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## *Survey on Life Cycle Management and Version Control in Oracle Application Express*

**Digvijay Virpura<sup>1</sup>**

PhD Scholar  
Rai University, Saroda  
Ahmedabad, Gujarat, India

**Dr. Priya Swaminarayan<sup>2</sup>**

Principal  
Parul Institute of Computer Application  
Parul University, Vadodara, India

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**Abstract:** *As we are moving ahead in the Oracle Application Express technology, this paper is specifically focus on the possibilities and other aspects of implementing Application Life Cycle Management (ALM) and Version Control System (VCS) in Oracle Application Express. This paper also focuses on the options, Open source technologies available to implement ALM and VCS in Oracle Application Express technology. As Oracle APEX provides concurrent application development and it add more advantages to have multiple versions for the product.*

**Keywords:** *ALM and VCS in Oracle APEX, Application Life Cycle Management, Version Control, ALM, VCS.*

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### I. INTRODUCTION

Oracle Application Express is web-based and a rapid application development tool for developing applications as well as websites. As light weight architecture APEX can develop strong application and websites with minimal efforts. Application Developed in APEX are considered to have features like reliable, secure and scalable. One can use Oracle APEX in the development of small application build by individual to such a large environment with number of processions work together.

This paper focus on the implementation requirements, suggestions, options and software available as open source to implement Application Life Cycle Management and Version Control in Oracle Application Express. The Overall implementation of a large application requires a well-defined framework for the application developers to work simultaneously and to manage the Life Cycle of entire application with the version control system.

In application development and Maintenance many effective discipline have found but recently Application Lifecycle Management (ALM) has materialized a lot. As to manage development of applications we need to have a profound and concrete solution which can maintain the overall lifecycle of application development which can be done effectively in Application Lifecycle Management (ALM).

Application Lifecycle Management (ALM) generally divided into Operations, Governance and Development. ALM always starts with a notion. Initially in ALM analysis happens before the implementation process has start. Application Lifecycle Management (ALM) keeps track of the overall process of application development. Perfect tool will definitely help to make all the process easy and smooth.

Version Control is another aspect of software/Application Development and which will enable us to differentiate between versions of a document. The basic concept behind version control is to working on different files from the storage and place those file in a working environment, which will be updated and saved and then we can decide what to do with those files. Either we can roll back the changes which we have done or we can store those files in the version control system.

## II. APPLICATION LIFE CYCLE MANAGEMENT (ALM)

Oracle Application Express is a light weighted application environment as compared to other technologies. This paper provides specific recommendations to optimize the development and deployment of Oracle Application Express applications throughout their life-cycle, including the use of 3rd party source control products for maintaining version control [1]. Oracle Application Express is itself a concrete system which provides inbuilt Application Life Cycle Management. Oracle APEX has Team Development features like Milestones, Bugs, Features, To Dos, Feedback, and Team Development Summary [2]. Lifecycle Management will help companies to developed improved quality product.

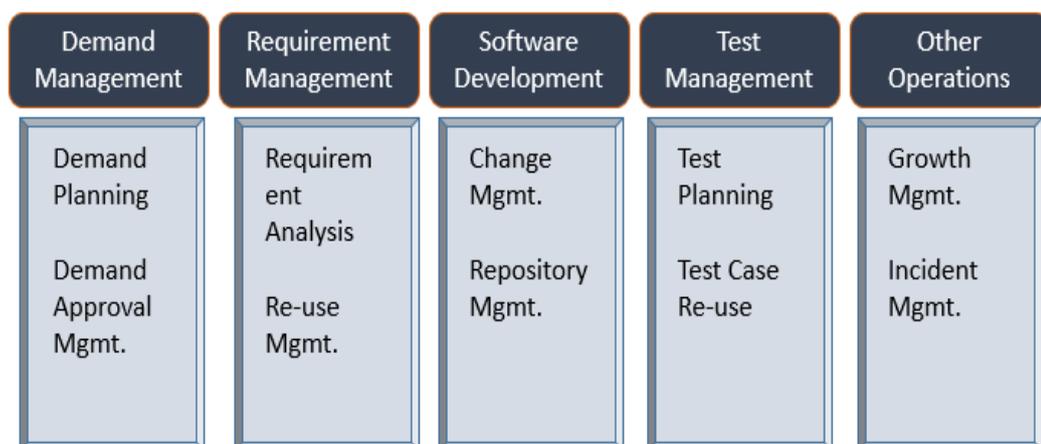
*'The coordination of development lifecycle activities, including requirements, modelling, development, build and testing, through: 1) enforcement of processes that span these activities; 2) management of relationships between development artefacts used or produced by these activities; and 3) reporting on progress of the development effort as a whole.'* [3]

The roots of the ALM tools lie in the history of Configuration Management (CM). Even ALM is not a kind of concept which is well defined but it represents many different aspects also. In any software development initial step is considered as a software requirement gathering where ALM framework can help from initial to last stage of development. In any organization problem identification and its solution is almost day to day activity but those solutions and other important things needs to be documented properly so it can be used for further product development. Documentation of such solutions has been done such that whenever one required it can be accessed and retrieve easily. ALM is not concentrating on a one or two aspects but it focus on the overall architecture.

## III. ALM TOOLS

Schwaber (2006) [3] and Shaw (2007) [4] have analyzed the main vendors' approaches to ALM and divided them into:

- Single vendor platform: Vendors define their own ALM interoperability frameworks and expect practitioners and other vendors to build integrations for that platform.
- Multi-vendor platform: The framework is developed in an open-source community, and practitioners can help drive requirements, influence the direction of the framework and even participate in the development project.
- Single repository: This approach expects vendors to build a complete set of ALM tools using a single repository to support traceability and cross discipline reporting.



**Figure 1: Application Life Cycle Management Tools**

Figure 1 shows the tools and disciplines in ALM. Many other disciplines are also included like Building requirement, Change and Configuration, Testing and Verification, Modeling and Simulations, Release Management etc. ALM will help in

the successful completion of a project. One needs to have proper system where all stakeholders can communicate with each other. Version Control provides 18 different operations you can execute under Version Control System. [5]

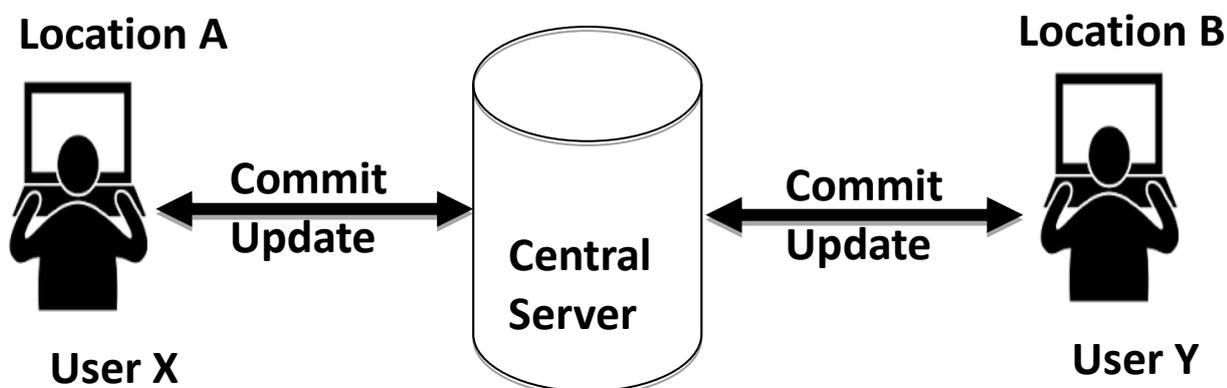
#### IV. VERSION CONTROL

The basic terminology behind Version Control is to keep track of all the files you want to work on and keep those files up-to-date with current updation. There will be a Central Repository which contain all the files in it and whenever any developer or user want to change anything, system will keep track of old file and new updated file. VCS will keep track of all those files which is checked-out from the system and also the files which is updated and store back into the Central Repository. All the files will have a version number as many time as the file is taken and placed back to the repository. There are situations where file needs to be shared among number of users at the same time and also there are needs where a file should not be allowed to use by more than one person, all will be keep track under Version Control. Operations like Create, Checkout, Commit, Update, Add, Edit, Delete, Rename, Move, Status, Diff, Revert, Log, Tag, Branch, Merge, Resolve and Lock [5].

<b>Create</b>	Will create Empty Repository
<b>Checkout</b>	Create New copy of Existing
<b>Commit</b>	Save Changes
<b>Update</b>	Updating the working copy
<b>Add</b>	Add new file
<b>Edit</b>	Modify a file
<b>Delete</b>	Remove file or directory
<b>Rename</b>	Rename file or directory
<b>Move</b>	Move a file in repository
<b>Status</b>	All the Changes done by users
<b>Diff</b>	Modification made to the working copy
<b>Revert</b>	Undo the change
<b>Log</b>	All history
<b>Tag</b>	Identification
<b>Branch</b>	Create another line of development
<b>Resolve</b>	Handle Conflicts resulting from a merge
<b>Lock</b>	Preventing users
<b>Merge</b>	Changes from one branch to another

(Image: 1 Operations in VCS) [5]

Under Version Control different things can be tracked like Sub Version System which keep track of smaller part of an applications. Version Control system can be implemented as a Centralized Version Control System (CVCS) and Decentralized Version Control System (DVCS) [5].



(Image: 2 Centralized Version Control) [5]

## V. CONCLUSION

In Oracle Application Express, Application Life Cycle Management and Version Control System played a crucial role in the software Development. Many things need to be covered in the Application Life Cycle Management System. Proper utilization of techniques mentioned under Application Life Cycle Management will improve the quality and reliability of a software or application.

As explained in this paper different aspects of Version Control System is also needs to be monitor and it also have many files and folders needs to be maintained. Version Control System itself a large environment needs to be handled. Motive behind this paper was to analyses the requirement of ALM and VCS for implementation in Oracle Application Express.

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## AUTHOR(S) PROFILE

**Virpura Digvijaysinh D**, received the MCA degree in Computer Science from Shree Swaminarayan Institute of Technology, Gujarat University and B.Com degree from Gujarat University in 2009 and 2005, respectively. From 2009 to 2011 I have worked as an Assistant Professor in Sardar Krushinagar Dantiwada Agricultural University. Then worked at K. P. Patel School of Management and Computer Studies (MCA) for 10 months. Currently working as an Assistant Professor at Natubhai V. Patel College of Pure and Applied Sciences, V. V. Nagar, Gujarat, INDIA.

