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BCIS309 – Work Integrated Learning PROJECT, software pathway

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Pyper vision Web app

Final report

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# Introduction

This report is the final documentation for the Aerodrome procedures web app for Pyper Vision. The purpose of this report is to illustrate how I developed the project and showcase some of the milestones achieved. The report also shows how I managed the course and what I learned from other related courses that benefited this project.

This report contains the following:

1. Introducing the background of Pyper Vision and the details of the project.
2. An outline of the project plan both in terms of industry and academic.
3. Showcase some of the deliverables I completed in different versions of the web app and explain some of the problems I encountered during the development process and how did I resolve them.
4. Evaluation of some of the level 6 and 7 courses I have completed and how they contributed to my project building.
5. The risk management plan and a review of how I implemented it.
6. The quality assurance plan and a review of how I ensure the quality of the deliverables.
7. Explanation about how ethics of IT professionals and other relevant principles will be implemented in this project.
8. A summary of the methodology that I used in the project.
9. Reflections of the learning process for BCIS309 and self-evaluation of the work completed.
10. The appendix includes the project management tools I used for this project, the latest risk assessment table, and the quality assurance table.

Acronyms

Table 1: List of Acronyms

|  |  |
| --- | --- |
| Abbreviation | Term |
| AS | Academic supervisor |
| IS | Industry supervisor |
| CC | Course coordinator |
| RPAS | Remotely Piloted Aircraft Systems |

# Project Details

This section briefly introduces the company and the background of the project.

## Project Name

Pyper Vision web app

## Overview of Industry Client

Pyper vision is a start-up company, and they specialise in aviation technology and have developed a fog dispersal system to deal with the visibility problem in airports. With the help of a drone (RPAS) and uniquely refined absorbent, the visibility will be created from decision height through to landing threshold and manoeuvring area in 10 minutes and the visibility can be maintained for 2 hours (Pyper Vision, n.d.). The dispersal system empowers the airports, airlines, and ATC to move aircraft without fog interruptions and help to save a huge amount of cost for both airline company and airport annually (Pyper Vision, n.d.).

## Project Background

### Overview

The focus of this project is to create a standard operating procedure app for Pyper Vision to digitalize the pre-flight procedure. It also provides a notification function to inform the Pyper vision team automatically if any operation is cancelled.

### Current Situation

Pyper Vision has been focussing on data scraping and data analysing airlines information in different airports and approaching potential customers. One of their objectives is to sell their dispersal system to different airports dealing with fog problems. They need an application to guide the airport staff to operate the dispersal system correctly and follow a standard process. Though some of the processes are still under trial, the data set for initiating an operation and the pre-flight check is predefined, and it will be helpful to get the resource I need to build the web app.

### Future Situation

Pyper Vision can test data flow and business logic by manipulating a real app. If everything goes correctly, they can outsource an IT team to build a mobile app as their final product.

# Project Scope

The Pyper Vision project is to build a web app to digitalize the procedure before a flight(drone) taking off. It allows users to create a new operation and follow standard steps by filling forms, checklists, and enable users to trace back the operation logs on a specific date. Unit tests are not required at this stage as this web app will work as a framework to demonstrate the features only.

## Project Goal(s)

### Industry

* Digitalize the procedures to improve work efficiency and mitigate on-field risks.
* Integrate all learning documents in one app to minimize the learning downtime.
* Ensuring understanding of the role while operating in an airfield.
* Ensuring consistency in the performance of duties.
* Facilitate compliances for new users.

### Student

* Demonstrate the capability to manage a project from design to implementation.
* Confident to work with a team and express my ideas to the public.
* Able to work with pressure and not afraid of learning new things whenever needed.

## Benefits of Project

### Industry

* Admin role will be able to manage sub-admin and staff account easily.
* Sub-admin role will be able to create their own staff in the specific airport.
* Admin role will be able to manage the checklist tasks in each procedure.
* Admin role will be able to view all operations on a specific date.
* Sub-admin and users will be able to view their airport operations on a specific date.
* All users can download the log files in excel format.
* All users will be able to report accidents and hazards on the airport field.
* All users can conduct pre-flight checks easily.

### Student

* Hands on experience to build a web app for commercial purpose.
* Working with a team and familiar with scrum framework.
* Understand Laravel, MySQL, and React in depth by implementing business logic.
* Familiar with different tools to manage project including GitHub, ClickUp.
* Communicate with remote staff by using Slack and Zoom.
* Familiar with Azure DevOps tools to manage the project.

## Project Requirements

### Amendments To Project Proposal

The original project proposal required identifying the faulty parts of the drone and sending a notification to technicians once any damaged parts identified in the field. This feature was delivered in version one of this app. However, in version two most of the updates were focused on role management, operation form design, and enabled admin to manage checklist tasks themselves. Pyper vision agreed to postpone the rest of the features that are not the most important ones.

### Expected Deliverables

**Industry**

1. Login system (register is no required)
2. Admin role feature

* Role management (admin role is able to create users with a role of staff, admin, or sub-admin and assign the user an airport)
* Procedure management (admin role is able to create, update, and delete tasks in checklists. The deleted tasks are soft deleted, and users can still retrieve them in the log file created before)
* Create a new operation.
* View all operation logs.
* Update log notes in the operation log.
* Download any log files.
* Notify the admin by email automatically if any procedure is not completed.
* Able to submit forms including accident/hazard report.

1. Sub-admin role feature

* Login to a specific view
* Role management (sub-admin role is able to create users with a role of staff or sub-admin, and the airport for this user is the same as the sub-admin)
* Create a new operation.
* View the airport own operation logs.
* Only able to update airport own log note in the operation log.
* Able to submit forms including accident/hazard report.

1. Staff role feature.

* Login to a specific view
* Create a new operation.
* View the airport own operation logs.
* Only able to update airport own log note in the operation log.
* Able to submit forms including accident/hazard report.

**Academic**

* Project proposal
* Project timeline
* Burn-down chart
* Risk management plan
* Quality assurance plan
* Half-way project report
* Methodology essay
* Weekly report
* Final project report
* Poster
* Panel presentation

# Stakeholder Management

As this is a work-integrated learning project, I need to report to both academic and industry supervisors to make sure the project is on the right track. I can also report to the course coordinator Dr David Weir if necessary. This section will show the project hierarchy and meeting schedule during the development process.

## Project Hierarchy

figure 1 Project Hierarchy table

Diagram

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## Reporting and Meetings

There will be weekly meetings with the academic supervisor and regular meetings with the industry supervisor as required.

**Academic Supervisor**

* Weekly meeting 10:30 am-11:00 am on Monday in Amit’s office
* Weekly reports
* Email if any uncertainty about the course or project

**Industry Supervisor**

* Weekly Zoom meeting 10 am- 10:30 am on Friday
* Using Slack for regular communication tool
* GitHub for version control of all documents

# Student Skills

This section will discuss some general skills and ICT specific skills needed to complete this project. I will make my plan of learning new skills if necessary.

## General Skills Required

Soft skills:

* Need to be able to communicate with stakeholders and express ideas, problems clearly.
* Witten skills to document project proposal and report.
* Time and project management: able to use appropriate tools to manage project status and improvements to ensure the deliverables meet the timeline.

## ICT Specific Skills Required

* Php (Laravel 8)
* MySQL
* HTML, CSS, React

## Skills from Relevant L6 and L7 Courses

**BCIS301 Management of Information and Communication Technologies**

* Research skills
* Essay written skills
* Project management skills

In this course, I was exposed to different big IT projects that were built in real life. By analysing those cases to get reasons why some projects are successful or fail in certain areas got me to understand writing code is just a small part of IT projects. It requires many project management skills to ensure a project successful. We also developed an ICT risk management assessment tool after strategic analysing two IT projects. One of the most important things I learned during this course was what is thematic analysis. I used this method to research for my methodology essay.

**Recommendation**

This course was very difficult for me to understand at first as the concepts like strategic analysis or frameworks were too abstract for me after only taking three level-5 courses. I wish I joined the class at a bit later stage of my studying journey.

**BCDE213 Interactive Media Development**

* Design thinking
* UI and UX design
* Wireframe design

One of the most important courses for me to understand how UI, UX designers’ work and how to make our app pretty and easy to use. Design thinking is more about how to think in the users’ position instead of a technical person. It also showed me the workflow of designing a product that meets users’ need. I used the workflow in my capstone project to get users’ requirements, analyse their problems, find solutions, implement the solution, and iterate again to improve. I feel more confident to design a project when I have a framework in mind.

**Recommendation**

This course has done very well in a theoretical demonstration of the concepts. If some of the demonstration about how to use a design tool like Figma or Adobe XD can be added into the course, that would be useful as students can learn some wrapped up tips at school.

**BCDE224 Best Programming Practices (Server-Side Programming - PHP)**

* SOLID principles
* OOP paradigm

This is one of my favourite courses as I learned MVC structure, the SOLID principles, internalization, regular expression, and most important I created a blog post website myself for the first time! I kept on learning PHP after this course, and I integrated my knowledge into the capstone project to build a much more complicated web app using PHP. I also learned Behaviour-Driven Development (BDD), and I used this method to demonstrate my progress to other people.

**Recommendation**

I would recommend adding a PHP framework like Laravel into the class. Students can get more ideas of how an MVC architecture works and how MySQL connects with a PHP framework in a real-life project after learning basic concepts in the class.

**BCDE214 Database Administration**

* Normalization
* Database design

Database administration is one of my favourite courses. We learned advanced level SQL scripts and how to design a solution to solve a real-life problem. The way Amit explained concepts was clear and to the point. He taught us how to think when we encountered problems. He always encourages me when he finds I am doing things right and why it is right. I used MySQL which was what I learned during this course as the database in the capstone project.

**Recommendation**

I wish we had a small section to talk about the NoSQL database that would give us more choices when we design the database for the capstone project.

## Approach to Learning New Skills

**Resources from industry and academic supervisors**

During the weekly meeting, I discussed with IS and AS the obstacles I encountered to learn new skills and got some hints from them.

**Research from internet**

I used the skills I learnt from school to conduct research (google, stack overflow, official documentation etc.) and took advantage of YouTube to find resources.

# Project Plan – High Level

The section will illustrate the high-level plan for this project, including the main phases, timetable, burndown chart, and where to allocate the resources that I need for this project.

## Phases

Phase one (two weeks)

* Gathering requirements from client
* Design wireframes
* Entity relationship diagram design
* Identify deliverables.
* Project proposal

Phase two (four weeks)

* Research and learn new skills required for this project.
* Methodology research
* Implementation Admin role features
* Halfway project report

Phase three (six weeks)

* Complete deliverables
* Methodology essay
* Final report (draft)

Phase four (two weeks)

* Project review
* Final report
* Poster
* Panel presentation

## Project management tool

I used ClickUp to plan the whole project at the initial stage. I continued using it to manage my academic deliverables. However, for the industry project, I found Azure DevOps was a much easier tool to manage the IT project as this tool works well with the Agile Scrum methodology that I chose to use for this project. There are some examples of how I managed the project and allocated my time to each deliverable in Appendix A.

## Timetable

Project start date: 15/03/2021(Week1)

Project halfway date: 07/05/2021 (Week 8)

Project finish date: 18/06/2021 (Week14)

Cost (Hours)

Industry Hours: 300 hours (22hrs/w)

Academic hours: 150 hours(11hrs/w)

Table 2: Industry timetable

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Industry Timetable | | | | | |
| Monday | **Tuesday** | **Wednesday** | **Thursday** | **Friday** | Total |
| 9am-10am, 12noon-2pm | 9am-2pm | 9am-2pm | 9am-2pm | 9am-2pm  (Industry Supervisor weekly meeting) |
| 3 hours | 5hours | 5hours | 4 hours | 5 hours | 22 hours |

Table 3: academic timetable

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Academic Timetable | | | | | |
| Monday | **Tuesday** | **Wednesday** | **Thursday** | **Friday** | Total |
| 10.30am (Industry Supervisor weekly meeting), course in campus | 6pm-8pm | 6pm-8pm | 6pm-8pm | 6pm-8pm |
| 3 hours | 2 hours | 2 hours | 2 hours | 2 hours | 11 hours |

## Burndown Charts

This section will show the original estimated timeline that I planned for the project versus the actual hours that I spent. The industry burndown chart had a big chunk of time block allocated at the last three weeks due to the learning requirements for React. Otherwise, the academic progress was steady through the time.

### Industry

figure2: industry burndown chart1

Table

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figure3: INDUSTRY BURNDOWN CHART2

Chart, line chart

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### Academic

figure4: Academic BURNDOWN CHART1

Table

Description automatically generated

figure5: Academic BURNDOWN CHART2

Chart, line chart

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## Resources/Access Required

* Pyper Vision Dropbox
* Pyper Vision Slack

# Project progress

This section will explain the actual outcomes of the project and demonstrate some of the features I built in different versions for this project. As the number of the behaviours included in three versions are more than thirty, I will only display some of the key behaviours using Behat framework which is a tool to write human-readable stories to describe those behaviours. Also, I will show some examples of the problems I encountered and how did I resolve them.

## The actual project outcomes

In the first three weeks after initiating the project, I had completed most of the deliverables required by Pyper Vision. I received many positive feedbacks and some suggestions from the team. They provided more details with the same deliverables. I then updated the project requirements and started version two. After I finished the version two, I realised that I still have some time to do more improvements and I discussed with them that I needed to build a version three of this app to sperate the front end and back end to better implement more features. However, I could not guarantee that I can finish this version on time as I needed to allocate some time on learning a new front end framework. They agreed that I could use version two as the final product to demonstrate the outcomes if I could not finish version three. Here are the actual project outcomes. I will demonstrate some outcomes of each version later in the section.

Table 4: Actual project outcomes

|  |  |
| --- | --- |
| Phase | Industry hours |
| Version one | 3 weeks |
| Gathering requirements from client  Design wireframes  Entity relationship diagram design  Implementation Admin role features | 75 hours |
| Version two | 5 weeks |
| Updating requirements and entity relationship diagram  Implementation admin, sub-admin, and staff role features | 110 hours |
| Version three | 3 weeks |
| Updating requirements and entity relationship diagram  Learning React  Implementation admin role features | 145 hours |

## Version one

### Feature1

**Feature**: Login as an admin

In order to use this app

As an admin

I need to be redirected to right page after login.

**Scenario**: login information matched with the data in the database.

Given: my role is an admin.

When: I click ‘Login’ button on login page

Then I should be able to see a dashboard page.

And I should be able to see ‘Staff’ route in sidebar.

figure6: version1 login page

Graphical user interface, application

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figure7: version1 admin dashboard

Graphical user interface, application

Description automatically generated

**Scenario**: login information does not match with the data in the database.

Given: my role is an admin.

When: I click ‘Login’ button on login page

Then I should see a warning message saying, ‘These credentials do not match our records.’.

figure 8: version1 fail to login

Graphical user interface, application

Description automatically generated

### Feature2

**Feature**: Create a new staff

In order to manage staff

As an admin

I need to create a new staff with certain role.

**Scenario**: I need to create a new admin.

Given: the admin name is ‘Admin2’, email address is ‘admin2@gmail.com’, password is ‘11111111’, phone number is ‘123456’.

When: I click ‘Create’ button on create new staff page

Then I should be redirected to staff list page and the new staff is added to the list of staff.

figure 9: version1 add staff page

Graphical user interface, application

Description automatically generated

figure 10: version1 staff info

Graphical user interface, text, application

Description automatically generated

### Feature3

**Feature**: Create a new checklist log

In order to operate a drone safely I need to finish a pre-flight checklist first

As a user

I need to be able to submit the checklist after finished it.

**Scenario**: Complete all tasks in the checklist.

Given: I work in ‘Christchurch airport’ and site name is ‘01’, chose ‘pre-flight checklist.

When: I click ‘Complete’ button on pre-flight checklist page

Then I should be redirected to the create a checklist page.

And a message saying, ‘Checklist completed’.

figure 11: version1 create a new checklist-1

Graphical user interface, application, Teams

Description automatically generated

figure 12: version1 create a new checklist-2

Graphical user interface, text, application

Description automatically generated

figure 13: version1 create a new checklist-3

Graphical user interface, application, Teams

Description automatically generated

## Version two

Before I continued the staff role’s features the team had a meeting with me to demonstrate some more features that they wanted from this app. The latest deliverables are updated in the section of project requirements. I stopped developing version one as the database needed to be redesigned. I started version two of this app. The main progress I made for the web app are as below:

### Feature1

**Feature**: Create a new staff

In order to manage staff from different airports

As an admin

I need to be able to create a new staff with a certain role and in a certain airport.

**Scenario**: I need to create a new sub-admin.

Given: the sub-admin name is ‘Sub-AdminCHCH1’, email address is ‘subadminchch1@gmail.com’, password is ‘11111111’, phone number is ‘123456’, airport is ‘Christchurch’.

When: I click ‘Submit button on ‘Add staff or admins page’

Then I should be redirected to staff list page

And the new staff is added to the staff list.

figure14: version2 add staff page

Graphical user interface, application

Description automatically generated

figure 15: version2 staff list page

Graphical user interface, application

Description automatically generated

### Feature2

**Feature**: Create a new task in a checklist

In order to manage tasks in a checklist

As an admin

I need to be able to create a new task in the checklist.

**Scenario**: I want to add a new task in a pre-flight checklist.

Given: the pre-flight procedure needs a new tasks ‘step4’.

When: I click ‘Add’ button on pre-flight checklist page

Then I should see the new task is added to the list of tasks on the same page.

figure 16: version2 pre-flight management1

Graphical user interface, application, Teams

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figure17: version2 pre-flight management2

A screenshot of a computer

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### Feature3

**Feature**: View operation logs in Calendar’s page on a specific day

In order to get an overview of all operation logs on a certain day

As an admin

I need to be able to see a list of operation log files after choosing a specific date.

**Scenario**: I need to add a new task in a checklist.

Given: the date I want to check is ‘2021-05-04’.

When: I click ‘Check’ button on calendar page

Then I should see a list of all operation logs on that day on the same page.

figure 18: version2 calendars page1

Graphical user interface, application

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figure 19: VERSION2 CALENDARS PAGE2

Graphical user interface, application, Teams

Description automatically generated

## Version three

In version three, I wrote the Laravel API in the back end and React as the front end. I was able to add one more feature that was to upload an image to the task of pre-flight checklist.

### Feature1

**Feature**: Add an image to the pre-flight checklist task

In order to make users easier to understand the task of pre-flight checklist task

As an admin

I need to be able to add an image to the pre-flight checklist task if necessary.

**Scenario**: I need to add an image to the task in the pre-flight checklist.

Given: the task name is task 2 and a picture is selected in the file system.

When: I click ‘Save’ button on pre-flight checklist page

Then I should see the new task with an image is added to the task list on the same page.

figure 20: version3 pre-flight checklist page1

Graphical user interface, text, application, email

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figure21: VERSION3 PRE-FLIGHT CHECKLIST PAGE2

Graphical user interface, text, application

Description automatically generated

figure 22: version3 pre-flight checklist page3

Graphical user interface, text, application

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## Problems encountered

Everything was under control when I received the requirements from AS at first. I got most of the things done within three weeks. Challenges emerged when I started version two and three as there were more details in some of the features or new skills needed.

1. In version two, I needed to create a new operation form with the user’s airport information displayed in the dropdown menu, for example, flight paths, drones, and pilots available in that airport. This function required models of User, Airport, Drone, Flight Path and Support Crew and made the entity-relationship complicated. I was a bit reluctant to move forward as I did not know where to start. I encouraged myself maybe design an ER diagram first to help me clear my mind.

figure 23: Part of version2 ER diagram

Diagram

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After that, I tried to write a to-do list which was much easier than coding.

figure 24: version2 to-do list-1

Graphical user interface, text, application, email

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figure 25: VERSION2 TO-DO LIST-2

Graphical user interface, text, application

Description automatically generated

What I did next was much more natural, just following the steps. I realized that when I broke a big problem into smaller pieces, I was less stressful, and the problem will be solved inevitably.

1. The other problem I encountered was when I learned how to configure the Laravel file to connect with React app. I found the documentation of Laravel and skimmed through it. Copied and pasted some of the code to my file. However, the code was broken. I got stuck there for four days kept receiving all sorts of status code except 200. I knew that I could not solve this problem if I was lazy to read through the documentation and understand what it was talking about. The problem was solved after I read the documentation and did some other research. What I learned here was reading the documentation was hard, but it works.

There were many moments that I thought I was going to give up about a certain feature. Now I realize that those uncertainties were the places where I broke my limits after I sticked to them and found a solution. The problem-solving journey made the project fascinated to me.

# Risk Management

Choose or develop a risk management tool is very important to evaluate how risky the project is at different stages. If those risks can be identified earlier and prevented from happening, the chances of achieving the final goal will be increased. This section will discuss various risks that can happen in this project. Justify the tool I am going to use to manage risks. I will also review the risk management and what can be improved in the future.

## Approach

For risk management process, four areas are involved in: risk assessment, risk reduction, risk tracking and risk reporting (Thomsett, 2004). I will explain each area as below:

### Risk assessment

According to Thomsett, there five generic types of risk: project risk, business risk, benefit-realization risk, support risk and personal risk (Lehman, 2007). I will analyse Pyper Vision Web app project based on those five types of risk.

**Project risks**: these could be risks that result in the project itself failure (Lehman, 2007). Pyper Vision is a start-up company, and they tend to implement many features in a limited time range. Within a small team, that can be a risk due to lack of time.

**Business risks**: these could be low quality IT product bringing negative impact to the business (Lehman, 2007). Pyper Vision final product might be working with high volume of data every day. If the web app is low quality, it may return wrong results, in which business would risk in losing customers.

**Benefit-realization risks**: these could be risks that result in the business not getting expecting benefits from the project (Lehman, 2007). This can happen when change-management component is not in place (Lehman, 2007). Pyper Vision might face this risk as this is a new product and new requirements can come out easily without letting development team up to date or fully understand. The final product might not fit all business requirements.

**Support risks**: if a project is taking more resource than the organization can afford, the project is in risk (Lehman, 2007). Pyper Vision web app is a relatively small project without costing much money to implement. However, the supporting team is small as well. If I get sick or could not working on the project temporarily, it will result in the project running out time for development.

**Personal risks**: these could be risks to developers’ own career or life if the project fails (Lehman, 2007). I could eliminate this risk at moment as this is my first intern project and I can benefit a lot from it.

### Risk reduction

I will use the risk mitigation strategy and contingency plan to reduce those risks identified above. Refer to the risk management table in Appendix B for more information.

### Risk tracking

I chose to use the Microsoft risk management template as the tool to track the risks in this project.

figure 26: risk assessment example

A picture containing text

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Explaining of Probability, Impact and Exposure

Table 5: explaining of probability, impact and exposure

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Probability | | Impact | | Exposure |
| 1-30% | Low likelihood of occurrence | 1-3 | The risk is low on project success | The result is computed as Probability x Impact. Sorting this column to get the biggest risks after entering all risks. |
| 40-70% | Medium likelihood of occurrence | 4-7 | The risk is medium on project success |
| 70-99% | High likelihood of occurrence | 8-10 | The risk is high on project success |

Explaining the rest of the columns

The **risk statement** mainly describes the risk and is composed of Condition and Consequence columns. **Condition** column defines the condition that may cause the risk. The **consequence** column defines the potential consequences of this risk.

The **Mitigation** column provides a plan of how to avoid this risk from happening or reduce the impact on the delivery of the result.

The **Contingency** column is used to design some backup plans if the risk becomes reality.

The **Trigger** column identifies the time or a situation that prompts me to start the contingency plan. This column enables me to respond to the risk in time.

The reason that I am using the current risk management tool is that it incorporates risk analyses and control in one table. Also, it allows ranking the priority of the risks by calculating the impact and probability of every risk. The high-risk factors will be listed on top. I would keep this table updated if any new risk identified and will use this tool to re-evaluate the project every week. Risk reporting

Using the risk management table as reference reporting to industry supervisor and academic supervisor about risk management when necessary.

### Review of risk management

There are a few lessons I learnt during the risk management process:

1. I did well at the first two versions to minimize the risk as I kept reminding myself that if there were too many requirements, try to identify the most important ones and test early to find if I could build them. Rationalize to the IS and AS why I was going to build or not build any features.
2. I deliberated to increase the risk by using React framework as I wanted to learn a new skill. The results proved that I did not make much progress at the end of version three. It was all right for this capstone project as I had version two to back me up. However, it would bring an extremely bad impact to a real project by using a new language. I should avoid that if I ever have to build an app by myself.
3. I did not review the low risk through the project much as I thought it was fine to ignore them. However, in the real project, I should eliminate that idea as the situation can be more complex than a capstone project at school and even low risk can get bad result financially.

## Risk Management Table

Refer to the latest risk assessment for the project as of 24 May 2021 detailed in Appendix B.

# Quality Assurance

Quality assurance takes care of all project management process to make sure they are conducted in a certain manner (Tasmanian Government, 2011). The level of quality in the Pyper Vision web app project is defined by stakeholders. In this section, I will describe the process to be conducted to ensure project quality. I will also review the quality assurance plan and what can be improved in the future.

## Approach

### Preparation

Gather the requirements of the project and ensure the stakeholders agree with the deliverables and level of quality assurance is needed (Tasmanian Government, 2011). The quality management plan will be documented including the deliverables and how activities will determine the results.

## Quality assurance plan

The latest quality assurance plan is detailed later in Appendix C.

### Amendments to the Quality Assurance Plan

According to the changes of project requirements, some of the industry deliverables standards have been redefined.

Table 6: amendments to the industry quality assurance plan

|  |  |
| --- | --- |
| Role management | Admin and sub-admin role can create/update/delete users except deleting self.  Admin role can create new users with a specific role and an airport assigned.  Admin and sub-admin staff management routes are protected (public or staff role cannot view this page).  Sub-admin role can create new users with a sub-admin role or a staff role. New users’ airport name will be the same as the sub-admin. |
| New operation | All users can create a new operation.  Public cannot view this page.  Form data need to be validated before submitted. If wind knot is more than 8, the operation will be cancelled, and an email will be sent automatically to the admin to inform the high wind speed situation with all the data in the operation form.  If the form is completed and wind is less than 8 knots, the page will be redirected to pre-flight check page after user click submit. |
| Pre-flight check | All users will be redirected to this page after finishing the new operation log.  Public cannot view this page.  If any task is not completed, user cannot fly a drone and the operation will be cancelled. The operation form completed last step and pre-flight checklist content will be saved into database and an email will be sent to the admin to inform the uncompleted pre-flight checklist. |
| Calendars | Admin role can choose a date to view all the operations created on that day.  Sub-admin and staff role can choose a date to view all the operations created on that day in their airport.  They should be able to update the operation log note and download the log files. |
| Procedure management | Admin role can view/create/update/delete tasks in pre-flight checklist.  After the deletion of a task, the previous log file should not be affected by this. |

Some of the deliverables that were not included in the proposal will be added here.

Table 7: AMENDMENTS TO THE academic QUALITY ASSURANCE PLAN

|  |  |
| --- | --- |
| Weekly report | Record the weekly report with IS and AS |
| Final project report | Refer to the final report marking rubric. |
| Poster and short paper | Refer to the poster and short paper marking rubric |
| Panel Presentation PPT | Refer to the panel presentation marking rubric. |

### Quality Assurance Plan Review

There are a few things I did well to ensure the quality of the project:

1. I met with my IS quite often in the first few weeks as I wanted to make sure the results were aligning with Pyper Vision’s needs. I explained the details to IS once I made any improvement, so I could get instant feedback to ensure I was on the right track.
2. I met with my AS almost every week to report the progress and demonstrated the new features of the app. AS could always give some constructive feedback at a different stage of the project. For example, at the beginning of the project, my AS suggested me to get data set of forms, so I could work on design the database, and at the end of version one, AS reminded me to search about how to deal with deletion as it could result in some serious problems for a project like this. AS also praised me whenever he found I was following good practice, so I would realize that I should continue that way of programming.
3. My knowledge gained at school also helped me to output results good in quality. I used design thinking to go through the whole process, SOLID principles to organize the code, and thematic analysis to do research.
4. For the weekly report, I kept some areas not updated as I found a better way for me. I created a separate file to record problems I encountered, how I resolved them and my reflections on certain jobs that I have done. I wrote it like a diary, and it was easy for me to trace back to get all details I need in one file. Also, I could update those areas even there were no meetings with AS or IS in that week.

# Summary Of Methodology Essay

As the only developer in Pyper Vision, I need to find an efficient way for me and the whole team to work together and maximise productivity. After the analysis of different methods, I have adopted Agile Scrum as the methodology to develop the products.

The reason I chose Scrum was Pyper Vision is a start-up company without much experience in developing a web application. The principles in Scrum promote communication between team members to identify issues through iterations, and I also researched about Scrum for the individuals to meet my situation. When acting in different roles in the Scrum team, I have to consider a problem at different levels instead of just a coding solution. This is an important skill in a real project where coding is only a small part of it.

In my methodology essay, I will conduct research about Agile that includes a set of values from where all other related methodologies derived. I also illustrate Scrum and comparing with some other methods like Extreme Programming and Feature-Driven Development. Finally, I will discuss how I implement Scrum in the project and the outcomes. The main contents include:

* What is Agile
* Why chooses Scrum
* Scrum for individual
* How to implement Scrum in the capstone project
* Reflection after using Scrum

After conducting Scrum for individual methodology in the project, I have a deep understanding of the roles in a Scrum team, and the Azure DevOps tool I chose to manage the project will also benefit me in the future when working in a bigger IT team.

# Ethics

It is important to understand and obey the ethics to be an IT professional. It is a bottom line to prevent ITP from doing things against the interests of other people. This section is going to elaborate on my understanding of each code of ethics when working in the industry as an IT student.

## Relevance of ITP Code of Ethics

### Good Faith

When working with people from different culture, background, I shall treat them equally without discrimination. An open and peaceful environment can help to bring more value to the team.

### Integrity

As an IT professional, users’ personal information might be exposed to me, or I might have a chance to take advantage of the bugs of a system. Integrity is the bottom line that I should always obey to be a reliable person.

### Community Focus

Always consider the interests of the community first, instead of the benefit of the personal or small group.

### Skills

I shall leverage the skills that are needed to work with clients or team members, and they do not need to compromise any other of the ethics.

### Continuous Development

In terms of continuous development, I shall keep learning new skills contributing to the team. With the right attitude, I will be able to encourage other professionals to do likewise.

### Informed Consent

I shall also keep reminding myself I have signed a confidentiality agreement and I should inform the clients if I can reveal their information to other parties. I shall tell the client if their actions are not environment-friendly or even illegal.

### Conflicts of Interest

During the development process, if I find any feature that is potentially unstable or may create bugs, I shall let the client know.

### Competence

I shall only give suggestion or produce code that I am aware of, instead of showing off the knowledge that I am not specialised in.

## Relevant Legislation

### Privacy/Confidentiality

I have signed a confidentiality agreement with Pyper Vision, and I shall obey the provisions inside the agreement. Besides, the web app is going to collect personal information. Users should know why that information is needed and they should be able to view and update their profile.

### Copyright

The copyright of this project belongs to Pyper Vision and the copyright sign should be displayed on each page of the app.

### Patents

The web app is for demonstration purpose and if they need to patent that I will help with the applying process. The patent will be given protection only in New Zealand.

# Sustainability, Inclusive Practice and Te Tiriti o Waitangi

This section will discuss how I will implement some relevant principles to the project.

## Relevance of Principles to Student and Industry

### Kaitiakitanga

I shall treat people the way that I want to be treated. Try to use resources wisely instead of wasting them.

### Rangatiratanga

Always give extra options for the client and listen to their feedback. The client should be able to decide how the process to be conducted and what is the criteria determining the project delivered successfully.

### Whanaungatanga

Organize some causal talks with the client apart from work. Treat them more like friends if they are not feeling uncomfortable with that.

### Mana Reo

Allow students and clients to use their own language when they think it is necessary to clarify with the project.

# Reflections

This section will document my reflections on course BCIS309 and the self-evaluation of my work throughout the project.

## Reflection On BCIS309

It was a challenging experience for me to complete a capstone project like this. I completed a simple project using Laravel during the summer holiday and it helped me to understand how to build a web application from scratch. However, it was not enough to finish the capstone project which was not just my homework for a certain course anymore but required multi-skills I acquired from different courses. Also, the capstone project made me shift my way of thinking problems from a student to an IT professional.

I thought the job was easy at first. I gathered the requirements and found a solution for them. I designed the wireframes. I was quite happy that I finished version one in three weeks until I received the feedback that they wished this app could create sub-admins for different airports and those sub-admins could manage their own staff. I realized that the requirements could be changed on the fly. It was good to have that experience and I was lucky enough that I had plenty of time to redesign the database at the very first stage of the development.

It is not difficult just to make the code work sometimes. However, it is different in real life project where I need to think about what the effects can be if I write code in a certain way. For example, it was easy to create a method to delete a checklist task. However, the negative impact may ruin the whole project if any tasks were deleted without being able to trace back in the production phase. The data in log files would be lost.

Apart from the industry work, I also learnt some lessons about how to manage the course. There were many forms to be signed off during the process. It was messy in my computer folders and that was the reason that I submitted uncompleted forms at the beginning. I then created a separate folder only for submissions.

Lastly, I learned that it is fine if I could not do everything. I felt the most stressed during the last three weeks of the project where I was working on version three using React as the frontend. Especially when I thought about I only had so much time left, and how could I finish version three on time. I spent double the time every week compared with what I normally spent on previous versions. Most of the time was allocated to learn React and connect Laravel with React. Not many contents were available online to fit my use cases in this project. I tried to piece information from different areas together without really understood the story behind it. The more jobs I wanted to do the more I was inpatient. I did not make much improvement until I finally admitted that I probably not able to finish this version on time. I was appreciated that the team allowed me to use the version two as the final presentation if I could not finish the version three. I found myself started making progress after I was in control of my mindset. After reading some of the documentation of Laravel by heart, things began to clear to me. I also made React sending requests to the backend successfully.

In a nutshell, I was proud of myself for being able to develop an app with so many features from scratch. This process convinced me that I can be a developer who is not afraid of challenges, willing to take little steps forward every time, and always trying my best to bring values to the customers.

## Self-evaluation

I will analyse my performance from different aspects of this project and mark them for myself accordingly.

**Course management - 4/5:** Despite I was not efficiently managing the submissions at the beginning. I reorganized the way of allocating the files. I finished the industry and academic deliverables on time and get positive feedback from tutors.

**The project – 5/5:** I finished all features of the project required on time. The industry supervisor and all other team members were impressed by the outputs in version two of this web app. I brought up my own ideas of how to improve the app and those ideas were accepted by the team. I believe my attitude towards this project and the outputs exceeding everyone’s expectation.

**Content of level 6 and level 7 courses -5/5:** I analysed all relevant content in level 6 and level 7 that were particularly helpful to the capstone project and made the recommendation in my opinion.

**Quality assurance programme – 5/5:** I kept the quality assurance plan up to date and maintained the quality of all deliverables using the knowledge I learned from all the courses.

**Risk management programme – 5/5:** I kept the risk assessment table up to date and regularly reviewed the risks that could make some negative impact on the project. I was able to minimize the risks through the course and finished all deliverables on time.

**Methodology essay – 4/5:** I did thorough research for the methodology essay and illustrated the way I used it in the project. Due to the language barrier, I might make mistakes in certain expressions. However, I tried to mitigate the misunderstanding by checking the essay through the app Grammarly and amended it based on the feedback from AS.

**Report – 4/5:** I followed the template structure to organize the report with the right images and tables used to make the report more readable. I also gathered feedback from different people to polish it and displayed most of what I did during the process.

**Panel – 4/5:** I believe I will present the project with my best try. The nervousness might show somewhere during the presentation. However, I will clearly design the PowerPoint to tell my story during the journey.

**Poster and short paper – 5/5:** I designed the poster to display my journey and outcomes in a fun way. I believe it will be thoughtful and creative.

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# Appendices

## Appendix A –Project management tool

Graphical user interface, application

Description automatically generated

Graphical user interface, application, Teams

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

Graphical user interface, text, application, chat or text message

Description automatically generated Graphical user interface, text, application, email

Description automatically generated

Graphical user interface, text, application, email

Description automatically generatedGraphical user interface, application

Description automatically generated

## Appendix B – Risk Management Table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Risk Statement | | (1%-99%) | (1-10) |  |  |  |  |
| # | **Condition** | **Consequence** | **Probability** | **Impact** | **Exposure** | **Mitigation** | **Contingency** | **Triggers** |
| 7 | Changing a new front end framework | The delay of making progress due to learning a new framework. | 50% | 7 | 3.5 | 1. Experiment and build a small React Laravel app to test the fetching data time from back end. | 1. Continue writing API based on Version two while learning a new front end framework to ensure making progress every day. | When the delay of fetching data time cannot be decreased. |
| 4 | Lockdown due to COVID-19 | Not able to meet all team members | 20% | 3 | 0.6 | Pay close attention to the epidemic information at any time and prepare for the lockdown in advance. | Develop a workflow to work remotely and able to communicate with team members through Slack, Zoom, email etc. |  |
| 5 | Sickness | The productivity can be low during recovery time | 10% | 5 | 0.5 | 1.Always set extra time for every deliverable. 2. Exercise regularly and rest well. | 1. Ask help from IS & AS. 2. Ara Health and Wellbeing Student Services can offer help. | Not enough rest and feel very tired. |

## Appendix C – Quality Assurance Table

|  |  |  |  |
| --- | --- | --- | --- |
| Deliverable | Development Phase | Success criteria / standards (how is it measured?) | \*Signee(s) |
| Login system | Completed | 1. User can login the web app after entering the right email and password. User should be redirect to dashboard page. 2. User cannot login the web app either email or password is wrong. Error message will display to inform user credential its wrong and user can re-login in the same page. | IS & AS |
| Role management | Completed | 1. Admin and sub-admin role can create/update/delete users except deleting self. 2. Admin role can create new users with a specific role and an airport assigned. 3. Admin and sub-admin staff management routes are protected (public or staff role cannot view this page). 4. Sub-admin role can create new users with a sub-admin role or a staff role. New users’ airport name will be the same as the sub-admin. | IS & AS |
| New operation | Completed | 1. All users can create a new operation. 2. Public cannot view this page. 3. Form data need to be validated before submitted. If wind knot is more than 8, the operation will be cancelled, and an email will be sent automatically to the admin to inform the high wind speed situation with all the data in the operation form. 4. If the form is completed and wind is less than 8 knots, the page will be redirected to pre-flight check page after user click submit. | IS & AS |
| Pre-flight check | Completed | 1. All users will be redirected to this page after finishing the new operation log. 2. Public cannot view this page. 3. If any task is not completed, user cannot fly a drone and the operation will be cancelled. The operation form completed last step and pre-flight checklist content will be saved into database and an email will be sent to the admin to inform the uncompleted pre-flight checklist. | IS & AS |
| Calendars | Completed | 1. Admin role can choose a date to view all the operations created on that day. 2. Sub-admin and staff role can choose a date to view all the operations created on that day in their airport. 3. They should be able to update the operation log note and download the log files. | IS & AS |
| Procedure management | Completed | 1. Admin role can view/create/update/delete tasks in pre-flight checklist. 2. After the deletion of a task, the previous log file should not be affected by this. | IS & AS |
| Submit forms (accident/hazard report) | Completed | 1. Both admin and staff can report accident and hazard identified. | IS & AS |
| Project proposal | Completed | 1. Complete a project proposal with all the required content included. | IS & AS |
| Risk management table | Completed | 1. Develop a risk management table that are approved by academic supervisor and industry supervisor. 2. Review the risk management table regularly. 3. Report to academic supervisor and industry supervisor if the status of the any risk is unresolvable. | IS & AS & CC |

|  |  |  |  |
| --- | --- | --- | --- |
| Deliverable | Development Phase | Success criteria / standards (how is it measured?) | \*Signee(s) |
| Quality assurance table | Completed | 1. Develop a QA table and is approved by academic. 2. Review the QA table every week and report to academic supervisor and industry supervisor. | IS & AS & CC |
| Project timeline | Completed | 1. Including project phases, timetable, burndown chart. | AS & CC |
| Methodology report | Completed | 1. Refer to the methodology marking rubric. | AS & CC |
| Weekly report | Completed | 1. Record the weekly report with IS and AS | IS & AS |
| Final project report | Completed | 1. Refer to the final report marking rubric. | AS & CC |
| Poster and short paper | Completed | 1. Refer to the poster and short paper marking rubric | IS & AS & CC |
| Panel Presentation PPT | Completed | 1. Refer to the panel presentation marking rubric. | IS & AS & CC |