Method Selection & Planning

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Method Selection

As a team, we have adopted the Agile Methodology due to its focus on the client, keeping them at the centre of development. The Agile Methodology allows us to immerse the client in the development process and enables us to respond dynamically to changes in their requirements through iterative development. Iterative development means we develop the software in small stages, with each iteration improving on the previous one. In contrast, a fixed approach involves a single, inflexible plan. As students, we are inexperienced; it is unrealistic for us to plan every stage of our project before we begin. Consequently, an agile approach benefits us, as we can correct our mistakes in real time without having to restructure an entire plan. Furthermore, using an agile approach also allows us to deliver software quickly to our clients, ensuring that we meet their requirements and enable them to see their product frequently. Moreover, using an agile approach allows us as a team to break the project down into smaller, more manageable tasks, helping us stay organised and structured.

Since Agile is our overall philosophy, we will use the Extreme Programming (XP) and Scrum frameworks during the development process. We chose to use XP as our main development framework because it provides practical engineering practices such as pair programming, test-driven development, and continuous integration, to ensure that our game is reliable and adaptable. Additionally, XP enables us to maintain a simple implementation, with a focus on frequent releases and iterations. It is much more efficient to work on one feature at a time and have another team member test these while others are being developed. XP promotes these practices and prevents us from developing the entire project before we discover issues with the implementation.

Using Scrum as our project management framework provides a flexible way to apply agile principles. We can organise our work into sprints, keeping the project manageable as team members can focus on one small feature at a time. Additionally, scrums enable better team collaboration, where everyone knows what they're working on and how their tasks fit into the sprint goal.

Tools

Documentation

For our documentation, we chose to use Google Docs because it is free to use and allows for real-time collaboration, enabling multiple team members to work on the same document simultaneously. Furthermore, with all files stored on the cloud, team members can access documentation anytime, anywhere, and from any device. Additionally, Google Docs automatically saves all changes, eliminating the risk of losing work. Likewise, the version history feature enables us to easily track edits and restore previous versions if needed.

Microsoft Word was considered as an alternative way of documentation due to its ease of use and familiarity with all team members. However, we chose Google Docs instead due to its real-time collaboration capabilities, which are essential for an Agile team, as we can see

updates instantly and leave comments for discussion. Also, the auto-save feature is crucial for preventing the risk of losing work, which would waste time and reduce productivity.

Communication

As a team, we chose WhatsApp as our primary communication method because all group members were already familiar with the app and had it installed. Furthermore, using a mobile app enabled us to communicate quickly, reducing delays compared to alternative methods such as email. The app also works on tablets and computers, allowing everyone to stay connected wherever they are.

Additionally, we also chose to use the Discord app due to its accessibility across multiple devices and familiarity. Its extensive feature list supports our agile approach. Features like voice channels are useful for pair programming sessions as they allow for quick discussions without the need to schedule formal meetings. Moreover, creating channels for different conversations allows us to keep them organised. Consequently, it is easier for us to find information later without having to scroll through a single large chat, as is often the case with WhatsApp. Discord's file-sharing feature also allows us to instantly share assets, such as sprites or code snippets, by simply dragging and dropping them into the chat.

For the second half of this project, WhatsApp was the only communication medium used, as some team members were unfamiliar with Discord. We made the decision to only use WhatsApp as it would be more time consuming for team members to create a new Discord account and familiarise themselves with the platform, rather than just using a platform all team members were already familiar with.

Version Control

We chose GitHub as our version control system because it supports code collaboration through the use of branches. These Branches allow multiple people to work on the same project simultaneously, which is essential for our agile approach. Branches will enable us to do this without accidentally overwriting someone else's work. Changes can then be merged smoothly using pull requests. In addition, GitHub maintains a full history of changes to code and documentation, allowing us to review and restore previous versions if necessary.

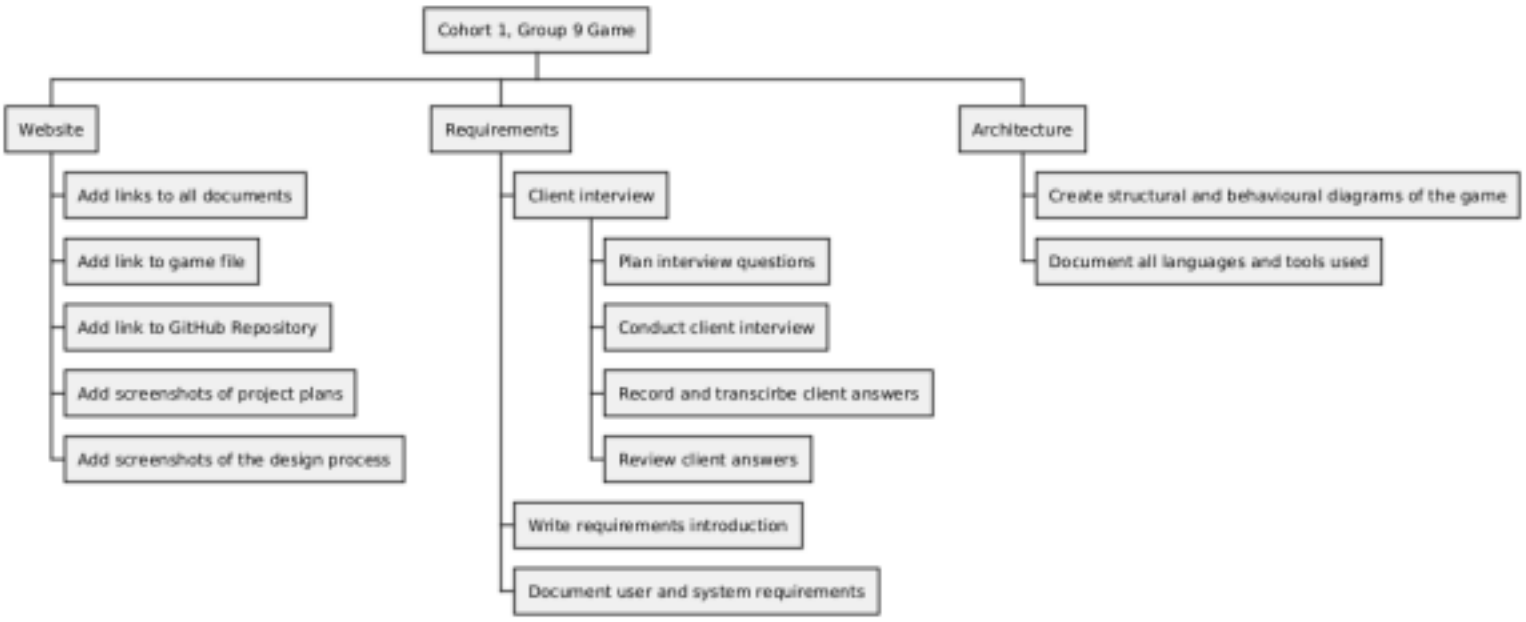
Another version control system considered was Apache Subversion since it is easy to understand and widely used. However, it encourages large commits, which contradicts our development framework of smaller iterative work. Furthermore, branching and merging are more error-prone compared to GitHub, where managing branches is easy. Because we are using an Agile methodology, frequent iterative development is essential; therefore, using Apache Subversion would not be the best approach.

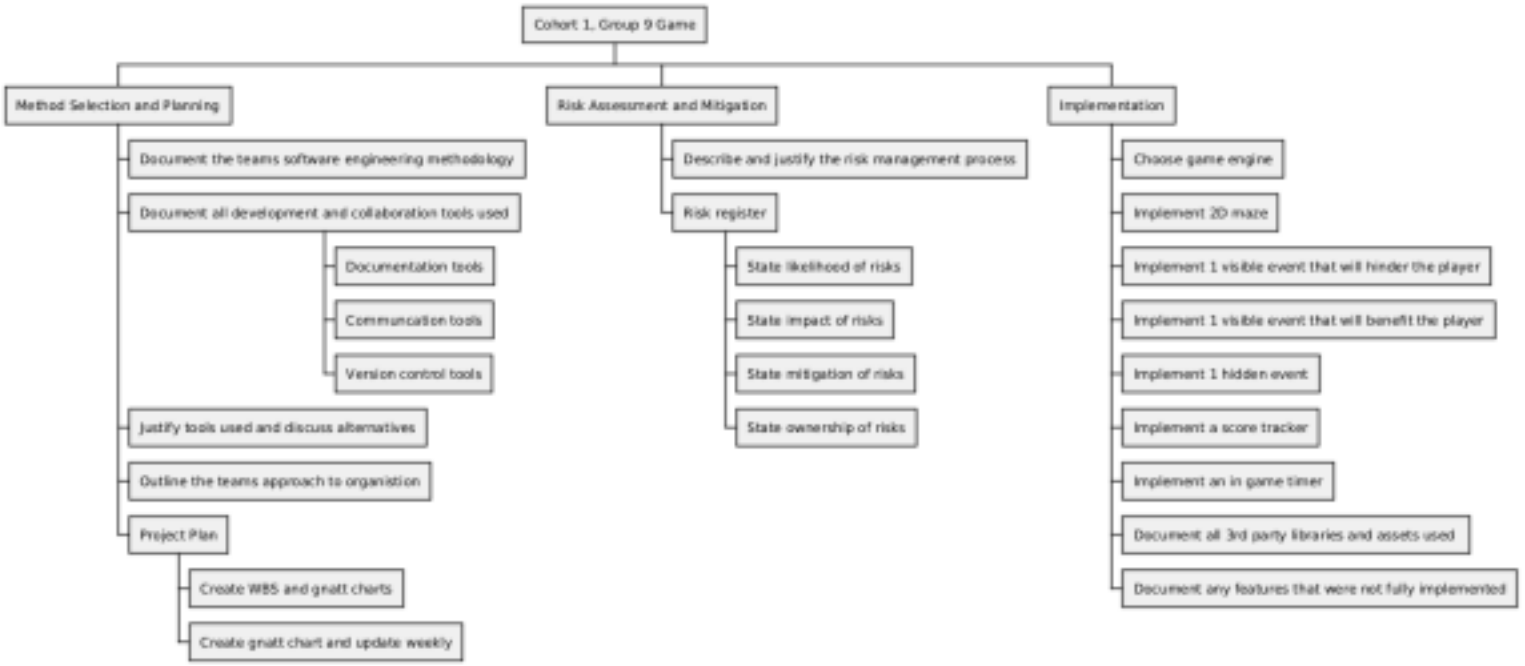
Organisational Approach

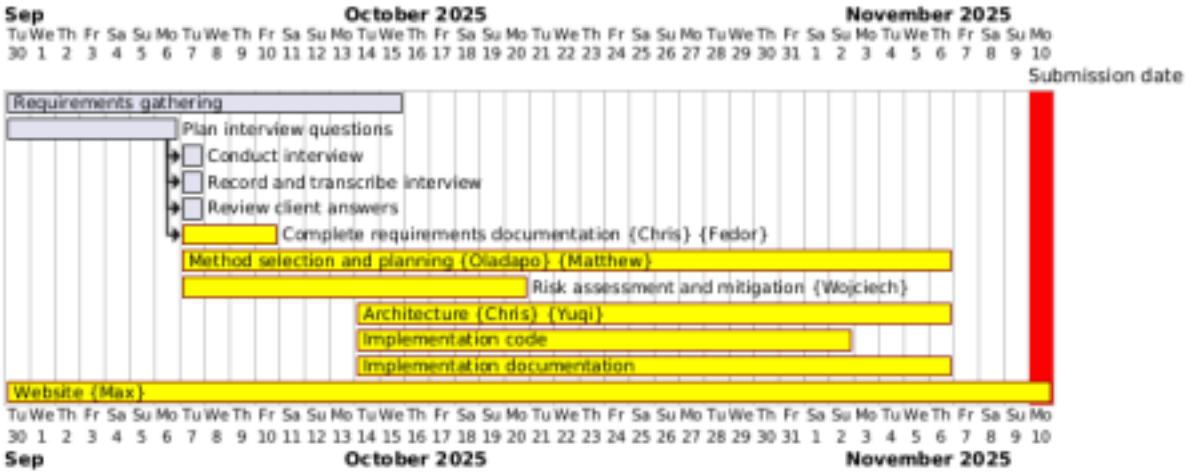
At the start of the project, we listed everyone's strengths so we knew who could do what best and could assign tasks accordingly. We decided this was the best approach because it builds teamwork and understanding, reduces confusion later, and helps the project flow more smoothly. Furthermore, it also highlighted gaps in our skills, which we can develop later on by taking on tasks that weren't our initial strengths.

Every week, we meet in person to review our progress on the project and set deadlines for the upcoming week. A Gantt chart is then created for that week, so we can visually see the tasks to be completed. This approach allows all team members to see what needs to be done and by when. Improving team coordination and making it easier to track our progress. Furthermore, it keeps the team accountable and helps us identify when a team member is struggling to meet deadlines, so we can take appropriate steps to address it. We assign multiple people to a task to increase the speed and efficiency with which we complete our set deadlines. Moreover, it improves accuracy and quality by having multiple people review the same work, ensuring our project is of the highest quality. During our meetings, we also use that time to make decisions about our project as a group. We chose this approach over a virtual one because we found it easier to communicate our ideas face-to-face than over a call. In addition, we can ask questions, clarify points, and reach agreements more quickly than during an online call.

Project Plan







During week 2, we first created an overall Gantt chart to gain a general idea of when we needed to complete each deliverable to submit the project before the deadline. Furthermore, we also created a work breakdown diagram to break each deliverable down into smaller, manageable pieces. Additionally, it helped each person understand what needed to be done for the section they were working on.

During week 3, we interviewed our client to gather requirements for the game. This allowed us to begin working on the requirements section of the documentation, which was essential for other parts of the project, such as architecture and implementation. Furthermore, we also realised that we needed to assign two people to implement the code instead of one, due to the project's scope and the limited time we had to fulfill the requirements. Because of this, one person was removed from working on method selection and planning and added to help implement the code as well. We also extended the time taken to complete the requirements documentation by a few days, as we initially underestimated the amount of work required to complete it.

During week 4, the requirements documentation was completed, allowing us to begin working on the architecture. Furthermore, it was at this point that we decided how we wanted the game to look, and coding for the game started.

During week 5, we found that the risk assessment and mitigation weren't completed by the time we initially stated, as the team member was ill. Therefore, we assigned a team member who had finished their tasks to help out with the documentation.

During week 6, we also found that the game implementation wasn't completed by the time we initially stated. However, we discovered that we still had some time before the submission deadline, so we extended it by a few days. All documentation was completed by the initial date we set, so team members without any work to do helped to complete the code to ensure that we met the submission deadline.

Week	**Sprint Goal**	**Planned Tasks**	**Responsible Member(s)**
8	Read and understand code and documentation of the other team and analyse the new brief.	Look through all inherited documents from the previous team, familiarise ourselves with their coding and documentation style. Analyse the new brief and brainstorm ideas to meet the new requirements.	All - As all team members will need to make changes to the previous documents/code.
9	Finalise events and start implementation.	Finalise the ideas to meet the new requirements and start implementing these new initial game features. Allocate the different tasks to team members.	Leo - New level map Charlie, Charmaine, Bertie - add 3 new events, 1 hindering, 1 helpful and 1 hidden.
10	Feature completion and preparation for user tests.	Continue implementation of the remaining features to be ready for user testing the following week. Implement the Achievements system. Begin setting up the continuous integration system for the project. Complete the prepared consent forms and questionnaire for user testing.	Leo - New level map Charlie, Charmaine, Bertie - add 3 new events, 1 hindering, 1 helpful and 1 hidden. Charlie - Achievements Bertie - Continuous integration system. Jane - Consent forms Anupam - Questionaire
11	User Testing	Conduct in person user tests to gather feedback, identify and make necessary changes	All - Every team member should conduct at least 1 user test.

		needed to fix important issues. Compile all data and complete Eval2 document.	Leo, Charlie, Charmaine, Bertie - Fix issues Anupam - Eval2 write up
Winter break	Finalisation and documentation	Complete the final aspects of implementation. Complete all documentation. Update project website.	Implementation - Leo, Charlie, Charmaine, Bertie All - Change2 Test 2 - Leo, Charlie, Charmaine, Bertie Continuous Integration - Jane, Yousif, Anupam Website - Bertie

Week 8:
In week 8 we submitted that we wanted to take over group 9's project. As we came to this decision fairly early on in the week, we had time to look through the team's documentation and read through the new design brief during a group meeting. This week we also created the planning table above, but as we were following the Scrum methodology, this plan was bound to evolve. The table included a Scrum sprint column which was the goal intended to be met by the end of that week. These goals were then reassessed weekly and re-prioritised when necessary. We also came up with initial ideas for more helpful, hindering and hidden events, as well as discussing how to implement the leaderboard and achievements.

Week 9:
In week 9 we finalised the 11 ideas we wanted to implement, 3 helpful, 5 hindering and 3 hidden. Development began on these new features with tasks being allocated to team members. The main focus for this week was on implementation rather than documentation so this was not included in the initial plan. Implementation followed the XP method initiated by group 9 and continued by our group as the focus was on small changes. A short term goal was established to introduce at least 1 new gameplay event by the following week.

Week 10:
By week 10, only 1 of the 3 planned events had been incorporated into the implementation. This backlog of events was carried over into this week, so that development could continue on these events, ensuring all required features were completed. Testing was done after each event was completed, aligning with XP practices. Alongside this, documentation was started for the user testing the following week including the written consent forms and the user testing questionnaire. The aim was to have almost all events completely added in time for this testing. A start was also made to the continuous integration as outlined by the plan above.

Week 11:

This was the final week before winter break. Not all planned events had been added, so user testing began later in the week than originally intended. In this week, only 2 tests were done in person, as team members were ill or could not make it on site to do these tests. The remaining tests were scheduled to be done over winter break, virtually. As a result of all user test data not gathered this week, the Eval2 document was also not started.

Winter Break

A larger proportion of work than was initially planned was to be completed during the winter break. As our initial plan was not followed as closely as expected, we needed to make a more thorough new plan as shown in the ‘Planning Updates’ document to ensure all tasks were completed before the submission deadline. The task backlog was reviewed and re-evaluated. Although there were deviations from our initial plan, this was not a problem as both Scrum and XP involve adapting to change in response to project progress. We split the remaining tasks up into smaller, more manageable chunks so that more than 1 person could work on it as shown by the change document being broken down. As people were busy on different weeks during the holidays, all tasks spanned multiple weeks, so the week column was omitted from the new table. This sprint was over 4 weeks, rather than the 1 or 2 week sprints aimed for in the previous weeks. The priority column was removed from the table as all remaining tasks were required to be finished by the project deadline date. At this stage in the project, there was no real way to distinguish high, moderate and low priority tasks as incomplete tasks would affect the completion of the final deliverables. All tasks were therefore treated as high priority. Removing this column also helped simplify the plan, allowing team members to focus on project completion, rather than importance.