The cybercrimes on financial and banking services:The Challenges and Treatment.

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Abstract :

The purpose of this paperis to show the risks ofa new electronic financial and banking services as credit and debit cards, internet banking and mobile banking that produced for the growth of Information Communication Technology in the sphere of financial and banking services,witch have helped to save time, money and effort But on the opposite excrected a new threat and challenge called cybercrime with an new ways as cards fraud, fishing, email fraud and hacking.

The study found that cybercrime can be reduced in financial services by Strengthen cyberc security, the employees training program, educate the community, and by enacting a new laws fighting cybercrime and adopt effective global international law be based on information and database.

Keywords: Information and communications technologies,financial and banking services, cybercrime.

الملخّص:

ان غرض هذه الورقة البحثية هو عرض مخاطر الخدمات المالية والمصرفية الالكترونية الجديدة كبطاقات الائتمان، الصيرفة عبر الانترنت والصيرفة عبر الهاتف والتي نتجت عن نمو تكنولوجيا المعلومات والاتصال في مجال المحيط المالي والمصرفي، التي ساعدت على توفير الوقت والمال والجهد لكن بالمقابل أفرزت تهديد وتحدي جديد يدعى بالجرائم المعلوماتية وبأساليب جديدة كاحتيال البطاقات، الاصطياد، احتيار البريد الالكتروني والقرصنة.

توصلت الدراسة انه يمكن تخفيض الجرائم المعلوماتية وهذا من خلال تقوية الأمن المعلوماتي، تعزيز برامج تدريب المستخدمين، تثقيف المجتمع على نطاق واسع خاصة المستخدمين النهائيين للكومبيوتر والشبكات، سن قوانين جديدة لمكافحة الجريمة المعلوماتية وتبني قانون دولي فعال يؤسس على المعلوماتية وقاعدة بيانات.

الكلمات المفتاحية: تكنولوجيا المعلومات والاتصال، الخدمات المالية والمصرفية، الجرائم المعلوماتية.

INTRODUCTION

The Information Communication Technology has revolution alized different aspects of human life and has made our lives simpler. It has been applied in different industries and has made business processes simpler by sorting, summarizing, coding, and customizing the processes. The banking and financial services industry, considered the main industries affected by the information technology.

The growth of Information Communication Technology in the sphere of financial services has provided a wealth of opportunities for Financial and banking institutions to enhance services to customers through new products witch have helped to save time, money and effort from an operational perspective But on the opposite a new threat and challenge called cybercrime.

Cybercrime has become a worse danger modern economic today, it have affected different sectors among which financial sector is one of them.Especially the losses caused by cybercrime witch increase among the time, to take the issue of threats to cybercrime and what should be taken to reduce those threats we review the following points:

I. Cybercrime conceptual framework.
II. Threats of cybercrime in financial and banking services
III. Cyber threat protection for Financial Services:

I.Cybercrime conceptual framework:

Among the many types of illegal actes that affect the average citizen is cybercrime. this phenomenon goes by a number of differents names,including “crime by keyboard “and “ information -technology” or high- technology” crime.

1. Definition ofcybercrime:

It is important to bear in mind that there is no universally accepted definition of the term cybercrime,Based on international organization of securities(IOSCO)Research Department tentatively Cyber-Crime defined as: a harmful activity, executed by onegroup (including both grassroots groups or nationally coordinated groups) through computers, IT systems and/or the internet and targeting the computers, IT infrastructure and internet presence of another entity(1).Also defined as the use of computer or other electronic devices via information systems to facilitate illegal behaviors(2), Depending international organisation.United Nations In tenth congress on “prevention of crime and treatment of offenders” which is devoted to issues of crimes related to computer networks, cybercrime was broken into two categories and defined as:

*Cybercrime in narrowsense (computer crime): any illegal behaviourdirected by means of electronic operations that targets the security of computer systems and the data processed by them.

*Cybercrime in broader sense (computer – ralated - crime) : any illegal behaviour committed by means of, or in relation to, a comptuer system or network , including such crimes as illegal possession and offering or distributing information by means of a computer system or network.(3)

2. Reasons for Cyber Crime:

The reasons for the vulnerability of computers may be said to be(4):

- Capacity to store data in comparatively small space: The computer has unique characteristic of storing data in a very small space. This affords to remove or derive information either through physical or virtual medium makes it much easier.
- Easy to access: The problem encountered in guarding a computer system from unauthorised access is that there is every possibility of breach not due to human error but due to the complex technology. By secretly implanted logic bomb, key loggers that can steal access codes, advanced voice recorders; retina imagers etc. that can fool biometric systems and bypass firewalls can be utilized to get past many a security system.
- Complex: The computers work on operating systems and these operating systems in turn are composed of millions of codes. Human mind is fallible and it is not possible that there might not be a lapse at any stage. The cyber criminals take advantage of these lacunas and penetrate into the computer system.
- Negligence: Negligence is very closely connected with human conduct. It is therefore very probable that while protecting the computer system there might be any negligence, which in turn provides a cybercriminal to gain access and control over the computer system.
- Loss of evidence: Loss of evidence is a very common & obvious problem as all the data are routinely destroyed. Further collection of data outside the territorial extent also paralyses this system of crime investigation.

3. Classificationof cybercrime:

There are many types of cybercrime prevailing in the system; broadly we can classify them in to four major categories as discussed below(5):

-Crime against individuals

Cybercrimes committed against individual persons include such types of crimes like transmission of Child Pornography, Harassment of any one with the use of a computer such as e-mail, Cyber Defamation, Hacking, Indecent exposure, E-mail spoofing, IRC Crime (Internet Relay Chat), Net Extortion, Malicious code, Trafficking, Distribution, Posting, Phishing, Credit Card Fraud and Dissemination of obscene material including Software Piracy. The potential harm of such a crime to individual person can hardly be bigger.

-Crime against property:Another classification of Cyber-crimes is that, Cybercrimes against all forms of property. These crimes include computer vandalism (obliteration of others' property), Intellectual Property Crimes, Threatening, Salami Attacks. This kind of crime is normally prevalent in the financial institutions or for the purpose of committing financial crimes. An important feature of this type of offence is that the amendment is so small that it would normally go unobserved.

- Crime against organization:The third type of Cyber-crimes classification relate to Cybercrimes against organization. Cyber Terrorism is one discrete kind of crime in this kind. The growth of internet has shown that the standard of Cyberspace is being used by individuals and groups to pressure the international governments as also to terrorize the citizens of a country. This crime obvious itself into terrorism when a human being "cracks" into a government or military maintained website. It is across the world agreed that any and every system in the world can be cracked.

-crime against society:The forth type of Cyber-crimes relate to Cybercrimes against society. In this category forgery, cyber terrorism, web jacking, polluting the Youth through Indecent, Financial Crimes, Sale of Illegal Articles, Net Extortion, Cyber Contraband, Data Diddling, Salami Attacks, Logic Bombs types of crime is included. Forgery currency notes, revenue stamps, mark sheets etc,can be forged using computers and high quality scanners and printers. Web Jacking hackers gain access and control over the website of another, even they change the content of website for fulfilling political objective or for money.

4. Effects of cybercrimes on global economy:In the past, cybercrime was committed mainly by individuals or small groups, today Cybercrime is a fast-growing area of crime. More and more criminals are exploiting the speed, convenience and anonymity of the Internet to commit a diverse range of criminal activities that know no borders, either physical or virtual, cause serious harm and pose very real threats to victims worldwide.Cybercrime had many effects on global economy

-Potential Economic Impact:

Cybercrime costs businesses approximately US$400 billion worldwide, with an impact on approximately 200,000 jobs in the U.S., and 150,000 jobs in the EU, according to a new report from the Center for Strategic and International Studies (CSIS) and sponsored by McAfee(6).

Cybercrime damages trade, competitiveness, innovation, and global economic growth. Studies estimate that the Internet economy annually generates between $2 trillion and $3 trillion, a share of the global economy that is expected to grow rapidly.

Based on CSIS estimates, cybercrime extracts between 15% and 20% of the value created by the Internet. Cybercrime's effect on intellectual property is particularly damaging, and countries where intellectual property creation and intellectual property -intensive industries are important for wealth creation lose more in trade, jobs and income from cybercrime than countries depending more on agriculture or industries of low-level manufacturing, the report found.

-Impact of Cyber Crime over Consumer Behavior:The information revolution, coupled with the strategic leveraging of the Internet, has exposed a number of relatively open societies to the dangers of cybercriminal and cyber terrorist acts, especially in commercial business transactions. With the development of e-commerce, this commercial dark side has become known as cybercrime and has taken on many forms that affect the perceptions of the way we shop online. Corporations should realize that these threats to their online businesses have strategic implications to their business future and take proper measures to ensure that these threats are eliminated or significantly reduced so that consumer confidence in the Internet as an alternative means of shopping is maintained(7).

- Impact on Market Value:The economic impact of security breaches is of interest to companies trying to decide where to place their information security budget as well as for insurance companies ‘that provide cyber-risk policies.

This new and evolving view of damage becomes even more important as many firms rely on information systems in general and the Internet in particular to conduct their business. This precedent may force many insurance companies to compensate businesses for damage caused by hacker attacks and other security breaches(8).

II. Threats of cybercrime in financial and banking services:

The rise of the information society has provided a wealth of opportunities for Financial and banking institutions to enhance services to customers through new products These have helped to save time, money and effort from an operational perspective But on the opposite end, cybercriminals are finding new ways to exploit weaknesses and working to develop ever more sophisticated methods of attack – or finding high-tech reinventions of old tricks The cost to consumers – and to society as a whole.

1. the most important e- financial and banking services targeted by cybercriminals:

The integration of ICT and financial services generate many new electronic services that led to her appearance to increase the volume of activity of cybercrime, but the most important e- financial and banking services that are targeted by cybercriminals are:

-Payment cards(9):

A payment card is typically a 3 ⅜” by 2 ⅛” plastic card with either a magnetic stripe or a computer chip that stores the card user’s data, including card number and expiration date. The most familiar types of payment cards have amagnetic stripe and include credit, debit, and prepaid cards.

Credit Card: A credit card is any card that may be used to borrow money or buy products and services on credit. The balance can be paid in full by a set due date or paid over time with interest, as long as the borrower makes monthly minimum payments in amounts specified by the card-issuing bank. Credit cards are issued by banks, retail stores, and other businesses.

Debit Card: A debit card is associated with a checking or other deposit account. Funds are drawn from the associated account to settle debit card transactions, such as retail purchases or ATM withdrawals. Cardholders authorize debit card transactions by signing their name or by entering a personal identification number (PIN).

Prepaid Card: Prepaid cards differ from credit and debit cards in that they offer consumers a way to pay early for future purchases. Value is prepaid into the card account, and the cardholder can spend these funds at a later date by presenting the card for payment at accepting merchants or, in some cases, by using the card with a PIN to withdraw cash at ATMs.

- Onlinebanking(10):

a system that enables bank customers to access accounts and general information on bank products and services or perform account transactions directly with the bank through a personal computer using the internet as the delivery channel; customers are able to access all of their accounts through the website of the bank and are allowed to conduct banking activities such as transferring funds, paying bills, viewing account balances, paying mortgages or purchasing financial instruments and certificates of deposits;

-Mobile banking:

Banking is an application of mobile computing which provides customers with the support needed to be able to bank anywhere, anytime using a mobile handheld device and a mobile service such as Short Message Service (SMS). Mobile banking facility removes the space and time limitations from banking activities such as checking account balances or transferring money from one account to another and time saving when we go to bank and doing some banking activities(11).

2. Threats Faced by the Financial Services Sector

Financial Service industry faces a larger number of threats than most other industries. Here are nine of the biggest challenges(12):

-Advanced Persistent Threats:

APTs use undetected, continuous computer hacking processes to gain access to a high value organization's network. Phishing emails or other tricks to fool employees into downloading malware are a common practice. When the unauthorized person gains access, they often go undetected for a long period of tie—quietly stealing data, committing fraud, destroying an institution's economic stability or undermining its reputation.

-Insider and Internal Threats:

Any employee, contractor, supplier, or business partner who has authorized yet uncontrolled access to systems and/or sensitive information all have the opportunity to do irrevocable harm to a company. This threat has grown more substantial by the increased use of personal devices in the workplace, personal email, and cloud-based and USB storage devices. Intentionally or unintentionally, insiders can undermine systems, open them to malicious intrustion ,andengage in fraud, theft or market manipulation.

-Denial of Service Attacks :

These threats are defied as "any attack intended to compromise the availability of networks and systems" and are of concern to financial corporations operating consumerfacing websites or trading systems. Such attacks flod a network with phony connection requests, making it unavailable to process legitiate user requests.

-Account Takeovers:

Cyber criminals have quickly discovered how to exploit financial and market
systems that interface with the Internet, such as the Automated Clearing House (ACH) systems, card
payments, and market trades. Exploiting system users, rather than the systems themselves, earn
criminals access to existing bank or credit card accounts or financial systems, and allow them to carry
out unauthorized transactions. A recent report on cybersecurity in the banking sector identified that
almost half (46 percent) of institutions reported account takeovers as the most frequent cyber intrusion activity they experience.

-Securities and Market Trading Breaches:

Financial institutions in the securities and brokerage business, as well as their customers, are frequently targeted by cyber criminals. According to the studies, Market manipulation and unauthorized stock trading are common risks faced by traders and the exchanges they are sold on.

-Third-Party-Payment Processor Breaches:

Sophisticated cyber criminals are also targeting the computer networks of large payment processors, resulting in the loss of millions of dollars and the compromise of personal information of millions of individuals.

-Supply Chain Infiltration:

In recent years, trusted suppliers of technical, computer and security equipment, software and hardware have been targeted by cyber criminals seeking to gain physical and technical access to financial institutions. Cyber criminals are continuously devising new ways to infiltrate financial institutions, from posing as vendor employees to delivering infected equipment. Some recent attacks involved hardware installed in bank branch systems to enable transactions to be manipulated via mobile networks.

-Mobile Banking Breaches.

Meeting customer demands for greater mobile banking capability, has opened financial institutions up to another cyber threat. Cyber criminals have quickly figured out how to exploit the vulnerabilities in mobile technology by using malicious websites, text messages, or mobile applications to gain access to a user's credentials and account information.

-Payment Card Skimming.

A skimmer fitted to the outside or inside of an ATM or gas station pumpsenables a criminal to collect card numbers and personal identification number (PIN) codes. The stolen data is usually sold or used to make fake cards to withdraw money from the compromised accounts. As companies continue to roll out—and consumers embrace—new electronic, wireless payment systems, criminals are quickly adapting. Hackers have already designed Bluetooth-enabled wireless skimmers to instantly download data when in range of the wireless network.

3. Impact of cybercrime on financial services:

Before analyses the impact of cybercrime on financial services we must know before its types

1. Typesand of cybercrime in financial sector

There are various types of cybercrime in financial services, such as the ones we've just mentioned. They may include:

-Credit card fraud: There are many online credit card fraud are made when a customer use their credit card or debit card for any online payment, a person who had a mala fide intention use such cards(13).

-Email Fraud:In present period of life e-mail and websites are become a speedy, easy and preferred means of communication. some times by email fraud is made some of the hacker or a evil organization send email to bank customers that "congratulation you have won such a huge amount to enchase it please share your bank details" and by such customer simply have to type credit card number into www page off the vendor for online transaction or for enchase of such kind of amount then hacker make a miss use of such detail and make a crime which is also known as cybercrime as per law.

-Phishing:Phishing means acquire information such as usernames, passwords, credit card details, personal detail etc. by electronic communication. Phishing commonly uses fake emails or fake messages which contain link of virus/ malware infected fake websites. These website request user to enter their personal detail(14).

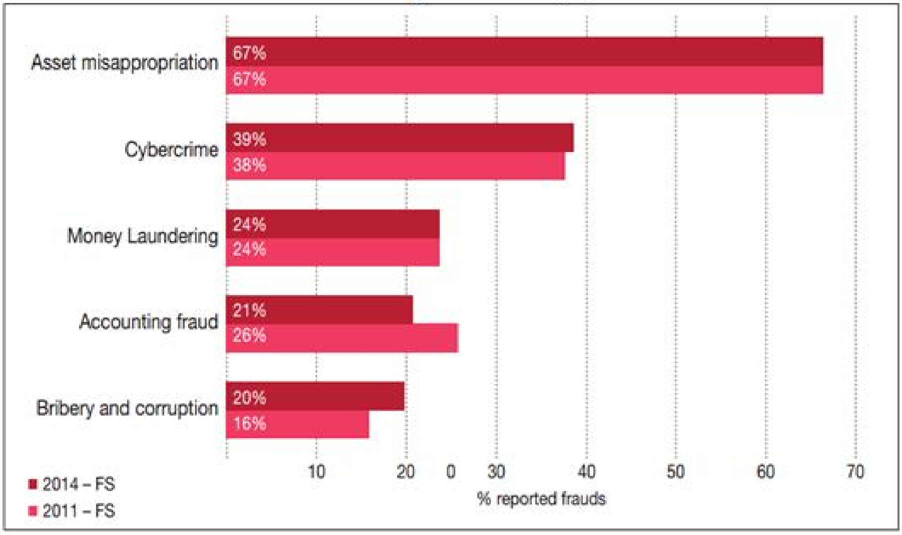
-Hacking:Hacking is the act of illegally accessing a system in order to achieve a high degree of

knowledge and gain information regarding both the operation and the data it contains, in order to adapt it to the hacker's needs The term hacking has acquired numerous identities during the period in which the cyber world has developed, gaining both negative and positive connotations(15).

2. Effects of cybercrime on Financial services :

Financial Services organisations have suffered economic crime.According to the Global Economic Crime Survey published by PricewaterhouseCoopers in 2014, cybercrime is one of the most common types of economic crime reported by financial services respondents—38 percent in 2011 versus 39 percent in 2014.

Fig1: Top 5 types of economic crime experienced by the financial sector during the survey period



Source : www.pwc.com/structure(visited 20/03/2016)

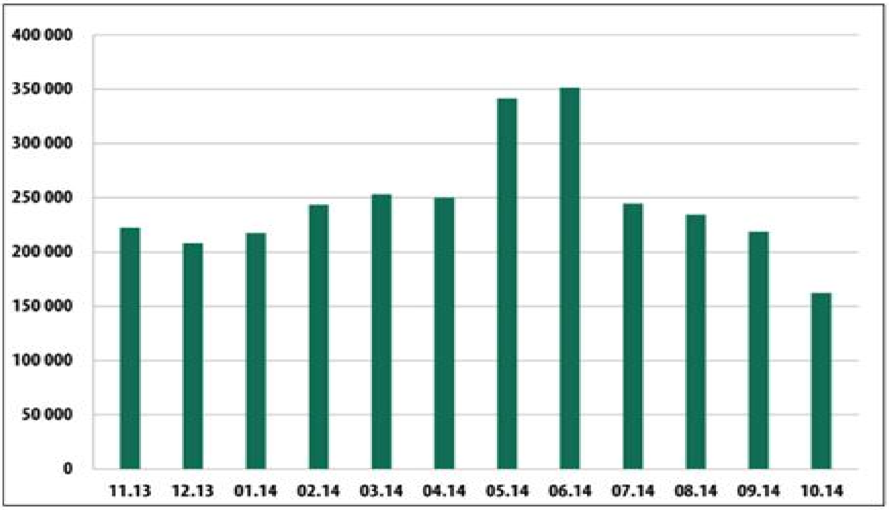
With advantage of what finance sector provides to their clients and customersmany facilities like internet banking, credit card facilities debit card facilities online transferCyberattacks targeting financial services firms are on the rise.

According to a Kaspersky Lab , 93% of financial services organizations experienced various cyberthreats in the past 12 months. Andcaused an average annualized loss of 28.33 million U.S. dollars in financial sectors in USA, and in united king cybercrime caused a loss of 2.4million U.S.pounds, and 46.4 billion in china.

According to the loss caused by on electronic banking and financial services by types, we find thatcybercriminals caused worldwide fraud on credit cards, debit cards and prepaid cards hit $16.31 billion last year on a total card sales volume of $28.844 trillion.is due to too many people who don't understand technology well are using(credit and debit, POS , ATMs, online and mobile banking) , cybercriminals are take it and caused arefor transactionsfraud are made when a customer use their credit card or debit card for any online payment, a person who had a mala fide intention use such cards.

According data, Kaspersky Lab products detected and neutralized a total of 6,167,233,068 threats during the reported period.During the reporting period, Kaspersky Lab solutions blocked 1,910,520 attacks attempting to launch malware capable of stealing money from online banking accounts.And12,100 mobile banking Trojans(16).

Fig.2: online threat in the banking sector



Source:Kaspersky Security Bulletin 2014. Overall statistics for 2014.(visited24/03/2016)

III. Cyber threatprotection for Financial Services:

To protect financial services from the risks of cybercrime must take many procedures:

1. Procedures related to Strengthcybercsecurity:

One of the best weapons against technology crimes is technology, Although measures taken in most financial services firms have been largely reactive, designed to defend against the types of attacks that have already occurred. Getting ahead of the threats, however, will require maturing information security capabilities to operational excellence. It requires(17):

-Advanced authentication:

Advanced authenticationoffers much greater protection than traditional security and anti-fraud approaches. A key advantage is that it is individualized for each user, and as a result resists the industrial-style automation that characterizes mass attacks. More than just identity management, advanced authentication methodologies monitor users' attributes and behaviors to keep imposters from accessing infrastructure and data. Attributes include users' normal locations, devices, applications and configurations. Behaviors include items such as the users' typical access time of day, recent browsing history and path through the site.

-Advanced automation:

Automation of security response and mitigation processes has lagged behind monitoring and alerting, but is due for a change. Once feeds, log data and human intelligence are combined into a sophisticated threat detection and discrimination mechanism, the stage is set for automated response. For example, upon identifying a bad actor by IP, URL or any other security control, an automated solution could not only block the activity and send an alert, but also isolate the affected system from the network, image the system for forensics, rebuild it to a known good state and bring it back online.

-Big Data analytics/ security intelligence:

Financial firms collect enormous volumes of security information, including endpoint and network device logs, asset databases, user data and much more. Modern data-mining and visualization techniques, accelerated by rules-based engines and machine-learning algorithms, have the potential to identify high-risk outliers with sensitivity unknown today. Traditionally a labor intensive process, cybercrime analysis will increasingly leverage the use of Big Data. The use of powerful, real-time analytics across multiple data sets – both structured and unstructured – will vastly improve the quality and speed of real-time cyber threat analysis while greatly reducing overall cost.

2.Procedures relating to personnel:

Strengthen the employees training program with comprehensive user-awareness program,. This program helps organizations improve their security culture by establishing a baseline of existing risky behaviour through the use of simulated phishing testing and training, educating employees on individual responsibility, and measuring improvements.

3. Procedures relating to educate the community:

We must educate the community at large, especially the subset that consists of the end user of computer and network systems. There are the people who are frequently direct victims of cybercrime and who all are ultimately indirect victims in terms of the extra costs they pay when companies they patronize are viticimized and the extra taxpayer dollars they spend every year in response to computer-related crimes. Law enforcement and IT professionals need to work more closely with the community to build a cyber-fighting team that has the skills, the means and the authority necessary to greatly reduce the instances of crime on the Internet.(22)(18)

4.Procedures relating to legal:

The main challenge for national criminal legal systems is the delay between the recognition of potential abuses of new technologies and necessary amendments to the national criminal law.

SuchThis challenge remains as relevant and topical as ever as the speed of network innovation accelerates:

- Adjustments to national law must start with the recognition of an abuse of new technology
- The identification of gaps in the penal code. To ensure effective legislative foundations.
- drafting of new legislation.

Although Many countries enacted new laws fighting cybercrime wich started in United States of America in 1978, expanded to most countries including arab countries such as arabie saoudite and united arab emirates but stay not eneght with local character and legal gaps that they contain, So it becomes necessary to call for action to adopt effective global international law be based on information and database Graphic information documented complete, specific to this aspect.

CONCLUSION:

The benefits of technology such as scale, speed and low error rate are also reflecting in the performance, productivity and profiability of financial services, which have improved tremendously in the past decade. Technology initiatives are taken by financial institutions in the areas of, mobile banking, electronic payments, internet, and also allowed a new crime to appear called cybercrime.

Cybercrime witch mean illegal behaviour committed by means of, or in relation to, a comptuer system or network , including such crimes as illegal possession and offering or distributing information by means of a computer system or network,is the second most commonly reported economic crime in the financial Services sector, accounting for 38% of incidents,Cybercrime costs businesses approximately US$400 billion worldwide, with an impact on approximately 200,000 jobs in the U.S., and 150,000 jobs in the European Union ,using many ways as cards fraud, fishing, email fraud and hacking.

Fighting threats of cybercrime based on three Procedures, first related to Strength cybercsecurity It requires advanced authentication, advanced automation and big Data analytics,the second relating to personnel by Strengthen the employees training program with comprehensive user-awareness program , the third relating to educate the community by educate the community at large, especially the subset that consists of the end user of computer and network systems, the last relating to legal by adjustments to national law ,identification of gaps in the penal code, and drafting of new legislation with adopt effective global international law be based on information and database .

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