SWEN90016 Software Processes and Management

Smart Solar & Storage Case Study

Group Name: SWAG

Tutorial Time: 14:15-15:15 / Monday

Executive Summary

The AERO-System, a nice electronics manufacturer that designs and manufactures specialized electronic products wants to reduce its energy cost to customers and owners. The company has proposed a new system which needs multiple technology platforms to implement it. During the management of the project, appropriate Agile Project Management Planning processes and Agile Software Development Life Cycle (and Sprint) shown in Trello are provided to help give a plan to the project. Besides, by analyzing the business problems and requirements in the project, specific techniques and IT solutions are included in the consideration.

Content

1. Introduction

Purpose of the document

The main purpose of the document is to clarify the whole process of the project management. It is essential as it can provide a picture for all the stakeholders include those non-technical audience about the implementation of the project and let them monitor each part to make sure the success of the project.

Scope of the project

The scope of the project includes designing a new smart inverter for energy transformation. Smart Meter, Battery Storage, Solar panel, ECLIPSE Smart Solar Inverter, Router, Weather Bureau, Mobile Interface and Market Trading Platform are also included. They could enable the system to switch between mains and battery preference, use algorithm to decide how the energy is managed, and make strategies to control how electricity is bought or sold. There are both financial and time constrains for this project, the Victorian Government has approved founding of $800,000. Besides, the project must be completed by November of 2018.

Business-value of the SDLC

Business value includes all forms of the value that determine the long development of the firm in the long term. For commercial value, it contains the functionality and work that could bring profit. For market value, it could increase the potential number of customers. For efficiency value, it is a method to increase efficiency which could reduce cost of the project.

Audience of the document

The audience of the project include all the stakeholders related to this project. From the Case Study, it is obvious that stakeholders include the leaders from AERO-Systems who responsible for this project and the group of IT Specialists with links to Melbourne University. Authorized staff from Victorian Government are also includes as the government granted the project.

Limitations of the document

Although the documents cover many aspects of the projects, it still may lack some details needed in the management such as the tasks in adapt phase and close phase are not listed in the document as they are not as important as tasks in other phases.

2. Project Management Plan(PMP)

2.1 PMP Phases Identification and Justification

Agile project management has 5 phases: Envision, Speculate, Explore, Adapt and Close. These phases correspond to several steps from the initial part to the finial delivery of the project, so they have different functionalities and contributions.

Phase 1 Envision

As the first step of the project, this phase is focused on initial identifications and decisions. In this phase, all the participants and stakeholders should be identified and then all the stakeholders need to be gathered to define key capabilities and business objectives of the project. This phase is important because it is the basis of the other stage.

Phase 2 Speculate

In the Speculate stage, all the requirements should be translated into a product backlog with the overall approach. Besides, the risk mitigation strategies and quality assurance should be planed. In this project, the speculate is the essential part as all the requirements should be analyzed and the product backlog and sprint backlog need to be established which need much effort to finish.

Phase 3 Explore

In this phase, the main task is to implement the requirements for the project, so work deliveries and tests become the two key activities. It is connected to iteration and every day work, that means the team work in an iterative manner to keep development the work until it meets the release condition.

Phase 4 and 5 Adapt and Close

In the adapt phase, the major work is to realize the project and adapt it to customer's needs. For this reason, the team should analyze the results of the execution and get the feedback from customer to adjust some parts. As the last phase, the close stage means the whole project is finished. However, in the following list, we need include these two phases in the PMP Task List because we focus on the Speculate phase.

2.2 PMP Task List

	I want to…	(Low-level tasks)	Estimated Time
At Envision Stage,	Create a client vision for a project	Identify the quality of objectives	1 Hour
		Identify the key capabilities and resources of the project	1 Hour
	Identify the stakeholders of the project and their goals	Identify any potential users such as project manager, project owner and customers by getting to know the industry	1 Hour
	Identify the business objectives	Meetings with stakeholders	3 Hours

	I want to…	(Low-level tasks)	Estimated Time
At Speculative Stage,	Gather initial product requirements for the Product Backlog	Have a meeting with stakeholders to verify their requirements	3 Hours
	Model the whole project	Gather the team to form a draft model according to all the requirements and List all the potential difficulty in the project	1 Day
		Have a discussion with stakeholders to adjust requirements if needed and improve the model	2 Hours
	List all the resources required in the whole project	Gather the team to analyze each module in the project to identify the potential resources	2 Hours

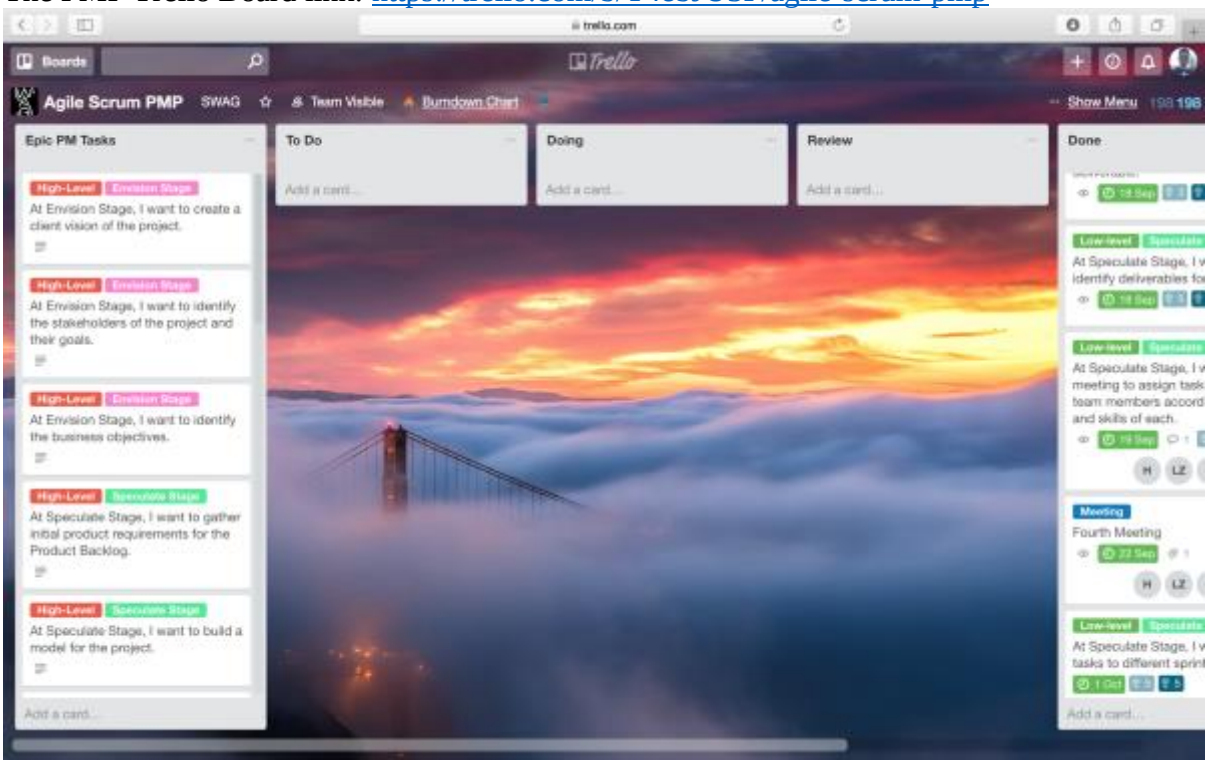
		Report the defined resources to the stakeholders.	1 Hour
	Create a Product backlog	Define the project workload as a list of product features according to requirements	1 Day
		Analyze major product features and translate into user stories	6 Hours
	Prioritize the features	Find the corresponding business driver and requirements for each feature	4 Hours
		Discuss with the team and set value for each feature and rank all features	2 Hours
	Determine tasks for each user story	Select all product backlog items in the form of user stories, define the tasks necessary to complete each backlog item	3 Hours
	Determine user points for each task	Consult with IT support to estimate current capabilities of hardware and software	1 Hour
	Build risk mitigation strategies	Discuss with stakeholders to understand their approaches to risks	2 Hours
		Identify relative risks for each feature when brainstorming with the team members	2 Hours
		Choose a tool to create a document that contains all related information to monitor risks	2 Hours

	Create a Budget	Estimate costs in different sections such as salaries, hardware costs and other resources by using similar project as guidelines	2 Hours
		According to estimation, create a detailed budget for the whole project	3 Days
	Make a quality assurance plan	Define quality attributes like performance, reliability and maintainability	2 Hours
		Decide the quantification tools to control the quality	1 Hour
	Create a delivery plan that includes a schedule and resource allocation	Identify deliverables for each sprint	2 Hours
		Estimate time and resources needed for each deliverable	1 Hour
	Create Sprint backlog	Locate tasks to different sprints and determine the release plan for each sprint.	3 Hours
		Team member select sprints and discuss the size and items included for each sprint backlog.	1 Hour

At Explore Stage,	**I want to…**	**(Low-level tasks)**	**Estimated Time**
	Keep record of daily work deliveries	Manage everyday activities required to deliver features at the end of iterations	2 Hours

2.3 PMP Trello Board

The PMP Trello Board link: https://trello.com/b/T4ebJU3F/agile-scrum-pmp



Clarification of Agile swim lanes

Epic PM Tasks

List all high-level project management tasks required to do to complete the project, each of them has been decomposed into multiple low-level tasks. In each high-level task card, we provide the links to its decomposed low-level tasks, and two labels which indicate which level the task belong to and which Scrum phase it is in.

To Do

List all low-level tasks that our team are going to do to manage the project. We provide two labels which are “level” and “phase”. They are the same as Epic PM tasks. We allocate human resources to each task. They will be responsible for the task. For better time management, we give a due date to each task. Each task must be done before that time. Moreover, we provide estimation like story point for each task.

Doing

Place tasks we are doing now into the swim lane.

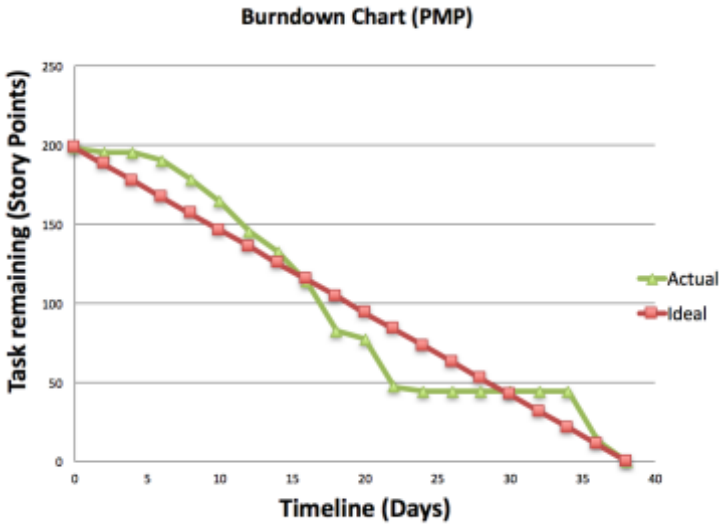
Review

Place tasks we finished without reviewing into this swim lane. Wait for team members doing review.

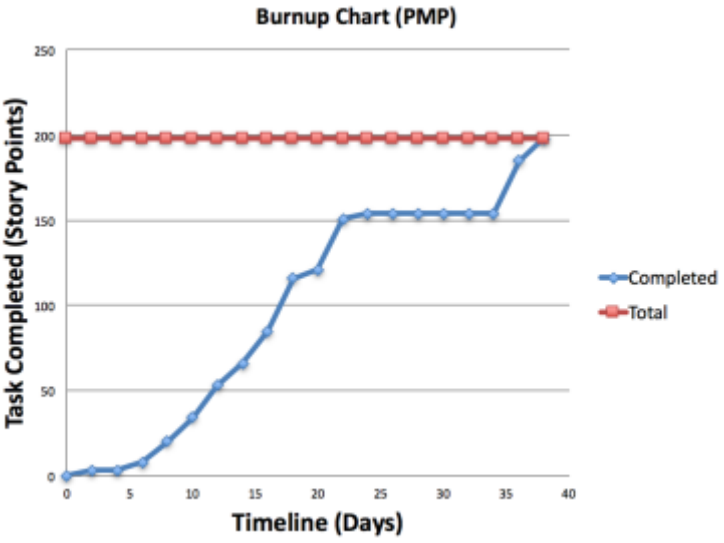
Done

Place tasks that are reviewed by our team into the swim lane.

2.4 PMP tasks burndown chart



2.5 PMP tasks burnup chart



3. Narrative Overview

3.1 Project Background

A local company in Melbourne plans to develop an AERO-System which is a nice electronics manufacturer that designs and manufactures specialized electronic products. Compared with traditional inverter, a new smart inverter designed by AERO-Systems could integrate home-generated solar power into the Australian electricity grid better. The application coordinates Smart Meter, Battery Storage, Solar panel, ECLIPSE Smart Solar Inverter, Router, Weather Bureau, Mobile Interface and Market Trading Platform. It enables the system to switch between mains and battery preference, use algorithm to decide how the energy is managed, and make strategies to control how electricity is bought or sold.

3.2 Business objectives

The main business objective of the system is to maximize the utilization of electricity through providing processed data for a wide range of user purposes. Other objectives include reducing energy costs for both consumers and owners, decreasing demand for electricity from the grid and improving resilience of the electricity network. To achieve these objectives, this project needs establish an AERO-System. This system needs coordinate the required hardware and system software to support the smart energy transaction, collecting data from solar panel and battery storage, processing these data and providing smart algorithm for better decision of electricity transaction and developing a configurable mobile interface.

3.3 Business Drivers

The following are business drivers:

1. Offer new product (the AERO-System).
2. Increased electricity price.
3. The affordability of new technology.
4. Offer functionality to increase electricity productivity.
5. Offer functionality for lower energy cost.
6. Offer functionality for lower money cost on energy.
7. Offer energy transaction between users and grid.

8. Offer market trading platform for P2P energy transaction.
9. Enable users to make their own decision for electricity transaction.
10. Offer advanced algorithm for the smarter inverter to help users make better decisions.
11. Provide predictive analytics on external data for making better strategy.
12. Offer user-friendly interface.

3.4 Constraints

There are both financial and time constrains for this project:

1. The Victorian Government has approved founding of $800,000.
2. The project must be completed by November of 2018.

3.5 Design Problem

For building the AERO-System, several design problems listed in the following content need to be solved:

1. It is difficult to create a suitable configurable algorithm. The algorithm will be decided based on difference preference, but how the algorithm handles all data from other nodes to create a most suitable energy strategy and usage mode.
2. It is difficult to define the price and the amount of the energy that could be sold, although there is a market trading platform in the system, the macro data still cannot get easily.
3. Real-time energy market is very new to people. People may not accept this kind of trade.
4. The forecast predictions from weather bureau may not be reliability leading a wrong energy strategy.
5. The inverter cannot transform enough solar energy into electricity. This will lead the system run more difficulty and less significantly because there are not enough data to create a useful energy strategy.

3.6 Product Backlog

Priorities are allocated as follow:

1. Must Have [1]: All of requirements with this priority must to be completed at first.
2. Should Have [2]: One or more of these items should be delivered if there is still available project resource left after completing the Must Have priorities.

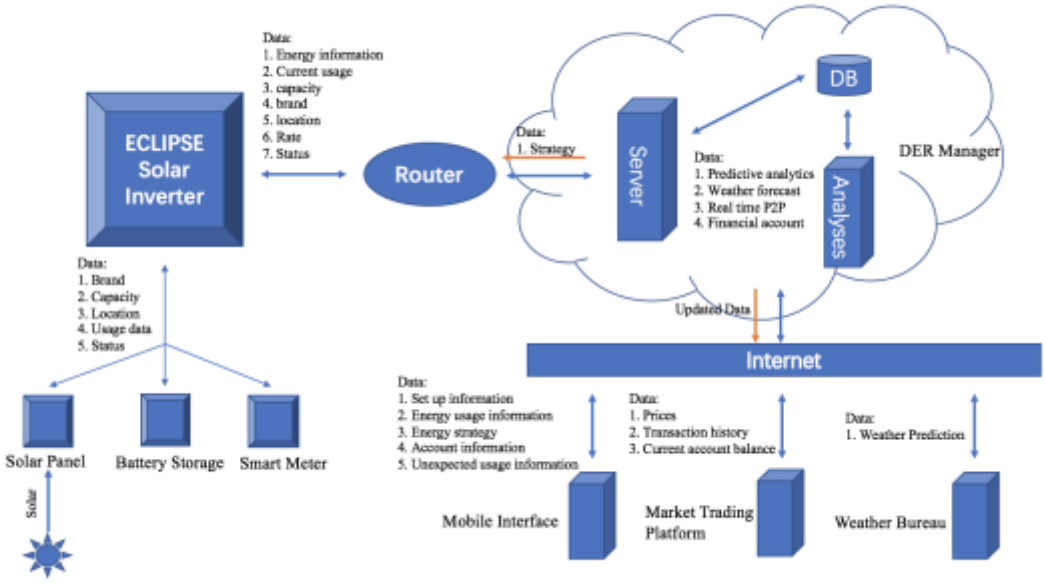
3. Could Have [3]: One or more of these items could be delivered if there is still available project resource left after completing the Must Have and Should Have priorities.

ID	As a/an …	I want to …	So that …	Priority	Business Driver
1	manager	get access to the DER manager system.	I can check the information of energy use in the ECLIPSE smart solar inverter.	1	Offer new product (the AERO-System).
2	manager	gather external information to make strategy.	I can make better decision based on the information.	1	Provide predictive analytics on external data for making better strategy.
3	electric company cooperator	control the energy usage.	I could manage the energy and reduce energy cost.	1	Offer functionality for lower energy cost
4	electric company cooperator	use the AERO-System	I could get profit from this system.	1	Offer new product (the AERO-System)
5	consumer	use ECLIPSE smart solar inverter	get the electricity energy transformed from solar energy.	1	Offer new product (the AERO-System)
6	consumer	manage my inverter configuration	I can use it more conveniently.	1	Offer user-friendly interface
7	consumer	manage my energy usage and strategy.	I can make better decision for energy usage.	1	Enable users to make their own decision for electricity transaction
8	consumer	manage my transaction.	I can make profits and ensure security.	1	Offer energy transaction between users and grid
9	seller	see my personal account information.	I can check my account information modify my selling strategy.	1	Provide predictive analytics on external data for making better strategy

10	seller	have a user-friendly transaction process with the trading platform	I could have a better user experience.	1	Offer user-friendly interface
11	seller	access the Market Trading Platform to see all my transaction history details	I could get my financial report each term.	2	Provide predictive analytics on external data for making better strategy
12	seller	monitor market situation through trading platform	I could set a reasonable selling price.	2	Provide predictive analytics on external data for making better strategy
13	manager	monitor the market.	I can improve the algorithm to manage the energy.	3	Offer market trading platform for P2P energy transaction.

4. Solution Overview

4.1 Diagram of System Boundaries



DRE Manager

DER manager aims to collect all node's data and distribute the data to mobile interface, market trading platform and ECLIPSE smart solar inverter. The data should also be analyzed in the DER manager. The data in the DER manager should be included predictive analytics, weather forecast, real time P2P electricity market information and financial account information.

Mobile Interface

The mobile interface will receive the data from DER manager and when the data including configure solar inverter, setting capacity, changing energy strategy is updated by the users, the data will be also transformed to DER manager. The mobile interface should also be easy to check and monitor energy usage information as well as trade with other people. The data in the mobile interface should be included set up information, energy usage, energy strategy, trading account and notify unexpected usage information.

Weather Bureau

Weather Bureau aims to weather predictions based on specific location and time. The weather predictions will transform to DER manager to help it do predictive analytics.

Market Trading Platform

The market trading platform is to sell or buy energy by user. The information about trading will be sent to DER manager and the platform will receive new trading strategy from DER manager. The data in marker trading platform should be included price, transaction history and current account balance.

ECLIPSE Smart Solar Inverter

The ECLIPSE smart solar inverter including three main parts: Solar Panel, Battery Storage and Smart Meter. The solar energy will be transformed into electricity energy by solar panel in this inverter and storage in battery. The meter will record location, usage data and status. All these data will transform to DER manager and receive a new energy strategy from DER manager. The data in ECLIPSE smart solar inverter should be included energy transformation information, current usage, brand, capacity, location and rate of consumption.

4.2 Business-Level and Feature-Level User Stories

The feature-level user stories are some proposed IT solutions linked to the business-level user stories. The following table shows the specific feature-level stories linked to specific business drivers.

Story Id	Business-Level Story	Feature-Level Story		Business Driver
		Story Id	Description	
1	As a manager, I want to get access to the DER manager system.	**M1**	As a manager, I want to get access to the DER manager system, so that I can check the information of energy use in the ECLIPSE smart solar inverter.	Offer new product (the AERO-System). The affordability of new technology.
2	As a manager, I want to gather external information to make strategy.	**M2**	As a manager, I want to get the information of electricity consumption, so that I can adjust strategies to control how electricity is bought/sold on the market.	Provide predictive analytics on external data for making better strategy.
		M3	As a manager, I want to get the weather information, so that I can make further analysis and prediction.	Provide predictive analytics on external data for making better strategy.
3	As a manager, I want to monitor the market.	**M4**	As a manager, I want to see the financial account, so that I can make better decision to make profile.	Provide predictive analytics on external data for making better strategy.
		M5	As a manager, I want to know the real time p2p electricity market, so that I can improve the algorithm to manage the energy.	Offer market trading platform for P2P energy transaction.
4	As an electric company cooperator, I want to control the energy usage.	**E1**	As an electric company cooperator, I want the ECLIPSE Smart Solar Inverter could connect the power grid, so that I could get access to that energy and manage it.	Offer new product (the AERO-System)

		E2	As an electric company cooperator, I want get access the information of expected energy consumption and feasible energy generation, so that I can reduced energy costs.	Offer functionality for lower energy cost
5	As an electric company cooperator, I want to use the AERO-System	**E3**	As an electric company cooperator, I want to make sure the Smart Meter could connect the power grid database through the interface, and then get usage from it successfully, so that I could get profit from the project, and electricity usage feedback report from the system could be used to adjust our work strategy.	Offer new product (the AERO-System)
6	As a consumer, I want to have successful energy transformation	**C1**	As a consumer, I want to use ECLIPSE smart solar inverter, so that I can get the electricity energy transformed from solar energy.	Offer new product (the AERO-System)
7	As a consumer, I want to manage my inverter configuration	**C2**	As a consumer, I want to set up the inverter with my preference, so that I can get better user experience.	Offer user-friendly interface
		C3	As a consumer, I want to receive alerts about system malfunction detection, so that I	Enable users to make their own decision for electricity transaction

			can know the energy strategy opportunely.	
8	As a consumer, I want to manage my energy usage.	**C4**	As a consumer, I want to monitor the energy usage, so that I can manage my energy usage more reasonable.	Enable users to make their own decision for electricity transaction
		C5	As a consumer, I want to control my own energy strategy, so that I can make better decision for energy usage.	Offer advanced algorithm for the smarter inverter to help users make better decisions
9	As a consumer, I want to manage my transaction.	**C6**	As a consumer, I want to buy and sell electricity online, so that I can make profits.	Offer energy transaction between users and grid
		C7	As a consumer, I want to check my trading account, so that I can ensure the security of my account.	Provide predictive analytics on external data for making better strategy
10	As a seller, I want to see my personal account information.	**S1**	As a seller, I want to check my current account balance as soon as possible with the help of trading platform, so that I could check if the money added into my account and the transaction is successful.	Provide predictive analytics on external data for making better strategy
11	As a seller, I want to predict the marketing situation for the strategy.	**S2**	As a seller, I want to get access to predictive information, so that I can modify my selling strategy.	Provide predictive analytics on external data for making better strategy

		S3	As a seller, I want to monitor market situation through trading platform, so that I could set a reasonable selling price	Provide predictive analytics on external data for making better strategy
12	As a seller, I want to use it conveniently.	**S4**	As a seller, I want to have user-friendly transaction process with the trading platform, so that I could get sale more and get more profits.	Offer user-friendly interface
13	As a seller, I want to access the Market Trading Platform to see all my transaction history details	**S5**	As a seller, I want to get access the Market Trading Platform to view all my transaction history details, so that I could get my financial report each term.	Provide predictive analytics on external data for making better strategy

4.3 Low-Level User Stories

Story Id	Feature-Level Story	Low-Level Story		Business Driver
		Story Id	Description	
M1	As a manager, I want to get access to the DER manager system, so that I can check the information of energy use in the ECLIPSE smart solar inverter.	**M1-1**	As a manager, I want to have an administer account in the DER manager system, so that I can get access to the DER manager system.	Offer new product (the AERO-System)
		M1-2	As a manager, I want to use my account to log in the DER manager system, so chat I can check energy information in the ECLIPSE part.	Offer new product (the AERO-System). The affordability of new technology.
M2	As a manager, I want to get the information of electricity consumption, so that I can adjust strategies to control how electricity is bought/sold on the market.	**M2-1**	As a manager, I want to have a data mined report based on electricity consumption, so that I can analyze the situation of consumption easily.	Provide predictive analytics on external data for making better strategy.
		M2-2	As a manager, I want to have a list of some based strategies in the system, so that I can adjust bought/sold strategies	Offer user-friendly interface. Offer advanced algorithm for the smarter inverter

			easily.	to help users make better decisions.
M3	As a manager, I want to get the weather information, so that I can make further analysis and prediction.	**M3-1**	As a manager, I want to get a data mined report of weather information based on data form weather bureau, so that I can make a prediction easily	Provide predictive analytics on external data for making better strategy.
M4	As a manager, I want to see the financial account, so that I can make better decision to make profile.	**M4-1**	As a manager, I want to see a data mined report based on the financial account, so that I can make a better decision to make profile.	Provide predictive analytics on external data for making better strategy.
M5	As a manager, I want to know the real time p2p electricity market, so that I can improve the algorithm to manage the energy.	**M5-1**	As a manager, I want to get a data mined report of the real time p2p electricity market information, so that I can improve the algorithm to manage the energy.	Offer market trading platform for P2P energy transaction.
		M5-2	As a manager, I want to get a suggestion of algorithm based on the report, so that I can manage the algorithm easily.	Offer advanced algorithm for the smarter inverter to help users make better decisions.

E1	As an electric company cooperator, I want the ECLIPSE Smart Solar Inverter could connect the power grid, so that I could get access to that energy and manage it.	**E1-1**	As an electric company cooperator, I want the ECLIPSE Smart Solar Inverter provide a useful interface for the power grid, so that I can get access the energy and manage it.	Offer new product (the AERO-System). Offer functionality to increase electricity productivity.
E2	As an electric company cooperator, I want to make sure the Smart Meter could connect the power grid database through the interface, and then get usage from it successfully, so that I could get profit from the project, and electricity usage feedback report from the system could be used to adjust our work strategy.	**E2-1**	As an electric company cooperator, I want the Smart Meter to provide a feedback interface for the power grid database, so that I can get feedback report form the system and adjust our work strategy.	Offer new product (the AERO-System). Offer functionality for lower energy cost.
		E2-2	As an electric company cooperator, I want the Smart Meter to provide a usage interface for the power grid, so that I can get profit form the project.	Offer user-friendly interface； The affordability of new technology. Offer functionality for

				lower money cost on energy.
E3	As an electric company cooperator, I want get access the information of expected energy consumption and feasible energy generation, so that I can reduced energy costs.	**E3-1**	As an electric company cooperator, I want to get a data mined report based on expected energy consumption and feasible energy generation, so that I can analyze the consumption easily.	Provide predictive analytics on external data for making better strategy
C1	As a consumer, I want to use ECLIPSE smart solar inverter, so that I can get the electricity energy transformed from solar energy.	**C1-1**	As a consumer, I want to set up the ECLIPSE smart solar inverter by calling the company, so that I can get the electricity energy transformed from solar energy.	Offer user-friendly interface. Offer functionality for lower money cost on energy.
C2	As a consumer, I want to set up the inverter with my preference, so that I can get better user experience.	**C2-1**	As a consumer, I want to log in the system, so that I can check my preference.	Offer new product (the AERO-System). The affordability of new technology.

		C2-2	As a consumer, I want to update my preference including configure the wifi details in DER manager and cloud login in mobile interface, so that I can get better experience.	Offer new product (the AERO-System). The affordability of new technology.
C3	As a consumer, I want to monitor the energy usage, so that I can manage my energy usage more reasonable.	**C3-1**	As a consumer, I want to check the information of my energy usage such as electricity balance in mobile interface, so that I can manage my energy more reasonable.	Enable users to make their own decision for electricity transaction. Offer functionality for lower money cost on energy.
C4	As a consumer, I want to receive alerts about system malfunction detection, so that I can know the energy strategy opportunely.	**C4-1**	As a consumer, I want to receive alerts whatever the mobile interface is running or not, so that I can know the energy strategy opportunely.	Offer user-friendly interface. Enable users to make their own decision for electricity transaction

C5	As a consumer, I want to control my own energy strategy, so that I can make better decision for energy usage.	**C5-1**	As a consumer, I want to get a data mined report based on my own energy consumption, so that I can make adjust a better energy strategy.	Offer advanced algorithm for the smarter inverter to help users make better decisions Offer functionality for lower money cost on energy.
		C5-2	As a consumer, I want to get a suggestion of energy strategy based on my own energy consumption, so that I can make better decision for energy usage.	Offer advanced algorithm for the smarter inverter to help users make better decisions.
		C5-3	As a consumer, I want to change my own energy strategy, so that I can chose my favorite strategy.	Enable users to make their own decision for electricity transaction.
C6	As a consumer, I want to buy and sell electricity online, so that I can make profits.	**C6-1**	As a consumer, I want to use mobile interface to buy or sell electricity online, so that I can make profits.	Offer energy transaction between users and grid.

C7	As a consumer, I want to check my trading account, so that I can ensure the security of my account.	**C7-1**	As a consumer, I want to have access to my trading account safely, so that I can use it to buy electricity	Offer new product (the AERO-System); Offer energy transaction between users and grid.
		C7-2	As a consumer, I want to check my trading account information such as the transfer funds, bank detail and balance in mobile interface, so that I can know my balance opportunely.	Offer new product (the AERO-System); Offer user-friendly interface;
S1	As a seller, I want to check my current account balance as soon as possible with the help of trading platform, so that I could check if the money added into my account and the transaction is successful.	**S1-1**	As a seller, I want to check my trading account information in mobile interface so that I can check if the money added into my account and the transaction is successful.	Offer user-friendly interface. Provide predictive analytics on external data for making better strategy
S2	As a seller, I want to get access to predictive information, so that I can modify my selling strategy.	**S2-1**	As a seller, I want to get a data mined report of predictive information, so that I can modify my selling strategy.	Provide predictive analytics on external data for making better

				strategy.
		S2-2	As a seller, I want to get a suggestion of market strategy, so that I can get more profile using this strategy.	Enable users to make their own decision for electricity transaction.
S3	As a seller, I want to monitor market situation through trading platform, so that I could set a reasonable selling price	**S3-1**	As a seller, I want to check out my market situation, so that I can adjust my market strategy	Offer user-friendly interface
		S3-2	As a seller, I want to change my selling price, so that I can get more profit.	Offer user-friendly interface
S4	As a seller, I want to have user-friendly transaction process with the trading platform, so that I could get sale more and get more profits.	**S4-1**	As a seller, I want to have more APIs for transaction process so that I can pay or get money in different ways.	Offer user-friendly interface.
		S4-2	As a seller, I want a safe, quick, and convenient transaction process, so that I can use it easily.	Offer user-friendly interface.

S5	As a seller, I want to get to access the Market Trading Platform to view all my transaction history details, so that I could get my financial report each term.	**S5-1**	As a seller, I want to have access to the Market Trading Platform in mobile interface, so that I can view all my transaction details.	Offer new product (the AERO-System). Offer user-friendly interface.
		S5-2	As a seller, I want to get a financial report form Market Trading Platform, so that I can manage my selling strategy easily.	Enable users to make their own decision for electricity transaction.

4.4 Proposed IT Solution

The Main proposed IT solution for this project is creating server-client system. The manager will control the server which is the DER Manager System in the cloud and the users will use mobile interface as client to get access to the server. All data getting from nodes in Manager DER SaaS will storage in the database in cloud. The following table showing specific IT solution linked to feature-level user stories and business driver.

IT Solution Id	Proposed IT Solution	User Story Id	Reasons	Business Driver
1	Creating a server-client system to develop Manager DER SaaS project.	**ALL**	The sever-client architecture is reliable and easy to develop.	Offer new product (the AERO-System)
2	Creating a user-friendly UI in server and client.	**ALL**	It is easily for users to use if the UI is user-friendly.	Offer user-friendly interface.

3	Using a database to storage a specific information.	**M1** **M2**	It is easily for database to storage data of account or information.	The affordability of new technology.
4	Letting the data in the database can be searched, updated, inserted and deleted.	**C2** **C3** **C5** **C7** **S4**	The database should be able to be executed by users.	The affordability of new technology.
5	Creating a API using PHP language to get access the database	**M1** **M3** **E1** **E2** **C2** **C7** **S1** **C6**	An API can let mobile interface get access the cloud system more easily and PHP language is a suitable language to build an API.	The affordability of new technology.
6	Gathering all information using data mining technology in DER Manager System and send it to the mobile interface	**M2** **M3** **M4** **E3** **C5** **M5** **S1** **S2**	Data mining technology can find more useful information and let users figure out their reports easily.	Enable users to make their own decision for electricity transaction.
7	Using machine learning technology to predict the most suitable strategy	**C5** **M5** **S2**	Machine learning technology is a popular technology to predict trend.	Provide predictive analytics on external data for making better strategy.
8	Setting up an alerting	**M3**	Alerting mechanism can help data	Enable

	mechanism in cloud server	**M4** **E2** **C3** **C4** **M5** **S1** **S4**	to be updated opportunely.	users to make their own decision for electricity transaction
9	Using existing APIs such as Bank API to rich project's functions.	**S3**	Existing APIs can reduce works and rich projects' functions	Offer energy transaction between users and grid. Offer market trading platform for P2P energy transaction.
10	Create a team to maintain the system.	**ALL**	Some bugs need to be solved after the product publishing	Offer new product (the AERO-System). The affordability of new technology.

5. Software Development Life Cycle(SDLC)

5.1 Team Velocity

The total story points for all user stories are 119. We have 5 sprints. We plan to do one sprint per week. Hence, the Team Velocity is 23.8 points/sprint.

5.2 Sprint Backlog

Sprint	User story ID	As a/an …	I want to …	So that …
Sprint 1	1	manager	have an administer account in the DER manager system	I can get access to the DER manager system.
	2	manager	use my account to log in the DER manager system	I can check energy information in the ECLIPSE part.
	3	manager	have a data mined report based on electricity consumption	I can analyze the situation of consumption easily.
	4	manager	have a list of some based strategies in the system	I can adjust bought/sold strategies easily.
	5	manager	get a data mined report of weather information based on data form weather bureau	I can make a prediction easily.
	6	manager	see a data mined report based on the financial account	I can make a better decision to make profile.
	7	manager	get a data mined report of the real time p2p electricity market information	I can improve the algorithm to manage the energy.
	8	manager	get a suggestion of algorithm based on the report	I can manage the algorithm easily.
Sprint 2	1	electric company cooperator	the ECLIPSE Smart Solar Inverter provide a useful interface for the power grid	I can get access the energy and manage it.
	2	electric company	the Smart Meter to provide a feedback	I could get feedback report form the system and adjust our work strategy.

		cooperator	interface for the power grid database	
	3	electric company cooperator	the Smart Meter to provide a usage interface for the power grid	I can calculate my profit based on the usage of electricity.
	4	electric company cooperator	get a data mined report based on expected energy consumption and feasible energy generation	I can analyze the consumption easily.
Sprint 3	1	consumer	set up the ECLIPSE smart solar inverter by calling the company	I can get the electricity energy transformed from solar energy.
	2	consumer	log in the system	I can check my preference.
	3	consumer	update my preference including configure the wifi details in DER manager and cloud login in mobile interface	I can get better user experience.
	4	consumer	check the information of my energy usage such as electricity balance in mobile interface	I can manage my energy more reasonable.
	5	consumer	receive alerts whatever the mobile interface is running or not	I can know the energy strategy opportunely.
Sprint 4	1	consumer	get a data mined report based on my own energy consumption	I can make adjust a better energy strategy.
	2	consumer	get a suggestion of energy strategy based on my own energy consumption	I can make better decision for energy usage.
	3	consumer	change my own energy strategy	I can choose my favorite strategy.
	4	consumer	use mobile interface to buy or sell electricity online	I can make profits.
	5	consumer	have access to my trading account safely	I can use it to buy electricity.
	6	consumer	check my trading account information	I can know my balance opportunely.

			such as the transfer funds, bank detail and balance in mobile interface	
Sprint 5	1	seller	have access to the Market Trading Platform in mobile interface	I can view all my transaction details.
	2	seller	get a financial report form Market Trading Platform	I could manage my selling strategy easily.
	3	seller	get a data mined report of predictive information	I could modify my selling strategy.
	4	seller	get a suggestion of market strategy	I can get more profile using this strategy.
	5	seller	have more APIs for transaction process	I can pay or get money in different ways.
	6	seller	a safe, quick, and convenient transaction process	I can use it easily.
	7	seller	check my trading account information in mobile interface	I can check if the money added into my account and the transaction is successful.

5.3 Acceptance Condition and Story Points

Low-Level Story ID	Acceptance Condition	Story Point
M1-1	Manager has its own account to access the DER Manager System.	**1**
M1-2	Manager can log in the DER Manager System.	**2**
M2-1	Manager can check the electricity consumption report on the DER Manager System.	**5**
M2-2	Manager can check the strategies list on the DER Manager System.	**1**
M3-1	Manager can check the weather information report on the DER Manager System	**5**
M4-1	Manager can check the financial report on the DER Manager System	**5**
M5-1	Manager can check the p2p market information on the DER Manager System	**5**
M5-2	Manager can get a algorithm suggestion form the DER Manager System	**8**

E1-1	Electric Company cooperator can use the energy that is generated by Smart Solar Inverter	**5**
E2-1	Electric company cooperator gets some feedback on their interface	**5**
E2-2	Electric company cooperator gets usage information form the system	**5**
E3-1	Electric company cooperator can check the energy consumption and energy generation report	**5**
C1-1	Consumer can set up the Smart Solar Inverter	**1**
C2-1	Consumer can log in the system	**2**
C2-2	Consumer can update their own preference on the mobile interface	**2**
C3-1	Consumer can check their own usage, balance information on the mobile interface	**2**
C4-1	Consumer can receive alert on the mobile interface when the energy strategy has been changed	**3**
C5-1	Consumer can check the energy consumption report on the mobile interface	**5**
C5-2	Consumer can get some suggestions to adjust their own energy strategy	**8**
C5-3	Consumer can adjust their own energy strategy	**2**
C6-1	Consumer can buy or sell their energy on the mobile interface	**8**
C7-1	Consumer have access to their own trading account on the mobile interface	**2**
C7-2	Consumer can check their own trading account information on the mobile interface	**2**
S1-1	Seller can view the transaction detail on the mobile interface	**2**
S1-2	Seller can check a financial report on the mobile interface	**5**
S2-1	Seller can check a predictive transaction report on the mobile interface	**5**
S2-2	Seller can get some suggestions to adjust their own market strategy	**8**
S3-1	Seller can finish their transaction process by many methods on the mobile interface	**3**
S3-2	Seller can finish transaction process easily without security risks	**5**
S4-1	Seller can check the trading account information on the mobile interface	**5**

5.4 SDLC Trello Board

The SDLC Trello board link: https://trello.com/b/P79IpMB2/sdlc

5.4.1 Clarification of Agile swim lane

Business-Level User Stories
place all business-level user stories. We provide a label “role” that indicates whose user story this is. They are manger, electric company cooperator, consumer and seller.

Feature-Level User Stories
place all feature-level user stories. We add a label to indicate its priority of a task.

Low-Level User Stories
place all low-level user stories. We allocate a story point to each user story.

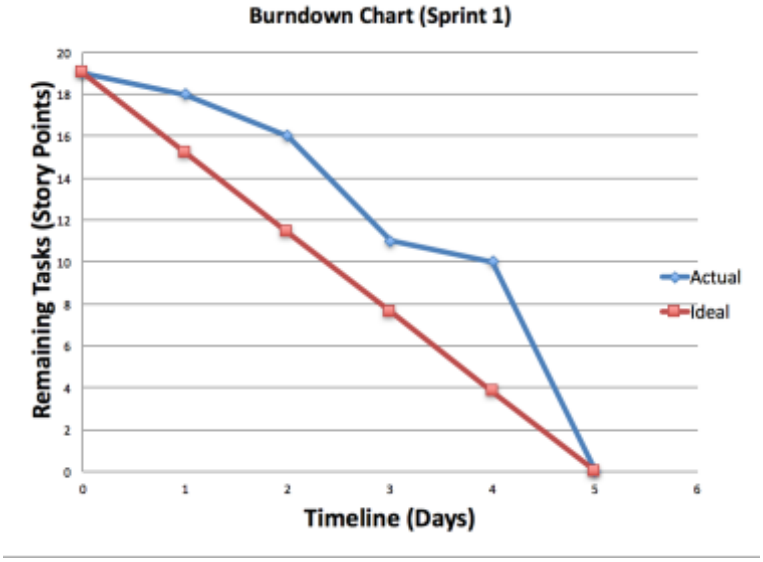
Sprint Backlog
place all sprints needed to be iterated.

In progress
place current sprint we are doing.

Done
place all sprints that have been done.

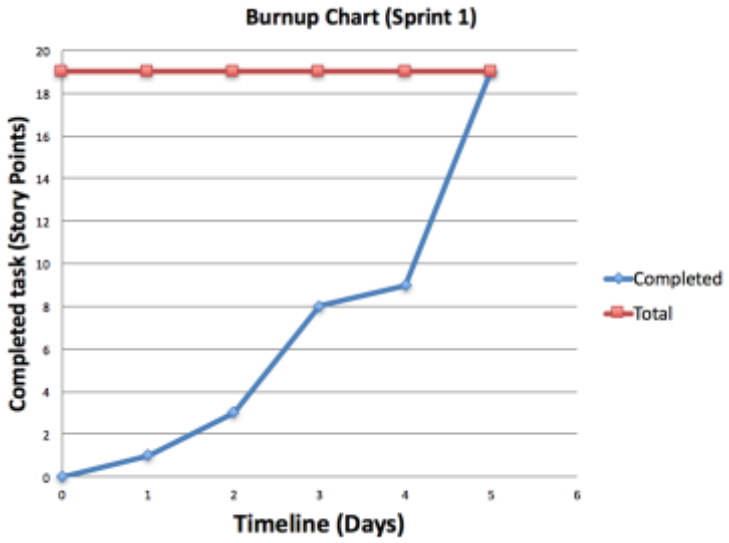
5.5 Sprint 1 Burndown Chart

A Burndown Chart provides a visual view for agile teams to get an idea of what has been accomplished and what is expected to do in a sprint. By viewing the chart, one can forecast release date of a sprint and check if any changes of scope are needed or if extra resources are required to deliver key features and functionalities on time. Basically, it provides a real-time tracking view for group members to monitor the progress and shows the current stand in a sprint. By looking at our Burndown chart for Sprint 1, half the work had done in the last day indicating work completion is behind schedule, which could cause by Sprint contains tasks with high story points.



5.6 Sprint 1 Burnup chart

Unlike Burndown chart, a Burnup chart tracks completed work and total work with two different lines, one is a work completed line; the other is the project scope line, it indicates the total amount of work to be completed and it also shows any changes regarding the total amount of work. By using a Burnup chart, agile teams can scope creep by looking at the project scope line to see if too many extra works been added to the total amount of work, which could lead to fail to complete the project on time. From the Burnup chart of Sprint 1, seem like the total amount of work had been consistent without any changes.



6. Conclusion

In conclusion, for establishing the new AERO System, many details should be included in the management. After defining the scope of the project and identifying different phases of PM Task List, a swim lane is created according to PM task card. Besides, the Product Backlog is listed with business-level and feature-level epics. Their relative priorities are also emphasized. In addition, a SDLC swim lane board is created according to the sprint backlog items. For the solution part, specific feature-level stories with expected IT implementations are shown linked to their business divers. The complete process of management would be the critical component for the success of the project.

7. Reference

[1] Cervino, B. (2016). Trello Agile Series: The Sprint Board. Retrieved from https://www.youtube.com/watch?v=pFbVxXOvQ8I&list=PL5YcgKPAsqiWCZuifUp9vJVwsDIjGroM-.

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[3] Nervegna, T. (2014). 10 tips for using Trello as an effective Agile Scrum project management tool. Retrieved from http://tommasonervegna.com/blog/2014/1/9/10-effective-tips-for-using-trello-as-an-agile-scrum-project-management-tool.

[4] Markgraf, B. (2015). Six Methods for the Estimation of Activity Duration in Project Management. Retrieved from http://smallbusiness.chron.com/six-methods-estimation-activity-duration-project-management-41782.html.

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Appendix A – Meeting Agenda and minutes

1. First Meeting Agenda

Team *Swag* Agenda
Date: *7 September 2017*
Location: *Brownless Biomedical Library*

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1. Apologies

   Lan Zhou has informed the team that she will be late for 1 hour.

2. Who has read the assignment Spec

   Everyone has read the assignment Spec.

3. Scrum Master's Role and Responsibilities

   Shuai Wang is the Scrum Mater of the team. He is mainly responsible for project management and set up meetings.

4. Next activity for the assignment

   Discuss Project Management Plan and Software Development Life Cycle.

5. Other tasks

   Sign up a Trello account so that we can create a team on Trello.

2. First meeting minutes

Minutes

Meeting of: *SWAG*
Held at: *Brownless Biomedical Library*
Date: *7 September 2017*
From: *2:30PM – 4:30PM*

Opening:

The regular meeting of the SWAG was opened at 2:30PM on Thursday in Brownless Biomedical Library by Shuai Wang.

Present:

Shuai Wang
Yu Han
Lan Zhou
Hao Mai
Shaoqing Liu

Approval of agenda:

The agenda was unanimously approved as distributed.

Approval of minutes

The minutes of the previous meeting were unanimously approved as distributed.

Project Plan: Week 7, Date 04/09/2017					
Task	Who: Resources	Estimated Time	Actual Time	Completed	Comment
Team meeting to discuss Narrative Overview	All	2 hours	2 hours	yes	Roughly complete list of high-level "epic" User Stories in Product Backlog
Conclude the context of case study	Shuai Wang	1 hour	1 hour	yes	Completed
Identify business objectives	Lan Zhou	1 hour	1 hour	yes	Well done
Describe the depth of understanding of the design problem	Hao Mai	1 hour	1 hour	yes	Well done
Finish Product Backlog	Shaoqing Liu & Yu Han	3 hours	3 hours	yes	Good job

Next meeting

The next general meeting will be at 3:30PM on Monday 11 September 2017 at ERC.
Minutes submitted by: Shuai Wang
Approved by: Shuai Wang

3. second meeting minutes

Minutes

Meeting of: *SWAG*
Held at: *Brownless Biomedical Library*
Date: *14 September 2017*
From: *2:00PM – 3:15PM*

Opening:

The regular meeting of the SWAG was opened at 2:00PM on Thursday in Brownless Biomedical Library by Shuai Wang.

Present:

Shuai Wang, Yu Han, Lan Zhou, Hao Mai, Shaoqing Liu

Approval of agenda:

The agenda was unanimously approved as distributed.

Approval of minutes

The minutes of the previous meeting were unanimously approved as distributed.

Project Plan: Week 8, Date 14/09/2017					
Task	Who: Resources	Estimated Time	Actual Time	Completed	Comment
Team meeting to discuss what should be included in submission	All	15 minutes	15 minutes	yes	SDLC is not sure whether should be added or not.
Discuss how to add PMP to visual board	All	20 minutes	20 minutes	yes	The x axis of burndown chart has not decided yet.
Discuss about Solution Overview	All	20 minutes	20 minutes	yes	Hardly to understanding the meaning of requirements
Discuss about how to show low-level and high-level card in visual board	All	15 minutes	15 minutes	yes	This question need to be asked to tutor

Next meeting

The next general meeting will be at 3:15PM on Monday 18 September 2017 at ERC.
Minutes submitted by: Hao Mai
Approved by: Shuai Wang

4. Third meeting minutes

Minutes

Meeting of: *SWAG*
Held at: *ERC Library*
Date: *18 September 2017*
From: *2:30PM – 4:30PM*

Opening:

The regular meeting of the SWAG was opened at 2:30PM on Monday in ERC Library by Shuai Wang.

Present:

Shuai Wang, Yu Han, Lan Zhou, Hao Mai, Shaoqing Liu

Approval of agenda:

The agenda was unanimously approved as distributed.

Approval of minutes

The minutes of the previous meeting were unanimously approved as distributed.

Project Plan: Week 9, Date 18/09/2017					
Task	Who: Resources	Estimated Time	Actual Time	Completed	Comment
Team meeting to reflect feedback of Narrative Overview from the tutor	All	30 mins	30 mins	yes	The understanding of the project is clearer
Discuss the structure of report	All	1 hour	1 hour	yes	Have a clear understanding of structure of report
Assign tasks	All	30 mins	30 mins	yes	Assigned tasks to everyone

Next meeting

The next general meeting will be at 2:30PM on Friday 22 September at ERC
Minutes submitted by: Lan Zhou
Approved by: Shuai Wang

5. Fourth meeting minutes

Minutes

Meeting of: *SWAG*
Held at: *ERC Library*
Date: *22 September 2017*
From: *2:30PM – 6PM*

Opening:

The regular meeting of the SWAG was opened at 2:30PM on Friday in ERC Library by Shuai Wang.

Present:

Shuai Wang, Yu Han, Lan Zhou, Hao Mai, Shaoqing Liu

Approval of agenda:

The agenda was unanimously approved as distributed.

Approval of minutes

The minutes of the previous meeting were unanimously approved as distributed.

Project Plan: Week 9, Date 22/09/2017					
Task	Who: Resources	Estimated Time	Actual Time	Completed	Comment
Each team member reports the percentage completed on their own tasks.	All	30 mins	30 mins	yes	All tasks are almost done. Need to refine.
Refine PM Tasks	Yu Han & Lan Zhou	4 hours	5 hours	yes	Fully identify all PM tasks.
Create PMP Trello board	Shuai Wang	2 hours	3 hours	yes	Have a basic and general PMP board. Need to allocate story points to tasks.
Propose IT solution & Identify the scope of project	Hao Mai	2 hours	2 hours	yes	Excellent work
Refine Narrative Overview	Shaoqing Liu	3 hours	3 hours	yes	According to feedback, the quality of this section is improved.

Next meeting

The next general meeting will be at 2:30PM on Monday 2 October at ERC.
Minutes submitted by: Yu Han
Approved by: Shuai Wang

6. Fifth meeting minutes

Minutes

Meeting of: *SWAG*
Held at: *ERC Library*
Date: *2 October 2017*
From: *2:30PM – 4:30PM*

Opening:

The regular meeting of the SWAG was opened at 2:30PM on Monday in ERC Library by Shuai Wang.

Present:

Shuai Wang, Yu Han, Lan Zhou, Hao Mai, Shaoqing Liu

Approval of agenda:

The agenda was unanimously approved as distributed.

Approval of minutes

The minutes of the previous meeting were unanimously approved as distributed.

Project Plan: Week 10, Date 2/10/2017					
Task	Who: Resources	Estimated Time	Actual Time	Completed	Comment
Discuss the feedback about PMP board from our tutor	All	20 mins	20 mins	yes	Identified time estimated, consumed points, resources allocated issues
Figure out how to abstract business level user story	All	1 hour	1 hour	yes	Got some ideas.
Assigning tasks to each member	All	30 mins	30 mins	yes	Completed
Create SDLC Trello board, add product backlog and sprint backlog into Trello, create burndown chart and burnup chart.	Shuai Wang	2 days	2 days	yes	Completed
Abstract business-level user story	Yu Han	2 hours	2 hours	yes	Completed
Write Acceptance Conditions for user stories	Shaoqing Liu & Hao Mai	2 days	2 days	yes	Excellent
Allocate story point to each user story	Shaoqing Liu & Lan Zhou & Shuai Wang	2 days	2 days	yes	Finished

Next meeting

The next general meeting will be at 2:30PM on Wednesday 4 October at ERC.
Minutes submitted by: Shaoqing Liu
Approved by: Shuai Wang

7. Sixth meeting minutes

Minutes

Meeting of: *SWAG*
Held at: *ERC Library*
Date: *5 October 2017*
From: *2:30PM – 3:30PM*

Opening:

The regular meeting of the SWAG was opened at 2:30PM on Thursday in Brownless Bio Medical Library by Shuai Wang.

Present:

Shuai Wang, Yu Han, Lan Zhou, Hao Mai, Shaoqing Liu

Approval of agenda:

The agenda was unanimously approved as distributed.

Approval of minutes

The minutes of the previous meeting were unanimously approved as distributed.

Project Plan: Week 10, Date 5/10/2017					
Task	Who: Resources	Estimated Time	Actual Time	Completed	Comment
Allocate story points to all low-level user stories.	All	30 mins	30 mins	yes	Completed
Check the progress of SDLC Trello board	All	10 mins	10 mins	yes	Need to add specific description to each sprint backlog.
Compute Team Velocity	All	10 mins	10 mins	yes	Completed

Next meeting

The next general meeting will be at 2PM on Sunday 8 October at ERC.
Minutes submitted by: Shuai Wang
Approved by: Shuai Wang

Appendix B – Group Member Time-Sheet

1. Time Sheet by Shuai Wang

Individual Timesheet

Member Name: *Shuai Wang*
Team name: *SWAG*
Tutorial Day & Time: *Monday, 2:15-3:15pm*

Date	Activity	Planned	Actual
Monday 2 Sept	Reading assignment spec	1 hour	1 hours
Thursday 4 Sept	Attend meeting 1 in Brownless Biomedical Library to discuss Narrative Overview part of the report	2 hours	2 hours
Friday 4 Sept	Conclude the context of case study	2 hours	2 hours
Thursday 14 Sept	Attend meeting 2 in Brownless Biomedical Library to discuss how to build PMP Trello Board for high-level and low-level PM tasks and Solution Overview	1 hour	1 hour
Monday 18 Sept	Attend meeting 3 in ERC Library to reflect feedback of Narrative Overview from our tutor	2 hours	2 hours
Friday 22 Sept	Attend meeting 4 in ERC Library to report what we have done and refine PM tasks and IT solution.	2 hours	5 hours
Saturday 23 Sept	Create PMP Trello Board	3 hours	3 hours
Monday 2 Oct	Attend meeting 5 in ERC Library to discuss feedback about PMP board from our tutor. Figure out how to abstract business-level user story. Assign tasks to each member.	2 hour	2 hours
Wednesday 4 Oct	Create SDLC Trello Board	2 hours	3 hours
Thursday 5 Oct	Attend meeting 6 in Brownless Biomedical Library to allocate story points to all low-level user stories, check the progress of SDLC Trello board, compute Team Velocity.	1 hour	1 hour
Sunday 8 Oct	Write Clarification of SDLC Trello board swim lanes and update PMP Trello board.	2 hours	3 hours
Monday 9 Oct	Integrate each member’s part into a whole report	2 hours	2 hours

2. Time Sheet by Lan Zhou

Individual Timesheet

Member Name: *Lan Zhou*
Team name: *SWAG*
Tutorial Day & Time: *2:15pm ~ 3:15pm Monday*

Date	Activity	Planned	Actual
Monday 2 Sept	Reading assignment spec	1 hour	1 hours
Thursday 4 Sept	Attend meeting 1 in Brownless Biomedical Library	2 hours	2 hours
Thursday 4 Sept	Identify business objectives and drivers	1.5 hours	2 hours
Thursday 14 Sept	Attend meeting 2 in Brownless Biomedical Library	1 hours	1 hours
Monday 18 Sept	Attend meeting 3 in ERC	2 hours	2 hours
Friday 22 Sept	Attend meeting 4 in ERC	2 hours	5 hours
Friday 22 Sept	List PMP task and decompose to low-level	3 hours	5 hours
Monday 2 Oct	Attend meeting 5 in ERC	2 hours	2 hours
Thursday 5 Oct	Attend meeting 6 in Brownless Biomedical Library	2 hours	2 hours
Thursday 5 Oct	Describe how to monitor a sprint using Burnup and Burndown chart	1 hours	1.5 hours

3. Time Sheet by Hao Mai

Individual Timesheet

Member Name: *Hao Mai*
Team name: *SWAG*
Tutorial Day & Time: *2:15pm ~ 3:15pm Monday*

Date	Activity	Planned	Actual
Thursday 6 Sept	Reading the specification of the group assignment	30 minutes	45 minutes
Thursday 7 Sept	Attending the first meeting in Brownless Library talking about the user stories for case study and the division of works.	2 hours	2 hours
Friday 8 Sept	Writing the design problems of the case study and integrating all part of works.	1 hour	1 hour
Monday 11 Sept	Rereading the specification of the partc_i to prepare the next meeting.	30 minutes	20 minutes
Thursday 14 Sept	Attending the second meeting in Brownless Library. Discussing about what are including in partc_i and some specific problems in partc_i.	1 hours	1 hours
Monday 18 Sept	Attending the third meeting in ERC. Discussing about the structure of assignment and specific information of partc_i. Arranging team members' works and my own part is olution overview and the feature-level stories	2 hours	2 hours
Tuesday 19 Sept	Writing feature-level stories	1 hour	2 hours
Wednesday 20 Sept	Keep working for the feature-level stories and start to write some proposed IT solutions	2 hours	2 hours
Friday 22 Sept	Attending the forth meeting in ERC. Finishing my own part of assignment2. Combining other team members works.	3.5 hours	3.5 hours
Sunday 24 Sept	Modifying the feature-level stories and proposed IT solutions.	30 minutes	45 minutes
Monday 25 Sept	Modifying the proposed IT solutions	30 minutes	30 minutes
Monday 2 Octo	Attending the firth meeting in ERC. Discussing the feedback of PMP board. Assigning some works to me: The low-level user stories and their acceptance conditions in SDLC board.	2 hours	2 hours
Tuesday 3 Octo	Writing the low-level user stories and their acceptance conditions.	2 hours	2 hours
Thursday 5 Octo	Attending the sixth meeting in Brownless Library. Allocating story points to low-level user stories and adjust the assignment based on feedback	1 hour	1 hour
Saturday 7 Octo	Writing the team reflection and individual timesheet	1.5 hours	1.5 hours
Sunday 8 Octo	Filling in the teamwork template	15 minutes	15 minutes

4. Time Sheet by Shaoqing Liu

Individual Timesheet

Member Name: *Shaoqing Liu*
Team name: *SWAG*
Tutorial Day & Time: *Monday, 2:15pm-3:15pm*

Date	Activity	Planned	Actual
Wednesday 6 Sept	Reading assignment spec and case study	1 hour	2 hours
Thursday 7 Sept	Attend meeting 1 in Brownless Library. Discuss the business level user stories of this project.	2 hours	2 hours
Saturday 9 Sept	Create the product backlog table.	1 hour	3 hours
Thursday 14 Sept	Attend the second meeting in Brownless Library, discussing the work division for part c_i.	1 hour	1 hour
Saturday 16 Sept	Determine the priority of each user story and identify the business drivers of this project.	1 hour	2 hours
Sunday 17 Sept	Groom each part of narrative overview.	30 mins	30 mins
Monday 18 Sept	Attend the third meeting in ERC, discussing the structure and content of part c_i.	2 hours	2 hours
Friday 22 Sept	Attend the forth meeting in ERC, modifying the narrative overview part based on the feedback, including identifying the project constrains and modifying the project background and business objectives.	3.5 hours	3.5 hours
Monday 2 Oct	Attend meeting 5 in ERC, discussing the feedback of part c_i and work division of part c_ii.	2 hours	2 hours
Tuesday 3 Oct	Create the sprint backlog table.	2 hours	2 hours
Thursday 5 Oct	Attend meeting 6 in Brownless Library, allocating story point to each low-level user story and estimating the team velocity.	2 hours	2 hours
Saturday 7 Oct	Filling the individual timesheet and teamwork template.	1 hour	1.5 hours

5. Time Sheet by Yu Han

Individual Timesheet

Member Name: *YU HAN*
Team name: *SWAG*
Tutorial Day & Time: *Monday, 2:15pm-3:15pm*

Date	Activity	Planned	Actual
Thursday 6 Sept	Read assignment 2	20 minutes	40 minutes
Thursday 7 Sept	Attended our meeting 1 to divide our work on defining user stories in Brownless Library.	2 hours	2 hours
Friday 8 Sept	Wrote the user stories for sellers and electric company cooperator.	1 hour	1 hour
Thursday 14 Sept	Attended the meeting 2 in Brownless Library to define the requirements for the following part and discuss some problems.	1 hours	1 hours
Monday 18 Sept	Attended the meeting 3 in ERC to. discuss about the structure of assignment and all specific tasks of partc_i were assigned to members.	2 hours	2 hours
Wednesday 20 Sept	Discussed about the PMP identification and began to write PMP task lists.	1 hour	1 hours
Friday 22 Sept	Attended the meeting 4 in ERC to discuss our own parts for the assignment.	3.5 hours	3.5 hours
Saturday 23 Sept	Finished the PMP task list and introduction	2 hours	3 hours
Monday 25 Sept	Combined other member's parts for the report.	1 hour	2 hours
Monday 2 Oct	Attended the meeting 5 in ERC to discuss the feedback of PMP board and divide the new work for members. I finished my part, wrote the business driver user stories.	3 hours	3 hours
Thursday 5 Oct	Attended the meeting 6 in Brownless Library to set story points through votes. New work was also assigned to members to fix the problems based on the feedback.	1 hour	1 hour
Friday 6 Oct	Rewrote the PMP list tasks and identification according to feedback and wrote the introduction, conclusion and the summary.	2 hours	2.5hours
Saturday 7 Oct	Wrote the team reflection and individual timesheet	2 hours	3 hours
Sunday 8 Oct	Finished the teamwork template	15 minutes	15 minutes