MID TERM MIS 631A

Q1) What are the advantages and disadvantages of the relational model?

Ans: The main Advantages and disadvantages of RDBMS are including:

Advantages:

1. Speed: Even though RDBMS is slow in terms of the performance where it comes to speed it is very fast in executing the queries. RDBMS can process large amount of the data in fraction of the seconds.
2. Security: RDBMS is really secure when accessing the database, we will be requiring username and password to access the tables in the database. The user can only work on the tables which he has access to.
3. Simplicity compared to other network models’ relational model is much simpler. It does not require complex quires to execute as it is free from query processing and complex structuring. A simple query is sufficient to execute the query the data.
4. It reduces redundancy and replication of data by not allowing duplicate values like we cannot have same primary key in the table.
5. Multiple users can access data at the same time as example one person is accessing the database other user from different can access the database at the same time.
6. It also supports multiple inheritance.

Disadvantages:

1. Cost: Where it comes to the cost RDBMS is expensive, we will be requiring licensee to use the applications like example for using oracle database we will be requiring licensee to run the applications.
2. Performance: Where it comes to the performance RDBMS is very slow. The performance depends on the number of the tables more the number of tables in the database. The slower will be RDBMS execution.
3. Physical Storage: RDBMS consumes lots of storage of data. If the data is terabytes we will be requiring lots of storages devices like hard disks and other storage devices.
4. We can store only structure data types in RDBMS, whereas we cannot unstructured datatypes in RDBMS we will be requiring NOSQL database like mongo DB and other Cassandra to store data.
5. Sometime there can be loss of data in transferring large amount of data in the database in the organizations.

2). What is the role of the data model in the database design process?

Ans: Data modelling is the first step in the process of database design. The data modelling focuses on what kinds of data should be stored in the database. It is also referred to as conceptual design. The data contained in the database like (entities like Employees, Manager, Departments and accounts) The relationship between data items like (Employees are supervised by manager and manager is the head of each department) The constraints on each data like (Employee name, address, phone number, pin code) Data modelling is preceded by planning and analysis. The effort devoted to this stage is proportional to the scope of the database. In the second step, the data items, relationships and the constraints are expressed in the form of high-level data-model because these concepts do not include the implementation details. The third step is database design which includes database logical design, and another is database physical design. Database logical design defines database in a data model whereas database physical design focuses on internal storage the database physical model discusses about the physical design of the database. The primary role of the data model is to communicate It is a specification of the database administrator to design a database design. Data model helps to define the relationship tables, primary and foreign keys and store procedures. It provides a clear picture of the base data and can be used by database developers to create a physical database.

Q3) Describe a specific challenge in the creation of a data model, and how to potentially overcome it.

Ans: While creating the data model we may encounter numerous challenges like storing data and retrieving the data Taking an example of mapping database of the California city used in the application like uber eats or grub hub. There might be several types of the information where we may need to store and retrieve accordingly. Let us consider an example of customers who used the application to order food from the restaurants we may need to display information like where is the restaurant located, types of dishes sold, prices, discounts, ratings, and feedbacks from the customers. We may have to create database design such way that retrieving the data and storing data is fast as possible. We may also need to consider the number of people using the application to order the food online like at the same time. We may also need to keep backup to store data incase there is loss of data. In case of uber delivery people we may need to display information like the location where the customers are located, location of the restaurants where he needs to pick the food. To overcome this information superfluity, challenges we usually speak about abstraction we manage complexity by choosing a given context. One type of the abstraction is filtering the data accordingly based on the users requirement we may not require to show information like how many orders does uber or grub hub delivery man currently have. Level abstraction is another sort of abstraction. The most basic principle behind levels is that things in a given model can be specified at several degrees of granularity. As a result, we construct a data model using several levels of granularity. We normally include a few things in a high-level data model to offer a foundation for integration and to help us manage complexity. Then, during the refinement phase, we start with a high-level data model, decompose it into a low-level data model, and prepare it for implementation.

Q4) Identify and explain three (3) potential negative outcomes that could result from failing to understand user data requirements?

Ans: The potential negative outcomes of user data requirements could be like data is not stored correctly. There might be duplicate values. Failure of an information systems project is one of the most devastating outcomes.

* User requirements are the conditions that must be met in order for developed software system to be accepted by the users, customers and other stakeholders.
* Due to poor requirements   the information system is incomplete and ambiguous. Misunderstood requirements and scope creep frequently result in resource over-allocation, increased costs, or late deliverables.
* Failure to comprehend consumers data requirements may lead to customer discontent since it falls short of their expectations. If users' data requirements are misinterpreted, the data model will be built on the wrong foundation, making it impossible to improve in the future.

Q5) When designing a database, what are the advantages and disadvantages of using

prototype?

Ans: The advantages of prototype are the following:

* Users can comprehend and assess prototypes more easily than data models. Without needing consumers to learn E-R modeling, we can create prototypes that demonstrate the effects of data model design decision.
* We can get speedier feedback because people are actively involved in the development. It ensures a higher level of client comfort and satisfaction.
* Errors can be noticed considerably earlier, and we can simply locate missing functionality in the meanwhile.

Disadvantages of Prototype model:

* Because of the constantly changing client needs, the prototype approach is expensive and provides insufficient documentation. As a result, there  can be too much variation  in requirements.
* In practice, this process may enhance the system's complexity by expanding the scope beyond the original plans.
* Incomplete applications may prevent the application from being used as intended.
* Customers sometimes expect the finished product to be supplied right away after seeing a prototype. After witnessing the initial prototype, they may not be satisfied or interested in the product. It's possible that the problem analysis is incomplete or insufficient.

Q6) Identify and explain potential advantages and disadvantages of including senior business managers and executives in data modeling exercises.

Ans: The advantages of including senior business managers and executives in data modelling are the following.

* Senior management brings a wealth of knowledge and expertise to the table. They have the real-life experiences of running the business on the ground. So, they are well aware of the numbers, figures and metrics used in data modeling. They are the right people who can guide you in assigning values to certain variable you are unsure of in the data modeling.
* Senior managers can help identify errors, acts of omission and commission in modelling at an earlier stage and help you correct them before the output of the data modelling goes to CXO level people in the organization.
* Senior business managers eventually are far more attentive to the future issues. Hence, if you are doing data modelling to do some futuristic planning or predictive modelling, senior managers can guide you and correct you at initial stages if something goes wrong.

Disadvantages of including senior managers in data modelling are the following:

* Due to their hectic schedules, senior management may not be able to devote the time and effort required for data modeling.
* They are usually quite chatty. They have the potential to derail the entire modeling process if not managed properly.
* They aren't usually adaptable or participatory. They have authority. It's possible that they won't allow convergence based on any assumption.

References:

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