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MDM Assignment 5

Q1. "Failure Recovery in mobile computing is based on ... recoverability conditions?

Data Consistency of a database is said to be data consistent if its contents do not allow users to infer a contradiction directly or indirectly using the database constraints specified in the database scheme. Ex :- If in a mobile distributed database, a certain relation is replicated several times, it might be that one copy does not contain a certain proposition while it is contained in another copy.

Schedules in which transactions commit only after all transactions whose changes they read commit, are called Recoverable Schedules, and this condition is a sufficient condition. In simple words if some transaction T_j is reading value updated or written by some other transaction T_i, then commit of T_j must occur after the commit of T_i.

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Ex :- R1(X), W1(X), R2(X), R1(Y), R2(Y), W2(X), W1(Y), C1, C2.

Ex :-

T_1	T_2
R(A)	
W(A)	
	W(A)
	R(A)
commit	
	commit

(Q2) What is information management and explain issues in information management?

Information includes both electronic and physical information. The organizational structure must be capable of managing this information throughout the info. lifecycle regardless of source or format. Information management is the collection and management of information from one or more sources and the

distribution of that information to one or more audiences. This sometimes involves those who have a stake in, or a right to that info. Management means the organization of and control over the structure, process and delivery of information.

Some of common problems and issues in Management Information System are as follows:-

i) Lack of Strategy, where though leaders know tools of information gathering but putting the info to use becomes a problem.

ii) Lack of Financial support and lack of education and research in the field have made it difficult for professionals to conceptualise info. policies.

iii) Lack of capital and poor market mechanism related to information infrastructure.

iv) Melting organizational needs, with companies relying on ~~de~~ big data analytics, today managers pull reports on existing activity to ensure they are factual based.

v) Keeping up with change, where Softwares needs to be upgraded and even replaced for a competitive business.

vi) Integrating new technologies for accounting, customer relationship management and project-management tools.

(Q3) If log management is a problem then do you think ... present your ideas.

One of the most widely used structure for database modifications is recording the log. Log can be defined as a sequence of log records, recording all the updates activities in the database.

In shadow paging approach

we treat the database to be made up of a number of fixed size disk pages. A directory is kept in main memory and all modifications go through it, with i^{th} entry in directory denoting i^{th} database page on disk.

The search process in log based approach is time consuming. Most of the transactions that are to be redone, had already performed their changes, and redoing them, as in log based approach will be time consuming.

In shadow paging, the overhead of log-record o/p is eliminated and recovery from crashes is significantly faster since no undo or redo are needed. ~~log based~~

Shadow paging causes database pages to change location when they are updated, hence preserving the locality property, but resulting in complex, higher overhead schemes for physical storage management. A garbage collection scheme also becomes necessary in shadow paging.

On the negative side shadow paging may require multiple blocks to be used for a single transaction commit, unlike the log-based approach which typically requires only one block access.

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Q4 Why the use of mobile agents provides a good way of ... database systems?

Database activities of Mobile database systems need regular updation and retrieval of information and updation logs from the users. This would require a constant data connection and all the users to be consistently connected over the network, which would hence require a very large communication or network cost. A similar situation may be seen in the case of Wireless Sensor Network, where the database transmi-ters and database may not be connected over the network for all instants but may work good with periodic connectivity too.

The use of mobile agents and PDAs enables to bottle down the network overhead by introduction of localised and personalised data replications, caching of relevant information, maintainance of log

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for the database updates. These operations enable end users to access the services even in disconnected state when it is not connected with the server or central database. When the connection is gained the mobile agents then follow protocols to push this changes over the global data to ensure consistency and also updates the relevant data that it may need to cache.

In the otherwise case, if these disconnected operations could not be achieved, then all the database activities over the system must always happen in a proper connection and even each set of transactions should be sequential. This would not enable cascading of several transactions would and maintainence of concurrency become a tedious task.