Evaluation Stage

For

Graded Unit Game

Dylan Gilmour

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## Outline

During my HND Graded Unit I created a game as part of my final project. My only initial outlines in choosing this project was for it to have sufficient complexity for someone with my level of abilities and skills and that it was to utilise at least one unfamiliar library. All other aspects and features of this project were to be decided by the individual carrying out this project.

My original plan was to create a 2 dimensional local multiplayer game in which two players compete or work together to clear the screen of the various coloured bricks using similar mechanics to the classic games Breakout and Pong. I would create this game using the programming language C# with the addition of the XNA game creation framework, and the development environment used will be Visual Studio 2010/2014.

## Analysis of Planning Stage

After receiving feedback based on the planning section of my project, I have realised that I could have broken down my initial requirements section further and added in additional requirements. This would have helped with the implementation stage by providing an in-depth outline of what was required.

I could have explicitly stated the aims and reasoning of choosing to create a game as my project. I feel the use case diagram was completed to satisfaction although the database was not included in my diagrams due to an oversight.

I have included an extensive list of resources required by myself to complete this project although references and locations for these resources were not provided due to lack of understanding that they were required. This would have aided with the implementation stage by having a list of where to access these resources.

Keeping the ease of use of my document in mind, in hindsight I should have scaled the Gantt chart better to ensure that it was easily readable and would fit properly within the report.

To aid in my implementation of the project a UI binding model should have been included but was left out due to a lack of knowledge on the subject. Overall I feel this section was well completed although there are a few improvements that could be made.

Upon implementing the game I noticed a few issues with the planning stage in that all of the user interface was designed using visual studios form builder as this was the only system in which I was familiar with, although when implementing, all of the user interface is handled by the XNA libraries which makes most of my user interface prototypes obsolete. Also all of the design of classes and variable typing was planned without knowledge of the XNA framework and the features it provides to aid in creation of game and as such updated models are provided in the technical manual as some major changes took place.

## Analysis of Research

As part of the planning stage research was carried out on the genre of game and on the target audience to provide a greater understanding of the features expected and usually available from this type of game.

As part of my research in to similar games that I took inspiration from. I was able to gain a better understanding of the features expected of similar games. The main games in which inspiration was taken where Space Invaders and Breakout although I did not provide an extensive list of which specific elements that will be similar. I feel that doing this research provided aid in the implementation stage as I was able to see some of my ideas in an already functioning game.

As part of market research a survey was created using Survey Monkey a tool which enables users to create a short free survey. This survey was able to provide knowledge on what type of people where interested in this game and what types of customization should be available to the user.

I feel as if I could have conducted more thorough investigation into the creation of games as this was my first experience in game creation the scope and complexity was underestimated which was detrimental to the final product due to the short allocation of time.

## Analysis of Implementation

|  |  |
| --- | --- |
| Functional Requirements | |
| Requirement | **IMPLEMENTED?** |
| Players will be presented with a menu system to choose which mode the game will run in | Yes |
| Players will be able to rebind the control system in a separate menu which can be accessed when the game is run | No |
| Players will have a method of control which will allow the bats to be moved horizontally along the screen and release the ball when it gets reset | Yes |
| The Menu system will be able to be controlled by the keyboard and the mouse | Keyboard functionality yes mouse no |
| Players will have 4 lives each to start with | Yes |
| High scores will be stored in a file which will be updated after each game over | Yes |
| High scores will be loaded at the high scores screen | Yes |
| High scores will be able to be viewed by a separate option in the main menu | Yes |
| Upon the ball making contact with the wall, bat or bricks the ball will ‘bounce’ and change its velocity | Yes |
| Player scores will be displayed on the game screen when the game is active | Yes |
| Player lives will be displayed when the game is active | yes |

* Presenting the player with a menu system was handled by incorporating and modifying a Microsoft screen manager library. I had no issues implementing this requirements
* During implementation stage I opted to remove the rebinding of the control scheme for the initial release of the game. This was done due to time constraints and I felt that the time spent implementing this feature was better spent implanting and polishing of the game mechanics
* Implementing a control scheme for the players was again handled by part of the Microsoft screen manager library and utilising the methods in that and modifying to add certain methods. There were no issues implementing the controls
* Upon implementing the menu system I made a decision to remove mouse functionality from the game as all other components of the game where keyboard driven to ensure continuity with the rest of the screens.
* Giving the player 4 lives was declared in the gameplay section and checked upon each update to check that it was still above 0. there were no problems with implementing this step
* Implementing the high score screen loads an access database and determines which mode is selected and displays the selected mode. This part of implementation was particularly challenging due to my lack of knowledge on how to connect to databases and a few unforeseen issues which caused the database to display incorrectly.
* Making the collision between bat and ball was handled between the main game classes calling the methods created in their respective classes. Although there is a slight bug with collision which makes it so the player could potentially complete the entire game without having to deflect the ball back.
* Displaying player scores and lives was done by using the part of the XNA framework responsible for drawing objects on the screen. there were no problems with implementing this step

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| --- | --- |
| non-Functional Requirements | |
| Requirement | **IMPLEMENTED?** |
| The bats will initially be coloured red and blue | Yes |
| The blocks will be red, blue, green, and orange | Yes |
| Colour of the bats will be able to change in the settings menu | No |
| Systems wishing to run the game will require to have .Net Framework 4 to run the games created | Yes |
| Systems will require Windows XP or higher but primary focus will be on Windows 7 and Windows 8(.1) | Yes |
| Hardware requirements are a graphics card that can support a minimum of Shader Model 1.1 and DirectX 9.0c in accordance with the requirements of XNA framework | Yes |
| The game backdrop will be black in colour | Yes |

* The colouring of the bats is handled by the part of XNA which is used for drawing of objects. there were no problems with implementing this step
* The colouring of the blocks is handled by the game logic then calling the section for XNA which is responsible for drawing objects. There were no problems with implementing this step although I added in another row of bricks as a new colour to fill up screen space and provide improved gameplay.
* The ability to change the colour of each individual bat in the settings menu was chosen to be omitted from this version of the game due to time constraints and unforeseen circumstances that arose during development. This requirement was chosen to be omitted because it doesn’t directly impact the gameplay of the game just a small customisation option for the player that some players don’t even want.
* Because the game was written with the XNA framework. The systems wishing to run this game will require some software installed such as a windows based operating system and XNA framework installed. This was implemented in the XNA framework libraries.
* The game backdrop was implemented within the screen manager component which draws a background in the game. There were no issues with implementing this.

### Bugs

During collision between a brick and the ball the deflecting of the ball is slightly bugged in the sense there is a specific way that the player can win the game without having to return the ball. As the ball will just continually bounce along the bricks breaking them. This could be fixed by re-working the entire collision model. This was chosen not to be done because of time constraints and how late in the development stage this bug was found and it doesn’t make the game unplayable.

Over all I feel the development stage went well with my limited knowledge of the XNA framework and games development. Although there were a few issues with the overall gameplay of the game I feel these were down to time management and the choice of development model used.

## Documentation Created

While creating this game a few pieces of documentation where produced to aid in the users understanding of the instructions and to aid any developers who wish to modify the game. This also aided in the implementation stage of development by doing planning and making diagrams. This includes:

* User Guide
* Technical Manual
* Internal Commenting
* Data Dictionary
* CRC Cards
* Case Diagram
* Use Case Diagram
* Sequence Diagram
* UI mock-up’s
* Gantt Chart
* Work Breakdown Structure

## Benefits Gained

During the course of this project I have gained various skills which will aid in my career and further study in software. I have expanded my knowledge on using the XNA framework and C# as a whole and the methods which are used to incorporate different things specifically the implementation and usage of an access database as I had some trouble incorporating that into my project.

## Unforeseen Circumstances

The major issue that I had was correctly implementing the database of the project. When I tried to display it. It would just keep printing the same values over and over again which was due to an oversight on my part of not clearing the dataset when the database is called for loading. Due to my lack of understanding of database implementation this issue caused me to spend a good portion of the allocated time in solving this problem which lead to me leaving out some of the requirements set out in the initial planning stage.

## Recommendations

For any future projects I undertake I think that changing the model away from the restrictive nature of the waterfall model on to the more open agile model which is more susceptible to changes. And will allocate more time for the implementation stage to account for any issues which may arise during this stage. Due to the nature of the waterfall method no changes are able to be made to the previous section once it was realised that most of the variable typing’s where needing changed. Also that testing is only completed at the end of the development stage which could mean that any bugs created during the process would cause other mechanics to be built upon that bug and then any fixing would require a lot of work to fix them.

## Changes Made

Although major changes were made to this project this was due to my lack of understanding of the XNA frame work and the methods and variable typing’s offered in this framework. I have changed most of the variable typing’s which were originally planned for to be using the visual studio C# framework where then changed to utilise the features of XNA.

## Conclusion

Overall I feel that the process of creating this project went well although the major changes made to the initial planning due to lack of understanding of the framework that was used. Although due to time constraints and some requirements having to be chosen to be omitted from this release of the game I am satisfied with the final product.