Fig. A.5: CPU

There are four steps that nearly all CPUs use in their operation: *fetch*, *decode*, *execute*, and *write back*. The first step, fetch, involves retrieving an instruction from program memory. In the decode step, the instruction is broken up into parts that have significance to other portions of the CPU. During the execute step various portions of the CPU, such as the arithmetic logic unit (ALU) and the floating point unit (FPU) are connected so they can perform the desired operation. The final step, write back, simply writes back the results of the execute step to some form of memory.

Random Access Memory

Random access memory (RAM) is fast-access memory that is cleared when the computer is power-down. RAM attaches directly to the motherboard, and is used to store programs that are currently running. RAM is a set of integrated circuits that allow the stored data to be accessed in any order (why it is called random). There are many different types of RAM. Distinctions between these different types include: writable vs. read-only, static vs. dynamic, volatile vs. non-volatile, etc.



Fig. A.6: RAM

Firmware

Firmware is loaded from the Read only memory (ROM) run from the Basic Input-Output System (BIOS). It is a computer program that is embedded in a hardware device, for example a microcontroller. As it name suggests, firmware is somewhere between hardware and software. Like software, it is a computer program which is executed by a microprocessor or a microcontroller. But it is also tightly linked to a piece of hardware, and has little meaning outside of it. Most devices attached to modern systems are special-purpose computers in their

own right, running their own software. Some of these devices store that software ("firmware") in a ROM within the device itself.

Power Supply

The power supply as its name might suggest is the device that supplies power to all the components in the computer. Its case holds a transformer, voltage control, and (usually) a cooling fan. The power supply converts about 100-120 volts of AC power to low-voltage DC power for the internal components to use. The most common computer power supplies are built to conform to the ATX form factor. This enables different power supplies to be interchangeable with different components inside the computer. ATX power supplies also are designed to turn on and off using a signal from the motherboard, and provide support for modern functions such as standby mode.

Removable Media Devices

There are many different removable media devices. The most popular are probably CD and DVD drives which almost every computer these days has at least one of. There are some new disc drives such as Blu-ray which can hold a much larger amount of information than normal CDs or DVDs. One type of removable media which is becoming less popular is floppy disk.

CD



Fig. A.7: CD-ROM

CDs are the most common type of removable media. They are inexpensive but also have short life-span. There are a few different kinds of CDs. CD-ROM which stands for Compact Disc read-only memory are popularly used to distribute computer software although any type of data can be stored on them. CD-R is another variation which can only be written to once but can be read many times. CD-RW (rewritable) can be written to more than once as well as read more

than once. Some other types of CDs which are not as popular include Super Audio CD (SACD), Video Compact Discs (VCD), Super Video Compact Discs (SVCD), Photo CD, Picture CD, CD-i, and Enhanced CD.

DVD

DVDs (digital versatile discs) are another popular optical disc storage media format. The main uses for DVDs are video and data storage. Most DVDs are of the same dimensions as compact discs. Just like CDs there are many different variations. DVD-ROM has data which can only be read and not written. DVD-R and DVD+R can be written once and then function as a DVD-ROM. DVD-RAM, DVD-RW, or DVD+RW hold data that can be erased and re-written multiple times. DVD-Video and DVD-Audio discs respectively refer to properly formatted and structured video and audio content. The devices that use DVDs are very similar to the devices that use CDs. There is a DVD-ROM drive as well as a DVD writer that work the same way as a CD-ROM drive and CD writer. There is also a DVD-RAM drive that reads and writes to the DVD-RAM variation of DVD.



Fig. A.8: DVD-ROM

Blu-ray

Blu-ray is a newer optical disc storage media format. Its main uses are high-definition video and data storage. The disc has the same dimensions as a CD or DVD. The term “Blu-ray” comes from the blue laser used to read and write to the disc. The Blu-ray discs can store much more data then CDs or DVDs. A dual layer Blu-ray disc can store up to 50GB, almost six times the capacity of a dual layer DVD (WOW!). Blu-ray discs have similar devices used to read

them and write to them as CDs have. A BD-ROM drive can only read a Blu-ray disc and a BD writer can read and write a Blu-ray disc.

Internal Storage

Internal storage is hardware that keeps data inside the computer for later use and remains persistent even when the computer has no power. There are a few different types of internal storage. Hard disks are the most popular type of internal storage. Solid-state drives have grown in popularity slowly. A disk array controller is popular when you need more storage then a single hard disk can hold.

Hard Disk Drive

A hard disk drive (HDD) is a non-volatile storage device which stores digitally encoded data on rapidly rotating platters with magnetic surfaces. Just about every new computer comes with a hard disk these days unless it comes with a new solid-state drive. Typical desktop hard disk drives store between 120 and 400GB, rotate at 7,200 rpm, and have a media transfer rate of 1 Gbit/s or higher. Hard disk drives are accessed over one of a number of bus types, including parallel ATA (also called IDE), Serial ATA (SATA), SCSI, Serial Attached SCSI, and Fibre Channel.

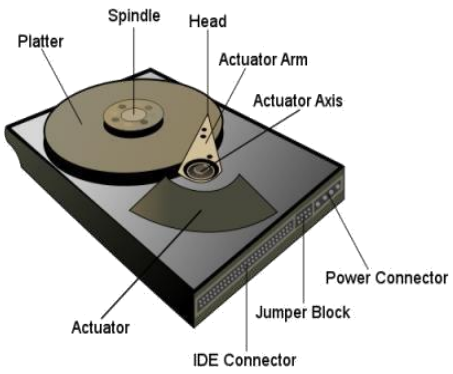


Fig. A.9: Hard Disk Drive

Solid-State Drive

A solid-state drive (SSD) is a data storage device that uses solid-state memory to store persistent data. An SSD emulates a hard disk drive, thus easily replacing it in any application. SSDs have begun to appear in laptops because they can be smaller than HDDs. SSDs are currently more expensive per unit of capacity than HDDs which is why they have not caught on so quickly.

Disk Array Controller

A disk array controller is a device which manages the physical disk drives and presents them to the computer as logical units. It almost always implements hardware RAID. RAID (Redundant Array of Independent Drives) is a technology that employs the simultaneous use of two or more hard disk drives to achieve greater levels of performance, reliability, and/or larger data volume sizes. A disk array controller also provides additional disk cache.

2. **Software**

System software can be separated into two different categories, utility programs and operating systems. Operating systems are the foundation of your computer and almost every electronic device. The OS boots up the computer and makes sure everything is operational. The OS is also what runs your cell phone and most of your electronic devices. The OS is, for the most part, the GUI (graphical user interface) that shows you all of your applications, and without the OS you cannot use the computer. There are many different types of OS's which are discussed later. Utility programs perform a very specific task, to either enhance or manage your computer. For example, your virus protection program, like Norton, is an example of a utility program along with the install/uninstall program that comes standard with Windows.

Systems Software

The operating system is a type of system software kernel that sits between computer hardware and end user. Systems Software are applications that are designed specifically for running the hardware on a personal computer and are used to maintain a platform for Application Software to be used. This means that systems software is designed to communicate with the internal parts of your computer such as the hard drive, RAM, ROM, cache, microprocessors, etc. so that the user doesn't have to. It contains all of the drivers necessary for this type of communication and, in the simplest sense; it is the interface between the user and the hardware. The Operating System (OS) is not only one of the most important systems software on a computer, but is also the most frequently used. It is the software that runs in the background and brings the separate physical parts of the computer together in order to provide the seamless stream of activity that a user experience. Some of its responsibilities include the transfer of data between the memory and disks (on the hard drive) as well as providing the information needed to display icons, text, cursors and other visible necessities on the display screen. This display is called the graphical user interface (GUI) and is entirely the result of the OS on the computer. This can be compared by viewing the differences between the Ubuntu OS and the Mac Snow Leopard OS. The icons between

the two are positioned differently and they look different too. The Mac OS and GUI tends to have a more three-dimensional aspect to it where Windows tends to appear flatter. It should also be remembered that the operating system conducts itself independently of both the user and any application software being used. This means that it is not directly dependent on the user or other programs in order to operate. Some other systems software would include BIOS and other device firmware. These help the user interact with other utilities such as diagnostic tools, language translators, data communication programs, as well as data management programs.

Windows

Windows is a series of operating systems that is designed by Microsoft. The first two versions of the Windows operating system, introduced in 1985 and 1987 respectively, were primitive. Windows 1.0 had only basic functions such as MS Paint and a word processor and Windows 2.0 had very rudimentary versions of Word and Excel. Windows did not become popular until its third release in 1990. Windows 3.0 had enhanced graphics, the ability to "multi-task", and (for the first time) virtual memory. This version was so popular that it stayed on the market for eleven years. The next big improvement came with Windows 95, which expanded from 16-bit to 32-bit (short for binary digit). Windows 2000 was known for its increase in plug-in devices that were congruent with the operating system. Windows XP, or Windows 2001, included a comprehensive help center to allow users to utilize different types of media and was designed mostly for user ease and convenience. The main feature of Windows Vista is the Instant Search at the bottom of the start menu. Then Windows 7 came out and the improvements were mainly to make it faster and easier to use. The most recent version of Windows is Windows 10. Windows 10 came out late July 2015. The new Windows will allow you do to more than one thing at once. It also allows for a new way to search and there is a way to open the Windows store from your home page. Windows is the most commonly used operating system and is used on about 90% of all personal computers.

Application Software

Application Software is the most common programs that run in the foreground of the computer. They tend to perform useful tasks which are not associated with computer maintenance, system boot-up, or hardware communication. Application software is directly reliant on the Systems Software to communicate to the physical components of the computer and cannot operate without it. If you were to visualize this, the Application Software would operate on top of the Systems Software and would be the most visible to the user while the Systems Software would remain in the background unnoticed. The Systems Software would then communicate to the Hardware on its behalf and deliver any information to it from the Application Software. In turn, any information needed from the Hardware would pass through the Systems Software to the

Application Software. Application Software is the most familiar forms of software and come in a variety of types. Most often they can be accessed through the graphical user interface of the operating system being used by double-clicking on an icon. Some of the most popular examples include word processors, spreadsheets, photo-editing programs, database programs, and accounting programs to name a few. This list is by no means the extent to which application software may be used and many more programs are being created constantly to help individuals with daily activities.

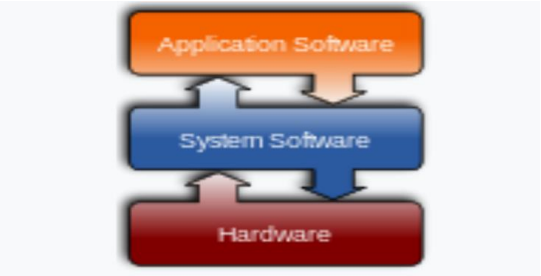


Fig. A.10: Layers of software above hardware

Antivirus, Antispyware, Firewalls, and Other Security Programs

Malware consists of viruses, Trojans, worms, spyware and other forms that disrupt computer operation. As mentioned, malware can infect computers in many ways, whereas the affected suffers while the infector gains. To protect against these threats, it is highly recommended to take advantage of the utility programs offered by the operating system as well as software programs. Popular antivirus programs for Windows include AVG, Norton 360, McAfee, Kaspersky and Microsoft Security Essentials. A firewall is used to monitor network ports by controlling inbound and outbound traffic to the network. Its primary purpose is to defend the computer from malware and hackers, but it can also interfere with programs that must access the Internet. It will also not remove malware if it has infected the computer; it only blocks the malware from entering. Spyware is software that tracks personal information unknowingly from the user, which can lead to serious problems. It is important to know the software, one is downloading and to understand its license agreement and privacy statement (to see if unwanted software is included).

3. **Driver**

A *device driver* is a software module that enables communication between a *user process* and a *peripheral device*. It may perform some or all of the following functions:

- Take the device online and offline
- Set parameters in the device

- Transmit data from the kernel to the device
- Receive data from the device and pass it to the kernel Handle and report I/O errors
- Handle exclusion and other multiuser, multitasking arbitration

Hardware Devices

Some examples of hardware devices are CD ROMs, disk drives, tape drives, printers, scanners, and terminals.

Hardware devices are categorized as block devices, character devices, mapped devices, or networked devices. A block device is a mass storage device (such as a disk) that can accept uses the integrated page cache for all data transfers. Device drivers that support the block interface are complex and are not covered in this manual.

4. **File Formats**

Following are some of the different types of file formats: -

GIF-GIF is most common in the animated form.

PDF- Invented by Adobe with the goal of capturing and reviewing rich information from any application on any computer, with anyone, anywhere.

MP3- This format of file contains an audio file.

ZIP-This file format contains files which are achieved.

PPTX-These files have a PowerPoint presentation.

MPEG-It is a video file format.

JPEG-JPEGs might be the most common file type your uncross on the web, and more than likely the kind of image that is in your company's MSW versions fits letter head.



Fig. A.11: Types of file extensions

Different kinds of file conversion like word to pdf

There are different software available on Internet for conversion of one file format to another. For e.g. Steps for conversion of file to pdf format using Online2pdf has been given.

Steps:-

1. Go to https://online2pdf.com/convert-docx-to-pdf.
2. Click on 'Select files' and browse the file on your computer.
3. Click on 'convert'.



Fig. A.12: Selecting files

5. **Printer Sharing**

How to Share a Printer

Sharing printers on a network used to be a nightmare, especially if the computers were all running different operating systems. Technology has progressed, however, and sharing a printer now is simpler than it has ever been. This is especially true if you are running Windows 7, 8, or Mac OS X. To learn how to share your printer on the network, and how to connect other computers to that share printer, see Step 1 below.

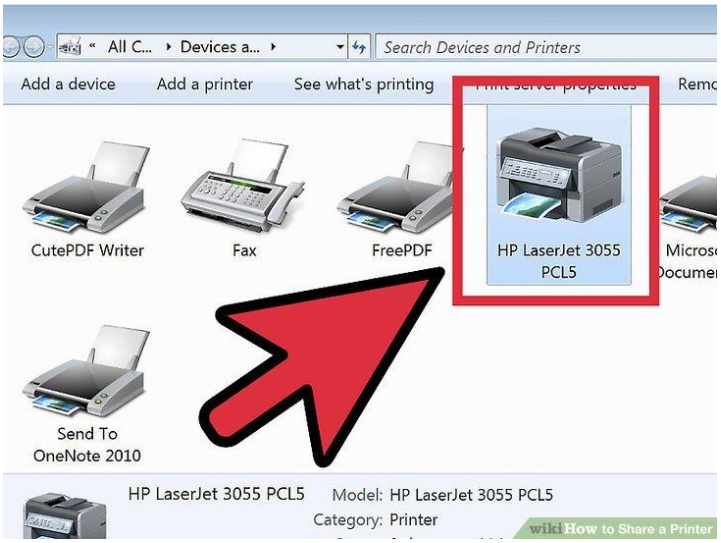


Fig. A.13: Searching for a printer

Install the printer drivers. In order to share a printer, it must be installed on the computer it is connected to. Most modern printers connect via USB and will install automatically when they are connected.

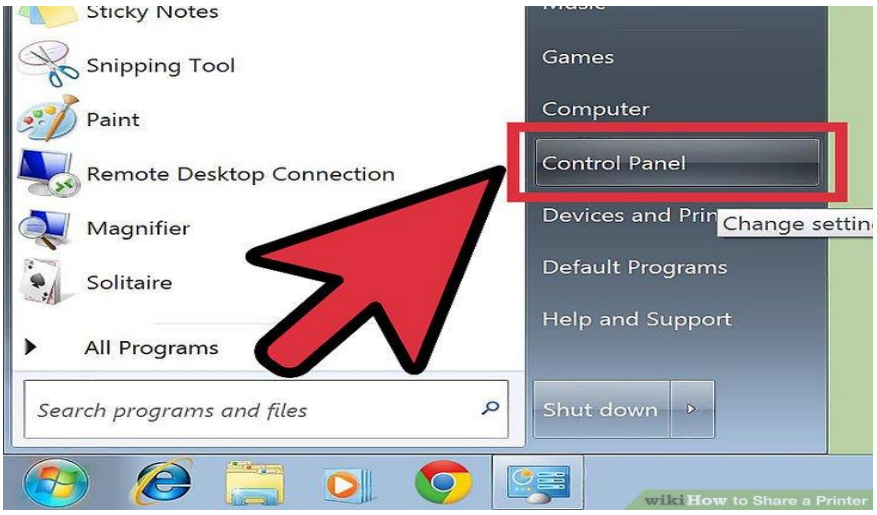


Fig. A.14: Opening control panel

Open the Control Panel. You can access the Control Panel in Windows 7 by clicking the Start menu and selecting Control Panel. In Windows 8, press ⊞Win + X and select Control Panel from the menu.



Fig. A.16: Opening Network and Sharing Center

Open the Network and Sharing Center. If your Control Panel is in Category view, click "Network and Internet", and then select "Network and Sharing Center". Click on "Network

and Internet". If your Control Panel is in Icon view, click the "Network and Sharing Center" icon.

Click the "Change advanced sharing settings" link. This is located in the left navigation pane of the Network and Sharing Center.

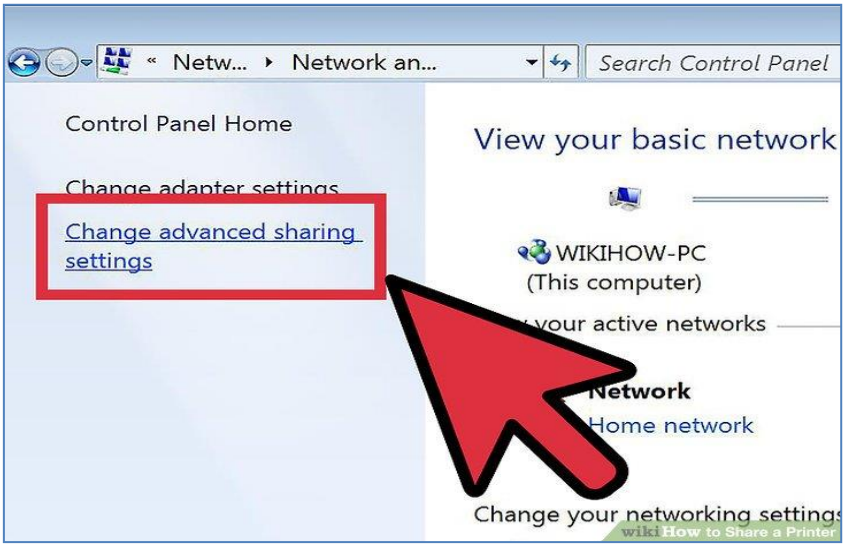


Fig. A.17: Opening 'Change advanced sharing settings'

Expand the profile you need to change. You will see three different options when you open the "Advanced share settings": Private, Guest or Public, and All Networks. If you are on a Home network, expand the Private section.

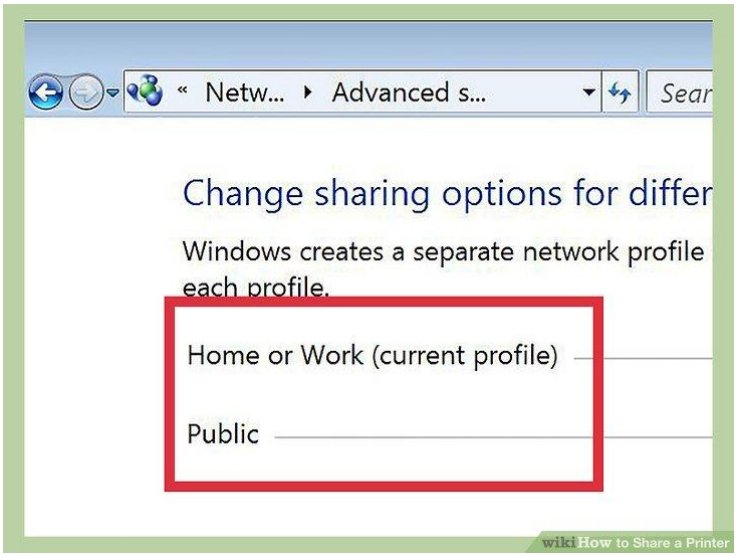


Fig. A.18: Expand private section

Enable "File and printer sharing". Toggle this on to allow other devices to connect to your printer. This will also allow you to share files and folders with other computers on the network.



Fig. A.19: Toggle the password protection

Toggle the password protection. You can decide whether or not you want to enable password protection for your printer. If it is turned on, only users who have a user account on your computer, will be able to access the printer.

- You can toggle password protection in the "All Networks" section.

Share the printer. Now that file and printer sharing has been turned on, you will need to share the printer itself. To do this, go back to the Control Panel and open the Devices and Printers option. Right-click on the printer you want to share and click "Printer properties". Click the Sharing tab, and then check the "Share this printer" box.

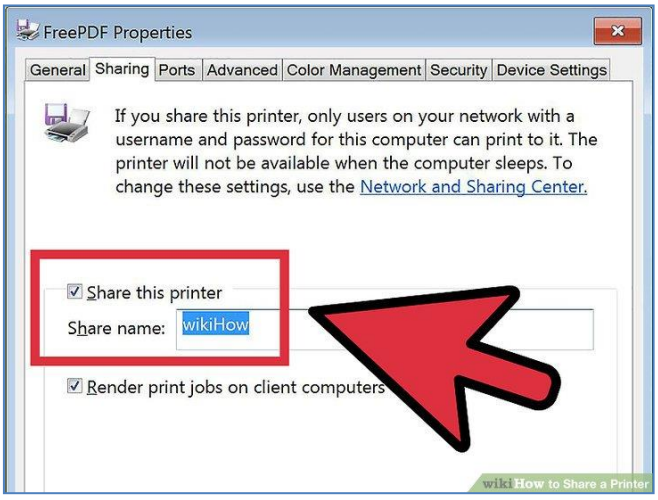


Fig. A.19: Share the printer

PRACTICE QUESTIONS

- **Convert the doc file into PDF using any online software provided on the Internet.**
- **Print any document of your choice by applying various settings of Printer.**
- **Install any software from the Internet and write its steps.**
- **Install scanner and scan a document.**
- **Installation of Antivirus.**
- **Installation of Printer Driver.**
- **Share A Printer On Network.**
- **Install Operating System.**
- **Install System (MS Office) Software.**

B. e-Governance Portals

1. E-HRMS (Employee Human Resource Management System)

- To develop a complete HR solution.
- To collate the data for creation of posts, determining staff strength and expected number of retirements in a year and rational deployment of staff in various field offices
- To develop HR related databases for analyzing the skill set of each employee by collecting the information like skills, compensation, personal details, demographic information, and other detailed relevant information.
- To link with attendance management (Biometric Based attendance System) for collecting and analyzing information about employees working hours and then to use in evaluating cost account for the departments.
- For providing Salary and Compensation Management to the departments to compute the pay roll details of the employees by using inputs of employees working hours and attendance.
- To developer Benefits Management System for calculating additional allowances and benefits provided to employees using details about insurance policies, pension plans.

Fig B.1: E-HRMS homepage



2. DigiLocker

DigiLocker User Manual

(https://digitallocker.gov.in)



Department of Electronics and Information Technology (DEITY)

1 Introduction

Digital Locker, one of the key initiatives under the Digital India initiative, is aimed at eliminating the usage of physical documents and enable sharing of e-documents across government agencies via a mechanism to verify "authenticity" of the documents online. Residents can also upload their own electronic documents and digitally sign them using the e-sign facility. These digitally signed documents can be shared with Government organizations or other entities.

USER ID CREATION

Step 1: Access digital locker at https://digitallocker.gov.in/

- Citizens with Aadhaar number can create Digital Locker accounts
- Kindly ensure that your current mobile number is registered with Aadhaar number
- You can update your mobile number in Aadhaar by visiting any UIDAI centre

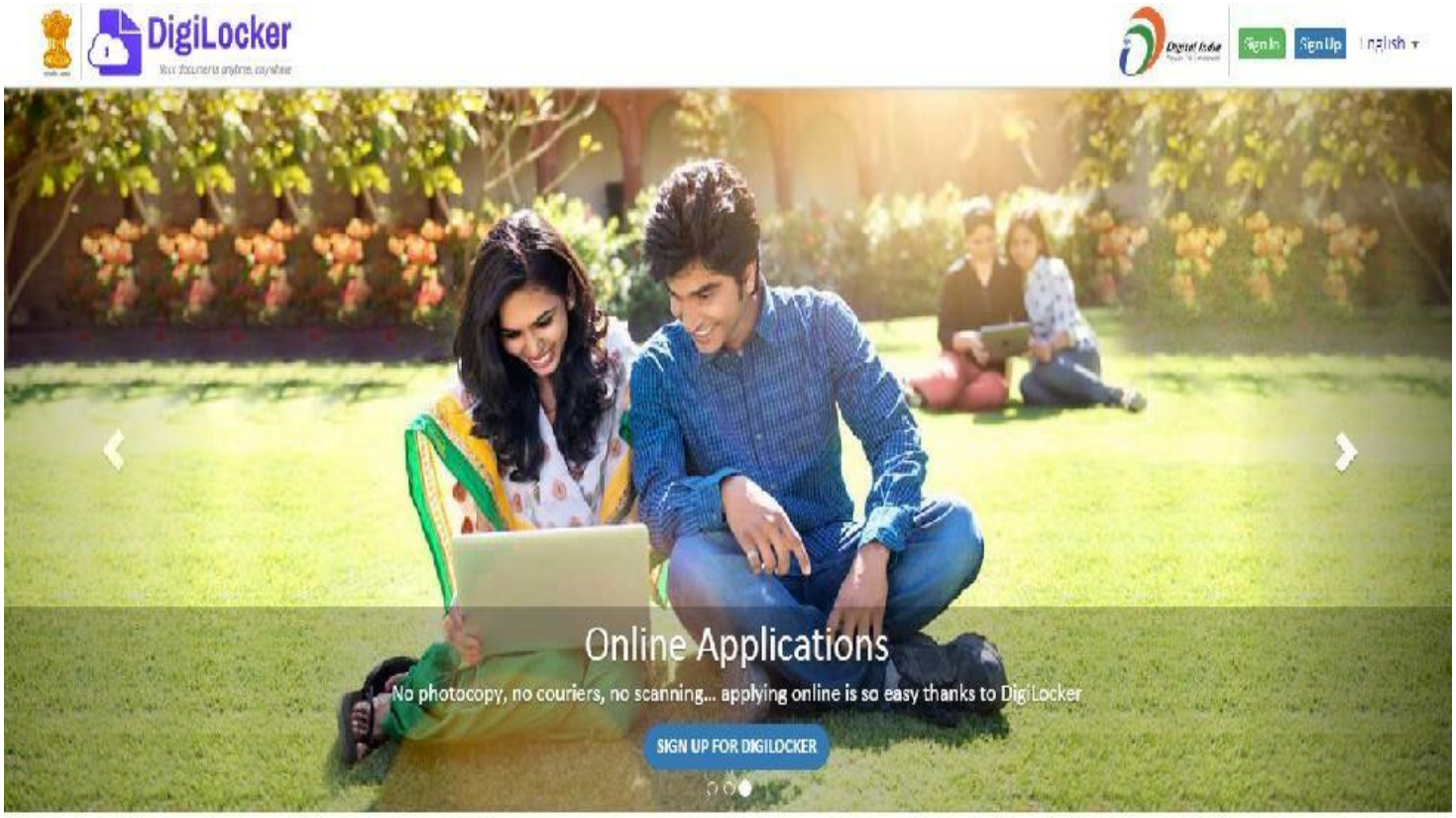


Fig B.2: Open DigiLocker homepage

Step 2: Click on 'Sign Up'

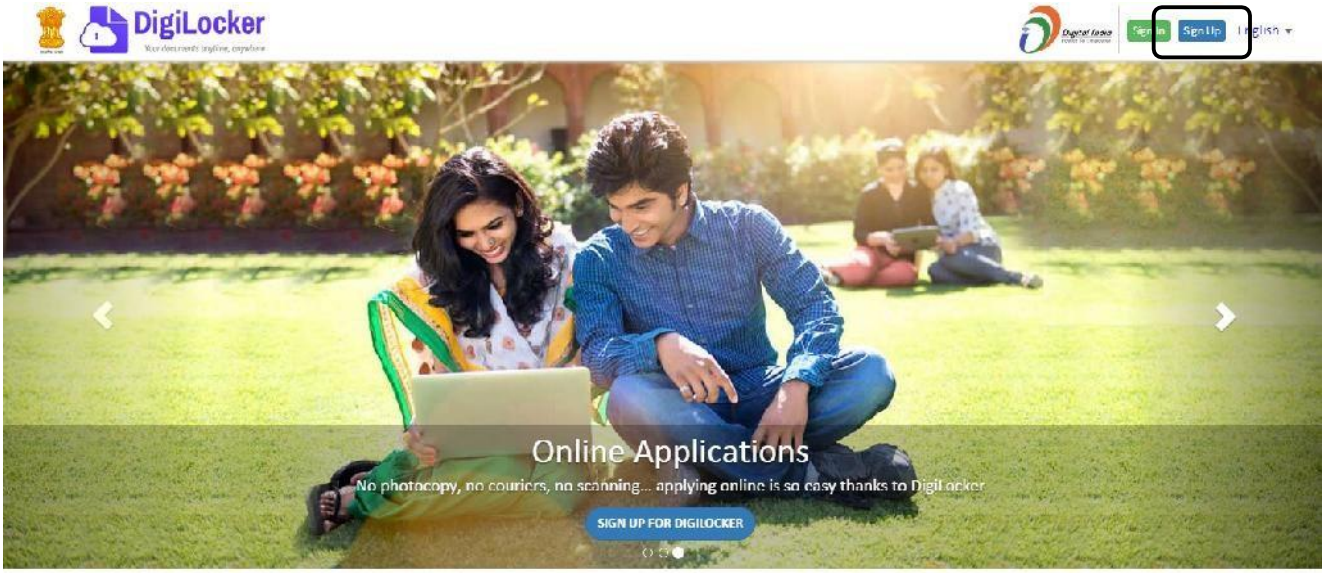


Fig B.2: Click on 'Sign Up'

Step 3: Enter your Aadhaar Number

- Enter your unique 12 digit Aadhaar number
- Two options are there to proceed further – **Use OTP** or **Use Fingerprint**

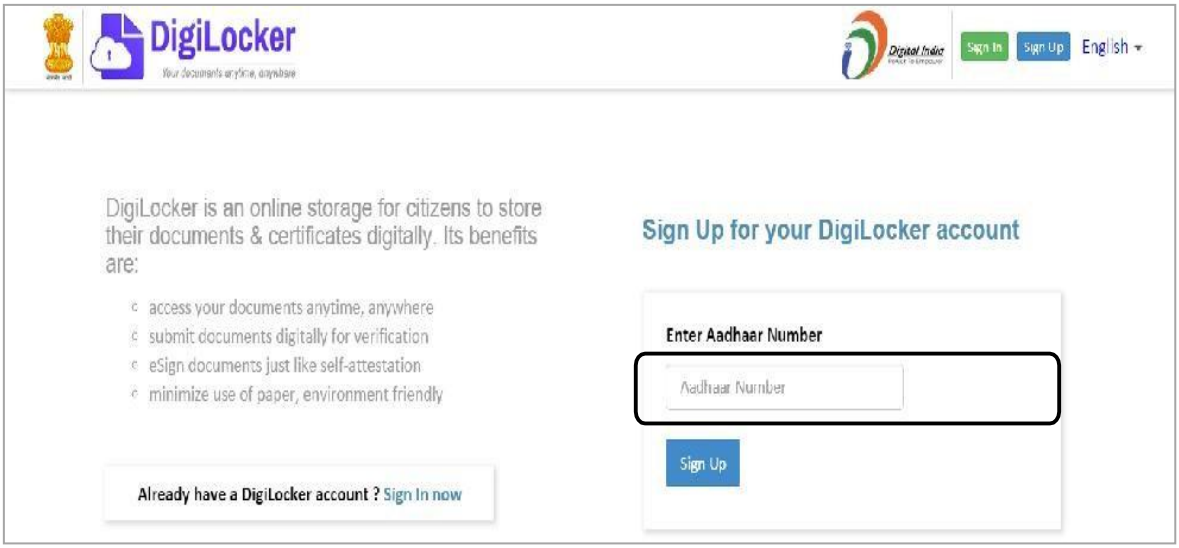


Fig B.3: Enter your Aadhaar Number

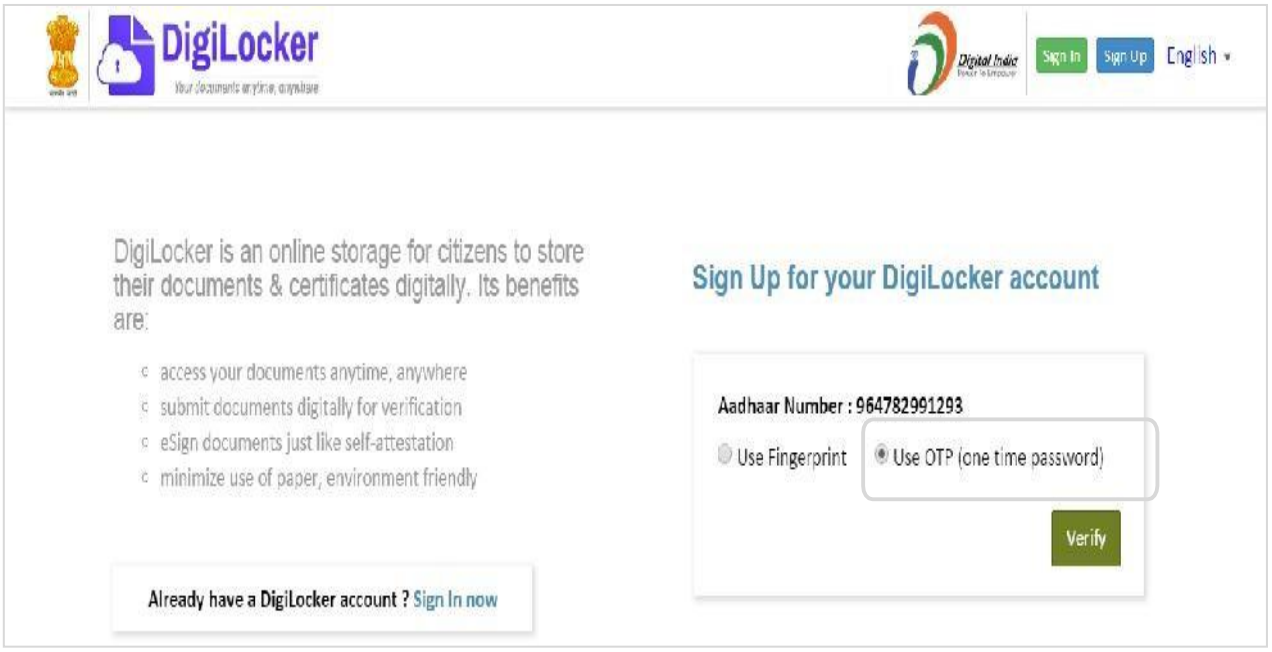
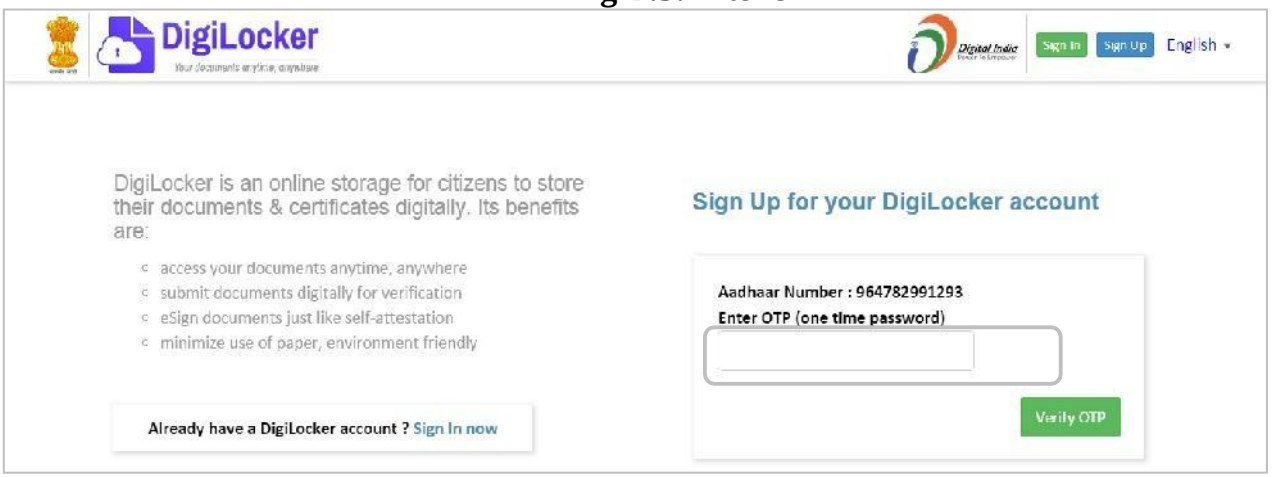


Fig B.4: Select 'Use OTP'

Option 1 : Use Aadhaar Registered Mobile Number – Select 'Use OTP'

- OTP received on your Aadhaar registered mobile needs to be entered on the screen
- Click on **Verify** button
- After validation of OTP, the application will prompt the user to create 'Username' and 'Password'.

Fig B.5: Enter OTP



Option 2: Use Fingerprint for Authentication – Select 'Use Fingerprint'

- Aadhaar approved biometric device is required for scanning fingerprint.
- Click on **Use Fingerprint** button to Sign Up using finger print instead of mobile number. This option is useful if the Aadhaar registered mobile number is not available or updated.



Fig B.6: Select 'Use Fingerprint

- Select the device type which is being used for scanning the finger print



Fig B.7: Select the device type

- Select declaration check box for proceeding further.

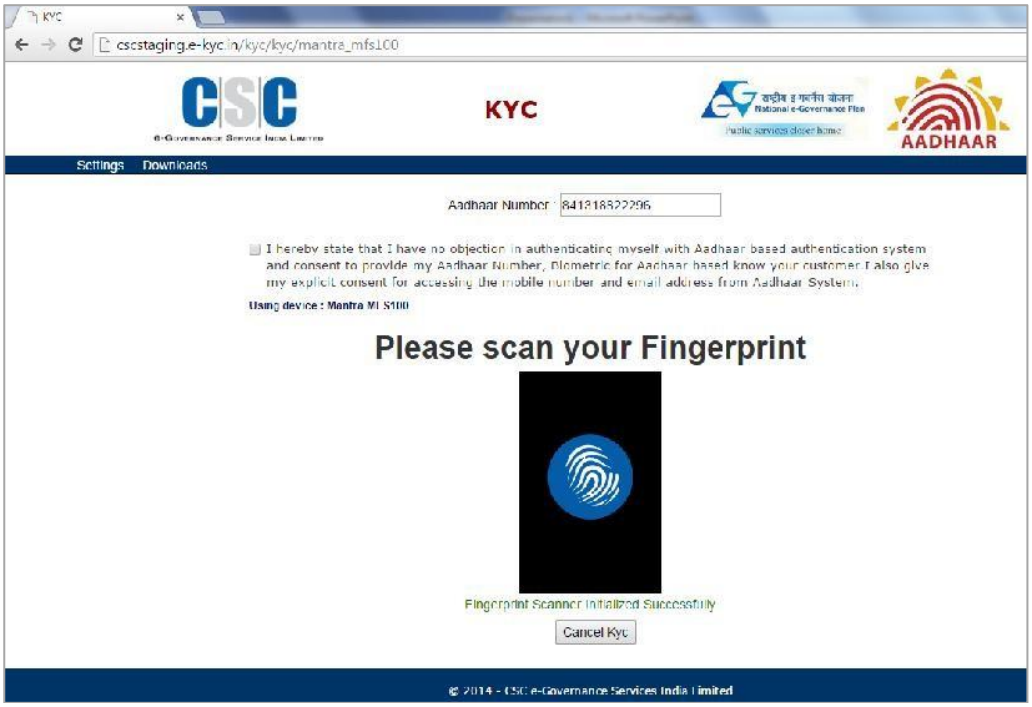


Fig B.8: Select declaration check box

- Finger print will be captured from the finger print scanner once the finger is placed on the device. After validation of finger print, the application will prompt user to create 'Username' and 'Password'.

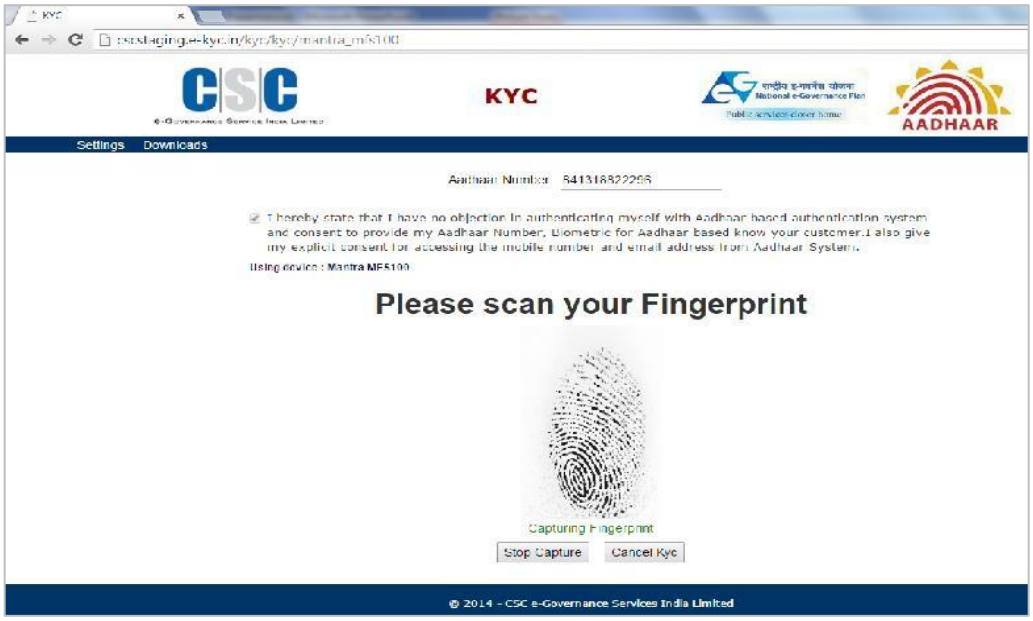


Fig B.9: Scan your Fingerprint

Step 5: User ID Creation

- The application will prompt the user to create 'Username' and 'Password'. Enter your desired User name and Password for 'Digital Locker' account
- Click on **SignUp** button
- After successful account creation, the application will show the 'Dashboard' page

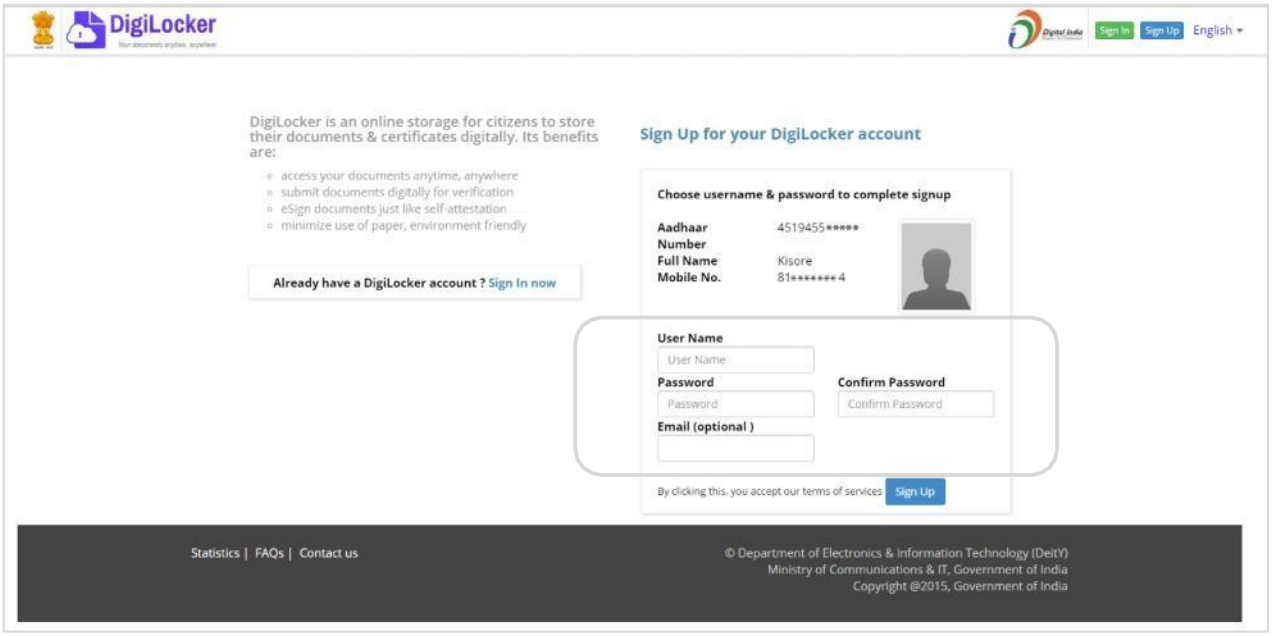


Fig B.10: Create user id and password

Sign In into Digital Locker Account

Step 1: Click on 'Sign In'

- Go to https://digitallocker.gov.in
- Click on **Sign In** at the top of the page



Fig B.11: Click on Sign in

Step 2: Enter User Details

- User can login via any of these 3 available options :
    1. Aadhaar Number and the OTP
    2. User name and Password provided during account creation
    3. Facebook ID validation

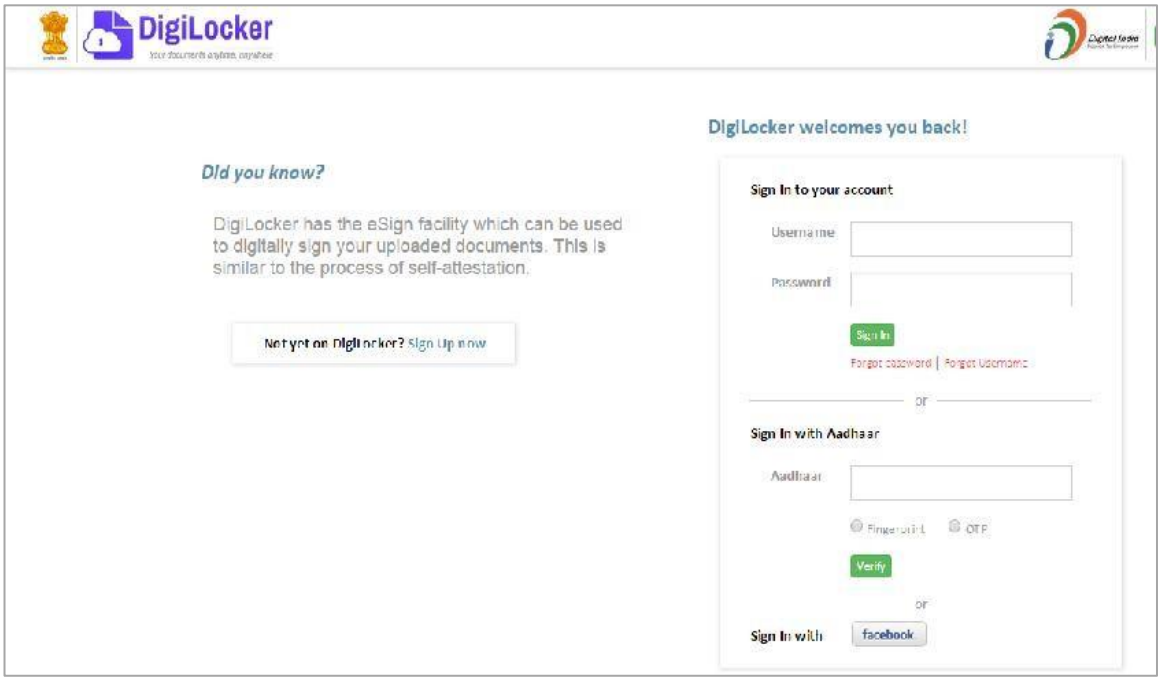


Fig B.12: Provide your credentials to login

- Entering Aadhaar OTP if Aadhaar number option is selected. Click on **Verify OTP**

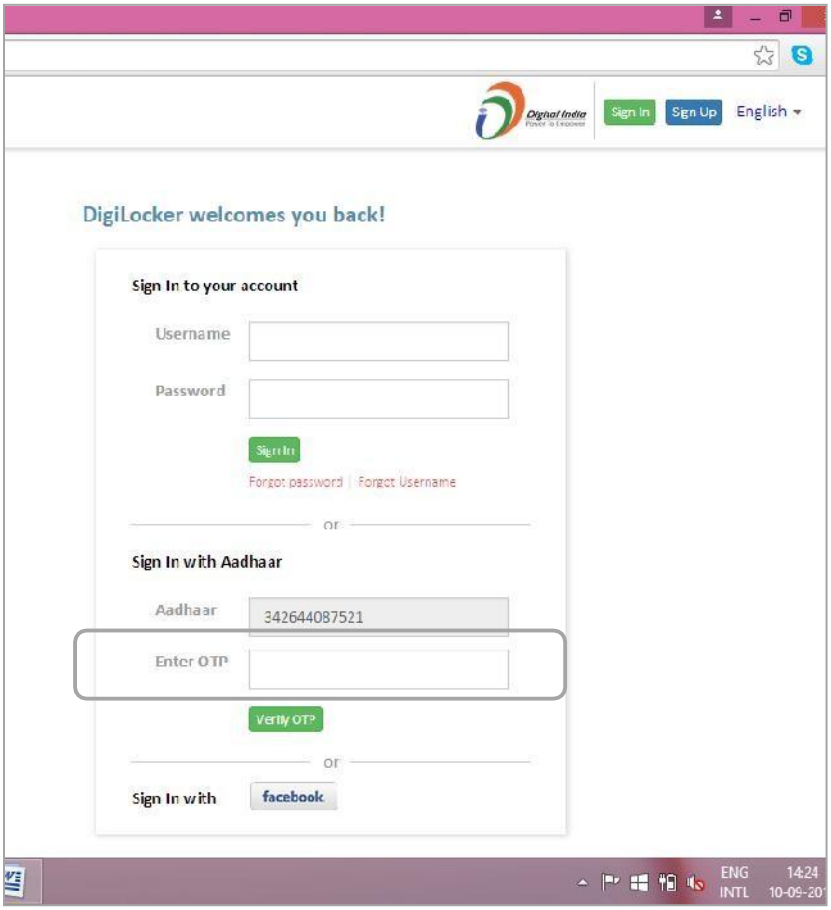
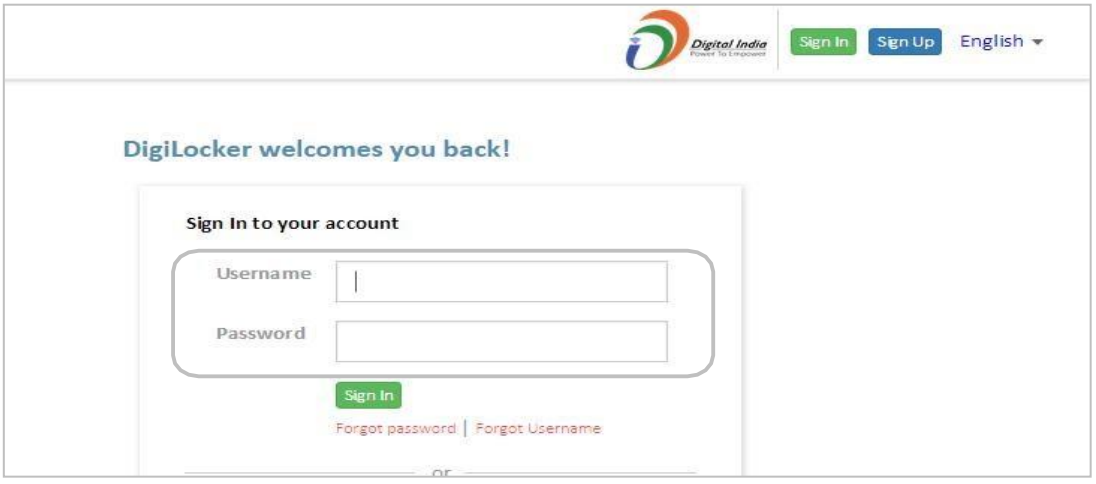


Fig B.13: Enter OTP

- Enter User ID and Password if User Name option was selected. Click on the **Sign In** button.

Fig B.14: Sign in with username and password



- Enter Facebook ID and Password if Social Media (Facebook) option was selected.

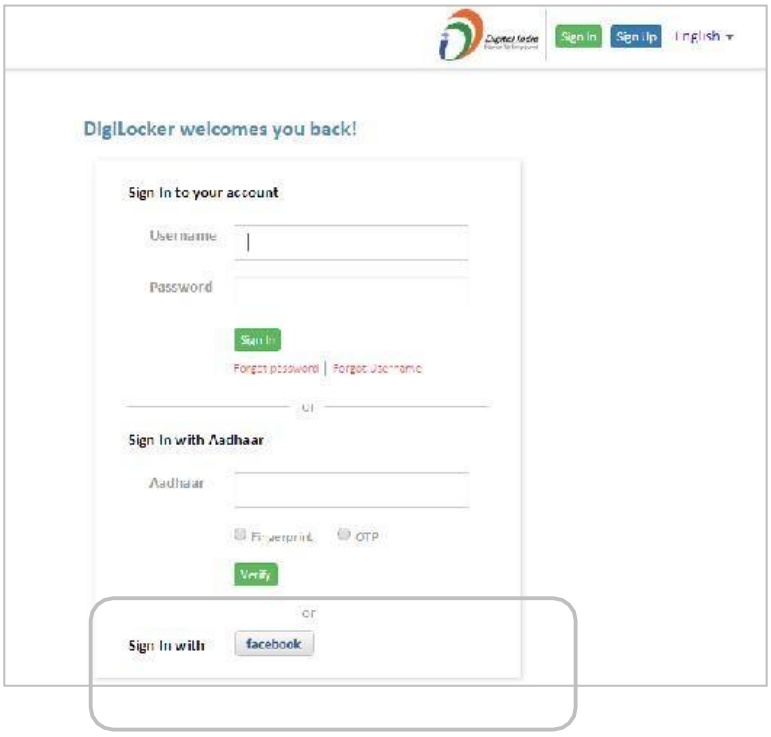


Fig B.14: Enter Facebook ID and Password



Fig B.15: Login pop-up will appear

Uploading Certificates & Documents Step 1: Document

Upload Screen

- After signing into Digital Locker, click on **Uploaded Documents** to upload your and then click on documents in the Digital Locker Account
- Multiple documents can be uploaded at a time



Fig B.16: Click on upload button

Step 2: Document Upload Screen

- Click on the Upload button as shown in the image
- Choose the location and select the file(s)
- After selecting file(s), click on **Open** button.
- Multiple documents can be uploaded at a time.

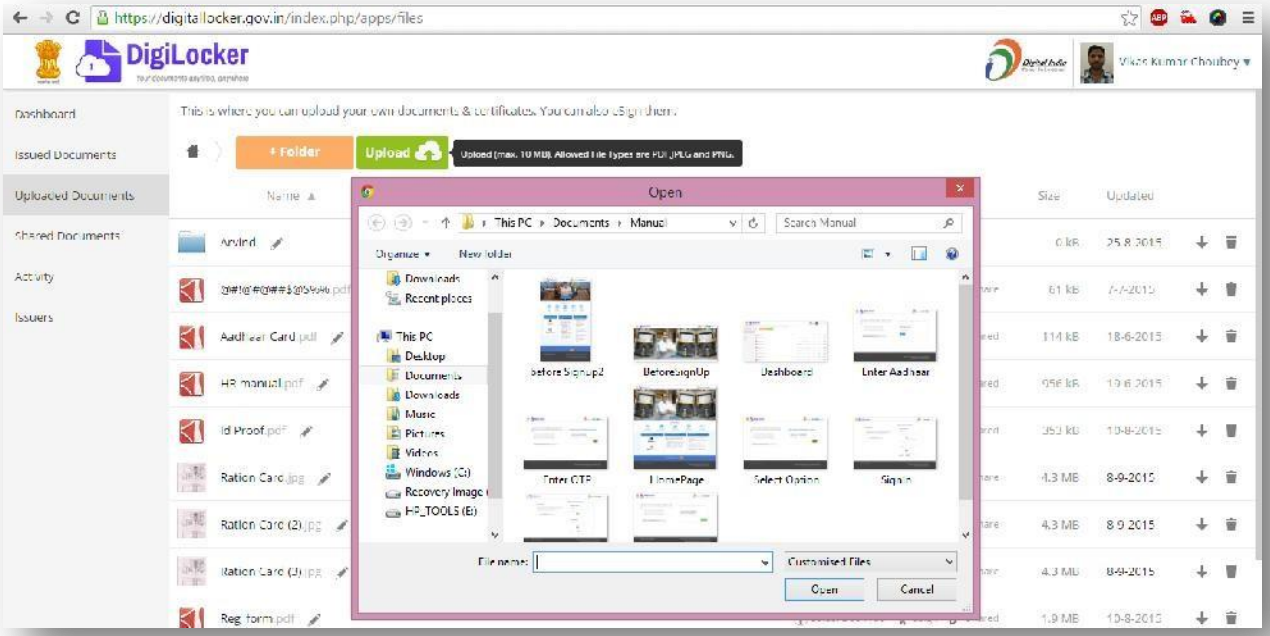
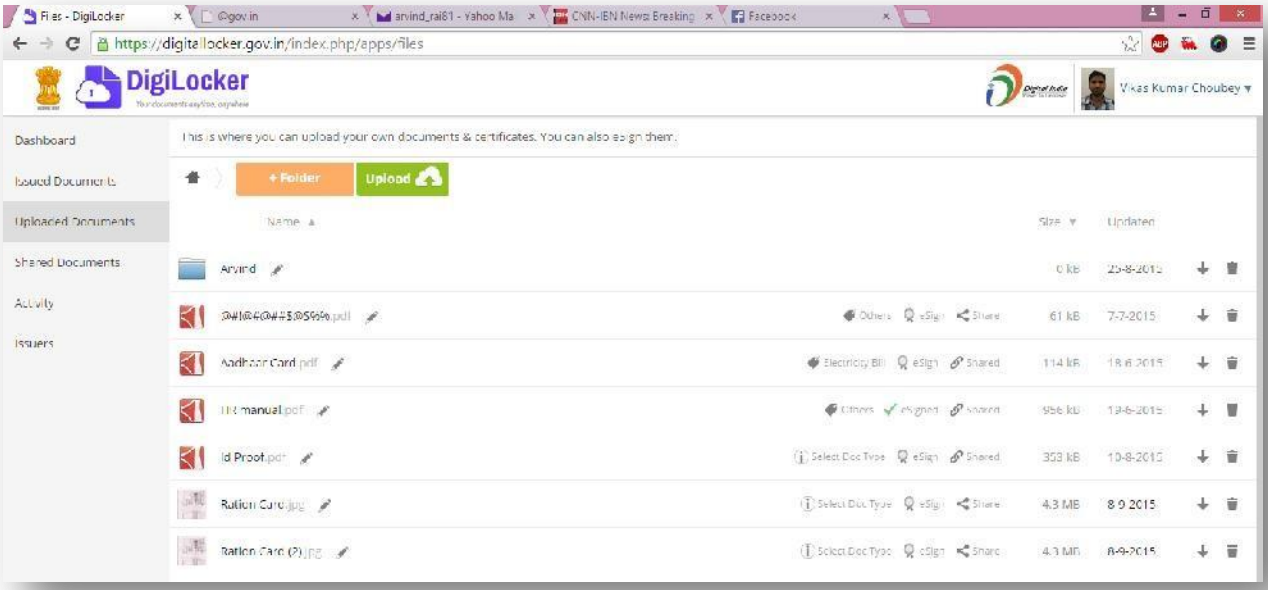


Fig B.17: Document Upload Screen

- The sample screen will look as the above picture
- Documents uploaded will be visible in 'Uploaded Documents'' section

Fig B.18: Documents will be visible as shown above



Step 3: Select Document Type

- Click on 'Select Doc Type' for any document listed in Uploaded Documents list
- Choose the Document type from the given drop down.
- If your document does not match with any of the predefined document types then select "Others" from the drop down.
- After above mentioned steps, click on **Save** button.

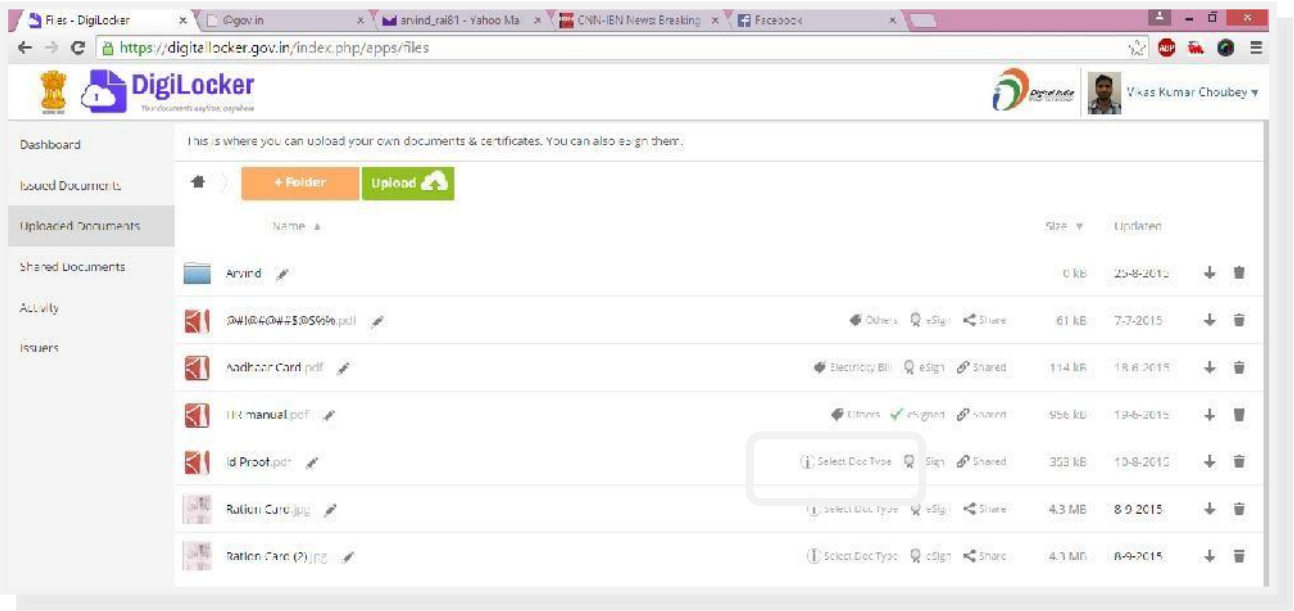


Fig B.19: Click on Select doc

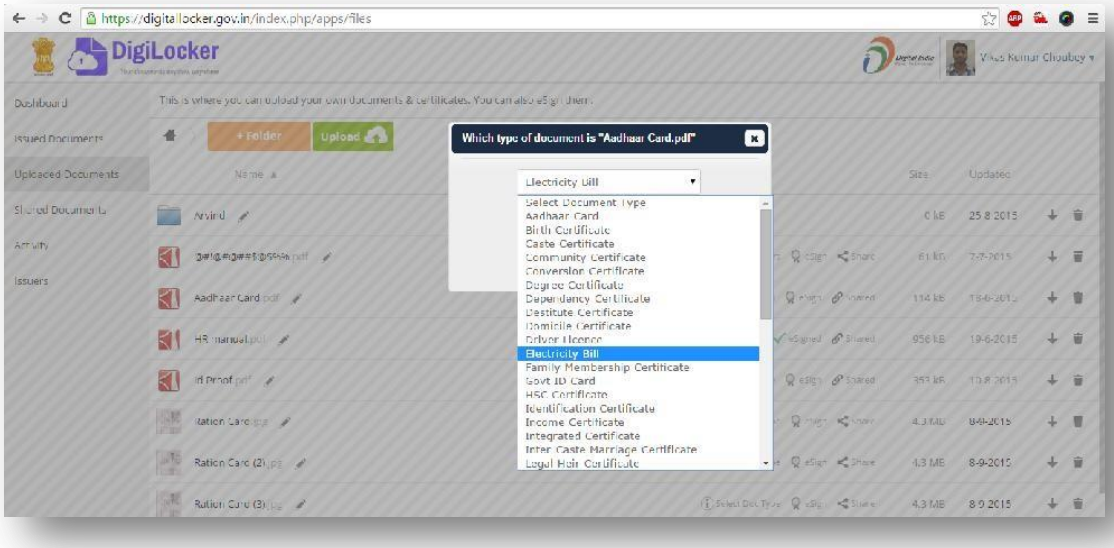


Fig B.20: Select Document Type

Viewing Certificates

- After login into Digital Locker account, click on to view **Uploaded Documents** all user uploaded certificates and documents
- Users can edit (file names, Doc type), download, and share files from here.



Fig B.21: Click on uploaded documents

eSign Document/Certificate

- Click on eSign link provided for each document in Uploaded Document section.

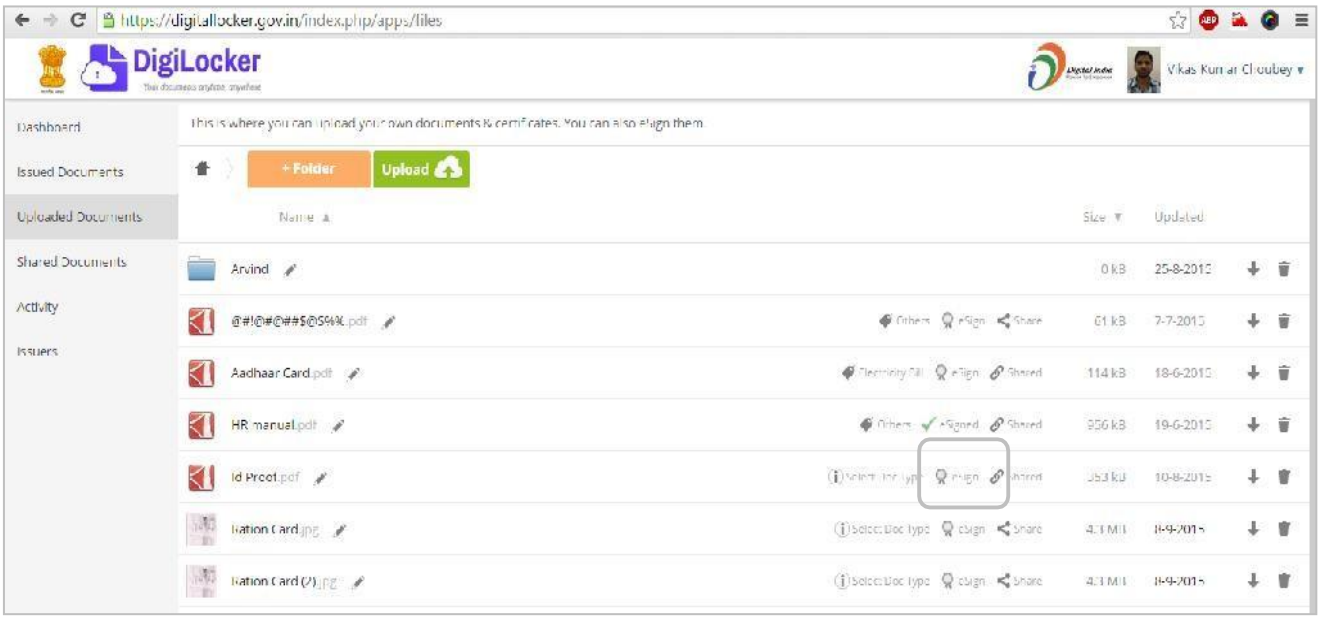


Fig B.22: Click on eSign link

- User will receive an OTP on mobile which needs to be filled in the text box.
- After entering OTP, click on eSign button.
- Selected document will be eSigned (and coverted into pdf if not already a pdf document)
- Only one document can be eSigned at a time



Fig B.23: Enter OTP

Share Document

- Click on share link provided for each document in Uploaded Document section.

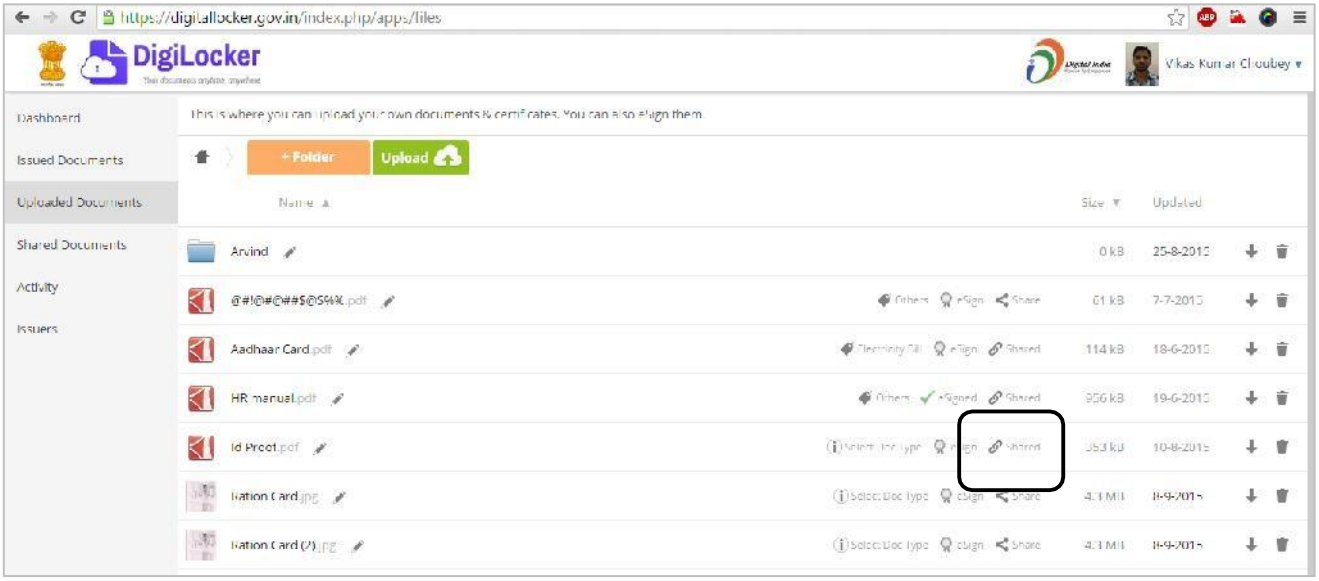


Fig B.24: Click on share link

- User will get a pop up for entering email ID with whom this document will be shared.
- After entering email ID, click on send button.
- Selected document will be shared with email address provided.
- Only one document can be shared at a time

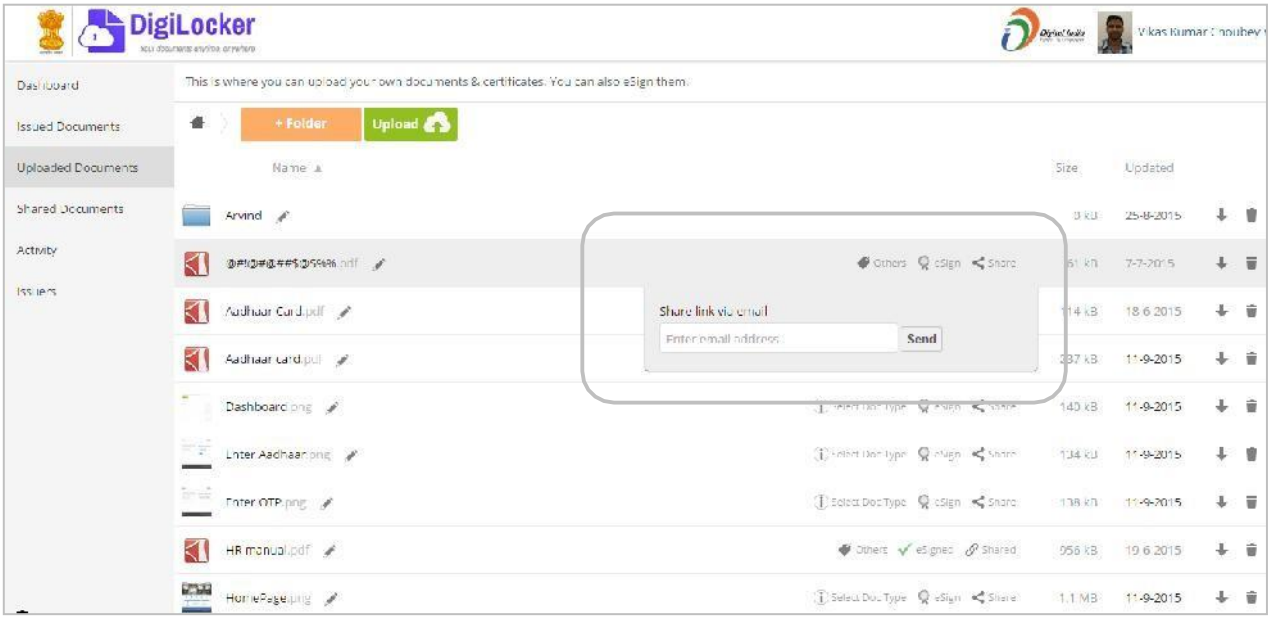


Fig B.25: Click on send button

Viewing Issued Documents

- After login into Digital Locker account, click on to **Issued Documents** view all issued certificates
- Users will be able to view URI of the documents shared with him/her by registered issuers
- Clicking on URI will fetch the actual document directly from issuer database/filesystem.

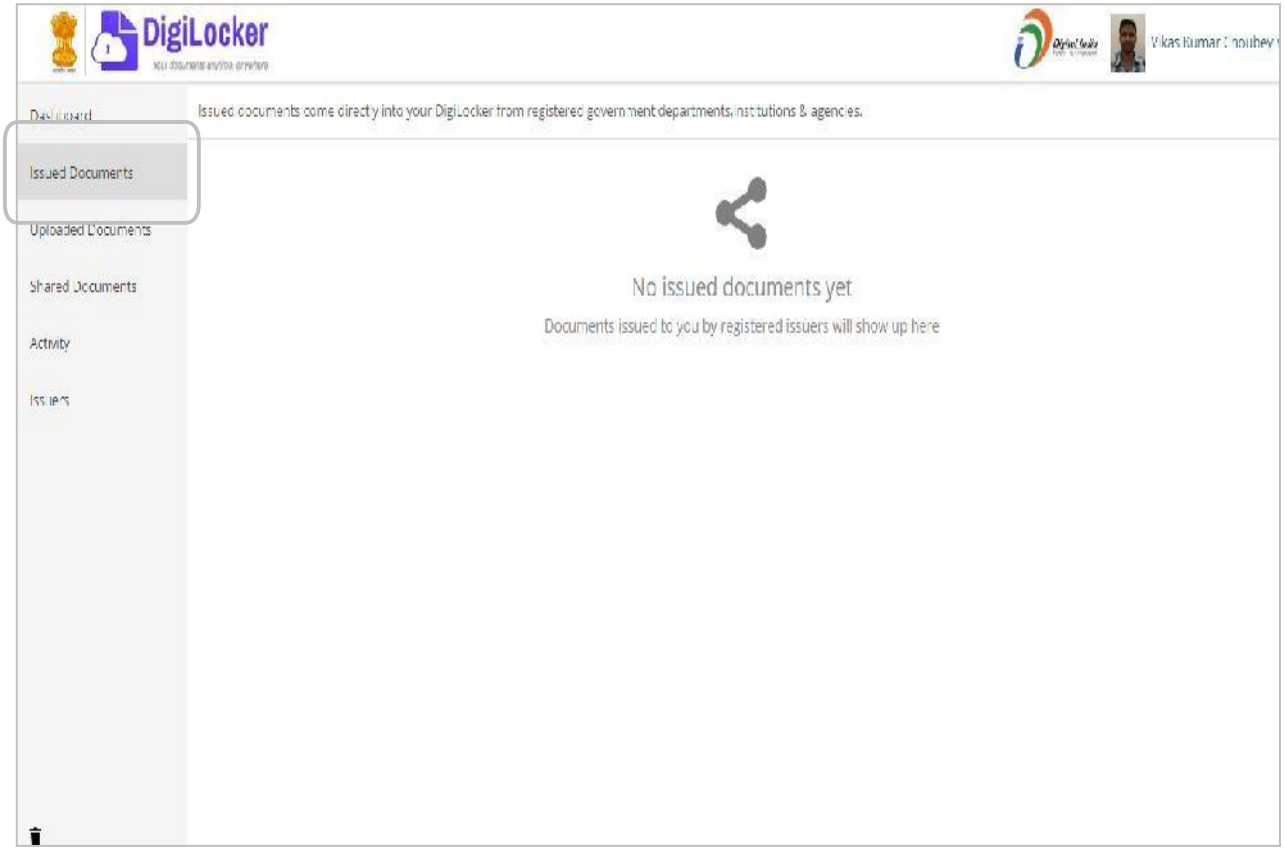


Fig B.26: Click on 'Issued Documents'

Viewing Activity

- After login into Digital Locker account, click on by **Activity** to view all the activities performed the logged in user in the system.

- Activity list is only for viewing. It cannot be edited or deleted.

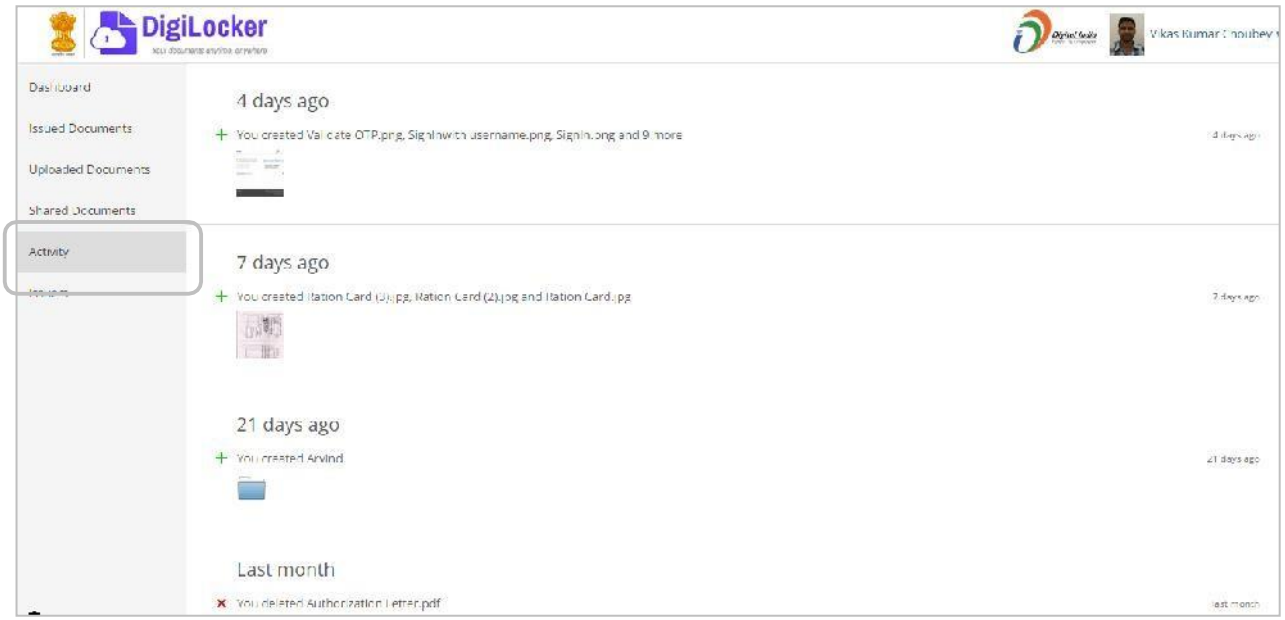
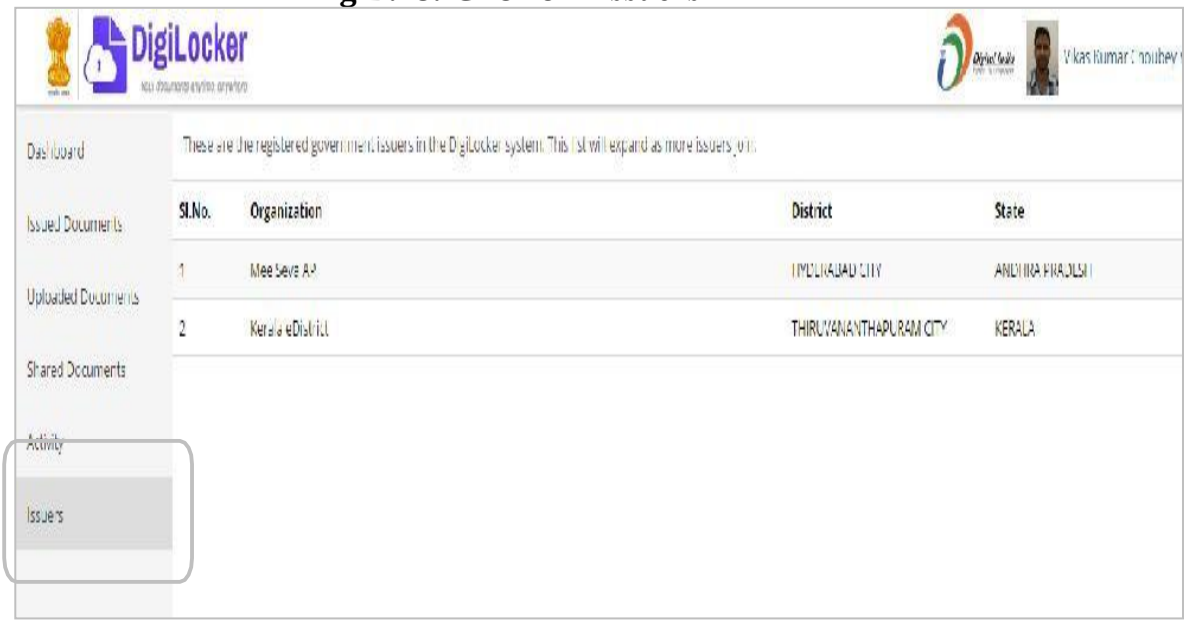


Fig B.27: Click on 'Activity'

Viewing Issuers

- After logging into Digital Locker account, click on **Issuers** to view all registered issuers who are part of the DigiLocker system.

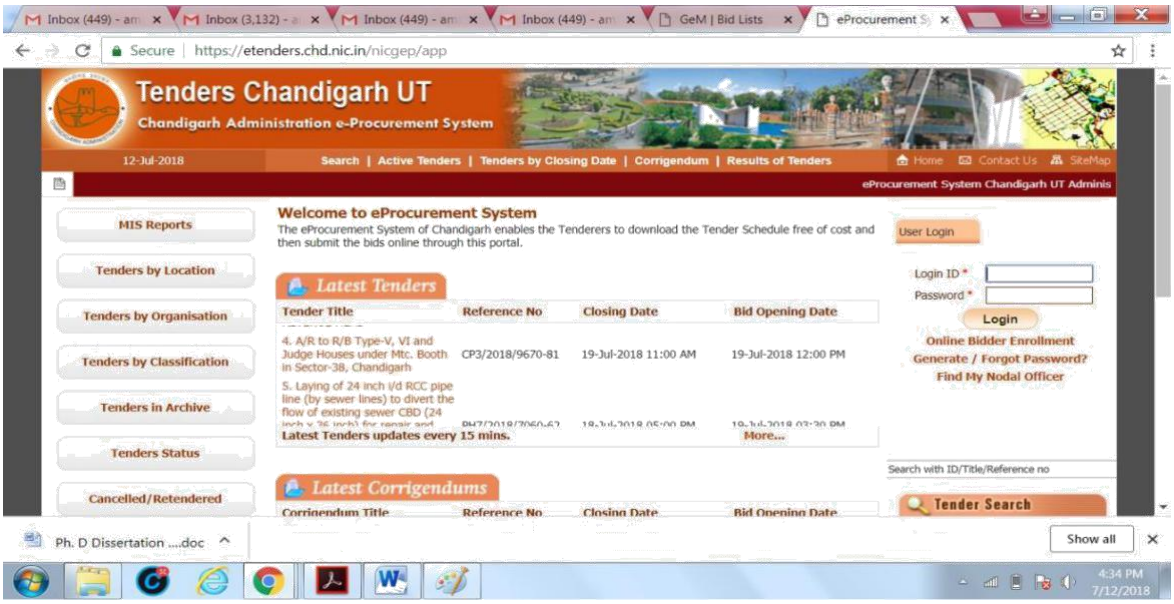
Fig B.28: Click on 'Issuers'



4. E-Tendering

An internet based process wherein the complete tendering process; from advertising to receiving and submitting tender-related information are done online. This enables firms to be more efficient as paper-based transactions are reduced or eliminated, facilitating for a more speedy exchange of information.

Fig B.29: Login Page



Bid Opening Process Flow: Authenticating using Encrypting Keys for Bid opening. Bid Opens on Specific Date and mentioned time as per Portal Date/Time settings.

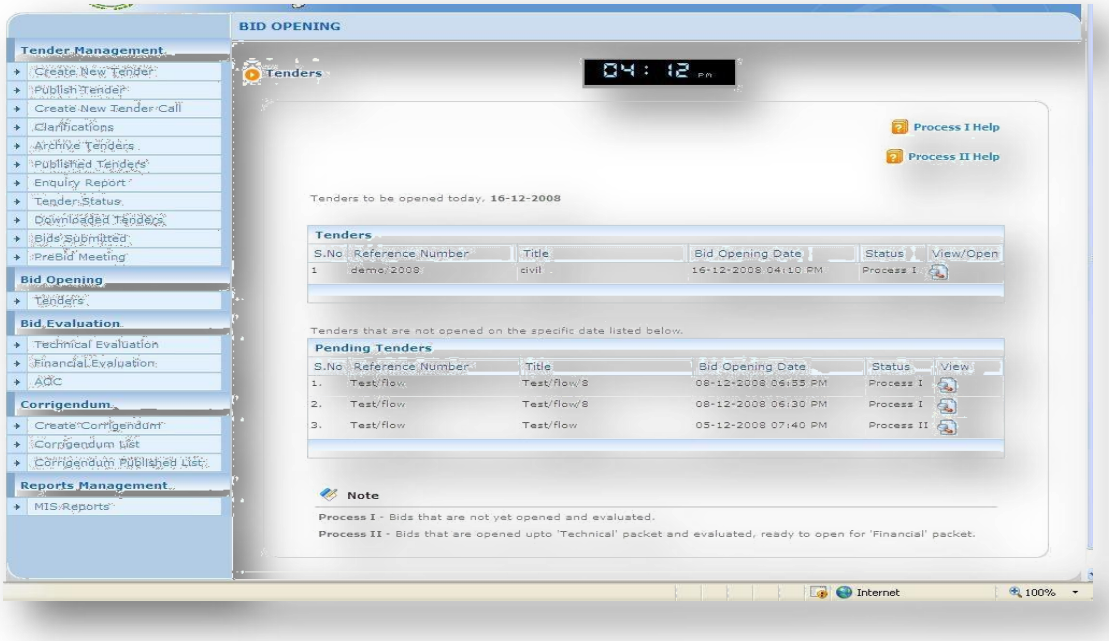
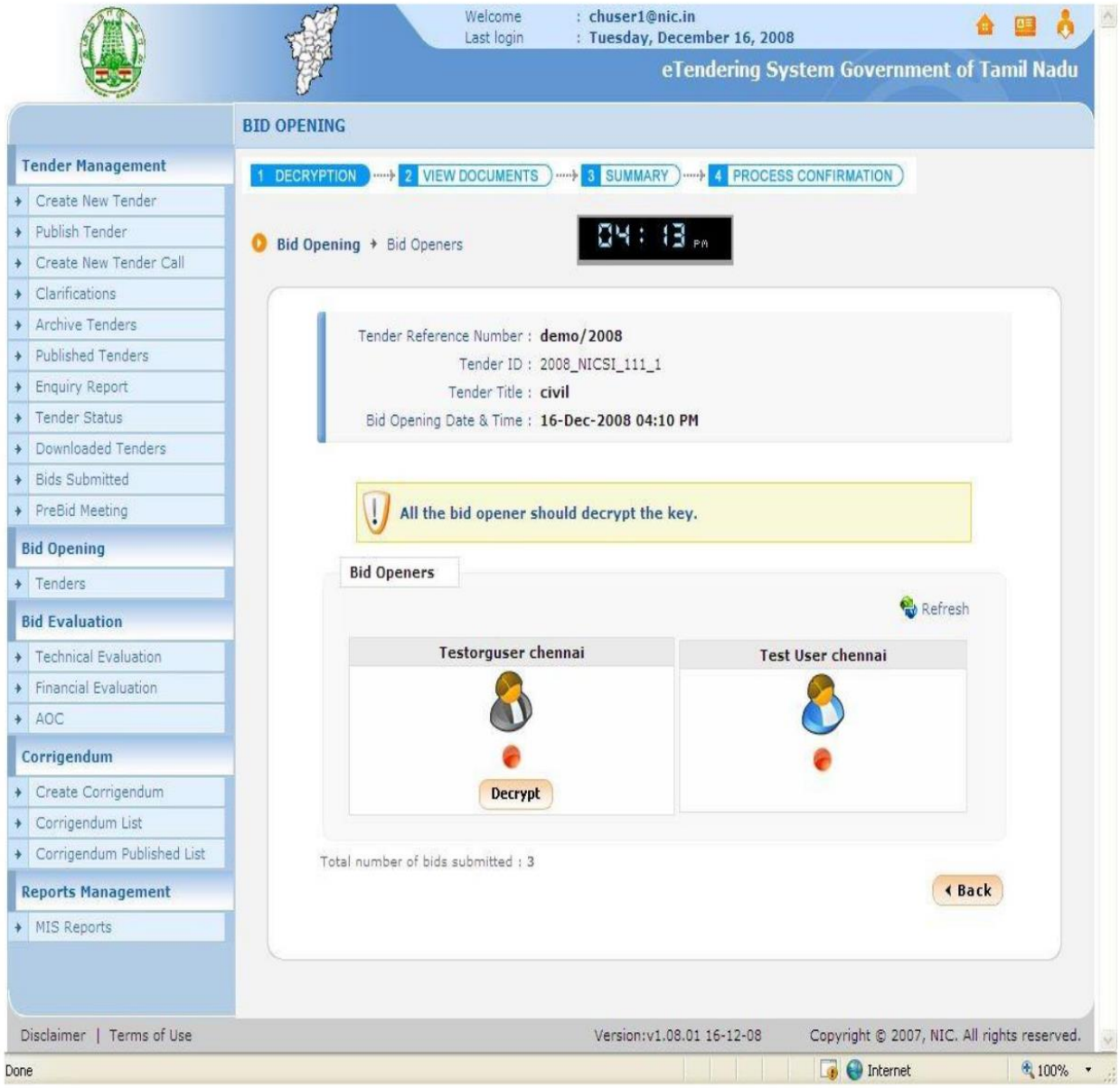


Fig B.30: Bid Opening Process Flow

Fig B.31: Bid Opens on Specific Date



5. MyGov (mygov.in)

Introduction –

MyGov

MyGov platform is a unique path breaking initiative which was launched on July 26, 2014 by none other than the Hon'ble Prime Minister of India, Shri Narendra Modi. It is a unique first of its kind participatory governance initiative involving the common citizen at large.

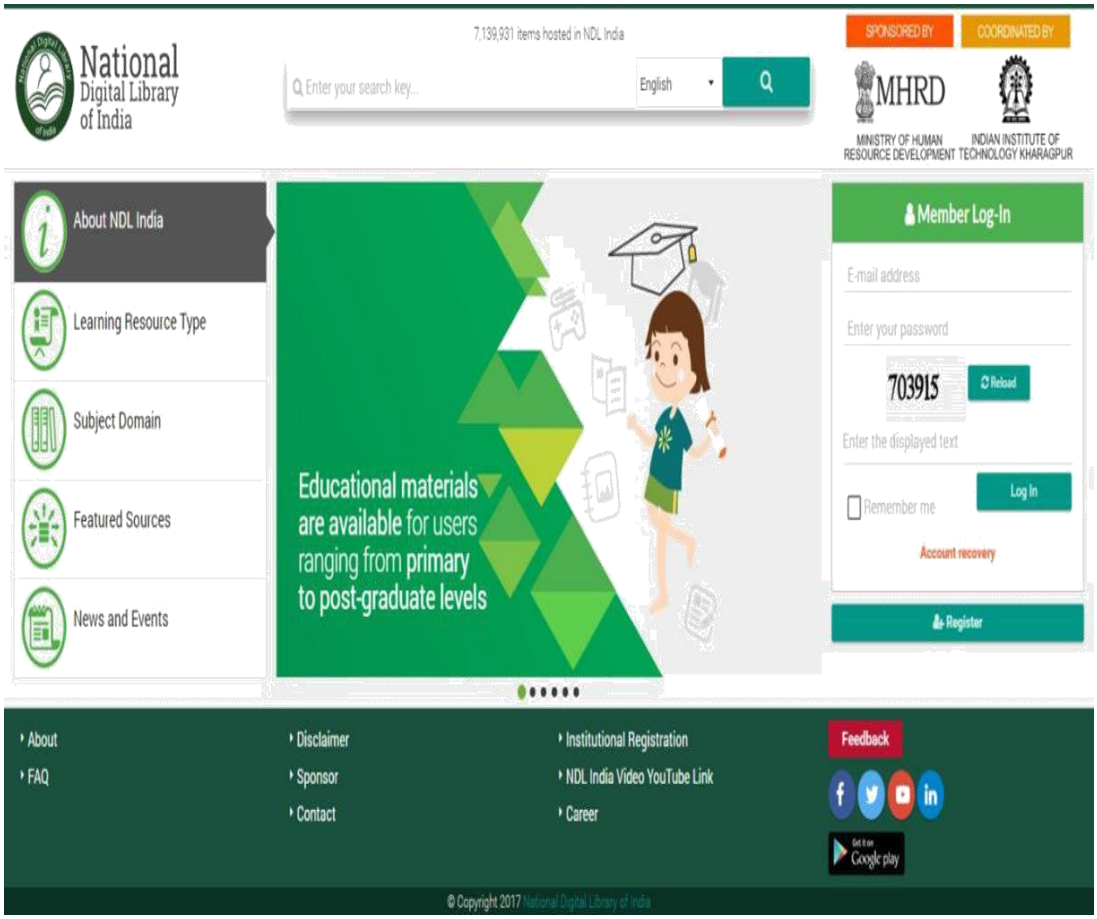
MyGov platform has become a key part of the policy and decision making process of the country. The major attributes of MyGov includes Discussion, Tasks, Talks, Poll/Surveys and Blogs on various groups based on the diverse governance and public policy issues.

Today MyGov has more than 4728.94K registered users those can contribute their ideas through discussions and also participate through the various earmarked tasks.

6. National Digital Library

The National Digital Library of India (NDL India) is an all-digital library that will integrate all existing digitized and digital contents across Institutions of the nation to provide a single-window access with e-learning facility to different groups of users ranging from primary level to higher education level and even life-long learners of our country. It will provide educational materials in various languages, in all disciplines, in different forms of access devices and will cater to differently-abled learners as well.

Fig B.32: NDL Homepage



You may click on the navigational buttons (green circles); on the left hand side panel to gain insight into some of the insertions on NDL India.

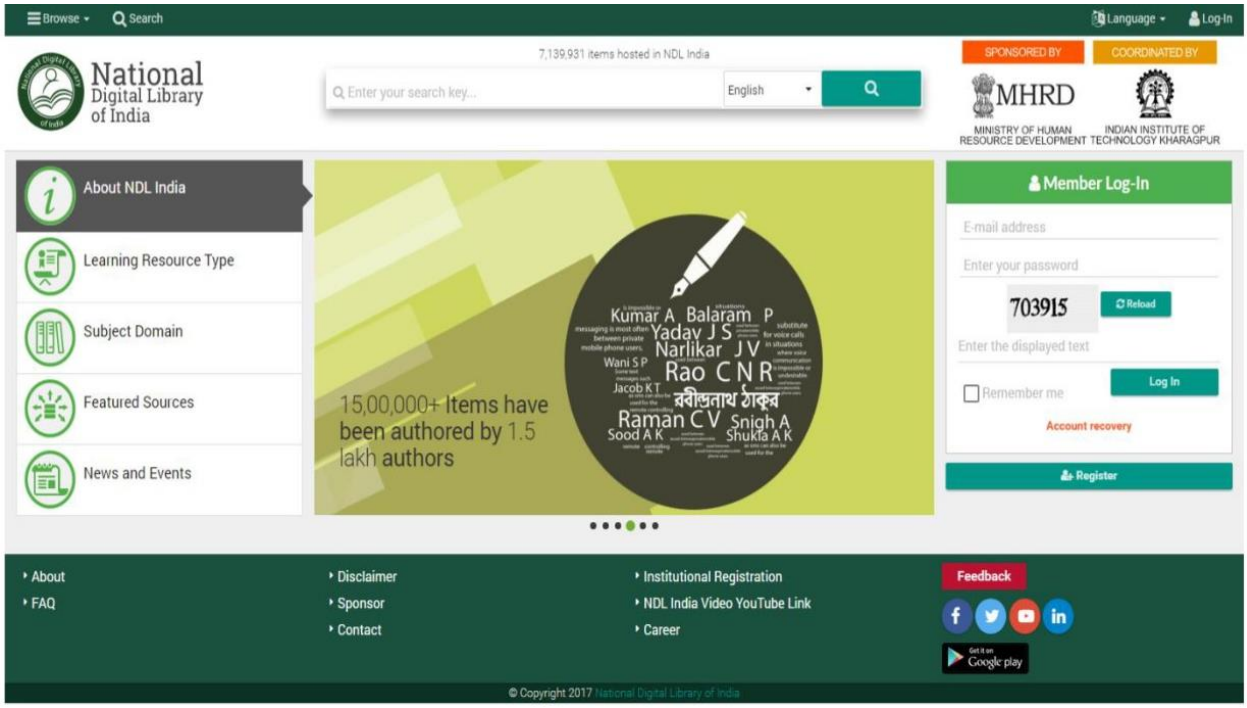
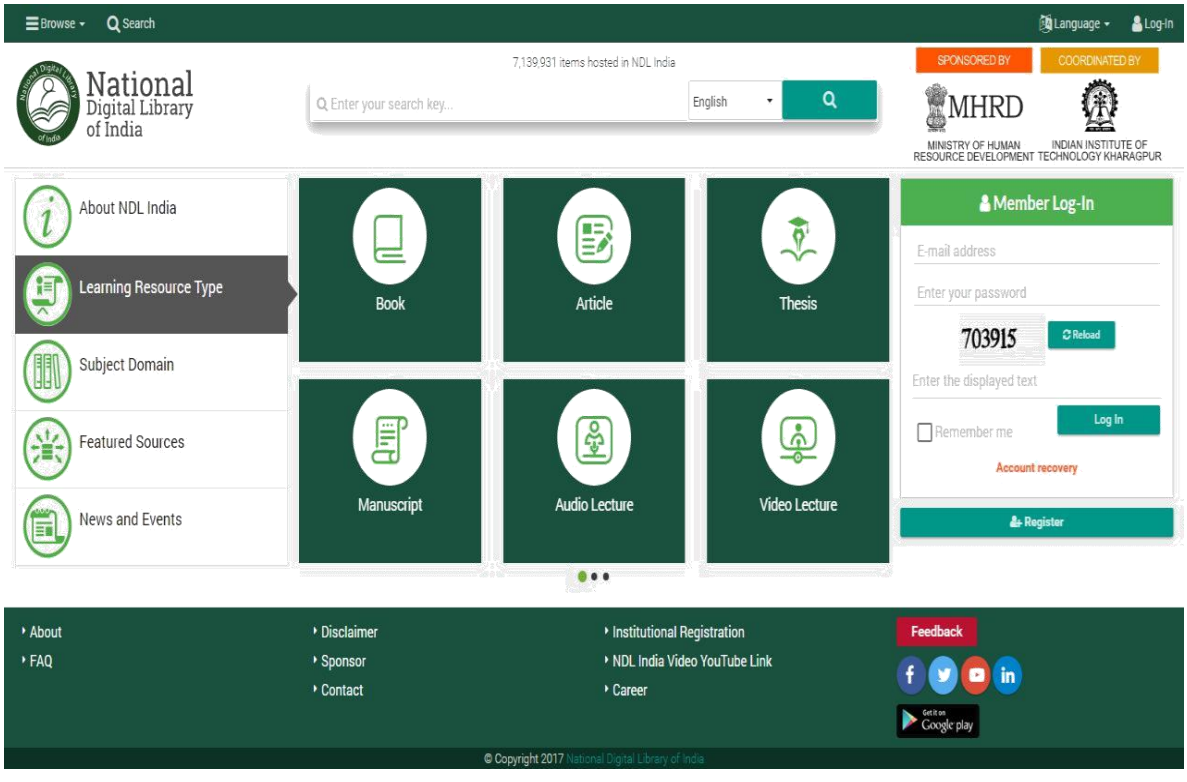


Fig B.33: NDL Homepage

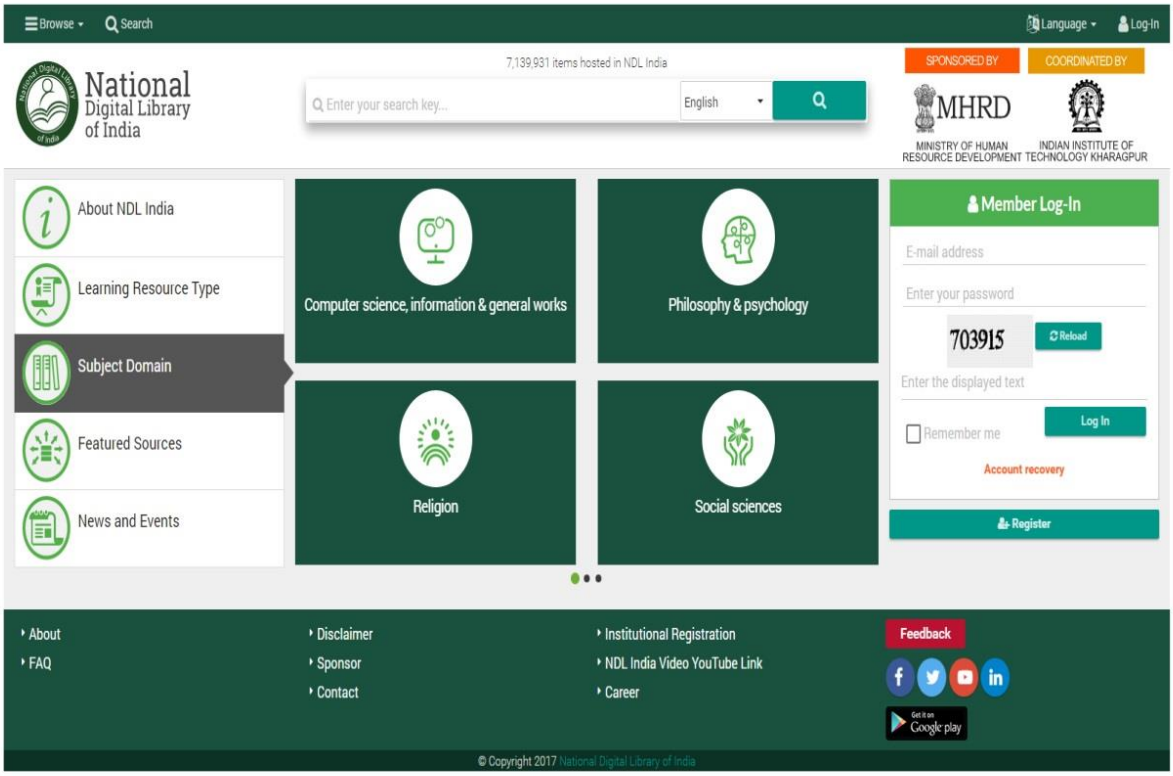
You may click on 'Learning Resource Type' on the left whereby you can see the different types of materials available like books, articles, video lectures etc.

Fig B.34: Click on 'Learning Resource Type'



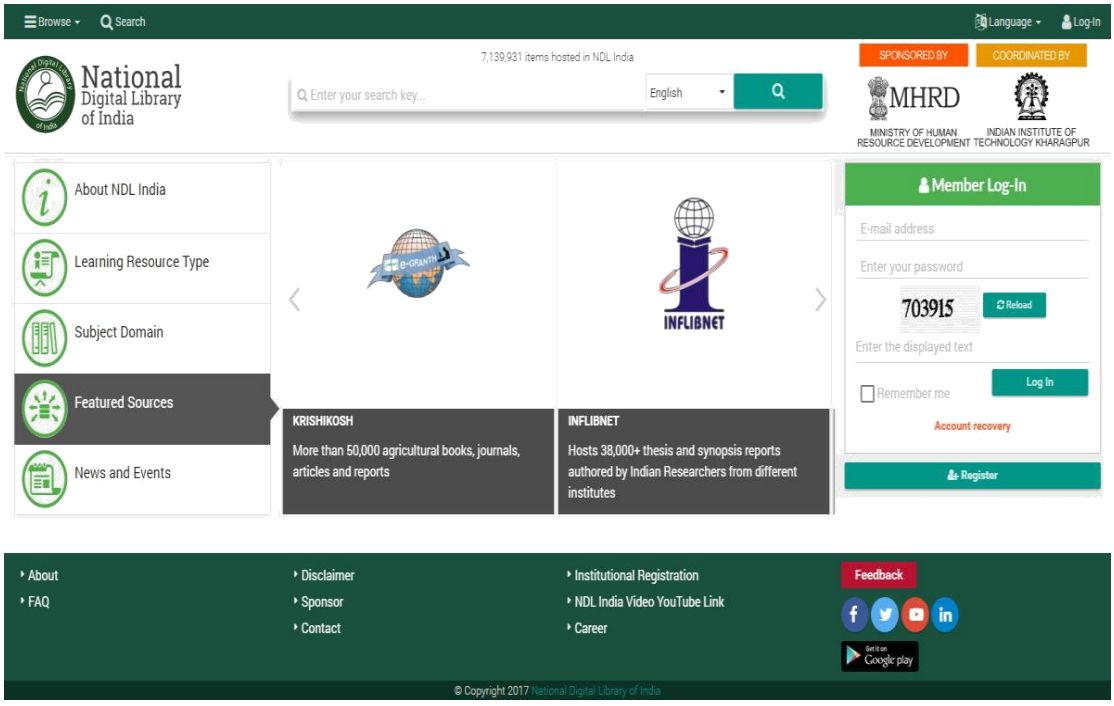
Similarly, 'Subject Domain' will show you a glimpse of the variety of subjects covered in NDL India.

Fig B.35: Subject Domain



Several important sources like NCERT, INFLIBNET, KRISHIKOSH etc. are displayed under 'Featured Sources' while 'News and Events' shows the host of events conducted by NDL India across the country.

Fig B.36: Click on 'Learning Resource Type'



7. Government e-Marketing (GeM)

Based on their commendations of the Group of Secretaries made to Hon'ble Prime Minister, the Government decided that it will create a one stop Government- Marketplace (GeM) to facilitate online procurement of common use Goods & Services required by various Government Departments / Organizations / PSUs. GeM aims to enhance transparency, efficiency and speed in public procurement. It provides the tools of e-bidding, reverse e-auction and demand aggregation to facilitate the government users, achieve the best value for their money. There are different reasons for purchasing a product on GeM as shown in figure.

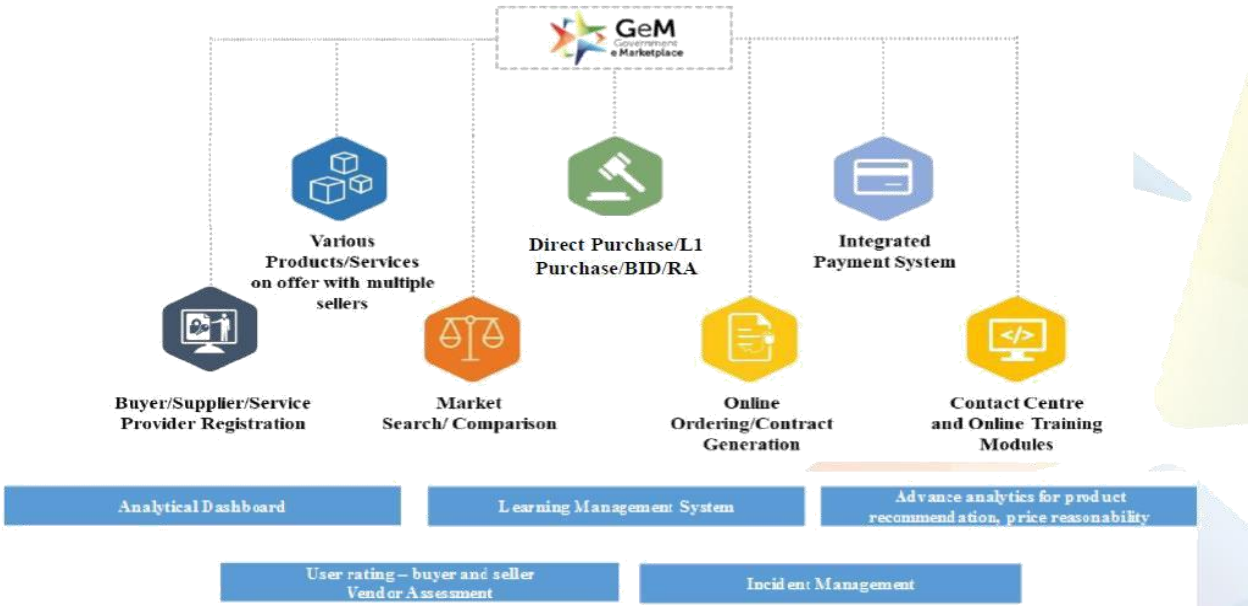


Fig B.37: Reason to buy product on GeM

Requirements to register on Gem Portal

User role to register on website is categorized as buyer and seller. A buyer which is a government organization needs to have Aadhaar number, official email id (gov.in/nic.in), official landline number and bank account details of an organization to register an organization on GeM portal. Below shown figure mention how to register in GeM as buyer.



Fig B.38: Buyer Registration

Similarly, the seller also registers on the GeM portal and below displayed figure shows the step to follow.

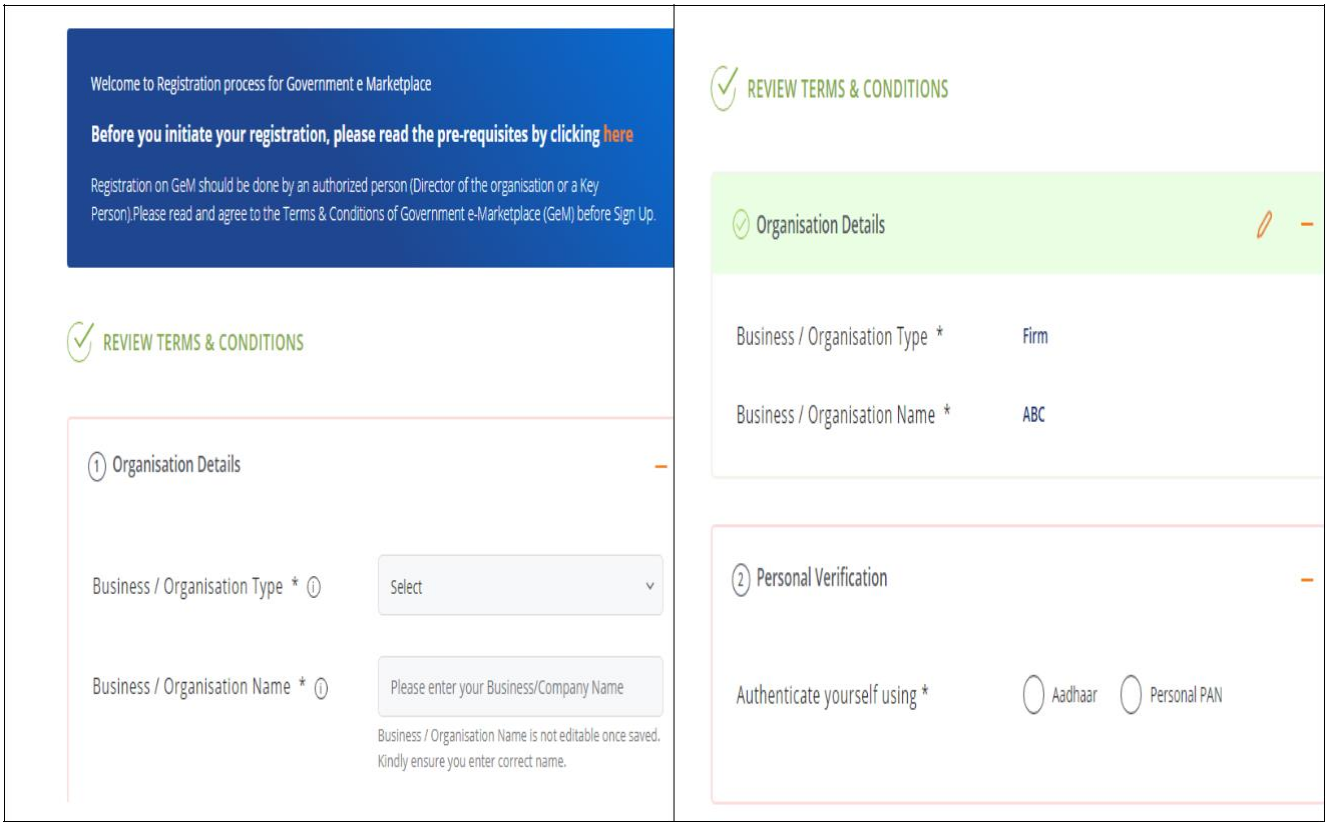


Fig B.39: Seller Registration Page

GeM Login Page

After registering with the GeM portal, user can access the GeM features with their login credentials as shown in below mentioned figure.

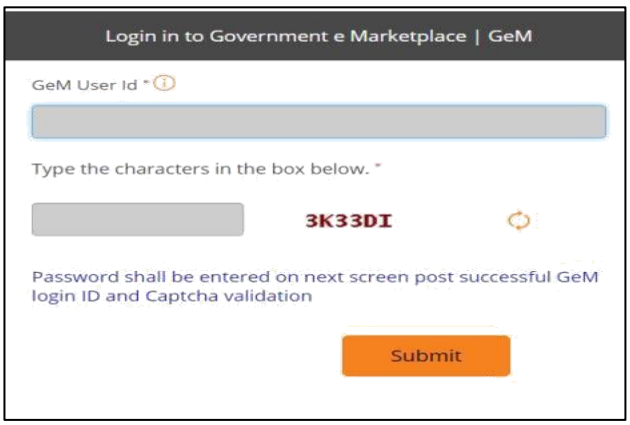


Fig B.40: Login Page

Dashboard for Bids

After user login as buyer below mentioned dashboard will appear which shows the published, draft and reverse auction (RA) bids. The dashboard also facilitates the buyer to search various product and services as per category as shown in figure.

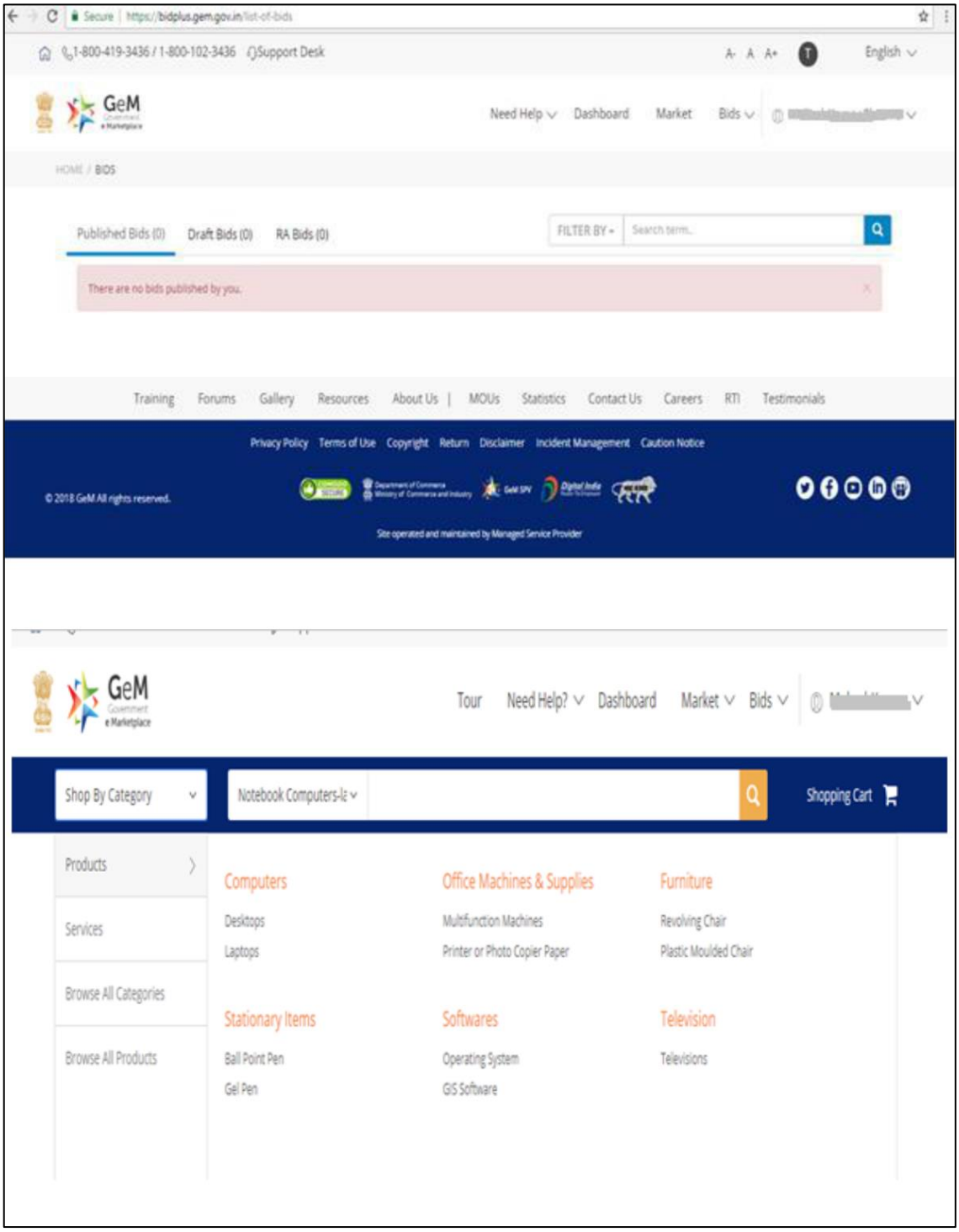
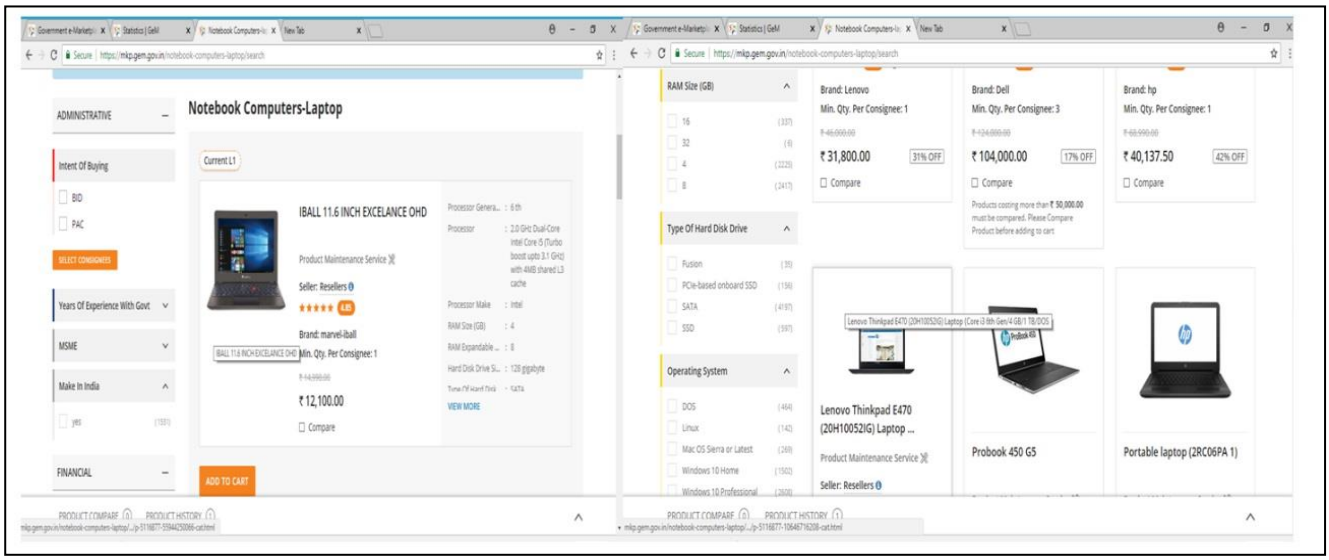


Fig B.41: Dashboard of user as buyer

Advanced Search

This feature allow user to search the product under various classifications and filter the product as per desired requirement. Below mentioned figure shows the list of products of different vendors which fulfill the searched criteria of user.

Fig B.42: Searching products on GeM



Purchase a Product

There are four ways to purchase a product from GeM portal and these are buy (without comparison), buy (with comparison), bidding purchase and reverse auction purchase. In direct buy (without comparison) just select the single product from the list and click buy button or add to cart if purchase more item. This type of purchase can be initiated when the total purchase amount of all products should be less than 25K as per latest government terms and condition. The same is shown in figure shown below.

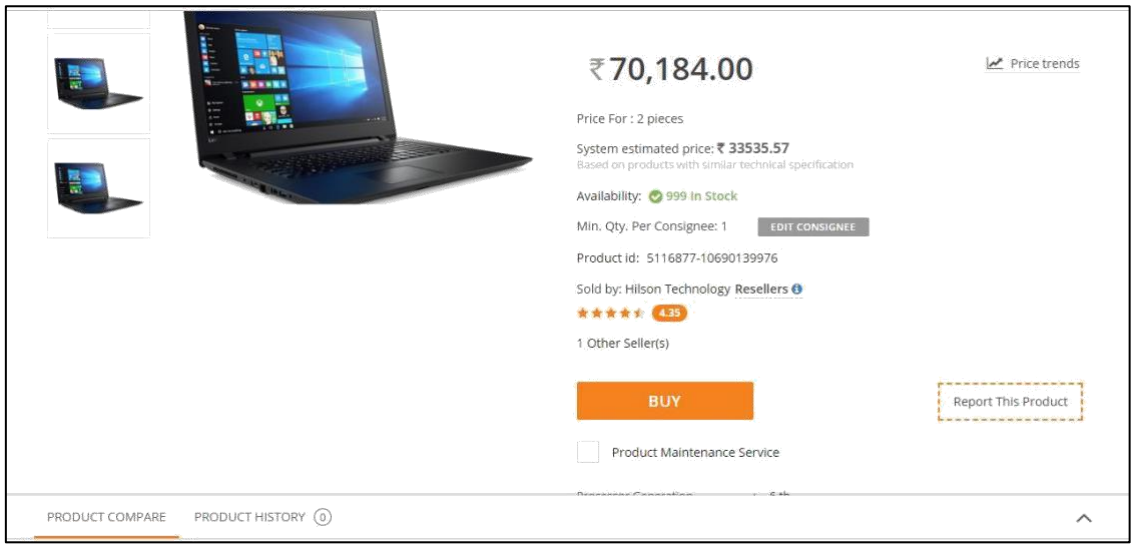


Fig B.43: Buy (Without comparison)

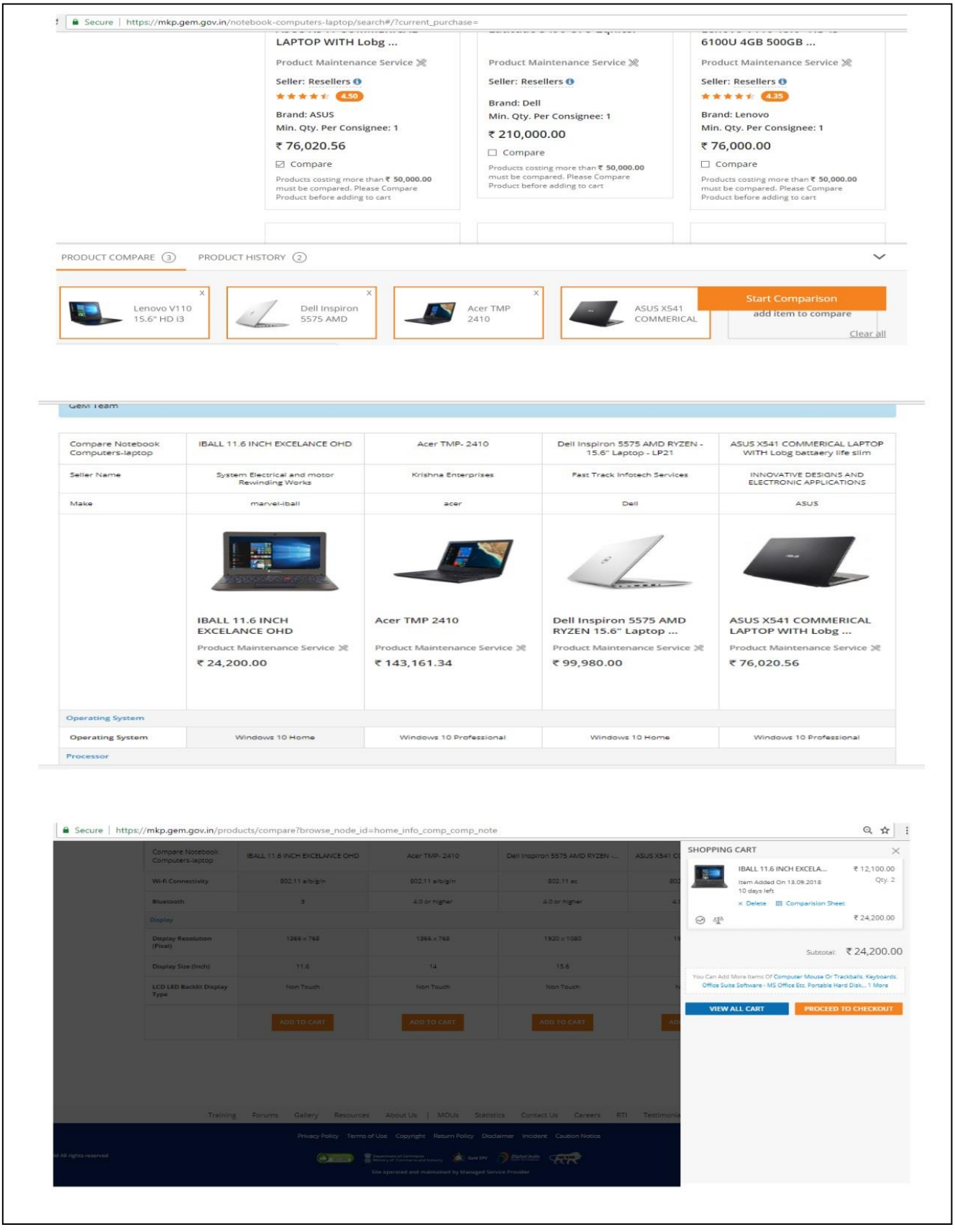


Fig B.44: Buy (With Comparison)

After selecting the product by buy option of with comparison and without comparison the below mentioned steps comes in which user click proceed to check out to move to next step of payment.

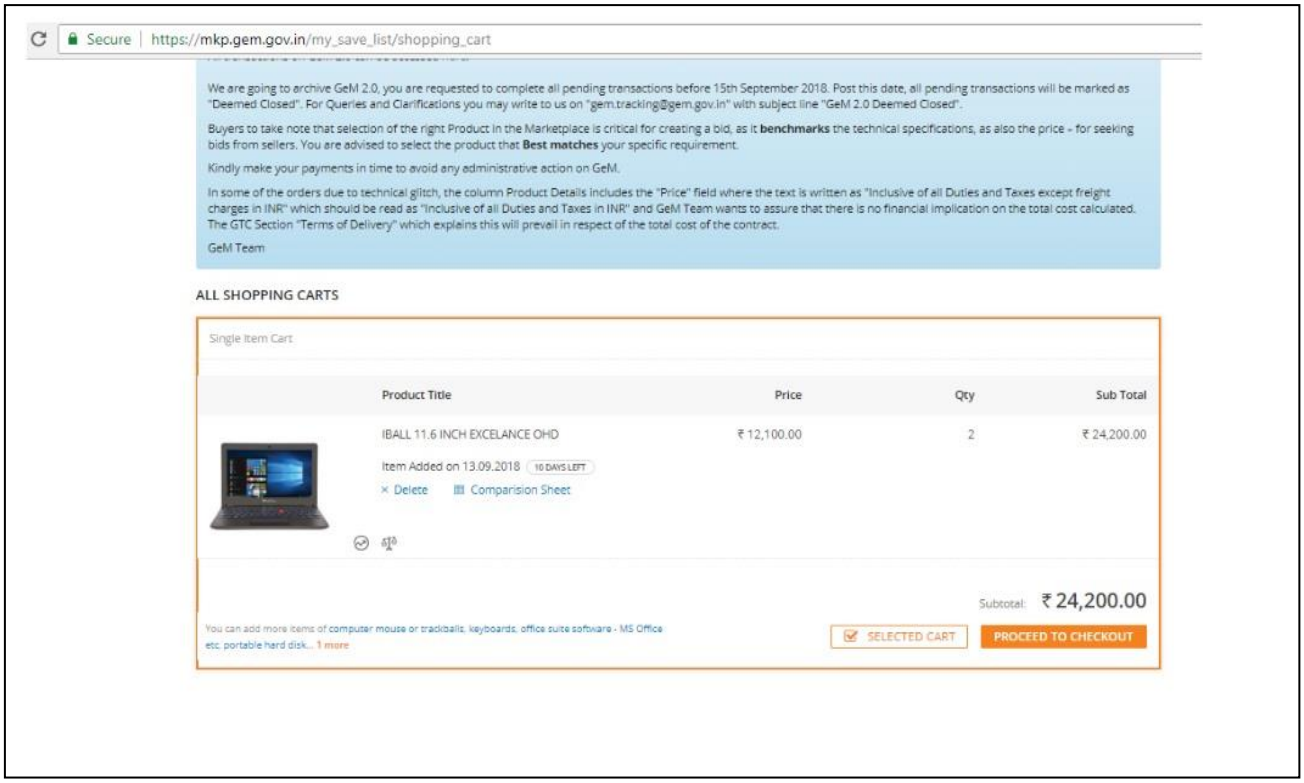


Fig B.45: Proceed to next step of payment after selection of product

Applying the purchase through bidding and reverse auction is similar as direct buy in GeM portal.

Bidding: Bidding is an offer (often competitive) to set a price by an individual or business for a product or service or a demand that something be done. Bidding is used to determine the cost or value of something.

Reverse Auction: A reverse auction is a type of auction in which the roles of buyer and seller are reversed. In a reverse auction, the sellers compete to obtain business from the buyer and prices will typically decrease as the sellers under bid each other.

Complete Working Process through GeM

Below mentioned figure show the integration of GeM portal with the public procurement ecosystem.

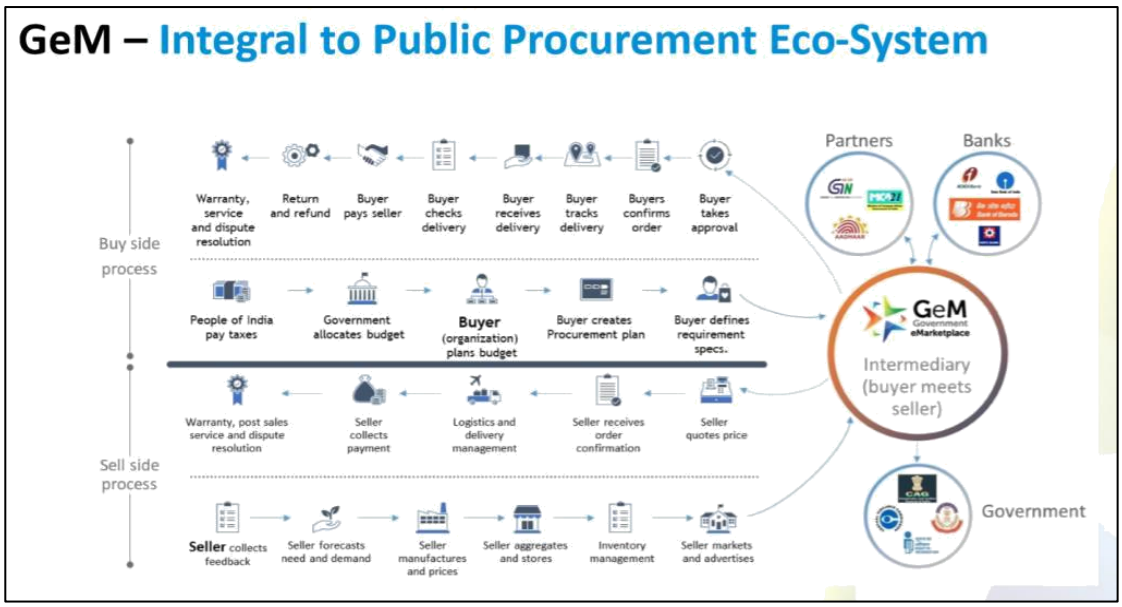


Fig B.46: Public Procurement Ecosystem

Raising a Ticket

If any user faces any problem related to the GeM portal, then they can raise a ticket which have unique Id which can be tracked to check the status of the ticket whether the problem is resolved or not. Raise a Ticket option is available at the footer of GeM postal as shown in figure.



Fig B.47: Shows Option of Raise a Ticket and LMS

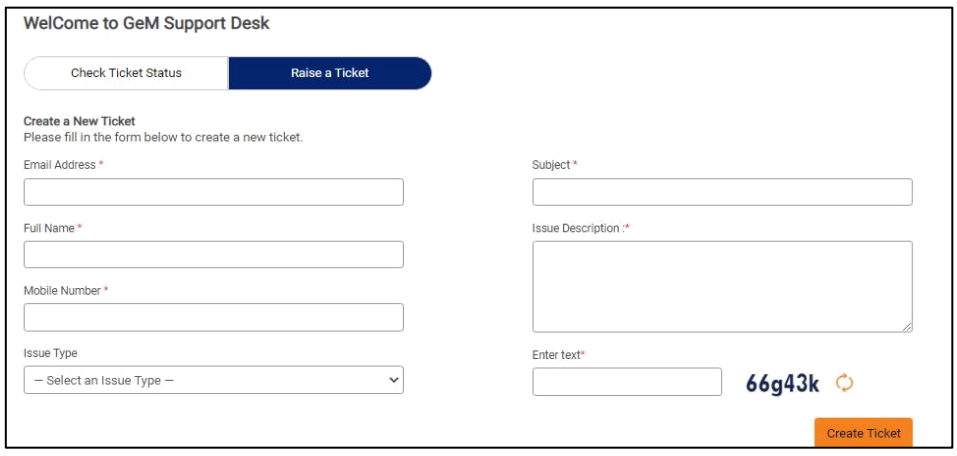


Fig B.47: Form a raise a Ticket

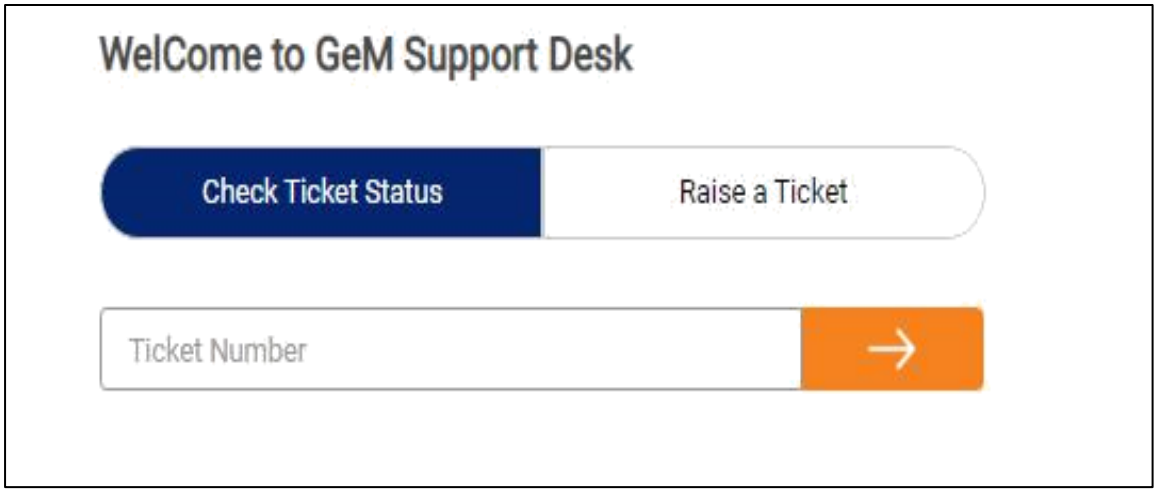


Fig B.48: Form to check the Status of the Ticket

GeM Learning Management System

GeM LMS is an invaluable, user-centric knowledge repository featuring learning paths to meet user specific needs and learn the ecosystem better. It serves as a platform for users and trainers

facilitating intermediate processes like registration training, live training using webinar, certification, feedback, FAQs and other user specific journeys.

Key Features of LMS:

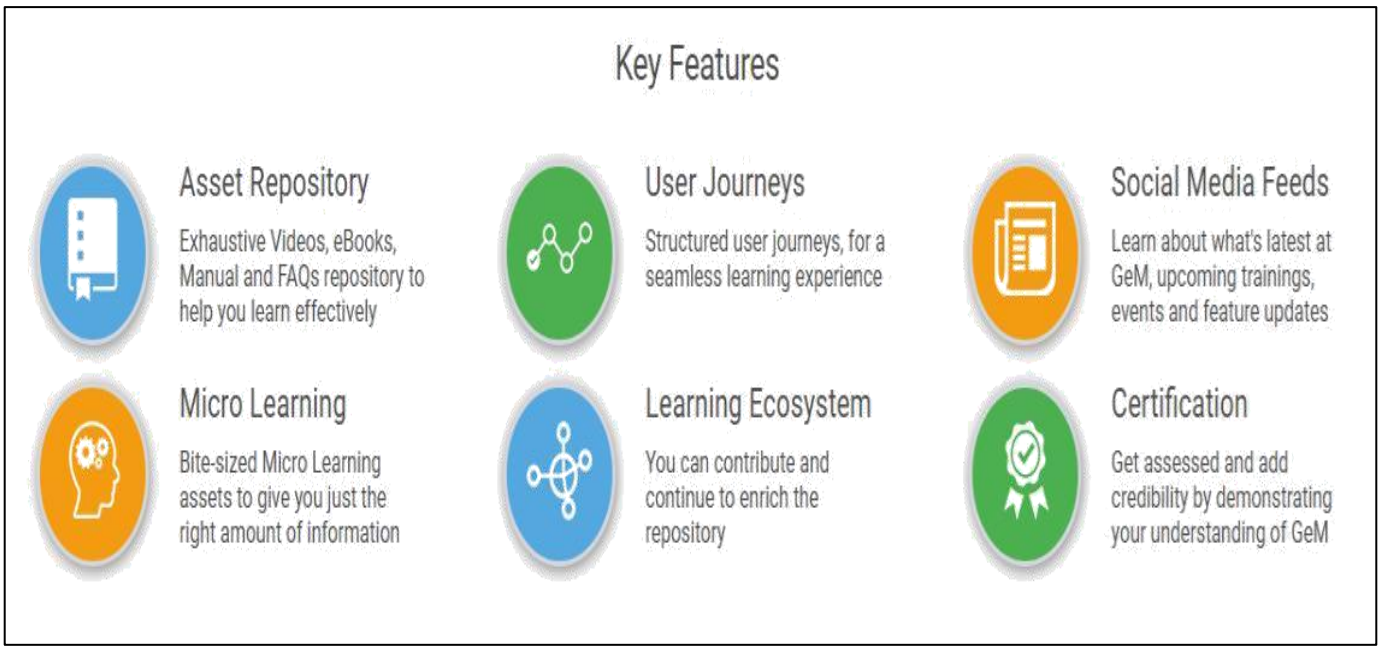


Fig B.49: Features of LMS

Steps to use the LMS portal of GeM: Following steps is to followed to use the GeM LMS portal.



Fig B.50: Steps to use LMS portal

8. E-office

Introduction



Why eOffice?

- An average document is photocopied 19 times
- Paper files get doubled every 3.5 years
- Paper usage in an average office grows 22 percent a year and doubles every 3.3 years
- Every 12 filing cabinets require an additional employee to maintain them
- The average search time for any document is 18 minutes and some are never found
- At any given time, 3-5 percent of an organization's files are lost or misplaced
- Large organizations lose/misplace a document every 12 seconds
- 92 percent of information is in manila folders
- Almost half of an office's time is spent handling paper/data entry
- 80 percent of today's information is paper based
- The average time to retrieve and file a paper document is 10 minutes
- E-mail causes an average 40 percent increase in paper consumption
- 12,500 sheets of paper can be made from one tree
- A letter has to pass through 41 steps and entered in dozens of the registers before it is answered

eOffice – Benefits

- Enhance transparency
- Increase accountability
- Assure data security and data integrity
- Transform the government work culture and ethics
- Promote innovation by releasing staff energy and time from unproductive procedures

eOffice Product Suite

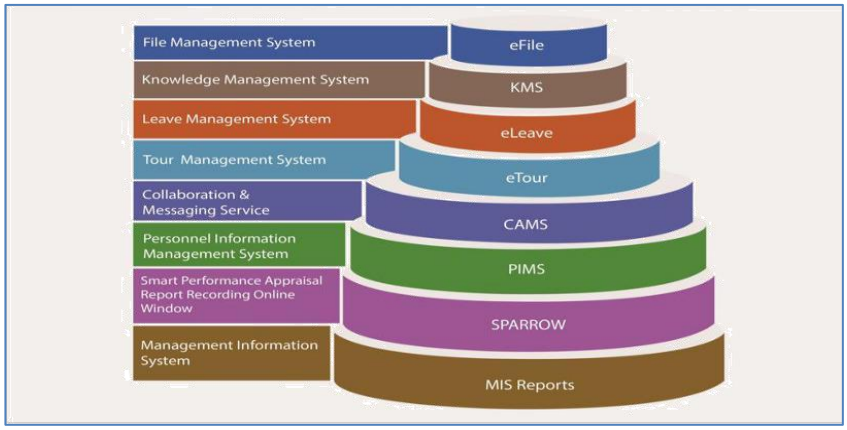


Fig B.51: eOffice Product Suite

File Management System (eFile)

eFile is a workflow-based system that replaces the existing manual handling of files with a more efficient electronic system.

This system involves all stages, including the electronic diarization of inward correspondence, creation of files, movement of correspondences and files, electronic signing of noting & drafts using Digital Signature Certificates (DSC), eSign, and finally, the archival of records.

Receipts	Files
• Diarization – Electronic / Email / Physical • Acknowledgement Generation • Receipt to Receipt and File Attachment • VIP Letter Tracking • Address Book • Signing on remarks • Legends on priority • Advanced Search on metadata • Receipt Status Monitoring System • Closing of Receipts	• File Creation – Electronic and Physical • Notings (Green and Yellow Note) • Correspondence • Draft for Approval (DFA) • Referencing • Digital Signatures on Noting and DFA • File to File and Receipt Attachment • Linking of File • Closing of File • Advanced Search on metadata
Dispatch	**Reports**
• Templates Selection • Digital Signatures • Advanced Search on metadata • Reminders and Follow-ups • Dispatch sent through email and post	• MIS Reports ➢ File/Diary Register Report ➢ File/Diary Movement Report ➢ File/Diary Pendency Reports ..... many more

Fig B.51: File Management System (eFile)

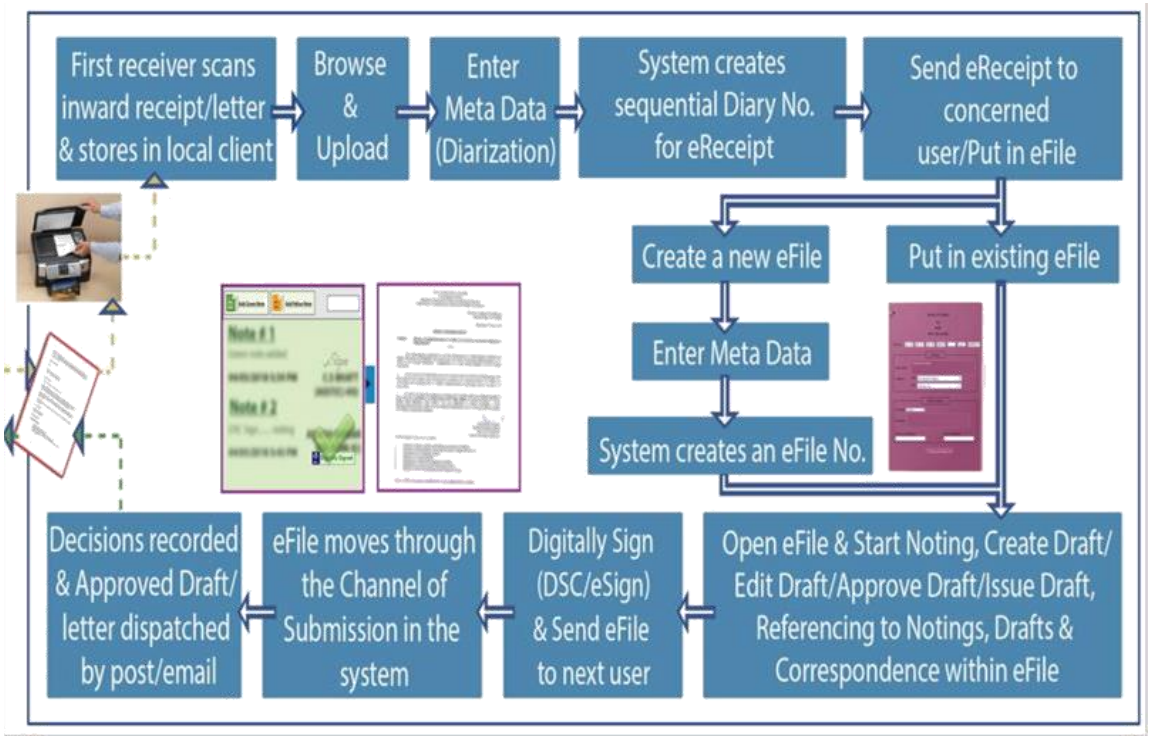


Fig B.52:eFile Process

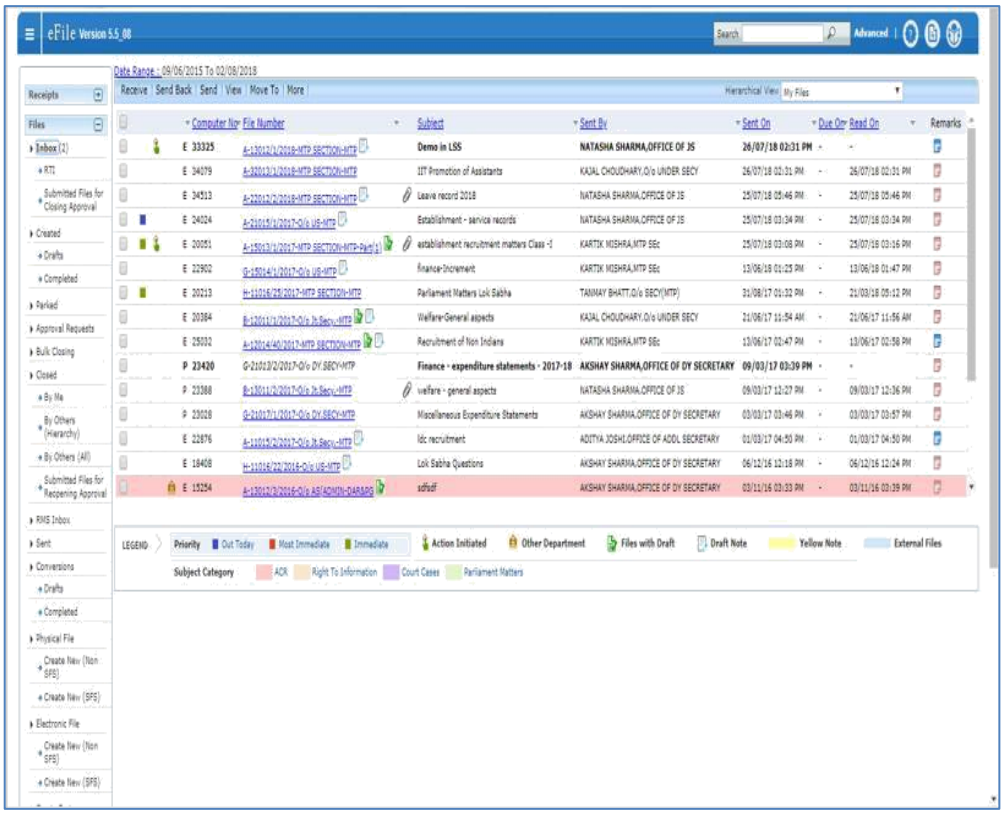


Fig B.53:eFile Inbox

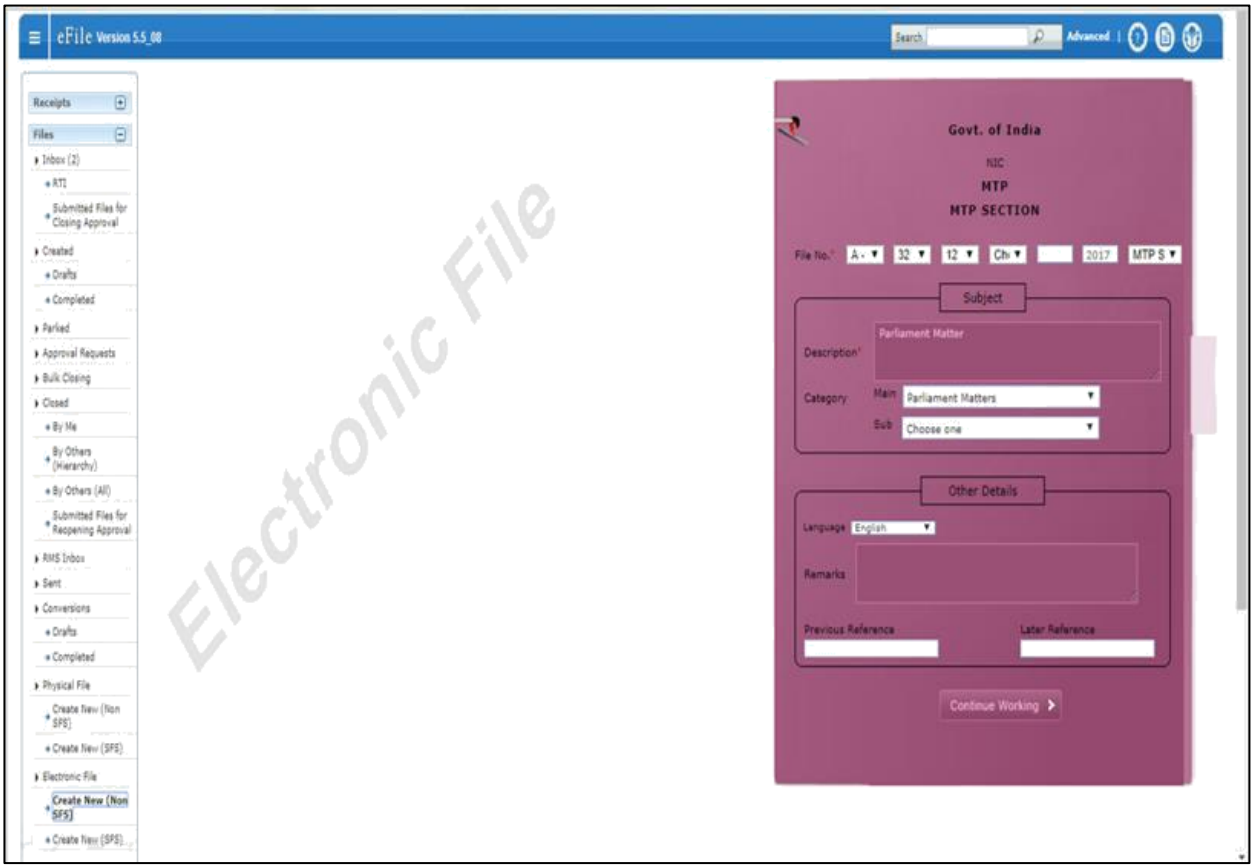


Fig B.54: Electronic File Cover Page

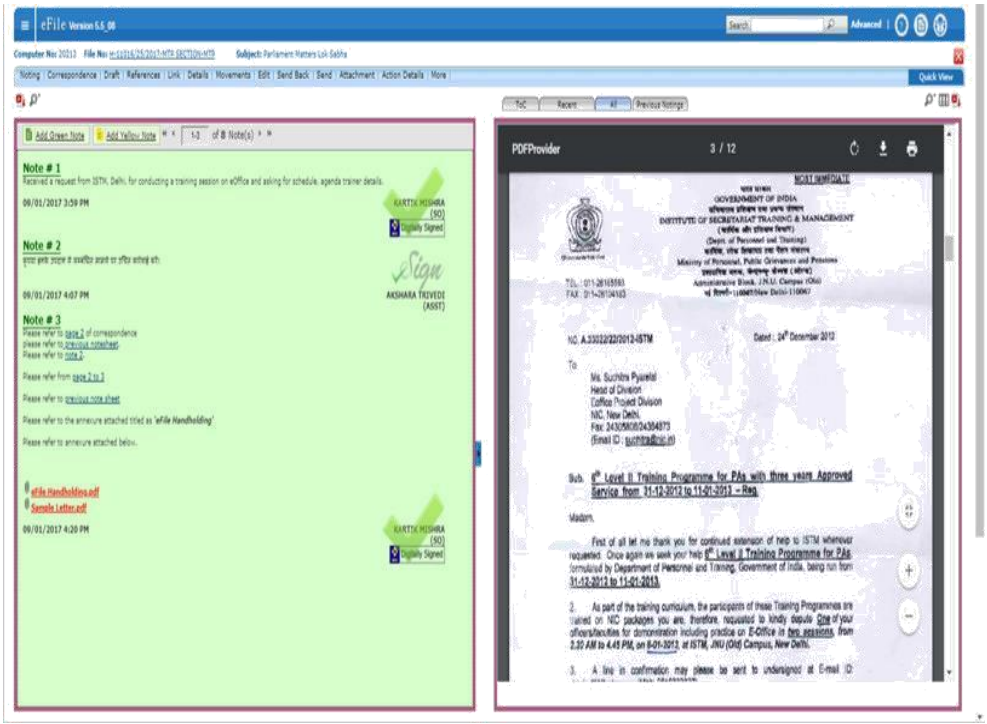


Fig B.55: Inner Look

Fig B.56: eFile – File Sending Page

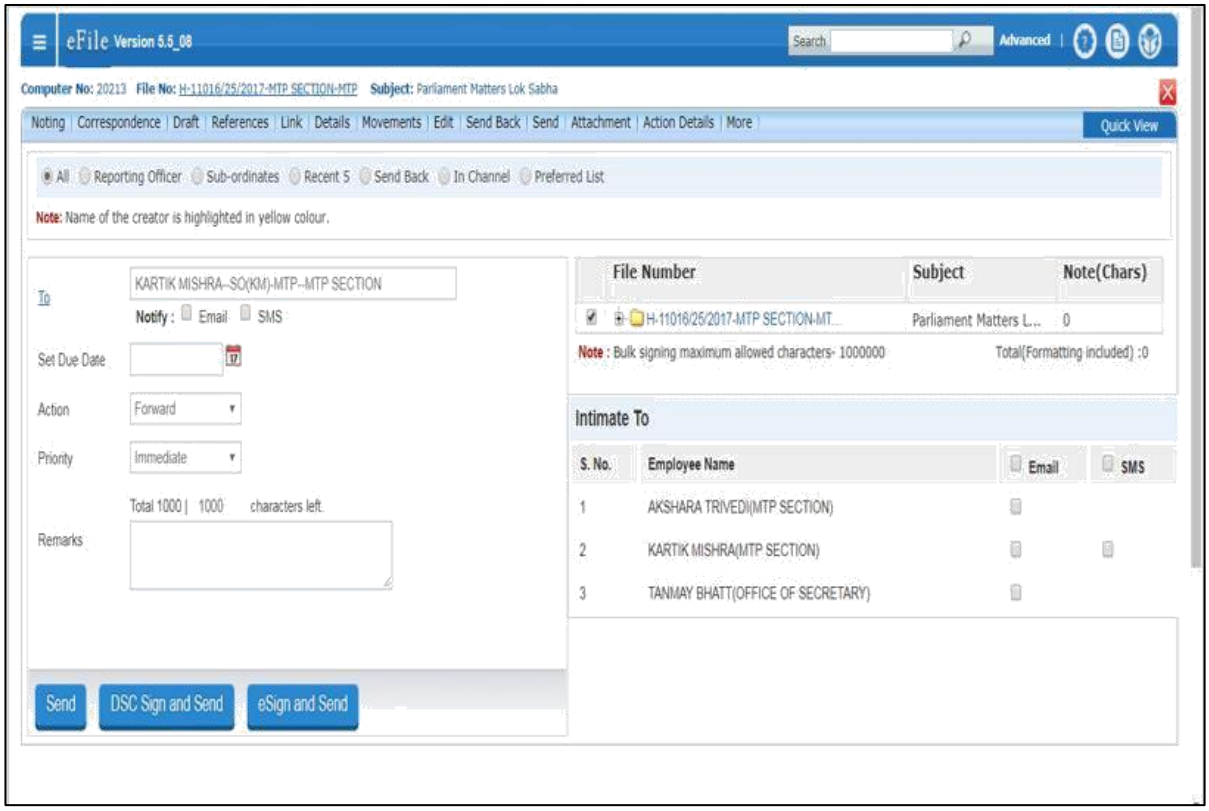
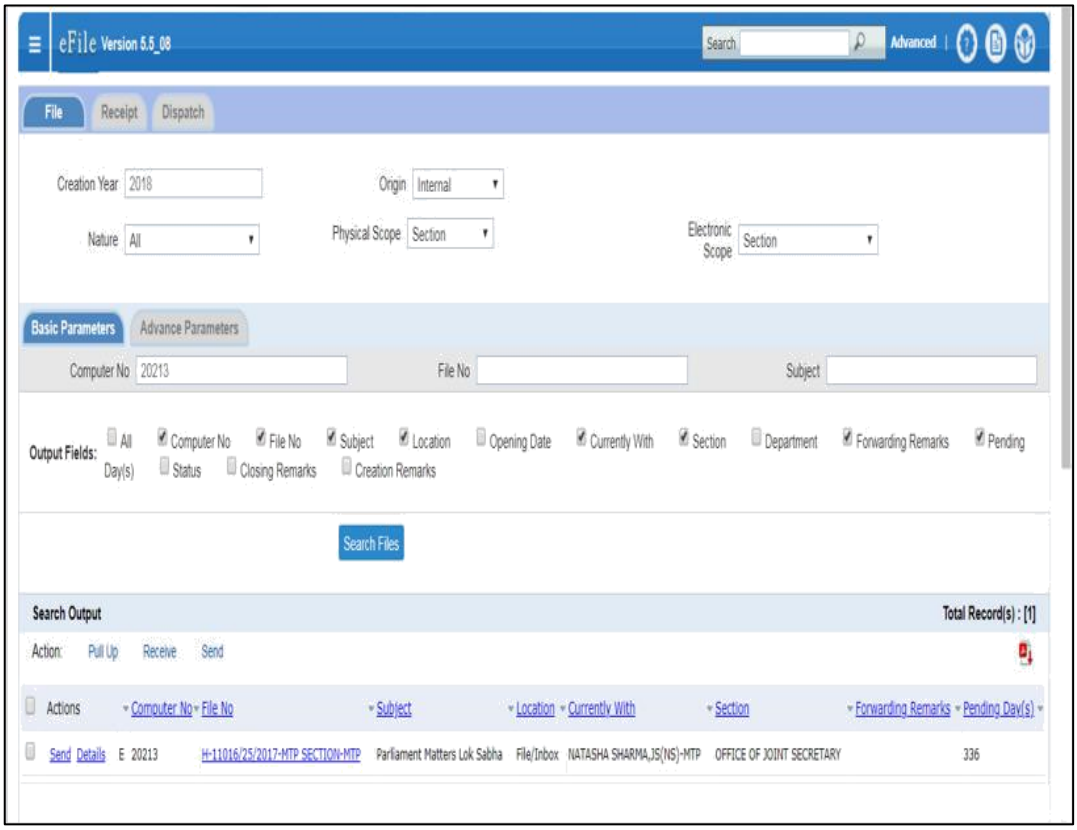


Fig B.57: eFile – Search Page



Knowledge Management System (KMS)

Enables users to create and manage electronic documents that can be viewed, searched and shared.

Contains a dynamic workflow to keep document in various stages

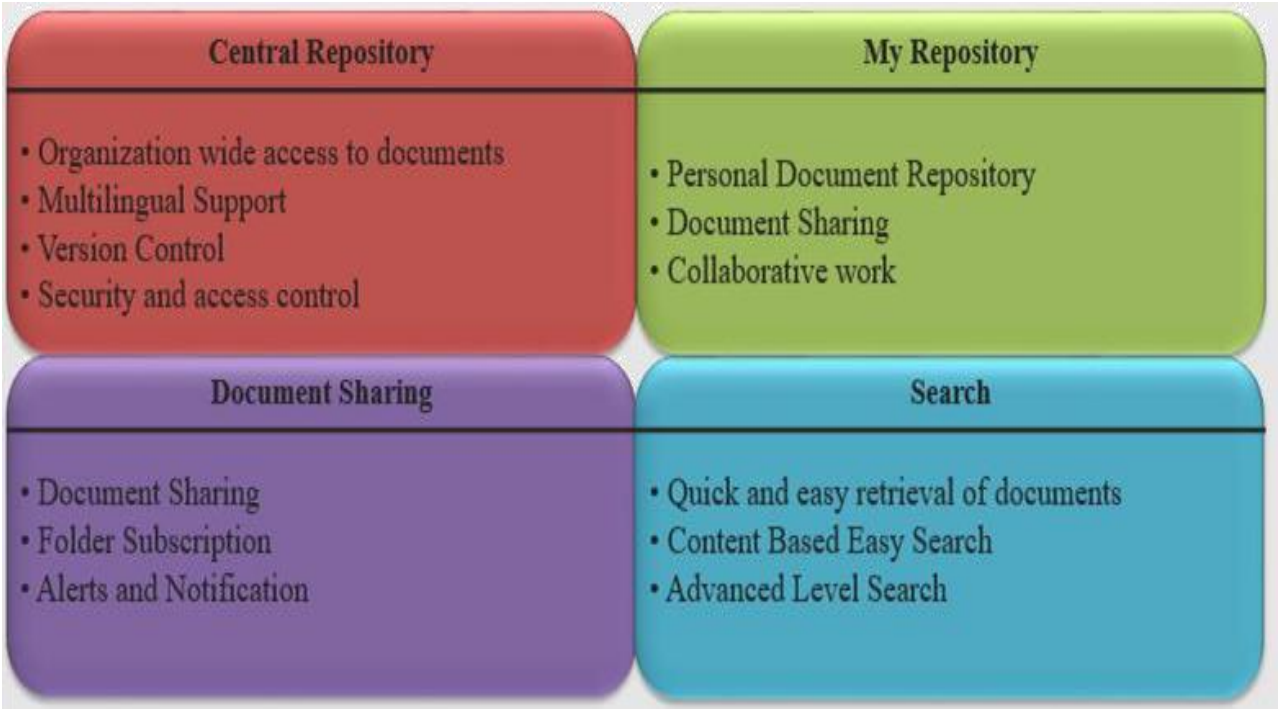


Fig B.58: KMS - Dashboard

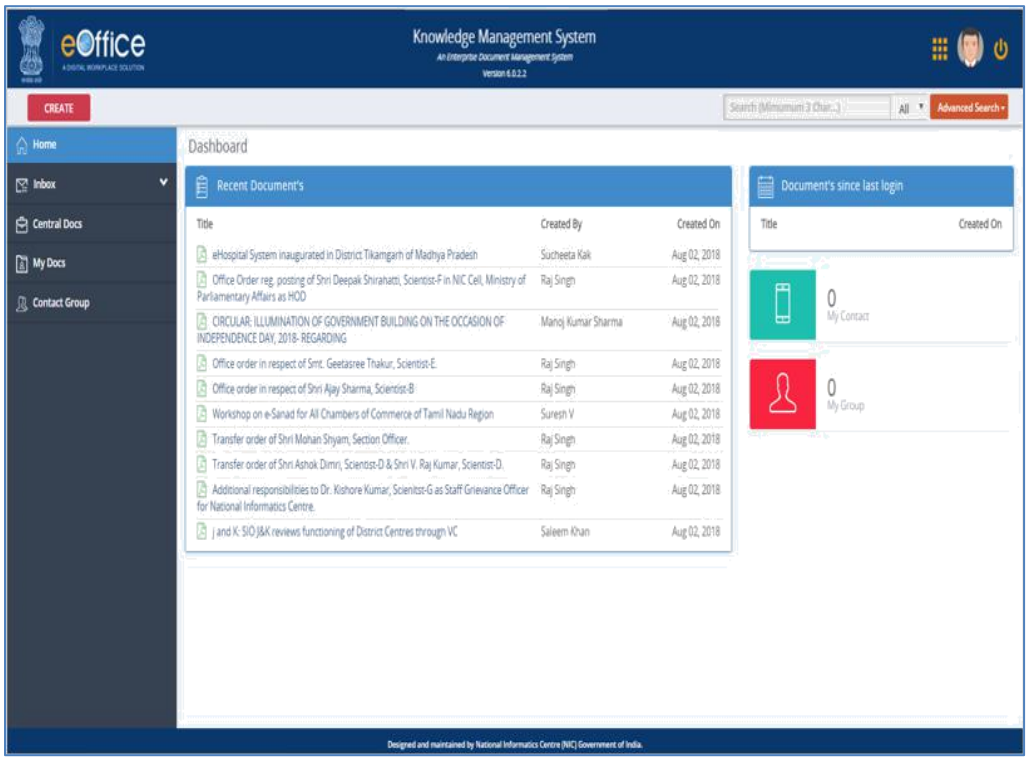
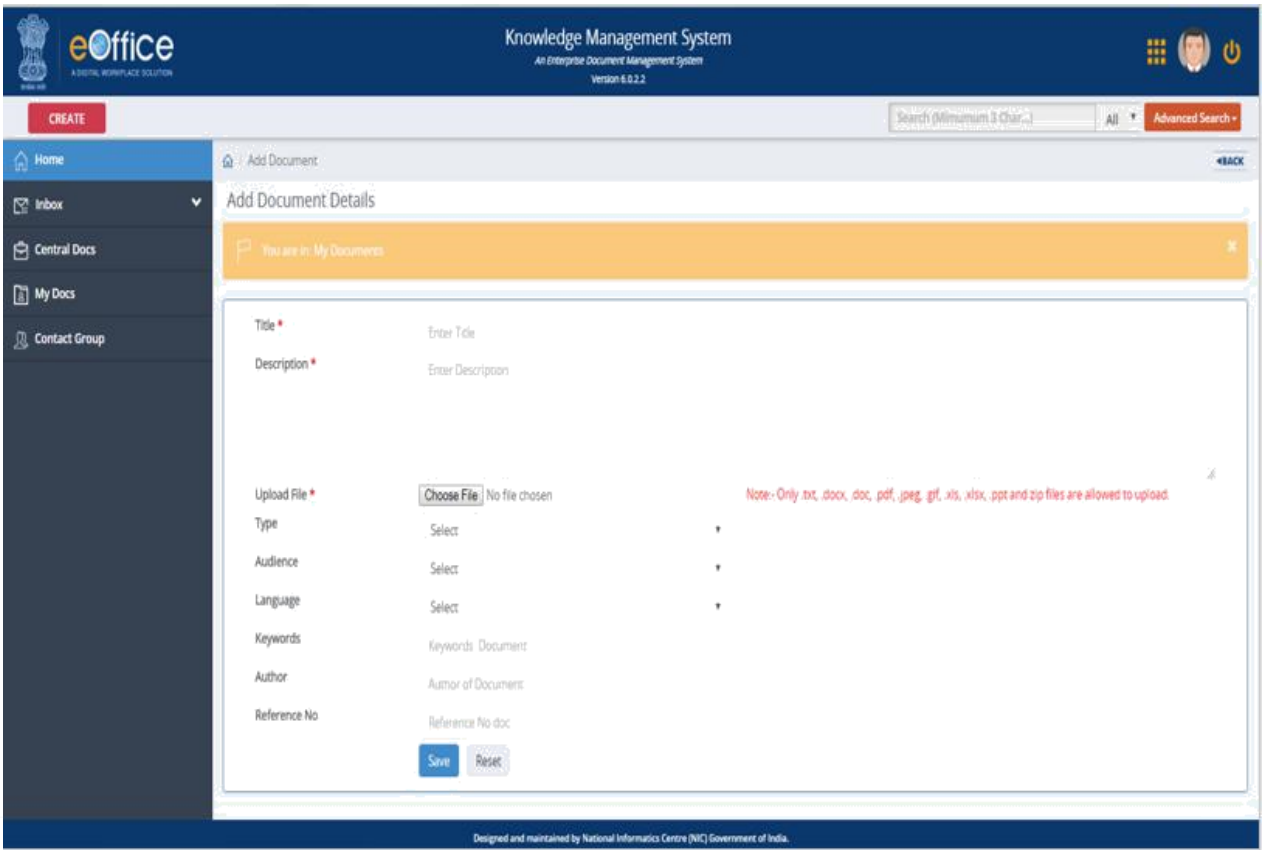


Fig B.59: KMS – Document Creation



MIS-Reports

Management Information System (MIS-Reports) is a system that provides real-time monitoring of an organization's productivity & efficiency through various transactional data made available for the organization.

Fig B.60: MIS Homepage



Fig B.61: MIS-Reports – File Register

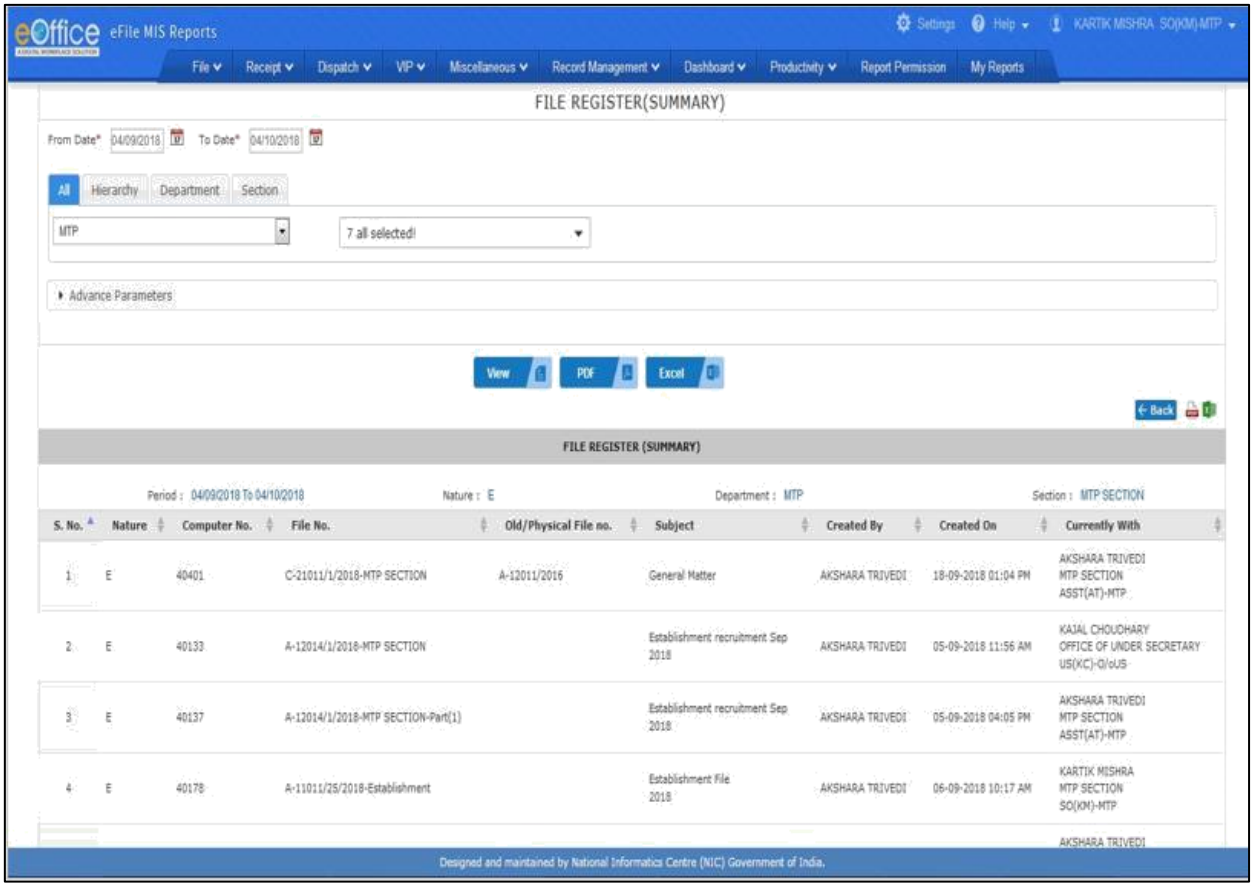


Fig B.62: MIS-Reports – Diary Register

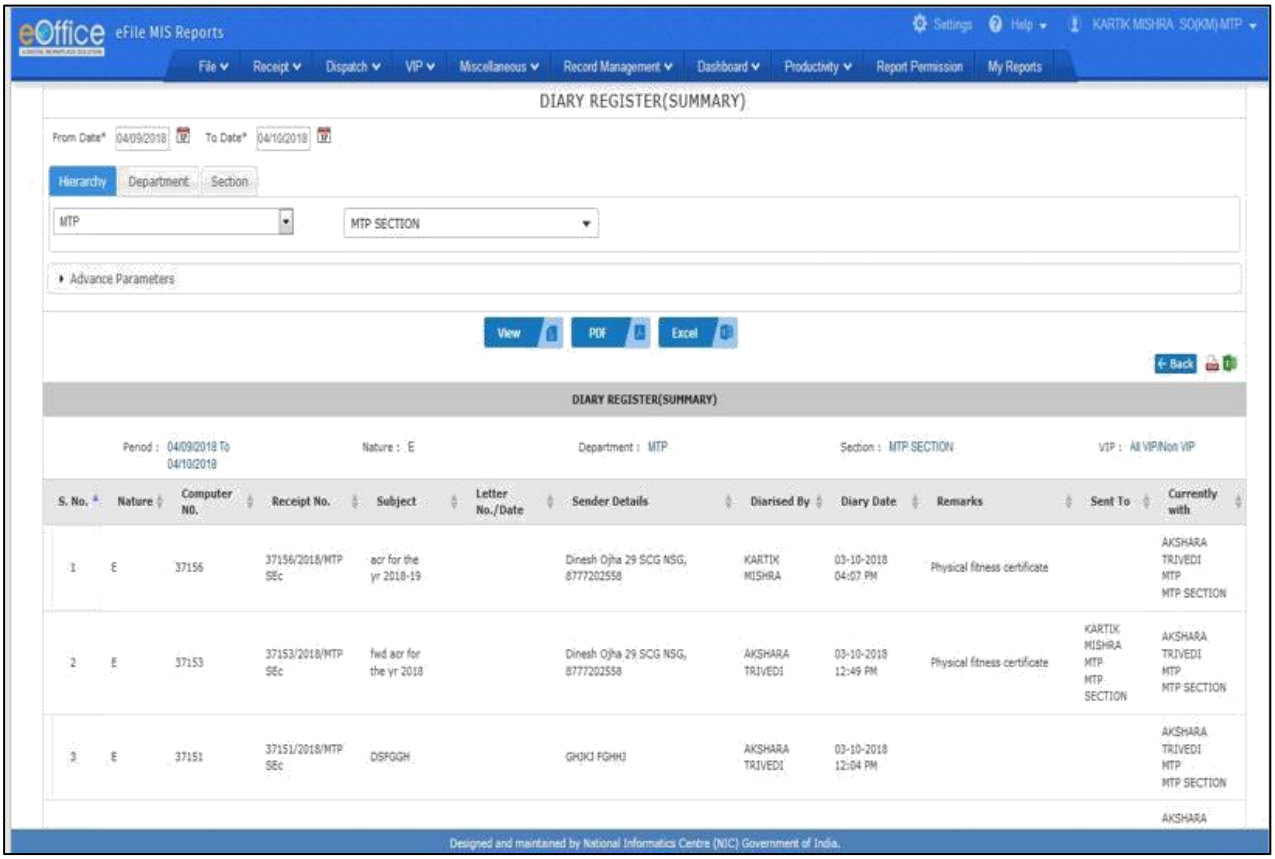


Fig B.63: MIS-Reports – Departmental File Pendency

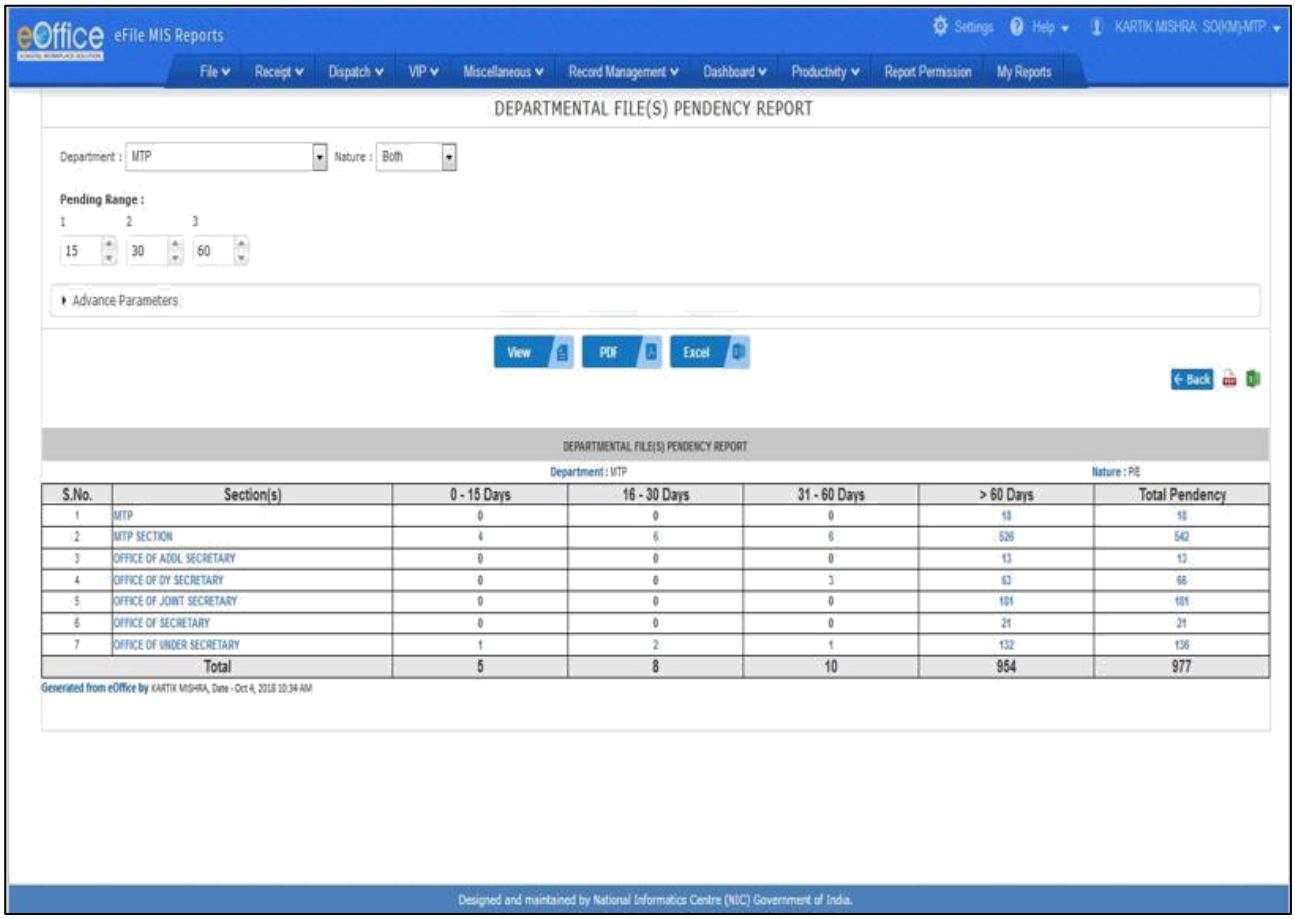


Fig B.64: eOffice Implementation Phases

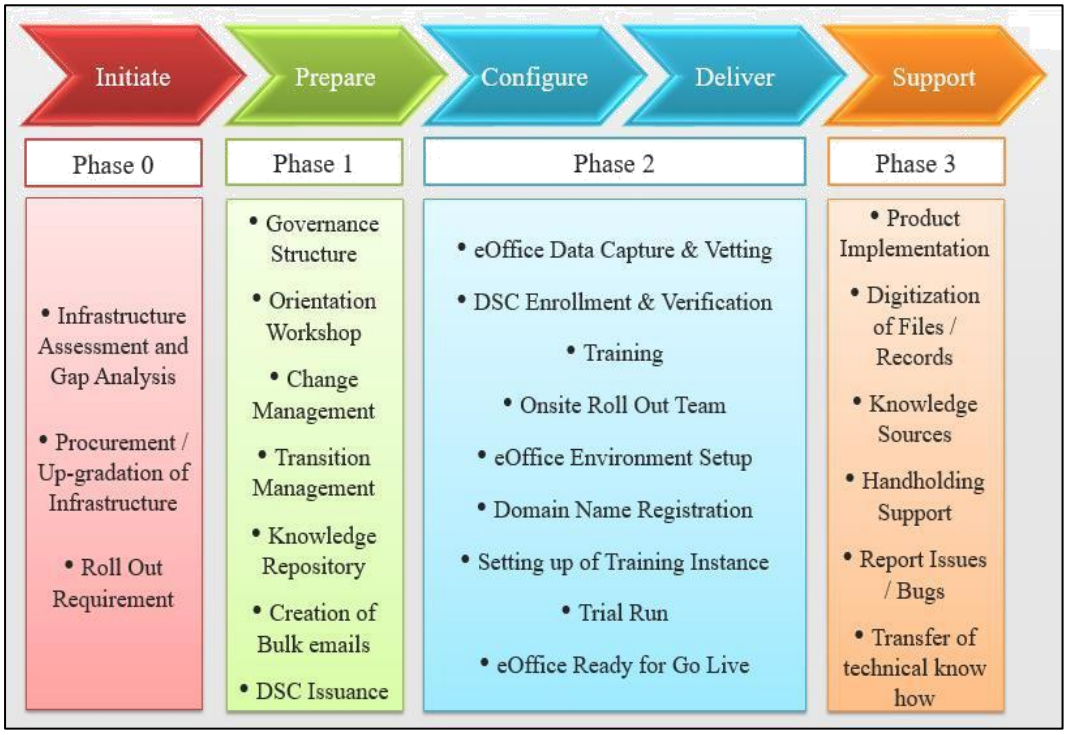
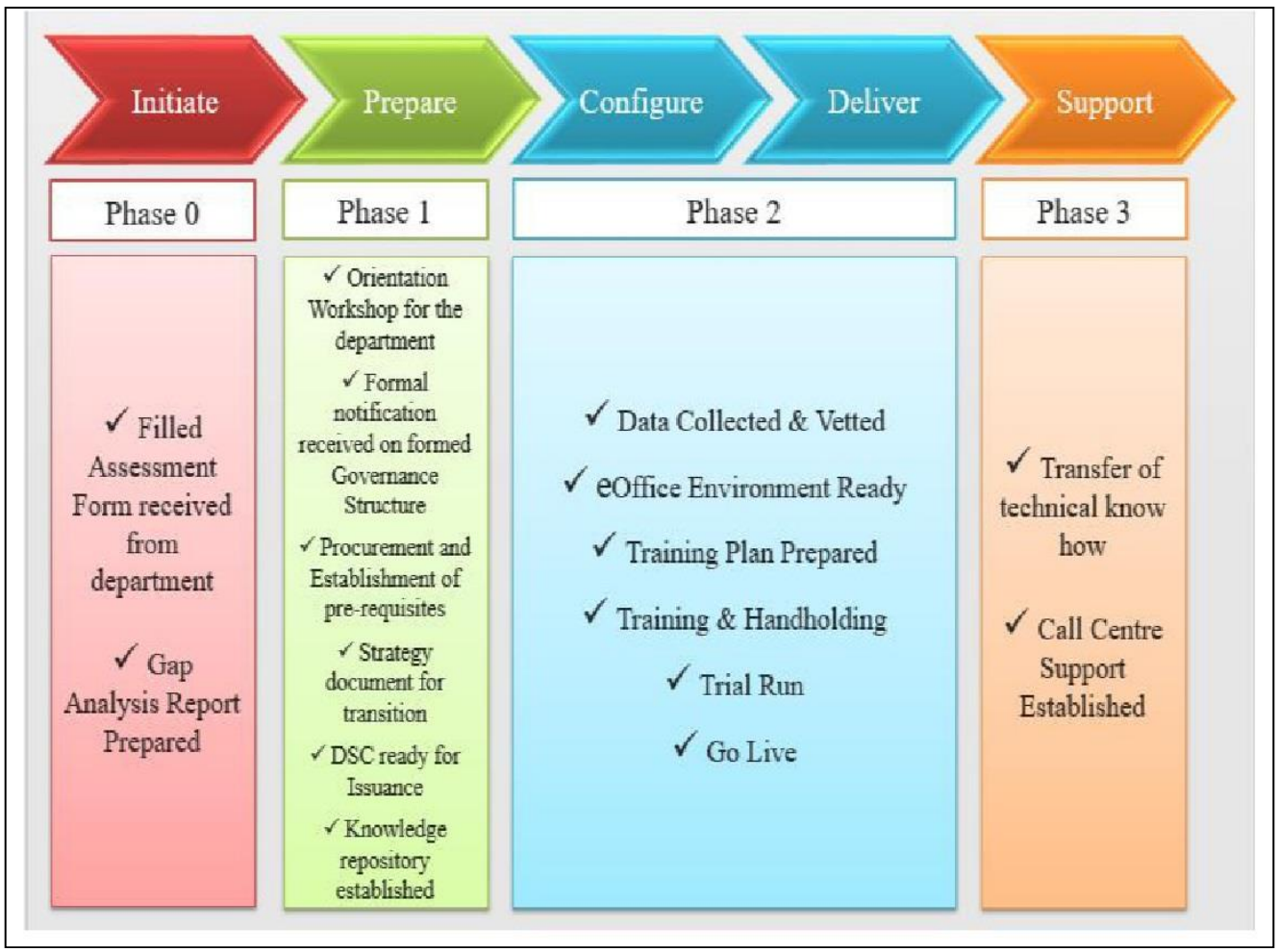


Fig B.65: eOffice Implementation Checklist



9. PFMS Expenditure, Advance and Transfer

Purpose

The objective of Expenditure, Advance and Transfer (EAT) module of Public Financial Management System (PFMS) is to help Program Implementing Agencies (PIAs) in filing of expenditure, transferring funds, advances and its settlement.

The process of feeding the day to day transactions as recorded in the cash book of the PIA on the PFMS portal is called expenditure filing. A step by step guide for each activity is provided in detailed in this user manual.

The following activities need to be completed by the Program Division (PD) for implementation of EAT:

- PIA Registration

- Hierarchy Mapping
- Identifying Components

Once PIA is registered on PFMS, it will receive an Agency Admin log in and password.

Steps involved in expenditure filing

I. Login into PFMS with Admin credentials



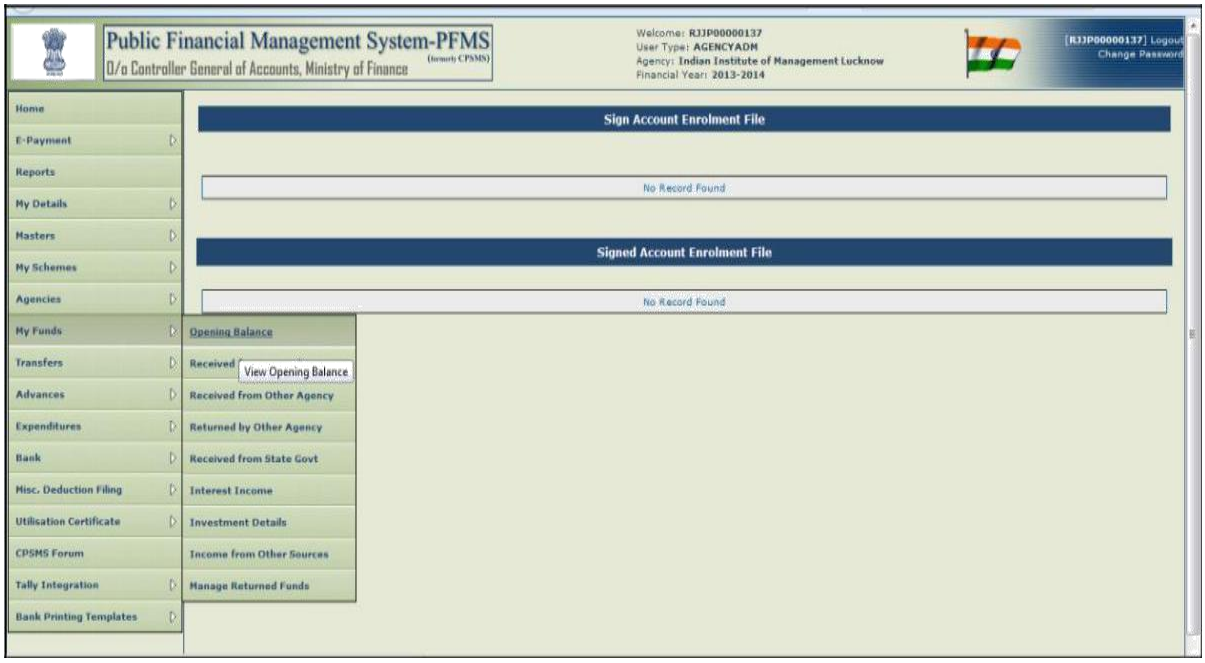
Entering receipts of PIA

The receipts of a PIA consist of opening balance, receipts from Central Government, receipts from other PIAs, receipts from State Government, returned by other PIAs, interest income, income from other sources, etc. All these details will be entered by the data operator and will be approved by the data approver.

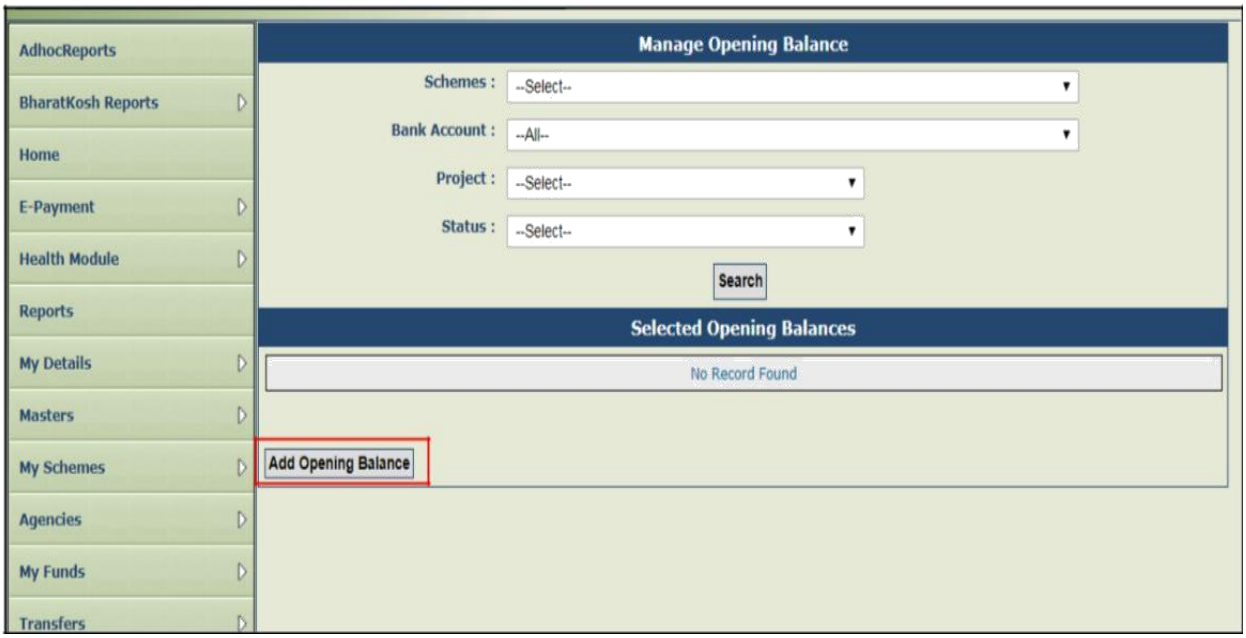
Opening Balance

The opening balance as per the cash book as on 1st April of the financial year is to be entered on the PFMS portal. This is a one-time exercise when the PIA starts filing expenditure on PFMS. In subsequent years, the opening balance will be automatically available in the system.

Step1: For entering opening balance, the data operator will login into PFMS portal and select **My Funds>Opening Balance** from the menu.



Step2: Click on **Add Opening Balance** button.



Step3: Select **Scheme** to which the opening balance is to be added from the dropdown list.

Step4: Select the **Bank Account** in which the opening balance is to be added (For Cash Balance, select Cash option from the drop down).

Step5: Available balance in the system against the bank account selected will be displayed by the system. At the start of Expenditure Filing by PIA, the available balance will be Zero.

Step6: Enter **Opening Balance Amount**.

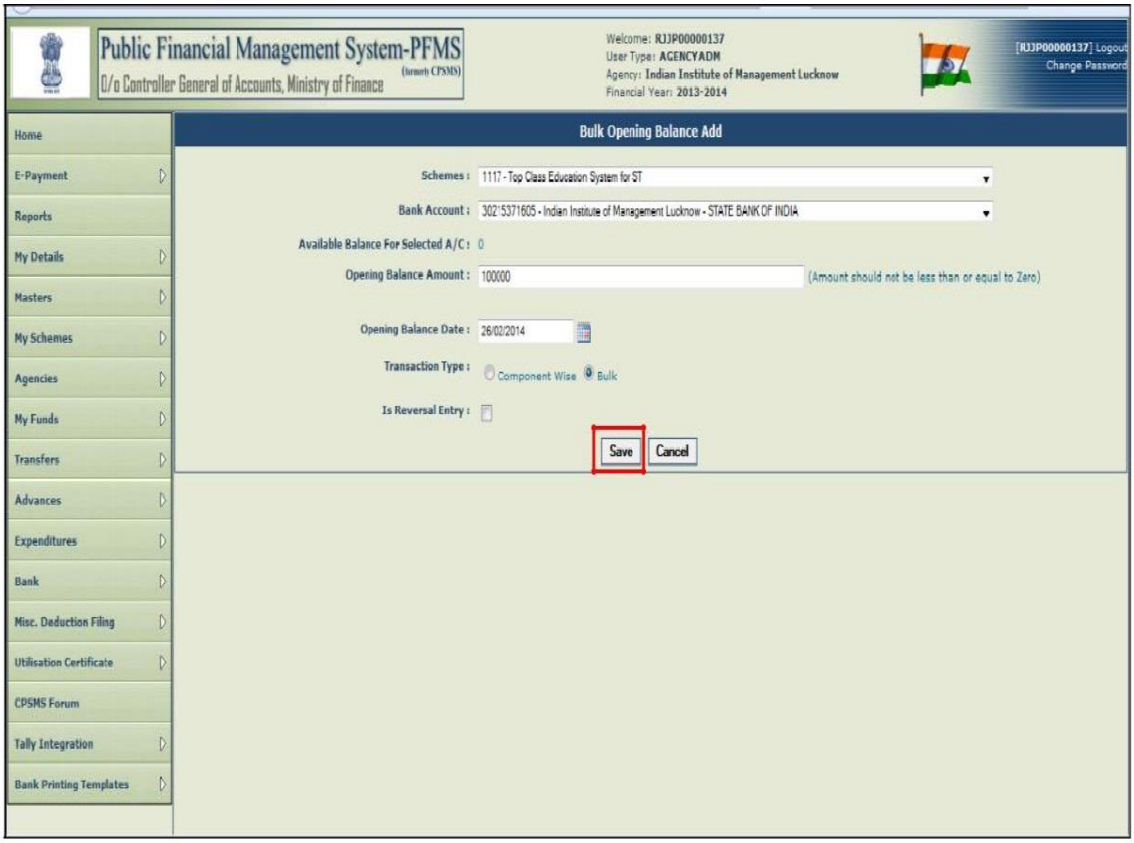
Step7: Select **Opening Balance Date** (This should be the date of beginning of EAT Module on PFMS).

Step8: Select **Transaction Type** (**Component Wise** option is for entering the opening balance against each and every component whereas **Bulk** option is for entering the opening balance against all components).

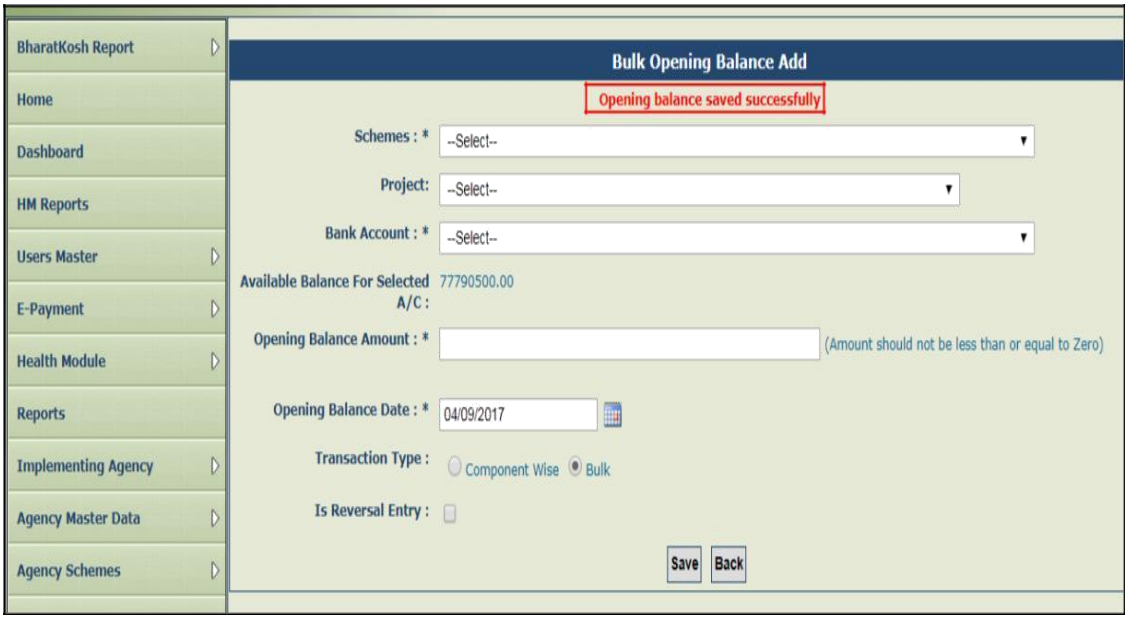
Step9: Select '**Is Reversal Entry'** check box option for making a reverse entry(deduction) from opening balance entered.

Step10: After entering all the details, click on **Save** button to save the opening balance in the system.

Fig B.66: PFMS Expenditure, Advance and Transfer



Step11: A message "**Opening balance saved successfully**" will be displayed.



Once the data is submitted by the data operator (Maker), it will be sent to Data Approver (Checker) for his approval. The steps are as under:

Step12: Data approver will log in and go to **My funds>Opening Balance**. The opening balance submitted by data operator (Maker) will be displayed in the page.

Step13: Click on **Bulk** button under **Scheme Component** to open the opening balance details page

Step14: Verify the details of opening balance.

Step15: The approver cans approve/reject/cancel transaction by clicking on the below figure**:**

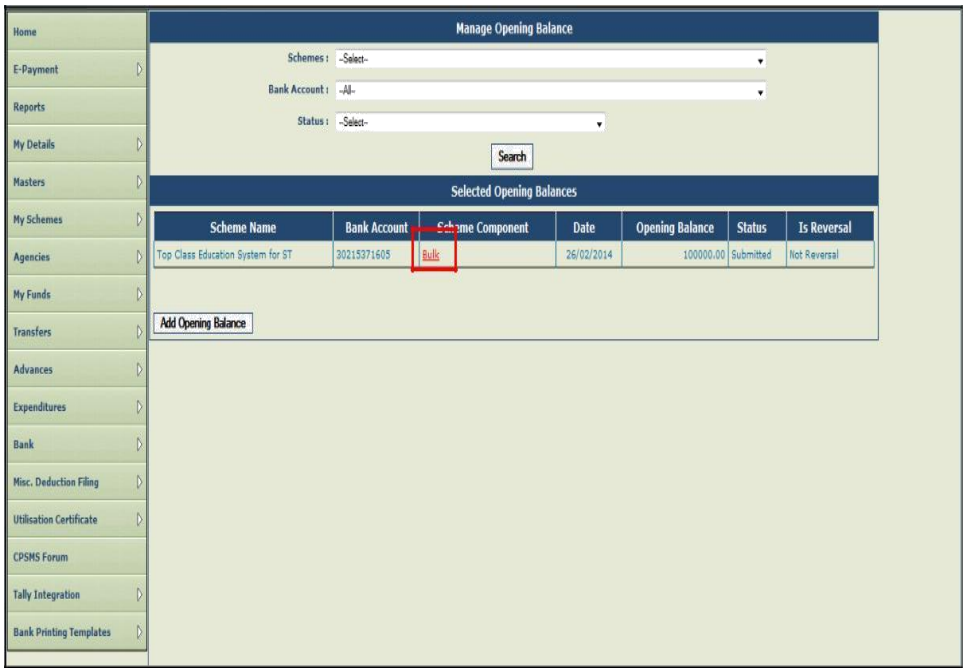
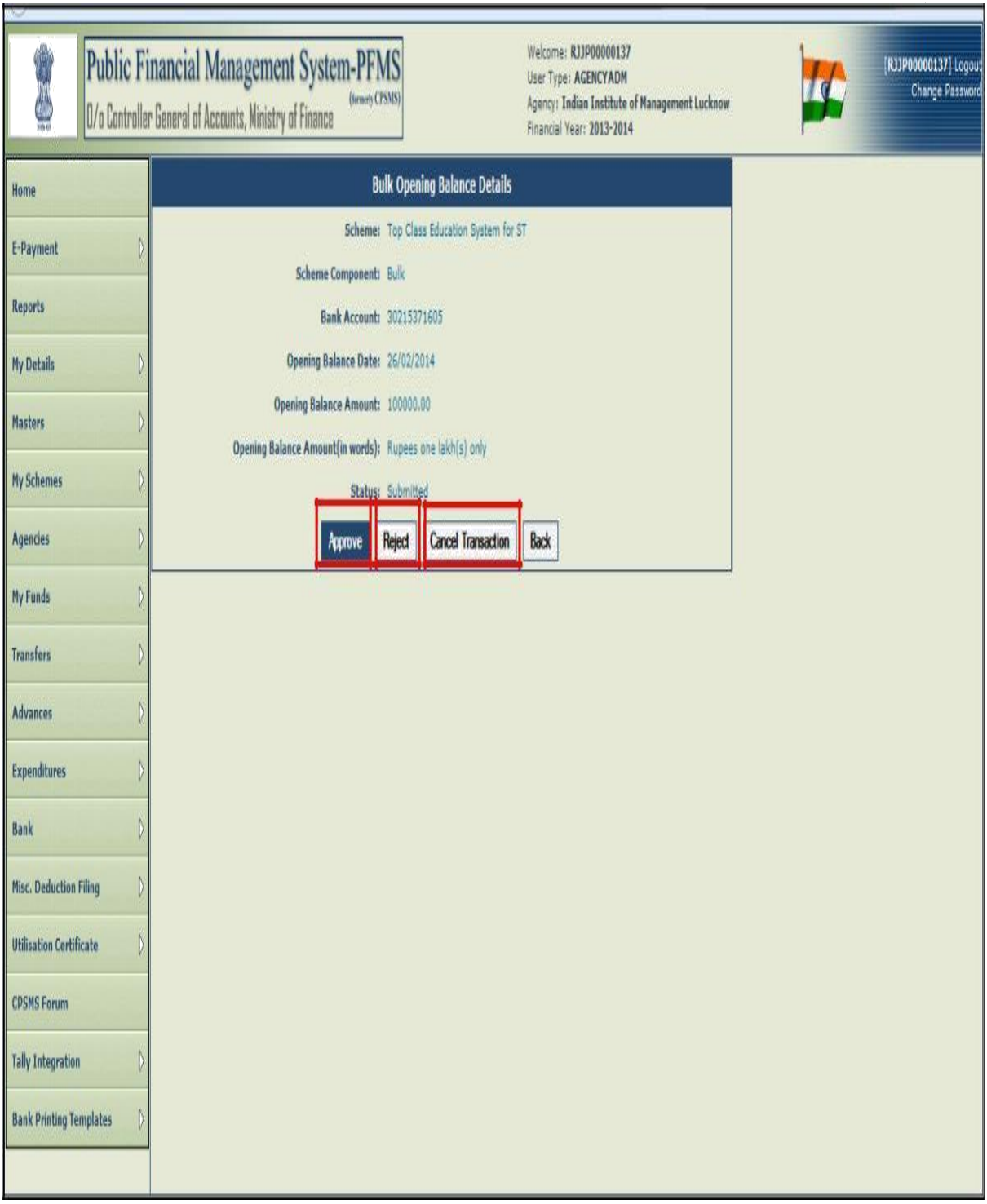


Fig B.67:Approve/Reject/Cancel Transaction button.



Note: The balance in the selected bank account for opening balance will be inflated to the extent of approved opening balance amount.

In case entry is 'Rejected' by checker, it can be edited and re-submitted by the data operator to him for his approval.

10. RTI

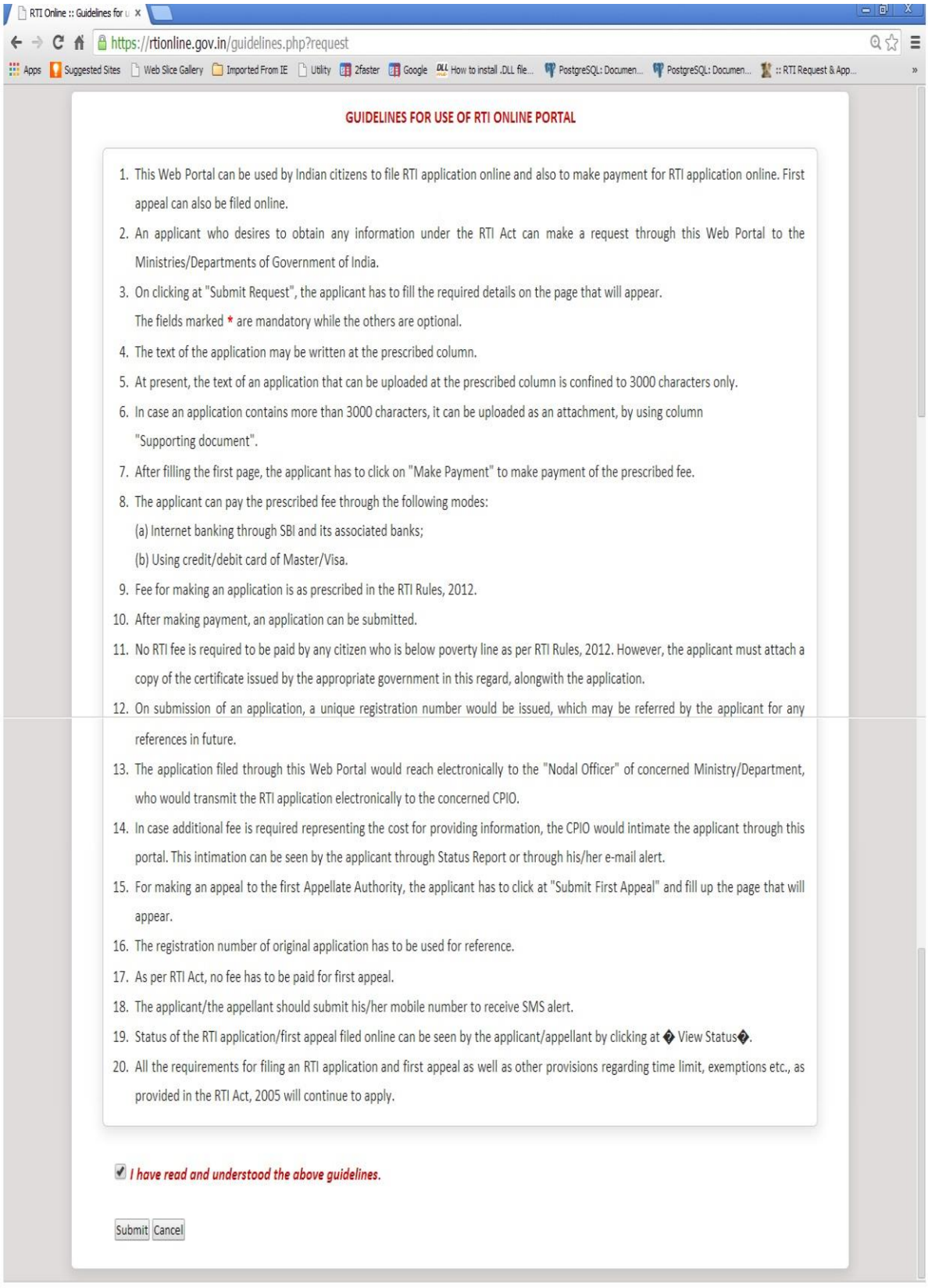
The url of the RTI software is: **https://rtionline.gov.in**

Citizen Module

Fig B.68: Home screen of citizen module.

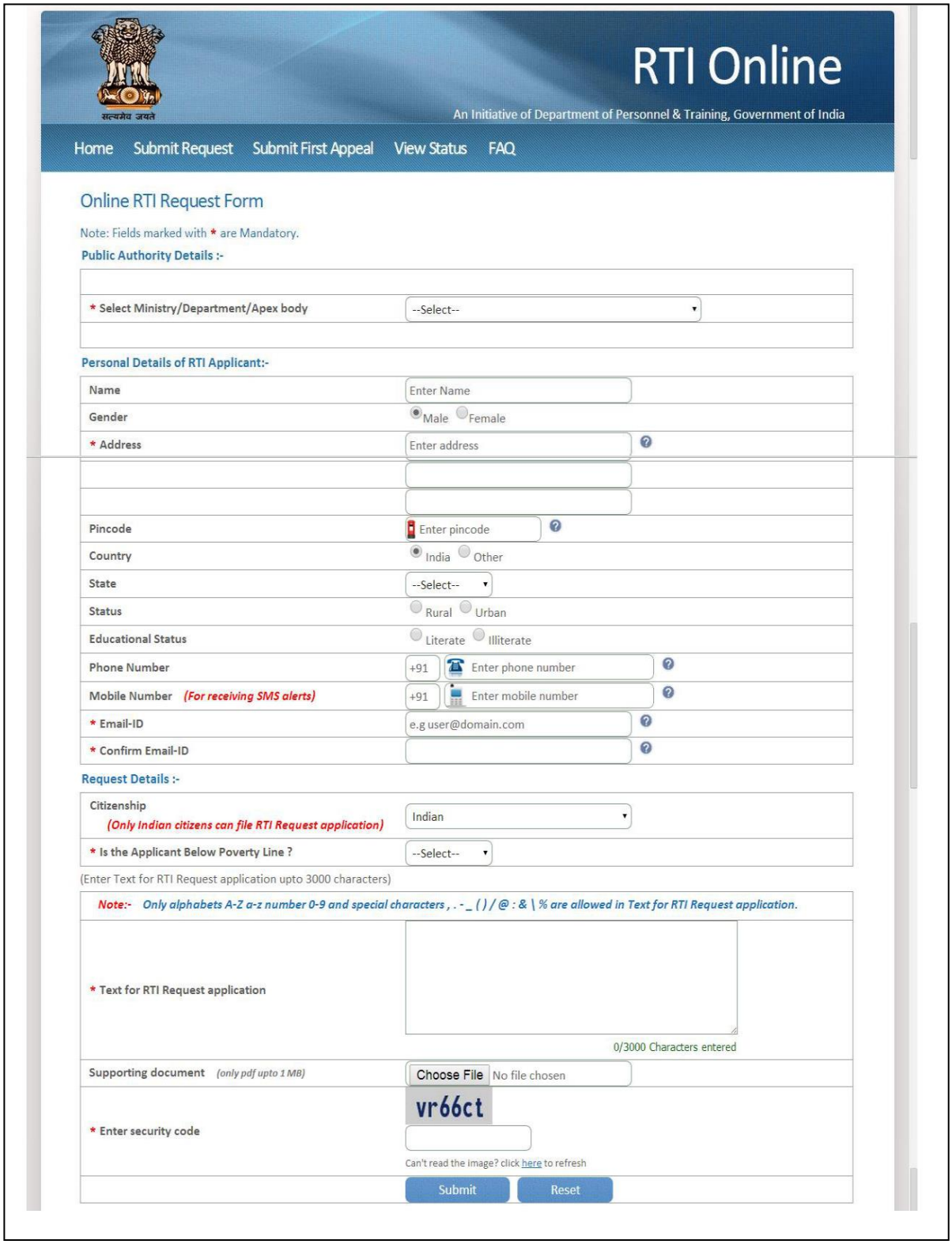


Fig B.69:Submit Request



Then **Online RTI Request Form** screen will be displayed. This form can be used to file an online RTI.

Fig B.70: Online RTI Request Form



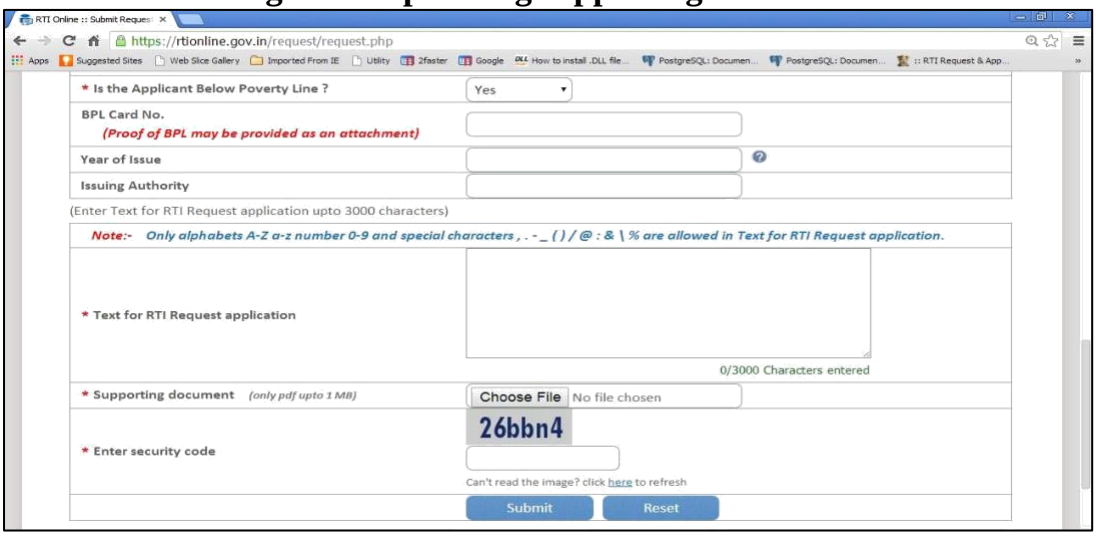
Ministry or Department for which the applicant wants to file an RTI can be selected from **Select Ministry/Department/Apex body** dropdown**.**

Applicant will receive **sms alerts** in case he/she provides mobile number. The fields marked * are mandatory while the others are optional.

If a citizen belongs to BPL category, he will select the option **Yes** in **"Is the Applicant Below Poverty Line?"** field and he has to upload BPL card certificate in **Supporting document** field**.**

1. **Supporting document** should be in **PDF** format and upto**1MB**.
2. No RTI fee is required to be paid by any citizen who is below poverty line as per RTI Rules, 2012.

Fig B.71: Uploading supporting documents



In **case of BPL category** the applicant can click on submit button to submit the RTI application.

On submission of the application, a unique registration number would be issued, which may be referred by the applicant for any references in future.

Fig B.72: Submission page



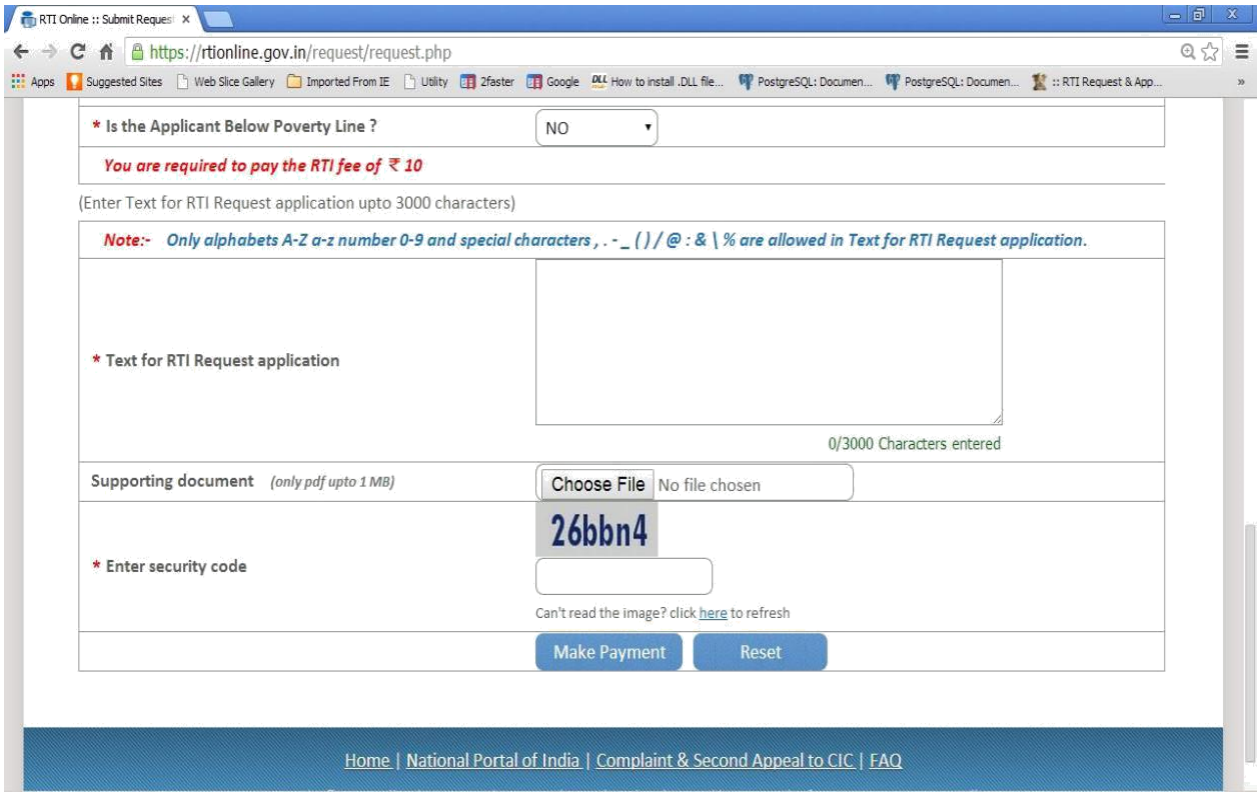
If a citizen belongs to Non BPL category he will select the option **NO** in **"Is the Applicant Below Poverty Line?"** field a1nd has to make a payment of **RS 10** as prescribed in the RTI Rules, 2012.

The applicant can pay the prescribed fee through the following modes:

(a) Internet banking through SBI and its associated banks;

(b) Using credit/debit card of Master/Visa.

Fig B.73: RTI request page



"Text for RTI Request application" should be upto**3000 characters**. If the text of RTI application is more than 3000 characters then RTI application can be uploaded in **Supporting document** field.

Note: - Only alphabets A-Z a-z number 0-9 and special characters, - _ ( ) / @ : & \ % are allowed in Text for RTI Request application.

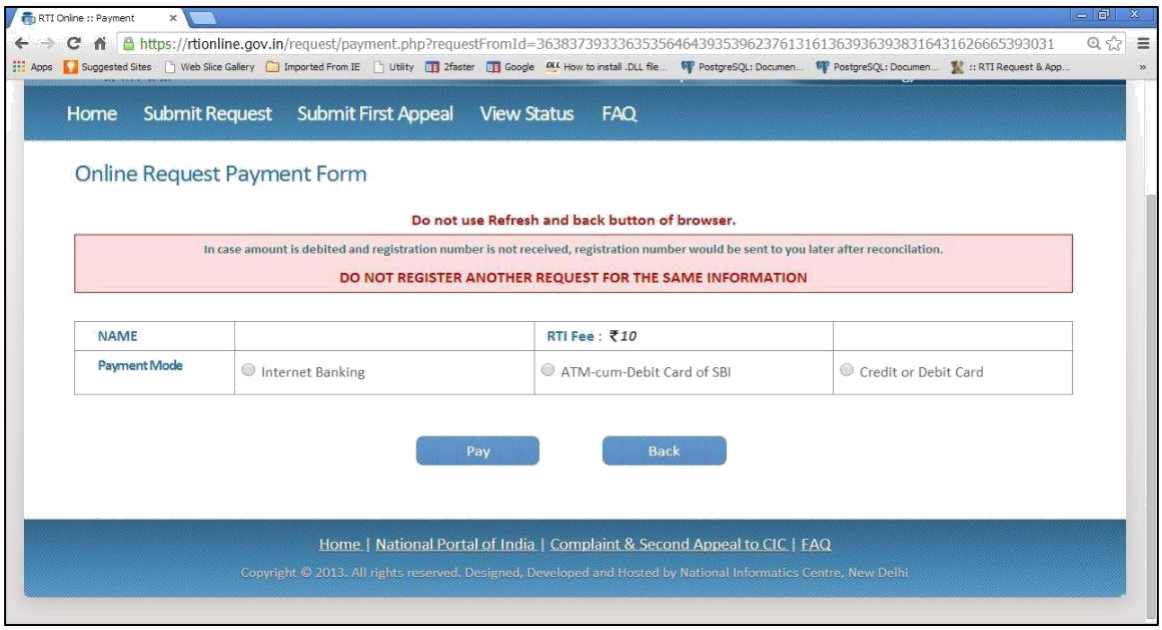
After filling all the details in the form click on **Make Payment** button.

On clicking Make Payment button **Online Request Payment form** will be displayed. The payment mode can be selected in this form.

Payment mode can be:

1. Internet Banking
2. ATM-cum-Debit Card
3. Credit Card

Fig B.74: Payment page

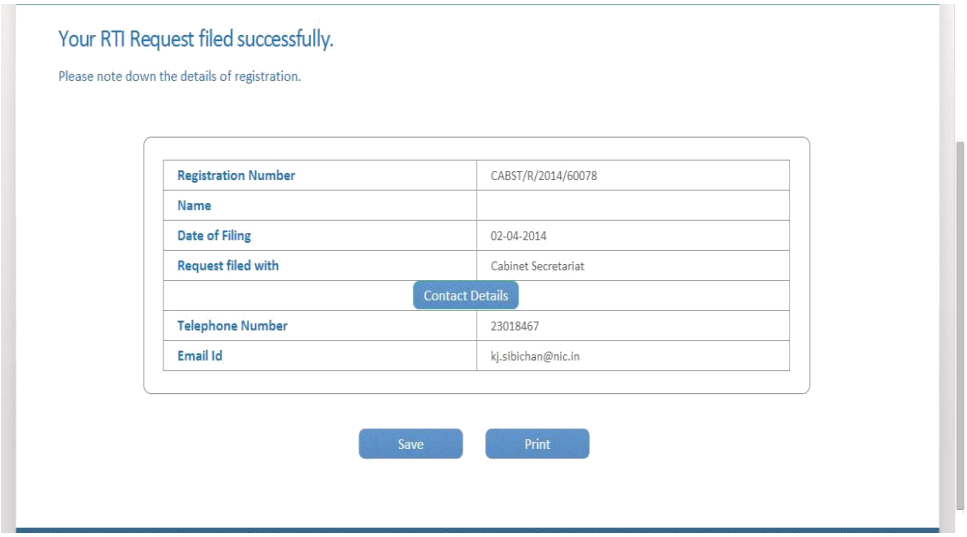


After clicking on the "**Pay**" button, applicant will be directed to SBI Payment Gateway for payment. After completing the payment process, applicant will be redirected back to RTI Online Portal.

On submission of the application, a unique registration number would be issued, which may be referred by the applicant for any references in future.

The applicant will get an email and sms alert (if mobile no. provided) on submission of application.

Fig B.75: Request successfully submitted



The application filed through this Web Portal would reach electronically to the **"Nodal Officer"** of concerned Ministry/Department, who would transmit the RTI application electronically to the **concerned CPIO**.

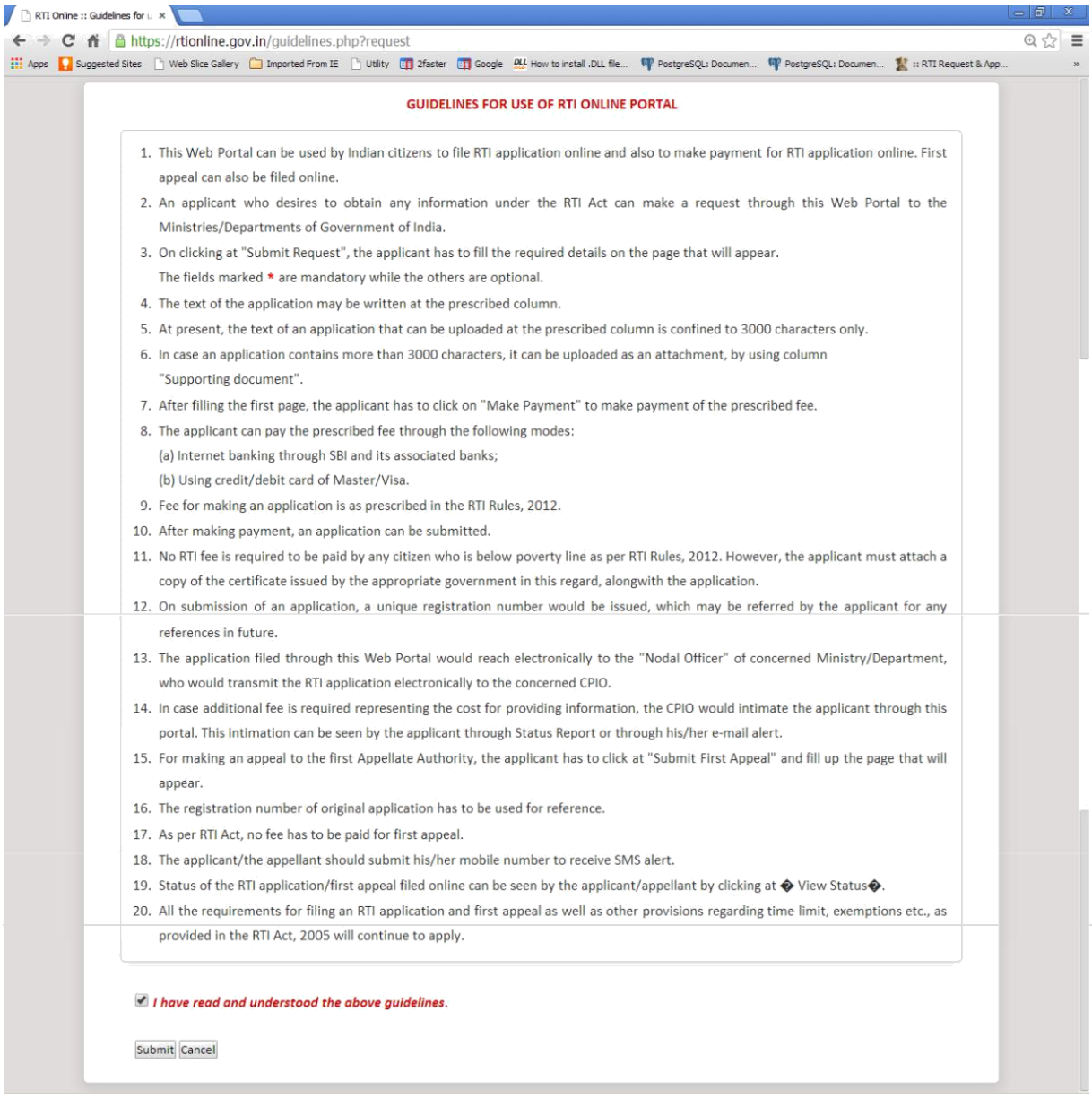
Submit First Appeal

For submitting First Appeal application, click on **Submit First Appeal** option.

On clicking on this option **"GUIDELINES FOR USE OF RTI ONLINE PORTAL"** screen will be displayed. This screen contains various guidelines for using RTI online portal.

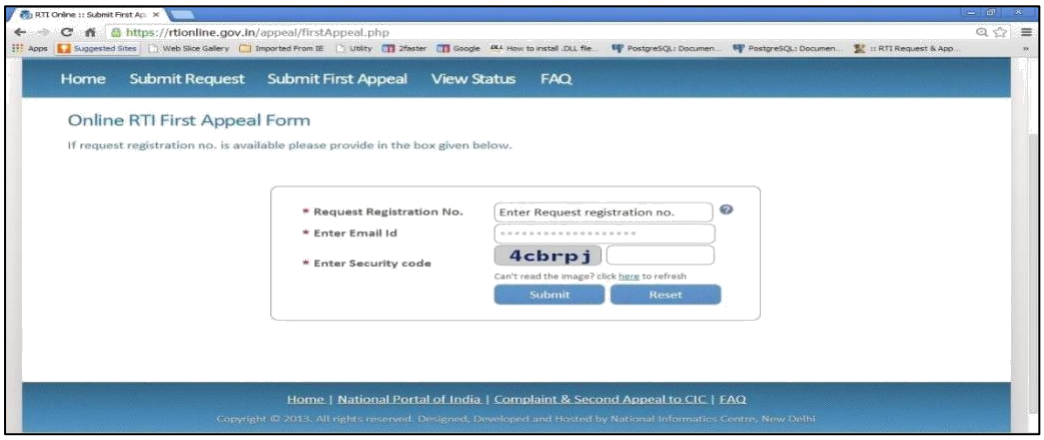
Citizen has to click on the check box ***"I have read and understood the above guidelines."*** and then click on submit button.

Fig B.76: Guidelines for First Appeal



Then ***Online RTI First Appeal Form*** screen will be displayed.

Fig B.77: Online RTI First Appeal Form screen

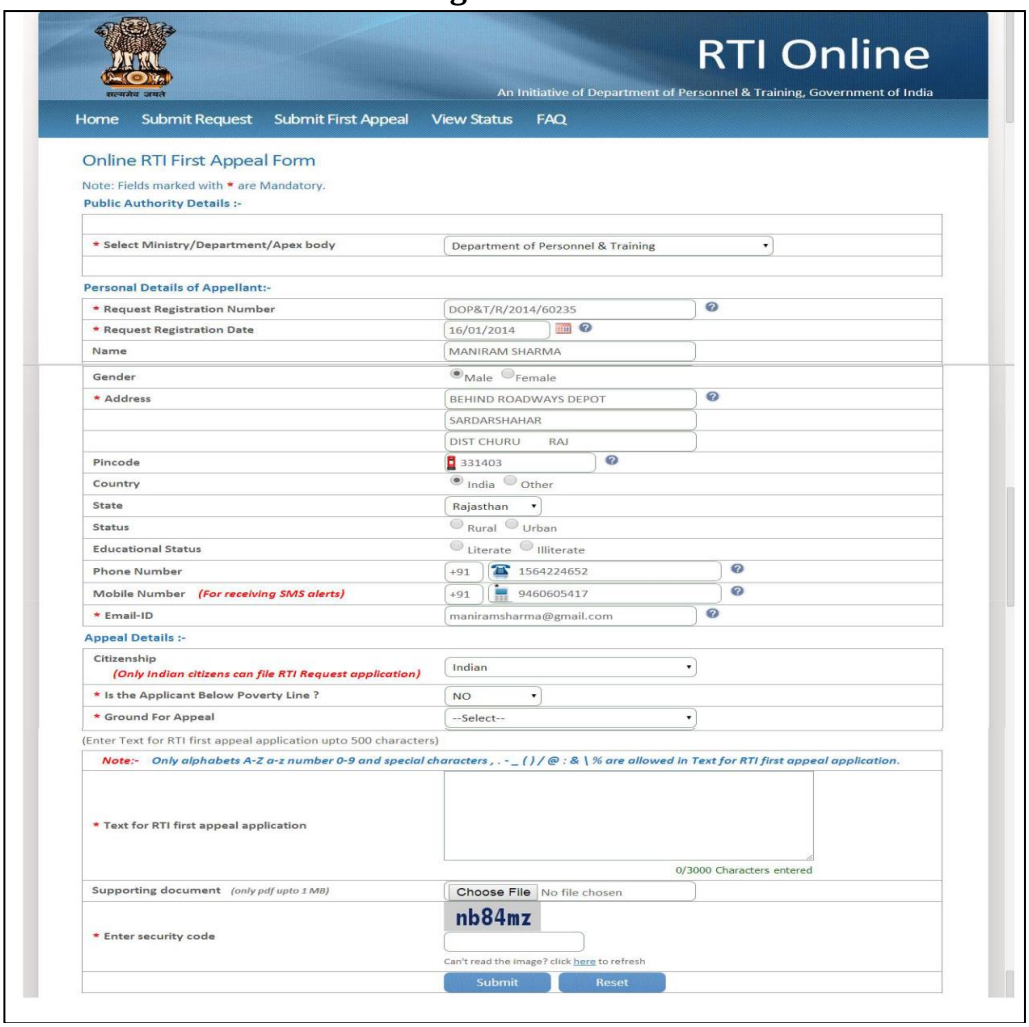


Applicant can enter Request Registration no., Email Id and security code in ***Online RTI First Appeal Form.***

On clicking on submit button ***Online RTI First Appeal Form*** will be displayed.

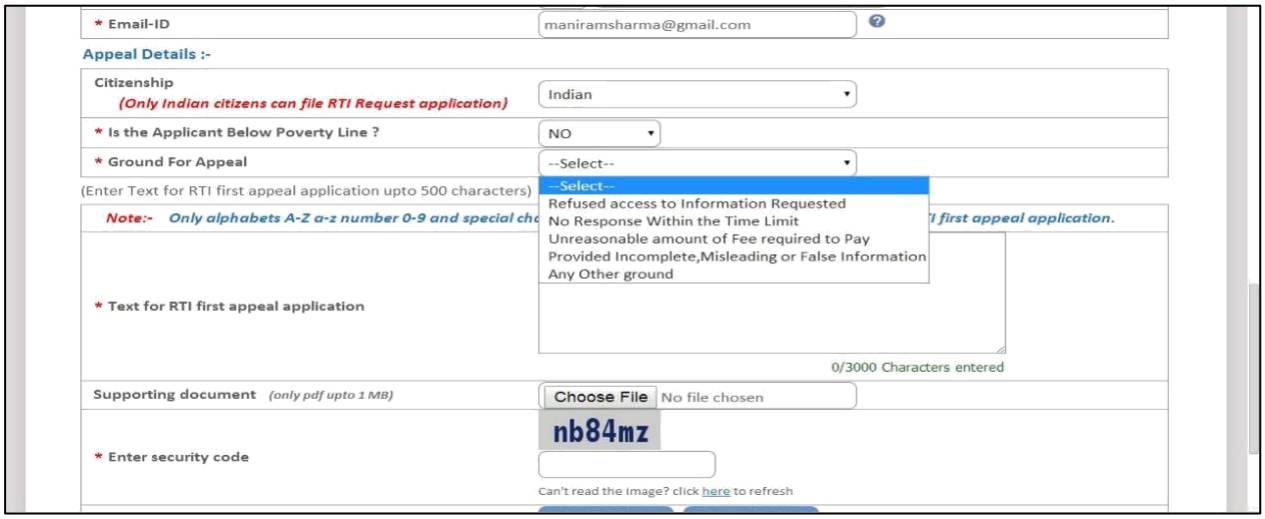
.

Fig B.78: Submit form



The applicant can select reason for filing appeal application from Ground For Appeal dropdown field.

Fig B.79: Select reason for appeal



"Text for RTI first appeal application" should be upto**3000 characters**. If the text of RTI first appeal application is more than 3000 characters then RTI appeal application can be uploaded in **Supporting document** field.

Note:

1. Only alphabets **A-Z a-z** number **0-9** and special characters **, . - _ () /**

   @ :& \ **%** are allowed in Text for RTI Request Application.

2. Supporting document should be in **PDF** format upto**1MB**.
3. As per RTI Act, no fee has to be paid for first appeal.

On submission of the application, a **unique registration number** would be issued, which may be referred by the applicant for any references in future.

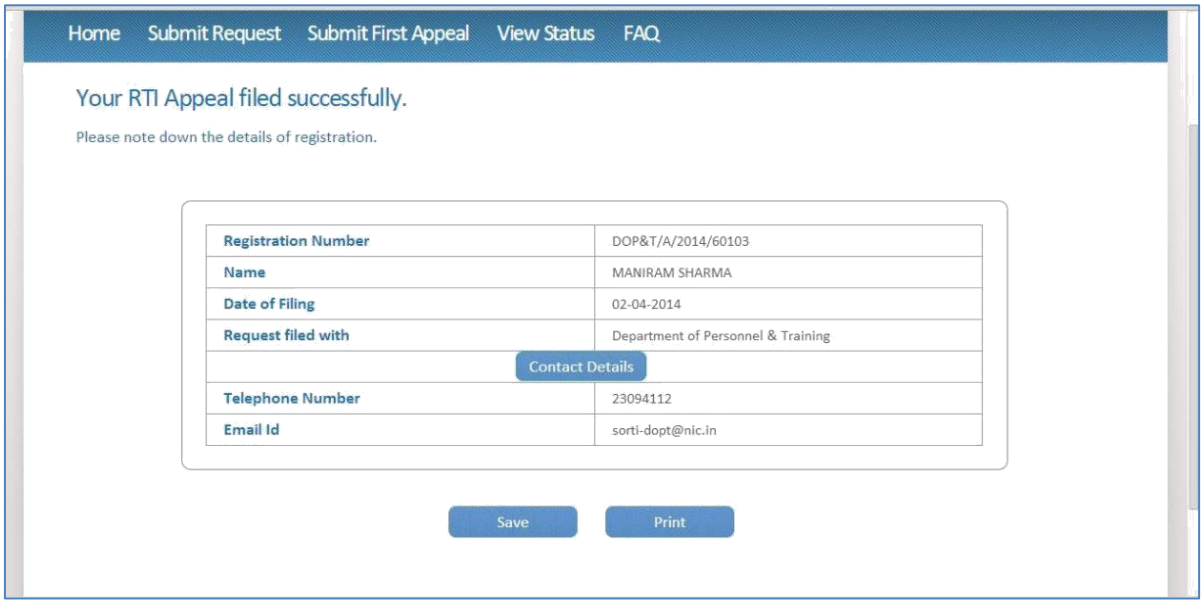


Fig B.80: Unique Registration Number Page

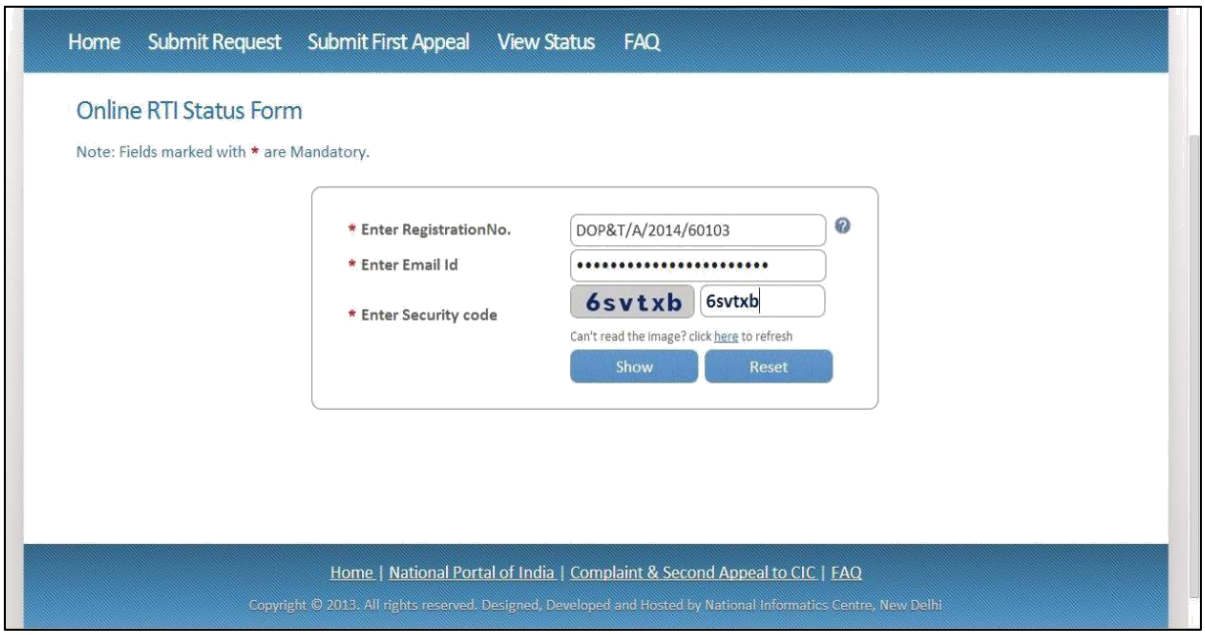
The application filed through this Web Portal would reach electronically to the **"Nodal Officer"** of concerned Ministry/Department, who would transmit the RTI application electronically to the **concerned Appellate Authority**.

View Status

Status of the RTI application/first appeal filed online can be viewed by the applicant by clicking on **View Status**.

On clicking this option ***Online RTI Status Form*** will be displayed.

Fig B.81: View Status Page



Applicant can enter Registration no., Email Id and security code in ***Online RTI Status Form.*** On clicking on show button ***Online RTI Status Form*** will be displayed

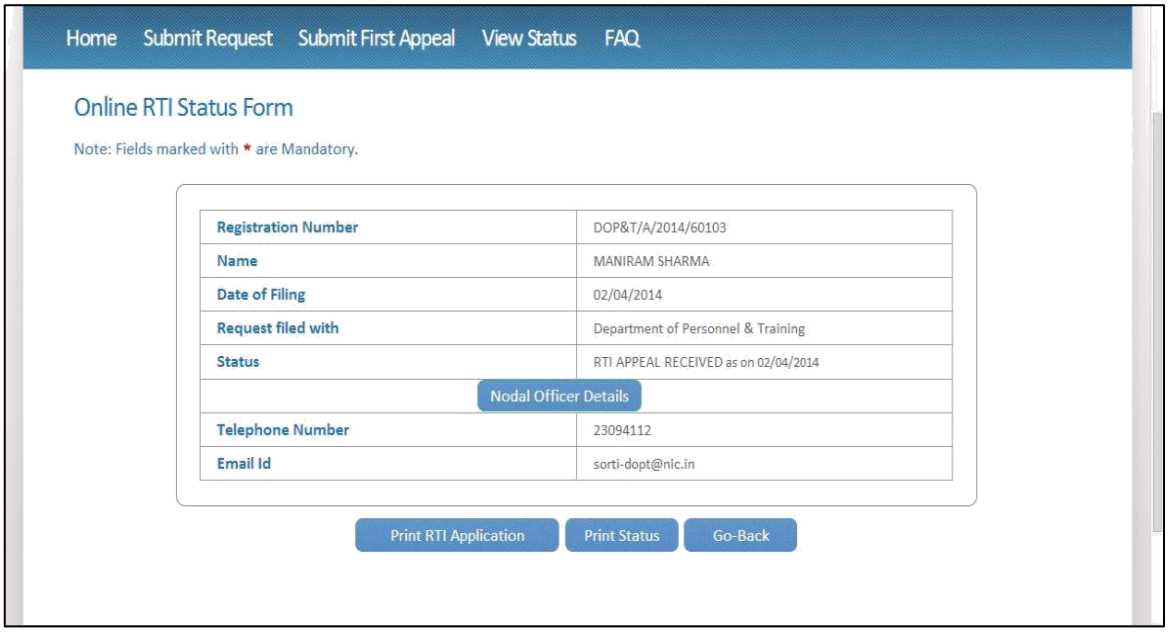


Fig B.82: Online RTI Status Form

In case of additional payment is demanded by CPIO following screen will be displayed.

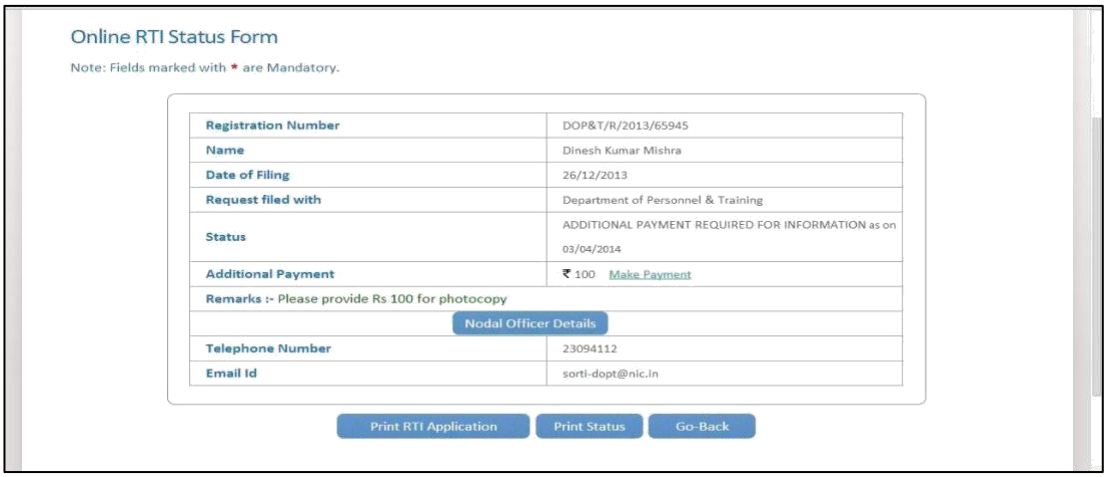


Fig B.83: Additional Payment Page

Additional payment can be made by clicking on **Make Payment** link. Then the applicant will be directed to payment gateway.

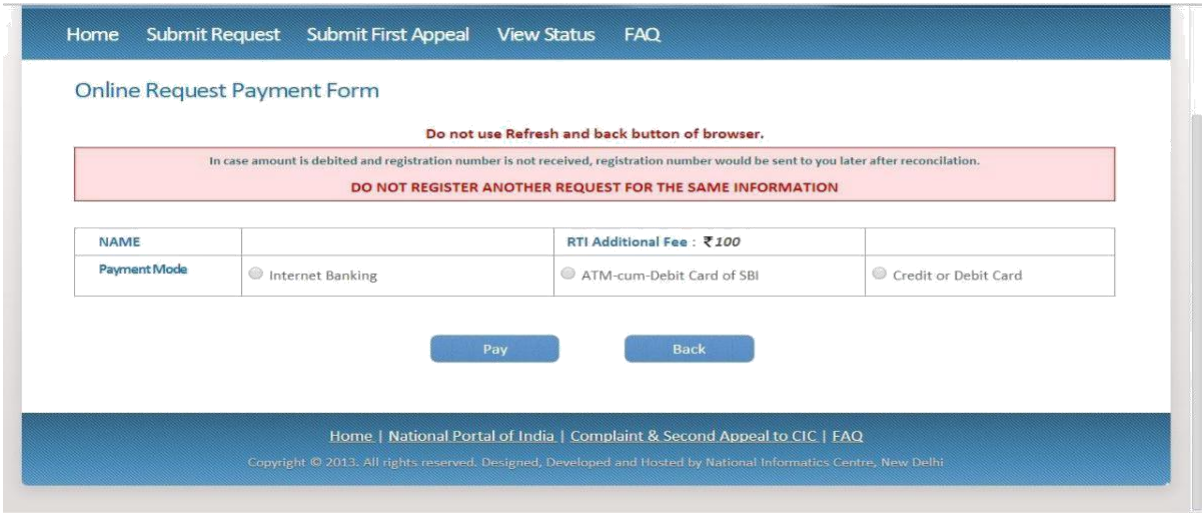


Fig B.84: Make Payment link Page

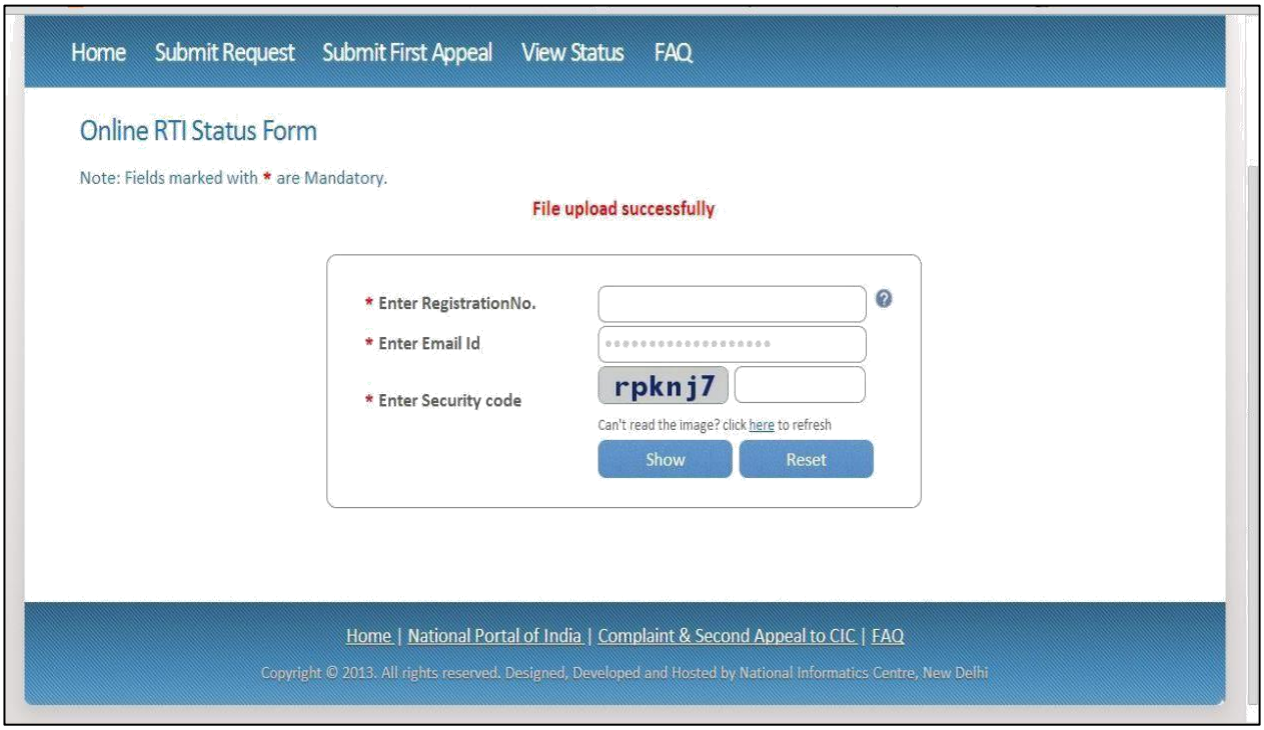
In case the document attached at the time of filing RTI Request is not accessible, then the following screen will be displayed in view status.



Document can be uploaded by clicking on **choose file** option and then click on Attached button.

The following screen will be displayed when file gets uploaded successfully.

Fig B.85: File uploaded successfully



In case RTI Request Application is returned to applicant following screen will be displayed.



Fig B.86:File uploaded successfully – Final Screen

RTI application will be returned to applicant without refund of amount in case RTI applications are filed for public authorities under the state governments including Government of NCT, New Delhi.

In case RTI Request Application is transferred to other public authority following screen will be displayed.

Fig B.87: RTI Request Application is transferred to other public authority



New Registration no will be generated in this case and applicant can see the status of his application by using this new registration no.

In case RTI Request Application is forwarded to multiple CPIOs, following screen will be displayed.

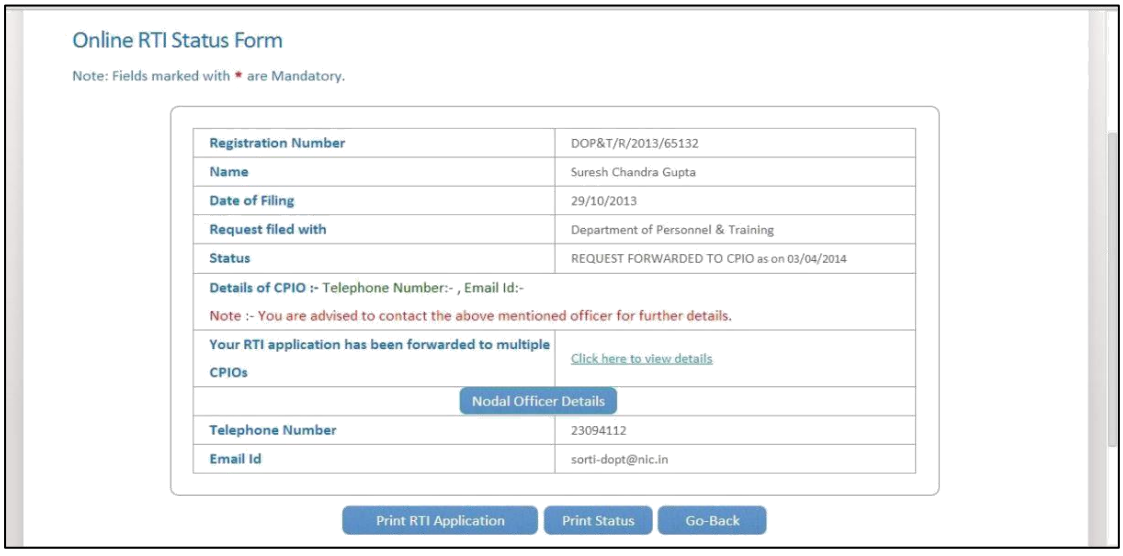
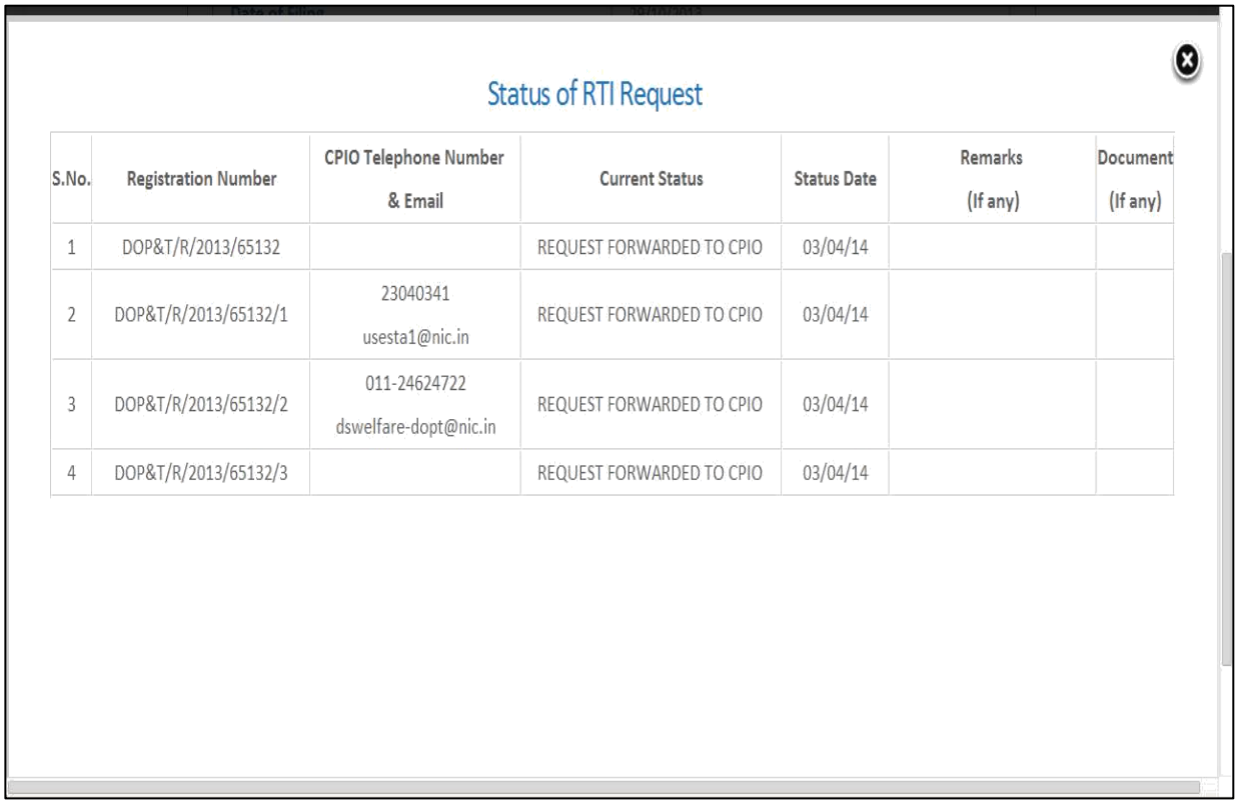


Fig B.88: RTI Request Application is forwarded to multiple CPIOs

On clicking on link **Click here to view details** following screen will be displayed.



Status of RTI Request

S.No.	Registration Number	CPIO Telephone Number & Email	Current Status	Status Date	Remarks (If any)	Document (If any)
1	DOP&T/R/2013/65132		REQUEST FORWARDED TO CPIO	03/04/14		
2	DOP&T/R/2013/65132/1	23040341 usesta1@nic.in	REQUEST FORWARDED TO CPIO	03/04/14		
3	DOP&T/R/2013/65132/2	011-24624722 dswelfare-dopt@nic.in	REQUEST FORWARDED TO CPIO	03/04/14		
4	DOP&T/R/2013/65132/3		REQUEST FORWARDED TO CPIO	03/04/14		

Fig B.89: Viewing details

For e.g.

If RTI application is forwarded to four CPIOs by Nodal officer, four registration numbers will be generated.

i.e

1. **DOP&T/R/2013/65132**
2. **DOP&T/R/2013/65132/1**
3. **DOP&T/R/2013/65132/2**
4. **DOP&T/R/2013/65132/3**

The application gets divided in four parts and the applicant can see status of these 4 parts by using four different registration numbers.

Four replies will be received by the applicant.

In case the applicant is not satisfied with the reply of a particular CPIO, then appeal needs to be filed for that particular registration no.

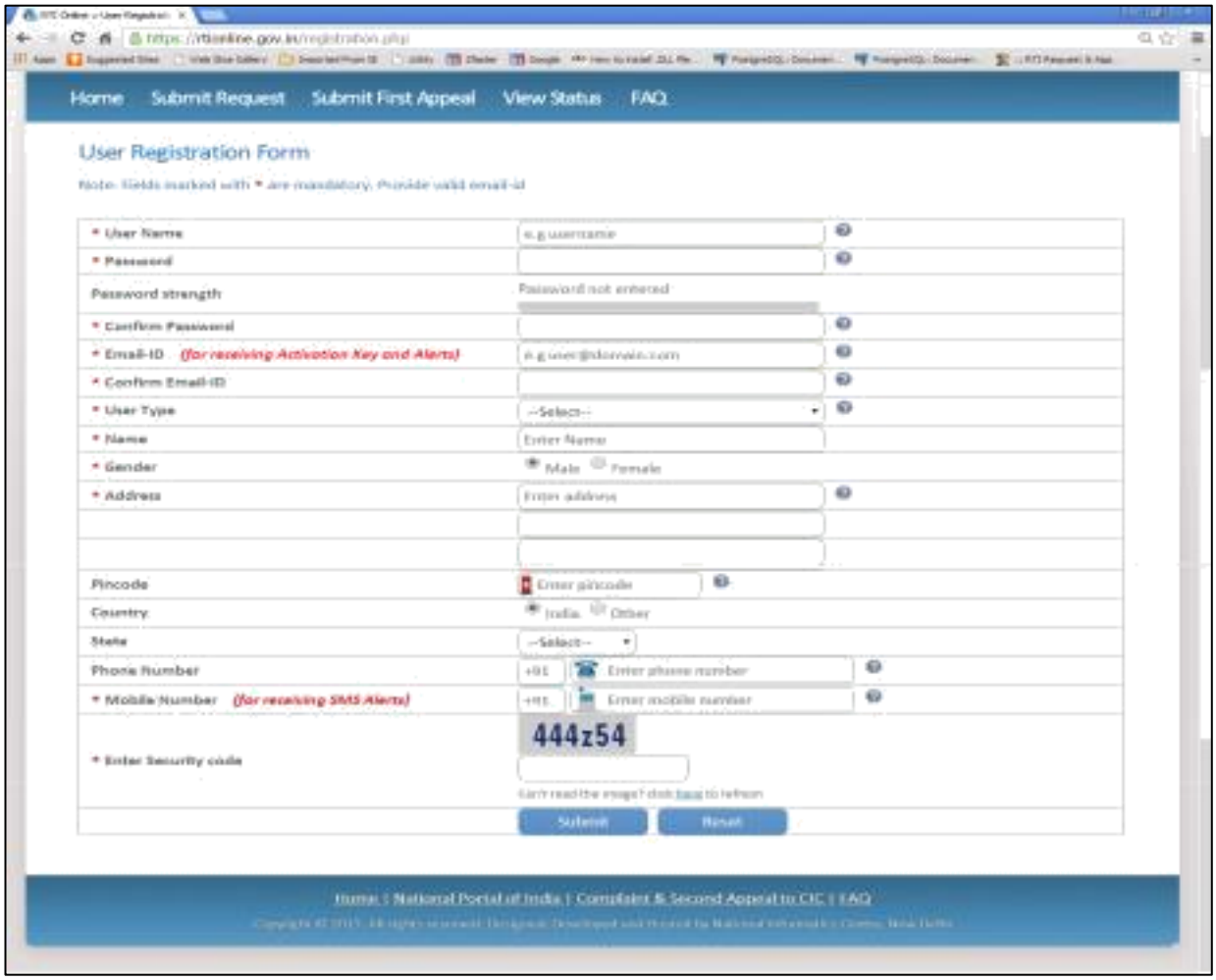
e.g.

If the applicant is not satisfied with reply of registration no DOP&T/R/2013/65132/1 then he/should file an appeal for registration no DOP&T/R/2013/65132/1 and not for original registration no DOP&T/R/2013/65132.

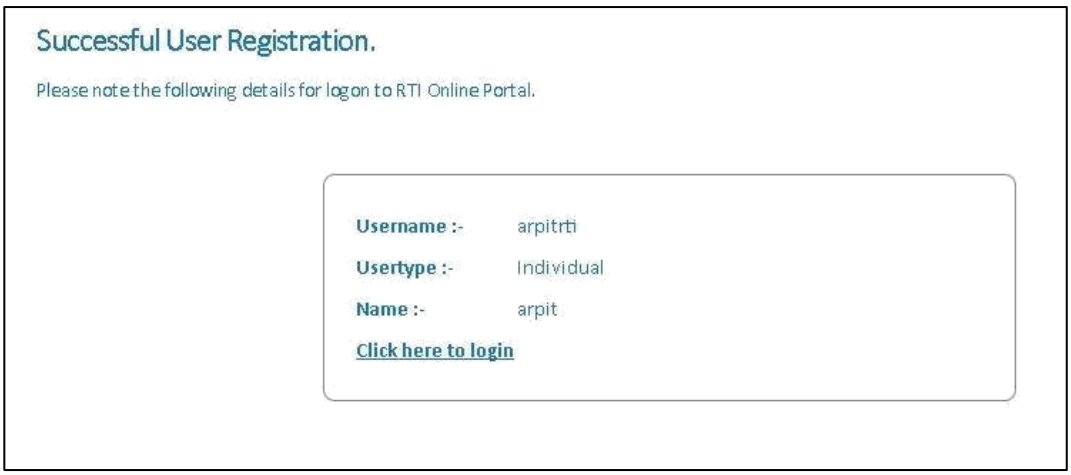
User Registration

On clicking sign up here link User Registration Form will be displayed. Citizens can register for RTI account by filling this User Registration Form.
Note: User Registration is not mandatory.

Fig B.89: User Registration Page



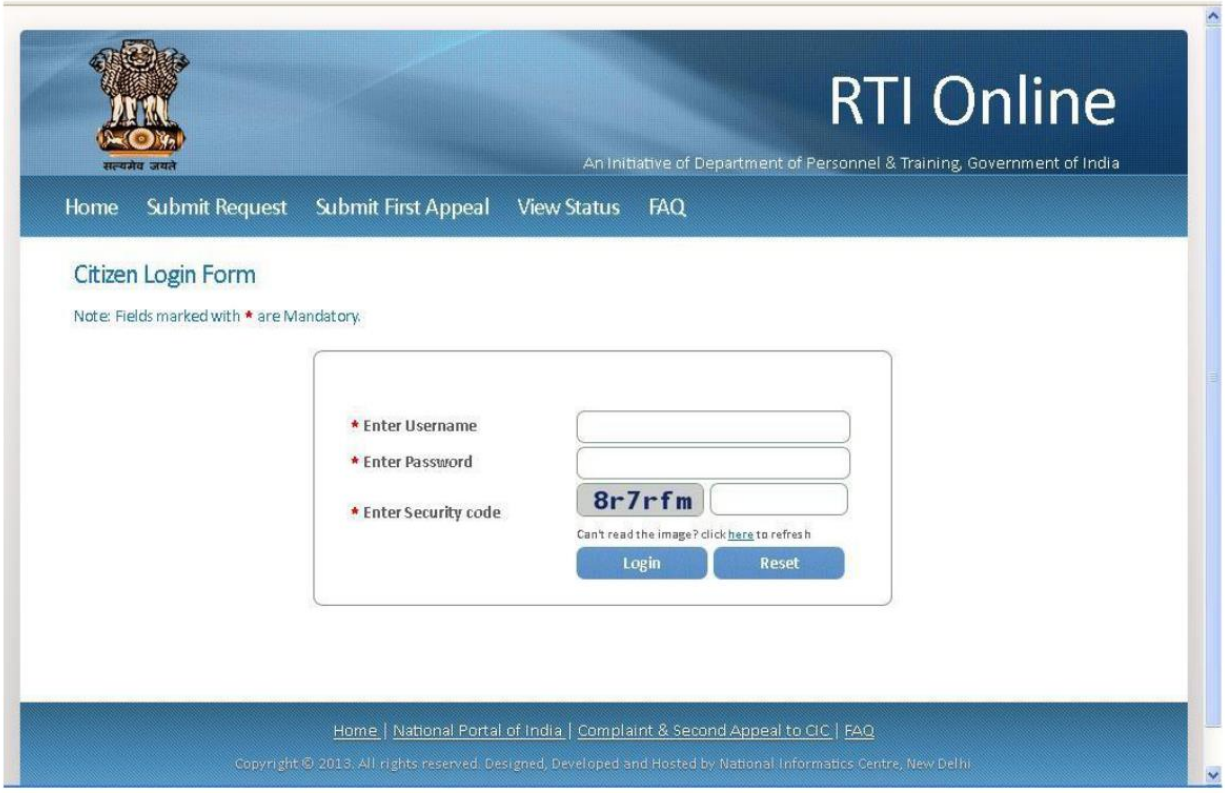
On successful registration following screen will be displayed.



After that, citizen has to click on the link **Click here to login.**

Then **citizen login form** will be displayed.

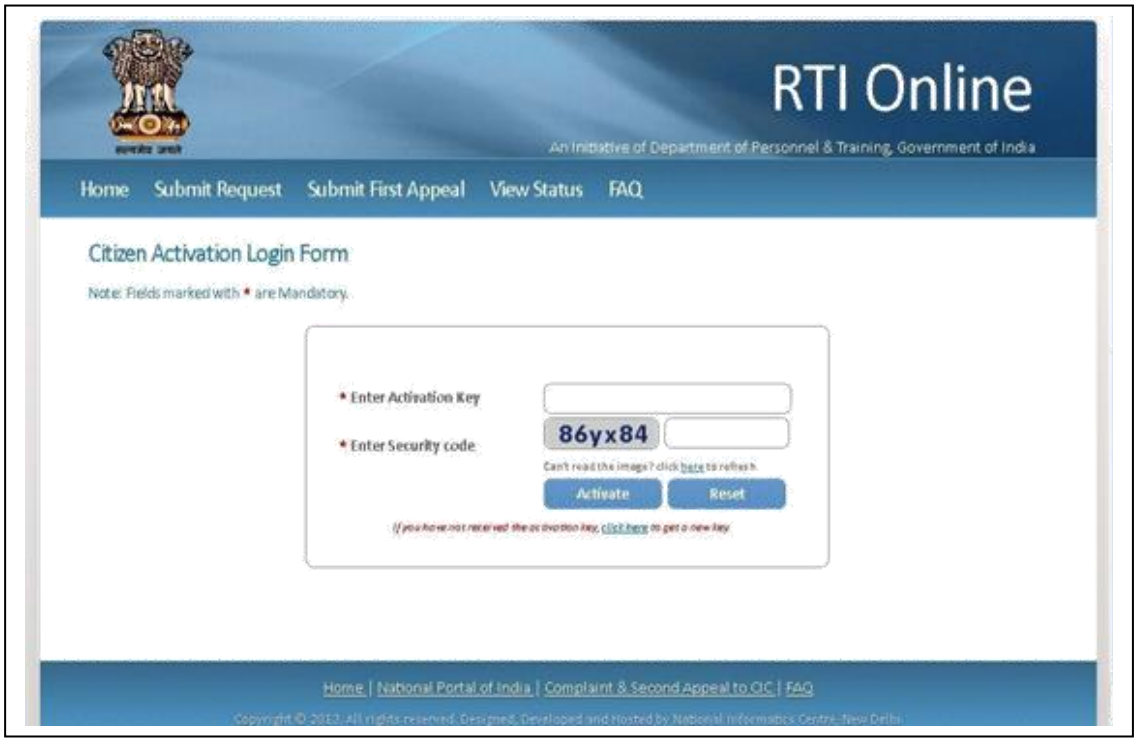
Fig B.90: Citizen Login Page



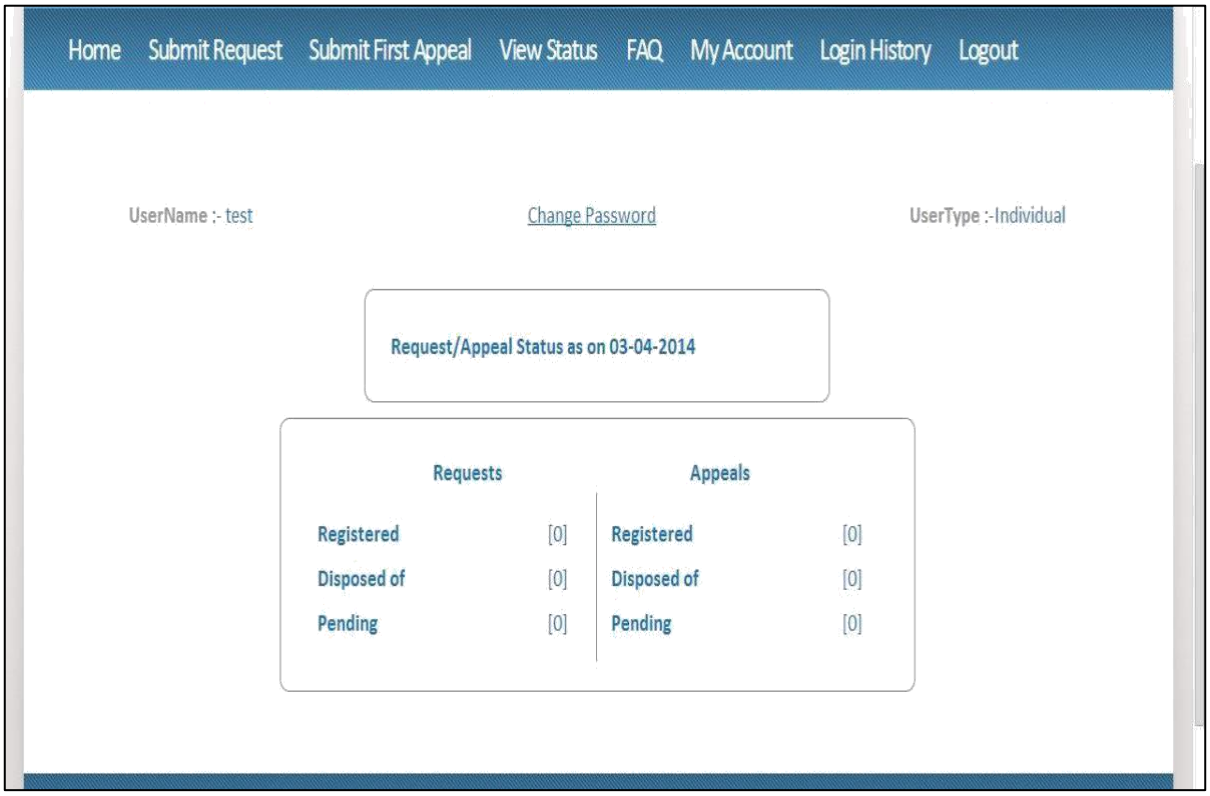
Citizen can enter **username, password and security code** in this form and then click on **login button.**

Then **Citizen Activation Login Form** will be displayed where citizen can enter Activation Key received in email and click on **Activate** button.

Fig B.90: Citizen Activation Login Form



After clicking on **Activate** button, following screen will be displayed.



Citizen can **change password** of his/her account by clicking on link **Change Password**.

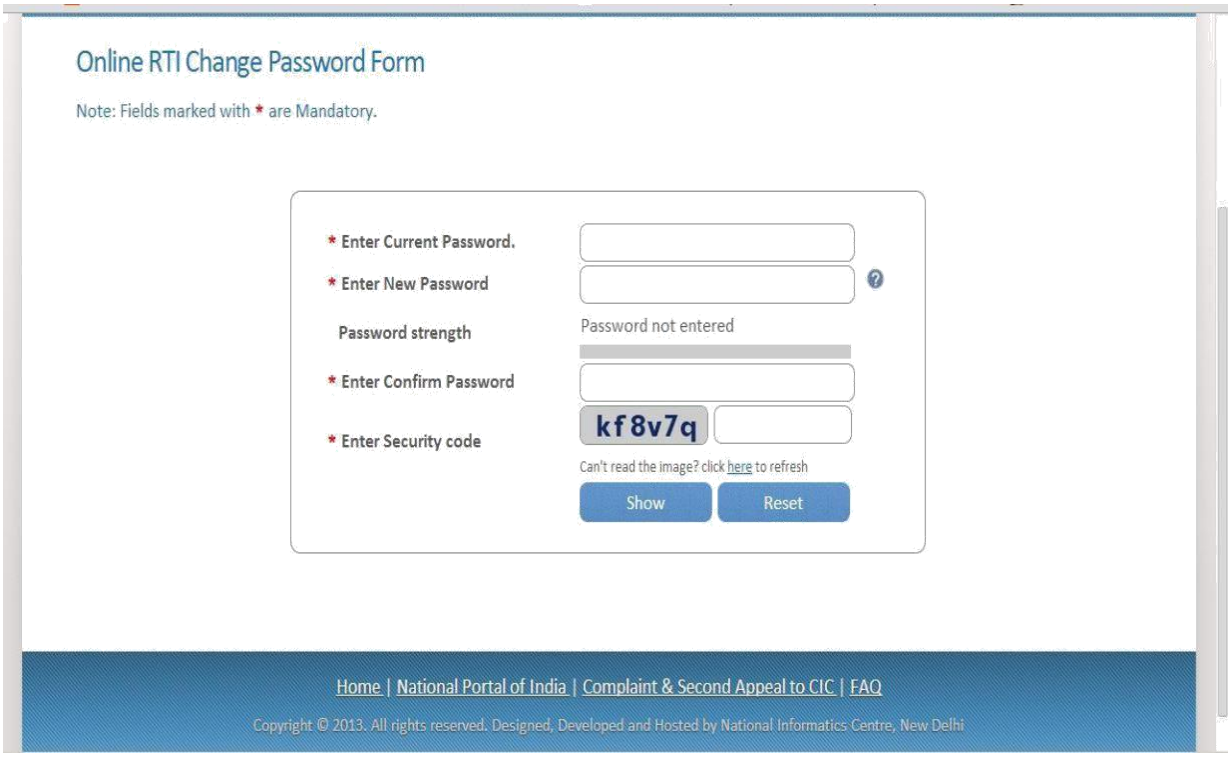


Fig B.90: Change Password Page

Update User Details

Account details of the citizen can be updated by clicking on link **My Account**

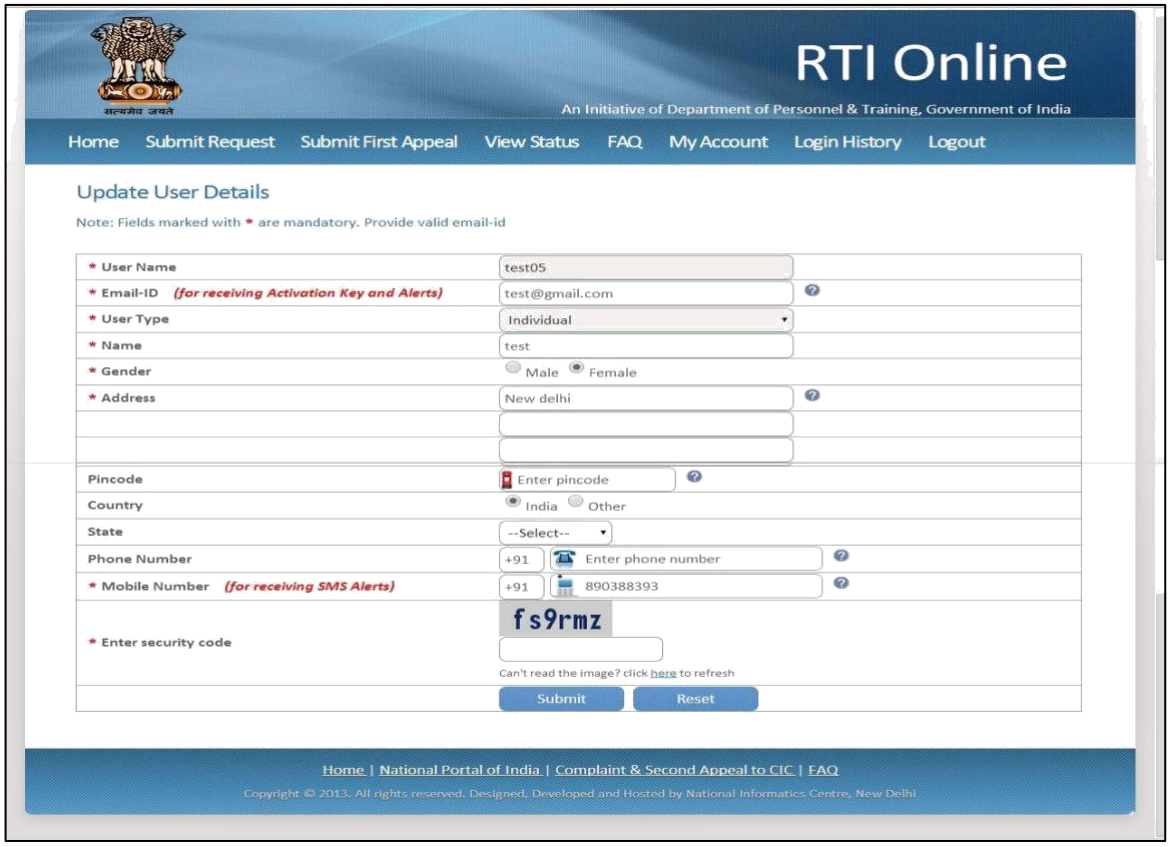


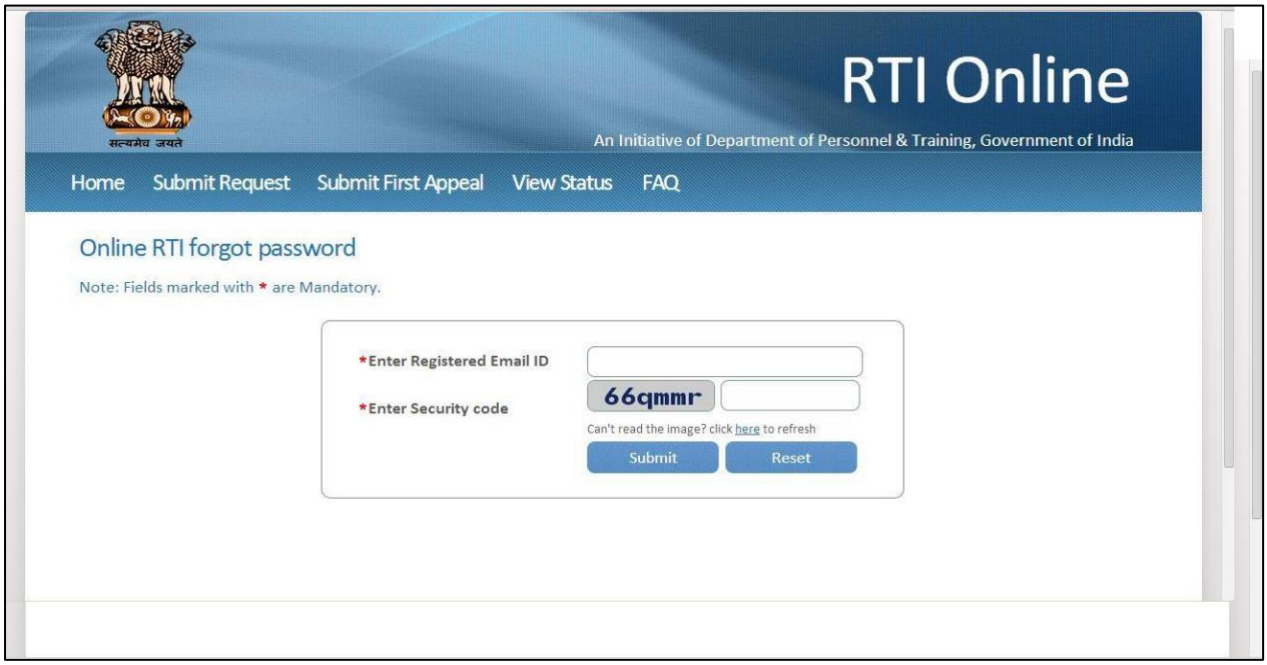
Fig B.91: My Account Page

Forgot Password

On clicking on Forgot Password link Online RTI forgot password screen will be displayed.

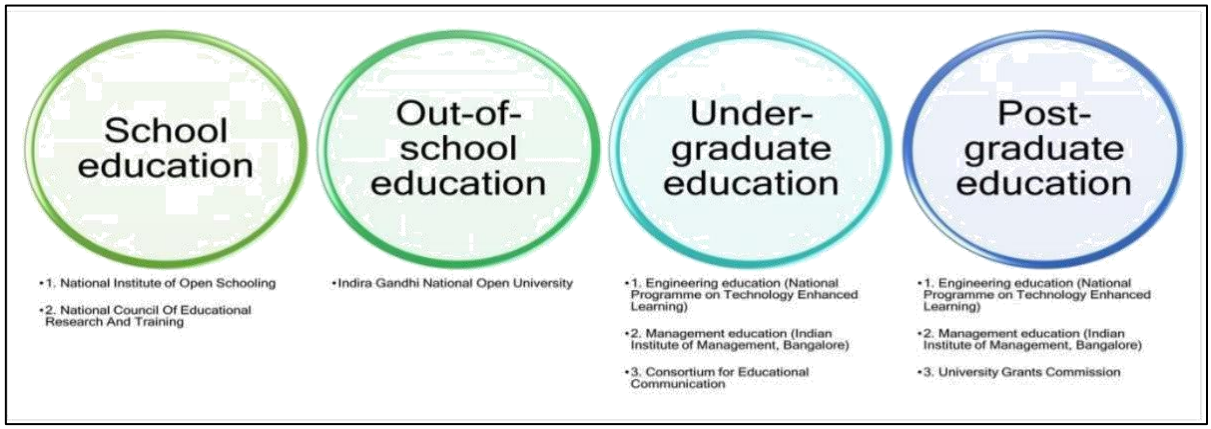
This form can be used to get the password of applicant's RTI account.
The password is sent on applicant's Email ID.

Fig B.91: Forgot Password Page



SWAYAM

SWAYAM is a program initiated by Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The objective of this effort is to take the best teaching learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy. This is done through an indigenous developed IT platform that facilitates hosting of all the courses, taught in classrooms from 9th class till post-graduation to be accessed by anyone, anywhere at any time. All the courses are interactive, prepared by the best teachers in the country and are available, free of cost to the residents in India. More than 1,000 specially chosen faculty and teachers from across the Country have participated in preparing these courses. The courses hosted on SWAYAM are in 4 quadrants – (1) video lecture, (2) specially prepared reading material that can be downloaded / printed (3) self-assessment tests through tests and quizzes and (4) an online discussion for more learning the doubts. Steps have been taken to enrich the learning experience by using audio-video and multi-media and state of the art pedagogy / technology. In order to ensure best quality content are produced and delivered, nine National Coordinators have been appointed: They are AICTE for self-paced courses, NPTEL for engineering, UGC for post-graduation education, CEC for under-graduate education, NCERT &NIOS for school education, IGNOU for out of the school students and, IIMB for management studies. Figure shows domains covered by MooCS.



Courses delivered through SWAYAM are available free of cost to the learners, however students wanting certifications shall be registered, shall be offered a certificate on successful completion of the course, with a little fee. At the end of each course, there will be an assessment of the student through proctored examination and the marks / grades secured in this exam could be transferred to the academic record of the students. UGC has already issued the UGC (Credit Framework for online learning courses through SWAYAM) Regulation 2016 advising the Universities to identify

courses where credits can be transferred on to the academic record of the students for courses done on SWAYAM. SWAYAM platform is indigenously developed by Ministry of Human Resource Development (MHRD) and All India Council for Technical Education (AICTE) with the help of Microsoft and would be ultimately capable of hosting 2000 courses and 80000 hours of learning: covering school, under-graduate, post-graduate, engineering, law and other professional courses.

PRACTICE QUESTIONS

1. To get familiar with user role account of GeM and learn to perform one complete purchase from it.
2. To get familiar with e-Tender and its bid opening method.
3. To get familiar with various functionality of EHRMS after registering with the website of EHRMS.

C. MICROSOFT OFFICE

1. MICROSOFT WORD

Familiarization with

MSWord

Microsoft Word (or simply **Word**) is a word processor developed by Microsoft. It was first released on October 25, 1983 under the name Multi-Tool Word for Xenix systems. Subsequent versions were later written for several other platforms including IBM PCs running DOS(1983), Apple Macintosh running the Classic Mac OS (1985), AT&T Unix PC (1985), AtariST (1988), OS/2 (1989), Microsoft Windows (1989), SCOU nix (1994), and OSX (2001).

Microsoft Word (Fig 80) is a word-processing application that can be part of the Microsoft Office suite or a stand-alone program installed on to your computer. The program can be used to write letters and different types of documents that can include graphics and pictures. Microsoft Word allows users to alter the appearance of text easily by changing its color, font style and size. The document is easily saved as a file on a computer or other media device and retrieved whenever needed for editing, sharing or printing.

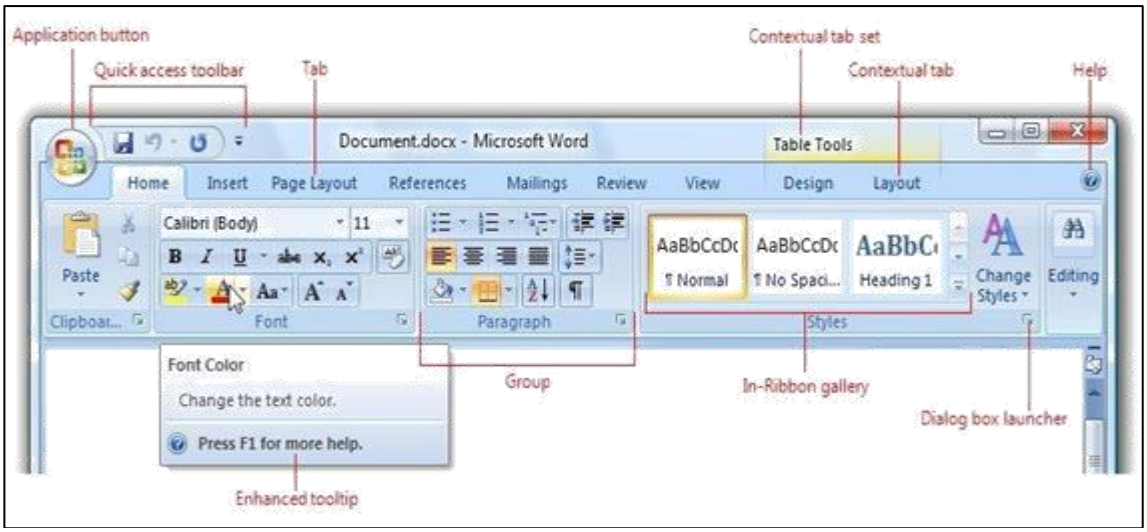


Fig C.1: MS Word homepage

Creating and Saving of Documents using MS Word

Follow these step-by-step instructions to create a document in Microsoft Word:

Step1: From the desktop or from your 'Start' menu, open Microsoft Word.

Step2: Microsoft Word will open up and present you with an option to select a document template, or a blank document.

Step 3: If you don't want to use any of the templates on display, click on the blank document.

Step 4: A new blank document will open up ready for you to start typing.

Follow these step-by-step instructions to save a document:

Step 1: Start a new document in Word and type your text.

Step 2: Click **File** in the top left-hand corner of the screen. Some versions of Word may have an 'Office' button in the top left-hand corner. Click on this to bring up the menu to continue.

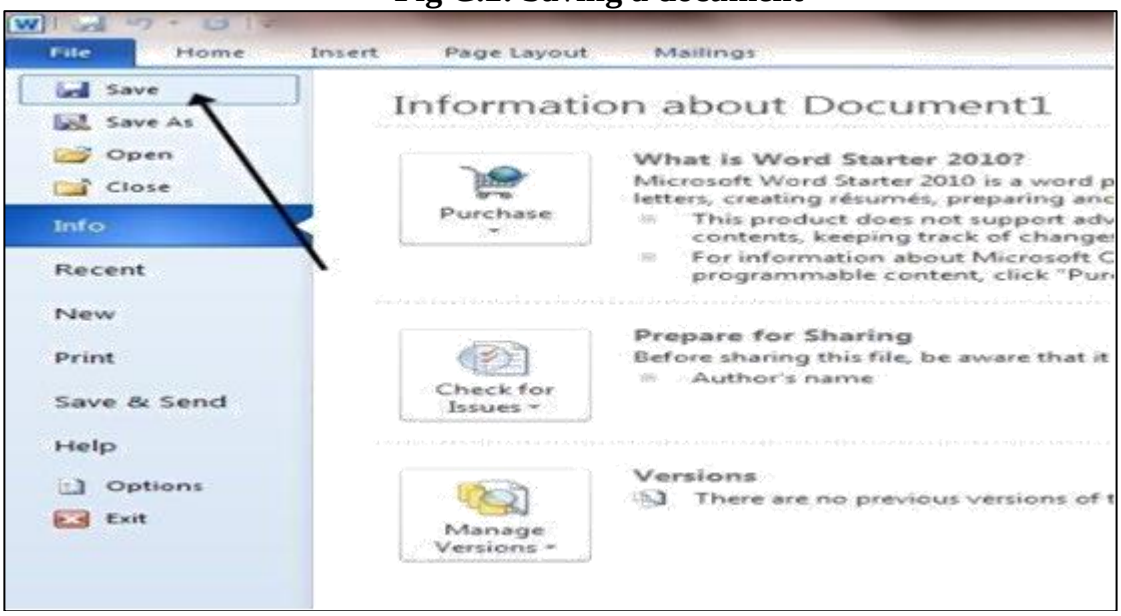
Step 3: From the menu, choose **Save**.

Step 4: A 'Save' dialogue box will come up. At the top and at the left-hand side in the list of folder options, it will show the folder where you'll be saving the document. If you wish to change this folder, navigate through the folders on the left-hand side of the dialogue box to choose the one where you want to save your document.

Step 5: Word will automatically give your document a name, based on the first few words of your text. If you don't like the given one, once you have chosen the destination folder, type a name for your document in the 'Filename' box. Come up with a name that is concise but will allow you to find the document easily again.

Step 6: Once you have typed in the name of your document, click **Save.**

Fig C.2: Saving a document



Step 7: Your document will now have a name, which will be shown at the very top of your document screen. If you make changes to your document and then save them after it has been saved originally, the dialogue box will not come up again. It will just save your changes without any visual notification being shown.

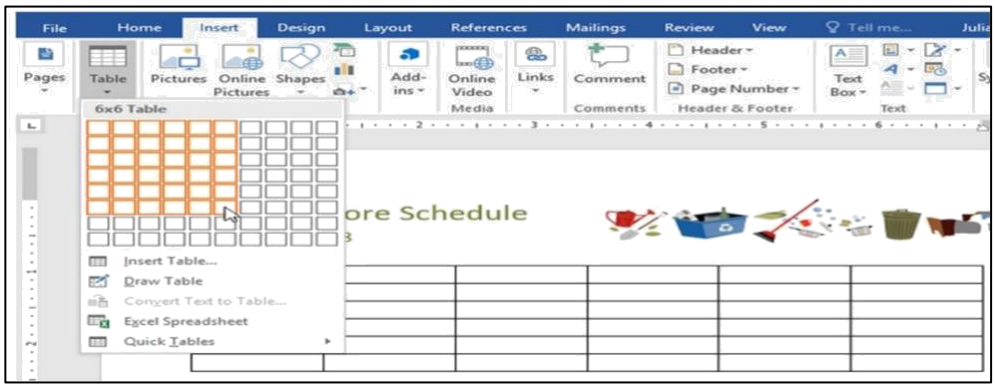
Step 8: The 'Save As' menu–the link to which is on the left-hand side of the 'File' dialogue box, beneath 'Save'– is used to save an existing document under another name.

Inserting and formatting Tables and other objects

To insert a blank table:

- Click on insert tab and then click on table.
- This will open a drop-down menu that contains a grid (fig 82). Hover over the grid to select the number of columns and rows you want.
- Select the required grid.
- To **enter text**, place the insertion point in any cell, then begin typing.

Fig C.3: Inserting a table

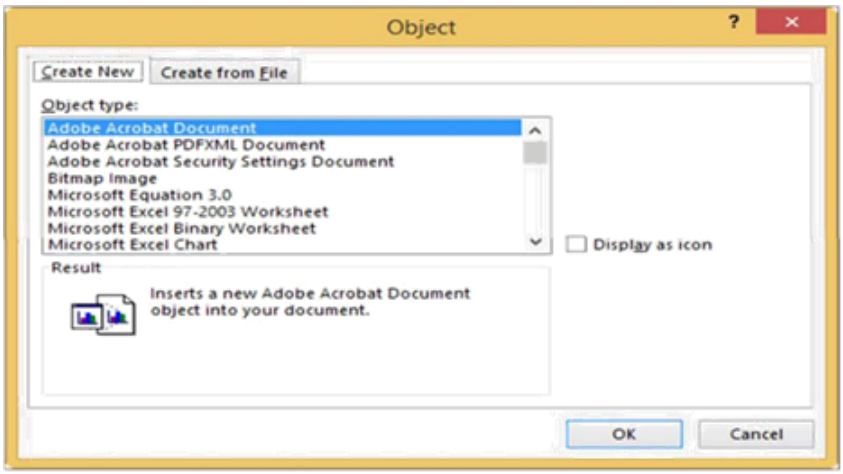


Other than Tables, Pictures, ClipArt, Shapes, Header, Footers and Charts can also be inserted into Blank Document.

Inserting a new object

Microsoft Word allows you to embed objects created in other programs into one document. These objects can offer data and other resources to support your document's objectives and create a visually pleasing layout for your recipients' view. Open the Word document and click the "Insert" tab on the command ribbon. Click the "Object" button in the Text group to open the Object dialog box. In the **Object** dialog box, click the **Create New** tab, and then select an option from the **Object type** list.

Fig C.4: Inserting a new object



Working with Page Layout setting and Printing documents

Page layout:-

The Page Layout Tab holds all the options that allow you to arrange your document pages just the way you want them. You can set margins, apply themes, control of page orientation and size, add sections and line breaks, display line numbers, and set paragraph indentation and lines.

In the **Page Layout** tab, a drop-down menu will appear. Click the predefined **margin size you** want. The margins of the document can be changed using the Margins **command**. In Page layout Tab, Page Orientation can be set as: **Portrait** or **Landscape** to change the page orientation.

Fig C.5:Orientation settings



Other Features of Page Layout

- To change the size of the Page, Select the **Page Layout** tab, then click the **Size** command.
- On the Page Layout Tab, in the Paragraph group, use the spacing controls to adjust the line spacing before and after each line. You will see the changes in your document.
- In the Paragraph group, use the Left and Right indent controls to indent the paragraph at the left, right or both margins.

Printing the Documents

- Open an existing Word document or start a new document and type your text. Once you've completed your document and are ready to print, click File in the top left-hand corner of your document. Alternatively, some versions of Word may have an Office button instead of a 'File' button – it's a round Office icon in the top left-hand corner of the screen. Click on this if you have one.
- Move down and click **Print** in the menu. This will bring up the 'Print' dialogue box. Choose how many copies of your document you need.

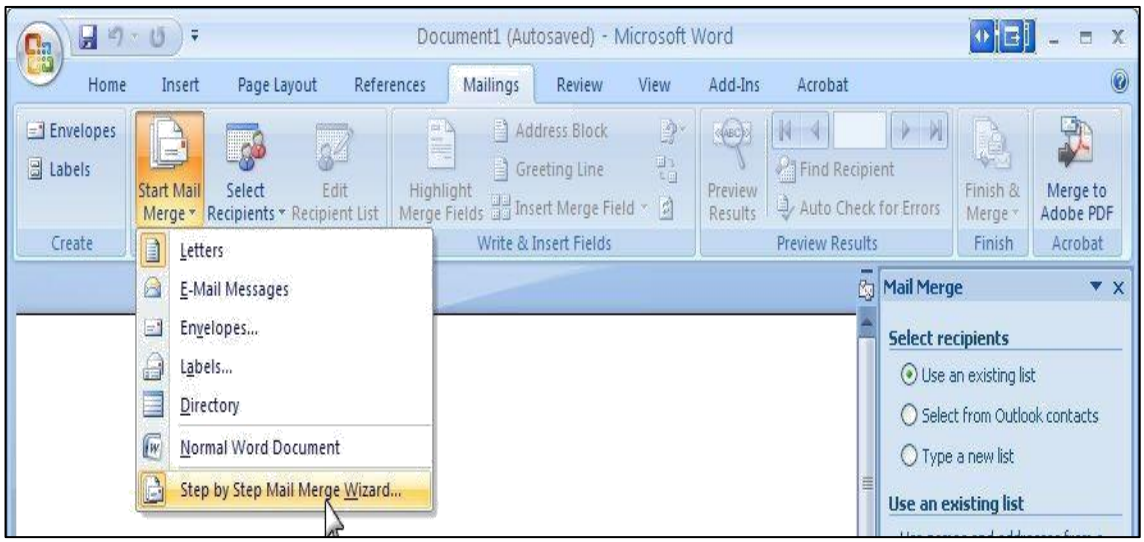
- Depending on your printer options, you can choose other printing features such as whether you want to print all pages or only certain pages. You can also change the orientation of the print from portrait to landscape and tell your computer and printer whether you're printing on a certain size of paper.
- You'll also see, on the right, a preview of your printed document will look like. When you're happy with your settings, click **Print**. The document will now start printing on your printer.

Working with Mail Merge

Mail Merge is a useful tool that allows you to produce multiple letters, labels, envelopes, name tags, and more using information stored in a list, database, or spreadsheet.

Step 1: Prepare data in Excel for mail merge.

- Column names in your spreadsheet match the field names you want to insert in your mail merge.
- All data to be merge dispersant in the first sheet of your spread sheet.

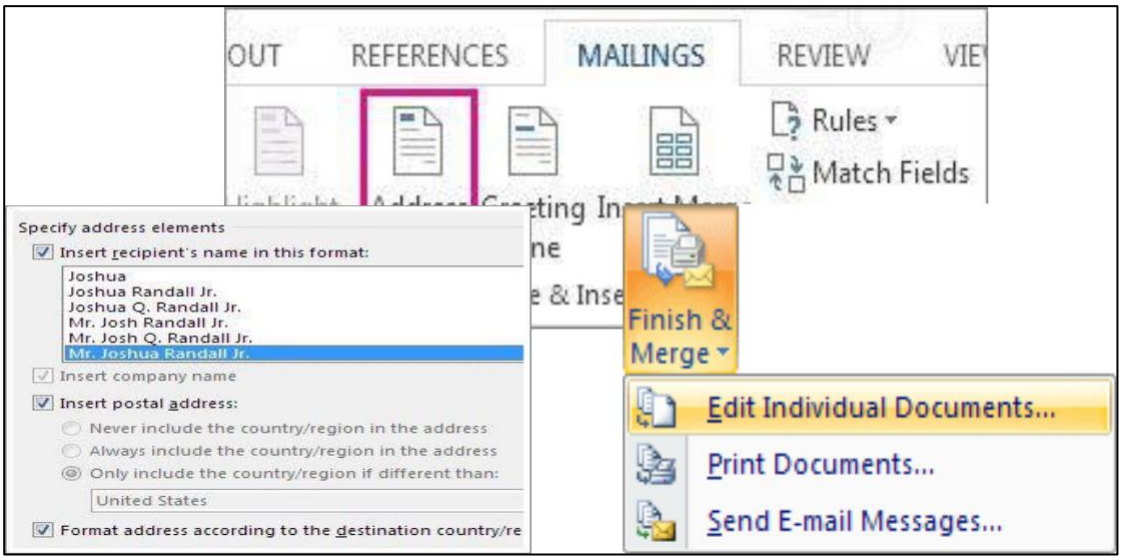


Step 2: Start the mail merge.

- In Word, choose **Blank Document>Mailings>Start Mail Merge**, and then choose the kind of merge you want to run.
- Choose **Select Recipients** for adding new list or existing list of recipients. In the **Mail Merge Recipients** dialog box, clear the check box next to the name of any person who you don't want to receive your mailing.

Step 3:-To insert an address block for an envelope, a label, an email message, or a letter.

a) On the Mailings tab, in the Write & Insert Fields group, choose Address Block.



b) In the **Insert Address Block** dialog box, choose a format for the recipient's name as it will appear on the envelope. Finish the mail merge. In the Finish group, choose Finish & Merge and choose Print Documents or Send Email Messages.

Practice of using shortcut keys

Shortcut Keys are combination that causes a specific command to be executed. Typically, shortcut keys combine the Ctrl or Alt keys with some other keys. Some of the examples of shortcut keys are:

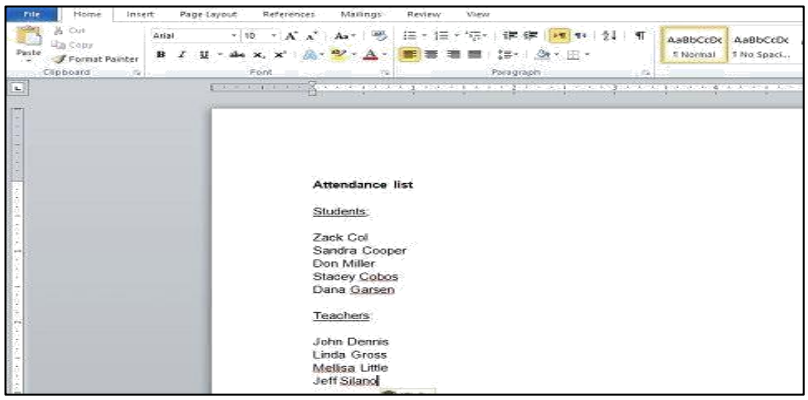
Common Shortcut Keys:-

- Ctrl+C ->COPY ,Ctrl+X ->CUT , Ctrl+V-> PASTE
- Ctrl+A -> SELECT ALL ,Ctrl+F -> FINDWORD

PRACTICE QUESTIONS

Q.1: Start the Mail Merge under Mailings, Select Recipients, Create New List, adding about 5 records to the List, save your document, and then fill in the Template document by adding Merge Fields to the document that reflect the data records that you just created. Also add some text. Save the Template Document.

Q.2: In a given following figure, Change the Page Margins to Narrow, Sort the students names alphabetically in ascending order, Add numbering to the "Students" and "Teachers" lists separately, Change the layout of the "Students" list into two columns



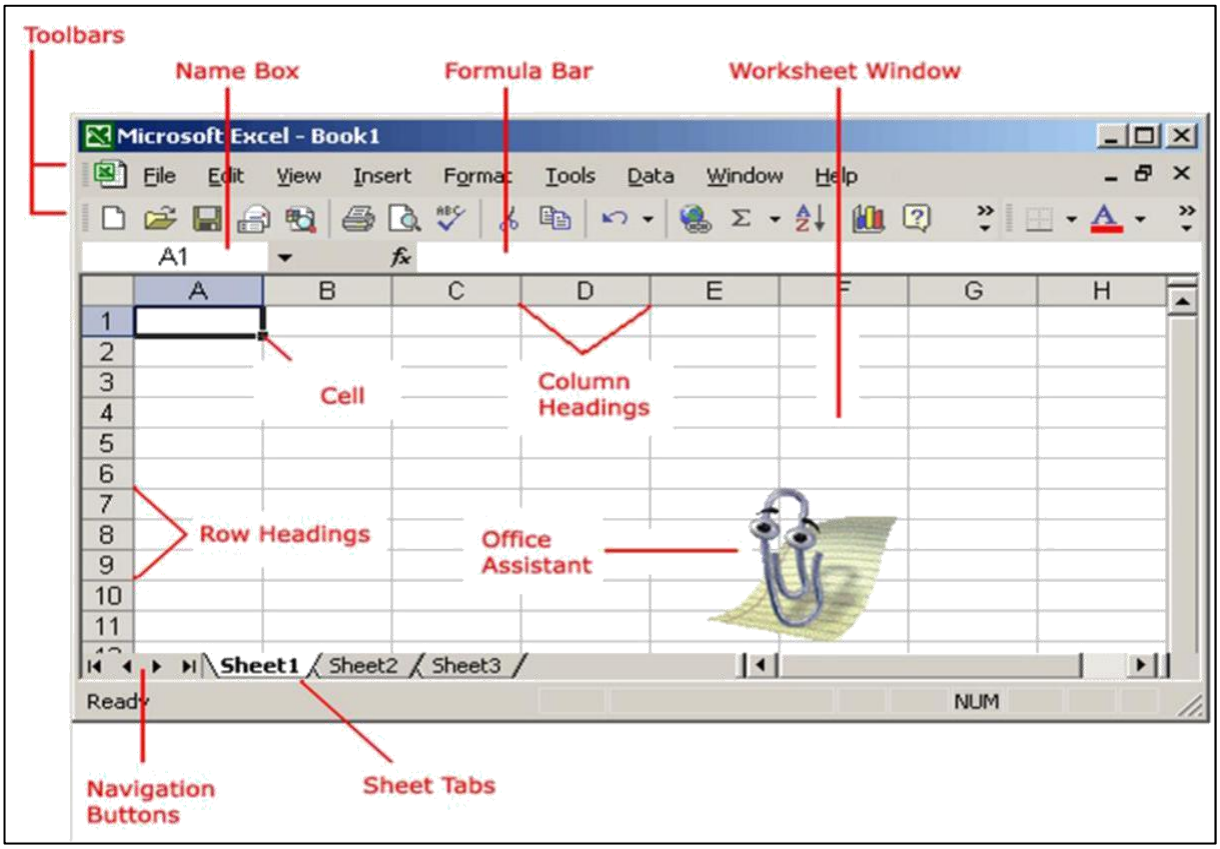
Q.3: Copy the logo of Chandigarh Administration from the website, resize and crop picture, change its text wrapping attributes to “In Front of Text” so that you can move the logo around the page at will and place it in front of any text on the page.

2. MICROSOFT EXCEL

Spreadsheet

Microsoft Excel has the basic features of all spreadsheets using a grid of cells arranged in numbered rows and letter-named columns to organize data manipulations like arithmetic operations. It has a battery of supplied functions to answer statistical, engineering and financial needs. In addition, it can display data as line graphs, histograms and charts.

Fig C.6: MS Excel homepage



Creating and saving document in MS-Excel

To save a workbook:

1. To create a new blank workbook: Select the **File** tab (fig 92). Keyboard shortcut: To quickly create a new, blank workbook, you can also press CTRL+N
2. Select **New**, then click **Blank workbook.** A new blank workbook will appear. Locate and select the **Save** command on the **Quick Access Toolbar**.
3. You'll then need to choose where to save the file and give it a file name. To save the workbook to your computer, select Computer, then click Browse
4. The Save As dialog box will appear. Select the location where you want to save the workbook.
5. Enter a file name for the workbook, then click Save.

Formatting Cells in MS-Excel

About Cell Formats

Each cell in a worksheet can be formatted with many properties. However, we must point out here that **the format of a cell does not affect the actual value in the cell.**

The Number Tab

The **Number tab** contains categories for the type of data that is in the cell. The default category is General. Other categories are number, currency, accounting, date, time, percentage, fraction, scientific, text, special, and custom.

Alignment Formatting Options

The second tab is **Alignment**. There are three "Text Control" options on this tab that are especially useful when formatting a spreadsheet with titles, subtitles, and column headings. They are "Wrap text" and "Merge Cells." The option, "Shrink to fit" will take the cell value and make the font small enough to be completely displayed.

Font Formatting

The third tab is **Font** and the usual options that one sees in most Microsoft Office products are available: font name, font style (regular, italic, bold), color, size, underline style (single, double, etc.), and the special effects of strike-through, superscript, and subscript.

Creating Borders on Worksheet Cells or Group of Cells

The Border tab provides a variety of border styles, and any color may be selected for a border. A border style and border color can be set for each side of an individual cell or a group of cells.

Patterns or Fill

The back ground of a single cell orange of cell scan be filled with any imaginable color, and a variety of pattern styles are available, such horizontal, vertical, or diagonal stripes, dots, and crosshatches of different widths and percentages of gray.

Locking and Hiding Cell Contents

This feature allows the user to define certain cells as Locked and/or Hidden. If a cell is formatted as Hidden, when that cell is selected in the worksheet, its contents will not display in the Formula Bar.

Using Basic Functions of all major categories

Functions are predefined formulas and are already available in Excel. A formula is an expression which calculates the **value** of a **cell**.

Let's look at some of the most commonly used functions in Excel.

S.No.	FUNCTION	CATEGORY	DESCRIPTION
1	SUM	Math & Trig	Adds all the values in a range of cells
2	MIN	Statistical	Finds the minimum value in a range of cells
3	MAX	Statistical	Finds the maximum value in a range of cells
4	AVERAGE	Statistical	Calculates the average value in a range of cells
5	COUNT	Statistical	Counts the number of cells in a range of cells
6	LEN	Text	Returns the number of characters in a string text
7	SUMIF	Math & Trig	Adds all the values in a range of cells that meet a specified criteria
8	AVERAGEIF	Statistical	Calculates the average value in a range of cells that meet the specified criteria
9	DAYS	Date & Time	Returns the number of days between two dates
10	NOW	Date & Time	Returns the current system date and time

Numeric functions

As the name suggests, these functions operate on numeric data. For e.g. IS NUMBER, RAND, ROUND, MEDIAN, PI etc.

String functions

These functions are used to manipulate text data. Some of the common string functions are LEFT, RIGHT, MID, ISTEXT etc.

Date Time Functions

These functions are used to manipulate date values. The following table shows some of the common date functions e.g. DATE, DAYS, MONTH etc.

VLOOKUP function

The VLOOKUP function is used to perform a vertical look up in the left most column and return a value in the same row from a column that you specify.

Relative and Absolute References

There are two types of cell references: **relative** and **absolute**. Relative and absolute references behave differently when copied and filled to other cells. Relative references **change** when a formula is copied to another cell. Absolute references, on the other hand, remain **constant**, no matter where they are copied.

Relative References

By default, all cell references are **relative references**. When copied across multiple cells, they change based on the relative position of rows and columns. For example, if you copy the formula **=A1+B1** from row 1 to row 2, the formula will become **=A2+B2.** Relative references are especially convenient whenever you need to **repeat** the same calculation across multiple rows or columns.

Absolute References

There may be times when you do not want a cell reference to change when filling cells. Unlike relative references, **absolute references** do not change when copied or filled. You can use an absolute reference to keep a row and/or column **constant**. An absolute reference is designated in a formula by the addition of a **dollar sign ($)**. It can precede the column reference, the row reference, or both.

Sorting and filtering data Using Sorting in Excel:

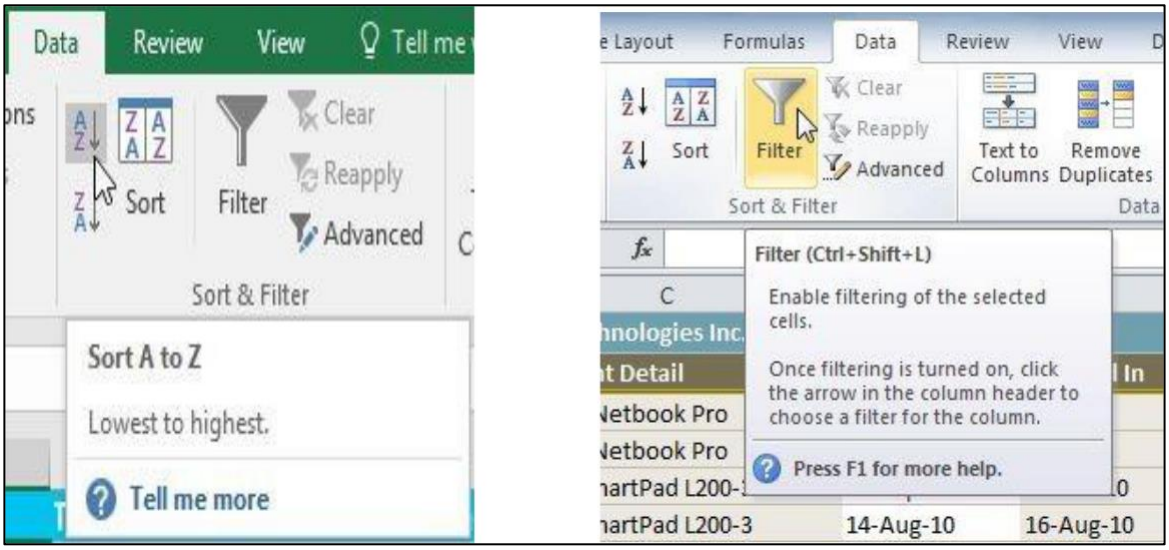
- Select a cell in the column you want to sort by.
- Select the Data tab on the Ribbon and then click A-Z command to sort A to Z, or the Z-A command to sort Z to A.
- The worksheet will be sorted by the selected column.

To filter data in Excel:

- Begin with a worksheet that identifies each column using a header row.
- Select the **Data** tab, then locate the **Sort & Filter** group.
- Click the **Filter** command. Drop-down arrows will appear in the header of each column. Click the **drop-down arrow** for the column you want to filter. In this example, we'll filter the Type column to view only certainty pes of equipment.
- The **Filter** menu appears.

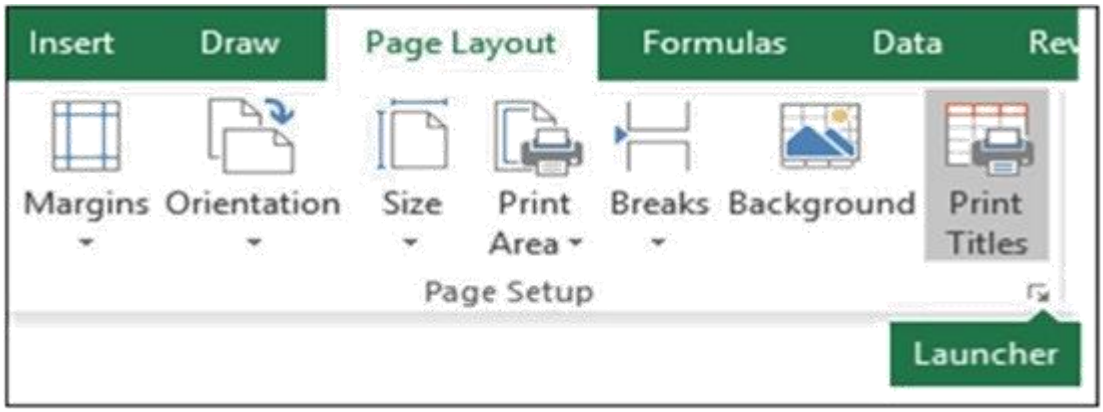
Uncheck the boxes next to the data you don't want to view, or uncheck the box next to **Select All** to quick lyun check all. **Check** the boxes next to the data you do want to view. In this example, we'll check Laptop and Projector to view only these types of equipment. Click **OK**. All other data will be filtered, or temporarily hidden. Only laptops and projectors will be visible.

Fig C.7: Filter button in Home tab



Setting Page layout and Printing

Page Setup: Click on the **Page Layout** tab, then in the **Page Setup** group, click the Dialog Box Launcher.



Orientation: Choose between landscape and portrait.

Scaling: Enlarges or reduces the worksheet or selection when you print so that it fits on the specified number of pages.

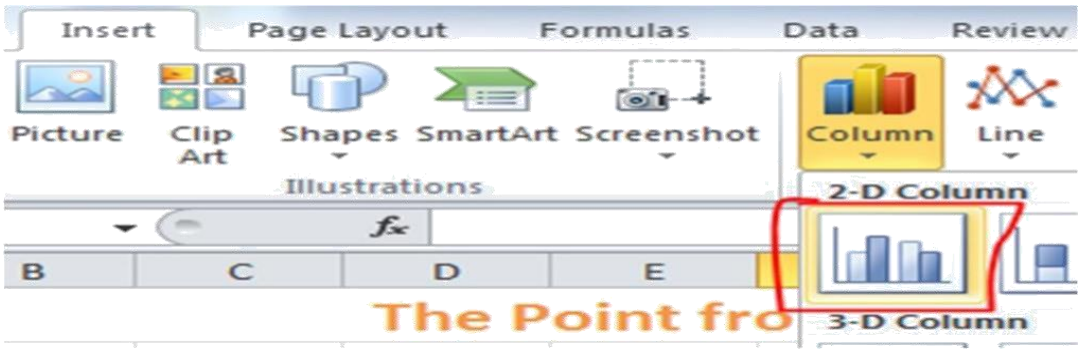
- **Adjust to** when you select **Adjust to**, you can enter a percentage in the **% normal size** box.
- **Fit to** when you select **Fit to**, you can enter a number in the **page(s) wide** box and the **tall** box.

Insertion and Designing of charts

Creating Charts

Step 1- Select the **Insert** tab on the top of Excel.

Fig C.8: Insert tab



Step 2:- From the **Charts** grouping; choose the type of chart you wish to create

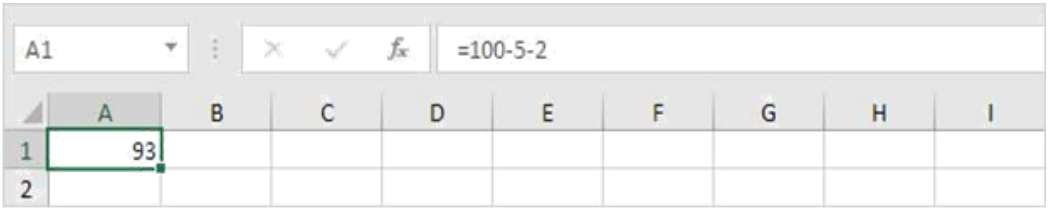
Step3:- A blank chart will appear, from the **Data** grouping, choose **Select Data**

Step 4:- Click inside the box labeled **Chart data range**, then click and drag to select those cells in Excel that contain your chart data.

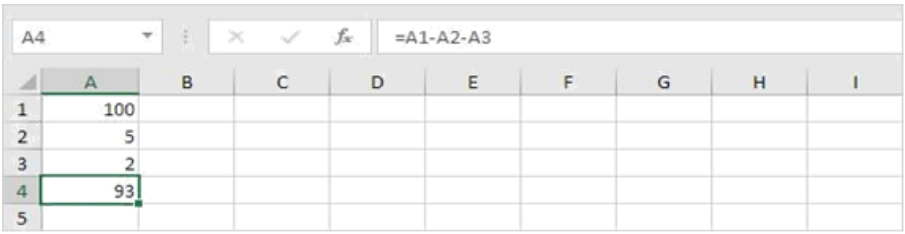
PRACTICE EXAMPLES

There's no SUBTRACT function in Excel. However, there are several ways to subtract numbers in Excel. Are you ready to improve your Excel skills?

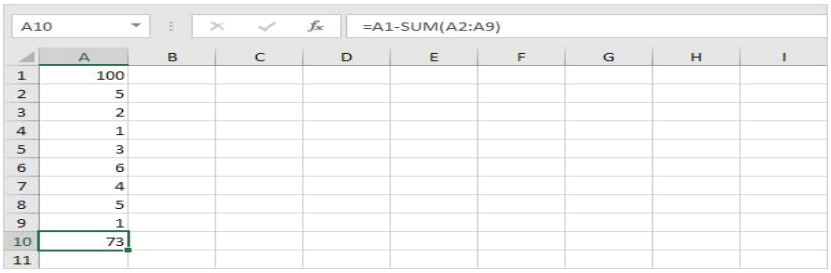
1. For example, the formula below subtracts numbers in a cell. Simply use the minus sign (-). Don't forget, always start a formula with an equal sign (=).



2. The formula below subtracts the value in cell A2 and the value in cell A3 from the value in cell A1.

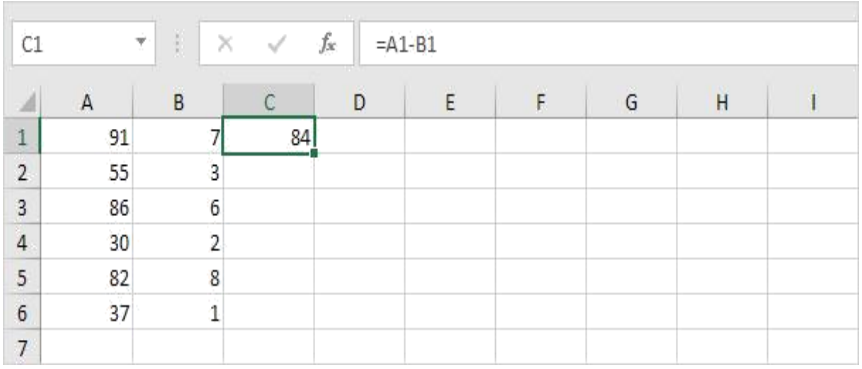


3. As you can imagine, this formula can get quite long. Simply use the SUM function to shorten your formula. For example, the formula below subtracts the values in the range A2:A9 from the value in cell A1.

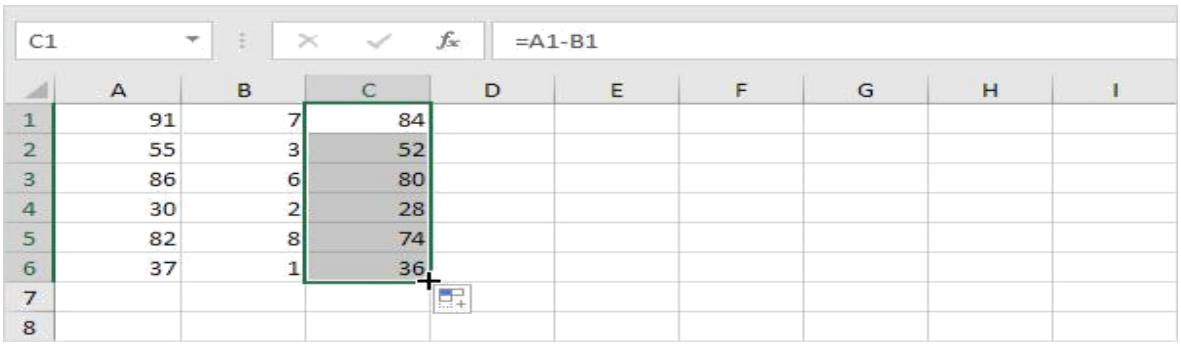


Take a look at the screenshot below. To subtract the numbers in column B from the numbers in column A, execute the following steps.

4a. First, subtract the value in cell B1 from the value in cell A1.



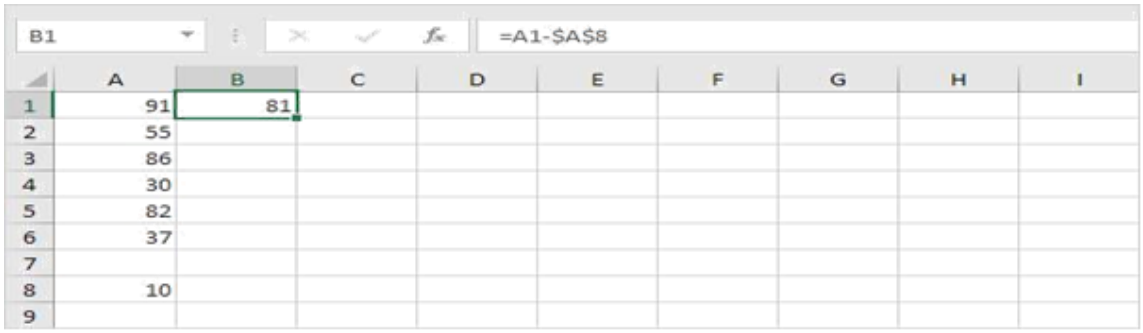
4b. Next, select cell C1, click on the lower right corner of cell C1 and drag it down to cell C6.



	A	B	C	D	E	F	G	H	I
1	91	7	84						
2	55	3	52						
3	86	6	80						
4	30	2	28						
5	82	8	74						
6	37	1	36						
7									
8									

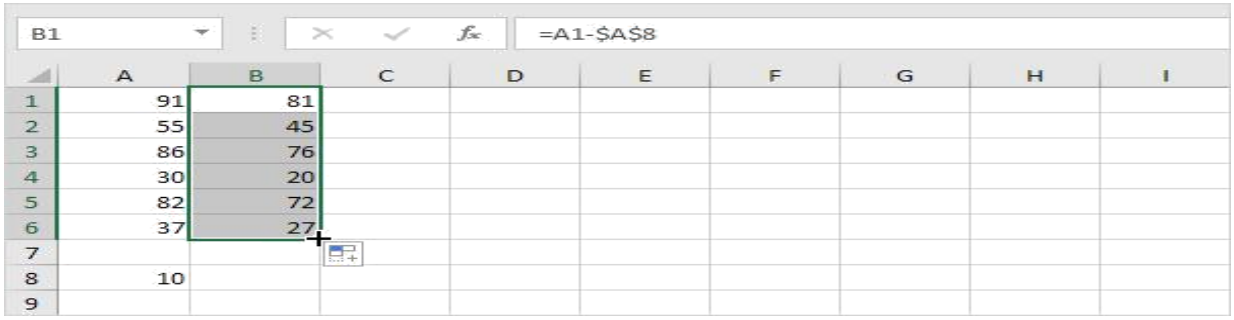
Take a look at the screenshot below. To subtract a number from a range of cells, execute the following steps.

5a. Firstly, subtract the value in cell A8 from the value in cell A1. Fix the reference to cell A8 by placing a $ symbol in front of the column letter and row number (A8).



	A	B	C	D	E	F	G	H	I
1	91	81							
2	55								
3	86								
4	30								
5	82								
6	37								
7									
8	10								
9									

5b. Next, select cell B1, click on the lower right corner of cell B1 and drag it down to cell B6.



	A	B	C	D	E	F	G	H	I
1	91	81							
2	55	45							
3	86	76							
4	30	20							
5	82	72							
6	37	27							
7									
8	10								
9									

Explanation: when we drag the formula down, the absolute reference (A8) stays the same, while the relative reference (A1) changes to A2, A3, A4, etc. Maybe this is one step too far for you at this stage, but it shows you one of the many other powerful features Excel has to offer.

3. MICROSOFT POWERPOINT

Creating Presentation Using PowerPoint

PowerPoint is a software package designed to create electronic presentations consisting of a series of separate pages or slides. PowerPoint is a slides how presentation program that's part of the Microsoft office suite of tools. PowerPoint makes it easy to create, collaborate, and present your ideas in dynamic, visually compelling ways.

Design layout

Open power point presentation and create a new file. Then select the appropriate layout as per your desire. Following are different layout mainly used (Fig104).

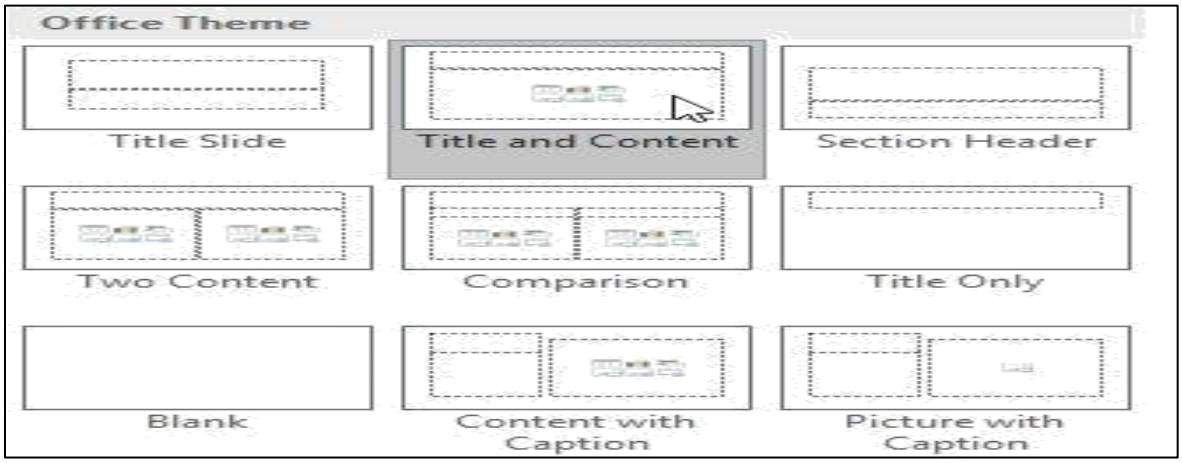


Fig C.9: Design Layout

Inserting different objects into slide

Open power point presentation and create a new file. Then go to the 'Insert Menu' and select the object which you want to insert.



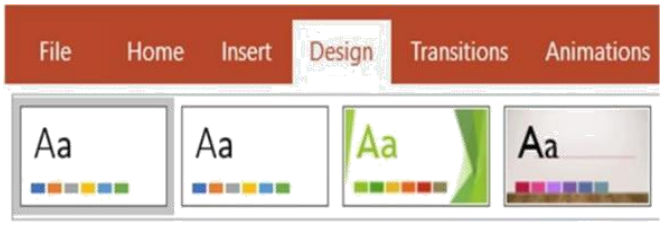
Fig B.99: Insert tab

Different design of slide

To apply a slide design only to the currently selected slide in PowerPoint, follow these steps: In the Design Tab, browse to the slide design that you want.

1. When you rest the mouse pointer over your selected design in the Slide Design task pane, a gray options button with an arrow appears. Click this button.
2. Double Click on the theme which you want to apply tithe current slides.

Fig C.10: Insert tab



Animation and Slide Transition

Step 1- Select the object or text on the slide that you want to animate.

Step 2- On the **Animations** tab of the ribbon, click **Add Animation**, and pick an animation effect.

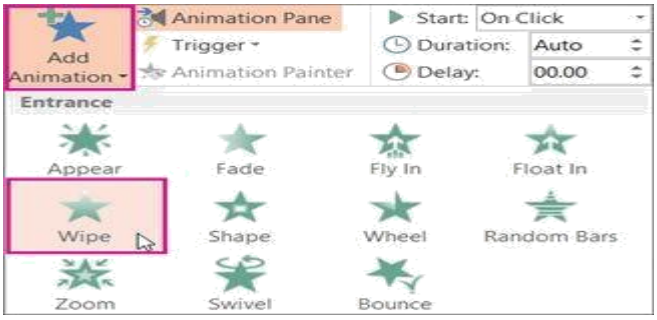


Fig C.11: Animation Pane

Setup a slideshow

Once you have all your slides completed and in the order you want, view your slide show. Click the 'Slide Show' tab at the top of the page and select 'From Beginning'. You can go through your entire slideshow, and change slides by clicking or pressing the right arrow. A shortcut to this is pressingF5.

Fig C.12: Setting up slideshow



4. NIC Email (https://email.gov.in/)

1. Managing Your Email

a. View

i. You can view your email messages as single messages or as conversations and you can view messages with the Reading Pane off, displayed at the bottom, or displayed on the right.

ii. To change how messages are grouped in your mailbox, on the toolbar click View and select whether to view by conversation or by message and where you want the Reading Pane to display.

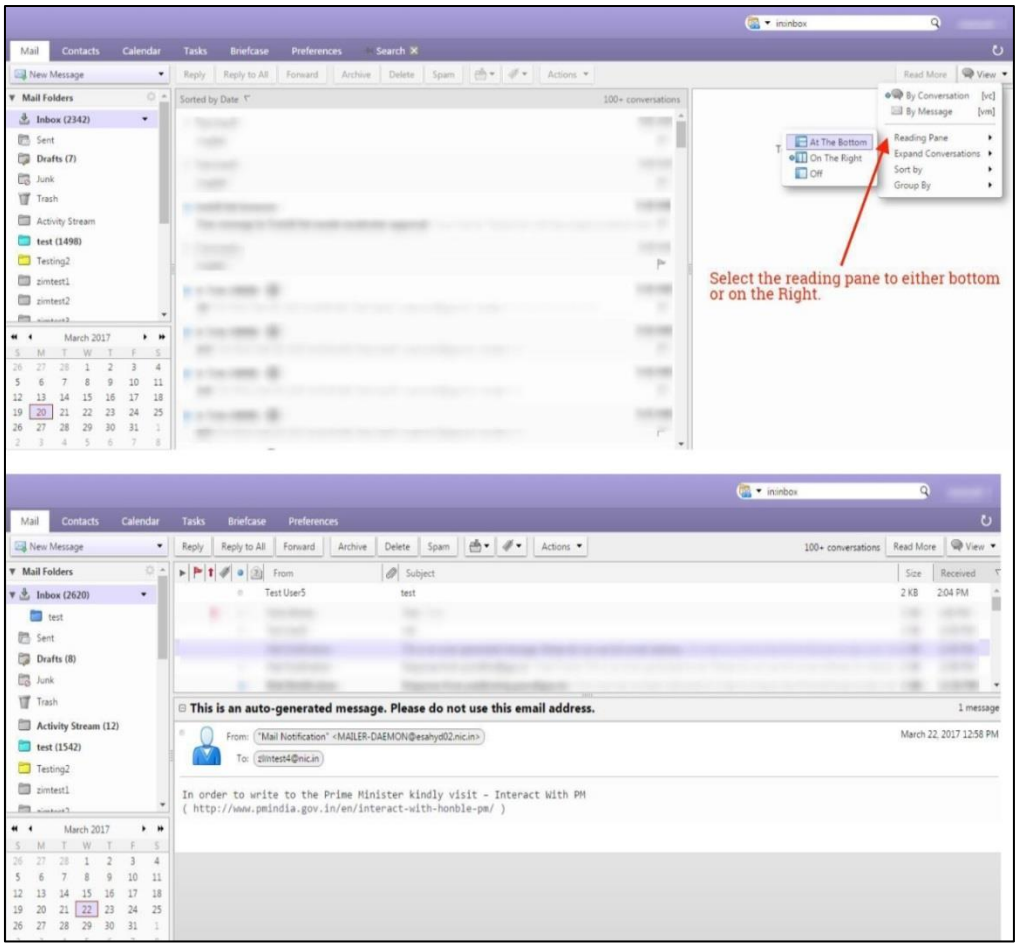


Fig C.13: Reading Pane

I. **View Email Messages by Conversation**

In the Conversation view your messages are grouped to make it easier to follow the thread of an email exchange. A conversation thread begins when you send or receive an email and then send or receive subsequent replies and forwards based on the original email. The subject displays only once in your Inbox and the number of email messages in the conversation is shown. **Conversations containing unread messages are shown in bold.**

Conversations can be in your Inbox another in your sent folder, and others in another folder. If you move a conversation from one folder to another, all messages within that conversation are also moved to that folder. Messages in the Sent folder and in the Trash folder are not moved.

To create a new conversation thread, you must create a new message, not reply to or forward an existing message.

II. **View Email Messages by Message**

Email messages in your mailbox can be organized by selecting the date a message is received and by Conversation.

i. On the Mail tab toolbar, click the View drop-down menu.

ii. Select either By Conversation or By Message.

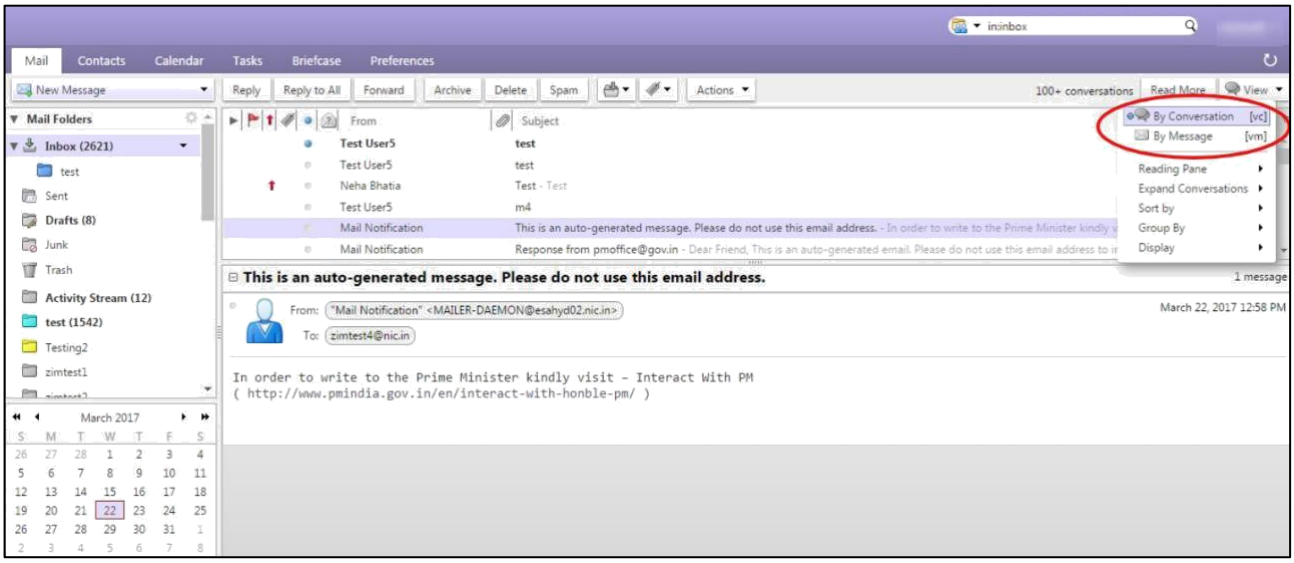


Fig C.14: View Email Message page

b. Attachments

Add Attachments using drag and drop

You can easily add an attachment to an email message by dragging the file from a folder into your email.

i. Select one or more files from your desktop and hold down the cursor on the file(s) to be attached.

ii. Drag the files to the message header area and release the cursor. The file names are displayed in the header.

a. Removing an Attachment

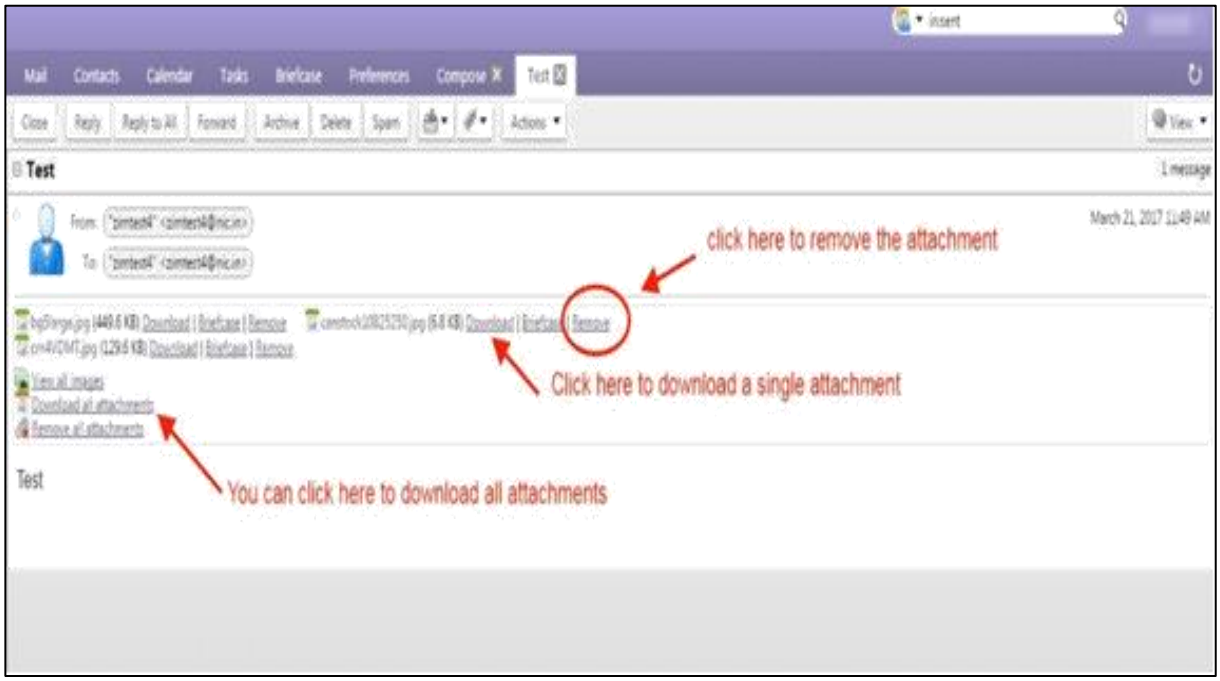
i. To remove an attachment, click the **x (cross)** in the attachment bubble.

User can download/remove all attachments

You can download or remove all attachments individually as the per user's choice by clicking on the file or you can also download all the attachments as a zip file by

Clicking on "**Download all attachment**" and remove all attachment by clicking on "**remove all attachments**".

Fig C.15: Downloading and removing attachments



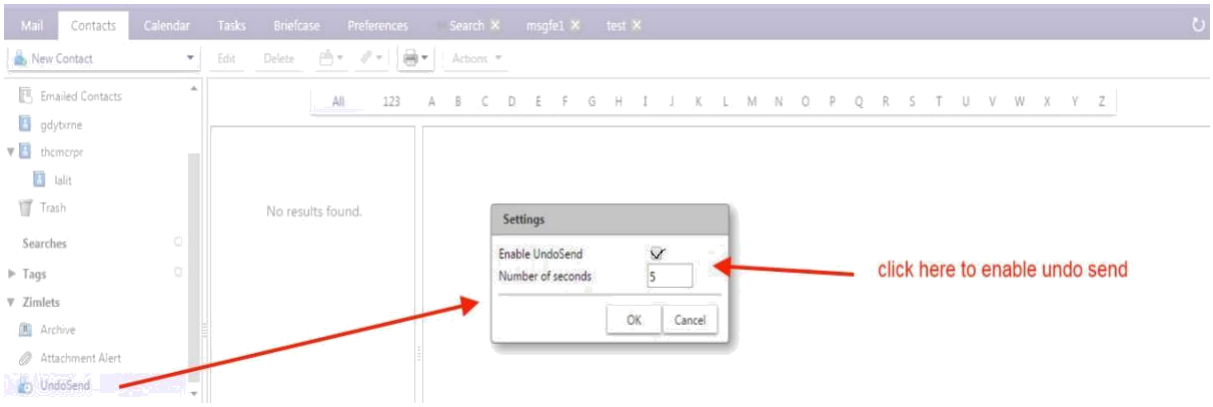
a. <u>Set priority Mail</u>

When you compose a new message you can set the priority of the new email. Click on options in the window and set the priority of the message to high, normal or low. If you want your message to be seen quickly and the reply should be given immediately you can set the priority to "HIGH". The sent message will have a high priority sign before the subject.

b. <u>Undo Send</u>

In the mail folders go to the last folder named as Undo send (Inside Zimlets). Click on "undo send". You can enable and set the number of seconds after which your mail will be sent. Compose an email and it will show a timer i.e. the number of seconds after which the mail will be sent. You can click on OK to proceed further or Cancel the sending process. Please enable undo send before proceeding.

Fig C.16: Undo sending



d. Add Persona(A role granted to the user)

Creating different personas allows you to use multiple email addresses from your mailbox.

For example, you could use your primary account persona test<xyz@nic.in>for your business email correspondence, and create a new persona for your personal email correspondencetest1xyz@gov.in.

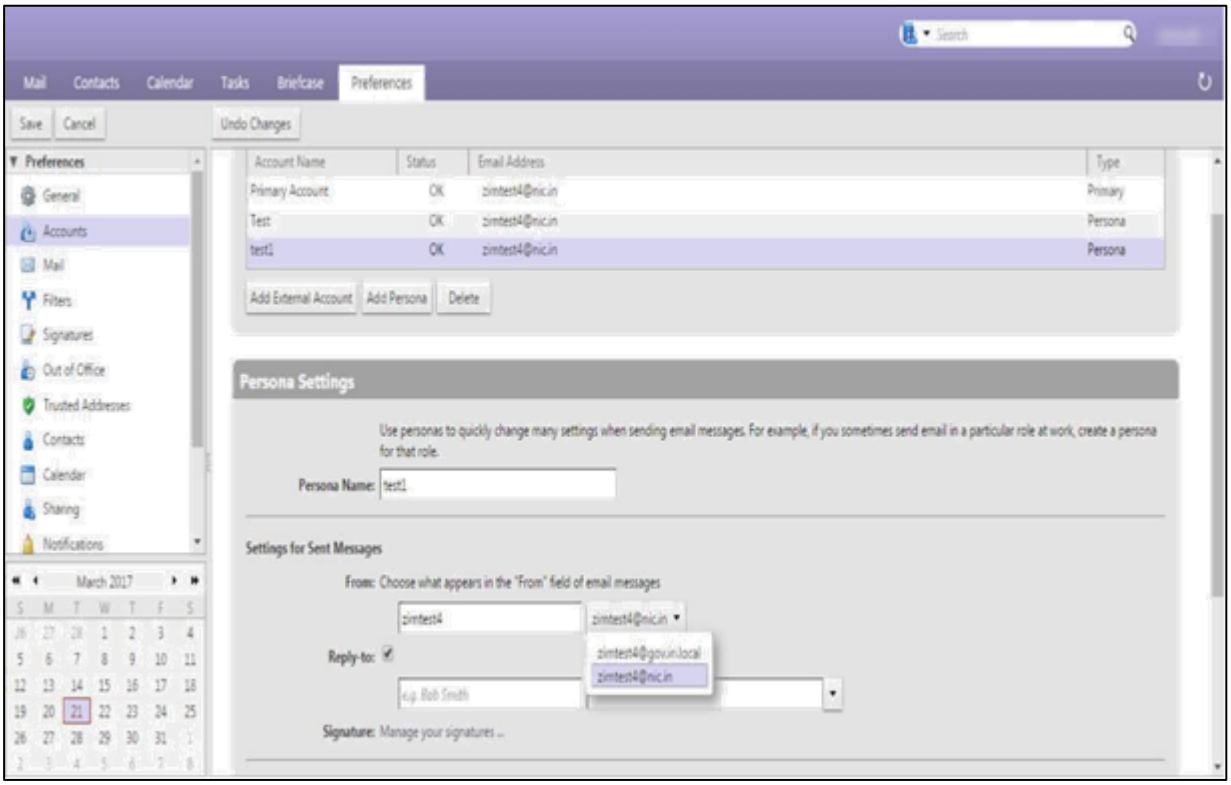
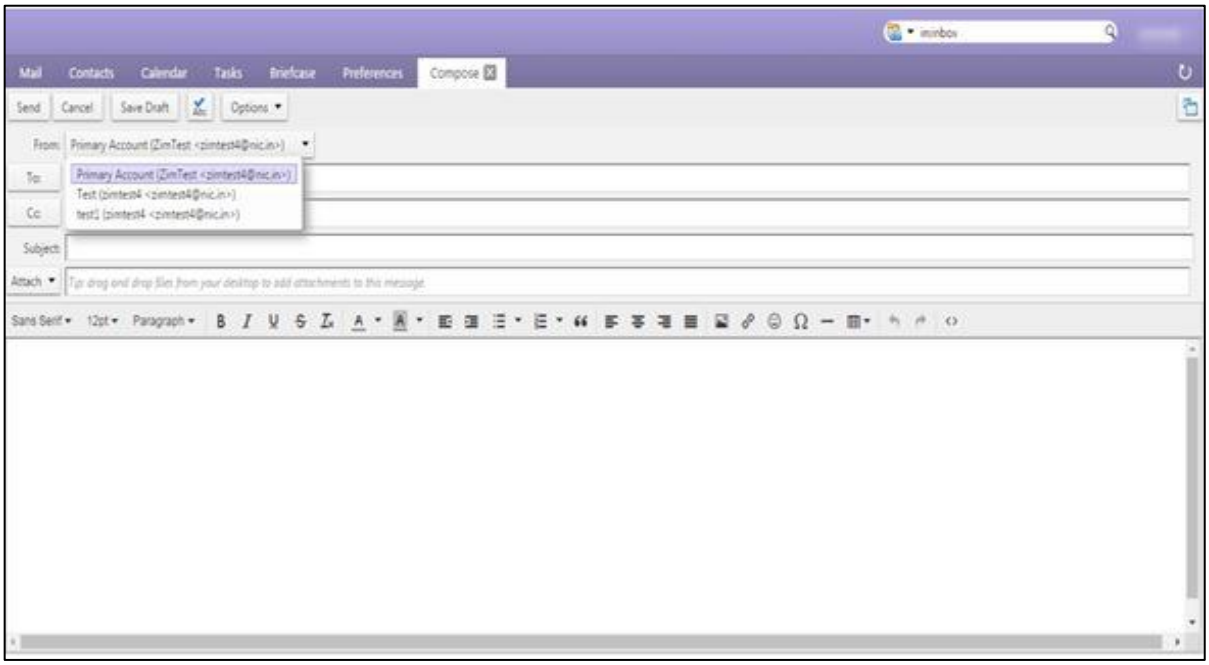


Fig C.17: Adding personal role



i. Go to the Preferences>>Accounts page.

   Your default account and personal information is shown as the primary account.

ii. Click on **Add Persona**. The account name New Persona1 displays in the Account Name column. Now, in the Persona Settings>Persona Name text box(you can change the name of the persona accordingly)

iii. In the Persona Name text box enter a descriptive word to identify the persona in the "From" list when you are composing an email. For eg: ABC (This is the from name of the persona). This name does not appear in the email message.

iv. In the Settings for Sent Messages section, specify the "From" information for this persona.

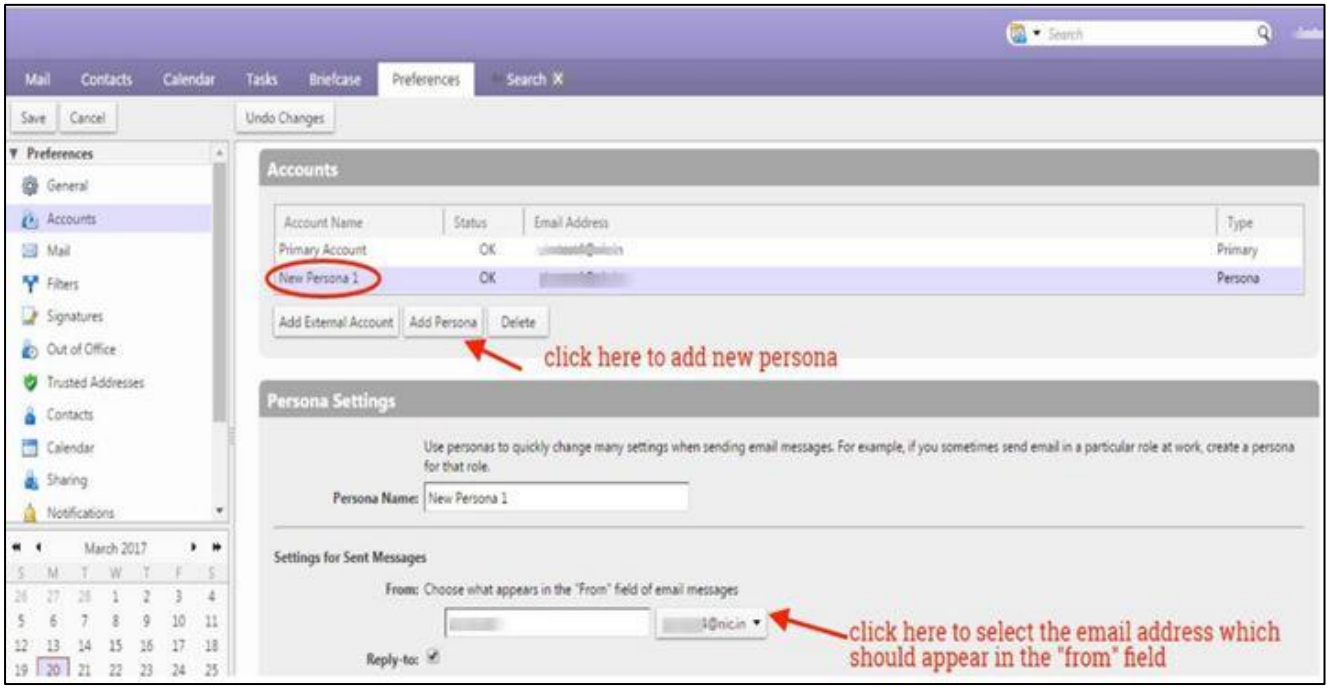
   In the "From" text box type the name that appears in the "From" field of your outgoing email messages. This is the name that is shown before your email address.

   In the drop-down menu next to the text box, select the email address from which to send messages.

   ******If this field is not editable, you do not have additional external accounts identified.

To direct replies to email messages from this persona to a name and address different from that which you configured in From, check Reply-to>**Set the "Reply-to" field of email messages to**, and enter the name to use in the textbox.

Fig C.18: Adding a new persona



vi. **Optional)** To associate a signature with the persona, click Signature: Manage your signatures...

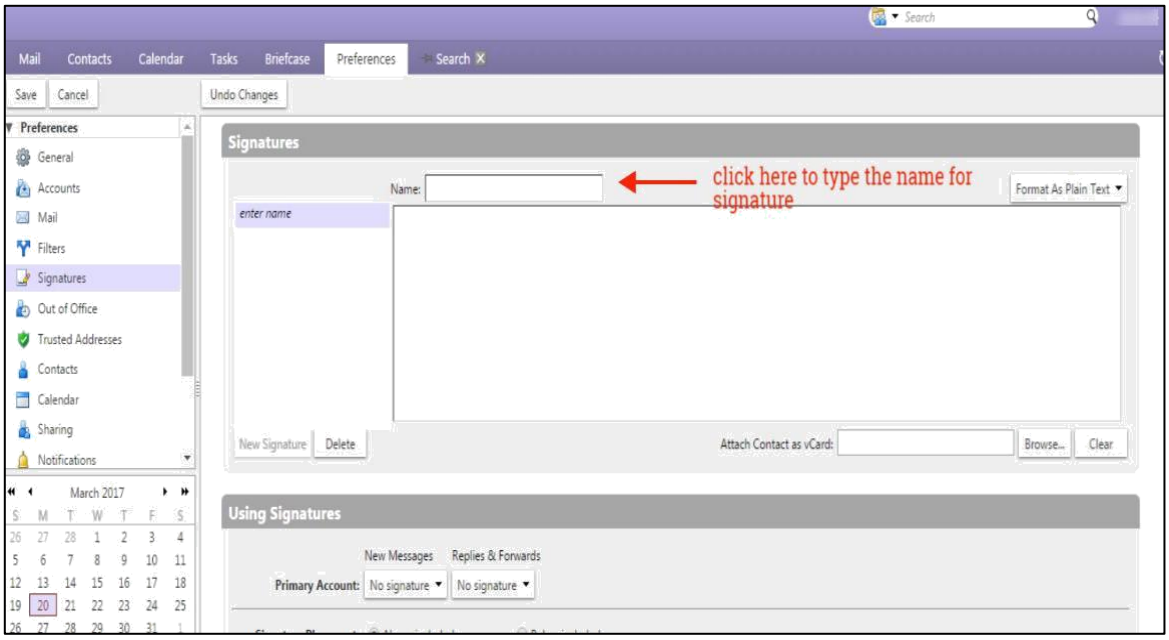


Fig C.19: Adding Name And Signature

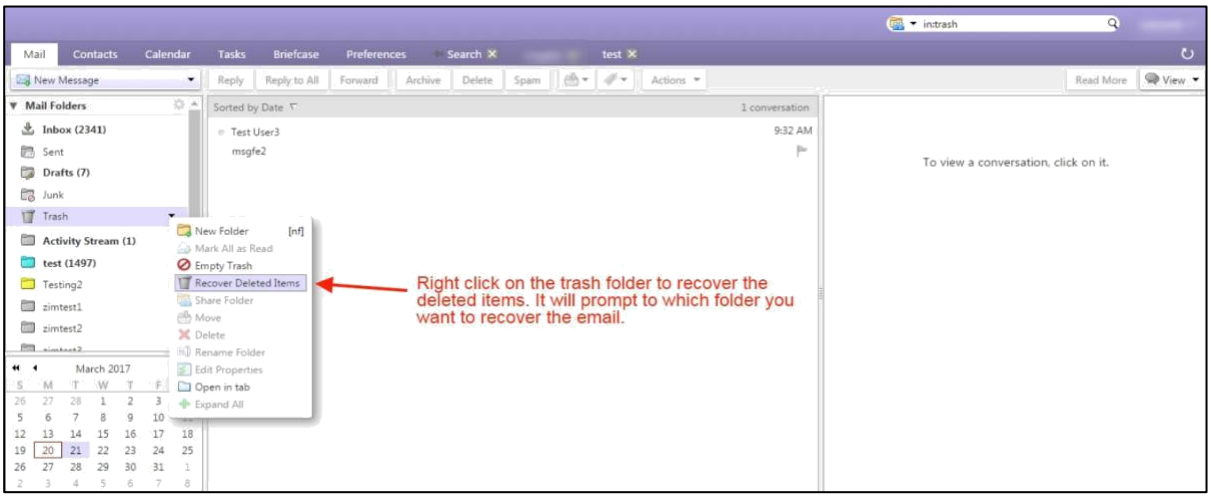
vii. To automatically **Use this persona** when replying to messages sent to a specific email address or when forwarding messages from that address, select when replying or forwarding messages sent to, and type the email address in the text box. If you are entering more than one email address, separate the addresses with either a comma or a semi-colon.

viii. To automatically **Use this persona** when replying to messages in a specific folder or when forwarding messages from this folder, select **when composing**, replying to or forwarding messages in folder(s). Click the folder icon to select one or more folders or to create a new folder. **If you are selecting more than one folder, separate the folder names with either a comma or a semi-colon.

ix. Click Save.

e. Dumpster

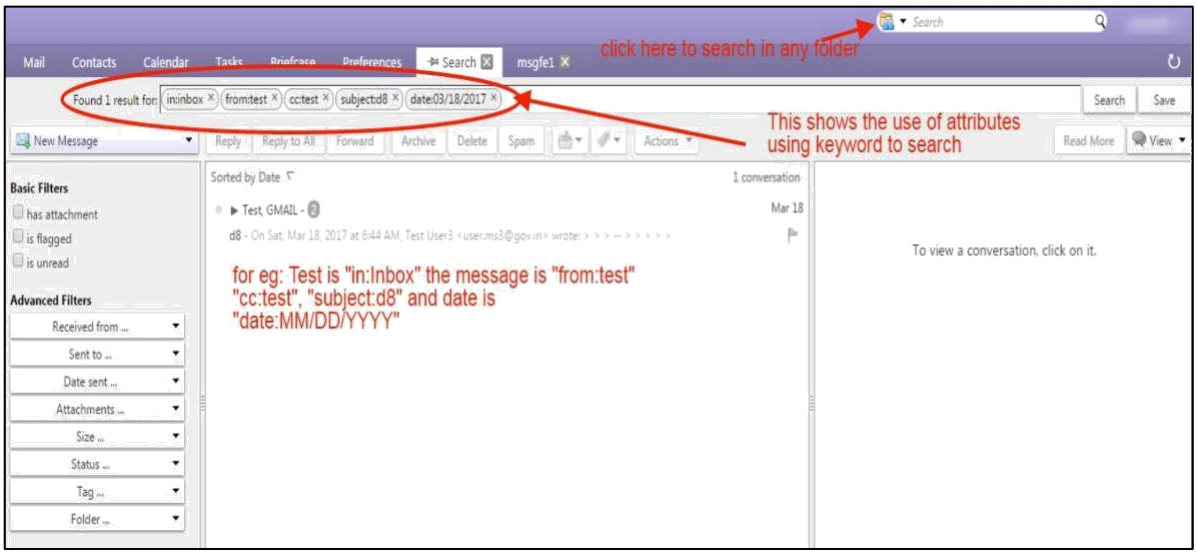
User can restore all the deleted mails from the trash folder within the defined number of days (i.e. within the timestamp of 90 days).



2. Search

User can search in respective folder by clicking on search tab on the top right corner of the page. Search can be performed using various attributes with a colon (:) symbol.

Fig C.20: Searching option



a) You can use these attributes to search in all the folders or they can be combined with other attributes to search in a specific folder.

b) In the search box type **in: inbox from:test subject: Helloto: support cc:test**, this will search in respective folder **"Inbox"** with from, subject, to and cc specified and if you search using **from: test**in the search box, without specifying any folder, this will **search** in **all the folders** for the user **"test"** from which the mail is received.

Few examples are listed below:-

i. **from**: Specifies a sender name or email address that is in the From header. This can be a text, as in "Aruna", an email address such asxyz@gov.inor a domain such as"@gov.in".



ii. **to**: It specifies one of the people to whom the email was addressed in the To:header.



iii. **cc**: It specifies a recipient in the cc: header of the message.



iv. **subject**: It specifies text that must appear in the subject header of the message. An example might be subject: new vacation policy.

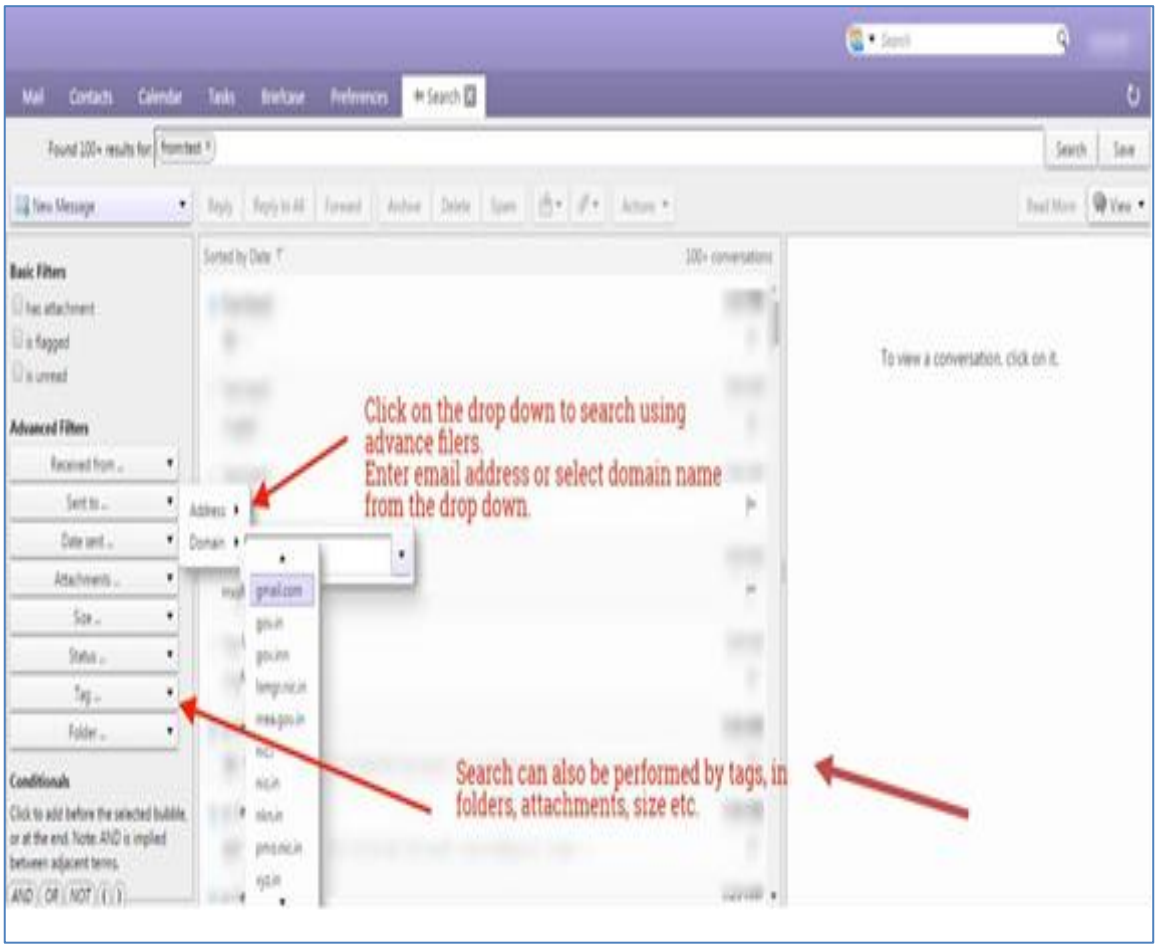
v. **in**: It specifies a folder in which search is to be performed. For example, in: sent would show all items in your 'Sent' folder. Similarly in: Inbox, in: Draft, in: Trash etc. will search in the respective folders.



vi. **date**: Use this keyword search messages for a specific date, using the format that is default for your browser's locale (format is MM/DD/YYYY). For example, date: 2/1/2007 would find messages dated February 1, 2007. The greater than (>) or less than (<) symbols can be used instead of after or before.



Fig C.21: Searching in advance tiers



- Please click here to view advance search keywords

3. Configuring POP3/IMAPClient

Please find the steps to configure the IMAP or POP3 account -

i. Go to settings>>Mail>>Accounts>>Add Account

ii. Enter valid Email ID

iii. Incoming mail serve :**imap.mail.gov.in**

iv. Outgoing mail server/ SMTP :**smtp.mail.gov.in**

v. IMAP Port:**993**

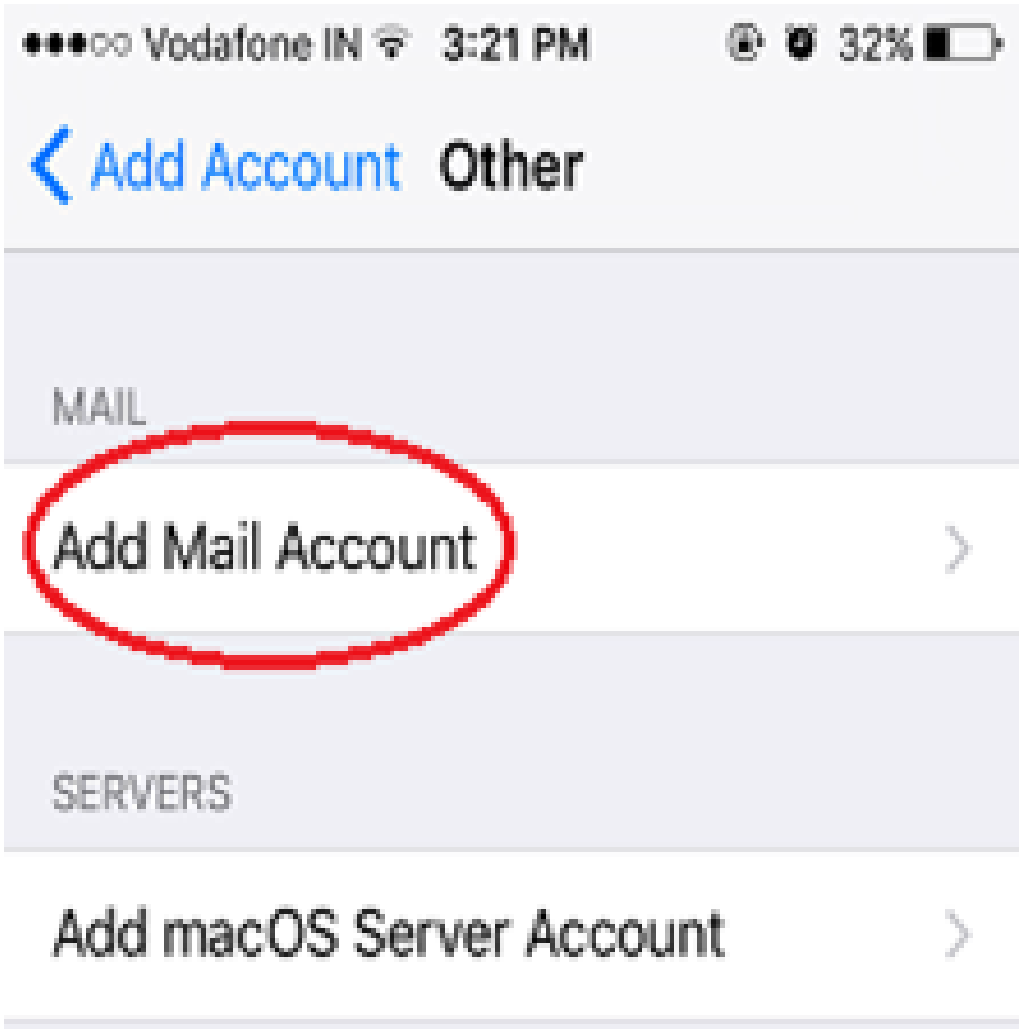
vi. SMTP Port:**465**

I. Mobile client IMAP(Iphone-IOS)

i. Click on settings>>Mail>>Accounts>>AddAccounts>>Others

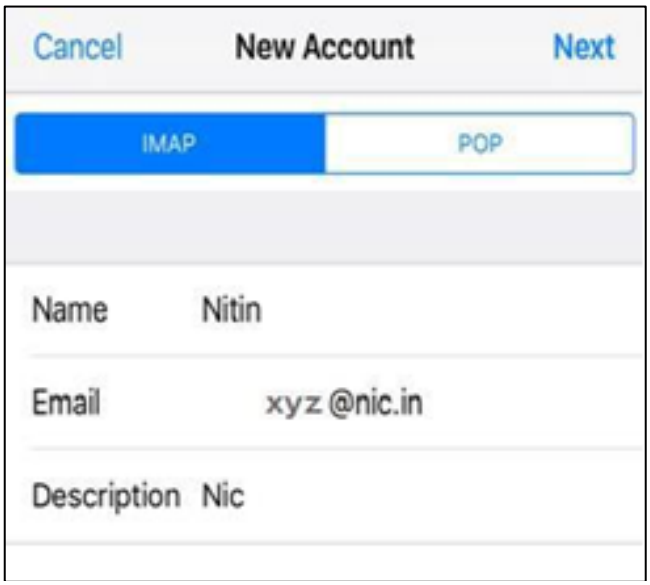


(Step-1): Click 'Other'



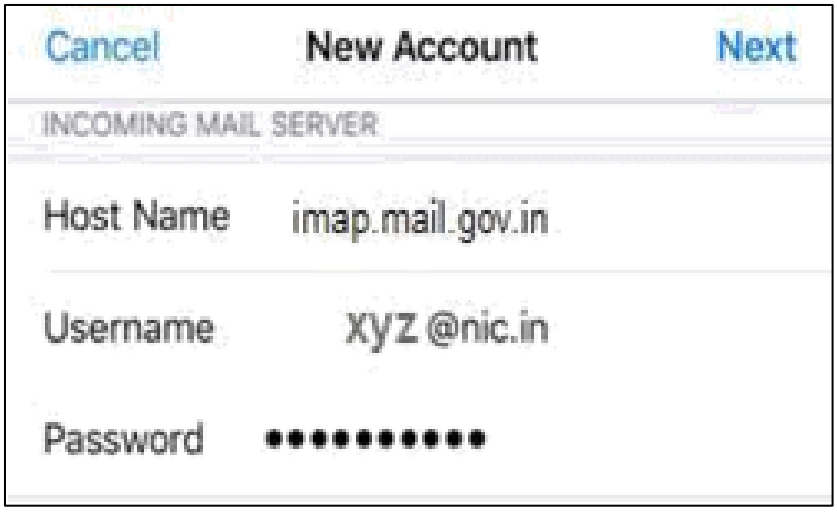
(Step-2): Adding Mail account

(Step-3): Fill required information



(Step-4): Fill username and password

Incoming Servers



(Step-5): Fill required information

Outgoing Server



II. Mobile client POP(Iphone-IOS)

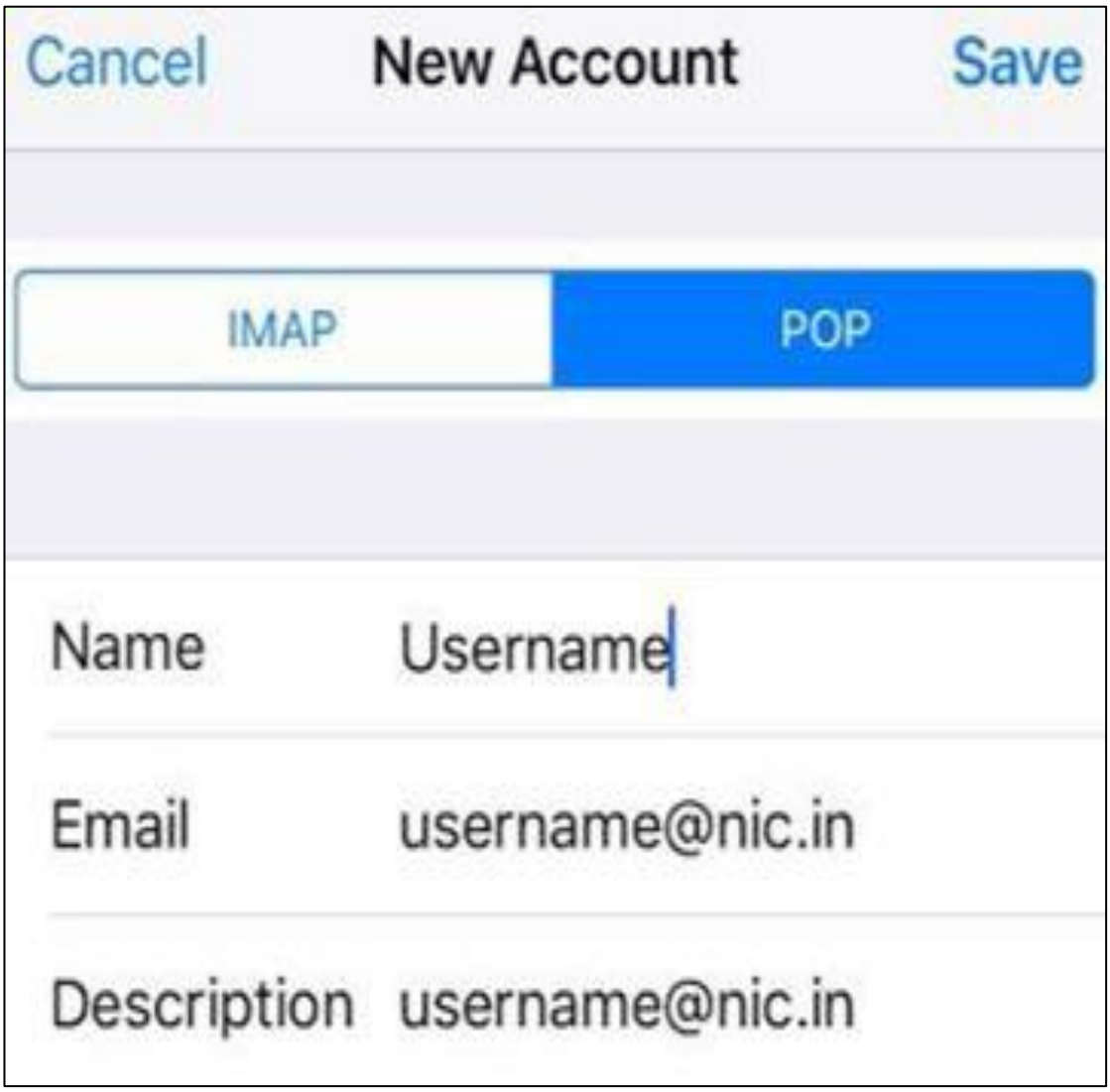


Fig C.22: Screenshots for mobile client POP(Iphone-IOS)



III. Mobile client IMAP(Android version)

Fig C.23: Incoming Server

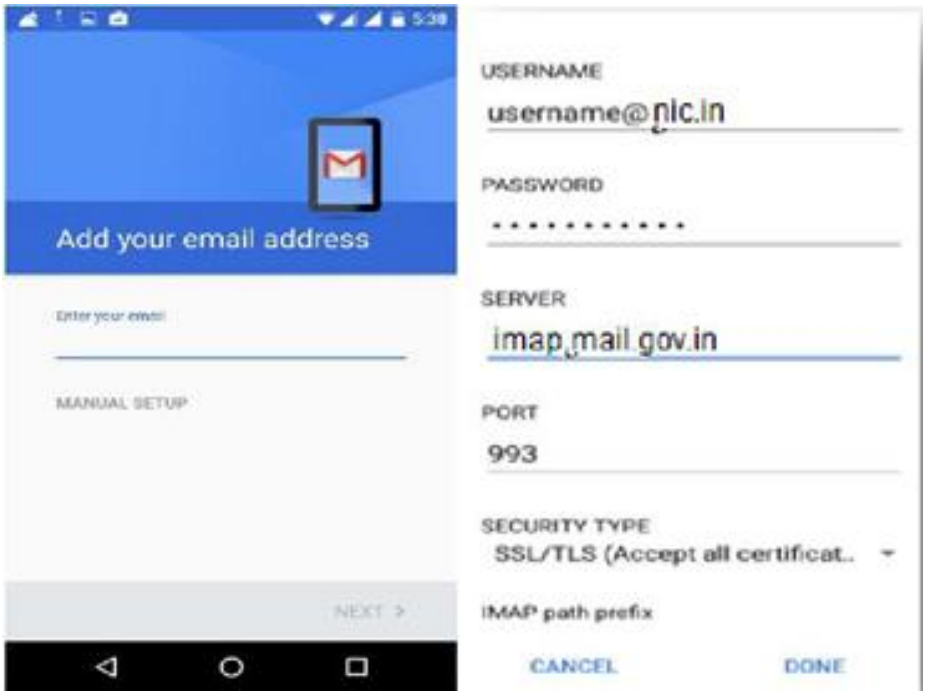
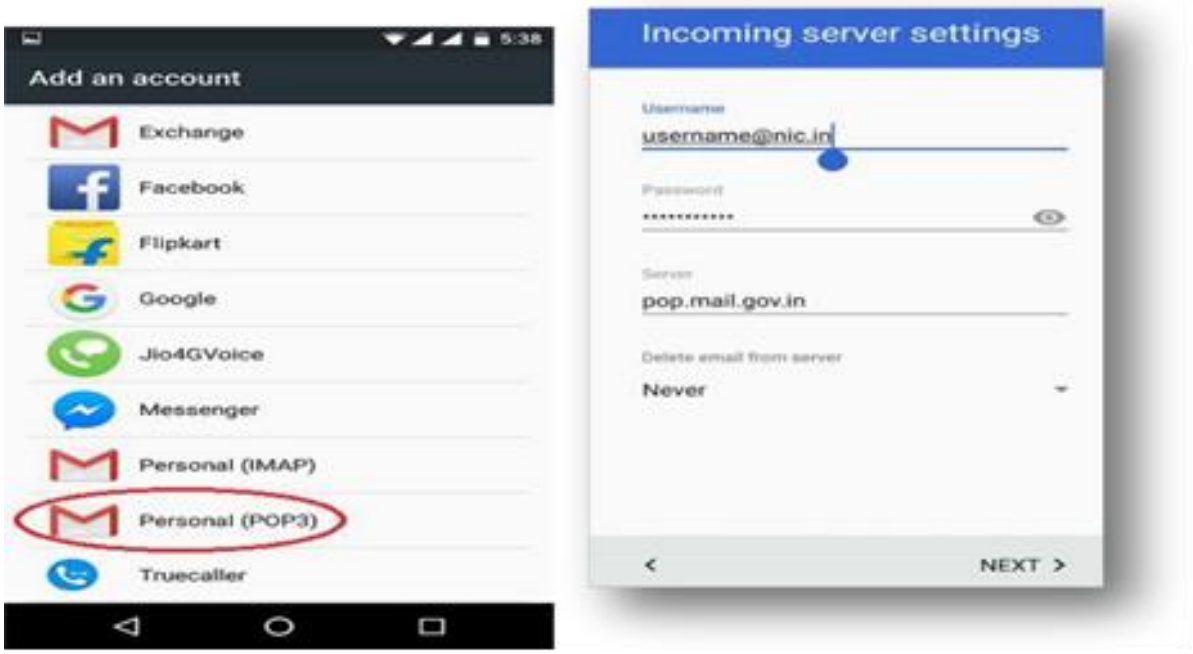
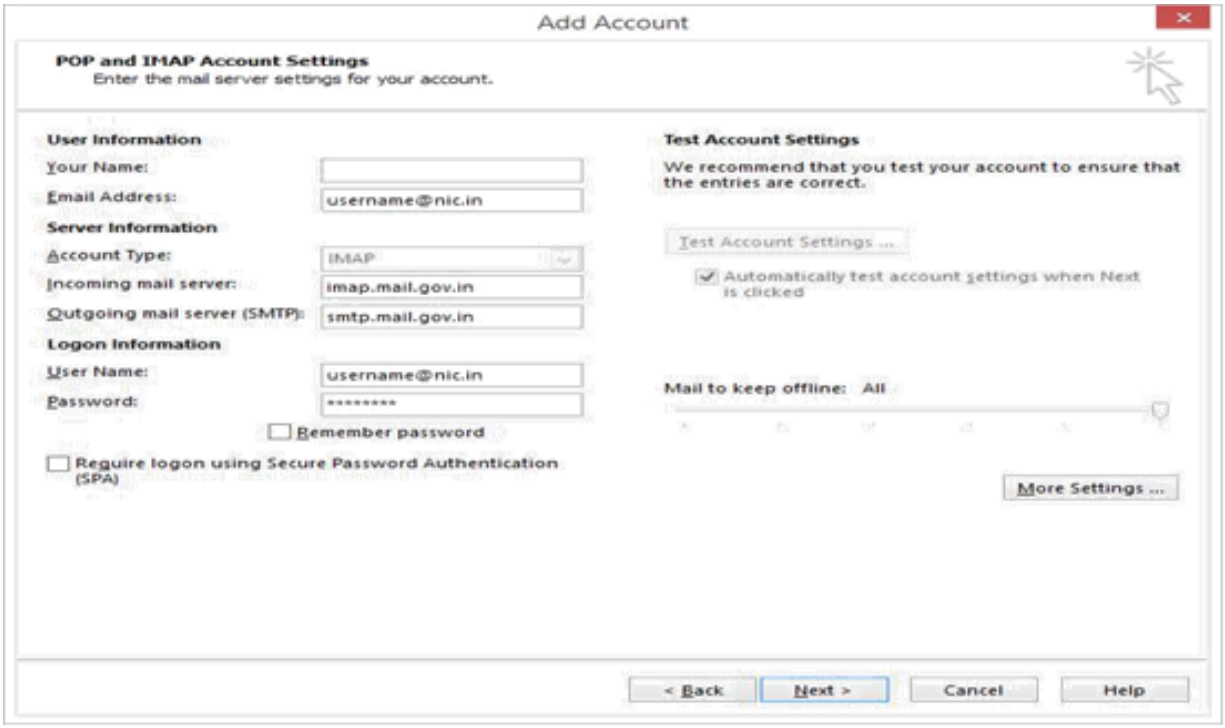


Fig C.24: Outgoing Server

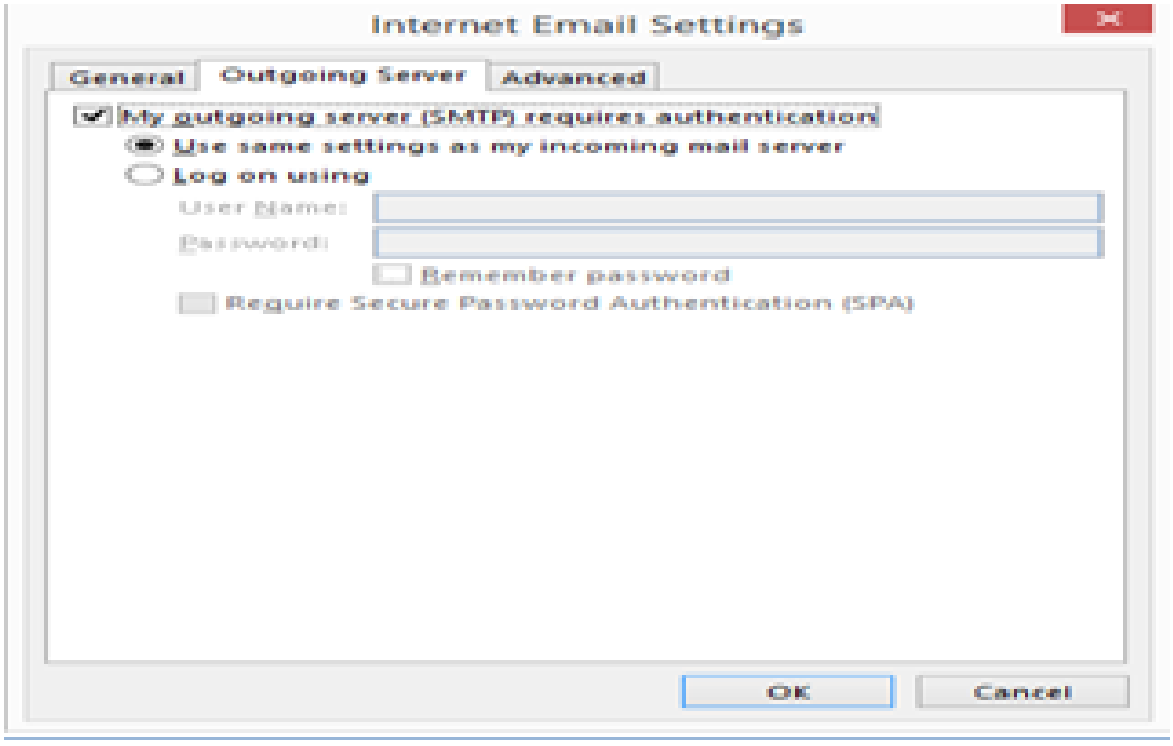


(Step-1)

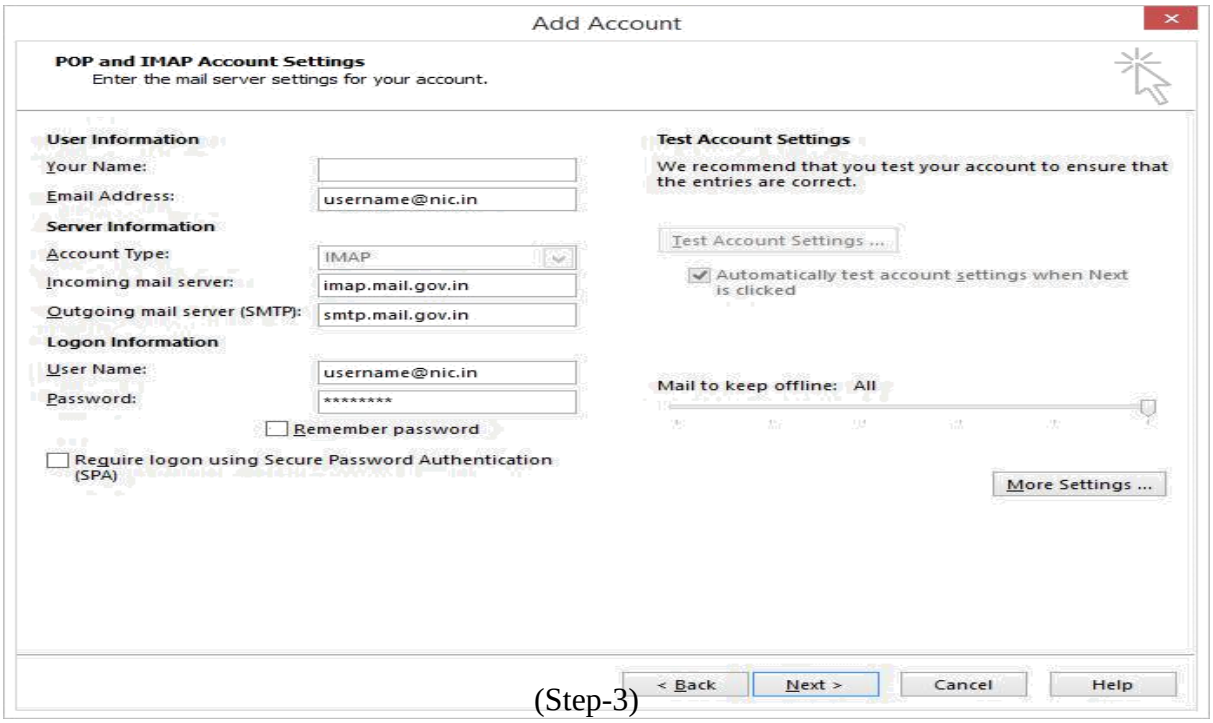
IV. Screenshots for IMAP Configuration in MicrosoftOutlook



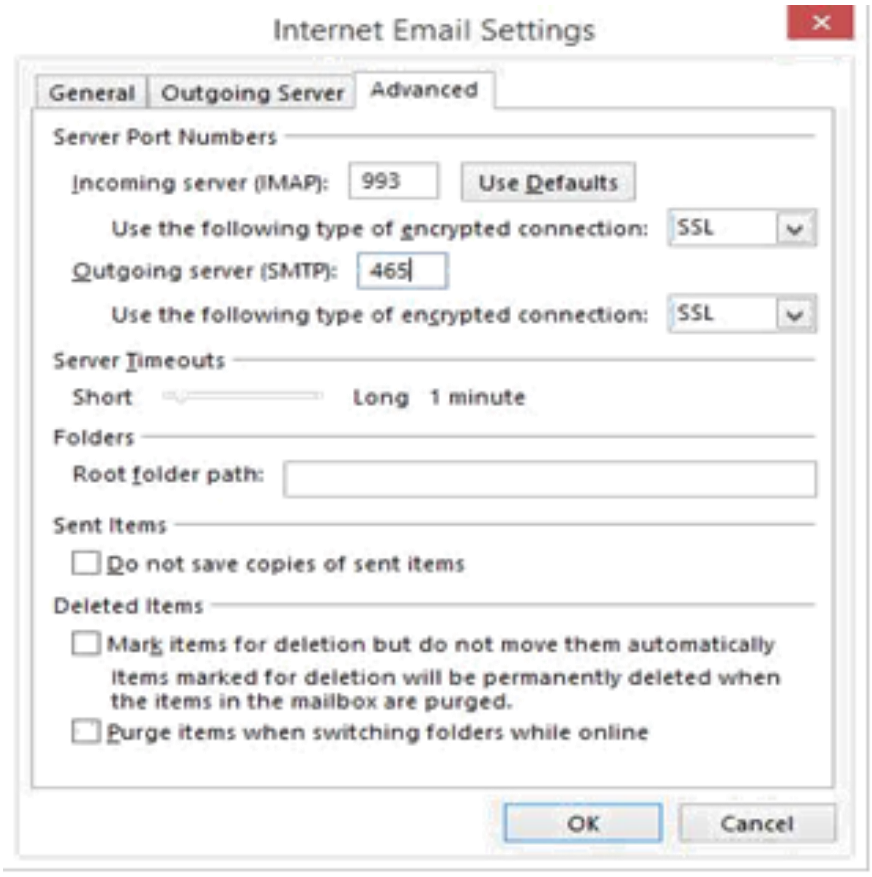
(Step-1)



(Step-2)

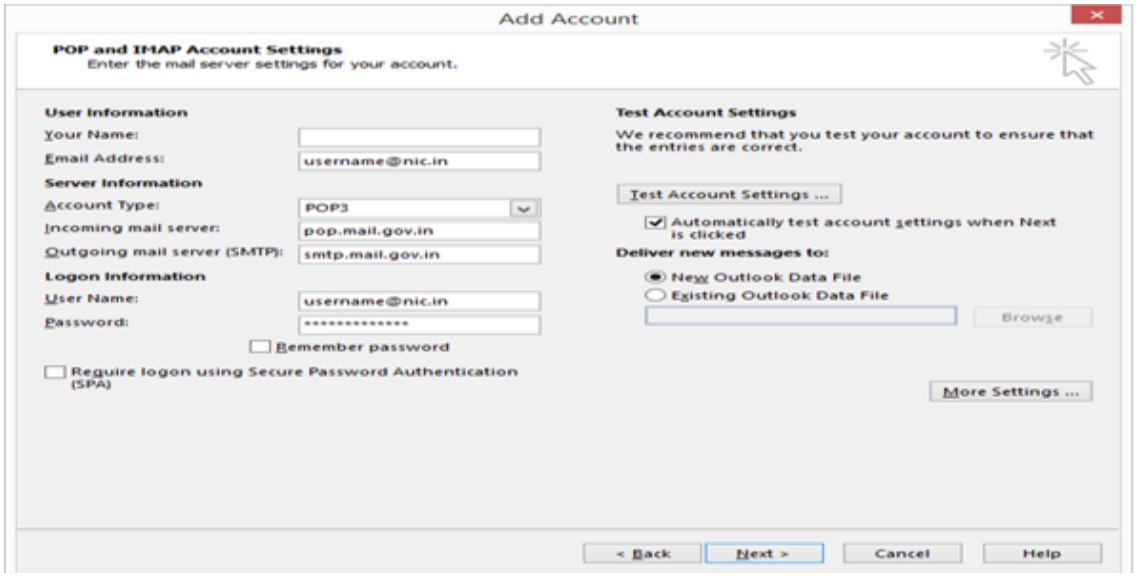

Add Account
POP and IMAP Account Settings
Enter the mail server settings for your account.
User Information
Your Name:
Email Address:
username@nic.in
Server Information
Account Type:
IMAP
Incoming mail server:
imap.mail.gov.in
Outgoing mail server (SMTP):
smtp.mail.gov.in
Logon Information
User Name:
username@nic.in
Password:
****
Remember password
Require logon using Secure Password Authentication (SPA)
Test Account Settings
We recommend that you test your account to ensure that the entries are correct.
Test Account Settings ...
Automatically test account settings when Next is clicked
Mail to keep offline: All
More Settings ...
< Back
Next >
Cancel
Help

(Step-3)

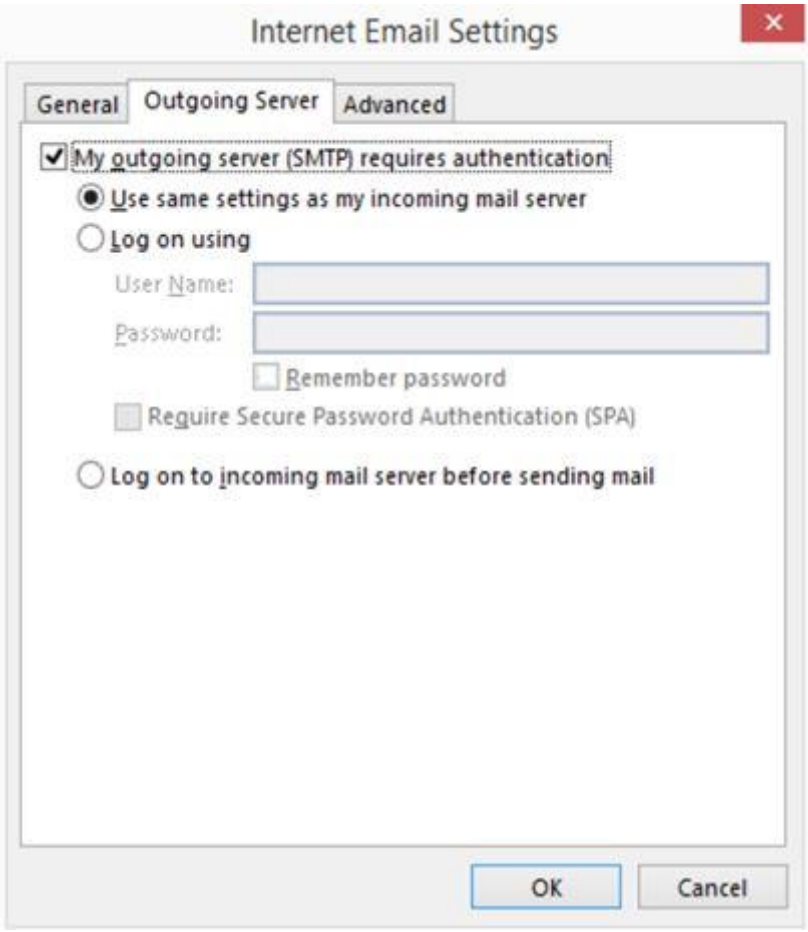

Internet Email Settings
General
Outgoing Server
Advanced
Server Port Numbers
Incoming server (IMAP):
993
Use Defaults
Use the following type of encrypted connection:
SSL
Outgoing server (SMTP):
465
Use the following type of encrypted connection:
SSL
Server Timeouts
Short
Long
1 minute
Folders
Root folder path:
Sent Items
Do not save copies of sent items
Deleted Items
Mark items for deletion but do not move them automatically
Items marked for deletion will be permanently deleted when the items in the mailbox are purged.
Purge items when switching folders while online
OK
Cancel

(Step-4)

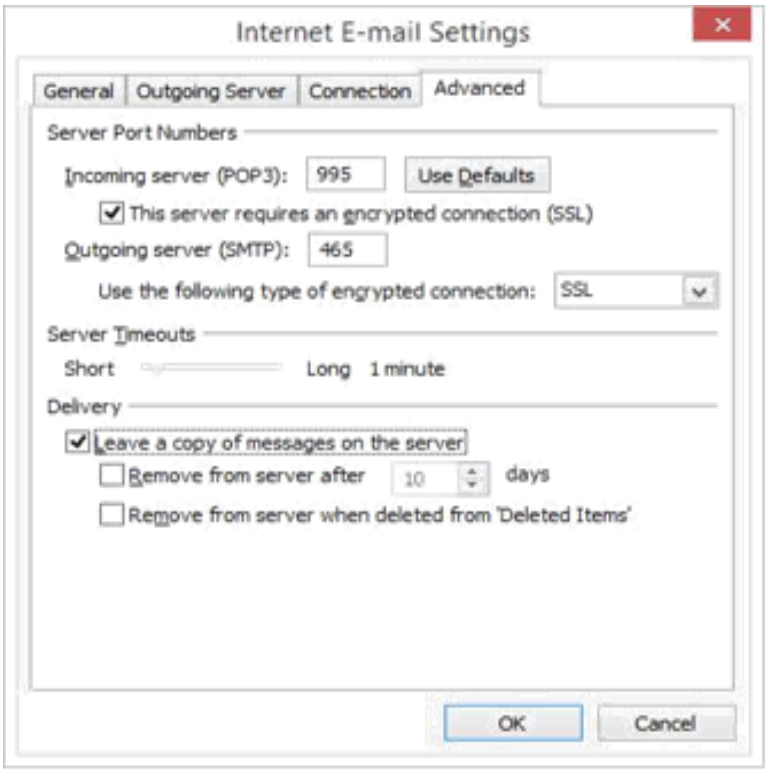
V. Screenshots for POP3 Configuration in Microsoft Outlook



(Step-1)



(Step-2)



(Step-3)

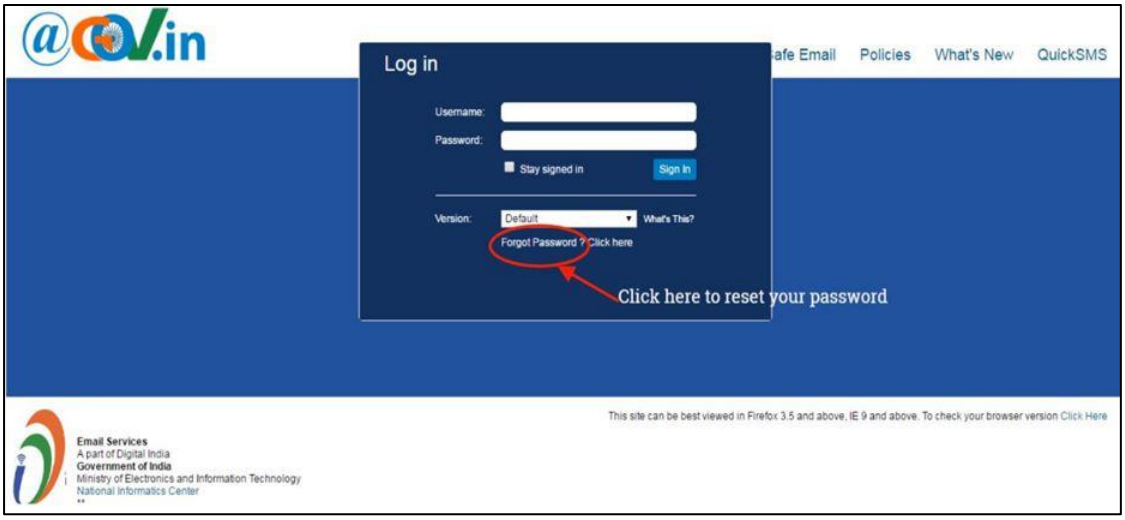
Note: - Please fill all the required fields as directed and if you require any help contact support on **1800-111-555 (Toll Free)** for help.

4. Reset your password

a. How to reset password

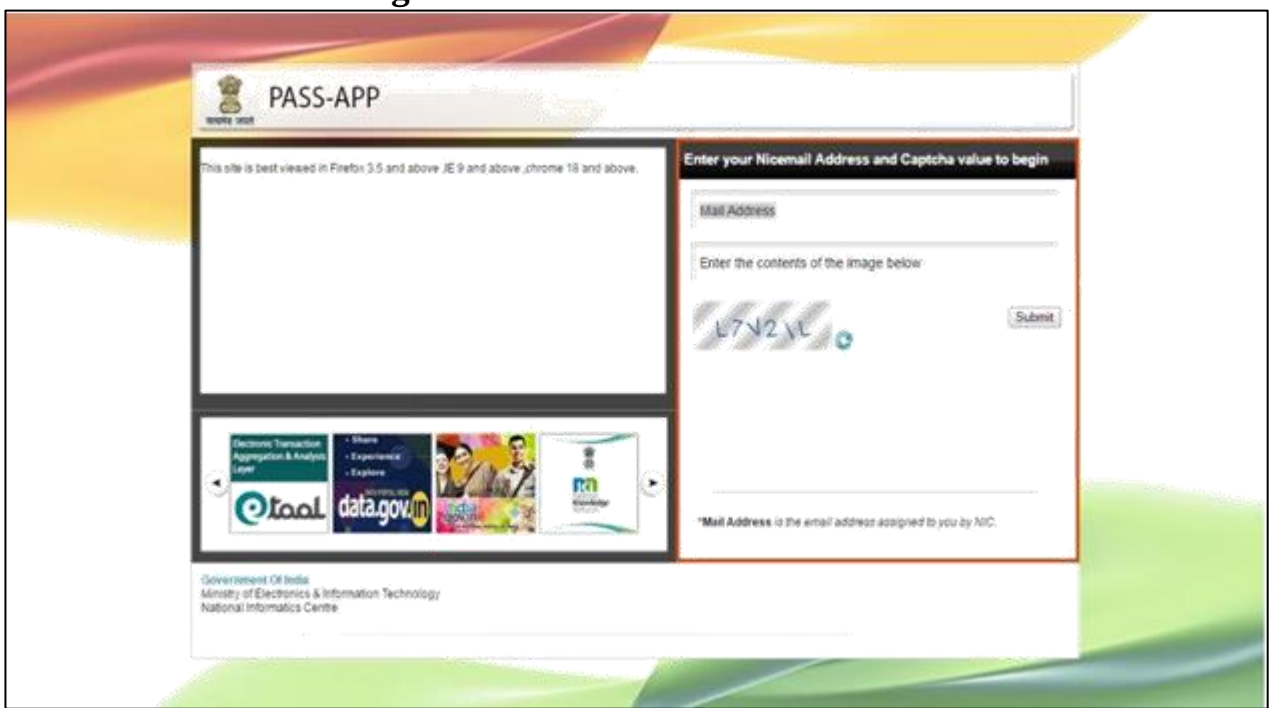
Please ensure that you mobile number is updated. If you have forgotten your password, click on forgot password on the login page of email.gov.in. You will be redirected to **PASS-APP** or follow the URL https://passapp.emailgov.in/. Using this application you can reset your password.

Fig C.25: Resetting password



You will be redirected to PASS-APP to reset your password.

Fig C.26: Redirection to PASS-APP

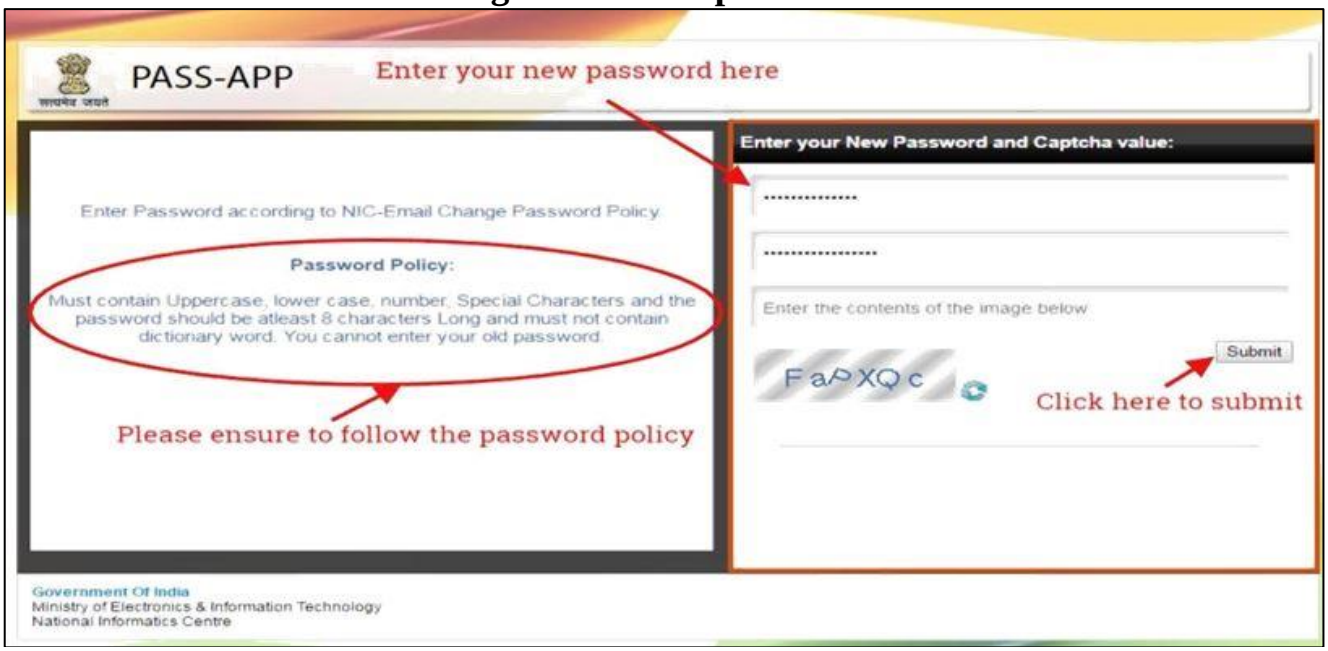


i. Enter the email address for which you wish to reset your password.

ii. Also, enter the Captcha value as displayed in the box.

iii. Click on submit button to proceed further.

Fig C.27: Enter password



Enter the random number which is sent to your mobile number. You can also resend OTP if not received at once (** Random number will be generated twice in 24 hours)

Now, enter the Captcha value and confirm your submission.

Now you will be redirected to a page which will prompt you to enter your new password twice. Enter the Captcha value to confirm.

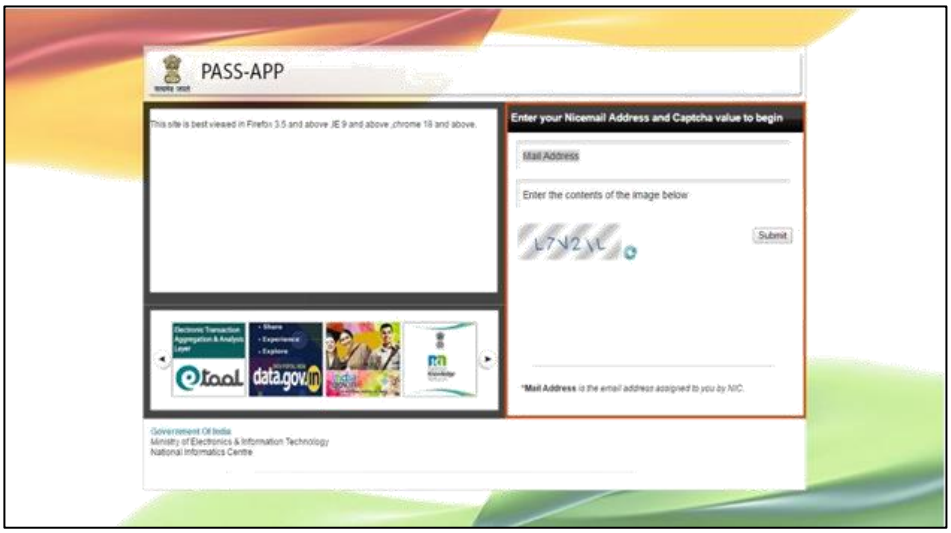


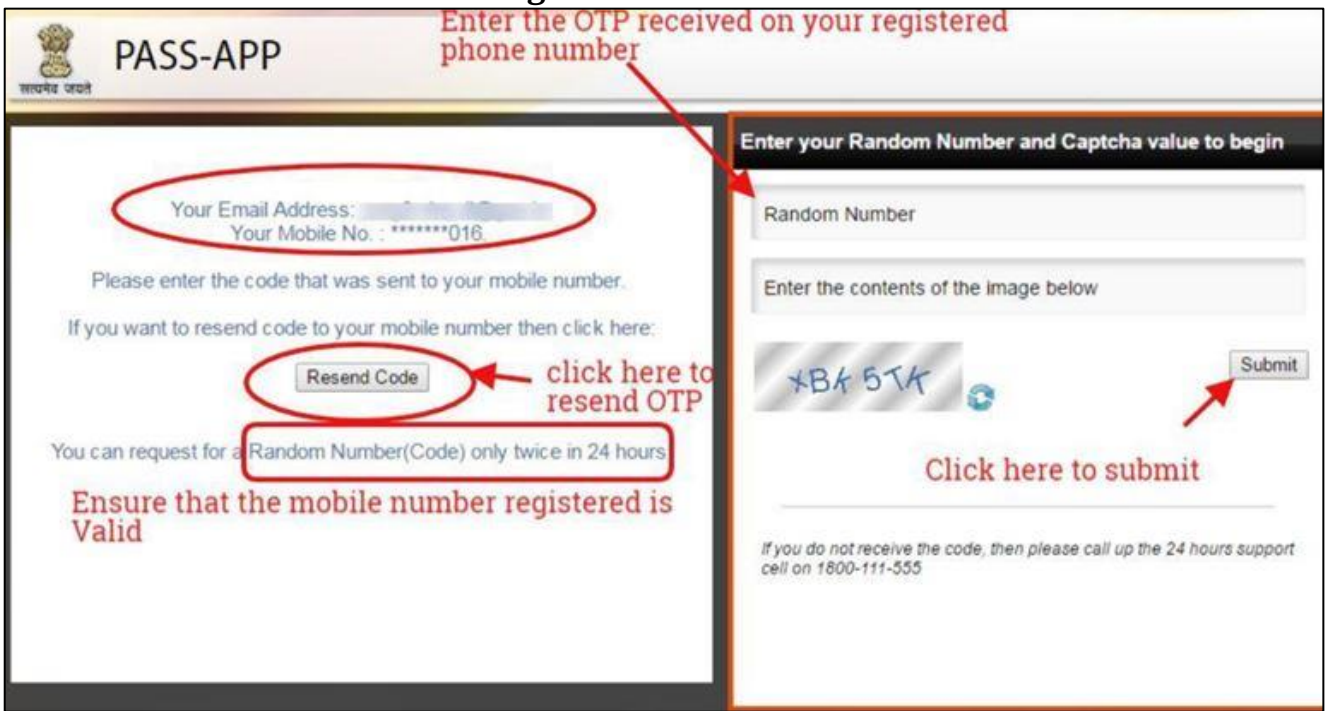
Fig C.28: Enter Captcha words

i. Enter the email address for which you wish to reset your password.

ii. Also, enter the Captcha value as displayed in the box.

iii. Click on submit button to proceed further.

Fig C.29: Enter OTP

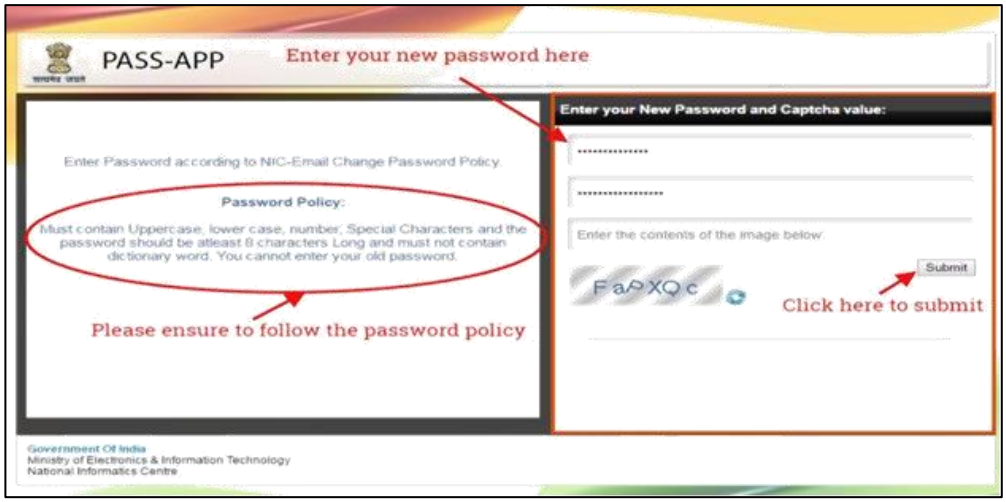


Enter the random number which is sent to your mobile number. You can also resend OTP if not received at once (** Random number will be generated twice in 24 hours)

Now, enter the Captcha value and confirm your submission.

Now you will be redirected to a page which will prompt you to enter your new password twice. Enter the Captcha value to confirm.

Fig C.30: Read password policy

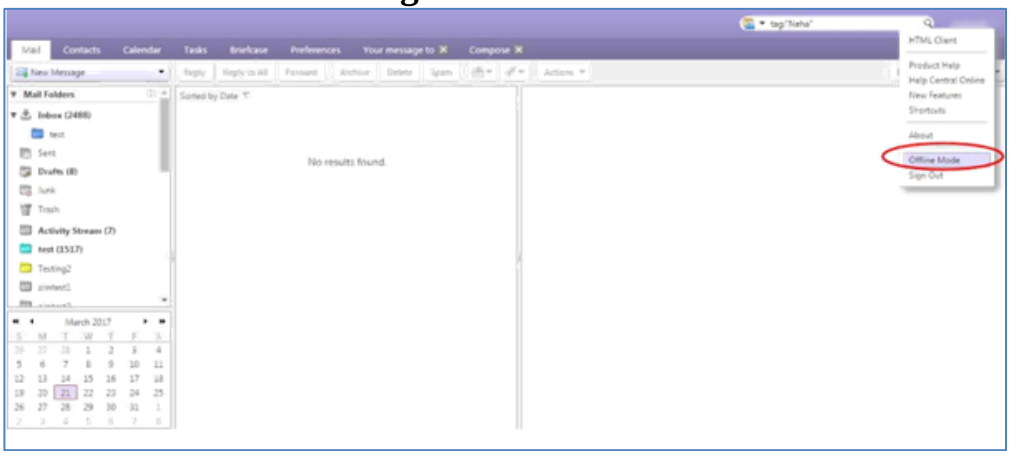


You must follow the password policy as prompted to reset your password.

5. Offline Mode

- This feature allows you to access the data without network connectivity.
- The web client will be automatically restored to online mode when network connectivity is in transition.
- The work performed in offline mode is stored in cache and synched with the server when restored to online mode.

Fig C.31: Offline Mode



Note: -For any issues please contact support at **1800-111-555(toll free)** or email at: support@gov.in

PRACTICE QUESTIONS

Q1: Create a power point presentation of 3 slides on “Uses of Internet” that contain header with images, apply animation on the images.

Q2: Make Power Point presentation on "Disadvantages of Internet" and then apply transition effects (such that while going from one slide to another there is a transition).

Q3: Prepare the presentation about advantage and disadvantage of Television of at least 3 slides and when the slideshow starts from beginning, second slide will display after 30 seconds without clicking mouse and using keyboard.

Q4: Create a Power point presentation of 3 slides on your “department.

Q5: Make a Power point Presentation of 3 Slides on the topic "Indian Army", apply the animation on the texts and use WordArt for Heading "Indian Army".

D. PROGRAMMING CONCEPT OF C/C++/JAVA/PYTHON

1. Introduction

What is Programming Language?

A programming language is a formal language, which comprises a set of instructions that produce various kinds of output. Programming languages are used in computer programming to implement algorithms. Motive of all programming languages is software development but what matters is that how rapidly, reliable and secure software can be developed using some particular programming language. To improve the development process and overcome the problems of Machine and Assembly language, timely new languages were developed like C, C++, Fortran, Java etc.

What is Java?

Java is a programming language and computing platform. Nowadays there are lots of applications and websites that will not work unless you have Java installed, and more are created every day. Java is fast, secure, and reliable. From laptops to datacenters, game consoles to scientific supercomputers, cell phones to the Internet, Java is everywhere!

It was developed by James Gosling and Patrick Naught on in 1991 at Sun Microsystems for their internal use but later it was released for public us in 1995.

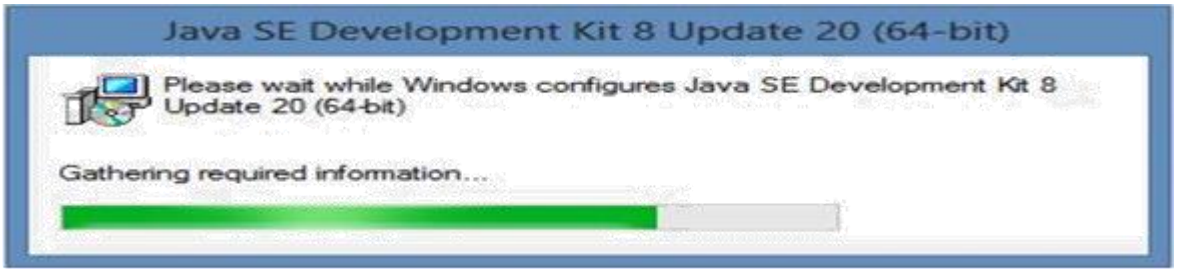
Java got so much popular because of its key feature "Platform Independence". Java application can be installed and run on different platforms because its architecture is not tied to any particular OS.Java was acquired by Oracle Corporation in 2010

Installing Java

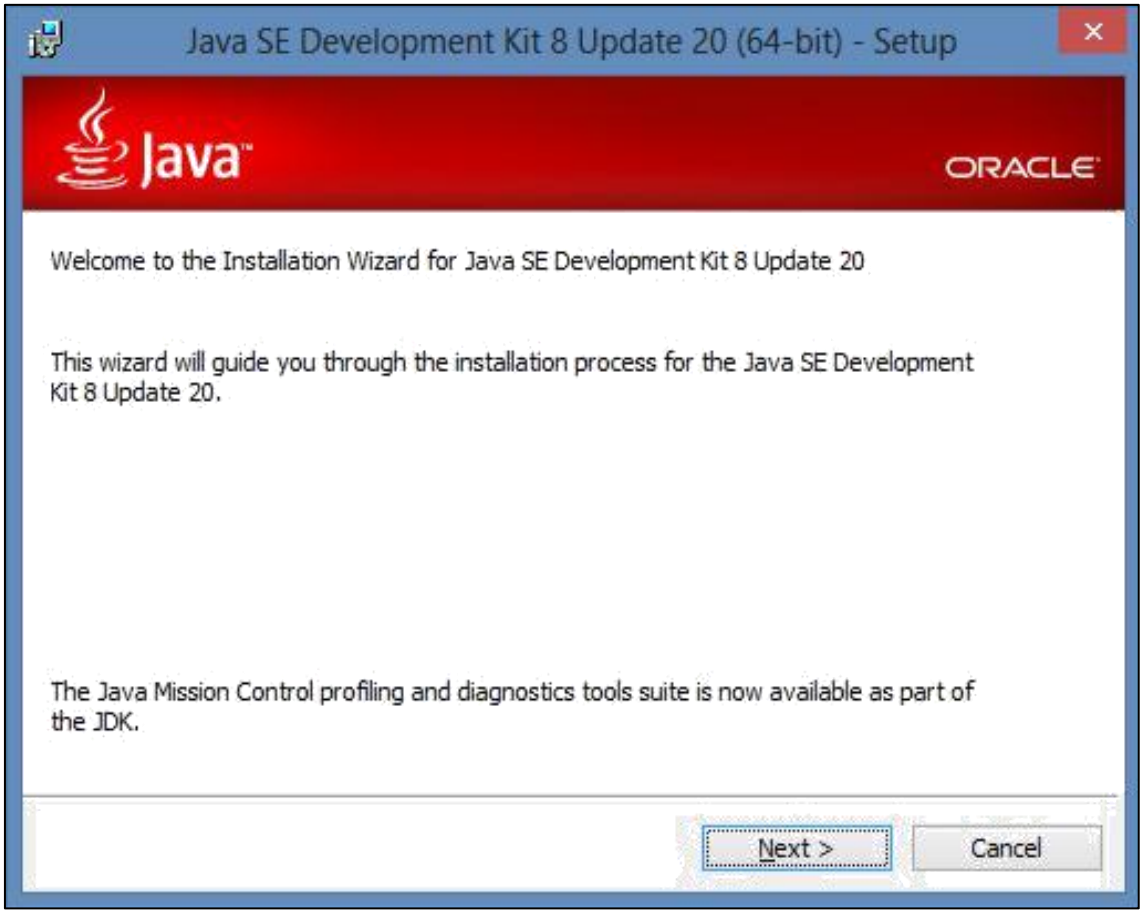
Installing Java on MS-Windows, Mac, Linux or Solaris is a simple process. All you need to download Java Distribution Unit and run that Distribution file just by double clicking on that file. During installation, you will see several screens that will help you to configure installation.

Step 1

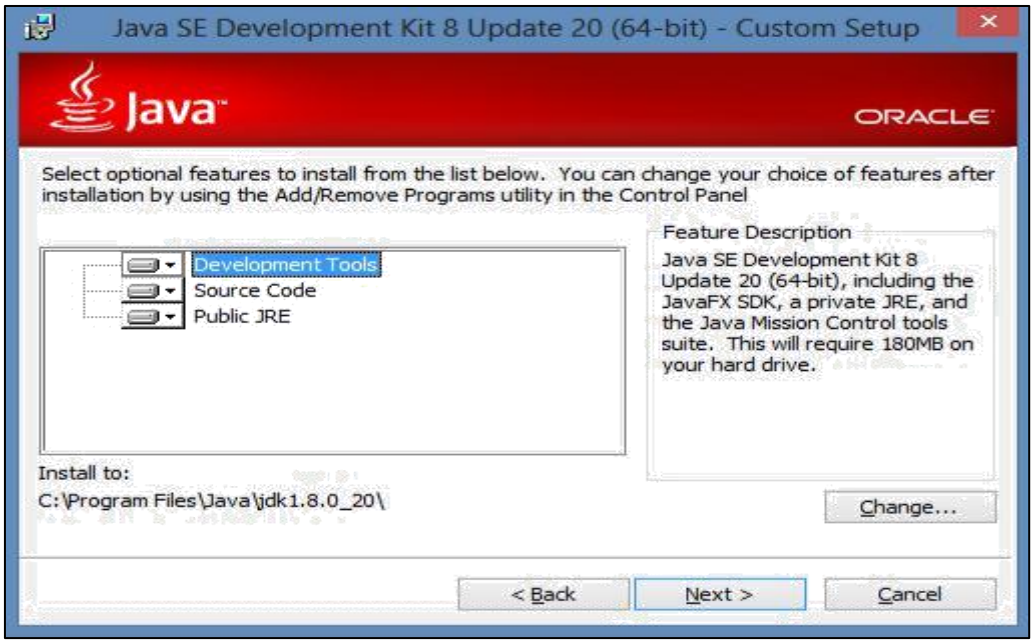
You will see following screen after double click on Java Distribution file. Installer will unpack distribution unit and gather required files.



Step 2
Click “Next” button

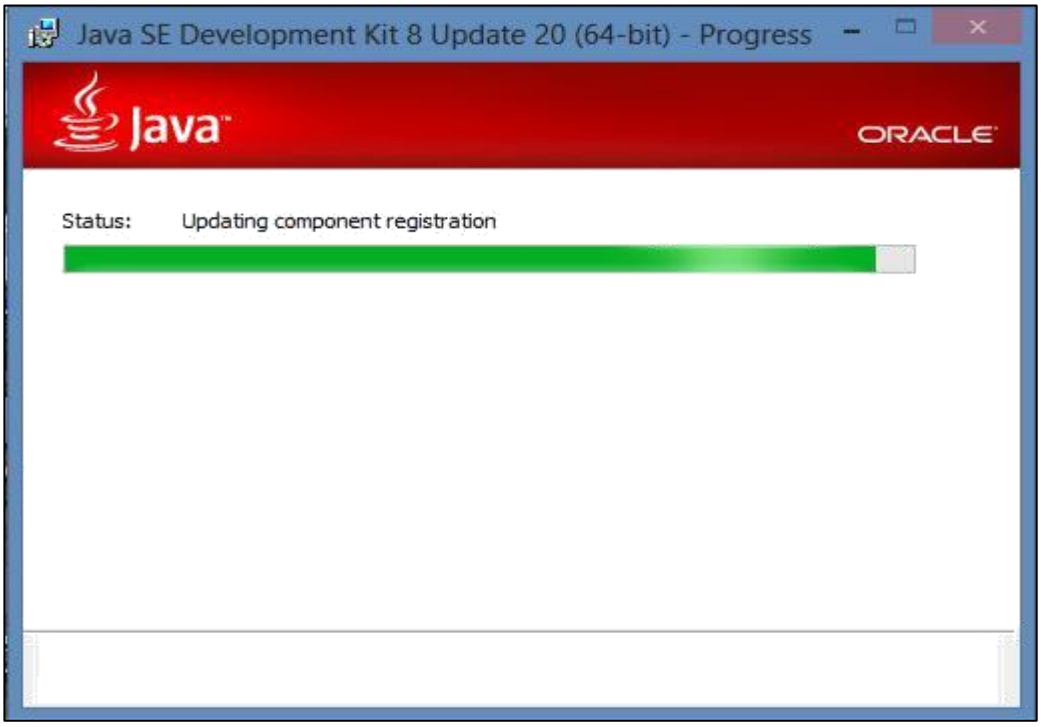


Step 3
This screen allows you to choose components that you want to install. By default all components are selected and we just need to click “Next”



Step 4

This screen shows the progress of components updating so you have to wait for a few minutes.



Step 5

This screen allows you to change installation folder. If you want to change location, click Change button and select preferred folder otherwise you can click “Next” button.



Step 6
This dialog shows progress of Java installation. It also takes time so again sit relax.



Step 7
This screen shows that java has been installed successfully. So just click on “Close” button to finish the setup process.

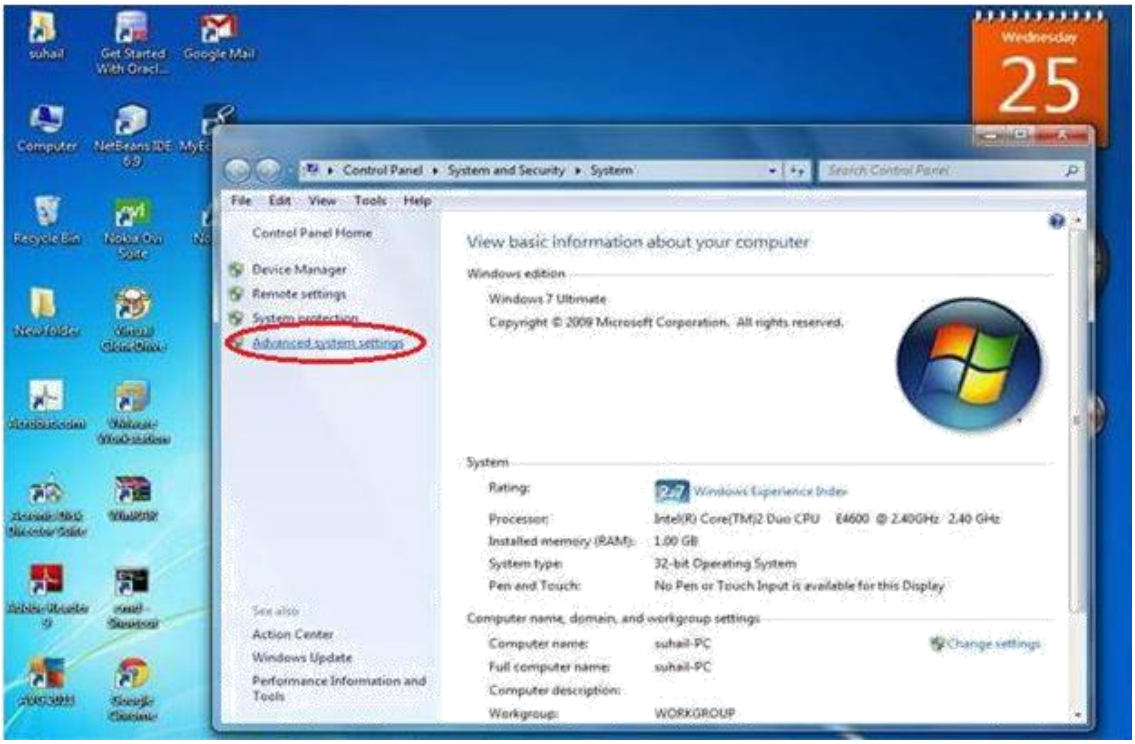


Once you have installed Java and want to write and run some programs, you must do some configurations. Do following steps.

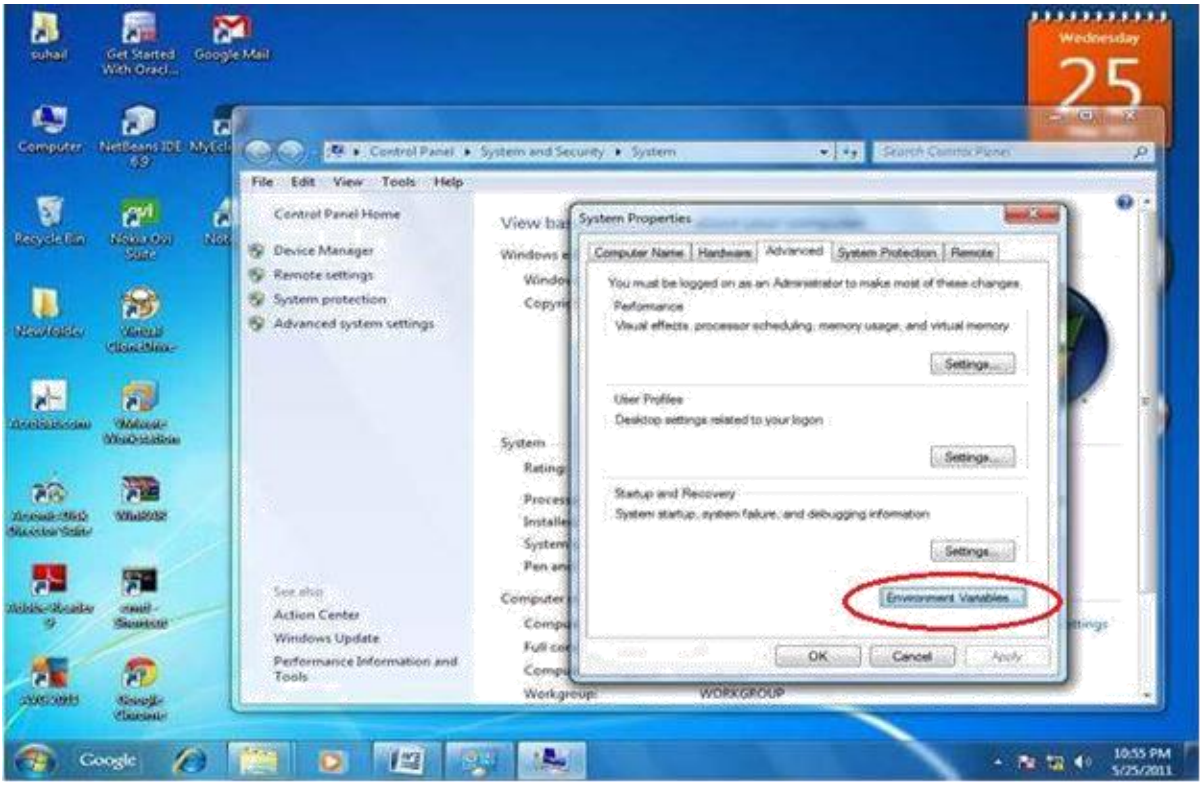
- Open My Computer Properties



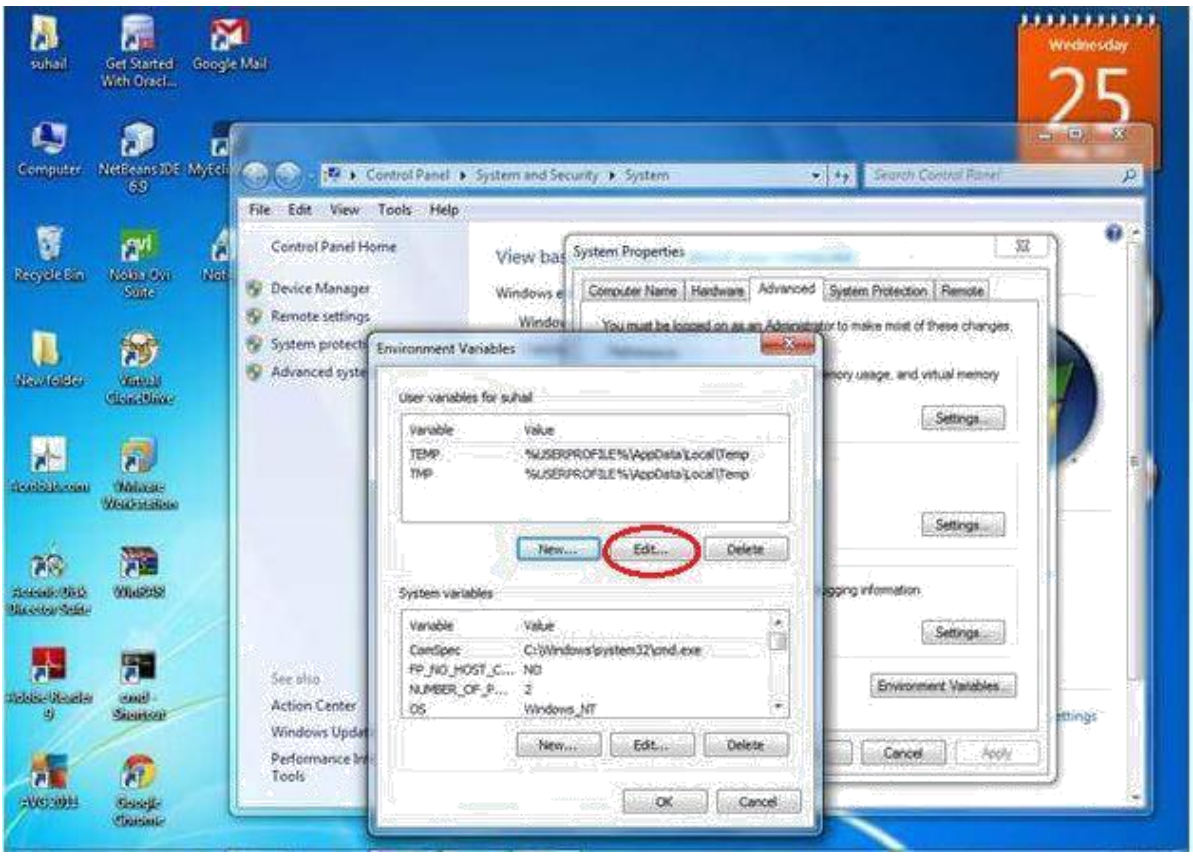
- Click "Advanced System Settings"



- **Click on “Environment Variables”**

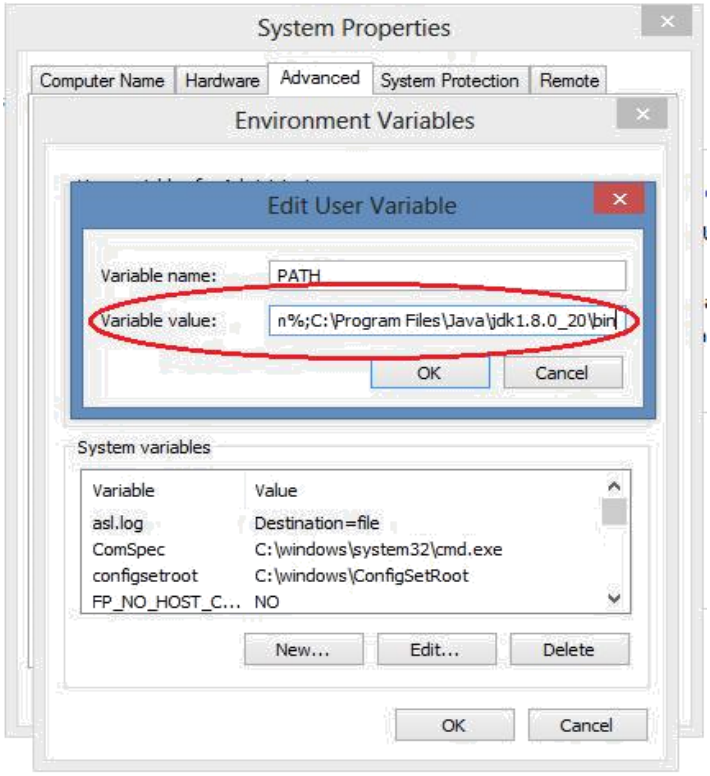


- **Select Path from first list and Click on “Edit” button under “User variables”**



Now type or paste java binary files' path in Variable value and click "Ok" button. Do not remove pre-filled value. Just put Semi-colon (;) and then type or paste your path.

Fig C.32:Type in variable value



Programming Terminology

Program – Every program is set of instructions that is used to instruct to computer that what, when and how to perform certain task. Every program takes input from user, processes that input and gives output.

Variable – A variable is a name given to memory location where some value is stored. During execution, variables hold inputs. Variables must be declared before use and there are some naming conventions for variables or other entities like

- Variable name must start with an alphabet or an underscore
- Variable name cannot contain space
- Variable name cannot contains special symbol except underscore
- Keywords cannot be used as variable names
- Variable name must be unique in its scope

Keywords – Keywords are those words whose meaning is defined to programming language and they cannot be used in any other context. In simple words, keywords are reserved words.

Operators – set of symbols are known as operators. Each operator performs specific task. E.g. + symbol is known as Addition operator. It adds two numbers or concatenates two strings. There are various operators that are categorized into various categories like

- Arithmetic Operators

+ Addition

- Subtraction

* Multiplication

/Division

% Modules/Remainder

- Logical Operators

&& AND

||OR

!NOT

- Comparison or Relational

Operators > Greater Than

>= Greater than or Equal To

< Less Than

<= Less Than or Equal To

- Assignment Operators

+= Add and Assign

-= Subtract and Assign

/= Divide and Assign

*= Multiply and Assign

2. Data Types

Data Types are used to specify that what kind of value a variable can store. Data type reserves memory for a variable. While declaring a variable, we must specify data type. Data type allocates memory for variable as well as specifies that what are valid operations that can be perform on it. Java has an extensive set of data types like

- byte
- short
- int
- long
- float
- double
- char
- String
- Boolean
- Object

Let's write simple Java program step by step

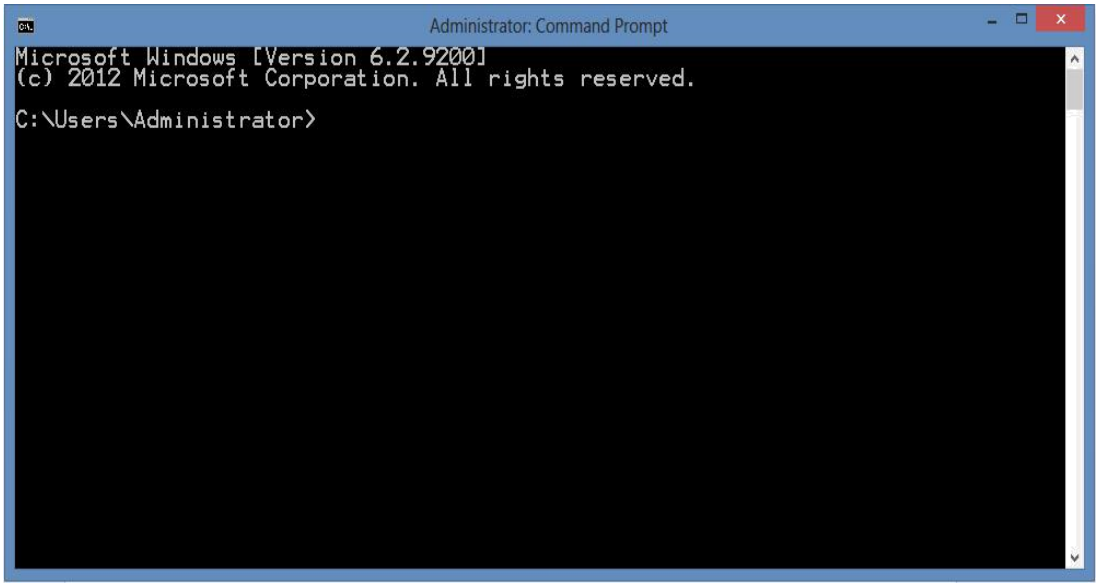
1. Open NotePad editor and write following program

```
class first
{
   public static void main(String[] args)
   {
            System.out.println("This is my first program of Java");
   }
}
```

2. Now save your program as "first.java" in "JPrograms" folder under C: drive
3. Open "Command Prompt" by typing CMD in search box of Windows OS

* Your command prompt will look something like this:

Fig C.33: Open Command prompt



4. Type CD\ and press "Enter" key to come out from folders
5. Now type <CD JPrograms> and press "Enter" key (don't use angle brackets)
6. Type following command at Command Prompt

Set path=c:\program files\java\jdk1.8.0_20\bin

* There could be different version of Java installed on your system. Try to copy this path from explorer rather than typing it yourself.

7. Type "javac first.java" to compile your first program
8. When your program compile and your want to run it, type "java first" and press enter key.

3. Control Statements

Control Statements are used to control flow of program execution.

Decision Control Structure

Decision Control structure is used decide that particular part of code will work or not. To accomplish this task IF and ELSE blocks are used. Using IF, we can specify some condition and code runs only when specified condition is satisfied.

```
If (condition)
{
   code
}
else
{
   code
}
```

Decision Control Structure program

```
Import java.util.Scanner;
class dec1
{
   public static void main(String[] args)
   {
            Scanner scr = new Scanner(System.in);

            System.out.print("Enter your age ");
            int age = scr.nextInt();

            if (age>=18)
            {
                  System.out.print("You are eligible for voting");
            }
            else
            {
                  System.out.print("You cannot vote");
            }
   }
}
```

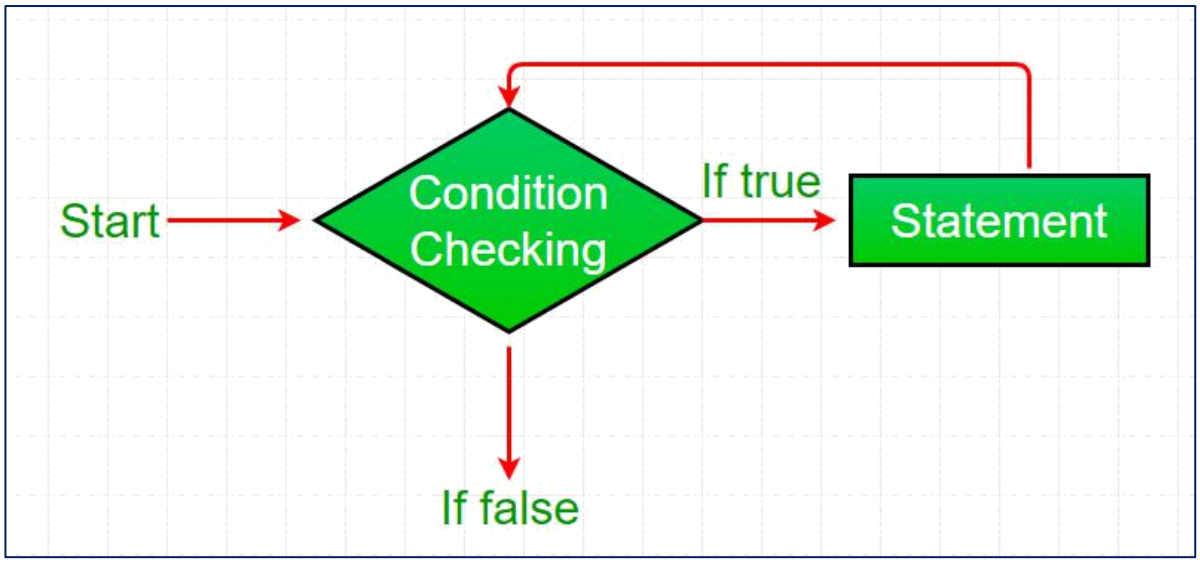
Looping Control Structure

Looping Control Structure is used to repeat a statement or set of statements. It is a feature which facilitates the execution of a set of instructions/functions repeatedly while some condition evaluates to true. Java provides three ways for executing the loops. While all the ways provide similar basic functionality, they differ in their syntax and condition checking time.

1. **while loop**: **A** while loop is a control flow statement that allows code to be executed repeatedly based on a given Boolean condition. The while loop can be thought of as a repeating if statement.

Syntax :

```
while (Boolean condition)
{
    Statements to be repeated
}
```



- While loop starts with the checking of condition. If it evaluated to true, then the loop body statements are executed otherwise first statement following the loop is executed. For this reason it is also called Entry control loop
- Once the condition is evaluated to true, the statements in the loop body are executed. Normally the statements contain an update value for the variable being processed for the next iteration.

When the condition becomes false, the loop terminates which marks the end of its life cycle.

4. Control Statements

Control Statements are used to control flow of program execution.

Decision Control Structure

Decision Control structure is used decide that particular part of code will work or not. To accomplish this task IF and ELSE blocks are used. Using IF, we can specify some condition and code runs only when specified condition is satisfied.

```
If (condition)
{
   code
}
else
{
   code
}
```

Decision Control Structure program

```
Import java.util.Scanner;
class dec1
{
   public static void main(String[] args)
   {
            Scanner scr = new Scanner(System.in);

            System.out.print("Enter your age ");
            int age = scr.nextInt();

            if (age>=18)
            {
                  System.out.print("You are eligible for voting");
            }
            else
            {
                  System.out.print("You cannot vote");
            }
   }
}
```

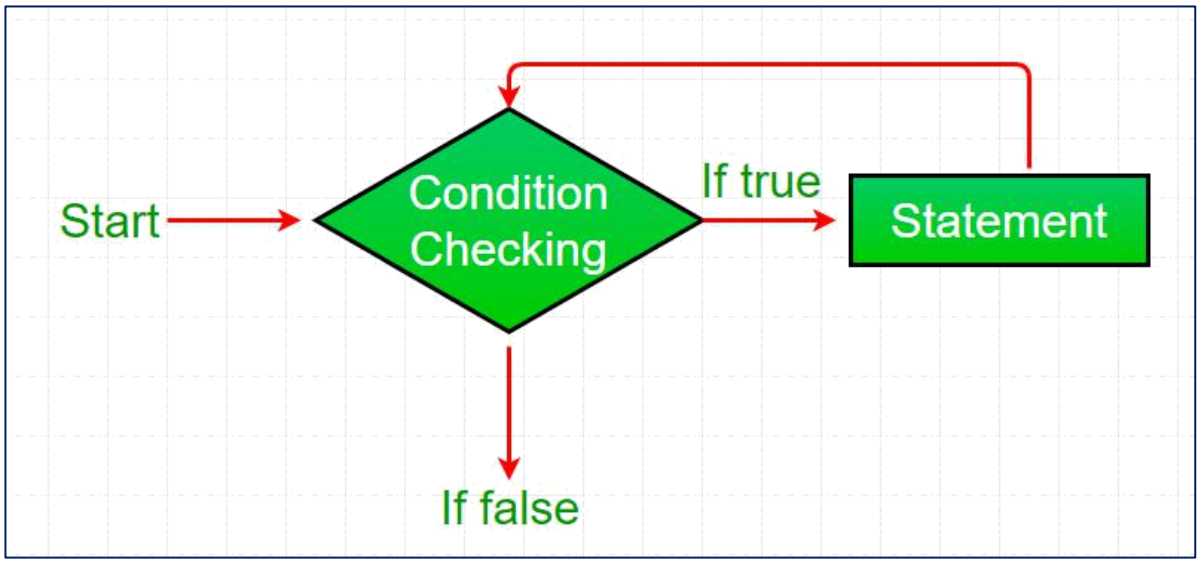
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Syntax :

```
while (Boolean condition)
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}
```



- While loop starts with the checking of condition. If it evaluated to true, then the loop body statements are executed otherwise first statement following the loop is executed. For this reason it is also called Entry control loop
- Once the condition is evaluated to true, the statements in the loop body are executed. Normally the statements contain an update value for the variable being processed for the next iteration.

When the condition becomes false, the loop terminates which marks the end of its life cycle.

```
// Java program to illustrate while loop
Classw hileLoop Demo
{
    Public static void main(String args[])
    {
        Int x = 1;

        while(x <= 4)
        {
            System.out.println("Value of x:"+ x);

            x++;
        }
    }
}
```

2. **for loop:** for loop provides a concise way of writing the loop structure. Unlike a while loop, a for statement consumes the initialization, condition and increment/decrement in one line thereby providing a shorter, easy to debug structure of looping.

   Syntax:

   for(initialization; Boolean condition; increment/decrement)
   {
   Statements to be repeated
   }

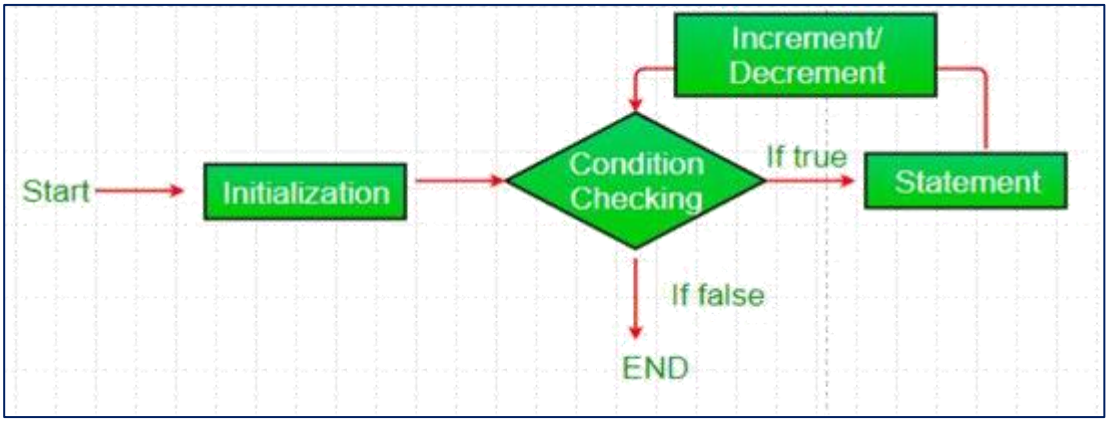
- Initialization condition: Here, we initialize the variable in use. It marks the start of a for loop. An already declared variable can be used or a variable can be declared, local to loop only.
- Testing Condition: It is used for testing the exit condition for a loop. It must return a Boolean value. It is also an Entry Control Loop as the condition is checked prior to the execution of the loop statements.

- Statement execution: Once the condition is evaluated to true, the statements in the loop body are executed.
- Increment/ Decrement: It is used for updating the variable for next iteration.
- Loop termination: When the condition becomes false, the loop terminates marking the end of its life cycle.

```
// Java program to illustrate for loop.
Class for Loop Demo
{Public static void main(String args[])
    {
        for (int x = 2; x <= 4; x++)
            System.out.println("Value of x:"+ x);
    }}
```

3. **Do While** : do while loop is similar to while loop with only difference that it checks for condition after executing the statements, and therefore is an example of **Exit Control**

   do
   {Statements to be repeated}
   While(Boolean condition);



- Do while loop starts with the execution of the statement(s). There is no checking of any condition for the first time.
- After the execution of the statements, and update of the variable value, the condition is checked for true or false value. If it is evaluated to true, next iteration of loop starts.
- When the condition becomes false, the loop terminates which marks the end of its life cycle.

- It is important to note that the do-while loop will execute its statements at least once before any condition is checked, and therefore is an example of exit control loop.

```
// Java program to illustrate do-while loop
Class do while loop Demo
{
    Public static void main(String args[])
    {
        Int x = 21;
        do
        {
            System.out.println("Value of x:"+ x);
            x++;
        }
        while(x < 20);
    }
}
```

4. Java Functions/Methods

A function is a set of statements that performs specific task in a program. It is nothing more than named block of statements that can be called any number of times. A function can accept values as arguments from calling program and it can return some value to calling program as response. In Java functions must be written in a class. There are thousands of built-in funtions/methods and you can create your own as well.

Creating Method

Syntax

Modifier return Type name of Method (Parameter List) {

  // method body
}

- **Modifier** − It defines the access type of the method and it is optional to use.

- **Return Type** − Method may return a value.
- **Name of Method** − This is the method name. The method signature consists of the method name and the parameter list.

- **Parameter List** − The list of parameters, it is the type, order, and number of parameters of a method. These are optional, method may contain zero parameters.
- **method body** − The method body defines what the method does with the statements.

```
class fn1
{
 static void greet()
 {
        System.out.println("Welcome James");
 }
 public static void main(String[] args)
 {
        greet();
 }
}
```

Above program has a method named "greet" that greets to a person. You already know that program execution starts with "main" method. So we have called "greet" method.

PRACTICE QUESTIONS

1. Explain the concept of increment operator with code snippets.
2. Write a complete program explaining the increment and decrement operators in Java.
3. How to Declare a Variable in Java?
4. How to Assign a Value to Variable?
5. How Many Types Of Datatypes Are There In Java?
6. Write a program to print numbers from 1 to 10.
7. Write a program to calculate the sum.

E. Internet and its Applications

What is the Internet?

- Internet is a world-wide global system of interconnected computer networks.
- Internet uses the standard Internet Protocol (TCP/IP).
- Every computer in internet is identified by a unique IP address.
- IP Address is a unique set of numbers (such as 110.22.33.114) which identifies a computer location.
- A special computer DNS (Domain Name Server) is used to give name to the IP Address so that user can locate a computer by a name.
- For example, a DNS server will resolve a name http://www.tutorialspoint.com to a particular IP address to uniquely identify the computer on which this website is hosted.
- Internet is accessible to every user all over the world.

Applications of the internet:

- Sending and receiving email
- Searching and browsing information archives
- Copying files between computers
- Conducting financial transactions
- Navigating (in your car, smart scooter, smart bike, or other)
- Playing interactive games
- Video and music streaming
- Chat or voice communication (direct messaging, video conferencing)

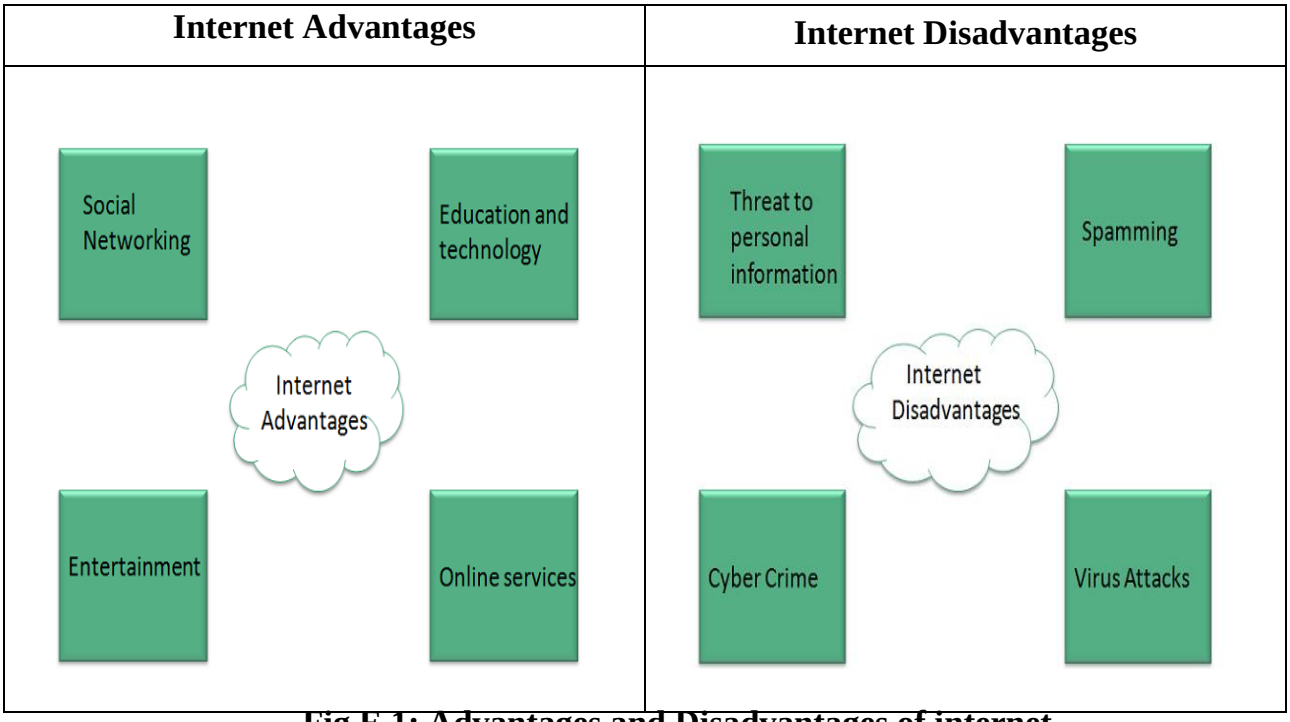


Fig E.1: Advantages and Disadvantages of internet

Features of Browsers with add-ons and plug-ins

- A web browser, or simply "browser," is an application used to access and view websites.
- Common web browsers include Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari.
- A plug-in, add-on, or extension are generally the same thing; a software component that adds a feature to an existing computer program.
- A browser plug-in expands a web browser's functionality by installing specific toolbars, adding buttons, links, or other useful functions, like pop-up blocking.

Basic Internet Terminologies

World Wide Web

World Wide Web or www is a collection of data stored and shared in the digital space. This collection of information form and connect into websites and divides into web pages.

Host (Network)

A Network Host is usually a computer or any device that connects to a computer network. It provides information and facilities to other computers and their users.

Web Browser

A web browser or browser is a software program that can access websites. Popular web browsers include Google Chrome, Apple's Safari, Internet Explorer and Mozilla Firefox.

Domain Name

This is a friendly naming system for giving addresses to web pages and servers. It is a description of a computer's location on the Internet. Usually, a dot separates a domain name, for example, www.google.com

IP Address

IP address identifies a device on the Internet communication network.

Homepage

A Homepage is the main page of a particular website. Usually, this is the first page you see when you open a website.

Search Engine

Search Engine is a software system that works to search information on the World Wide Web. Common examples of online search engines are Google, Yahoo, and Bing.

URL

Uniform Resource Locators—URLs—are the web browser addresses of internet pages and files. With a URL, you can locate and bookmark specific pages and files in a web browser. The format of a URL resembles this:

http://www.examplewebsite.com/mypage

For eg. - https://web.whatsapp.com/

HTTP and HTTPS

HTTP is the acronym for Hypertext Transfer Protocol, the data communication standard of web pages. When a web page has this prefix, the links, text, and pictures should work correctly in a web browser.

HTTPS is the acronym for Hypertext Transfer Projtocol Secure. This indicates that the web page has a special layer of encryption added to hide your personal information and passwords from others.

HTML and XML

Hypertext Markup Language (HTML) is the programming language of web pages.

ISP

You need an internet service provider (ISP) to get to the internet. You may access a free ISP at school, a library, or work, or you may pay for a private ISP at home. An ISP is the company or government organization that plugs you into the vast internet.

E-Commerce

E-commerce is electronic commerce—the transactions of selling and buying online. Every day, billions of dollars exchange hands through the internet and the World Wide Web.

Encryption and Authentication

Encryption is the mathematical scrambling of data so that it is hidden from eavesdroppers. Authentication is directly related to encryption. Authentication is the complex way that computer systems verify that you are who you say you are.

Downloading

Downloading is a broad term that describes transferring something you find on the internet or the World Wide Web to your computer or another device. For example, you might want to download a new musical ringtone for your smartphone or download a trial copy of Microsoft Office.

Computer Network Types

A computer network is a group of computers linked to each other that enables the computer to communicate with another computer and share their resources, data, and applications.
A computer network can be categorized by their size. A computer network is mainly of four types:

- LAN(Local Area Network)
- PAN(Personal Area Network)
- MAN(Metropolitan Area Network)
- WAN(Wide Area Network)

LAN(Local Area Network)

- Local Area Network is a group of computers connected to each other in a small area such as building, office.
- LAN is used for connecting two or more personal computers through a communication medium such as twisted pair, coaxial cable, etc.
- It is less costly as it is built with inexpensive hardware such as hubs, network adapters, and ethernet cables.
- The data is transferred at an extremely faster rate in Local Area Network.
- Local Area Network provides higher security.

PAN(Personal Area Network)

- Personal Area Network is a network arranged within an individual person, typically within a range of 10 meters.
- Personal Area Network is used for connecting the computer devices of personal use is known as Personal Area Network.
- Personal computer devices that are used to develop the personal area network are the laptop, mobile phones, media player and play stations.

MAN (Metropolitan Area Network)

- A metropolitan area network is a network that covers a larger geographic area by interconnecting a different LAN to form a larger network.
- Government agencies use MAN to connect to the citizens and private industries.
- In MAN, various LANs are connected to each other through a telephone exchange line.
- The most widely used protocols in MAN are RS-232, Frame Relay, ATM, ISDN, OC-3, ADSL, etc.
- It has a higher range than Local Area Network (LAN).

WAN(Wide Area Network)

- A Wide Area Network is a network that extends over a large geographical area such as states or countries.
- A Wide Area Network is quite bigger network than the LAN.
- A Wide Area Network is not limited to a single location, but it spans over a large geographical area through a telephone line, fibre optic cable or satellite links.
- The internet is one of the biggest WAN in the world.
- A Wide Area Network is widely used in the field of Business, government, and education.

1. Google Drive

Google Drive is a file storage and synchronization service developed by Google. Launched on April 24th, 2012, Google Drive allows users to store files on their servers, synchronize files across devices, and share files. In addition to a website, Google Drive offers apps with offline capabilities for Windows and mac OS computers, and Android and iOS smart phones and tablets. Google Drive encompasses Google Docs, Sheets and Slides, an office suite that permits collaborative editing of documents, spreadsheets, presentations, drawings, forms, and more. Files created and edited through the office suite are saved in Google Drive.

Fig E.2: Google Drive Logo



2. Google Docs

Google Docs is a free Web-based application in which documents and spreadsheets can be created, edited and stored online. Files can be accessed from any computer with an Internet connection and a full-featured Web browser. Google Docs is a part of a comprehensive package of online applications offered by and associated with Google.

Users of Google Docs can import, create, edit and update documents and spreadsheets in various fonts and file formats, combining text with formulas, lists, tables and images. Google Docs is compatible with most presentation software and word processor applications. Work can be published as a Web page or as a print-ready manuscript. Users

can control who sees their work. Google Docs is ideal for publishing within an enterprise, maintaining blogs or composing work for viewing by the general public.

Fig E.3: Features of Google Docs



3. Google Forms

Google form is a free Google application that allows you to quickly create and distribute a form to gather information. Form responses are saved in a Google spreadsheet in Google drive.

- **Opening Google Forms**

Step 1. Open Google Chrome.

Step 2. Go tohttp://drive.google.com

Step 3. Enter your full UWW email address, then click **next.**

Step 4. Enter your UWW password,

then click **Sign in**.

You will now be signed into Google Drive.

Step 5. Select **New > More > Google Forms** From the available menu.

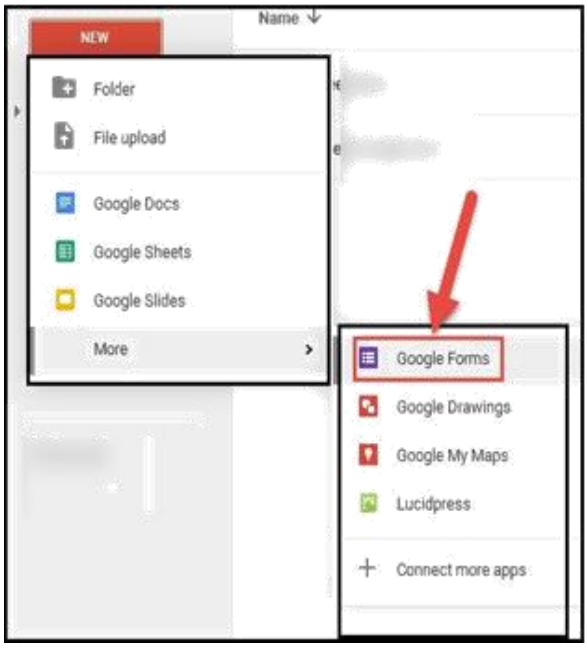


Fig E.4: Select Google Forms

- **Editing Google Forms**

Creating a New Form

Step 1.Select the type of form to create. You can create a blank form, a blank quiz, or select from a number of form templates.

Form Title

Enter a form title and description by clicking on the fields.



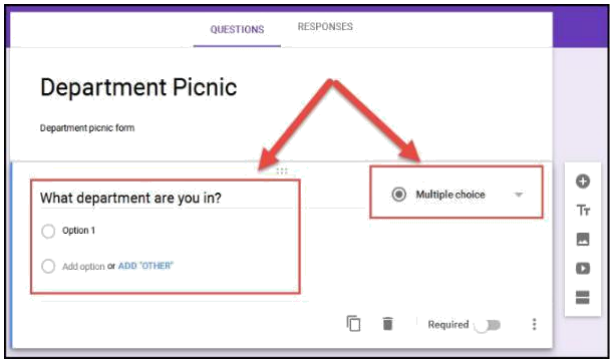
Fig E.5: Enter form title

Edit Questions

Step 1. Select"Untitled question" to enter

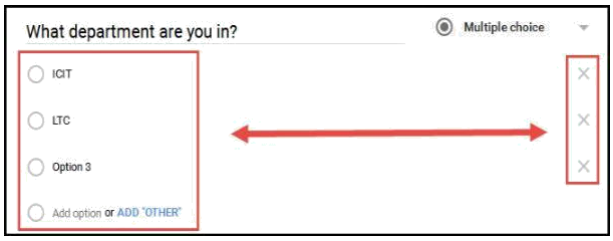
Your first question text.

Step 2. Use the dropdown to the right of the question to select the question type.



Step 3. Select each option to enter option text.

Step 4. Hit the "Enter" key to create a new option.



Note: Click the X to the right of each option to delete that option.

Note: Click the **Add Other** link to add an "Other" option to your list.

Add Questions

Step 1. Use the question toolbar to the right to add anew question, insert a new title and description, inset a picture, insert a video, or add a new section.

Step 2. Follow the steps above to edit the new question.

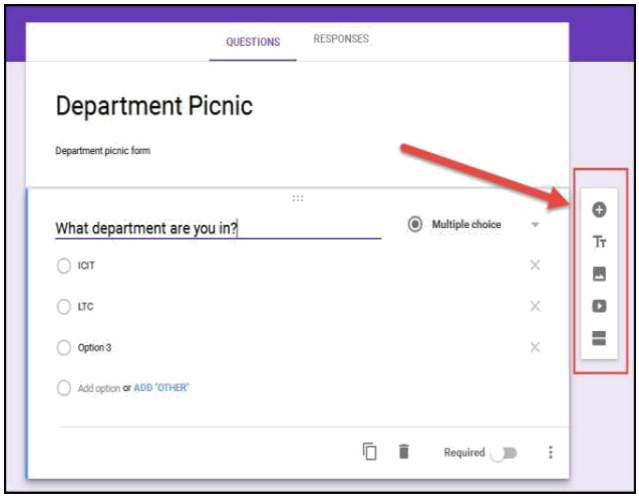


Fig E.6: Adding questions

Copy/Duplicate Question

Copying a question allows you to quickly add a new question with the same format as your current question.

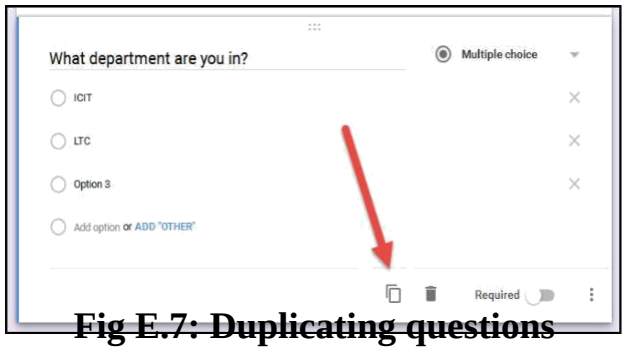


Fig E.7: Duplicating questions

Delete Questions

The delete button allows you to delete the selected question and options from the list.

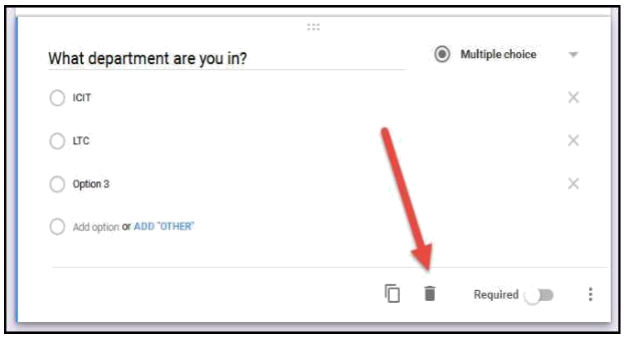


Fig E.8: Deleting questions

Required Questions

Select the “Required” button to make a question required.

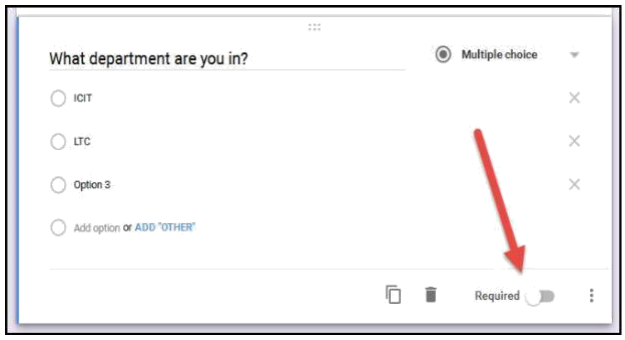


Fig E.9: Required questions

More Button

The ⋮ (More) button allows you to shuffle the order of questions and go to a new section based on a question answer.

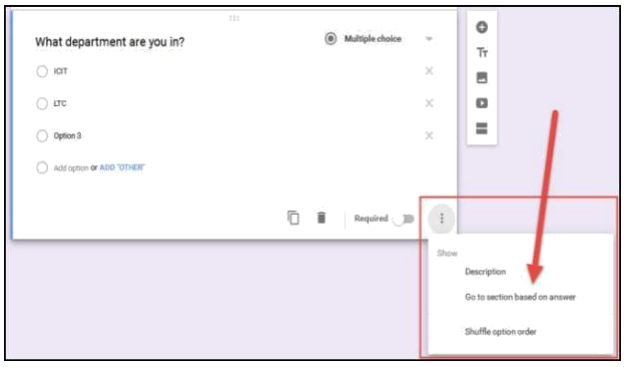


Fig E.10: More button

Form Colors/Themes

You can change the form color or theme by clicking the (Color Palate) button in the top right corner of the page.

Click the button to select a picture theme or upload your own background theme picture.

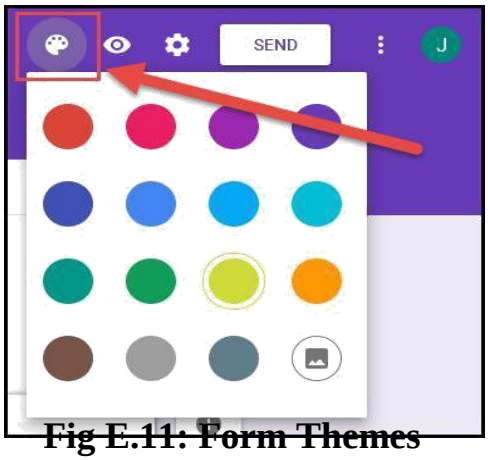


Fig E.11: Form Themes

Preview Form

Click the "Preview" button to open a new browser tab with a final view of your form. Close out of that tab to return to the "Edit Form" view to make changes.

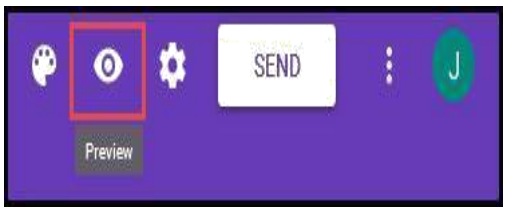
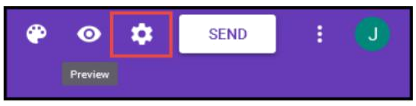


Fig E.12: Preview Form

Advanced Form Settings



Click the (Settings) button to customize your form.

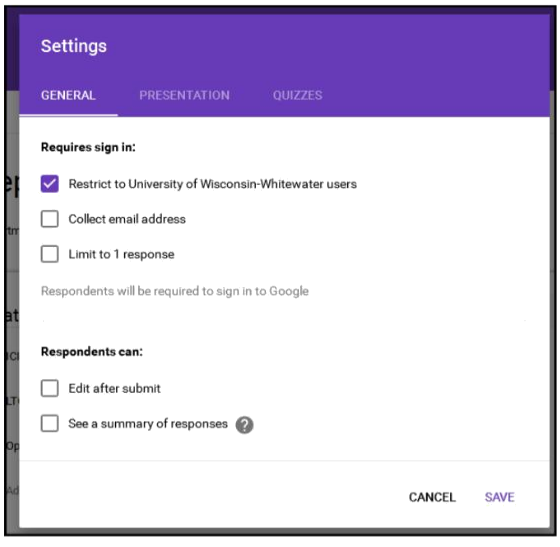


Fig E.13: Advance Form Settings

General Tab: Allows you to restrict users from your form, collect email addresses of users filling out your form, limit 1 response, etc.

Presentation Tab: Allows you to display a progress bar, shuffle question order, and submit another form response. You can also modify your confirmation message once a user submits a form.

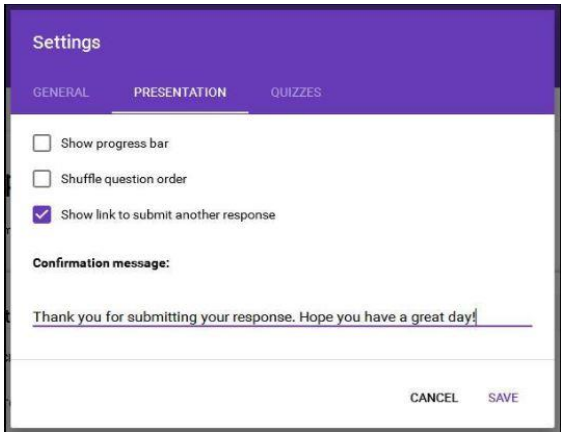


Fig E.14: Presentation Tab

Quiz: Allows you to set this form as a quiz, se grade options, etc.

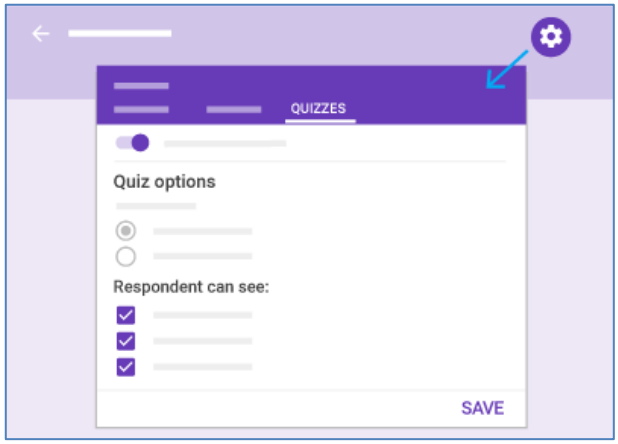


Fig E.15: Quiz Option

Send Form

Click the **Send** button to view different ways to distribute your form.



Send Via Email: You can send your form via email to recipients or send the form email to yourself, then use Outlook to forward the form link to others.

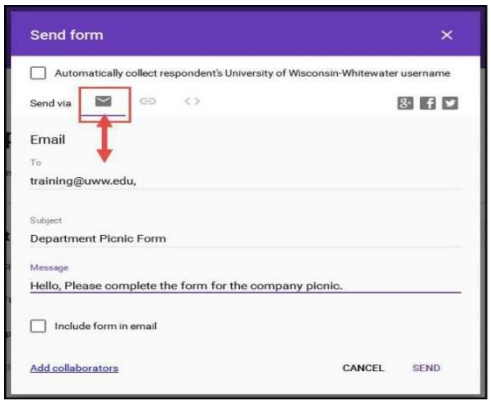


Fig E.16: Send via Email

Copy Form Link: Click the "link" icon to display the Form's URL link. Select the **Shorten URL** option to display a short link option.

Click the **Copy** link in the bottom right to copy the link.

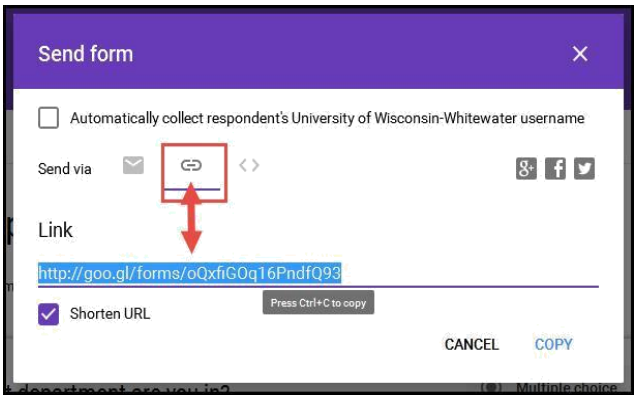


Fig E.17: Copy Form Link

Social Media: Click any one of the social media icons to share the form link using a social media platform.

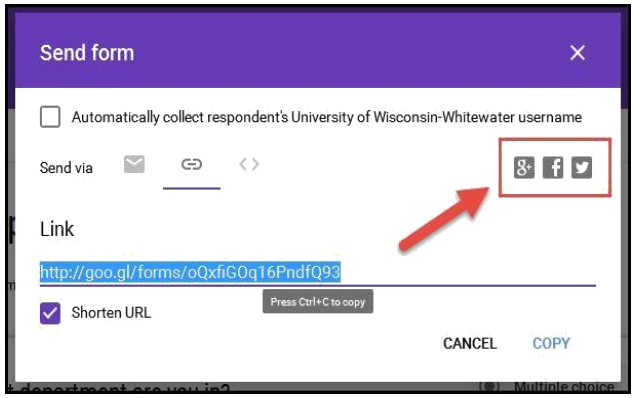


Fig E.18: Social Media

Viewing Responses

Click the **Responses** tab to view user responses to your form.

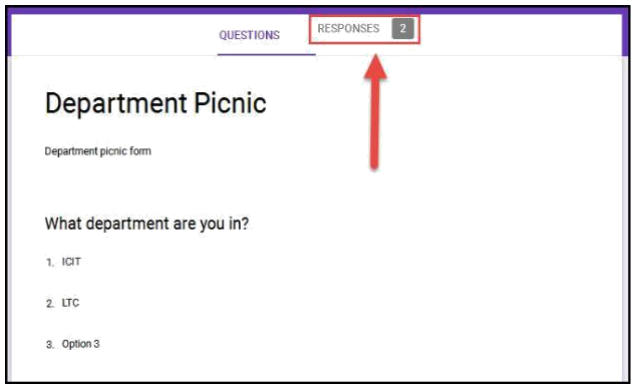


Fig E.19: Viewing Responses

Summary: Shows a pie chart percentage of responses for each question.

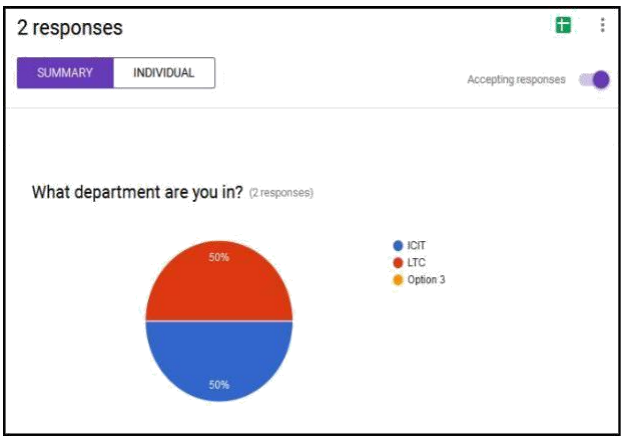


Fig E.20: Summary Chart

Individual: Displays each form response individually. Click the < or > button to move between each response.

Spreadsheet View: Click the (Create Spreadsheet) icon to create and view form responses in Google Sheets. Select to create a new spreadsheet or add to an existing spreadsheet.

Once a spreadsheet is created, click the again to open the spreadsheet.

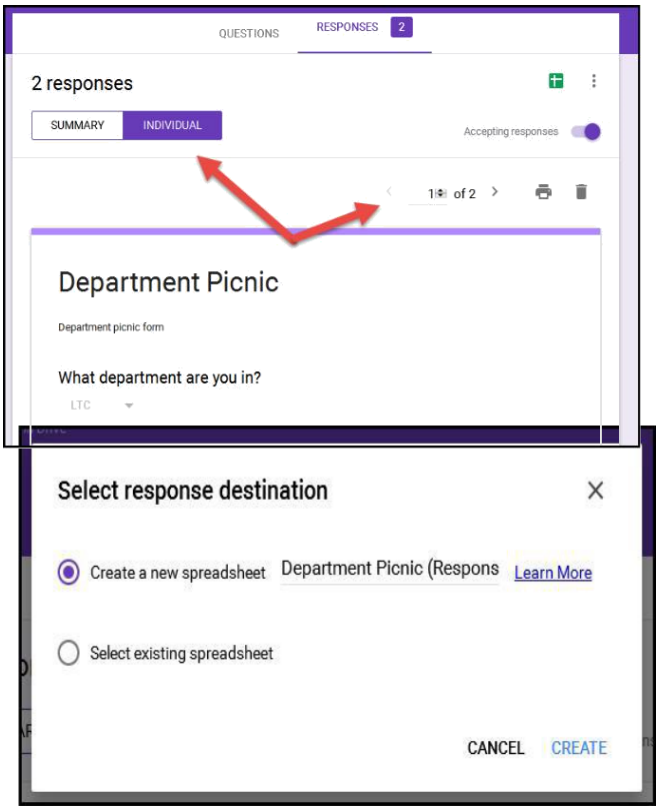


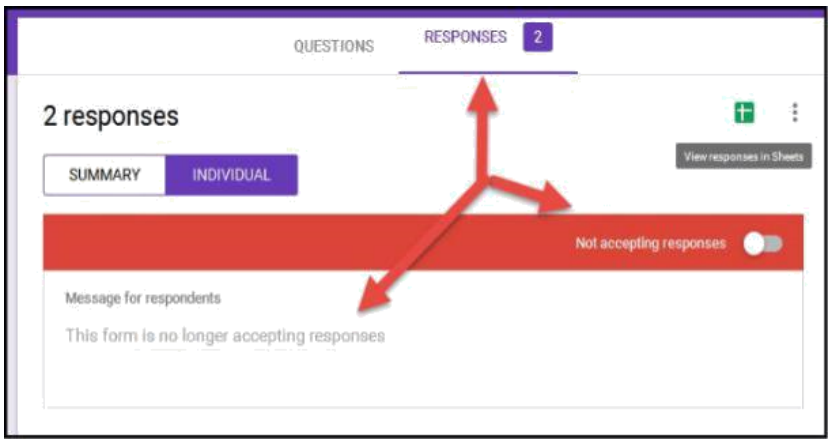
Fig E.21: Displaying individual responses

Note: If you wish to be notified of any new form submissions, select **Tools > Notification Rules** from the Google Sheet menu. Select your notification preference, then click **Save** to save your changes.

Note: Do not modify the sheet data until after you have collected all responses. Modifying the form could result in incorrect data placement.

Close Form

You can close the form for submission by selecting the **Responses** tab, then clicking the **Accepting Responses** toggle. You can modify the message respondents will see if they try to access your form while it is closed. Click the toggle again to reopen your form.



View Form and Form Responses in Google Drive

To edit your form or view your form response spreadsheet, go to Google Drive then select your form. Use the search box at the top of the page to find your form if the form was saved in a folder.

Delete Form

To delete your form completely, locate your form in Google drive, right click on the form name, then select **Delete**. You may also delete the form responses by following the same steps.

Note: Use the search box at the top of the page to locate your form if you cannot find it on your main Google drive page.

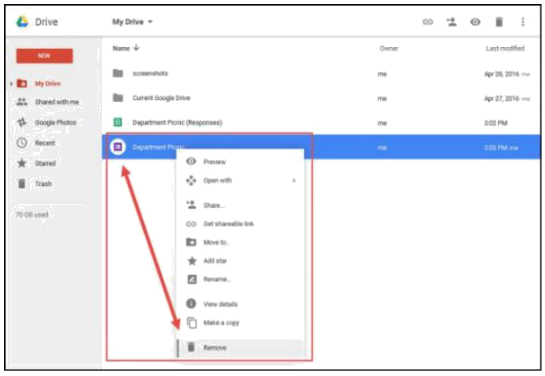
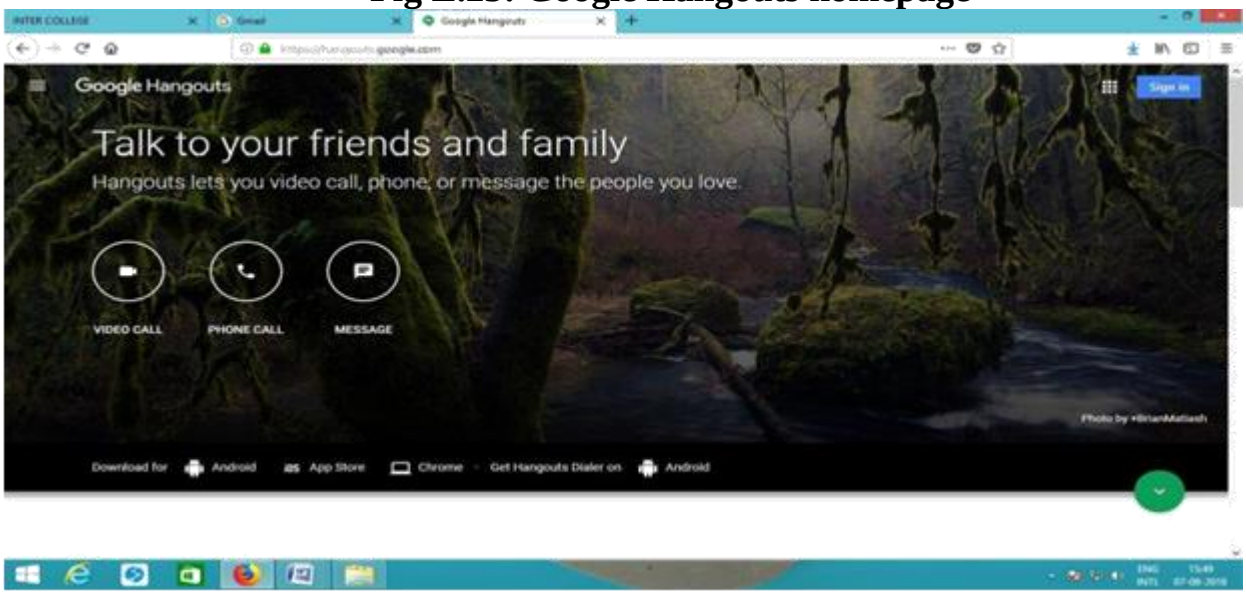


Fig E.22: Deleting a form

4. Google Hangouts

Google Hangouts is a communication platform developed by Google which includes messaging, video chat, SMS and VOIP features. It replaces three messaging products that Google had implemented concurrently within its services, including Google Talk, Google+ Messenger (formerly: Huddle), and Hangouts, a video chat system present within Google+. Google has also stated that Hangouts is designed to be "the future" of its telephony product, Google Voice, and integrated some of the capabilities of Google Voice into Hangouts.

Fig E.23: Google Hangouts homepage



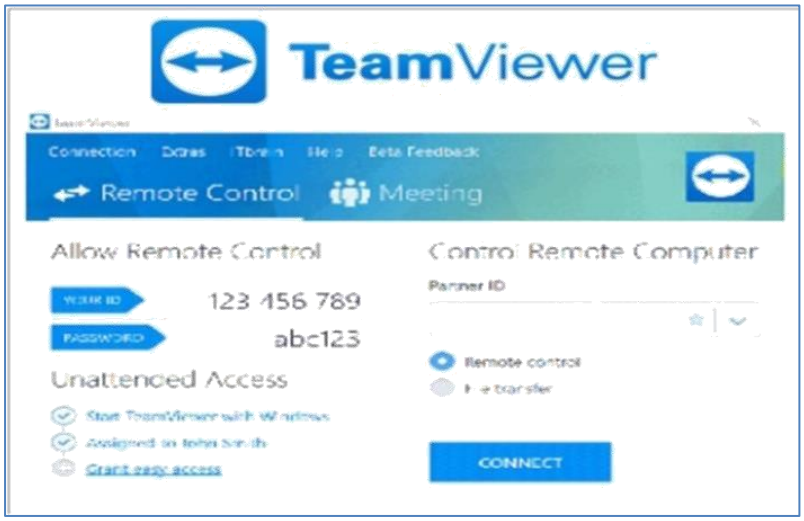
5. **Net Banking**

Net banking, also known as internet banking is an electronic payment system that enables customers of a bank or other financial institution to conduct a range of financial transactions through the financial institution's website. The online banking system will typically connect to or be part of the core banking system operated by a bank and is in contrast to branch banking which was the traditional way customers accessed banking services.

6. **Team Viewer**

Team Viewer is proprietary computer software for remote control, desktop sharing, online gaming, web conferencing and file transfer between computers. In Figure shows the interface for team viewer.

Fig E.24: TeamViewer Application



Features

Team Viewer is available for Microsoft Windows, macOS, Linux, Chrome OS, iOS, Android, Windows RT, Windows Phone 8 and BlackBerry operating systems. It is also possible to access a machine running Team Viewer with a web browser. While the main focus of the application is remote control of computers, collaboration and presentation features are included. Team Viewer can be used without charge by non-commercial users.

7. **Google Cloud BI solution**

Business intelligence software: Business intelligence software is a type of application software designed to retrieve, analyze, transform and report data for business intelligence. The applications generally read data that has been previously stored, often - though not necessarily - in a data warehouse.

Data warehouse - Data warehousing is the electronic storage of a large amount of information by a business or organization. A data warehouse is designed to run query and analysis on

historical data derived from transactional sources for business intelligence and data mining purposes.



Google Cloud BI solution is a comprehensive suite of data integration, transformation, analysis, visualization, and reporting tools from Google, which can make our data easily accessible, readily available, and most importantly, useful to our business. The Google Cloud BI solution is centered around Google BigQuery, a fully-managed cloud data warehouse.

PRACTICE QUESTIONS

1. Create an account in Google to use Google drive and then create folder in it. Now make new excel spreadsheet and save the sheet in Google drive.
2. To converse with another Google account using Google hangout.
3. Make an account on any e-commerce website; initiate shopping as per your requirement and make payment using net banking, debit or credit card.
4. Connect two computer system using team viewer and access one system from another.
5. Create an account on Digi Locker (digilocker.gov.in) and access it with Aadhaar card and upload document on it.
6. Create an account in YouTube, blogging site or any social networking website and use its basic features like uploading videos, posting blogs etc.
7. Download antivirus from its legitimate website and install it on computer system and access its various functions like scanning drive or files etc.

F. BASIC CONCEPTS OF NETWORKING

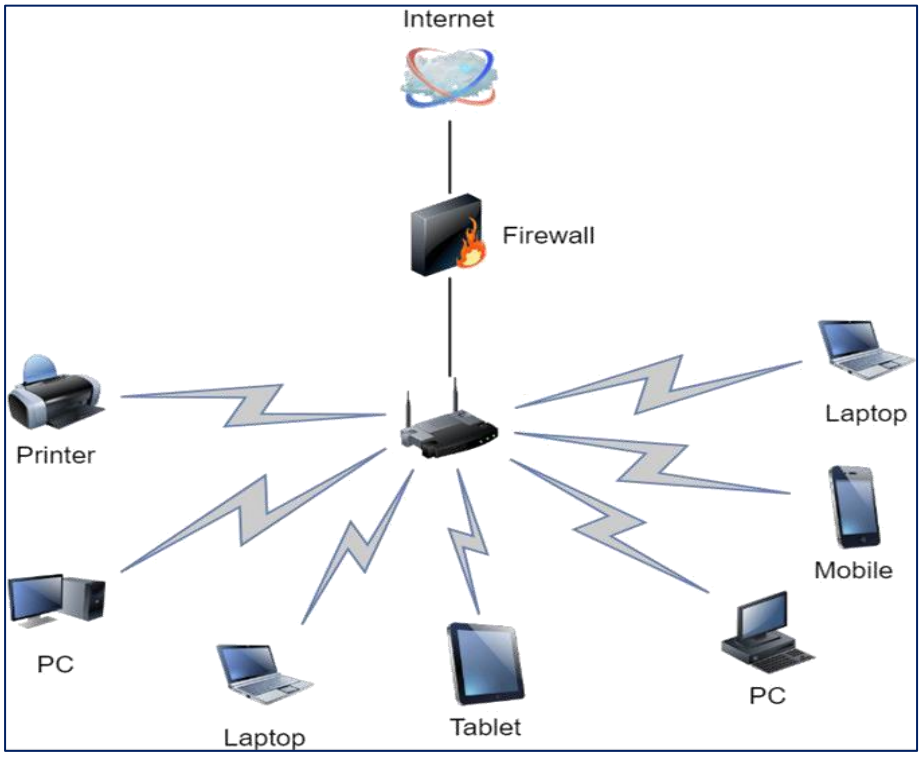
What is a Computer Network?

A computer network is a group of two or more interconnected computer systems. You can establish a network connection using either cable or wireless media. Every network involves hardware and software that connects computers and devices.

Uses of a Computer Network

- Helps you to connect with multiple computers together to send and receive information when accessing the network.
- Helps you to share printers, scanners, and email.
- Helps you to share information at very fast speed
- Electronic communication is more efficient and less expensive than without the network.

Fig F.1: Computer Network Components



Here are essential computer network components:

Switch

A switch is a networking device which connects other devices in a network and uses packet switching to send and receive data over the network.

Like a hub, a switch also has many ports, to which computers are plugged in. However, when a data frame arrives at any port of a network switch, it examines the destination address and sends the frame to the corresponding device(s).

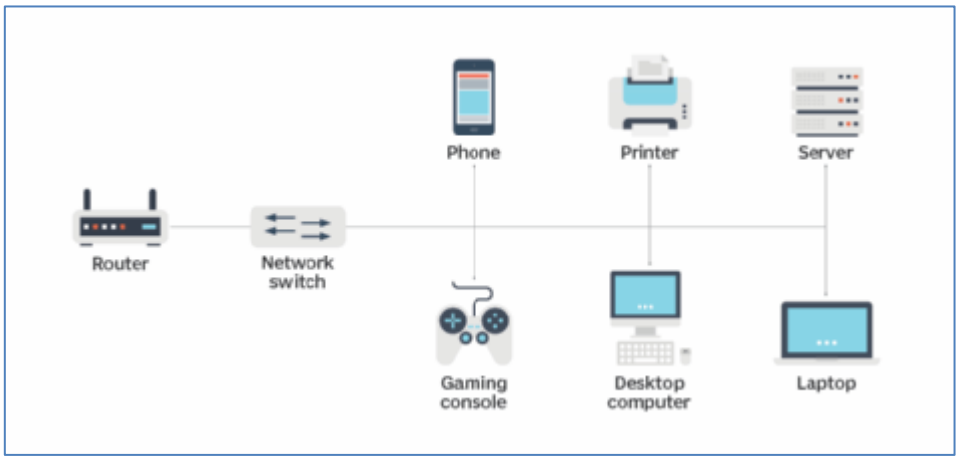
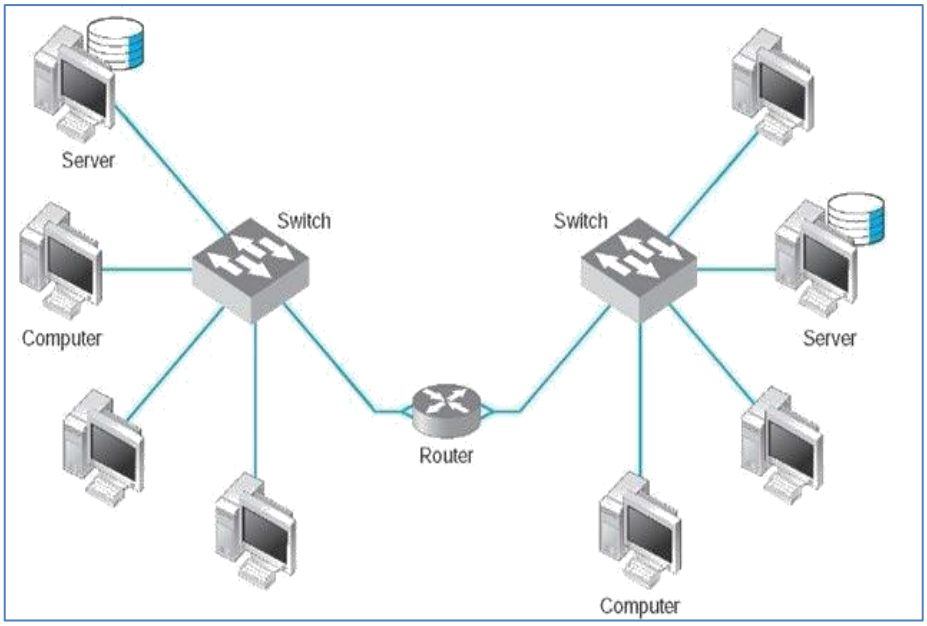


Fig F.2: Devices used in networking

Routers

A router is a networking device that forwards data packets between computer networks.

Fig F.2: Router



Routers perform the traffic directing functions on the Internet. Data sent through the internet, such as a web page or email, is in the form of data packets. A packet is typically forwarded from one router to another router through the networks that constitute an internetwork (e.g. the Internet) until it reaches its destination node. It automatically selects the best route for data to travel and send it on its way.

Servers:

Servers are computers that hold shared programs, files, and the network operating system. Servers allow access to network resources to all the users of the network.

Clients:

Clients are computer devices which access and uses the network as well as shares network resources. They are also users of the network, as they can send and receive requests from the server.

Transmission Media:

Transmission media is a pathway that carries the information from sender to receiver. We use different types of cables or waves to transmit data. Transmission media is broadly classified into two types.

1. **Bounded media (wired)**
2. **Unbounded media (wireless).**

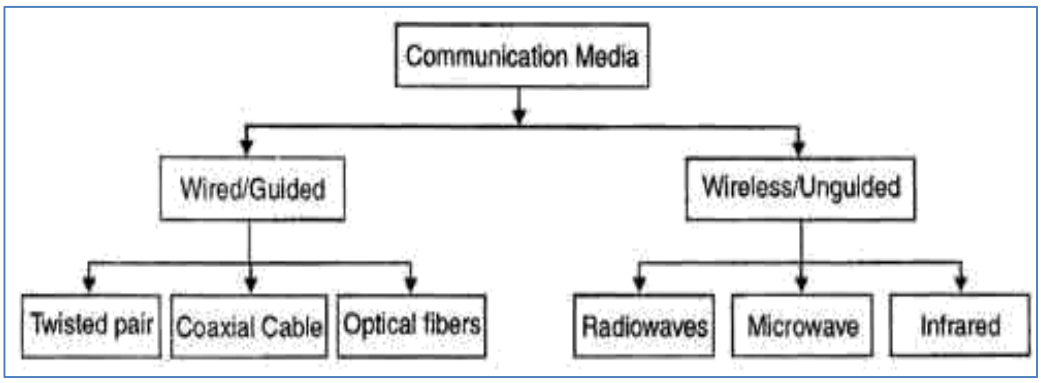


Fig F.3: Types of Communication Media

Access points

In computer networking, a wireless access point, or more generally just access point, is a networking hardware device that allows other Wi-Fi devices to connect to a wired network. The AP usually connects to a router as a standalone device, but it can also be an integral component of the router itself

Network Interface Card:

A network interface controller is a computer hardware component that connects a computer to a computer network. Early network interface controllers were commonly implemented on expansion cards that plugged into a computer bus

Protocol:

A protocol is the set of defined rules that allows two entities to communicate across the network. Some standard protocols used for this purpose are TCP,IP, UDP, FTP, etc.

Hub:

A hub is a networking device which is used to connect multiple devices in a network. They are generally used to connect computers in a LAN.

A hub has many ports in it. A computer which intends to be connected to the network is plugged in to one of these ports. When a data frame arrives at a port, it is broadcast to every other port, without considering whether it is destined for a particular destination or not

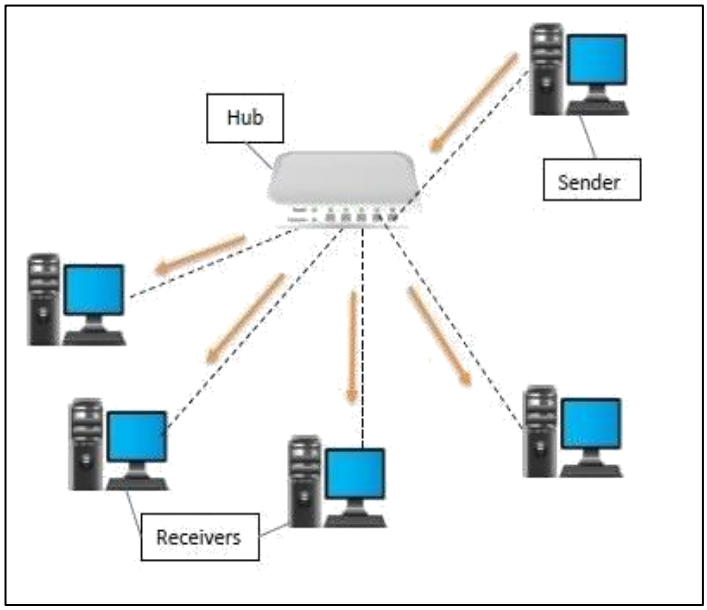


Fig F.4: Hub

LAN Cable:

Local Area Network(LAN) cable is also called as Ethernet or data cable. It is used for connecting a device to the internet.

OSI:

OSI stands for Open Systems Interconnection. It is a reference model which allows you to specify standards for communications.

Unique Identifiers of Network

Below given are some unique network identifiers:

Hostname:

Every device of the network is associated with a unique device name, which is called hostname.

IP Address:

IP address is a unique logical address assigned to a machine on the network. An IP address exhibits the following properties:

- IP address is the unique address assigned to each host present on Internet.

- IP address is 32 bits (4 bytes) long.

- IP address consists of two components: network component and host component.
- Each of the 4 bytes is represented by a number from 0 to 255, separated with dots. For example 137.170.4.124

DNS Server:

DNS stands for Domain Name System**.** It is a server which translates URL or web addresses into their corresponding IP addresses.

MAC Address:

MAC (Media Access Control Address) is known as a physical address is a unique identifier of each host and is associated with the NIC (Network Interface Card). Length of MAC address is 12 digit Hexadecimal numbers (Which is 6 bytes or 48 bits).

Port:

Port is a logical channel which allows network users to send or receive data to an application. Every host can have multiple applications running. Each of these applications are identified using the port number on which they are running.

PRACTICE QUESTIONS

1. What is Switch?
2. What is Routers?
3. Explain Transmission Media.
4. What is IP Address?

H. AWARENESS TO SOCIAL MEDIA

1. BLOGS

A blog is an online journal or informational website displaying information in the reverse chronological order, with the latest posts appearing first. It is a platform where a writer or even a group of writers share their views on an individual subject.

In the beginning, a blog was more of personal diary that people shared online, and it goes back to 1994.

Purpose of a Blog

There are many reasons to start a blog for personal use and only a handful of strong ones for business blogging. Blogging for business, projects, or anything else that might bring you money has a very straightforward purpose – to rank your website higher in Google SERPs

As a business, you rely on consumers to keep buying your products and services. As a new business, you rely on blogging to help you get to these consumers and grab their attention. Without blogging, your website would remain invisible, whereas running a blog makes you searchable and competitive.

So, the main purpose of a blog is to connect you to the relevant audience. Another one is to boost your traffic and send quality leads to your website.

Blog structure

The appearance of blogs changed over time, and nowadays blogs include different items. But, most blogs include some standard features and structure. Here are common features that a typical blog will include:

- Header with the menu or navigation bar
- Main content area with highlighted or latest blog posts
- Sidebar with social profiles, favorite content, or call-to-action
- Footer with relevant links like a disclaimer, privacy policy, contact page, etc.

Blogs and websites

A majority of people still wonder whether there is any difference between a blog and a website. What is a blog and what is a website? It's even more challenging to differentiate between the two today. Many companies are integrating blogs into their sites to perform the same function.

What differentiates blogs from websites?

Blogs need frequent updates. Good examples include a food blog sharing meal recipes or a company writing about their industry news.

Blogs promote perfect reader engagement. Readers get a chance to comment and voice their different concerns to the viewer. Static websites, on the other hand, consists of the content presented on static pages. Static website owners rarely update their pages. Blog owners update their site with new blog posts on a regular basis.

Key elements that identify a blog post from a static page include a publishing date, author reference, categories, and tags within a byline. While not all blog posts have all those byline elements, static website pages do not have any of these items. From a visitor perspective, the content on a static site will not change from one visit to the next. The content on a blog, yet, has the potential to offer something new each day, week, or month. Depending on the blog owner's publishing schedule.

2. TWITTER

It's a platform wherein users share their thoughts, news, information and jokes in 140 characters of text or less. Twitter makes global communication cheap and measurable. Profiles are (usually) public — anyone in the world can see what you write, unless you elect to make your profile private. Users "follow" each other in order to keep tabs on and converse with specific people.

On Twitter, following someone is not necessarily an admission of friendship, but nonetheless affords interaction and conversation — at least in short bursts.

There are certain terms that you must understand if you are interested to use Twitter

Tweet

It all begins with a Tweet. Join or start any conversation in the world with a simple Tweet. It is a 140 long characters message.

Retweet

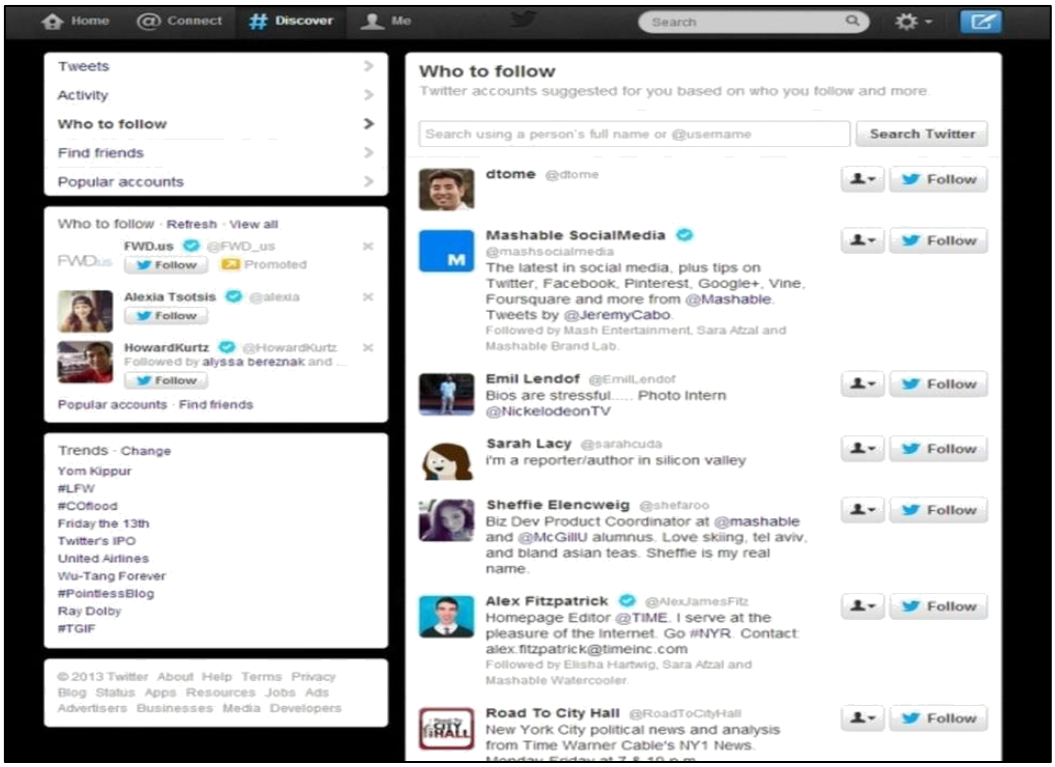
See something you like? Retweet it to spread the word instantly. Re-sharing or giving credit to someone else's tweet.

Follow

Never miss an update from the people that matter to you. Building your timeline all starts with a follow.

Search

Fig G.1: Twitter page



Wondering what something is all about. Search and see the conversation unfold line.

3. <u>You Tube</u>

What is YouTube?

YouTube is a video sharing website on which users can upload and share videos.

How did it start?

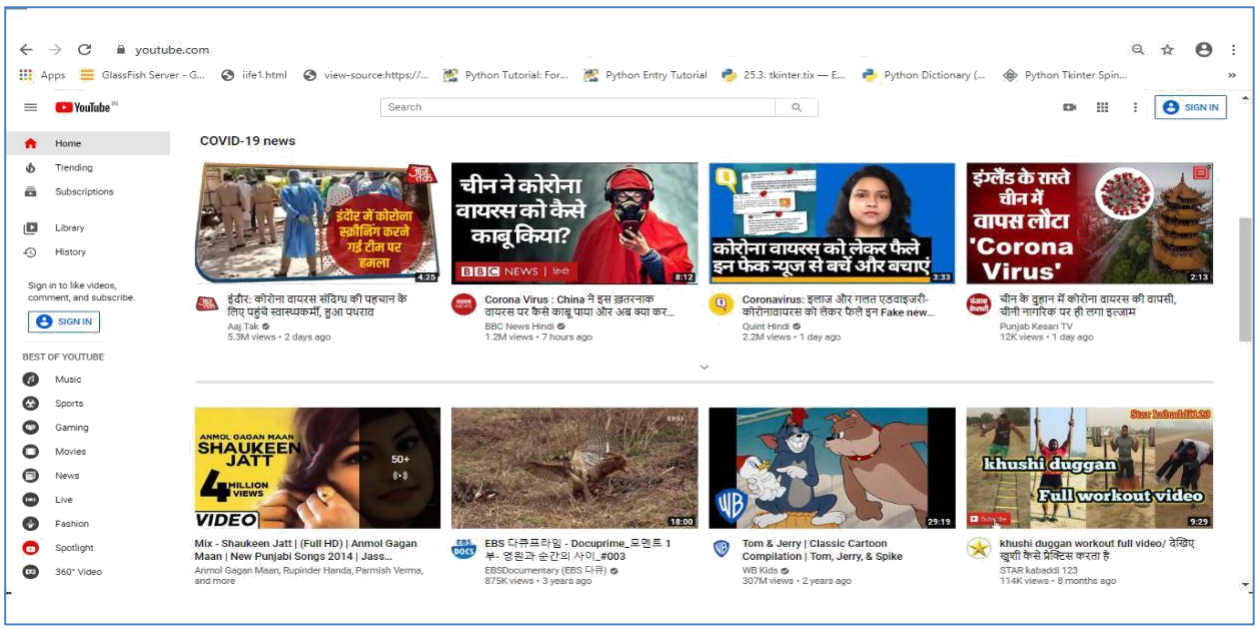
Three former PayPal employees created YouTube in February 2005. In November 2006, YouTube, LLC was bought by Google Inc. for $1.65 billion, and is now operated as a subsidiary of Google.

What's on YouTube?

You can use YouTube in many ways, but since it's a video -sharing network, two obvious options are to watch other people's videos and to upload your own videos so other folks can watch them. The site's motto is "Broadcast Yourself," but you don't have to, of course. You can simply watch other people broadcasting themselves. Unlike any other social networks, YouTube doesn't require you to create an account before you can search for content or view videos. Searching and watching are two activities you can engage in anonymously on the site. But if you want to broadcast yourself or anything else, you'll have to register for a Google account and get a username and password, because you can't upload videos without a user ID.

Fig G.2: YouTube Logo

Fig H.3: YouTube Home Page



On home page, there is a search option that can be used to find videos of your interest. Type in key terms- that is, names, places, events in the search field (the box to the left of “search” at the top of the page.

Once you have searched for a topic, you can refine your search by clicking on “search options” or you can click on links to open the video

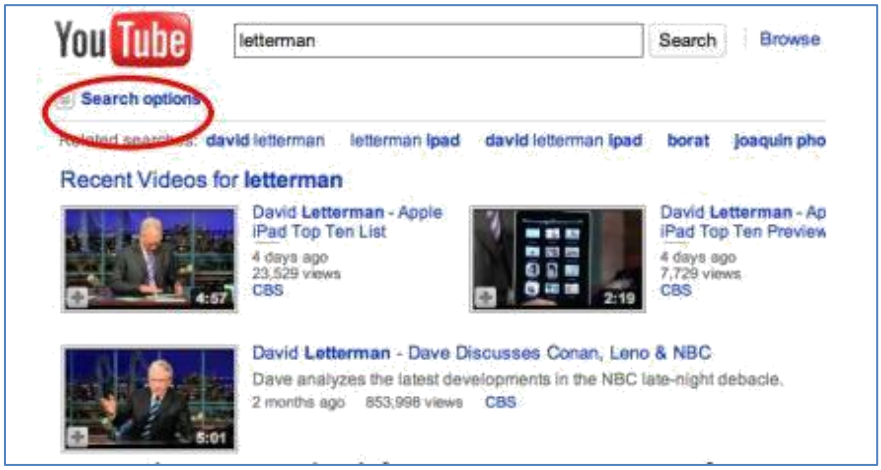


Fig G.4: Searching on YouTube

The vast collectionof videos are organized in your homepage (after you’ve signed in, if you choose to create an account) in a few wats. The nice things are that you can remove any of the categories if you don’t like particular.

Features Videos: Mostly videos provided by YouTube commercial partners, although occasionally contains user –submitted videos that are high popular

Subscriptions: If you like the video(s) posted by one user/organization/company, you can subscribe to that channel and see all of their videos on your main YouTube page.

Recommended for You: Videos suggested by YouTube based on videos you've see or ones you've marked as a "favorite".

Recent Activity: Videos you have watched recently

Most Popular/Most viewed: "MostPopular" seems to be calculated by some kind of YouTube-designed algorithm

Creating YouTube Channel

If you have a Google account, you can watch, share and comment on YouTube content. However, Google accounts don't automatically create YouTube channels. Getting a new channel set up is a simple and quick process, though.

Go to YouTube and Sign In

Go to YouTube and click "Sign In" in top right corner of the page

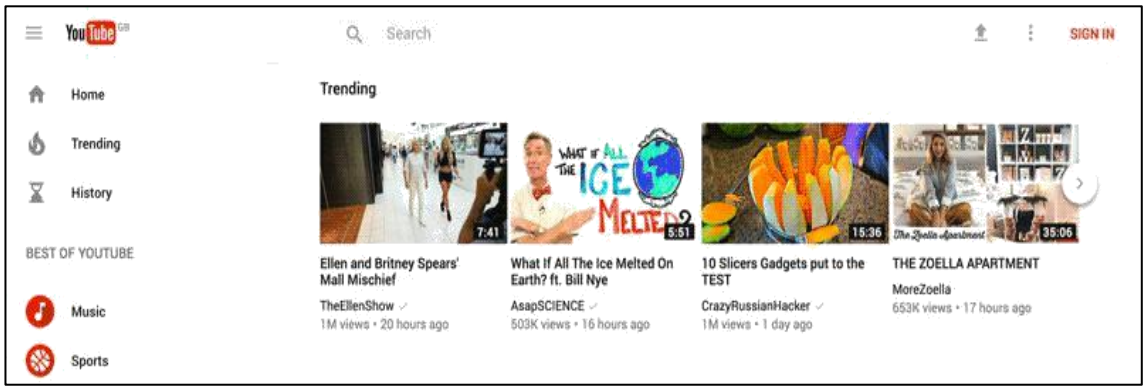


Fig G.5: Sign in option in YouTube

Then log in using the Google Account you'd like your channel to be associated with:

Fig G.6: Signing in using Google account



Head over to your YouTube settings

In the top right corner of the screen, click on your profile icon and then click “Settings” link

Under your settings, you’ll see the option to “Create a Channel”, click on that link:

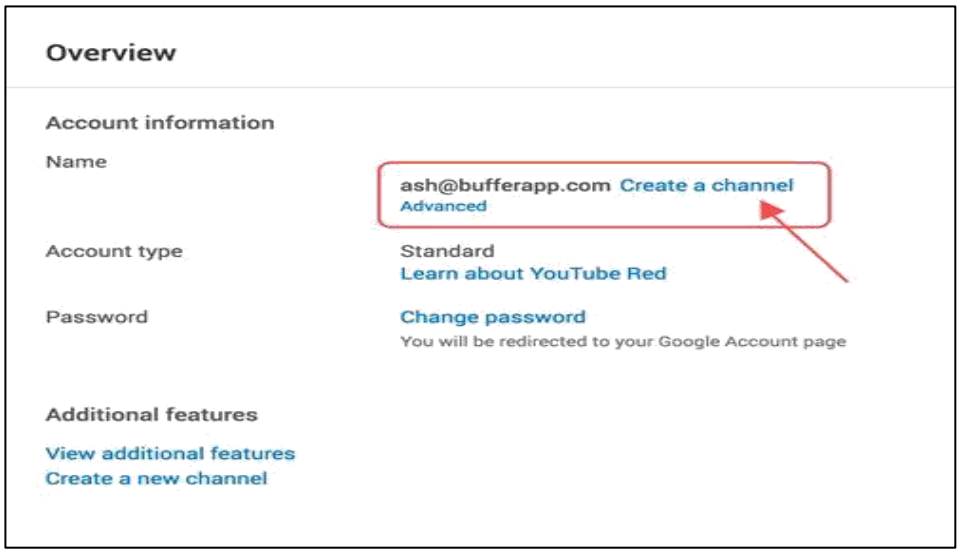


Fig G.7: Creating a channel

Next, you’ll have the option to create a personal channel or create a channel using a business or other name

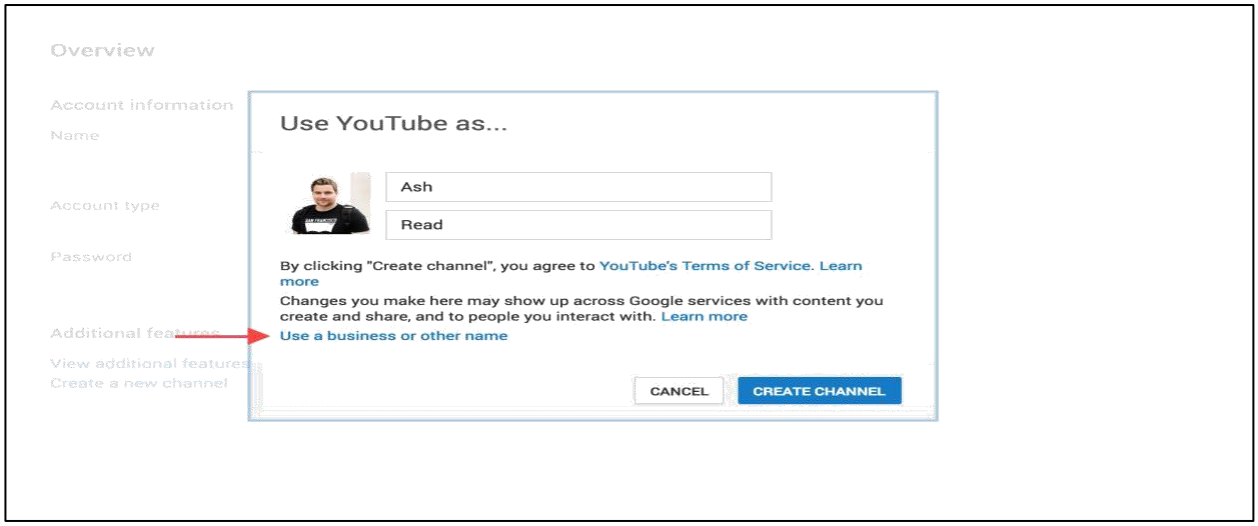


Fig G.8: Naming the channel

Now it’s time to name your channel and select a category. The channel options available include:

- Product or Brand
- Company or organization
- Arts, Entertainment or Sports
- Other

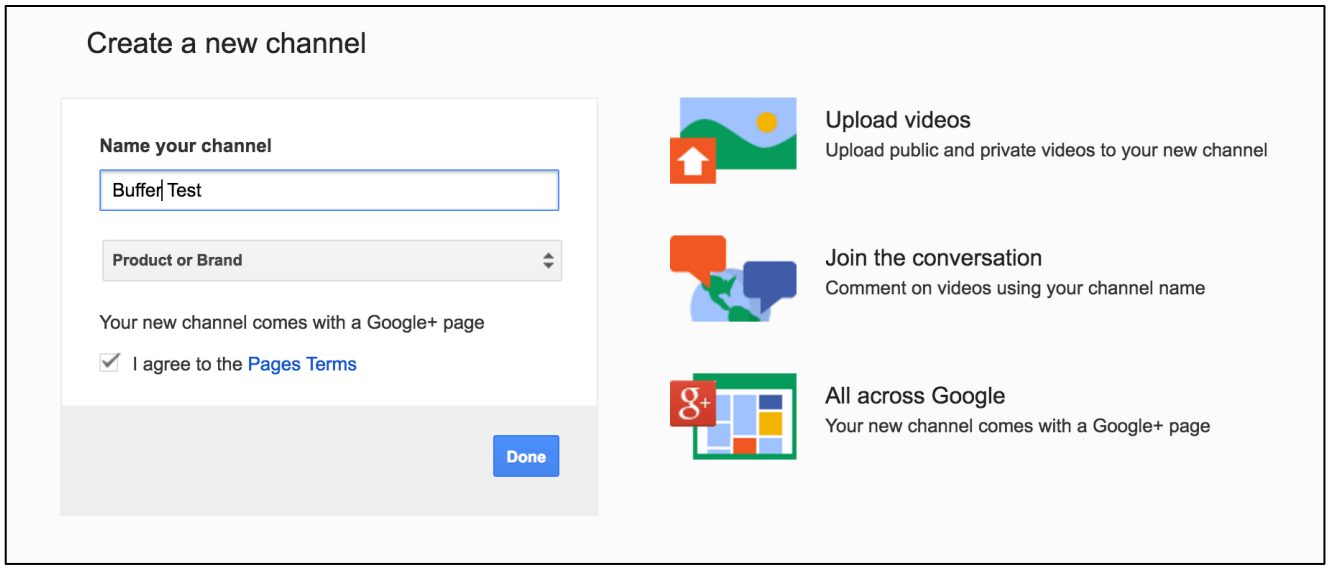


Fig G.9: Uploading videos

4. **Instagram**

What is Instagram?

Instagram is an American photo and video sharing social networking service owned by Facebook. It was created by Kevin Systrom and Mike Krieger, and launched in October 2010 on iOS. A version for Android devices was released in April 2012.

People can upload photos or videos to our service and share them with their followers or with a select group of friends. They can also view, comment and like posts shared by their friends on Instagram. Anyone 13 and older can create an account by registering an email address and selecting a username.

Over the past few years, Instagram has seen exponential growth – from one million users in December 2010, to over one billion user in 2019.

Fig G.10: Instagram Logo



Steps to use Instagram

1. **Set up your account and profile**

If you don't have Instagram app on your phone, you can download it from the App Store, Google Play Store, or Microsoft Store. After download, you need to create your account and profile. When you create your account on the mobile app, the app will guide you through a few basic steps for getting set up.

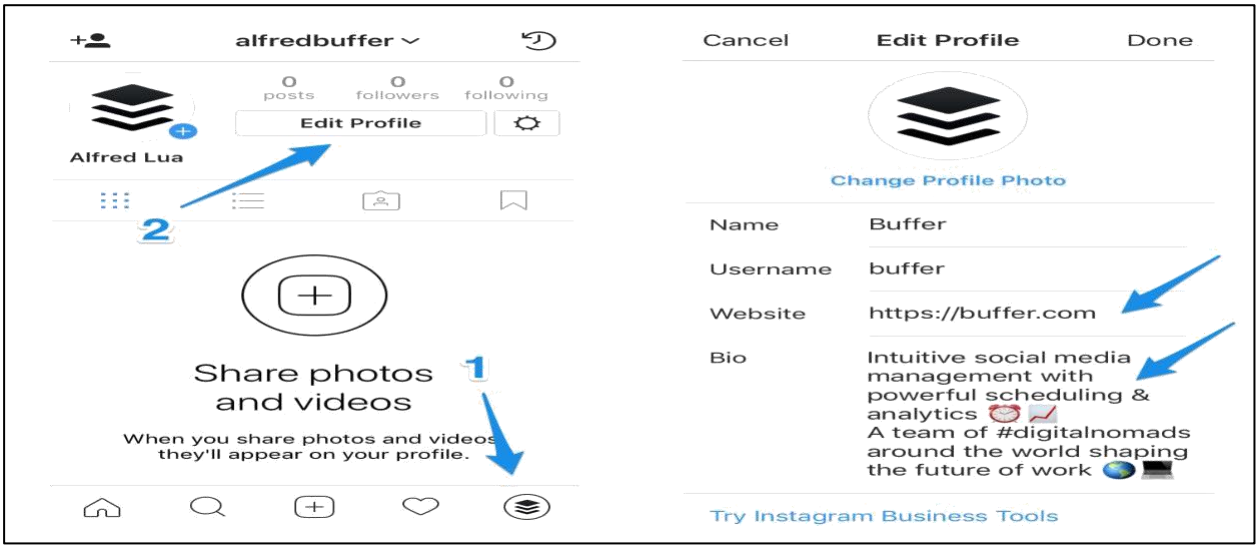
2. **Profile Photo**

Your Instagram profile photo will be displayed as a circle. You can select profile photo from gallery or you can click at the moment while setting up your profile.

3. **Profile Information**

The app will not prompt you to fill out your profile information but it will be great to do so. To fill out your profile information, go to your profile in the app and tap on "Edit-Profile".

Fig G.11: Edit Profile option



4. **Post Photos or videos**

When you want to post a photo or video, just click the "+" icon at the bottom. Instagram will show you the most recent photos in your photo library. You can also choose to take a new photo or video by tapping on "Photo" or "Video" respectively.

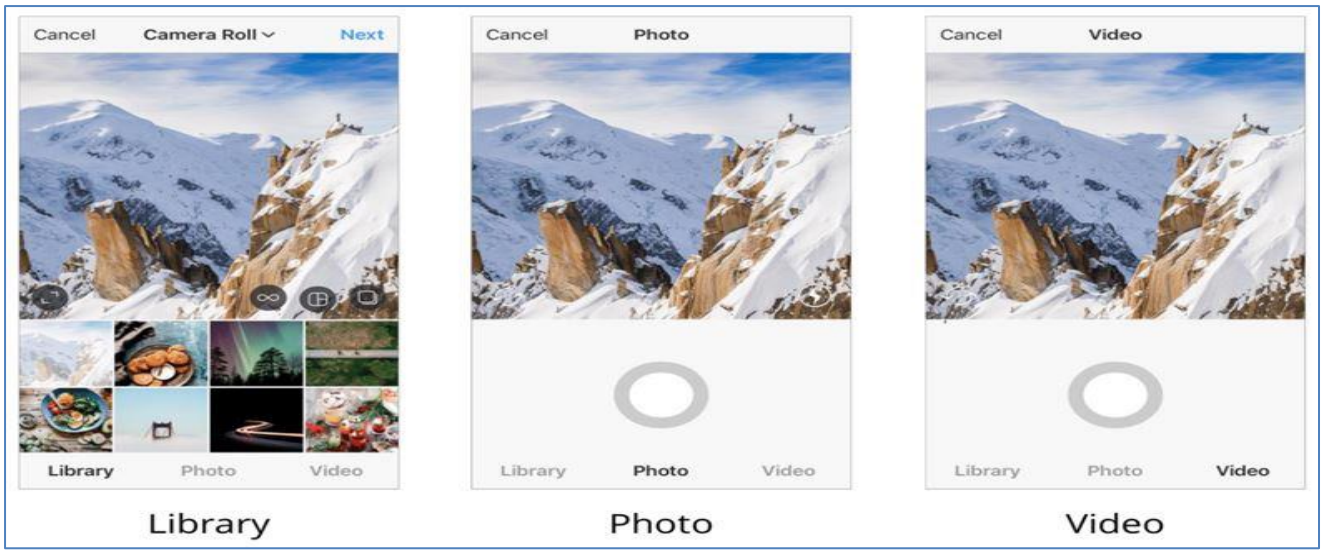


Fig G.12: Posting Photos and Videos

5. Edit your Media

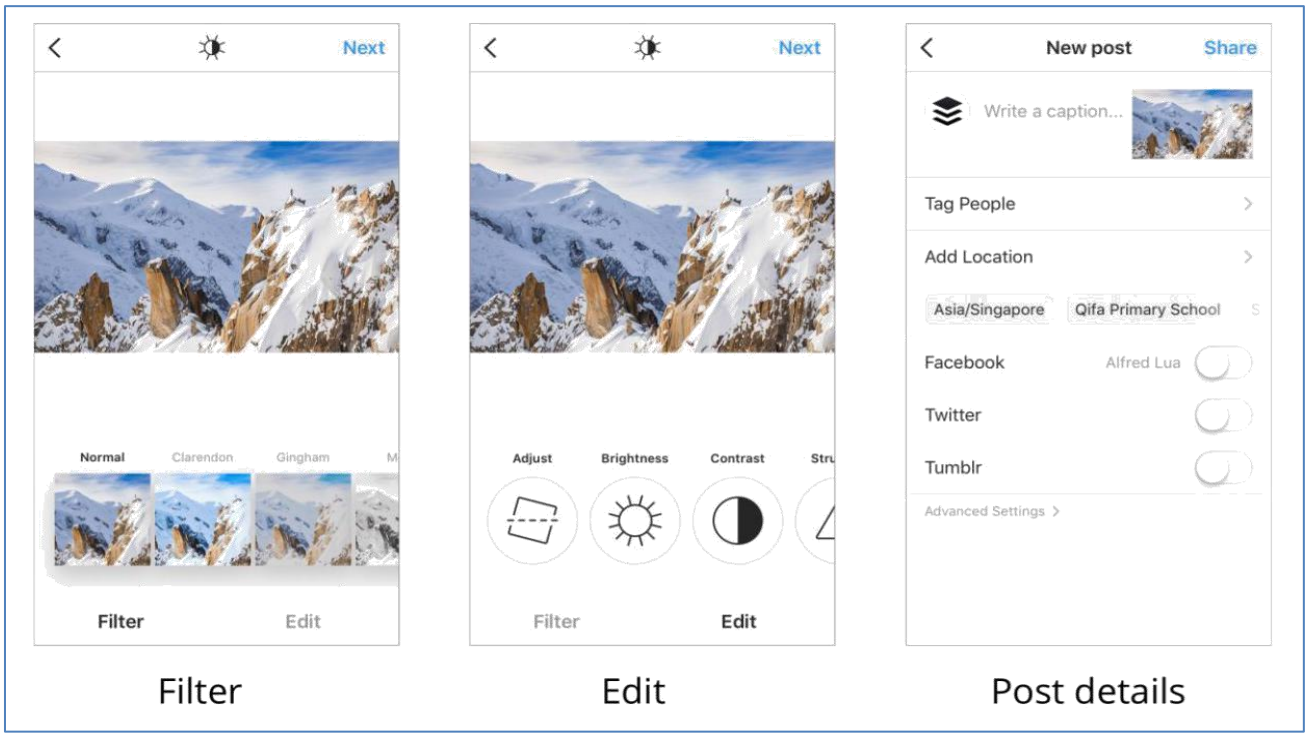


Fig G.13: Editing Photos and Videos

Once you have selected your media for your post, you can add a filter or edit its orientation, brightness, contrast, and more. When your media is ready to go, just tap "Next" to fill out your post details.

- **Write a caption:** Your caption appears just below your media when your post is published. You can mention another Instagram account (i.e. @username) and add hashtags. Accounts that you mention will receive a notification about it, and your post will appear when someone searches for the hashtags you used.

- **Tag People:** If you are posting a photo or a collection of photos, you can tag multiple Instagram accounts in each photo. The accounts you tag will also receive a notification about it.
- **Add Location:** If your media is a photo or video of a location, you could add a location tag to your post. Your post will appear when someone searches for posts in that specific location.
- **Social shares:** If you have connected other social media profiles to your Instagram account, you can easily share your posts on those profiles by toggling the switch.

6. Find people to follow

If you have not followed any accounts, Instagram will prompt you to "Find people to follow" on your feed and provide three ways to discover people to follow. You can either connect your Facebook account, connect your contacts, or follow profiles suggested by Instagram. A better approach, I feel, is to use the Instagram search and explore feature.

In the search and explore tab, Instagram will show you Instagram stories and posts that you might like. Here's how I would go about finding people to follow:

- Type in a keyword that is relevant to your business in the search bar
- Check out the suggested Instagram profiles or hashtags
- Follow the profiles that are relevant to your business
- Check out profiles that are recommended to you when you follow a profile

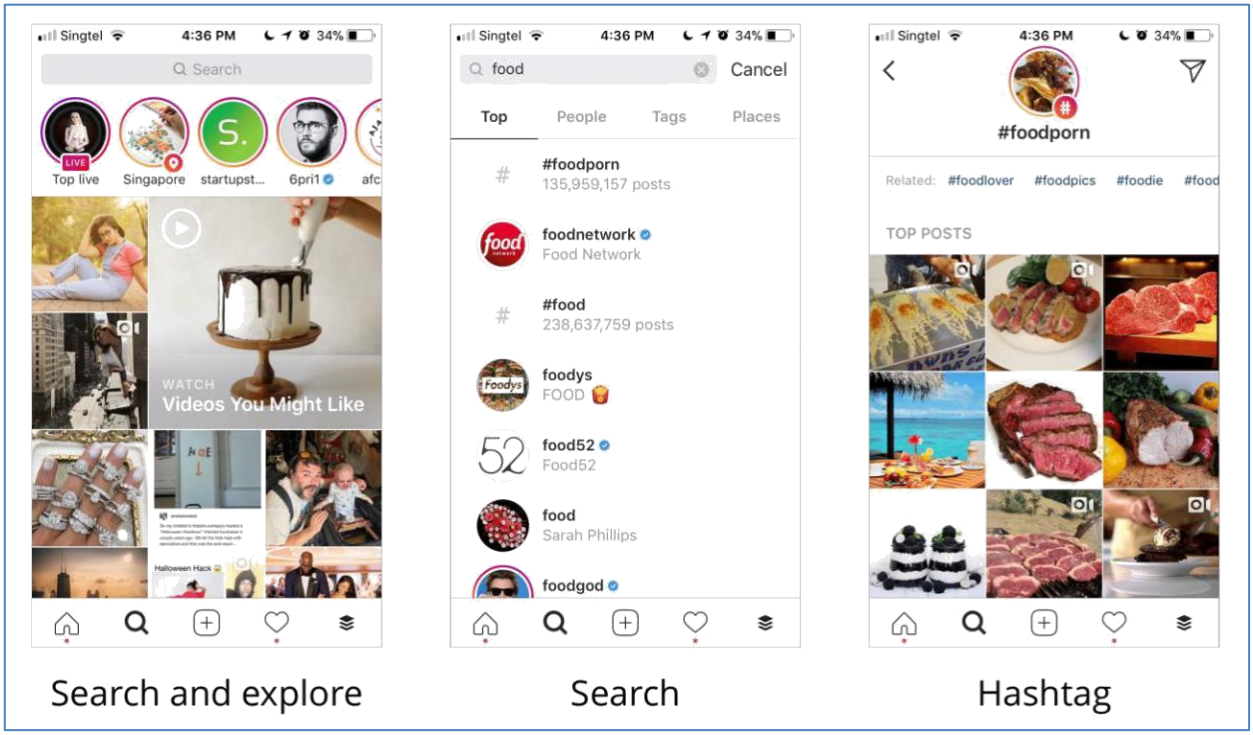


Fig G.14: Find people to follow

5. **Facebook**

What is Facebook?

Facebook (FB) is a very popular social networking site that was launched in 2004. Registered users create a profile, which allows them to upload photos/videos, send messages, and connect with other people and businesses. It is international, and available in approximately 50 languages. Facebook also allows for creating events (and sending invitations) as well as a host of other things, such as playing games.

Businesses, bands, and organizations often create a Facebook page to market or promote themselves. This class will focus on the basics for the individual, not the business.

Signing Up

To create an account, you must have a working email address.

Please keep in mind that when you are signing up, you do not have to provide all the information that you are asked for – you can limit it to what you feel comfortable submitting. Remember, depending on your privacy settings or the specific piece of information, it may be seen by a great number of people.

Note: though you must provide your birthday when signing up, you can change the setting so that it is not viewable (or that only the month and day are viewable.) When registering, your birthdate is asked to verify that you are at least 13 years old and to, according to Facebook, "make sure you get the right Facebook experience for your age."

Your Profile

By signing up, you created an account -- you didn't set up your profile. Your profile, which is what people can see about you, is still probably blank.

By default, there are some sections that everyone can see, unless you change your settings. Contact information is available only to your confirmed friends by default. We'll get more in to privacy settings later

6. **Skype**

How to use Skype

Skype is awesome. Anyone can download it, and you can use it to chat "face to face" or make a regular voice call. It's easy to use, and best of all, it's free. And who doesn't love free stuff?

Getting started with the popular calling app may take some getting used to if you've never used it before. If you're a Microsoft Windows 10 user, then this Skype guide is for you.

Getting set up

The first step in using Skype is downloading it and setting up your account. They are two steps that are far easier today than they've ever been and will get you well on the way to your first Skype chat or call.

Step 1: Open your browser of choice and navigate to the Skype homepage. **Click** the big blue *Get Skype* button, and it will open the corresponding Microsoft store page. Alternatively, open the Microsoft Store yourself by clicking the taskbar icon, or searching for *Microsoft Store* in the search box. When there, search for "Skype" and click the corresponding app page.

Step 2: Click the blue *Get* button to download and install Skype for Windows 10. The Microsoft Store may ask you if you want to use it across multiple devices, in which case you'll need to sign in with your Microsoft account. If you'd rather just have a dedicated Skype account, choose *no thanks*.

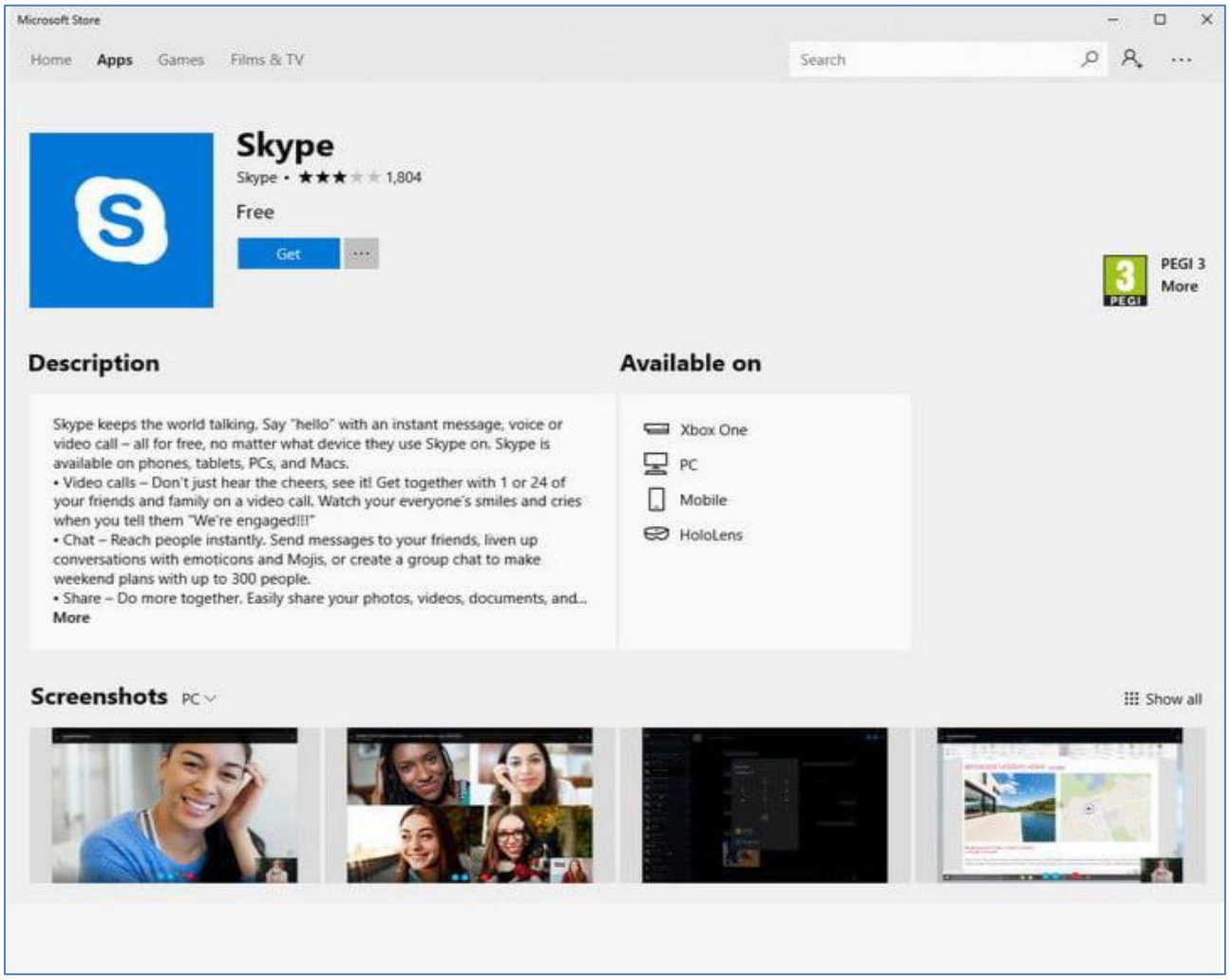
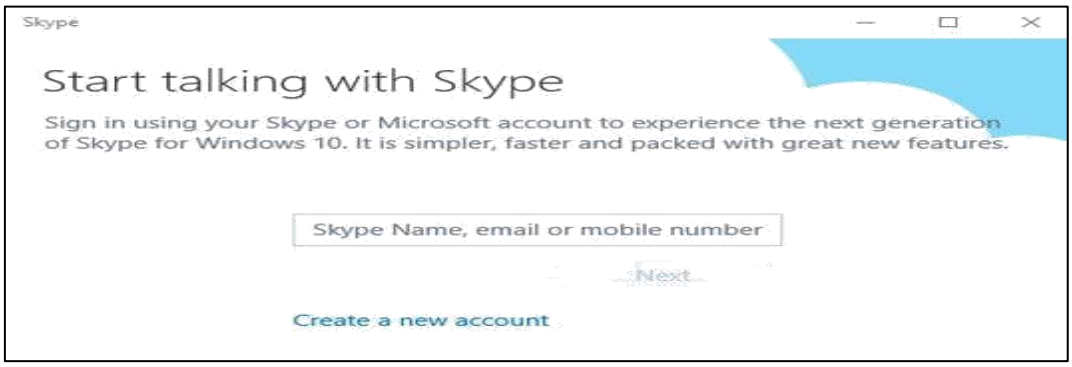


Fig G.15: Downloading Skype

Step 3: Skype should now be installed on your system. To start it up, use the search box in your Windows taskbar and look for *Skype*. When it pops up in the search box, click the corresponding icon.

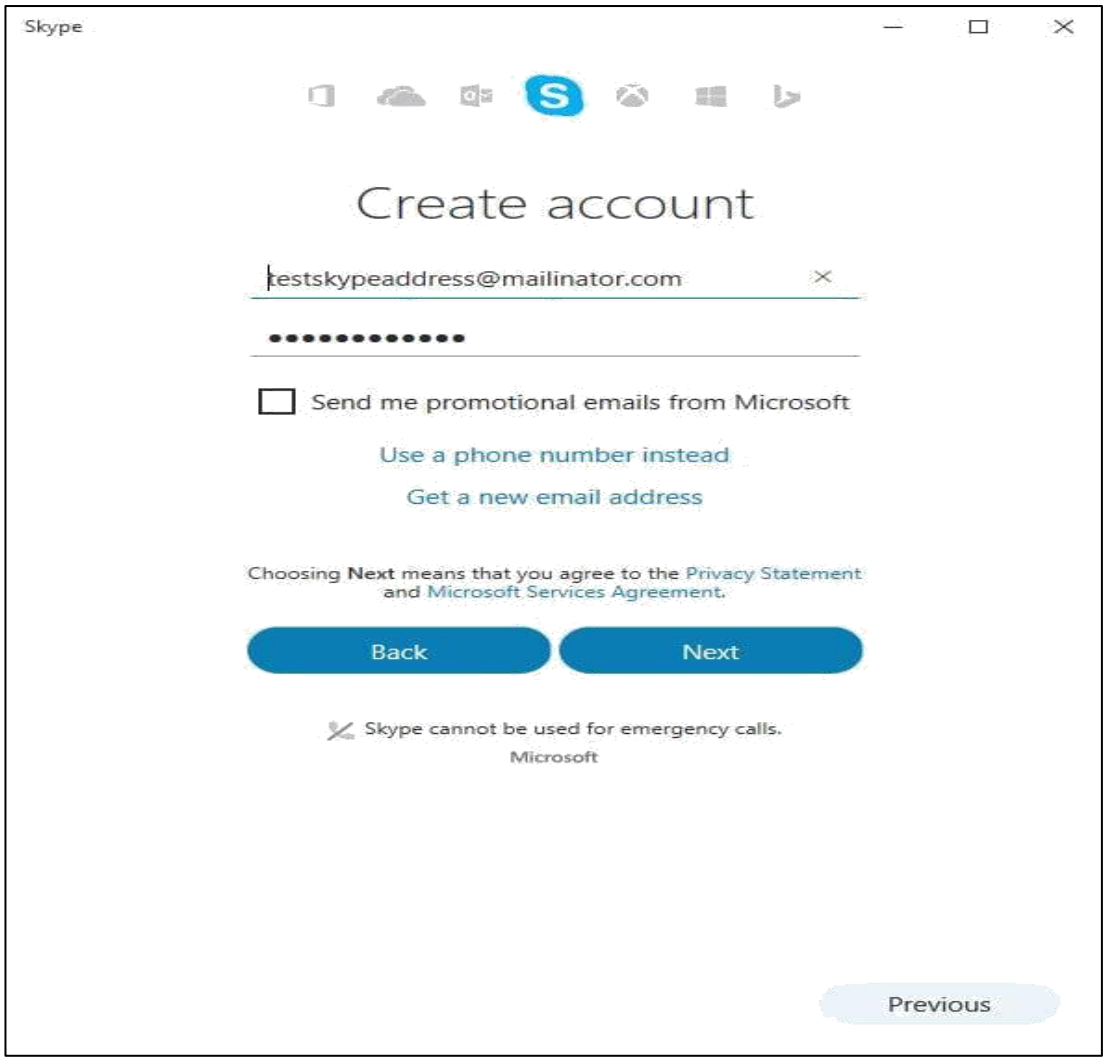
Step 4: If you already have a Skype account, you can log in with your Skype name, email, or phone number and skip through to the next section. To make a new account, click the *Create a new account*, text.

Fig G.16: Creating a new account



Step 5: You can sign up for a Skype account with an email address or phone number. It's totally up to you which you would prefer to link with your new account. When you've decided, input the relevant information and click *next*. Note: Doing so automatically causes you to agree with Microsoft's services agreement and privacy statement.

Fig G.17: Creating username and password



Step 6: The next screens will ask you to input personal information like age, name, and location. Input all of that and continue clicking through. When asked for a verification code, check your corresponding email or phone number and input the code.

Step 7: If asked for a CAPTCHA code, input that, and click *Create Account*. You now have a functioning Skype account.

Finding friends and family

Where once you needed to know all of your friends' details and had to add them as Skype contacts, today, all you need to know is a single piece of information, and you can find them quickly and start chatting straight away.

Step 1: When you first log in to your account, Skype will ask you if you want to import your existing contacts. If you already have some set up on your Microsoft account, doing so will fill out your contact list immediately.

Step 2: To find anyone else you want to talk to, select the *Search Skype* box in the top left-hand corner and search for their real name, Skype name, or email address.

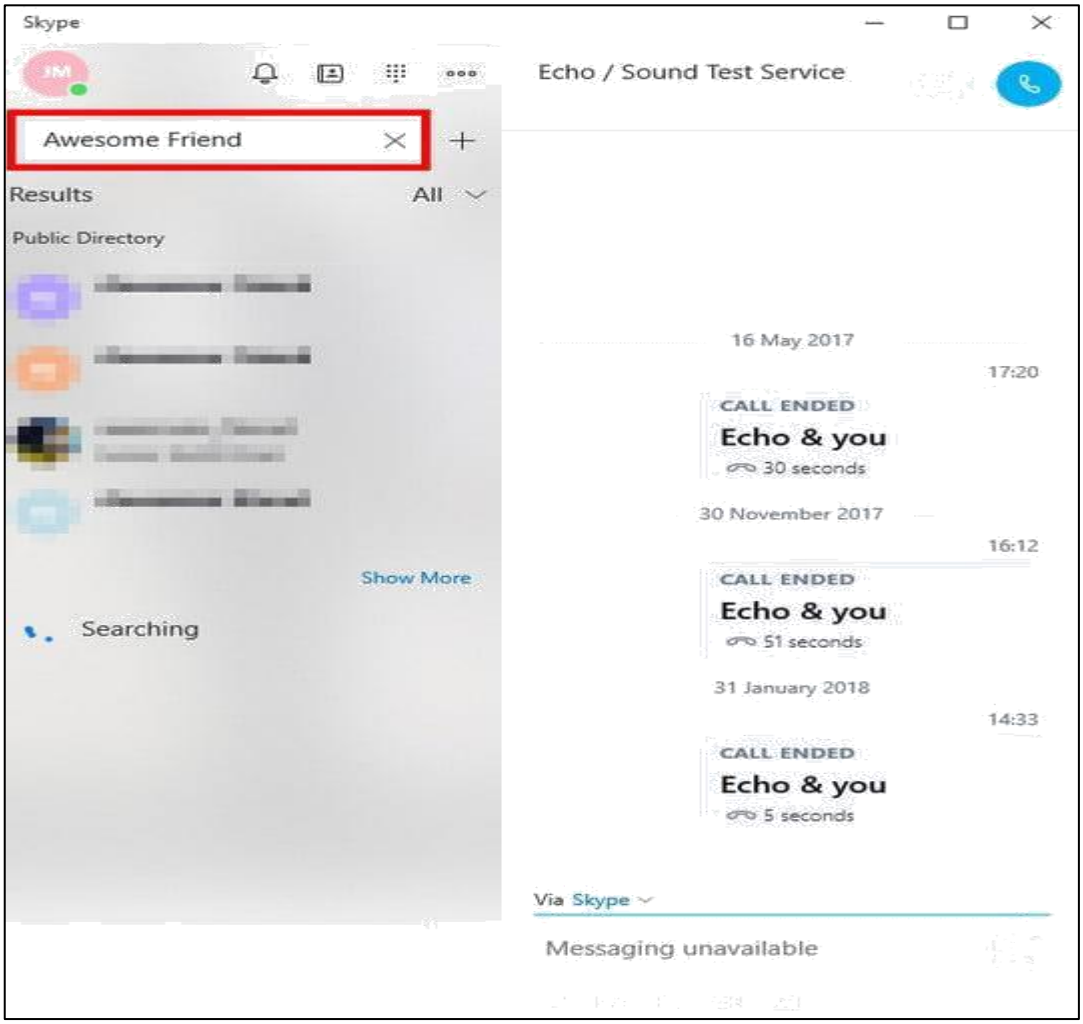


Fig G.18: Searching Skype

Step 3: If your friend has a common name — and sometimes if they don't — you may find that there are several people to choose from in the list that pops up. Use profile pictures to find the person you're looking for, or click on them, then on the name at the top of the window, to view their profile information.

That's it; you're ready to begin chatting. Anyone you talk to will automatically be added to your contact list.

Text chats

Not in the mood for a voice call? Having a sneaky conversation at work while the boss isn't looking? Text chats are just as useful today as they've ever been; there's a reason Facebook Messenger and WhatsApp remain two of the most popular apps in the world. Here's how to text chat on Skype.

Step 1: Select the person you want to talk to either from the list of recent conversations on the left or your contact list at the top of the Window. Doing so will open up a chat on the right-hand side of the app window.

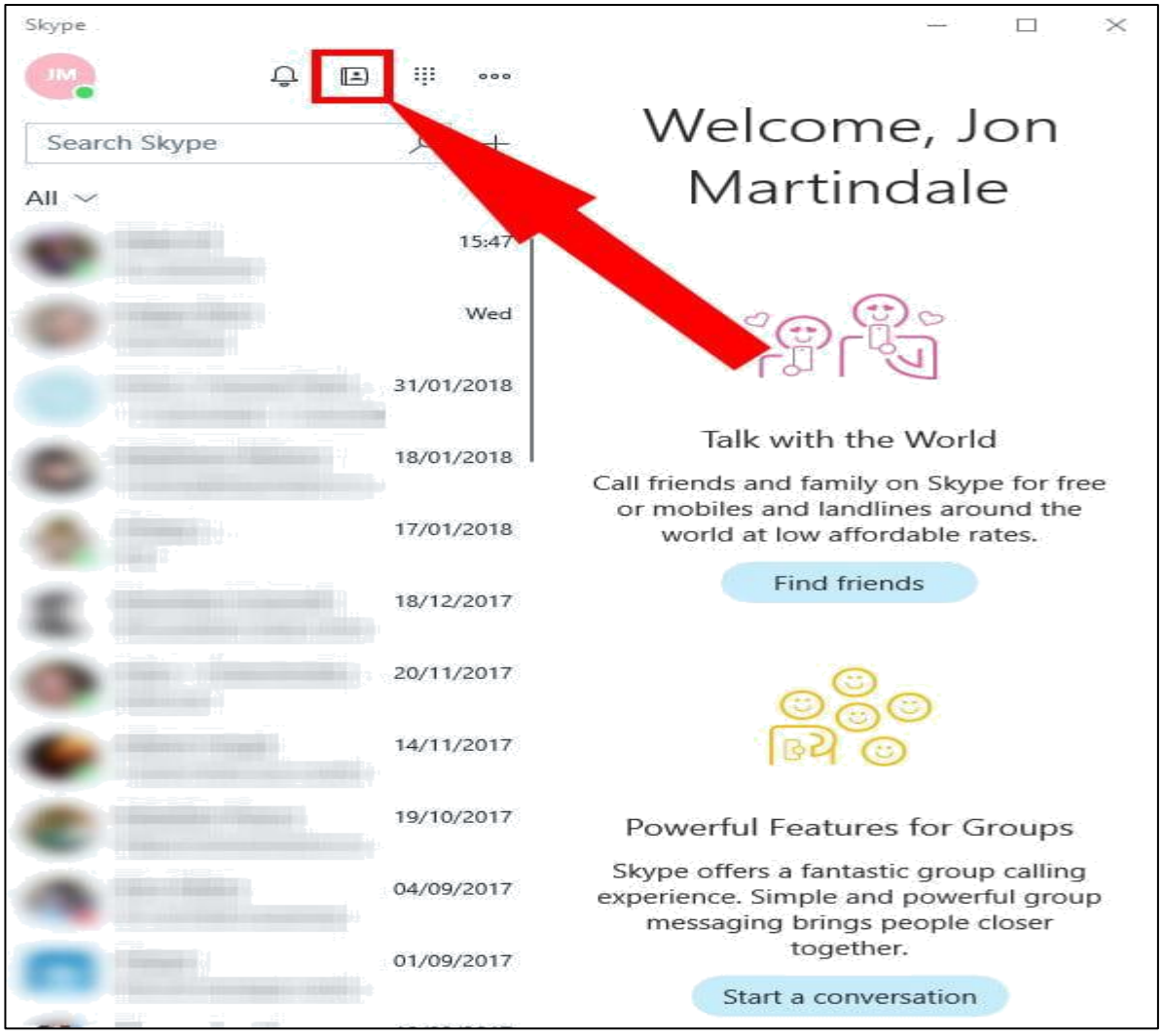


Fig G.19: Sending message in Skype

Step 2: Click the bottom of the conversation panel where it says *Type a message*. Type what you want to say and hit enter, or click the send arrow on the right-hand side.

Step 3: Await a response. Rinse and repeat!

Voice calls

When Skype first launched, its big selling point was its voice over internet protocol (VOIP) abilities. While it would go on to facilitate voice calls to landlines and mobile devices, its Skype to Skype voice calling function remains a crucial component of its service. Setting up a call is as easy as ever.

Step 1: Make sure you have a compatible microphone and headphones/speaker set up. Plug them in and make sure Skype has picked them up by clicking the three-dotted menu at the top of the Window, then going to Settings. You can leave your Speakers and Microphone as the Default device, but you can specify your chosen input and output options with the drop-down menus if you want.

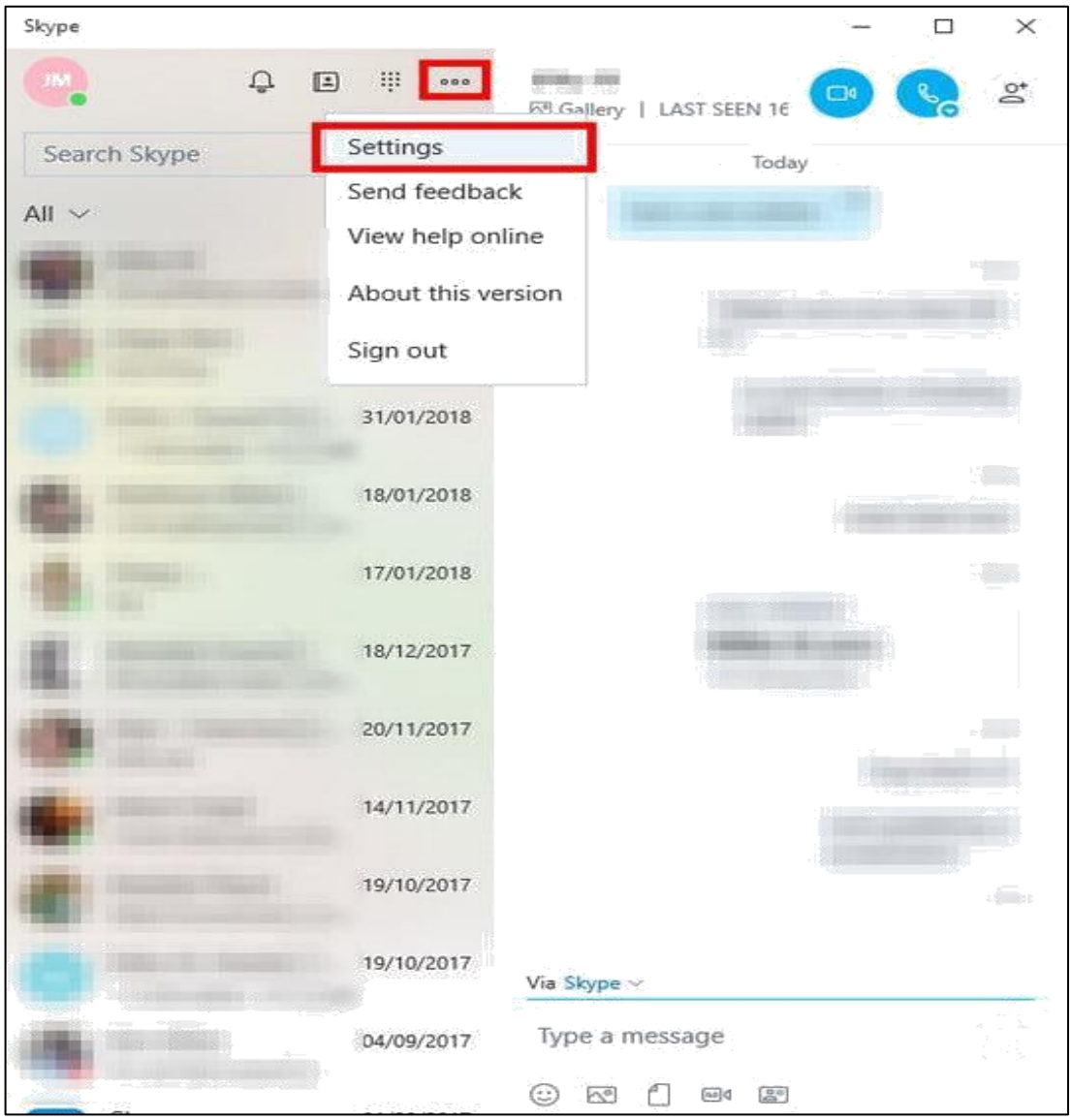


Fig G.20: Settings in Skype

If you want to test that your hardware is working correctly, use the *Test audio* link in the Settings menu. *Alternatively*, call Skype's *Echo* services using the same steps as below.

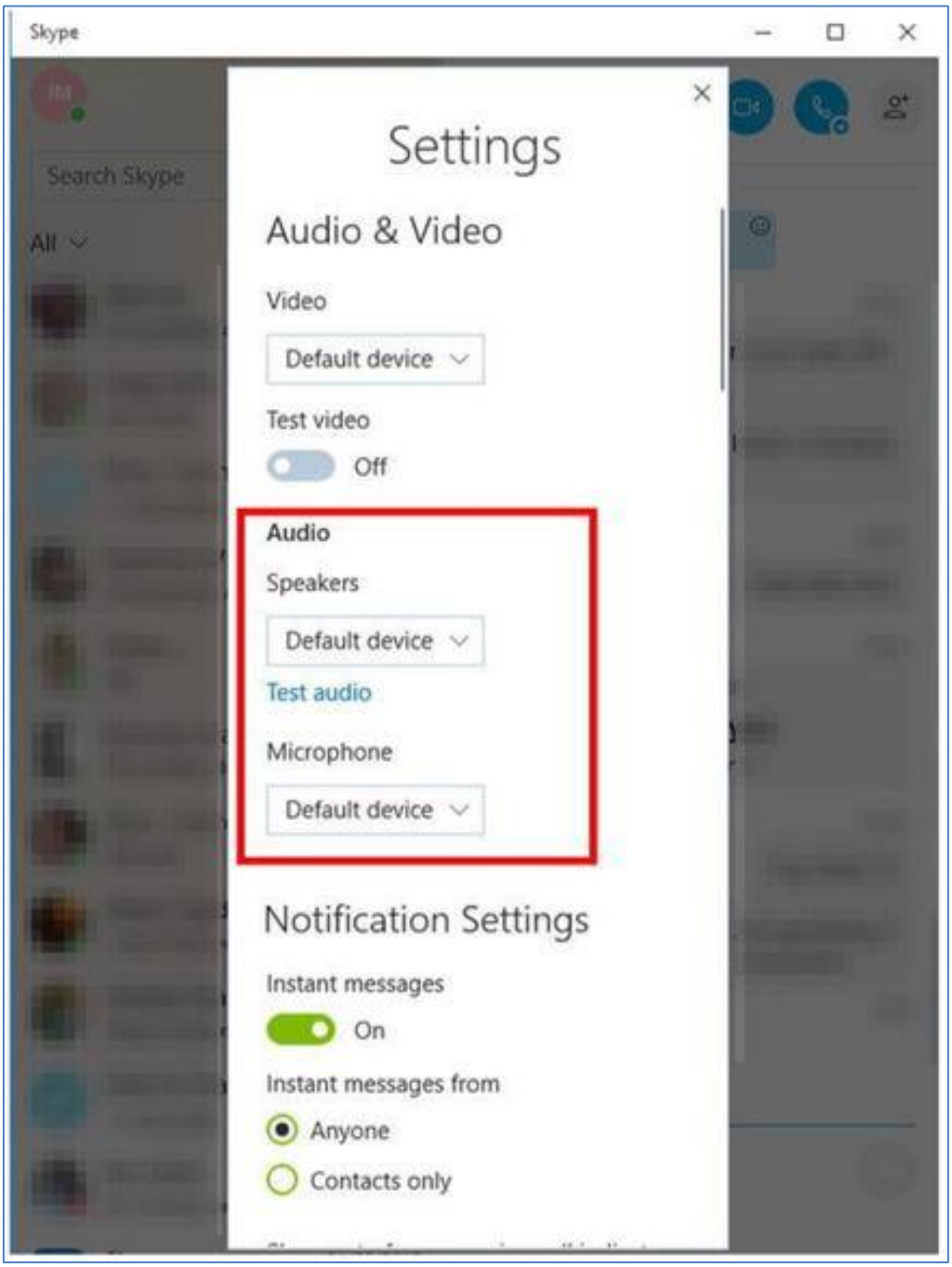


Fig G.21: Sound settings in Skype

Step 2: Select the contact or person you want to talk to in the same manner as the text chats.

Step 3: Click the blue phone icon in the top right-hand corner. If that person is online and Skype is open, you will then call them directly. If they accept the call, you will begin a voice call automatically.

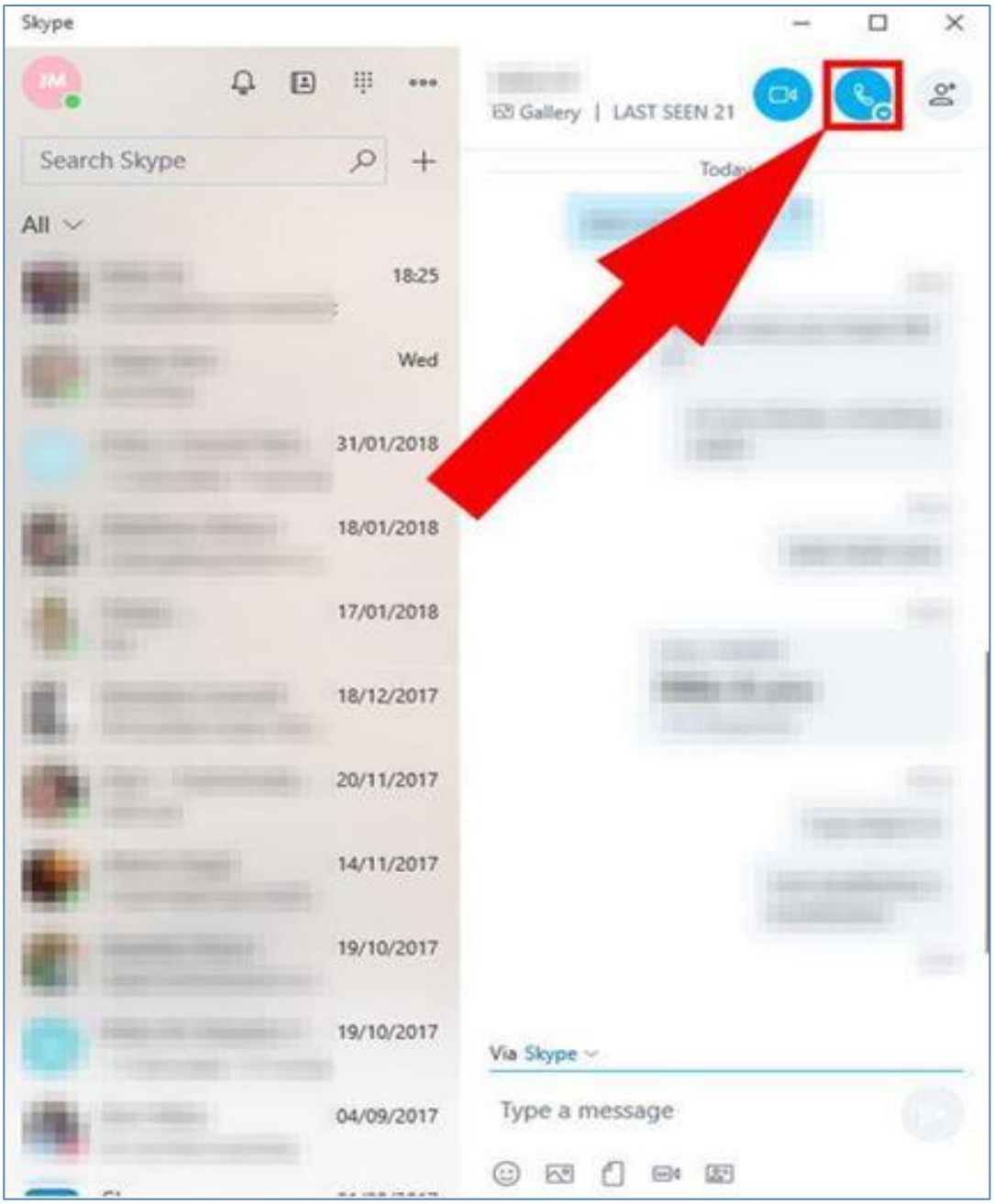


Fig G.22: Attending calls in Skype

If someone rings you in the same manner, just click the corresponding button to pick up the call. Alternatively, if you don't want to talk to them, click the red button instead.

Video calls

To add an extra dimension to your conversations, why not use Skype's video call function? All you need is a webcam and a willingness to show your face on it.

Step 1: Make sure that your camera is working correctly with Skype in a similar manner to your speakers and microphone. Click the three-dot menu icon and select Settings.

Click *Default Device*" under the video heading at the top of the page and select your webcam from the drop-down menu.

If you want to double-check it's working correctly, toggle the *Test video*, button in the settings menu. If it's working correctly, a live-video of you will appear within the menu.

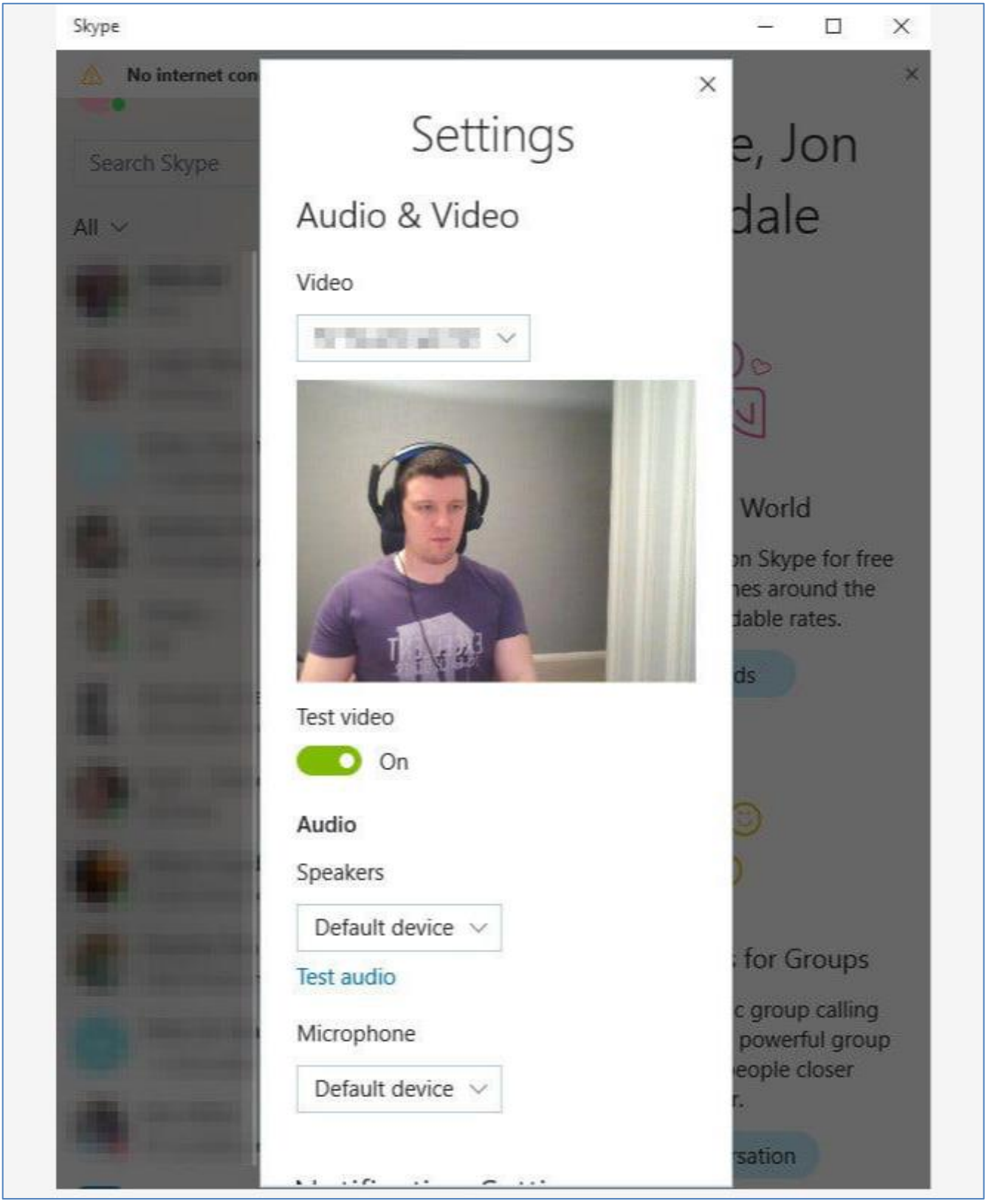
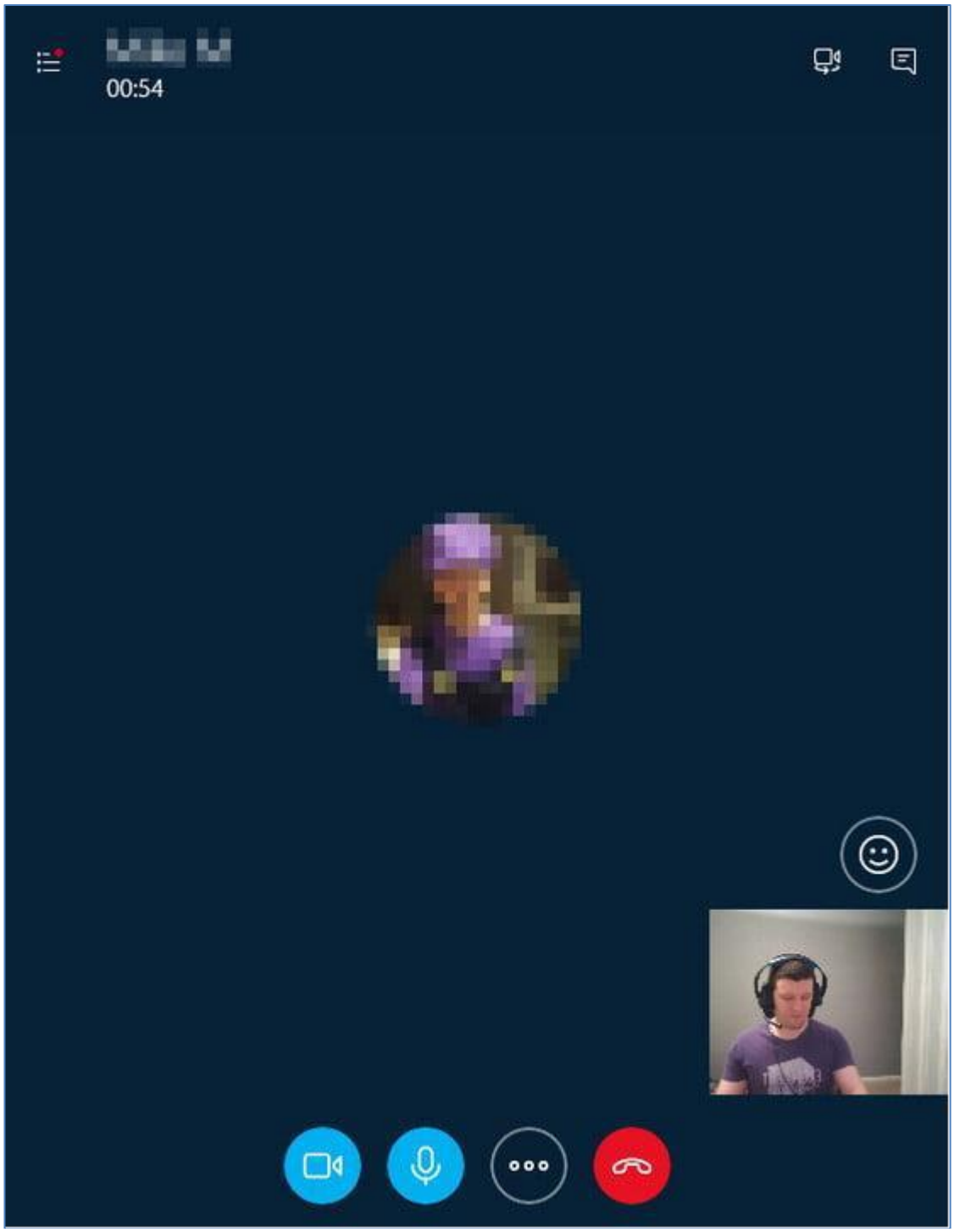


Fig G.23: Testing video in Skype

Step 2: When ready, select the contact you want to call and click the blue camera icon in the top right-hand corner. Alternatively, start a voice call and then click the same camera button in the call window.

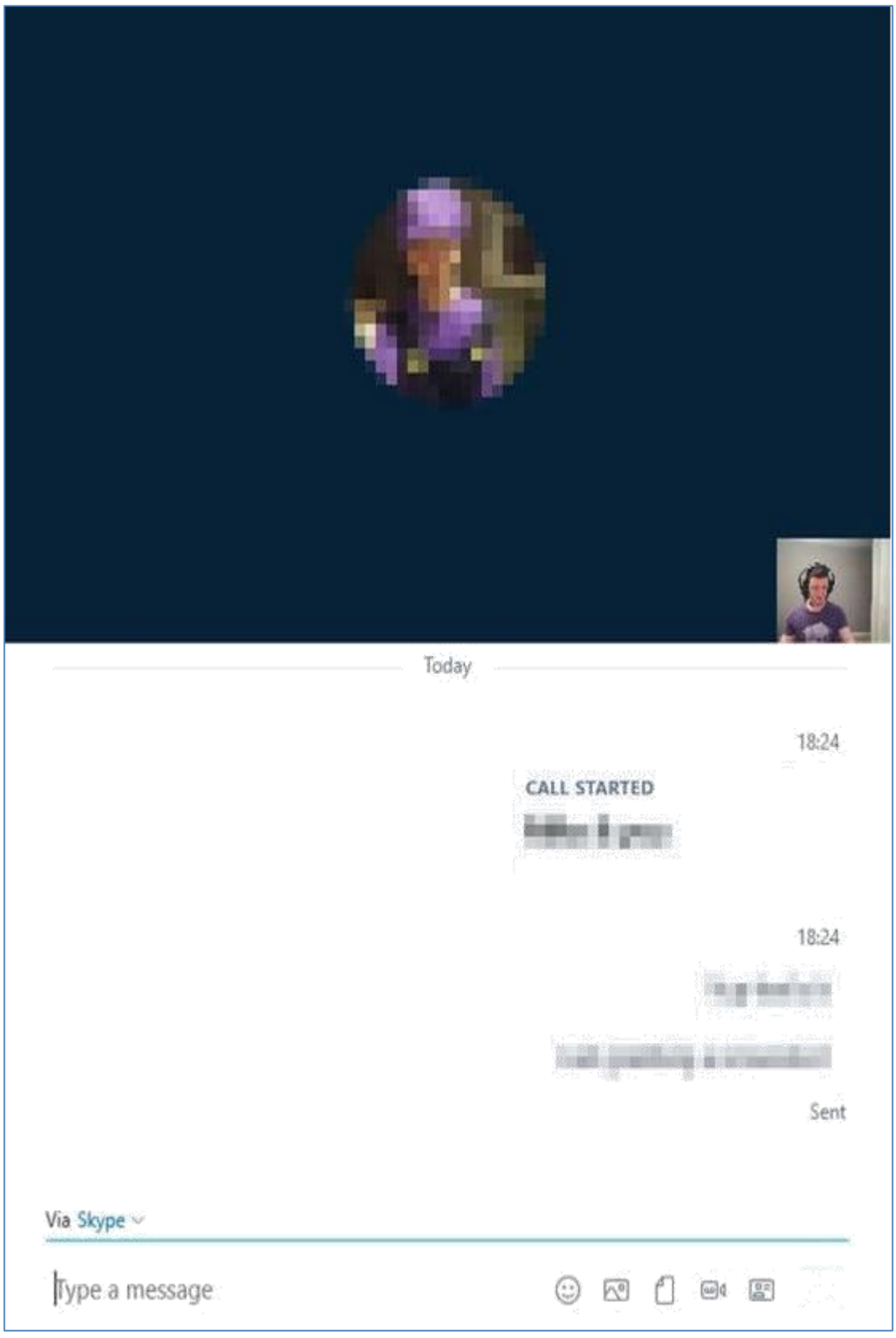
When the call is running, you can see a miniature version of the video your friend sees in the bottom right-hand corner. If they start their webcam in return, you'll see them in the main window.

Fig G.24:How a Skype call looks



Step 3: If you want to text chat during the call for whatever reason, click the text chat button in the top right-hand corner of the video call window. That will shrink the main video section of the window and give you the usual text chat options below.

Fig G.25: Text chatting during a call



7. Google Meet

How to set up a video conference in Google Meet

1. **Click the app icon** (it looks like a video camera) to open the dashboard and get started.

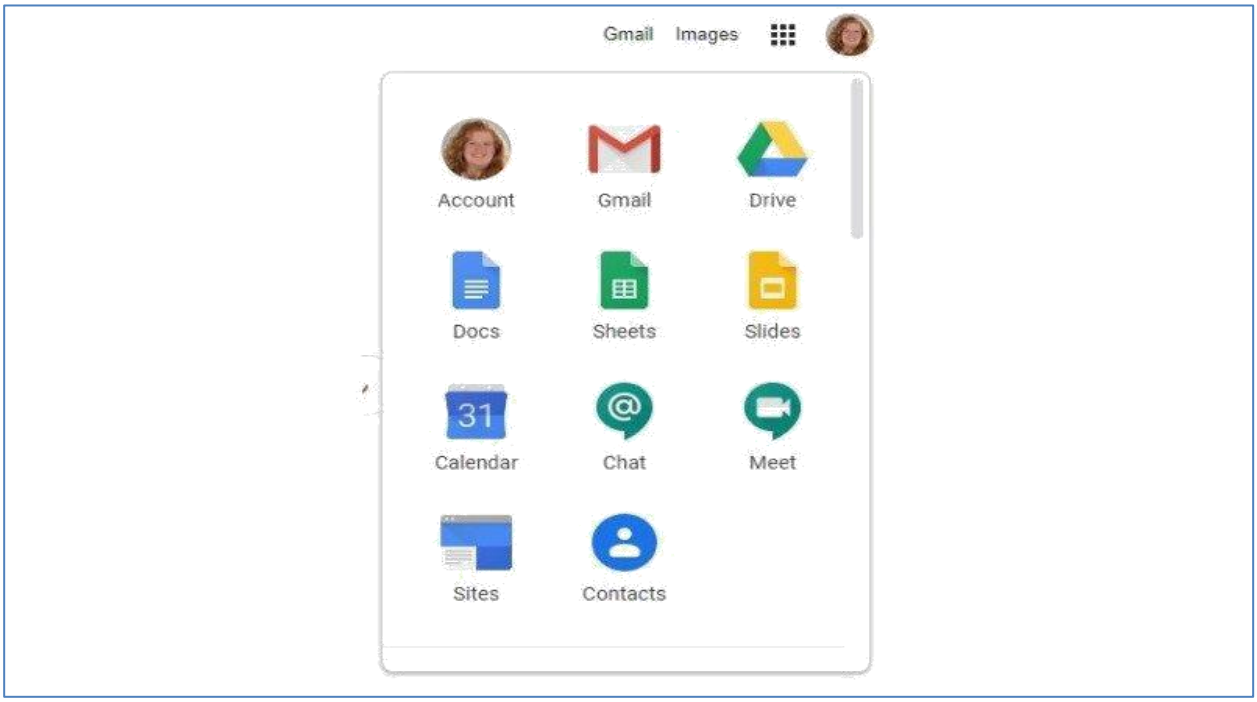


Fig G.26: Click on the app button

2. In the upper right-hand corner you will see the settings icon. **Clicking this icon** opens a view window that shows your device's audio and webcam so you to test them.

   o This is a good way to make sure the tools you need to host a video conference are working.

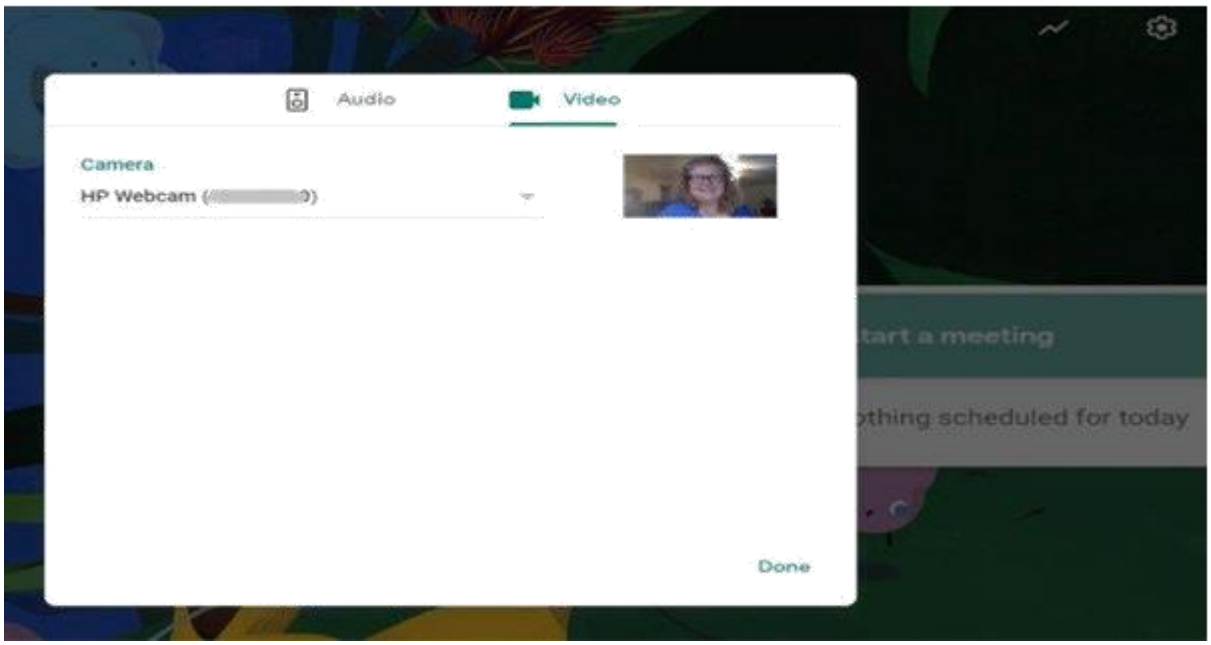


Fig G.27: Open the view button

3. When you're ready to create a meeting, simply click **Join or start a meeting**.



Fig G.28: Click on Join Meeting

4. You will be asked to enter a meeting code if you are joining an existing meeting, or to title the meeting you are creating. Click **Continue**.

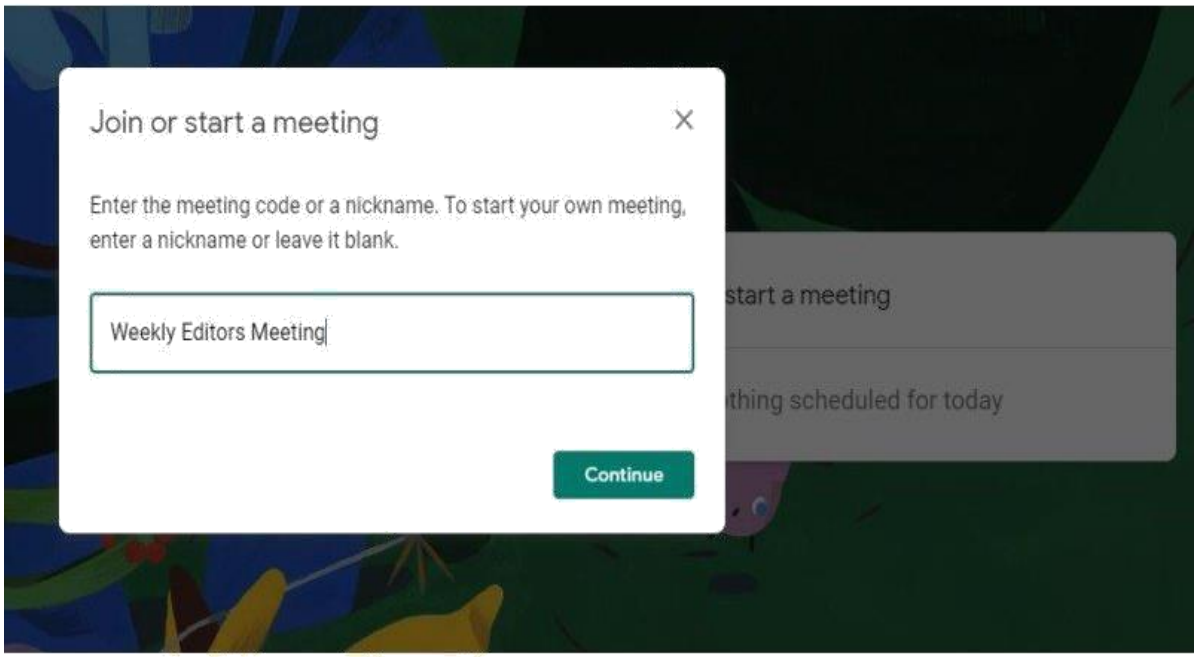


Fig G.29: Enter Meeting code

5. On this screen, you will again have a chance to make sure your device's audio and video capabilities are working. On the right-hand side of the view screen, click **Join now** to start your meeting.

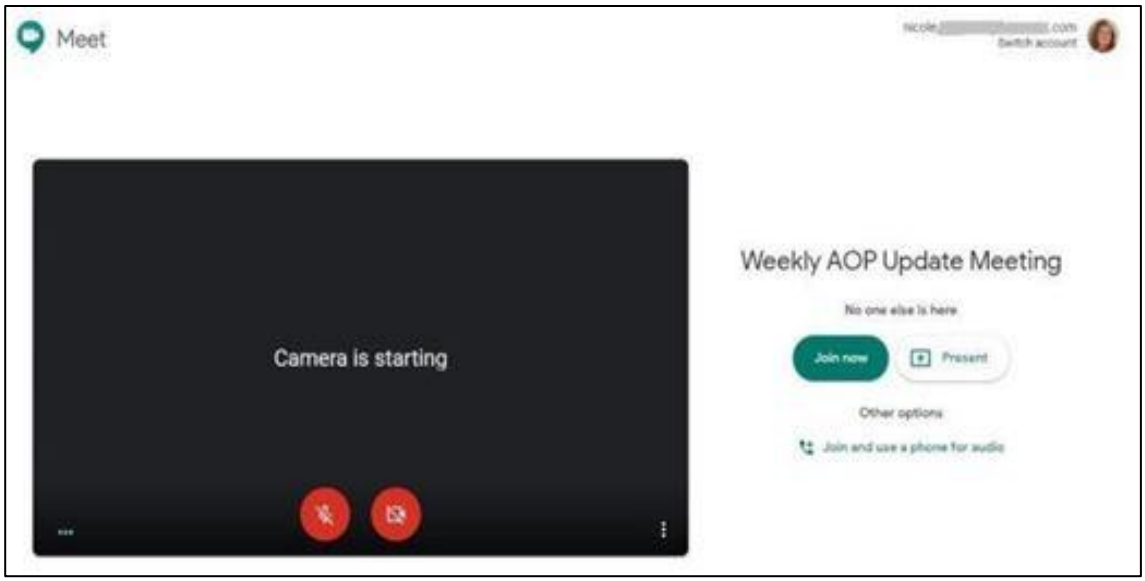


Fig G.30: Voice and video options

6. A window will pop up with your meeting information and a link to **Add people**. Clicking this will list all people in your Gmail contacts along with a field to invite others not in your contacts.

7. After choosing who to invite, click **Send invitation**. This will send the meeting link to your attendees.

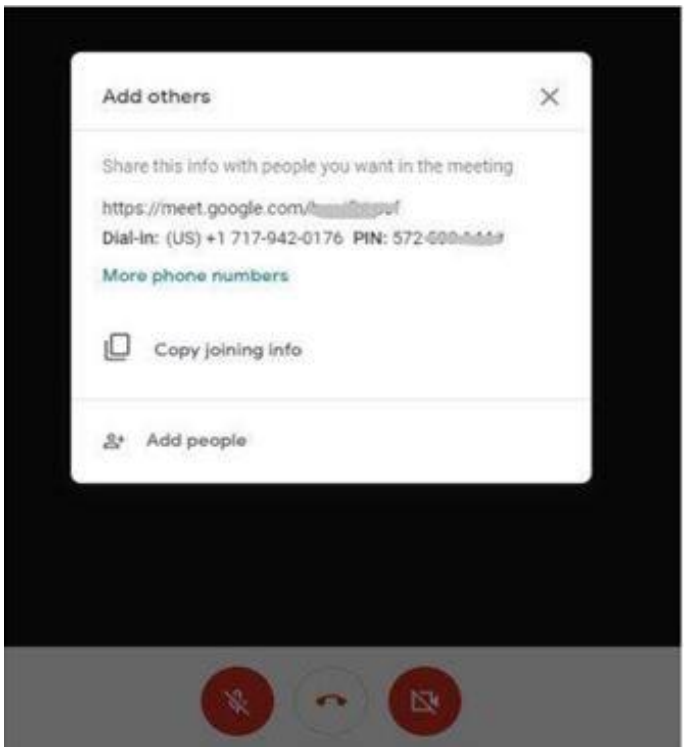


Fig G.31: Sharing link for meeting

8. If you are the presenter, from your screen you will see tools for conducting your conference. In the bottom right-hand corner, click the three dots. This will give you the option to **Record meeting**. You will also find **Turn on captions** for members who are hearing impaired.

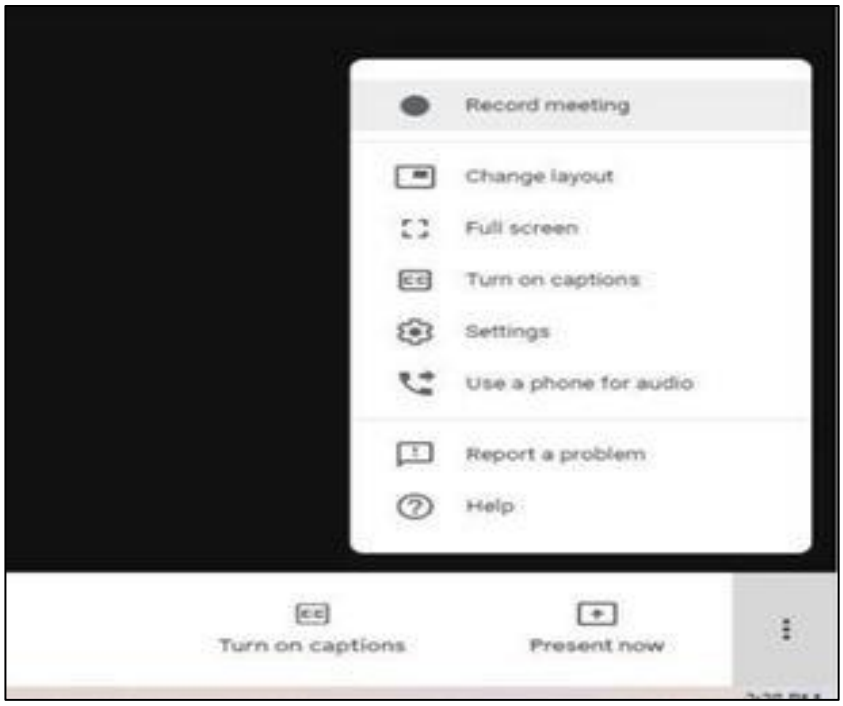


Fig G.32: Record meeting

9. Also at the bottom of the screen, you will also see **Present now**. Clicking this gives you the option to share your screen and anything you have displayed there, including slide presentations and videos.

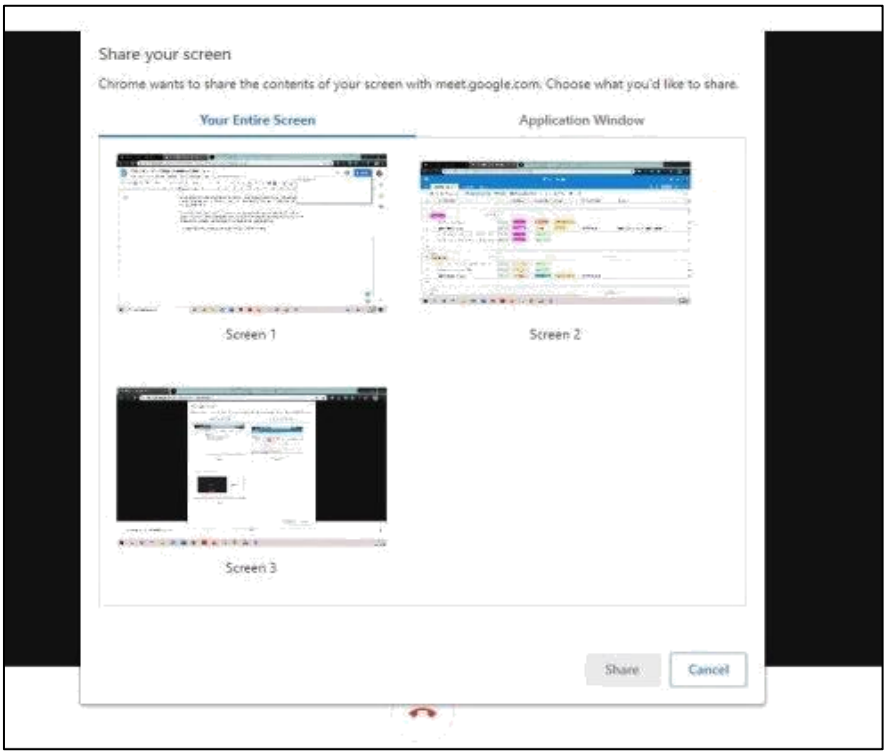


Fig G.33: Sharing screen

10. At the top of the screen, you will see **two icons**. The first tells you how many people are currently in your meeting. Clicking it will show you who is attending and if they are

muted or not. You can also send a quick invite or reminder to anyone you see has forgotten to join.

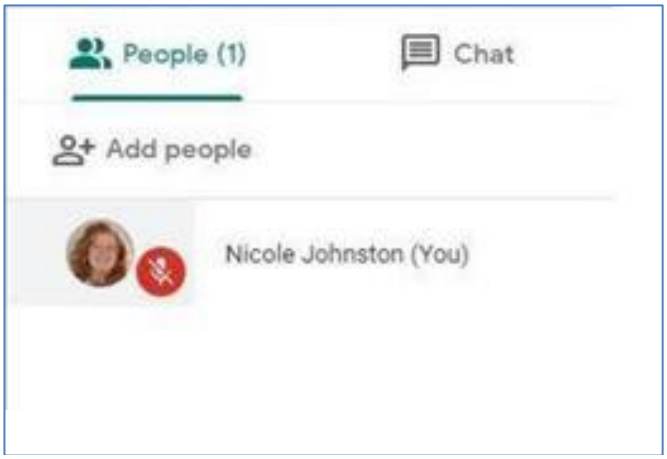


Fig G.34: Viewing people

11. The **second icon** opens the chat features. This is good for keeping tabs on questions being asked by muted participants. You can also share documents, links, and images through the chat feature.

Fig G.35: Chat function in Google Meet



Overall, Google's meeting app is really straightforward and pretty easy to figure out. But if you need help with any part of your Meet video conference, Google has a healthy support group with FAQs, troubleshooting articles and how-to videos.

PRACTICE QUESTIONS

1. To get familiar with various functionality of Blogs websites.
2. To get familiar with various functionality of Twitter.
3. To get familiar with various functionality of YouTube Channels and upload a video on YouTube.
4. To get familiar with various functionality of Instagram.
5. To get familiar with various functionality of Facebook.
6. To get familiar with various functionality of Google meet.
7. To get familiar with various functionality of Skype.

H. Cyber Security

1. Backup Your Files

Backup refers to the process of making copies of data or data files to use in the event the original data or data files are lost or destroyed.

Why is Backup Needed?

The main purpose is to recover the lost data from an unpredictable event like deletion by mistake or file corruption which in many cases is caused by a virus. An example is **Ransomware**, which encrypts all your data when your computer gets infected and the second is to roll back the data at a specific time you want.

How is this Process Managed at Big Companies?

It is suggested that in bigger companies which have a large volume of data, it is necessary to have a backup administrator, which is one of the most trusted persons in the company because he has access to all the data of that organization and generally deals with the backup routine check and the health of the backup.

Backup Devices

CD and DVD, Blue-Rays − They are used for home/personal usage where people can store their documents, mainly personal or office related documents because they have small capacities varying from 750MB to 50GB.



Fig H.1: CD's and DVD's

Removable Devices − They are again for home usage (data, documents, music, photos, movies) which can be a Removable USB or external hard disks. Their capacities lately have increased a lot, they vary from 2 GB to 2 TB.

Fig H.2: Pen Drive



Network attached storage (NAS) − They are generally devices that are used in small businesses for backup purposes because they offer a centralized manner of backup. All the users can connect through the network to access this device and save data.

They are lesser in cost when compared to other solutions and they also offer a good fault tolerance as they are configured in RAID (redundant array of independent disks). They can be rack or non-rack mounted. They offer a good level of authentication of users and web console managing.



Fig H.3: Network attached storage

Types of Backups Based on Location

The types of backup can vary on the size of the business, budget and the data importance.

They are divided in two types −

- Local Backups
- Online Backups

Generally local backups store the data in a CD, NA Storages, etc. as there can be a simple copying of files or by using any third party software. One of them in the server is the Windows backup which is included in the Windows Server Edition License.

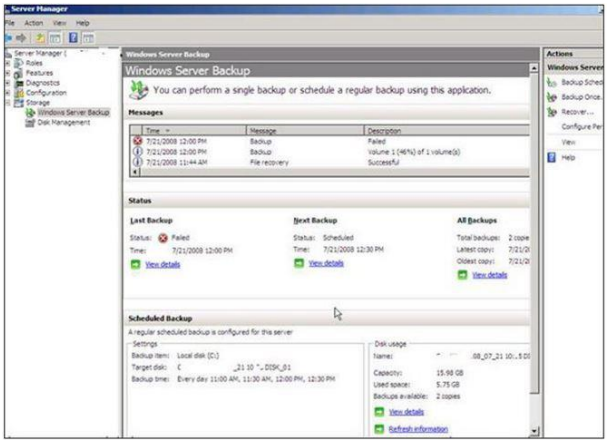


Fig H.4:Online backup

Another one is Acronis which is one of the best in the market − http://www.acronis.com/en-eu/

Online Backup or Cloud Storage

One of the biggest trend is online storage where the companies and users can store their data somewhere in the cloud, and it is cheaper as well rather than doing it all by yourself. There is also no need for any backup infrastructure and maintenance.

For a personal user it is offered for free by the biggest vendors like Microsoft. It offers OneDrive and you can store up to 5GB in their cloud and it has an interface for different Operating Systems.

The second is the Google Drive, which is a product by Google, wherein the files synchronizes automatically.

Fig H.5: Google Drive



For small or big companies, mentioned before, online or cloud backup solution are a good solution for them because of the cost and the liability.

The biggest vendors offering such service are Microsoft with AZURE solution which is offering a very high performance and scalability for this solution.

The other is Amazon with it product S3 details about this product can be found on − http://aws.amazon.com/s3/

Most effective backup strategy

The standard best practice for backing up data is known as the 3-2-1 rule. The 3-2-1 backup strategy simply states that you should have 3 copies of your data (one production data and 2 backup copies) .Keep the backup copies on different media. Keep one backup copy offsite. This prevents losing copies of the database in case of an event such as a natural disaster. One of the most common examples of an offsite backup is through the use of the cloud. Another alternative is to keep a physical copy in another secure location.

2. **Email Scams**

Phishing

Phishing is a scam where criminals typically send emails to thousands of people. These emails pretend to come from banks, credit card companies, online shops and auction sites as well as other trusted organizations. They usually try to trick you into going to the site, for example to update your password to avoid your account being suspended. The embedded link in the email itself goes to a website that looks exactly like the real thing but is actually a fake designed to trick victims into entering personal information.

Email scams

Email is an excellent communication tool. However, email is frequently used to deliver unwanted material which could be annoying and malicious, causing considerable harm to your computer and yourself. This is Spam (or Junk) email. The vast majority of email sent every day is unsolicited junk mail. Examples include:

- Advertising, for example online pharmacies, gambling.
- Get rich quick and work from home schemes.
- Hoax virus warnings.
- Hoax charity appeals.
- Chain emails which encourage you to forward them to multiple contacts (often to bring 'good luck').

How spammers obtain your email address

- Using automated software to generate addresses.
- Enticing people to enter their details on fraudulent websites.
- Hacking into legitimate websites to gather users' details.
- Buying email lists from other spammers.
- Inviting people to click through to fraudulent websites posing as spam email cancellation services.
- From names/addresses in the cc line, or in the body of emails which have been forwarded and the previous participants have not been deleted.
- The very act of replying to a spam email confirms to spammers that your email address exists.

How to spot spam

Spam emails may feature some of the following warning signs:

- You don't know the sender.
- Contains misspellings designed to fool spam filters.
- Makes an offer that seems too good to be true.
- The subject line and contents do not match.

- Contains an urgent offer end date (for example “Buy now and get 50% off”).
- Contains a request to forward an email to multiple people, and may offer money for doing so.
- Contains a virus warning.
- Contains attachments, which could include .exe files.

The risks

- It can contain viruses and spyware.
- It can be a vehicle for online fraud, such as phishing.
- Unwanted email can contain offensive images.
- Manual filtering and deleting is very time-consuming.
- It takes up space in your inbox.

Use email safely

- Do not open emails which you suspect as being scams.
- Do not forward emails which you suspect as being scams.
- Do not open attachments from unknown sources.
- If in doubt, contact the person or organization the email claims to have been sent by ...
- better safe than sorry.
- Do not readily click on links in emails from unknown sources. Instead, roll your mouse pointer over the link to reveal its true destination, displayed in the bottom left corner of your screen. Beware if this is different from what is displayed in the text of the link from the email.
- Do not respond to emails from unknown sources.
- Do not make purchases or charity donations in response to spam email.
- Don’t click on ‘remove’ or reply to unwanted email.
- When sending emails to multiple recipients, list their addresses in the 'BCC' (blind copy) box instead of in the 'To' box. In this way, no recipient will see the names of the others, and if their addresses fall into the wrong hands there will be less chance of you or anybody else receiving phishing or spam emails.
- Similarly, delete all addresses of previous parties in the email string, before forwarding or replying.

- If you are suspicious of an email, you can check if it is on a list of known spam and scam emails that some internet security vendors such as McAfee and Symantec feature on their websites.

- Most Microsoft and other email clients come with spam filtering as standard. Ensure yours is switched on.
- Most spam and junk filters can be set to allow email to be received from trusted sources, and blocked from untrusted sources.
- Most internet security packages include spam blocking. Ensure that yours is up to date and has this feature switched on.

3. **Fight Against Malware**

Malware, short for malicious software, is software designed to disrupt computer operation, gather sensitive information, or gain unauthorized access to computer systems. While it is sometimes software, it can also appear in the form of script or code. Malware is a general term used to describe any kind of software or code specifically designed to exploit a computer, or the data it contains, without consent. The expression is a general term used by computer professionals to mean a variety of forms of hostile, intrusive, or annoying software.

Avoid Malware

Following the tips below can help reduce your risk of downloading unwanted malware and spyware: • Keep your security software updated. At a minimum, your computer should have anti-virus and anti-spyware software, and a firewall. Set your security software, internet browser, and operating system (like Windows or Mac OS) to update automatically.

- Don't click on any links or open any attachments in emails unless you know who sent it and what it is. Clicking on links and opening attachments – even in emails that seem to be from friends or family – can install malware on your computer.
- Download and install software only from websites you know and trust. Downloading free games, file-sharing programs, and customized toolbars may sound appealing, but free software can come with malware.
- Minimize "drive-by" downloads. Make sure your browser security setting is high enough to detect unauthorized downloads. For Internet Explorer, for example, use the "medium" setting at a minimum.
- Use a pop-up blocker and don't click on any links within pop-ups. If you do, you may install malware on your computer. Close pop-up windows by clicking on the "X" in the title bar.

- Resist buying software in response to unexpected pop-up messages or emails, especially ads that claim to have scanned your computer and detected malware. That's a tactic scammers use to spread malware.
- Talk about safe computing. Tell your kids that some online actions can put the computer at risk: clicking on pop-ups, downloading "free" games or programs, opening chain emails, or posting personal information.
- Back up your data regularly. Whether it's text files or photos that are important to you, back up any data that you'd want to keep in case your computer crashes.

Detect Malware

- Monitor your computer for unusual behavior.
- Slows down, crashes, or displays repeated error messages
- Won't shut down or restart
- Serves up a barrage of pop-ups
- Displays web pages you didn't intend to visit, or sends emails you didn't write
- New and unexpected toolbars
- New and unexpected icons in your shortcuts or on your desktop
- A sudden or repeated change in your computer's internet home page
- A laptop battery that drains more quickly than it should
- Get Rid of Malware

Follow the tips below if you suspect there is malware is on your computer.

Disconnect your computer from the Internet.

- Update your security software, and then perform a manual scan of your entire system.
- If the manual scan doesn’t locate and remove the infection, you may need to reinstall your operating system, usually with a system restore disk that is often supplied with a new computer. Note that reinstalling or restoring the operating system typically erases all of your files and any additional software that you have installed on your computer.
- After reinstalling the operating system and any other software, install all of the appropriate patches to fix known vulnerabilities.

4. Password Protection

Passwords provide the first line of defense to your business computers and electronic devices. It’s important that you use strong passwords that are hard to guess. Understand what makes a strong password, and how to create one.

Use strong passwords to protect your business

If passwords are too simple, hackers can easily guess or gather them, giving cybercriminals free access to your system. Once they're in, you have a major problem. The stronger and more complex your passwords, the safer your network will be from a cyber-attack.

Passwords should:

- Be at least 10 characters long
- Not contain a complete word which easily links to you including your name, company name, family member or pet
- Include a mix of upper-and lower-case letters, numbers and symbols
- Be different from each other and from previous passwords
- Change regularly
- Be kept private
- Be unique and hard to guess

Useful Tips:

- Use the letters of a song, musical or movie title and change some of the characters to make a strong password.
- Use a password manager – this will create and securely store unique passwords for you.
- Don't write passwords down on paper or store a list in a word document – they can be stolen and used to access your accounts.
- Select no when a computer offers to automatically remember your password when logging onto a website.
- Always give employees different logins (user name and passwords) for your business systems.

Multi-factor authentication (MFA) is an authentication method in which a computer user is granted access only after successfully presenting two or more pieces of evidence (or factors) to an authentication mechanism: knowledge (something the user and only the user knows), possession (something the user and only the user has), and inherence (something the user and only the user is).

Two-factor authentication (also known as 2FA) is a type, or subset, of multi-factor authentication. It is a method of confirming users' claimed identities by using a combination of two different factors:

1) Something they know
2) something they have, or

3) something they are.

Example are to supplement a user-controlled password with a one-time password (OTP) or

code generated or received by an authenticator (e.g. a security token or smartphone) that only the user possesses.

5. UPI

Requirements for registration on UPI

- Smartphone with internet facility
- Bank Account details (only for registration)
- AVAILABLE APPS (28 BANK APPS)

SBI app, PNB UPI, UPI Collect (ICICI), Axis Pay, Canara Bank UPI, UCO UPI, Union Bank UPI,

OBC UPI and 20 other banks

Fig H.6: UPI Registration Process

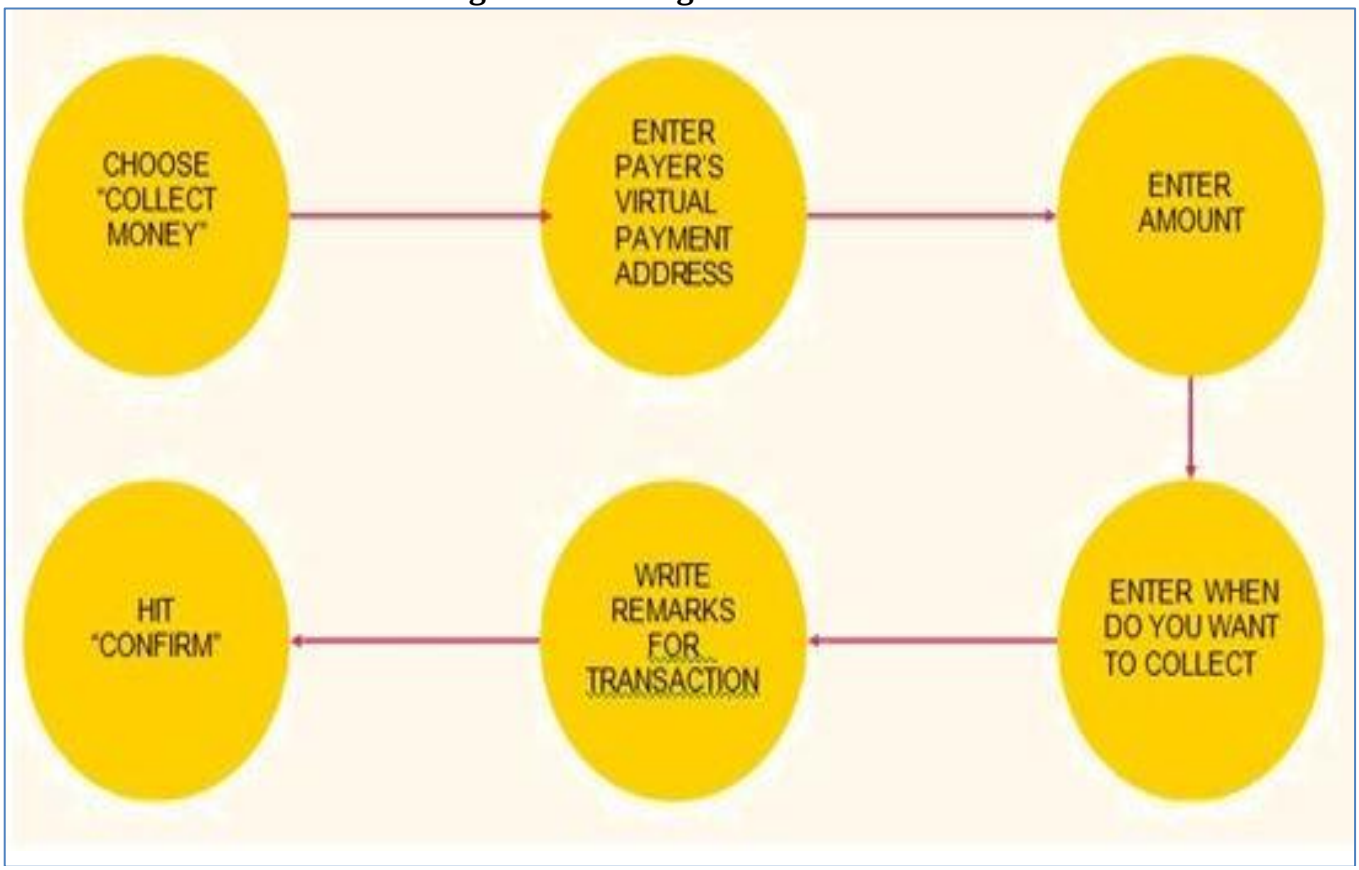
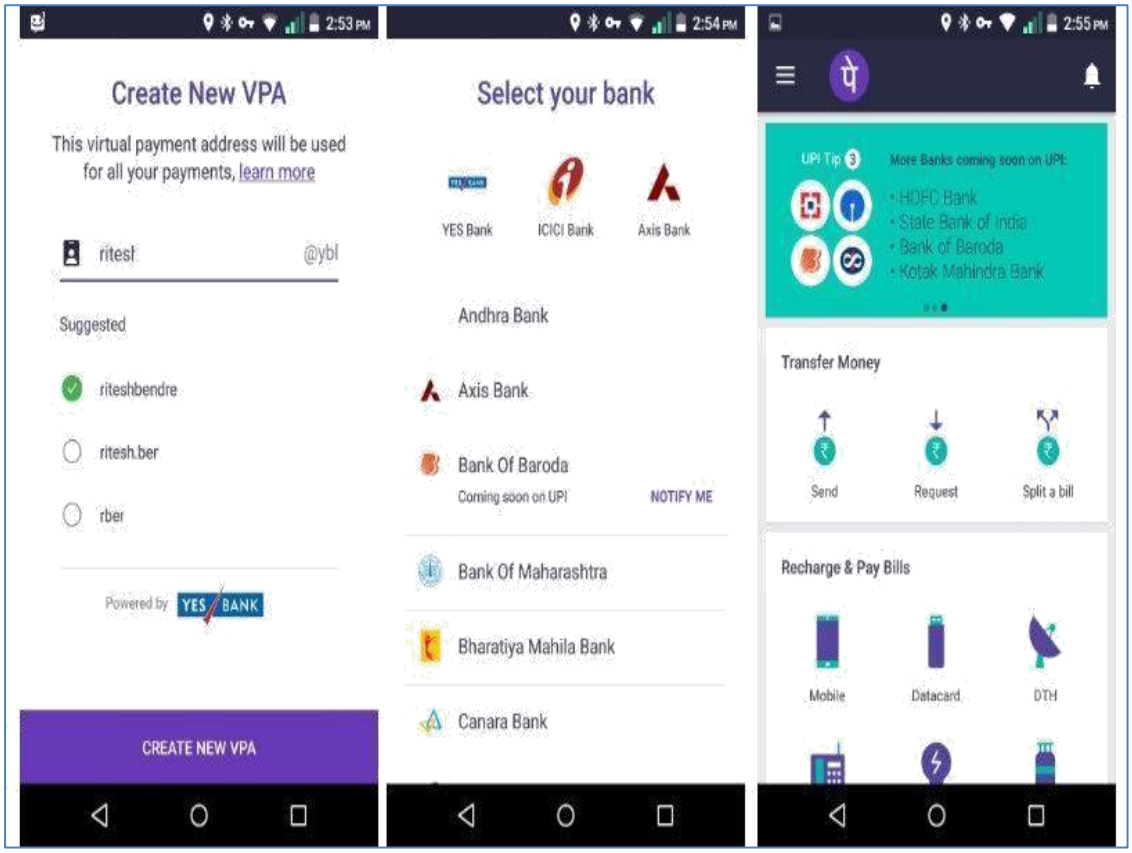


Fig H.7: Registering on UPI



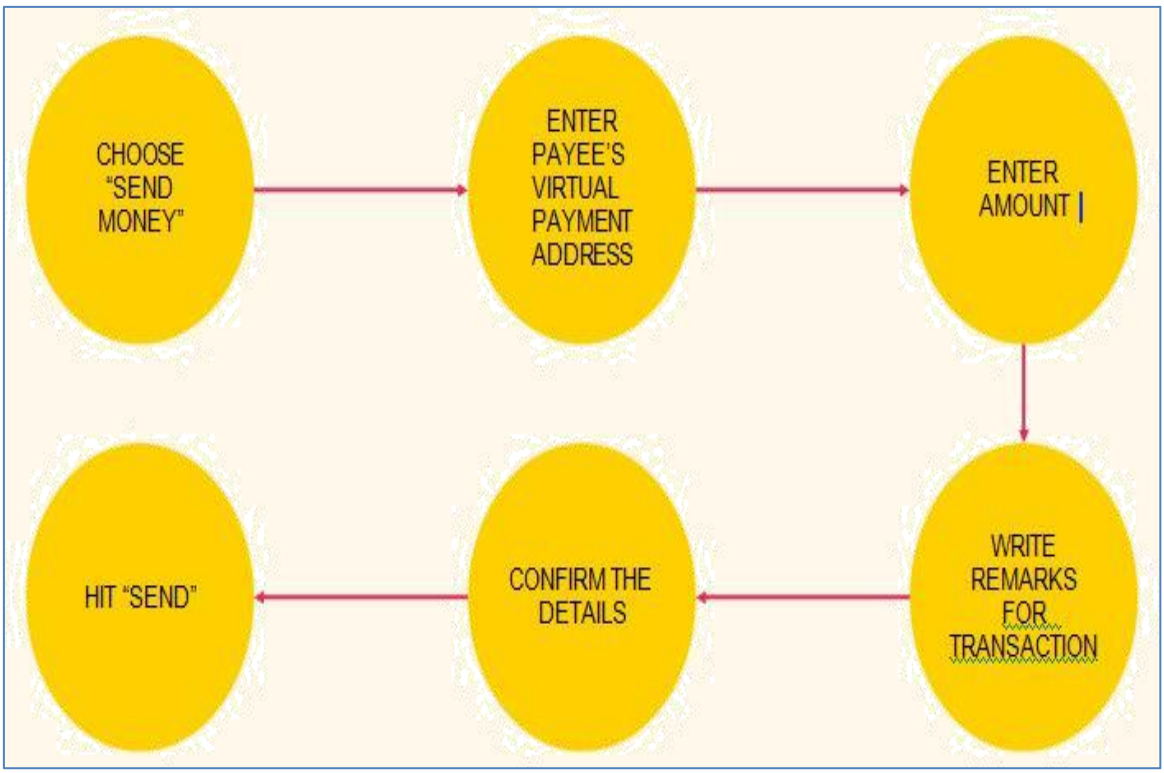


Fig H.8: Sending Money on UPI

Fig H.9: Sending Money

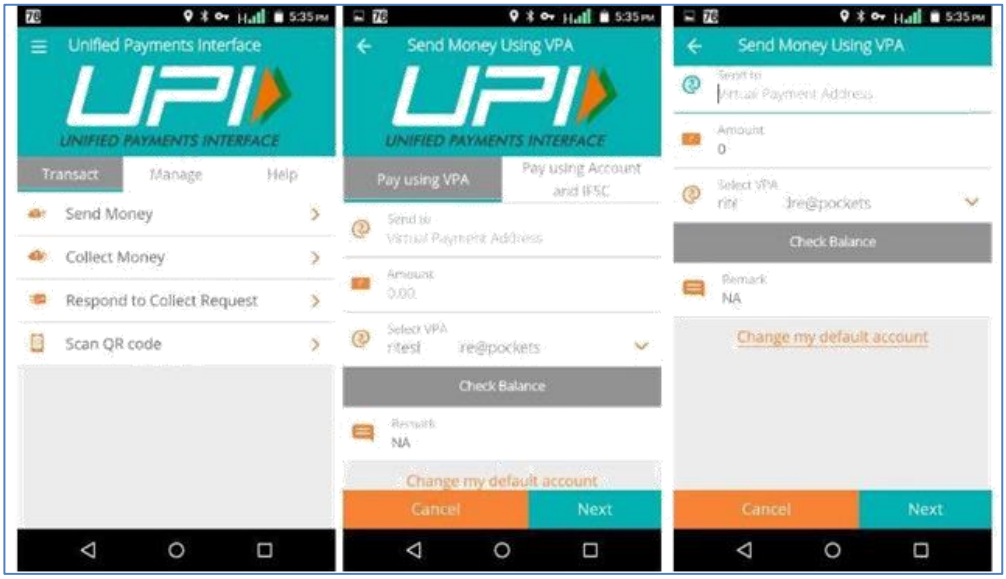
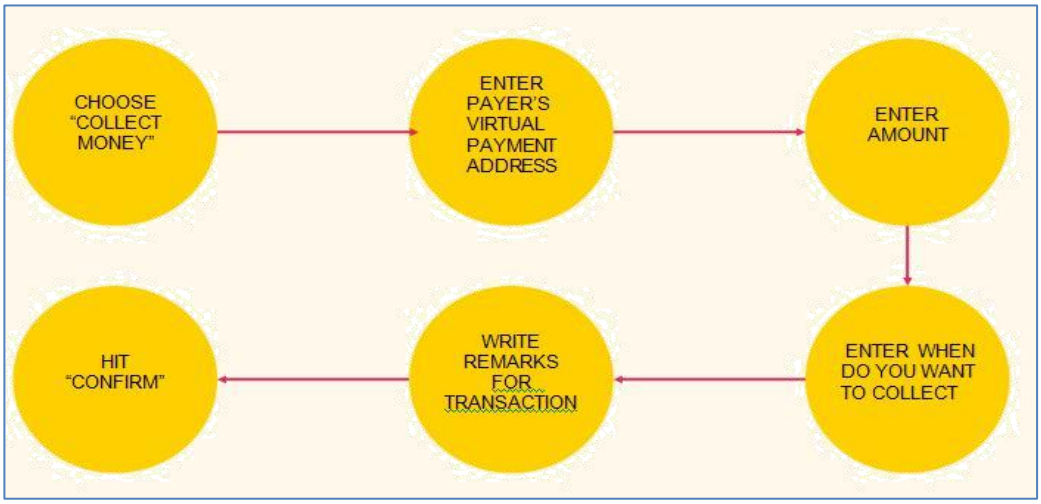
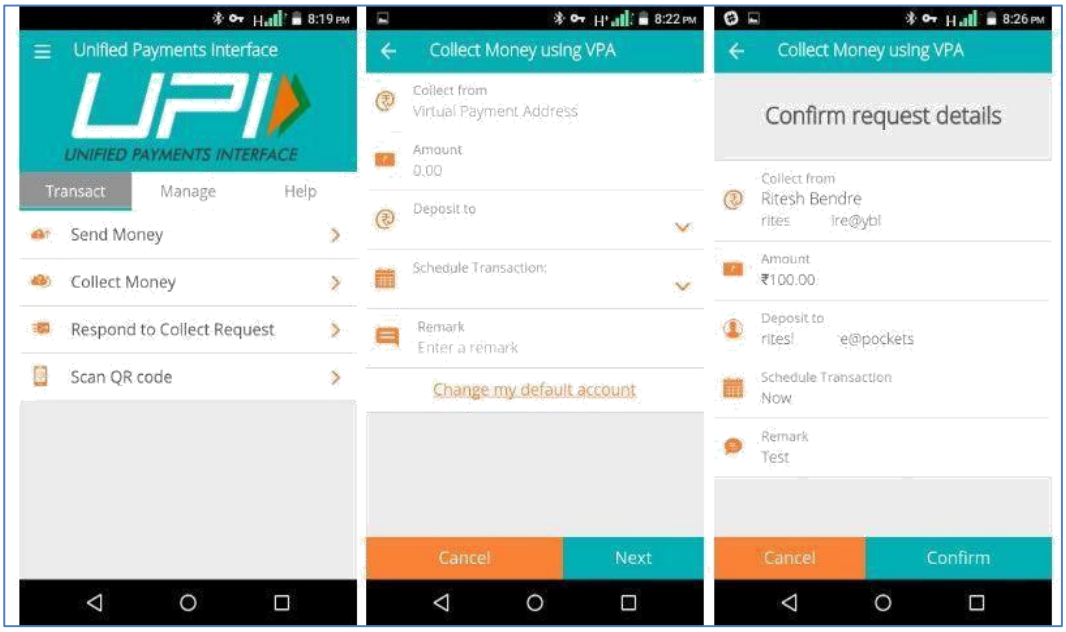


Fig H.10: Collecting Money (raise a demand) on UPI





PRACTICE QUESTIONS

1. How should I perform my backups?
2. What are Email Scams?
3. What is the best protection against malware?
4. To get familiar with various Password Protection.

I. Awareness to Project Management Tools

MIS Report and Analysis

What is MIS Report & How It Works?

MIS report provides a summarized and bulletin view of different verticals that are required to be monitored for the proper functioning of your business. The primary use of MIS reports is to take set parameters and compare it to the performance of business operations.

They provide a concise view of a company performance in terms of revenue, orders, customer queries, HR indices, employee performance and attrition.

By analyzing the variance between the estimated target with the achieved results, businesses can adopt new practices that would result in higher performance. The primary contribution of MIS reports is to condense disparate figures to provide insights on the business model.

What are the Types of MIS Reports?

- **Sales MIS Reports**: Sales MIS report is created and managed by the sales and marketing departments for transactional analysis of various products and services. The analysis is based on variance, which is the difference between the estimated sales compared to actual sales.
- **Budget Reports:** In any business, creating budget report is necessary to manage allotted finances and to minimize expenses. Some common budget reports that can be generated include production budget, expense budget, income budget, cash budget, etc.
- **Production Reports:** The manufacturing department is responsible for the creation of production reports which include the comparison of set production targets and the final production count. Variation between the targeted and achieved production helps in quantifying the overall process efficiency.
- **Cash flow Statement Report:** With this MIS report, business operations department can analyze the inflow and outflow of cash, to check the overall transactions at a certain period. It also helps in tracing fund sources that have been utilized for the outflows.
- **Funds Statement Report:** Funds Statement Report is processed by the accounting and finance team to keep a track of the fund sources. It is also created to check where the funds have been utilized.

- **Profit Report:** Profit reports are created by the accounts department to check the difference between actual and estimated profit (or loss) at a certain time span. It also accounts the factors which led to the profit or loss.
- **Income Statement Report:** Reports for income, taxes, ledgers and balance sheet are crucial for assessing the financial data of shareholders and investors. With the help of income statement report, accountants can analyses the concurrent financial state of a business.
- **Abnormal Losses Reports:** Coming under the umbrella of manufacturing department, the report on abnormal losses can help business reduce expenditure. Some of the abnormal losses include manufacturing defects, spillage or breakdown of machinery, defects in raw material or natural calamities.
- **Costing Reports** Cost reports are one of the most important aspects of MIS. Whether it is a small business or an enterprise, overall costs incurred by different departments is analyzed to see if it can be reduced.
- **HR MIS Reports**: HR MIS Reports help in analyzing the performance of employees at certain duration of time. It calculates the total amount of tasks, assignments or projects completed by different employees in that duration.
- **Inventory Reports:** MIS provides inventory reports to which raw material is in surplus and which ones need to be replenished. It also helps keep daily, weekly, monthly and quarterly production and stock statements.

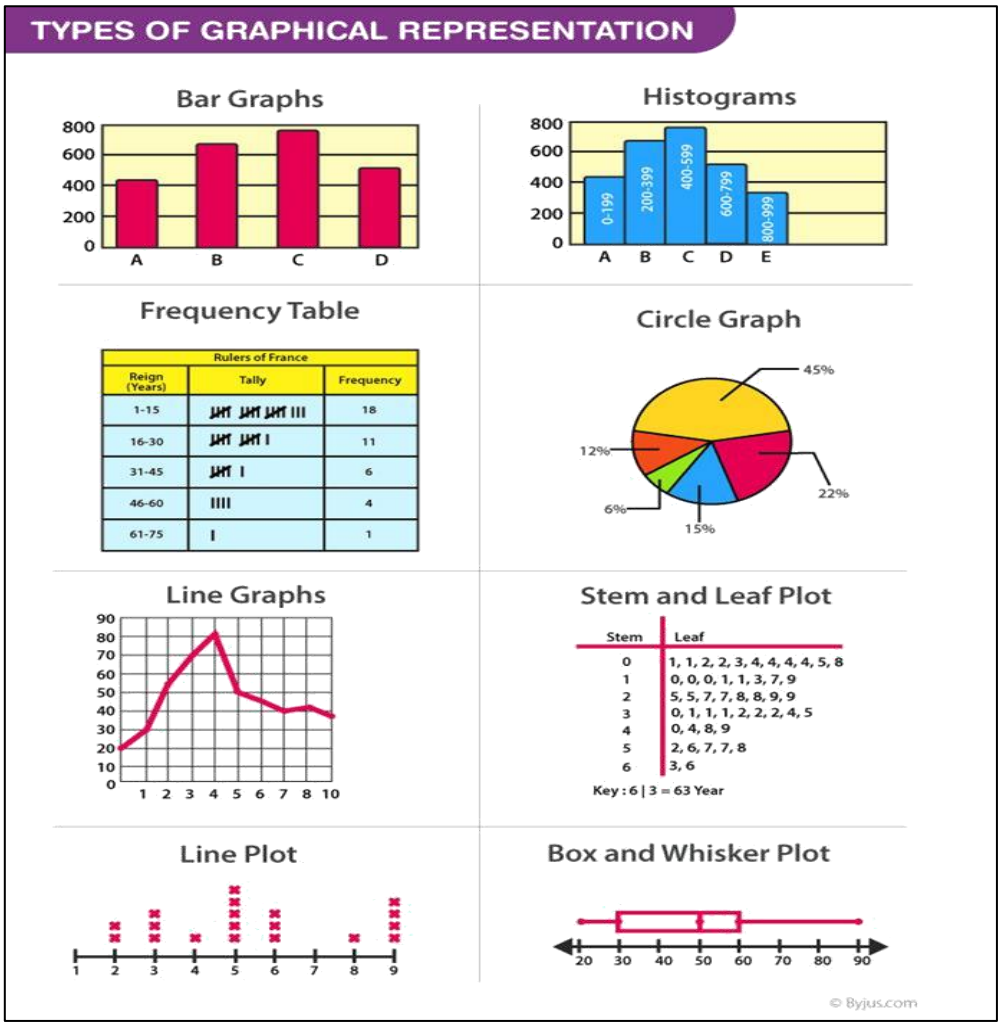
2. Different Graphical Representation and study analysis

Graphical Representation is a way of analyzing numerical data. It exhibits the relation between data, ideas, information and concepts in a diagram. It is easy to understand and it is one of the most important learning strategies. It always depends on the type of information in a particular domain. There are different types of graphical representation. Some of them are as follows

- **Line Graphs** – Linear graphs are used to display the continuous data and it is useful for predicting the future events over time.
- **Bar Graphs** – Bar Graph is used to display the category of data and it compares the data using solid bars to represent the quantities.
- **Histograms** – The graph that uses bars to represent the frequency of numerical data that are organised into intervals. Since all the intervals are equal and continuous, all the bars have the same width.
- **Line Plot –** It shows the frequency of data on a given number line. ‘ x ‘ is placed above a number line each time when that data occurs again.

- **Frequency Table** – The table shows the number of pieces of data that falls within the given interval.
- **Circle Graph** – Also known as pie chart that shows the relationships of the parts of the whole. The circle is considered with 100% and the categories occupied is represented with that specific percentage like 15%, 56% , etc.
- **Stem and Leaf Plot** – In stem and leaf plot, the data are organized from least value to the greatest value. The digits of the least place values from the leaves and the next place value digit forms the stems.
- **Box and Whisker Plot** – The plot diagram summarizes the data by dividing into four parts. Box and whisker shows the range (spread) and the middle (median) of the data.

Fig I.1: Types of charts



General Rules for Graphical Representation of Data

There are certain rules to effectively present the data and information in the graphical representation. They are:

- Suitable Title: Make sure that the appropriate title is given to the graph which indicates the subject of the presentation.
- Measurement Unit: Mention the measurement unit in the graph.

- Proper Scale: To represent the data in an accurate manner, choose a proper scale.
- Index: Index the appropriate colours, shades, lines, design in the graphs for better understanding
- Data Sources: Include the source of information wherever it is necessary at the bottom of the graph.
- Keep it Simple: Construct a graph in an easy way that everyone can understand.
- Neat: Choose the correct size, lettering, colours etc in such a way that the graph should be a visual aid for the presentation of information.

Graphical Representation in Math's

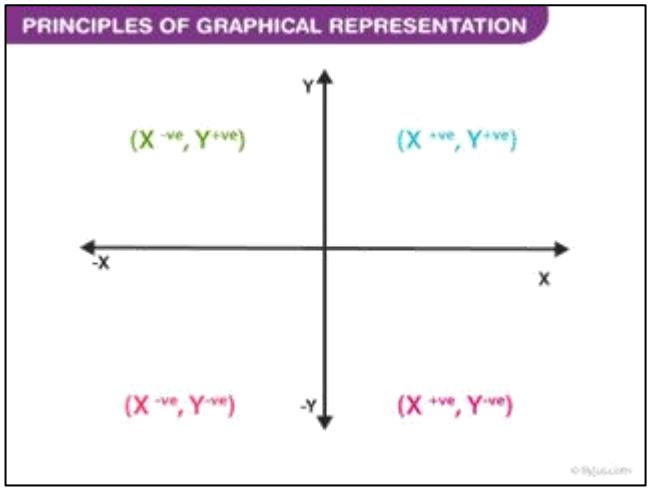
In Mathematics, a graph is a chart with statistical data that are represented in the form of curves or lines drawn across the coordinate point plotted on its surface. It helps to study the relationship between two variables where it helps to measure the change of amount of variable with respect to another variable within a given interval of time. It helps to study the series distribution and frequency distribution for a given problem. There are two types of graphs to visually depict the information. They are:

- Time Series Graphs – Example: Line Graph
- Frequency Distribution Graphs – Example: Frequency Polygon Graph

Principles of Graphical Representation

Algebraic Principles are applied to all types of graphical representation of data. In graphs, it is represented using two lines are called coordinate axes. The horizontal axis is denoted as x – axis and the vertical axis is denoted as y – axis. The point at which two lines intersect is called origin, ' O '. Consider x axis, the distance from origin to the right have a positive value and the distance from the origin to the left side have positive value. Similarly for the y axis, the distance above the origin has a positive value and the distance below the origin have negative value.

Fig I.2: Principles of Graphical Representation



Generally frequency distribution are represented in four methods, namely

- Histogram
- Smoothed frequency graph
- Pie diagram
- Cumulative or give frequency graph
- Frequency Polygon

Merits of Using Graphs

Some of the merits of using graphs are as follows:

- The graph is easily understood by everyone without any prior knowledge.
- It saves time
- It allows to relate and compare the data for different time periods
- It is used in statistics to determine the mean, median and mode for different data, as well as in interpolation and extrapolation of data.

Sample Example for Frequency polygon.

Here are the steps to follow for finding the frequency distribution of a frequency polygon and it is represented in a graphical way.

- Obtain the frequency distribution and find the midpoints of each class interval.
- Represent the mid points along X-axis and frequencies along Y-axis.
- Plot the points corresponding to the frequency at each mid-point.
- Join these points, using lines in order.
- To complete the polygon, join the point at each end immediately to the lower or higher class marks on the X-axis.

Question :

Draw the frequency polygon for the following data:

Class Interval	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	4	6	8	10	12	14	7	5

Solution :

Mark the class interval along x – axis and frequency along y – axis.

Let assume that class interval 0-10 with frequency zero and 90-100 with frequency zero.

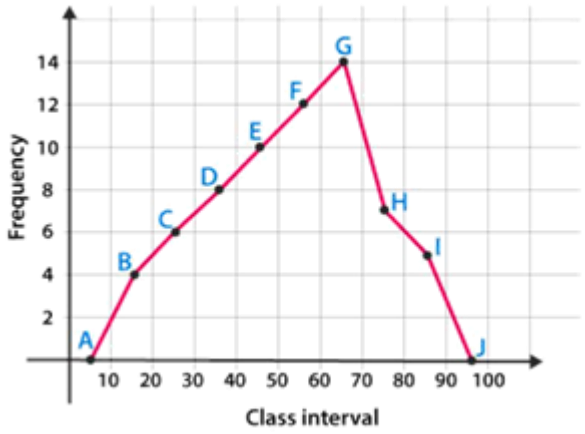
Now calculate the midpoint of the class interval.

Class Intervals	Midpoints	Frequency
0-10	5	0
10-20	15	4
20-30	25	6
30-40	35	8
40-50	45	10
50-60	55	12
60-70	65	14
70-80	75	7
80-90	85	5
90-100	95	0

Using adjacent table, plot the points A (5, 0), B (15, 4), C (25, 6), D (35, 8), E (45, 10), F (55, 12), G (65, 14), H (75, 7), I (85, 5) and J (95, 0).

To obtain the frequency polygon ABCDEFGHIJ, draw the line segments AB, BC, CD, DE, EF, FG, GH, HI, IJ.

Fig I.3: Plotting points in graph



3. PERT/CPM

Why PERT/CPM?

- Prediction of deliverables
- Planning resource requirements
- Controlling resource allocation
- Internal program review
- External program review
- Performance evaluation
- Uniform wide acceptance

APPLICATIONS OF PERT/CPM TECHNIQUES

- Construction of a Dam or Canal
- Construction of a building or highway
- Maintenance or Overhaul of aircrafts
- Space Flights
- Designing a Prototype of a Machine

Steps in PERT/CPM

- PLANNING
- SCHEDULING
- ALLOCATION OF RESOURCES
- CONTROLLING

Framework for PERT and CPM

- Define the Project. The Project should have only a single start activity and a single finish activity.
- Develop the relationships among the activities.
- Draw the "Network" connecting all the activities.
- Assign time and/or cost estimates to each activity
- Compute the critical path.
- Use the Network to help plan, schedule, and monitor and control the project.

CPM - Critical Path Method

- Drafting the design of Program or Project
- Evaluation of drafted Program or Project
- Review of evaluated Program or Project

PERT - Project Evaluation & Review Techniques

- To analyze and represent the tasks involved in completing a given project
- Accommodates the variation in event completion time
- Event-oriented technique rather than start- and completion-oriented
- Commonly used in conjunction with the critical path method
- Basic Terms In Network Analysis
- Activity Event Constraints
- Network Diagram Critical Path
- Errors in Network Construction

PRACTICE QUESTIONS

1. To get familiar with various MIS Reports.
2. Different Graphical Representation and study analysis

J. Basic Concepts of Mobile

1. Mobile Features

awareness Mobile Phone

A mobile phone is a wireless handheld device that allows users to make and receive calls and to send text messages, among other features. The earliest generation of mobile phones could only make and receive calls. Today's mobile phones, however, are packed with many additional features, such as web browsers, games, cameras, video players and even navigational systems.

A mobile phone may also be known as a cellular phone or simply a cell phone.

Smart Phone

A smartphone is a cell phone that allows you to do more than make phone calls and send text messages. Smartphones can browse the Internet and run software programs like a computer. Smartphones use a touch screen to allow users to interact with them. There are thousands of smartphone apps including games, personal-use, and business-use programs that all run on the phone. The picture is an example of the Apple iPhone, one of the most popular smartphones available today.

What can a smart Phone can do?

Smartphones are loaded with features and capabilities that make them more than a phone.

- Make and receive phone calls text messages.
- Take, show, and store pictures and video.
- Browse the Internet, as well as send and receive e-mail.
- GPS capability for location and navigation.
- Record and play audio and music.
- Display time and date and other functions such as alarm clock, stopwatch, and timer.
- Display weather and temperature information.
- Voice dictation and take notes.
- Virtual assistant using Siri, Google Assistant, or Cortana.
- Access utilities, such as a flashlight, e-book reader, and calculator.

2. Operating System and Applications

Mobile Operating Systems

An Operating System is an interface between hardware and user. It manages hardware and software resources of the system.

A Mobile OS is an operating system that is specifically designed to run on mobile devices such as mobile phones, smartphones, PDAs, tablets etc.

Much like Linux and Windows operating system controls your desktop or laptop, a mobile OS controls your mobile devices and other programs run on top of Mobile OS.

When you purchase a mobile device, you want to know about the OS to ensure compatibility and support for the mobile applications you want to use.

Popular Mobile Operating Systems

- **Android**
- **Bada (Samsung Electronics)**
- **BlackBerry OS**
- **iOS**
- **Symbian OS**
- **WebOS**
- **Windows Mobile**

Android OS

The Android mobile Operating System was developed by Google to run on smartphone (Touch screen). With time number of versions have been launched:

Cupcake

Donut

Éclair

Froyo

Ginger Bread

Honey Comb

Ice Cream Sandwich

Jelly Bean

Kitkat

Lollipop

Marshmallow

Nougat

Oreo

1. Bada

Bada is a Samsung's Mobile OS. Bada was launched in 2010. It has mobile features such as Multipoint-touch, 3D graphics, applications downloading and installation.

Now Samsung is planning to kill off its Bada OS and merge it with Tizen.

Tizen phones will be able to run apps designed for Bada devices, but it won't be possible to upgrade a Bada phone to Tizen.

2. BlackBerry

BlackBerry OS is a proprietary mobile OS developed by Canadian company named BlackBerry. Its limited to BlackBerry smartphones.

The operating system provides multitasking and supports specialized input devices like trackball, trackwheel etc.

3. Symbian OS

Symbian is a discontinued operating system designed for phones. It was developed in 1998 by Symbian Ltd.

Symbian was used by major mobile phone brands, like Samsung, Motorola, Sony Ericsson, and above all by Nokia. It was most popular OS for phones until end of 2010. At a time when smartphones were in limited use.

Symbian disappeared from market with time when Android came into use.

4. iOS

Apple's mobile operating system for its iPhone, iPad, iPod touch, Apple TV and similar devices. Apple iOS was originally called the iPhone OS but was renamed in 2010 to reflect the operating system's evolving support for additional Apple devices.

iOS was the first mobile OS with touch screen, handwriting recognition and voice recognition features etc.

5. webOS

webOS, also known as Open webOS, HP webOS, Palm webOS and LG webOS. It is a Linux based multitasking operating system for smart devices like smart phones and smart TVs.

Initially developed by Palm Inc.(which was acquired by Hewlett-Packard). The Operating system was later sold to LG Electronics.

Installing Apps

Nowadays, mainly two mobile operating systems are used:

- Android

- iOS

The companies of both Operating Systems have developed a market place over internet from where people can download and install different apps (Mobile Applications)

Play Store: It is Google's market place where we find Mobile Apps for Android based mobiles.

App Store: It is Apple's market place where we find apps for Apple Mobile Phones (iPhone).

There are thousands of paid and free apps on App Store and Play Store

Mobile Apps

There are millions of apps available on Google, Play Store, Apple App Store and Microsoft Store. Some of these are free and few are paid. There are various categories of Mobile apps like

- Games
- Music Apps
- Banking Apps
- Photo Editors
- Messengers
- Browsers
- Video Players
- Health Guidance Apps
- Online Shopping Apps

Following are some popular apps

1. **WhatsApp**



It is one of the most popular and widely used chat applications that also supports communication between international phone networks. It has many chat features such as video calling, audio calling, chat message deletion, emojis, status and more.

2. **UC Browser**



When it comes to mobile browsers, UC completely dominates the market with its amazing mobile compatible browsing app. UC browser is also available in a mini version for low-memory devices and has all the features you can expect in a mobile browser.

3. **Uber**



Uber is the most used location-based cab hiring app that allows users to hire drivers, cabs, bikes and shared rides for local and outstation transits. It is an easy, convenient, safe and cost-effective way of transporting within or nearby your city. Since it is a location-based app, Uber works fine on any GPS-enabled mobile device.

4. **SHAREit**

It is a free file sharing application by Lenovo that can be used to transfer audio, video and image files from a Wi-Fi compatible mobile/desktop device to another. The app is available for Windows, Android, iOS and many other platforms.

5. **Google Maps**



It is the most widely used mobile location and GPS tracking app. Maps by Google is a complete location app with features like GPS tracking, address sharing, navigation, real-time traffic updates, lane guidance, local place search and more.

6. **Gmail**



It is an email messaging application by Google that was first invented for web and now also has a dedicated mobile app variant for Android, iOS and other platforms. Gmail is the most used email application around the world.

7. **Amazon Mobile**



Amazon is the world's leading eCommerce marketplace which is now also available through a dedicated mobile application to target its mobile buyers and sellers. The Amazon mobile application works almost exactly same as the website.

8. **Netflix App**



It is an online video streaming website/app that lets you watch movies, videos, TV series and other content from Netflix through your mobile device or PC. The mobile app is more convenient as you can watch your favorite movies and videos from anywhere at anytime. The app is more popular in English speaking countries.

9. Google Pay (Tez)



Google Pay is Mobile Payment App by Google, it is one app for all your payment need. With Google Pay, you can send and receive money very quickly, pay bills, buy online, recharge Phone and dish, Pay at offline stores, Bank to bank money transfer. It is a simple and secure mobile payment app.

PRACTICE QUESTIONS

1. To get familiar with various Mobile Features.
2. To get familiar with Install Application on Mobile.

K. Awareness to IoT

Internet of Things (IoT)

The Internet of Things (**IoT**) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.



The Internet of Things is, world's leading research and advisory company, states that 14.2 billion connected things will be in use in 2019, and that total will reach 25 billion by 2021. The adoption of IoT in various applications are– smart home, smart industries and IoT is in agriculture too! IoT is constantly getting bigger and better.

The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors, processors and communication hardware.

Difference between Embedded device and IoT device

Embedded System is a combination of hardware and software which performs a specific task.An Embedded System is a combination of customized hardware and customized software. Customized hardware is the personalized design to suit your specific system with specific set of requirements. Customized software (also known as Embedded Firmware) is the software piece that gives life to the hardware. Developers conceptualize, write and cultivate the source code in order to develop a program that can perform desired functionality.

The Internet of Things (**IoT**) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that **are** provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

IoT is a big model that tries to integrate multiple thing together. Embedded Systems are part of the overall IoT by taking two key components in terms of IoT devices and IoT gateway. The IoT devices are smaller and specific in nature which will not have OS running them. However IoT gateway are larger and generic in nature which will have OS running them. These OS can come in multiple flavors namely Embedded OS, IoT OS or RTOS. With this Embedded programming becomes a part of IoT programming.

Hence, from a system developer's perspective, programming IoT device or IoT gateway will remain the same. They will use a programming language (like C) and use a target platform in order to develop them. However the role of embedded system developer has grown more in IoT domain, as he/she not only has to develop the **device (product view)** but also integrate them into the **cloud (solution view)**. This is the process in order to have an end-to-end IoT solution work.

Applications of Internet of Things

1. **Smart home**

   Smart Home clearly stands out, ranking as highest Internet of Things application on all measured channels. The IoT Analytics company database for Smart Home includes 256 companies and startups. More companies are active in smart home than any other application in the field of IoT. The total amount of funding for Smart Home startups currently exceeds $2.5bn. This list includes prominent startup names such as Nest or AlertMe as well as a number of multinational corporations like Philips, Haier, or Belkin.

2. **Wearables**

   As consumers await the release of Apple's new smart watch in April 2015, there are plenty of other wearable innovations to be excited about: like the Sony Smart B Trainer, the Myo gesture control, or LookSee bracelet. Of all the IoT startups, wearables maker Jawbone is probably the one with the biggest funding to date. It stands at more than half a billion dollars!

3. **Smart City**

   Smart city spans a wide variety of use cases, from traffic management to water distribution, to waste management, urban security and environmental monitoring. Its popularity is fueled by the fact that many Smart City solutions promise to alleviate real pains of people living in cities these days. IoT solutions in the area of Smart City solve traffic congestion problems, reduce noise and pollution and help make cities safer.

4. **Smart grids**

Smart grids are a special. A future smart grid promises to use information about the behaviors of electricity suppliers and consumers in an automated fashion to improve the efficiency, reliability, and economics of electricity.

5. **Industrial internet**

The industrial internet is also one of the special Internet of Things applications. While many market researches such as Gartner or Cisco see the industrial internet as the IoT concept with the highest overall potential, its popularity currently doesn't reach the masses like smart home or wearables do. The industrial internet however has a lot going for it.

6. **Connected car**

The connected car is coming up slowly. Most large auto makers as well as some brave startups are working on connected car solutions.

7. **Connected Health (Digital health/Telehealth/Telemedicine)**

Connected health remains the sleeping giant of the Internet of Things applications. The concept of a connected health care system and smart medical devices bears enormous potential, not just for companies also for the well-being of people in general. Yet, Connected Health has not reached the masses yet.

8. **Smart retail**

Proximity-based advertising as a subset of smart retail is starting to take off.

9. **Smart supply chain**

Supply chains have been getting smarter for some years already. Solutions for tracking goods while they are on the road or getting suppliers to exchange inventory information have been on the market for years.

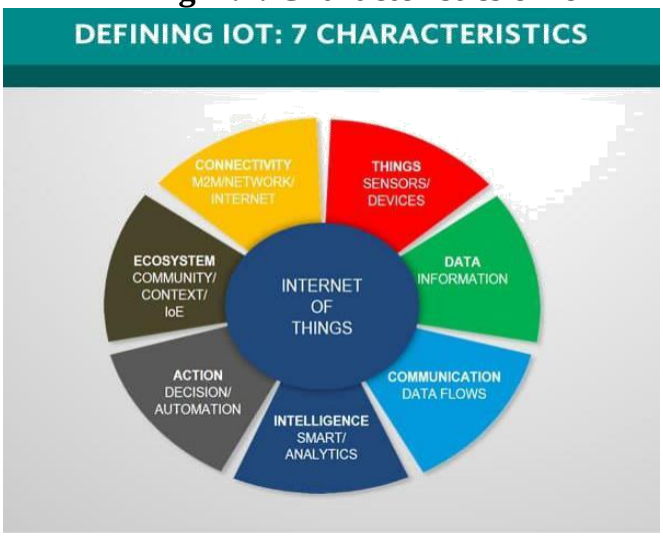
10. **Smart farming**

Smart farming is an often-overlooked business-case for the internet of Things because it does not really fit into the well-known categories such as health, mobility, or industrial. Smart farming will become the important application field in the predominantly agricultural-product exporting countries.

IoT characteristics

- Connectivity
- Things. Anything that can be tagged or connected as such as it's designed to be connected
- Data
- Communication
- Intelligence
- Action
- Ecosystem

Fig K.1: Characteristics of IoT



Internet of Things ecosystem:

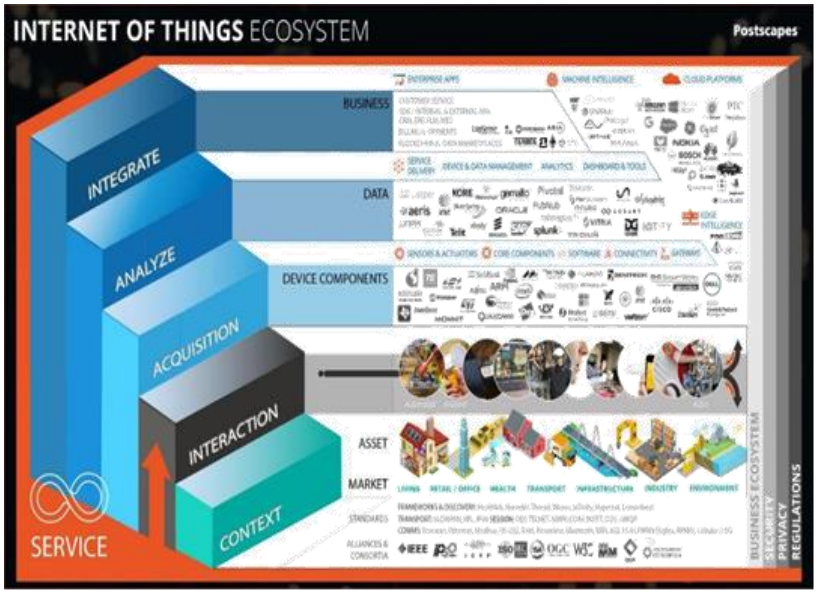
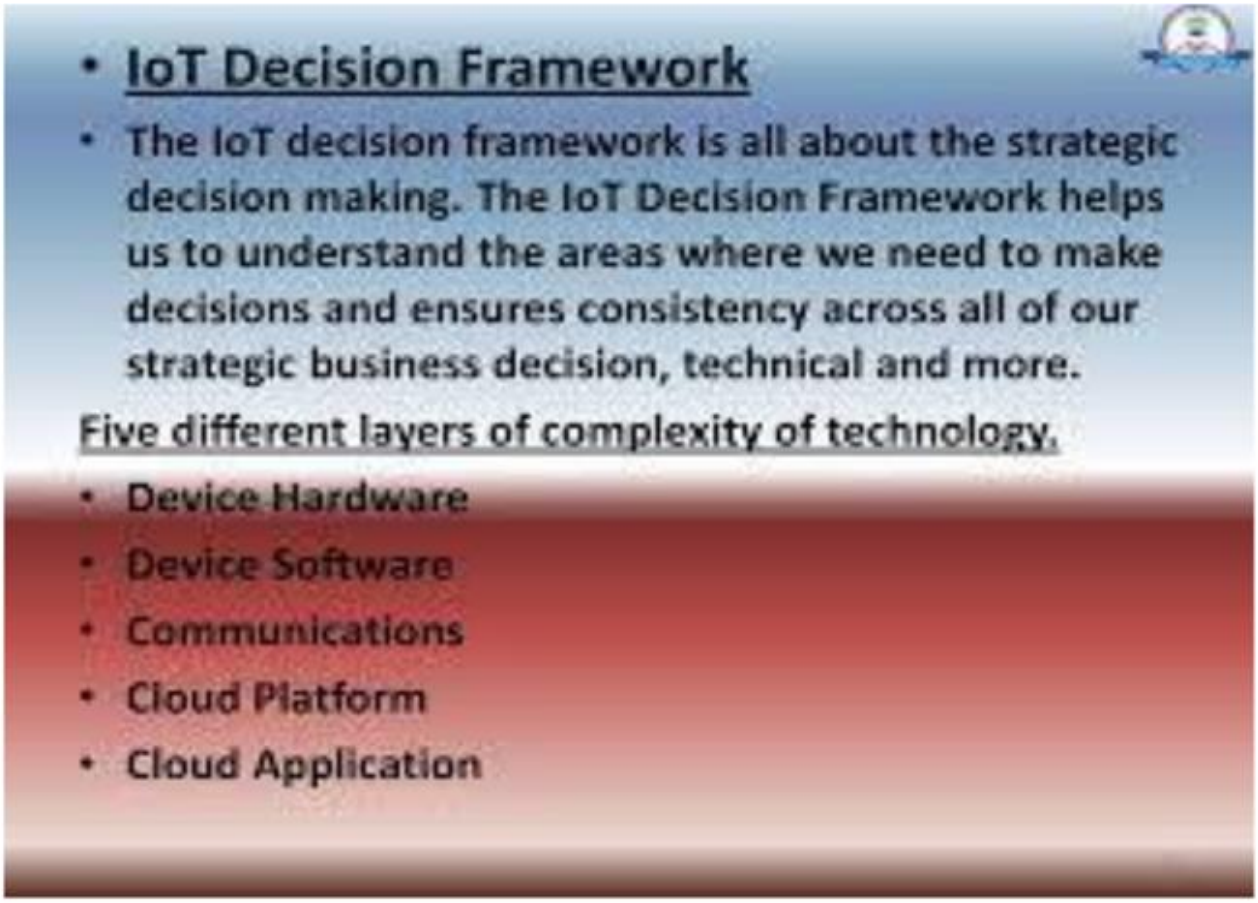


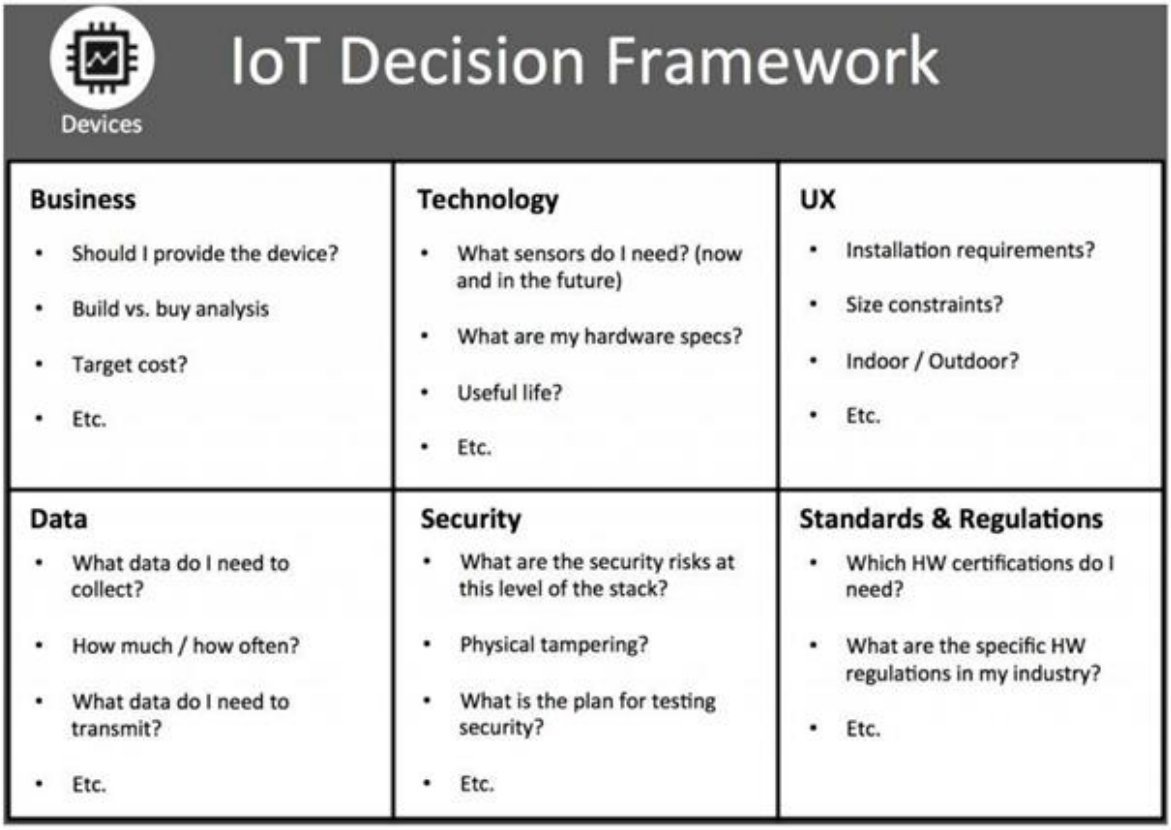
Fig K.2: IoT Ecosystem

It includes all the components that enable businesses, governments, and consumers to connect to their IoT devices. The ecosystem includes remotes, dashboards, networks, gateways, analytics, data storage, and security.

IoT Decision Framework

Fig K.3: IoT Framework





IoT Solution Architecture Models

Basically, there are three IoT architecture layers:

1. The client side (IoT Device Layer)
2. Operators on the server side (IoT Getaway Layer)
3. A pathway for connecting clients and operators (IoT Platform Layer)

In addition, the fundamental features of sustainable IoT architecture include functionality, scalability, availability, and maintainability. Without addressing these conditions, the result of IoT architecture is a failure.

Therefore, all the above-mentioned requirements are addressed in 4 stages of IoT architecture mentioned below —

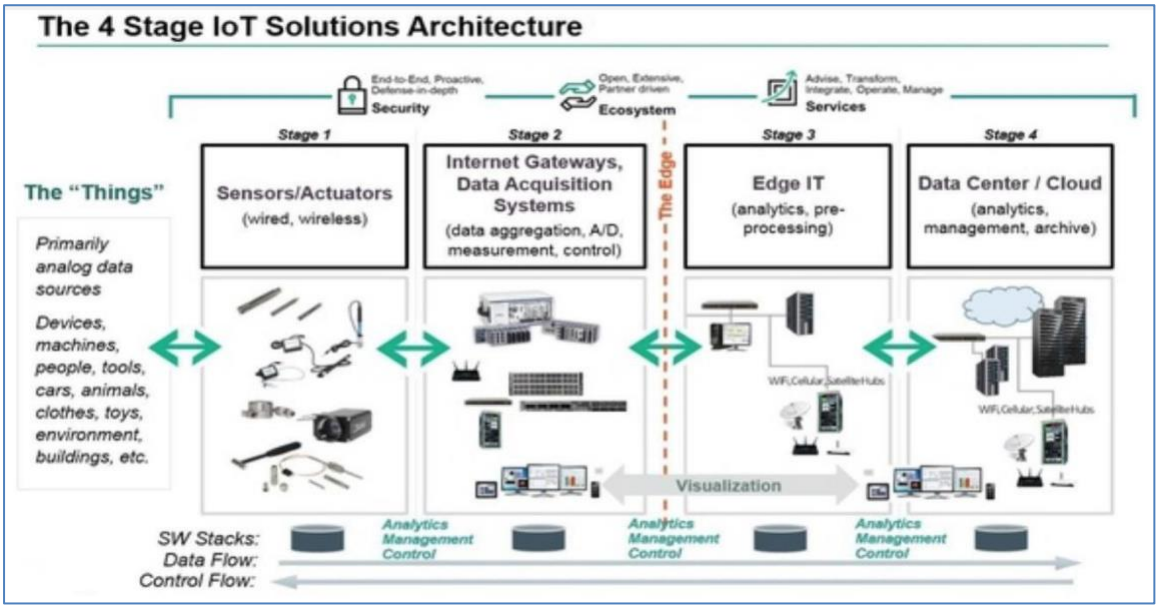
An Overview of the Main Stages in the IoT Architecture

In simple terms, the 4 Stage IoT architecture consists of

1. Sensors and actuators
2. Internet getaways and Data Acquisition Systems
3. Edge IT
4. Data center and cloud.

The detailed presentation of these stages can be found on the diagram below.

Fig K.4: IoT Architecture



Stage 1. Networked things (wireless sensors and actuators)

The outstanding feature about sensors is their ability to convert the information obtained in the outer world into data for analysis. In other words, it's important to start with the inclusion of sensors in the 4 stages of an IoT architecture framework to get information in an appearance that can be actually processed.

For actuators, the process goes even further — these devices are able to intervene the physical reality. For example, they can switch off the light and adjust the temperature in a room.

Because of this, sensing and actuating stage covers and adjusts everything needed in the physical world to gain the necessary insights for further analysis.

Stage 2. Sensor data aggregation systems and analog-to-digital data conversion

Even though this stage of IoT architecture still means working in a close proximity with sensors and actuators, Internet getaways and data acquisition systems (DAS) appear here too. Specifically, the later connect to the sensor network and aggregate output, while Internet getaways work through Wi-Fi, wired LANs and perform further processing.

The vital importance of this stage is to process the enormous amount of information collected on the previous stage and squeeze it to the optimal size for further analysis. Besides, the necessary conversion in terms of timing and structure happens here.

In short, Stage 2 makes data both digitalized and aggregated.

Stage 3. The appearance of edge IT systems

During this moment among the stages of IoT architecture, the prepared data is transferred to the IT world. In particular, edge IT systems perform enhanced analytics and pre-processing here. For example, it refers to machine learning and visualization technologies. At the same time, some additional processing may happen here, prior to the stage of entering the data center.

Likewise, Stage 3 is closely linked to the previous phases in the building of an architecture of IoT. Because of this, the location of edge IT systems is close to the one where sensors and actuators are situated, creating a wiring closet. At the same time, the residing in remote offices is also possible.

Stage 4. Analysis, management, and storage of data

The main processes on the last stage of IoT architecture happen in data center or cloud. Precisely, it enables in-depth processing, along with a follow-up revision for feedback. Here, the skills of both IT and OT (operational technology) professionals are needed. In other words, the phase already includes the analytical skills of the highest rank, both in digital and human worlds. Therefore, the data from other sources may be included here to ensure an in-depth analysis.

After meeting all the quality standards and requirements, the information is brought back to the physical world — but in a processed and precisely analyzed appearance already.

Stage 5 of IoT Architecture

In fact, there is an option to extend the process of building a sustainable IoT architecture by introducing an extra stage in it. It refers to initiating a user's control over the structure — if only your result doesn't include full automation, of course. The main tasks here are visualization and management. After including Stage 5, the system turns into a circle where a user sends commands to sensors/actuators (Stage 1) to perform some actions.

Major IoT Boards in Market

There are several IoT boards available in the market to build the project. Some of the major IoT Boards are described below:

Raspberry Pi:

Raspberry Pi is a much popular device used in building IoT project. The recently launched Raspberry Pi 3 includes built-in WiFi and Bluetooth making the most compact and standalone computer. It provides a powerful environment to install a variety of programming packages such as Python, Node.js, LAMP stack, Java and much more. Using 40 GPIO pins, and four USB ports you can connect many peripherals and accessories to the Pi.



Fig K.5: Rasberry Pi board

Arduino:

Arduino boards are the microcontrollers and microcontroller kit for building digital devices that can be sense and control objects in the physical and digital world. Arduino boards are furnished with a set of digital and analog input/output pins that may be the interfaced to various other circuits. Some Arduino boards include USB (Universal Serial Bus) to load programs from the personal computer.



Fig K.6: Arduino board

ESP8266:

The ESP8266 is a low-cost Wi-Fi microchip with 32-bit microcontroller capability, standard digital peripheral interfaces. There are different types of ESP8266 boards are available for different needs. The primary goal of this board is to deal with the built-in Wifi through AT commands if used as device module, but you can 'program' using Arduino board however it also read and controls input/output, digital and analog.



Fig K.7: ESP8266 micrrochip

Sense HAT 8x8 RGB LED matrix:

Raspberry Pi Sense HAT is an integrated sensor that can measure humidity, temperature, acceleration, and pressure. The 8x8 LED matrix display data read from Raspberry Pi Sense HAT sensors. The Sense HAT has an 8×8 RGB LED matrix includes the following sensors:

1. Gyroscope
2. Accelerometer
3. Magnetometer
4. Temperature
5. Barometric pressure
6. Humidity



Fig K.8: Raspberry Pi Sense HAT sensor

Bluetooth Module HC-05:

Bluetooth Module HC-05 device is a 6 pins Bluetooth device that is used for wireless communication. Usually, this device connects small devices like mobile phones, PDAs and TVs using a short-range wireless connection to exchange data. It communicates with the microcontroller using the serial port (USART).

Pin Description

- **EN:** It is the enable pin, when it is connected to 3.3V then model is enabled. ○ **+5V:** This is the supply pin for connecting +5V.
- **GND:** It is the ground pin.
- **TX:** It is the transmitter pin of the UART communication.
- **RX:** It is the receiver pin of UART communication.
- **STATE:** It indicates whether the module is connected or not. It acts as a status indicator.



Fig K.9: Bluetooth Module HC-05

PRACTICE QUESTIONS

1. To get familiar with various real-life application of IoT.
2. To get familiar with devices used in IoT.