Spreadsheet Macro Generation through Query Building Tool

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ABSTRACT: Now-a-days all the commercial and non-commercial organizations want to preserve the data in digital format without pen and paper concept. The major need in those systems is document analysis and report management. These kinds of data management requirements are fulfilled by a single entity called SpreadSheet. Most of the industries are using this important feature SpreadSheet for most of their organization and non-organizational needs. The SpreadSheet internally has some useful features such as Statistic-Visualization, Report Generation, Linear Program Models; Web based internal data downloading options and many more. SpreadSheet contains many functions, which is really needed to all type of users for example data processing logic, data storage with reporting and so on. For these kind of opportunities SpreadSheets are the mostly used and most needed port in current industry as well as there is a very big market available for the SpreadSheet to write up the business logic and convert those complexities by using macro. So, that the Query Building Tool provides the data transformations more effectively and provides lots of interesting features to its users. The main motto of our Query Conversion tool is to converting the SQL complex queries into the Spreadsheet Macro, so, that the complex database oriented operations are easy to all kind of users to process data transactions.

KEYWORDS: Query Conversion, Macro, Relational Databases, Spreadsheets, Data Transformation.

I. INTRODUCTION

Spreadsheets are among the most ordinarily utilized applications for information administration and verification. They consolidate information handling with exceptionally differing supplementary highlights: measurements, representation, detailing, direct programming solvers, Web inquiries occasionally downloading information from outer sources, and so on. Be that as it may, the spreadsheet worldview of calculation still needs adequate investigation. In this system, we show that a spreadsheet can execute ,mostly queries inform of SQL, simply by using spreadsheet equations. We give an quiry compiler, which interprets any given SQL question into a worksheet of a similar semantics, counting NULL esteems. Along these lines, database operations end up noticeably accessible to the clients who would prefer not to relocate to a database.

II. LITERATURE REVIEW

Following are some existing studies and approaches related for Spreadsheet Macro Generation Through Query Building Tool.To the best of our knowledge, the problem of expressing relational algebra and SQL in spreadsheets has not been considered in the setting.

The following results are the most similar to our work.The paper[1] proposes an extension of The earlier paper [4] demonstrated as a "proof of concept", that Excel (and other spreadsheets) are capable of storing and querying relational data, and can thereby serve as database engines.

Hence extended version of spreadsheet proposes an extension of the set of spreadsheet functions by a carefully designed database function, whereby the user can specify and later execute SQL queries in a spreadsheet-like style, one step at a time.   These

additional operators are executed by a classical database engine running in the background. Our contribution means that exactly the same functionality can be achieved by the spreadsheet itself.

There is a paper[5] which describe a project, named Query by Excel to extend SQL by spreadsheet-inspired functionality, allowing the user to treat database tables as if they were located in a spreadsheet and define calculations over rows and columns by formulas resembling those found in spreadsheets.

In the paper[1] a spreadsheet interface is offered for specifying these calculations, which had to be specified in an SQL-like code in the earlier papers. Finally, paper describes a method to allow RDBMs to query data stored in spreadsheets
Bin Liu et al. [6] presented direct data manipulation query interface. Main objective of the article is to create a spreadsheet like interface which easily can access and query the database through the direct manipulation interface.Error rate is much high in the spreadsheets. So a method or tool is needed to detect the errors and remove them from spreadsheets. Therefore, a strategy to significantly improve the reliability of spreadsheets could be to add (a) higher-order programming constructs and/or (b) a type system to spreadsheets.Robin Abraham [7] introduced a type system and type inference algorithm for spreadsheets and demonstrated how these algorithms will identify the programming errors in spreadsheets.
Andrew Witkowski et al. [9], [10] proposed spreadsheet like computation in relational database system through extensions to SQL, allowing OLAP tools to handle the user interface

III. PROPOSED METHODOLOGY

The present framework offers a two fold commitment. It is a broadened form of a before framework [1], which showed as a "proof of idea", that Excel (and different spreadsheets) are equipped for putting away and questioning social information, and can in this way fill in as database motors.
In our proposed system, we offer a fully automated method to construct spreadsheet implementations for a wide class of relational data transformations. In this some operators of relational algebra are re-implemented to accept a variable number of input columns and to support NULL values. The full automation of the translation process reduces the number of human introduced errors in the spreadsheet application.This project demonstrate that a spreadsheet can implement data transformation definable in SQL merely by utilizing spreadsheets formulas.
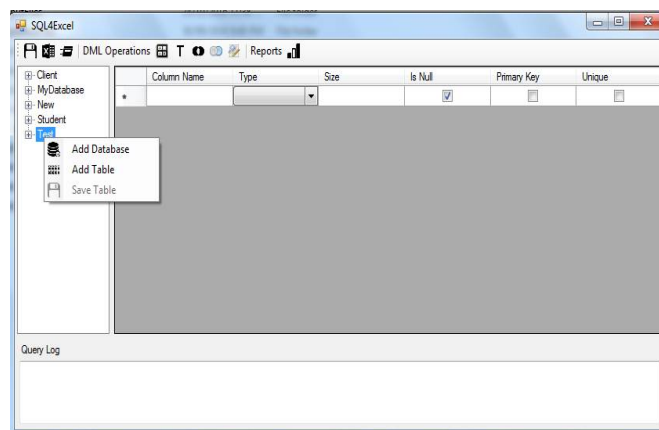

Fig .1. User interface to provide queries

From above provided user interface user enters the query and after that get their execution designs in a spreadsheet. The Figure shown above provide a user interface where user can create database, tables and also select the operation which he/she wants to perform.In which we have provided the mathematical ,text,Union ,Join ,Find and replace and graph related operations.While creating table there also provided a range of data types and their size.Due to such type of structure there is no need to mention SQL query. And this is more advantageous in the case where we have to do conditional operations .It is difficult to write spreadsheet formula for such queries but in our proposed system sql queries for such type is easy to mention and spreadsheet formula is automatically generated.
End clients can even now work in the vanilla spreadsheet, advantage from its highlights like information examination and perception and also the person who is not compatible with sql queries can also perform such sql operation .

IV. ARCHITECTURAL MODEL OF A DATABASE IMPLEMENTED IN A SPREADSHEET
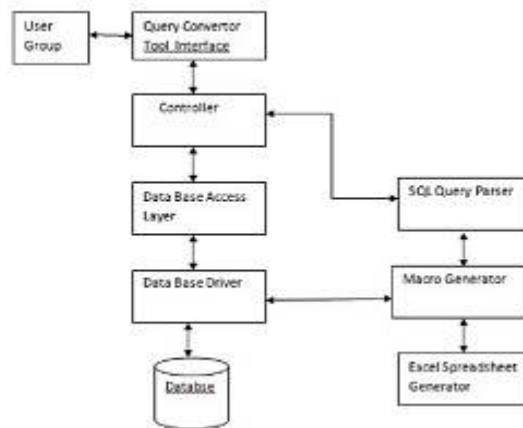

Fig.2. Architecture of system

As you can see in the above diagram below are major component in the system.
_ Database :- We are using sql database where business logic is store.

_ Database-Driver :-Sql database access driver which is used to connect database
with external system
.
 DAL :- Database access layer which is written in java to handle all operationrelated to database.
Query-Convertor-Tool Interface :- This is main interface module which is take SQL from the database and pass
information for the processing.
 SQL-Query-Parser :- This component is mainly used to parse the sql of different types and generate the required
information for the spreadsheet macro query generator.
Macro Generator :-Which convert the SQL query in form of macro
 Spreadsheet Generator :- Which generate an Excel spreadsheet including output of all operation with macros.
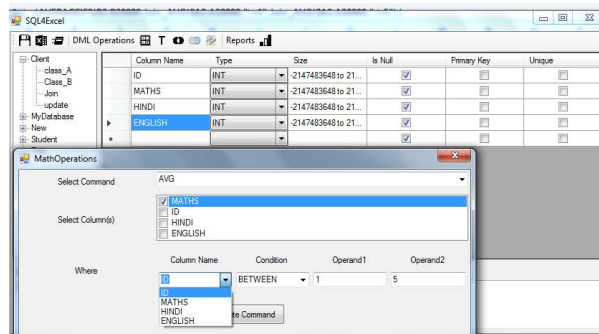
V. EXPERIMENTAL RESULTS

Fig.3. Mathematical Operations

The above fig. 3 shows the how average query (one of the operation from mathematic operation) is executed.
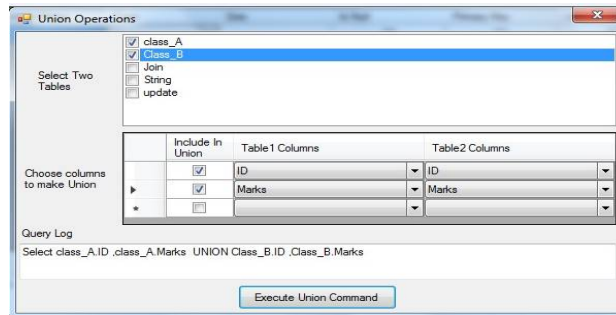
Fig.4. Union Operations

Fig. 4 shows the how Union query is executed on two tables named class A n Class B and columns ID and Marks.
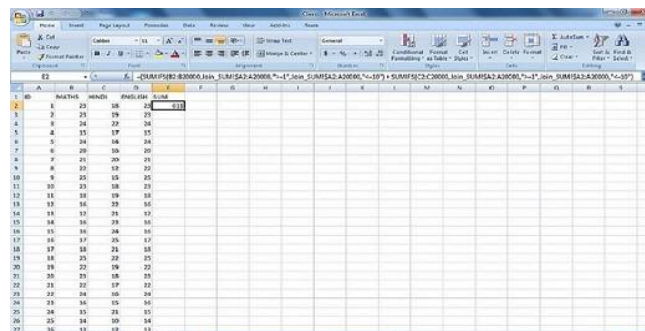

Fig.5. Client View

Fig.5 shows that how the result is generated in the spreadsheet and formula of given query in spreadsheet.

In this section,the performance of proposed methodology is evaluated. After performing experiment we got following results as per shown in below graphs. Here we have performed comparative experiment between different time required to perform different sql queries in milli seconds.For analysis we have taken the one database named College in that there are three tables one is for shift college which have 580 records and other tables are regular college and personal details of that students .These two records have 1050 records.
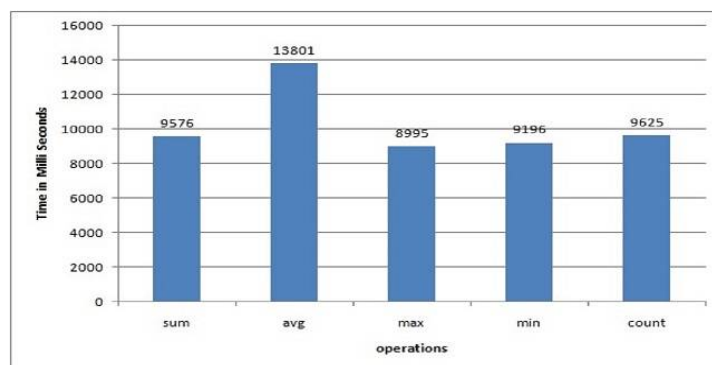

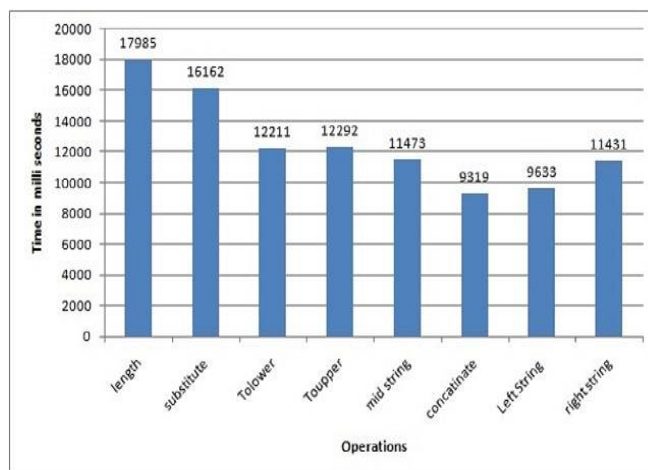Fig. 6: Time for mathematical operations
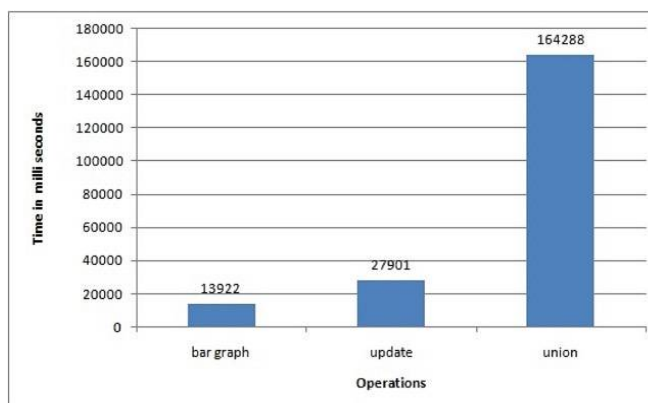
Fig. 7: Time for string operations

Fig. 8: Time for Union,Graph operations

VI. CONCLUSION AND FUTURE DIRECTIONS

This tool will show database query can be also translated into the spreadsheet macro i.e we can also get sql queries in the form of spreadsheet formula .So business can use spreadsheet features like reporting, data analysis ,filtering , sorting etc. With the help of this tool small business does not need to migrate to the database and can execute queries without remembering any query syntax . And as a next step we plan to develop optimization for sql queries translation into spreadsheet and also try to develop other operations of sql to be translated into spreadsheet.

REFERENCES

[1].Jacek Sroka, Adrian Panasiuk, Krzysztof Stencel, and Jerzy Tyszkiewicz "Translating Relational Queries into Spreadsheets" " transaction on knowledge and Engineering vol. 27 ,No.8 , AUGUST 2015.
[2]. xil. (2012, May). Connecting list of users with list of companies—please help [Online]. Available:http://www.mrexcel.com/forum/excel-questions/642466-connecting-list-users-list-companies-please-help.html
[3]. stefanaalten. (2013, May). Combining two lists into one big list [Online]. Available: http://www.mrexcel.com/forum/excelquestions/ 704217-combining-two-lists-into-one-big-list.html
 [4]. J. Tyszkiewicz, "Spreadsheet as a relational database engine," in Proc. ACM SIGMOD Int. Conf. Manag. Data, 2010, pp. 195–206.

[5]. A. Witkowski, S. Bellamkonda, T. Bozkaya, A. Naimat, L. Sheng, S. Subramanian, and A. Waingold, "Query by excel," in Proc. 31st Int. Conf. Very Large Data Bases, 2005, pp. 1204–1215.

[6]. B. Liu and H. V. Jagadish, A spreadsheet algebra for a direct data manipulation query interface, in Proc. IEEE Int. Conf. Data Eng., 2009,pp. 417428.

[7]. R. Abraham and M. Erwig, Type inference for spreadsheets, in Proc. 8th ACM SIGPLAN Symp. Principles Prac. Declarative Program., 2006, pp. 7384.

[8] B. Liu and H. V. Jagadish, "A spreadsheet algebra for a direct data manipulation query interface," in Proc. IEEE Int. Conf. Data Eng., 2009, pp. 417–428.

[9] A. Witkowski, S. Bellamkonda, T. Bozkaya, G. Dorman, N. Folkert, A. Gupta, L. Shen, and S. Subramanian, "Spreadsheets in RDBMS for OLAP," in Proc. ACM SIGMOD Int. Conf. Manag. Data, 2003, pp. 52–63.

[10] A. Witkowski, S. Bellamkonda, T. Bozkaya, N. Folkert, A. Gupta, L. Sheng, and S. Subramanian, "Business modeling using SQL spreadsheets," in Proc. 29th Int. Conf. Very Large Data Bases, 2003, pp. 1117–1120.