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Cyber Security to Information Assurance: An Overview

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Abstract

Cyber Security is an important and major concern in today's age. The term Cyber is gaining popularity in a different spectrum. Initially, the concept of Cryptography was there and thereafter other concepts have been emerged viz. Computer Security; which is mainly concern about the security of the computer and computing. It is about the security of Computer and gradually other areas have been emerged and became popular such as Network Security which is talks about the designing, development and managing secure network systems. The growing popularity of the websites and a large number of users have resulted in another important area in the field called Web Security. Gradually the large amount of data and its management leads the concept of Database and the rising challenge in respect of Database is called Data Security. Naturally, the rising concepts of Data Security, Web Security, and Network Security gave birth to the concept of Information Technology Security (IT Security). Though, later on, few other broader concepts have emerged such as Information Security, Information Assurance. However, important to note that few other issues are also emerging and very much popular viz. Data Privacy and Information Privacy. This paper is offered a detailed overview of the security and privacy related topics in a brief manner. The main aim and agenda of the paper is to aware non IT (even IT candidates) community about the securities related to the Computing and Information.

Keywords

Cyber Security, Cyber Crime & Laws, IT Security, Information Assurance, IT Management, Privacy.

Introduction

Cyber Security and Information Privacy is an important concern these days for the information management and vis-à-vis risk management. Today each and every type of organizations and institutes are facing challenges regarding security and there are huge needs for cyber and information security related awareness [1], [5]. The concepts of security broaden enough in last decade itself. The concept of mobile security, mobile security and risk management is the major concern of current age. Today we are living in Information age and it is called as Digital Age, in this era security is an issue and challenge. Government body, organizations, and individuals are gaining a lot of benefits from the cyber world and side by side there are concern and issues regarding its threat. Hence organizations are moving towards manual information security and privacy as well. Hence the concept of Information Assurance and Risk Management are increasing rapidly. The concept of Data Security, Web Security and also IT Security are also moving towards different alternative solutions [2], [4], [6].

Objective

The paper is theoretical and conceptual in nature and mainly deals with the following aim and agenda (but not limited to the)—

- To learn about the basics of Computer and Allied (Cyber) related terms and concepts emerged in recent past in a brief manner.
- To learn about the basics of Security related concepts viz. Computer Security, Network Security, Database & Web Security, IT Security etc.
- To learn about the more recent concept of Information Security and Information Assurance which are closely related with the management etc.
- To learn about the basic nature and characteristics of the Information Assurance in simple context.
- To learn about the Function and role of the Information Assurance in general and simple context.
- To learn about the laws governing IT and Cyber world with reference to India.

Cyber Sciences? The Increasing Shape

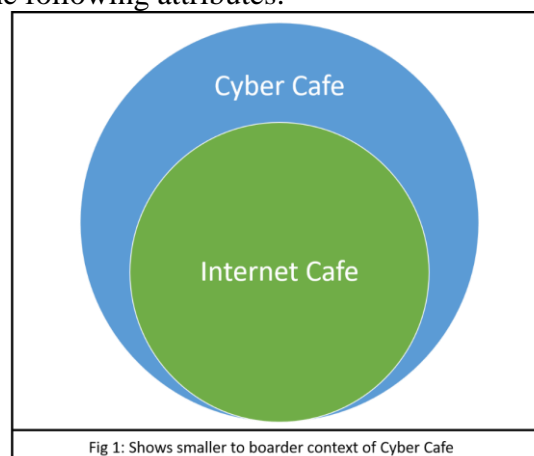
Cyber is related to information technology. There are many objects/areas which are associated with cyber. Most commonly we learned about the Cyber Cafe. Such as –

- **Cyber café**
- **Cyber crime**
- **Cybernetics**
- **Cyber space**
- **Cyber hygiene**
- **Cyber warfare**
- **Cyber organism**
- **Cyber law**
- **Cyber attack**
- **Cyber culture**
- **Cyber age**
- **Cyber security**
- **Cyber forensic**

However, among these areas within Cyber Sciences and Technologies few important and major concerns are provided (herewith)—

Cyber Café

Cyber café is derived from the term ‘Café’ (which was originated from the term coffee) during 1990’s the increasing number of computers and allied products need initial the concept of Internet Café. Thereafter, the concept of Cyber Café was emerged with merge boarder context (shown in fig 1). In generally cyber café means the following attributes.



- Use of Internet to the common people or licensed or registered members.
- Use of computer for documentation, official purpose, academic purpose, business and personal purpose.
- To educate candidates towards the basic computer literacy and also other areas such as Internet Literacy, Web Literacy, Network Literacy etc.

Cybernetics

Cybernetics is an important concept of controlling system using technology. It is very much associated with physical, biological, social systems.

Cyber Warfare

Cyber warfare is an important concept in cyber world. It is about the use of Computer and IT Crime and cyber related technologies to the state, nation and territories by other countries.

Cyber Culture

Cyber culture is an important concept information/ society/ information age/ IT age/ Digital age or more clearly Digital society. In this system individuals and common people are very much associated with IT and digital (cyber products, tools and technologies). Cyber culture is apart from this associated with application of IT in cultural affairs, rituals etc [3], [7].

Cyber Forensic

Cyber forensic is related to computer and IT forensic. It is a part of management science, law, medical science and obviously information technology. Cyber forensic is also a part of forensic science (digital forensic science). It is required for examining the affairs related to cyber-crime and analysing data.

Cyber Laws and Act

Cyber Law is a concept and area which combined with information and communication technology or IT with Legal Studies/ Law. Country wise Cyber law depends upon the situation and jurisdiction. Cyber Law is also called as IT Law or Internet Law or ICT (Information and Communication Technology) Law. As Law formed and governed by the rules and regulation thus it is passed and ensured by the controlling body, constitution, court or similar bodies. As far as Cyber Law is concerned it is controlled by specific cyber security task force, police and anti crime cell etc. In Information Technological Field, crime is an important issue and for managing such crime various acts has been passed [4], [8], [10]. The following are some of the directly and indirectly related act may be useful for this purpose—

- Electronic Commission Privacy Act, 1986
- Federal Privacy Act, 1974
- Data Security Act, 2007
- Data Accountability & Trust Act
- Computer Fraud and Abuse Act, 1984
- Communication Act, 1996
- IT Act 200 etc

In India, Information Technology act was passed in the year 2000 and thereafter in 2005 another important act was passed by the parliament. It is officially called as Right to Information (RTI) Act. IT Act is an important act that was passed in the year 2000 by the President of India. It is mainly undertaken due to increasing number of cyber crime and IT Crime. IT Act is applicable throughout the nation for offence and crime management. In 2008 the IT Act was revised. Most of the important portion of this act is under Section 66. Internationally among the laws and major rules in respect of Cyber and IT Systems HIPPA and COPPA are important.

HIPPA

HIPPA is stands for Health Insurance Portability and Accountability Act that was incorporated in 1996 by the United State Government. The cone idea for this fact was:

- Established procedure regarding Health Information Privacy.
- Closer and discloser of Health Information Authorisation.

The HIPPA deals with two titles:

- Health Care portability, renewability.
- Preventing Health Care, Administrative simplification, Medical Liability reformed. Practically the HIPPA act deals with privacy rules, transaction and code set rule, security rule, unique identifier rule, enforcement rule act.

After implementation of HIPPA act, several areas have been developed such as the effect on research, the effect on clinical care, the betterment of reduction of implementation cost, better education and training related to Health Care.

With the help of HIPPA reduction of violation in health care system, become an important success may developing and un-developing countries have been followed the HIPPA act.

COPPA

COPPA stands for Children Online Privacy Protection Act. In 1998 United State Congress passed the act and with effect from April 2000 in COPPA searching information having adult content requires parental permission. Apart from this in COPPA the role of service provider, product manufacturer etc. have been mentioned. Most of the product and services comes with parental advice and digital signature.

Cyber Crime

When the crime involves with computer and network, it is called as cyber-crime. This kind of offense is mainly undertaken by an individual or group to an individual or group. Cyber-crime is mainly related to internet crime. In recent past cyber-crime is also has a different form, it is called cyber-crime [6], [9]. Cyber-crime may have different target tools and technologies. Such as-

- Individual computer.
- Group of computer.
- Server/s.
- Database.
- Network.
- Website.
- Intranet/ extranet system etc.

There are many concerns which are fall under the Cyber and Internet Crime and among these few major are include—

- Getting password by the illegal way by the email attachment is called phishing. It is an important cyber crime and offense.
- Any kind of virus or malware attached file contents violation of cyber law world and thus it is an offensive act.
- Use of content without the permission of the author or responsible person is called cyber crime.

Cyber Security

Cyber security is related to the cyber-crime and the forensic. It is required for preventing unnecessary access from the third party. Cyber security is also related with the following areas –

- Computer Security
- IT Security.
- Information Security.

Cyber-crime is increasing day by day and thus security measurement also increasing in different areas such as-

- Web Security
- Database Security
- Network Security

Information Assurance: A Journey towards Diverse Range

Information Assurance is a valuable aspect of Information Science and Technology. Information Assurance is related to Information security, Information Technology security, Network security etc. The following diagram (fig: 2) shows the smaller (similar) areas of this field –

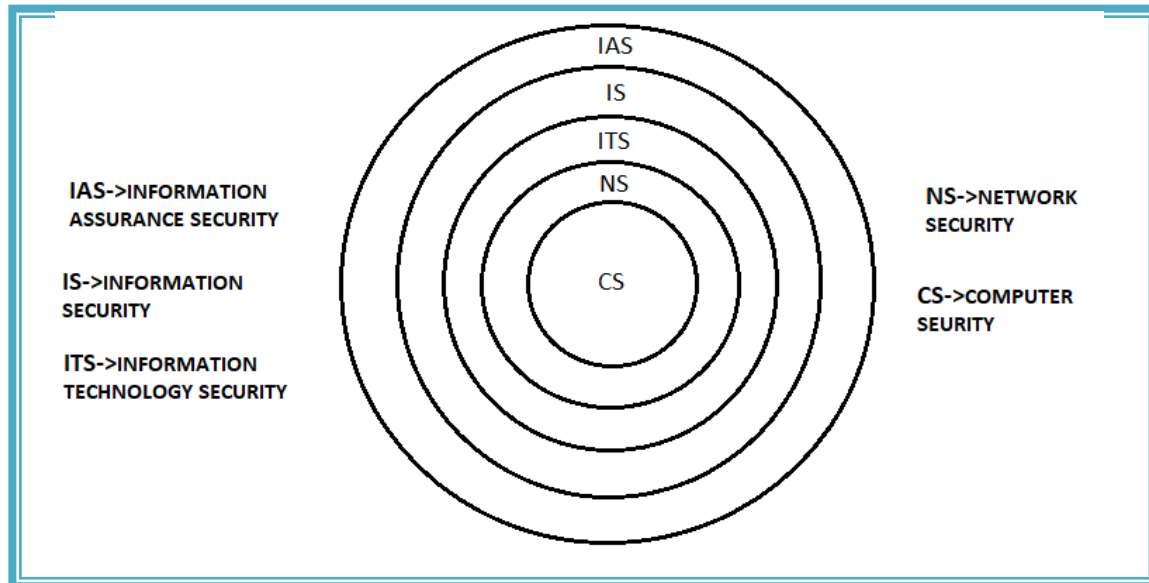


Fig: 2-The broader and smaller areas of Information Technology

Information Assurance is a theory and practice for managing and assuring information, data, and knowledge. It is about technological and manual solution to information. It is closely related with information privacy. Information Assurance is the extension of information security. It talks about data and information uses, processing, storage, and transformation.

The term is widely used in western countries as an alternative of cyber security also. In generally information Assurance can be done by two following methods –

- **Computational and technological systems.**
- **Traditional and manual systems.**

As per as technological system is concerned, it is mainly deals with following areas and tools (i.e. all the areas of IT Security or Cyber Security)—

- **Database Security**
- **Network Security**
- **Web Security**

Information Assurance: Function

- Information assurance is dedicated to make information available to each and every individual in a right place.
- To protect data privacy, Information Privacy and protection from unauthorized and illegal access.
- To ensure technological security lies on information, hence it is liable for information security and also IT security.
- To ensure homeland security including terrorism, cyber terrorism, cyber war.
- To ensure mobile security and its allied areas.
- To ensure network privacy, security and assurance, database.
- Information assurance responsible for design, development, modernization and secure database and information management system.

- Information assurance is responsible for cloud security, infrastructure management, and trust management.
- Information assurance is responsible for strategies risk management in information and technological sectors.
- Information assurance responsible for malicious attack prevention and hacking.
- Information assurance is dedicated for the fraud management dependable system creation in term of IT.
- Information assurance is responsible for making information transparency and public right toward information and IT.
- Information assurance is support the holistic development of manual information system, computational information system; in term of security and privacy.
- Information assurance is in favour of designing and implementing Information, cyber and IT related policy and its framework.

Conclusion

Hence in technological ways, information assurance is a broadest area. Others emerging issues and areas like mobile security, cloud security, infrastructure management and security. Growing Cyber Crime and Information Assurance creates the position of the Professionals in this field which includes (but not limited to)—

- Cyber security analyst.
- Cyber security expert.
- IT Manager.
- IT security analyst.
- Cyber forensic expert.
- Ethical hacker.
- Data security analyst.
- Web security analyst.
- Network Analyst

Day by day the concept is rising and Cyber and Information Security space is rising rapidly. Internationally many universities have been established different wings, centers, schools and department to entertain these areas for the creation of a secure Cyber Infrastructure and Information Assurance. Internationally most of the countries in today's age established a Department or Ministry in Information Technology/ ICT/ Allied areas and in recent past, the concepts of Information and Homeland Security became popular doing a lot of affairs for the security.

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References

- [1] Bacon, T., & Tikekar, R. (2003). Experiences with developing a computer security information assurance curriculum. *Journal of Computing Sciences in Colleges*, 18(4), 254-267.
- [2] Bélanger, F., & Crossler, R. E. (2011). Privacy in the digital age: a review of information privacy research in information systems. *MIS quarterly*, 35(4), 1017-1042.
- [3] Chakraborty, R., Ramireddy, S., Raghu, T. S., & Rao, H. R. (2010). The information assurance practices of cloud computing vendors. *IT professional*, 12(4), 29-37.
- [4] McFadzean, E., Ezingard, J. N., & Birchall, D. (2011). Information assurance and corporate strategy: a Delphi study of choices, challenges, and developments for the future. *Information Systems Management*, 28(2), 102-129.

- [5] Paul, P.K., Chatterjee, D., Bhuimali,A., Atarthy, A. (2016). Cyber Crime: An Important facet for promoting Digital Humanities—A Short Review in *Saudi Journal of Humanities and Social Science*, 1 (1), 13-16
- [6] Paul, P.K. & Aithal, P. S. (2018). Cyber Crime: Challenges, Issues, Recommendation and Suggestion in Indian Context, *International Journal of Advanced Trends in Engineering and Technology* 3(1), 59-62
- [7] Paul, P. K (2013) Cyber Crime and its Challenges with Special Reference to Solution. *International Journal System Simulation*, 7 (2), 77-82.
- [8] Paul, P.K., Shivraj, K. S.(2014) “Cyber Crime and Information Professionals: A Brief Overview and Conceptual Study” *Asian Review of Social Sciences* 5 (1), 18-22.
- [9] Schafer, J., Ragsdale, D. J., Surdu, J. R., & Carver, C. A. (2001). The IWAR range: a laboratory for undergraduate information assurance education. *Journal of Computing Sciences in Colleges*, 16(4), 223-232.
- [10] Schepens, W., Ragsdale, D., Surdu, J. R., Schafer, J., & New Port, R. I. (2002). The Cyber Defense Exercise: An evaluation of the effectiveness of information assurance education. *The Journal of Information Security*, 1(2), 1-14.