Audit Log Manager

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# DOCUMENT MANAGEMENT AND CONTROL

## **Version and amendment history**

| Date | Author(s) | Version | Change Reference |
| --- | --- | --- | --- |
|  |  |  |  |
| 18 Feb 2019 | Shrikesh Pandey | 1.0 | Initial Version |

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## **Review and approval**

| Name | | Role | | Date | Review/Approval Email | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | N | |  | | | |  |  |
|  | |  | |  | |  | | |

# Introduction:

**“*A simple log of changes, intended to be easily written and non-intrusive.”***

An audit log is the simplest, yet also one of the most effective forms of tracking temporal information. The idea is that any time something significant happens you write some record indicating what happened and when it happened.

The Oracle built-in auditing can only show that who and what did with a table e.g. update, but it could not show which rows and/or which data has changed from what to what. The Oracle DBMS\_FGA solution can only show the SQL commands what executed. The WorkSpace Manager has a history possibility but it stores the whole row data. It is not too economical way. That is not so easy to provide a generic solution for the audit log problem, because there are a lot of data types and the user can define additional types e.g. nested types

**Audit Log Manager is an** Oracle SQL and PL/SQL solution to log data changes. The Audit Log manager aka ALMGR could be in a separate schema. The tables of this schema are editable via ALMGR package, and are readable via views, and it uses triggers for logging, but this triggers are in its schema/user, so they are not visible for the logged schema users.

This can be installed into the production schema without creating separate schema for ALMGR.

**Audit Log Manager** can handle only number, string and date data types. These data types are convertible to VARCHAR2. The set of history managed tables and columns are stored in a **configuration table**.

The logging of changes managed by database triggers which are owned by ALMGR schema (if the ALMGR has installed into separated schema), so they are not visible for the logged table owners.

The data logging triggers are generated by stored procedures but the generator procedures do not run automatically. Every time when a table structure has changed the user has to start the generators for the table manually if it necessary or it can be run automatically by jobs or other triggering event / switching method.

# Working:

Every data log of every schema, table rows, and columns will be stored in the same place where it is installed.

There are two levels of logs are managed by ALMGR **Row level logs** and **Column level log.**

* 1. In the row level there are who, when, which program with, what (insert, update or delete) did on which table which row.
  2. The rows are identified its primary key. That means every logged table must be a primary key. This is the first restriction.
  3. The column level log adds the previous value of the modified column to the row level log. It shows the real changes but only the past. The present value is in the table. This means
  4. The INSERT command creates only a row log.
  5. The UPDATE command create a row and one or more column logs with the previous values of the changed columns.
  6. The DELETE command stores the whole data row (every columns)
  7. The previous value of the columns are stored in a (very long) VARCHAR2 field.

# Limitation and Restriction:

* 1. It can log the following data types only:

CHAR, DATE, FLOAT, NCHAR, NUMBER, NVARCHAR2, VARCHAR2, TIMESTAMP

* 1. The whole length of primary key data must be 400 chars max.
  2. The length of the column log field is 4000 char, so only the first 4000 chars will be stored of the data fields. (in Unicode only 2000 chars)

# Installation:

* + 1. Run the INSTALL\_ALMGR.sql to install the “Audit log manager”.

# Technical Specification:

* 1. Database objects
     1. Tables
     2. Packages
     3. Configuration parameter
     4. Other Parameters

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