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# Redefining Cyber Security- A Bibliometric Approach

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**Abstract:** *The difficulty of cyber security is widespread, and professionals are working hard to address the security issues that are constantly emerging. To clarify the research course for the growing technology, it is crucial to define the keywords for the field. An outline of redefining cyber security's keywords from a bibliometric approach is given in this study. Many sources have been reviewed in order to create the keywords. The gathered keywords have been cleaned up using the National Institute of Standards and Technology's (NIST) definition, and the linked keywords have been manually grouped. A list of keywords has been determined as a result, and their reasoning has been given. You can use these key phrases to download the associated bibliographic entries*

**Keywords:** Bibliometric Approach

## I. INTRODUCTION

Any new technology, including artificial intelligence, the internet of things, big data, advanced mobile computing, cloud computing, e-commerce, and others, relate to and include cyber security as a component. Even while the breadth of cyber attribution is limited, developing technologies are more advanced and vulnerable to cyber-attacks. Cybercriminals frequently utilise common consumer systems as a middleman to carry out their illegal activities. So, the mechanisms for assigning responsibility for cyber activities should be carried out cooperatively on a worldwide scale without regard to political boundaries; for this, international cyber laws, policies, and strategies can be used. Because financial institutions have saved a lot of data on computers and other devices, cyber security is crucial in the digital world.

Much of the data is regarded as sensitive, and unapproved access or exposure could have unfavourable effects. To protect those information assets against threats and attacks in the internet is the goal of cyber security. The nature of cyberattacks is more coordinated, multifaceted, and cross-disciplinary. The word "cyber security" is frequently situational in the sense that a single connected device could be attacked, as well as an enterprise or a whole organisation. Protecting information technology systems and data from cyber-attacks is more crucial and vital for corporate, private, and public sectors. Cyberattacks and threats. Researchers and academics frequently combine network security, application security, web security, online security, mobile security, and internet security when referring to cyber security. So, defining keywords connected to cyber security is crucial for carrying out quantitative research and outlining the expanding field. Detailed keyword research has been done for this project and a set of keywords.

## II. RESEARCH METHODOLOGY

Keyword restriction was implemented in stages. In the first step, the ambiguity of the cyber security domain was discussed with related domains. In the second step, the available keywords are manually collected from the existing literature, synonyms (IEEE Thesaurus, WorldNet and Lexical.net) and international standards organization (NIST, Glossary of British Standards Institution and National Initiative for Cyber Ported .net). Studies). In the third step, grouping of the collected keywords is done and irrelevant or unwanted keywords are discarded in the last step. For example, the keyword "voting system" is not related to cyber security. Finally, the identified keywords were sent to the research experts to get their opinion on the subject and the same is shown in Table II.

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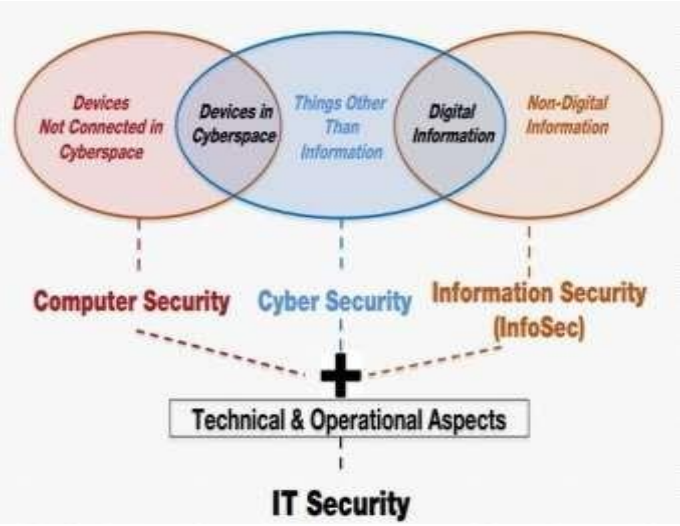
## III. RESULTS

**Ambiguity of Cyber Security domain**

Researchers often use the term Cyber Security interchangeably with Computer Security or Information Security. *Information security,* for example, is protecting information of any kind while *Computer Security* is related to protecting a standalone computing machine whereas Cyber Security is to prevention of information in the cyberspace which is an individual aswell as international concept.




(Source:https://vncybersecu.com/2018/10/29/cyber-security-vs-it-security/).

**Mapping of keywords with definition**

Set of distinct keywords that probably have a strong reference to cyber security hasbeen discussed. The cyber security correlated keywords organized into six Clusters and presented in table I. The clusters were organized as per the definitions given below.

- **Cyber Security**: Prevention of cyberspace from cyber-attack.
- **Cyber Threat or Cyber Crime**: A threat or event or attack of crime that exploits the use of cyberspace by a company in order to interrupt, disable, kill or maliciously manipulate a network environment / infrastructure; or damage data integrity or steal managed information.
- **Broader Concept**: There is a wide scope for these subject areas.
- **Hackers**: Hackers are unauthorized users who hack into computer systems in order to steal, modify or damage information.
- **Cyber security framework**: This framework consists of an interdependent network of infrastructures for information systems which includes the Internet,telecommunication and computer systems.
- **Network Security**: It is related to preventing and tracking unapproved access, violence, alteration, or denial of a network of computers and resources that are availablein the network.

Table I. Clustering of keywords

| Cluster | Related Keywords | Definition | Keyword meetsthe definition ofCyber Security |
|---|---|---|---|
| Cyber Security | Cyber crisis management, cyber safety, cyber security management, cyber threat management, Cyber incident Management, Cyber defense | Ability to protect the cyberspace from cyber-attacks. | Yes |

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| | | | |
|---|---|---|---|
| Cyber threat – cyber crime | Worm, virus, Malicious code, spam, Trojan, malware, malvertising, Scare ware, Adware, Backdoor, A mplication attack, browser hijacker, Botnet, command and control server, Data breach / leakage / data loss, data theft, security breach, security threat, Security Incident, exfiltration | An incident or circumstance which has the potential to cause a loss of assets and the unintended effects or effect of such loss | No |
| Hackers | Black hat, white hat, Botnet, crypto-locker, dropper, key logger, script kiddies, Bot herder, botmaster, Hacktivist ,Threat Hunters, Phisher | Hackers are unauthorized users who hack into computer systems in order to steal, modify or damage information. | No |
| Broaderconcept | Computer security, Information IT security, System security, Web security, Online security, Internet security, Mobile security, Telecommunication security, Cybernetics | There is a wider scope. | No |
| Networksecurity | Cryptography or cryptology, IP Security, Packet Sniffing prevention, Firewall, Intrusion prevention systems, Pen test, Intrusion Detection and Prevention system | It is related to preventing and tracking unapproved access, violence, alteration, or denial of a network of computers and resources that are available in the network. | No |
| Cyber Security Framework | Cyberspace, Cyber Infrastructure, Cyber Ecosystems, cyber- physical system | This framework consists of an interdependent network of infrastructures for information systems which includes the Internet, telecommunication and computer systems. | No |

**Delineating the search terms**

After clustering the keywords, we have identified keywords directly related to the definition of Cyber Security and provided in the table II with definitions. These keywords are represented the field Cyber Security as a domain and keywords are related to threats / attacks / incidents have not been consideredbecause of the definition of Cyber Security is the act of prevention of information in the cyberspace. Cyber space is a widespread, interconnected digital technology.

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**Table II. Cybersecurity and related keywords**

| Tentative Keywords | Definition |
|---|---|
| Cyber Security | Prevention of cyberspace from cyber-attacks. |
| Cyber crisis management | It provides the strategic framework and guidelines to preparefor, respond to, and begin to coordinate recovery from cyber incident or Crises (Readiness, response, and recovery) |
| Cyber incident management | Monitoring and detection of security incidentson-computer or network. |
| Cyber threat management | It is an early detection of risks, situational awareness driven by evidence, timely decision- making and threat mitigation actions. |

## IV. CONCLUTION

The study redefines cyber security as a domain search term from a bibliometric perspective. We have defined the keyword according to NIST's standard definition for Cyber Security in terms of technical and operational aspects. Keywords can be used to search and retrieve bibliographic records related to cybersecurity by indexing databases using wildcards.

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