As part of an ongoing series of 10-minute technical talks presented by NIC officials of their choice on a regular basis, the recent technical session held on 30-Mar-2024.

The details of the presenters, along with their topics and ratings, were as follows:

| S.No. | Name | Designation | Topic | Rating (5.0) |
|---|---|---|---|---|
| 1. | Smt. Pooja Mann | Scientific/Technical Assistant-A | OWASP Top 10 | 4.1 |
| 2. | Sh. Lalit Kapoor | Scientist-F | SQL Versus NoSQL | 4.7 |
| 3. | Sh. Sanjay Kumar | Scientist-F | Internet of Behaviors (IoB) | 4.5 |
| 4. | Sh. Swetansh | Scientific/Technical Assistant-B | Quantum Safe Cryptography | 4.5 |

## Open Web Application Security Project (OWASP Top 10)

Smt.Pooja Mann gave a comprehensive overview of the OWASP Top 10, which is a standard awareness document for developers and web application security. It represents a broad consensus about the most critical security risks to web applications. It is globally recognized by developers as the first step towards more secure coding.



*Smt. Pooja Mann giving the Technical Talk on OWASP Top 10*

Organizations should adopt this document and start the process of ensuring that their web applications minimize these risks. The OWASP Top 10 is updated periodically to reflect emerging threats and changes in the technology landscape.

The latest OWASP Top 10 list includes vulnerabilities such as Injection, Broken Authentication, Sensitive Data Exposure, XML External Entities (XXE), Broken Access Control, Security Misconfigurations, Cross-Site Scripting (XSS), Insecure Deserialization, Using Components with Known Vulnerabilities, and Insufficient Logging & Monitoring. Organizations use the OWASP Top 10 as a reference guide to prioritize their efforts in securing their web applications and to understand the most common vulnerabilities that attackers may exploit.

The OWASP has maintained its Top 10 list since 2003, updating it every two or three years in accordance with advancements and changes in the application security market.

## SQL Versus NoSQL

Sh. Lalit Kapoor gave a presentation on the difference of SQL (Structured Query Language) and NoSQL (Not Only SQL) which are two distinct approaches to database management, each with its own set of advantages and use cases.



*Sh. Lalit Kapoor giving presentation on SQL vs NoSQL*

SQL databases are based on the relational model, where data is organized into tables with predefined schemas, and relationships between tables are established using foreign key constraints. SQL databases typically adhere to ACID (Atomicity, Consistency, Isolation, Durability) properties, ensuring data integrity and reliability. They are well-suited for handling structured data and complex queries, making them ideal for applications with strict consistency requirements, such as financial systems and traditional enterprise applications.

The term NoSQL, short for "not only SQL," refers to non-relational databases that use a non-tabular format to store data, rather than in rule-based, relational tables in relational databases. NoSQL databases use a flexible schema model that supports a wide variety of unstructured data. Common type of NoSql Databases are key-value, Documents, Wide columns, Graphs.

NoSQL is not a campaign against the SQL language. NoSQL stands for "Not Only SQL." It provides more possibilities beyond the classic relational approach of data persistence to the developers. NoSQL DBMS is not a replacement for RDBMS, rather it is to support the gaps found in RDBMS while dealing with big data. NoSQL databases Follow BASE Properties.

SQL databases prioritize consistency over availability — the whole transaction fails if an error occurs in any step within the transaction. In contrast, NoSQL databases prioritize availability over consistency. Instead of failing the transaction, users can access inconsistent data temporarily. Data consistency is achieved eventually, but not immediately.

SQL databases follow fixed or predefined schema, while NoSQL databases follow dynamic schema.SQL databases are vertically scalable, while NoSQL databases are horizontally scalable.

NoSQL databases embrace a flexible data model, allowing for the storage and retrieval of unstructured or semi-structured data without requiring a fixed schema.

They are designed for horizontal scalability, enabling them to handle large volumes of data and high throughput by distributing data across multiple nodes.

## Internet of Behaviors (IoB)



*Sh. Sanjay Kumar presentation on the Internet of Behavious*

Sh. Sanjay Kumar spoke about the Internet of Behaviors which is an emerging technology that has the potential to revolutionize the way businesses interact with their customers. By collecting data about people's behaviors, businesses can gain insights that can help them make better decisions, improve customer experiences, and optimize their processes.

It refers to the collection and analysis of data from various sources to influence or change behaviors. It intersects with the Internet of Things (IoT) and focuses on how technology can be used to monitor, analyze, and modify human behavior.

IoB utilizes data from various sources such as social media, smartphones, wearables, and other IoT devices to understand consumer behavior, preferences, and habits. This data is then analyzed using advanced analytics and AI algorithms to derive insights.

Businesses and organizations use IoB to personalize experiences, improve customer engagement, and drive desired behaviors. For example, retail companies may use IoB to analyze customer shopping patterns and deliver targeted advertisements or promotions.

However, IoB also raises ethical and privacy concerns as it involves collecting and analyzing large amounts of personal data. Ensuring transparency, consent, and data security are crucial in the development and deployment of IoB applications to maintain trust and mitigate potential risks.

## Quantum Safe Cryptography

Quantum Safe Cryptography, also known as Post-Quantum Cryptography (PQC), is a field of study that aims to develop cryptographic algorithms resistant to attacks by quantum computers. Quantum computers have the potential to solve certain mathematical problems much faster than classical computers, which could render many of today's cryptographic systems vulnerable.

Quantum Safe Cryptography focuses on designing algorithms that remain secure even in the presence of quantum computers. These algorithms are based on mathematical problems that are believed to be hard for both classical and quantum computers to solve. Examples include lattice-based cryptography, code-based cryptography, hash-based cryptography, and multivariate polynomial cryptography.

The development and standardization of Quantum Safe Cryptography are essential to ensure the long-term security of sensitive information, such as financial transactions, communications, and data storage, in the post-quantum era. Efforts are underway by organizations such as NIST (National Institute of Standards and Technology) to evaluate and standardize quantum-resistant cryptographic algorithms to prepare for the eventual arrival of large-scale quantum computers. decision-making.



*Sh. Swetansh Shatak showing the demonstration of Quantum Safe Cryptography*

## Quiz Competition on Mobile App

A quiz competition was also organized based on the technical presentations delivered by NIC Officials. A total of 31 officials participated in the quiz competition which was held on the Hindi Bodh Mobile App developed by NIC HP. 16 multiple-choice questions based on the technical content delivered by the officers were asked in the quiz competition.

Now, participants can give feedback on the quality of questions posted by the presenters through the mobile app. This new feature was incorporated to the Hindi Bodh App.

### The result of the quiz competition was as follows:

| Position | Participant Name | Designation | Place of Posting |
|---|---|---|---|
| 1st | Sh. Sandeep Kumar | Scientist-E | NIC HP Vidhan Sabha |
| 2nd | Sh. Mukesh Kumar | Scientist-D | NIC HP State Centre |
| 3rd | Sh. Chunni Lal | Scientist-C | NIC HP State Centre |



*NIC HP officials attending the technical session*

As agreed that the following NIC officials will present a technical talk on the topic of their choice during the upcoming meeting scheduled for coming working Saturday, 06-Apr-2024.

| S.No. | Participant Name | Designation | Place of Posting |
|---|---|---|---|
| 1. | Sh. Vijay Kumar Gupta | Scientist-F | NIC HP State Centre |
| 2. | Smt Vandana Sankhayan | Scientist-C | NIC HP State Centre |
| 3. | Sh. Bhupinder Pathak | Scientist-F | NIC Distt Centre Kangra |
| 4. | Sh. Jagdeep | Scientific/Technical Assistant-A | NIC Distt Centre Lahual & Spiti |

### The following officials were present in the technical talk on 30-03-2024:

| NIC HP State Centre | | |
|---|---|---|
| 1 | Sh. Ajay Singh Chahal | SIO-Cum-Scientist-G |
| 2 | Sh. Lalit Kapoor | Scientist-F |
| 3 | Sh. Sanjay Kumar | Scientist-F |
| 4 | Sh. Sanjay Sharma | Scientist-F |
| 5 | Sh. Vijay Kumar Gupta | Scientist-F |
| 6 | Sh. Vimal Kumar Sharma | Scientist-F |
| 7 | Sh. Sandeep Kumar | Scientist-E |
| 8 | Sh. Daljeet Singh Rana | Scientist-E |
| 9 | Sh. Sanjay Thakur | Scientist-E |
| 10 | Sh. Ashish Sharma | Scientist-D |
| 11 | Sh. Sarvjeet Kumar | Scientist-C |
| 12 | Smt. Vandana Sankhayan | Scientist-C |
| 13 | Sh. Mukesh Kumar | Scientist-D |
| 14 | Sh. Chunni Lal | Scientist-C |
| 15 | Smt. Monika | Scientist-B |
| 16 | Kum. Ankita Mishra | Scientist-B |
| 17 | Sh. Jitender Sharma | Scientific Officer -SB |
| 18 | Smt. Pooja Mann | Scientific/Technical Assistant-A |
| **District Centre Bilaspur** | | |
| 19 | Sh. Rakesh Kumar | Scientist-D |
| **District Centre Chamba** | | |
| 20 | Sh. Ramnarayan Yadav | Scientist-B |

## District Centre Hamirpur

| 21 | Sh. Vinod Kumar Garg | Scientist-F |
|----|----------------------|-------------|
| 22 | Sh. Anurag Gupta | Scientist-E |

## District Centre Kangra

| 23 | Sh. Bhupinder Pathak | Scientist-F |
|----|----------------------|-------------|
| 24 | Sh. Akshay Mehta | Scientist-E |

## District Centre Kinnaur

| 25 | Sh. Balwan Singh | Scientist-D |
|----|------------------|-------------|

## District Centre Kullu

| 26 | Sh. Brijender Kumar Dogra | Scientist-E |
|----|---------------------------|-------------|
| 27 | Sh. Sanjay Gupta | Scientist-E |

## District Centre Lahual & Spiti

| 28 | Sh. Jagdeep | Scientific/Technical Assistant-A |
|----|-------------|----------------------------------|

## District Centre Mandi

| 29 | Sh. Akhilesh Bharati | Scientist-E |
|----|----------------------|-------------|
| 30 | Sh. Ashwani Kumar | Scientist-E |

## District Centre Shimla

| 31 | Sh. Pankaj Gupta | Scientist-F |
|----|------------------|-------------|
| 32 | Sh. Deepak Kumar | Scientist-C |

## District Centre Sirmour

| 33 | Sh. Vijay Kumar | Scientist-E |
|----|-----------------|-------------|
| 34 | Sh. Mohan Rakesh Aggarwal | Scientist-D |

## District Centre Solan

| 35 | Sh. Sanjeev Kumar | Scientist-C |
|----|-------------------|-------------|
| 36 | Sh. Swetansh Shatak | Scientific/Technical Assistant-B |

## District Centre Una

| 37 | Sh. Sanjeev Kumar | Scientist-E |
|----|-------------------|-------------|
| 38 | Sh. Bhupinder Singh | Scientist-D |