bcis309

Methodology essay

Agile scrum



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# Introduction

Agile has become popular in software development as it addresses problems effectively in project management. There are different methodologies under Agile. As the only developer in Pyper Vision, I researched Agile and chose Scrum as the methodology to manage this project. In this essay, I will descript what Agile is, compare some of the methodologies, why I chose Scrum. After that, I will discuss Scrum for the individual, which suits my situation the best and how I adapted it in the industry. I will also conclude the lessons I learnt through the whole management process and how to improve it in the future.

# Agile

## What is Agile?

Agile Manifesto was written by 17 software practitioners in 2001 (Agile101, n.d.). Agile represents not just frameworks and practices but the values behind different approaches to dealing with change. Those approaches can help people to adapt to uncertainty and respond correctly. When Agile used in software development, 12 Principles based on the Agile Manifesto should be followed (12-principles-behind-the-agile-manifest, n.d.):

1. Deliver software at a fast pace and keep improving it is the most important thing.
2. Allow changing requirements in any phases of the development.
3. Continuously deliver working software through iterations.
4. Developers should cooperate with business people to understand the latest business environments and requirements.
5. Work with reliable people and trust their capability to accomplish the job.
6. Even though remote work is possible for software development, the most efficient communication is through face-to-face.
7. Working feature or software is the key point to measure the progress of a project.
8. The development can be continuously going on to meet users’ new requirements or make improvement.
9. Keep paying attention to improving technical and design skills.
10. Simplicity is better than complexity. Avoid wasting time on jobs that are not necessary.
11. Self-organizing teams create the best work.
12. Review previous jobs regularly and fine-tune the way of working next time.

## Common methodologies in Agile

Extreme programming (XP)

It is an efficient programming methodology involving customers and developers working intensively. Customers express their needs through testimonials, and developers achieve the requirement by accomplish a set of small tasks and testing the software at the same time (NAYDENOV, n.d.).

Scrum

It focuses more on how to manage projects consisting of a set of principles. Product owners collect information from business and transfer the requirements into the backlog for IT teams. Teams’ members will turn the distribution into sprints (NAYDENOV, n.d.).

Feature-Driven Development (FDD)

This methodology is built up with a list of features. Development and design testing plan are implemented through each feature development process (NAYDENOV, n.d.).

## Compare and Contrast.

Table : Pros and cons of agile methodologies

|  |  |  |
| --- | --- | --- |
|  | Pros | Cons |
| XP | * Efficiency * Minimum of document preparation. | * Works for a small team with a high level of discipline (NAYDENOV, n.d.). |
| Scrum | * A set for principles of managing projects. * Promote communication between colleagues. * Enable the team to spot issues at the development stage. * Most suitable for IT businesses | * Use scant records for handover to complete the sprint (NAYDENOV, n.d.). |
| FDD | * Provide high-quality documentation and code assessment. * Optimal for banking and financial sectors. | * Good for big organization. * Require a high level of planning and design skills (NAYDENOV, n.d.). |

# Scrum

## Why scrum?

As Pyper Vision is a start-up company and they have a small team, Scrum suits them best according to the pros and cons listed above. They aim to create a brand-new application. Along with the business growth, the requirements of the application might change from time to time. Scrum methodology creates a way for them to manage the workflow and increase productivity.

## Roles in Scrum

Scrum team: consists of three roles, one Scrum master, one Product Owner, and Developers (scrum-guide, n.d.).

Product owner: turns requirements into backlogs. They manage the order and content of backlogs and review the Increment at the end of each Sprint (scrum-guide, n.d.).

Scrum master: serves between Scrum team and other team members in the organization to apply Scrum well.

Developers: complete any usable Increment in each Sprint (scrum-guide, n.d.).

## Structure of Scrum

The Product owner defines the Product Backlog according to the project goals. The developers in Scrum Team fulfil Increment during a Sprint. The Scrum master facilitates the sprint process. Before repeating the process, Scrum Team reviews the result and adjust for the next Sprint.

# Scrum for individual

Scrum also works for individuals. The challenge is to switch the perspective from different roles and learn to be your own Product Owner, Scrum Master, and development team members.

As your own Product Owner, you need to fully understand the features and requirements of the project. Give a full explanation for each feature and even wireframes for later reference (Lucidchart Content Team, n.d.). Prioritize things to do to improve productivity.

As your own Scrum Master, you need to look at the problems from Scrum Master’s perspective whenever you get stuck and find ways to resolve the problems (Lucidchart Content Team, n.d.).

Being your own development team seems to be the easiest job to do. You still need to remind yourself to complete the job with the right attitude (Lucidchart Content Team, n.d.).

At the end of each sprint, summarise the process has been done and make improvement to the next sprint.

# Scrum in industry

## Roles in scrum

### Pyper Vision specialize in aviation technology (Pyper Vision, n.d.) and performing multiple jobs in Pyper Vision is common among team members. As the only developer in the team, I was willing to take three roles in the scrum team to better set up the plan for myself and boost productivity. After meeting with industry supervisor Athira, I have fully understood what kind of application they need.

### Product owner

As a product owner, I created a backlog list containing all features Pyper Vision needs for this project. Here is a draft of the requirements provided by Athira.

Figure : app structure from athira

A picture containing text, receipt

Description automatically generated

The main purpose of this app is to save the training time of using Pyper Vision’s dispersal system for the staff in different airport and ensure the staff follow the standard process required by Pyper Vision. They also want to create a Calendars page to trace back the log files on a specific date. I then transfer the requirements into doable features for developers.

Industry requirements

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

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

1. Sub-admin role feature

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

1. Staff role feature.

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

### Scrum master

It was intimidating when the first time seeing the deliverable list as I have never done a project like this before. Then I put myself into the role of the Scrum Master to solve the problem and break down the project into smaller tasks. After discussing with the team members, I decided to focus on the first three features which can bring more values to this project. I set one week as a sprint to push myself forward.

Before start coding, I designed the wireframe and entity-relationship diagram to get an overview of the app.

Figure : project wireframe1

Graphical user interface

Description automatically generated

Figure : project wireframe2Graphical user interface, application

Description automatically generated

Figure : project wireframe3Graphical user interface

Description automatically generated

Figure : project wireframe4Graphical user interface, application

Description automatically generated

Figure : project wireframe5

Graphical user interface, application

Description automatically generated

Figure : project version1 er diagram

Diagram, schematic

Description automatically generated

The first two sprints went well, and I finished the first version of this app. Then the CEO of Pyper Vision Emily arranged a meeting with me and the other two team members. They gave me more details about the project regarding the specific content in the operation form. They need the users in different airports to be able to choose their own flight paths, a drone model and a pilot who is going to control the drone. I realized that I had to redesign the project according to the new requirements.

Here is the entity-relationship diagram for version two of the web app.

Figure : project version2 er diagram

Diagram, schematic

Description automatically generated

### During the whole process, I found one of the hardest jobs comes from being a Scrum Master. This role takes a big responsibility for how well a project can move forward. Take me as an example, I design the entity-relationship diagram acts as a high-level design for the implementation phases later. I always refer to the diagram when I am a bit unsure about which models should create first and what properties should include when I work as a developer. Without a clear design beforehand, I would easily get confused when I dive deep into coding.

### Developer

I chose Laravel 8, MySQL as the backend language and database respectively. The principle for me as a developer is to deliver workable features as fast as I can. I decided to start from the feature I am more confident on and test early to prepare for the next step. The results turned out to be better than I expected. I managed to finish version one in three weeks, and I managed to develop many features, for example, role management, sending an email notification automatically and downloading files in excel format.

The reason that I can develop a project that fast was I convinced the supervisors to allow me to use the language I am more familiar with instead of a language they prefer. It was obvious to see the productivity dropping when I was moving to version three of this project. I decided to separate the back end, and front-end to improve some of the features. I chose to adopt React as the front-end framework which I did not know very well. Although learning a new framework benefited me a lot, the time consuming harmed the value delivered for the client. Therefore, as a Scrum Master, it is important to consider the developing team’s preference when it comes to choosing a language for a project.

## Azure DevOps tool

I started to Azure DevOps tool to manage the project. Its robust functions helped me save lots of time in each sprint. I can easily create backlogs, sprint, and drag and drop tasks in each sprint. Azure DevOps tool has been adopted by many software teams. It allows assigning jobs to different team members. I can imagine how easy it is going to manage a project in the future when I work in an IT team.

## Sprints

I have done 8 sprints in total, and I felt more and more comfortable using the scrum methodology to develop a project. Most of the sprints were gone through in a certain way, I would spend most of the time in a sprint finishing one or two features and the rest of the time testing new functions that I am not sure about. One of the functions was downloading the log file in excel format. I decided to do research online and create an endpoint and test it if I can download a file in excel format. I use less time and not stressed out in this way instead of implementing the feature when I am not ready.

## Review

I have a sprint review every Friday which is the end of a sprint. I am satisfied with the progress of the whole project. For most of the sprint review, I got feedback from IS and AS and then planned for next week. If possible, I would also make a priority of the functions I might need to test early in the next sprint. Also, I reviewed the project whenever I found things can be improved in the future and recorded them down immediately. This makes the improvement more efficient, and I do not have to spend a big chunk of time recalling something that I might have forgotten already.

Scrum has made this project developed more productively and I learned a lot from switch between different roles. Scrum for one will help me become a better team member in a bigger IT team as I will try to think ahead and solve problems myself. I have hands-on experience in understanding deliver workable features as fast as I can to bring value to the customers.

# Reflection

## Understand each role’s job in a Scrum Team better.

Scrum for one has taught me a lot about how each role works in a scrum team. The Product Owner needs to be very clear about the deliverables and give priorities about them. At the end of each sprint, the Product Owner is the one to review the result with team members and adjust for the next sprint. The Scrum Master deals with the problems confronted and finds a way to push the process go forward. This role works between different team members to clarify things for developers. The Developer role is the one to create increments and needs to have solid coding skills.

One of the other problems was industry supervisor is more comfortable with Python while I prefer to use PHP. I offered her two choices one is to give me time to learn Python leaving the result might unpredictable or allowing me to develop in Laravel which a PHP framework and I will be a more reliable person to deliver some results.

## Which part did well?

There are servals parts I did well during the development phase.

### As a product owner

I designed the backlogs into details that easy for a technical person to understand. It reduced the risk of misunderstanding and made sure everything is on the right track at the beginning.

### As a scrum master

I communicate with supervisors and other team members in time to get feedback from them. Making the right decisions when encountered problems. I decided to do lots of early tests before choosing which feature is going to build the next step. I also explained to team members to avoid certain time-consuming designs at an early stage instead to focus on core features working well.

### As a developer

I kept the whole team updated with what I have done during the stand-up meeting and managed to finish version one in three weeks earned me more time to upgrade the application in version two.

## Feedback about Azure DevOps

I used Azure DevOps to manage the project. The Boards feature offers me the best solutions to match the scrum methodology. In the Boards tag, I can click backlogs to view a list of backlogs and edit them on the same page. I can also create tasks under each backlog and assign them to different sprints. When I finish any task, I can change the task status to Done. It appears very clear at first glance about the progress for each backlog.

In the Board tag, I can also click sprints to view the detail of each sprint and create new tasks on the sprint page. I can drag and drop the task to the different status column. I used this page as my reference during the stand-up meeting to report to the team about what I did yesterday and what I am going to do today.

Azure DevOps has many features for new users to learn. It might get lost where to start at first, but once I found the features I need and get familiar with them, it is a very good tool for teams who are going to develop their product using the Scrum methodology.

## How to improve Scrum in the future.

Scrum for one has taught me a lot as it forced me to be a one-person team. I got a chance to understand different roles. However, a lot of things can be improved if I ever do scrum again.

Firstly, learn to explain technical concepts to people. Things will be different if I work in a big team and each person has their individual scrum role. More communication will be involved. I will discuss and clarity technical related questions with other developers, but this situation did not appear many for me to explaining or clarifying stuff with different team members in this project.

The other lesson that I learned was not to get scared when the requirements seem not clear at first. As a team member, focus on building the key features and get feedback will diminish the uncomfortable feeling gradually. The requirements might be vague in the first few sprints, it will be clearer as the process moving on.

Finally, I need to learn to think in other people’s position. It is not a problem when I conduct scrum for one as I know myself well and I can assign or design jobs better for myself. It might not be the same in a bigger team. What they think about the teamwork, how they take the challenges and what extra information they need to know to design the process in a better way might need me to think about to make sure everyone is on the same page. I believe I still have a lot to learn to be a Scrum Master who needs to have the strong technical knowledge and leadership skills to be better understand projects and organize a team.

In a bigger team, the situation might be more complex. However, the key value remains the same if the team uses Agile scrum as the methodology and that is to deliver the workable features fast and keep improving. The capstone project offered me the chance to explore the power of the scrum and how fast I can make progress.

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