FINAL REPORT FOR SOFTWARE INTERNSHIP AT NOVASOL

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ABSTRACT

During my internship at NovaSol I was able to experience work in a software department of a Technical Company. Since I have had some experience with databases and my interest in software, my boss assigned me to facilitate the transition of database software. This report contains what I have learned during the internship.

INTRODUCTION

NovaSol is a company that was founded as an Innovative Technical Solutions in October 1998. NovaSol specializes in the research, engineering development, and productization of next-generation active and passive optical systems. The department that I was personally working in was the software department. The workplace was secure with locked doors. I was assigned a temporary pass on the first day of work. The person that I reported to was Keith Nakanishi who is the Director of ISR Software. Mr. Nakanishi placed me in a cubicle near his and was always there to answer my questions.

I have done some work with databases in past internships but not nearly in this magnitude. The size of the databases that I have worked on have been very small and consisted on only a few members. The databases that I was to be working on during the internship did not consist of much members but the size of the project files were a lot bigger. The amount of people working on a project at NovaSol isn’t that big but the availability of encompassing for more users is an important aspect of software development.

TASKS

1. Migrate VSS Databases

Team Foundation Server Provides tools to effectively manage software development projects. The old software used by NovaSol was VSS and will not be supported in the upcoming year. Due to this, Mr. Nakanishi has decided to make the move to TFS. TFS has a lot of good features that can be utilized.

Since the software was new to me the first task was to read up and learn about the basic commands and operations of Team Foundation Server. My boss bought an informational book about TFS for the both of us. The beginning of the internship consisted of learning how to set up the framework and use the basic commands. The structure of TFS can be easier explained by looking at the breakdown in Figure 1.
As shown in Figure 1, the top-level of this database structure is the TFS server which branches into collections. These collections can be set up to contain many different projects. This type of organization aids in project development. Once the general framework was set up I could assign users with specific privileges. The user's privileges could be for the entire collection or just for a specific project. This is very useful so that users only have access to the data that they are allowed. For the databases that I migrated the only user that was set to be active was Mr. Nakanishi’s administrative account.

The VSS databases needed to be migrated to a selected TFS collection. TFS has a migration tool that would take VSS projects and convert them to TFS projects. The book along with steps found on the internet made the migration process go fairly smoothly. I ran into a couple of problems, one being the physical memory on the computer that I was doing the migrations with.

2. Create a Migration Guide

The second task I was assigned was to create a migration guide for my boss to use to migrate future projects. Since I was performing the migration on several databases I could word the process better. This was also useful since while performing the first couple migrations, I encountered a lot of problems. One of the problems was that I did not have all of the required permissions such as administrative privileges. The finalized migration guide contained tips that I had found as well as useful links.

3. Edit Nightly Build Script

Another important task that was assigned to me was to edit the nightly build script. A nightly build script is run every night. This builds certain projects that are specified in the build script. Projects can contain a large amount of source code, so a full build could take up to an hour depending on the size of the project. These builds are an important part of software development since developers need to know if the code that they have edited will work correctly.
The build script is written in Perl. Perl is a general-purpose dynamic programming language. A sample of Perl code is depicted in Figure 2.

```
#!/usr/bin/perl

$y = $PERL_VERSION;
print 'Perl version = $y\n';

$x = $getnumber;
y = $getnumber;
z = 123;
$t = $x + $y + $z;

print 'Sx + Sy + Sz = $t\n';

# The program ends here...
# the subroutine is just tacked on at the end:

sub getnumber {
    print 'Type in a number: ';
    $number = <stdin>;
    chop($number);
    $number;
}
```

Figure 2. Sample Perl Code

This was the first time I have experienced using Perl. Although the syntax is unique, the general layout is similar to basic C. The main changes that I needed to make to the nightly build script were to create a subroutine that used TFS utility commands and figure out what TFS commands correlated to the VSS commands. To do this I manually used the TFS commands in the command line. Once I was sure that I found the correct TFS command I replaced it with the old VSS command. The most difficult part of this task was that in order to complete the replacement I needed to understand what the original script was doing. This tested my understanding of Perl as well as my understanding of the scripts algorithm.

**OUTCOMES**

This internship let me experience work in software environment. I was not able to complete the migration of all of the databases assigned to me due to space and time limitations. The migration guide that I created should be sufficient to complete the migration process of the remaining database. The biggest skill that was enhanced during this internship was the ability to adapt and learn. There were a lot of things that I needed to learn to complete my daily tasks such as learning Perl.

Version control was something that I learned during the internship. Version control in respect to programming is the management of changes to a program. The use of version control is very important as a software developer. This allows the developer to roll back to a previous working build. I have had the experience in the past where I was working on a program with a group of people and a member made a change to the program. The change although small caused an error and that error took a long time to get rid of. This problem mainly occurred
because we did not have a previous version to roll back to. TFS keeps track of changes made to a project and provides the option to roll back. I used this feature while learning the different command codes.

CONCLUSIONS

I was able to complete most of the assigned tasks.
1. Migrate VSS databases to TFS
2. Create a Migration guide
3. Edit the Nightly Build Script

From this internship I gained a lot of information about how software development is used to complete projects. There was a lot of software and command line commands that I used which were new to me. Besides the knowledge that was learned from completing my assigned tasks I gained a lot from talking to my boss and fellow workers. They gave a lot of good advice that I will take with me as I prepare to enter the workforce after graduation. I had a great semester working at NovaSol.

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