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THE BRIDE PROJECT REQUIREMENTS ANALYSIS REPORT

1. Goals & Objectives

The main purpose of this project is creating an adventure computer game with 3D computer graphics that supports loadable multiple 3D scenes, game scripting and artificial intelligence for computer players.

The goal of this documentation is to make an analysis of the project “The Bride” and identify the requirements respectively.

2. Statement of Scope

“The Bride” is a project that aims to be a computer adventure game with arcade components. The game will allow players to watch the hero both from hero’s and their eyes and will be rendered considering the 3D graphics pipelining. In order to increase the reality and immersion, the game will be donated with realistic graphic and sound effects.

The end user will be able to control all of the functions of the hero. He will interact with the program through a graphical user interface which enables him to access all the functionality of the hero and also game settings, preferences.

In order to increase the entertaining & exciting factors in the game, the end user will meet various puzzles in different levels, that will force the end user brainstorming and finding more about the pieces that make up the game. The user shall also meet different rivals at each level.

3. Process Model

The linear sequential model has been chosen as the process model of the project since the time limits for the project are strictly defined. After the final design report a prototype shall also be developed with limited functionality in order to obtain more information about the process affairs.

The process model could also be chosen as prototyping, however since the prototype will be created after the design phase, soon after the beginning of the implementation phase, it will

not be possible to make huge modifications on the project on the prototype which makes the prototyping method obsolete.

Consequently, linear method principles shall be thoroughly applied. The team should work on the software meticulously considering all the cases and reduce the possible design handicaps to minimum.

4. Team Organization

The democratic decentralized team organization is chosen for this project since time boundaries are relatively wide (about a year) and the problem is large-scaled. Also the number of project members is only four and communications will be horizontal as a consequence. The members also know each other well and rely on each other. The decisions on problems and approach are made by group consensus. All of these reasons support our decision in choosing democratic decentralized as team organization.

5. Hardware Requirements

- A graphics adapter of at least 32 MB memory
- A central processing unit with at least 1200 Mhz speed
- 256 MB random access memory
- Windows /98/NT/2000/XP

6. Software Requirements

The team is aiming to build a system that will be compatible with Windows operating systems. The C++ language will be used for the implementation of the software. The graphics library to be used is OpenGL, together with GLUT. Another important library to be used for the implementation of the software is the physics engine, namely, Open Dynamics Engine (ODE). ODE provides a starting point for creating a game engine. It is an open source, high performance library for simulating rigid body dynamics.

It is fully featured, stable, mature and platform independent with an easy to use C/C++ API. It has advanced joint types and integrated collision detection with friction, it supports rays

as primitive objects calculating the path and detecting any collision with other objects in the simulation world. ODE is useful for simulating vehicles, objects in virtual reality environments and virtual creatures and used in today's many computer games. The only remaining physics rules to handle are the ones related with heat. The team will also implement its own component for this group of rules.

7. Project Specifications

7.1. Game Overview

The Bride is a FPS game. Uma (The Bride), who is a former assassin betrayed by her boss, is going to kill Bill, her former employer. She is going to take revenge from the assassin circle, for shooting her at her wedding - along with everyone else in attendance - and leaving her for dead. Four years after surviving a bullet in the head, Uma emerges from a coma and swears revenge on her former master and his deadly squad of international assassins, Lucy, Daryl, Vivica, Michael. She continues battling her way up the chain of command, knowing it will ultimately lead her to her main goal: her chance to kill Bill.

The game consists of five levels. In each level Uma is going to slay the assassin defined for that level according to the chain of command. After slaying Bill in the final level the game comes to an end. For each level there will also be other members of the circle who will try to prevent Uma from reaching her goal. In addition to challenge with the circle members there will be puzzles throughout each level, which will direct Uma to each level's head assassin.

As players progress in the game, the hero will gain experience and improve his skills so that he will be able to upgrade his powers. Also, during each level our hero will find new items that will be used both for solving puzzles and completing levels.

The Bride will be a windows-based game with a user friendly environment that presents menus easy to use. The game will have a realistic atmosphere with the help of graphical interface, sound effects, videos, scenario, environments and characters.

7.2. Game Details

In this part of the document our aim is to present the details of the game and component that make up the game. The details for a component are accompanied by use cases and the requirements related to that component.

7.2.1. Characters

Every character in the game will have attributes as health, strength and attack. Health which is measured by hit points is the level of vitality of a character and when it decreases down to zero (because of the damage taken by other characters) that character dies and is eradicated from the game. Strength identifies the amount of damage taken by attacks of the other characters. The more the strength of the character is the less damage he takes from attacks. Attack attribute utilizes the damage that the character does to other characters. The more the attack points of the character is, the more damage he does to other characters.

BUC_01¹: User sees the health, strength, experience and attack damage of the hero at the bottom of the screen, in the play mode.

BHLSR_01: Every character in the game shall have a health value that denotes the required attack damage in order to kill that character at that time.

BHLSR_02: The health field in the play-mode shall display hero's health.

BHLSR_03: Every character in the game shall have a strength value that denotes a coefficient for how much health points is to be reduced from a character when the character gets a hit.

BHLSR_04: The strength field in the play-mode shall display the strength of the hero

BHLSR_05: Every character in the game shall have an attack damage value that denotes how much health points is to be reduced from the character's rivals when they got hit by the character.

BHLSR_06: The attack field in the play-mode shall display the attack damage of the hero for the current conditions.

BHLSR_07: When health points of a character reaches zero, the character shall be eradicated

¹ * : **BUC_x** is used as a shortcut for "The Bride Use Case with number x", since it will be easier and better to deal with the use cases if we have tags for them.

from the game environment.

BHLSR_08²: If the hero is eradicated from the game, the program shall jump to the game menu from the play mode.

7.2.2. Uma (The Bride)

Uma , namely the bride, is the main character in the game. The player will control all of her actions. She is a beautiful, blond, sexy woman in her mid thirties with tight body lines. She weights approximately 50 kilograms (most of which is muscle of course) and she is 1.80m tall. Her long, fair yellow hair and the sanity in her looks could make a numerous number of men fall in love with her. Beneath this innocent look, the bride who is on her way to take revenge for being put in comma has heroic capabilities and power who takes life without interrogation.

The main character is able to move rationally throughout the environments in the game. She can jump, crouch, walk or run at any time. Uma can also take or drop items from ground and use them as defined for each, during the game. She is very skillful in both near and far combat. In addition to each characters attributes she also has an experience attribute. She gains experience points as she progresses and kill other characters in the game. The amount of experience gained when Uma kills a character depends on how strong that character is. When this experience value reaches to predefined values, the strength and attack points of the bride increases.

Uma also carries a special item, that she uses as a bag which has a capacity limit for carrying various items. Uma is able to use the items carried within the bag whenever necessary.

BHLSR_09: Health, attack damage and strength values of the characters shall increase if the difficulty level or the game level increases.

BHLSR_10: Each character in the game shall be able to progress in the game either by walking or by running.

BHLSR_11: The hero shall be able crouch and jump when she meets a circumstance that she is not able to pass via walking or running.

BHLSR_12: The hero shall be able to open a locked door or box if she has the necessary items.

BHLSR_13: The hero shall have a backpack that has a predefined capacity for each level, in

² **BHLSR_x** is used for “The Bride High Level Software Requirements with number x” with the reasons defined before.

order to carry items with her.

BHLSR_14: The hero shall be able to take an item from the ground (or from a box) every time she tries.

BHLSR_15: If the hero takes a weapon from the ground and have her hands free, she will use the weapon.

BHLSR_16: If the hero takes an item that is not a weapon or her hands are full she will put the item immediately in her backpack.

BHLSR_17: If hero's backpack is full, she shall not be able to take any item in the environment.

BHLSR_18: Each character in the game shall be able to shoot if he/she has a pistol with bullets.

BHLSR_19: If characters are in the defined range for pistols and shoot at the correct direction, they shall give damage points to the shooted character.

BHLSR_20: The hero shall have an experience value, with a corresponding field in the play-mode, with an increasing value when she improves in the game by killing her rivals.

BHLSR_21: According to the health, strength and attack damage values of the characters that has been slain, the hero shall gain experience points proportionally.

BHLSR_22: If experience value of the hero reaches a value that is defined to be a boundary, hero's vitality and strength shall increase.

BHLSR_23: The hero shall use one hand to carry a weapon and the items.

BHLSR_24: The hero shall use both other hands for carrying bigger swords.

7.2.3. Members of the Assassin Circle

These are the enemies of the bride. Circle members immediately take action to kill Uma when they face her, which is to be in the sight range of a facing member. In order to kill Uma members are able to shoot at her and also try to stay in the sight range defined for pistols.

BHLSR_25: Circle members shall be able to recognize the hero and take action for her.

BHLSR_26: Circle members shall be able to follow the hero for a defined time interval, if the hero tries to escape.

BHLSR_27: Circle members shall be able to escape from the hero if they face an unbearable situation like having no bullets left or having health points less than a predefined value.

BHLSR_28: If there is a defined dialog for a circle member, he/she shall talk with the hero.

7.2.4. Head Assassins (Lucy, Daryl, Vivica, Michael, Bill)

These are the stronger enemies in the game. There will be only one of them in each level and their power (the damage they make) will improve gradually as the level increases. They all vary in visual appearance and amount of attributes they possess.

BHLSR_29: Head Assassins shall be stronger than the assassin servants.

7.2.5. Assassin Servants

The servants of the head assassins are somewhat more easier to hunt. Their power (the damage they make) also increases with respect to the levels. Servants will vary in appearance and amount of attributes possessed.

7.2.6. Environments

The game will generally take place in closed environments (indoors). According to each level the rooms in the environment will be specially designed. Rooms will vary in size, shape, lighting conditions and textures used for them, also will have specific properties like pictures, paintings, movies on the walls.

For opened environments there will be weather conditions defined for each like being shiny, foggy, snowy, rainy

In order to increase the realism in the game, every part of the game will be rendered considering the lighting conditions in the current environment and the material properties.

BUC_02: User makes the hero travel in open environments with various weather conditions, in play mode.

BUC_03: User makes the hero pass through different rooms with different properties, in play mode.

BHLSR_30 : Both open and closed environments shall vary in structure.

7.2.7 Items

There will be several items that are going to be used during the game to solve puzzles, to kill enemy characters and to find a path in the environment. The items will include weapons, chargers, books, boxes, lights, maps, keys, health packs and pieces that will have some meaning when they are fixed.

All items might be used in forming puzzles or be placed in the environment with serving no functionality. They will be carried within hero's backpack and will serve as defined whenever they are retrieved from the bag.

BUC_04: User makes the hero collect, drops, uses different items like weapons, chargers, books, boxes, lights, maps, keys, health packs and pieces.

BUC_05: User uses an item by double clicking on it in the bag ingame interaction window.

BUC_06: User sees the contents of the bag by inputting from keyboard and views name and quantity of the selected item.

BHLSR_31: The hero shall be able to use an item if it is appropriately usable at that moment when the user double clicks that item in the bag.

7.2.8. Weapons

These are the items that are able to decrease the health of enemy characters and so that used for killing rivals. There will be two kinds of weapons, first of them are pistols and the other ones are swords. These items will have a damage capacity assigned for each, that will be used while decreasing enemies' health. Shooting at a character or object that is out of this defined maximum distance between the gun and the character/object, will have no effect. Pistols will have a defined capacity for them and whenever they are fed with a new charger they will be reloaded to this maximum capacity. Swords will vary in size and color while pistols will have a standard form.

BUC_07: User benefits from the weapons (swords and pistols) to make the hero decrease the hit

points of the enemies.

BHLSR_32: Swords shall vary in size and color while pistols shall have a standard form.

BHLSR_33: There shall be swords with different damage values.

BHLSR_34: There shall be a defined range for pistols.

BHLSR_35: A Pistol shall be reloaded with a charger.

7.2.9. Chargers

These are used for pistols as an ammo source. After retrieving a charger from the backpack pistols will be reloaded using this item as a source.

BUC_08: User reloads the pistol using chargers that he collects during the game.

BHLSR_36: Hero shall be able to reload her pistol using chargers she gathered whenever user inputs for it.

BHLSR_37: Chargers shall have a defined bullet capacity.

7.2.10. Books

These items are used in order have a specific skill or how to use a specific weapon. Books are used in forming puzzles.

BUC_09: User make the hero learn how to use a specific weapon or find a clue about a puzzle by making him read books.

BHLSR_38: There shall be different kinds of books that gives information about a weapon or a puzzle in the game.

7.2.11. Lights

There will be both dynamic and static light sources in the game. The user will be able to use these sources according to the properties defined for them. It will be possible for the user to turn on and off the static lights that are defined for the current environment. The user will be able

to carry dynamic light sources within her bag and use them whenever necessary.

BUC_10: User finds a way through the passages using light sources in the environment.

BHLSR_39: All light sources shall have a defined lightning power.

BHLSR_40: The hero shall be able to turn the static light sources on/off.

BHLSR_41: The hero shall be able to use dynamic lights while moving.

7.2.12. Boxes

Boxes will vary in size and color. They will generally carry items. The hero will be able to get the item if she opens the box whenever a box contains one.

BUC_11: User make the hero open locked boxes.

BHLSR_42: There shall be boxes varying in size & color, some of which containing items.

7.2.13. Maps

Maps are used for finding correct paths in the environment, which either takes the hero to level goals or solutions for the puzzles. Maps will be displayed as a new screen whenever used.

BUC_12: User finds a way in the passages using maps.

BHLSR_43: There shall be maps that displays current level's paths.

7.2.14. Keys

Keys are used for opening locked boxes and locked doors. The hero will be able to open a locked door or box if she is close enough and has the correct key defined.

BUC_13: User makes the hero open locked boxes and doors using keys.

BHLSR_44: There shall be different keys that are used for opening locked boxes & doors.

7.2.15. Health Packs

Hero restores her health (hit) points using health packs. The health packs will have a defined restoration point.

BUC_14: User restores the health points of the hero with the health packs.

BHLSR_45: The hero shall use health packs to restore her health points.

7.2.16. Levels

The game will have five levels. Every level will start with displaying information about the current level which tells the events happened and the goal of that level. In each level the bride will walk through various passages and traverse rooms which will lead her to the head assassins if she is able to find the correct path. In the first level the bride wakes up from a comma in a hospital and leads her way to her first rival Vivica. During the second level Uma's aim is to slay Lucy and afterwards she will take revenge from Daryl in the third level. The fourth level is where she will slay Michael , who is Bill's brother, and take her to the final goal in the game. The game is over after killing Bill in the fifth level.

BUC_15: User plays in five different levels, starting with the first level and ending with the fifth level.

BHLSR_46: There shall be five different levels in the game, with a definite starting and ending points.

BHLSR_47: The first level shall start after the execution of the game program.

BHLSR_48: Levels shall follow eachother.

BHLSR_49: Levels shall accept the end of the current head assassin as the ending delimiter.

7.2.17. Puzzles

During the game the hero will face some puzzles that are going to be solved in order to

reach the goal defined for each level. In order to solve a puzzle hero will have to find and gather the necessary pieces and items that are needed to solve that puzzle.

Puzzles will include finding keys in order to open locked doors, maps showing the way to new weapons, special items and assassins, lights that have to be used to find ways in the dark, maps & books and pieces that are to be gathered to reach levels goals.

In order to get hints to find a special item, a key that is needed to open a locked-door, a path that will take the hero to her level-goals the hero will have to use help from other characters in the game. There will be interaction windows that displays the dialog when the hero start one with a character. The hero will solve all the puzzles defined within the game to finish the game. If the hero completes all the steps that are defined as a solution for the puzzle, she solves the puzzle. The hero can use the information gained in a dialog whenever she meets the part of the puzzle that requires the information.

BUC_16: User deals with puzzles during each level.

BHLSR_50: There shall be different types of puzzles.

BHLSR_51: Puzzles shall have a number of steps to be completed.

BHLSR_52: Each step within a puzzle shall require a piece, an item or additional information that are going to be gathered from the environment defined for each level.

7.3. Graphical User Interface

The users will interact with the program via a graphical user interface with inputs from the keyboard & mouse. Within this context the program is used to refer to the main software which initiates the introductive/conclusive parts and menus displayed before/after and during the game itself and the game for the part of the program which user controls the character and interacts with the game environment that is to say which he/she plays the game. This interface will be divided into parts as follows:

BUC_17: User starts the program by clicking on the program's associated executable file in Windows environment.

BUC_18: User sees information about the the company and program on the screen after he starts the program.

BUC_19: User sees a list of menu options as start new game, load game, options, highlights, exit for the game.

BUC_20: User selects starting a new game option in the menu and watches a cinematic about the game and reads information about the first level.

BUC_21: User starts controlling the character after viewing information about the game .

BHLSR_53: The program shall have an executable file on the operating system it is loaded by which the program can be initiated.

BHLSR_54: In the opening of the program name, version and logo of the program and project team shall be displayed.

BHLSR_55: When starting new game option is selected the program shall play a cinematic about the game and shall display information about the game namely level (events, goals) .

BHLSR_56: A menu screen including start new game, load game, options, highlights, help, exit shall be displayed as a new window in the program.

BHLSR_57: There shall be information windows in the program where the user will only be able to view the information about the program such as company and game name, logo, loading status of the game and priori information about a specific level or a part.

BHLSR_58: After information about the game is displayed the program shall jump to play mode.

7.3.1. Game Menu

The game menu will have buttons defined for spawning a new game, loading a saved game, changing the game settings, displaying game & level information and exiting from the program. To start a game player will either spawn a new game or load a saved game. When user initiates a new game, information about the scenario will be displayed and after that user will start controlling the hero in the game.

7.3.2. Save Menu

This menu will enable the user to save the game currently being played. There will be buttons which will enable the user return to play-mode, save the current game and jump to the

game-menu. The user will pass to the play-mode, and continue the game, if he/she clicks on the play button. If the user chooses to pass to the game-menu without saving, current game information will be discarded. If the user clicks on the save-game button, a new menu with a list showing the names of the saved games before, will appear for the user to specify a name for the game to be saved. User inputs either a new name or an existing name that is in the list and then the current game will be saved. If the user specifies a name that is already on the list, the contents of the game will be replaced with the new one.

BUC_22: The user turns back to the game, play mode, after he saves the current game.

BUC_23: After saving the game or without saving it, the user jumps back to the game menu losing the current game information if it is not saved.

BUC_24: In save game menu the user either specifies a name or chooses an existing name and saves the current game.

7.3.3. Play Mode

Play-mode will enable users to see the details about the hero, like her health, experience, strength and attack damage. There will be also buttons and subfields to display information about the current weapon used, number of bullets left if applicable, the items within the bag and current level. The user will be able enter to the save-menu from play-mode inputting a key from the keyboard.

BUC_25: While playing the game user interrupts the game by inputting from keyboard and sees save game menu.

BHL SR_59: The program shall display a save menu and information about the current level, level goals, when user interrupts during the game (play mode).

7.3.4. Ingame Interaction Window

The conversations between other characters, a view of puzzle related materials such as text, pictures, animations, map of that level and bag-pack of the hero in the game will be displayed on the ingame windows. These windows will be a part of the play mode and will

appear eventually on the screen provided that the user gets closer enough to a character or activates an object or button in the game by inputting from keyboard or mouse. User will be able to communicate with the characters/puzzles in the game environment using the game interaction windows.

BUC_26: User sees the map of the level with path information about that level, if he uses a map defined for that level.

BUC_27: User gets closer to a character or object included in a puzzle and views a new screen that shows information (conversation text, figures) about the puzzle.

BUC_28: User sees the contents of the bag by inputting from keyboard and views name and quantity of the selected item.

BHLSR_60: There shall be in game interaction windows in the game that are part of the play mode which shall provide communication between user and the game.

BHLSR_61: The program shall display the map as an in-game interactive window of the current level whenever the user requests for it.

BHLSR_62: The program shall display an in-game interactive window displaying information (conversation text, figures, a view of puzzle related materials, animations) about the puzzle whenever user is involved in a puzzle in example he gets closer to a character or object.

BHLSR_63: The program shall display the contents of the bag as an in-game interactive window where user can select the items and the program shall display name and quantity information about the selected item.

7.3.5. Information Window

The information about the company and game like its name, logo, loading status of the game and priori information about a specific level or a part of a game before it starts will be displayed in information windows. The user will only be able to view the information on these windows and skip them either interrupting from keyboard or waiting enough letting them pass.

7.3.6. Options Menu

In options-menu there will be fields showing current game-settings and buttons enabling

users to change them. User will be able to configure sound, keyboard, mouse and difficulty-level of the game by using these fields.

BUC_29: User modifies the current (difficulty level, sound, keyboard and mouse) settings of the game using the options menu.

BUC_30: User selects options menu from the main menu.

BHLSR_64: A new window displaying the difficulty level, sound, keyboard and mouse configurations shall be demonstrated.

BHLSR_65: The program shall allow the user to change the current (difficulty level, sound, keyboard and mouse) settings of the game from the options menu and store these new settings to use from then on.

7.3.7. Highlights

This window will give information about the product.

BUC_31: User sees information about the program (creators of the program, web site of the project) when he selects highlights option from the main menu.

BHLSR_66: The program shall output information about the program (creators of the program, web site of the project) in highlights window when highlights option is selected.

7.3.8. Load Menu

This button will enable the user to load a game that is saved before. If the user jumps to the load menu from the main menu, the list of the saved games will be displayed. When the user chooses a name from the list, the game with the specified name will be loaded.

BUC_32: User selects load game option and continues the game that he identifies.

BHLSR_67: The program shall display the load menu when the user selects load game option and when he identifies the game to be loaded an information window showing the loading status

of the program and the name of the level that the user had been playing in. Then the program shall enter play mode.

7.4. Sound Effects

The reality of the game will be enhanced with various sound effects, including characters, items, environment conditions, background music and dialogs.

BUC_33: User hears various kinds of sound effects following the events which are related to opening and closing of locked doors & boxes, environmental happenings, weapons and behaviours of the characters.

BHLSR_68: The software shall associate different kinds of sound effects for the events as opening and closing of locked doors & boxes, environmental happenings, weapons and behaviours of the characters.

7.5. Technical Details

The game environment will consist of different scenes which will be generated by texture mapping and lightning effects. By this way we are planning to present realistic scenes for end-users. We are planning to develop characters, environments and objects with 3D modeling tools, graphic libraries, thus having a realistic atmosphere.

We will use AI techniques to make enemies smarter. A hostile character will have the ability to follow the hero so that he does not allow the hero to get out off the predefined range of his weapon.

In order to create a user friendly environment, we are going to make the menus easy to manage and self explaining. During the game controlling the movements and skills of the hero will be straight forward and information about buttons will be reached from the options menu.

BUC_34: In the play mode, user controls the movement of the main character (hero) using input devices (keyboard and mouse).

BUC_35: User exits program using the quit game optionality in the game menu.

BHLSR_69: If the current game is saved, the program shall store the necessary information about the game and associate the information with the name defined by the user.

BHLSR_70: The program shall be able to turn back to play mode and make the game continue from the point user interrupted.

BHLSR_71: From the save game menu, the program shall be able to enter to main menu window depending on the input taken from the user.

BHLSR_72: The program shall redefine the new place or next action (taking an item, shooting at something, using an item) of the hero considering to the user inputs.

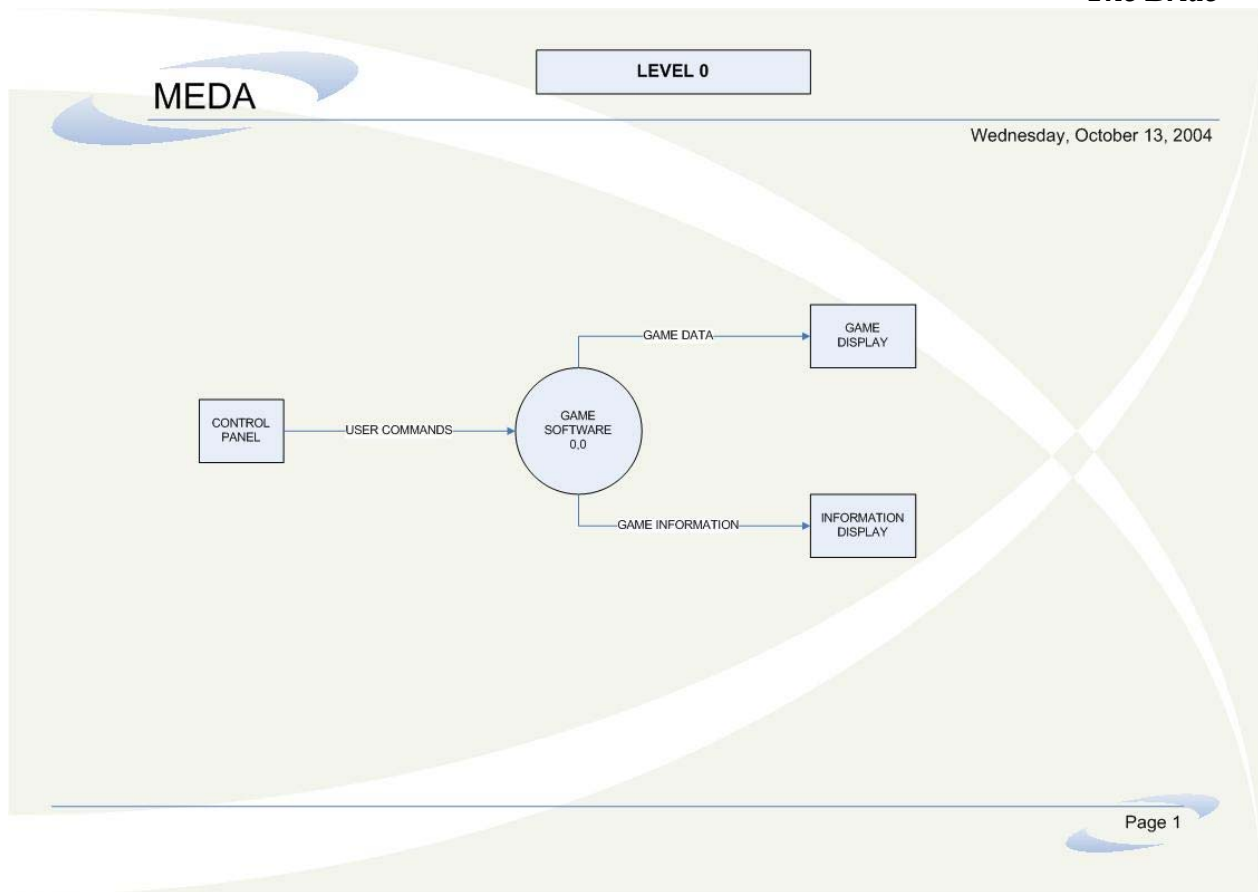
BHLSR_73: The program shall provide user-friendly, self explaining menus, descriptive icons, simplified usage.

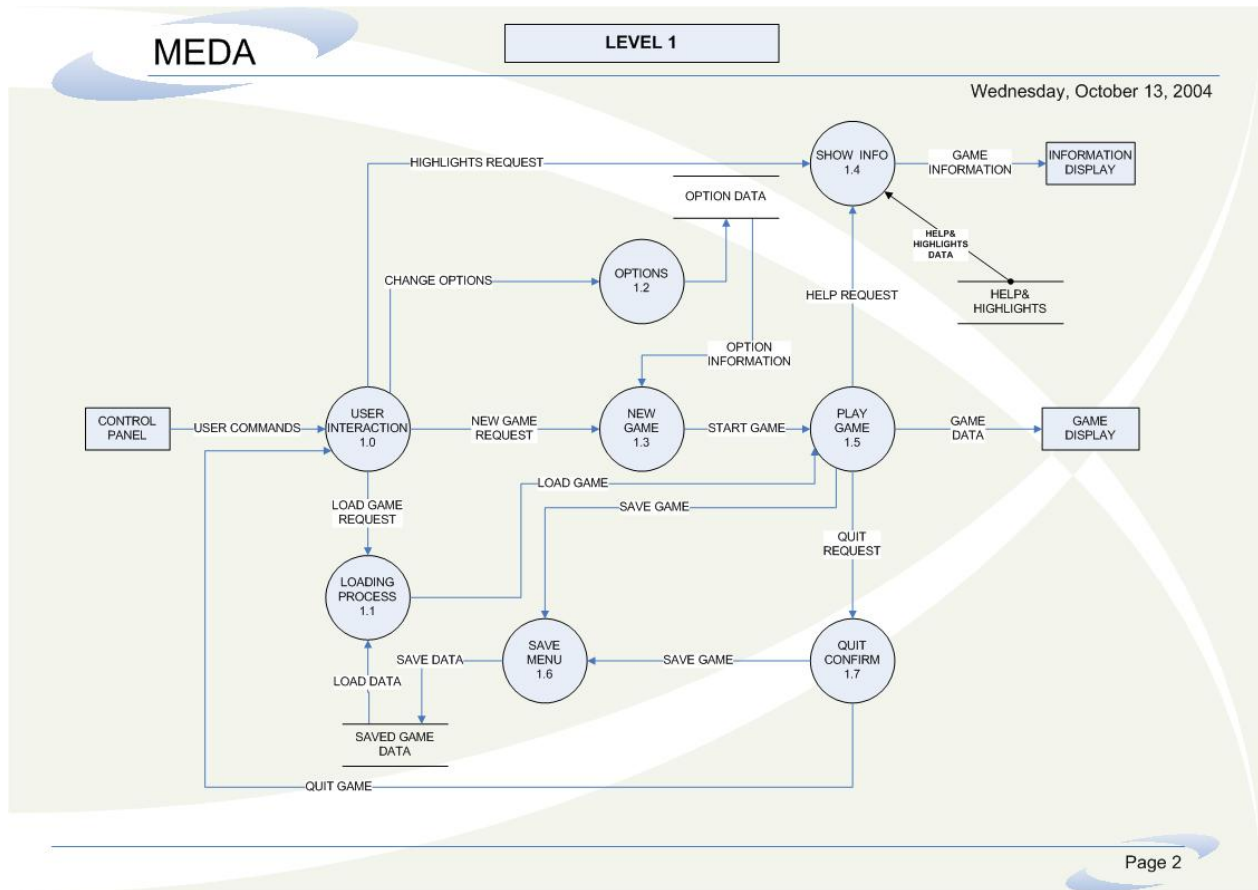
BHLSR_74: When user selects quit option from the game menu, the program shall be terminated.

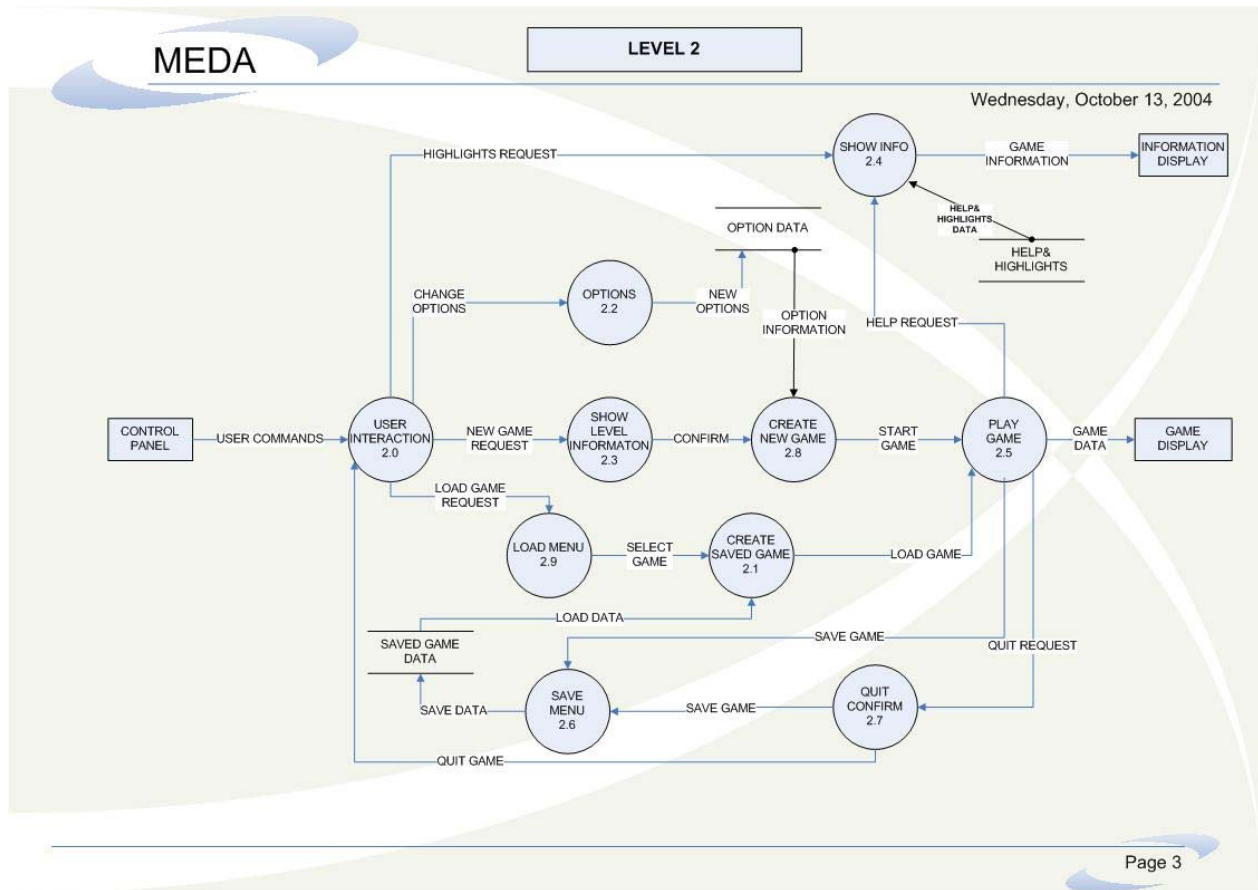
8. Flow Charts

In this section, the DFDs and STD of the project are given. These diagram show the functionality and behavior of the software according to the given inputs.

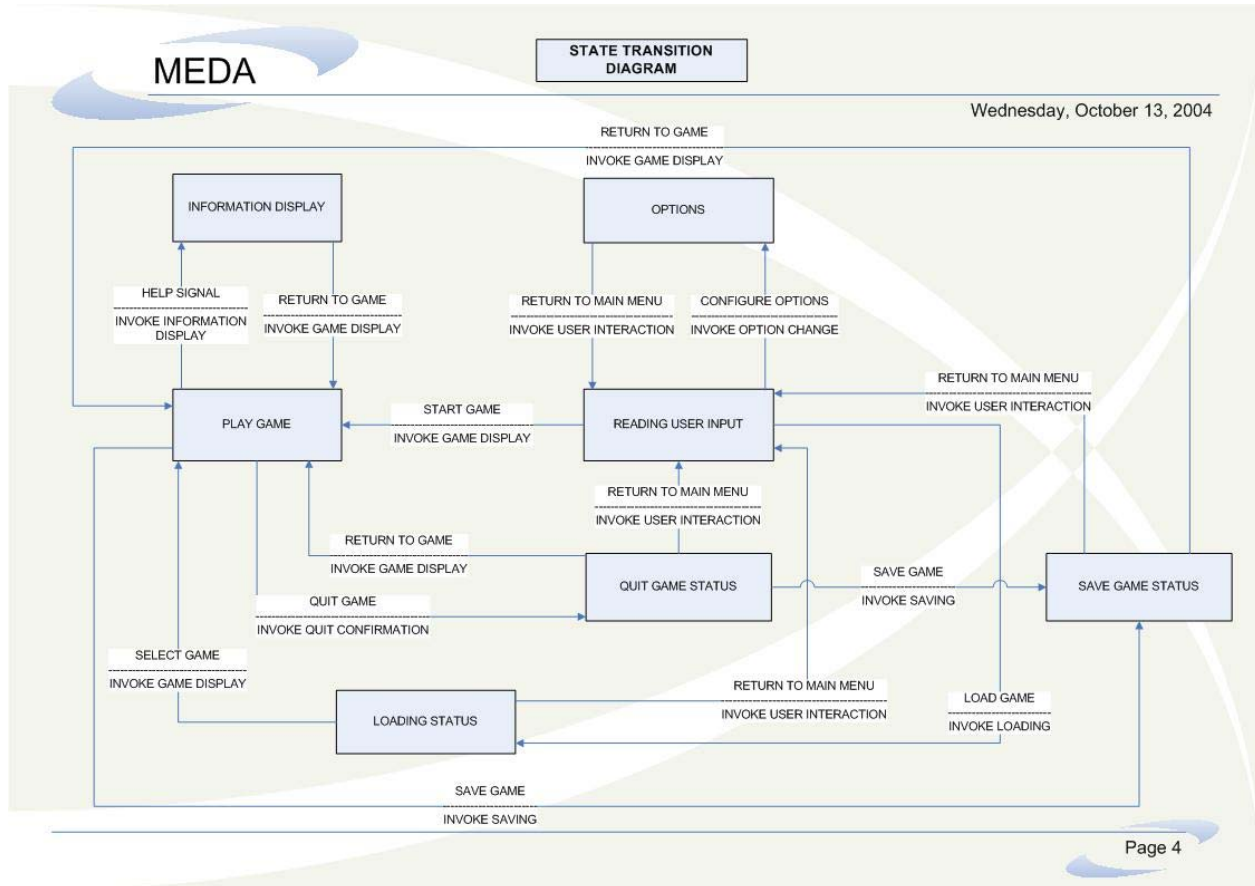
8.1. Data Flow Diagrams







8.2. State Transition Diagram



9. Software Quality Assurance

Software Quality Assurance will focus on the management issues and the process specific activities that enable a software organization to ensure that it does the right things at the right time in the right way. Software Quality Assurance plan provides a road map for instituting software quality assurance.

9.1. Scope And Intent of SQA Activities

The objectives of Software Quality Assurance are:

- A quality management approach
- Effective software engineering technology
- Formal technical reviews that are applied through the software process
- Control of software documentation and the changes made

- Measurement and reporting mechanisms

9.3. Formal Technical Reviews

A Formal Technical Review is a software quality assurance activity that is performed by software engineers. The objectives of the Formal Technical Reviews are:

- Uncovering errors in function, logic, or implementation for any representation of the software
- Verifying that the software under review meets its requirements
- Ensuring that the software has been represented according to predefined standard
- Achieving software that is developed in a uniform manner
- Making projects more manageable

Here are the Formal Technical Reviews that we will conduct during the software process

- Walkthroughs
- Inspections

After each module we design, we'll do a test on the functionality of the module using block box testing method. And for each week, when the team set down come to a meeting, we will ask the team mates to do a inspection on the modules, then hook up the other's work, do a walkthroughs of all the module functionalities.

9.2.1. Review Walkthroughs

Description and Focus of Review

This review mainly focuses on the integrations of the parts that we design such as interfaces and game modules. We will ask other team members to do the walkthroughs with the presence of coder.

9.2.2. Review Inspection

Description and Focus of Review

This review is mainly focus on the correctness of the parts that we designed. Usually allow the other two team-members to do a private test, without the designer's interrupt. This idea is try to allow other team-members bring out the test cases.

System Specification Review

System specification usually changed after each weekly meeting. As for this moment, most of the system designs have been settled down. And since we are actually doing a bug fixing, the system specification is almost there. Even we have expended the project into a higher levels, the basic mapping of the project is still the same.

Software Project Plan Review

The purpose of Software Project Plan is over look of the whole project.

10. RISK ANALYSIS

10.1. Scope And Intent of RMMM Activities

We want the software to be free of any defects or errors, but it is hard or at times almost impossible to develop a system that is free of any defects. To be safe we would like to have a risk management plan to counter any difficulties that may impact the development or the creation of the software. Our goal is to assist the project team in developing a strategy to deal with any risk.

10.2. Risk Management Roles

Every one associated with the software has responsibility of managing the risk. That is if everyone participated and paid close attention to all the details during the early phase of the software development many risk can be avoided.

Software development team can avoid from risk by checking their schedule, product size, estimates regarding costs of the development, getting all the details of the equipment that are provided or are accessible to them.

10.3. Risk Descriptions

This section describes the risks that are likely to be encountered during this project.

10.3.1. Business Impact Risk

This is the risk where concern is that of the not being able to come up or produce the product that has impact on the customers' business. Since our team is new to develop a project of this area, unsuccessful results about meeting the needs of the customers in this project will affect our future plans on the market negatively.

10.3.2. Customer Risks

This is the risk where concern is customers' motivation or willingness in helping the software development team. As we are not developing a product for a specific customer, we will not emphasize customer risks.

10.3.3. Development Risks

If customers fail to provide all the necessary equipment for the development and execution of the software this will cause the software to become a failure. So in other words customer has to be able to provide time and resources for the software development team. If all the requested resources are not provided to the software development team odds for the software development to fail rises greatly.

10.3.4. Employee Risk

This risk is totally dependent on the ability, experience and willingness of the software development team members to create the working product. If the team members are not experience enough to use the application necessary to develop the software it will keep pushing the development dates until it's too late to save the project. If one or more members of the

software development team are not putting in all the effort required to finish the project it will cause the project to fail.

10.3.5. Process Risks

Process risk involves risks regarding product quality. If the product developed does not meet the standards set by the customer or the development team it is a failure. This can happen because of the customer's failure to describe the true business need or the failure of the software development team to understand the project and then to use proper equipment and employees to finish the project.

10.3.6. Product Size

This risk involves misjudgment on behalf of the customer and also the software development team. If the customer fails to provide the proper size of the product that is to be developed it will cause major problems for the completion of the project. If software development team misjudges the size and scope of the project, team may be too small or large for the project thus spending too much money on project or not finishing project at all because of shortage of finances.

10.3.7. Technology Risk

Technology risk involves of using technology that already is or is soon to be obsolete in development of the software. Such software will only be functional for short period of time thus taking away resources from the customer. Since the technology changes rapidly these days it is important to pay importance to this risk. If customer request use of software that soon to be obsolete software development team must argue the call and have to pursue customer to keep-up with current technology.

10.4. Risk Table

The following table describes the risks associated with the project. The appropriate categories of the risks are also given, as well as probability of each risk and its impact on the development process.

Probability And Impact For Risk

Risk no	Category	Risks	Probability	Impact
1	Employee Risks	Temporary unavailability of a team member	30%	3
2	Employee Risks	One of the team members quits the course.	10%	1
3	Employee Risks	Lack of skills and experience	70%	2
4	Product Size	Size of the software can be underestimated	40%	2
5	Development Risks	Unavailability of the pc's in department	5%	4
6	Customer Risk	No risk	0%	
7	Technology Risk	Difficulties in learning new software	50%	2
8	Business Impact	Tight delivery deadline	20%	2

Impact Values

1
2
3
4

Description

Catastrophic
Critical
Marginal
Negligible

10.5. Risk Management Strategies

Risk No

- 1 - We don't have to work in parallel. That member may finish his job before or just after the due time.
- 2 - We may still get help from him.
- 3 - We will study hard.

- 5 - This is not a problem, we may continue our job with our own pc's.
- 7 - We may get help from our senior friends.

11. Project Estimates

11.1. Estimation Techniques And Results

Two estimation Techniques have been used in this project:

- Functions Points (FP) → Albrecht and Goffney Model
- Lines of Code (LOC) → Intermediate COCOMO

	Weighting Factor				
Measurement Parameter	Count	Simple	Average	Complex	
Number of user inputs	8	3	<u>4</u>	6	32
Number of user outputs	2	4	5	<u>7</u>	14
Number of user inquiries	0	3	4	6	0
Number of files	15	7	<u>10</u>	15	150
Number of external interfaces	0	5	7	10	0
Count Total					196

Factor (F _i)	Value
1- Backup and recovery	5
2- Data communications	4
3- Distributed processing	0
4- Performance critical	5
5- Existing operating environment	4
6- On-line data entry	0
7- Input transaction over multiple screens	0
8- Master files updated on-line	1
9- Information domain values complex	4
10- Internal processing complex	5
11- Code designed for reuse	3

12- Conversation/Installation in design	3
13- Multiple installations	4
14- Application designed for change	4
$\Sigma (F_i)$	42

$$\begin{aligned}
 \text{FP} &= \text{count total} * [0.65 + 0.01 * \Sigma(F_i)] \\
 &= 196 * [0.65 + 0.01 * 42] \\
 &= 196 * [0.65 + 0.42] \\
 &= 196 * 1.07 \\
 &= 210
 \end{aligned}$$

$$\begin{aligned}
 \text{LOC} &= \text{FP} * 64 \quad (\text{Programming language is mainly C++ . Its LOC /FP is 64.}) \\
 \text{LOC} &= 210 * 64 \\
 \text{LOC} &= 13440
 \end{aligned}$$

The estimates for LOC are plugged into the COCOMO formula for effort and duration estimation. The basic COCOMO model is used, for which

- Effort $E = a \text{ KLOC}^b$
- Duration $D = c E^d$

The project is classified as an organic project, using default values $a = 2.4$, $b = 1.05$, $c = 2.5$ and $d = 0.38$.

$$\begin{aligned}
 E &= 2.4 * (\text{KLOC})^{1.05} \\
 &= 2.4 * (13,440)^{1.05} \\
 &= 2.4 * 15,3 \\
 &= 37 \text{ person-months}
 \end{aligned}$$

$$\begin{aligned}
 D &= 2.5 * E^{0.38} \\
 &= 2.5 * (37)^{0.38} \\
 &= 2.5 * 4 \\
 &= 10 \text{ months}
 \end{aligned}$$

Kemerer model

$$\begin{aligned} E &= 60,62 * 7,728 * 10^{-8} * (210)^3 \\ &= 468,47 * 10^{-8} * (210)^3 \\ &= 43 \text{ person-months} \end{aligned}$$

since our team is composed of 4 people $D = E / 4$

$$D = 43 / 4 = 10 \text{ months}$$

11.2. Cost Estimations

We will work on this project for 10 months with 4 people. We should learn new software and therefore buy some books about them. If we were working in a company part time, we would earn a salary of 400\$ per month. So we can guess that our software should cost about 16000\$.

12. Appendix

Schedule for the project is given within the following graphs.

