Assignment 2

Cloud Development

CLDV6211

ST10061509

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1. The Search System of Azure Cognitive Search differs greatly from classic search engine platforms.

Azure Cognitive Search presents a unique set of attributes and design features that contrast sharply with traditional search engines. The AI-powered Azure Cognitive Search provides enterprise-level structured data infrastructure (Microsoft, 2024) whereas traditional search engines like Google Search mainly service the web sphere and utilize keyword algorithms for rankings (Microsoft, 2024). Long-term indexing functions of Azure Cognitive Search move past textual analysis through its integrated AI models including natural language processing (NLP) and entity recognition and sentiment analysis and image and language translation extraction (Chappell, 2020).

Azure Cognitive Search employs semantic capabilities to reveal obscure data relationships in unstructured information and proves ideally suited for legal document searches and healthcare patient records and academic research repositories as well as product catalog searches in e-commerce platforms that demand exact filtered search results (Feldman, 2021). The integration of Azure Cognitive Search operates with Azure Blob Storage and Azure SQL and AI enrichments pipelines enables users to search from various data sources through one interface. The deployment of AI enrichments for large-scale operations leads to higher expenses and custom skill configuration becomes more complex and data indexing for big datasets and frequently updated content can cause latency when utilizing Azure (Feldman, 2021).

Organizations can combat these limitations by performing batched indexing operations during off-peak times and defining enrichment pipelines in advance to minimize duplicate processing and taking advantage of Azure auto-scale partition abilities (Microsoft, 2024). Search performance can be optimized through both the practice of data caching and the fine-tuning of scoring profiles in order to maintain budget control.

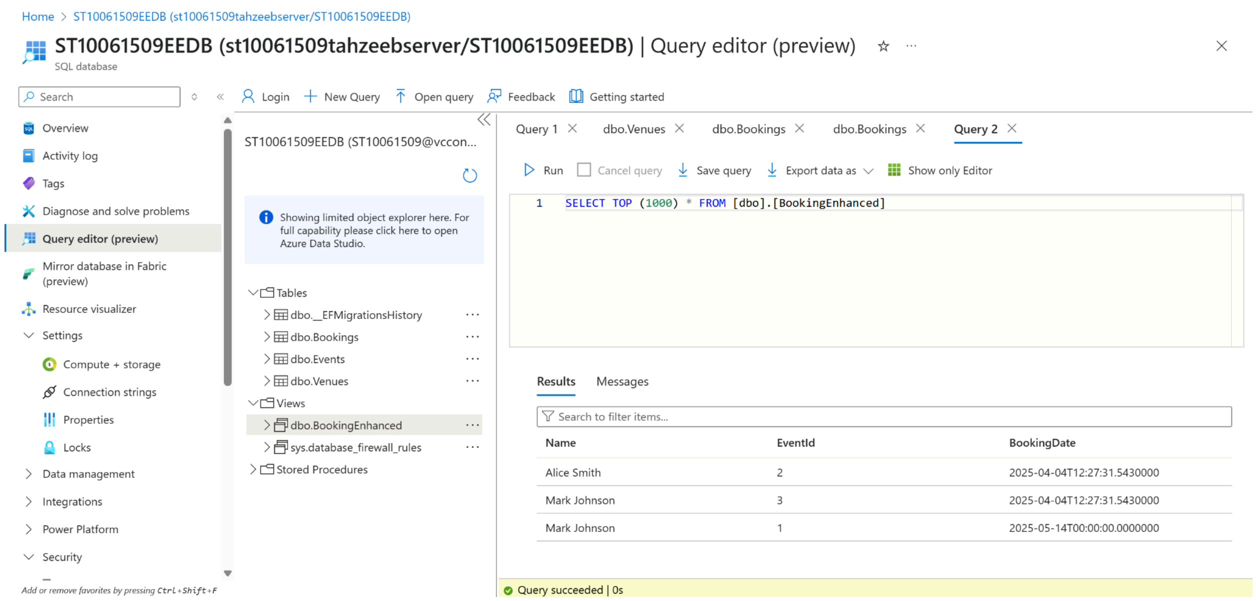
2. Database normalization for cloud-based designs plays an essential role.

Database normalization stays as a vital building block for creating cloud-based databases on both Azure SQL Database and Azure Database for PostgreSQL. Normalisation makes data work better by cutting redundancy and keeping information patterns smooth while moving it into linked table groups (Connolly and Begg, 2015). Database normalisation helps cloud users save money on storage while decreasing data errors and optimizing their write functions according to Keller's (2022) research. Regularised data structures make operations more efficient but they create performance bottlenecks for applications which heavily read data through numerous table combination processes (Microsoft, 2024).

When denormalized data is used alongside distributed NoSQL databases and analytical workloads such as Azure Cosmos DB and Azure Synapse Analytics Microsoft 2024 ensures better query performance even if it increases data duplicate storage. Reporting dashboards need denormalized databases to respond quickly whereas search engines or big data applications also get fast results from these structures.

Effective cloud database design requires a precise determination of which parts should be normalized and which parts should be denormalized because of workload requirements. Our method uses normalization for reliable business systems like banking or ERP then uses denormalization at specific points in high-data-read situations (Feldman, 2021). A combination of Azure cloud-native features including elastic pools and caching layers with read replicas can offset the performance and scalability trade-offs between database structure.

Screenshot.



Links:

https://github.com/IIEWFL/cldv6211-part-2-ST10061509-Mohammed-Moosa

https://st10061509eventease.azurewebsites.net/

Reference List:

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