



INDIVIDUAL REPORT

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PRCO204 - Group 7

Introduction

In this report, I will mainly discuss the reflection on the project in its entirety, my own position in the team and the activities that I carried out.

Scenario

The application is for an airline industry. Booking and managing flights involves sensitive customer information in general. The aim is to build an information that supports flight booking (e.g., start, destination, time, seats, and luggage). There is a lot more to the application but these are the initial user stories that would create a minimum viable product in the initial sprints

Background

Our client is an airline company and they request us to develop an airline booking system due to their needs. We designed the system as a single web API which is connected to MySQL database.

This system aims to provide an online platform for the user to book flights. To achieve the goal, the first function which need to be developed is to let users be able to search the details of the flights by selecting the origin and destination.

In addition, users will be able to purchase the airline ticket through the system and check out the booked flight information.

Due to the concern of convenience, users can also view their own information along with being able to edit their information to prevent any outdated information.

Moreover, we have defined different levels of the account in order to meet the needs of different roles for example: Administrator, senior staff and junior staff.

Staffs can help customers to search the flight information and also purchase the airline ticket for both junior & senior level. Furthermore, staffs are available to help customer for modifying their flight booking information.

However, only senior staff can be able to edit the customer's information.

In terms of Administrators, they are able to edit all of the account's information and activate the account if it's being locked. Moreover, the administrators can edit the all of the flight information.

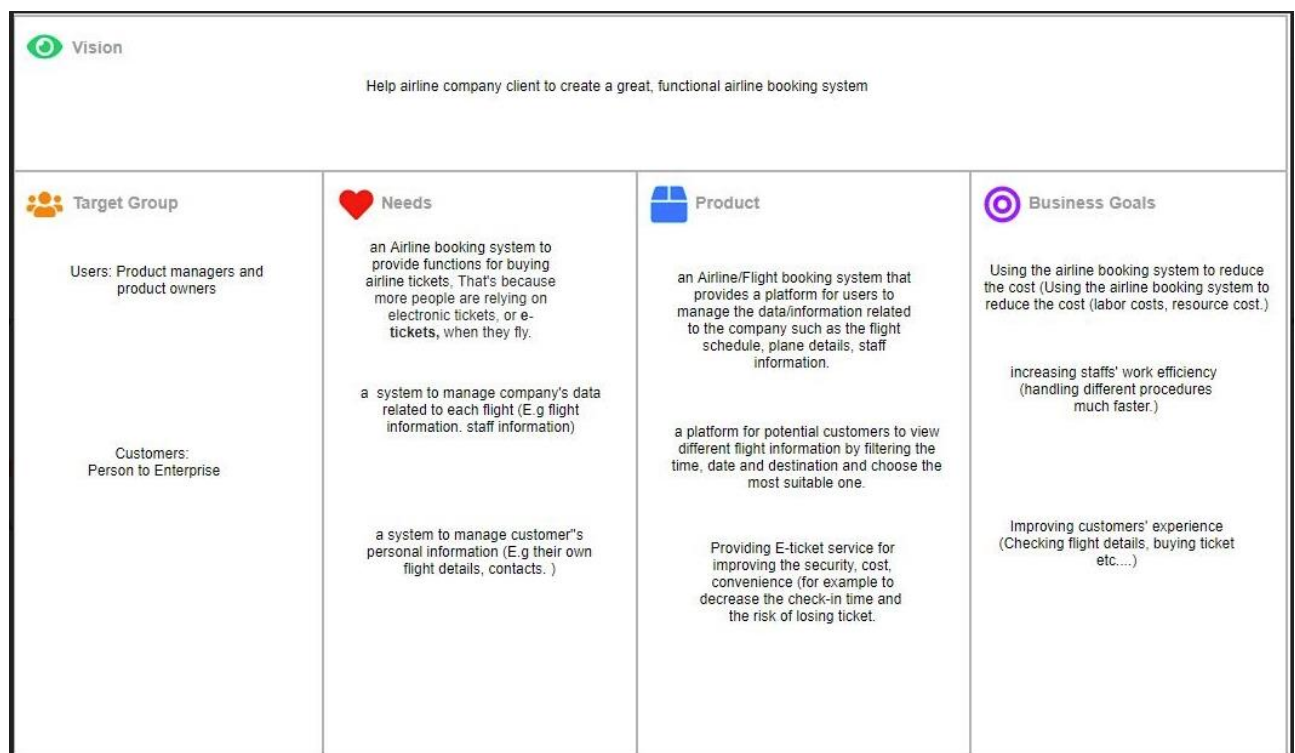
Requirements:

Below are the basic requirements of the customer for the system.

1. As a customer, I wish to book a flight ticket through the system.
2. As a customer, I wish to send enquiry to the flight ternary.
3. As the management team of the airline company, I wish to control the flight booking request/changes.
4. As the management team of the airline company, I wish to handle customer enquiry.
5. As the management team of the airline company, I wish the payment can be done through the system.

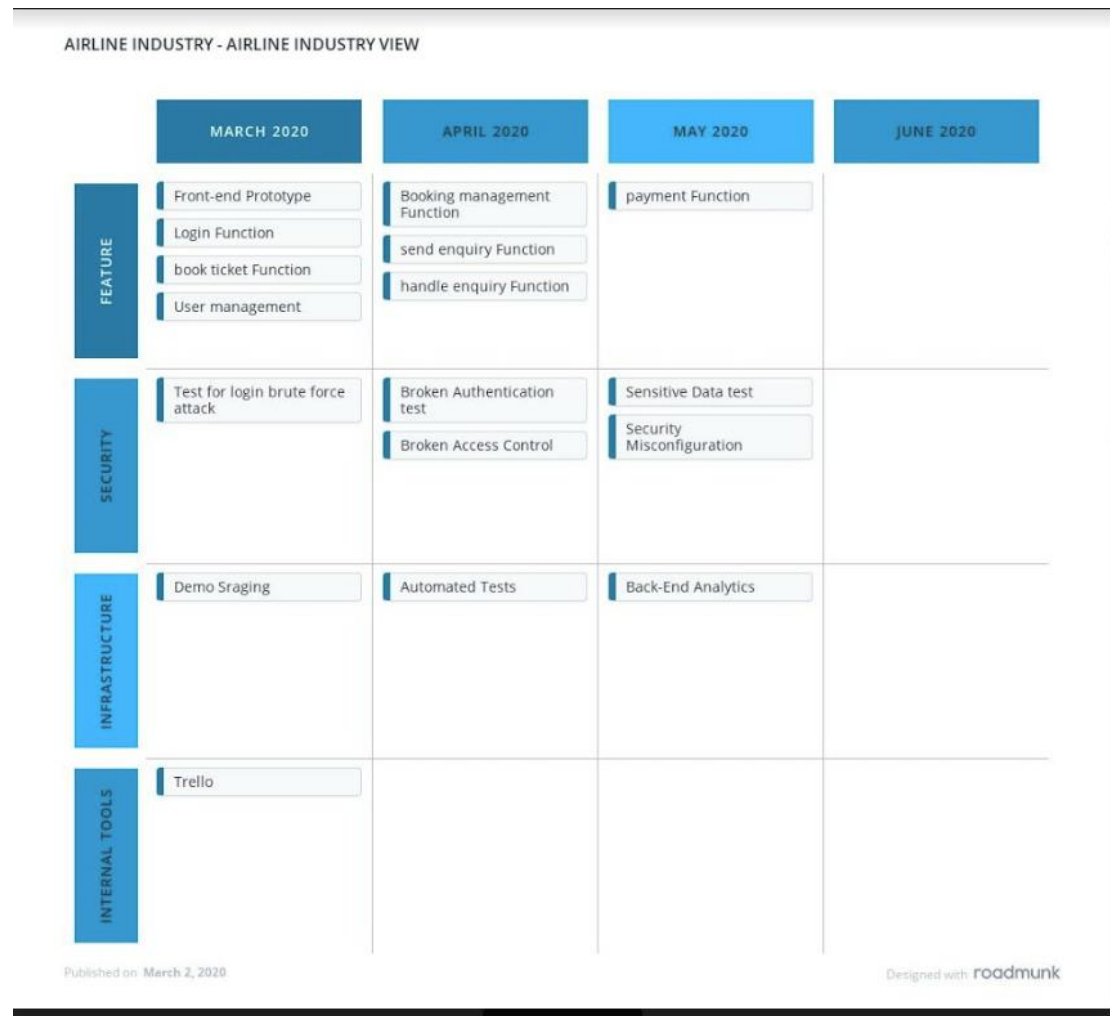
Production vision board

In order to describe, validate and visualize our production vision strategy, I developed the product vision board to capture the target group, user needs, key product features and business goals.



It is important for the project management at the initial stage as it helped to define the project design and project goals such as what functions will need to be developed in the system, what kinds of people are going to use the system and what is the focus point of the project.

Product Backlog

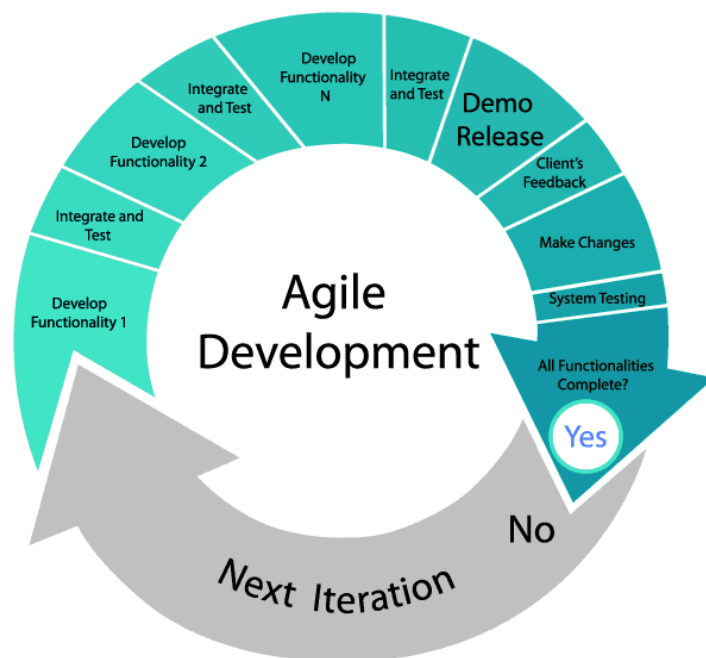


For the initial stage of the project development, we have created a product back log to anticipate our project development progress. For example to finish all the functions before the start of May. However, as lacking of project management experience, there's a discrepancy between the expectation and the reality as we did change the schedule for several times for modifying the project tasks.

Agile Development

As a scrum master, it was important for me to have general consensus with other teammate for the method of project development to ensure the project can be developed effectively. To achieve this, we need to adapt one of the project management methodologies.

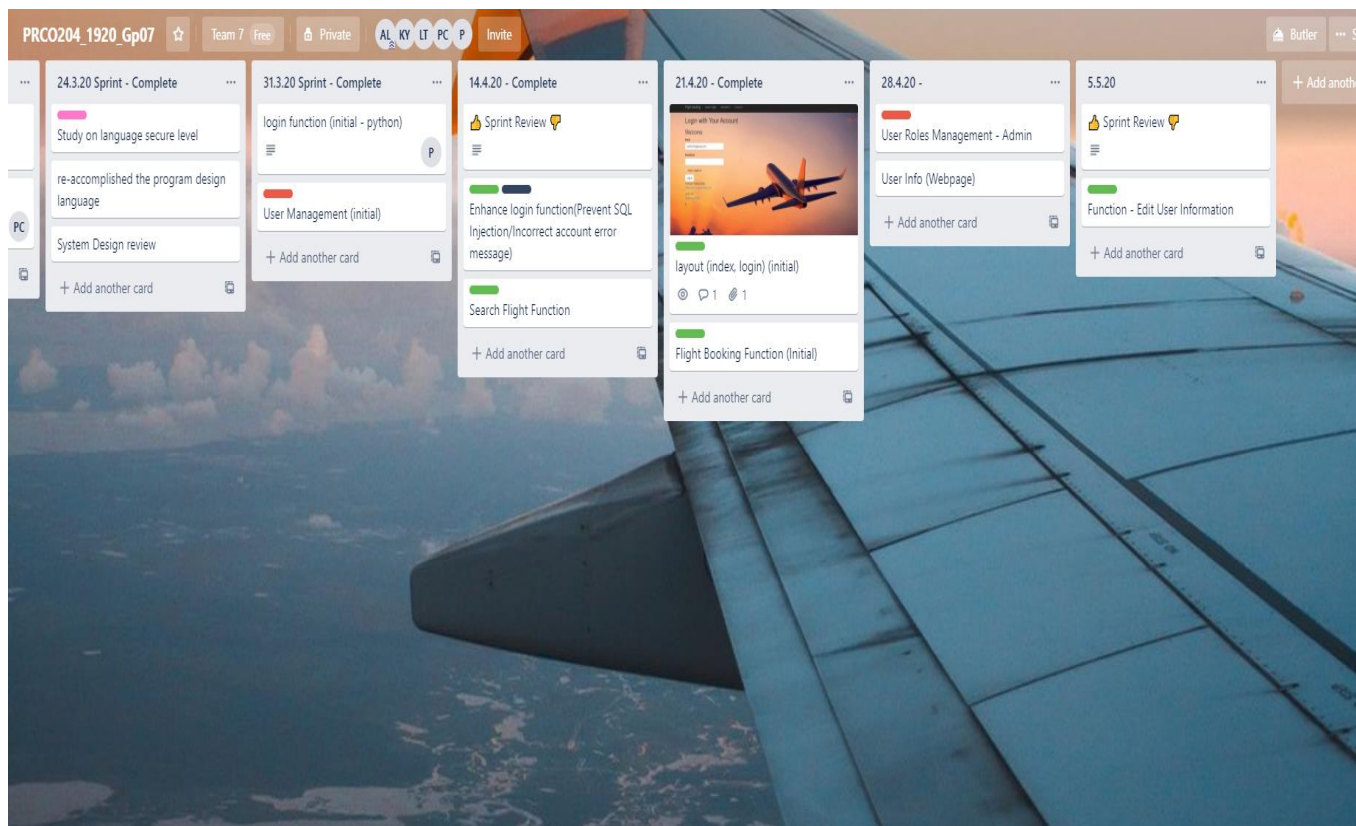
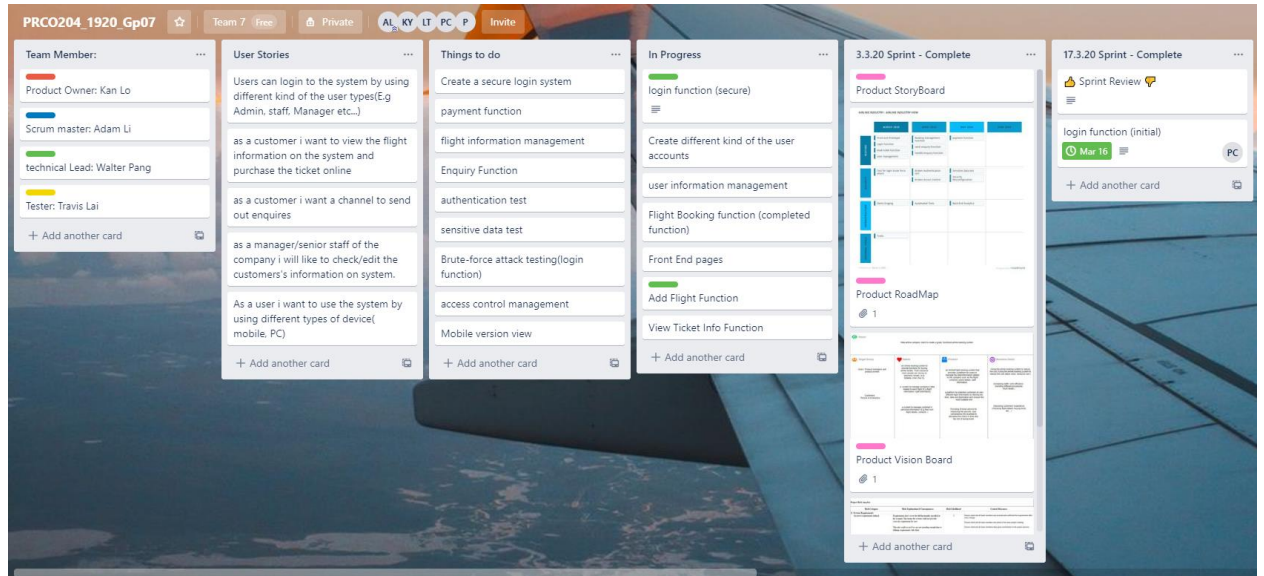
Agile development refers to a development methodology that Comprises various approaches to software development under which requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their customers or end users. It advocates adaptive planning, evolutionary development, early delivery, and continual improvement, and it encourages flexible responses to change



Scrum board

To management the project development progress in agile development project, Scrum board is an extremely useful tool for me and the team to make sprint backlog items visible. By using the scrum board, I was able to manage the progress of each tasks effectively and record tasks completed by each teammate.

For creating the Scrum board, **Trello** is the scrum board management tool I chose to manage the sprint backlogs.

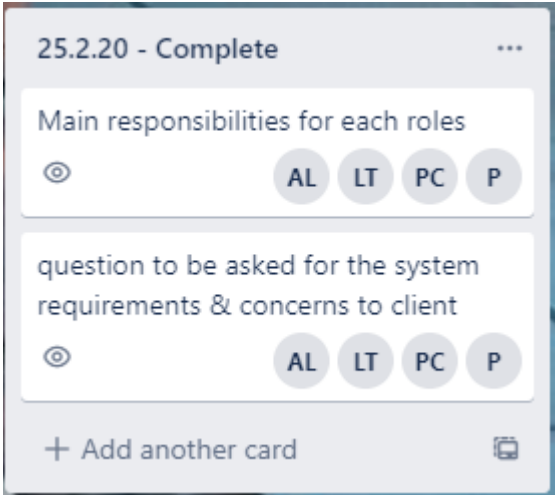


By using Trello, High efficiency for handling the product backlog, release planning and sprint backlog is one of the advantages, also I reviewed it weekly in order to manage the project progress such as Things-to-do-list, completed tasks, In-progress tasks and important

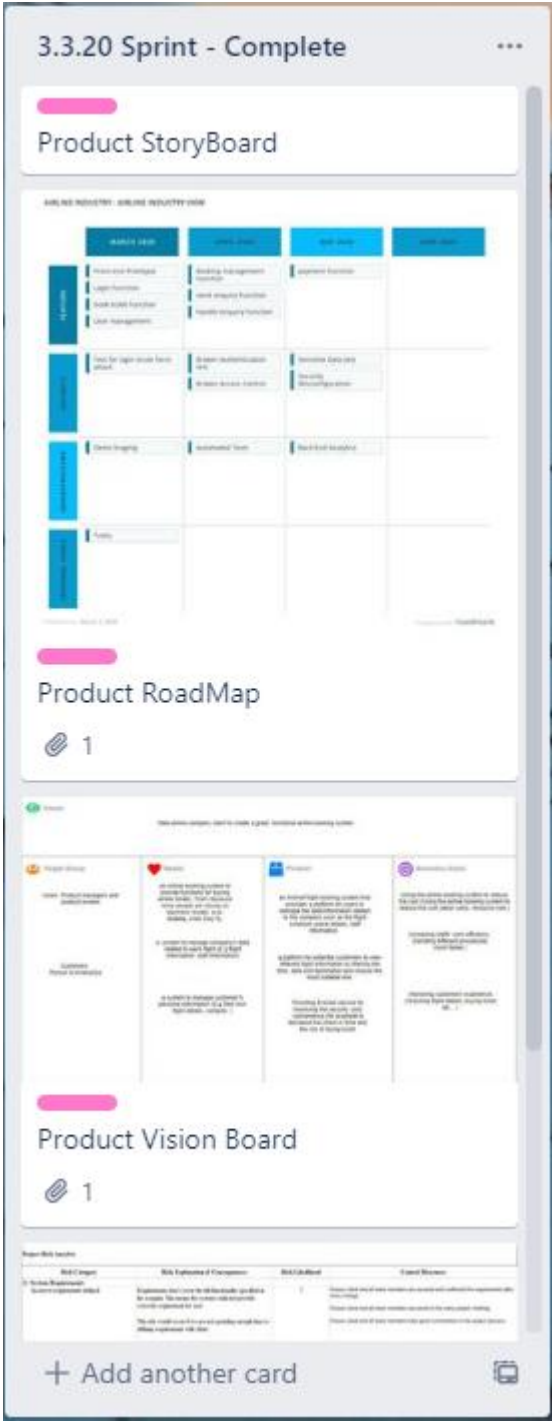
date's remark to ensure each teammate works under the expected timeline.

Design and implementation

I was using scrum board to guarantee our project progress is following the expected schedule as we as the user stories and below are the summary of the weekly scrum board which is showing the design and the implementation (activities) I did during the project.

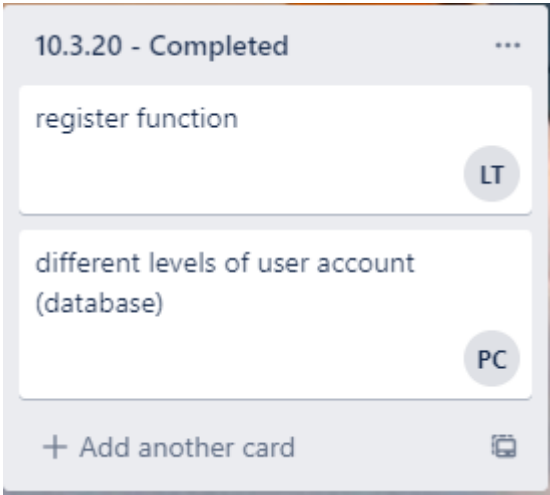
Sprint number	Week 1
Date	25/2
	
Activities I have carried out	<ul style="list-style-type: none">▪ Suggested to have a discussion for the responsibilities for each role▪ Suggested to prepare question about system requirements & system concerns

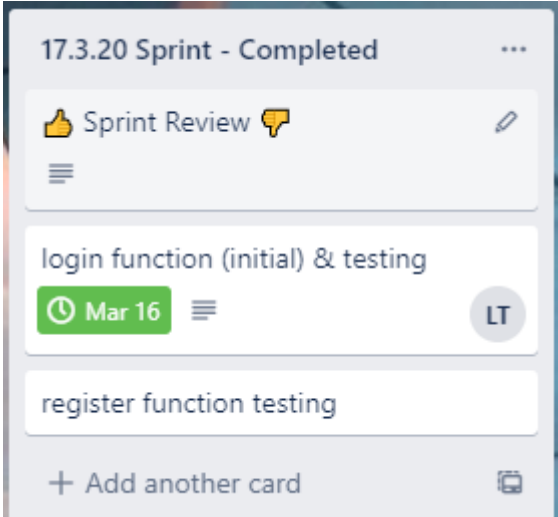
Sprint number	Week 2
Date	3/3

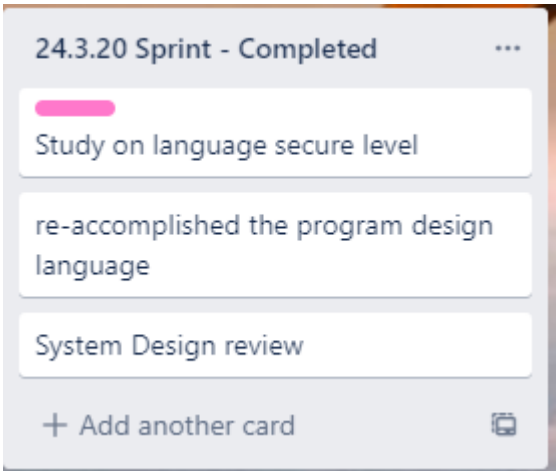


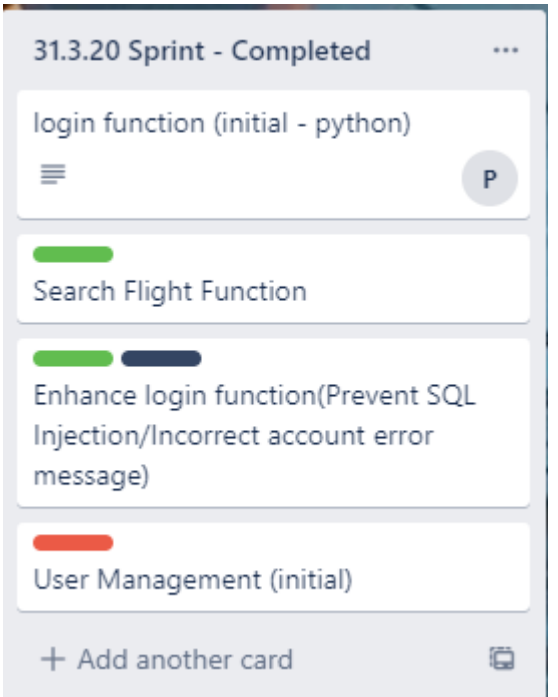
Activities I have	<ul style="list-style-type: none"> Arranged task for teammates to finish (product
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carried out	backlog , risk analysis and user stories board) <ul style="list-style-type: none"> ▪ Finish the product vision board
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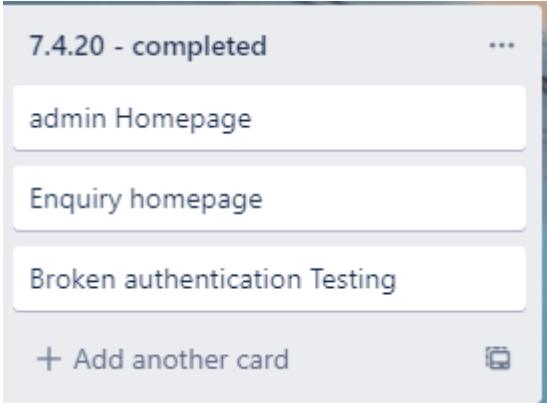
Sprint number	Week 3
Date	10/3
	
Activities I have carried out	<ul style="list-style-type: none"> ▪ Added task-to-do list in the Trello scrum board ▪ recorded the reason why the login function had not been develop with the expected timeline.

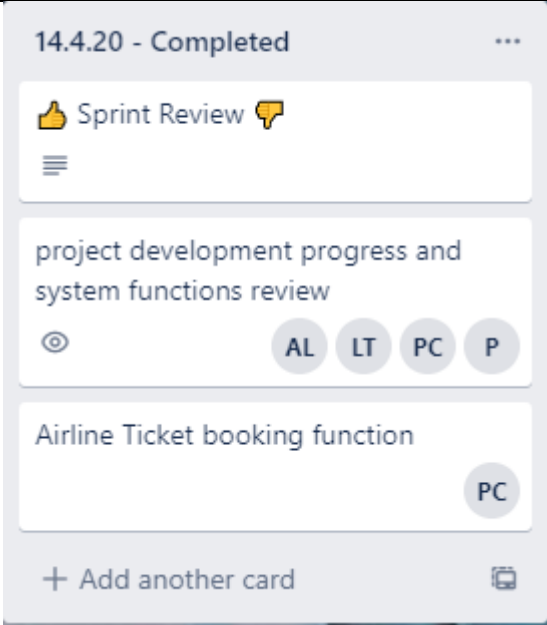
Sprint number	Week 4
Date	17/3
	
Activities I have carried out	<ul style="list-style-type: none"> ▪ Reviewed the whole scrum sprint board and ensured it's matched with the project progress. ▪

Sprint number	Week 5
Date	24/3
	
Activities I have carried out	<ul style="list-style-type: none"> Suggested to study on language secure level and re-accomplished the program design language

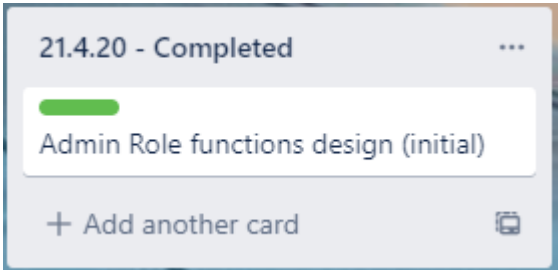
Sprint number	Week 6
Date	31/3
	

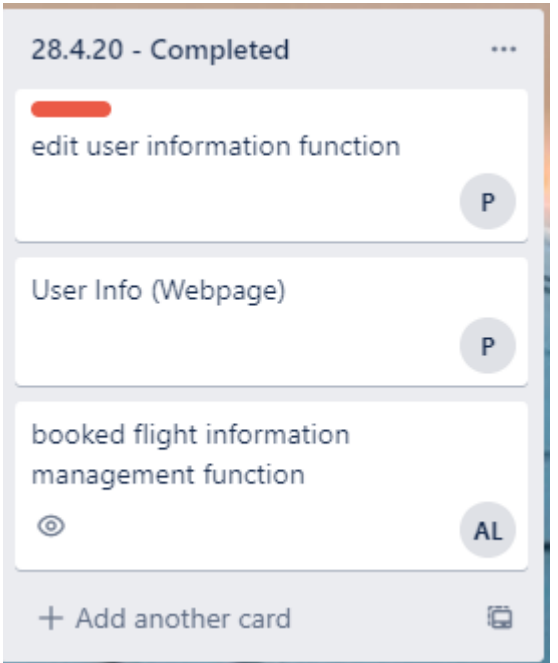
Activities I have carried out	Recorded the reason why the search flight function has been delayed to complete
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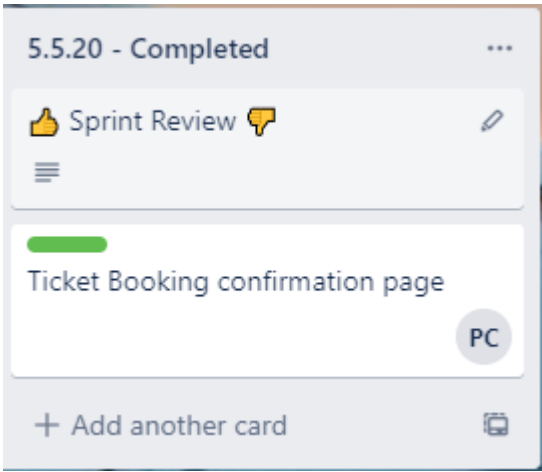
Sprint number	Week 7
Date	7/4
	
Activities I have carried out	<ul style="list-style-type: none"> Developed admin Homepage & Enquiry Page

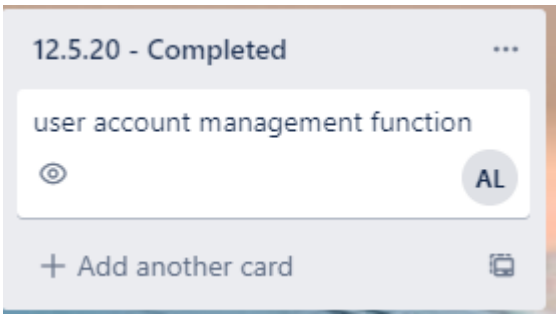
Sprint number	Week 8
Date	14/4
	
Activities I have carried out	<ul style="list-style-type: none"> Reviewed the whole scrum sprint board and ensured it's matched with the project progress. Suggested to have a review on the system functions and the project development progress

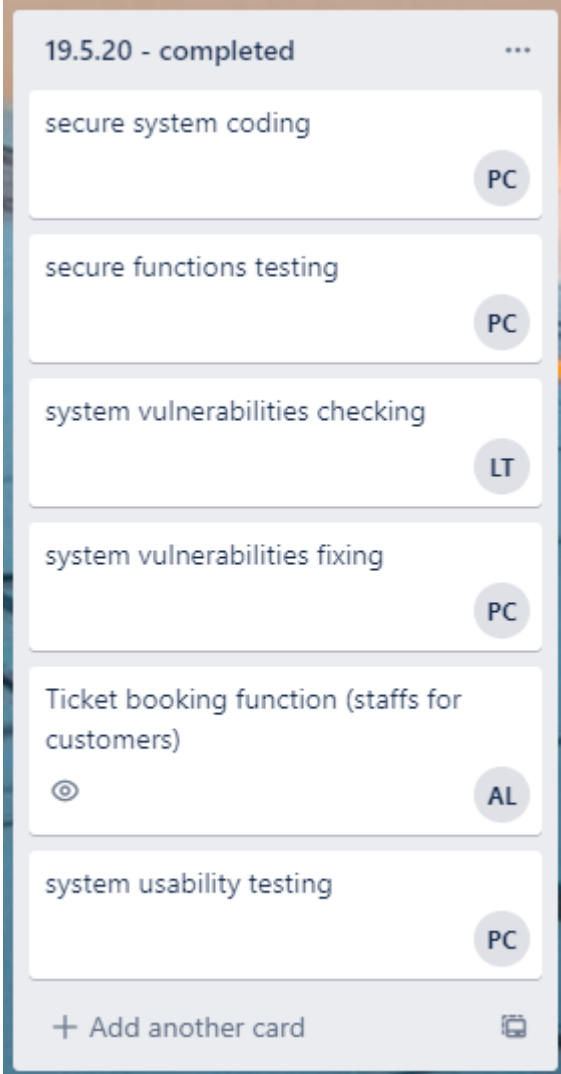
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Sprint number	Week 9
Date	21/4
	
Activities I have carried out	<ul style="list-style-type: none"> Designed what functions will be needed for the admin role

Sprint number	Week 10
Date	28/4
	
Activities I have carried out	<ul style="list-style-type: none"> Developed flight information management function

Sprint number	Week 11
Date	5/5
	
Activities I have carried out	<ul style="list-style-type: none"> Reviewed the whole scrum sprint board and ensured it's matched with the project progress.

Sprint number	Week 12
Date	12/5
	
Activities I have carried out	<ul style="list-style-type: none"> Developed the “user account management function”

Sprint number	Week 13
Date	19/5
	
Activities I have carried out	<ul style="list-style-type: none"> ▪ Developed “ticket booking function (staffs for customers)” ▪ Suggested to demonstrate the system to find out the vulnerabilities

Testing

During the project, we had completed security testing and also I had completed the testing for the functions I developed

Security

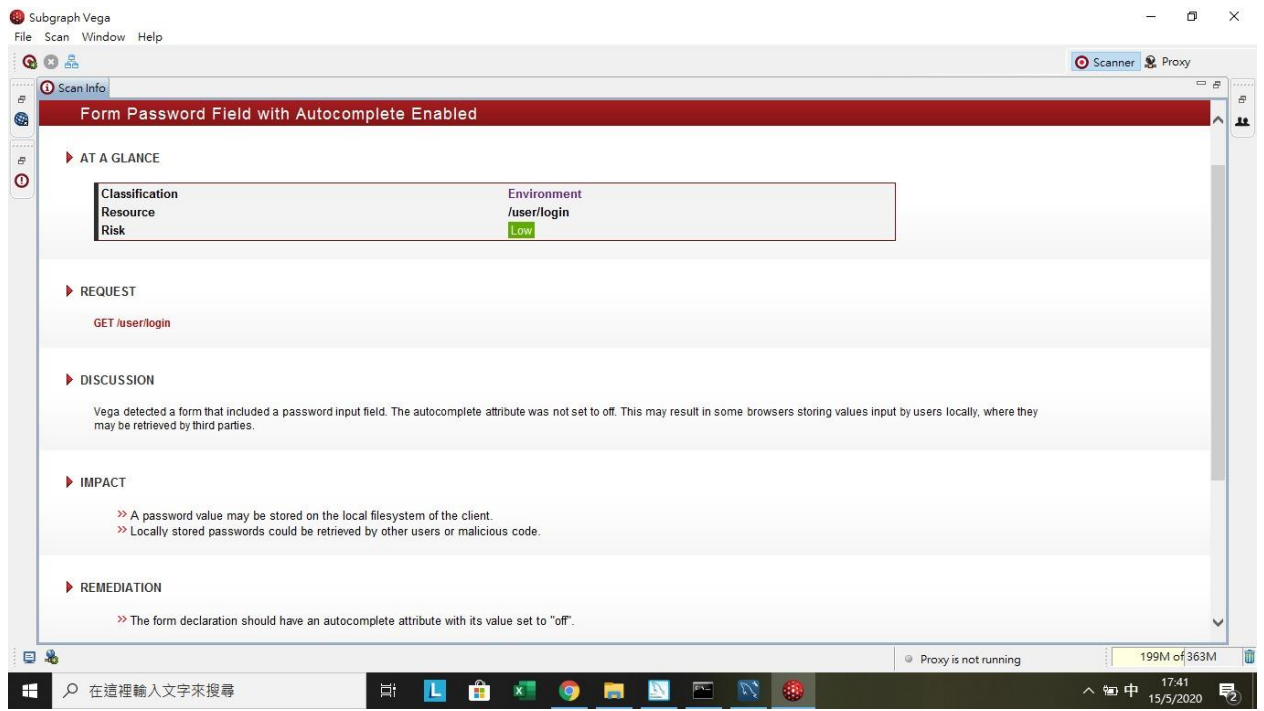
Below are the security issue we had found during the project development and

Form Password Field with Autocomplete enabled

The screenshot displays the Subgraph Vega security scanner interface. The main window shows a report for a security issue titled "Form Password Field with Autocomplete Enabled". The report is structured as follows:

- AT A GLANCE**
 - Classification: Resource
 - Risk: Low
 - Environment: /user/register
- REQUEST**
 - GET /user/register
- DISCUSSION**
 - Vega detected a form that included a password input field. The autocomplete attribute was not set to off. This may result in some browsers storing values input by users locally, where they may be retrieved by third parties.
- IMPACT**
 - >> A password value may be stored on the local filesystem of the client.
 - >> Locally stored passwords could be retrieved by other users or malicious code.
- REMEDIATION**
 - >> The form declaration should have an autocomplete attribute with its value set to "off".

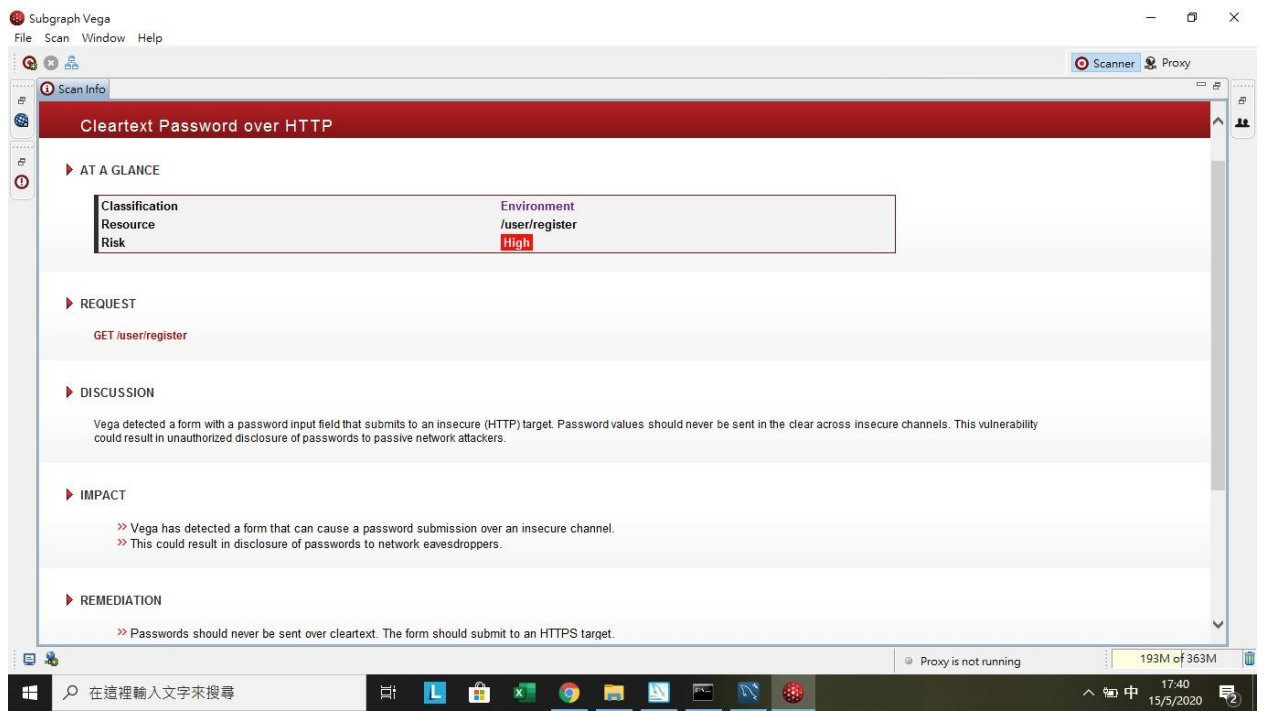
The interface includes a menu bar (File, Scan, Window, Help), a toolbar with icons for search, scan, and proxy, and a status bar at the bottom indicating "Proxy is not running" and "204M of 363M". The Windows taskbar at the bottom shows the date and time as 17:41 on 15/5/2020.

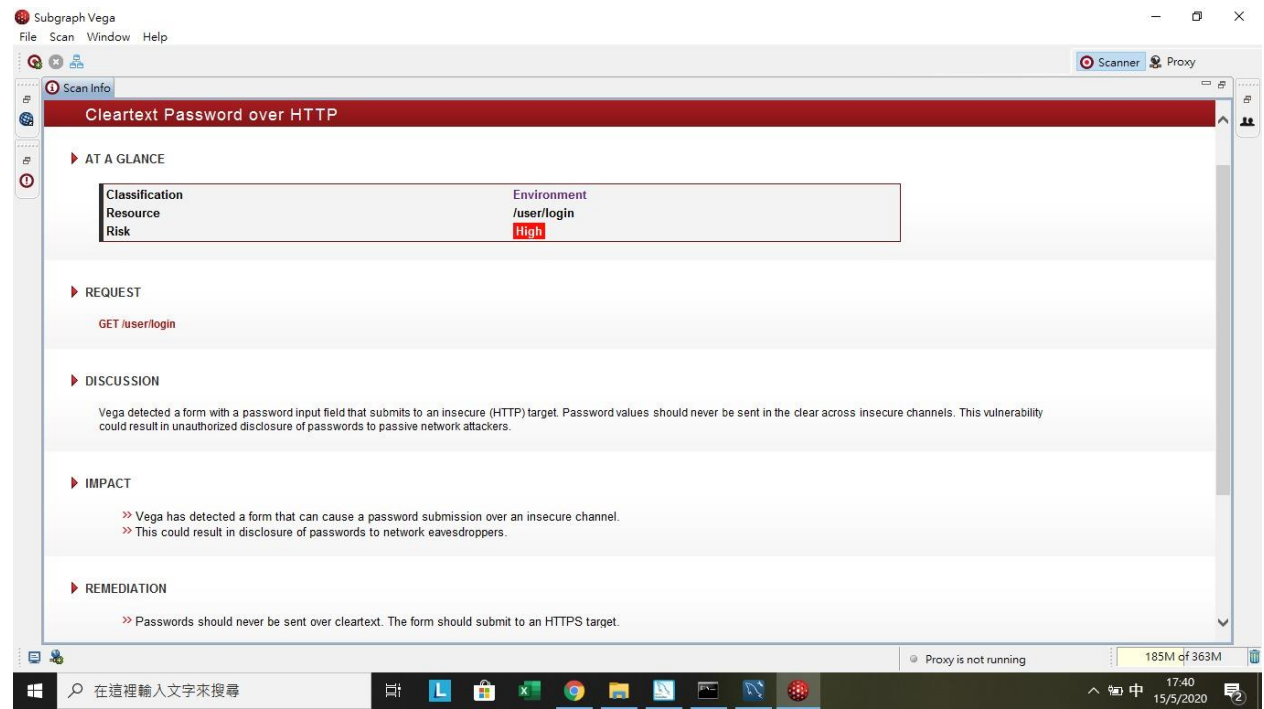


Solution

Add the attribute `autocomplete="off"` to the form tag or to individual "input" fields. However, since early 2014, major browsers don't respect this instruction, due to their integrated password management mechanism, and offer to users to store password internally.

Cleartext Password over HTTP





Solution

compile () method of Regex module makes a Regex object, making it possible to execute regex functions onto the *pat* variable. Then we check if the pattern defined by *pat* is followed by the input string *passwd*. If so, the search method returns *true*, which would allow the password to be valid.

SQL Injection

To prevent SQL injection, input validation is one of the most effective method to solve the security problem, by preventing symbols like “= + &” to be summited in the form, it can prevent the attackers to insert SQL query into input fields.

Moreover, ORM(Object-Relation Mapping) has been adapted to map our DB tables to our objects, allowing us to read, write and query entire objects. It reduced our use of explicit SQL so it was useful to avoid SQL injection.

Broken authentication

Broken authentication attacks aim to take over one or more accounts giving the attacker the same privileges as the attacked user. **Authentication** is “**broken**” when attackers are able to compromise passwords, keys or session tokens, user account information, and other details to assume user identities.

We have adapted certain actions to prevent broken authentication by restricting password length and password complexity, and also to prevent URL rewriting

Apart from the security testing, I had completed the testing for the below own-made functions

Edit user information

The image shows two screenshots of a web application interface for 'SFUAirline'.

The top screenshot displays the 'Edit user' page. The URL is `https://127.0.0.1:5000/main/edituser/s1001`. The page features a navigation bar with links: SFUAirline, Search Flight, Userinfo, Logout, Manager, Book for user, and Contact us. The main content area has a background image of an airplane wing. On the left, there is a form with the following fields: user name (s1001), user email (s1001@email.com), Full name (s1001_01), Passport, Passport expiration Date (with a date picker), Passport country, Contact number, Address, Gender (set to Female), and a checkbox for 'user available'. A 'Submit Userinfo' button is at the bottom of the form.

The bottom screenshot displays the 'manager_user' page. The URL is `https://127.0.0.1:5000/main/manager_user`. The page features the same navigation bar. Below the navigation bar, it says 'Hello, admin'. There is a table with the following columns: user id, user name, Full name, Email, contactNo, gender, address, regist date, and available. Each row has an 'edit' button next to the 'available' column.

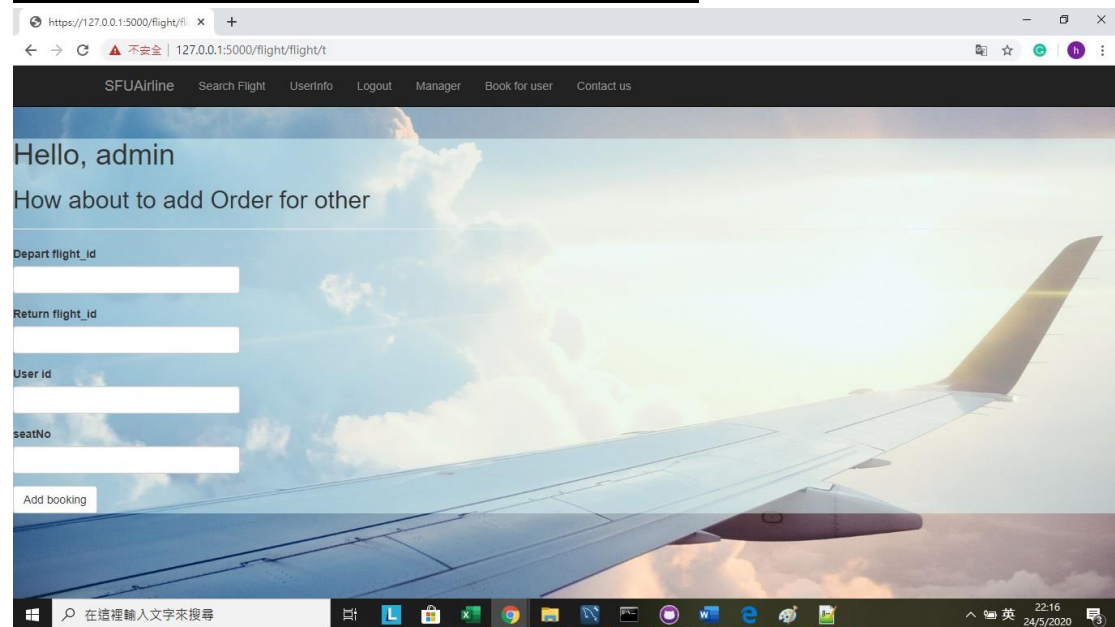
user id	user name	Full name	Email	contactNo	gender	address	regist date	available
1	admin	administrator	admin@admin.com	None	None	None	2020-05-24 05:03:20	True
2	senior	seniorOfFlight	senior@admin.com	None	None	None	2020-05-24 05:03:20	True
3	s1001	s1001_01	s1001@email.com	None	None	None	2020-05-24 05:03:20	True
4	tai950706@gmail.com	None	tai950706@gmail.com	None	None	None	2020-05-24 08:16:45	True
5	travis_lai	None	dsf@dsad.com	None	None	None	2020-05-24 10:57:30	False

Testing action: tried to edit a random user account with s1001 as the username,

s1001@email.com as the email address and s1001_01 as the full name.

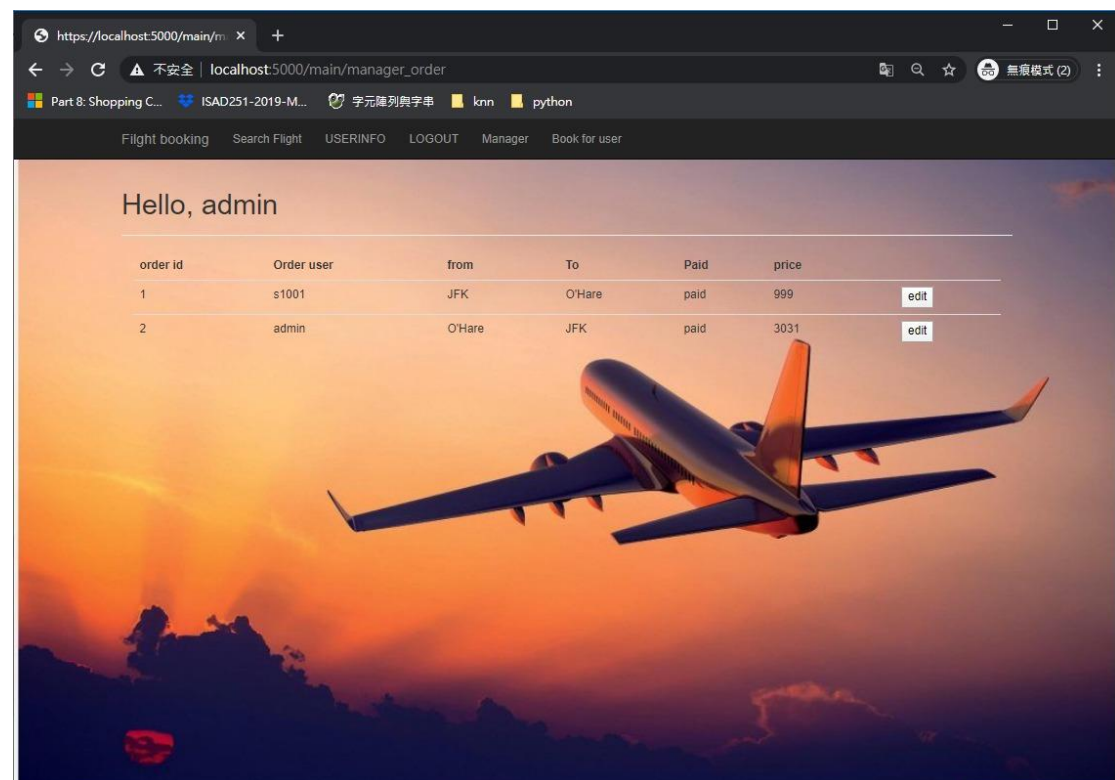
Testing result: the action has been done successfully, the edited user information has been displayed successfully on the user account management page.

Ticket booking function (staffs to customers)



The screenshot shows a web browser window with the URL <https://127.0.0.1:5000/flight/flight/t>. The page has a navigation bar with links: SFUAirline, Search Flight, Userinfo, Logout, Manager, Book for user, and Contact us. The main content area has a background image of an airplane wing flying over clouds. The text "Hello, admin" is displayed. Below it, the text "How about to add Order for other" is shown. There are four input fields labeled "Depart flight_id", "Return flight_id", "User id", and "seatNo". An "Add booking" button is located below the input fields. The Windows taskbar at the bottom shows the time as 22:16 on 24/5/2020.

Testing action: tried to help user – s1001 to book a flight with origin as JFK and destination as O'hare.



The screenshot shows a web browser window with the URL <https://localhost:5000/main/m...>. The page has a navigation bar with links: Flight booking, Search Flight, USERINFO, LOGOUT, Manager, and Book for user. The main content area has a background image of an airplane flying over a sunset. The text "Hello, admin" is displayed. Below it, a table shows the flight booking information.

order id	Order user	from	To	Paid	price	
1	s1001	JFK	O'Hare	paid	999	edit
2	admin	O'Hare	JFK	paid	3031	edit

Testing result: the booking has been completed and the booking record has been displayed on the order management page properly.

Project Management

Role for the project

In this project, my primary role is scrum master which is responsible for project management, leading weekly scrums, populate project backlog and collate formal documentation etc...

Feedback gained from the interim submissions

During the interim submissions, it was suggested the project can be management with different aspects.

For example, it was suggested to have a better proposal and study before developing the system. As it was helpful for finding the best way to develop the project (for example: programming language selection, program management methodology, development tools selection etc....) as we had changed the programming language for the system during the project development as lacking the full study for researching the programming language property, it led the progress of the project development had been delayed.

Moreover, it was suggested some of the functions can be more comprehensive in order to make them more usable and user-friendly. For example, the admin should not only be able to edit the user account information but also be able to delete the accounts.

Reflection and conclusion

This project is required to create a web application which provides the online airline ticket booking system for the users to purchase airline ticket via the website. As It was the first time I developed the team project as a scrum master, it was a great experience for me to understand how to manage a project effectively, such as using agile development methodology and to create scrum artefacts to make sure we can keep reviewing the project and make modification during each stage of the project

I think one of the most time-consuming part of the project was at the security design level. As I have no experience on how to secure a system before and it is also one of the most important part for website application as it mainly affects the user experience and the customer satisfaction for the system.

For me I think the project management is also one of the most important part that I will need to be improved in the project. Although I learnt a lot about how to manage the project progress by using different management methods and tools, it still got a lot of things for me to learn on how to have an effective communication with the teammates to make sure the project can be developed as expected and to provide an inclusive working environment for all of us to develop the project.

I think this project is as a good experience for me to learn more about the security programming and agile development methodology.

Marking Category	% claimed	Justification /evidence	Final mark(please leave it blank)
Process - Project Management - Objectives - V&V - Approach	25%	https://github.com/cpass19999/PRCO204HK-Project---Airline-Team-7-/blob/master/Documentation/Project%20Management%20Review_.docx https://github.com/cpass19999/PRCO204HK-Project---Airline-Team-7-/blob/master/Documentation/PROC204_Group7_Group%20Report.pdf	
- Background - Communications - Implementation - LSEP	25%	https://github.com/cpass19999/PRCO204HK-Project---Airline-Team-7-/blob/master/Documentation/minutes%20of%20the%20group%20meeting.docx https://github.com/cpass19999/PRCO204HK-Project---Airline-Team-7-/blob/master/Documentation/offical%20meeting%20minutes%20with%20the%20client.docx	