

The University of Melbourne  
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SWEN90016 Software Processes and Management  
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# JJFresh – Project Management Plan

Version 1.2

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# Executive Summary

Jess and James plan to change their business model by getting a web-based system for online ordering of their produce box offerings. In this way, they may be able to gain more orders while maintaining their existing customer base. Because Jess and James want to reduce the cost of website development, the JJFresh online store will be implemented by a student team from the University of Melbourne.

In this project, Jess and James are the Business Owners of the project. The teaching team of the Software Processes and Management subject would take the role of Product Owner and help the student team to complete the project. As the approach we used to deliver our project is Scrum, the student team would cooperate as a Scrum team to maximize their efficiency. The customers of JJFresh would be our main external stakeholders.

Through communication with Jess and James, the student team fully understood the needs of Jess and James. All the in-scope and out-scope requirements of the project have been defined and confirmed by Jess and James. Three future enhancements would not be considered in the initial development. Besides, based on the consideration of flexibility and the speed of website delivery, Scrum is chosen as our software development cycle model.

The business value of this project is to meet the need of the people who want to buy fruit and vegetables from JJFresh but cannot go during the business hours of the physical store. The increase in orders would also increase the revenue of the store. Moreover, the teaching team and the student team can gain benefits from this project.

The risks of the project have been analyzed, and possible solutions for them are also provided in this report. The technology we choose to implement the online store is *Wix*, which can help quickly create a website. Since we are a virtual team, we mainly use a cloud-based video conferencing tool called *Zoom* to communicate. *Slack* is also used to help us exchange information and resources.

The Scrum process would be finished in 5 weeks, from April 27 to May 8. There would be three sprints in our Scrum process. Due to the time constraints of the project, the first two sprints would last two weeks, while the last one would only last one week. All of the story points would be assigned to the first two sprints. The last sprint is only used for flexible control.

Through rough estimation, the project will cost Jess and James about \$ 3,000. The project will provide Jess and James with an online store, which is expected to increase their revenue.

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# 1. Introduction

## 1.1 Purpose of document

This document provides details about how the development team plans, implements, and monitors the development of the JJFresh online store.

According to the project requirements specification, this document describes in detail the scope of the project and possible risks, and how to control it. The technologies that will be used throughout the development process are defined by the development team, while the project plan containing the development team's size and project needs would be defined by the Scrum master.

This document will serve for all parties involved in the entire development cycle, such as Scrum Master, Product Owner and developers.

## 1.2 Audience of document

<TODO>

## 1.3 Evolution of document

All of the people in the student team participated in the preparation of the document. Yicun Tian is responsible for writing the Executive Summary, Introduction (Chapter 1), Roles and Responsibilities (Section 3.1), Communication Plan (Section 3.2), and Risk management (Section 3.3). Hongzhang Li is the person who wrote the Project Information part (Chapter 2). Pin Wang and Chongjing Zhang, as developers, are responsible for defining the technology used to implement the project (Section 3.4). Zhangfeng Qiu, who served as Scrum Master, provide detail about the Project Planning (Section 3.5) and proofread all content in the document. The evolution of document is shown in Table 1.1.

Version	Created by	Date created	Comments
Version 1.0	Yicun Tian, Hongkang Li, Pin Wang, Chongjing Zhang, Zhangfeng Qiu	April 27, 2020	In this version, the student team cooperated together to complete Chapter 1 to Chapter 3 of the Project Management Plan, including the definition of key stakeholders, Scope and SDLC of the project, evaluation of business value, constraints, the definition of people's role in the team, communication plan, risk management, definition of the technology used in the project and project planning.

Version 1.1	Yicun Tian, Hongkang Li, Pin Wang, Chongjing Zhang, Zhangfeng Qiu	May 18, 2020	In this version, the document is updated based on Rajesh Chittor's feedback and the actual situation of the project. Section 4.1 is now included in the document. The detail of the update history is shown in Section 1.3.1.
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Table 1.1: Evolution of document

### 1.3.1 Version 1.2 update history

<TODO:1>

1. Redesign all the table in the document. Increase readability and change the date format.
2. Provide names of the people in the teaching team and the student team.
3. Move the origin Section 1.2 to Section 1.1. Mention who the document will serve in Section 1.2
4. Add one suppliers into key stackholders in Section 2.1 and provoid benefit analysis for them in Section 2.4.
5. Fix mistakes about the advantage of Scrum in Section 2.3.
6. Change the roles in Section 3.1. Now, Yicun Tian and Hongkang Li would play the role of Product owner and the teaching team would play the role of subject matter expert.
7. Provide detail about the virtual meeting rooms in Section 3.2.
8. Provide specific time for communication plan in Section 3.2.
9. Add Emergency Meeting and Daily communication into the communication Matrix in Table 3.2.
10. Change the probability of Risk 1 in Section 3.3.1. Improve the risk triggers of risk 1 and risk 4 to make a more comprehensive risk impact analysis.
11. Add reference for Bang-for-the-Buck to the footnote.
12. Redefine the value point and story point in the product backlog and provide milestone definition in Section 3.5. Remove tasks definition in Table 3.6.
13. Re-estimate the velocity of the development team based on the first sprint feedback.
14. Update the Second Sprint Plan in Section 3.5.6.

## 2. Project Information

### 2.1 Key Stakeholders

The key stakeholders here are classified according to their relevant interests. Different groups of stakeholders below get different benefits from the project. The detail of the roles and responsibilities definition would be discussed in Section 3.1.

Stakeholders	Internal/ External	Influence on Project
Jess and James	Internal	Jess and James are the people who defined the requirements of the project. They will not directly participate in the development of the online store website. They are users of the website and can provide feedback to the development team during the development process.
The teaching team: <ul style="list-style-type: none"><li>• Marion Zal</li><li>• Doc Wallace</li><li>• Rajesh Chittor Sundaram</li><li>• Esther Rotimi</li><li>• Subramaniam Ramasubramanian</li><li>• Chong Kuok</li><li>• Saksham Agrawal</li></ul>	Internal	The teaching team of SWEN90016 is playing the role of Product Owner in the project. They are responsible for contact with Jess and James and understand their need. They cooperate with the Scrum master of the project and help define the product backlog. Also, they give advice and feedback to the student team during the development process.
The student team: <ul style="list-style-type: none"><li>• Yicun Tian</li><li>• Hongkang Li</li><li>• Pin Wang</li><li>• Chongjing Zhang</li><li>• Zhangfeng Qiu</li></ul>	Internal	The student team cooperates as a Scrum team in the project. They are responsible for both planning and developing the online store project.
Customers	External	The satisfaction of the customers is an important factor for project success. The main source of website revenue comes from them. Their feedback can help the development team improve the application.

Suppliers	External	<TODO>
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Table 2.1: Stakeholder Register

## 2.2 Scope

### 2.2.1 What is in-scope?

<TODO: This has been written exhaustively, but remember each of these requirements should be listed separately since they form an important part in the final acceptance and testing of the product. For example, there are two different login functionalities, one for admin and one for customers. You can mention them as different requirements under login system. Each of the requirements should be simple, concise and be verifiable. Example 1: The system shall provide a UI for the customers to login into the system by entering a user name and a password; Example 2: The system shall provide a UI for the customers to login into the system by entering a user name and a password>

1. **Login system:** Users need to register an account with personal information for the first time. They should be able to log in with an email address and a password. After log in to the online store website, they are able to manage their orders. The owners of JJFresh should have an admin account to manage all the orders. Both customer account and admin account would be accessible from a single URL.

*High priority:* An online store website is not only for browsing information but also a platform for trading fruits and vegetables. Without a Login system, either the customers or Jess and James can manage their orders.

2. **Management of personal information:** Users should be able to add or edit their personal information. The name, home address, and upon three multiple contact phone numbers are included in the personal information.

*High priority:* If the customers change their phone number or address, this function is important to avoid some trouble caused by outdated information. Without this feature, Jess and James may deliver products to the wrong address and cannot contact the buyer.

3. **Products display system:** The website should be able to display different types of products with different sizes and prices to the users. At least three different types of produce boxes with three different sizes would be provided.

*High priority:* Users should be able to know what products they can buy in the online store. The prices of the products should be shown based on the types, sizes, and the number of products selected by customers.

4. **Order management system:** Users should be able to place their orders after selecting what they want. When the booking is final, a confirmation email containing information about the date, time, type, and size of the box would be sent to the customer. If customers want to modify an existing order, they have to cancel and recreate it. Jess and James should be able to manage these orders on the website.

*High priority:* It is the basic part of the purchase function. An online store cannot do any business without an order management system.

5. **Database system** A database system that can store information about users, products, and orders is required.

*High priority:* An online store is a type of software products that need a database system to store more and more data.

6. **Date selecting system:** In this project, the customer should be able to choose a day and time for delivery. Delivery options are in hour blocks. Only two bookings are allowed in a particular hour. Bookings should be available for the next seven days only.

*High priority:* Because JJFresh online store offers delivery service, a date selection system is required to avoid date conflict and feasible delivery solutions.

### 2.2.2 What is out-of-scope?

The features in the future enhancements are out-of-scope:

1. An online payment system is not included in the initial development of the project. The physical delivery details need to be considered by Jess and James.
2. No AI solution would be provided to help improve the delivery process.
3. Adding multiple bookings for the same time slot is not currently allowed. Only two bookings are allowed in a particular hour.

Also, the features below are out-of-scope:

1. No navigation system on delivery is included. The system will not verify the authenticity of the address. Jess and James have to find their way to their customers' addresses themselves.
2. No delivery distance calculate function would be provided. The system will not judge whether the address is too far, so Jess and James have to decide whether they would deliver to an address or not.
3. Communication service with customers except confirmation message sending is not included. Jess and James have to decide how to communicate with their customers themselves.

## 2.3 Delivery approach

The delivery approach we choose for our project is **Scrum**, an agile method that can provide high flexibility and quick delivery. Our decision is based on the following reasons.

1. Scrum can provide an incremental delivery system to help the JJFresh online store retain flexibility while continually producing outcomes. As each sprint backlog represents a new release of the product, the sprint process provides an increment delivery system, which can shorten the time for saleable product delivery. The sprint review in the Scrum process can help the software development meet the requirement of the stakeholders. Also, the sooner the application enters the market, the sooner the project team can get feedback from the users to improve their product, which can help improve the user experience. Clients are continuously involved during every stage. And it can reduce waste and rework and increase the satisfaction of clients.
2. The sprint process in the Scrum model can provide regular adaptation to changing circumstances. Unlike the Waterfall model, which is very difficult to move back to makes changes in the previous phases, using Scrum would make the development of the JJFresh online store website able to adapt to unforeseen circumstances, allowing for changes to be easily incorporated if required.
3. By doing sprint review and sprint retrospective at the end of each sprint, the client and team know exactly what is complete and what is not. This reduces the risk in the development process.



4. Scrum intends small or mid-sized dedicated teams with high coordination, which is suitable for our team with five members. The Waterfall model, which involves large teams and lack of coordination among team members, can not meet our needs.

## 2.4 Business Value

JJFresh is currently busy in the morning but almost empty in the afternoon. The deployment of this project will keep JJFresh's existing customers who shop in the morning and shift the afternoon business hours from offline to online, which offers delivery service for current and potential customers who cannot go to JJFresh store at that time. The online store will operate 24 / 7, which is much longer compare to the old business hours, thus provides customers with the convenience of placing orders at any time. With these advantages, the online store project would attract more customers for JJFresh. The increase in customers can increase fruit and vegetable orders, and therefore help Jess and James gain more financial benefits and avoid JJFresh from being closed. The financial and Non-Financial benefits for different stakeholders are shown in Table 2.2.

Stakeholders	Financial benefits	Non-Financial Benefits
Jess and James	Jess and James are the business owners of the JJFresh online store project. The success of the project can help them change their business model. They would gain more customers due to the extension of the business model. Also, the increase in customers would increase the number of orders, which can increase their revenue.	They can gain experience in operating an online fruit shop. The online store website can also increase the chance of JJFresh being searched by a search engine of a browser, which can improve the exposure, thereby improving their brand awareness.
The teaching team	The teaching team of the Software Processes and Management subject is employed by the school. They can get salary by guiding students.	Teaching students in this project can increase their experience in teaching and management.
The student team	If the project achieves commercial success, students may receive financial awards from Jess and James.	They would gain software development experience from the project, which can increase their project experience and help boost their CV. Also, working as a team can improve their teamwork ability.
Customers	For the customers who are used to buy fruits from JJFresh, home delivery can save them time and money. They don't need to spend money on transportation to jjfresh. Of course, the delivery fee must be considered. But it would be a trade-off.	Customers would be able to buy fruits and vegetables with high quality in a more convenient way. Also, for unforeseen circumstances like Covid-19, buying online can reduce their unnecessary travel and keep them safe.
Suppliers	<Todo>	<Todo>

Table 2.2: Business Value

## 2.5 Constraints

- Team members are lack of experience in Scrum. Scrum is an Agile process and is difficult to do without experience, especially an experienced Scrum master. The student who plays the role of Scrum master has no Scrum management experience before. There may be many problems during the development process.
- People in the development team are unfamiliar with creating a website in Wix.com. Also, students who are responsible for the implementation of the project are not full-time workers. The efficiency of their development may be low, which may result in the delay of the project.
- A virtual team may not able to follow all the processes in Scrum. Appropriate improvements and compromises would be applied to some specific processes in the Scrum. Communication in a virtual team is less frequent and less rich than face-to-face interaction. Some of the team members are not in Australia, and because of the time difference, daily Scrum will be conducted via chat, which may bring negative effects to the project.
- The tool provided by Wix.com only has limited functions, which make it impossible to achieve the requirements perfectly. And the website implement by Wix.com has poor scalability. If Jess and James want to expand their business scale, the development team may have to redevelop the entire project with other web technics.
- The delivery range of Jess and James is limited, and users who are too far away cannot get services.
- The time limit of the project is only about one month. The overall implementation of the project may not be perfect in such a short time.

## 3. Project Governance

### 3.1 Roles and Responsibilities

Roles	Member	Responsibilities
Business Owner	Jess and James	The business owners are the main Stakeholder of the team. They are responsible for determining the priority of upcoming work in the Backlog, get resources for the team, and modifying the Release Plan as necessary with the Product Owner.
Product Owner	Yicun Tian, Hongkang Li	The product owner is the spokesperson for the customer or stakeholders. Their primary responsibility is to ensure the product to-do list is transparent and clearly expressed, and everyone in the team has the same understanding of the project. Also, they are responsible for defining the product backlog with the Scrum master. They have no active role to play in daily stand-up, but they are welcome to attend.
Scrum Master	Zhangfeng Qiu	The Scrum Master is the person in charge of the Scrum process. His primary responsibility is to guide the development team and communicate with product owners in daily development activities.
Development Team Members	Pin Wang, Chongjing Zhang	The Scrum development team is composed of professionals who deliver the incremental work of "Done" products that may be released at the end of each Sprint.
Subject Matter Expert	The teaching team – mainly by Rajesh Chittor Sundaram.	The people with specialized knowledge or talent that is needed by the Team

Table 3.1: Roles and Responsibilities

## 3.2 Communication Plan

Firstly, as a virtual team, we mainly use *Slack* and *Zoom* for information transfer, such as publishing message notifications, file sharing, etc. The link of each *Zoom* meeting would be released by Scrum Master in the meeting channel of the project *Slack* group. The Scrum Master is responsible for reminding the team to join the meeting in time. The meeting record would be provided by the Scrum Master. The example of our virtual meeting communication system is shown in Figure 3.1.

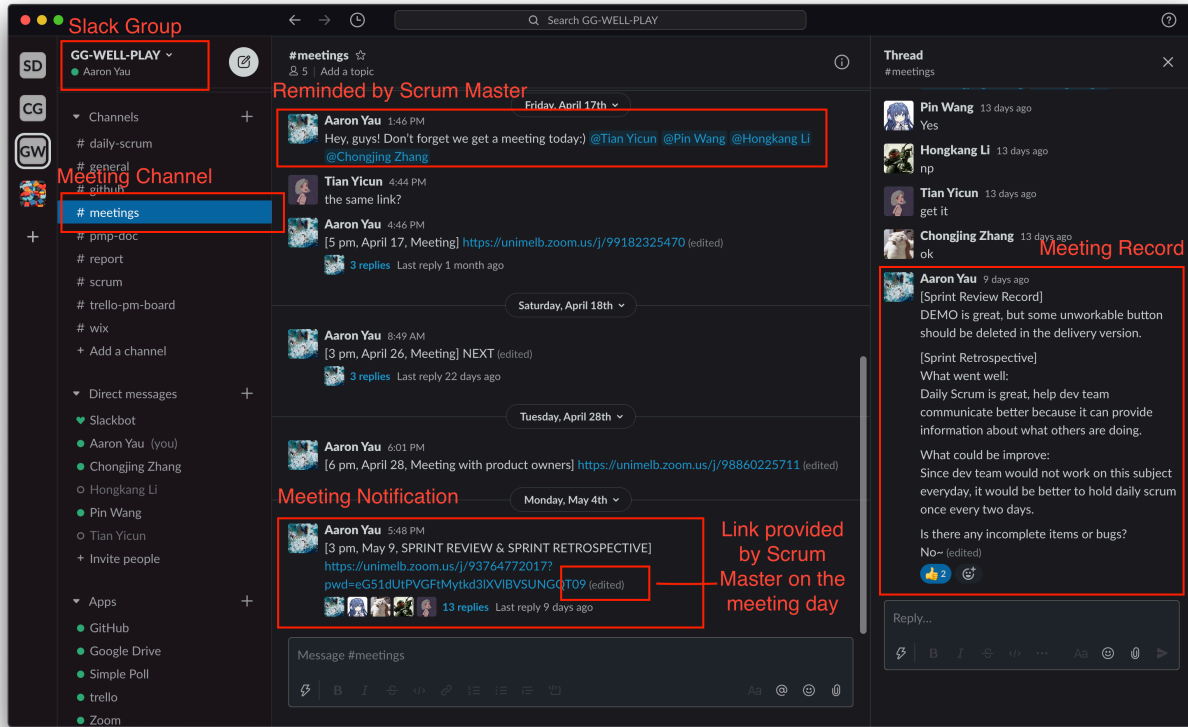


Figure 3.1: Example of our Virtual Meeting Communication System

Secondly, we use *Trello* to help manage our Agile Board. Both the Project Backlog and the Sprint Backlog are managed on the Agile Board.

Furthermore, *Github* is used to help enhance our teamwork and to manage our outcomes, such as the release of code and report.

According to the constraints of running a virtual team (Section 2.5), we adjusted some of the communication processes in Scrum, and our communications matrix is shown in table 3.2.

Processes	Stakeholder	Communication Objective	Format	Frequency	Owner	Importance
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Emergency Meeting	- Scrum Master - Everyone in the team relative to the emergency meeting	To handle any unforeseen emergency situation.	Virtual Meeting – <i>Zoom</i> ; Formal Report	Anytime when needed	Scrum Master	High
Project Planning Meeting	- Scrum Master - Product Owner - Dev team - Subject Matter Expert	Provide definition of the product backlog and provide a project plan for the whole project.	Virtual Meeting – <i>Zoom</i> ; Formal Report	Weekly before the first sprint	Scrum master	High
Sprint Planning Meeting	- Scrum Master - Product Owner	Provide Sprint Backlog, which selects high priority items from the Product Backlog that the Development Team can commit to delivering in a single Sprint.	Virtual Meeting – <i>Zoom</i>	At the beginning of each sprint: - April, 27, 2020 - May, 11, 2020 - May, 25, 2020	Scrum master	High
Daily Scrum	- Scrum Master - Product Owner - Dev team	A short meeting used to start a day's work. Since we defined our features clearly, and every progress is shown in the Agile Board in <i>trello</i> , we defined the importance of it to be medium.	Chat in the <i>daily-scrum</i> channel of <i>Slack</i>	Daily in the first sprint. In the second sprint, only held on: - Monday - Wednesday - Friday	Scrum master	Medium
Sprint Review	- Scrum Master - Business Owner - Product Owner - Dev team	Show the demo of new features to Stakeholders and get feedbacks from them.	Virtual Meeting – <i>Zoom</i>	At the end of each sprint: - May, 8, 2020 - May, 22, 2020 - May, 30, 2020	Scrum master	Medium

Sprint Retro-spective	- Scrum Master - - Business Owner - - Product Owner - - Dev team	An examination of what went well, what could be improved, etc. To make each Sprint more efficient and effective than the last.	Virtual Meeting – <i>Zoom</i>	At the end of each sprint - May, 8, 2020 - May, 22, 2020 - May, 30, 2020	Scrum master	Medium
Daily communication	- Anyone in the team	For exchanging information and better cooperation	Casual Chat on <i>Slack</i> or personal <i>Zoom</i> meeting.	Any working hours when needed	Anyone in the team	Low

Table 3.2: Communication Matrix

### 3.3 Risk Management

#### 3.3.1 Risk Impact Analysis Table

We follow the following scoring rules to assess the impact of each risk: (1) *no impact*; (2) *minimal impact*; (3) *moderate impact*; (4) *severe impact*; and (5) *catastrophic impact*; The Risk Impact Analysis Table is shown in Table 3.3.

Risk ID	Risk Type	Description	Probability	Impact	Justification
1	Product	Design problem - The software developed by Wix has low scalability and is un-transferable.	60%	4	Although Wix can help quickly implement some basic functions, it may not be suitable for implementing the future enhancement of the project. There are many restrictions on creating a website on Wix. For example, the starter plan (\$5 per month) doesn't remove ads from the website, and there is no unlimited bandwidth or storage plan provided. You cannot build a high availability server in Wix. The site created by Wix is not transferrable.

2	Business	Cancel orders maliciously or for no reason.	3%	5	Malicious orders may cause unnecessary waste. Some malicious buyers may intentionally create many orders and cancel them on the day of delivery. This kind of malicious actions may negatively affect the operation of the website and cause unnecessary loss.
3	Business	Email system or network system may fail.	5%	2	If the email system or network system failed, the buyer would be unable to receive a confirming email after ordering. If clients were not able to receive feedback in time, they would not know whether their orders are confirmed or not. This situation may cause adverse effects on the user experience and cause unnecessary loss.
4	Business	Service cancelation - Jess and James cannot deliver in time due to unforeseen circumstances.	5%	1	Unforeseen circumstances like Jess and James getting sick or unnecessary travel ban may result in delivery cancelation. When they are unable to deliver, they have to provide reasons for their customer and cancel the order. Even though they may lose some money and customers may be disappointed, the impact of it would be small.

Table 3.3: Risk Impact Analysis Table

### 3.3.2 Risk Register

Risk ID	Trigger	Owner	Response	Response Strategy Type	Resources Required
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1	The new requirements proposed by Jess and James are confirmed by the development team that could not be implemented through Wix.	The development team	The development team can redevelop the whole system based on traditional web technics. Although it may take more time for the development team, it can meet the needs of users. Also, keeping more reusable interfaces during development can help reduce the impact of this risk.	Mitigate or avoid	The development team needs to keep more reusable interfaces during the development process.
2	A user creates lots of orders in a short time and then cancels them without any reason.	Jess and James	Limiting the number of times a user can cancel per week and limiting the time when the user cancels the order can help reduce the impact of this risk. For example, cancelation within 24 hours of the specified delivery time is not allowed. Also, customers would be asked to pay an advance deposit to reduce the economic loss caused by cancelation.	Mitigate	Jess and James need to spend effort to judge the reliability of the orders.
3	Users complain that no confirmation email is sent to them.	Users(Jess & James and customers)	If this risk occurs due to network failure, the system should be able to detect the user's network conditions and provide prompts automatically. The operation of the user to place an order is idempotent, which means that two identical operations will only operate once. If there is a problem with the function of auto-replying emails, the administrator of the maintenance system should be able to detect it in the background, the system is abnormal, and fix the bug in time.	Mitigate	The system needs to consume resources to detect the user's network environment and react to it.



4	Jess or James is sick, or the government announced an unnecessary travel ban policy.	Jess and James	If an unnecessary travel ban policy is announced, Jess and James have to follow the rules and cancel their orders with an apology email sent to their customers. If the order cannot be delivered in time because the seller is sick or other assents, they can decide to hire another person to deliver or cancel their orders. It would be a trade-off between economic loss and user satisfaction loss.	Mitigate or accept	Hiring others for delivery would result in an economic loss, while cancelation of orders can bring negative effects to user experience.
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Table 3.4: Risk Register

### 3.4 Technology

The following are some technologies we researched for web development.

Name	Responsibility	Description	Pros	Cons
HTML	Front end language	Hypertext markup language (HTML) is a standard markup language designed for documents to be displayed in web browsers and describes the structure of web pages.	<No comparison>	<No comparison>
CSS	Front end language	Cascading Style Sheets is a style sheet language that describes the presentation of documents written in markup languages such as HTML.	<No comparison>	<No comparison>
JavaScript	Front end language	JavaScript is a high-level, often just-in-time, multi-paradigm programming language that supports interactive web pages. It is an important part of web applications.	<No comparison>	<No comparison>
Bootstrap	Front end framework	Bootstrap is a front-end framework that includes HTML and CSS based design templates and JavaScript plugins. It allows users to create responsive designs easily.	Easy to use and saves time; Compatible with all browsers; Responsive structures and styles;	Load time can be slow, file size can be huge; All websites using Bootstrap look the same with out style customization;

Foundation	Front end framework	Foundation is a front-end framework that is a collection of HTML, CSS and JS. It is a easy-to-use, powerful, and flexible framework for building web applications on any device.	Fast development; Adapt to all devices; Robust grid system;	Community support is worse compare to Bootstrap; Need time to learn for beginners;
Angular	Front end framework (JS)	Angular is a development platform for building web applications using TypeScript.	Component-based architecture allows reuse of components of UI, which is easy for writing tests; High performance; Fast development;	Difficult to manage components; Need time to learn for beginners; Lacks CLI documentation;
React.js	Front end framework (JS)	React is a JavaScript library for building user interfaces. It can be used as the basis for developing web pages and mobile applications.	Components are modularized; Stable; Compatible with all browsers; Fast development;	Longer learning time than Angular; Lack of documentation; Less straightforward than pure JavaScript;
Vue.js	Front end framework (JS)	Vue.js is an progressive, incrementally adoptable MVVM JavaScript framework for building user interfaces and single-page applications.	Clear documentation, simple to study; Small and fast; Components are modularized;	Too flexible that the codes are irregular; New framework, not very mature, has a smaller community;
Java	Back end programming language	Java is a programming language that is class-based, object-oriented, and concurrent.	High-level language with simple syntax; Object-oriented programming allows reuse of codes; Supports multi-threading and distributed computing; Compatible for all platforms;	Slower than natively compiled languages; Less compact;

PHP	Back end programming language	PHP is a server scripting language and a powerful tool for web development. It is fast, flexible and pragmatic that makes it easier to make dynamic and interactive web pages.	Compatible for all platforms; Easily embedded into HTML; High scalability; Large community;	Slower than other languages; Flexibility allows bad code;
Python	Back end programming language	Python is an interpreted, high-level, general-purpose programming languages.	Easy to use and read; Multi-paradigm approach; Flexible;	Slower than natively compiled languages; Doesn't allow multi-threading;
Django	Back end framework (Python)	Django is a Python-based high-level web framework follows MTV architectural pattern. It encourages rapid development and clean, pragmatic design.	Fast processing and developing; Scalable and flexible;	Not for smaller projects; Monolithic;
Spring MVC	Back end framework (Java)	Spring MVC is a Java-based web framework that implements all the basic features of a core Spring framework like Inversion of Control and Dependency Injection.	Highly scalable and flexible; Use of modularity thus easy for testing; Large community;	Too complex, need time to learn for beginners; No clear guidelines;
Express.js	Back end framework (Node.js)	Express is a minimal and flexible Node.js web application framework that provides a robust set of features for building web applications and APIs.	Fast development; Same language can be used to code front end; Simple; Flexible	Not for heavy projects;
Wix	Web development platform	Wix is a popular cloud-based website builder. It provides an easy-to-use combination of powerful features that make it easy to build websites.	Flexible; Provides an app market; Easy to use; Massive template collection;	Loading is slow; Templates cannot be changed easily; Site cannot be transferred;

Weebly	Web development platform	Weebly is a simple site builder with templates for great design. It allows the user to edit a website without any coding skills.	Massive template collection; Built-in support for e-commerce; Easy to use; Flexible;	Cannot add functionality not provided;
WordPress	Web development platform	WordPress is a free and open source website builder.	Powerful features; Scalability; Easy to use; Massive themes; A lot of free plugins;	Loading can be slow; Need to keep website updated; Doesn't support drag and drop;

Table 3.5: Available Web Development Technologies

Among all technologies we researched above, we choose to use Wix content management system to build the website. Wix requires no coding skills or other usage of frameworks. It supports drag and drop to build web pages and provides a user-friendly UI to set the style of web components that integrates HTML and CSS from codes into user interfaces. And Wix also provides user-friendly UI to react to user actions with event handlers, this supports visualization of JavaScript. So far, Wix substitutes all front end languages or frameworks coding with user interfaces without any code. And Wix conceals the back end code in encapsulated apps, but also let users to implement customized logic using Node.js. Nonetheless, Wix offers a database operated by itself which also supports changes through graphical user interface. This database maintains the consistency of the usage of Wix platform, without extra database construction.

Compare to other website builders, Wix is more flexibly as it supports usage of Node.js to write customized backend code and take action when doing processes. And it already provides ready-made modules including online shop, user login, user permission management, and check out with credit card which can be used in developing the JJFresh website.

By using Wix, we will save time of building and integrating the frameworks and adjusting the component properties with the help of visible user interface. And since we don't have much experience in web development, Wix's characteristic that it requires as least coding as possible is suitable us, and can help us focus on project management instead of catching up with the technology stacks. Therefore, we decided to use Wix to develop the website.

## 3.5 Project Planning

The SDLC of our project is Scrum. Since the key requirements for the initial development provided by Jess and James are fixed, a Fixed-Scope Release Planning would be used to plan our project.

### 3.5.1 Product Backlog

The detail of product backlog is shown in Table 3.6. *Fabonacci sequence*<sup>1</sup> is used to provided relative estimation to both story point and value point.

The story points of different features are estimated by the development team and the Scrum master, based on the volume, risk, uncertainty and complexity of the features. We set the cost of the simplest feature (Edit

<sup>1</sup><https://www.mountingoatsoftware.com/blog/why-the-fibonacci-sequence-works-well-for-estimating>

admin account information) to 1 story point. And then estimate all other features' cost based on comparison with the simplest feature.

The value points of the features are estimated by the product owners. We set the value of the least value feature (Edit admin account information) to 1 value point. And other features' values are estimated based on their relative value compared to the least value feature.

BFTB Score is the abbreviate of the Bang-for-the-Buck<sup>2</sup> Score, which is a way of measuring how to get the most value in the shortest time. It is used to help assess the priority of the features. The BFTB Score is calculated by the formula below:

$$\text{BFTB Score} = \frac{\text{Value Point}}{\text{Story Point}}$$

Initially, we define three milestones in our project.

- The first milestone is to let the website go online without the function of purchase. The website can display all kinds of information about the products and provide the service of user registration. At the same time, the database is initially established to record the data of users and products.
- The second milestone is to allow users to place orders to purchase products. After this milestone, sellers can view and modify user orders. Basic requirement testing has to be passed in this milestone.
- The third milestone is to finish the future enhancement, which would not be considered in the initial development.

The features in Table 3.6 are ordered by their priority. The priorities are defined base on both the BFTB score and the development requirements. For example, even though the Database feature has a low BFTB score, because we can't record any data without it, its priority is still the highest.

Except for the three future user stories at the end of the product backlog table, all others are must-have stories because they are key requirements defined by Jess and James.

Milestone	Feature	User Story	Story Point	Value Point	BFTB Score
1	Database	As an admin, I need a database, so that I can store all the information of customers orders.	8	5	0.625
1	Admin sign in and sign out	As an admin, I want to provide my username and password, so that I can register an admin account.	2	2	1
1	Manage product infomation	As an admin, I want to manage product information, so that I can change the price or picture of my products.	5	3	0.6
1	Browse product menu	As a customer, I want a menu that shows all the products, so that I can know what products are the website selling.	8	5	0.625

<sup>2</sup><http://leftfoot.com.au/blog/struggling-with-relative-estimation-and-why-we-dont-use-time-watch-this>

1	Customer sign up	As customers, I want to sign up for the website, so that I can a member of the website.	2	2	1
1	Customer sign in and sign out	As customers, I should be able to sign in and sign out, so that I can manage my account and orders.	3	3	1
1	Customer add and edit client information	As customers, after login, I can add or edit my information like home address, user name, email address, and contact number.	2	3	1.5
2	Add products to shopping cart	As customers, after login, I can add or edit my information like home address, user name, email address, and contact number.	2	5	2.5
2	Manage shopping cart	As a customer, I want to manage my shopping cart, so that I can remove those I don't want or add some more products.	8	5	0.625
2	Check out shopping cart	As a customer, I want to choose the day and time for delivery, so that I can get the fruit on the right day.	8	5	0.625
2	Cancel orders	As a customer, I need to get the ability to cancel an order so that I can modify an order and then re-create.	2	2	1
2	View and manage orders	As an admin, I want the specific information of the user's order, so that I can packaging user orders.	8	5	0.625
2	Register admin account	As an admin, I need to get the ability to register for a new admin account, so that I can get more admin accounts if I need them.	1	1	1
2	Edit admin account information	As an admin, I may want to edit my admin account information, so that I can change the password.	1	1	1
3	Add multiple bookings for the same slot	As an admin, I want to add multiple bookings for the same slot in the future. So that I can employ others to deliver boxes.	8	2	0.25
3	Using AI to calculate delivery routes and times	As an admin, I want to use AI technology to help me calculate an optimal route and time for delivery.	13	3	0.231
3	Extended to allow for payment online.	As an admin, I want to be paid online, so that I can save my time and improve the delivery efficiency.	13	3	0.231

Table 3.6: Product Backlog

### 3.5.2 Must-have Story Points

Without calculating the features needed in the future, the total number of must-have story points is 60.

$$SP_{total} = 60 \text{ (Story Point)}$$

### 3.5.3 Velocity Estimating (Re-estimate)

There are two developers in our team. Since both of them are students, each of them can only spend about 1.2 to 3 hours a day on the project. They can work five days a week, so the total working hours of a week are 12 to 30 hours. We simply suppose each story point to be equivalent to one hour of working time. So the min velocity ( $V_{min}$ ) for a two-week sprint is about 24 story points, and the max velocity ( $V_{max}$ ) is about 60 story points. And by using the formula shown below, we can get our minimum and maximum number of sprints, which are 1 and 2.5, respectively. The velocity re-estimation burndown chart is shown in Figure 3.2

$$S_{min} = \frac{SP_{total}}{V_{max}}, S_{max} = \frac{SP_{total}}{V_{min}}$$

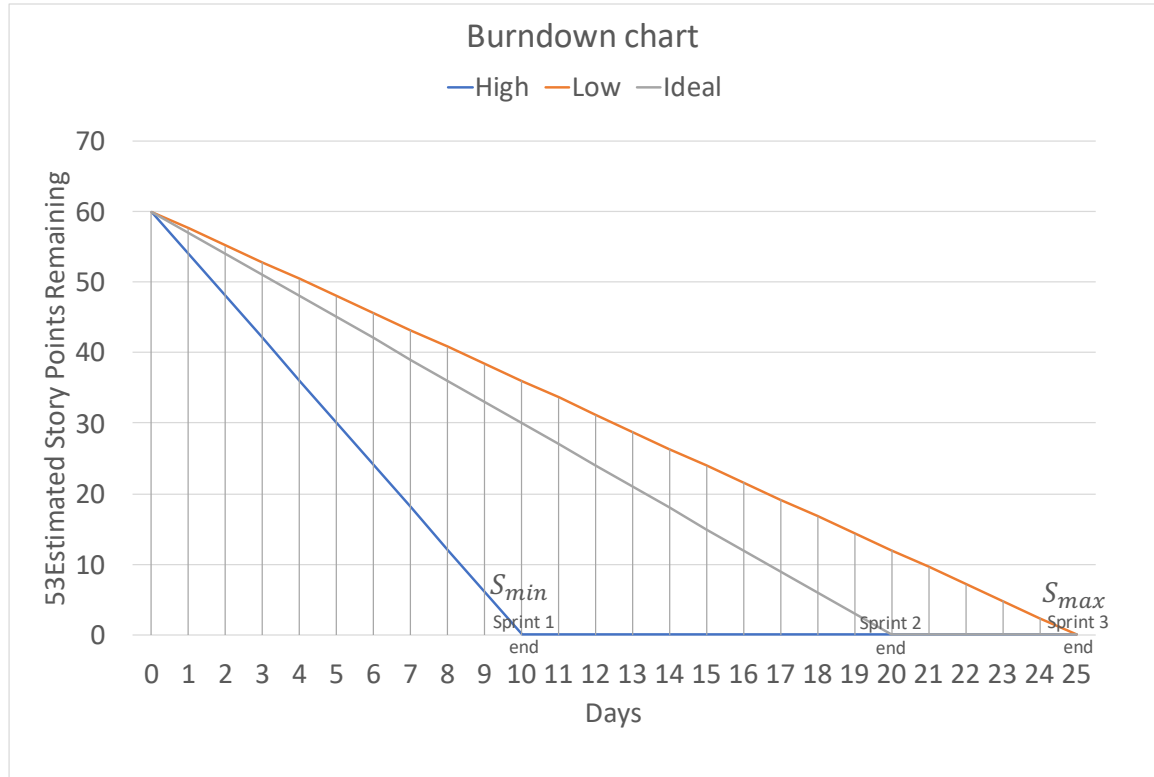


Figure 3.2: Velocity Re-estimation



### 3.5.4 Sprint Planning

#### Sprint Cycle

The development phase of our project would start on **Monday, April 25**. Since the final delivery due date of the whole project is **June 1**, we decided to divide our development into three phases, each corresponding to a sprint.

The first phase is to let the website go online without the function of purchase. The website can display all kinds of information about the products and provide the service of user registration. At the same time, the database is initially established to record the data of users and products. The first sprint will last for two weeks, **from Monday, April 27 to Friday, May 8**.

In the second phase, we need to realize the function that users place orders to purchase products, and sellers can view and modify user orders. Preliminary testing will also take place at this phase. The second sprint will last for two weeks, **from Monday, May 11 to Friday, May 22**.

The third stage is mainly based on user feedback to repair the vulnerability, carry out more tests and improve the existing functions. If some functions left over from the first two sprints are not implemented, they will also be solved in this sprint. As the project is nearing its end and there is less work left, the sprint in this phase will last only one week, **from Monday, May 25 to Friday, May 29**.

On **the first Monday of every sprint**, a Sprint Planning meeting would be held to select high priority items from the product backlog that the development team can commit to delivering in a single Sprint. The select itmes would be add to Sprint Backlog.

On **the last Friday of each sprint**, a Sprint Review meeting would be held to demonstrate the new features to Stakeholders, and a Sprint Retrospective meeting would be held to review the sprint.

A 15-minute Daily Scrum would be held **everyday** in the first sprint to start up the jobs. Everyone has to share what he/she did yesterday, what he/she plan to do, and what obstacles are slowing him/her.

### 3.5.5 The First Sprint Plan

As mention in Section 3.5.4, the main goal of the first sprint is to launch a webpage where customers can browse products. Considering both the BFTB Score, which is shown in Table 3.6 and the actual development needs, the Sprint Backlog of the first sprint is shown in table 3.7. The total velocity and the delivery value of the first sprint is 30 story points and 25 value points, respectively.

Index	Feature	Tasks	Story Point
1	Build database	1.Define the order model( <i>1-hour</i> ); 2.Define the user information model( <i>1-hour</i> ); 3.Define the admin information model( <i>1-hour</i> ); 4.Create table and relation( <i>2-hour</i> ); 5.Test( <i>1-hour</i> )	8
2	Browse product menu	1.Provide a page for showing the list of the products( <i>3-hour</i> ); 2.Show the types of the products( <i>1-hour</i> ); 3.Show the price of the products( <i>1-hour</i> ); 4.The price would change automatically( <i>1-hour</i> ); 5.Show the pictures of products( <i>1-hour</i> ).	8
3	Customer sign up	1.Check whether the information of the user is valid( <i>1-hour</i> ); 2.Add the user to the database and send a confirming email to the new member if valid( <i>1-hour</i> ).	2

4	Customer sign in and sign out	1.Sign in, check whether the user exist and whether the user's password correct(1-hour); 2.Sign out(1-hour); 3.Handle the problem of forgetting the user password (Allow password reset)(1-hour).	3
5	Customer add and edit client information	1.Add and edit the name, email address, home address(1-hour); 2.Add and edit up to three multiple contact phone numbers(1-hour).	2
6	Manage product infomation	1.Change the price of products(1-hour); 2.Change the pictures of products(1-hour); 3.Change the type of products(1-hour); 4.Add products(1-hour); 5.Delete products(1-hour).	5
7	Admin sign in and sign out	1.Sign in(1-hour); 2. Sign out(1-hour).	2

Table 3.7: The first Sprint Backlog (4.27 - 5.8)

### 3.5.6 The Second Sprint Plan

As mention in Section 3.5.4, the main goal of the second sprint is to allow users to place orders to purchase products. After this sprint, sellers can view and modify user orders. Basic requirement testing has to be passed in this sprint.

Following the feature development priority provided in Table 3.6, the Sprint Backlog of the second sprint is shown in Table 3.8. The total velocity and the delivery value of the first sprint is 30 story points and 24 value points, respectively.

Index	Feature	Tasks	Story Pointt
1	Add products to shopping cart	1.Select size, type and amount of the products and add them to shopping cart.(2-hour)	2
2	Manage shopping cart	1.Select the items to pay(1-hour); 2.Change the amount of items(1-hour); 3.Delete items(1-hour); 4.View the price of the items selected(1-hour); 5.Provide a page to show all the items in the shopping cart(3-hour).	8
3	Check out shopping cart	1.Choose a day and time for delivery.(1-hour). Only two bookings are allowed in a particular-hour.); 2.Send a confirming email to the customer(1-hour); 3.Show the day and time which is valid(2-hour); 4.Add an order to the user's order list(1-hour); 5.Handle synchronization problem(2-hour).	8
4	Cancel orders	1.Cancel order(1-hour); 2.Send emails to both customer and admin(1-hour).	2

5	View and manage orders	1.Confirm order( <i>1-hour</i> ); 2.Order rank by date( <i>1-hour</i> ); 3.Cancel order and provide reason( <i>1-hour</i> ); 4.Provide a page to show order list with order information attach to it( <i>4-hour</i> );	8
6	Register admin account	1.Provide way for admin account registration( <i>1-hour</i> ).	1
7	Edit admin account information	1.Provide way for admin account information editing( <i>1-hour</i> ).	1

Table 3.8: The Second Sprint Backlog (May 11 - May 25)

## 4. Project Execution, Monitoring and Control

We finish all the features required in the initial development process on May 18, 2020. But because the document has to be updated to version 1.2 before May 23, 2020. We can't update artefacts generated by the second sprint review meeting and the second sprint retrospective to the document in this version.

We use a handy tool called *Trello* to manage our Agile Board. The feature cards in the Agile Board are set by the Scrum Master with tasks checklist defined inside them. Students in the development team would add themselves to a specific card and move the card to the *TODO* list after the Daily Scrum standup meeting. A card is moved to *DONE* list only if all the tasks in it are finished and pass tests. The total finish story points can be quickly check in the upper left corner of the *DONE* list. By checking the card in the *DONE* list, the Scrum Master can keep track of everyone's contribution.

The burndown chart is updated by the Scrum Master after every daily standup. By comparing the actual jagged line with the ideal schedule straight line, the Scrum Master can easily evaluate whether the development team is working efficiently, whether the sprint backlog can be finished on time and whether the progress of the project is hindered. Also, the burndown chart is used to re-estimate the velocity of the development team.

< Write a summary of your project status, and how you are tracking with respect to milestones and deliverables, as if the project manager was reporting to the stakeholders. This should be an accurate reflection of how the team progressed, not a generic update.> 7.2.1 Process Related Artefacts < Include all process related artefacts relevant to your process. e.g. agendas, minutes, a timesheet per member (timesheet per member is required regardless of the chosen lifecycle), screenshots of communications (e.g. whatsapp messages, wechat) or copies of emails, progress Gantt charts, updated schedules, sprint planning meeting outcomes, sprint review inputs and outcomes, velocity estimations, burndown charts, low level task decompositions, images of Kanban boards, and any other process related artefacts that will demonstrate to your markers how well you were executing and managing the process (you may include them in an Appendix with a reference from this section to improve readability of the document).> 7.2.2 Product Related Artefacts < Include all products related artefacts such as requirements, use cases, user stories, designs, completed features lists, screen shots to show the status of the product and any other product related artefacts that will demonstrate to your markers how well you were progressing towards achieving the milestones you planned (you may include them in an Appendix with a reference from this section to improve readability of the document).> <All other artefacts that show progress but cannot be included in the report, including code written by your team (if applicable), must be submitted as a .zip file through the submission link we provide for this purpose>

### 4.1 Project Status: Friday Week 9

#### 4.1.1 Process Related Artefacts

#### 4.1.2 Product Related Artefacts

#### 4.1.3 Risk Monitoring and Control