



# SQL Query analyze and security precaution tutorial (SQL-QASPT) for entry-level database administrator's

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**ABSTRACT**—Oracle database is known worldwide as a secure and reliable database to maintain organization data. So many organizations prefer Oracle DBA to administrate their database. A junior Database Administrator would face many challenges in handling Oracle database administration activities. For reducing these difficulties, this proposed system provides various level of warning messages and securing precaution techniques, which are to be done before executing DBA level SQL commands. Essentially most of the fresher DBA's are aware about Administration queries but may not be cognizant about affecting environments and indirect security problems belonging to it. So, DBA can Perform Admin level SQL queries to proposed SQL Query analyze and security precaution tutorial (SQL-QASPT) System, and based on the query, it will give warning message and secure configuration techniques for the DBA to consider before performing Administrative operations.

**Keywords**— warning message, precaution techniques, QASPT, DBA, tutorial.

## 1, INTRODUCTION

The majority of organizations use database to maintain their organizational data because maintaining large amount of data and confidential information without database is difficult and also not secure. Oracle is known as a reliable and secure database management system for administration process. Thus wide range of organizations hire oracle Database administrators to maintain their database. Oracle DBA's main responsibilities include, create and maintain database, provide appropriate privilege to appropriate users, monitoring database, backup, recovery, restore database and many more. In general companies categorize DBA's as junior DBA and senior DBA. Senior DBAs should be able to perform Admin commands (SQL queries) without trouble as they are well aware about precaution operations to be done before performing admin commands.

Normally, most of the junior level DBA raise doubts, whenever they perform critical Administrative operations, because many DBA commands could create security problems indirectly to database. To avoid this confusion our proposed SQL Query analyze and security



precaution tutorial(SQL-QASPT) helps by providing useful warning messages and precaution operations to be done before performing administrative queries. This proposed system is available round the clock, so whenever the DBA have doubts they can type particular SQL query into SQL-QASPT system, based on that it will provide warning messages and precaution suggestions.

Technically, this system first takes admin query from DBA, which is then analyzed using splitting technique to identify what kind of operation the query performs. Based on that SQL-QASPT system will match the pattern and retrieve the suitable warning and solution message for particular command. This paper is structured as follows: Section II contains the existing and proposed system analysis. In section III presents the warning message and precaution model. Further in section IV discussed about main features of SQL Query analyzing and precaution tutorial. In section V Preparing Groundwork for SQL Query analyzing and precaution tutorial. Further in section VI Architecture of SQL-QASPT Finally section VII presents our conclusions and future work.

## **2, SYSTEM ANALYSIS**

### **2.1 Existing System**

In the past traditional system whenever entry level or junior DBA performing Admin command, they most likely ask doubts or suggestion to senior DBA otherwise they will search from internet and online tutorial. But the drawback is that, not all the time senior DBA available in the office to clarify junior DBA doubts and searching in internet takes much time, moreover accuracy of the answer is unconvincing.

### **2.2 Proposed System**

In proposed system, namely SQL Query analyze and security precaution tutorial effectively helps entry level DBAs regarding their security knowledge. So, whenever Entry level DBAs interact with SQL-QASPT, they will get back useful warning messages as well as suggestions regarding security precaution operations to be done before performing admin query.

## **3, WARNING MESSAGE AND PRECAUTION INFORMATION**

SQL-Query analyze and precaution model is a tutorial for creating awareness to DBA's regarding precaution operations to consider before executing Admin commands. By using this SQL-QASPT model DBA will get warning message and precaution information.

### **3.1 Warning Message**

After execution of DBA Admin command, the system will give useful warning message to DBA. The warning message includes

- i. What all are the security challenges may occur to database after performing particular Admin Query



- ii. Type of users going to be affected
- iii. Type of avoiding techniques

### **3.2 Precaution Information**

After getting warning message, SQL-QASPT instruct precaution operations to be done before performing the Admin query the precaution information includes:

- i. What to do before performing Admin user SQL query
- ii. Syntax for the precaution operational SQL query, DBA must need to consider to avoid security issue

## **4, MAIN FEATURES OF SQL QUERY ANALYZE AND SECURITY PRECAUTION TUTORIAL (SQL-QASPT)**

### **4.1 Simplicity**

The SQL-QASPT is a user friendly application used to solve entry level DBA doubts on the spot. SQL-QASPT is an application that easily adapt with various vendors. The information given by SQL-QASPT is simple and understandable by Entry level DBA.

### **4.2 Maintainability**

Using SQL Query analyse and security precaution tutorial (SQL-QASPT), the system admin easily update new security problems and warning messages through QASPT front end.

### **4.3 Scalability**

Whenever the new security problems identified by SQL-QASPT team, that problem can be analyzed and precaution information added into SQL-QASPT database. Every time the existing security problem solved in the newer version of oracle database. So, the solved problems can be removed from SQL-QASPT. So the system is scalable one.

### **4.4 Accuracy**

The SQL-QASPT system is using well defined splitting and keyword matching techniques to generate warning message and precaution information. So, the system will gives most possible and accurate output to users.

## **5, PREPARING GROUNDWORK FOR SQL- QASPT**

Before developing any good application, we must do some groundwork. Groundwork is a way of collecting or processing pre-requirements for a computer application.



### 5.1 DBA specialist

To develop SQL-QASPT system, an oracle DBA specialist team needs to be assigned. The team includes, various oracle DBA specialist from various organization. The team can discuss about Database Admin security problems and solutions, and come up with a report.

### 5.2 DBA forum

The DBA specialist report isn't enough to create security tutorial. It is also required to collect information from public DBA forum and web sites regarding security problems.

### 5.3 Accuracy

Database Administration is an extremely responsible job in the organization. So, the Solution (Warning message/security precaution) given by SQL-QASPT is must be 100% accuracy. Therefore the solution is should verified several times by DBA experts.

### 5.4 Transformation

The collected problem and solution is differing in the format like video, audio, text based information. So, the collected report converted into single format for trouble-free access.

## 6, ARCHITECTURE OF SQL QUERY ANALYZE AND SECURITY PRECAUTION TUTORIAL

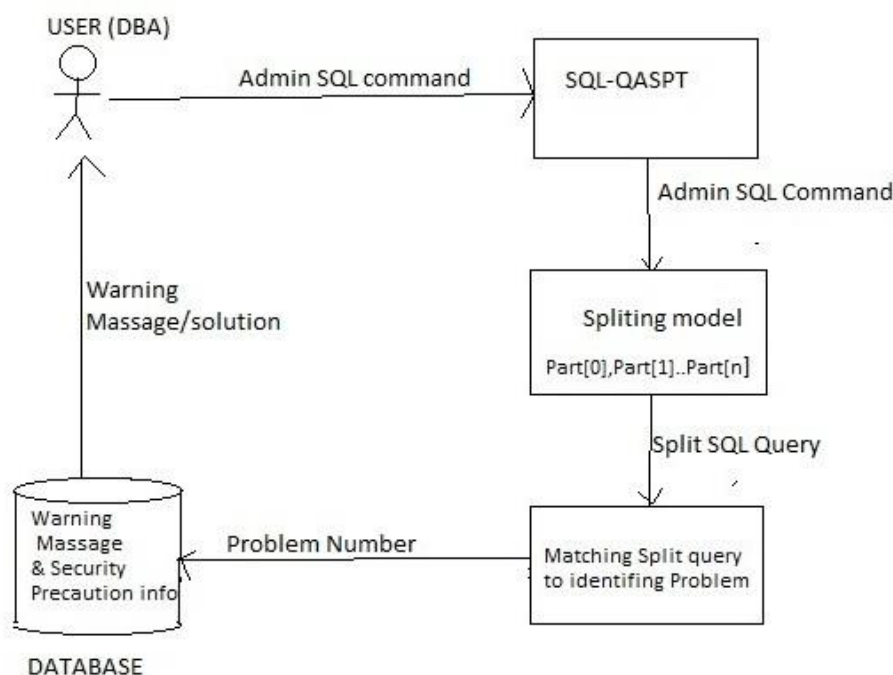


Figure.1 Architecture of SQL-QASPT

### 6.1 User (DBA):



The User (DBA) performing Doubtful admin SQL command into SQL-QASPT system to get warning message and precaution information for particular admin command.

Example SQL query:

```
SQL> DROP TABLE EMP;
```

## 6.2 Splitting Model

Using Splitting Model, the Query split in to several parts. The word splitting using space bar. After Splitting the SQL command transform into keyword Matching area.

Example: DROP---->Part [0]

TABLE---->Part [1]

EMP----->Part [2]

## 6.3 Matching Model

The Split Query will match with pre-defined keywords, if the keyword match is found, the match no. throw into Database (Where warning message& solution stored).

Example:

```
IF(Part [0].ToString()=="DROP" && Part[1].ToString=="TABLE")
{
SELECT warn_msg, solution FROM warn_solution WHERE problem_no=1;
}
ELSE IF(Part[0].ToString()==DROP && Part[1].ToString==USER)
{
SELECT warn_msg, solution FROM warn_solution WHERE problem_no=2;
}
.....
.....
```



#### **6.4 Database (Warning Message & Precaution Information)**

The Database Contain list of DBA Problems, Warning Message and Precaution Information. Using Problem No. (Unique ID) the warning message and Precaution information's are passed to appropriate user.

Example:

```
SELECT warn_msg, Solution FROM warn_solution WHERE problem_no=1;
```

QUERY: DROP TABLE Table\_emp;

##### WARNING MESSAGE

SYS user cannot able to perform FLASHBACK operation. So, your Table directly dropped from the Database. It won't be stored in recycle\_bin table. Make sure the table can't be restored using Flashback Query.

##### PRECAUTION INFORMATION

To avoid this issue please take a backup of particular table.

You can backup table using DataPump , RMAN or Normally copying table.

Syntax (Data Pump): expdp username/password file=tablename.dmp tables=(tablename)

Normal copying: create table new\_table1 as select \* from old\_table;

#### **6.5 Sample example problems & solutions**

➤ Example 1

QUERY: GRANT SELECT ANY TABLE TO SCOTT;

##### WARNING MESSAGE

Check If O7\_DICTIONARY\_ACCESSIBILITY parameter is set to false or true,

If O7\_DICTIONARY\_ACCESSIBILITY=false , the user who have SELECT ANY TABLE privilege , they cannot able to access sys user tables and they can permitted to access other user data.

If O7\_DICTIONARY\_ACCESSIBILITY= true, the SELECT ANY TABLE privilege allows access to see the data dictionary as well as all user data including SYS schema.

##### PRECAUTION INFORMATION

If you want to permit access to all user tables including "SYS" user tables



```
SQL>ALTER SYSTEM SET O7_DICTIONARY_ACCESSIBILITY=FALSE  
SCOPE=SPFILE; (restart required)
```

If you want to permit access to all user tables excluding "SYS" user tables.

```
SQL>ALTER SYSTEM SET O7_DICTIONARY_ACCESSIBILITY=FALSE  
SCOPE=SPFILE; (restart required)
```

### ➤ Example 2

#### QUERY

```
CREATE DATABASE LINK local  
CONNECT TO sys IDENTIFIED BY password123 USING 'orcl';
```

#### WARNING MESSAGE

Make sure your DATABASE LINK is not using "SYSDBA" privilege user for the reason that SYSDBA user to become a very powerful user in the database.

If the DB link created using "SYSDBA" privileged user, the other side whoever is accessing the link can control the whole database and it create more security issues.

#### PRECAUTION INFORMATION

Please kindly avoid creating link using "SYSDBA" user instant of that please connect with normal user.

(OR)

Please create new user for connecting DB Link and grant appropriate privileges to the new user.

Note: This is just suggestion given by SQL-QASPT system and not mandatory to follow.

### **7.CONCULSION AND FUTUREWORK**

This paper introduces a High level DBA tutorial system that helps to reduce Doubts over the Administration command (SQL Query). Primarily this tutorial system will be very useful for Entry-level or Junior DBA's. The system namely, "SQL query analyze and security precaution tutorial".

The presented system, SQL-QASPT, is very useful for DBAs. The system will provide accurate warning messages and security precaution information to DBA, in case they have doubts with particular administrative commands (SQL Queries). Note, the senior DBA may not always be available to guide the Junior DBA in any organization and some night shifts



are handled only by entry-level DBA. In many situations, the Entry level DBA will look for senior DBA's suggestions to perform admin command, but this system avoid the traditional method and it's used to perform Admin Query without the help of senior DBA. The SQL-QASPT system only focus on oracle Database. In future it can easily extended to MySQL, SQL server and so on.

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## BIOGRAPHY



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