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**Part 2**

**E. Database Design, Cognitive Search**

1. The difference between Azure Cognitive Search and Traditional Search Engines.

Azure Cognitive Search is powered by a cloud-based AI which is designed to index unstructured as well as structured data and provide an excellent experience.

The differences from a traditional search engine are:

The AI Enrichment, azure uses AI to extract images as well as pdf files and audio while traditional is limited to keyword matching.

The Built-in NLP, azure uses many built in services which rises its compatibility for users while traditional search engines you need to manually implement things or use 3rd party tools.

Indexing Flexibility, azure indexes data from many different sources while traditional usually requires structured sources.

Cloud-First, azure is fully managed and scalable while traditional at most times need those aspects to be done manually.

Custom Ranking, azure has strong support with profiles and traditional is limited and requires manual setup.

Use cases where cognitive search excels include Event Ease Booking search where it will enable natural languages and you can include semantic ranking, so everything has relevant matches. Document or Email search where if the system has a file such as pdf that’s being stored, cognitive search can extract the text from it. Multilingual and image based searching, can extract and also translate data from an image.

The limitations are that the data must be indexed manually or with the use of APIs, the pricing, and it has a limited complex query joins so meaning no SQL joins.

2. The importance of database normalization in cloud-based design.

It has many advantages such as storage efficiency where it reduces the amount of duplicated data, data consistency where changes in one table don’t need to be duplicated in more places, and it has easier maintenance, where updates and deletes are more efficient.

You could use denormalization in high reading scenarios and search indexing.

For azure normalized query speed is slower, write speed is faster, storage cost is lower and it is best for transactional systems. Where denormalized query speed is faster, write speed is slower, storage cost is higher and its best for analytics.

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