Seminar Topic Summary Report

Tentative Cover Page

Institution Name: Basaveshwar Engineering College, Bagalkot

Department of Computer Applications (M.C.A)

Course: MCA

Seminar Topic : Introduction to NoSQLDatabase

Submitted by:

Semester: II

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1. Introduction:

NoSQL databases are designed to handle large-scale, distributed data sets with ease, supporting diverse data models such as document, key-value, columnar, and graph. In today's digital world, organizations generate massive volumes of structured and unstructured data at rapid speeds. Traditional relational databases often struggle to meet the scalability, flexibility, and performance requirements of such data-intensive applications. This has led to the emergence of NoSQL (Not Only SQL) databases, which provide a non-relational, highly scalable alternative for data storage and retrieval.

2. Seminar Topic Details:

Title of the Topic: Introduction to NoSQL Databases
Area/Domain: Database Management Systems, Big Data, Web Development
Keywords: NoSQL, MongoDB, Key-Value Stores, Schema-less, Scalability

3. Topic Summary:

NoSQL stands for "Not Only SQL" and refers to a new generation of databases that differ from traditional relational databases. They are designed to handle a large volume of rapidly changing, unstructured data and to overcome the limitations of RDBMS, especially in web-scale applications.

There are four primary types of NoSQL databases:
- Document databases (e.g., MongoDB) store data as documents (JSON/BSON format), making them suitable for flexible, hierarchical data.
- Key-value stores (e.g., Redis) store data as key-value pairs for fast retrieval.
- Column-family stores (e.g., Cassandra) are optimized for reading and writing large volumes of data across distributed systems.
- Graph databases (e.g., Neo4j) are useful for relationship-intensive data like social networks.

NoSQL databases offer advantages such as high scalability, schema flexibility, and performance across distributed environments. They are widely used in applications like social media, e-commerce platforms, IoT systems, and real-time analytics

4. Relevance to MCA Curriculum:

This topic is highly relevant to the MCA curriculum as it builds on subjects such as:
- Database Management Systems (DBMS)
- Cloud Computing
- Web Technologies
- Big Data Analytics

5. Learning Objectives:

-Understand the limitations of traditional relational databases.
- Learn the key concepts and architecture of NoSQL databases.
- Differentiate between various types of NoSQL databases.
- Explore real-world applications of NoSQL technologies.
- Gain insights into choosing the right database based on project requirements

6. Expected Outcome:

By the end of this seminar, we will be able to:

- Identify when to use NoSQL over SQL.
- Analyze different types of NoSQL databases and select the appropriate one for use case.
- Apply NoSQL concepts in real-world projects and academic research.
- Build scalable and efficient data management solutions.
- Develop a practical understanding of MongoDB, Cassandra, and Redis.

7. References :

[1] Sadalage, P. J., & Fowler, M. (2013). NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence. Addison-Wesley.

[2] MongoDB Inc. (n.d.). https://www.mongodb.com

[3] Cattell, R. (2011). Scalable SQL and NoSQL data stores. ACM SIGMOD Record, 39(4), 12-27.

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