

**REPORT ON**

**PROFESSIONAL INTERNSHIP**

**WITH**

**AUTODESK SINGAPORE R&D**

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**Abstract**

This final report provides a summary about my training and industrial experience during the Professional Internship ( PI) at Autodesk Singapore R&D. During the internship, I have been involved in various kinds of QA activities for the product Vault, ensure that a new build works correctly following the plan and help increase the automated testing coverage of the product. Throughout the internship, I have had a chance to work with experienced senior developers and received valuable advice during code reviews with them. Last but not least, I was able get a good grasp of how a company works effectively in the industry by taking part in sprints planning for the future.

**Acknowledgement**

I would like to express my deep gratitude to many people who have supported and helped me during my 6 - month internship.

Thanks to my supervisor Mr. Yogeshwar Gandhe, a senior QA analyst at Vault team. I really appreciate all the advice and support from him.

Thanks to Viridian team. I have received many useful and valuable advice throughout code reviews with senior developers from this team.

Thanks to Adriel Tan and Xiaoyu Liu, my fellow interns as well as my teammates in Brown team. I would not complete and understand all the work without their help.

Finally, I would like to thank all the people from Vault team, other interns and anyone I have had a chance to work and bond with during the last 6 months. They all helped me experience this wonderful internship.

**List of symbols and abbreviations**

ASRD – Autodesk Singapore Research and Development

API – Application programming interface

QA – Quality Assurance

ADMS - Autodesk Data Management Software

VCS – Version Control System

***Chapter 1.***

**Introduction**

**1.1 About the company:**

Autodesk, Inc. is an American multinational software corporation that makes software for the architecture, engineering, construction, manufacturing, media, and entertainment industries. The company was founded in 1982 by John Walker, a coauthor of the first versions of AutoCAD[1].



*Figure 1. Autodesk logo*

ASRD was established in 1991.

**1.2 About my project:**

In company, I was a part of Brown team, working on a product Autodesk Vault. Besides many kinds of QA activities which needed to be performed weekly, my main project is to increase automated testing coverage for the product (writing API tests).

This report will give a brief overview about the QA activities I have had a chance to involve with:

* Smoke test
* API test

***Chapter 2.***

**Projects**

Our team have worked on Autodesk Vault. It is a data management software which helps designers maintain and organize their files when they have to work on many different products from Autodesk. It helps track design revisions and manage the release process smoothly. The Vault environment works as a client server application with the central SQL database and ADMS applications installed on a Windows- based server with client access granted via various clients ( typically Vault Explorer)[2]. ADMS acts as a middleware, handle requests from client, send to the database and return the output.



*Figure 2. Autodesk Vault logo*

Besides my main project, our team needs to complete smoke test weekly whenever a new build of the product is released to keep things go with the time plan.

**2.1 Smoke test:**

Smoke test is a first and basic step in QA procedure. This is the essential test needed to be done on which testers can conclude whether they will continue testing or not.

This is a basic flow for smoke test:

1. Receive information about the new build (versions of add-ins for testing).
2. Create a new ECS machine and remote to it. (or revert back to the old snapshot from last test). This step is to avoid any issues caused by environmental issues which are hard to debug.
3. Install add-ins, new build and try to run smoke test ( follow instructions in wiki page of Autodesk)
4. Construct the report, create a JIRA issue if there is any bug/ defect.

Smoke test (also called as Sanity test) is preliminary testing to detect simple failures. A tester will choose and run a small subset of test cases which cover the most important features of the product (log in/out, check out/in the files…). If any defect happens, the developers are required to fix before running full test suites which take much more time to complete.

The standard components in smoke test for each new build:

* Vault Client
* Vault ADMS
* Thin Client
* ACAD add- in
* Office
* Inventor add- in
* Revit

**2.2 API test:**

API testing is a part of integration testing which involves testing API to determine whether the product meets expectations for functionality, performance and security [3] (See more about *API* in *Appendix A*).

When a new build is released, it is important to make sure that all functions of this build works correctly. Theoretically, testers can manually test these functions (like open applications and try to perform specific operations). However, Autodesk Vault is a complex product with enormous number of functions, it would be inefficient and time- consuming to test each function manually. The solution is to code API tests in order to run automatically whenever there is a new build. As Autodesk Vault is a 13- year- old product, most of its functions have not been covered in API tests yet. Thus, my project is to increase the testing coverage for the product by writing test cases (in C#). Obviously, this is a continuous and long term project leading to the ultimate goal of covering all the functions of Vault.

*2.2.1 Overview and set up:*

*Current condition:* The API tests code base has been built in recent years so the testing coverage is considered limited compared to the number of functions in Autodesk Vault.

*Set up:* Autodesk has been using VCS Perforce4V to build the product Autodesk Vault, so I needed to set up the new machine, cloned the workspace and synced the code to my local machine before starting to change it.

As API test is a kind of white box testing (See more about *White box testing* in *Appendix A*), testers are required to possess a certain level of knowledge about coding and the product, so I need to make sure to understand the functions correctly whenever I am assigned a completely new task.

This is an overview about essential steps for API test:

1. Receive JIRA tasks ( See more about *JIRA* in *Appendix B*)
2. Try to understand the way functions work (required arguments, desired outputs for specific inputs…) using Fiddler 4 (See more about *Fiddler 4* in *Appendix C*).
3. Write the test cases (in C#)
4. Submit to code review through a tool Smart Bear (which compatible with Perforce) and wait for approval from senior developers.
5. Check in or revert back step 2 to fix the code.

*2.2.2 Write the test cases:*