Allocation			Replication		
Site	Fragment	Transmission Cost	Site	Fragment	Transmission Cost
S_4	F_1	242990	S_3	F_1	271190
S_5	F_2	13200	S_4	F_2	15600

Table 21. Allocation and replication Proposed by (Amer et al., 2020)

Allocation			Replication		
Site	Fragment	Transmission Cost	Site	Fragment	Transmission Cost
S_4	F_1	242990	S_3	F_1	271190
S_5	F_2	13200	S_3	F_2	13800

Table 22. Allocation and replication using IVAM

5. Conclusion and Future scope

In distributed database, fragments are distributed among the sites connected within a network. This paper addresses the issue of fragment allocation and replication by increasing the successful queries using a mathematical model IVAM. Here, an example using IVAM is introduced with four fragments and four sites. Initially fragments are allocated on first come first serve basis. Weight is given to access frequency of fragments at each site and this information is maintained using an AFC. This improves the Successful retrieval ratio as compared to initial allocation and earlier works. Cases with varying number of sites are considered. The proposed algorithm works effectively for variable number of sites and fragments. This approach also covers the storage constraint aspect. Both maximum access frequency and storage capacity are evaluated simultaneously. Allocation of multiple fragments at a single site is also possible if the sufficient capacity to store fragments at the site is available. Replication is also done on the sites where the access frequency is high. This makes the process complete and reliable. Replication helps in improving the availability of data at sites but if the number of updates is large, it is advisable to limit the replication.

In future, this work may be extended considering the load balancing constraint and site clustering environment.

6. Conflicts of Interest

The authors declare no conflict of interest.

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