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Individual reflective report – software engineering practice

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# Executive Summary

I enrolled in this unit as part of my second semester study of Information Technology and Systems at the University of Canberra. My personal learning goals from this unit was to gain a sound understanding of Software Engineering and Software Development Lifecycle. With its emphasis on both theory and practice, the unit has provided a sound basis for further advanced studies in the field of software engineering.

Having no previous experience of software development in a team, undertaking the group project was helpful in learning how the theories introduced in the lectures are applied in practice. It has helped me gain understanding of both technical and management aspect of software engineering. A list of skills learned include project planning, scheduling, risk management, configuration management, software reuse, software testing and people management. Besides, I would like to improve my skills in Agile development methodologies and gain some additional hands-on experience on how these methodologies are implemented in an actual workplace.

During the course of the group project, there were things that went well both at the group level and at an individual level, and also things that did not go so well. Not having dedicated enough time to work on initial plan has resulted in delays and changes later in the project. Some of the technical decisions like not using a version control system has affected the project. My own lack of web programming competency has also resulted in delays in meeting the schedule. These issues helped highlight the importance of planning phase, and the need to have enough skills in a team.

On the positive side, the group’s communication channel has been effective. This is because we chose a platform (Instant Messaging app) that all the group members are familiar with. Personally, I was able to take the role of group coordinator and schedule group meetings, notify the members when certain datelines are due and document overall progress of the project through reports and notes.

Overall, undertaking the unit has been both challenging and exciting. Many new concepts are learned, some of which are put in practice in the group project. All the skills gained from the unit can be used in workplace environments in the future.

# Individual Self-assessment & Growth

From my current course at the University of Canberra, I have acquired technical skills both in terms of using software applications and also in software programming languages. I am comfortable using Office productivity suits, and Integrated Development Environments like Dreamweaver, Eclipse and Visual Studio. I also have intermediate skills in HTML, CSS and Java programming languages.

Learning these technical skills has mainly been on an individual level and I have not worked in a group to carry out software development activities. As such, I do not have any formal experience in software engineering processes and related skills like managerial and inter-personal skills.

In view of my skill level as describe above, I decided to enrol for the unit primarily to learn and experience:

1. software development lifecycle and methodologies,
2. tool and techniques for collaborative software development in a group
3. People management
4. Communication skills
5. Schedule management
6. Risk analysis and management

Professional software development is rarely an individual undertaking. Today, almost all the software development work is carried out by teams rather than individuals. Hence, the skills mentioned above are required if I am to succeed in my aspiration to become a software developer or an engineer.

Following are some of the specific skills I gained throughout the unit:

1. Project scheduling in the planning phase – The unit highlighted various schedule representation techniques which takes care of duration of activity, to whom the activity is assigned and its dependencies. When my group first submitted the Initial group project plan, we were not able to make a satisfactory schedule because we did not factor in these aspects. I used schedule representation technique to update an improved version of the project schedule which was included in the mid-semester report.
2. Better understanding of Personality Types – Understanding personality types and having a healthy mix of people with different personalities and skills is found to be very important during the course of the group project. All the group members are task oriented. We were more concerned about doing the individually assigned tasks rather than looking at the overall project scope and goals. I personally made an effort to initiate communication between group members, both online and face to face, to discuss general project progress and issues.
3. Communication skills – Working on a group project with people we have never met before is hard. It becomes harder when the common language we speak is not our first language. In an effort to improve my social and communication skills, I proposed and initiated our line of communication which included online instant messaging, face to face meeting on weekends and other meetings to practise group presentations.
4. Report Writing skills – As the person assigned with the task of preparing and writing the group reports, I had to learn how to write professional and formal reports. I used the skill I gained to write the mid-semester and final group report and this individual report. I am glad I could improve my writing skills as I can use it in other units and also in work environment after completion of the course.
5. Risk Management – With better understanding of risk management processes like identification, analysis, planning and monitoring, the group was able to come up with an improved risk management strategy in the mid-semester report. Risk identification during the project development was also easier and clearer though the size and scope of the group project did not cover extensive risks.
6. Importance of version control system – Having a version control system to manage software code in collaborative software development is very important. Though the group decided not to use version control in our project (because of group members’ inexperience with version control), I quickly realized its importance once it became difficult to merge individual works together in the project.
7. Deployment to Production – I used software building and deployment skills to deploy the group project on a server on Amazon Web Services. This task entailed building, configuring and deploying ASP.NET application on a public server.

At the end of the the unit, apart from the above mentioned skills, I have acquired an understanding of various concepts and skills, some of which are not directly applied to the group project. They are:

1. A general understanding of the software engineering cycle
2. Agile development methodologies
3. Software engineering ethics
4. Change management
5. System security
6. Software testing and
7. Software reuse

While there are many aspects of software engineering discipline in which I would like to improve and have practical experience if possible, I would like to highlight the following specific areas which I feel are important in actual work environment:

1. Hands on experience in Agile development methodologies: Agile is considered the standard methodology in most of the software development projects. Practical experience and skill in agile is therefore considered necessary requirement. I could get this skill by attending Agile courses or working as an intern in a company that uses agile.
2. Improve Communication and group work skills: As mentioned above, the software development is carried out as a group endeavour. To be able to work in such environment, communication and group work skills are essential. One potential way to gain this skill could be through participating in more group works in my course at University.
3. Software Reuse: A software product is not always built from scratch but existing software components are reused to save cost and effort. I would therefore like to learn software reuse in little more detail. Taking an advanced software engineering course might help me acquire this skill.
4. Effort estimation: During the group project, I have not been able to properly estimate effort required to implement a task. This has resulted in the group project’s schedule being estimated mostly based on consensus amongst the members. I would like to acquire more experience in effort estimation techniques.

# What I did well in the Group Project

Personally, I was involved more in preparing the group project plan, project reports, arranging group meetings and deploying the final product on a public server.

I was able to come up with a fairly tidy project schedule with enough room to accommodate change. This was also helped by the fact that we chose to do a website as our project. I feel I also did well in managing and arranging group meetings for regular status updates, reminding the group members on upcoming deadlines and arranging time for the group to practice presentations.

Deployment of the project website on a server was also completed successfully together with creation of deployment documentation. This document outlines the steps necessary to deploy an ASP.NET web application on a server running Debian Linux. I was able to complete these tasks successfully because of my previous experience in system administration and documentation.

# What I could have done differently in the Group Project

One main thing that I could have done differently is the planning phase of the project. The group wasted some time unable to decide what to do for the project. I think I should have put in a little more effort in arranging few more group meetings which could have resulted in less time being wasted in the beginning of the project.

The group project would also have benefitted if the members took some time to properly analyse our existing skills and choose an appropriate project accordingly. We are not able to implement an initially agreed scope because it involved integrating a database with the website and the group members did not have the required skill.

Another is the decision on use of version control. If I personally, and also the the group has spent some time learning a version control system, we would have been able to work more effectively with less issues in integrating each other’s work.

# How else could I use things I have learnt in the unit

While the unit covered extensively on the aspects of software engineering, it was not feasible to use everything in the group project. For example, estimation of effort for the individual tasks, meeting with group members similar to agile daily scrum and extensive testing of the group project outcome was not possible because of conflicting available timings of group members, inability to estimate programming skill requirement for the project and the nature of the project itself.

In my future work activities, I can foresee myself using following aspects of software engineering that I learnt in this unit:

1. People management and communications: As a manager leading a software development team, I would prioritize people management. I would ensure that a right mix of personalities are included in the team, set up conducive working environment, look into people’s motivation and introduce easy and effective communication channels in the team. I would also conduct other activities to build team cohesiveness like having a games night once a month and organizing events to celebrate achievements and milestones.
2. Agile development methodology and tools: In a small software development team undertaking a smaller project, I would use the agile development methodologies. From the initial planning phase, the team would seek active involvement from the customer and build good working relationships between the team and the customer. This will help establish clear requirements, evaluate deliverables and provide frequent and timely feedback when requirements change. Tools that automate task creation, estimation and assignment to team members will also be used. A screen displaying Kanban board and burndown chart can be used to keep track of the project progress which can be viewed by the whole team.
3. Software Testing: To maintain high standards of software quality, I would emphasize on the importance of software testing in my projects. A test driven approach would be incorporated and the development team would do unit testing. An external testing team would be recruited to do system testing.

# Notes

1. The Project website can be accessed at: <http://54.70.241.11/>
2. The deployment documentation can be accessed at: <http://54.70.241.11/deployment_documentation.pdf>