

# **NAVIGATING THE FUTURE : UNVEILING THE DYNAMICS OF INDUSTRY 5.0**

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THE DYNAMICS OF INDUSTRY 5.0

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## PREFACE

In an era marked by technological revolutions, the concept of Industry 5.0 stands at the forefront, promising a paradigm shift in the way industries operate. As we navigate the ever-evolving landscape unravel the intricacies and possibilities that Industry 5.0 holds. “Navigating the Future” invites all attendees to be active contributors to the ongoing dialogue that shapes the future on industries, fostering a community of forward – thinkers and innovators who are well – equipped to drive positive change in the world of Industry 5.0

Industry 5.0 is regarded as a fifth industrial revolution in which consumers could satisfy their individual requirements as per the tastes and expectations. Although the repetitive tasks are done by robots in Industry 4.0 which is at the mass customization level, Industry 5.0 aims to perform mass personalization with help of Artificial Intelligence.

Industry 5.0 is expected to revolutionize the production process with higher autonomy to collaborative robots. Industry 5.0 is the futuristic industrial revolution which is expected to bring in more creativity and innovation in the products by allowing robots to perform repetitive tasks. It is expected to utilize the creative intellectual capability of human optimally. Moving from mass production to custom manufacturing techniques and production system digitization and intelligentization.

In the lines if above, the PG & Research Department of Commerce has organized two days Conference on the theme “Navigating the Future: Unveiling the Dynamics of Industry 5.0” with the following objectives, to understand and gain knowledge on the functional areas of Industry 5.0; to provide a holistic understanding of the multifaceted dynamics of Industry 5.0 and to enhance the research aptitude among the academicians, scholars towards dynamic changing environment.

To get more insights on the above theme, research articles were invited for presentation and publication. The Department has received fifty (50) articles on various sub-themes from Professors and research scholars of various colleges in Tamil Nadu, Kerala and Karnataka. The Editorial Board has reviewed and edited all the papers scrupulously and meticulously with plagiarism check.

The Editorial Board has recommended and forwarded all the articles in the form of Edited Book with ISBN Publication Number for disseminating the knowledge to all the stakeholders of Higher Education Institutions and Industry concerned.

This book is a comprehensive guide for understanding and utilizing on various themes to generate indepth knowledge on it and suitable for research scholars as well as corporates. We hope that you will find this book informative and inquisitive as much as we learnt it.

Editorial Board.

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## **CYBER SECURITY AND INDUSTRY 5.0**

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### **Abstract**

Industry 5.0 is the raremost industrial revolution characterised by the integration of humans and machines working collaboratively in a smart plant terrion. Cyber security is crucial in Industry 5.0 to protect data, networks and connected devices from cyber threats, ensuring the integrity of operations. In this article, it is dealt with objective of cyber security, types of cyber security crimes, types of cyber security, challenges of cyber security, cyber security and Industry 5.0 with reference to cyber threats in Industrial sectors and how to overcome it. It also covered a few aspects of cyber maturity in the industry in tomorrow.

**Keywords:** Cyber-crimes, cyber security, cyber threats

### **Introduction of Cyber Security:**

Cyber security is the protection of internet connected system including hardware, software & program or data from cyber hacks.

### **Need of Cyber Security:**

1. To protect private data
2. To protect intellectual data
3. To protect banking & financial data
4. National security
5. Global security
6. Protect sensitive data

### **Objectives of Cyber Security:**

The main objective of cyber security are to protect the confidentiality, integrity and availability of information and systems. These are also known as the "CIA Triad" and form the basis of all security programs .

#### **1) Integrity :**

It means to ensure data as well as systems must be accurate, complete, consistent and have not been modified without the users prior permission by any un authorised parties.

There are various measures one can take in order to achieve integrity, some of those are

- Implementing access control mechanism
- Using Cryptographic techniques
- Applying checksums or hashes
- Conducting audits and reviews

## 2) Availability :

It is simply to ensure that the data as well as systems are accessible and functional whenever needed by authorised parties. Some of the cyber security measures one can take to achieve availability are

- Implementing redundancy and diversity
- Using load balancing and failover techniques
- Performing testing and validation procedures

## 3) Confidentiality :

It ensure that data as well as system are protected from unauthorised disclosure and exposure. Some of the suggested measures to maintain confidentiality

- implementing encryption techniques
- Using authentication techniques
- Employing firewalls and network segmentation techniques

## 4) Access Control :

It is to ensure that data as well as systems should only be accessed by authorised parties based on their roles, permission and needs. Some of the measures to achieve access control are

- Using password management tools
- Employing role based access control (RBAC) or attribute based access control (ABAC) model
- conducting access review and audit procedures

## 5) Authentication :

It is to ensure that users or devices are who they claim to be .

Measures to ensure authentication are

- implementing biometric techniques
- Using token based techniques
- onducting Verification and validation procedures

## 6) Compliance :

It is to ensure that the data as well as system adhere to the laws, standards, regulation & policies

### Types of Cyber Crimes:

#### 1. Hacking :

Hackers enter a restricted area and gain access to another person's personal data and sensitive information without that person's permission.

## **2. Cyber Theft :**

Hackers violate copyright law and it's part of cybercrime which means theft done through computer or internet. Eg:- Information theft, Password identity theft.

## **3. Cyber Stalking :**

This is being seen more in social media sites. In this stalker harass the person by repeatedly sending dirty messages or email.

## **4. Identity Theft :**

Hackers target people who use online transactions and banking services. They get into a lucrative conversation with a person to get that person' bank A/C, debit card and Internet banking details then they take out all the money of a person.

## **5. Malicious software :**

Many such dangerous software is created by hackers who can not only steal the data of computer or mobile by connecting to any internet but also delete it and can crash your entire system.

## **6. Phishing :**

The hacker sends a message or email to a person posing as a trusted institution, which looks absolutely legitimate. The hackers motive is to cause financial harm to that person by taking bank a/c and debit card details etc.

## **7. Denial of Services :**

The main purpose of DOS attack is to reduce traffic of a network or service.

## **Types of Cyber Security:**

All the crimes mentioned above are done online and 6 best cyber security to prevent them are

### **1) Network and Gateway security :**

Firewall is a wall for a network that only allows secure things in and keeps unsafe threats out.

### **2) Data loss Prevention :**

In this process all the data of the user is fully encoded using security socket layer (SSL). Data is encrypted.

### **3) Application Security :**

The applications being used in the network go through a security process, If the application is vulnerable then it is taken out of network.

**4) E mail Security :**

Email is provided security by installing spam filters in the network.

**5) Antivirus Security :**

Every person who access the internet or uses the external memory on his Pc or Laptop.This protects our Pc or Laptop from different viruses.

**6) Network Access Control :**

NAC protects the functionality of the network, ensuring that only authorised users and devices have access to it.

**Cyber security and Industry 5.0**

Industry 5.0 complements and extends Industry 4.0. By developing innovative technologies in a human centric way, Industry 5.0 can support and empower rather than replace workers; by doing so we increase industries resilience and make it more sustainable.

**Industry 5.0 Enabling Technologies**

1. Bio inspired materials
2. Smart materials
3. Renewable energies
5. 5G communication
6. Advanced Wifi
7. Advanced cyber physical systems
8. Smart additive manufacturing (SAM)
9. Banking 4.0
10. Crypto currency
11. Advanced block chains
12. AI Advanced Algorithms
13. Machine learning