# REPORT

# DESIGN AND DEPLOYMENT OF DYNAMIC WEBSITE

## Introduction:

In this report, we detail the design and development process of a dynamic website hosted on Amazon Web Services (AWS) utilizing an SQL database. The website incorporates advanced functionalities such as user authentication, real-time data updates, interactive interfaces, and robust security measures. Furthermore, we delve into advanced concepts of SQL databases in AWS, conduct a comparative analysis with other database technologies, and provide insights into cost optimization strategies.

## Website Development:

The website was developed on AWS using a combination of services including Amazon RDS for the SQL database, AWS Lambda for serverless computing, Amazon S3 for storage, and Amazon Cognito for user authentication. The website features complex data relationships, stored procedures, triggers, and optimized queries to enhance performance and functionality.

## Advanced SQL Database Concepts:

Our research on SQL databases in AWS included exploring database replication, distributed architectures, high availability, and disaster recovery strategies. We implemented strategies such as multi-AZ deployment for high availability and utilized AWS Database Migration Service for seamless replication.

## Comparative Analysis:

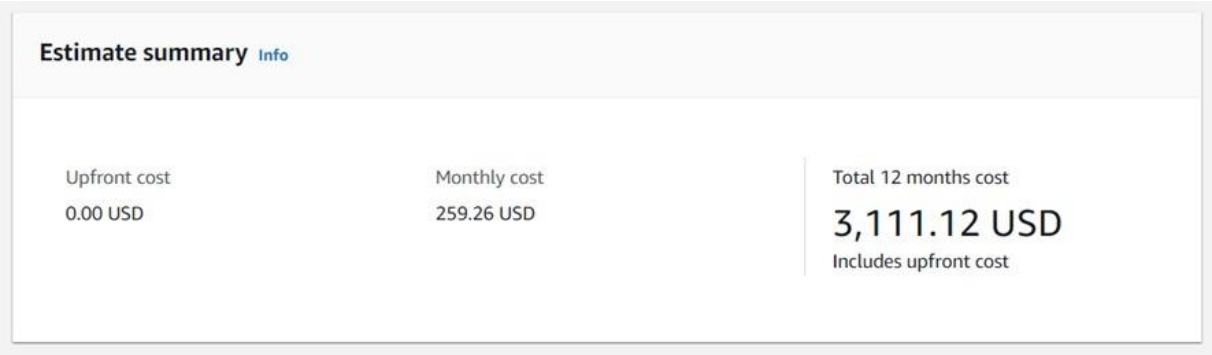
We conducted a detailed comparative analysis of SQL databases with other technologies like NoSQL, NewSQL, and graph databases. While SQL databases offer strong data consistency and structured querying capabilities, NoSQL databases excel in horizontal scalability and flexibility in data modeling. NewSQL databases aim to combine the scalability of NoSQL with the transactional capabilities of SQL databases.

## Security Framework:

The SQL database in AWS was secured using fine-grained access control, encryption at rest and in transit, intrusion detection systems, and comprehensive auditing and monitoring. We leveraged AWS Identity and Access Management (IAM) for access control and AWS Key Management Service (KMS) for encryption.

**Cost Analysis:**

Our cost analysis considered factors such as database instance types, storage requirements, data transfer costs, and scalability options. We optimized costs by utilizing reserved instances for predictable workloads and implementing auto-scaling for variable workloads.




Monthly cost of an average EC2 Instance is: $9.05 approx.

Monthly cost of an average RDS for SQL Server is: $250.21 approx.

**Conclusion:**

In conclusion, the development of a dynamic website on AWS with an SQL database involved the integration of advanced functionalities, implementation of complex database concepts, comparative analysis with alternative technologies, establishment of robust security measures, and optimization of costs. The website exemplifies the capabilities of AWS services in hosting sophisticated web applications while ensuring performance, scalability, and security.