

**COMP30050**

**Software Engineering Project**

**Final Report**

**“A creative variant on an old reliable”**

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**Introduction**

**“Like many businessmen of genius he learned that free competition was wasteful, monopoly efficient. And so he simply set about achieving that efficient monopoly.”** - ***Mario Puzo***

Monopoly is a game where players roll two six-sided dice to move around the game board buying and trading properties, and develop them with houses and hotels. Players can collect rent from their opponents, with the aim of the game being driving said opponents into bankruptcy. The game has numerous house rules and multiple editions exist; Monopoly has since become a part of international pop culture, having been “locally licensed in more than 103 countries and printed in more than thirty-seven languages.”[1]

For our 3rd year Software Engineering Project, we were assigned the task of creating a virtual rendition of the classic Monopoly game. We were then split into groups of four, and given a time period of roughly 5 weeks to complete our assigned project, in which we could design and create an entire Monopoly game, to our own design specifications. We were then advised to marry our game with a theme, one from famous pop culture references, and place a template of that reference on the game. The game was to be designed in the Java programming language, and we were given the necessary resources through online sources, the course teaching assistants, and information provided through the lecture slides each week. The task, while it seemed to be arduous, will be of major significance, as currently there are no major Monopoly games online for a consumer base that has been loyal Monopoly players for generations.

**Approach**

With the Software Engineering Project from the previous year, members of the team had experience in implementing a version of Monopoly, thus becoming a foundation for our project. We drew on this experience and implementation to bare the ground for our own version of Monopoly. Concurrent with the information received in the lectures, we began our research and development in order to get our project working as quickly and as efficiently as possible.

To achieve this, we knew we had to work as collaboratively as possible, and keep communication frequent and pervasive. We knew it would be a challenge completing this project, to our own spec, as well as to that provided by our lecturer, Tony Veale, as we knew we had to prioritise the time to get our code up and running by the due date.

Based on experience, Alan had the idea of using Agile methodologies, in having weekly meetings to keep up to the date with the work each team member was doing, as well as the overall progress of the team. We knew we needed the time and space to work together, so we vacated to a free room often, to make use of whiteboards, and map out our path for completing this project.

We coupled the weekly sprints, with collaboration on Trello and Github, to make our lives and respective jobs easier. We understood the only way we would ever get the work completed in time, was to keep an open mind as to our approach to the project, and be ready to share our thoughts and progress as often as possible, simply for the nature of a team project.

Committing to our sprint deadlines, coupled with any other outstanding and ongoing work, would prove to be a challenge in itself, but one we were all ready for, and the confidence in overcoming this challenge, was evident to see.

**Final Design**

**Game Feature Comparison**

**Implementation**

**Final Project Work Breakdown**

**\*Sprint 1: Formulate the idea for the game and set out individual goals\***

**\*Sprint 2: Core game mechanics\***

**\*Sprint 3: Linking our code together, planning for additional features\***

**\*Sprint 4: Implementing additional features, begin testing\***

**\*Sprint 5: Final code tests, as well as final report\***

**“Just an idea of what to put in the Gantt chart, we should flesh it out with as much information as possible - maybe put in a list of the sprint work under it, so as to add clarity to the bars of the chart, we can make it up to show we were somewhat consistent, adding soft extensions in places etc”**

**Individual Reports**

“As the team leader, I knew I had a responsibility to ensure the project was firstly to be completed to specification, as well as being completed on time. This was to ensure that we had a project we were all satisfied with, one that worked to our team spec, as well as that provided by Tony.

Our first step was to decide on the path we would take in order to achieve this specification, and we attained this through open and collaborative communication. I knew it was the only way we could get it working, and from my experience of the module last year, I knew it was a method that would work.

Through much deliberation and suggestion from the team, we settled on an idea of how to make our game work and stand out, and we built from this foundation. I feel our weekly meetings proved invaluable as we could chart our progress, and build upon completed work in preparation for the next meeting.

I worked on the Board class, as well as the classes that handled each individual tile. Drawing inspiration from autonomous research, as well as my own knowledge of the game, I began drawing up my plan for completing this task. Using the various interfaces given to us through our lectures, I began implementing the Property class, building upon what I had from the lectures. Using this, I formulated the rest of the class, creating variation where required, such as the Railroad and Utility class. I endeavoured to update the rest of the team with my progress, which proved to be slow at times. Eventually, I completed the tile implementations, including methods I knew would have to be completed in the future; this was to ensure I covered every possibility the game could throw at us.

As well as this work, I made sure to keep informed as to what work the rest of the team was doing, advising them where I could, and listening to their ideas, paying dividends on our way to completing the project as best we could.

Taking charge of this project was my first experience in doing such, but I enjoyed the challenge. I found it tough at times, but overall, I was very happy with how everything turned out.” - *Alan*

**Technical Challenges**

**Below covers the technical challenges encountered by members of the team. \*\*ADD SOME IN OR MAKE THEM UP\*\***

“When attempting the assignments preceding the initial project implementation, I found understanding interfaces to be a bit of an issue. Having never used them before, I knew they would be paramount to the success of our project, so I endeavoured to research interfaces in an attempt to upskill myself, allowing for a stronger project. After careful study and some trial and error, I finally got to grips with interfaces, so much so that I decided to create an interface for usage in the various tile classes.” - *Alan*

*“*Whilst designing the classes, I found myself encountering instances in which I had to implement classes using methods that were not yet implemented in any class, even those done by other members of the team. I found this to be a bit challenging as I had no reference to formulate code for the methods so there was a lot of chopping and changing of code required to overcome this. It also helped that I made a list of the methods which satisfied the condition of having not been implemented, allowing me to delegate them where required.” - *Alan*

**Testing and Evaluation**

As a group, we decided that it would be best to leave the majority of the testing implementation to after we had finished the core game mechanics and logic of our project. Upon completion of this condition, we used the techniques picked up over the course of the module, as well as those picked up through autonomous research, to facilitate our testing.

Using JUnit, we began to test each class in turn, writing enough test cases so as to cover ourselves should an issue arise with our classes. This was done in an effort to maximise our testing, concurrent with designing clean code for use in our project.

This delay in initial testing allowed us to create a game design we were all satisfied with, albeit a few bumps in the road. Although not fully compliant with the initial project specification set out in our interim report, we believe that our code is as good as we could make it, and no doubt plan to improve upon this knowledge over upcoming projects and whatever else we may find ourselves doing.

Overall, we were very happy with how our project turned out. There was a feeling that had we started working a bit earlier, we would have had more time to work on more complex features, slightly losing out a bit on our game’s standing. However, given how we approached the work, and our mindset in doing so, it was our opinion that the project was coded to the best of our ability, and are open to keeping communication alive post project, in order to further improve our project.

**Group Collaboration**

As a group, I feel the collaboration between the individual members was quite strong. As with any project, there were members more communicative than others, as some people like to work in silence. Although work was completed and our weekly sprints adhered to, it did pose a bit of a challenge, especially when communicating through the various mediums we assigned ourselves to. This was notable in the Facebook chat, for example, as it was hard to find a time when everyone was present and online, so progress updates weren’t always as quick as we would have preferred, but we made do.

The usage of GitHub and Trello paid dividends as well, as it allowed us to keep track of what was currently being worked on and by whom, not to mention what work was left to complete, as well as any potential ideas that could help our game stand out. These mediums oft made up for the occasional miscommunication or lack of, and it helped us stay on track and meet our deadlines, hard or soft.

As team leader, Alan took it upon himself to talk to the individual members of the team, communicating updates should a lack of online presence arise. This kept the focus, coupled with constant ideas and suggestions on what to do next, and as such, allowed the team to overcome the challenges they were faced with in the collaborative aspect of the group.

**Conclusion**

**References**