CIS552 – COURSE PROJECT

HEALTHCARE INDUSTRY MANAGEMENT SYSTEM.

FINAL PROPOSAL

Team members:

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Introduction:

The aim of this project is to enhance the effectiveness of the HEALTHCARE INDUSTRY MANAGEMENT SYSTEM by incorporating NoSQL databases. This will facilitate the efficient management of a network of treatment records, prescribed medications, confidential patient demographics, and other relevant data.
The system aims to efficiently organize treatment records, prescribed medications, and confidential patient demographics. With this system, healthcare professionals can access patient information quickly and accurately, leading to better patient care.
By utilizing NoSQL databases, the project aims to enhance scalability and flexibility in managing substantial amounts of unstructured data in a more economical and effective manner.

Abstract:

When managing a significant amount of data, the present relational database system may encounter scalability difficulties. It may struggle to handle a high volume of reads and writes, leading to a slow or unresponsive system. Moreover, maintaining data consistency and integrity can be challenging as the data increases. To address these concerns, NoSQL databases can offer a superior solution.

The Health Care management system will incorporate two Key-value stores and one Document store utilizing NoSQL technology for storing relevant data. Use of Neo4j for graph-based store.

- NoSQL Key-value databases are an efficient and scalable choice for a healthcare management system. By using key-value pairs, specific data items can be quickly retrieved and updated, providing healthcare professionals with fast access to patient information. These databases can scale horizontally to accommodate growing amounts of data, making them suitable for healthcare

organizations that handle large volumes of patient data. Additionally, they can handle unstructured data types, such as images and documents, enabling healthcare professionals to manage a wide variety of data types efficiently.

- NoSQL Document-based databases are a suitable choice for a healthcare management system to manage unstructured data like medical records, images, and clinical notes. These databases store data as flexible documents, enabling healthcare professionals to manage data that doesn't fit neatly into traditional data structures. They are highly scalable, fault-tolerant, and support horizontal scaling, making them ideal for large and distributed healthcare systems. By utilizing NoSQL Document-based databases, healthcare organizations can efficiently manage, store, and retrieve unstructured data, resulting in better patient care and informed decision-making.
- A graph-based data store in NoSQL can be useful for managing complex relationships and connections in the healthcare industry. It can be used to store and analyze patient information, relationships between medical professionals, and treatment plans. The database can be queried to find patterns and connections that may not be easily visible in traditional databases. Popular graph-based data stores in NoSQL include Neo4j, OrientDB, and ArangoDB. A graph-based data store in NoSQL can provide a powerful tool for managing complex healthcare data.

Key-Value Stores:

Amazon DynamoDB is an excellent choice for storing and managing healthcare data in key-value pairs. Its fast and scalable nature allows for quick and reliable access to patient information, medical records, and treatment plans. Additionally, its flexible data model can store complex data structures, and its auto-scaling feature can adjust resources to meet changing needs. Security features such as encryption at rest and in transit, fine-grained access control, and IAM integration also make it a reliable choice for healthcare management systems. Overall, Amazon DynamoDB provides a secure and efficient solution for managing healthcare data in key-value stores.

Document Store:

MongoDB is a robust and flexible solution for managing healthcare data in document-based NoSQL databases. Its ability to store complex data structures, flexible schema, scalability, and security features make it an ideal choice for healthcare management systems.

Graph-Based:

Neo4j is a graph-based NoSQL data store suitable for managing interconnected healthcare data. It can easily represent complex relationships between patients, doctors, diagnoses, and treatments. The ability to traverse the graph and query relationships in real-time makes it an efficient tool for healthcare management systems. Its scalability and security features make it a reliable choice for storing and analyzing healthcare data.