**SOFTWARE ENGINEERING G6046**

**Agile process model**

**Guidance for organising and documenting a sprint cycle**

**Summary**

For your group coursework, the development process should follow an Agile-like process model. We will discuss the nature of Agile in lecture classes. There is no “gold standard” or “standard methodology” for doing a project the Agile way. Every organisation has its own flavour that suits its business. But we can draw upon the core ideas to create a process model that is suitable for this group coursework activity. Just because we are embracing Agile, there is no excuse for zero or poor quality documentation. We need to develop an appropriate type of documentation standard. The guidance document sets out what should be documented for each intensive iteration of development work (“sprint”). You can adapt the template given in this document, as long as you can justify your reasons, and document them convincingly in your final submission.

Remember that the group coursework is as much about the final codebase you produce as it is the journey that gets your there. There is a strong emphasis on team working, and discovering what works and what does not.

**The Agile process model.**

Agile places an emphasis on creativity over complex documentation, but that does not mean zero documentation. It is an iterative process model that typically sees development over a series of sprints, until the product is seen to meet the needs of the customer. Remember that:

* A sprint is typically of fixed duration. In industry 2-4 weeks is not unusual. For this module, 1-2 weeks is going to be more appropriate.
* A sprint generally involves focussed working on a problem, to the exclusion of all else. In industry a Scrum master is responsible for isolating the team from external distractions. For this module, this not practical as you have other modules and coursework to work on.
* Each sprint should give rise to a working prototype. Code delivered at the end of a sprint that does not work, or does not deliver on the objectives of the sprint has no real value. The objectives of the sprint should be achievable within the sprint. You can always re-plan so that an objective is moved to a later sprint.
* At the end of each sprint, the customer would provide feedback on what has been achieved and this would be used to inform the next sprint. In industry, this engagement with the customer is critical to making Agile work. You can get customer feedback by showing your work at a seminar session. You do not have to do this, but getting feedback is useful. You can use the user requirements document you have been given, and the updates you receive from the customer via the Canvas discussions to assess whether your sprint has met its objectives.

So a typical sprint runs like this:

1. Determine the “user stories” that are to be addressed. This can take the form of a user story narrative, and/or a set of “task cards” that describe some useful part of the overall problem that you intend to solve. You should be able to show that the stories or cards reflect what the customer has asked for in their user requirements document. If the customer did not ask for it, why would you be developing it? Consider prioritising task cards. This may reflect the significance of the task, or how complex you think it may be to achieve.
2. Determine whether there are any specific system requirements (functional, non-functional and domain requirements) that naturally emerge from your user stories or task cards. They do not need to be exhaustive, but they will focus your mind on exactly what needs to be done, and what needs to be tested.
3. Assign team members and resources to deliver the sprint. Some simple project planning is appropriate here. Consider any key risk factors and what strategies you have in place for them.
4. Make any design decisions that are essential for the delivery of the sprint. This can take the form of class analysis (for OO implementations), system or other high level diagrams, UML diagrams, including although not limited to, use cases, sequence diagrams and state diagrams. You only need to do sufficient design to support the sprint objectives.
5. Develop a test plan. Once you run your sprint, you should test your prototype. This will likely require some mix of automated unit testing and human-run system testing. To figure out what needs to be tested, look at any specific system requirements you set out for the sprint.
6. Get feedback on your work. Compare what you have done with the user stories and task cards. If you need more feedback, show your work to the customer.
7. Set your priorities for the next sprint, using knowledge and experience gained from your last sprint. The customer can provide help here – just email them if you need to.

Each sprint cycle needs to be documented to provide the evidence necessary for your final submission. The documentation is much more lightweight than would be the case for a Waterfall development process model. You may find it helpful to have one person in your team co-ordinating the documentation process. You should keep backups of your documentation and look after it with the same care you should afford your codebase. A working program with poor quality documentation will not grade very well.

You can organise as many sprints as you think appropriate. But each sprint will need to be documented, so that markers can get a clear sense of the progression of your group throughout this coursework activity. It is likely that most groups will have between 4-6 sprints. Some might have more, it’s really down to you to decide as a group how you will make this process work.

**Sprint cycle template documentation model.**

Use the template at **Appendix A** as a basic model for what the documentation should look like for each sprint. You can adapt this documentation model if you think appropriate. You should be prepared to justify any such changes in your final submission.

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**APPENDIX A: SPRINT DOCUMENTATION TEMPLATE**

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| 1. **Summary data** | |
| Team number | 11 |
| Sprint technical lead(s) | Anson Wong |
| Sprint start date | 12/2/2021 |
| Sprint end date | 26/2/2021 |

*The technical lead may vary from one sprint to the next. This is down to how you collectively organise your team.*

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| 1. **Individual key contributions** | |
| **Team member** | **Key contribution(s)** |
| Anson Wong | Programmer, Planner |
| Danny Newsom | Programmer |
| Tomasz Czarnecki | Programmer |
| Abdullah Al-Hiyarat | Programmer |
| Mohammad Jallad |  |

*This data should help you to agree your peer assessment at the end of the project. If there is a dispute over your peer assessment, the markers will refer to this section as evidence to support a final decision.*

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| 1. **User stories / task cards** |
| *Provide text descriptions of any user stories or task cards you have selected for this sprint. These should naturally emerge from the user requirements document and discussion on Canvas. If you produce task cards, they should show the relative priority of the task for this sprint.*  User Stories:  The client: Watson Games Formed in 1963, Watson Games Ltd. are the UK’s leading producer of quality board games. In 1986, they expanded upon the acquisition of Wadleys after they ran into financial difficulties arising from the widely reported corporate espionage scandal “Mousetrap gate”. Watson Games design, produce and market high end board games designed to appeal to a wide range of ages. The shareholders for Watson Games feel that the company needs to expand its operations to embrace the digital era and so have decided to develop a computer version of their classic Clue! game. Clue! was originally designed for up to 6 players and has a reputation as a social experience. However, Watson also realise that it is often not possible in a never-complex world to find 6 players to play the classic game. The head of game development, Quentin Raffles, has hit upon the idea that the computer version (the “simulation”) could include an option for the computer program to take the role of one or more of the players, offering an opportunity for a richer gaming experience for a smaller number of players.  The game is for 2-6 players. The game is played by moving around a playing board that represents the ground floor of Archers Avenue. The object of the game is to solve, by means of elimination and deduction, the problem of the murder of Dr Phlox, the owner of the house, whose body has been found at the bottom of the stairs. The winner is the first person to identify in one accusation the murderer, the weapon used and the room in which the crime was committed. That information is stored on cards placed in the “murder envelope” and remains a mystery until a player makes the correct accusation.  The 6 persons in the house are represented by playing pieces: Col Mustard, Prof Plum, Rev Green, Mrs Peacock, Miss Scarlett and Mrs White. The weapons are represented by small tokens. Any one of the weapons might have been the one used. The weapons are as follows: dagger, candlestick, revolver, rope, lead piping and spanner.  There are 6 cards representing the persons in the house. There are 6 cards representing the weapons. There are 9 cards representing the rooms shown on the playing board. In the physical version there are “detective notes cards” to enable players to record their investigations.  Task Cards:   1. Board Generation (Danny) 2. Turn Handler (Abdullah) 3. Game Generator (Tomasz) 4. Player Inputs (square selection) (Anson) |

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| 1. **Requirements analysis** |
| *For the user stories/task cards selected, set out what key functional, non-functional and domain requirements you have identified. Remember that functional and non-functional requirements can be further categorised as mandatory (“shall”) and desirable (“should”). You can use free text descriptions or tabular formats. Remember that domain requirements cannot be acted upon directly. They require domain expertise to refine them into meaningful functional and non-functional requirements. All requirements should be SMART (Specific, Measurable, Achievable, Realistic and Time-Bounded). The requirements analysis does not need to be exhaustive, but should focus on things that are important for this sprint. They should also form a basis for testing.* |

Task Cards:

1. Board Generation (Danny)

* Shall:
  1. Keep a 2D array map of all the movable space
  2. Generate map and graph of the board
     1. Graph stores connection between connected squares
  3. (use excel for mapping?)

1. Turn Handler (Abdullah)

* Shall:
  + Keep track of order
  + Able to remove player from the turn order
  + Next turn
    - Pass current player to next
  + Keep players in an array
  + Keep current player as index of the array

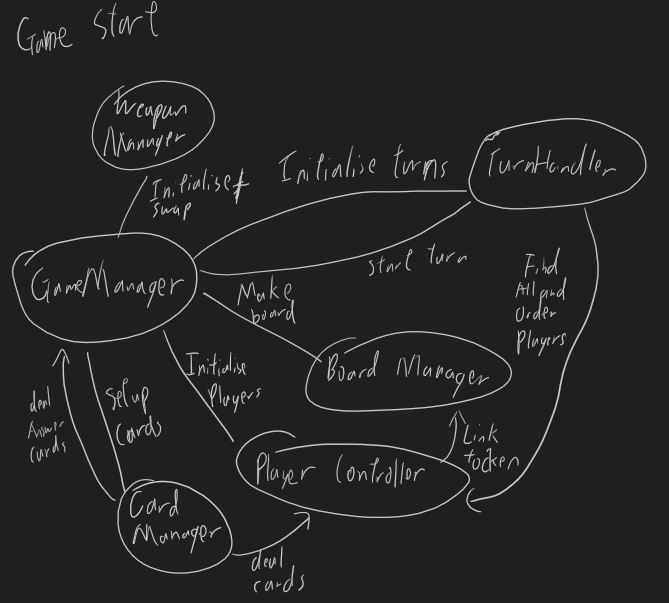
1. Game Generator (Tomasz)

* Shall
  + New cards class
  + Set correct cards for answer cards
  + Store and Returns a list current playing cards
* Should
  + Pass cards to game manager
  + Deal remain random cards to players
  + Pass cards to player handler
  + Allocate weapons to random room

1. Player Inputs (square selection) (Anson)

* Shall
  + Select which square to move
    - Raycast from camera/ player mouse position
    - Select the square that it hits
  + Making a suggestion
    - Selecting the suggested cards
  + Making an accusation
    - Selecting the accusation cards (like suggested cards)
* Should:
  + Roll dice button
  + End turn button
  + Handle inputs to the notebook

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| 1. **Design** |
| *Remember that you only need to do enough design to support the objectives of the sprint. For teams working with OO implementation languages (likely most of you), this would include a class diagram. You may find it useful to develop simple Application Programming Interfaces (APIs) for key classes. This will focus your attention on what each class needs to make available for other classes to use. It also supports good documentation practice and helps coders work together* |



**\*Please Refer to the ClueGame Doc in the Planning folder for more details**

* Board Class
  + Stores graph of the board
* BoardGenerationScript
  + Generate Board
    - Takes a csv file and generate board
  + Get the generated board
* Player Handler Class
  + Which player it is
  + Is it AI
  + List of possessed cards
* Turn Handler
  + Start Game
    - Initialise turn List
  + Next Turn
    - Pass to the next player
  + Get current Player
    - Returns current player
  + Remove Player
    - Remove a certain player
* Card Class
  + Super class cards
  + Inherited by Character, Weapon, Room cards
* Game Generator
  + Shuffle Cards
    - Randomly mixes the cards to an array of cards
  + Set Answer Cards
    - Pick the first 3 occurrence of each card type
  + Get Play Cards
    - Returns remaining playable cards
* Player Input Handler
  + Select square
    - Piece a space on the board to move, check if it can move to that square
  + Roll Dice
    - Calls roll dice script
  + Make suggestion
    - Calls make suggestion script
  + Make accusation
    - Calls make accusation script
  + End Turn
    - Calls next turn from turn handler

Gantt Chart: https://sharing.clickup.com/g/h/4g8em-8/2313cf92eff0027

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| 1. **Test plan and evidence of testing** |
| *You should consider:*   * *Unit/component level testing – typically achieved using automated test procedures such as Junit in Java. This level of testing demonstrates that individual classes are working as you intend.* * *System level testing – typically a human lead and documented test process that shows the prototype working as a whole entity.*   *Testing should show that the requirements you set out are being delivered on. They provide a means of showing that we have delivered what the user stores and task cards set out. Remember to identify a useful set of boundary test conditions.*  *Evidence of testing should demonstrate that the prototype achieved has been tested according to the test plan. If there are deficiencies, then these should be documented, as they will need further work in a subsequent sprint.*  Constant playtesting  **\*We will check with unity testing framework**  Update: Unity unit testing is not too good, so we decided to create test scenes to test certain collection of components and element of the game |

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| 1. **Summary of sprint** |
| *You should consider and discuss:*   * *Did you achieve your objectives for this sprint?* * *Is there a working prototype?* * *What went well, and what did not go well? If things did not go well, what have you learned and what will you do differently for the next sprint?* * *Is there any feedback from the customer?* |

Task Cards:

1. Board Generation (Danny)
   1. Works perfectly
   2. Used an array instead graph
2. Turn Handler (Abdullah)
   1. There is an empty script with empty methods
3. Game Generator (Tomasz)
   1. Returns 2 arrays. One for answers, one for playable cards
4. Player Inputs (square selection) (Anson)
   1. Can detect mouse point at certain tile
   2. Made tile glow

There is no combined prototype, though we have a working game board with working dice.

We underestimated the time needed for our goals as we were all busy with other commitments. We will be shortening the sprints to 1 week sprints and more meetings to keep everyone on track.