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CYBER CRIME : A Review

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Abstract - Cybercrime, a broad category of illicit activities conducted via computer networks and the internet, spans a spectrum of malicious behaviours. These include disrupting network operations, stealing sensitive data, hacking into bank systems for financial gain, perpetrating various forms of fraud, distributing child pornography, trafficking in illicit materials, stealing intellectual property, committing identity theft, and violating privacy rights. The repercussions of cybercrime ripple far beyond mere financial losses. They manifest in economic disruption, as cyberattacks can cripple businesses, disrupt supply chains, and destabilize financial markets. Moreover, victims of cybercrime often endure psychological distress, experiencing anxiety, fear, and a sense of violation due to the invasion of their privacy and loss of control over personal information. Collaboration and partnerships between governments, law enforcement agencies, industry stakeholders, and civil society organizations are crucial. By sharing intelligence, resources, and best practices, these entities can enhance their collective ability to combat cyber threats effectively.cybercrime presents a multifaceted challenge that demands a comprehensive response. By implementing a combination of cybersecurity measures, legal frameworks, educational initiatives, and collaborative efforts, stakeholders can work together to mitigate risks, safeguard individuals and businesses, and uphold security and trust in the digital realm.

Keywords - Cybercrime, Phishing, Data breaches, Cybersecurity, Economic crime

I. INTRODUCTION

Cybercrime is a relatively modern form of criminal activity that encompasses illegal actions carried out using computers, the internet, or other technological platforms recognized under the Information Technology Act. It covers a wide range of illicit activities, where computers or the internet serve as either tools or targets. With society's increasing reliance on technology, cybercrime has become an uncontrollable menace, exploiting the widespread use of computers in daily life. The term "cybercrime" encompasses various offenses, including cyber-stalking, cyber-terrorism, e-mail spoofing, e-mail bombing, cyber pornography, and cyber-defamation, among others [1]. Additionally, traditional crimes can also fall under the category of cybercrimes if they are committed through computer or internet mediums. This includes activities such as electronic cracking and denial-of-service attacks. The consequences of cybercrime can be severe, potentially disrupting critical infrastructure, compromising national security, and causing widespread chaos. Despite advancements in technology, current strategies to combat cybercrime are inadequate, necessitating the development of further preventive measures.

Understanding the motivations behind cybercrime requires insight into the characteristics of both perpetrators and victims [2]. Perpetrators often target organizations such as hospitals, government offices, financial institutions, and research organizations to steal confidential data or personal information. Victims, on the other hand, are often unsuspecting users of computer systems who fall prey to cybercriminal tactics

The rapid pace of technological advancement, particularly in the realm of information and communication technology (ICT), has contributed to the proliferation of cybercrime [3]. While the internet offers numerous benefits, it also presents opportunities for malicious actors to exploit vulnerabilities and perpetrate crimes. cybercrime represents a significant challenge in today's interconnected world. As technology continues to evolve, it is essential to develop effective strategies to prevent and combat cybercriminal activities, safeguarding individuals, organizations, and society as a whole.

II. LITERATURE REVIEW

Cyber criminals are a persistent threat across all countries with internet connectivity, encompassing various groups or categories, including.

1. **Hackers**: These individuals possess advanced technical skills and exploit vulnerabilities in computer systems to gain unauthorized access, steal data, or disrupt operations for personal gain or malicious intent [4].
2. **Phishers**: Phishers use deceptive tactics, such as fraudulent emails or websites, to trick individuals into divulging sensitive information like passwords, credit card numbers, or personal details, which they then exploit for financial gain or identity theft.

3. **Scammers**: Scammers employ fraudulent schemes, such as fake job offers, lottery scams, or online romance scams, to deceive victims into sending money or personal information under false pretenses.
4. **Malware Developers**: These individuals create malicious software, such as viruses, worms, or ransomware, designed to infect computers or networks, steal data, or extort money from victims.
5. **Cyber Extortionists**: Cyber extortionists threaten individuals or organizations with harm, data breaches, or distributed denial-of-service (DDoS) attacks unless a ransom is paid.
6. **Cyber Terrorists**: These individuals or groups exploit technology to spread fear, disrupt critical infrastructure, or advance ideological or political agendas through cyber attacks.
7. **State-Sponsored Hackers**: Government-sponsored cyber operatives engage in espionage, sabotage, or cyber warfare to gain strategic advantages, gather intelligence, or undermine adversaries.
8. **Cyber Espionage Agents**: These actors conduct covert surveillance or theft of sensitive information, trade secrets, or intellectual property on behalf of government agencies, corporations, or criminal organizations.
9. **Insiders**: Insiders, such as disgruntled employees or contractors, exploit their access privileges to steal or leak confidential information, commit fraud, or sabotage systems from within an organization.
10. **Botnet Operators**: Botnet operators control networks of compromised computers, known as botnets, to launch coordinated attacks, distribute spam, or carry out other illicit activities remotely.

Children and adolescents often engage in delinquent behavior patterns due to various factors, with curiosity being a significant motivator [5]. Curiosity drives them to explore and discover new things, sometimes leading to experimentation with activities considered deviant or risky. Additionally, children may engage in delinquent behaviour to establish their identity and assert their uniqueness among peers. The desire to stand out or gain recognition within their social group can push them towards behaviors that may be seen as rebellious or disruptive.

Organized hackers typically operate in coordinated groups to achieve specific objectives, often driven by political motives or ideological agendas. These groups may align with certain political ideologies, fundamentalist beliefs, or national interests. For instance, some organized hacker groups may aim to advance political agendas, promote nationalist causes, or disrupt perceived adversaries.

One prominent example is the alleged involvement of Chinese hacker groups in cyber attacks targeting government websites and infrastructure of other nations. These attacks are often linked to geopolitical tensions and strategic interests, with the intention of gathering intelligence, exerting influence, or advancing national objectives.

Professional hackers, also known as crackers, are individuals with advanced technical skills who engage in hacking activities for financial gain or employment purposes. Unlike hobbyist or ideological hackers, professional hackers are motivated primarily by monetary incentives. Discontented employees represent a significant threat to cybersecurity, particularly due to their insider knowledge and access privileges within an organization. This group comprises individuals who have either been terminated by their employer or harbor grievances and dissatisfaction with their current employment situation. Traditionally, internal attacks, perpetrated by discontented employees, have posed a considerable threat to computer networks. Statistics indicate that approximately 70 percent of all attempted intrusions are attributed to insiders, according to Brigadier General Md. Khurshid Alam

III. CATEGORIES

Cybercrime manifests in various forms, including Data Crime and Network Crime. In Data Crime, perpetrators intercept data streams to or from targets to gather sensitive information. This can involve monitoring network traffic or observing other data streams, potentially compromising the privacy and integrity of communications. Additionally, Data Modification occurs when unauthorized parties intercept and alter data in transit before retransmitting it, undermining its reliability and trustworthiness. Data Theft involves illegally copying or extracting information from businesses or individuals, often comprising user data, financial details, or other confidential information, with severe legal consequences for perpetrators upon apprehension.

On the other hand, Network Crime encompasses Unauthorized Access and Virus Dissemination. Unauthorized Access involves gaining illicit entry into computer systems or networks, either by insiders or external hackers. This unauthorized access can lead to data breaches, theft of sensitive information, or disruption of services, posing significant risks to organizational security. Virus Dissemination involves the distribution of malicious software, such as viruses, worms, or Trojan horses, which infect and compromise the security of computer systems or networks. These malicious programs can cause damage, disrupt operations, or facilitate further cyber attacks, highlighting the importance of robust cybersecurity measures to protect against these threats.

Related crimes encompass aiding and abetting cyber crimes, computer-related forgery and fraud, and content-related offenses [6]. Aiding and abetting charges typically involve three elements: knowledge of another person's criminal actions, intent, and providing assistance. Computer forgery and fraud involve offenses committed using computer technology. Content-related offenses include cyber-sex, unsolicited commercial communications, cyber defamation, and cyber threats. The financial impact of these attacks on

victims amounts to millions of dollars annually, which can significantly affect the economic development of underdeveloped or developing countries.

IV. **Types of Cyber Crimes**

Hacking involves unauthorized access to computer systems or networks, often with the intent to steal or manipulate data, disrupt operations, or compromise security. Hackers exploit vulnerabilities in software, networks, or human behavior to gain access to sensitive information or control over systems. This can lead to data breaches, financial losses, or damage to the reputation of individuals or organizations [7]. Virus dissemination involves the distribution of malicious software, known as viruses, that infect computer systems and compromise their security. Viruses can replicate themselves and spread to other computers, causing damage, data loss, or disruption of operations. They often exploit vulnerabilities in software or trick users into executing infected files.

Logic bombs are malicious code or software programs that are designed to execute a harmful action when triggered by a specific event or condition [8]. They are often hidden within legitimate programs or systems and can be activated remotely by the attacker. Logic bombs can delete files, corrupt data, or disrupt system functionality.

A denial-of-service attack aims to disrupt the normal functioning of a computer system, network, or website by overwhelming it with a flood of traffic or requests. This effectively renders the target inaccessible to legitimate users, causing downtime, financial losses, or reputational damage. Distributed denial-of-service (DDoS) attacks involve multiple sources and are particularly challenging to mitigate.

Phishing is a deceptive technique used by cybercriminals to trick individuals into revealing sensitive information, such as passwords, credit card numbers, or personal details. This is often done through fraudulent emails, websites, or messages that appear to be from legitimate sources. Phishing attacks can lead to identity theft, financial fraud, or unauthorized access to accounts.

Email bombing involves sending a large volume of emails to a victim's inbox, overwhelming their email server and causing disruption. Spamming refers to the mass distribution of unsolicited emails, often containing fraudulent or malicious content. Both email bombing and spamming can clog up email systems, waste resources, and facilitate phishing or malware distribution.

Web jacking involves gaining unauthorized access to and control over a website or web server, often for malicious purposes. Attackers may deface the website, steal sensitive information, or use it to distribute malware. Web jacking can damage the reputation of the website owner and disrupt online services.

The TOR (The Onion Router) network is an anonymous communication network that allows users to browse the internet and communicate anonymously. While TOR provides privacy and anonymity to users, it is also used by cybercriminals to conduct illicit activities, such as drug trafficking, hacking, or the dissemination of illegal content. The anonymity provided by the TOR network can make it challenging for law enforcement agencies to track and apprehend cybercriminals.

Pharming involves redirecting internet traffic from legitimate websites to fraudulent or malicious websites without the user's knowledge or consent. Attackers exploit vulnerabilities in DNS servers or manipulate DNS records to redirect users to phishing sites or malware-infected pages. Pharming can lead to identity theft, financial fraud, or malware infections.
The sale of illegal articles refers to the online trade or distribution of prohibited or illicit goods, such as drugs, firearms, counterfeit goods, or stolen merchandise. Cybercriminals use underground marketplaces or illicit websites to facilitate the sale of illegal articles, bypassing legal regulations and endangering public safety.

Cyber pornography involves the distribution, production, or consumption of sexually explicit material over the internet or electronic communication channels. This includes images, videos, or text that depict explicit sexual content and may involve minors or non-consenting individuals. Cyber pornography can perpetuate exploitation, harm vulnerable individuals, and violate laws related to obscenity and child protection. Software piracy refers to the unauthorized copying, distribution, or use of copyrighted software without the permission of the owner or license holder. Pirated software undermines the revenue of software developers and distributors, violates intellectual property rights, and exposes users to security risks, as pirated versions may contain malware or lack essential updates.

A salami slicing attack involves stealing small amounts of money or data from numerous accounts or transactions over time, with the aim of avoiding detection [9]. Attackers often exploit financial systems or electronic transactions to skim fractions of funds or information, which accumulate into significant losses or unauthorized access.

Identity theft occurs when an individual's personal information, such as their name, social security number, or financial details, is stolen and used to commit fraud or other criminal activities. Credit card fraud involves the unauthorized use of someone else's credit card information to make purchases or obtain funds illicitly. Both identity theft and credit card fraud can lead to financial losses, damaged credit, and legal consequences for victims.

V. Cyber Crimes related to Finance

The organization Price Waterhouse Coopers, known for its economic crime survey, defines cyber economic crime as offenses committed using computers and the internet. These crimes encompass actions like distributing viruses, illegal file downloads, phishing, pharming, and theft of personal information such as bank details [10]. The defining characteristic is the central role of computers and the internet in the crime. The Global Economic Crime Survey 2011 conducted by the organization revealed a significant rise in cybercrime in India, attributed to the rapid growth of internet usage. Despite providing numerous benefits, the internet has also facilitated cybercrime, with 24% of respondents reporting incidents within the past year. The surge in cybercrime presents new challenges posed by tech-savvy fraudsters. This trend is evident in recent cyberattacks on multinational companies and financial institutions. The increase in e-business volume and internet penetration could be contributing factors to this rise. Economic crime is a global phenomenon that affects all industries and organizations. Despite its seriousness, there's a lack of awareness among some organizations about being victims of economic crime. This can be attributed to the infrequency of fraud risk assessments, exposing more organizations to fraud risks and associated consequences.

Economic crime not only incurs direct costs but also damages employee morale, tarnishes brands, and affects market share. As society demands more ethical behavior, businesses must prioritize building and maintaining public trust. With increased reliance on the internet and technology, organizations are susceptible to cyber attacks globally. Cybercrime ranks among the top four types of economic crime, with the IT department perceived as a high-risk area. Despite monitoring electronic traffic, many organizations lack access to forensic technology tools and cyber security training, leaving them vulnerable to cyber threats [11]. A significant percentage of cyber threats originate within India or through a combination of domestic and international sources. However, many respondents lack access to necessary forensic tools and have not received cyber security training. Asset misappropriation, particularly cyber-enabled, has seen a remarkable increase over the years. Cybercrime offers lower risks and higher rewards compared to traditional crimes, as perpetrators can operate remotely, making detection and prosecution challenging for law enforcement agencies.

VI. Phishing and Vishing

In the realm of computing, phishing stands as a form of social engineering, characterized by deceptive attempts to illicitly obtain sensitive information, such as passwords and credit card details, by posing as a trustworthy entity in official electronic communications, such as emails or instant messages

The term "phishing" originates from the use of increasingly sophisticated tactics to lure individuals into revealing their financial information and passwords. This involves sending emails falsely claiming to represent legitimate enterprises, with the aim of tricking recipients into divulging private information, which can then be exploited for identity theft. These emails typically direct users to visit a website where they are prompted to update personal information, like passwords, credit card numbers, social security details, and bank account information, which the legitimate organization already possesses. However, the website is fraudulent and designed solely to harvest the user's sensitive information.

The underlying motive behind phishing is to exploit individuals' trust, leading them to share their credit card information, passwords, bank account details, and other sensitive data under the false belief that they are interacting with a legitimate organization, when in reality, they are unknowingly providing this information to a fraudulent website or entity, which intends to misuse it for financial gain.

Similar to phishing, Vishing is a criminal practice that employs social engineering and Voice over IP (VoIP) technology to extract personal and financial information from the public for financial gain. Vishing, a portmanteau of "voice" and "phishing," leverages the trust associated with traditional landline telephone services to deceive victims. VoIP enables caller ID spoofing, sophisticated automated systems, and anonymity for the perpetrator, allowing them to trick individuals into divulging credit card numbers and other information for use in identity theft schemes

In the realm of Internet-based banking, phishing attacks have become a prevalent risk. Banks often attempt to shift liability onto customers by claiming negligence in responding to phishing emails. However, the legal perspective may differ. Phishing constitutes multiple violations of the Information Technology Act 2000, particularly after the amendments of 2008, resulting in wrongful losses for customers[12].

Banks may be held liable under established banking laws, which stipulate that customers cannot be blamed for forgery, regardless of its sophistication. Furthermore, banks may be deemed negligent under Sections 79 and 85 of the Information Technology Act 2000 for failing to utilize digital signatures for authenticating internet transactions, thus making them accountable for any offenses involving bank-owned computers. Notably, Bank of India set a precedent by accepting liability for phishing in a case filed in Bangalore and reimbursing the victim along with interest for losses incurred due to phishing fraud.

VII. Denial of Service Attack

This refers to an act carried out by a perpetrator who overwhelms a victim's network bandwidth or fills their email inbox with spam messages, thereby obstructing their access

to essential services. Termed as a denial-of-service attack (DoS attack), it aims to incapacitate a network by inundating it with superfluous traffic. Various DoS attacks, such as the Ping of Death and Teardrop attacks, exploit weaknesses in TCP/IP protocols

In a standard connection process, a user requests server authentication, and upon receiving approval, gains access. In a DoS attack, however, the attacker floods the server with multiple authentication requests, filling it up. These requests contain false return addresses, preventing the server from locating the user to send approval. Consequently, the server's resources are tied up, sometimes for prolonged periods, before it eventually closes the connection[13]. The attacker then repeats the process, perpetually disrupting the service.

Distributed denial-of-service (DDoS) attacks offer several advantages to perpetrators. Utilizing multiple machines allows for a higher volume of attack traffic, making it harder to mitigate. Additionally, shutting down multiple attack machines is more challenging, and the behaviour of each attacker can be more covert, complicating detection and intervention.

In today's digital era, data and information hold immense value. Whether it's business secrets, technical expertise, creative works, or personal data like usernames and credit card numbers, these assets fuel the information economy. Cybercrime, particularly data theft through hacking and other methods, is rampant, posing a significant threat to individuals and organizations alike

VIII. Data Diddling

Data diddling refers to the alteration of data either before or during its input into a computer system. Essentially, it involves changing information from its intended form as it is being entered into a computer file by individuals inputting data, through a virus, by the programmer of a database or application, or by any other party involved in the data storage process [14]. The perpetrator could be anyone participating in various stages of data handling, including creation, recording, encoding, examination, verification, conversion, or transmission. This method represents one of the simplest ways to commit a computer-related crime, often requiring minimal computer skills. However, despite its simplicity, the consequences of data diddling can be significant.

In India, electricity companies are particularly susceptible to this type of crime. The NDMC Electricity Billing Fraud Case of 1996 serves as a pertinent example. In this case, the computer network utilized by the NDMC (New Delhi Municipal Council) for managing electricity bills was exploited. The responsibility for tasks such as bill collection, computerized accounting, record maintenance, and bank remittances was delegated to a private contractor with expertise in computer technology. Exploiting his access, the contractor manipulated data files to reflect lower receipts and bank remittances, thereby embezzling a substantial amount of funds.

VI. CONCLUSIONS

In conclusion, the escalating prevalence of cybercrime poses significant challenges to individuals, organizations, and society as a whole. As outlined in the extensive exploration of various forms of cybercrime, from hacking and phishing to identity theft and financial fraud, it's evident that no sector remains untouched by the pervasive reach of cybercriminal activities. Moreover, the evolving tactics and sophisticated techniques employed by cybercriminals demand a concerted effort to develop robust preventive measures and effective strategies for combating such threats.The literature review sheds light on the diverse motivations driving cybercriminal behavior, ranging from financial gain and ideological agendas to insider threats and state-sponsored operations. Understanding these motivations is crucial for devising targeted interventions and bolstering cybersecurity frameworks to mitigate risks effectively.

Furthermore, the categorization of cybercrimes into data crimes, network crimes, and related offenses provides a comprehensive framework for comprehending the multifaceted nature of cyber threats. From data breaches and unauthorized access to the dissemination of malware and cyber pornography, each category underscores the complex challenges inherent in safeguarding digital assets and preserving privacy in the digital age.Moreover, the discussion on phishing and vishing underscores the critical role of social engineering tactics in perpetrating cybercrimes. As cybercriminals continue to exploit human vulnerabilities through deceptive means, efforts to raise awareness, enhance digital literacy, and implement robust authentication mechanisms are imperative to mitigate the risks associated with such fraudulent activities. In conclusion, addressing the complex challenges posed by cybercrime demands a multifaceted approach encompassing technological innovation, legal reforms, public awareness campaigns, and international cooperation. By fostering a culture of cybersecurity resilience and collective action, we can strive towards creating a safer and more secure digital ecosystem for generations to come

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