James Moran

This report is a reflection of our team’s development process of the Game Café System. This report details the design, development, testing and reflection of the project, among other aspects.

Development Report

Software Systems Development (AE2)

Contents

[1. Elicitation of Requirements 1](#_Toc513804330)

[1.1 Work Breakdown Structure (WBS) 2](#_Toc513804331)

[2. Analysis of Requirements 3](#_Toc513804332)

[2.1 Robustness Diagram 3](#_Toc513804333)

[2.2 User Stories 4](#_Toc513804334)

[2.3 Sequence Diagram 5](#_Toc513804335)

[3. Expression of Requirements 6](#_Toc513804336)

[4. The Use of SCRUM in Our Team 7](#_Toc513804337)

[5. Project Design 8](#_Toc513804338)

[5.1 Structure Chart 8](#_Toc513804339)

[5.2 Use-Case Diagram 8](#_Toc513804340)

[6. Project Development 9](#_Toc513804341)

[Logging my Tasks 9](#_Toc513804342)

[7. Testing the Project 10](#_Toc513804343)

[8. Integrating the Project 11](#_Toc513804344)

[9. Refactoring for the Project 12](#_Toc513804345)

[10. Configuration Management/Version Control 13](#_Toc513804346)

[Bibliography 14](#_Toc513804347)

[References 15](#_Toc513804348)

# Elicitation of Requirements

For the requirements elicitation (Requirements Gathering), there is the base set of what the User would (most likely), want from the system. This is detailed in Appendix A: Base Project Requirements.

These were obtained from the assignment brief, as this is what the system must have as base requirements.

This was deemed as an appropriate means to get the base set of requirements, as they are noted in the assignment brief and we had no other input to use for the requirements at a base level (such as via surveys, interviews of the client, etc.). Indeed, as interviewing the client would more than likely produce similar results to what is detailed in the assignment brief, for the aspects of such a management system, the Game Café is most likely to want to organise.

From these base requirements, a Mind Map of what the system must have, can be formed. Our project’s Mind Map Is shown under Figure 1 of Appendix D: Figures.

From this, a Work Breakdown Structure (WBS) for the project can be formed, this is detailed on the next page.

## 1.1 Work Breakdown Structure (WBS)

This WBS Diagram and respective Sprint Breakdown detail the tasks that we would want to complete for the project, as well as the order for such (left to right in the WBS Diagram and from Sprint 1 to Sprint 3 for the project’s Sprints). This is shown under Figure 2 of Appendix D: Figures.

We deemed this as being a suitable method for considering all the work we would have to complete and the respective order for completing these tasks, as is laid out above, because each set of tasks for the phases, must be completed before moving onto the next phase (from the WBS Diagram, for each Sprint). For the Sprints, the objectives for that sprint are broken up into multiple tasks, which are then listed on our team’s Trello board, so that we can appropriately assign them to the most suitable team-member.

This would flow well for our team’s mentality, so long as all of the team members put in the respective hours, however, due to other projects that had to be prioritised over this project (as there is a Final Major Project (FMP), that each student must complete), not every team-member was able to put in as many hours as was suitable for this project (8 hours per week).

# Analysis of Requirements

## 2.1 Robustness Diagram

This section begins with discussion of the Game Café Staff Member Robustness Diagram, to ensure that the Staff Members of the Game Café are able add information to the database, or make bookings for eSports Events, without having to manually validate the information they add to the system for such. This can be found under Figure 3 of Appendix D: Figures.

This diagram was assembled using Microsoft Visio 2013, after finding Robustness Diagram Symbols for Visio, from the Microsoft online repository of symbols for Visio.

This was deemed to be a suitable method for putting together the Robustness Diagram, as I am familiar with the use of Visio in assembling such diagrams, having produced a Robustness Diagram for Engineering Software Systems (ESS), in the second year. This diagram has all the necessary flow that is expected for this type of diagram, with the correct links to show how a Game Café Staff Member is to manage information that is within the Game Café Management System’s Database.

## 2.2 User Stories

From Figure 3, it is now possible to define the User Stories for a Game Café Staff Member, which then can be used to determine the functional-requirements of the system. These are listed in Appendix B: User Stories.

The Robustness Diagram, along with the project’s Mind Map, were used to form these User Stories, given what we knew about what they would want from the system at the point.

The Robustness Diagram was used here, to ensure the User Stories had a required level of feasibility to them and that the features the User wanted from the system, were being met.

## 2.3 Sequence Diagram

This is for a Staff Member of the Game Café, adding information to the system’s database. This can be found under Figure 4 of Appendix D: Figures.

This diagram was assembled using Microsoft Visio 2013, with the symbols for a Sequence Diagram, being present in Visio by default.

This was deemed to be a suitable method for putting together this Sequence Diagram, as I am familiar with the use of Visio in assembling such diagrams, having produced a Sequence Diagram for Engineering Software Systems (ESS), in the second year. This diagram has all the necessary flow that is expected for this type of diagram, with the correct order that shows the process for a Game Café Staff Member adding information to the system’s database, along with the interactions between them, the interface of the Management System and the Game Café Management System’s Database.

# Expression of Requirements

After the elicitation and analysis of the requirements, it is now possible to clearly define our interpretation of the requirements. These are defined in Appendix C: Requirement Definition.

These requirements are tailored for the User, with what they would expect from the system given what is detailed in the base list of requirements, the User Stories and the project Mind Map.

These were put together by looking at the aforementioned project artefacts and deriving what the User expects from the system from them.

This approach was taken, as it was deemed the most suitable means to properly define the requirements, based on the End User of the system (a Game Café Staff Member), with the focus on them and their needs.

# The Use of SCRUM in Our Team

As has been mentioned, there are 3 sprints that were to be undertaken for the project.

A Trello board was used to help with organising our team. A screenshot of this can be found under Figure 5 of Appendix D: Figures.

Other than this, only the Model View Controller (MVC) design pattern was used, for the implementation of the project.

Our interpretation of the SCRUM development-methodology suited our team quite well, as we were not too strict on how we obeyed it (with our team not preferring Stand-Up Meetings) and once again, there were other project deadlines that we had to consider. We still made sure to use a source-control system, update our progress in our own time-logs and note completion of tasks to the group, using the Trello board.

# Project Design

For this stage of the project, various diagrams were used to guide the design of the system.

## 5.1 Structure Chart

Starting with this diagram, for how a Game Café Staff Member adds a Database Entry. This can be found under Figure 6 of Appendix D: Figures.

## 5.2 Use-Case Diagram

This is followed by this diagram. This can be found under Figure 7 of Appendix D: Figures.

From the Use-Case Diagram on the previous page, it is now possible to derive a Class Diagram, for the basic structure of the application (to perform these initial Use-Cases). This can be found under Figure 8 of Appendix D: Figures.

Once again, Microsoft Visio 2013 was used to create Figure 7 and 8 (but not Figure 6).

It was used as, yet again, I have experience in using Visio to form such diagrams for past projects (such as for the ESS project). With these diagrams and the layout I had created them within, clearly showing the Use Cases for the Game Café Actors and the classes involved in the implementation of the solution. The team has been fine with these means of showing these design components of the Game Café System.

# Project Development

## Logging my Tasks

To keep a log of the hours I have put into the project, I kept a project tracking log, with tasks, their descriptions, the estimated hours for that task, the hours expended, reasons for why there were less hours expended than expected (if that is the case for a particular task), any overtime hours and the reasons for why overtime hours were expended, if overtime was put in. A screenshot of this, can be found under Figure 9 of Appendix D: Figures.

Microsoft Excel 2016 was used for this.

I used Excel, as I have used it before, for the purpose of creating hourly time-logs, for other projects (such as the ESS project), where it has been suitable for the purpose of showing my usage of time throughout those projects.

# Testing the Project

This was conducted using a test table. This can be found under Table 1 of Appendix E: Tables.

The tests were of functional requirements and this method for testing was used, as it is the simplest to execute and the most straight forward to understand.

# Integrating the Project

The project was integrated with Microsoft Visual Studio 2015, using C# as the programming language. A Screenshot of this can be found under Figure 10 of Appendix D: Figures.

We used Visual Studio 2015, as this was required n the lab-setup, for a Windows Form application, that we wanted to use for the application. We chose this type of application for the Game Café management system, as we believed it would provide a familiar and understanding user-interface for any of the Game Café Staff Members.

# Refactoring for the Project

For this, most of the changes are noted in the commitments to our GitHub hosted GIT Repository (this is available via <https://github.com/ChrisPryor/SSD-AE2/commits/master>).

Of most note though, is that a group member, finishing off the implementation, having to change the data-set used in the application, as the initial data-set I had created, was no longer working as intended.

# Configuration Management/Version Control

For version control, we used a GIT repository, via GitHub. This is available at: <https://github.com/ChrisPryor/SSD-AE2/commits/master>. A screenshot showing some of these commitments, can be found under Figure 11 of Appendix D: Figures.

GitHub was used, as GIT is a source control system that all group members are familiar with, with me having used it for many projects and personal storage, having sufficient storage capacity for the group to use it freely and being able to see past versions of certain components of the project (whether these are code files and their revisions, or other types of files such as diagrams).

# Bibliography

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