University of York

Department of Computer Science

SEPR - Assessment 3

Updated

Method Selection and Planning

Team Craig

Thomas Burroughs

Huw Christianson

Joseph Frankish

Isaac Lowe

Beatrix Vincze

Suleman Zaki

Method Selection and Planning

Method Selection

After careful consideration, we have decided that an agile approach would be the most suitable approach for our project since it is recommended for small teams [1] and encourages team communication [2]. Due to our lack of experience in game design, the flexibility it offers through its incremental and iterative work sequences will help us adapt and change our plan each work cycle as we learn from our mistakes. We will also be able to quickly implement new features to better satisfy requirements of a customer that may change over time [3].

We have chosen Scrum framework due to its popularity [4], short length of sprints and the overlapping development model [5] which will suit our project best. Scrum agile framework that emphasises product development instead of the plan and documentation. It breaks down the work into sets of tasks that can be completed in a certain time frame called a 'sprint'. It encourages team communication through the introduction of regular team meetings called 'scrums' where all team members discuss what they have already implemented and what the goals for the future sprint are. In our case the length of each sprint will be about one to two weeks depending on the complexity of each assessment. For example, for Assessment 3 we will have one-week sprints due to the shortness of the assessment period. This will allow the team to have a greater turnaround of work each week, boosting productivity. Having shorter sprints will also reduce the impacts of transpiring risks by reducing the time between transpiration and mitigation. We will have two ~~to three~~ face-to-face meetings a week to discuss the current state of the project and individual tasks of each team member as well as any difficulties they may have encountered or expect to encounter, as in line with our agile methodology. One of the two meetings each week will be focused around updating the risk assessment and discussing any risks which have arisen during the previous sprint. This will be especially prevalent for Assessment 3 as developed risks will have a greater impact on deliverables due to the short nature of the assessment period. We will also make sure to regularly communicate with the client to ensure that new requirements are being implemented.

Communication and Development Tools

To support our project, we have used the following tools:

Google Drive (File Sharing)- Google Drive was chosen to be our file storage service as it allows file sharing across multiple different devices, as well as instant collaboration on documents between team members. It also prevents data loss as all documents created on the drive are saved in the cloud.

GitHub (Code Sharing)- GitHub was chosen to be our code sharing and version control tool as it allows any changes pushed into the global repository to be easily noticed, and having multiple repository makes it less susceptible to data loss. If a server failure was to occur, production is not halted, as people can still push changes to their local repositories.

~~**Slack (Communication) -** Slack was chosen to be our communication tool as it allows the creation of multiple channels, and has a searchable history, which allows us to quickly search through conversations and find shared files. In addition, slack bots allow supplementary features such as setting reminders or tracking important conversations to improve organisation. Finally, as a few members of the team did not have Facebook, Slack was chosen due to its accessibility and ease of use on multiple devices.~~

WhatsApp (Text Communication) – WhatsApp was chosen as our text-based communication as each member was already experienced with the app and is free on all mobile devices. It will be used to arrange face-to-face meetings (as required by our agile approach) and to discuss possible reassignments and upcoming deadlines. Each member of the group will be able to see every message, preventing confusion on assignments and duplication of discussion.

Google Hangouts (Audio Communication) – Within our group is clear that some team members find it difficult to voice their concerns effectively over text-based communication. It is also difficult to accurately specify instructions or requests over text-based communication due to the ambiguity of natural language. As a result of the previous, the

group will also use Google Hangouts to communicate when group members cannot arrange to meet face-to-face or difficulty has arisen due to previous test-based miscommunications.

Website Builder (Web Development)- Website Builder was used to create our website as the site has hundreds of different templates to select from and offers free hosting as well as free website creation services. The simple to use editor allowed us to make professional looking websites quickly and efficiently.

~~**StarUML (UML Diagram Production)-** StarUML allows for quick and simple UML diagram creations with multiple different customization options, letting us to create professional looking diagrams in a short amount of time. Furthermore, it can be easily exported to different file formats.~~

Lucid Chart (UML Diagram Production)- We need a free tool which can provide intuitive and collaborative resources for diagramming and the ability to export these diagrams to other file types. For this, we will use an online tool called Lucid Chart, as it provides all previous requirements, a robust backup system for our documents and an extensive shape and connector library which will be very useful for our UML diagrams.

~~**Google Sheets (Gantt Chart Production)** Google Sheets allows for quick chart generation and easy editing in case of changes to the plan.~~

Microsoft Excel 2016 (Gantt Chart Production)- Excel allows for quick and easy chart generation and editing should change to the plan be needed. Excel boasts hundreds of useful features such as the ability to export files as a pdf. For this reason, along with the fact that Excel is free for all students and all team members are familiar with its capabilities, make Excel a suitable choice of tool.

Gimp (Logo + Game Graphics Production)- Gimp was used to create various arts and logos as it offered a variety of different editing options, while being free to use.

GitHub Project Boards (Work Management)- A tool used to create project boards that help organize or prioritize tasks. Any team member can upload or complete requests, as well as see the progress of a requested job, avoiding multiple people doing the same task.

IntelliJ IDEA (Code Implementation)- A Java IDE was required for our code implementation. We chose to use IntelliJ IDEA as it is a powerful tool that allows people to quickly and easily write or edit code. It can anticipate and suggest appropriate names, methods and expressions during coding, on top of being able to analyse code on the run, to detect any errors.

Tiled Map Editor (Level Editor)- We decided to use a level editor to create our levels to save time. Tiled was selected due to its ease of use, as well as the fact that it supports numerous different level implementations, which allowed us to be far more flexible with our level creation.

Project Planning

To assign and manage all individual tasks of each member we are using Google Drive, where we can create to-do lists, and GitHub Project Boards. However, for a better overview of all the tasks and their deadlines we have created a Gantt Chart [6] to help visualise time constraints of each task. Each task has a starting date, a finishing date, an assigned priority (low, medium or high; based on the marking scheme in the assessment brief and predicted difficulty of completion) and is made up of ‘subtasks’ which are indicated with lighter colour than the main task. Tasks and subtasks belonging to the critical path are coloured orange. Task dependencies are indicated by black

arrows. If a dependency path branches out it is indicated by a knot (black dot). Paths that cross but do not have a knot are not dependent on each other.

As the project is being developed according to the Scrum methodology, the plan will be regularly revised to ensure that each task is assigned a suitable time frame as current predictions are only estimations and will change depending on team performance and changing requirements. The plan will also be adjusted when risks transpire. For example, should a potential risk transpire that delays the completion of the implementation, the plan will be adjusted by reducing the allocated time for another deliverable or a change of team roles may be made to try and redirect back towards the original plan. Any changes will be reflected in the final Gantt chart.

Plan for Assessment 4

Below is a link to the updated Gantt chart for Assessment 4. Suitable adjustments have been made to the previous Gantt chart. These changes have been made as our understanding of each of the task required for assessment has increased so a better approximation for how long each task takes can be given. Furthermore, our understanding of the team's strengths and weaknesses has also improved and therefore certain tasks have been allocated more time to accommodate for this. For example, our team's strength is documentation rather than implementation and due to this more time must be spent on the implementation in order to meet the same standards as our documentation.

Link to Updated Gantt Chart for Assessment 4:
https://teamcraigzombie.github.io/assets/downloads/UpdatedGanttChart3.pdf

As was the case for Assessment 3, a changeover of projects will take place the same week as the deadline for the previous assessment. Due to this, the team will meet on Feb 19th to discuss the creation of a presentation to show the changes we had made during Assessment 3. At this meeting team members will be allocated responsibilities for the presentation. From Feb 19th to Feb 21st team members will work on the presentation and create a demo video to be played during SEPR practical on Feb 21st. During this SEPR practical, members of the team will make notes on other SEPR group's presentations, with careful considerations being made on whether other group's deliverables match our expected quality standards. The group will mark down whether each group's project reaches the team's set criteria. Our criteria for the Assessment 3 deliverables are as follows: well-documented code with an appropriate UML diagram; an abundance of both black-box tests and unit-tests which cover the majority of the code base; well written documentation with good explanations/justifications; a game free from major crashes or errors. The team will be looking specifically for good clarity in all documentation and code comments as we believe this will allow our team to transition between projects more seamlessly.

On Feb 22nd the team will meet to discuss each group's project using the notes made during that week's SEPR practical. Each team member will put forward their choice of team with suitable justification. The team will each bring a computer device to show an example of their chosen game to jog the memories of other team members. This addition to the meeting was incorporated as a similar meeting which took place for Assessment 3 was unsuccessful as team members could not grasp each game from just worded descriptions. After each team member has put forward their chosen game, a discussion will then commence in order to reach a unanimous decision. Should a unanimous decision not be made the Team leader for Assessment 3 will make the executive decision and email the module lecturers with our choice.

In Assessment 4, the requirements of the project will change, and suitable adjustments must be made to the game in order to meet the new requirements. Due to this, a meeting will ensue the week commencing Feb 25th where the team will decide on changes to team roles and the responsibilities of each role. The changes of roles in Assessment 3 proved vital as team members who felt uncomfortable or out of their depth in previous assessments managed to provide more quality work and had a much greater impact on the project after changing roles. At this meeting, the team will discuss changes which need to be made to documentation (requirement specification, method and planning and risk assessment) and changes to implementation and subsequent architecture diagrams. Each of these changes will be placed into a change table with an issue date and completion date. However, some of these changes may be rejected when our understanding of the assessment evolves.

Once the meeting has taken place, the implementation of discussed changes will begin (Week commencing Feb 25th). Programmers will also use this week to take time to understand the previous group's code and architecture.

We believe that this is very important as our implementation of changes in Assessment 3 were significantly delayed due to the lack of understanding of coding methods. Often programmers would override methods which they were not aware of, creating errors and wasting valuable coding time. Once again, we will abide by our agile methodology, by testing our code alongside implementation in weekly iterations (1-week sprints). Regression testing will also take place during each sprint to ensure that previous functionality is unaffected by our implementation changes. Implementation will finish by April 14th , so on return from the Easter holidays the team can finalise all black-box and Unit tests which will be completed by April 18th. Once the implementation of the game has been completed, programmers will summarise modifications to the code between the 12th and 19th of April. The team have considered that exam revision may take priority over the SEPR team project during the Easter Holidays and therefore the addition of one week for finalising implementation will not have a significant impact on time allocations for other deliverables. The team has also agreed that fortnightly Google hangout meetings will occur during the Easter holidays to address risks that may have transpired during the break.

As a team, we believe that our writing of our documentation is our strongest asset and therefore, feel comfortable beginning documentation over the Easter holidays. Work on the Project Review report will begin March 17th and the Evaluation and Testing report will begin April 1st. Due to the nature of Project Review report- the summary of the evolution of team structure and methods- team members can work independently on the write up using previous assessments deliverable to guide them. The lack of collaboration needed for this deliverable should hopefully enable the team to produce useful and quality documentation whilst not at university. The project review report will be completed by the 26th of April. 10 days have been allocated after returning from the Easter break to regroup and edit documentation collaboratively. This should hopefully help to fix ambiguities or problems with documentation that may have arisen whilst the group were apart.

Finally, after the completion of the implementation and the summaries of changes to the code some team members will have limited responsibilities. As a result, these team members will begin work on the presentation (starting April 24th) which will be presented to the client. As more team members fulfil their responsibilities more of the team will be assigned to completing the presentation. The team will also make time between the end of Assessment 4 and the presentation date (tbc) to rehearse the presentation to minimise potential issues when presenting.

Team Roles

After analysing each team member's skills and interests we have assigned specialised roles for each person. In addition to their main role, each team member is expected to participate in software development and testing. However, since agile approach is flexible and encourages close collaboration between team members, team roles are not fixed and can be changed and modified to better suit current tasks. We, as a team, are aware of the potential risks that can arise by sharing role responsibilities and allowing flexibility with team roles. Team members with the same team roles, especially programmer or tester, can result in unnecessary confusion and conflicts. This often arises due to team members working independently on the same functionality or task but without clear collaboration. Due to this, ambiguous team roles have been portioned into numerous sub-roles. For example, the Tester role has been split into white-box tester and black-box tester to help mitigate conflicts and collaboration issues. In turn, this should also ensure the fair sharing and distribution of resources.

As can be seen below, a team leader has been introduced for managing sprints and leading team meetings along with other important responsibilities. Despite having a clear team leader further leaders have been included to act as 'experts' on each deliverable e.g. Head Developer who is an 'expert' on the implementation. Each 'expert' will be able to make executive decisions on the deliverable they have been assigned.

Team Leader – Joe Frankish Team leader takes on the role of the Scrum Master, i.e. is responsible for managing sprints, setting tasks and leading team meetings.

Secretary – Beatrix Vincze Secretary is responsible for recording time, attendance, what was discussed and what the set tasks are at each meeting.

Head Developer – Suleman Zaki Head Developer coordinates developers and makes sure the code is

properly documented. The Head developer will also have the authority to make executive decisions on implementation should an agreement not be made.

Web Developer – Isaac Lowe Web Developer is responsible for creating the website and keeping it up to date according to the requirements set in the assessment brief.

Test Leaders – Huw Christianson (Unit Tester) & Tom Burroughs (Black-Box Tester) Test Leader is responsible for testing the game and making sure it runs smoothly without any bugs. Testers are also responsible for notifying the developers of any failed tests. They are also responsible for ensuring good requirement traceability and ensuring all requirements have been tested.

Risk Manager – Beatrix Vincze Risk Manager maintains and updates the Risk Assessment document. Team members are assigned risks to monitor and then report their status to the Risk Manager at the start of each meeting if they have changed. The Risk manager is also responsible for making notes and updating the risk assessment table during each Risk meeting.

Report Manager- Joe Frankish Report Manager is responsible for ensuring each of the final deliverables meets the Assessment specification before the assessment hand-in. The Report Manager also makes sure each of the deliverables abides by the groups expected quality standards and the report has good and consistent grammar.

Client Interface – Tom Burroughs Client Interface is responsible for communicating with the client and making sure that all the requirements are understood by the team.

Graphic Designers – Suleman Zaki & Joe Frankish Graphic designer creates or sources the team logo and produces images and graphics for the website and the final game.

References

[1] I.S. Sommerville, “Software Engineering”, 9th ed. [Online]. Available: https://edisciplinas.usp.br/pluginfile.php/2150022/mod_resource/content/1/1429431793.203Software%20Engineering%20by%20Somerville.pdf [Accessed: 24-Oct-2018].

[2] “Manifesto for Agile Software Development”, 2001. [Online]. Available: http://agilemanifesto.org/ [Accessed: 24-Oct-2018].

[3] J. Highsmith and A. Cockburn, “Agile software development: the business of innovation”, 2001. [Online]. Available: https://ieeexplore.ieee.org/abstract/document/947100 [Accessed: 24-Oct-2018].

[4] G. Azizyan, M.K. Magarian and M. Kajko-Matsson, “Survey of Agile Tool Usage and Needs”, 2011. [Online]. Available: https://ieeexplore.ieee.org/document/6005503 [Accessed: 24-Oct-2018].

[5] M. Cohn, “Introduction to Scrum”, 2014. [Online]. Available: https://www.mountaingoatsoftware.com/presentations/an-introduction-to-scrum [Accessed: 24-Oct-2018].

[6] “Geese Lightning Gantt Chart” [Online]. Available: https://drive.google.com/open?id=1BOSIotijhqRKzfSGPk2d6Ov3EU8i6pJX [Accessed: 20-Jan-2019].