Chapter 1
Introduction to e-Government and its Scenario in Nepal

Definition of e-Government and Global Practices

e-Government (short for electronic government) also known as e-Gov (Internet government, digital government, online government, or connected government) consists of the digital interactions between a government and citizens (G2C), government and businesses/Commerce (G2B), government and employees (G2E), and also between government and governments (G2G).

The world is rapidly transforming into one society driven by an outstanding increase in the amount of communication between civilizations. It has really become information driven society, in which information and communication technology is playing important and indispensable role. Keeping up with the 21st century, governments around the world are embracing Information Technology (IT). In every region of the globe - from developing countries to industrialized ones - central and local governments are putting critical information online, automating bulky processes and interacting electronically with their citizens. The arrival of new information and communication technologies (ICTs) has significantly enhanced our capabilities to collect, process, and distribute information. Almost all developing countries regard ICTs as an important factor while preparing their national development plans. One area has received outstanding attention is the use of ICT in the quest of good governance, usually termed e-Governance.
2014 e-government rankings

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Figure: 2
Source: http://unpan3.un.org/

Nepal in e-Government Development Index Ranking

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<th>Rank</th>
<th>Country</th>
<th>EGDI</th>
<th>Online Service Component</th>
<th>Telecomm. Infrastructure Component</th>
<th>Human Capital Component</th>
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<td>0.1174</td>
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</table>

Figure: 3

According to the United Nation survey for world e-Government leaders, the Republic of Korea stands on the top of the EGDI Ranking where as Nepal is at 165th position.
e-Government and e-Governance

E-government and e-governance can be defined as two very distinct terms. E-government is a broader topic that deals with the whole spectrum of the relationship and networks within government regarding the usage and application of ICTs. E-government is actually a narrower discipline dealing with the development of online services to the citizen, more the e on any particular government service - such as e-tax, e-transportation or e-health. E-governance is a wider concept that defines and assesses the impacts technologies are having on the practice and administration of governments and the relationships between public servants and the wider society, such as dealings with the elected bodies or outside groups such as not for profits organizations, NGOs or private sector/corporate entities. E-governance encompasses a series of necessary steps for government agencies to develop and administer to ensure successful implementation of e-government services to the public at large.

There is a widespread curiosity among citizens about e-government. The below Figure 4 explains what people think when they hear the term e-government. E-government encompasses most of the below mentioned points where the picture try to explain the relation and benefits through e-government to provide various kind of services to its people via public administration from bureaucracy to service provider.

**WHY E-GOVERNMENT?**

- "It’s hype"
- "Everyone else is doing it, so it’s probably important and useful"
- "We don’t want to fall behind all others"
- "We think it will provide faster, more convenient government services"
- "We think it will reduce costs for individuals and businesses to deal with government"
- "To reduce corruption and fight poverty"
- "We think it’s a tool for transformation of public administration from bureaucracy to service provider"
- "We think it will reduce costs for government (reduced data entry costs, lower error rates)"
- "We think it will improve democratic process"
- "We need to reach out to a broader part of population"

Figure: 4
Citizen needs for e-Governance

- Greater government accountability
- Easy to access information
- Convenient services
- Quick response to requests
- Fast delivery of services
- Data security and confidentiality
- Citizen centric government

Government’s goals through e-Governance

- Becoming more proactive
- Increase internal efficiency and service levels to constituents
- Greater transparency
- More service oriented
- Reduced operating expenses
- Change citizens view of their governments as bloated, wasteful, and unresponsive to their most pressing needs
- Developing new sources of growth and a way to reduce vulnerability
- Better public services and quality of life
- Electronic communication between government agencies
- Citizens can conduct important/frequent/complex administrative procedures with government agencies electronically

<table>
<thead>
<tr>
<th>TRADITIONAL VS E-GOVERNMENT</th>
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<tbody>
<tr>
<td>Use of Resources</td>
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<tr>
<td>Infrastructure</td>
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<td>Cost of Service</td>
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<td>Speed of Service</td>
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<tr>
<td>Return on Investment</td>
</tr>
<tr>
<td>Transparency</td>
</tr>
<tr>
<td>Participation</td>
</tr>
</tbody>
</table>

Figure: 5
The above points can be better summarized by the Figure 5. It compares e-Government with traditional government. Hence, from the above figure data e-Government results high efficiency of work in comparison to the traditional government method.

**e-Government Implementation in Nepal**

We are in the process of building “New Nepal”. “New Nepal” should not become only a popular slogan but really the “New Nepal” with all the positive values and aspirations of its citizens geared towards the peace and progress. There are many dimensions streamlined and drivers identified to make our “New Nepal” dreams come true. One of such dimensions is the reformation of the government. Governance and its service process should be well reengineered to fulfill the aspirations of its citizens. Information and Communication Technology (ICT) and its tools can help its effective and efficient transformation.

In regard to this, the government of Nepal has prepared e-Government Master Plan Consulting Report (eGMP) with the collaborative effort with the Korea IT Industry Promotion Agency (KIPA), which is an attempt to lay the ground work for e-Government transformation.

E-government Vision is ‘The Value Networking Nepal’ through:
- Citizen-centered service
- Transparent service
- Networked government
- Knowledge based society

E-government mission statement is:
Improve the quality of people’s life without any discrimination, transcending regional and racial differences, and realize socio-economic development by building a transparent government and providing value added quality services through ICT.

To realize the vision and mission, the consulting team worked out strategies and selected 33 projects in sectors comprising G2C, G2B, G2G and infrastructure. All the projects are vital for Nepal, but there is a limitation of time, budget, human resource and capability of implementing such projects. Thus, the priority was given by considering the availability of technologies, institutional readiness, emergency handling capacity as well as environmental impact. There were 8 projects chosen as priority projects which were building groupware systems for government, government portal, national identification, education, communication network, enterprise architecture, PKI and integrated data center.

Although there are some missing elements in the eGMP, it may led to the successful e-Government in Nepal. All plans are continuously evolve so that the eGMP should be evaluate and update. Establishing good coordination between government organizations to make seriously committed environment to help implement e-Gov successfully.

**Ongoing e-government projects of Nepal Government**

- **National Portal**
  - It is a government website that will act as the single window (one-stop-shop) for all government e-Services and electronic information of Nepal to be delivered to citizens (G2C), business (G2B) and government employees (G2E). Delivery of e-Services will
enable increased citizen participation and attempt to create an open, transparent environment through integration of different government information systems and services.

- **Inland Revenue Department (e-VAT, e-PAN, e-Filling, e-TDS)**
  - The IRD is responsible for the administration of Value Added Tax, Income Tax, and Excise Duty. All these taxes can now be entered online through the web application developed by IRD. This has made taxpayers' job easier.

- **Office of Company Registrar**
  - Office of the Company Registrar (OCR) Nepal is online making it easier to start a business which was otherwise very cumbersome. One can apply for company registration online, reserve their unique company names and check intended company name is available, file company documents and much more. It is one of the important approaches by digitizing the government works. OCR’s e-Services started from 2069/07/24 (November 09, 2012) while many other e-Services were added only on February 7th, 2013 to OCR’s website.

- **Department of Foreign Employment**
  - All the information of Department of Foreign Employment is made public and put in the website. It has an online application to track the record of an foreign employee through their passport number and permit number.

- **Machine Readable Passport**
  - Department of Passport has been issuing Machine Readable Passports (MRPs) as per the guidelines of ICAO Machine Readable Travel Document. To effectively carry on this job, the Ministry of Foreign Affairs has awarded the contract to Oberthur Technologies of France, a globally renowned company in the field of smart card technology and associated services, which personalizes the Nepalese Machine Readable Passports to the Department of Passport.

- **Government Accounting System (FCGO)**
  - Financial Comptroller General Office (FCGO) is the main agency responsible for the Public Financial Management (PFM) system of Government of Nepal (GoN). IT based Government Accounting System (CGAS) has also been designed and is executed. This captures transactions and their accounting, book keeping, reporting in respect of expenditure, revenue, and retention money in these units.

- **Personal Information System (MOGA) (pis.gov.np)**
  - Ministry of General Administration, department of civil personnel records is now online with more features added soon. Currently Post Management Information System, Sheet roll Information System, Asset Related Information System, SMS System and Online Appointment system are live.

- **Business Portal**
  - The e-portal provides easy, one-stop-shop access to exhaustive information about licensing requirements for business activities in Nepal. Here, Nepali businesses, large
and small, can access detailed information on relevant business licenses and permits, including requirements, cost, application forms and contact details for relevant regulatory agencies.

- **e-Procurement**
  - PPMO has developed an online portal for all the works related to public procurement. It has a portal [https://www.gepson.gov.np](https://www.gepson.gov.np) which gives a web interface for all services. E-procurement web portal of GEPSION is designed to facilitate the bidder to submit their bids through e-submission. Proposed alternative for submission of bid through e-submission is used to increase transparency, non-discrimination, equality of access, and open competition. This site provides easy to use internet access for tender information, information on award of contracts and an alternate facility to submit bids through e-submission to all interested bidders as specified in the Instructions to Bidders.

- **Public Service Commission**
  - Many processes of Public Service Commission are now going online. It includes online application, result viewing etc. For now a single vacancy has been open for online application as a pilot project. From the next year all the vacancies of public service commission has to be submitted online.

- **Government Groupware**
  - The Groupware seeks to share information and to communicate in real-time. Also it seeks to store and manage distributed information efficiently and support cooperative work among workers. It provides a single platform for mail, chat, web conferencing and document management system.

**Upcoming e-Government Projects**

- **e-Customs**
  - This service will soon provide a web based online system for all services related to customs.

- **Vehicle Registration (G2C): Transfer of Ownership, Blue Book Renewal, smart card for blue book**
  - Department of Transport Management is soon going to launch smart card system for the current Blue Book. This will make all work related to vehicle registration easier. In the next phase current licenses are also going to be replaced by smart cards.

- **National ID**
  - National ID project is aimed in providing a single identification smart card to all the citizens which will contain all information regarding the citizen.

- **Land Reform Information Management System (DOLRM)**
  - Department of Land Reform Management will soon launch a system which is aimed on
digitizing all process related to land registration and transfer. It will also digitize all land registration certificate such that each user will have his own digital form of land registration certificate.

- **e-Passport**
  - e-Passport is aimed on digitizing the current passport system. All the information regarding citizen's passport will be available in the digitally via online application.

- **e-Visa**
  - e-Visa is aimed on digitizing the current visa system of Nepal Government.

**Emerging Challenges of e-Government**

Depending on a country's economic, social, and technological reality, before an e-government program can progress, it must overcome a series of challenges, such as:

- Low Internet penetration
- Infrastructure restrictions
- Digital Divide
- Concerns regarding privacy and security
- Limited number of qualified IT specialists
- Unavailability of Payment Gateway
- Lack of Digital Signature
- Lack of IT literacy among the citizens
The above Figure-5 shows different barriers for the implementation of e-Government in context of Nepal. As such, Policy Barrier, Technical Barrier and Socio-Cultural via Financial Barrier are the major factors affecting the proper implementation e-Government in Nepal.
Chapter 2
National Information Technology Center and its role in e-Government Implementation

National Information Technology Center (NITC) - An Introduction

The National Information Technology Center (NITC), was established in the year of 2002 in line with IT Policy 2000 with the vision of developing and promoting Information Technology Sector of Government of Nepal. Being an implementing agency for Government of Nepal, NITC acts as a focal point for implementation of Government e-Services, which includes but not limited to ICT development projects for e-Governance.

Objectives of NITC in brief:

- Make information technology accessible to the general public and increase employment through this means
- Build a knowledge-based society
- Establish knowledge-based industries
- Implementation of e-Governance in Nepal

NITC Functionalities

e-Government Implementation Hub

Use of e-Governance is to raise the quality of services delivered by governments to citizens and businesses. Most governments in the developed world have moved towards implementation of IT to deliver services to the citizens as well as better govern their internal programs. Today wide ranges of e-Governance projects are being implemented at different parts of the country including the projects designed to reduce digital divide in rural areas that have been ignored in the past.

e-Governance is a radical concept that covers wide range of IT enabled reforms. They are as follows:

- Prioritize the governments need to use IT and the Internet to provide services between government agencies, citizens, and business
- Improve the democratic values of the government process and administrations through more transparency, accountability, and involvement
- Make the internal operation of public administrations more efficient
- Change the mindset of the administration for successful implementation of e-Governance
- Create awareness of IT in the top bureaucracy
- Expand access of IT to the common people through establishment of self sustaining Tele-center in rural part of the country

Server co-location

NITC co-locates servers of different governmental organizations and agencies in Government Integrated Data Center (GIDC). There are large numbers of Nepal governmental organizations that have been hosting their servers in GIDC. The government organizations hosting their servers in GIDC are:
1. Office of the Prime Minister and Council of Ministers
2. Ministry of Federal Affairs and Local Development
3. Ministry of Foreign Affairs
4. Ministry of Physical Infrastructure and Transport
5. Ministry of Home Affairs
6. Ministry of Education
7. Ministry of Co-operatives and Poverty Alleviation
8. Ministry of Peace and Reconstruction
9. Office of Controller of Certification
10. Department of Passport
11. Public Procurement Monitoring Office
12. National Emergency Operation Centre
13. Office of Company Registrar
14. Department of Customs
15. Credit Information Bureau
16. Department of Foreign Employment
17. Nepal Stock Exchange Ltd.(NEPSE)
18. Financial Comptroller General Office (FCGO)
19. Election Commission of Nepal
20. Rastriya Banijya Bank Ltd.
21. Department Of Hydrology and Meteorology
22. Nepal Television
23. CDS and Clearing Limited
24. Department of Drugs
25. Kathmandu Metropolitan City Office
26. Lalitpur Sub-Metropolitan City
27. Pokhara Sub-Metropolitan City
28. Bhaktapur Municipality
29. Water and Energy Commission
30. Department of Survey
31. University Grand Commission
32. Department of Immigration
33. National Information Commission
34. National Planning Commission
35. Department of Labor
36. MOFALD-SEAM-Nepal Project
37. Nepalese Army
38. Ministry of Industry
39. Skill Development Project - Ministry of Education
40. Office of the Attorney General
41. Department of Forest Research and Survey (DFRS)
42. Social Security Fund
43. National ID Management Center
44. National Geographical Infrastructural Project

**Network and Internet Service Provider**

NITC has been providing high speed Internet to different governmental organizations, agencies and departments through optical fiber network inside the Singhdurbar premises. Currently, NITC is providing Internet to more than 30 governmental organizations. It also administers and troubleshoots government high speed network infrastructure of Singhdurbar premise and provide technical support to organizations inside the Singhdurbar.

**Following are the list of Agency who have taken Internet Service from NITC**

1. Office of the Prime Minister and Council of Ministers
2. Ministry of Finance
3. Ministry of Defense
4. Ministry of Home Affairs
5. Ministry of Federal Affairs and Local Development
6. Ministry of Physical Infrastructure and Transport
7. Ministry of Education
8. Ministry of Peace and Reconstruction
9. Ministry of Foreign Affairs
10. Ministry of Commerce and Supplies
11. Ministry of Labor & Employment
12. Ministry of Information & Communication
13. Ministry of Law, Justice, Constituent Assembly & Parliamentary Affairs
14. Ministry of Land, Reform and Management
15. Ministry of Industry
16. Ministry of Science, Technology and Environment
17. Ministry of Energy
18. Ministry of Women, Children and Social Welfare
19. Ministry of Agriculture Development
20. Ministry of Irrigation
21. Ministry of General Administration
22. Ministry of Forests and Soil Conservation
23. Ministry of Culture, Tourism and Civil Aviation
24. Ministry of Co-operatives and Poverty Alleviation
25. Ministry of Urban Development
26. National Vigilance Centre
27. Radio Nepal
29. Byawasthapika Sansad Sachiwalaya
30. Administrative Court
31. Udhyans Shakha
32. National Planning Commission
33. Nepal Television
34. Public Service Commission
35. National Investigation Department
36. Singh durbars Secretariat Reconstruction Committee
37. National Id Management Center
38. Nepal Law Commission
39. Department of Printing
40. Department of Archeology
41. National Emergency Operation Center
42. B.P. Koirala Memorial Planetarium, Observatory and Science Museum Development Board
43. Office of Controller of Certification
44. Narayandal Gulma
45. Singh durbars Police
46. Civil Hospital
47. Financial Comptroller General Office
48. Tourism Board
49. Peace Fund Secretariat
50. Social Security Fund
GIDC (Government Integrated Data Center)

GIDC was established in the year 2009 and was the grant project form Korean government to Government of Nepal. Currently, GIDC is housing servers of Nepal government organizations, departments and agencies.

The objectives of GIDC are:

- Minimize investment cost by using GIDC based common facilities
- Improve stability and efficiency through concentrated central management within Data Center that provide Internet access and management for e-government
- Minimize operation cost by means of centralized GIDC
- Offer easy expansion and upgrade for increasing demands
- Offer basic environment for government co-location and integrated government mailing service

Disaster Recovery Center (DR)

DR Center is the exact replica of GIDC which is soon going to be established in Hetauda, Nepal. The MOU has already been signed and construction is about to being soon. It is also a grant project for Korean government to Government of Nepal. DR center works as a backup for GIDC.

National Portal and Business License e-Portal

National Portal

The Nepal government National Portal (nepal.gov.np) provides easy, one stop access to information and services of different Nepal governmental organizations.

Figure: 7
The figure 7 is the Home page of Nepal Government e-Portal where anyone can acquire formal information regarding different sectors of Nepal like Tourism, Business, Citizens and various other factors including government plans and activities and its people.

**Business license Portal**

The Nepal Business e-portal (licenseportal.gov.np) provides easy, one-stop access to exhaustive information about licensing requirements for business activities in Nepal. Here, Nepali businesses, large and small, can access detailed information on relevant business licenses and permits, including requirements, cost, application forms and contact details for relevant regulatory agencies. This license portal is part of a broader set of initiatives undertaken by the Government of Nepal to improve the investment climate.

![Business license Portal](image)

**Figure: 8**

The Figure 8 is the landing page of Nepal Business License e-Portal where all the necessary information regarding business example, government polices and rules can be found in this portal.

The technical support for both of these systems is administered by NITC.

**e-Services (Domain Registration, Web Hosting, Email)**

NITC has been providing domain registration, webhosting and email services to Nepal government organizations.

**Singhdurbar e-Gate Pass System**

NITC has been providing e-Gate pass system for general people to enter Singhdurbar premise quickly and easily. NITC provides e-Gate pass admin account to offices inside Singhdurbar and the
corresponding office issues the gate pass of their visitors through Singhdurbar e-Gate pass system. Currently 44 offices and departments inside Singhdurbar are using the e-Gate pass system. Below three figures are the snapshots of Singhadurbar Gatepass System.

Figure: 10

Figure: 11
Human Resource Development

National Information Technology Center (NITC) is the main implementing body of e-Government in Nepal. Developing human resource in the field of IT is the first & foremost need to implement e-Government. It is difficult to implement e-Government without IT literate human resource. To empower the ICT literacy NITC has been conducting Basic, Advance and Expert level computer training course along with ICT awareness training programs and workshops inside and outside the Kathmandu valley. NITC has already trained more 2350 people from different government agencies and NGOs.

Consultancy and Advisory Service

NITC provides consultancy and advisory service about ICT to all the Government organizations and departments within the country.

Research and Development:

NITC conducts research and development work relating to ICT for the development of ICT sector in Nepal.

Tele-Center

The approach to Tele-center was instigated in order to shrink the Digital Divide that evolved from the situation in which substantial number of citizen in the developing country lack to obtain the rights of developmental progress. In general, through the concept of Tele-center, it is aimed to provide the deficit community with the ease of modern Information Technological services such as internet, email, fax, photocopy, scan etc in order to help them reach the realm of development.
Establishment of Tele-center helps to reduce the Information and knowledge poverty, consequent trivial boundary relation in developmental effort to showcase major changes in modern Information and Communication sector. At present, it is strongly felt that with the establishment of Tele-center, developmental methodology based on Information and Communication technology should also go hand in hand.

Tele-centers can also be used in local level to be integrated with government services. The local level employees can be trained to use e-government services such as land registration, tax records etc.

**Activities of NITC:**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Services</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Total Number of Domain Registered</td>
<td>969</td>
</tr>
<tr>
<td>2.</td>
<td>Total Number of Website Hosted</td>
<td>508</td>
</tr>
<tr>
<td>3.</td>
<td>Email Service Provided to No. of Government Agencies</td>
<td>95</td>
</tr>
<tr>
<td>4.</td>
<td>Internet Service Provided to No. of Government Agencies</td>
<td>52</td>
</tr>
<tr>
<td>5.</td>
<td>No. of Government Agencies Server Co-located</td>
<td>47</td>
</tr>
<tr>
<td>6.</td>
<td>E-gate Pass System Provided to No. of Government Agencies</td>
<td>47</td>
</tr>
<tr>
<td>7.</td>
<td>Number of Government Employees Trained</td>
<td>2350</td>
</tr>
</tbody>
</table>

Figure: 13
Chapter 3

General Concept of File Management System

**Explorer or Computer**

In Windows, you can use either Explorer or the Computer icon to manage your files & folders. Use the one you are most comfortable with (unless you are using a Classroom PC, in which case you will have to use Computer).

**Starting Explorer**
(Not available on Classroom PCs)

- Open Explorer by clicking on the **Start** button and typing Windows Explorer into the search program and files area.

**Starting Computer**

- Open Computer by double-clicking on its icon on the Windows Desktop.

**Common tasks**

1. **Selecting files and folders**

   You must select a file or folder before you use it.
   - To select a single file, click once on it
   - To select a list of files, click once on the top item of a list. Hold the Shift key, then click on the last item of the list
   - To select non-adjacent multiple files one by one, hold down the Ctrl key as you click

2. **Dragging files or folders**

   - Click on an object and hold down the left mouse button. Drag to a new location to copy or move the object and release the left mouse button.

3. **Sending files to a USB pen drive**

   - Insert your memory stick into the front facing USB port
   - Start Explorer or Computer
   - Select the file or files you wish to back up
   - Right-click the mouse and Choose Send To > {name of} Disk from the list of menu options

4. **Creating a new folder**

   - Select the location for the new folder
   - From the menu bar, select **New Folder**
   - Type in the name you wish to give to the new folder and then press the Return key
   - To make a sub-folder, open an existing folder and follow the same procedure

5. **Renaming files or folders**

   - Right-click on the file or folder you want to rename
   - From the **shortcut** menu, choose **Rename**. The name is highlighted and surrounded by a box, allowing you to overtype the existing name and press **Return**
6. Deleting files and folders
- Select the file(s) that you want to delete
- Press the Delete key or select Delete from the shortcut menu. You will be asked to confirm that you want to delete the file(s). Click on Yes if you are sure you wish to delete the file(s)

Filenames in Windows
File names in Windows can be up to 260 characters long (including extensions, e.g. .doc) and can contain any characters (including spaces) except the following symbols: / ? : * " > < |

Give your files short and meaningful names – don’t necessarily use Windows automatic file naming which can produce bizarre and overly long file names. The filename includes the path name too, i.e. C:\Program Files\filename.txt

**Note:** Be careful when renaming files that you do not change the file extension (after the . ) as the file may no longer open.

Overwriting files
You may be asked to confirm that existing files should be overwritten. Check the date, time & size of each file carefully before saying yes. New versions of files can easily be overwritten.

Resorting to backup copies
If you have to resort to your latest backup:
- Leave the backup disk write-protected
- Take a copy of the latest backup file and use this for working on
- If your most recent backup is found to be flawed take a copy of the previous one

Thus if disaster strikes again, you still have a protected copy of your work.

Using Computer
Double-click the Computer icon on the Windows desktop to examine your files and folders. Select a drive icon to view its contents.

Each time you double-click on a drive or folder icon, a new window will open displaying the contents of that drive or folder.

Copying files to another folder or drive
- Right-click on the file(s) to copy
- Select Copy from the shortcut menu
- Navigate to the new disk or folder
- Right-click on the destination folder
- Click Paste from the shortcut menu

Moving files to another folder or drive
- Select the file(s) to move
- Drag the file to the destination folder or drive
Using Explorer

In Explorer, you can see the hierarchy of folders on your computer and, on the right-hand side, all the files and folders in a selected folder. This is especially useful for copying and moving files.

Figure: 14

Selecting which drive to view

To view the contents of a drive or folder, first select it from the navigation panel on the left of the Explorer window, then expand it:

- Click to expand a drive or folder
- Click to collapse a drive or folder

Copying files to a folder on the same drive

- Select the file(s) to copy
- Hold down the Ctrl key and drag the file(s) to the new folder, then release

Copying files to another drive

- Select the file(s) to be copied from one drive
- Drag them to the new location on the destination drive

Moving files to a folder on the same drive

- Select the file(s) to be moved
- Drag the file(s) to the new folder

Moving files or folders to another drive

- Select the file(s) or folders to be moved
- Hold down the Shift key and drag the file(s) or folders to the new location on the destination drive
Chapter 4

General Concept on Office Package

Microsoft Word 2007

Word is a very popular text formatting and editing program. It is the standard for writing papers and other documents. This tutorial and quick start guide will help you become more familiar with the basic tools of Word.

The Basics - Tips

Saving Your Work - The first thing you should always do when you start a new document is to Save it. Saving your work ensures that it is not lost or misplaced and also allows Word to maintain an AutoSave file. This allows you to recover a document if your computer malfunctions when you are in the middle of editing. Formatting - Avoid formatting as you type. „In-line“ formatting tends to produce unintended results. It is better to write your text first, then select the text and apply formatting to the entire section all at once.

Accessing Features - There is usually more than one way to access any given options or features in Word. Most of the popular Tools are available to you as icons in the Ribbon at the top of the Word window. You can also access the formatting options for any item by right-clicking on it (ctrl-click on Mac).

Undoing Errors - If you make a mistake (for example, you paste over an entire section of text, or delete by accident), you can usually undo it by choosing Quick Access Toolbar >> Undo on the Menu Bar. This reverses the last several actions. You can also Undo an action by typing Ctrl-Z.

MS WORD 2007 - New Interface

When you open Word 2007, you will notice that it looks quite different from Word 2000 and Word 2003. The same tools are all there, but they are arranged very differently and new features have been added.

If you are already familiar with Word 2000 or 2003, it may take you a while to adjust to this new arrangement of tools. This tutorial uses Word 2007 and you can use it as a quick reference guide for most of the common tools.

Arrangement of Tools in Word 2007

![Ribbon and Quick Access Toolbar](Image)

Figure: 15
The **MS Office Button** contains the main file functions

- New, Open, Save, Save as, Print, Print Preview, etc.

The Quick Access Toolbar contains shortcuts to Save, Undo, and Repeat

Each **Ribbon Tab** displays a **Ribbon** that provides a set of **Tool Groups**.

- The **Ribbon Tab and the Tool Groups in the Ribbon** correspond to the **Menu and Toolbar** in Word 2000 and 2003
  
- The **Name** of each **Tool Group** is listed at the bottom of the Group
  - Example - In the **Home Tab**, the second **Tool Group** is named **Font**
  - The name "**Font**" is under the **Font Tool Group**

In Word 2007, tools with similar uses are organized so that they are usually found within the same Tool Group or at least within one Ribbon. If you do not find a tool in the Ribbon you think it should be in, try exploring the other Ribbon Tabs.

<table>
<thead>
<tr>
<th>Getting Started – Opening and Saving a Document</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start a New document</strong></td>
</tr>
<tr>
<td>MS Office Button &gt;&gt; New</td>
</tr>
<tr>
<td>- The <strong>MS Office Button</strong> is located in the top left corner of the Word 2007 Window</td>
</tr>
</tbody>
</table>

| **Open an existing Document**                  |
| MS Office Button >> Open                       |

| **Open a file from a different Version or Format** |
| Word 2007 will automatically convert a document from a compatible version of Word or from .txt, .rtf, or Microsoft Works (*.wks) |
| - Your document will open in **Compatibility Mode** |
| - This will prevent you from using certain tools in Office 2007 which are not compatible with Office 2000 or 2003 |
| - When you finish editing a document, be **VERY CAREFUL** to save any converted documents in their original format |
| - Please read the **Important Notes** below regarding saving in Office 2007. |
IMPORTANT NOTES: Saving Documents in WORD 2007

1. In the Computing Facilities, files on the Desktop are NOT SAVED when you log off.
   - ALWAYS use Save As... to save your file to a USB Flash Drive, UVicTemp, or CD
   - You can also save a file to the Desktop and then send an email to yourself with the file as an attachment

2. If you are NOT running Office 2007 at home and you save a document as Word 2007 (*.docx),
   YOU WILL NOT BE ABLE TO OPEN IT AT HOME! (see step 3 below)

3. If you have Office 2000 or 2003 or you use a Mac at home or in the Computing Facilities
   - You will have to save your document as an older version
   - Go to MS Office Button >> Save As
     ✓ At the bottom, there is a bar that asks you to “Save as Type:”
     ✓ Choose Word 97-2003 Document (*.doc)
   - DO NOT CHOOSE “Word Document (*.docx)”

4. If you are using a PC at home running Office 2000 or 2003
   - You can download the MS Office 2007 to Office 2003 Compatibility Pack from Microsoft's website
     o http://www.microsoft.com/downloads/
     o Under New Downloads, choose "Microsoft Office Compatibility Pack for Word..."
   - Even with the Compatibility Pack, you might lose data / formatting when you save as an older version
   - There is no Compatibility Pack available for Mac yet.

<table>
<thead>
<tr>
<th>Save the current document</th>
<th>MS Office Button &gt;&gt; Save or Save As...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save a document as a different Name, Version, or Format</td>
<td>• Please read the Important Notes above regarding saving in Office 2007!</td>
</tr>
<tr>
<td></td>
<td>• In the bars at the bottom of the Save As... Window</td>
</tr>
<tr>
<td></td>
<td>• Give your document a new name in “File Name:”</td>
</tr>
<tr>
<td></td>
<td>• Select the version and format from “Save as type:”</td>
</tr>
</tbody>
</table>

Setting Document Formatting and Page Layout

<table>
<thead>
<tr>
<th>Page Layout Tab</th>
<th>Insert Tab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Page Orientation</td>
<td>Page Layout Tab &gt;&gt; Page Setup Group &gt;&gt; Orientation</td>
</tr>
<tr>
<td></td>
<td>Choose Portrait or Landscape depending on your text</td>
</tr>
</tbody>
</table>
| Adjust the page Margins | **Page Layout Tab >> Page Setup Group >> Margins**  
- Adjust the values of the margins as desired.  
- For example:  
  - To have 1" margins on all sides, choose  
  - **Normal** To set 1/2" margins on all sides,  
  - choose **Narrow** To set your own margins, choose **Custom** |
|------------------------|---------------------------------------------------------------|
| Create Columns - used for newspapers or brochures | **Page Layout Tab >> Page Setup Group >> Columns**  
Highlight the text you wish to split into columns or set up columns before you start writing.  
- In the **Page Setup Group**, click on **Columns**  
- Choose the number of columns you wish to create |
| Page Numbering & Insert Headers and Footers | **Insert Tab >> Header and Footer Group >> Page Numbers** then **Design - Header and Footer Tools >> Header & Footer, Insert, Options, and Position Groups**  
- Click on **Page Number** and choose which type you want  
  - Plain 1, 2, and 3 correspond to **Left, Right, and Centre**  
- When you click on a type of Page Number, the **Ribbon** will change to a hidden Ribbon called **Design - Header and Footer Tools**  
- The **Header Footer Group** (at the left of the Ribbon) has options for the Header, Footer and Page Numbers  
  - Click on **Page Number** to add Page Numbers to your document  
  - To add the **Date**, your **Name**, or an **image** click on the appropriate tool  
  - in the **Insert Group** (2nd group in Ribbon)  
- The **Options Group** lets you choose **not** to display the Header or Footer on the first page. It also has options for creating different headers and footers for even and odd pages.  
- **Margins of Headers and Footers**  
  - The **Position Group** changes **margins** for the Header or Footer |
| Turn on „in-line” Spell Check or Grammar Check to check spelling and grammar as you type | **MS Office Button**  
- Click on the **MS Office Button**  
- At the bottom of the MS Office Button Window, click on **Word Options**  
- Choose **Proofing** from the side bar on the left  
- In the lower half of the Proofing window  
- Check boxes for  
  - “Check Spelling as you type”  
  - “Check Grammar with Spelling” |
## Formatting Text and Paragraphs

### Home Tab - Clipboard, Font, & Paragraph Groups

<table>
<thead>
<tr>
<th>Move a section of text</th>
<th><strong>Home Tab &gt;&gt; Clipboard Group</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• <strong>Select</strong> the appropriate section of text</td>
</tr>
<tr>
<td></td>
<td>• Click on the <strong>Cut</strong> or <strong>Copy</strong> Tools in the ClipBoard Group</td>
</tr>
<tr>
<td></td>
<td>• Place the cursor at desired destination</td>
</tr>
<tr>
<td></td>
<td>• Click on the <strong>Paste</strong> Tool in</td>
</tr>
<tr>
<td><strong>Alternate method 1</strong></td>
<td>• <strong>Select</strong> the appropriate section of text</td>
</tr>
<tr>
<td></td>
<td>• Click and hold the mouse button</td>
</tr>
<tr>
<td></td>
<td>• Drag the selected text to its destination within your document</td>
</tr>
<tr>
<td><strong>Alternate method 2</strong></td>
<td>• <strong>Select</strong> the appropriate section of text</td>
</tr>
<tr>
<td></td>
<td>• Press <strong>Ctrl-X</strong> to cut or <strong>Ctrl-C</strong> to copy</td>
</tr>
<tr>
<td></td>
<td>• Place the cursor at desired destination</td>
</tr>
<tr>
<td></td>
<td>• Press <strong>Ctrl-V</strong> to paste</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Change Font formatting</th>
<th><strong>Home Tab &gt;&gt; Font Group</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• <strong>Select</strong> a section of text</td>
</tr>
<tr>
<td></td>
<td>• Click on the appropriate tool to change the Font options</td>
</tr>
<tr>
<td></td>
<td>✓ <strong>Font, Font size, Font Colour, Bold, Italic, Underline</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indent first line of a paragraph using Tab</th>
<th><strong>The Left Tab</strong> is set by default to <strong>0.5 inches</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To indent the first line of a paragraph with this tab setting:</td>
</tr>
<tr>
<td></td>
<td>• Go to the beginning of the paragraph and hit the <strong>Tab</strong> key on the left of the keyboard</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indent a whole paragraph</th>
<th><strong>Home Tab &gt;&gt; Paragraph Group &gt;&gt; Increase Indent Tool</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Select the paragraph or section of text that you want to indent</td>
</tr>
<tr>
<td></td>
<td>• Click on the <strong>Increase Indent tool</strong> in the Paragraph Group</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Create Block Quotes</th>
<th><strong>Home Tab &gt;&gt; Paragraph Group &gt;&gt; Alignment Tools</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Block quotes are basically regular text that is indented on both sides of the page. They are usually aligned to <strong>Justify</strong>. This means that they are aligned to have the left AND right sides of the paragraph even with the indentation</td>
<td></td>
</tr>
<tr>
<td>□ <strong>Select</strong> the portion of text you wish to block quote</td>
<td></td>
</tr>
<tr>
<td>□ In the <strong>Paragraph Group</strong>, click on the small arrow in the lower right corner of the Group</td>
<td></td>
</tr>
<tr>
<td>□ The <strong>Paragraph Dialog Box</strong> should appear</td>
<td></td>
</tr>
<tr>
<td>□ In the <strong>General</strong> section, set the <strong>Alignment</strong> to <strong>Justify</strong></td>
<td></td>
</tr>
<tr>
<td>□ Set the <strong>Indentation Before Text</strong> and <strong>After Text</strong> to the desired settings</td>
<td></td>
</tr>
</tbody>
</table>
| Create Bullets or Numbering | **Home Tab >> Paragraph Group >> Bullet and List Tools**  
- Type out your points and place a return (hit Enter) at the end of each point so they each start on a new line  
- At the end of the last point hit Enter twice  
- Select all of the points you typed  
- Click on the desired type of **Bullet or List Tool** in the Paragraph Group  
- To indent some points to a second level of Bullets  
  - Highlight those points and choose the **Increase Indent Tool** in the **Paragraph Group**  
- To change the symbol used for the **Bullet**  
  - Click on the **small arrow** right next to the **Bullet Tool**  
  - A Dialog Box will pop up and allow you to edit the Bullet Symbol |

<table>
<thead>
<tr>
<th>Inserting Items – Footnotes, Page Breaks, Tables, Images</th>
</tr>
</thead>
</table>
| **Insert Footnotes & Endnotes** | **Reference Tab >> Footnotes Group >> Insert Footnote**  
To add Footnote:  
- Click on the Insert Footnote or Insert Endnote Tool in the Footnotes Group  
- Word will place a superscript number in the body of the text and insert a **matching** number at the bottom of the page where you can type the text of the Footnote.  
- For **Endnotes**, matching numbers are inserted at the end of document.  
- Word **automatically adjusts the numbering** as you insert foot- or endnotes into the middle of a document  
- More options for Footnotes can be found by clicking on the small arrow at the bottom right corner of the Footnotes Group |

| Insert a Page Break | **Insert Tab >> Pages Group >> Page Break**  
- Place the cursor where you want the Page Break to occur  
- Click on the **Page Break Tool**  

To add other types of breaks (section, column...)  
**Page Layout Tab >> Page Setup Group >> Breaks**  
- Place the cursor where you want the Page Break to occur  
- Click on the **Breaks Tool** to show the drop-down menu  
- Choose the type of Break you want to insert |

| Insert an Image from a File or from Clip Art | **Insert Tab >> Illustrations Group >> Picture or Clip Art**  
- If you already have an image in a file on your computer  
  - Click on the **Picture Tool** in the **Image Group**  
  - In the window that opens locate and select image you want to insert  
  - If you want to use a **Clip Art** image  
  - Click on the **Clip Art Tool** in the **Image Group**  
  - A window will open on the right side of your screen  
  - Type in key words for the type of clip art you want |
| Insert a Text Box | Insert Tab >> Text Group >> Text Box  
|                   | ✗ Click on the Text Box Tool in the Text Group  
|                   | ✗ Choose a type of Text Box  
|                   | ✗ Type or copy text into the Text Box  
|                   | ✗ Adjust the size accordingly by click-dragging the small side squares  |
| Insert an AutoShape | Insert Tab >> Illustrations Group >> Shapes  
|                    | ✗ Click on Shapes in the Illustrations Group  
|                    | ✗ Choose a type of Shape  
|                    | ✗ Click+drag to draw the shape to the size you desire  
|                    | ✗ Adjust the size accordingly by click-dragging the small side squares  |

| Finishing Steps - Spell Check and Print Preview |  |
| Spell-check my document | Review Tab >> Proofing >> Spelling and Grammar  
|                         | Save Your Work before performing this operation!  
|                         | The spell-check window will open automatically and begin to check your document.  |
| Print Preview - See what printed output will look like | MS Office Button >> Print >> Print Preview  
|                                                          | Save Your Work before performing this operation!  
|                                                          | ✗ Close Print Preview is in the Preview Group at the right end of the Ribbon. This will return you to your editable document.  |
Microsoft PowerPoint 2007

Microsoft PowerPoint is a slide show presentation program developed by Microsoft. It was officially launched on May 22, 1990, as a part of the Microsoft Office suite.

PowerPoint 2007 interface

Here's a quick walkthrough of the PowerPoint 2007 interface -- unlike PowerPoint 2002 & 2003 (XP), PowerPoint 2007 doesn't look the same anymore. The menus and toolbars are replaced by the Ribbon tabs, a Quick Access Toolbar, and the mini toolbar. The task panes are still available, and most of the PowerPoint views also remain the same.

Figure shows a screenshot of the interface -- each part of the interface is explained later in this page.

Office Button: Choose this button to open a new presentation, save the presentation, and access PowerPoint options.

Quick Access Toolbar: Also known as the QAT, this is a customizable toolbar placed by default next to the Office Button -- you can add icons for your often used commands to this toolbar.

Ribbon: The Ribbon has tabs which in turn contain groups of buttons for various options -- some groups also contain galleries (for example galleries for Themes and Theme Colors).

Slides/Outline Pane: Normally placed on the left side of the interface, this pane contains two tabs -- the Slides tab and the Outline tab. The Slides tab shows thumbnails of all the slides in the open presentation. The Outline tab shows the same slides in outline view.

Status Bar: A horizontal strip that provides information about the open presentation like slide number, applied Theme, etc. It also includes the view and zoom options.
Notes Pane: Directly below the active slide, this is where you input speaker notes for the current slide. None of this content is visible on the actual slide while presenting -- although it is visible in both Notes Page view and Presenter view.

View Buttons: Essentially there are three view buttons displayed right beneath on the status bar with zoom-in and zoom-out.

Normal View - Clicking this enables Normal view, Shift-clicking this gets you to Slide Master view.

Slide Sorter View - Clicking this displays zoom able thumbnails of every slide in the open presentation. Shift-clicking this button gets you to Handout Master view.

Slide Show from current slide - Show the presentation as a full screen slideshow from the current selected slide. Shift-clicking brings up the Set Up Show dialog box.

1. Slide Area: Displays the active slide.

2. Task Pane: The Task Pane contains more options and appears when you choose an option in one of the Ribbon tabs -- for example if you click the Clip Art button on the Insert tab of the Ribbon, the Clip Art task pane opens (as shown in the figure above on this page).

3. Mini Toolbar: This toolbar is not shown in the figure above -- it's a semitransparent floating toolbar that spawns right next to the cursor -- and it is also available instantly with a right-click.

Opening PowerPoint

To open PowerPoint in Windows, click on the Start button --> Programs --> Microsoft PowerPoint or Double-click on the PowerPoint icon on the desktop.
When PowerPoint 2007 is opened, a blank Title slide appears by default as the first slide in your new presentation. You can start a new presentation when you first open PowerPoint or after PowerPoint is already open.

To change the layout of an open slide, click on the Layout button in the Home tab.

- **PowerPoint Already Open**

To start a new presentation, click on the Office button on the top left corner of the screen and select New:

The New Presentation window will appear. Here you can select from a variety of themes and templates by looking under Installed Themes and Installed Templates. From here you can also search Microsoft Online for more themes and templates.

**Inserting Slides**

There are two ways to add new slides to your presentation. New slides are automatically inserted after the currently selected slide, and by default will take on the layout and theme of the preceding slide.

- **Quick Menu Options**

  To insert a new slide using the Quick Menu, in the Slides panel right click the slide after which you want a new slide inserted and select New Slide.

  To change the layout of the slide, right click the new slide in the Slides panel, select Layout and select the desired theme.

- **Ribbon Option**

  From the Home tab in the Slides group, click on New Slide. A blank slide will be inserted after your active slide.

  If you wish to choose the layout while creating your new slide, click the ▼ on the New Slide button and choose a theme.

**Adding & Editing Content**

To add text to your slide, you can either use the placeholders provided when you choose a layout or create a text box on a blank slide.

- **Adding Text to a Placeholder**

  If you have selected a layout for your slide, you will see boxes that contain dummy text which read something like "Click to Add Title" or "Click to Add Text". When you click in the box, the dummy text will disappear, the cursor will become a blinking line ( | ), and you can begin to type your text.

- **Inserting & Resizing a Text Box**

  To create a text box in a blank slide, go to the Insert tab on the Ribbon and click on the Text Box button. Your mouse pointer will change to an insertion point. Left click and drag your cursor
across the screen to choose the size and location of your text box.

If you wish to resize your text box after it is created, hover your mouse over the circles or squares around the border of the box. The circles will resize both the width and the height of the box, the squares on the top and bottom will resize the box vertically, and the squares on the sides will resize it horizontally.

When your cursor changes shape, left click and drag your mouse. The circles in the corners will adjust both height and width while the squares to the sides will adjust one or the other.

To rotate the text box, left click on the green circle above the box and drag your mouse.

To simply move the box, click on the border and drag your mouse. **Tip: If you want to move the box in a straight line, hold down the Shift key before clicking and dragging the mouse.**

- **Deleting a Text Box**

To delete a text box, click on the border of the box. Once the border is highlighted, press the [Delete] key on your keyboard.

- **Adding Notes**

There are two ways to insert notes in PowerPoint.

  - **To insert short notes:** In the Normal view, click on the Notes box at the bottom of your screen and type your text.
  - **To insert longer notes:** Click on the View tab. Under Presentation Views select the Notes Page button. Type your notes in the space that appears below your slide.

- **Inserting Headers & Footers**

To add a header and footer, click on the Insert tab, then on the Header & Footer button. The Date & Time and Slide Number buttons will bring up the same dialog box.

1. **Fixed and Automatic Dates** - PowerPoint gives you the option to add either a fixed date and time, which will remain the same, or a date and time that automatically update. If you choose to have a date and time that automatically update, the date and time will always match the date and time that you run your slide show.

2. **Slide Number** - Check this box to show the slide number.

3. **Footer** - Check the Footer box and add text to have text appear at the bottom of the slide.

4. **Apply/Apply To All** - To insert your chosen elements into your slide, select Apply to have the information appear only on your current slide, or Apply To All to have it appear on every slide. If any of the information is repeated on the title slide, check the Don’t show on title slide box to avoid repeating the information.

5. **Preview** - The Preview box shows you where on your slide the information will appear. You can not change this from within this screen, but once you insert the information you can click and drag the box anywhere in your slide, just like any other text box.
Note: If you chose to Apply To All, moving the text box in one slide will not affect the placement of
the information in the rest of your slides.

6. Notes and Handouts - Under this tab, you can choose your header and footer preferences for
your handouts.

Design Themes

Design themes are a convenient way to add a professional flair to your presentation. Themes
include preset color palettes, fonts, backgrounds, and formatting effects. PowerPoint provides you
with the option to customize one of their existing themes or to build your own.

➢ Selecting a Theme

To choose a Theme for an open slide, use the Theme group under the Design tab. Use the arrows
on the right of the Theme group to scroll through the themes, or to see all available themes at once.
When you hold your mouse over any of the examples, PowerPoint will show you a preview of the
slide.

➢ Customizing a Theme

To change the color scheme for your theme, click Colors and choose either a built-in palette from
the drop down list, or click on "Create New Theme Colors..." at the bottom of the list to design your
own palette.

To change the font set, click on Font and select a set from the list, or click on "Create New Theme
Fonts..." to create your own.

To change the formatting effects (line and fill formatting) for the slide, click on Effects and choose
from the built-in options.

To change the background for a theme, click on Background Styles in the Background group to
choose a preset style, or click on "Format Background..." to customize a style.

Backgrounds

➢ Customizing the Background Color

You can customize the background of individual slides by changing the color and adding shading,
texture, or patterns.

- First select the slide you want to customize.
- Under the Design tab in the Background group, either click the Background Styles button
  and choose "Format Background..." or click the menu arrow to bring up the Format Background dialog.
- Select a Fill Style. You can choose from a solid fill, a gradient, or a picture/texture. Play
  around with the settings until you're satisfied.
Working With Graphics

Inserting an Image in PowerPoint

First select the slide where you would like the image to appear.

- Under the Insert tab, click on the Picture button under the Illustrations group.
  - OR if your slide has a text box with a media button, click the Insert picture from file button on the bottom left.

- In the Insert Picture dialog find the folder where you saved your image and double-click it.

- Your image will appear on the slide.

- If needed, adjust the size of the image by using the "handles" on the edges just as you would adjust any other object.

Animating Text and Images

Slide animations, when used properly, can add some flair to your presentation. You can use animations to make your text and images appear on the screen dramatically or to make smooth transitions between slides and topics.

Note: Keep in mind that the key to using animations effectively is to use them in moderation! Too many animations will distract your audience.

Adding Animation to Slides

PowerPoint 07 provides preset animations to allow you to easily add animations to any object on your slide. This includes text, images, clipart, charts and SmartArt.

While the preset options PowerPoint provides are quick and easy, we strongly recommend using the custom animation options which allow you more control over the animations.

1. Click on the object or text box you wish to animate to select it (hold down the Ctrl button while clicking to select more than one).
2. In the Animations tab under the Animations group, select an option from the Animate pull-down list. As you hover your mouse over each choice PowerPoint will preview the effect on your slide.
   - Hint: The options available in the pull-down menu will differ depending on what type of object you are animating. The image on the left shows the options available for
3. Repeat for any other slides or objects you wish to animate.

Remember that animations will be applied only to the object or the text box selected. If you wish to have the same effect applied across several slides you will have to add them to each.
Custom Animations

Using custom animations allows you to have more control over your animations.

1. Click on the object or text box you wish to animate to select it (hold down the Ctrl button while clicking to select more than one).
2. In the Animations tab under the Animations group click on the Custom Animation button.
3. The Custom Animation pane opens
4. From the Add Effect drop-down menu choose the kind of effect you want (Entrance, Emphasis, Exit, Motion Paths) and then the animation itself. The drop-down list shows only a few possibilities, so choose More Effects... for more options.
5. To customize the speed, properties and timing of your animation, either click on the effect you wish to modify on the Custom Animation Pane. Note: If you want to customize the effects on individual list items, see below.
6. Once you have the animation you would like to modify selected, use the options in the Modify: [Effect] section of the Custom Animation Pane. These options will change depending on the effect selected. Note: If PowerPoint is not showing you a preview of your animation, make sure the AutoPreview box is checked.
7. Repeat steps 2-6 for as many animations as you would like to add. Hint: If the button on the Custom Animation Pane says "Change" instead of "Add Effect" click outside the object to deselect it and then click on it again.

Selecting Individual Animations in a List

You can also customize the animations for individual items on a list, rather than modifying the list as a whole. But use this option sparingly, as too many different effects will distract your audience!

To choose an individual effect, you have a couple options:

1. Click on the effect you wish to modify on the Custom Animation Pane. If there is a blue bar beneath it like this: click on it to expand the contents.
2. On the slide itself, beside your list will be numbers. Click on the number for the list item/animation you wish to edit. There may be several numbers next to the item, depending on how many
Microsoft Excel 2007

Introduction

- Microsoft Office Excel 2007 (or Excel) is a computer program used to enter, analyze, and present quantitative data.
- Excel sheet contains 256 column and 65,536 row.
- Microsoft Excel is a spreadsheet application developed by Microsoft for Microsoft Windows and Mac OS.
- A spreadsheet is a collection of text and numbers laid out in a rectangular grid.
- Often used in business for budgeting, inventory management, and decision making.

Workbook, worksheet, chart sheet, workspace:

- An Excel worksheet (also known as a spreadsheet) is a single spreadsheet that contains cells organized by rows and columns.
- A workbook is an Excel file that contains one or more worksheets. In each of the workbook worksheets are in separate tabs on the bottom of the Excel window. By default, a new Excel workbook will contain three worksheets.
- A separate sheet in a workbook that contains only a chart, which is linked to the workbook data is known as chart sheet.
- Group of Workbooks is called Workspace. If you open the same workbooks every day, save these workbooks as a workspace.

Function of MS Excel:

- Financial calculations
- Creating charts
- Use of conditional formatting
- Manages and organize massive data
- Data sorting and analysis

Excel window:

![Figure 16](image)

**Figure 16**

Entering Text, Numbers, and Dates in Cells:

- The formula bar displays the content of the active cell
- Text data is a combination of letters, numbers, and some symbols
Number data is any numerical value that can be used in a mathematical calculation
Date and time data are commonly recognized formats for date and time values

Entering Multiple Lines of Text within a Cell:

- Click the cell in which you want to enter the text
- Type the first line of text
- For each additional line of text, press the Alt+Enter keys (that is, hold down the Alt key as you press the Enter key), and then type the text

Inserting a Column or Row:

- Select the column(s) or row(s) where you want to insert the new column(s) or row(s); Excel will insert the same number of columns or rows as you select
- In the Cells group on the Home tab, click the Insert button (or right-click a column or row heading or selected column and row headings, and then click Insert on the shortcut menu)

Entering a Formula:

- A formula is an expression that returns a value
- A formula is written using operators that combine different values, returning a single value that is then displayed in the cell
  - The most commonly used operators are arithmetic operators
- The order of precedence is a set of predefined rules used to determine the sequence in which operators are applied in a calculation
  - Click the cell in which you want the formula results to appear
  - Type = and an expression that calculates a value using cell references and arithmetic operators
  - Press the Enter key or press the Tab key to complete the formula

Copying and Pasting Formulas:

- With formulas, however, Excel adjusts the formula’s cell references to reflect the new location of the formula in the worksheet

Introducing Functions:

- A function is a named operation that returns a value
- For example, to add the values in the range A1:A10, you could enter the following long formula:
  \[ A1+A2+A3+A4+A5+A6+A7+A8+A9+A10 \]
  Or, you could use the SUM function to accomplish the same thing:
  \[ \text{SUM(A1:A10)} \]
Entering Functions with AutoSum:

- The AutoSum button quickly inserts Excel functions that summarize all the values in a column or row using a single statistic

  - Sum of the values in the column or row
  - Average value in the column or row
  - Total count of numeric values in the column or row
  - Minimum value in the column or row
  - Maximum value in the column or row

Find an average:

You can use the AVERAGE function to find the mean average cost of all

Find the largest or smallest value:

The MAX function finds the largest number in a range, and the MIN function finds the smallest number in a range.

IF function:

- returns a value based on a logical test.
- A logical test is any expression that can be evaluated as TRUE or FALSE (i.e. is it raining, or 5+3=8, or C3=87).

IF(logical_test, value_if_true, value_if_false)

  - Logical_test is any value or expression that can be evaluated to TRUE or FALSE.
  - Value_if_true is the value that is returned if logical_test is TRUE.
  - Value_if_false is the value that is returned if logical_test is FALSE.

Inserting and Deleting a Worksheet:

- To insert a new worksheet into the workbook, right-click a sheet tab, click Insert on the shortcut menu, select a sheet type, and then click the OK button
• You can delete a worksheet from a workbook in two ways:
  ✓ You can right-click the sheet tab of the worksheet you want to delete, and then click Delete on the shortcut menu
  ✓ You can also click the Delete button arrow in the Cells group on the Home tab, and then click Delete Sheet

Renaming a Worksheet:

✓ To rename a worksheet, you double-click the sheet tab to select the sheet name, type a new name for the sheet, and then press the Enter key
✓ Sheet names cannot exceed 31 characters in length, including blank spaces
✓ The width of the sheet tab adjusts to the length of the name you enter

Moving and Copying a Worksheet:

✓ You can change the placement of the worksheets in a workbook
✓ To reposition a worksheet, you click and drag the sheet tab to a new location relative to other worksheets in the workbook
✓ To copy a worksheet, just press the Ctrl key as you drag and drop the sheet tab

Editing Your Work:

❖ To edit the cell contents, you can work in editing mode
❖ You can enter editing mode in several ways:
  ✓ double-clicking the cell
  ✓ selecting the cell and pressing the F2 key
  ✓ selecting the cell and clicking anywhere within the formula bar

Using Find and Replace:

• You can use the Find command to locate numbers and text in the workbook and the Replace command to overwrite them

Working with Portrait and Landscape Orientation:

✓ In portrait orientation, the page is taller than it is wide
✓ In landscape orientation, the page is wider than it is tall
✓ By default, Excel displays pages in portrait orientation

Printing the Workbook:

✓ You can print the contents of your workbook by using the Print command on the Office Button
✓ The Print command provides three options:
  ✓ You can open the Print dialog box from which you can specify the printer settings, including which printer to use, which worksheets to include in the printout, and the number of copies to print
  ✓ You can perform a Quick Print using the print options currently set in the Print dialog box
  ✓ Finally, you can preview the workbook before you send it to the printer
Chapter 5

General concept on Computer Hardware and Software

Computer Hardware

Computer hardware includes all the electrical, mechanical, and the electronic parts of a computer. Any part that we can see or touch is the hardware.

1.1 Components of Computer:

1.1.1 Input Devices:

- **Keyboard:**

  A computer keyboard closely resembles a typewriter keyboard. It has additional keys to handle specific functions required by a computer.

  A computer keyboard has three categories of keys:
  - Alphanumeric Keys (Alphabet & Numeric)
  - Special purpose keys
  - Function keys

- **Mouse**

  A mouse is an input device which is used to point and select some options on the VDU. A mouse may have one, two or three buttons. The function each button depends on the program.

- **Scanner**

  There are a number of situations when some information (picture or text) is available on paper and is needed on the computer disk for further manipulation. A scanner is used for this purpose. A scanner scans an image and transforms it into ASCII (special code used by the computers) and graphics. These can be edited, manipulated and combined, and then printed.
• **Light pen:**

An input device that utilizes a light-sensitive detector to select objects on a display screen. A light pen is similar to a mouse, except that with a light pen you can move the pointer and select objects on the display screen by directly pointing to the objects with the pen.

• **Touch Screen**

Touch panel displays and pads are now being offered as alternatives to keyboard. Here the input can be given through the computer screen, that accepts the input through monitor; users touch electronic buttons displayed on the screen or they may use light pen.

• **Microphone**

Microphone is an input device, which takes voice as input.

• **Track Ball**

Trackball, a pointing device, is a mouse lying on its back. To move the pointer, you rotate the ball with your thumb, your fingers, or the palm of your hand. There are usually one to three buttons next to the ball, which you use just like mouse buttons.

The advantage of trackballs over mouse is that the trackball is stationary so it does not require much space to use it. In addition, you can place a trackball on any type of surface, including your lap.
1.1.2 Output Devices:

- **Printer:**

A printer is any device that prints text or illustrations on paper. Two commonly used printers are the dot-matrix printer and the laser printer.

Printers are classified on the basis of a number of parameters like, the speed of printing, quality of output, direction of printing, and the kind of interface they have with the computer.

- **Monitor:**

A monitor or a display is an electronic visual display for computers. The monitor comprises the display device, circuitry and an enclosure. The display device in modern monitors is typically a thin film transistor liquid crystal display (TFT-LCD) thin panel, while older monitors used a cathode ray tube (CRT) about as deep as the screen size.

- **Plotter:**

A plotter is an output device similar to a printer, but normally allows you to print larger images.

- **Multimedia Speaker:**

A multimedia speaker is the hardware device connected to a computer's sound card that outputs sound generated by the computer.

1.1.3 System Unit:

System unit components include the processor, memory module, cards, ports, and connectors. Many of the system unit’s components reside on a circuit board called the motherboard.

1.1.3.1 Components of System Unit:
• **Motherboard:**

It's the basis of component of the computer. It's the first component installed in the system unit, and it holds all of the circuitry that ties the functions of the computer components together.

• **Central Processing Unit (CPU):**

The central processing unit, or the brains of the computer, sits on the motherboard. All the instructions you give the computer - like a click of a mouse - go through the CPU, which processes in billions of cycles per second. CPU significantly impacts overall computing power and manages most of a computer’s operations. The CPU contains the control unit and the arithmetic/logic unit.

• **Control Unit:**

The control unit directs and coordinates most of the operations in the computer. For every instruction, the control unit repeats a set of four basic operations called the machine cycle: (1) fetching the instruction or data item from memory, (2) decoding the instruction into commands the computer understands, (3) executing the commands, and, if necessary, (4) storing, or writing the result to memory.

• **Arithmetic and Logical Unit (ALU):**

The arithmetic/logic unit (ALU) performs the execution part of the machine cycle. Specifically, the ALU carries out three operations:

- Arithmetic operations – performing calculations, which include addition, subtraction, multiplication, and division
- Comparison operations – comparing data items to determine if the first item is greater than, equal to, or less than the other item
- Logical operations – working with conditions and logical operators such as AND, OR, and NOT

1.1.3 **Storage Device:**

Storage device also known as digital storage, storage, storage media, or storage medium, a storage device is any hardware capable of holding information on a computer. The storage device may hold, or save, the information temporarily or permanently.
There are two types of storage devices used in computers: a primary storage device, such as RAM, and a secondary storage device, like a hard drive. Secondary storage can be removable, internal, or external storage.

1.1.3.1 Primary Storage:

- **RAM**

  Random Access Memory (RAM) is the area that is used for holding the programs and their data while the computer is working with them. RAM means the memory can be read from and written to randomly. The RAM is also known as short term memory because once the power is switched off all data in the RAM is erased.

- **ROM**

  It contains permanently recorded instructions that are vital for starting up a computer. Instructions in ROM can be read but cannot be changed, hence the name Read-Only Memory. Further, these instructions are not erased when power goes off.

- **Cache Memory**

  A computer’s CPU is a fast device. But the storage devices are not as fast as the CPU. Most of the time the CPU has to slow down because of these devices. A small section of the high speed RAM is used to keep frequently needed information which is known as cache memory.

1.1.3.2 Secondary Storage:

Computer’s primary storage or main memory is volatile and expensive. So, one need some storage device to store data and other information. It should be cheap and should not lose the content when power is switched off. This storage is called as the secondary storage.

**Types of Secondary Storage:**

Currently the most common forms of secondary storage device are:

**Hard disks**

Hard disks differ from floppy disk in that they have been designed to store very high volume of data. Currently hard disks can store gigabytes of data (e.g. 200GB) and they are an integral part of the computer. Most operating systems are stored in hard disks and all materials (software, documents, images, music files etc) that you save on your computer is stored in the hard disk.
• Optical Disks

CDs/DVDs form part of a category of storage devices called optical disks. The latter make use of light energy to store information and are very suitable to store information of relatively high capacity.

• Flash Drive :

A flash drive is a small external storage device, typically the size of a human thumb that consists of flash memory. USB flash drives are removable and rewritable reads and writes to flash memory. They are a solid-state storage medium that's both inexpensive and durable.

Flash Memory cards :

Flash memory is a non-volatile computer storage chip. These Memory cards currently vary in sizes. Flash memory cards have most of the same characteristics of a flash drive in that they are inexpensive and durable, and are very small.

2.0 Software:

As we are aware, computer cannot do anything on its own. It is the user who instructs computer; what to do, how to do and when to do. In order to perform any task, you have to give a set of instructions in a particular sequence to the computer. These sets of instructions are called Programs. Software refers to a set of programs that makes the hardware perform a particular set of tasks in particular order. Software can be classified mainly into following categories and sub-categories are shown in figure below.

2.1 System Software:

When you switch on the computer the programs stored in ROM are executed which activates different units of your computer and makes it ready for you to work on it. This set of programs can be called system software. System software are sets of programs, responsible for running the computer, controlling various operations of computer systems and management of computer resources. Operating System (OS) falls under this category.
2.1.1 Operating System:

An operating system is a system software that provides an interface for a user to communicate with the computer, manages hardware devices (disk drives, keyboard, monitor, etc), manages and maintains disk file systems and supports application programs. Some popular Operating systems are UNIX, Windows and Linux.

Although operating system provides all the features users need to use and maintain their systems, inevitably, they still do not meet everyone’s expectations. This has led to another type of system software called "Utilities". These are programs that bridge the gap between the functionality of an OS and the needs of users. Utility programs are a broad category of software such as compress (zip)/uncompress (unzip) files software, anti virus software, split and join files software, etc.

2.2 Application Software:

Application software is a set of programs, which are written to perform specific tasks, for example: An application package for managing library known as library information system is used to manage information of library such as: keeping book details, account holder details, book issue details, book return details etc. Another application package for managing student details is called student’s information system, manages student’s roll no, name, parents name, address, class, section, processing of examination results etc. Application software can be broadly classified into two types:

(a) Generalized packages

(b) Customized packages
2.2.1 Generalized Packages:

These are user friendly software written to cater to user’s very general needs such as preparing documents, drawing pictures, database to manage data/information, preparing presentations, play games etc.

It is a group of programs that provide general purpose tools to solve specific problems. Some of the generalized packages are listed below:

- Word Processing Software (for preparing documents): Word Perfect, MS-Word, OpenOffice.org Writer
- Spreadsheets (Data Analysis): Lotus Smart suites, MS-Excel, OpenOffice.org Calc, Apple Numbers
- Presentations: Presentation Graphics, MS-PowerPoint, OpenOffice.org Impress
- Database Management System: MS-Access, OpenOffice.org Base, MS-SQL Server, ORACLE
- Graphics Tools: Paint shop pro, Adobe Photoshop

2.2.2 Customized Packages:

These are the applications that are customized (or developed) to meet the specific requirements of an organization/institution. For Example: Student information details, Payroll packages, inventory control etc.
Chapter 6

E-Mail and Internet

Computer network

A computer network is an interconnected group of computers. Two or more computers connected together for the purpose of file sharing, resource sharing, internet sharing etc. is called computer network or just network.

Types of Networks

There are several different types of computer networks. Computer networks can be characterized by their size as well as their purpose.

The size of a network can be expressed by the geographic area they occupy and the number of computers that are part of the network. Networks can cover anything from a handful of devices within a single room to millions of devices spread across the entire globe.

Some of the different networks based on size are:

- Personal area network, or PAN
- Local area network, or LAN
- Metropolitan area network, or MAN
- Wide area network, or WAN

Figure 36: LAN, MAN, WAN
Internet

The Internet is a worldwide, publicly accessible series of interconnected computer networks, linked by copper wires, fiber-optic cables, wireless connections, etc. It is a "network of networks" that consists of millions of smaller domestic, academic, business, and government networks, which together carry various information and services, such as electronic mail, online chat, file transfer, and the interlinked Web pages and other documents of the World Wide Web.

Internet allows us to:

- exchange electronic mail (E-mail) with friends and colleagues with accounts on the Internet;
- share research and business data among colleagues and like-minded individuals.
- post information for others to access; request and provide assistance with problems and questions.
- access multimedia information that includes sound, photographic images and even video; and
- gather valuable feedback and suggestions from customers and business partners.

Internet common uses are:

- Virtual Class room.
- Internet Telephony
- Online Gaming
- Entertainment
- Information Finding
- Financial Transaction.
- Online Training
- Ecommerce
- Data Sharing
- Social Networking
- News
- Instant Messages
- Job Searching
- Marketing and Advertising etc.
Internet provides us various services. Some of the important services that Internet provides are:-

1. **E-mail**, for exchange of electronic mail messages.
2. **File Transfer Protocol (FTP)**, a system for storing and retrieving data files on large computer systems.
3. **TELNET**, a way of connecting directly to remote computer systems on the Internet.
4. **The World Wide Web**, The World Wide Web (www) is a method of posting and accessing interactive multimedia information, allowing users from all over the world to access a wealth of information quickly and easily.

### Website (Webpage)

A **website** is a collection of **Web pages**, images, videos or other digital assets that is hosted on one or more web servers, usually accessible via the **Internet**. A Web page is a document, typically written in (X)HTML, that is almost always accessible via **HTTP**, a protocol that transfers information from the **web server** to display in the user's **Web browser**. All publicly accessible websites are seen collectively as constituting the "**World Wide Web**".

The World Wide Web is a system of interlinked documents that can be accessed through the Internet. With the use of a web browser, a user views web page that may contain text, images, videos, and other multimedia and navigates between them using hyperlinks.

Viewing a web page on the World Wide Web normally begins either by typing the URL (yahoo.com is a URL) of the page into a web browser. The browser then requests the resource by sending a request to the web server and displays the content of that web page. The URLs of the pages organize them into a hierarchy, although the hyperlinks between them control how the reader perceives the overall structure and how the traffic flows between the different parts of the site.

### Web browser

A **web browser** is a **software application** which enables a user to display and interact with text, images, videos, music, games and other information typically located on a **Web page** at a **website** on the **World Wide Web** or a local area network. Text and images on a Web page can contain hyperlinks to other Web pages at the same or different website. Web browsers allow a user quickly and easily access information provided on many Web pages at many websites by traversing these links. Web browsers format **HTML** information for display, so the appearance of a Web page may differ between browsers.

The major web browsers are Firefox, Internet Explorer, Google Chrome, Opera, and Safari.

### Internet service provider

An **Internet service provider** (abbr. **ISP**) is a company or business that provides access to the **Internet** and related services. In the past, most ISPs are run by the telecom companies or any other ISP operator. Major ISPs in Nepal are: NTC, NCELL, Worldlink, Mercantile, SUBISU cable net, vianet, classictech etc. Most of the ISPs provides services like Wireless Internet, cable internet, internet through Optical fiber, datacard, Mobile SIM etc.
Web Search Engines and its Application

A Web search engine is a tool designed to search for information on the World Wide Web. Information may consist of web pages, images, information and other types of files. Some search engines also mine data available in newsgroups, databases, or open directories. Unlike Web directories, which are maintained by human editors, search engines operate algorithmically or are a mixture of algorithmic and human input. There are different kinds of Search Engines like AltaVista, Google, Yahoo! Search, MSN Search, Wikia Search etc.

For example the Google.com, bing.com, yahoo.com etc.

Google search

Google, a Web search engine owned by Google, Inc., is the most used search engine on the Web. Google receives several hundred million queries each day through its various services.

E-mail

Email is short form of Electronic Mail. It is a store-and-forward method of composing, sending, receiving and storing messages over electronic communication systems. The term "e-mail" applies both to the Internet e-mail system based on the Simple Mail Transfer Protocol (SMTP) and to intranet systems allowing users within one organization to e-mail each other. Intranets may use the Internet protocols or X.400 protocols for internal e-mail service supporting workgroup collaboration. E-mail is often used to deliver bulk unsolicited messages, or "spam", but filter programs exist which can automatically delete some or most of these, depending on the situation. Modern e-mail systems are based on a store-and-forward model in which e-mail computer server systems, accept, forward, or store messages on behalf of users, who only connect to the e-mail infrastructure with their personal computer or other network-enabled device for the duration of message transmission or retrieval to or from their designated server. Rarely is e-mail transmitted directly from one user's device to another's. While, originally, e-mail consisted only of text messages composed in the ASCII character set, virtually any media format can be sent today, including attachments of audio and video clips.
Email is much the same as a letter, only that it is exchanged in an electronic form and through electronic medium. The first thing you need to send and receive emails is an email address. You can create an email address at web sites which provide free email services.

The free mail servers as listed below:
- **yahoo mail server**: www.yahoo.com
- **hotmail mail server**: www.hotmail.com
- **gmail mail server**: www.gmail.com
  etc…
When you create an account, you are given an email address to send from and receive emails.

**E-mail address**

An **e-mail address** identifies a location to which e-mail messages can be delivered. Often, the domain of an e-mail address is that of an e-mail service, such as Google's **Gmail**, Microsoft's **Hotmail**, Yahoo’s **Yahoo** etc. The domain can also be the domain name of the organization that the recipient represents, or of the recipient's personal site.

An e-mail address typically has two main parts:

For example: **ram@hotmail.com**

The first field is the user name (ram) which refers to the mailbox name. Then there is the sign (@) which is the same in every email address. Then comes the host name also called domain name which refers to the mail server address (hotmail.com, yahoo.com, gmail.com)

The "user name" of an e-mail address can be up to 64 characters and the **domain name** a maximum of 255 characters.

**Things to be considered while creating email account:**

- Username should be unique.
- No space is allowed in username.
- Password shouldn’t be less than 6 characters and combination of letters and numbers.
- Password shouldn’t contain username.

**Valid e-mail addresses**

- abc@example.com
- Abc@example.com
- aBC@example.com
- abc.123@example.com

**Invalid e-mail addresses**

- Abc.example.com (character @ is missing)
- Abc.@example.com (character dot(.) is last in local part)
- Abc..123@example.com (character dot(.) is double)
Format
Internet e-mail messages consist of two major sections:

- **Header** — Structured into fields such as summary, sender, receiver, and other information about the e-mail
- **Body** — The message itself as unstructured text; sometimes containing a signature block at the end

The header is separated from the body by a blank line.

**Header**
The message header consists of fields, usually including at least the following:

- **From:** The e-mail address, and optionally the name of the sender
- **To:** The e-mail address[es], and optionally name[s] of the message's recipient[s]
- **Subject:** A brief summary of the contents of the message
- **Date:** The local time and date when the message was written

Other common header fields include:

- **Cc:** carbon copy
- **Bcc:** Blind Carbon Copy
- **Received:** Tracking information generated by mail servers that have previously handled a message
- **Content-Type:** Information about how the message has to be displayed, usually a MIME type
- **Reply-To:** Address that should be used to reply to the sender.
- **References:** Message-ID of the message that this is a reply to, and the message-id of this message, etc.
- **In-Reply-To:** Message-ID of the message that this is a reply to.

Many e-mail clients present "Bcc" (Blind carbon copy, recipients not visible in the "To" field) as a header field. Different protocols are used to deal with the "Bcc" field; at times the entire field is removed, whereas other times the field remains but the addresses therein are removed. Addresses added as "Bcc" are only added to the SMTP delivery list, and do not get included in the message data.

So, the others users who are in To, and CC will not know that the email has also been sent to the user in Bcc but the email will be delivered to the user in Bcc also.

**Creating E-mail Account**
The example is based on creating e-mail account in hotmail mail server. You can create your e-mail account in any of the free mail servers as per your convenience. The process is almost same in all of those servers.

**To Sign up e-mail account**
**Steps**
1. Type www.hotmail.com at Address bar of internet explorer
2. Then click on Sign Up
3. Click on Get it Free
4. Fill the form as indicated

5. Then click **I Accept**
6. Then **Sign In** by typing **user name** and **password**

**Composing new messages (File Attachment)**

**To send e-mail**

**Steps**

1. First **Sign In** your email account with **user name** and **password**
2. Click on **New**
3. **To:** type email address to whom your are sending mail (for multiple recipients separate with comma or semicolon)
4. **Subject:** Type subject
5. Then type the required message
6. Then click **Send**

**To send mail with file attached**

**Steps**

1. Click on **New**
2. **To:** type email address to whom your are sending mail
3. **Subject:** Type subject
4. Then type the required message
5. Then click **Attach** and choose **File**
6. Then **Browse** the file to be sent
7. Then click **Attach**
8. Then click **Send**
How to create a Gmail account?

Google mail' or ‘Gmail‘ is a web-based email account in which emails are stored on the internet rather than on your computer. Internet email can be a flexible option as you can access emails from any computer that has internet access – for example, at internet cafés – anywhere in the world. In this guide, we’re going to show you how to get started with email by creating an account in Gmail. You’ll need: a computer with internet access. Follow these step-by-step instructions to create a Gmail account:

Step 1: Open up your internet browser and go to the Google home page: www.google.com
Step 2: Click on Gmail at the top right corner of the page.

Step 3: You’ll now be in the ‘Sign in’ section. As you don’t have a Google account yet, you need to create one. Click Create an account.

Figure 40: Google Screen Shot

Figure: 41
**Step 4:** To set up your new account, Google needs some information about you – first, your first and last names. The ‘choose your username’ is the unique email address that you wish to use, which will be placed before ‘@gmail.com’. Because it needs to be unique, Google may have to check the availability of any name that you decide on to make sure that no one already has it. Type an email name into the ‘choose your username’ box and then fill out the rest of your information. You will need to ensure that the ‘I agree to the Google terms of service and Privacy Policy’ is ticked. Then click **next step**.

**Step 5:** If the email name that you requested in is not available, you’ll get a message saying that somebody already has that username and offering you some alternatives. You can decide to accept one of the alternatives or type in another name and check its availability once more. You will have to complete some of the other boxes again. You may have to do this a few times. Once you finalise your email address, it’s a good idea to make a note of it so that you can refer to it until you remember it.

**Create your Google Account**

![Create your Google Account](image)

**Step 6:** You’ll need to come up with a password so that you can log in securely to your account. Google may explain that you should try one with at least 8 characters long to be secure. Use letters and numbers to make the password more secure and difficult to guess. You’ll need to re-enter your password to ensure that it’s you choosing it and not a hacker’s (robot). This is why it also asks you to insert two random words at the bottom of the page – this is a CAPTCHA code. You can skip this step if you don’t want to type in the CAPTCHA code but you will need to verify via a mobile phone if you don’t.
**Step 7:** Once you have completed this page fully, clicking **Next Step** will take you to the Create Profile Page. If you don’t wish to have a picture on the web, click Next Step to complete setting up your email. If you do, Click on **Add Profile Photo** and find a photo to add. Then click **Next Step**.

**Step 8:** You will now have set up your account. You can go straight to your inbox and get started, or you can set up a photo to show as your profile picture.

Click on **Add a photo** to upload a photo and select a photo.

Or click on **Next Step** to go to your inbox and get started.
Chapter 7
Virus Problem and Protection

What is Virus?

- Virus is a piece of code which is capable of copying itself and typically has a detrimental effect, such as corrupting the system or destroying data.
- Some viruses are benign or playful in intent and effect ("Happy Birthday, Ludwig!") and some can be quite harmful, erasing data or causing your hard disk to require reformatting.

The First Computer Virus

The Creeper virus was first detected on ARPANET, the forerunner of the Internet, in the early 1970s. Creeper was an experimental self-replicating program written by Bob Thomas. Creeper gained access via the ARPANET and copied itself to the remote system where the message, "I'm the creeper, catch me if you can!" was displayed.

In 1982, a program called "Elk Cloner" was the first personal computer virus to appear outside a single computer or lab where it was created. Written in 1981 by Richard Skrenta, it attached itself to the Apple DOS 3.3 operating system and spread via floppy disk, infecting the personal computer and displaying a short poem beginning "Elk Cloner: The program with a personality."

![Image of Elk Cloner]

Figure: 44

How do you get infected by a computer virus?

Most of the times you get infected in the following ways:

- Sharing music, files or photos with other users
- Visiting an infected Web site
- Opening spam email or an email attachment
● Downloading free games, toolbars, media players and other system utilities
● Installing mainstream software applications without fully reading license agreements

What does a computer Virus do?

Some computer viruses are programmed to harm your computer by damaging programs, deleting files, or reformatting the hard drive. Others simply replicate themselves or flood a network with traffic, making it impossible to perform any internet activity. Even less harmful computer viruses can significantly disrupt your system’s performance, sapping computer memory and causing frequent computer crashes.

Different types of computer viruses

Below is a list of different types of computer viruses and what they do:

Macro Viruses

These viruses infect the files created using some applications or programs that contain macros such as doc, pps, xls and mdb. They automatically infect the files with macros and also templates and documents that are contained in the file. They hide in documents shared through e-mail and networks.

Memory Resident Viruses

They usually fix themselves inside the computer memory. They get activated every time the OS runs and end up infecting other opened files. They hide in RAM.

Overwrite Viruses

These types of viruses delete any information in a file they infect, leaving them partially or completely useless once they are infected. Once in the computer, they replaces all the file content but the file size doesn’t change.

Direct Action Viruses

These viruses mainly replicate or take action once they are executed. When a certain condition is met, the viruses will act by infecting the files in the directory or the folder specified in the AUTOEXEC.BAT. The viruses are generally found in the hard disk’s root directory, but they keep on changing location.
Directory Virus

Also known as cluster virus or file system virus. They infect the computer’s directory by changing the path indicating file location. They are usually located in the disk but affect the entire directory.

Web Scripting Virus

Most web pages include some complex codes in order to create an interactive and interesting content. Such a code is often exploited to cause certain undesirable actions. They mostly originate from the infected web pages or browsers.

Multipartite Virus

These type of viruses spread in many different ways. Their actions vary depending on the OS installed and presence of certain files. They tend to hide in the computer’s memory but do not infect the hard disk.

FAT Viruses

These lardy viruses attack the file allocation table (FAT) which is the disc part used to store every information about the available space, location of files, unusable space etc.

Companion Viruses

These types of viruses infect files just like the direct action and the resident types. Once inside the computer, they ‘accompany’ other existing files.

Polymorphic Virus

They encode or encrypt themselves in a different way every time they infect your computer. They use different encryption and algorithms. This makes it difficult for the antivirus software to locate those using signature or string searches (since they are very different in each encryption).

Worm

This program is very similar to a virus and has the ability to self-replicate leading to negative effects on your computer.

Trojans

Trojans can illegally trace important login details of users online. For example E-Banking is very common among users, therefore, vulnerability of tracing your login details whenever your PC is working without any strong powerful antivirus installed.

Email Virus

This is a virus spread via an email. Such a virus will hide in an email and when the recipient opens the mail.

Browser Hijacker

This virus can spread in many different ways including a voluntary download. If infects certain browser functions especially in form of re-directing the user automatically to certain sites.
Boot Infectors

They include the boot sector plus master boot record types. All the viral codes can be separate location; however they infect the hard disks or the floppy.

What are the symptoms of a computer virus?

- Antivirus software detects a problem
- Pop-ups suddenly appear (may sell security software)
- Disk space disappears
- Files or transactions appear that should not be there
- System slows down to a crawl
- Unusual messages, sounds, or displays on your monitor
- Your mouse moves by itself
- Your computer shuts down and powers off by itself
- Often not recognized

Different symptoms for Computer Virus
Antivirus Software

Anti-virus software is a program or set of programs that are designed to prevent, search for, detect, and remove software viruses, and other malicious software like worms, trojans, adware, and more. Antivirus (or anti-virus) software is used to safeguard a computer. Antivirus software may also remove or prevent spyware and adware, along with other forms of malicious programs.

There are several different companies that build and offer anti-virus software and what each offers can vary but all perform some basic functions:

- Scan specific files or directories for any malware or known malicious patterns
- Allow you to schedule scans to automatically run for you
- Allow you to initiate a scan of a specific file or of your computer, or of a CD or flash drive at any time.
- Remove any malicious code detected –sometimes you will be notified of an infection and asked if you want to clean the file, other programs will automatically do this behind the scenes.
- Show you the ‘health’ of your computer

Free antivirus software generally only searches your computer using signature-based detection which involves looking for patterns of data that are known to be related to already-identified malware. Paid antivirus software will usually also include heuristics to catch new, or zero-day threats, by either using genetic signatures to identify new variants of existing virus code or by running the file in a virtual environment (also called a sandbox), and watching what it does to see if it has malicious intent.

Virus designers, however, usually test their malicious code against the major antivirus types of malware, specifically ransomware, use polymorphic code to make it difficult to be detected by antivirus software. Besides using antivirus software to keep your computer safe and running smoothly, it is also always a good idea to be proactive: make sure your web browser is updated to the latest version, use a firewall, only download programs from websites you trust and always surf the web using a standard user account, rather than your administrator one.

Different types of Antivirus Software

Due to increasing threat for information security there are many companies manufacturing antivirus solutions. Some antivirus softwares are free which sometimes are not recommended for complete security. Antivirus softwares can be found as complete solutions as well as individual units like e-mail protection, internet security, anti spyware, etc.

Some antivirus software:

- AVG antivirus
- Bitdefender antivirus
- Kaspersky antivirus
- Norton antivirus
- Trend Micro antivirus
- Avast antivirus
- McAfee antivirus etc,
“Wilber takes his computer anti-virus protection seriously.”

Elmer makes sure his computer doesn’t get a virus by never taking it out of the box.

Figure: 48
Chapter 8
Nepali Unicode Software

Introduction

Fundamentally, computers just deal with numbers. They store letters and other characters by assigning a number for each one. Before Unicode was invented, there were hundreds of different encoding systems for assigning these numbers. No single encoding could contain enough characters: for example, the European Union alone requires several different encodings to cover all its languages. Even for a single language like English no single encoding was adequate for all the letters, punctuation, and technical symbols in common use. Any given computer (especially servers) needs to support many different encodings; yet whenever data is passed between different encodings or platforms, that data always runs the risk of corruption.

Unicode provides a unique number for every character used in the computer, no matter what the platform, no matter what the program, no matter what the language. This completely minimizes the conflicts and data corruption caused by the incompatible coding system. With the system globally compatible for any data processing and encoding system the Unicode Standard has been adopted by such industry leaders as Apple, HP, IBM, Just System, Microsoft, Oracle, SAP, Sun, Sybase, Unisys and many others. Unicode is required by modern standards such as XML, Java, ECMA Script (JavaScript), LDAP, CORBA 3.0, WML, etc., and is the official way to implement ISO/IEC 10646. It is supported in many operating systems, all modern browsers, and many other products. The emergence of the Unicode Standard and the availability of tools supporting it are among the most significant recent global software technology trends.

Incorporating Unicode into client-server or multi-tiered applications and websites offers significant cost savings over the use of legacy character sets. Unicode enables a single software product or a single website to be targeted across multiple platforms, languages and countries without re-engineering. It allows data to be transported through many different systems without risk of data being corrupted.

How Does it Help Nepali Computing?

Up to now, various locally developed unauthorized Nepali fonts such as Himali, Preeti, Kantipur, Sama etc. has been developed and used to fulfill the need of documents required in Nepali language. All these fonts though use the Devnagari font as their base, have different coding system. This brings about a lot of complication in downloading the documents from one pc to other, especially when the document prepared in a particular font doesn’t get downloaded in the other computer in the absence of the same font in the latter one.

To view the document, the exact font had to be installed in the receiving computer. Sometimes even a single page of document may contain several kinds of fonts which make the downloading process even more complicated and time consuming. But with the Unicode Devnagari font installed in the keyboard, this problem is completely minimized. The Unicode Devnagari font can be downloaded in any computer in any part of the globe provided that has Windows 2000 or XP installed in it.
Characteristics of Unicode

- Easy to type, Generally type as a pronunciation
- Not to worry about Alt+ 000 and etc…
- Facility of Traditional as well as Romanized Typing
- Letters are free
- Not to worry about Font Problem
- Cannot write out of Rule
- Easy sorting (Ascending/Descending) according to number or word (By Alphabetically)
- Can create Database in Nepali Language
- Easy in case of Mailing or Chatting

Advantages of Unicode

- Simple and pure writing
- Scientific Computer Work
- Time Saving due to Romanized Typing and not Tedious
- Making Nepali Language as International Standard

केहि उदाहरणहरू:

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<th>नेपाल</th>
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<td>mero deS</td>
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<td>ram</td>
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अन्य:

ष् +ट् +र् = ष्ट्र
द् +य = द्य
क + र् + मा = कर्मी
Types of Fonts

There are two types of Fonts in Nepal Unicode. These are:

1. Mangal (Old Version)
2. Kalimati (New Version)

Some examples below show the different between these two fonts:

**Mangal**

गुरुङ्ग, उड्डयन, व्यक्त

**Kalimati**

गुरुङ्ग, उड्डयन, व्यक्त

Some minor changes have been made in the upgraded Nepali Unicode Keyboard Layouts. These changes are demonstrated with explanations below.

Changes or Updates in the Romanized Keyboard Unicode Layout

Nepali Unicode Keyboard Layout (Romanized)

The typing style in Unicode Environment differs from the traditional style in non-unicode environment

**What was Before?**

\[ c = छ, \quad C = च \]

**But now:**

\[ c = च, \quad C = छ \]
Nepali Romanized Keyboard Layout

Changes or Updates in the Traditional Keyboard Unicode Layout

Nepali Unicode Keyboard Layout (Traditional)

The ‘+’ key in your keyboard is used as a Zero Width Non-Joining character while ‘=’ key work as a Zero Width Joining character.

**Zero Width Non Joiner (ZWNJ)** is typically used to represent the separated form of characters.
that normally fuse together to form a ligature. In the context of Nepali, the halanta representation
has an implicit behavior similar to zero-width joiner. The ZWJ and ZWNJ, among other things, can
be used to represent different forms of conjuncts as shown in the following example:

र +ल + छ + द +र + ल + इ + य = नाखेय
द +ल + द + थी = न्यटी
द +ल + श + द = न्दत्त
क +श + ल + थो = कालो
क +श + श + र + ल + य = कवर्य
प +ल + र + (Zero Width Joiner) + ल + थो = प्लो
र + आ + थ + ऐ + ल = राल
र + र + (Zero Width Joiner) + ल + थ = र्ख
श + द + र + थ + प + आ + न + र + र + ल + गुर्यचर
छ + श + थ + द + थ = छयात
च + दी + ल = चैल

The ZWJ following the consonant+halant sequence (‘ka’+ halant in the example) represents the
half-consonant form of the syllable (‘ka’ in the above example). The ZWNJ, on the other hand, is
used in representing the split or separated form of the conjunct. When neither the ZWJ nor the
ZWNJ appears following the halant character, the conjunct is shown in the customary full ligature
form.

• बु + दर + थु + र
• त + त + क + तच
• क + र + य + क + र + म + कार्यकम
• ग + र + ह + ग + गहन
• क + ब + त + र + ती + लिए
• क + प + तित + ज + रतिज
• ज + ज + नौ + ज - नानी
• म + द + दाह + गुढ़ा
• श + क + तित + नालिं
• ब + र + ह + म + ब्रह्मा
• ड + त + ड + ड + ड
Installation

Nepali Language Input in Windows 7

After the completely installation of Nepali Unicode Software following instruction should be followed:

1. The steps are written based on Windows 7 Ultimate edition, and should work for all other editions.
2. Go to the Control Panel >> Region and Language Settings
3. On Region and Language wizard select Keyboards and Languages tab.
4. To change your keyboard or input language to Nepali, click Change Keyboards, you should see the following Text Services and Input Languages screen.
5. Click Add to install Nepali Language in Windows 7. (check on the Default input language drop down menu if it has been already enabled)
6. Now, on Add Input Language box select Nepali (Nepal) >> Keyboard Nepali, and Click OK.
7. Now you shall be taken to Text Services and Input Languages screen again where you should apply the settings. Click OK and you are ready with Nepali (Nepal) Keyboard in Windows 7.

To get started with Nepali Keyboard, select the NE (Nepali – Nepal) from the Language bar near the hidden icons or Action Centers at right corner of the Taskbar as illustrated.

To interchange the Languages (Nepali and English), Please press Alt+Shift key and start to type.
Chapter 9

Other e-Government Applications

Business License e-Portal

- A single platform which provides detail information about business licenses required for starting and running a business.
- The ‘Search’ facility allows the user to search by keyword, licensing agency, business type, or industry.
- Available in Nepali and English, it is freely accessible to members of the business community, individuals and organizations through the internet.
- Contains a comprehensive inventory of 130 licenses and related information on approvals for starting and operating businesses.
- Through the e-portal, entrepreneurs will now have access to authentic information through one website, helping them prepare applications without having to visit different issuing agencies.
- The below figures re snapshots of Nepal Business License e-Portal.

Figure: 50
The license portal is available in both English and Nepali language.

License portal provides search based on different options like organization to provide license, type of business, law guiding the license and etc.
Introduction to Company Registration System (OCR):

CRO has introduce an online company registration system where users can register a new company, change company profile, check for valid company name through online web service. This has helped CRO to digitize most of it work. The system can be accessed through the following URL: https://www.ocr.gov.np/CRO

![Website of Company Registration Office](image)

**Figure: 53: Website of Company Registration Office**

The figure shows the home page of the website of company registration office.

![User Login screen of website of Company Registration Office](image)

**Figure: 54 : User Login screen of website of Company Registration Office**
Users can sign in with their username and password to access and change all the information about their company. The above interface provides all the details on the ways to register a new company and to get the username and password of an already registered company.

**Features:**
- Reserve company name online
- Post all document online for new company

**e- Value Added Tax returns:**

**Introduction**

There is a persistent increase in the number of VAT registrants. IT has crossed the 40,000 mark. At the time of conversion from the then existing sales tax to VAT, a total of 2045 taxpayers were converted as VAT registrants. As the taxpayers are increasing, the amount of revenue collection and the level of tax compliance is improving today. e-VAT RETURNS is an Internet based system. This allows to insert online Returns information. Effort has been made to simplify the system so that the system can be operated without any training.

**How to use e-VAT returns**
- First take username and Password from IRD office.
- Go to [ird.gov.np](http://ird.gov.np)
- Click on Taxpayer Portal under Online services
- Go to e-VAT Return

!![User login screen of e-VAT system](image)!!

- Then go to VAT Return Login
- After login enter VAT detail with reference to sales, purse book detail.
- Then submit the data
- After that verify the entry data with previous month credit amount.
- Then deposit the tax in bank
e-Permanent Account Number (e-PAN)

e-PAN is an Internet based system. This allows to insert online PAN information. Effort has been made to simplify the system so that the system can be operated without any training.

Personal Account Number System (e-PAN System):

e-PAN is an Internet based system. This allows access to any tax payers and tax officers from anywhere. Effort has been made to simplify the system so that the system can be operated without any training. Only requirement will be access to Internet and skill to operate Internet. Following steps will clarify processes of the system.

Accessing e-PAN:

Figure: 56: Landing page of e-PAN system

How to register e-PAN?
Submit required document in IRD office with application creation username and password

Accessing e-PAN:

Access to e-PAN is from the official website of Inland Revenue Department which is www.ird.gov.np. In the top menu there is a menu item that reads e-PAN System. By clicking the link user will be directed to PAN System site.

Getting Submission Number:

First step to enter PAN registration information by the taxpayer is to book a submission number. To do this, users have to click ‘Get Submission Number’ menu in the top. System will then ask user to enter the following
1. User name
2. Password
3. Reconfirmation of password,
4. Pan type(Individual, business or Proprietary Business)
5. Pan for(either income tax only or Income tax and Vat both)
6. Name of the taxpayer entity,
7. Registration date(date from which taxpayer wishes to register for pan) and

Figure: 57: Get Submission Number page of e-PAN system
Confirmation:

Figure: 58: Confirmation Page for Submission Number, Username and Password.

After entering these information and submitting the information system will assign a unique number (eg, 6200000123) and display it to the user. User must remember user name, password and this submission number to enter, modify and submit the records. User can proceed to enter PAN records from this step itself or enter PAN records later.
Personnel Information System (PIS)

Introduction

Personnel Information System (PIS) is a computerized database application that maintains and manages all the demographic and service profile of a civil servant. Simply, the application is an electronic format of the “Sheet Roll” that every civil servant must fill up during his/her first appointment. The PIS maintains the vital information of an employee such as Sheet Roll Number, name, date of birth, gender, father’s and grandfather’s name, nominee, permanent address, PF number, CIT number. Similarly, the system also keeps track of all the service events of an employee during his career within the civil service such as appointments, transfers, promotions, placements, educational background, awards, training details, medical allowances, disciplinary actions. With such feature rich application, the system maintains the complete organizational structure of the Government of Nepal and is classified by various service groups, posts and positions. In addition, is able to generate the entire payroll details (Talabi Pratibyaden) for an employee based on his/her PIS data.

What are its major features and functionalities?

- Keeps track of an entire service history of an employee
- Maintains Organizational structure of the Government classified by various service groups, posts and positions
- Maintains a complete sanctioned posts and positions of GoN (Darbandi)
- Gender based information
- Vacancy and retirement forecasting
- Employees complete demographic profile
- Sanctioned versus Occupied posts within the Ministry/Department/office
- Automatically calculates and generates payroll (Talabi Pratibyadan)
- Automatically generates letters of Appointments, transfers, promotions, retirements, placements, pension & gratuity authorization letters
- Ability to customize letters template
- Calculates Pension and Gratuity amount based upon PIS data along with the Government rules and regulations
- Ability to export PIS data to MS Excel
- Ability to build your own customized query and generate specific results
- Maintains a complete audit trail of every transaction made
- Highly secured, reliable and easy to use features
- Online help and discussion forum
Login Details:

![Login page of e-PIS]

Figure: 59: Login page of e-PIS

The above figure shows the login interface of the PIS system. All the data of a government employee could be accessed after logging in to the system.
Public Service Recruitment Management System (PRMS)

Using this application citizens can apply for different government job vacancies online. All the data entered by the citizens are saved in the server such that user can reuse the same data to apply for different vacancies. This application can also be used to store results of different vacancies and question paper for different vacancies.

![Login page of Public Service Recruitment Management System](image)

Figure: 60 : Login page of Public Service Recruitment Management System
Chapter 10

Information Security

Information Security – an Introduction

What is Information Security?

Information security, sometimes shortened to InfoSec, is the practice of defending information from unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction.

Information security is the process of protecting the availability, privacy, and integrity of data. While the term often describes measures and methods of increasing computer security, it also refers to the protection of any type of important data, such as personal diaries or the classified plot details of an upcoming book. No security system is foolproof, but taking basic and practical steps to protect data is critical for good information security.

Importance of Security

Information security is important for every company within all areas of business – hardly any company today can deny the importance of keeping their information secure. Having an information security management system (ISMS) shows that your organization manages its information properly and systematically thus keeping your information correct, easily accessible and well protected.

An information security management system (ISMS) is a set of policies concerned with information security management or IT related risks.

The governing principle behind ISMS is that an organization should design, implement and maintain a coherent set of policies, processes and systems to manage risks to its information assets, thus ensuring acceptable levels of information security risk.

Headline news about stolen and missing data is becoming a frequent occurrence nowadays. In today’s high-tech technology environment, organizations are becoming more and more dependent on their information systems. The public is increasingly concerned about the proper use of information, particularly personal data. The threats to information system from criminals and terrorists are increasing.

The internet allows an attacker to attack from anywhere on the planet.

Risks caused by poor security knowledge and practice:

- Identity Theft
- Monetary Theft
- Legal Ramifications (for yourself and companies)
- Termination if company policies are not followed

Many organizations identify information an area of their operation that needs to be protected as a part of their system of internal control. It is vital to be worried about information security because
much of the values of e-Government services are concentrated in the value of information.

As we have already discussed that Nepal is in the infancy stage of e-Government services, if security is breached at this stage, people of Nepal having very less IT literacy rate will be reluctant in using these services which may result in failure of such e-Government services.

Security Service gap for E-government Services

![Graph showing the trend of development of e-Government services and Security services.](image)

Figure: 61

Figure 61 shows trend of development of e-Government services and Security services. As from 1990 till 2010 the gap between the Security services curve and e-Government service curve is growing continuously. This gap means that although e-Government services are growing rapidly whereas security services are not growing at that rate. The increase in this gap shows that the e-Government services are vulnerable to threats as the development of security is lagging behind. We should be more focused to shorten this gap to make the e-Government services more reliable and secure.

The gap in the above curve has given rise to computer criminals creating a huge threat to our digital information. The figure no. 62 below shows different computer criminal activities.
Leading Threats

- Virus
- Worm
- Torjan Horse
- Social Engineering
- Rootkits
- Botnets/Zombies

Figure: 62

Figure: 63: Pictorial representation of different computer threats
Virus

- A virus attaches itself to a program, file, or disk
- interferes with operation, and to copy, corrupt or delete your data
- When the program is executed, the virus activates and replicates itself
- The virus may be benign or malignant
  - Viruses result in crashing of computers and loss of data
- In order to recover/prevent virus/attacks:
  - Avoid potentially unreliable websites/emails
  - System Restore
  - Re-install operating system
  - Anti-virus (i.e. Avira, AVG, Norton)

Worm

In a computer, a worm is a self-replicating virus that does not alter files but resides in active memory and duplicates itself.

- More sophisticated than viruses
- Independent program which replicates itself and sends copies from computer to computer across network connections.
- Upon arrival the worm may be activated to replicate.
**Torjan Horse**

- Trojan horse program which seems to be doing one thing, but is actually doing another
- Sets up back door in a computer system for intruder to gain access later
- Download a game: Might be fun but has hidden part that emails your password file without your knowledge.

**Social Engineering**

Social engineering manipulates people into performing actions or exposing confidential information. Similar to a confidence trick or simple fraud, the term applies to the use of deception to gain information, commit fraud, or access computer systems.

**Phishing = Fake Email**

Phishing: a trustworthy entity asks via email for sensitive information such as SSN, credit card numbers, login IDs or passwords.
Pharming = Fake Web Pages

Dear valued customer of TrustedBank,

We have received notice that you have recently attempted to withdraw the following amount from your checking account while in another country: $135.25.

If this information is not correct, someone unknown may have access to your account. As a safety measure, please visit our website via the link below to verify your personal information:

http://www.trustedbank.com/general/custverifyinfo.asp

Once you have done this, our fraud department will work to resolve this discrepancy. We are happy you have chosen us to do business with.

Thank you,
TrustedBank

Member FDIC © 2005 TrustedBank, Inc.

Figure 69 : Examples of pharming

The link provided in the e-mail leads to a fake webpage which collects important information and submits it to the owner.

- The fake web page looks like the real thing
- Extracts account information

Botnet

- A botnet is a large number of compromised computers that are used to create and send spam or viruses or flood a network with messages as a denial of service attack.
- The compromised computers are called zombies

Figure 70 : How attacker works
Man in the Middle Attack

An attacker pretends to be your final destination on the network. If a person tries to connect to a specific WLAN access point or web server, an attacker can mislead him to his computer, pretending to be that access point or server.

![Diagram of a man in the middle attack](image)

Figure 71: How attacker works

Rootkit

- Upon penetrating a computer, a hacker installs a collection of programs, called a rootkit.
- May enable:
  - Easy access for the hacker (and others)
  - Keystroke logger
- Eliminates evidence of break-in
- Modifies the operating system

![Graphical representation of rootkit](image)

Figure 72: Graphical representation of rootkit
Recognizing a Break-In or Compromise

Symptoms:

- Antivirus software detects a problem
- Pop-ups suddenly appear (may sell security software)
- Disk space disappears
- Files or transactions appear that should not be there
- System slows down to a crawl
- Unusual messages, sounds, or displays on your monitor
- Your mouse moves by itself
- Your computer shuts down and powers off by itself
- Often not recognized

Current Scenario in Information Security

Consumers are bombarded with media reports narrating dangers of the online world.

Some of the news regarding worldwide information thefts is given below.

Probe Targets Archives’ Handling of Data on 70 Million Vets

The inspector general of the National Archives and Records Administration is investigating a potential data breach affecting tens of millions of records about U.S. military veterans.

JPMorgan Chase Hacking Affects 76 Million Households

A cyber attack this summer on JPMorgan Chase compromised the accounts of 76 million households and seven million small businesses, a tally that dwarfs previous estimates by the bank and puts the intrusion among the largest ever.

Banks: Credit Card Breach at Home Depot

Multiple banks say they are seeing evidence that Home Depot stores may be the source of a massive new batch of stolen credit and debit cards that went on sale this morning in the cybercrime underground. Home Depot says that it is working with banks and law enforcement agencies to investigate reports of suspicious activity.

Hackers hit companies like Nasdaq, 7-Eleven for $300 million

Over seven years, five Russians and a Ukrainian used sophisticated hacking techniques to steal more than 160 million credit and debit card numbers, target more than 800,000 bank accounts and penetrate servers used by the Nasdaq stock exchange.

UDID leak source ID'd: BlueToad mobile firm says it was hacked

A small mobile publishing company said today that it was the source of the large number of unique Apple device IDs leaked to the Internet last week.
Blue Toad said in a statement that it was the "victim of a criminal cyber attack, which resulted in the theft of Apple UDIDs from our systems." A UDID is a unique device identifier, which Apple has strongly encouraged developers to move away from for privacy reasons.

**Insider Steals Data of 2 Million Vodafone Germany Customers**

Vodafone Germany said on Thursday that an attacker with insider knowledge had stolen the personal data of two million of its customers from a server located in Germany.

**Safe and Secure User Practices**

**Security: Defense in Depth**

Defense in depth uses multiple layers of defense to address technical, personnel and operational issues. For example, a top secret document is stored in a high security building which has electronic fences on the perimeter. Motion sensors are on the ground and ID card entry is followed by biometric authentication. Key based entry and user-name password are required for accessing the document.

Every layer of security in the above scenario makes up defense in depth. If any of the layers fails to protect, then the next layer is in place to provide protection. A common example for home users is any antivirus, which provides (among other capabilities):

- an antivirus application
- a firewall application
- an anti-spam application
- parental controls
- privacy controls

![Defense in Depth Layers](image)

Figure: 73
Anti-Virus and Anti-Spyware

- Anti-virus software detects malware and can destroy it before any damage is done
- Install and maintain anti-virus and anti-spyware software
- Be sure to keep anti-virus software updated
- Many free and pay options exist

Figure 74: Types of commercially available antivirus

Firewall

A firewall acts as a wall between your computer/private network and the internet. Hackers may use the internet to find, use, and install applications on your computer. A firewall prevents hacker connections from entering your computer. It filters packets that enter or leave your computer.

Figure 75: Windows default firewall
Protect your Operating System

Microsoft regularly issues patches or updates to solve security problems in their software. If these are not applied, it leaves your computer vulnerable to hackers. The Windows Update feature built into Windows can be set up to automatically download and install updates. Avoid logging in as administrator.

Creating a good Password

<table>
<thead>
<tr>
<th>Combine 2 unrelated + = words</th>
<th>Mail + phone=m@!f0n3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbreviate a phrase</td>
<td>My favorite color is blue= Mfciblue</td>
</tr>
<tr>
<td>Music lyric</td>
<td>Happy birthday to you, happy birthday to you, happy birthday dear John, happy birthday to you. hh2uhb2uhbdJhb2u</td>
</tr>
</tbody>
</table>

Figure: 76
Creating a good password

Figure: 77
Password Recommendations

Never use admin or root or administrator as a login for the admin

A good password is:

- private: it is used and known by one person only
- secret: it does not appear in clear text in any file or program or on a piece of paper pinned to the terminal
- easily remembered: so there is no need to write it down
- at least 8 characters, complex: a mixture of at least 3 of the following: upper case letters, lower case letters, digits and punctuation
- not guessable by any program in a reasonable time, for instance less than one week.
- changed regularly: a good change policy is every 3 months

Beware that someone may see you typing it. If you accidentally type your password instead of your login name, it may appear in system log files

Avoid Social Engineering & Malicious Software

- Do not open email attachments unless you are expecting the email with the attachment and you trust the sender.
- Do not click on links in emails unless you are absolutely sure of their validity.
- Only visit and/or download software from web pages you trust.

Other Hacker tricks to avoid

- Be sure to have a good firewall or pop-up blocker installed
- Pop-up blockers do not always block ALL pop-ups so always close a pop-up window using the ‘X’ in the upper corner.
- Never click “yes,” “accept” or even “cancel”

- Infected USB drives are often left unattended by hackers in public places.
Secure Online Banking and Business

- Always use secure browser to do online activities.
- Frequently delete temp files, cookies, history, saved passwords etc.

Figure: 79: Example of secure website

Backup Important Information

- No security measure is 100%
- What information is important to you?
- Is your back-up:
  - Recent?
  - Off-site & Secure?
  - Process Documented?
  - Tested/Encrypted?
Chapter 11

Electronic Transaction Act

Introduction to Electronic Transaction Act

It is means to make, legal provisions for authentication and regularization of the recognition, validity, integrity and reliability of generation, production, processing, storage, communication and transmission system of electronic records by making the transactions to be carried out by means of electronic data exchange or by any other means of electronic communications, reliable and secured, and where as, for controlling the acts of unauthorized use of electronic records or of making amendment in such records through the illegal manner.

Introduction to digital signature

A digital signature is an electric signature, just like your handwritten signature, is used to authenticate your identity. Public-key cryptography makes this possible. Public-key cryptography involves the use of two cryptographic keys, one private and one public. Whatever the public key encrypts, the private key can decrypt, and vice versa. The user (say Shyam) keeps his private key and the public key is available to anyone. Suppose Shyam wants to send a message to Sita, how does a digital signature work? Shyam uses digital signature software to pass the message through a mathematic function (so-called one-way hashing) then produces a message digest which is the summary (hash code) of the message [1, 2]. Shyam then uses the software to encrypt the message digest with his private key. The result is the digital signature. Then Shyam appends the digital signature to the document and sends it to Sita.

Is a digital signature reliable?

When Sita gets Shyam’s document, she uses his public key to decrypt the signature then gets a message digest. If this works, it proves that the signature is from Shyam because only Shyam owns the private key. Sita then runs the message through the same hashing function used by Shyam to get a message digest. If the two processes produce the same message digest, Sita knows the message is originally from Shyam and has not been changed. We know this is reliable because: (1) it is not possible to get the original message from the message digest because the hash function is one-way (2) the message encrypted by Shyam’s private key can only be decrypted by Shyam’s public key.

Introduction to Public Key Infrastructure (PKI)

In a PKI system, each user has two keys: a public key and a private key. These keys can be used for encrypting and decrypting information, for electronically signing electronic information, and for verifying the authenticity of their owner. This document focuses on the usage of PKI technology as related to electronic signatures only.

In a PKI system, the public key is distributed widely, while the corresponding private key is held by its owner in a secure place. While both keys are mathematically related, the public key cannot reveal the private key. This makes Public Key Infrastructure a great technology for digital signatures. As an example, when Sita wants to sign a document and send it to Shyam, she is
performing a mathematical function by using her private key. She then sends the original document, along with its signature and her public key, to Shyam. In order for Shyam to ensure that the document actually came from Sita, Shyam applies a certain computation method to the signature (known as a signature verification), using the public key. As a result, he gets a document fingerprint. If it is the same fingerprint as the document that Sita had sent him, then Sita’s signature is verified. Otherwise, Shyam knows that Sita was not the one signing this document, or that the document has been changed from the time that Sita had signed it.

Since only Sita knows her private key, and since this key cannot be computed from the public key, data-integrity and non-repudiation are ensured. This process results in signer accountability. In other words, in a courtroom the signer can never claim he/she hasn't signed the document.

PKI for security purposes is useful, but there is still an ingredient missing. How can Shyam know whether Sita, who had sent him the signed document, is indeed the same Sita that he wants to conduct business with? Shyam needs certification from a trusted third party who knows Sita and can verify that she is indeed who she claims to be. Such entities are called PKI Certificate Authorities (CA); they issue PKI certificates to ensure the authenticity of the signer. PKI certificates can be compared to passports issued by countries to their citizens for world travel. When a traveler arrives at a foreign country, there is no way for authenticating the traveler’s identity but to trust the passport issuer (in PKI terminology: the CA) and use the passport to authenticate its holder in the same way that Shyam uses the CA’s certificate for authenticating Sita’s identity.

**Why Use PKI-based Digital Signatures?**

In today’s business and legal systems, paper-based signatures are the most common legal way to ensure the accountability of the signer. Despite the fact that signature forgery is prevalent, signatures are still the most popular (and legal) method used in business today. As more organizations and businesses migrate from paper to electronic transactions, better signer accountability is needed in the electronic world. Basic digital signatures were devised and have become legal in most parts of the world during the past couple of years.

The EU Directive recognized this vulnerability and defined in the Directive a stronger type of electronic signature, the Advanced Electronic Signature. Although the Directive had done its best to remain technology-neutral, only Public Key Infrastructure (PKI) digital signatures meet the requirements for such signatures. Advanced digital signatures provide not only stronger user authentication, but also protect the integrity of the data signed, thus ensuring non-repudiation of the transaction by the signer.

Strong signatures are critical to your organization. Basic electronic signatures that are not PKI based are vulnerable solutions that add data (text, sound, symbol, picture etc.) to a document and can only serve as a weak method of signer authentication. Only Public Key Infrastructure (PKI)-based digital signatures offer the best technology to protect against forgery by providing data integrity and non-repudiation.
But as mentioned briefly earlier, PKI has had its own problems preventing it from becoming the leading technology for digital signatures. In the next section we shall discuss the deployment problems of PKI based systems.

**Cybercrime**

Cybercrime is one of the fastest growing areas of crime. More and more criminals are exploiting the speed, convenience and anonymity that modern technologies offer in order to commit a diverse range of criminal activities. These include attacks against computer data and systems, identity theft, the distribution of child sexual abuse images, internet auction fraud, the penetration of online financial services, as well as the deployment of viruses, Botnets, and various email scams such as phishing.

The global nature of the Internet has allowed criminals to commit almost any illegal activity anywhere in the world, making it essential for all countries to adapt their domestic offline controls to cover crimes carried out in cyberspace. The use of the Internet by terrorists, particularly for recruitment and the incitement of radicalization, poses a serious threat to national and international security.

In addition, the threat of terrorism forces authorities to address security vulnerabilities related to information technology infrastructure such as power plants, electrical grids, information systems and the computer systems of government and major companies.

**The changing nature of cybercrime**

In the past, cybercrime has been committed by individuals or small groups of individuals. However, we are now seeing an emerging trend with traditional organized crime syndicates and criminally minded technology professionals working together and pooling their resources and expertise.

This approach has been very effective for the criminals involved. In 2007 and 2008 the cost of cybercrime worldwide was estimated at approximately USD 8 billion. As for corporate cyber espionage, cyber criminals have stolen intellectual property from businesses worldwide worth up to USD 1 trillion.

**Problems and challenges**

Nepal’s cyber world is ruled by Electronic Transaction Act (ETA) 2063 that protects users online against cyber crimes. Though the cyber law is present but due to lack of proper monitoring and updates it serves little use in protecting users online. The dynamics of internet has grown phenomenally where the ETA has been fixed and constant. Internet provides easy accessibility and other facilities but at the same technology also threatens the nation in lack of proper mechanism and policies which needs to be researched and worked on.

Nepal has seen ups and downs in its technology but due to its limited policies and regulation Nepal faces a huge hindrance in the coming days. Technology has been passed on but with little governance, and lack of proper mechanism and measures to cater the need at time of emergency,
Nepal faces a huge threat or challenge in overcoming the online threat.

Cyber laws have become essential in view of the rapid developments in information technology. Online communication has given rise to a new global commerce in ideas, information and services. Information Technology (IT) is changing almost all aspects of human activity like communication, trade, culture, education, entertainment, and knowledge. With the rapid advances in computer technology over the past few years, there has been increasing concern in many countries for the need to develop and modernize the law in order to take full advantage of technological improvements and at the same time to guarantee that states can respond to computer crime and related criminal law issues associated with these developments.

The cyber law encompasses a wide variety of legal issues which includes intellectual property, privacy, freedom of expression, and jurisdiction

Nepal’s Case

Prior to 2004, the government of Nepal dealt with cyber crimes under the Public Offence Act. Nepal Police dealt with cyber crimes but they were not aware about the technical aspects of these crimes, which meant that the sanctions were not effective and relative to the crime.

Later The Electronic Transaction and Digital Signature Act 2004, also known as the cyber law, was passed. This law was forecast to be landmark legislation for the development of IT industry in Nepal.

Under Act of 2004, hacking, deleting data, stealing e-documents, software piracy and posting defamatory information invite criminal and civil sanctioning to individuals and institutions. Under this law, the government can punish cyber offenders with up to five years of imprisonment and/or a fine of up to fifty thousand rupees. However, much depends on the severity of the crime. The law has tightened the security for banking transactions through electronic means, which should boost the economic activities across the Internet via Nepal.

Section 47, Electronic Transactions Act (2008), Publication of Illegal Materials in Electronic Form. This section states that it is an offense to publish or display any material in the electronic media, including the Internet, which may be contrary to public morality or decent behavior, or which is prohibited to publish or display by the prevailing law. The penalty for this offense is a fine of 1,000 Rupees and/or up to five years’ imprisonment. Subsequent offenses will be punished for each time with a 1.5% increase of the penalty prescribed for the previous conviction

The biggest challenge before the cyber law is its integration with the legacy system of laws applicable to the physical world. The unique structure of the Internet has raised several legal concerns. While grounded in physical computers and other electronic devices, the Internet is independent of any geographic location. While real individuals connect to the Internet and interact with others, it is possible for them to withhold personal information and make their real identities anonymous. If there are laws that could govern the Internet, then it appears that such laws would be fundamentally different from laws that geographic nations use today. Since the Internet defies geographical boundaries, national laws will no longer apply. Instead, an entirely new set of laws will be created to address concerns like intellectual property and individual rights. In effect, the Internet will exist as its own sovereign nation.
Chapter 12

Information Technology Policy

Definition

Policies are used to set a standard for performance. Through policy, an organization can develop clear expectations for students, parents, teachers and administrators. It provides a framework for consistent actions regardless of district or school in a region, or even state-wide. Federal and state laws set a policy framework for the use of technology within the school system. All states and school districts are required to have technology plans in compliance with federal policies.

ICT RELATED ACTS AND POLICIES

- Telecommunication Act, 1997 A.D.
- Telecommunication Regulation, 1997 A.D.
- Nepal Telecommunication Authority’s (working procedure related) regulation, 2002 A.D.
- National Communication Policy, 1992 A.D.
- Long Term Policy of Information and Communication Sector, 2059 B.S. 2002 A.D.
- Electronic Transaction Act 2006 A.D.
- IT Policy 2010 A.D.

Figure 80: Nepali act and policies related to ICT

Why is IT Policy Important?

First and foremost, proper policies protect the institution from non-compliance with the law. Clear organizational guidelines allow organizational leaders to avoid overlooking any legal imperatives which might otherwise go unnoticed. In addition, ensuring that persons with disabilities are able to communicate and learn is a moral responsibility. Accessibility benefits everyone, not just people with disabilities.
Vision

"To place Nepal on the global map of information technology within the next five years."

Background

The world's least developed countries including Nepal have availed themselves of the opportunity to rapidly develop education, health, agriculture, tourism, trade and various other sectors using information technology (IT). The extensive application of this technology will engender economic consolidation, development of democratic norms and values, proportional distribution of economic resources and enhancement of public awareness, thereby raising living standards and eventually contribute significantly to poverty alleviation. It is the information technology, which will turn out to be a strong infrastructure for mitigating Nepal's geographical adversities. In the coming years, globally, there will be a significant difference in the economic conditions of the countries developed in the field of information technology and of the countries lagging behind in this field. The persistence of such disparities may not be congenial even for the developed countries. In this context, there is a greater possibility that the international community will extend its support to developing countries in the promotion of information technology. Such assistance will certainly play a vital role in the national development of a least developed country like Nepal. Hence, it has become essential to formulate a policy at the earliest for developing information technology with a view to boosting up national economy.

Objectives

The information technology policy shall be formulated to achieve the following objectives:

- To make information technology accessible to the general public and increase employment through this means,
- To build a knowledge-based society and
- To establish knowledge-based industries

Strategies

- The following information technology strategies shall be adopted to accomplish the above-mentioned objectives through rapid development and extension of information technology in a fair and competitive manner.
- The government shall act as a promoter, facilitator and regulator.
- High priority shall be accorded to research, development and extension of information technology with participation of private sectors.
- Competent manpower shall be developed with the participation of both the public and the private sectors for the sustainable development and extension of information technology.
- Domestic and foreign investment shall be encouraged for the development of information technology and the related infrastructures.
- Information technology industry shall be promoted.
- Speedy and qualitative service shall be made available at a reasonable cost by creating a healthy and competitive atmosphere among information technology service providers.
- Computer education shall be incorporated in academic curriculum starting from the school level.
✓ Professional efficiency shall be enhanced through the use of information technology.
✓ Information technology network shall be extended to rural areas.
✓ Nepal shall be placed on the international market through information technology.
✓ Export of services related to information technology (software and hardware) shall be increased to 10 billion rupees within the next five years.
✓ Nepal shall be placed on the global map of information technology.
✓ E-commerce shall be promoted with legal provisions.
✓ Information technology shall be used to assist e-governance.
✓ Information technology shall be applied for rural development.

Challenges:

IT policy is a significant and important step in the right direction towards the developing the ICT sector and represent the society as knowledge based society. But however several challenges have beset Nepal’s efforts aimed at building upon the initial momentum that it gained in the ICT domain. Due to the lack of political constancy deterred Nepal from effectively capitalizing on the promise Unleashed by digital opportunities as the country found itself confronting a host of competing priorities ranging from the ones posed by security challenges to that of endemic poverty and poor governance. In the planning process, the government expressed its desire to meld Nepal into a knowledge-based society. The broad objective for the IT sector was to promote IT as a tool for social and economic development; to promote social development by using IT to improve agricultural, health, education, and other services and sectors; to promote economic development by establishing an IT park to produce and export low-cost software and eliminate the poverty from country which is the one of major problem for Nepal.

We have the experience of failure for completely implementing the Policy and over the last few years with scarce resources tied up in security efforts, implementation of the IT Policy has slipped from the government’s priority list. Although the institutional provisions have been put in place, the key implementing body is too under-resourced to effectively oversee implementation. We also know that e-governance in Nepal is enhancing but still not fully developed. But we can assume this process of finalizing the IT policy was a long but inclusive one.

Today we have still many problems. Political and Social Instability, Funding depend upon highly politicized and very limited facility is provided by government which is not enough and it is not fully utilized are problem in past years. So from learning the lesson from previous chapter of implementing and developing IT Policies we have to address every aspect that reflect IT Sectors. An implementation programmed involving both the government and private sector still needs to be encouraged and supported to maximize the potential for IT in Nepal.
Chapter 13

Government Integrated Data Center (GIDC)

GIDC – an Introduction
It's an National Data Center for Nepal for the first time in the whole history of ours, built with the help of the KOICA, Korean Government. The name given for this Data Center is Government Integrated Data Center (GIDC). Investment of 23 corer had been made for this project. This project was started on 14th May, 2008.

Figure: 81 NITC Building

It has mainly three types of Data Centers:
- Internet Data Center (IDC)
- Storage Data Network (SDN)
- Enterprise Data Center (EDC).

1. IDC: It provides data and Internet services for other companies. It consists of 16 Terabyte storage and 10 Terabyte as a backup for keeping the data of government and the other organizations.

2. SDN: It is a network of interconnected storage devices and data servers usually located within an enterprise data center or as an off-site facility offering leased storage space.

3. EDC: This is the central processing facility for an enterprise’s computer network.

The below figure explains different phases of development for the implementation and
operation of GIDC.

The concept of GIDC was provisioned in the national e-Governance Master Plan (eGMP) through KOICA assisted construction of GIDC. The construction of GIDC was completed and handed over to NITC in May 2009. High end computing infrastructure with multi-tier security works as a base infrastructure to host e-Gov. applications. It improves stability and efficiency through concentrated central management within Data Center that provide Internet access and management for e-government.

Figure: 82

The above figure 82 shows the relation between GIDC and NITC with additional information like Human Resource, System, Infrastructure and a service provider to different government agencies.

Features of GIDC
- High End Computing Infrastructure
- Storage Area Network (SAN)
- High Speed Local Area Network
- Multi-Tier Security
- High Speed Internet Connectivity
- 24*7*365 Help Desk
- Multi level redundant power back-up
- Air Conditioning Management
- Fire Detection & Control System

Objectives of GIDC
- Minimize investment cost by using GIDC based common facilities
- Improve stability and efficiency through concentrated central management within Data Center that provide Internet access and management for e-government
- Minimize operation cost by means of centralized GIDC
- Offer easy expansion and upgrade for increasing demands
- Offer basic environment for government co-location and integrated government mailing service

Facilities of GIDC

Information Technology System:
- Routers, Backbone Switches etc.
- Integrated Network Management System
- Integrated Server Management System
- Integrated Storage
- Integrated Back-up
- High level firewall with security for different attacks and threats

**Infrastructure System:**
- Air-Circulation System: HVAC (Heating, Ventilating, and Air Conditioning)
- Main Monitoring Room: Integrated Console
- Facility Management System: Water Leakage Sensing
- Disaster Prevention System: Fire-Fighting

**Electrical System:**
- Auto Load Transfer Switch
- Main Power Switchboard (3 Transformers)
- Emergency Generator: 400 KW
- U.P.S.- 200KVA
- Batteries: 480 nos.

**Security Features**
To guard against line failure or intrusion, the data center is staffed 24 hours a day. Movement throughout the facility is escorted at ALL times. There is 24x7 closed circuit monitoring of all areas and entrances. Between the cameras, access control, and the security team, the datacenter facilities are pretty secure. Along with the physical security there is multi layered logical security system to prevent any data loss. There are high level firewall devices to limit access to different services and logging devices to keep track of everything that is happening inside the system.

The Figure 83 shows the different levels of logical security for the protection of data inside NITC. There are seven layers of Security Services provided by NITC including firewall and anti spam security. These layers provide complete content protection along with integrated management, logging & reporting.

![Multi-Layered Security Services](image_url)