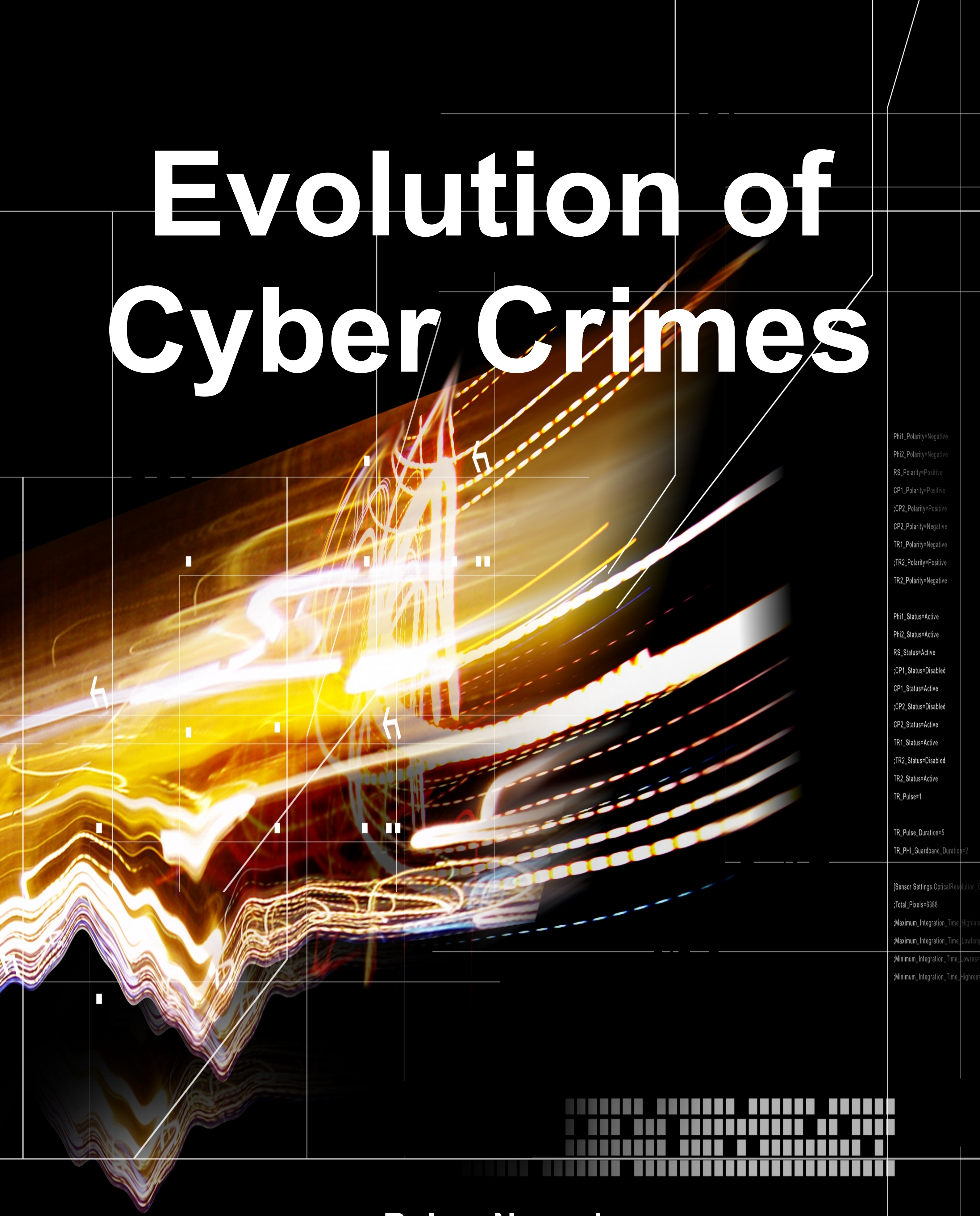
Evolution of Cyber Crimes



Rohas Nagpal
Asian School of Cyber Laws

About the author

Rohas Nagpal is the founder President of Asian School of Cyber Laws.

He advises Governments and corporates around the world in cyber crime investigation and cyber law related issues. He has assisted the Government of India in drafting rules and regulations under the Information Technology Act, 2000.

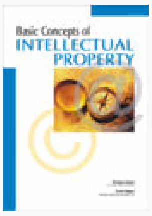
He has authored several books, papers and articles on cyber law, cyber terrorism, cyber crime investigation and financial law.

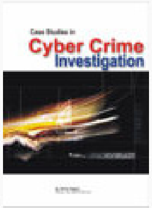
Rohas lives in Pune (India) and blogs @ rohasnagpal.com

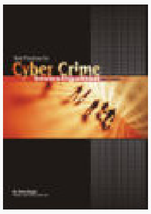
Some of the papers authored by Rohas Nagpal

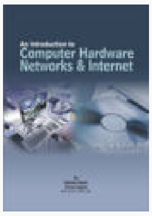
1. Internet Time Theft & the Indian Law
2. Legislative Approach to Digital Signatures
3. Indian Legal position on Cyber Terrorism
4. Defining Cyber Terrorism
5. The mathematics of terror
6. Cyber Terrorism in the context of Globalisation
7. Biometric based Digital Signature Scheme

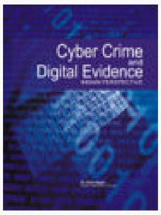
Some of the books authored by Rohas Nagpal

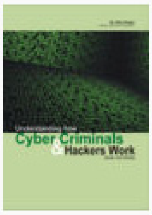


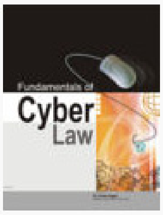


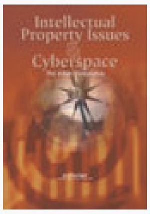


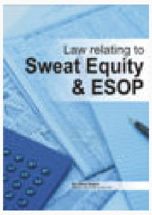












1. Evolution of cyber crime

The first recorded cyber crime took place in the year 1820!

That is not surprising considering the fact that the abacus, which is thought to be the earliest form of a computer, has been around since 3500 B.C. in India, Japan and China. The era of modern computers, however, began with the analytical engine of Charles Babbage.

In 1820, Joseph-Marie Jacquard, a textile manufacturer in France, produced the loom. This device allowed the repetition of a series of steps in the weaving of special fabrics. This resulted in a fear amongst Jacquard's employees that their traditional employment and livelihood were being threatened. They committed acts of sabotage to discourage Jacquard from further use of the new technology. This is the first recorded cyber crime!

Today, computers have come a long way with neural networks and nano-computing promising to turn every atom in a glass of water into a computer capable of performing a billion operations per second.

In a day and age when everything from microwave ovens and refrigerators to nuclear power plants are being run on computers, cyber crime has assumed rather sinister implications.

Cyber crime can involve criminal activities that are traditional in nature, such as theft, fraud, forgery, defamation and mischief. The abuse of computers has also given birth to a gamut of new age crimes such as hacking, web defacement, cyber stalking, web jacking etc.

A simple yet sturdy definition of cyber crime would be "**unlawful acts wherein the computer is either a tool or a target or both**".

The term computer used in this definition does not only mean the conventional desktop or laptop computer. It includes Personal Digital Assistants (PDA), cell phones, sophisticated watches, cars and a host of gadgets.

Recent global cyber crime incidents like the targeted denial of service attacks on Estonia have heightened fears. Intelligence agencies are preparing against coordinated cyber attacks that could disrupt rail and air traffic controls, electricity distribution networks, stock markets, banking and insurance systems etc.

Unfortunately, it is not possible to calculate the true social and financial impact of cyber crime. This is because most crimes go unreported.

1.1 Financial Crimes

Money is the most common motive behind all crime. The same is also true for cyber crime. Globally it is being observed that more and more cyber crimes are being committed for financial motives rather than for “revenge” or for “fun”.

With the tremendous increase in the use of internet and mobile banking, online share trading, dematerialization of shares and securities, this trend is likely to increase unabated.

Financial crimes include cyber cheating, credit card frauds, money laundering, hacking into bank servers, computer manipulation, accounting scams etc.

Illustration 1
Punjab National Bank in India was cheated to the tune of Rs. 13.9 million through false debits and credits in computerized accounts.

Illustration 2
Rs. 2,50,000 were misappropriated from Bank of Baroda in India through falsification of computerized bank accounts.

Illustration 3
The Hyderabad police in India arrested an unemployed computer operator and his friend, a steward in a prominent five-star hotel, for stealing and misusing credit card numbers belonging to hotel customers.

The steward noted down the various details of the credit cards, which were handed by clients of the hotel for paying their bills. Then, he passed all the details to his computer operator friend who used the details to make online purchases on various websites.

Illustration 4
In 2004, the US Secret Service investigated and shut down an online organization that trafficked in around 1.7 million stolen credit cards and stolen identity information and documents.

This high-profile case, known as “Operation Firewall,” focused on a criminal organization of some 4,000 members whose Web site functioned as a hub for identity theft activity.

Illustration 5

In 2003, a hacker was convicted in the USA for causing losses of almost $25 million. The defendant pleaded guilty to numerous charges of conspiracy, computer intrusion, computer fraud, credit card fraud, wire fraud, and extortion.

The hacker and his accomplices from Russia had stolen usernames, passwords, credit card information, and other financial data by hacking into computers of US citizens. They would then extort money from those victims with the threat of deleting their data and destroying their computer systems.

1.2 Cyber Pornography

Cyber pornography is believed to be one of the largest businesses on the Internet today. The millions of pornographic websites that flourish on the Internet are testimony to this. While pornography per se is not illegal in many countries, child pornography is strictly illegal in most nations today.

Cyber pornography covers pornographic websites, pornographic magazines produced using computers (to publish and print the material) and the Internet (to download and transmit pornographic pictures, photos, writings etc).

Illustration 1
A school student from Delhi (India), who was regularly teased for having a pockmarked face, used a free hosting provider to create www.amazing-gents.8m.net.

He regularly uploaded “morphed” photographs of teachers and girls from his school onto the website. He was arrested when the father of one of the victims reported the case to the police.

Illustration 2
The CEO of online auction website bazee.com (a part of the ebay group) was arrested by the Delhi police for violating India’s strict laws on cyber pornography. An engineering student was using the bazee website to sell a video depicting two school students having sexual intercourse. Bazee.com was held liable for distributing porn and hence the CEO was arrested.

Illustration 3
The CEO of a software company in Pune (India) was arrested for sending highly obscene emails to a former employee.

1.3 Sale of Illegal Articles

It is becoming increasingly common to find cases where sale of illegal articles such as narcotics drugs, weapons, wildlife etc. is being facilitated by the Internet. Information about the availability of the products for sale is being posted on auction websites, bulletin boards etc.

It is practically impossible to control or prevent a criminal from setting up a website to transact in illegal articles. Additionally, there are several online payment gateways that can transfer money around the world at the click of a button.

The Internet has also created a marketplace for the sale of unapproved drugs, prescription drugs dispensed without a valid prescription, or products marketed with fraudulent health claims.

Many sites focus on selling prescription drugs and are referred to by some as "Internet pharmacies." These sites offer for sale either approved prescription drug products, or in some cases, unapproved, illegal versions of prescription drugs. This poses a serious potential threat to the health and safety of patients.

The broad reach, relative anonymity, and ease of creating new or removing old websites, poses great challenges for law enforcement officials.

Illustration

In March 2007, the Pune rural police cracked down on an illegal rave party and arrested hundreds of illegal drug users. The social networking site Orkut.com is believed to be one of the modes of communication for gathering people for the illegal "drug" party.

1.4 Online Gambling

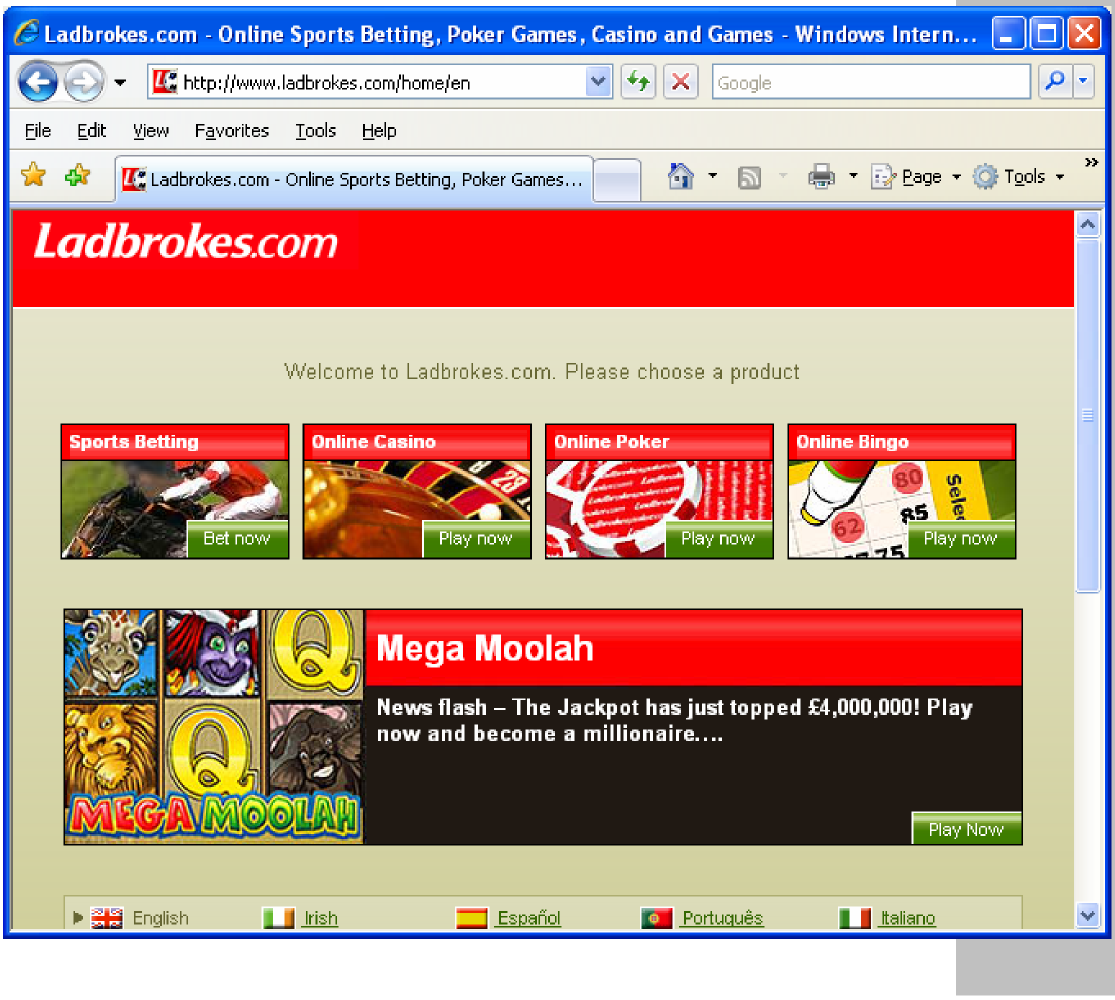
There are thousands of websites that offer online gambling. The special issue with online gambling is that it is legalised in several countries. So legally the owners of these websites are safe in their home countries.

The legal issues arise when a person residing in a foreign country like India (where such websites are illegal) gambles on such a website.

Illustration

The website **ladbrokes.com** permits users to gamble on a variety of sports such as cricket, football, tennis, golf, motor racing, ice hockey, basketball, baseball, darts, snooker, boxing, athletics, rugby, volleyball, motor cycling etc.

Additionally it also features an online casino. The website has no technical measures in place to prohibit residents of certain countries (where online gambling is illegal) from betting at their website.



Ladbrokes.com - Online Sports Betting, Poker Games, Casino and Games - Windows Intern...

http://www.ladbrokes.com/home/en

Welcome to Ladbrokes.com. Please choose a product

Mega Moolah

News flash – The Jackpot has just topped £4,000,000! Play now and become a millionaire....

1.5 Intellectual Property Crimes

These include software piracy, copyright infringement, trademarks violations, theft of computer source code etc.

Illustration 1

A software professional from **Bangalore** (India) was booked for stealing the source code of a product being developed by his employers. He started his own company and allegedly used the stolen source code to launch a new software product.

Illustration 2

In 2003, a computer user in **China** obtained the source code of a popular **game** - LineageII from an unprotected website. This proprietary code was then sold to several people in 2004. One of those people set up a website, www.l2extreme.com, to offer the "Lineage" game at a discount.

Despite legal warnings from the South Korean company that owned the Lineage source code, the suspect did not shut down the site. He rented powerful servers - enough to accommodate 4,000 simultaneous gamers - and solicited donations from users to help defray the costs.

The loss in potential revenues for the South Korean company was estimated at $750,000 a month. The US FBI arrested the suspect and the website was shut down.

1.6 Email Spoofing

A spoofed email is one that appears to originate from one source but actually has been sent from another source e.g Pooja has an e-mail address pooja@asianlaws.org.

Her ex-boyfriend, Sameer spoofs her e-mail and sends obscene messages to all her acquaintances. Since the e-mails appear to have originated from Pooja, her friends may take offence and relationships may be spoiled for life.

Illustration 1
In an American case, a teenager made millions of dollars by spreading false information about certain companies whose shares he had short sold.

This misinformation was spread by sending spoofed emails, purportedly from news agencies like Reuters, to share brokers and investors who were informed that the companies were doing very badly.

Even after the truth came out the values of the shares did not go back to the earlier levels and thousands of investors lost a lot of money.

Illustration 2
A branch of the erstwhile Global Trust Bank in India experienced a run on the bank. Numerous customers decided to withdraw all their money and close their accounts.

An investigation revealed that someone had sent out spoofed emails to many of the bank's customers stating that the bank was in very bad shape financially and could close operations at any time. The spoofed email appeared to have originated from the bank itself.

1.7 Forgery

Counterfeit currency notes, postage and revenue stamps, mark sheets, academic certificates etc are made by criminals using sophisticated computers, printers and scanners.

Illustration 1
In October 1995, Economic Offences Wing of Crime Branch, Mumbai (India), seized over 22,000 counterfeit share certificates of eight reputed companies worth Rs. 34.47 crores. These were allegedly prepared using Desk Top Publishing Systems.

Illustration 2
Abdul Kareem Telgi, along with several others, was convicted in India on several counts of counterfeiting stamp papers and postage stamps totalling several billion rupees.

1.8 Cyber Defamation

This occurs when defamation takes place with the help of computers and / or the Internet. e.g. Sameer publishes defamatory matter about Pooja on a website or sends e-mails containing defamatory information to Pooja’s friends.

Illustration 1
Abhishek, a teenaged student was arrested by the Thane police in India following a girl’s complaint about tarnishing her image in the social networking site Orkut. Abhishek had allegedly created a fake account in the name of the girl with her mobile number posted on the profile.

The profile had been sketched in such a way that it drew lewd comments from many who visited her profile. The Thane Cyber Cell tracked down Abhishek from the false e-mail id that he had created to open up the account.

Illustration 2
The Aurangabad bench of the Bombay high court issued a notice to Google.com following a public interest litigation initiated by a young lawyer.

The lawyer took exception to a community called ‘We hate India’, owned by someone who identified himself as Miroslav Stankovic. The community featured a picture of the Indian flag being burnt.

Illustration 3
Unidentified persons posted obscene photographs and contact details of a Delhi school girl. Suggestive names like ’sex teacher’ were posted on the profile.

The matter came to light after the girl’s family started receiving vulgar calls referring to Orkut.

1.9 Cyber Stalking

Cyber stalking refers to the use of the Internet, e-mail, or other electronic communications devices to stalk another person.

Stalking generally involves harassing or threatening behaviour that an individual engages in repeatedly, such as following a person, appearing at a person's home or place of business, making harassing phone calls, leaving written messages or objects, or vandalizing a person's property.

Most stalking laws require that the perpetrator make a credible threat of violence against the victim; others include threats against the victim's immediate family.

Illustration 1

In the first successful prosecution under the California (USA) cyber stalking law, prosecutors obtained a guilty plea from a 50-year-old former security guard who used the Internet to solicit the rape of a woman who rejected his romantic advances.

He terrorized the 28-year-old victim by impersonating her in various Internet chat rooms and online bulletin boards, where he posted, along with her telephone number and address, messages that she fantasized about being raped.

On at least six occasions, sometimes in the middle of the night, men knocked on the woman's door saying they wanted to rape her.

Illustration 2

An honours graduate from the University of San Diego in USA terrorized five female university students over the Internet for more than a year.

The victims received hundreds of violent and threatening e-mails, sometimes receiving four or five messages a day.

The student, who pleaded guilty, told the police that he had committed the crimes because he thought the women were laughing at him and causing others to ridicule him. In reality, the victims had never met him.

Illustration 3

In 2005, a minor from Massachusetts (USA) was convicted in connection with approximately $1 million in victim damages.

Over a 15-month period, he had hacked into Internet and telephone service providers, stolen an individual’s personal information and posted it on the Internet, and made bomb threats to many high schools.

1.10 Web defacement

Website defacement is usually the substitution of the original home page of a website with another page (usually pornographic or defamatory in nature) by a hacker.

Religious and government sites are regularly targeted by hackers in order to display political or religious beliefs. Disturbing images and offensive phrases might be displayed in the process, as well as a signature of sorts, to show who was responsible for the defacement.

Websites are not only defaced for political reasons, many defacers do it just for the thrill. For example, there are online contests in which hackers are awarded points for defacing the largest number of web sites in a specified amount of time. Corporations are also targeted more often than other sites on the Internet and they often seek to take measures to protect themselves from defacement or hacking in general.

Web sites represent the image of a company or organisation and these are therefore especially vulnerable to defacement. Visitors may lose faith in sites that cannot promise security and will become wary of performing online transactions. After defacement, sites have to be shut down for repairs, sometimes for an extended period of time, causing expenses and loss of profit.

Illustration 1

Mahesh Mhatre and Anand Khare (alias Dr Neukar) were arrested in 2002 for allegedly defacing the website of the Mumbai Cyber Crime Cell.

They had allegedly used password cracking software to crack the FTP password for the police website. They then replaced the homepage of the website with pornographic content. The duo was also charged with credit card fraud for using 225 credit card numbers, mostly belonging to American citizens.

Illustration 2

In 2001, over 200 Indian websites were hacked into and defaced. The hackers put in words like bugz, death symbol, Paki-king and allahhuakbar.

In the case of 123medicinindia.com, a message was left behind which said – “Catch me if uuu can my deraz lazy adminzzz" – challenging the system administrators to trace the miscreants.

The offenders were allegedly a group of hackers who go by the name of 'Pakistani Cyber Warriors'.

Illustration 3
In 2006, a Turkish hacker using the handle iSKORPiTX was able to breach the security of a group of web servers, containing more than 38,500 web sites in less than a day!

Illustration 4
The first Defacers Challenge took place on Sunday, July 6, 2003. There was a special prize for the first contestant to deface 6,000 web sites.

The contest was conducted over a six-hour period. Points were awarded based on the server's operating system.

Windows: 1 point,
Linux: 2 points,
BSD: 2 points,
AIX: 3 points,
HP-UX: 5 points
Macintosh: 5 points

1.11 Email Bombing

Email bombing refers to sending a large number of emails to the victim resulting in the victim's email account (in case of an individual) or mail servers (in case of a company or an email service provider) crashing.

Email bombing is a type of denial-of-service attack. A denial-of-service attack is one in which a flood of information requests is sent to a server, bringing the system to its knees and making the server difficult to access.

Illustration 1
A British teenager was cleared of launching a denial-of-service attack against his former employer, in a ruling under the UK Computer Misuse Act.

The teenager was accused of sending 5 million e-mail messages to his ex-employer that caused the company's e-mail server to crash. The judge held that the UK Computer Misuse Act does not specifically include a denial-of-service attack as a criminal offence.

Illustration 2
In one case, a foreigner who had been residing in Simla, India for almost 30 years wanted to avail of a scheme introduced by the Simla Housing Board to buy land at lower rates. When he made an application it was rejected on the grounds that the scheme was available only for citizens of India.

He decided to take his revenge. Consequently, he sent thousands of mails to the Simla Housing Board and repeatedly kept sending e-mails till their servers crashed.

1.12 Data Diddling

One of the most common forms of computer crime is data diddling - illegal or unauthorized data alteration. These changes can occur before and during data input or before output. Data diddling cases have affected banks, payrolls, inventory records, credit records, school transcripts and virtually all other forms of data processing known.

Illustration 1
The NDMC Electricity Billing Fraud Case that took place in 1996 is a typical example. The computer network was used for receipt and accounting of electricity bills by the New Delhi Municipal Council.

Collection of money, computerized accounting, record maintenance and remittance in the bank were exclusively left to a private contractor who was a computer professional.

He misappropriated huge amount of funds by manipulating data files to show less receipt and bank remittance.

Illustration 2
A keyboard operator processing orders at an Oakland USA department store changed some delivery addresses and diverted several thousand dollars worth of store goods into the hands of accomplices.

Illustration 3
A ticket clerk at the Arizona Veterans' Memorial Coliseum in USA issued full-price basketball tickets, sold them and then, tapping out codes on her computer keyboard, recorded the transactions as half-price sales.

1.13 Salami Attacks

These attacks are used for committing financial crimes. The key here is to make the alteration so insignificant that in a single case it would go completely unnoticed.

For instance, a bank employee inserts a program, into the bank's servers, that deducts a small amount of money (say Rs. 2 a month) from the account of every customer. No account holder will probably notice this unauthorized debit, but the bank employee will make a sizeable amount of money every month.

The attack is called "salami attack" as it is analogous to slicing the data thinly, like a salami.

Illustration 1
Four executives of a rental-car franchise in Florida USA defrauded at least 47,000 customers using a salami technique.

They modified a computer billing program to add five extra gallons to the actual gas tank capacity of their vehicles.

From 1988 through 1991, every customer who returned a car without topping it off ended up paying inflated rates for an inflated total of gasoline.

The thefts ranged from $2 to $15 per customer - difficult for the victims to detect.

Illustration 2
In January 1997, Willis Robinson of Maryland USA, was sentenced to 10 years in prison for "having reprogrammed his Taco Bell drive-up-window cash register - causing it to ring up each $2.99 item internally as a 1-cent item, so that he could pocket $2.98 each time".

The management assumed the error was hardware or software and only caught the perpetrator when he bragged about his crime to co-workers.

Illustration 3
In Los Angeles USA four men were charged with fraud for allegedly installing computer chips in gasoline pumps that cheated consumers by overstating the amounts pumped.

The problem came to light when an increasing number of consumers claimed that they had been sold more gasoline than the capacity of their gas tanks!

However, the fraud was difficult to prove initially because the perpetrators programmed the chips to deliver exactly the right amount of gasoline when asked for five- and 10-gallon amounts (precisely the amounts typically used by inspectors).

1.14 Denial of Service Attack

Denial of Service attacks (DOS attacks) involve flooding a computer with more requests than it can handle. This causes the computer (e.g. a web server) to crash and results in authorized users being unable to access the service offered by the computer.

Another variation to a typical denial of service attack is known as a Distributed Denial of Service (DDoS) attack wherein the perpetrators are many and are geographically widespread.

Illustration 1
A series of distributed denial of service attacks in February 2000 crippled many popular websites including yahoo.com, amazon.com and cnn.com

Illustration 2
A series of more than 125 separate but coordinated denial of service attacks hit the cyber infrastructure of Estonia in early 2007.

The attacks were apparently connected with protests against the Estonian government's decision to remove a Soviet-era war memorial from the capital city.

It is suspected that the attacks were carried out by Russian hackers. The attack lasted several days.

1.15 Virus / Worm Attacks

Computer viruses are small software programs that are designed to spread from one computer to another and to interfere with computer operation. A virus might corrupt or delete data on the victim's computer, use the victim's e-mail program to spread itself to other computers, or even erase everything on the victim's hard disk.

Viruses are most easily spread by attachments in e-mail messages or instant messaging messages. Viruses can be disguised as attachments of funny images, greeting cards, or audio and video files. Viruses can also spread through downloads on the Internet. They can be hidden in illicit software or other files or programs.

Worms, unlike viruses do not need the host to attach themselves to. They merely make functional copies of themselves and do this repeatedly till they eat up all the available space on a computer's memory.

Brain (in its first incarnation written in January 1986) is considered to be the first computer virus for the PC. The virus is also known as Lahore, Pakistani, Pakistani Brain, Brain-A and UIUC. The virus was written by two brothers, Basit and Amjad Farooq Alvi, who lived in **Lahore, Pakistan**. The brothers told TIME magazine they had written it to protect their medical software from piracy and was supposed to target copyright infringers only.

The virus came complete with the brothers' address and three phone numbers, and a message that told the user that their machine was infected and for inoculation the user should call them.

When the brothers began to receive a large number of phone calls from people in USA, Britain, and elsewhere, demanding them to disinfect their machines, the brothers were stunned and tried to explain to the outraged callers that their motivation had not been malicious.

They ended up having to get their phone lines cut off and regretted that they had revealed their contact details in the first place. The brothers are still in business in Pakistan as internet service providers in their company called **Brain Limited**.

Illustration 1

The VBS_LOVELETTER virus (better known as the Love Bug or the ILOVEYOU virus) was reportedly written by a Filipino undergraduate. In May 2000, this deadly virus became the world's most prevalent virus. Losses incurred during this virus attack were pegged at US $ 10 billion.

VBS_LOVELETTER utilized the addresses in Microsoft Outlook and e-mailed itself to those addresses. The e-mail, which was sent out, had “ILOVEYOU” in its subject line. The attachment file was named “LOVE-LETTER-FOR-YOU.TXT.vbs”.

People wary of opening e-mail attachments were conquered by the subject line and those who had some knowledge of viruses, did not notice the tiny .vbs extension and believed the file to be a text file. The message in the e-mail was “kindly check the attached LOVELETTER coming from me”.

Illustration 2
Probably the world’s most famous worm was the Internet worm let loose on the Internet by Robert Morris sometime in 1988. The Internet was, then, still in its developing years and this worm, which affected thousands of computers, almost brought its development to a complete halt. It took a team of experts almost three days to get rid of the worm and in the meantime many of the computers had to be disconnected from the network.

Illustration 3
In 2002, the creator of the Melissa computer virus was convicted. The virus had spread in 1999 and caused more than $80 million in damage by disrupting personal computers, business and government computer networks.

Illustration 4
In 2006, a US citizen was convicted for conspiracy to intentionally cause damage to protected computers and commit computer fraud.

Between 2004 and 2005, he created and operated a malicious software to constantly scan for and infect new computers.

It damaged hundreds of US Department of Defence computers in USA, Germany and Italy. The software compromised computer systems at a Seattle hospital, including patient systems, and damaged more than 1,000 computers in a California school district.

Illustration 5

Logic bombs are event dependent programs. This implies that these programs are created to do something only when a certain event (known as a trigger event) occurs. e.g. even some viruses may be termed logic bombs because they lie dormant all through the year and become active only on a particular date (like the Chernobyl virus).

1.16 Trojans and Keyloggers

A Trojan, as this program is aptly called, is an unauthorized program which functions from inside what seems to be an authorized program, thereby concealing what it is actually doing.

Keyloggers are regularly used were to log all the strokes a victim makes on the keyboard. This assumes sinister proportions, if a key logger is installed on a computer which is regularly used for online banking and other financial transactions. Key-loggers are most commonly found in public computers such as those in cyber cafes, hotels etc. Unsuspecting victims also end up downloading spyware when they click on “friendly” offers for free software.

Illustration 1
A young lady reporter was working on an article about online relationships. The article focused on how people can easily find friendship and even love on the Internet. During the course of her research she made a lot of online friends. One of these ‘friends’ managed to infect her computer with a Trojan.

This young lady stayed in a small one bedroom apartment and her computer was located in one corner of her bedroom. Unknown to her, the Trojan would activate her web camera and microphone even when the Internet was switched off. A year later she realized that hundreds of her pictures were posted on pornographic sites around the world!

Illustration 2
The network administrator in a global bank received a beautifully packed CD ROM containing “security updates” from the company that developed the operating system that ran his bank’s servers.

He installed the “updates” which in reality was Trojanized software. 3 years later, the effects were still being felt in the bank’s system!

1.17 Internet Time Theft

This connotes the usage by an unauthorized person of the Internet hours paid for by another person.

Illustration

In May 2000, the Delhi police arrested an engineer who had misused the login name and password of a customer whose Internet connection he had set up.

The case was filed under the Indian Penal Code and the Indian Telegraph Act.

1.18 Web Jacking

Just as conventional hijacking of an airplane is done by using force, similarly web jacking means forcefully taking over control of a website. The motive is usually the same as hijacking – ransom. The perpetrators have either a monetary or political purpose which they try to satiate by holding the owners of the website to ransom.

This occurs when someone forcefully takes control of a website (by cracking the password and later changing it). The actual owner of the website does not have any more control over what appears on that website.

How does web jacking take place?

The administrator of any website has a password and a username that only he (or someone authorized by him) may use to upload files from his computer on the web server (simply put, a server is a powerful computer) where his website is hosted.

Ideally, this password remains secret with the administrator. If a hacker gets hold of this username and password, then he can pretend to be the administrator.

Computers don't recognize people – only usernames and passwords. The web server will grant control of the website to whoever enters the correct password and username combination.

There are many ways in which a hacker may get to know a password, the most common being password cracking wherein a "cracking software" is used to guess a password. Password cracking attacks are most commonly of two types.

The first one is known as the dictionary attack. In this type of attack the software will attempt all the words contained in a predefined dictionary of words.

For example, it may try Rahim, Rahul, Rakesh, Ram, Reema, Reena … in a predefined dictionary of Indian names. These types of dictionaries are readily available on the Internet.

The other form of password cracking is by using ‘brute force’. In this kind of attack the software tries to guess the password by trying out all possible combinations of numbers, symbols, letters till the correct password is found. For example, it may try out password combinations like abc123, acbd5679, sdj#%^, weuf*(-)*.

Some software, available for password cracking using the brute force technique, can check a huge number of password combinations per second.

When compared with a dictionary attack, a brute force attack takes more time, but it is definitely more successful.

Illustration

In an incident reported in the USA, the owner of a hobby website for children received an e-mail informing her that a group of hackers had gained control over her website. They demanded a ransom of 1 million dollars from her.

The owner, a schoolteacher, did not take the threat seriously. She felt that it was just a scare tactic and ignored the e-mail.

It was three days later that she came to know, following many telephone calls from all over the country, that the hackers had web jacked her website. Subsequently, they had altered a portion of the website which was entitled ‘How to have fun with goldfish’.

In all the places where it had been mentioned, they had replaced the word ‘goldfish’ with the word ‘piranhas’.

Piranhas are tiny but extremely dangerous flesh-eating fish. Many children had visited the popular website and had believed what the contents of the website suggested.

These unfortunate children followed the instructions, tried to play with piranhas, which they bought from pet shops, and were very seriously injured!

1.19 Email Frauds

> *Dear Mr. Justin Williams, I'm Vikas Manjit Singh from Punjab (India). I belong to a city named Ludhiana.*
>
> *Mr. Williams, I am having a brother in Canada who is also named Justin Williams. He was adopted from my parents by some Mr. William Ram of Welland. Me and my mum came over to Canada to leave Justin to his new family (William Ram's Family). It happened in June 1985.*
>
> *So Mr. Justin Williams, if you are the same person I'm talking about. Then please give me some time so that I can let you know the realities.*

Imagine the thoughts going through Mr. Justin William's head after reading this email. Is he really adopted? Where are his birth parents? Is this email from his birth brother?

In reality, this is a scam email originating from a college in Sangroor (India)! Canadian citizens are targeted with these emails. If the targets start believing the sender to be their brother, they are asked to send money so that their "brother" can travel to Canada with the proof of the victim's adoption!

This is just one of the hundreds of email scams being perpetrated on the Internet. These scams are commonly referred to as Nigerian 419 scams. These scam emails are believed to originate from Nigeria and section 419 of the Nigerian Penal Code relates to cheating (like the famous section 420 of the Indian Penal Code).

The 419 letter scams originated in the early 1980s as the oil-based economy of Nigeria went downhill. In the 1990s, letter scams gave way to email scams.

In 2007, Asian School of Cyber Laws conducted a 3 month intensive investigation of hundreds of scam emails. The results were very surprising to say the least. Less than 10% of these emails had actually originated from Nigeria!

A majority of these emails (more than 60%) have originated from Israel, followed by the Netherlands, UK and other European countries. The "birth brother" email was the only one originating from India.

Most of these scam emails promise the receiver millions (or sometimes billions) of dollars. Most commonly the email says that some rich African bureaucrat or businessman or politician has died and left behind a lot of money.

The scamster states that the Government is going to confiscate the money. The only way out is to transfer the money to the bank account of the email recipient. All that the email recipient has to do is send his bank account details. For this a generous fee of a few million dollars will be paid!

If someone actually falls for this scam and provides the bank details, he is sent some official looking documents relating to the bank transfer of a huge sum of money. Once the victim is convinced of the “genuineness” of the transaction, something appears to go wrong.

The victim is informed that a small amount of money (ranging from US$ 100 to 2500) is needed for bank charges or other paper work. This money is the motive behind the elaborate scam. Once the victim pays this money, the scamster disappears from the scene.

The lottery scam emails inform the recipient that he has won a million dollar lottery run by Microsoft, Yahoo or some other well known global company. The winner is asked to provide his bank details and pay a small sum for bank charges and other processing fees.

Another scam email begins with “This is to inform you that we are in possession of a consignment, deposited by British National Lottery which is to be couriered to you”. The email asks for 470 pounds to be sent to the courier company so that the cheque for the lottery prize can be sent.

Another scam email comes with the subject line “Blessed is the hand that giveth”. The sender claims to be a widow on her deathbed. She wants to donate her wealth to someone who will pray for her.

Another scam email comes from an “employee of the Euro Lottery”. The “employee” claims to be in a position to carry out a lottery fraud and is willing to share the money with the email recipient.

What is common in all these scams is that scanned versions of official documents are emailed to potential victims. Once the victim is convinced of the genuineness of the transaction, a small fee is requested for meeting bank charges / legal fees / courier charges etc. It is this small fee that is the motive behind the scam.

It is believed that thousands of people are defrauded of billions of dollars every year through these scams.

Illustration 1

In 2005, an Indian businessman received an email from the Vice President of a major African bank offering him a lucrative contract in return for a kickback of Rs 1 million.

The businessman had many telephonic conversations with the sender of the email. He also verified the email address of the 'Vice President' from the website of the bank and subsequently transferred the money to the bank account mentioned in the email. It later turned out that the email was a spoofed one and was actually sent by an Indian based in Nigeria.

Illustration 2

A new type of scam e-mail threatens to kill recipients if they do not pay thousands of dollars to the sender, who purports to be a hired assassin.

Replying to the e-mails just sends a signal to senders that they've reached a live account. It also escalates the intimidation.

In one case, a recipient threatened to call authorities. The scammer, who was demanding $20,000, reiterated the threat and sent some personal details about the recipient—address, daughter's full name etc. He gave an ultimatum:

"TELL ME NOW ARE YOU READY TO DO WHAT I SAID OR DO YOU WANT ME TO PROCEED WITH MY JOB? ANSWER YES/NO AND DON'T ASK ANY QUESTIONS!!!"

Some emails claim to be from the FBI in London and inform recipients that an arrest was made in the case.

The e-mail says the recipient's information was found with the suspect and that they should reply to assist in the investigation. These emails are part of the scam!

1.20 Cyber Terrorism

Computer crime has hit mankind with unbelievable severity. Computer viruses, worms, Trojans, denial of service attacks, spoofing attacks and e-frauds have taken the real and virtual worlds by storm.

However, all these pale in the face of the most dreaded threat – that of cyber terrorism.

Asian School of Cyber Laws has defined cyber terrorism as:

> Cyber terrorism is the premeditated use of disruptive activities, or the threat thereof, in cyber space, with the intention to further social, ideological, religious, political or similar objectives, or to intimidate any person in furtherance of such objectives.

Illustration 1
In 1996, a computer hacker allegedly associated with the White Supremacist movement temporarily disabled a US based Internet Service Provider (ISP) and damaged part of its record keeping system.

The ISP had attempted to stop the hacker from sending out worldwide racist messages under the ISP's name. The hacker signed off with the threat, "you have yet to see true electronic terrorism. This is a promise."

Illustration 2
In 1998, Spanish protestors bombarded the Institute for Global Communications (IGC) with thousands of bogus e-mail messages. E-mail was tied up and undeliverable to the ISP's users, and support lines were tied up with people who couldn't get their mail.
The protestors also spammed IGC staff and member accounts, clogged their Web page with bogus credit card orders, and threatened to employ the same tactics against organizations using IGC services.

They demanded that IGC stop hosting the website for the Euskal Herria Journal, a New York-based publication supporting Basque independence.

Protestors said IGC supported terrorism because a section on the Web pages contained materials on the terrorist group ETA, which claimed responsibility for assassinations of Spanish political and security officials, and attacks on military installations. IGC finally relented and pulled the site because of the "mail bombings."

Illustration 3
In 1998, a 12-year-old boy successfully hacked into the controls for the huge Roosevelt Dam on the Salt River in Arizona, USA.

He might have released floodwaters that would have inundated Mesa and Tempe, endangering at least 1 million people.

Illustration 4
In 2005, US security consultants reported that hackers were targeting the U.S. electric power grid and had gained access to U.S. utilities' electronic control systems.

Illustration 5
In 1998, ethnic Tamil guerrillas swamped Sri Lankan embassies with 800 e-mails a day over a two-week period.
The messages read "We are the Internet Black Tigers and we're doing this to disrupt your communications." Intelligence authorities characterized it as the first known attack by terrorists against a country's computer systems.

Illustration 6
During the Kosovo conflict in 1999, NATO computers were blasted with e-mail bombs and hit with denial-of-service attacks by hacktivists protesting the NATO bombings.

In addition, businesses, public organizations, and academic institutes received highly politicized virus-laden e-mails from a range of Eastern European countries, according to reports. Web defacements were also common.

Illustration 7
Since December 1997, the Electronic Disturbance Theater (EDT) has been conducting Web sit-ins against various sites in support of the Mexican Zapatistas.

At a designated time, thousands of protestors point their browsers to a target site using software that floods the target with rapid and repeated download requests.

EDT's software has also been used by animal rights groups against organizations said to abuse animals.

Electrohippies, another group of hacktivists, conducted Web sit-ins against the WTO when they met in Seattle in late 1999.

Illustration 8
In 1994, a 16-year-old English boy took down some 100 U.S. defense systems.

Illustration 9
In 1997, 35 computer specialists used hacking tools freely available on 1,900 web sites to shut down large segments of the US power grid. They also silenced the command and control system of the Pacific Command in Honolulu.

Illustration 10

In 2000, Asian School of Cyber Laws was regularly attacked by Distributed Denial of Service attacks by “hactivists” propagating the “right to pornography”. Asian School of Cyber Laws has spearheaded an international campaign against pornography on the Internet.

Illustration 11

In 2001, in the backdrop of the downturn in US-China relationships, the Chinese hackers released the Code Red virus into the wild. This virus infected millions of computers around the world and then used these computers to launch denial of service attacks on US web sites, prominently the web site of the White House.

Illustration 12

In 2001, hackers broke into the U.S. Justice Department's web site and replaced the department's seal with a swastika, dubbed the agency the "United States Department of Injustice" and filled the page with obscene pictures.

1.21 Use of encryption by terrorists

A disturbing trend that is emerging nowadays is the increasing use of encryption, high-frequency encrypted voice/data links, encryption software like Pretty Good Privacy (PGP) etc by terrorists and members of organized crime cartels.

Strong encryption is the criminal's best friend and the policeman's worst enemy.

Illustration 1

Leary, who was sentenced to 94 years in prison for setting off fire bombs in the New York (USA) subway system in 1995, had developed his own algorithm for encrypting the files on his computer.

Illustration 2

The Cali cartel is reputed to be using

- sophisticated encryption to conceal their telephone communications,
- radios that distort voices,
- video phones which provide visual authentication of the caller's identity, and
- instruments for scrambling transmissions from computer modems.

Illustration 3

The Italian mafia is believed to use PGP (Pretty Good Privacy) software for symmetric as well as asymmetric encryption.

Illustration 4

On March 20, 1995, the Aum Supreme Truth cult dropped bags of sarin nerve gas in the Tokyo subway, killing 12 people and injuring 6,000 more.

Members of the cult had developed many chemical and biological weapons, including Sarin, VX, Mustard gas, Cyanide, botulism, anthrax and Q fever.

It is believed that preparations were underway to develop nuclear capability. The cult was also believed to be developing a "death ray" that could destroy all life!

The records of the cult had been stored in encrypted form (using the RSA algorithm) on computers.

The enforcement authorities were able to decrypt the information as the relevant private key was found in a floppy disk seized from the cult's premises. The encrypted information related to plans of the cult to cause mass deaths in Japan and USA.

Illustration 5
In 1997, a Bolivian terrorist organization had assassinated four U.S. army personnel.

A raid on one of the hideouts of the terrorists yielded information encrypted using symmetric encryption.

A 12-hour brute force attack resulted in the decryption of the information and subsequently led to one of the largest drug busts in Bolivian history and the arrest of the terrorists.

Illustration 6
James Bell was arrested for violating internal revenue laws of the USA. He did this by:

- collecting the names and home addresses of agents and employees of the Internal Revenue Service (IRS) of the USA in order to intimidate them

- soliciting people to join in a scheme known as "Assassination Politics".

Under this scheme those who killed selected government employees, including tax collectors, would be rewarded;

- using false Social Security Numbers to hide his assets and avoid taxes;
- contaminating an area outside IRS premises in many states of the USA with Mercaptan (a stink gas).

Investigators found on his computer documents relating to a plan to destroy electronic equipment with nickel-plated carbon fiber.

They also found an invoice for the purchase of the fiber at his residence, and a bundle of the material at the residence of his associate, Robert East. Bell had exchanged PGP-encrypted e-mail messages with some of his associates.

As part of his plea bargain, he turned over the passphrase to his private key. This allowed investigators to decrypt messages that he had received.

Illustration 7

Dutch organized crime syndicates use PGP and PGPfone to encrypt their communications. They also use palmtop computers installed with Secure Device, a Dutch software product for encrypting data with International Data Encryption Algorithm (IDEA).

In 1995, the Amsterdam Police captured a PC in possession of one organized crime member. The PC contained an encrypted partition, which they were able to recover only in 1997.

Illustration 8

An encryption case occurring in Vilseck, West Germany involved theft, fraud, and embezzlement of U.S. defense contractor and U.S. government funds from 1986 to 1988.

The accused had stored financial records relating to the crimes on a personal computer, the hard disk of which had been password protected.

The police used hacking software to defeat the password protection, only to find that some of the files listed in the directory had been encrypted.

They then found the encryption program on the hard disk and used brute force tools to decrypt the files.

Illustration 9

The Dallas Police Department in the USA encountered encryption in the investigation of a drug ring, which was operating in several states of the USA and dealing in Ecstasy.

A member of the ring, residing within their jurisdiction, had encrypted his address book. He turned over the password, enabling the police to decrypt the file.

Meanwhile, however, the accused was out on bail and alerted his associates, so the decrypted information was not as useful as it might have been.

The police noted that Ecstasy dealers were more knowledgeable about computers when compared with other types of drug dealers, most likely because they were younger and better educated.

Illustration 10

Kevin Poulson was a skilled hacker who rigged radio contests and burglarized telephone-switching offices and hacked into the telephone network in order to determine whose phone was being tapped and to install his own phone tapping devices.

Poulson had encrypted files documenting everything from the phone tapping he had discovered to the dossiers he had compiled about his enemies. The files had been encrypted several times using the Data Encryption Standard.

A US Department of Energy supercomputer took several months to find the key, at a cost of millions of dollars. The result yielded nearly ten thousand pages of evidence.

Illustration 11

The mother of a 15-year old boy filed a complaint against an adult who had sold her son US $ 1000 worth of hardware and software for one dollar.

The man had also given the boy lewd pictures on floppy disks.

The man subsequently mailed the boy pornographic material on floppy disks and sent pornographic files over the Internet.

When the accused was arrested it was found out that he had encrypted a directory on the system using PGP. The police were never able to decrypt the files.

Asian School of Cyber Laws

Head Office

6th Floor, Pride Senate,
Opp International Convention Center,
Senapati Bapat Road,
Pune - 411016.
India

Contact Numbers
+91-20-25667148
+91-20-40033365
+91-20-65206029
+91-20-6400 0000
+91-20-6400 6464
Fax: +91-20-25884192

Email: info@asianlaws.org
URL: www.asianlaws.org