A report on

Oracle Upgrade Project

By

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At

Aditya Birla Insulators, Halol, Gujarat

Practice School –II Station of

**BIRLA INSTITUTE OF TECHNOLOGAY AND SCIENCE,
PILANI (Rajasthan)**

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Station: Aditya Birla Insulators   **Centre:** Halol

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Title of the Project: "Oracle Upgrade Project"

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Key words: Database, Oracle, RDF **Abstract:**

The old database query management system worked on ProC (also known as Stored Procedure), a subroutine available to applications that access relational database management system (RDBMS). Changes to stored procedures are harder to keep track of within a version control system than other code. Hence, a Resource Description Framework (RDF) based solution was required to ensure future adaptability of the end user application needed within the organization.

Signature of Student   **Signature of PS Faculty**

Date   21 December 2020   **Date   21 December 2020**

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INTRODUCTION

Aditya Birla Insulators currently uses ProC, better known as stored procedures, to fetch and display the data stored in the database tables. using SQL. It is a type of code in SQL that can be stored for later use and can be used many times.

So, whenever the query needs to be executed, instead of calling it, the stored procedure can be called. Parameters can be passed to a stored procedure, so that the stored procedure can act based on the parameter values that is passed.

DISADVANATAGES OF CURRENT SOLUTION

Proc can only be executed on the database and utilizes more memory in the database server. Other disadvantages include:

- **Testing** of a logic which is encapsulated inside a stored procedure is very difficult. Any data errors in handling stored procedures are not generated until runtime.
- **Debugging:** Depending on the database technology, debugging stored procedures will either be very difficult or not possible at all. Some relational databases such as SQL Server have some debugging capabilities.
- **Version** control is not supported by the stored procedure.
- **Cost:** An extra developer in the form of DBA is required to access the SQL and write a better stored procedure. This will automatically incur added cost.
- **Portability:** Complex stored procedures will not always port to upgraded versions of the same database. This is especially true in case of moving from one database type (Oracle) to another database type (MS SQL Server).

ADVANTAGES OF SOLUTION IMPLEMENTED

The company will be moving to a Resource Description Framework (RDF) based solution which can be efficiently implemented and stored. RDF based model will have following advantages

- RDF model is essentially canonicalization of a directed graph and thus has all the advantages and generality of structuring information using graphs.
- The basic RDF model can be processed even in absence of more detailed information (an "RDF schema") on the semantics: it already allows basic inferences to take place, since it can be logically seen as a fact basis.
- The RDF model has the important property of being *modular*: the union of knowledge (directed graphs) is mapped into the union of the corresponding RDF structures; this means that:
  1. Information processing can be fully parallelized
  2. In presence of partial information (an essential feature of volatile environment like the web) the output is still consistent RDF model that can be successfully processed
- RDF syntax is layered: the basic serialization syntax allows for quite a powerful encoding, while still being compact.

<u>PROCESS FOLLOWED</u>

Ideally, I would be at the site working on the database locally, but due to the COVID-19 pandemic this wasn't possible. We first tried to setup remote desktop connection using an in-house application used by Aditya Birla Group, parent company of Aditya Birla Insulators, as an VPN gateway, but we were unsuccessful in doing so. So, we resorted to setting up an empty replica of the database server on my machine and using that as reference for all queries to be written.

The design of table was based on inputs from team. Once the template of older table was provided, I went ahead and wrote the queries for the report generator using SQL. Once the query was finished, I submitted it to my mentor who checked the query for any errors or suitable improvements and later implemented in the final report builder file in order to run it on actual database server and see if it functioned properly and if not, pointed out where there might have been a mistake and possible ways to tackle it.

WORKING WITH ORACLE REPORT BUILDER

Oracle Reports Builder is the report-building component of Oracle Reports, a powerful enterprise reporting tool that enables rapid development and deployment of sophisticated Web and paper reports against any data source (including an Oracle database, JDBC, XML, and text files). Leveraging Java EE technologies such as JSP and XML, reports can be published in a variety of formats (including HTML, XML, PDF, spreadsheet, delimited text, PostScript, and RTF) to any destination (including e-mail, Web browser, Oracle Portal, and file system) in a scalable, efficient manner. Recognizing the differences between Web publishing and paper publishing, Oracle Reports Builder provides the power to develop high quality output for the Web and e-business requirements.

Oracle report builder enable us to structure the look of the tables which are fetched based on the query statement which is submitted through a query builder window.
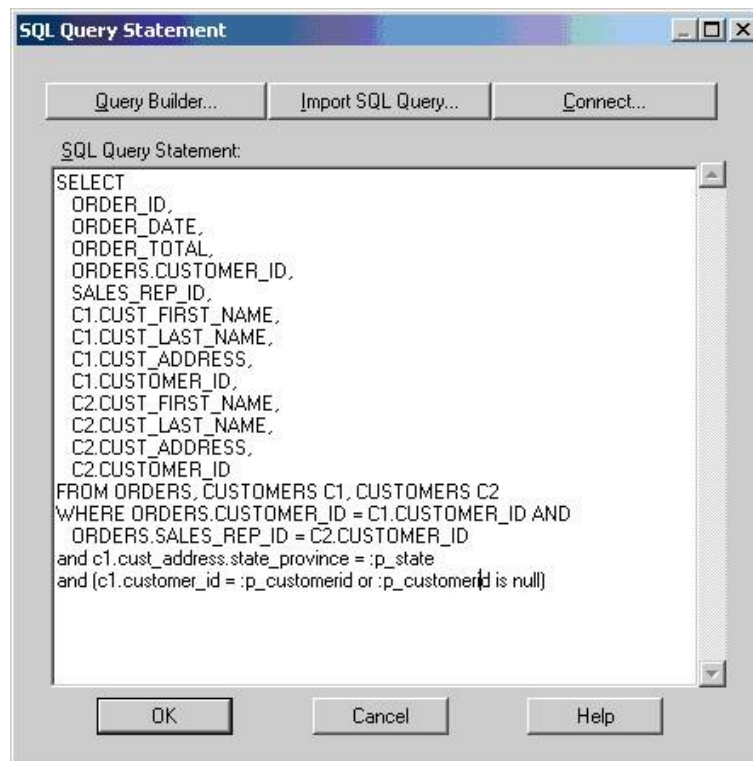
Properties of the report such as user parameters, groups, datalinks and layout can then be specified as per requirements.
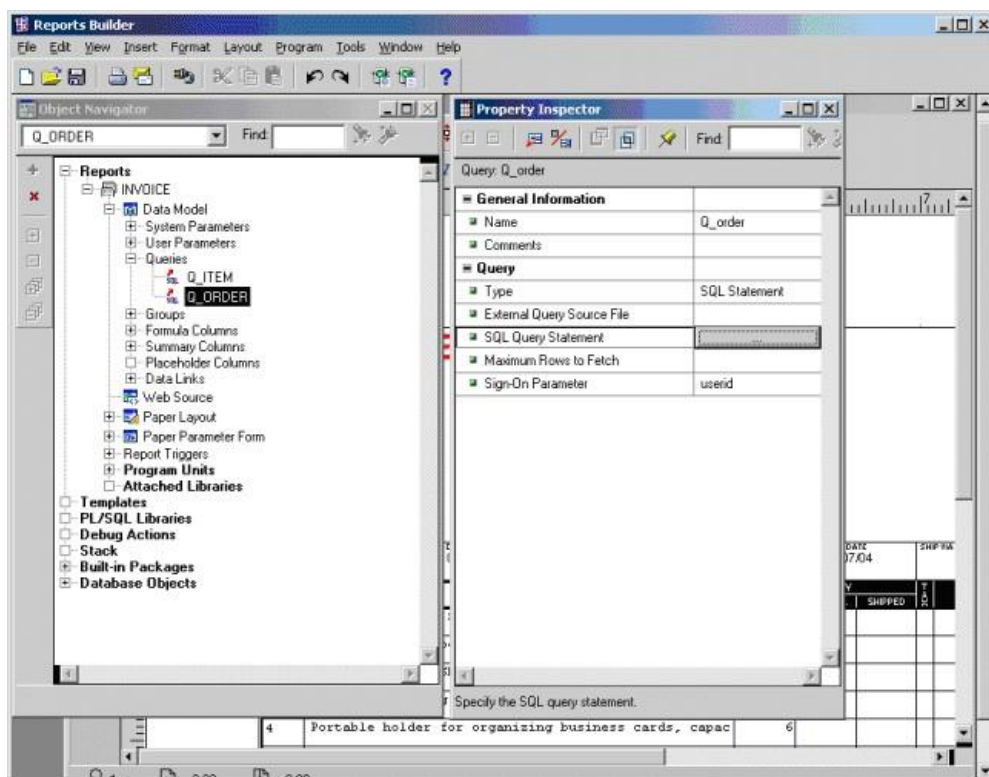
The invoice report editor allows user to change the appearance of the report as required by the client or for in-house apps for intra-departmental use within the company.
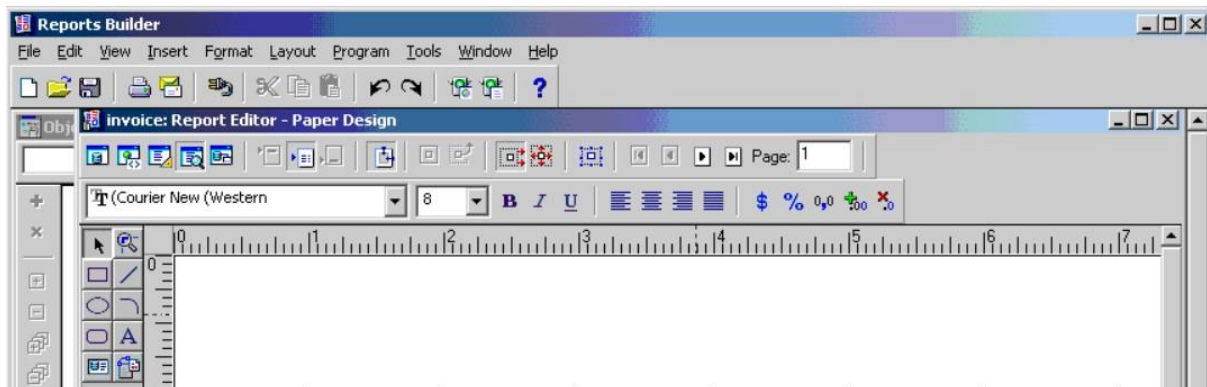
Example

Here is an example of a query fetched using reports developer

					ADITYA BIRLA INSULATORS				
					EMPLOYEE STATUS				
				From 01-JAN-20 To 21-AUG-20					
Location	Cat	Job_Code	Dept_Name	Ticket	Employee_Name	Join_Date	Designation	Left_Date	Status
HALOL	S		MANAGEMENT	70518	JAYATI URMIL DESAI	10-FEB-2020	ASSISTANT OFFICER		A
HALOL	S		KILN	70519	MANTU KUMAR	20-FEB-2020	DEPUTY ENGINEER		A
HALOL	S		FINANCE & ACCOUNTS	70520	SUMIT GAYEN	26-FEB-2020	DEPUTY OFFICER		A
HALOL	S	11	DESIGN OFFICE	70521	MINAL N MAKWANA	18-MAY-2020	SENIOR ENGINEER		A

This window specifies the parameters of the data required which are then fetched based on the query in Appendix A

Window

Maintenance Report

21/08/2020

Data Selection For Report

Date from 01/01/2020   To 21/08/2020

Report Type ● JOIN   ○ LEFT   ○ BOTH

Location ● HALOL   ○ RISHRA

Report Format ● HTML   ○ EXCEL

Due to company data privacy policy, further depth cannot be discussed.

<u>LEARNINGS FROM THE INTERNSHIP</u>

My internship experience was very nice and these are the key takeaways from it both technical and non-technical:

1. Experience of working with professional software.
2. Importance of effective communication, teamwork and efficient planning.
3. Application pf technical concepts real life problems.
4. Learning how to work independently remotely.
5. How to write optimized code
6. Improved my SQL coding along with understanding how to set up projects in Oracle Reports Builder.
7. Improvement in interpersonal skills

<u>CONCLUSION</u>

Database upgrades are very important for all organisations as they improve information relay within the organization and at times also to the clients. This is a long-term project and the IT team will still be improving upon the work done so far. With our contribution, we have been able to move in a direction with a better method ABI can improve on their existing system and reduce delays in data retrieval from their database servers.

RDF implementation of data is useful process which reduces risk of error and saves time as well as effort. The code is elastic and can be used even if the database is updated in the future with more data.

APPENDIX-A: Query for displaying the data under section 2.1

SELECT ('HALOL') LOC,CATEGORY,(TO_CHAR(JOB_CODE)) BAND, B.DEPT_NAME,TICKET, NAME,TO_CHAR(JOIN_DATE,'DD-MON-YYYY') JOIN_DT, DESIGNATION, TO_CHAR(NVL(LEAVING_DATE,RETIRED_DATE),'DD-MON-YYYY') LEFT_DT, STATUS

FROM payemp_ref A, paydep_mas B

WHERE A.DEPT = B.DEPT

AND   JOIN_DATE >= :FM_DATE

AND   JOIN_DATE <= :TO_DATE

AND :LOC_NO NOT IN (2)

AND   TICKET <= 90000

AND :REP_NO NOT IN (2)

AND   A.DELETED = 'N'

UNION ALL

SELECT ('HALOL') LOC,CATEGORY,(TO_CHAR(JOB_CODE)) BAND, B.DEPT_NAME,TICKET, NAME,TO_CHAR(JOIN_DATE,'DD-MON-YYYY') JOIN_DT ,DESIGNATION, TO_CHAR(NVL(LEAVING_DATE,RETIRED_DATE),'DD-MON-YYYY') LEFT_DT ,STATUS

FROM payemp_ref A, paydep_mas B

WHERE A.DEPT = B.DEPT

AND (NVL(LEAVING_DATE,RETIRED_DATE)) >= :FM_DATE

AND (NVL(LEAVING_DATE,RETIRED_DATE)) <=:TO_DATE

AND :REP_NO NOT IN (1)

AND :LOC_NO NOT IN (2)

AND   TICKET <= 90000

AND   A.DELETED = 'N'

UNION ALL

```sql
SELECT        ('RISHRA')        LOC,CATEGORY,(JOB_BAND)        BAND,
B.DEPT_NAME,TICKET,      NAME,TO_CHAR(JOIN_DATE,'DD-MON-YYYY')
JOIN_DT,                                        DESIGNATION,
TO_CHAR(NVL(LEAVING_DATE,RETIRED_DATE),'DD-MON-YYYY')
LEFT_DT, STATUS

FROM payemp_ref@ABIHCY2ABIRCY A, paydep_mas@ABIHCY2ABIRCY B

WHERE A.DEPT = B.DEPT

AND   JOIN_DATE >= :FM_DATE

AND   JOIN_DATE <= :TO_DATE

AND   CATEGORY      != 'C'

AND  :LOC_NO  NOT IN (1)

--AND   TICKET  <= 90000

AND :REP_NO  NOT IN (2)

AND   A.DELETED  = 'N'

UNION ALL

SELECT        ('RISHRA')        LOC,CATEGORY,(JOB_BAND)        BAND,
B.DEPT_NAME,TICKET,      NAME,TO_CHAR(JOIN_DATE,'DD-MON-YYYY')
JOIN_DT                                        ,DESIGNATION,
TO_CHAR(NVL(LEAVING_DATE,RETIRED_DATE),'DD-MON-YYYY')
LEFT_DT, STATUS

FROM payemp_ref@ABIHCY2ABIRCY A, paydep_mas@ABIHCY2ABIRCY B

WHERE A.DEPT = B.DEPT

AND  (NVL(LEAVING_DATE,RETIRED_DATE))  >= :FM_DATE

AND  (NVL(LEAVING_DATE,RETIRED_DATE))  <=:TO_DATE

AND :REP_NO NOT IN (1)

AND   CATEGORY      != 'C'

AND  :LOC_NO  NOT IN (1)

--AND   TICKET  <= 90000

AND   A.DELETED  = 'N'

ORDER BY 1,2,5
```

<u>REFERENCES</u>

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5) https://stackoverflow.com/questions/459457/what-is-a-storedprocedure

6) https://www.tutorialspoint.com/dbms/dbms_data_schemas.htm

GLOSSARY

1) **SQL:** Structured Query Language is a domain-specific language used in programming and designed for managing data held in a relational database management system (RDBMS), or for stream processing in a relational data stream management system (RDSMS). It is particularly useful in handling structured data, i.e. data incorporating relations among entities and variables.
2) **Query** is a question or inquiry about a set of data.
3) **Proc** or **Stored Procedure** is a set of Structured Query Language (SQL) statements with an assigned name, which are stored in a relational database management system as a group, so it can be reused and shared by multiple programs.
4) **DBA:** Database analyst deals with database technologies that warehouse information in very specific ways. A database analyst is part of conventional corporate IT teams that maintain data assets through very specific research and activities.
5) **Schema:** A database schema is the skeleton structure that represents the logical view of the entire database. It defines how the data is organized and how the relations among them are associated. It formulates all the constraints that are to be applied on the data.
6) **RDBMS:** Stands for "Relational Database Management System." An RDBMS is a DBMS designed specifically for relational databases. Therefore, RDBMSes are a subset of DBMSes. A relational database refers to a database that stores data in a structured format, using rows and columns.