

# Classical Data Migration Technique in Multi-Database Systems (SQL and NOSQL)

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**Abstract-**Data Migration is a process of transferring information between two systems that support different formats. Data migration is necessary when an organization decides to use a new computing systems or database management system that is incompatible with current system. Information is becoming an increasingly valuable corporate asset, the demand for a right tool to store, manage, and move this information in a cost efficient and reliable manner do arises. As part of an Information Lifecycle Management (ILM) best-practices strategy, the organizations require innovative solutions for migrating data among heterogeneous database systems and environments. All data warehouse systems are read optimized, so data is renormalizing while migrating from data base to data warehouses. The NOSQL databases are takes very important role to handling huge amount of data with different kinds of data. Whenever an organization decided to migrate their databases from structured to unstructured an efficient data migration tools will be very much useful to the industries.

**Keywords—** Datamigration, SQL, NOSQL,

## I. INTRODUCTION

Nowadays Database systems have become an essential part of any computer software, almost every computer system be it personal or corporate do have a database system. Low introduction and running cost being the main reason for this popularity. Having a look at the current trend when an organization starts, it usually starts as a Small- Scale industry and hence Microsoft Access Database is quite capable of handling its records and databases. But perceptibly as the company expands its database has to expand too. Thus industries have switched to efficient database tools like oracle, mysql. Recently cloud based applications are placing vital role to support cloud applications many organizations are migrating their database to NOSQL. Data migration can be used for server storage, equipment replacement or upgrades, website consolidation, server maintenance and for the data centre relocation. Data migration tool can also be used by organizations for dealing with the migration issues regarding the complex data exports and imports. After all, exporting, importing or migrating data between different sources is very time consuming and complicated task, especially if these data sources store data in different

formats. This is where a database migration tool comes handy.

## II. STRUCTURED DATABASES

Structured data is defined as the information with the high degree of organization. The structure data will have schema. The schema will define the data how to store with including the data type. Relational databases are used to store the structure data. And Structured Query Language (SQL) is used to manipulate the relational data. Relational databases are like Ms Access, Oracle, MySQL are support to store the transactional data. The relational data is used to do the day to day transactions. The information will store as tables, the database can have one or more number of tables. The structured databases are having limitation with ETL (extraction, transformation, loading). The structure databases cannot ETL the huge amount of data. Writing relations between large tables are also becoming very big problem for database developers. And structured databases will store the homogeneous data. A table can store all the rows based on the schema defined for that data that is called metadata. These are the problems facing by the industries with structured databases.

## III.UNSTRUCTURED DATABASES

Unstructured databases are very efficient and support for data decentralization. Unstructured databases are useful to store large amount of data with multiple varieties. There are no schema restrictions and metadata limitations. User can store any kind of data into their databases. NOSQL databases are support to store the unstructured data. NOSQL means not only SQL. Here the data will be stored in JSON (java script object notation) format. MongoDB is the most popular NOSQL database. MongoDB is document database. Data is stored in a 'collection' which is called as 'table' in SQL. Every collection has number of 'documents' which are 'rows' in SQL. Here every document is unique. A unique id is created automatically for every document. It is also feasible to store multimedia data like images and videos.

## IV.DATABASE CONVERSION

To migrate data from one database server to another database server data conversion is important. In msaccess database the column datatype is different from mysql, oracle and mongodb. The data types in Access are Number, Date/Time, Number and Text. The datatypes in mysql are integer, char, varchar, Date, Timestamp, blob and clob. The datatypes in oracle are number, char, varchar, varchar, Date, Timestamp, blob and clob. The datatypes in mongodb are string, integer, Boolean, double, timestamp, date, binarydata.

To migrate database table from msaccess to mysql create the table in mysql same as msaccess. To create table in mysql we have to find msaccess column names and its datatypes. If the column datatype is text in the msaccess we have to create the column datatype as varchar mysql. If the column datatype is number in the msaccess we have create the column datatype as integer mysql.

To migrate database table from mysql to mongodb create the collection in mongodb same as mysql. To create collection in mongodb, we have to find mysql column names and its datatypes. If the column datatype is text in the mysql, we have to create the column datatype as string. If the column datatype is integer in the mysql we have create the column datatype as integer mysql.

### V. ETL ALGORITHM

ETL comes from Data Warehousing and stands for Extract-Transform-Load. ETL covers a process of how the data are loaded from the source system to the data warehouse. Currently, the ETL encompasses a cleaning step as a separate step. The sequence is then Extract-Transform-Load.

#### a) Extract

The Extract step covers the data extraction from the source system and makes it accessible for further processing. The main objective of the extract step is to retrieve all the required data from the source system with as little resources as possible. The extract step should be designed in a way that it does not negatively affect the source system in terms of performance, response time or any kind of locking.

#### b) Transform

The transform step applies a set of rules to transform the data from the source to the target. This includes converting any measured data to the same dimension (i.e. conformed dimension) using the same units so that they can later be joined. The transformation step also requires joining data from several sources, generating aggregates, generating surrogate keys, sorting, deriving new calculated values, and applying advanced validation rules.

#### c) Load

During the load step, it is necessary to ensure that the load is performed correctly and with as little resources as possible. The target of the Load process is often a database. In order to make the load process efficient, it is helpful to disable any constraints and indexes before the load and enable them back only after the load completes. The

referential integrity needs to be maintained by ETL tool to ensure consistency.

#### d) Algorithm

- Step 1: Lock the target database in source system.
- Step 2: Lock the target database in destination system.
- Step 3: Extract information from target database from source system.
- Step 4: Transform information to destination database.
- Step 5: Release lock of source and destination systems.

### VI. IMPLEMENTED WORK

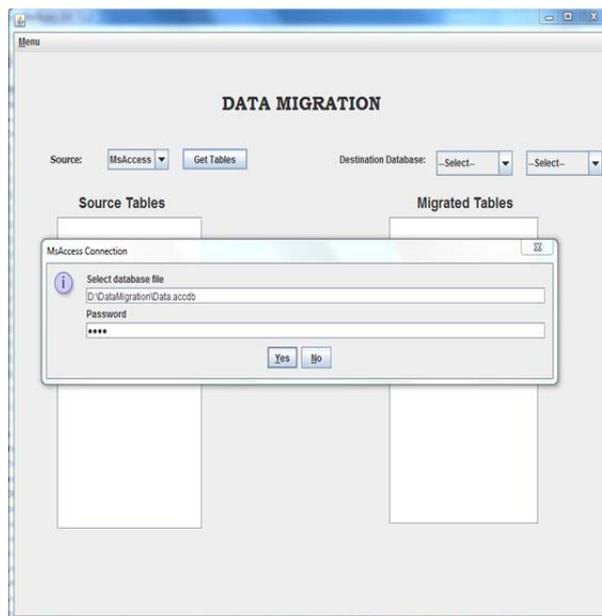


Fig.1. Selecting source database

Fig.1. shows the ms access database 'data.accdb' file to migrating table.

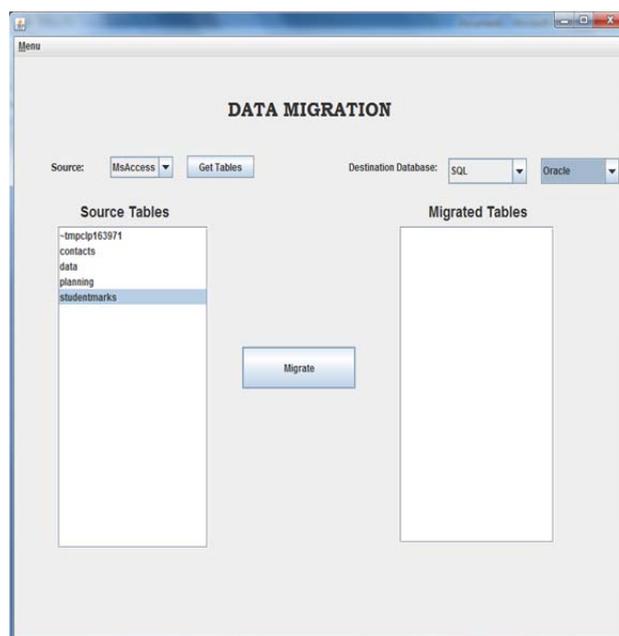


Fig.2. selecting source database table and destination database

Fig.2. shows ms access database table 'studentmarks' and oracle database.

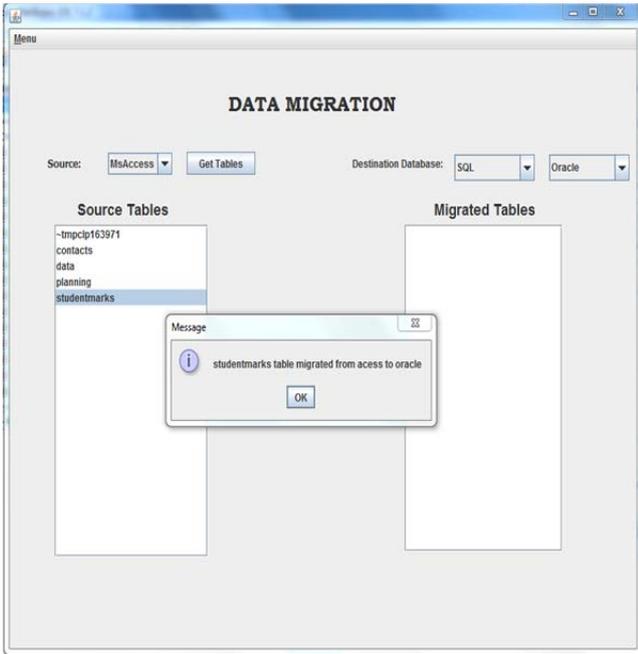


Fig.3. migrating table

Fig.3.shows migrating msaccess database table 'studentmarks' into destination database oracle.

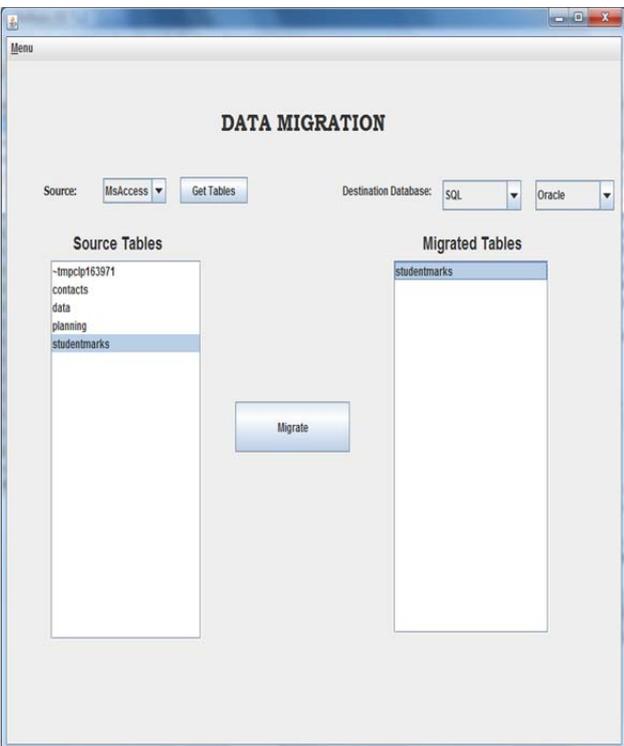


Fig.4. migrated table from msaccess to oracle

Fig.4.shows migrating msaccess database table 'studentmarks' into oracle database

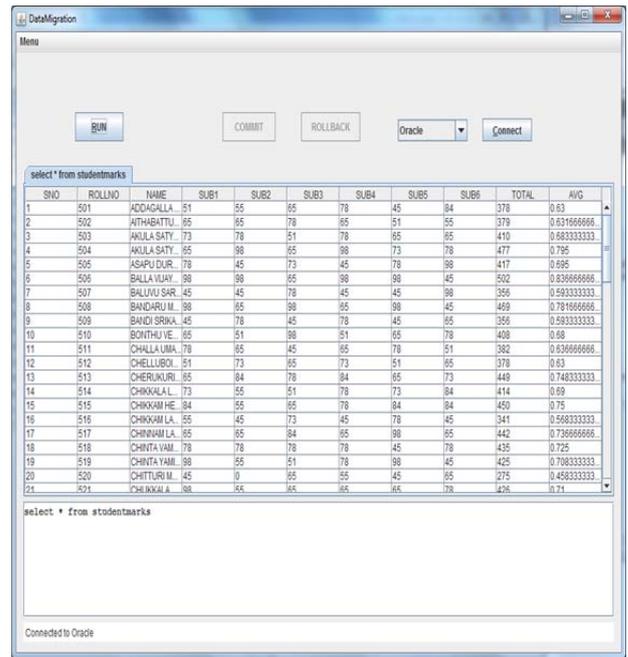


Fig.5. data on oracle database studentmarks table

Fig.5. shows data on oracle database studentmarks table.

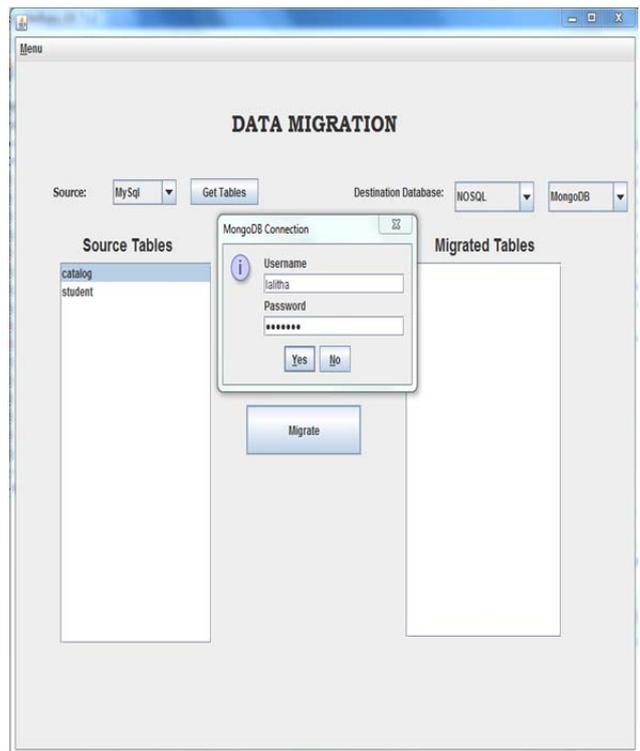


Fig.6. selecting source database table and destination database

Fig.6. shows mysql database table 'studentmarks' and mongodb database.

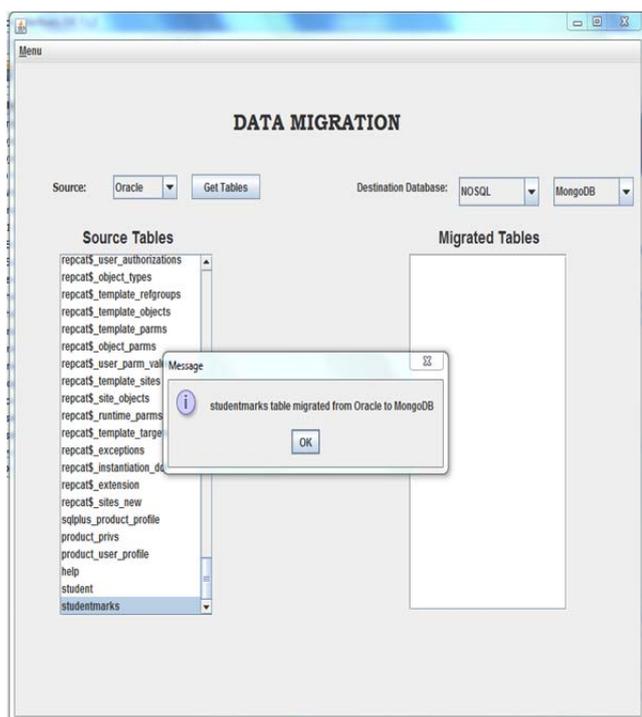


Fig.7. migrating table

Fig.7.shows migrating oracle database table 'studentmarks' into destination database mongodb.

### CONCLUSION

By using the snapshots, other queries can be processed while processing the data migration. But these techniques are not always adaptive hence other technique for data migration is necessary. In this scheme, target data in the source database is locked to prevent the execution of any queries on the target data until the data migration is completed. By using Database Migrating tool is aimed at making the conversion, calibration and configuration of an MS access database to Oracle database, without any [9] .

manual effort and the need of technical knowledge. Finally after successful migration the target data is unlocked. During the whole process of migration the target data is unaffected what so ever be the condition.

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