



# Implementation of Data Migration between Two Different Databases for Inter Connected Tables

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**ABSTRACT:** To begin this project, we will try to Migrate tables from Oracle to MS Access for the initial process of the project. Our goal is to keep the main structures of the tables in intact format, means we will get the original database structure with its original data after data migration process over. This whole process is called as data migration between two different databases in our project. And in our project we will get the tables in MS Access Platform as it was in the Oracle Platform. In this project, inter related tables those are linked by foreign keys will be migrated means there corresponding parent tables, child tables will also be migrated.

**KEYWORDS:** Databases, Migrate, Table, Goal, Oracle, MS Access, Intact.

## I. INTRODUCTION

Here, we will work and find out how data will be migrated from Oracle to MS Access platform keeping the entire structure of the database intact.

As our work progressed, we found out how the details of the table structure can be fetched from Oracle, which means Oracle itself is allowing copying its table's structure. If we were unable to collect these data about the structure through SQL, then we had to think about how to break the security of the DBA part of the Oracle in an ethical manner.

## II. RELATED WORK

### •Discussion of Actual Work:

Here, we are discussing about our actual work to convert the database from Oracle to MS Access. Section [1] discusses the establishing the connection. While section [2] gives the idea about these two databases. And [3] is an entire example of the migration process.

#### 1. Establishing the connection between two databases:

- ❖ We have implemented our concept of migrating data from Oracle to MS Access in Visual Basic (6.0) to develop the software which will be able to convert the database from Oracle to MS Access.
- ❖ All necessary actions required for connecting the Oracle database and MS Access database through Visual Basic were done.
- ❖ The SQL commands were written in VB properly so that they could be fired in proper database and the output were kept in record sets. Here, at first, SQL commands were fired through VB, the output were temporarily stored in record sets provided by VB. From the record set, each record were taken tuple wise and they were stored one by one in MS Access keeping the format of each fields intact.

#### 2. Required information about Oracle database and implementation in MS Access:

##### 2.1 Creation of table structure in MS Access:

To migrate the table, at first we had to get the details about the structure of the table which was to be migrated. If multiple tables were related with each other, means more than one table was joined with reference keys, and then we had to get the details of every table's structure and so on. This information about the tables was used later to create the same tables with similar relations to other tables in MS Access.

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To get the actual structure of a table in Oracle we use “desc <table name>” command. But as we were working with VB and using SQL so we had to find the equivalent command of “desc” in SQL. We can get the structure from the table in oracle named “all\_tab\_columns”. All required fields were taken from “all\_tab\_columns” using the proper SQL command.

The required fields to be fetched from “all\_tab\_columns” table were the field name, data type, data length, constraint name, constraint type. This information was later used to define or create the main structure of the table in MS Access.

COLUMN_NAME	DATA_TYPE	DATA_LENGTH	CONSTRAINT_NAME	CON
B	VARCHAR2	10	SYS_C005561	P
C	VARCHAR2	10	SYS_C005561	P

Fig. 2.1

The output of “desc” equivalent SQL command for a particular table having 2 Primary keys- B, C

## 2.2 Getting information from table user constraint:

In the following fig 2.1 constraint name, constraint type and r\_constraint name from “user\_constraint” table are shown:

CONSTRAINT_NAME	CON	R_CONSTRAINT_NAME
SYS_C005561	P	

Fig. 2.2

Output of SQL command with constraint name and their type

## 2.3 Finding the primary key in the table:

Primary key is the important part of any table, as it can uniquely identify any tuple from other tuples. It cannot be null. It also has vital role at the time of inserting any data tuple wise in a table. So, to fetch the information about primary key of any table and store it in a variable is very important. This will be used during the creation of the table in MS Access. So, we had to use the SQL command to find the primary key in the table.

The following fig 2.1 shows the primary key present in a particular table. It provides the information about column name, constraint name, r\_constraint name and constraint (CON).

TABLE_NAME	COLUMN_NAME	CON	CONSTRAINT_NAME	R_CONSTRAINT_NAME
P1111	B	P	SYS_C005561	

Fig. 2.3

Information about Primary key

In the above figure 2.1 is for a table, let named P1111 and column\_name is the field which is the primary key of that table and “P” in the column of “CON” means the corresponding field is primary key.

This command is also capable of finding the composite key (when more than one field together uniquely identifies the tuple, it is called composite key).

As discussed in section 2.2, that information was used to get the primary key.

## 2.4 Finding the foreign key between the tables:

It is also very important to find the foreign key or reference key between tables. We know, by foreign key tables are inter related to each other. And the field which is used as reference key in tables must have same data type and structure. If foreign key or its structure is altered, omitted or replaced, then the entire table is changed and we are



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not able to migrate the actual table, in fact it will show an error message. So it is very important to find the foreign keys, store it in a variable and declare it in the MS Access table, keeping the entire database intact.

The following fig. 2.4 shows the reference keys present in the database:

TABLE_NAME	COLUMN_NAME	TABLE_NAME	COLUMN_NAME
P111	B	P1111	B
P111	A	P1112	A

Fig. 2.3.2.4.1

Foreign keys present in the tables

In the above fig. 2.4 the foreign key are denoted to corresponding field name and it also gives the information about the field which is referenced to it.

Similar structure is created while creating the table structure in the MS Access and hence the main structure is kept intact.

## 2.5 Parent- child relation between tables:

It is also important to find which table is related to each other and which one is created first. We know many table could be related to each other. The table which is created first is called the parent table, while the later created table is called child table. Let us divide the creation of table in levels in Oracle database. At the time of creating the tables in MS Access, the tables in first level of Oracle must be created before the second level and so on. In similar words, every child table can only be created, if and only if all the parent tables of that child table are defined first.

The following fig. 2.5 shows parent tables of a particular table selected.

TABLE_NAME	COLUMN_NAME	TABLE_NAME	COLUMN_NAME
P111	B	P1111	B
P111	A	P1112	A

Fig. 2.5

Parent table of a particular table

This structure is maintained while creating the database in MS Access.

## 2.6 Selecting the table to be migrated:

After login in with the user name and password in the database of Oracle, we have to select the table which will be migrated to the MS Access. So, we have to show all the tables available under that user, so that the user can select the table. This list of tables is shown by the data grid in our software, user will select the table and the table will be migrated to the MS Access platform keeping its main structure, relation with other table and data types of every field intact.

All tables available under a particular user is shown from where particular table can be chosen for migration.



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Vol. 4, Issue 2, February 2016

In the following Fig. 2.6 we can get the list of tables available for a particular user:

TNAME	TABTYPE	CLUSTERID
P1222	TABLE	
P1223	TABLE	
P121	TABLE	
P211	TABLE	
P13	TABLE	
P111	TABLE	
P122	TABLE	
P21	TABLE	
P11	TABLE	
P12	TABLE	
P2	TABLE	
P1	TABLE	
C1	TABLE	
P1112	TABLE	
P1111	TABLE	
P1221	TABLE	

Fig. 2.6  
Tables available under a particular user

Once the user selects the table it is migrated to MS Access.

### III. SIMULATION RESULTS

#### 3. Example:

To illustrate our work let us consider the following example given in fig. 3.1

Here, a table named **P111** has two parent tables – **P1111** and **P1112**.

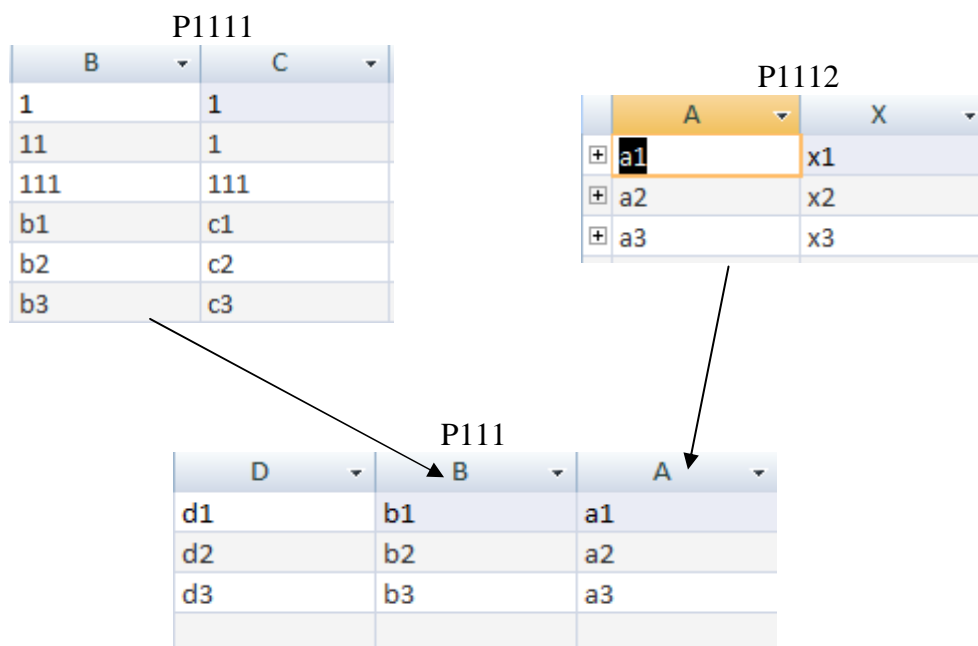
We want to migrate this P111 table from Oracle to MS Access. As it has two parent tables,

So parent tables must be migrated first. Only after the migration of all parent tables with the data, then only the child table will be created and data will be inserted, i.e. migration will be completed.

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Vol. 4, Issue 2, February 2016



Structure of database in Oracle to be migrated in MS Access

We want to migrate **P111** table from Oracle to MS Access. Here is the step by step explanation how this tables is migrated from Oracle to MS Access.

### 3.1 Finding the foreign key in child table:

As we select the child table and convert it, at first, it searches for the foreign key. Here child key have two foreign keys. Fig. 2.4.1.1 shows the information about the foreign keys fetched by the SQL command.

TABLE_NAME	COLUMN_NAME	CON	CONSTRAINT_NAME	R_CONSTRAINT_NAME
P111	A	R	FK_P1112	SYS_C005460
P111	B	R	FK_P1111	SYS_C005461

Fig 3.1.1  
Foreign keys of child table

So before creating the structure of P111 table, it goes to P111 and P1112 tables.

### 3.2 Creation of structure of foreign key:

As it moves to P1111 table, which is foreign key of P111 table, it again searches for foreign key of P1111 table. Fig. 3.2.1 shows it has no result.

no rows selected

Fig 3.2.1  
No foreign key of P1111

### 3.3 Creation of structure and data insertion P1111 table:

As P1111 have no foreign key so it starts to construct the structure of P1111 table. Then it finds the Primary key of it and one by inserts the tuples.



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### 3.4 Creation of structure and data insertion P1112 table:

The above process is done recursion ally meaning as 3.3 creates and inserts data in table P1111, then the structure of P1112 is created, primary key is implemented and data are inserted.

### 3.5 Creation of structure of P111 table and data insertion:

As all the tables of P111 table now has been created, so it comes back to P111 table, then creates it structure and inserts all the data. And finally all table are migrated from Oracle to MS Access.

## IV. CONCLUSION AND FUTURE WORK

As our initial goal was to migrate database into MS Access, so we are able to convert this database into MS Access from Oracle. As Oracle is providing some of its basic table to be read, so we can get the idea about the actual structure of table in Oracle, so that same structure can be created in MS Access. Here, no need of breaking the security of DBA is needed.

As we migrate the database from Oracle platform to MS-Access platform for the first attempt. It can be done by other platforms too, e.g.: Mysql, PostgreSQL platforms.

Migrating the data using the concept of Composite Primary Key will be emphasised in our project.

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## BIOGRAPHY



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### Achievements:

1. Got 431st Rank on NEST(Nationwide Education And Scholarship Test) Aptitude Test 2013,
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(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 2, February 2016



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Achievement:

1. Accepted my name for publication in “Who’s Who Science and Engineering, 2011 – 2012” published by “Marquis Who’s Who”, USA on 31st Dec 2010
2. Selected his name as “Top 100 Engineers’ 2011”, by “International Biographical Centre”, Cambridge, England
3. Selected his name as “Outstanding 2000 Intellectuals of the 21st Century, 2012”, by “International Biographical Centre”, Cambridge, England