



# INTRODUCTION TO CYBER SOCIETY ,CYBER CULTURE AND CYBER SPACE

Lesson # 1

# Topics

- ▶ Main Objective
  - ▶ Cyber Society
  - ▶ Cyber Culture
  - ▶ Cyber Culture Components
  - ▶ Cyber Space Concept
  - ▶ Cyber Space Communities
  - ▶ The Cultures of Computing
  - ▶ Effects of Cyber Culture on Society
  - ▶ Outcomes
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# Main Objective

- ▶ Positive Online Environment of Internet users and a healthy cyber culture for the Internet community.
  - ▶ A recognition of the power of the Internet to benefit oneself and the community at large .
  - ▶ To **reflect** on how to become a responsible user of social networking sites and a commitment towards building a healthy cyber culture .
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# CYBER SOCIETY



# Cyber Society

- ▶ **Cyber Society** :Focuses on the construction, maintenance and facilitation of community in electronic networks and computer-mediated communication.



# CYBER CULTURE



# Cyber Culture

## Introduction:

- ▶ **World Wide web** is the collection of electronic documents.
  - ▶ Each electronic document on the web is called a web page. Which can contain text, graphics, audio and video.
  - ▶ The use of World Wide Web by a people or a group of people for the exchange of social expectations, custom, history and language is called cyber culture.
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# Cyber Culture

- ▶ Like every culture has its own language, the cyber culture is not the exception to this rule.
  - ▶ It converts the human written language or symbols to machine language and reconverts to human understandable language so the people on the destination can understand.
  - ▶ Now a day's specially in online chatting the cyber language is creates of new codes which affects our daily spoken language.
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# **CYBER CULTURE COMPONENTS**



# Cyber Culture Components

- ▶ Internet
  - ▶ Website
  - ▶ E-Mail
  - ▶ Blog
  - ▶ Online Chat
  - ▶ E-Commerce
  - ▶ Social Networks
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# THE INTERNET



# Cyber Culture Components

## The Internet

- The network formed by the co-operative interconnection of a large number of computer networks.
  - No one owns the Internet.
  - There is no central administration to the internet.
  - Main goal of the internet is to connect several computers together for the exchange of messages and share the information etc.
  - Community of people.
  - Collection of resources.
- 

**WEBSITE**

# Cyber Culture Components

## Website

- A location connected to the Internet that maintains one or more web pages.
  - Web pages are the building blocks of the website.
  - Web pages includes documents like texts and multimedia contents etc.
  - A web sites may be accessible through a public Internet Protocol (IP) network, such as the Internet, or a private local area network (LAN), by referencing a uniform resource locator (URL) that identifies the site.
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**E-MAIL**

# Cyber Culture Components

## **E-mail (Electronic Mail)**

- **Electronic mail**, most commonly called **email**.
  - E-mail is the Most widely used application on the internet.
  - Messages that are sent electronically from one computer to another is an e-mail message.
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**BLOG**

# Cyber Culture Components

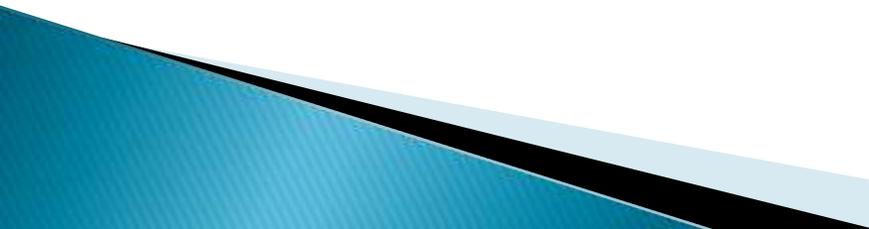
## **Blog:**

- A **blog** is a discussion or informational site published on the World Wide Web consisting of discrete entries ("posts").
  - A regularly updated website or web page, typically , runs by an individual or a small group.
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# ONLINE CHAT

# Cyber Culture Components

## Online Chat

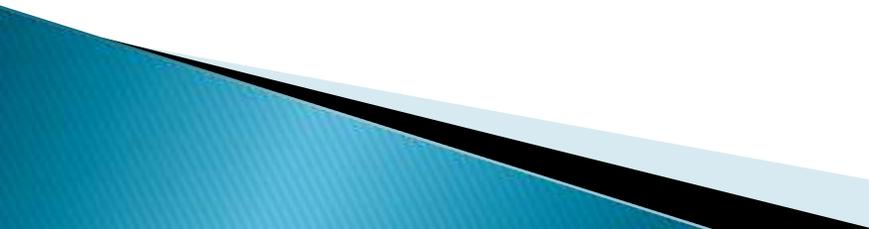
- Any kind of communication over the **Internet** that offers a real-time transmission of text messages from sender to receiver is called online chat.
  - Online chat may address point-to-point communications as well as multicast communications from one sender to many receivers and video chat, or may be a feature of a web conferencing service.
  - Any direct text-based or video-based (webcams), one-on-one chat or one-to-many group chat by using tools such as instant messengers, Internet Relay Chat (IRC) etc.
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# **E-COMMERCE**



# Cyber Culture Components

## E-Commerce

- **Electronic commerce**, commonly written as **e-commerce**, is the trading or facilitation of trading in products or services using computer networks, such as the Internet.
  - Commercial transactions conducted electronically on the Internet.  
E.g.
  - Online shopping.
  - Online market places.
  - Business to business buying & selling.
  - Online newsletter for marketing prospective.
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# **SOCIAL NETWORKS**



# Cyber Culture Components

## **Social Networks**

- A dedicated website or other application which enables users to communicate with each other by posting information, comments, messages, images , videos are referred to as social networks. For example networks like
  - Face book.
  - Linked in.
  - Twitter.
- 

# CYBER SPACE



# Concept of Cyber Space

- ▶ The cyberspace is a term used to describe the space created through the union of electronic communications networks such as the internet, which enables computer facilitated communication between any numbers of people who may geographically dispersed around the globe.
  - ▶ Cyberspace is a public space where individuals can meet, exchange ideas, share information, provide social support, conduct business etc.
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# Concept of Cyber Space

The human interaction does not require physical connection to communicate, but is rather characterized by the interconnection of millions of people throughout the world through chat room, email, Facebook etc.

# Concept of Cyber Space



# Cyber Space Communities

- ▶ Due to worldwide use of computer network, people are now able to get together and form cyber communities that can exchange messages easily through cyberspace.
  - ▶ Physically meeting has been reduced due to introduction of cyber culture.
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# The Culture of Computing

- ▶ Culture is an important process in computer related contexts. The processes that create meaning in actions.
  - ▶ Cyber culture is indicated to break down borders and barriers, not only between nations but also between groups and individuals separated from each other due to some reasons.
  - ▶ If cyber culture grows then those who are cut off from cyber culture will feel more isolated from society and will not be properly updates about latest development and fast change.
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# Effects of Cyber Culture on Society



# Effects of Cyber Culture on Society

- ▶ The cyber culture has brought great impact on human individual's life.
  - ▶ In education the style of teaching learning has changed. The student teacher interactivity can be formed online.
  - ▶ The cyber culture has great influence in the business world.
  - ▶ The use of internet for emails and other social networks is our participation in the cyber culture.
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# Effects of Cyber Culture on Society

- ▶ Cyber culture reduced the gap between groups and individuals separated from each other due to some reasons.
  - ▶ Now days there are many social networking sites like Face book, MySpace and Twitter, which all serve to provide links to many friends to maintain their relationship.
  - ▶ These social networks are means of interactivity between people around world.
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# Effects of Cyber Culture on Society

- ▶ Face to face communication is becoming weak due to emerging of these social networks.
  - ▶ The People who don't have the ability to communicate face to face they can exchange their views, through these social network.
  - ▶ Business decision can be made through video conferences.
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# Out Come

- ▶ The cyber culture is developing and we need to know the values and believes of this culture.
  - ▶ Cyber culture has great influence on human culture and in way new uniform global culture is developing.
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# References

- ▶ <https://en.wikipedia.org/wiki/Cyberculture>
- ▶ <https://sites.google.com/site/inhainternetlanguage/random/what-is-cyberculture>
- ▶ <http://sociologyindex.com/cyberculture.htm>
- ▶ <http://www.slideshare.net/wowox/cyberculture-27445734>

THANK YOU





# FUNDAMENTALS OF E- COMMERCE

Lesson # 2

# Overview of the Lesson

- ▶ Main Objective
- ▶ Basic of E-Commerce.
- ▶ Types of E-Commerce.
- ▶ Process of E-Commerce
- ▶ Advantages of E-Commerce
- ▶ Disadvantages of E-Commerce
- ▶ E-Shopping Safety Tips
- ▶ Outcomes



# Main Objective

- ▶ Basic knowledge about E- Commerce environment.
  - ▶ Identify the main business and market place models for electronic communication and trading.
  - ▶ Understanding of different transactions mechanisms available through online services.
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# E-COMMERCE

# E-Commerce Basics

- ▶ Process of buying, selling or exchanging products, services and information through computer networks.
- ▶ It refers to the use of the Internet and the Web to manage business between and among organizations and individuals.

## **Domains of E –commerce**

1. Physical Domain
2. Digital Domain

# E-Commerce Basics

## **Traditional E- Commerce**

- ▶ All the dimensions are physical in nature
- ▶ Perform all business transactions off-line.
- ▶ Buy and sell products through physical agents and representatives.

## **Pure E- commerce**

- ▶ All the dimensions are digital in nature.
  - ▶ Pure online (virtual) organizations.
  - ▶ Buy and sell products online.
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# E-Commerce Basics

## Hybrid Approach

- ▶ A combination of physical and digital dimensions
  - ▶ Primary business carried out in the physical world.
  - ▶ Provide some services on line.
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# E-Commerce Example

kaymu | Lamudi | Carmudi | OVAGO | Contact us: 042111152968 | Sell Now

**kaymu**.pk

I'm looking for... All Categories Login Register

- Men's Fashion
- Women's Fashion
- Jewelry & Watches
- Mobiles & Tablets
- Tvs, Appliances & Cameras
- Computers, Laptops & Gaming
- Home & Living
- Health & Beauty
- Kids & Babies
- Books, Arts & Entertainment
- Sporting Goods
- Food & Beverage
- Wholesale
- ★ Other Categories



Spring Essential Women's T-shirts **Face Makeup** Men's Sandals Men's Shorts

# **E-COMMERCE TYPES**



# Types of E-Commerce Models

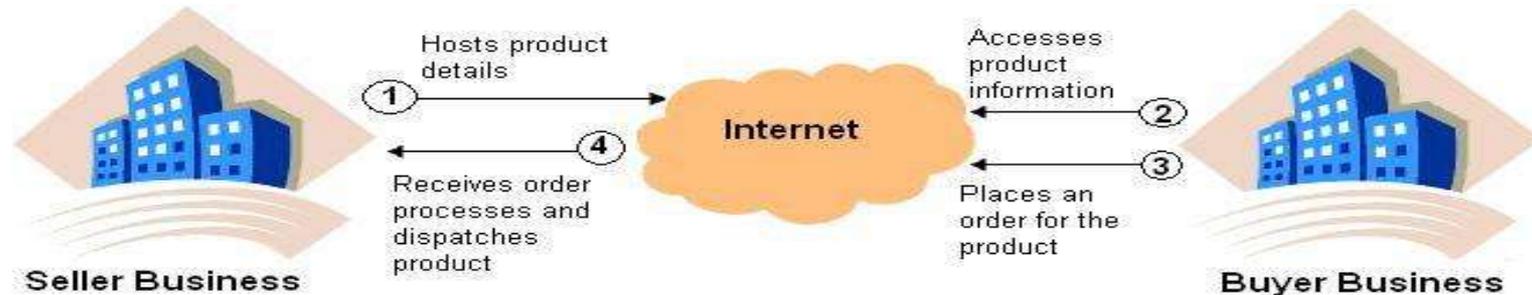
## Four Major Domain on which E-Commerce Works

- ▶ **Business-to-Business (B2B) Model**
  - ▶ **Business-to-Consumer (B2C) Model**
  - ▶ **Consumer -to-Business (C2B) Model**
  - ▶ **Consumer-to-Consumer (C2C) Model**
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# Business-to-Business (B2B) Model

B2B Model describes commerce transactions between businesses, such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer.

**Example:** Dell deals computers and other associated accessories online but it does not manufacture all those products. So, in order to deal those products, first step is to purchase them from unlike businesses i.e. the producers of those products.

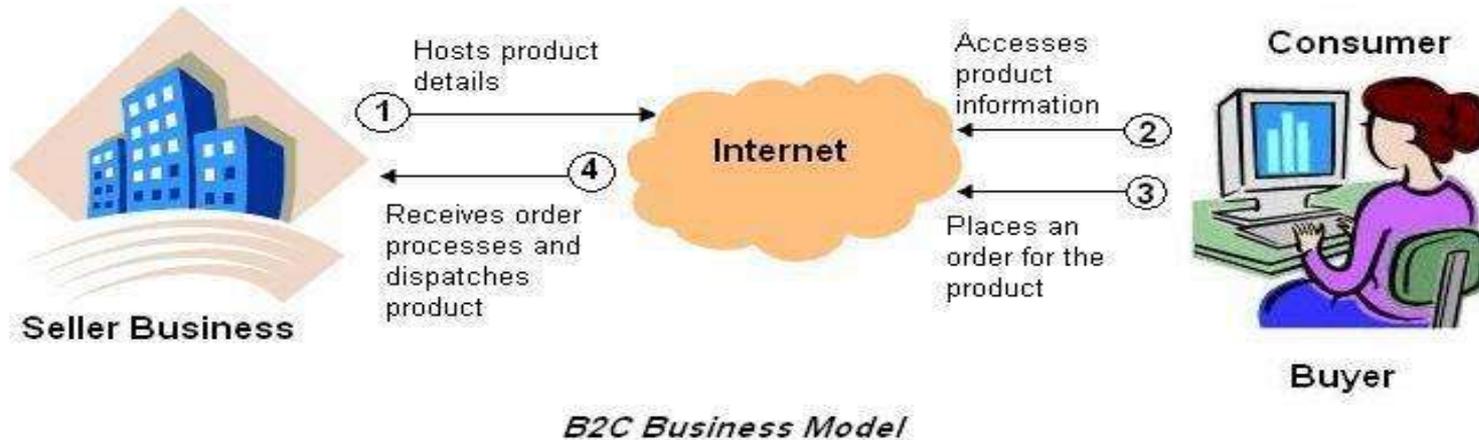


*B2B Business Model*

# Business-to-Consumer (B2C) Model

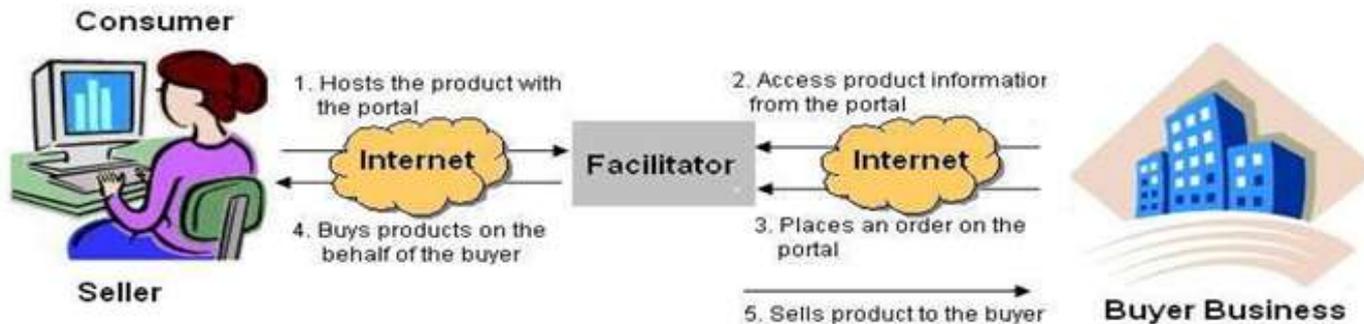
The B2C model involves transactions between business organizations and consumers. It applies to any business organization that sells its products or services to consumers over the Internet. These sites display product information in an online catalog and store it in a database. The B2C model also includes services online banking, travel services, and health information.

Example: [www.daraz.pk](http://www.daraz.pk), [www.amazon.com](http://www.amazon.com) etc....



# Consumer-to-Business (C2B) Model

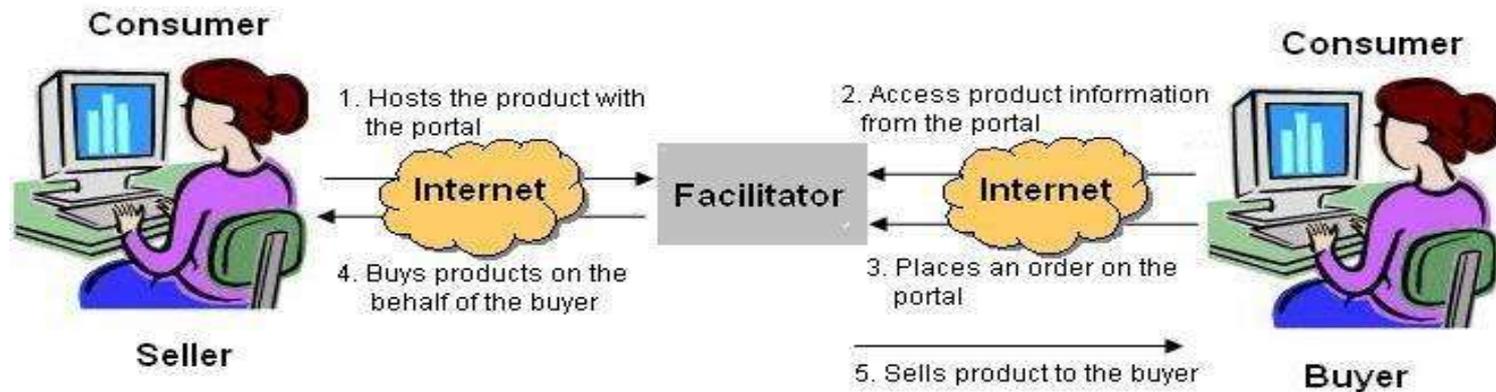
- ▶ A C2B model, is a type of commerce where a consumer or end user provides a product or service to an organization.
- ▶ An example is Priceline.com, where the customer names a product and the desired price, and Priceline tries to find a supplier to fulfill the stated need



# Consumer-to-Consumer (C2C) Model

The C2C model involves transaction between consumers. Here, a consumer sells directly to another consumer.

eBay.com, olx.com, etc... are common examples of online auction web sites that provide a consumer to advertise and sell their products online to another consumer.

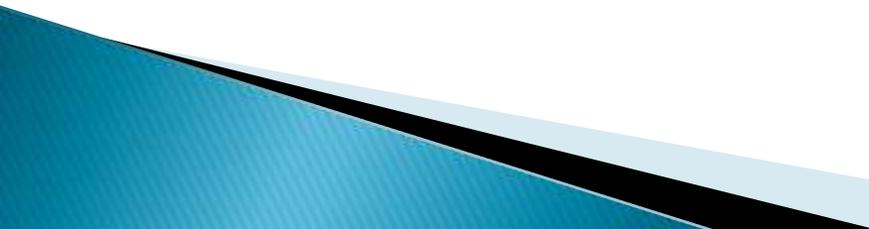


*C2C Business Model*

# **PROCESS OF E-COMMERCE**



# Process of E-commerce

- ▶ A consumer uses Web browser to connect to the home page of a merchant's Web site on the Internet.
  - ▶ The consumer browses the catalog of products featured on the site and selects items to purchase.
  - ▶ The selected items are placed in the electronic equivalent of a shopping cart.
  - ▶ When the consumer is ready to complete the purchase of selected items, He/she provides a bill-to and ship-to address for purchase and delivery .
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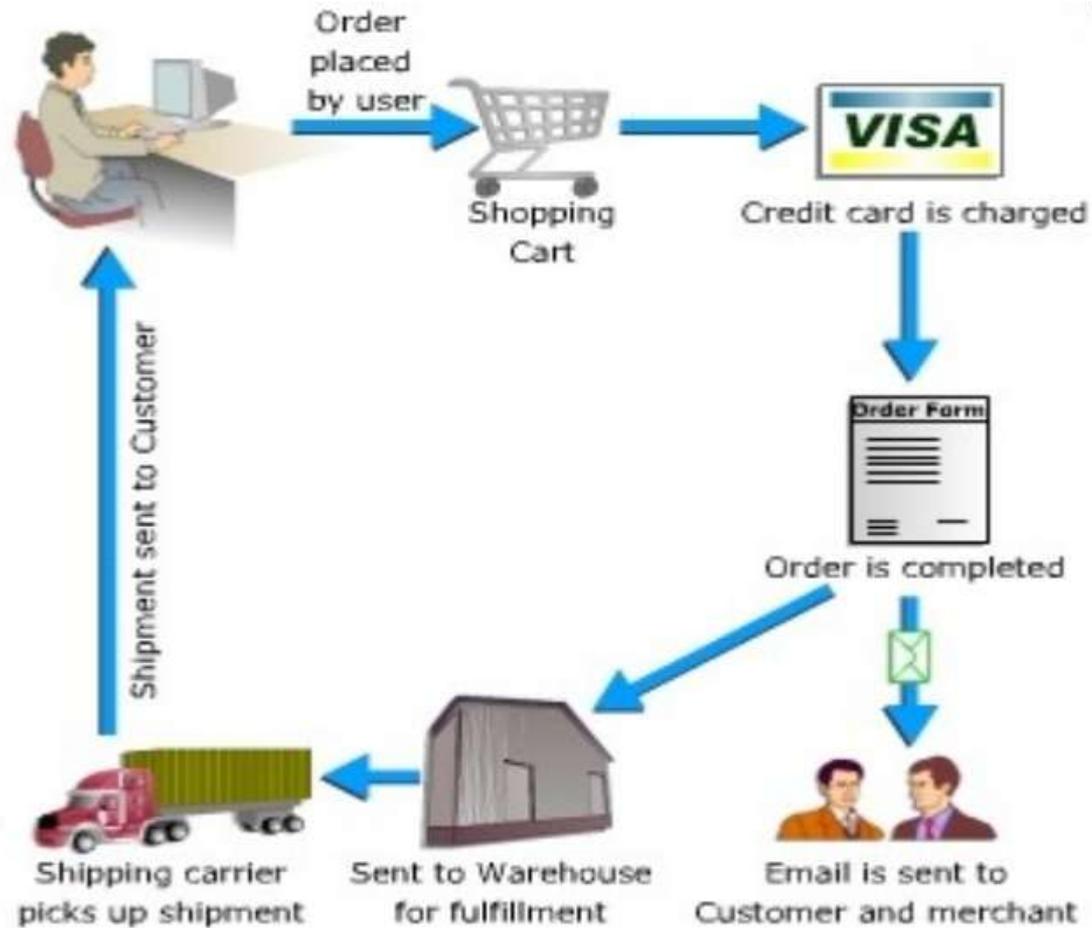
# Process of E-commerce

- ▶ When the payment method is identified and the order is completed at the Commerce Server site, the merchant's site displays a receipt confirming the customer's purchase.
- ▶ The Commerce Server site then forwards the order to a Processing Network for payment processing and fulfilment.

These are some common steps of online transactions.



# Process of E-commerce



# **ADVANTAGES AND DISADVANTAGES OF E-COMMERCE**



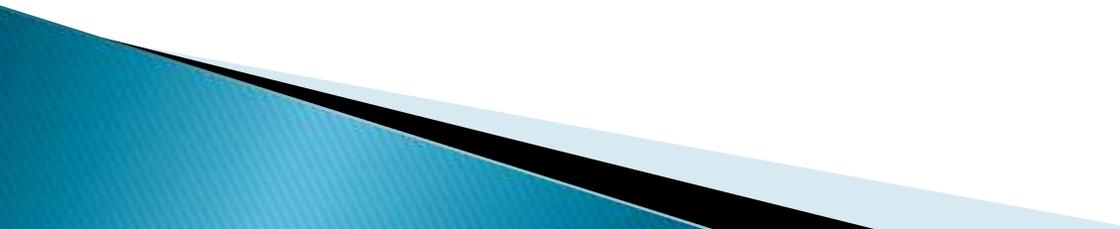
# Advantages of E- Commerce

- ▶ Faster buying/selling procedure, as well as easy to find products.
  - ▶ Buying/selling 24/7.
  - ▶ You can shop anywhere in the world.
  - ▶ Low operational costs and better quality of services.
  - ▶ No need of physical company set-ups.
  - ▶ Easy to start and manage a business.
  - ▶ Customers can easily select products from different providers without moving around physically.
  - ▶ Communication improvement.
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# Disadvantages of E- Commerce

- ▶ Unable to examine products personally.
  - ▶ Not everyone is connected to the Internet.
  - ▶ There is the possibility of credit card number theft.
  - ▶ Mechanical failures can cause unpredictable effects on the total processes.
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# **E-Shopping Safety Tips**



# E-Shopping Safety Tips

- ▶ **Check out sellers:** Conduct independent research before you buy from a seller you have never done business with. Some attackers try to trick you by creating malicious websites that appear real, so you should verify the site before supplying any information.
  - ▶ **Make sure the site is genuine:** Before you enter your personal and financial information to make an online transaction, look for signs that the site is secure.
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# E-Shopping Safety Tips

- ▶ **Protect your personal information:** Before providing personal or financial information, check the website's privacy policy. Make sure you understand how your information will be stored and used.
  - ▶ **Turn your computer off when you're finished shopping:** Many people leave their computers running and connected to the Internet all day and night. This gives scammers 24/7 access to your computer to install malware and commit cyber-crimes.
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# Outcomes

Have the concepts and processes that comprise the technical infrastructure of e-commerce sites and be able to solve problems about online transactions.



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- ▶ [http://www.slideshare.net/siddhesh130995/e-commerce-31086645?qid=71930f23-5bfd-4e6a-b9e0-910bfa64cac3&v=&b=&from\\_search=2](http://www.slideshare.net/siddhesh130995/e-commerce-31086645?qid=71930f23-5bfd-4e6a-b9e0-910bfa64cac3&v=&b=&from_search=2)
- ▶ [http://www.slideshare.net/munishsingla71/e-commerce-ppt-10713485?qid=689adfcf-df44-45d5-a4d2-663b93e2d9ae&v=&b=&from\\_search=6](http://www.slideshare.net/munishsingla71/e-commerce-ppt-10713485?qid=689adfcf-df44-45d5-a4d2-663b93e2d9ae&v=&b=&from_search=6)
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- ▶ [http://www.slideshare.net/m8817/security-in-ecommerce?qid=695c2245-7ed4-4a9c-aadc-1b753036a56e&v=&b=&from\\_search=10](http://www.slideshare.net/m8817/security-in-ecommerce?qid=695c2245-7ed4-4a9c-aadc-1b753036a56e&v=&b=&from_search=10)
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- ▶ [https://www.youtube.com/watch?v=FAyit\\_s9eY0](https://www.youtube.com/watch?v=FAyit_s9eY0)
- ▶ <https://www.youtube.com/watch?v=xKJjyn8DaAw&nohtml5=False>

THANK YOU





# INTRODUCTION TO CYBER CRIMES

# Overview of the Lesson

- ▶ Main Objective
  - ▶ Introduction to Cyber Crime
  - ▶ Categories Of Cyber Crime
  - ▶ Types of Cyber Crimes
  - ▶ Safety Tips
  - ▶ Outcomes
- 

# Main Objective

- To explore about cybercrime.
  - To create basic awareness about cyber crime .
  - To gain more knowledge about cyber crime.
  - Understanding of the risks of harmful online behavior.
- 

# **CYBER CRIMES**

# Introduction to Cyber Crime

## **Cyber Crime:**

- ▶ Computer crime or cybercrime, refers to any crime that involves a computer , Mobile and a network.
- ▶ Computer may be used as a weapon for crime or as a target.

**The Computer as a Target :** Using a computer to attack other computers.

**The computer as a weapon:** Using a computer to commit real world crimes.

## **Cyber Criminals:**

- ▶ Those who are doing crimes by using the computer as a target or an object.

# What is Cyber Crime? Simple Theory

- When you purchase a home it comes with a door and a lock. You always ensure that the door/lock exist and working properly. You may even purchase security systems.
  - Likewise, Your Computer System is your home and security tools are your door/lock .
  - So if someone breaches into your computer System, accesses all your personal accounts and tampers your data, is the criminal who is committing the crime.
  - And committed crime is known as cyber-crime.
- 

# **CATEGORIES OF CYBER CRIME**



# Categories Of Cyber Crime

## **Cyber Crime Against Individual**

- ▶ This type of cyber crime can be in the form of hacking, identity theft, cyber bullying, cyber stalking etc.

## **Cyber Crime Against Property**

- ▶ Just like in the real world where a criminal can steal and rob, even in the cyber world criminals resort to stealing and robbing.
  - In this case, they can steal a person's bank details and misuse the credit card to make purchases online.

# Categories Of Cyber Crime

## **Cyber Crime Against Government**

- ▶ Although not as common as the other two categories, crimes against a government are referred to as cyber terrorism.
  - In this category, criminals hack government websites, military websites or circulate propaganda.

# **TYPES OF CYBER CRIMES**



# Types of Cyber Crimes

There are numerous types. Some of which are:

- ▶ **Hacking:** Hacking in simple terms means illegal access into a computer system without the permission of the computer owner/user.
  - ▶ **Software Piracy:** This crime occurs when a person violates copyrights and unauthorized copying of software.
  - ▶ **Cyber Stalking:** The crime in which the attacker harasses or threaten a victim using electronic communication, such as e-mail, instant messaging (IM), or messages posted to a Web site or on social networking sites.
- 

# Types of Cyber Crimes

- ▶ **Malicious Software:** These are Internet-based software or programs that are used to disrupt a network. The software is used to gain access to a system to steal sensitive information or data or causing damage to software and hardware. (virus, worms, Trojan Horse, web jacking, e-mail bombing etc.)
  - ▶ **Identity Theft:** A criminal accesses data about a person's bank account, credit cards, debit card and other sensitive information.
  - ▶ **Cyber Bullying:** Cyber bullying is when the Internet and related technologies are used to bully other people, in a deliberate, repeated, and hostile manner. This could be done via, text messages or images, personal remarks posted online, hate speeches and posting false statements in order to humiliate or embarrass another person.
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# Types of Cyber Crimes

- ▶ **Denial-of-service attack:** This involves flooding a computer resource with more requests than it can handle. This causes the resource (e.g. a web server) to crash thereby denying authorized users the service offered by the resource.
- ▶ **E-mail Spamming & Spoofing:** Email spoofing refers to email that appears to have been originated from one source and it was actually sent from another source. Email "spamming" refers to sending email to thousands and thousands of users - similar to a chain letter.
- ▶ **Computer Vandalism:** Damaging or destroying data rather than stealing or misusing them is called cyber vandalism. These are program that attach themselves to a file and then circulate.

# **SAFETY TIPS**



# Safety Tips

- Use antivirus software's .
- Insert firewalls .
- uninstall unnecessary software .
- Maintain backup .
- Never send your credit card number to any site that is not secured.
- Avoid sending any photograph online particularly to strangers.
- Do not open mails from strangers. This prevents your system from unwanted attacks.



# Safety Tips

- Don't respond to harassing or negative messages.
  - Learn more about Internet privacy.
  - Keep your operating system up to date.
  - Change passwords frequently and Use hard-to-guess passwords.
  - Don't share access to your computers with strangers .
  - If you have a Wi-Fi network, password protect it.
  - Disconnect from the Internet when not in use.
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# Outcomes

As internet technology advances so does the threat of cyber crime. In times like these we must protect ourselves from cyber crime. Antivirus software, firewalls and security patches are just the beginning. Never open suspicious emails and only navigate to trusted sites.

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- ▶ [http://www.slideshare.net/tusharmalhot/cyber-crime-12320892?qid=769158d0-e1e2-47aa-bc34-c8d9fa89d727&v=&b=&from\\_search=13](http://www.slideshare.net/tusharmalhot/cyber-crime-12320892?qid=769158d0-e1e2-47aa-bc34-c8d9fa89d727&v=&b=&from_search=13)
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- ▶ [http://www.slideshare.net/soreingam/cyber-crime-28351567?qid=769158d0-e1e2-47aa-bc34-c8d9fa89d727&v=&b=&from\\_search=22](http://www.slideshare.net/soreingam/cyber-crime-28351567?qid=769158d0-e1e2-47aa-bc34-c8d9fa89d727&v=&b=&from_search=22)

# **CYBER SECURITY**

# Topics

- ▶ Main Objective
  - ▶ What is cyber security
  - ▶ Need of Cyber Security
  - ▶ Major Security Problems and Solutions
  - ▶ Security Measures
  - ▶ Advantages of cyber security
  - ▶ Outcomes
- 

# Main Objective

- ▶ The objective is to educate and create awareness amongst the students community on use of technology, internet media and its implication on possible cyber crimes.
  - ▶ Some of the possible prevention measures . One can take to avoid getting victimized for a cyber crime.
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# **CYBER SECURITY**



# What is Cyber Security

- ▶ Cyber security refers to the technologies and processes designed to protect computers, networks and data from unauthorized access and attacks delivered through the Internet by cyber criminals.
  - ▶ Protecting computer system and information from unauthorized access or destruction / abuse.
- 

# What is Cyber Security

Security deal with three primary issues, called the CIA triad.

1. **Confidentiality** : Assurance that only authorized user may access a resource.
  2. **Integrity**: Assurance that resources has not been modified.
  3. **Availability** : Assurance that authorized user may access a resource when requested.
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# Need of Cyber Security

- ▶ Protecting information in the digital age requires constant caution to deter thieves who would steal financial, proprietary, and personal identification data.
- ▶ Cyber security is necessary since it helps in securing data from threats such as data theft or misuse, also safeguards your system from viruses.
- ▶ Security measures provides full security services to balance the needs of providing information to those who need it with taking action to mitigate the dynamic threats posed by cyber thieves and cyber terrorists.



# Need of Cyber Security

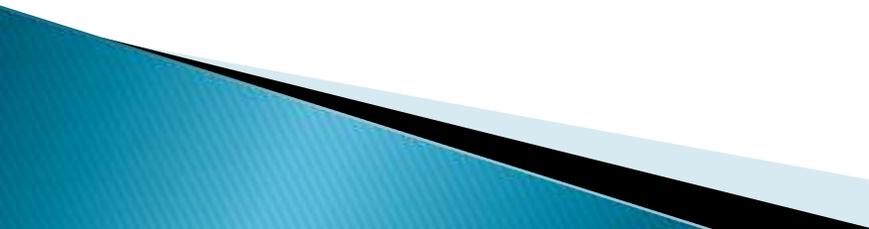
## Home Computer Security

- ▶ Your home computer is the popular target for intruders.
- ▶ They look for credit card numbers, bank account information.
- ▶ Use your computers to attack other computers on the internet.

## Why Intruder attack home computers?

- ▶ Not very secure
- ▶ Easy to break into

## How do they attack your computers?

- ▶ They send you E- mail with a virus
  - ▶ They often install new programs that let them continue to use your computer (Back door).
  - ▶ Trojan horses are such programs which are used as the back doors.
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# SECURITY PROBLEMS AND SOLUTIONS



# Major Security Problems and Solutions

- Virus and Worms
- Hacker
- Malware
- Trojan Horses
- Password Cracking



# Major Security Problems and Solutions

## **Virus and Worms:**

- ▶ A Virus is a “program” that is loaded onto your computer without your knowledge and runs against your wishes.

## **Virus can reach to your computer in may ways**

- ▶ CD- Rom
- ▶ E-mails
- ▶ Websites
- ▶ Downloaded Files

**Check each of the above for viruses before using it.**



# Major Security Problems and Solutions

## Solution:

- ▶ Install a security suite that protects the computer against threats such as viruses and worms.
- ▶ Handle E- mail attachments carefully.



# Major Security Problems and Solutions

## Hackers:

- ▶ A person who secretly gets access to a computer system in order to get information, cause damage, etc.
- ▶ Hackers attack where they see weakness. A system that hasn't been updated recently has flaws in it that can be taken advantage of by hackers.

## Solution:

- ▶ It may be impossible to prevent computer hacking, however effective security controls including strong passwords, and the use of firewalls can help.
  - ▶ Regularly update your operating system
  - ▶ Install Anti virus software's.
- 

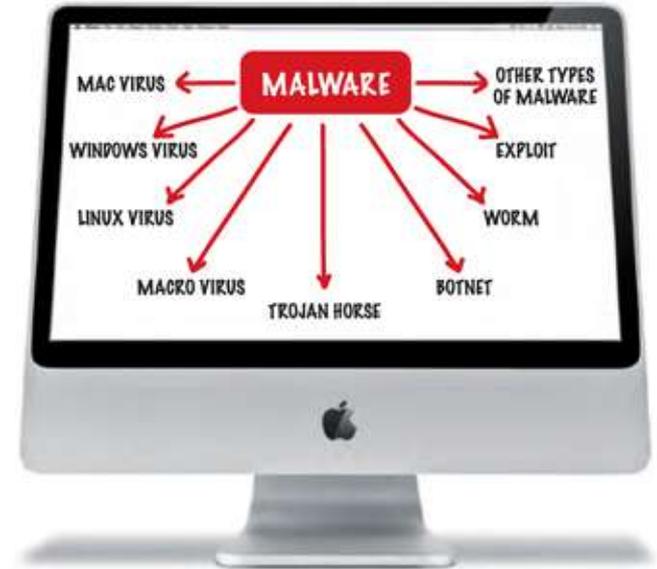
# Major Security Problems and Solutions

## Malware:

- The word "malware" comes from the term "Malicious software."
- Malware is any software that infects and damages a computer system without the owner's knowledge or permission.

## Solution:

- Download an anti-malware program that also helps prevent infections.
- Activate Network Threat Protection, Firewall, Antivirus.



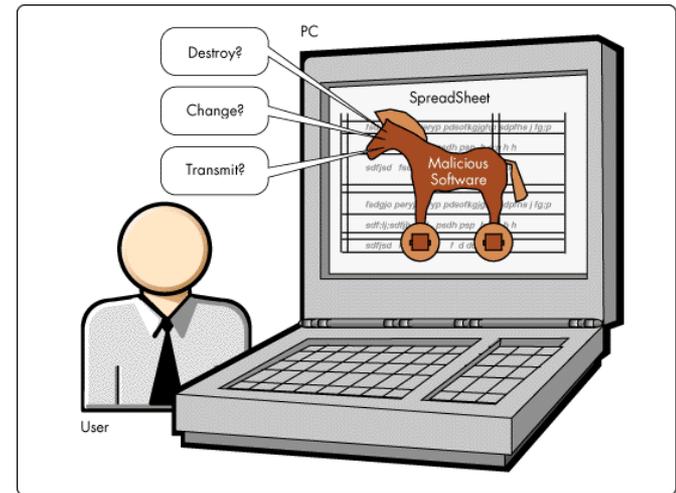
# Major Security Problems and Solutions

## Trojan Horse:

- Trojan horses are email viruses that can duplicate themselves, steal information, or harm the computer system.
- These viruses are the most serious threats to computers

## Solution:

- Security suites, such as Avast Internet Security, will prevent you from downloading Trojan Horses.



# Major Security Problems and Solutions



## **Password Cracking:**

- ▶ Password attacks are attacks by hackers that are able to determine passwords or find passwords to different protected electronic areas and social network sites.

## **Solution:**

- ▶ Use always Strong password.
- ▶ Never use same password for two different sites.

# SECURITY MEASURES

# Things to do for Protecting your Computer

- ▶ Use security software.
- ▶ Maintain current software and updates.
- ▶ Never share passwords .
- ▶ Do not click random links.
- ▶ Do not download unfamiliar software off the Internet.
- ▶ Log out or lock your computer.
- ▶ Remove unnecessary programs or services.
- ▶ Frequently back up important documents and files.



# **ADVANTAGES OF CYBER SECURITY**



# Advantages of Cyber Security



1. Protects system against viruses, worms, spyware and other unwanted programs.
2. Protection against data from theft.
3. Protects the computer from being hacked.
4. Minimizes computer freezing and crashes.
5. Gives privacy to users.

# Outcomes

Improve the knowledge about cyber security and to overcome several security loopholes , Also it helps to spread awareness among normal people about emerging security threats. Simple and practical prevention methods are explained in the lesson to prevent PCs from infection.



# CRYPTOGRAPHY

## Lesson # 5

# Introduction of Cryptography

- ▶ The method of hiding plaintext in such a way as to hide its substance is called encryption.
  - ▶ Encrypting plaintext results in unreadable gibberish called cipher text
- 

# Origin

When Julius Caesar sent messages to his generals, he didn't trust his messengers. So he replaced every A in his messages with a D, every B with an E, and so on through the alphabet. Only someone who knew the “shift by 3” rule could decipher his messages.



# Caesar's Cipher

ABCDEFGHIJKLMNOPQRSTUVWXYZ

and sliding everything up by 3, you get

DEFGHIJKLMNOPQRSTUVWXYZABC

where  $D=A$ ,  $E=B$ ,  $F=C$ , and so on.

“SECRET” encrypts as “VHFUHW

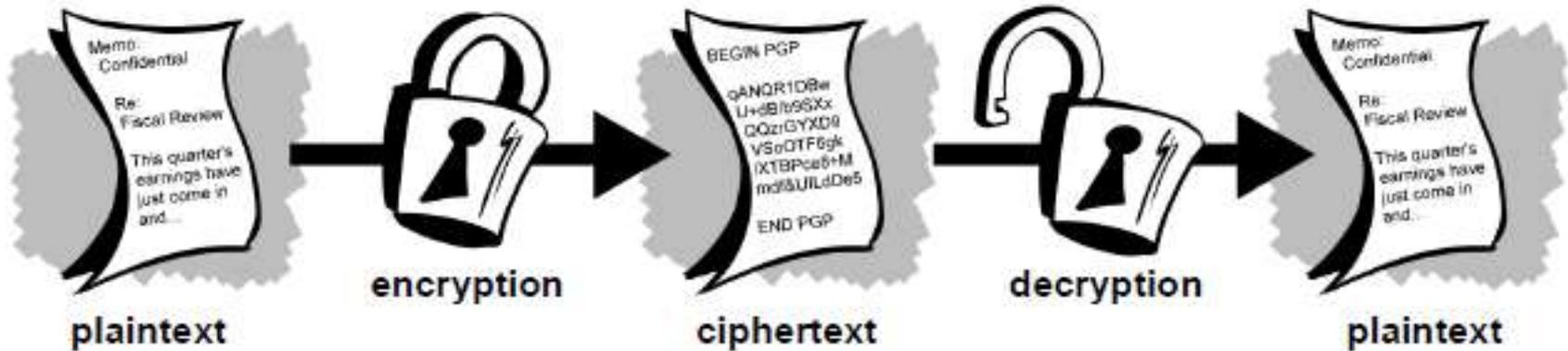
# Examples

Handwritten musical notation on a ten-line staff. The notation consists of various rhythmic symbols, including stems, beams, and note heads, written in black ink. Some symbols are highlighted in green. The notation is arranged in a series of horizontal lines, suggesting a sequence of notes or rests. The symbols are somewhat abstract and stylized, characteristic of a shorthand musical notation system.

# CONVENTIONAL CRYPTOGRAPHY



# Conventional cryptography



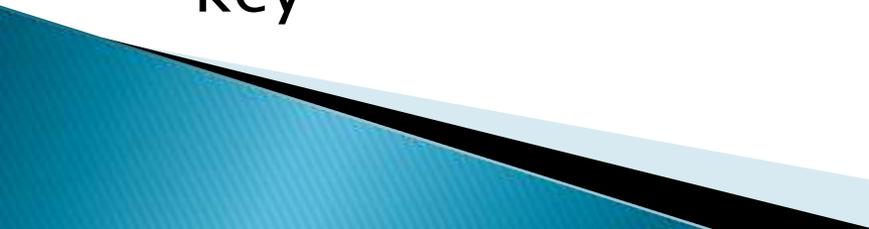
# Conventional cryptography

- ▶ It is very fast. It is especially useful for encrypting data that is not going anywhere.

**BUT**



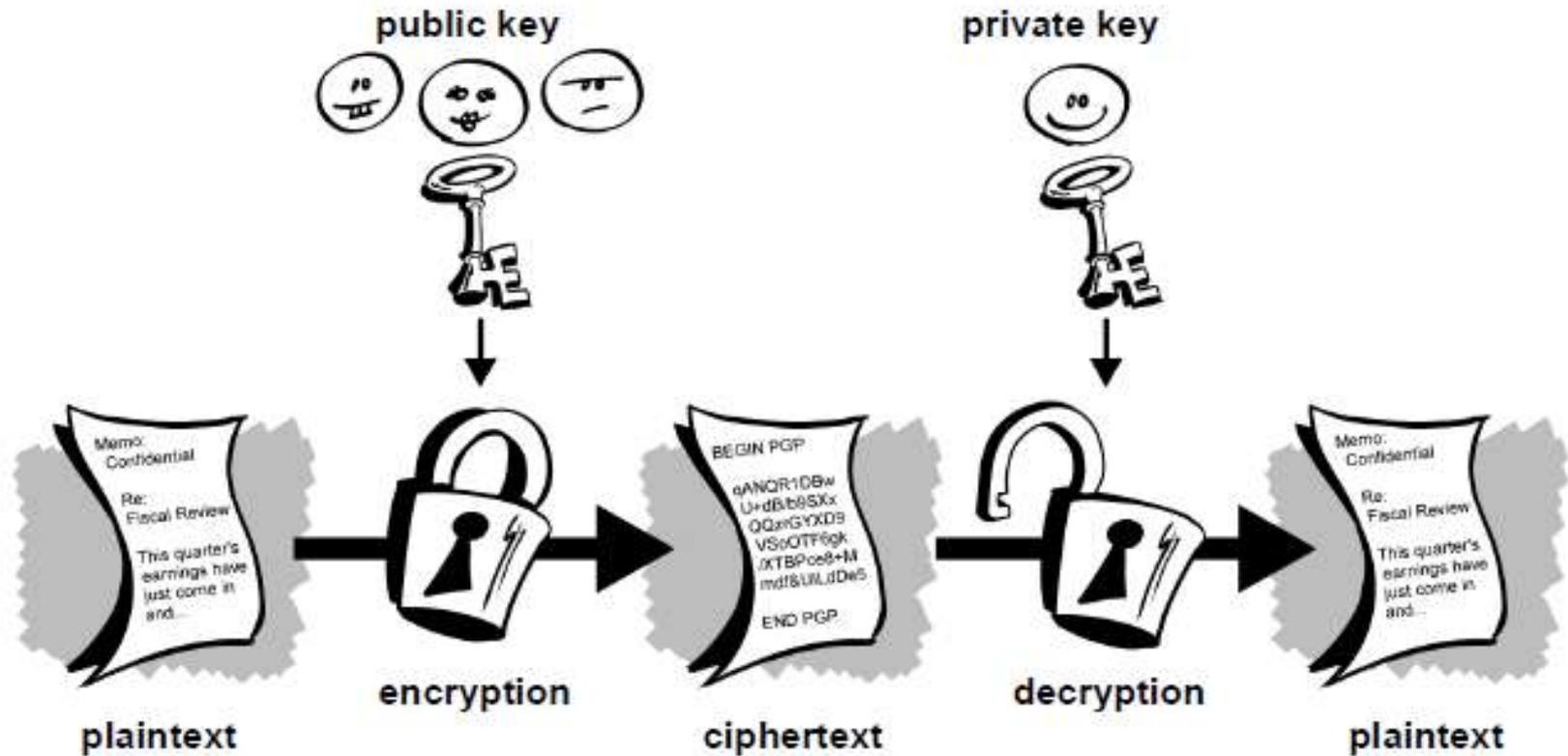
# Key Management

- ▶ Both ends must agree upon a key and keep it secret between themselves.
  - ▶ Being on different physical locations, they must trust a courier (secure communication medium) to prevent the disclosure of the secret key.
  - ▶ Anyone who overhears or intercepts the key in transit can later read, modify, and forge all information encrypted or authenticated with that key
- 

# PUBLIC KEY CRYPTOGRAPHY



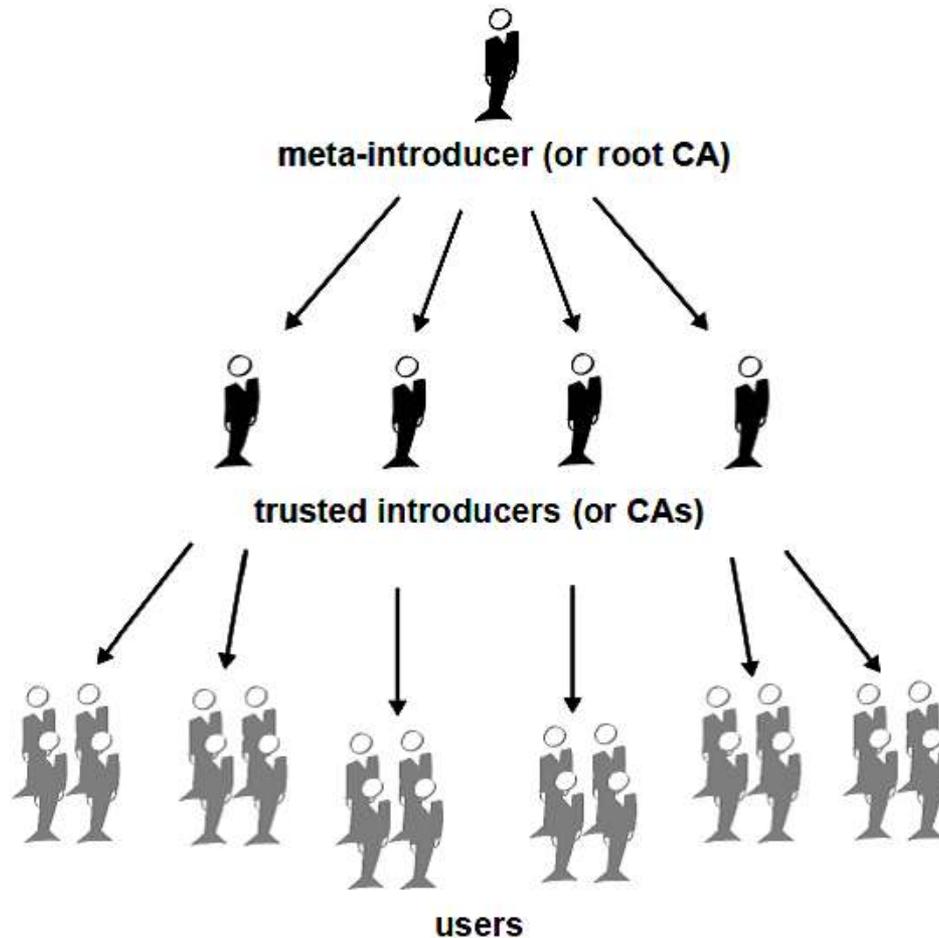
# Public key cryptography



# Certificate Management and Distribution

- ▶ Public Key Infrastructures
  - ▶ Certification Authority, or CA
    - CA is authorized to issue certificates to its computer users. (ACA's role is analogous to a country's government's Passport Office.)
- 

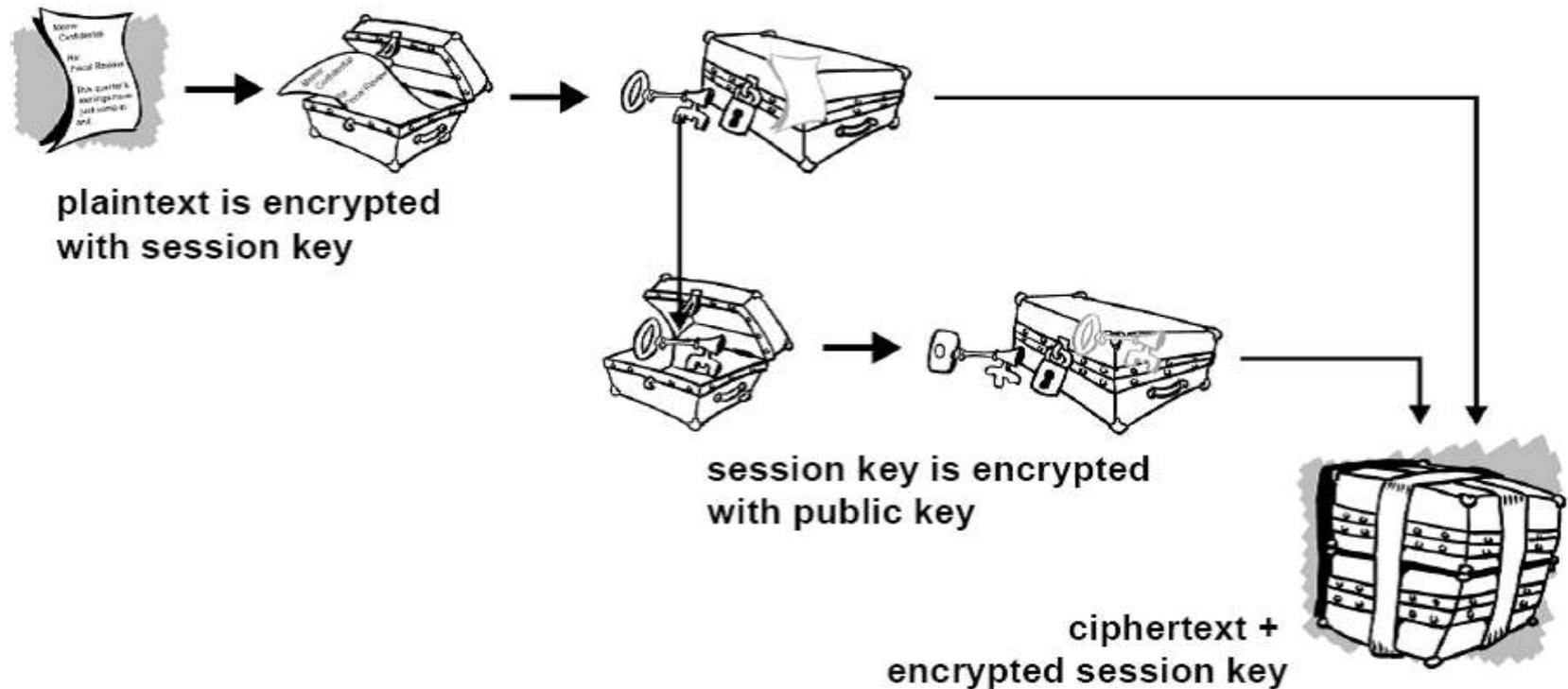
# Certificate Management and Distribution



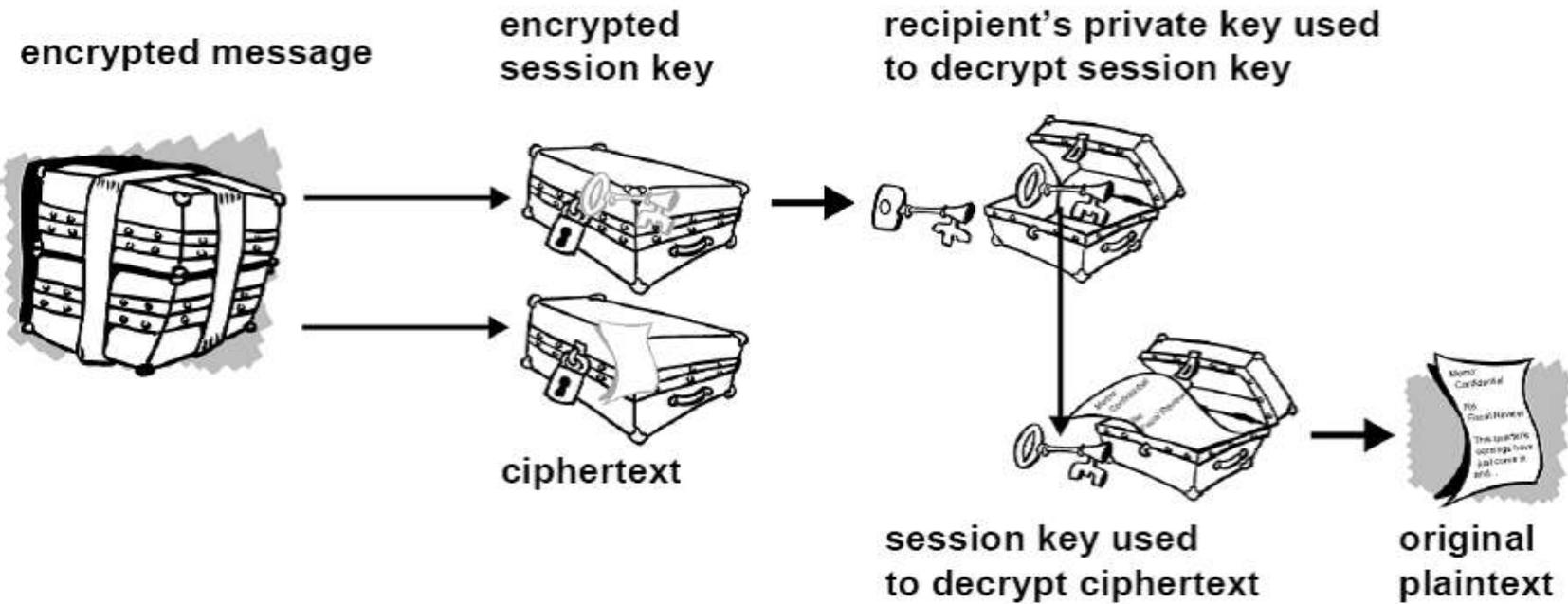
# HYBRID APPROACH



# Hybrid Approach



# Hybrid Approach





# Introduction to Cyber Law

## Lesson # 6

# Definition

The term “Cyber Law” Refers to all the legal and regulatory aspects of the Internet and its users



# NEED OF CYBER LAW



# Need of Cyber Law

## Cyber Murder

A hacker changed the value of insulin in a patient's online prescription who was admitted in a hospital the nurse injected that quantity and patient expired.

# Need of Cyber Law

- ▶ E-commerce penetrates into every corner of the modern business
  - ▶ Regulatory Issues
  - ▶ Emails
  - ▶ Social Media
  - ▶ Video Streaming
- 

# Need of Cyber Law

- ▶ Email spoofing
  - ▶ Financial crimes
  - ▶ Online gambling
  - ▶ Sale of illegal articles
  - ▶ Forgery
  - ▶ Cyber Defamation
  - ▶ Cyber stalking
- 

# Need of Cyber Law

- ▶ Denial of Service attack
  - ▶ Trojan attacks
  - ▶ Worms and Viruses
  - ▶ Data diddling
  - ▶ Intellectual Property crimes
  - ▶ Cyber Disputes
  - ▶ Unauthorized access to computer systems
  - ▶ Salami attacks
- 

# **THE ROLE OF LAW AND LAWYERS**



# The role of law and lawyers

The 1<sup>st</sup> rule of management is delegation.  
Don't try and do everything yourself because  
you can't.



# The role of law and lawyers

- ▶ Consultancy
  - ▶ The Subject matter Expert
  - ▶ A blend of Law and Technology
- 

# CYBER REGULATION'S EVOLUTION



# Cyber Regulation's Evolution

- ▶ UNCITRAL 1966
  - ▶ Model Law on
    - E-Commerce 1996
    - E-Signatures 1996
  - ▶ Wipo Copy Rights Rules 1996
  - ▶ Wipo Performance and Phonograms Treaty Rules 1996
- 

# Cyber Regulation's Evolution

- ▶ ICANN Uniform Domain Name Disputes Resolution Policy 1998
  - ▶ DMCA      1998
  - ▶ EUCD      2001
  - ▶ ITA        2000
- 

# Cyber Regulations in Pakistan

- ▶ The Electronic Transaction Ordinance 2002
- ▶ Prevention of Electronic Crime Ordinance 2008

# CYBER LAWS IN PAKISTAN

## Lesson # 7

# Cyber Laws in Pakistan

- ▶ There are different laws, promulgated in Pakistan.
- ▶ These laws not only deal with crime of Internet
- ▶ These deal with all dimensions related to computer & networks.
- ▶ Two of them are most known.
- ▶ They are:
  - Electronic Transaction Ordinance 2002
  - Electronic / Cyber Crime Bill 2007

# Electronic Transaction Ordinance 2002



# Electronic Transaction Ordinance 2002

## Overview

- ▶ The Electronic Transactions Ordinance (ETO), 2002, was the first IT-relevant legislation created by national lawmakers.
  - ▶ Protection for Pakistani e-Commerce locally and globally.
  - ▶ Protect Pakistan's critical infrastructure
  - ▶ It is heavily taken from foreign law related to cyber crime.
- 

# Pre-ETO 2002

- ▶ No recognition of electronic documentation
  - ▶ No recognition of electronic records
  - ▶ No recognition of evidential basis of documents/records
  - ▶ Failure to authenticate or identify digital or electronic signatures or forms of authentication
  - ▶ No online transaction system on legal basis.
  - ▶ Electronic Data & Forensic Evidence not covered.
  - ▶ No Rules for all of these ...
- 

POST ETO 2002

# Post ETO 2002

- ▶ Electronic Documentation & Records recognized
  - ▶ Electronic & Digital forms of authentication & identification
  - ▶ Messages through email, fax, mobile phones, Plastic Cards, Online recognized.
- 

# ETO 2002

## Sections

- There are 43 sections in this ordinance
- It deals with following 8 main areas relating to e-Commerce.
  - Recognition of Electronic Documents
  - Electronic Communications
  - Web Site
  - Digital Signatures Certification Providers
  - Stamp Duty
  - Attestation, certified copies
  - Jurisdiction
  - Offences

# VIOLATION OF PRIVACY INFORMATION



# 36. Violation of privacy information

- ▶ Gains or attempts to gain access
  - ▶ To any information system with or without any purpose
  - ▶ To acquire the information unauthorized
  - ▶ Imprisonment 7 years
  - ▶ Fine Rs. 1 million
- 

# DAMAGE TO INFORMATION SYSTEM



## 37. Damage to information system

- ▶ Alter, modify, delete, remove, generate, transmit or store information
  - ▶ Create hindrance in information access
  - ▶ knowingly when not authorized to do so
  - ▶ Imprisonment 7 years
  - ▶ Fine Rs. 1 million
- 

# OFFENCES TO BE NON-BAIL ABLE

## 38. Offences to be non-bail able

- ▶ All offences under this Ordinance shall be non-bail able, compoundable and cognizable.

# PROSECUTION AND TRAIL OF OFFENCES



## 39. Prosecution and trial of offences

- ▶ No Court inferior to the Court of Sessions shall try any offence under this Ordinance.

# Electronic/Cyber Crime Bill 2007

# Overview

- ▶ “Prevention of Electronic Crimes Ordinance, 2007” is in force now
- ▶ It was promulgated by the President of Pakistan on the 31st December 2007
- ▶ The bill deals with the electronic crimes included:
  - Cyber terrorism
  - Data damage
  - Electronic fraud
  - Electronic forgery
  - Unauthorized access to code
  - Cyber stalking
  - Cyber Spamming/spoofing

# Electronic/Cyber Crime Bill 2007

- ▶ It will apply to every person who commits an offence, irrespective of his nationality or citizenship.
  - ▶ It gives exclusive powers to the Federal Investigation Agency (FIA) to investigate and charge cases against such crimes.
- 

# Electronic/Cyber Crime Bill 2007

## Punishments

- ▶ Every respective offence under this law has its distinctive punishment which can be imprisonment or/and fine.
- 

# Sections

## **Data Damage:**

- ▶ Whoever with intent to illegal gain or cause harm to the public or any person, damages any data, shall come under this section.

## **Punishment:**

- ▶ 3 years
  - ▶ 3 Lac
- 

# Electronic/Cyber Crime Bill 2007

## **Electronic fraud:**

- ▶ People for illegal gain get in the way or use any data, electronic system or device or with intent to deceive any person, which act or omissions is likely to cause damage or harm.

## **Punishment:**

- ▶ 7 years
  - ▶ 7 Lac
- 

# Electronic/Cyber Crime Bill 2007

## Electronic Forgery:

- ▶ Whoever for unlawful gain interferes with data, electronic system or device, with intent to cause harm or to commit fraud by any input, alteration, or suppression of data, resulting in unauthentic data that it be considered or acted upon for legal purposes as if it were authentic

## Punishment:

- ▶ 7years
  - ▶ 7 Lac
- 

# Electronic/Cyber Crime Bill 2007

## Malicious code:

- ▶ Whoever willfully writes, offers, makes available, distributes or transmits malicious code through an electronic system or device, with intent to cause harm to any electronic system or resulting in the theft or loss of data commits the offence of malicious code.

## Punishment:

- ▶ 5 years
  - ▶ 5 Lac
- 

# Electronic/Cyber Crime Bill 2007

## Cyber stalking:

- ▶ Whoever with intent to harass any person uses computer, computer network, internet, or any other similar means of communication to communicate obscene, vulgar, profane, lewd, lascivious, or indecent language, picture or image.
- ▶ Threaten any illegal or immoral act
- ▶ Take or distribute pictures or photographs of any person without his knowledge
- ▶ Commits the offence of cyber stalking.

## Punishment:

- ▶ 3 Years
- ▶ 3 Lac

# Electronic/Cyber Crime Bill 2007

## **Spamming:**

- ▶ Illegal electronic messages to any person without the permission of the recipient.

## **Punishment:**

- ▶ 6 month
  - ▶ 50,000
- 

# Electronic/Cyber Crime Bill 2007

## **Spoofing:**

- ▶ Whoever establishes a website, or sends an electronic message with a fake source intended to be believed by the recipient or visitor or its electronic system to be an authentic source with intent to gain unauthorized access or obtain valuable information

## **Punishment:**

- ▶ 3 Years
  - ▶ 3 Lac
- 

<b>Offence</b>	<b>Imprisonment (years)</b>	<b>Fine</b>
Criminal Access	3	3 Lac
Criminal Data Access	3	3 Lac
Data Damage	3	3 Lac
System Damage	3	3 Lac
Electronic Fraud	7	7 Lac
Electronic Forgery	7	7 Lac
Misuse of Device	3	3 Lac
Unauthorized access to code	3	3 Lac
Malicious code	5	5 Lac
Defamation	5	5 Lac
Cyber stalking	3	3 Lac
Cyber Spamming	6 months	50,000
Spoofing	3	3 Lac
Pornography	10	-----
Cyber terrorism	Life	10 Million

# CRITICISM

# Criticism

- ▶ There are seemingly 21 ‘cyber’ issues covered in this Bill
  - ▶ It may seem to cover all aspects of the new digital era.
  - ▶ But detailed look shows quite the contrary.
  - ▶ Practically in all issues the government has gone the extra mile to reinvent a new definition, significantly deviating from the internationally accepted norms.
- 

# Criticism

- ▶ There seems to be an elaborate play of words within the document
  - ▶ allow room for the regulating body (FIA) to confuse and entrap the innocent people
  - ▶ The FIA, has been given complete and unrestricted control to arrest and confiscate material as they feel necessary
  - ▶ A very dangerous supposition
  - ▶ Safeguards and Protection
- 

# Criticism

## ▶ One example of the hideous nature of the bill:

- The Government has literally attempted to insert a new word in the English language.
- The word TERRORISTIC is without doubt a figment of their imagination vocabulary
- Hence they attempt to define the word, quite literally compounding the problem at hand
- They have actually defined what real-life terrorism might be
- But fail to explain what they mean by the word Cyber in cyber terrorism.
- the concern is that there happens to be no clear-cut explanation on how a Cyber Terrorism crime is committed.

# Why we must know Cyber Laws?

- ▶ Which specific laws apply to Organization.
  - ▶ By law, which information assets need to be protected?
  - ▶ Organizational Policies and Rules
- 

# CONCEPT OF CYBER SPACE JURISDICTION AND OTHER PRINCIPAL OF JURISDICTION

**LESSON # 8**

# JURISDICTION



# JURISDICTION

The right, power, or authority to administer justice by hearing and determining controversies.

- Territorial Jurisdiction
  - Extra Territorial Jurisdiction
  - Cyber Jurisdiction
- 

# TERRITORIAL JURISDICTION



# TERRITORIAL JURISDICTION

Refers to jurisdiction over cases arising in or involving persons residing within a defined territory.

# EXTRA TERRITORIAL JURISDICTION



# EXTRA TERRITORIAL JURISDICTION

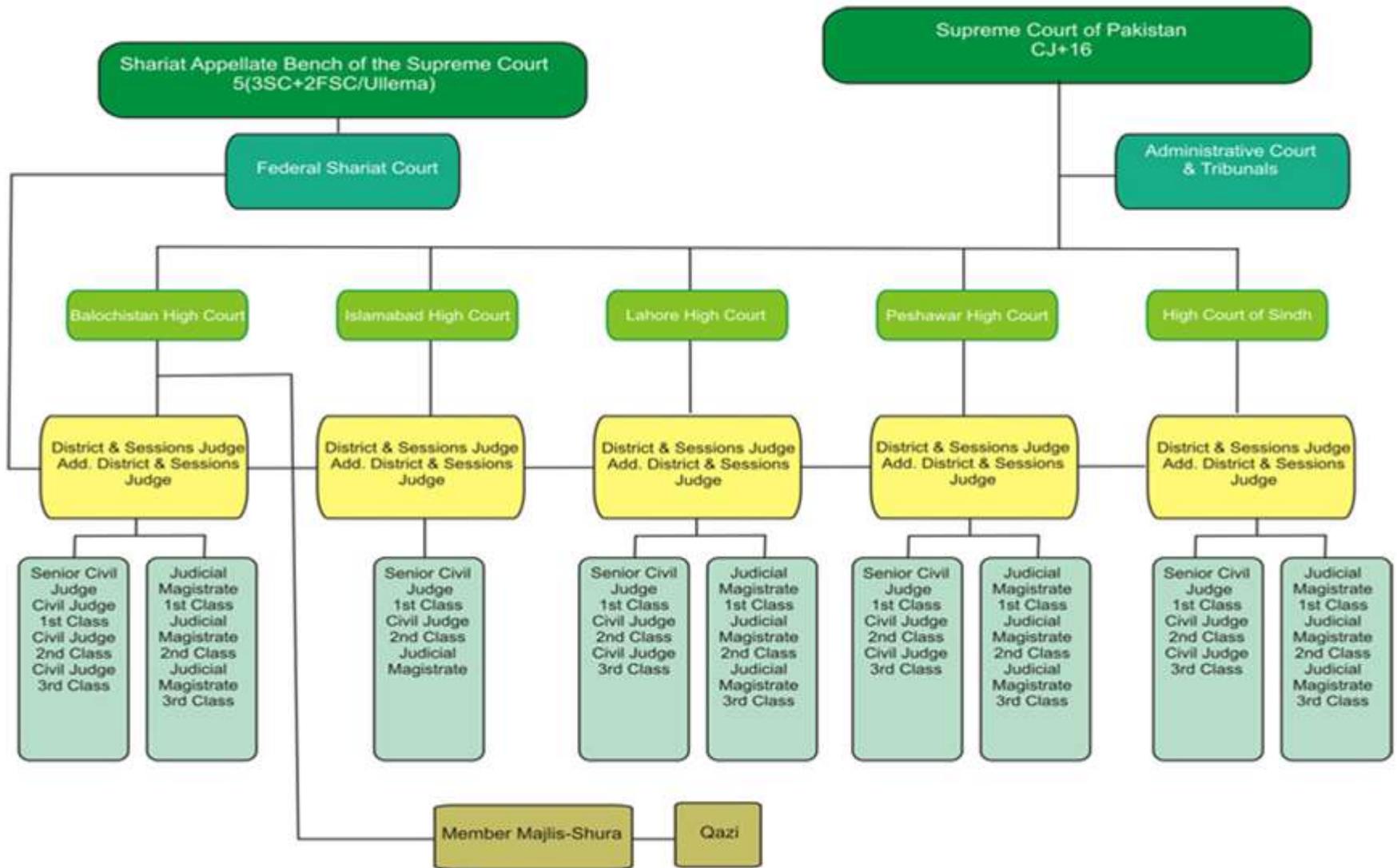
Extra territorial Jurisdiction refers to a court's ability to exercise power beyond its territorial limits.

# CYBER JURISDICTION



# CYBER JURISDICTION

A virtual approach, defining the cyber world beyond the boundaries of nation states enforcement of cyber laws uniformly accepted.



# CYBER DISPUTE/CONFLICT



# CYBER DISPUTE/CONFLICT

A tense situation between and/or among nation-states and/or organized groups where unwelcome cyber attacks may result in retaliation



# INTELLECTUAL PROPERTY RIGHTS, PRIVACY AND FREEDOM OF SPEECH

Lesson # 9

# LECTURE OVER VIEW

- Concept of Virtual Property
- Trademarks
- Copyrights
- Patents
- Data Protection Laws

# CONCEPT OF VIRTUAL PROPERTY

# CONCEPT OF VIRTUAL PROPERTY

## Definition

- ❖ An emerging property form – virtual property – that is not intellectual property, but that more efficiently governs rivalrous, persistent, and interconnected online resources.
- ❖ Examples include URL, email address, IP address etc.
- ❖ Virtual property is govern through the law of intellectual property
  - ❖ **Rivalrousness**, in the physical world, lets the owner exclude other people from using owned objects We often desire the power to exclude in cyberspace too, and so we design that power into code. By design, we make code that can only be possessed by one person. Thus, rivalrousness exists also in code. If one person controls rivalrous code, nobody else does. For example, no one but the owner of an internet address (or those the owner permits) can post content to that address. If person A owns a given internet address, person B cannot put her website up at that address. If one person has a given email address, nobody else can receive mail at that same address

# Contd..

- ❖ **Persistent:** For example, an email account can be accessed from a laptop, a desktop, or the local library. When an email account owner turns her laptop off, the information in that account does not cease to exist. It persists on the server of her Internet Service Provider.
- ❖ Objects in the real world are also naturally **interconnected**. Two people in the same room experience exactly the same objects. Objects in the real world can affect each other, by the laws of physics. Similarly, code can be made interconnected, so that although one person may control it, others may experience it. The value of a URL or an email address is not solely that the owner can control it; the value is that other people can connect to it, and can experience it. They may not be able to control it without the owner's permission, but – as with real estate in the real world – with the owner's invitation they may interact with it.
- ❖ Amazon as virtual property

# TRADEMARKS

# TRADEMARKS

## Definition

- ❖ A symbol, word, or words legally registered or established by use as representing a company or product.
- ❖ In cyber world URL's are more like trademarks
- ❖ Provides the rights of the owner of a name, symbol, mark for protection to avoid consumer confusion. This applies specifically in the acquisition of domain names that are appropriate for a business' trademark. Trademark protection has typically resided at the nation state level, and the global nature of the internet has caused problems with the use of certain domain names. A secondary issue is the difference in countries with respect to "first to use" versus "first to file".



# Contd..

- ❖ Consumer Protection Act, 15 U.S.C. § 1114, 1125(a) (2000)
- ❖ **Cybersquatting:** is the behavior of acquiring a domain name with the intention of reselling to a third party which has a higher perceived value for that name, or to exploit 'traffic' that domain name generates based on consumers' presumption of the purpose of the domain name.



# COPYRIGHTS

# COPYRIGHTS

- ❖ Provision to own over a specific period of time
- ❖ Examples are books, music, research journals, website etc.
- ❖ License is description given by the owner on how to use the property
- ❖ Copy right protection
- ❖ Fair use Clause
- ❖ Expansion of Top Level Domains (TLD's)



# PATENTS

# PATENTS

- ❖ A patent is a government authority or license conferring a right or title for a set period, especially the sole right to exclude others from making, using, or selling an invention
- ❖ Patent Right
- ❖ Patent Ordinance
- ❖ Patent Rules
- ❖ Patents Granted by IPO (Intellectual Property Orgar
- ❖ Patents Expired



# DATA PROTECTION LAWS

# DATA PROTECTION LAWS

- ❖ Data protection laws are to provide protection to electronic data with regard to the processing of electronic data
- ❖ Pakistan Data Protection Act 2005
- ❖ Advantages of Data Protection Act
- ❖ Disadvantages of Data Protection Act



# References



# **ESTABLISHMENT OF INVESTIGATION AND PROSECUTION AGENCIES**

## **LESSON # 10**

# LECTURE OVER VIEW

- Establishment of Investigation and Prosecution Agencies
- National Réponse Centre for Cyber Crimes (Nr3c)
- Power of Officers
- Real Time Collection of Traffic Data
- Retention of Traffic Data
- Trans Order Access
- Warrant for Disclosure of Data



# **ESTABLISHMENT OF INVESTIGATION AND PROSECUTION AGENCIES**

# ESTABLISHMENT OF INVESTIGATION AND PROSECUTION AGENCIES

## Cyber Crime

One of the largest computer security companies, Symantec Corporation, defines cybercrime as “Any crime that is committed using a computer or network, or hardware device”.

## Existing Strategies and Cybercrime in US

- ❖ Department of Defense Strategy for Operating in Cyberspace
- ❖ Strategy to Combat Transnational Organized Crime
- ❖ International Strategy for Cyberspace
- ❖ National Strategy for Trusted Identities in Cyberspace
- ❖ Council of Europe Convention on Cybercrime
- ❖ National Strategy to Secure Cyberspace

# **NATIONAL RESPONSE CENTRE FOR CYBER CRIMES (NR3C)**

# NATIONAL RESPONSE CENTRE FOR CYBER CRIMES (NR3C)

## Responsabilités

### **Some of the responsabilités are listed below**

- ▶ Enhance the capability of Government of Pakistan and Federal Investigation Agency to effectively prevent growing cyber crimes.
- ▶ Reporting & Investigation Centre for all types of Cyber Crimes in the country.
- ▶ Liaison with all relevant national and international organizations to handle cases against the Cyber Criminals.
- ▶ Provide necessary technical support to all sensitive government organizations to make their critical information resources secure.
- ▶ Carry out regular R & D activities to make the Response Centre as a centre of technical excellence.
- ▶ Provide timely information to critical infrastructure owners and government departments about threats, actual attacks and recovery techniques. A role of Computer Emergency Response Team (CERT).
- ▶ To provide on demand state-of-the-art electronic forensic services and cyber investigative to support local police.

# POWER OF OFFICERS

# POWER OF OFFICERS



Subject to provisions of Cybercrime Bill 2015 Act, an investigating officer shall have the powers to :

- ❖ Have access to and inspect the operation of any specified information system.
- ❖ Use or cause to be used any specified information system to search any specified data contained in or available to such information system.
- ❖ Obtain and copy any data, use equipment to make copies and obtain an intelligible output from an information system.
- ❖ Have access to or demand any information, code or technology which has the capability of retransforming or unscrambling encrypted data contained or available to such information system into readable and comprehensible format or plain version.
- ❖ Require any person by whom or on whose behalf, the investigating officer has reasonable cause to believe, any information system has been used to grant access to any data within any information system within the control of such person.

# Contd..

- ❖ Require any person having charge of or otherwise concerned with the operation of any information system to provide him reasonable technical and other assistance as the investigating officer may require for investigation of an offence under this Act; and
- ❖ Require any person who is in possession of decryption information of an information system, device or data under investigation to grant him access to such decryption information necessary to decrypt data required for the purpose of investigating any such offence.



# **REAL TIME COLLECTION OF TRAFFIC DATA**

# REAL TIME COLLECTION OF TRAFFIC DATA

- ❖ Many organizations and defense industry base, have discovered that while traditional security monitoring systems can help information assurance efforts, they are rarely enough to react to today's external, targeted, persistent, zero-day attacks. As a result, leading agencies and some private sector organizations are beginning to replace point-in-time audits and compliance checks with a continuous monitoring program to help them prioritize controls and provide visibility into current threats.

# **RETENTION OF TRAFFIC DATA**

# RETENTION OF TRAFFIC DATA

The policy for retention of Traffic data Under Pakistan Electronic Crime act 2015 is as follows

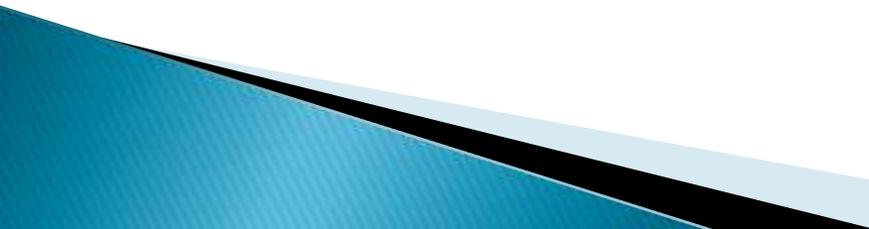
- ❖ A service provider shall, within its existing or required technical capability, retain its traffic data for a minimum period of ninety days or such period as the Authority may notify from time to time and provide that data to the special investigating agency or the investigating officer whenever so required.
- ❖ The service providers shall retain the traffic data under sub section (1) by fulfilling all the requirements of data retention and its originality as provided under sections 5 and 6 of the Electronic Transaction Ordinance, 2002 (LI of 2002).
- ❖ Any person who contravenes the provisions of this section shall be punished with imprisonment for a term which may extend to six months or with fine which may extend to or with both.



# **WARRANT FOR DISCLOSURE OF DATA**

# WARRANT FOR DISCLOSURE OF DATA

The policy for warrant for disclosure of data Under Pakistan Electronic Crime act 2015 are as follows

- ❖ Upon an application by an investigating officer that demonstrates to the satisfaction of the Court that there exist reasonable grounds to believe that specified data stored in an information system is reasonably required for the purpose of a criminal investigation or criminal proceedings with respect to an offence made out under this Act, the Court may, after recording reasons, order that a person in control of the information system or data to provide such data or access to such data to the investigating officer.
  - ❖ The period of a warrant issued under sub-section (1) may be extended beyond seven days if, on an application, a Court authorizes an extension for a further period of time as may be specified by the Court.
- 

**THANK YOU**

# PROSECUTION AND TRAIL OF OFFENCES

Lesson # 11



# LECTURE OVER VIEW

- Offences to be compoundable and non-cognizable
- Prosecution and trial of offences
- Order of payment of compensation

# **OFFENCES TO BE COMPOUNDABLE AND NON-COGNIZABLE**

# OFFENCES TO BE COMPOUNDABLE AND NON-COGNIZABLE

## CYBER OFFENCES

There are about 19 cyber offences defined in Pakistan Ordinance No. LXXII or 2007 to make provision for prevention of the electronic / cyber crimes

### OFFENCES

- ❖ Criminal Access
- ❖ Cyber Stalking
- ❖ Spamming
- ❖ Spoofing
- ❖ Unauthorized Interception
- ❖ Cyber Terrorism
- ❖ Criminal Data Access

# Contd..

- ❖ Unauthorized Access to Code
- ❖ Misuse of Encryption
- ❖ Malicious Code
- ❖ Enhanced Punishment For Offences Involving Sensitive
- ❖ Data Damage
- ❖ System Damage
- ❖ Electronic Fraud
- ❖ Electronic Forgery
- ❖ Misuse of Electronic System or Electronic Device
- ❖ Offences By Corporate Body

# **PROSECUTION AND TRIAL OF OFFENCES**

# PROSECUTION AND TRIAL OF OFFENCES

It is critically important to explore factors delaying investigation and prosecution of cyber crime offending to raise awareness and expose these barriers to justice

- ❖ Criminal Activities Perpetrated Electronically
- ❖ Law Enforcement and Policing
- ❖ Investigating Cyber Crime
- ❖ Impediments to Evidence Discovery and Analysis

# **ORDER FOR PAYMENT OF COMPENSATION**

# ORDER FOR PAYMENT OF COMPENSATION

- ❖ Punishment Of Imprisonment
- ❖ Fine
- ❖ Compensation To Victim



# **PREVENTION MEASURES FOR CYBER CRIMES**

Lesson # 12

# LECTURE OVER VIEW

- ▶ Cyber Crime Cases
- ▶ Protection of Credit Cards and Bank Accounts
- ▶ Secure IT Infrastructure
- ▶ Password Policy
- ▶ Awareness for Staff and Organizations

# **CYBER CRIME CASES**

# CYBER CRIME CASES

## ▶ Thursday, 13-Sept-2012

2 Cyber Criminals arrested in Bahawalpur

## ▶ Cyber Crimes against Pakistani women

## ▶ January 02, 2016

FIA cyber crime lodges first case of 2016

### DANGERS AHEAD

#### Websec: 2014 security predictions

- Advanced malware volume will decrease
- Attacks will lure executives and compromise organizations via professional social networks
- Attacker will be more interested in cloud data than your network
- As social networking continues to appeal to the business community in 2014, attackers will use professional websites to research and lure executives
- Perkit, Neatino and other exploit kits will rise for power following the arrest of Blackhole's creator
- Cybercriminals will target the weakest links in the information chain
- Java will remain highly exploitable and exploited—with greater repercussions
- Cybercriminals will devote more time to finding new uses for tired-and-true attacks and crafting



# **PROTECTION OF CREDIT CARDS AND BANK ACCOUNTS**

# PROTECTION OF CREDIT CARDS AND BANK ACCOUNTS

- Credit Card Safety First
- Keep Your Account Number Private
- Be Careful With Your Receipts
- Be Sure Your Device And Networks Are Secure
- Think Credit Card Protection When Shop Online
- Keep Your Password Secret
- Check Your Account Often
- Report Loss Card And Suspected Fraud Right Away



# SECURE IT INFRASTRUCTURE

# SECURE IT INFRASTRUCTURE



## ➤ **Logical Network Security Segmentation**

- Network Security Zones
- Restricted Zone
- Management Zone

## ➤ **Security Event Logging**

## ➤ **Network Intrusion Detection and Prevention Systems**

## ➤ **Packet Capture**

# PASSWORD POLICY

# PASSWORD POLICY



This policy is designed to protect the organizational resources on the network by requiring strong passwords along with protection of these passwords, and establishing a minimum time between changes to passwords.

- Password Protection
- Password Requirements
- Choosing Passwords

# **AWARENESS FOR STAFF AND ORGANIZATION**



# AWARENESS FOR STAFF AND ORGANIZATION

Awareness learning needs to enter the 21<sup>st</sup> Century

- 49% Intentional attack by external hackers, criminals, terrorists or activists.
- 45% unintentional Error by Employees or Contractors.
- 40% Intentional Attacks by Employees or Contractors.
- 17% Third party suppliers or joint venture partners as a route exploited by cyber criminals.

**THANK YOU**

# CYBER SECURITY STRATEGIC PLANNING FOR PAKISTAN

Lesson # 13

# CHALLENGES

- ▶ CYBER AWARENESS
  - ▶ LACK OF CYBER AWARENESS
  - ▶ NATIONAL CYBER SECURITY FORUM
  - ▶ ABSENCE OF REGIONAL COOPERATION
  - ▶ DIGITAL RIGHTS AND OBLIGATION
  - ▶ CYBER CENSORSHIP
  - ▶ UNCHECKED HACKTIVISM
- 

# **CYBER AWARENESS**



# CYBER AWARENESS

- ▶ Cyber security has yet to blip on the national radar.
  - ▶ No political party has included it on its manifesto.
  - ▶ No legislation on cyber issues in the parliament .
  - ▶ Police department, judiciary & lawyers have little/no knowledge and experience in investigating & prosecuting digital crimes.
  - ▶ No chamber of commerce runs any cyber security course or gives advice to businesses to secure their digital enterprises.
  - ▶ No policy in preventing import of hardware with embedded technologies.
  - ▶ None of the government agency, electronic media, higher education institute has a cyber security policy.
  - ▶ Digitally advanced countries organize cyber awareness days/weeks.
- 

# **LACK OF NATIONAL CYBER POLICY**



# LACK OF NATIONAL CYBER POLICY

- ▶ National cyber mandate & division of turf among multiple stakeholders i.e. It ministry, moi, most, mod, js hq, int agencies .
- ▶ National cyber strategy – issues such as protection of critical infrastructure & response to computer emergencies.
- ▶ Cyber terrorism.
- ▶ Cyber criminal code .
- ▶ Laws to regulate online businesses .
- ▶ Cyber censorship – rules & policies .
- ▶ Foreign policy
  - how to respond diplomatically to cyber incidences .
  - policy for delegates attending the GGE conferences at the un, internet governance conferences & international seminars .
  - policy guidelines for engagement with ITU.
- ▶ Defense policy – how to react to various kinds of attacks .

# **NATIONAL CYBER SECURITY FORUM**



# NATIONAL CYBER SECURITY FORUM

Government to create a national cyber security forum and designate a lead ministry /Agency .

- ▶ Lead ministry to publish a national calendar for holding cyber security seminars .
  - ▶ Lead ministry to organize national cyber security drills more than once annually .
  - ▶ Lead ministry to run courses for parents to digitally monitor their children.
  - ▶ Universities to group together to promote cyber security education under the umbrella of the HEC .
- 

# **ABSENCE OF REGIONAL CO-OPERATION**

# ABSENCE OF REGIONAL CO-OPERATION

- ▶ Countries are cooperating jointly and en bloc in cyber security issues i.e. Asian is very active in this regard.
  - ▶ There is no bilateral or regional cooperation in South Asia. SAARC can provide an important forum for cyber security .
- 

# **DIGITAL RIGHTS AND OBLIGATIONS**



# DIGITAL RIGHTS AND OBLIGATIONS

- ▶ Is our Government aware of its national digital obligations?

In matters like enforcing un convention on right of children (UNRC) preventing children pornography through digital means .

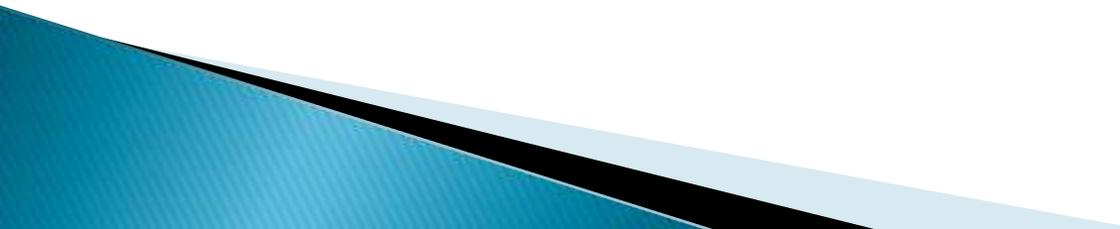
- ▶ What are a citizen's digital rights?

To access all kinds of websites .

- ▶ What are the citizen's obligations?

To prevent cyber bullying/sexual harassment & reporting illegal activity in cyber space .

# **CYBER CENSORSHIP**



# CYBER CENSORSHIP

**Cyber censorship** is of what can be accessed, published, or viewed on the Internet. Cyber censorship can be implemented by:

- ▶ National policy for handling digital incidents e.g. The YouTube incident .
  - ▶ Stronger filters for pornographic sites .
  - ▶ Efficient mechanisms to control preventing spread of hate literature & operations of prohibited organizations .
- 

# UNCHECKED HACKTIVISM



# UNCHECKED HACKTIVISM

- ▶ Uncontrolled hacktivism now forms part of the India Pakistan rivalry.
  - ▶ Independent group of hackers with colorful names like Pakistan cyber army, Indian cyber army, Pakistan hackers club, Pakhaxors, predators PK, Hindustan hacker's organization defaces an Indian or Pakistani website.
  - ▶ Mostly the homepage is littered with poorly- worded patriotic statements and taunts that often provoke the other nation's hacking groups to retaliate.
- 

# UNCHECKED HACKTIVISM ....

- ▶ The homepage is defaced and replaced with juvenile comments. Often, these hackers block visitors' access to important information. Such acts, of course, lead to more cyber defacements, with the most "coveted" targets being government websites. A cyber-attack is usually triggered by some act of violence or aggression from the rival country. Within a span of hours, these groups of hackers locate a high-value website that doesn't have adequate cyber security in place, and gains root access to the web server by hacking into it.
- 

# Reference

KTH-SEECs Applied Information Security (AIS) Lab



# CYBER CRIME AND LAW : INTERNATIONAL PERSPECTIVE

Lesson # 14

# CHALLENGES

- ▶ What is a gTLD?
  - ▶ What is a ccTLD?
  - ▶ International Cyber Crime
  - ▶ International Jurisdiction
  - ▶ Convention on Cyber Crime
  - ▶ Role of ICANN in Internet Regulation
- 

**WHAT IS A gTLD?**

# WHAT IS A gTLD?

- ▶ A gTLD is a generic top level domain. It is the top-level domain of an Internet address, for example: .com, .NET and .org.
- ▶ In addition, seven new gTLDs were also selected by ICANN (the Internet Corporation for Assigned Names and Numbers) on November 16, 2000.
- ▶ These are:
  - .aero (for the entire aviation community)
  - .biz (for business purposes)
  - .coop (for cooperatives)
  - .info (unrestricted)
  - .museum (for museums)
  - .name (for personal names)
  - .pro (for professionals).

**WHAT IS A ccTLD?**



# WHAT IS A ccTLD?

- ▶ A ccTLD is a country code top-level domain, for example: .mx for Mexico.
  - ▶ These ccTLDs are administered independently by nationally designated registration authorities.
  - ▶ There are currently 252 ccTLDs reflected in the database of the Internet Assigned Numbers Authority (IANA).
  - ▶ WIPO, which has a ccTLD Program, has launched a database portal, facilitating online searches for information related to country code top level domains.
- 

# **INTERNATIONAL CYBER CRIME**



# INTERNATIONAL CYBER CRIME

- ▶ There is no commonly agreed single definition of “cyber crime”.
  - ▶ It refers to illegal internet-mediated activities that often take place in global electronic networks.
  - ▶ Cyber crime is "international" or "transnational" – there are ‘no cyber-borders between countries’.
  - ▶ International cybercrimes often challenge the effectiveness of domestic and international law and law enforcement.
- 

# **INTERNATIONAL JURISDICTION**



# INTERNATIONAL JURISDICTION

- ▶ International jurisdiction refers to the fact that the courts of a given country will be the most appropriate to hear and determine a case that has an international dimension.
  - ▶ A dispute has an international dimension where, for example, the parties have different nationalities or are not resident in the same country.
  - ▶ In such a situation the courts of several countries might have jurisdiction in the case, and we have what is known as a conflict of jurisdiction.
  - ▶ The rules of international jurisdiction lay down criteria for determining the country whose courts will have jurisdiction in the case.
- 

# CONVENTION ON CYBER CRIME

# CONVENTION ON CYBER CRIME

- ▶ The Convention on Cybercrime, also known as the Budapest Convention on Cybercrime or the Budapest Convention.
  - ▶ It is the first international treaty seeking to address Internet and computer crime by harmonizing national laws, improving investigative techniques, and increasing cooperation among nations.
  - ▶ It was drawn up by the Council of Europe in Strasbourg, France, with the active participation of the Council of Europe's observer states Canada, Japan, South Africa and the United States.
- 

# **ROLE OF ICANN IN INTERNET REGULATION**

# ROLE OF ICANN IN INTERNET REGULATION

- ▶ To reach another person on the Internet you have to type an address into your computer -- a name or a number. That address must be unique so computers know where to find each other.
  - ▶ ICANN coordinates these unique identifiers across the world. Without that coordination, we wouldn't have one global Internet.
  - ▶ In more technical terms, the Internet Corporation for Assigned Names and Numbers (ICANN) coordinates the Internet Assigned Numbers Authority (IANA) functions, which are key technical services critical to the continued operations of the Internet's underlying address book, the Domain Name System (DNS).
- 

# ROLE OF ICANN IN INTERNET REGULATION....

The IANA functions include:

- ▶ The coordination of the assignment of technical protocol parameters including the management of the address and routing parameter area (ARPA) top-level domain
  - ▶ The administration of certain responsibilities associated with Internet DNS root zone management such as generic (gTLD) and country code (ccTLD) Top-Level Domains.
  - ▶ The allocation of Internet numbering resources; and other services. ICANN performs the IANA functions under a U.S. Government contract.
- 

# REFERENCE

[http://ec.europa.eu/justice/glossary/international-jurisdiction\\_en.htm](http://ec.europa.eu/justice/glossary/international-jurisdiction_en.htm)

[https://en.wikipedia.org/wiki/Convention\\_on\\_Cybercrime](https://en.wikipedia.org/wiki/Convention_on_Cybercrime)

<https://www.icann.org/resources/pages/welcome-2012-02-25-en>

<http://www.wipo.int/amc/en/center/faq/domains.html#1>

**THANK YOU**





# CYBER LAW COMPLIANCE

Lesson # 15

# CHALLENGES

- ▶ Need of Cyber Law
  - ▶ Laws of Electronic Transactions
  - ▶ Electronic Transactions Ordinance 2002
  - ▶ International Consensus Principles
  - ▶ Cyber Laws Situation in Pakistan
- 

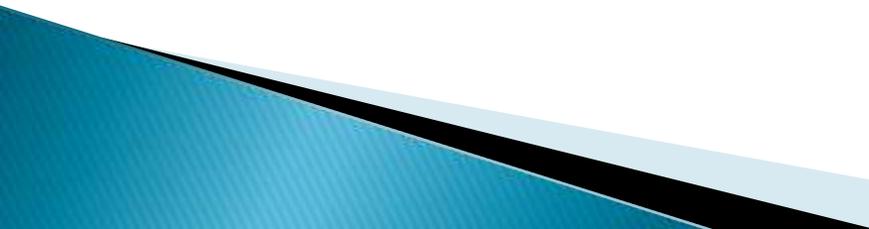
# NEED OF CYBER LAW

- ▶ Trade and business communications through electronic means give rise to a number of legal issues.
  - ▶ For instance if a service were sold over the Internet across countries, in which geographical location can the transaction be deemed to have occurred? This question may be important from the point of view of consumer protection and establishing jurisdiction.
  - ▶ Furthermore electronic transactions require electronic contracts and electronic signatures which have not been provided for in the contract laws of many countries. Most countries that wished to participate in electronic commerce needed to undertake major legislative reforms in this regard.
- 

# LAWS FOR ELECTRONIC TRANSACTION

- ▶ United Nations Commission on International Trade Law (UNCITRAL) is a core legal body of United Nations with universal membership, specializing in commercial law reform.
  - ▶ In order to increase trade worldwide, UNCITRAL is formulating modern, fair, harmonized rules on commercial transactions, including;
  - ▶ Conventions, model laws and rules that are acceptable worldwide.
  - ▶ Legal and legislative guides and recommendations of great practical value.
  - ▶ Technical assistance in law reform projects.
- 

**A report was prepared by the UNCITRAL experts on “Legal value of computer records” and based on that report the Commission adopted the following recommendations to states to review legal requirements:**

- Affecting the use of computer records as evidence in litigation.
  - That certain trade transactions or trade related documents be in writing.
  - Necessitate handwritten signature or other paper-based method of authentication on trade related documents; and
  - That documents for submission to governments be in writing and manually signed .
- 

# ELECTRONIC TRANSACTIONS ORDINANCE 2002

Government of Pakistan adopted its IT Policy in the year 2000 and after studying UNCITRAL model laws, looking at various legislations of both Civil and Common law countries, reviewing different implementation schemes of electronic authentication, regulatory models and best practice guidelines and appreciating the above-mentioned three approaches being followed all over the world, has followed the “International Consensus Principals on Electronic Authentication” designed by Internet Law and Policy Forum and “two-tier” approach.

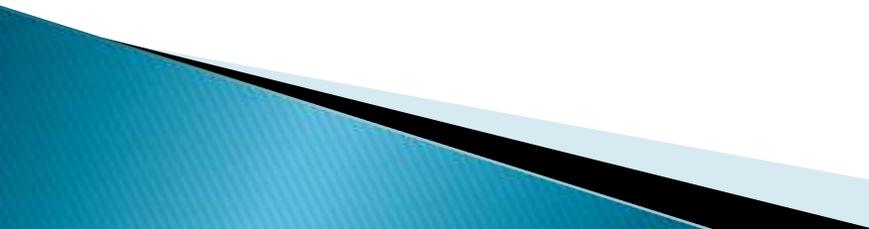


# TWO-TIER APPROACH

- ▶ Some jurisdictions have begun to realize that first two approaches are not necessarily mutually exclusive, and so have adopted “two tier” approach representing convergence and synthesis of the first two approaches.
  - ▶ This consolidated approach generally takes the form of enacting laws that prescribe standards for operation of PKIs, and concurrently take a broad view of what constitutes a valid electronic signature for legal purposes.
  - ▶ This “two-tier” approach has found increasing support, most notably in the European Union and Singapore.
- 

# INTERNATIONAL CONSENSUS PRINCIPLES

International Consensus Principles prepared by Internet law and Policy Forum (ILPF) in Sept' 2000 to create a predictable legal environment are as below:

- ▶ Remove legal barriers to electronic authentication.
  - ▶ Respect freedom of contract and parties' ability to set provisions by agreement.
  - ▶ Harmonization: make laws governing electronic authentication consistent across jurisdictions.
  - ▶ Avoid discrimination and erection of non-tariff barriers.
  - ▶ Allow use of current or future means of electronic authentication.
- 

# CYBER LAW SITUATION IN PAKISTAN

- ▶ Overall the situation of cyber laws is very encouraging in Pakistan and we are ahead of many developing countries in this respect.
- ▶ **The Analysis of the above laws shows that :**
  - There should be some well-coordinated effort to critically review drafts already prepared.
  - Prepare drafts of remaining required laws with single focal point in the Federal Government to avoid conflicts, overlapping and gaps.

# Reference

<http://www.supremecourt.gov.pk/ijc/articles/10/1.pdf>