

Aditya Raj

BCIS309 – Work Integrated Learning Project, Software Development Pathway

Semester 1, 2021

SQL Test Automation for Ara Institute of Canterbury

Project Proposal – Version 0.5

Table of Contents

[Document Control 3](#_Toc68722434)

[Introduction 4](#_Toc68722435)

[Project Details 5](#_Toc68722436)

[Project Name 5](#_Toc68722437)

[Overview of Industry Client 5](#_Toc68722438)

[Project Background 5](#_Toc68722439)

[Project Scope 6](#_Toc68722440)

[Project Goals 6](#_Toc68722441)

[Benefits of Project 6](#_Toc68722442)

[Project Requirements 6](#_Toc68722443)

[Expected Deliverables 7](#_Toc68722444)

[Stakeholder Management 8](#_Toc68722445)

[Project Hierarchy 8](#_Toc68722446)

[Reporting and Meetings 8](#_Toc68722447)

[Student Skills 9](#_Toc68722448)

[General Skills Required 9](#_Toc68722449)

[ICT Specific Skills Required 9](#_Toc68722450)

[Skills from Relevant L6 and L7 Courses 9](#_Toc68722451)

[Approach to Learning New Skills 9](#_Toc68722452)

[Project Plan – High Level 10](#_Toc68722453)

[Phases 10](#_Toc68722454)

[Timetable 10](#_Toc68722455)

[Burndown Charts 11](#_Toc68722456)

[Resources/Access Required 11](#_Toc68722457)

[Risk Management 12](#_Toc68722458)

[Approach 12](#_Toc68722459)

[Risk Table 12](#_Toc68722460)

[Quality Assurance 13](#_Toc68722461)

[Approach 13](#_Toc68722462)

[Quality Assurance Table 13](#_Toc68722463)

[Test Plan/Scenario/Cases 13](#_Toc68722464)

[Methodology 14](#_Toc68722465)

[Overview 14](#_Toc68722466)

[Literature Review 14](#_Toc68722467)

[Critique (Pros and Cons) 15](#_Toc68722468)

[Ethics 16](#_Toc68722469)

[Relevance of ITP Code of Ethics 16](#_Toc68722470)

[Good Faith 16](#_Toc68722471)

[Integrity 16](#_Toc68722472)

[Community Focus 16](#_Toc68722473)

[Skills 16](#_Toc68722474)

[Continuous Development 16](#_Toc68722475)

[Informed Consent 16](#_Toc68722476)

[Conflicts of Interest 16](#_Toc68722477)

[Competence 16](#_Toc68722478)

[Relevant Legislation 17](#_Toc68722479)

[Privacy/Confidentiality 17](#_Toc68722480)

[Copyright 17](#_Toc68722481)

[Patents 17](#_Toc68722482)

[Sustainability, Inclusive Practice and Te Tiriti o Waitangi 18](#_Toc68722483)

[Relevance of Principles to Student and Industry 18](#_Toc68722484)

[Reflections 19](#_Toc68722485)

[Approach 19](#_Toc68722486)

[References 20](#_Toc68722487)

[Appendices 21](#_Toc68722488)

[Appendix A – Detailed Project Plan 21](#_Toc68722489)

[Appendix B – Risk Management Table 24](#_Toc68722490)

[Appendix C – Quality Assurance Table 25](#_Toc68722491)

# Document Control

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Author | Version | Status of Document/Updates Made |
| 22/03/2021 | Aditya Raj | V0.1 | Document Creation |
| 30/03/2021 | Aditya Raj | V0.2 | The First Draft Submitted for Marking |
| 4/04/2021 | Aditya Raj | V0.3 | The Second Draft Submitted for Marking |
| 6/04/2021 | Aditya Raj | V0.4 | The Third Draft Submitted for Marking |
| 7/03/2021 | Aditya Raj | V0.5 | The Final Draft Submitted for Marking |

# Introduction

This proposal document serves to provide the reader with a detailed outline of the work that will be conducted in this project. The categories that will be covered include the steps that are to be taken, variables that are to be considered and resolved while considering the project goals, objectives, and information about those that are directly involved including the industry supervisors and the skills I need to implement for the solution.

This document has been divided into sections, with information regarding the parties included in the project process of completing paperwork, the scope of the work and the requirements for the positive completion of the project. To complete the project within various conditions, a risk management document is also included, the conditions include potential risks, ethical considerations to be worked on and the skills needed to work on, throughout this project’s runtime. Finally, at the end of this document, there are references to any materials that I have used in the creation of this proposal.

# Project Details

Information that is directly related to this project is included in this section, such as information regarding the Industry supervisor, the tasks necessary to be completed, the immediate situation of the project and what is the projected outlook when the project has achieved completion.

## Project Name

SQL Test Automation

## Overview of Industry Client

The industry clients are the tutors of the Department of Enterprise and Digital Innovation at Ara Institute of Canterbury in Christchurch, New Zealand. The deployed product will also be used by the students of specific database courses at the Institution.

## Project Background

### Overview

The purpose of this project is to deploy a product that allows students in specific courses and from specific rooms to submit their SQL language code work onto the Ara Moodle website and get automated marks and feedback instantly. This is important to the clients, the tutors of Ara because they save many weeks not having to download all the student work to run and mark individually, also the students do not have to wait many weeks to get their marks and feedback returned, therefore the business problem which is that many weeks lost in manual marking student work and giving feedback by tutors is saved.

### Current Situation

Currently, tutors must individually download each student work from the Ara Moodle website, run the SQL code, manually mark, and give feedback to the work and return the results to the students either by paper or publish results online. This process can take many weeks for tutors and students also must wait to get their results.

### Future Situation

Once the project is completed and the product has been deployed, the client, the tutors simply must provide the product to students which they can use and get instant marks and feedback, using this information, tutors can also record these marks for the student’s records. Rather than taking up many weeks, the process will end on the same day, saving up many hours of work for the client, helping them focus on other work.

# Project Scope

The goals to be achieved and the areas that will be covered by the project regarding both the skills required and the areas to be worked on up until the product is completed are part of this section.

## Project Goals

### Industry

For the industry, the project goals include the products ability to perform automated marking of student work, including:

1. Notifying the student whether their SQL code is correct with a “yes” or not correct with a “no” result.
2. The product should allow the student to self-mark without being revealed the correct answer.
3. They should receive feedback as to why their work is correct or not correct.

### Student

As a student working on the project, my goal is to develop an understanding of how to use technologies that will be needed for the development of the product, including tSQLt a database unit testing framework for SQL Server. I will also need to understand how the product will be able to compare the students work with the model answer to give them feedback and marks. My overall goal is to successfully produce a deployable final product for this project.

## Benefits of Project

### Industry

The industry will benefit from this project using a product that saves time for both the tutors who will not have to spend many weeks marking student work and students who will also benefit by getting back their marks back instantly and automatically.

### Student

As a student working on this project, I will also benefit by having developed new skills using SQL Server and tSQLt framework within. The experience I gain from developing this product will help me progress further in my IT career.

## Project Requirements

The requirements for this project include the use of the tSQLt framework and SQL Server 2017 and 2019, this is important because the final product must work across both versions of SQL Server. The product must work in room X205 at Ara Institute City Campus, other rooms may have the product deployed in the future. The product must also compare the student work with the model answer provided by the tutors, looking and comparing specifically at the fields, data, order and tables in the SQL code files.

## Expected Deliverables

### Industry

There are four deliverables for this project:

1. The SQL Test Automation product marks student work from a directory, providing a “yes” or “no” result for correct or incorrect work.
2. The product allows students to self-mark, but without revealing to them the answers, building on from deliverable one.
3. The product will need to provide word feedbacks as to why the students work is correct or not correct.
4. The final deployable product, without errors and bugs.

### Academic

These are the academic requirements for this project:

1. Project Proposal & WIL Agreement
2. Halfway Report
3. Methodology Essay
4. Panel Presentation
5. Final Academic Report

# Stakeholder Management

This section covers information about all the individuals involved in the project whether it be directly or indirectly, this includes the Industry supervisor and the potential customers of the company. The following are primary points of contact for the project:

## Project Hierarchy

The people directly and indirectly involved in this project are:

1. Tutor/Industry Supervisor – Amit Sarkar
2. Tutor/Industry Supervisor – Alister MacGregor
3. Tutor/Academic Supervisor – Robert Oliver
4. Student Capstone Project Intern – Aditya Raj

## Reporting and Meetings

The main option of communication between meetings has been via emails. For the reporting of the project with the industry supervisors, we may have multiple meetings in a week. A show and tell meeting with the industry supervisors may occur every week on Wednesday at noon. There will also be having weekly meetings with the academic supervisor whenever suitable to them.

# Student Skills

The skills needed for the project to effectively make use of the tools and equipment to complete the tasks that are scheduled for use and completion are covered in this section.

## General Skills Required

The general skills required for this project include:

* Self-Management/Organisation
* Time Management
* Teamwork
* Communication
* Report Writing/Documentation

## ICT Specific Skills Required

The ICT specific skills required for this project include:

* Word processing for documentation.
* Creating spreadsheets for documentation.
* Ability to read, write and understand code.
* Data entry in databases.
* Writing emails for communication.
* File management and version control.

## Skills from Relevant L6 and L7 Courses

The skills relevant from Level 6 and 7 courses for this project include:

* Ability to read, write and understand code.
* Report and essay writing.
* Creating and managing databases using MySQL.
* Using Apache and MySQL Server.
* Programming practices.

## Approach to Learning New Skills

The skills that are needed for this project will be learned outside the hours of working on the project so that there is more time spent working on the product rather than spending time learning the new skills. Practice and research of the new skills will be done where and when possible. These skills can be defined as the project progresses by talking to people who have used these skills or is part of their normal duties.

# Project Plan – High Level

The planning of this project is the focus of this section, it involves the steps that will be taken at each phase of the project including estimations for resources consumed and the time taken to complete the project.

## Phases

The project will involve the use of the Agile Scrum methodology, therefore there will be multiple sprints including the software development phases for each. The following diagram shows how this will work for each sprint:

## Timetable

A total of 300 industry hours have been provided for this project. I plan to do an estimate of 30 hours each week to complete industry work:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
| 8am – 3pm (7hrs)  Industry Work | **8am – 4pm (8hrs)**  Industry Work | **8am – 10am (2hrs)**  Industry Work | **8am – 3pm (7hrs)**  Industry Work | **8am – 1pm (5hrs)**  Industry Work | **8am – 6pm (10 hrs)**  Academic Work |
| 3pm – 5pm  WIL Session |  | **10am – 12pm**  Advanced Programming | **3pm – 5pm**  WIL Session | **1pm – 3pm**  Advanced Programming |  |
|  |  | **12pm – 1pm (1hr)**  Industry Meeting |  |  |  |
|  |  | **3pm – 11pm**  **(8 hrs)**  Academic Work |  |  |  |

These dates are subject to change and more meetings may be needed to be added when appropriate. Weekly meetings with the academic supervisor to be confirmed, subject to availability. As per the academic hour’s allocation of 300 hours, I plan to do an estimate of 18 hours per week of academic work.

## Burndown Charts

### Industry

The industry burndown chart can be found in the appendix section of this document. The chart reveals my industry progress of the project, with the allocation time of 300 hours for the project. As the project continues, the chart is to be updated.

### Academic

The academic burndown chart can be also found in the appendix section of this document. The chart reveals my academic progress of the project, with the allocation time of 300 hours for the project. Just as the industry chart, this chart is also to be updated as the project continues.

## Resources/Access Required

For me to work on this project, I will need access to rooms N209 and X205 at Ara Institute, City Campus because it is a requirement that the final product is deployed in X205 and to test this, this room needs to be used. N209 will be used to work on code. I will also require access to computers running SQL Server 2017 and 2019 for the testing of the product on both versions because it is a requirement that the deployed product be executable on both versions, whichever is installed on a specific computer.

# Risk Management

Risks may be present or may arise during the runtime of the project, this section covers these risks including their solutions or methods of mitigation for these issues and risks.

## Approach

The risk table features a list of risks that could arise during the runtime of the project. The table explains the condition of the risks, their consequence, their probability, impact and exposure measurements, their mitigation strategy, their contingency, and triggers. There is a range of variables present in each of the risks documented, they have been identified in the risk table.

## Risk Table

The risk management table can be also found in the appendix section of this document. It features 5 risks covering various types of risks that may arise during the project ordered from the highest to lowest exposure rating.

# Quality Assurance

Steps must be taken to ensure that the project meets prerequisites that have been requested and that these are at an expected standard. This section covers the processes that have been set up within the industry to fulfil these quality assurance requirements.

## Approach

For the quality assurance of the deliverables, test-driven database development with tSQLt will be adhered to throughout the runtime of the project. This involves the creation of test classes, unit tests, the use of mocked (fake) objects to simulate real object behaviour so that the objects being tested do not affect the other dependencies and many more. This approach has been selected to achieve the most functional, robust, flexible, and quality final product from the development and testing phases of the project. These requirements will be reviewed at the end of each sprint.

## Quality Assurance Table

The quality assurance table can be found in the appendix section of this document. It covers a list of all deliverables, the criteria for acceptance and who all accept them.

## Test Plan/Scenario/Cases

For the testing of the deliverables, the product produced will be tested using unit tests and manual testing in which a user will do functional and usability testing to evaluate changes for the next sprint.

# Methodology

This section of the document explores the practices that are used to achieve success in the business, its benefits, and its disadvantages. As well as how it will be anticipated to progress the project.

## Overview

There are many types of project management processes that are used for software development, one of which is the Agile methodology, this methodology is one of the most popularly used in the world, this is mainly because it values adaptability and flexibility for companies. Agile is better equipped to provide responsiveness to the ever-changing business requirements and gets teams to focus on practical increments (Muslihat, 2018)

## Literature Review

The Agile methodology is comprised of values and principles that come from the Agile Manifesto, which was created in response to the shortcomings of the Waterfall, a traditional methodology that was not satisfactory for company projects because of its linear process that did not allow for constant improvement and innovation for products to strive in the ever-changing software market, whereas Agile does and companies get to stay on top with Agile (Muslihat, 2018).

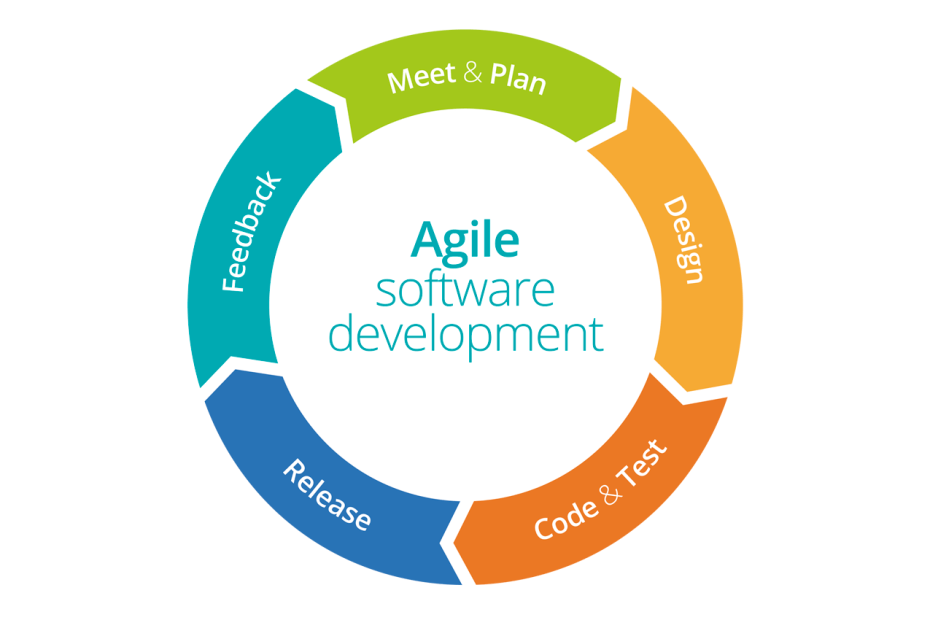


Figure 1 Agile Process (Software Engineering Authority, 2018)

In conjunction with Agile, the Agile Scrum methodology depends on incremental development, it is a framework allowing teams to collaborate while working on complex projects. The iterations are made up of two to four-week sprints, in which each sprint has a goal for a deliverable product (Business News Daily Editor, 2020). For the SQL Test Automation project, there is going to be 3 sprints over 2 weeks each and the final sprint which is the final product will be 4 weeks, the sprints will end with the completion of each project outcome, as previously detailed in the expected industry deliverables part of this document.

With each sprint, the product is built within the sprint period, frequent planning and goal setting allow the team to focus on objectives and increase productivity (Business News Daily Editor, 2020).

## Critique (Pros and Cons)

The following are the pros and cons of the Agile Scrum Methodology (Henricksen, 2019):

|  |  |
| --- | --- |
| Pros | Cons |
| Easy to explain and understand and light framework. | The product results are expected at the end of each sprint, teams need to work faster/harder. |
| Feedback allows changes to happen and better adapt the product to the company. | Scrum implementations can fail due to many company reasons. |
| Important features are prioritised over features that will never be used. | Excessive embracing change can lead to scope creep. |
| With scrum, the sprints are visible to all team members for them to work on. | Developers may not want to spend time on meetings. |

# Ethics

There may be ethical issues involving the project and its completion, this section outlines these ethical issues that may arise and how they will be dealt with.

## Relevance of ITP Code of Ethics

These ethics have been outlined as per (IT Professionals New Zealand).

## Good Faith

With good faith, people must be treated with dignity, equality, be without discrimination, be considered of, and the values and cultural sensitivities of all groups in the community affected by the work being conducted in the project.

## Integrity

With integrity, people must behave with honour, dignity, and integrity to be worthy of the trust of the profession and encourage it within the community. To apply appropriate judgement, apply honesty and exercise initiative to participate positively to the well-being of the public in general and the project.

## Community Focus

Before your responsibility to the profession and interests whether sectional or private, the prosperity of the community must come before the project.

## Skills

Without the settlement of other tenets, skills and knowledge are to be applied in the interest of the client/employers for/on behalf of whose actions are done for the project.

## Continuous Development

While promoting the collective wisdom of the profession, members of the team will continue to develop knowledge, skills and expertise during their careers while doing their best to actively promote their peers to do the same, for the project.

## Informed Consent

To remain informed, there should be steps taken. Clients, employers of the economic, social, environmental, or legal consequences may arise from actions carried out during the project.

## Conflicts of Interest

Clients shall be informed if there are any conflicts of interest, of which there is the observation of, between the work shown and the awareness of the client or employee, which can undesirably affect the work done in the project.

## Competence

Professional practice should be obeyed, as well as services delivered and advice thoroughly and carefully, within the areas of competency for the project.

# Relevant Legislation

## Privacy/Confidentiality

Regarding the project, the product that is developed will need to collect Ara Institute student information such as full name, student ID number, etc, as well as the course code and assessment number of the work they are submitting for automated marking. As per these requirements, The Privacy Act 2020 will be considered to make sure that the student information and work stay private and only for the use of marking their work via the SQL Test Automation product.

## Copyright

Efforts will be made to create original work for the project, if for any reason, other people’s work is needed, they will be appropriately asked for permission and acknowledged, and this will be done according to the copyright licence they have given their work. The product developed part of this project will only be made available within Ara Institute for private use by students and tutors only, it will not be used publicly or outside Ara Institute.

## Patents

The product because of this project may or may not be patented by the industry supervisors at Ara Institute as it is for use only within Ara Institute. If patented, this will stop others from making, using, or selling the product for up to 20 years and the rights will exist within the Canterbury region.

# Sustainability, Inclusive Practice and Te Tiriti o Waitangi

The four principles that must be obeyed during the runtime of the project are covered in this section. Their meanings will be covered.

## Relevance of Principles to Student and Industry

### Kaitiakitanga

For work to be carried out and completed, there should not be any personal issues and waste to the company resources that have been provided by the industry sponsor for the project. The reputation of the industry sponsor is reflected by this. The attitudes in the workplace and the personal reputation as a worker.

### Rangatiratanga

Any decisions or choices made concerning the project must be correctly assessed and adhered to the resources made ready, also including taking opinions of other team members and the industry supervisor.

### Whanaungatanga

The industry supervisor must be consulted to ensure that tasks are being carried out in order and within the set expectations. All reporting done in the team means that all team members part of the project understands what is happening so that they can assist when needed, doing this ensures that relations grow within the team.

### Mana Reo

Efforts should be made to ensure that the use of Te Reo or other languages is being accommodated by the team members on the project.

# Reflections

The following section will look at the way notes will be taken to capture the lessons learnt and reflections during the runtime of the project.

## Approach

For the reflection of lessons learning during the runtime of this project, notes will be taken by writing down what needs to be worked on for next time, this includes what changes need to be made before work beginning to avoid future mistakes or liabilities. Time needs to be taken out to reflect on what is happening and what can be done so that work can happen easier or more efficiently. Work should be done by saving time and resources, these reflections will help with that in mind.

# References

Business News Daily Editor. (2020, February 25). *What Is Agile Scrum Methodology?* Retrieved April 3, 2021, from Business News Daily: https://www.businessnewsdaily.com/4987-what-is-agile-scrum-methodology.html

Henricksen, T. (2019, January 23). *Scrum pros and cons.* Retrieved April 4, 2021, from Medium: https://medium.com/@TomHenricksen/scrum-pros-and-cons-acf6b53b1ad6

IT Professionals New Zealand. (n.d.). *The ITP Code of Ethics.* Retrieved March 30, 2021, from IT Professionals New Zealand: https://itp.nz/Members/Code-of-Ethics

Muslihat, D. (2018, March 2). *Agile Methodology: An Overview.* Retrieved April 3, 2021, from Zenkit: https://zenkit.com/en/blog/agile-methodology-an-overview/

Software Engineering Authority. (2018, March 24). *Agile as a Software Development Process.* Retrieved April 4, 2021, from Software Engineering Authority: https://ao.gl/agile-as-a-software-development-process/

# Appendices

The following appendices have been presented from the above sections of this document.

## Appendix A – Detailed Project Plan

10 Week Project Plan for All Deliverables:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| April | 5 | *Easter* | *Easter* | **Project Proposal & WIL Agreement Due** |  |  |
| 12 | **Project Start** |  |  |  |  |
| 19 | Term Break |  |  | **22nd April 1st Deliverable** |  |
| 26 | *Anzac Day* |  |  |  |  |
| May | 3 |  |  |  | **6th May 2nd Deliverable** |  |
| 10 |  |  |  |  |  |
| 17 |  |  |  | **20th May 3rd Deliverable** |  |
| 24 |  |  |  |  |  |
| 31 |  |  |  |  |  |
| June | 7 | *Queen's Birthday* |  |  |  |  |
| 14 | Study Week |  |  | **17th June Final Deliverable** | **Project End** |
| 21 | Exam Week |  |  |  |  |
| 28 | Exam Week |  |  |  |  |

Industry and Academic Plan of Allocated Hours:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Industry Allocation Hours** | | | | | |
|  |  | Hours per Week | | Remaining Hours | |
| # | Week | Planned | Actual | Planned | Actual |
| 1 | 12/04/2021 | 30 |  | 300 | 300 |
| 2 | 19/04/2021 | 30 |  | 270 | 300 |
| 3 | 26/04/2021 | 30 |  | 240 | 300 |
| 4 | 3/05/2021 | 30 |  | 210 | 300 |
| 5 | 10/05/2021 | 30 |  | 180 | 300 |
| 6 | 17/05/2021 | 30 |  | 150 | 300 |
| 7 | 24/05/2021 | 30 |  | 120 | 300 |
| 8 | 31/05/2021 | 30 |  | 90 | 300 |
| 9 | 7/06/2021 | 30 |  | 60 | 300 |
| 10 | 14/06/2021 | 30 |  | 30 | 300 |
| **Total Industry Hours:** | | | **0** |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Academic Allocation Hours** | | | | | |
|  |  | Hours per Week | | Remaining Hours | |
| # | Week | Planned | Actual | Planned | Actual |
| 1 | 22/02/2021 | 18 | 4 | 300 | 300 |
| 2 | 1/03/2021 | 18 | 4 | 282 | 296 |
| 3 | 8/03/2021 | 18 | 4 | 264 | 292 |
| 4 | 15/03/2021 | 18 | 4 | 246 | 288 |
| 5 | 22/03/2021 | 18 | 5 | 228 | 283 |
| 6 | 29/03/2021 | 18 | 33 | 210 | 250 |
| 7 | 5/04/2021 | 18 | 6 | 192 | 244 |
| 8 | 12/04/2021 | 18 |  | 174 | 244 |
| 9 | 19/04/2021 | 18 |  | 156 | 244 |
| 10 | 26/04/2021 | 18 |  | 138 | 244 |
| 11 | 3/05/2021 | 18 |  | 120 | 244 |
| 12 | 10/05/2021 | 18 |  | 102 | 244 |
| 13 | 17/05/2021 | 18 |  | 84 | 244 |
| 14 | 24/05/2021 | 18 |  | 66 | 244 |
| 15 | 31/05/2021 | 18 |  | 48 | 244 |
| 16 | 7/06/2021 | 18 |  | 30 | 244 |
| 17 | 14/06/2021 | 18 |  | 12 | 244 |
| **Total Academic Hours:** | | | **60** |  |  |

Industry and Academic Burndown Charts:

## Appendix B – Risk Management Table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Condition** | **Consequence** | **Probability** | **Impact** | **Exposure** | **Mitigation** | **Contingency** | **Triggers** |
| **1** | Not meeting submission deadlines | An increased workload due to not meeting project submission deadlines. | 80% | 9 | 7.2 | Break down tasks and get them done within a manageable timeframe before the submission deadline so that work is submitted on time. | Work harder to catching up to where I am supposed to be at with project work. | When the workload is getting harder to manage. |
| **2** | COVID-19 Alert Level change | Change to COVID-19 Alert Level 3 or 4, unable to work on the project at Ara, will have to work from home. | 15% | 7 | 1.05 | Be prepared to work from home, keep all documents on OneDrive and other places for easy access from anywhere. | Work from home, use the OneDrive pre-saved work to continue the project from home. | When government instructions are announced and/or have become active. |
| **3** | Sickness | Work deadline delays due to sickness (fever, weakness, cold) | 20% | 5 | 1 | Stay safe and healthy, keep warm, social distance, wash hands regularly, wear a mask in public. | Take medication on time and stay home. Get rest and eat healthily. Keep warm. Contact doctor to get tested. | When I get sick, feel weak and/or have symptoms of sickness. |
| **4** | Data loss/  corruption | Data lost due to accidental deletion or corruption or damage of hardware | 10% | 9 | 0.9 | Have many copies of files backed up on OneDrive and locally on an external hard drive or home desktop/laptop. Also, keep many versions to revert to if needed. | Use backup data from wherever available. | When some or all data is lost. |
| **5** | Major earthquake | Damage to home and workplace, unable to access work on the project. Possibly not internet or electricity. | 5% | 9 | 0.45 | Keep all documents on OneDrive and other places for easy access from anywhere. | Continue working from where possible. | Whenever it is safe to do so after the earthquake. |

## Appendix C – Quality Assurance Table

|  |  |  |  |
| --- | --- | --- | --- |
| Deliverable | Development Phase | Success criteria/standards | Signees |
| First Deliverable | Development & Testing | First test classes and unit tests successfully validate complete table structures to meet SQL standards. | Amit Sarkar, Alister MacGregor |
| Second Deliverable | Development & Testing | Unit tests successfully compare and identify data errors to SQL standards. | Amit Sarkar, Alister MacGregor |
| Third Deliverable | Development & Testing | Mocked (fake) objects are used with unit tests and successfully simulate the real objects. | Amit Sarkar, Alister MacGregor |
| Final Deliverable | Development & Testing | All functions are successfully achieved using unit testing and SQL standards. | Amit Sarkar, Alister MacGregor |