

## Method Selection & Planning

### Proposed Software Engineering Method

Initially, our team had to choose between the Agile methodology and Waterfall model. However, as the structure of the project implies, the Waterfall model is not the best option for us because it focuses on isolated sequential work – analysis -> design -> code -> test, and it is not particularly good for fast-paced teams. Also, there is a large documentation overhead, which is not suitable for a small team because producing the documentation would be time consuming and is not necessary for non-safety critical applications like ours. Additionally, when using the Waterfall model, it is rather difficult to return to an earlier development stage, such as updating the implementation after conducting system tests, because it can involve modifying a lot of documentation. This is an important consideration because there is a high possibility that the requirements or architecture will change at some point during the project, and so our team decided to use one of the agile methodology methods, called Scrum, as this will be best suited for a small development team, as well as being most capable at adapting to requirement changes.

First, the project is divided into 4 short-period assignments, thus Scrum is perfect for this as it encourages short development cycles, i.e. sprints. Also, we first had to gather all of the requirements for the project from the client and other sources before starting the actual development. In our opinion, the Scrum workflow is ideal for this because within each sprint, a part of the requirements is developed into a shippable part of the product, which can be evaluated by the customer to ensure the product continues to meet their expectations.

Furthermore, a lot of thought was put into choosing a software development methodology, however before coming to a final decision, the structure of the team was decided. We think that as long as the team is managed correctly and work is done on time, there should be no strict structure. Besides, it was already clear that the team members were better suited for working towards all parts of the development, rather than each having an explicit role within the team.

### Development and collaboration tools

To begin with, as clear communication among team members is important and it is not necessarily the case that all work will be done during meetings and practicals, we had to find a suitable way for the team members to work remotely and keep in touch with each other. In addition, although the team is relative small and work-related collisions may be avoided, Scrum suggests that team members are encouraged to work on the same tasks and help each other, thus tools that could ensure high productivity and streamline our workflow are needed. Also, having in mind that it is very common for teams to have a lack of specific end date when using Scrum, we had to find a way to create and manage deadlines in our project. As a result, we chose these development and collaboration tools to include in our workflow:

- **Facebook Messenger** – This is used for group communication outside meetings and practicals.
- **Google Drive** – We use it to store temporary, work-in-progress documents. Google Docs features help us all work on the same document at the same time without any collisions.
- **Github** - We use it to store the source code and final documents. In addition, we take advantage of Github Pages feature and host our website on it.
- **Gantt charts** – Although this type of charts are not mentioned anywhere in the Agile methodology, we still use them to set deadlines for sprints, and, most importantly, track our time during each of them.

### Team Organisation

As a team we have opted for a fairly flexible plan for organisation that also makes it clear what everyone in the team needs to be doing at any given time.

Work is planned for the long term with deadlines for each section through use of a gantt chart. More short term plans are set by allocating work dynamically and is done in sprints. These sprints typically last a week and meetings are set in between so that the whole group can get an overview on what is being covered and offer input if needed.

As a team, during sprints we meet regularly face to face to organise our work deadlines and give updates on what we have been working on. In these meetings we analyse the work that we have done as well as discuss any issues that need to be resolved. If anyone is facing any difficulties the team will use these meetings to work together to help overcome them.

When starting a new sprint we assign work fairly evenly to each member of the team. If there is a member who feels they are more suited to a given task then they will usually say so and the work will be given to them. This also improves the motivation of the team as they are working on what interests them. The allocated tasks form the backlog of the sprint and a deadline is chosen for them.

When finishing a sprint we review the work and each member will explain the work to the rest of the team so that everyone is up to date with the project. This is also when feedback is given by the team and our progress is presented to the stakeholder if need be.

Our leader ensures that all the work is covered and assigned and encourages the rest of the team to get the work done while participating himself. The leader also manages and prioritises the backlog and verifies that the right work is being done.

The rest of the team does not have any set roles which allows flexibility in work. Each team member is given as much autonomy as possible with their work which ensures a sense of commitment however there is always focus on collaboration - work as a whole is seen as a shared responsibility and the team is usually collocated in its work to help achieve this.

As the team is quite small and there are no great differences in skillsets this seems to be the most natural approach. Meetings are also fairly informal and members of the team are encouraged to put forward their own ideas or ask questions without any pressure.

Work assigned to people within the group is monitored through documentation such as the ownership of risk mitigation but is mainly done over messenger and meetings as the deadlines are fairly short and without rigid work assignment as long as communication is performed whenever necessary it may be more of a hindrance to document precisely.

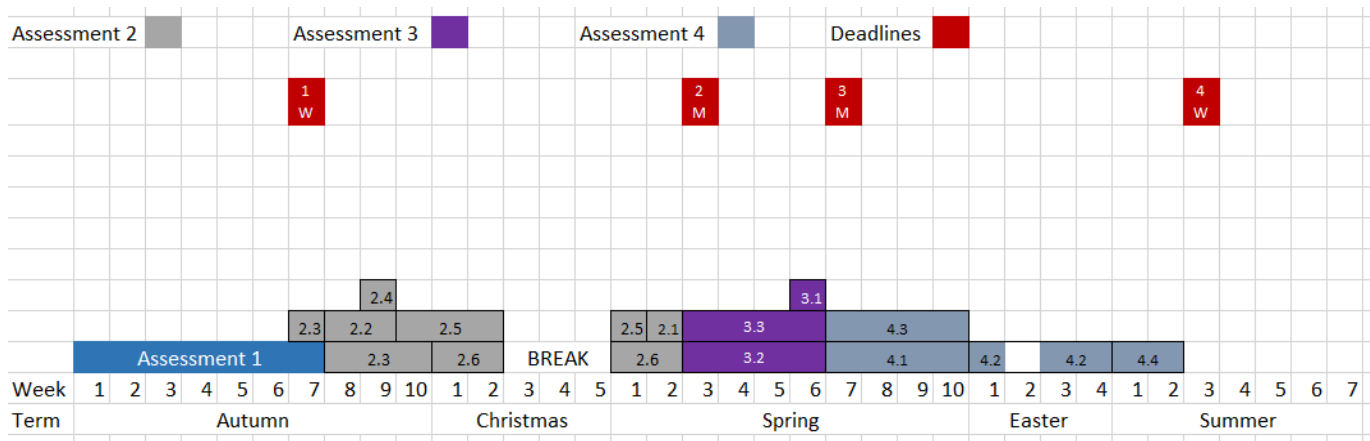
### Systematic Plan For Rest of Project

Gantt charts are being used within the team to organise our time and ensure that all the deadline are met. The Gantt charts also help by ensuring every team member knows what work is due and when rather than relying on needing to be told.

The current schedule can be seen below, although this schedule is subject to change as the project is executed. There is the chance that an unexpected issue arises such as a team member falling ill and being unable to complete their work, in such instances the schedule could be changed to accommodate such eventualities.

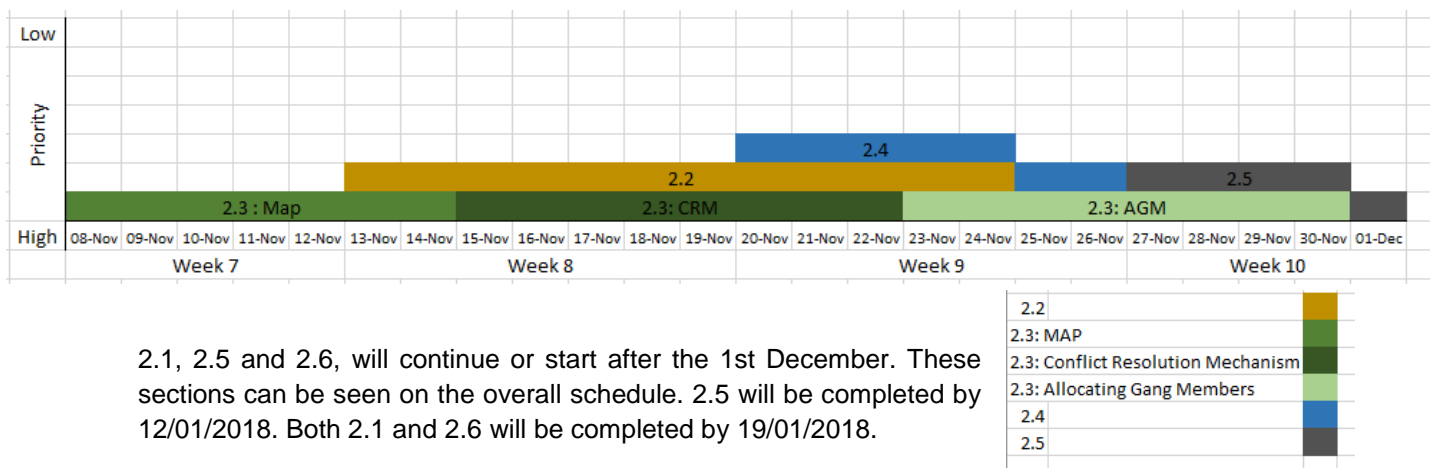
The segments of the project are listed using the reference number for the each individual assessment (i.e. Assessment 2 is split into 2.1, 2.2, 2.3, etc.). Each assessment is also colour coded to allow a clear visual representation of each assessment.

There are red indicators at the top of the Gantt chart that show when the deadlines are, the indicator contains the number of the assessment (1,2,3 or 4) and M or W (Monday or Wednesday). This helps



to visualise the time scale for the assessment in conjunction with the deadline itself.

A more indepth layout of the schedule for Assessment 2 can be seen below. Section 2.2 - 2.5 are displayed on the schedule below. This schedule shows how the group will be splitting the time allocated for 2.3 along with other sections of Assessment 2 that will be running in parallel. The priority for these tasks can be seen on the y-axis.



2.1, 2.5 and 2.6, will continue or start after the 1st December. These sections can be seen on the overall schedule. 2.5 will be completed by 12/01/2018. Both 2.1 and 2.6 will be completed by 19/01/2018.