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RESEARCH ARTICLE

Design of a Simple Graphical User Interface to the Relational Database Management System

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Abstract— *This proposed work aims to provide a powerful Integrated Development Environment (IDE) client for Oracle database server. Using this client tool user does not require more knowledge of oracle database. With the intuitive DB tool GUI increase your code quality and reduce the development process time. By using this client software IDE, users can access and maintain the oracle software in an easy way and even help them to use the oracle client before implementing a real software development project which is running on oracle database. This GUI is designed using the strategy called Model-View-Controller (MVC). MVC paradigm is an intuitive and widely accepted strategy in UI design, be it web or rich client UI (using swing, flex, java FX, etc.). Results can show whether this software is useful to help software developer and oracle user to access the oracle database in efficient way.*

Keywords— *Oracle Client, Oracle database, MVC, IDE, User and Software developer*

I. INTRODUCTION

Most organizations today use a database to automate their information systems. A database is an organized collection of information treated as a unit. The purpose of a database is to collect, store, and retrieve related information for use by database applications. A database management system (DBMS) is software that controls the storage, organization, and retrieval of data. A relational database is a database that stores data in relations (tables). A table is a two-dimensional representation of a relation in the form of rows (tuples) and columns (attributes). A tuple is an unordered set of attribute values. Each row in a table has the same set of columns.

Oracle Database is an RDBMS. Oracle Database has extended the relational model to an object-relational model, making it possible to store complex business models in a relational database. Structured Query Language (SQL) is the set-based, high-level declarative computer language with which all programs and users access data in an Oracle database. SQL provides an interface to a relational database such as Oracle Database. SQL*Plus is the Oracle tool used to run SQL statements against Oracle Database [3]. To work with this tool user

should have knowledge about Oracle and SQL. The non expert database users cannot access the database using SQL*Plus.

To overcome this problem Graphical User Interface tools were introduced. Here the difficulty is learning of the tool for the users who have no technical knowledge (non-computer professions) such as Accountant or Statisticians, Social Analysts.

The main objective of this product is to provide a powerful and customized Integrated Development Environment (IDE) client for Oracle database server. This software can save more time and money by reducing the user effort to access the oracle database in command line client(SQL*Plus).Using this client tool user does not require more knowledge of oracle database.

The Design Standard which used to develop this tool is Model-View-Controller (MVC).MVC is a widely adopted pattern, across many languages and implementation frameworks, whose purpose is to achieve a clean separation between three components of most any application:

- Model: business logic & processing
- View: user interface (UI)
- Controller: navigation & input.

A number of patterns for Graphical User Interface(GUI) applications have been proposed by the software community. The well-known Model-View-Controller (MVC) provides a good starting point for the developers. MVC paradigm is an intuitive and widely accepted strategy in UI design, be it web or rich client UI [5].

II. SYSTEM ARCHITECTURE

The user interacts with the GUI tool in the way such as click the button to create table. This software validates the user input by using appropriate swing actions. The dialog box allows the user to update the values of the database, and the frame panel simply reflects the changes as the final textual display. If any error found then the software will provide the detail description. If there is no error found in validation the Query will be passed to the Oracle Server. The function of oracle server is to execute the query and return the result. This software can import html, excel files into oracle database and export tables into xml, html, excel files. The following figure shows the architecture of this Oracle management Tool. This software is developed using Java.

Java is a high level programming language and it can be characterized as object oriented, concurrent platform independent.

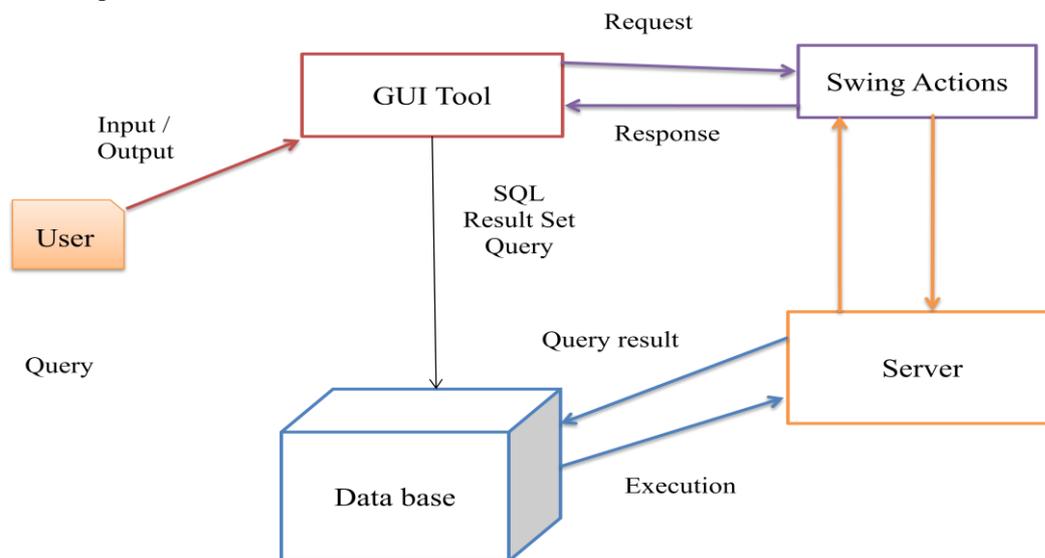


Fig 1 Architecture of oracle management tool using MVC.

The features of this software and their functions are described below.

Create Table feature enables the user to create the table with appropriate properties. Keys, constrains, indexes can be created using the options provided. There is an option for entering comments about the table columns.

DDL View generate Data Definition Language (DDL) statements that show the database object details in SQL statements that you have designed in the schema or database. Database Objects supports the following database objects such as table, sequence, trigger, procedure, function, package, synonyms and index. View Data, we can able to view more than one table at a time by selecting table name from the combo box. Using insert feature, we

can able to insert one record by using GUI insert dialog. Using delete feature, we can able to delete one or more than one record at a time by selecting the row from the delete GUI dialog.

Update enables the user to update one record at a time by changing the field data from the update GUI dialog. By selecting alter column menu item in the Table menu option, we can able to alter the table column. Once you selected the alter column menu item, the alter column panel appears where we can alter the selected table column. This panel contains add and remove column option button at the bottom. Import/Export feature we can import Excel sheet and export table data into excel, html, xml.

Using Table Segregation feature we will segregate the different types of tables. This segregation of tables is based on the data type of column like nested table, large object (LOB) and user defined object.

Conversion feature helps User and database developer for converting Oracle database from/to flat files (XML) and Excel files and vice versa . Commit / Rollback are helpful to user who will mislead to delete, update and modify data from the table. Database Object Search finds the database objects of table name, procedure, package, sequence, trigger, view, synonyms, index, and database link. For changing the schema name, we need to press the change schema menu item in the File menu. Once we selected the schema menu item, one dialog menu will appear where we have to select schema name and its login password.

Once we selected the change login menu item, one user login dialog will appear where we have to enter the oracle server IP address and oracle login credentials. The login credentials are correct, and then tool will change the database login. By selecting the relation menu in the table menu option, we can get two types of table relation menu items such as Primary and Reference key relations. Tools menu Provides Pie and Bar chart report generation for the database schema.

III. RESULTS & DISCUSSION

The user can create table with appropriate properties using the options provided for this feature as shown in fig.2.By clicking the plus symbol button we can add more columns. Using the keys panel user can define primary key, foreign key and unique key .For that user no need to type the column name but the user can select the field name from the list.

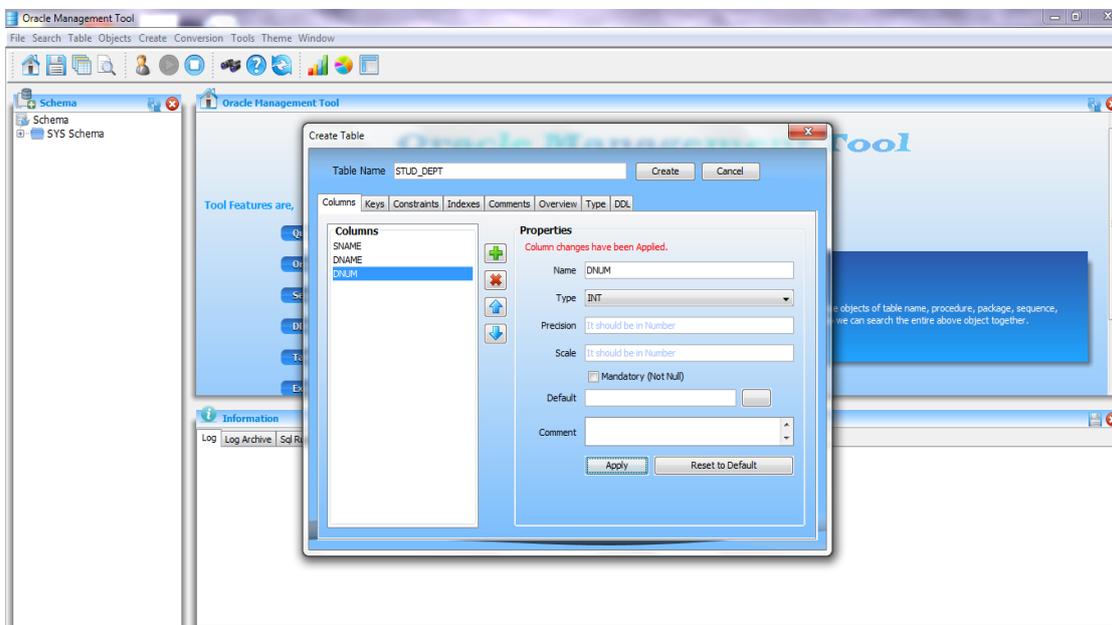


Fig 2 Table Creation.

The following figure depicts the view of selected table content. If the user wants to view all content of the table he/she can use this option. We can edit the table data using Insert, Delete and Update buttons.

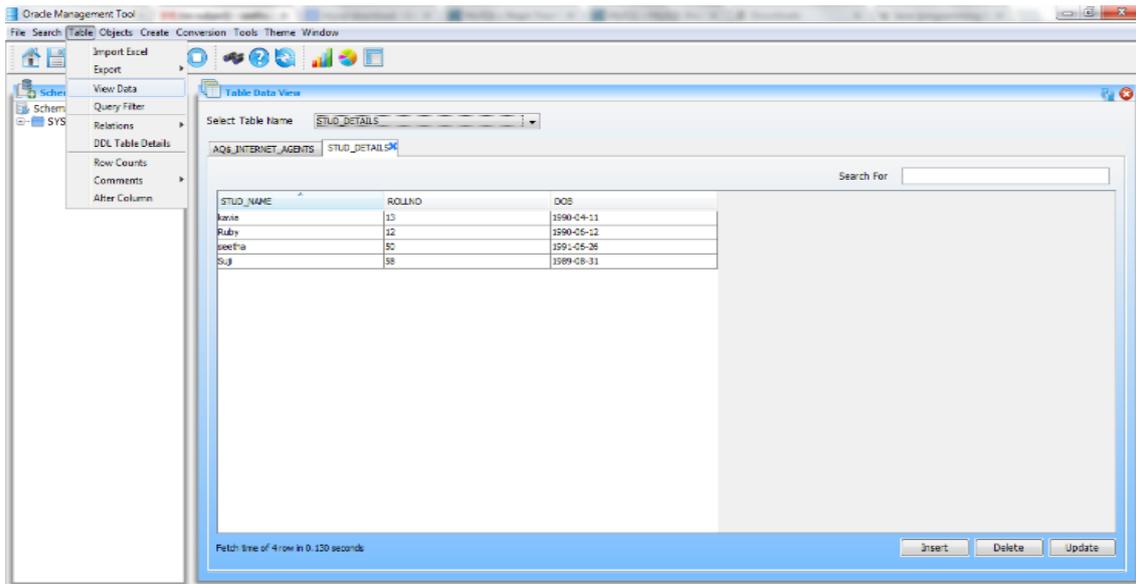


Fig 3 View and Edit Table Data.

The Query filter option used to view selected content from the table as shown in fig.4. There are three significant types of data filter setting options available such as Logical, Range and List settings.

- ✓ In case of Logical setting, it will filter a table column with respect to mathematical logical relationship like <, >, <=, >=, != and ==.
- ✓ If a setting is Range, it will filter a table column with respect to values between minimum and maximum.
- ✓ If a setting is List, it will filter a table column with respect to list of values that are given by a user.

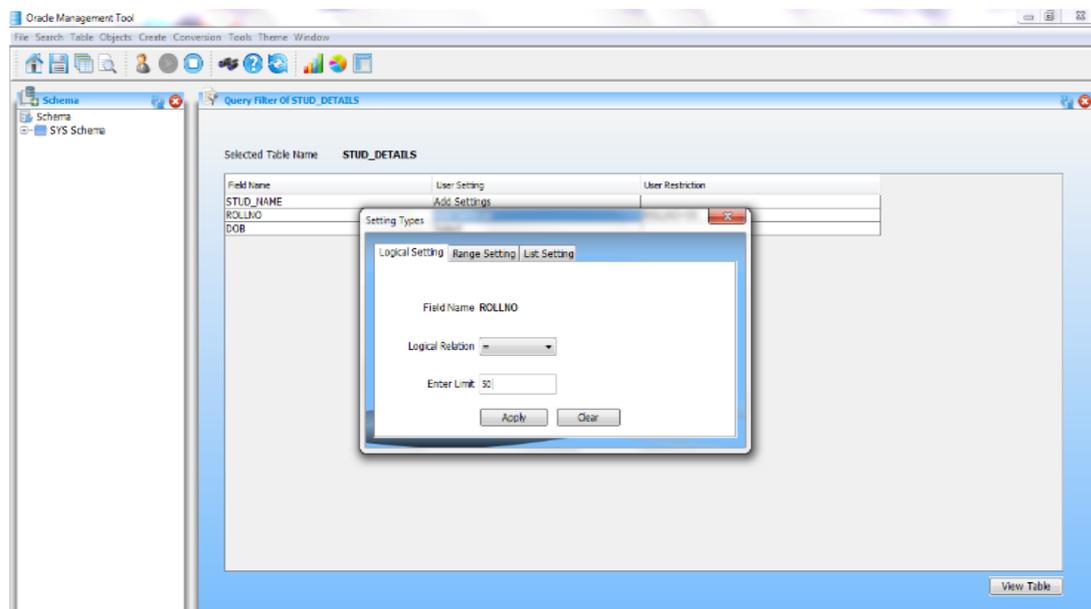


Fig 4 Query Filter.

Use of import (fig.5) through excels have many advantages over other oracle import tools like SqlDeveloper, Toad, Razar, etc.

- ✓ It provides adjustable import parameters, including source data formats for all the fields and destination data formats for the selected fields, commit options, number of records to skip, etc.
- ✓ It shows the position where errors have occurred in excel sheet.

- ✓ Before loading the data, it will show all the constraints problems like Primary, Foreign, Unique and Condition check constraints. It also shows table dependency problem.

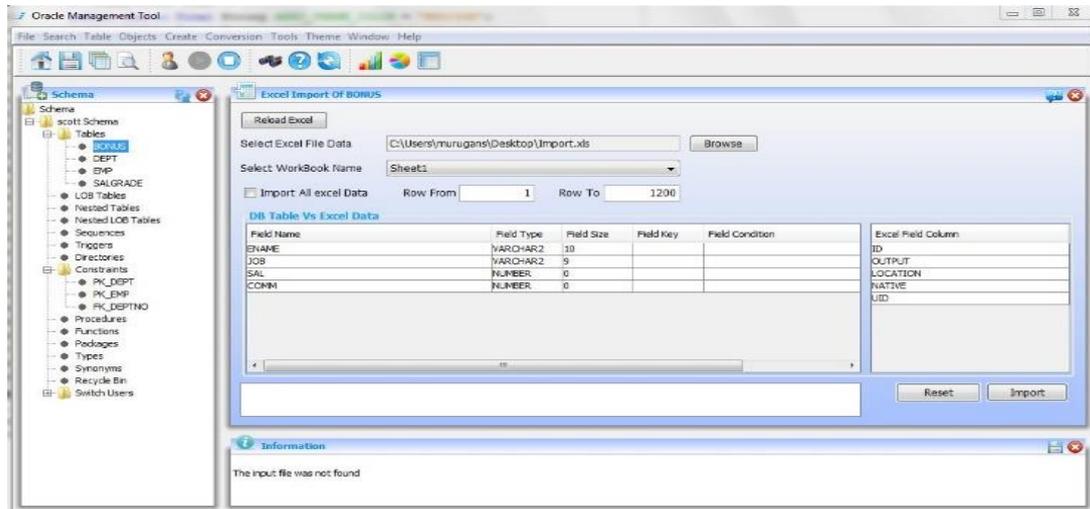


Fig. 5. Excel Import Feature.

The Excel Export feature will support for exporting one or more table from a particular schema at a moment. It has an option, which provides how many tables can be loaded in a single work sheet. This will be helpful if user wants limited number of tables in a single excel sheet.

IV. CONCLUSIONS

This Oracle client GUI provides efficiency in many ways to use Oracle Database by using this tool, database access time will be reduced significantly to those who are using it. At present this tool supports the latest oracle release of ORACLE 11gR2SERVER and also earlier version of ORACLE SERVER (10g, 9i).

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