UVic Breakout

Requirement Specifications and Conceptional Design

ABILITY SOFTWARE

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Project Summary

This document is in response to Almost Games' RFP for a team to develop a GPS Based Text-Adventure RPG video game. The requirements and constraints of the game are described, as well as desired aspects of the final product. Project objectives are outlined along with the user-product interaction.

Project Objectives

The proposal requests a GPS Based Text-adventure RPG Video Game. The game must be completed within a 3 month period. The game will include RPG-like elements mirroring game styles of 80's text adventure games. The game will incorporate a modern element, GPS and smartphones, into the old genre. The game will be playable as an application on a smartphone. The in game map, of which the player will traverse, is a replication of the UVic campus. In order to visit locations in the game and progress through the story, the player must also physically visit the in game locations in real life. The GPS on the smartphone will detect when the player is in the right location and progress the game. Riddles based on landmarks may be incorporated into the game to incentivize the physical aspect. Though, users will generally interact with the game using the traditional text based game approach. It is intended that the in-game setting of UVic will have some themes within certain areas, game story will be designed around those themes. The story of the game is intended to be satiric, heartwarming, and ridiculous. A variety of stories will be present in the game, a main story as well as smaller side stories.

Vision

The game will incorporate traditional elements of RPG, such as quests, items, secrets, and levels. The game will run in a state to state manner, a player's current state consists of their items, level, prior interactions, and their point in the story, from the current state the next state the player can enter is determine from their decisions and current state elements. The number of states the game includes will be negotiated, though it should so much that through one typical playthrough less than 50% of the state elements are used. Inclusion of puzzles and riddles is encouraged though difficulty should remain easy to not induce frustration in the player. Hints should be readily available to a player. No player should get stuck for an elongated period of time. Emergent gameplay and multiple ways to progress through a game element is a stretch goal.

The game will make interesting use of the GPS built into smartphones. The in game map will be a replica of the floor plan and environment of areas at UVic. The player's location in real life will be synced to the player's location in the game. The GPS on the phone detects when the user in is in a specific location and triggers game elements accordingly. The in game map will load a

map for each location of interest the player walks into. The outside UVic campus will have its own map as well as buildings of interest.

The game contains a variety of characters, items, and character skills. Characters will populate the game world at a rate of about 1-2 per area. The characters will all have distinct personalities. The characters will offer the player insight, advice, items and other game-related elements. Some characters will attempt to harm the player. Items are available to the player from character interaction and finding them in the map. Randomization and luck in finding items should be used sparingly. Items include consumables and weapons. Consumables are used by the player and affect player status and other game elements. Weapons are mostly aesthetic since the game does not feature an active combat system. Some weapons will have special effects however. The character will level up in various skills at arbitrary intervals. These skills will have a weak effect on the game and are mostly there to make the player feel good about themselves.

User Interaction

The user interface for the GPS-enabled text-based RPG will be kept as simple as possible, while still giving the user all the information they need on demand. The interface will be divided into four sections, a title, an image or map, a situation description, and a list of options the player can perform.

Title

Each zone will have its own title to remind the player where they are. This title will be split into two parts, the first will tell the player what game zone they are in, and the second will tell them what part of that zone they are in. Examples are provided below.

Damaged Spaceship – Outside
Zombie Bunker – 3rd Floor Main Hallway

Image

Each zone the player is in will have its own image, either an edited image of the real UVic at that location, or a picture of the UVic map with their position marked on it. The edited images will mostly be a picture of the building or area the player is currently in, and may have some edits to go with the theme for that area. The images will also be pixelated to fit in with the style of the game in general.

Description
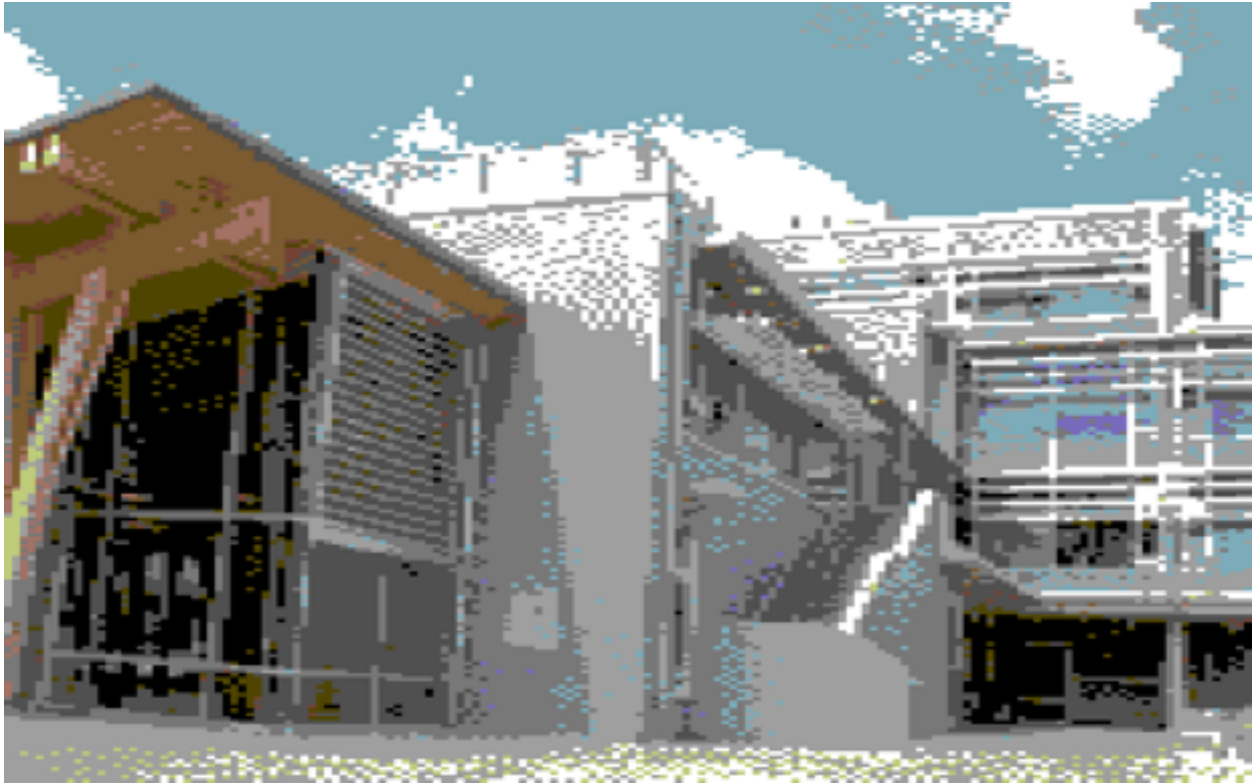
Below the image will be a text description of their situation. This might include details such as their current status, what they see, and where they could go.

You are in the third floor of the Zombie Bunker. Around you are many tables and chairs, mostly lined up against the left wall. It looks as though this area was used primarily for food stations during the zombie invasion of '06. There are still moldy shapes resembling pizza slices on the tables. There are a few doors, but all are locked. There is another hallway to your right, and a short hallway to your left.

You are outside a broken metallic structure. It looks as though this was once a spaceship, but the hull is broken in many places. Perhaps there is still parts of use inside?

Actions

Finally, at the bottom of the screen will be a list of options the player can perform. This list will have a scrollbar if there are many possible options, but it will usually be limited to 3 or 4. This will also include the 'Inventory' button, which will always be available for the player to view their collected items.

Rusty Prison Shank

> An old rusty prison shank from the destroyed spaceship.
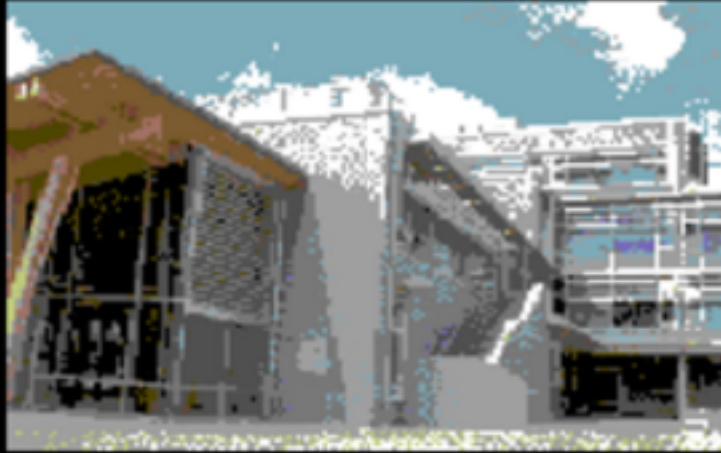
Back   Use

Moldy Pizza

Rusty Prison Shank

Sticky Note

Zombie Bunker
Right Hallway

> This appears to be an old bunker from the zombie invasion of '06. This hallway is narrow and has many rooms on the sides.

> There are three rooms, labeled 103, 104, and 105 that are intact.

Inventory

Go Back to Entrance

Open Door 103

User Interface Example

Users

The intended users for the UVic GPS enabled text-based RPG are students attending the University of Victoria. The GPS portion of the game requires the users to be on the University of Victoria campus. Additionally, the content of the game is based on the physical aspects of the campus, such as buildings.

The game is intended to be a single player experience. That is, there aren't player-player interactions in the game.

Environment

The environment of UVic GPS(Global Positioning System) enabled text-based RPG(Role Playing Game) is based around the campus of the University of Victoria. While the environment will not be identical to the University of Victoria campus, it will have similar aspects to the University of Victoria environment.

The environment will be segregated into large areas based on the layout of the University of Victoria. As an example, the location close to the Engineering Lab Wing (ELW) and the Engineering and Computer Science (ECS) building would be centred around technology and invention.

The in-game environment will be bounded by physical, GPS related boundaries. If a player physically walks outside of the boundaries, there will be in-game consequences. These in-game consequences may include injury, capture, or even death.

The game provides an in-built auto save function to be saved every time a new location is archived. The archived versions are then available to the players to visit and pick of the game where they left. The archives also allow the player to replay the different unlocked stages to try perhaps a different path to success like in SpaceShip Quest (check the story line).

Story Progression

 The game will be primarily narrative and the story will be a major emphasis on the story. However, the game will be designed to be short. This means the story must have appealing elements beyond pure character building. The story of the game is not explicitly defined, yet it will had emphasis towards relating with university students, primarily to those at the University of Victoria. The story will satiric, exciting, and uplifting, with areas that instill fear and a sense of ridiculousness.

 The conflicts of the game will primarily be in the form of puzzles. This replaces the need of an active combat system, and staying more true to the text-based RPG genre. However, there will still be combat and conflicts, but within the parameters of the text-based RPG genre. The puzzles will vary in difficulty and style. All styles of puzzles will include some, and varying, levels of physical world interaction. One style will be similar to solving a maze and another will be of a lock-and-key style. In the lock-and-key style of puzzle, the player will be presented with a lock, for a door, chest, etc., and must find the 'key', or code, in a different location in the physical world. As an example of the lock-and-key style of puzzle, the player may be presented with a locked location in-game while on the first floor of the building X in the physical world and the code to unlock the location will be the address of building Y.

The game will include non-player characters (NPC). These NPCs will interact with the player, offering items or quests, providing conflicts, or acting as a shop. Some NPCs will be integral to the game, some to a specific storyline, and some will be completely optional. NPCs will add to the emotional aspect of the game, with witty one-liners or offering heartwarming feelings.

As one of the RPG elements of the game, the game will include items and an inventory system. Items will be collected as rewards, through NPCs, or by exploration. Like NPCs, items may be integral to a specific storyline, aid the player, or even hinder the player.

Side Quests

While the story is the main focus of the game, it will also offer side quests. This offers additional stories and activities to the game. These side quests will enforce the ideas of exploration, puzzle completion, and conflict. These side quests will involve more and different chance than the main quests, offering additional replay value.

Story Completion

 The game may be completed in multiple ways.

Business	The business completion strategy involves earning enough currency, via quests or exploration, to open an in-game shop and set up a trade route between the player owned shop and NPC shops. This ending offers the player character a reason to remain the game environment and able to survive comfortably.
Completionist	The completionist storyline involves the character completing all the areas of the in-game world. This involves completing all puzzles in each location. This offers the player character a sense of mastering and ownership over the in-game world and thus a reason to remain.
Cultural	The cultural completion method involves resolving all major conflicts peacefully. This ending unites the locations of the in-game world and the NPCs revere the player character as a hero, and thus offers are reason for the player character to remain.
Engineering	The engineering-style completion is accomplished by accumulating in-game items to build a spaceship to escape the in-game world. The parts may be found via exploration, interaction with NPCs, or via a crafting. This ending offers the player an escape from the in-game world, back to the player character's original home.
Philosopher	The philosophical completion strategy involves the the player character finding inner peace. This is accomplished by completing one stage of each of the other completion strategies. This ending offers the player character a sense acceptance of their place in the in-game world, and thus a reason to remain.
Science	The cultural completion method involves the categorization of species of the in-game world. The species may be discovered via exploration or interaction with NPCs. The game ends upon discovery of all species. This ending offers the player character a sense of order and accomplishment within the in-game world and thus a reason to remain.

Management Plan

Minimal Systems Requirements

The product is a video game for mobile platforms, it will be released on Android, initially and an iOS version release in the future. The game will be available on the mobile device's respective app stores.

The game will be available only on the current version of Android Lollipop version 5.1.X and it will not be backwards compatible. It is entirely possible that the application will work on previous versions of software but the developer bears no responsibility for any damage to hardware or

software if the mentioned specific requirements are not met. Along with that, It is recommend that the Android software support for OpenGL is also present on the hardware, although this is a included in most Android platforms the developers take no responsibility in ensuring and checking that the OpenGL is working with all its dependencies on the current device.

The hardware requirements for the project to operate smoothly and seamlessly are listed below:

- Android Smartphone with the following specifications:
- Operating System: Android 4.0 "Ice Cream Sandwich" or later
- System on chip: Qualcomm Snapdragon S4 MSM8960
- CPU: 1.5 GHz dual-core Krait
- GPU: Adreno 225
- Memory: 2 GB
- Storage: 16 GB (minimum)
- GPS Sensor (working & tested)

** For any further clarification on compatibility please visit the Google's Android Compatibility Definition for Android "Ice Cream Sandwich" 4.0.X (http://static.googleusercontent.com/media/source.android.com/en//compatibility/android-4.0-cdd.pdf)

Implementation

The implementation of the game will be done entirely in Android Studio. The team will be using a combination of different platforms among themselves to coordinate the development.

Android Studio is the official IDE for Android application development, based on IntelliJ IDEA. Android Studio uses Java for functionality, and XML for GUI and UI.

The Android API for GPS sensors is also used for retrieving a user's current location on the smartphone to progress the game. Most Android devices allow applications to determine the current geolocation. This can be done via a GPS module, via cell tower triangulation or via wifi networks.
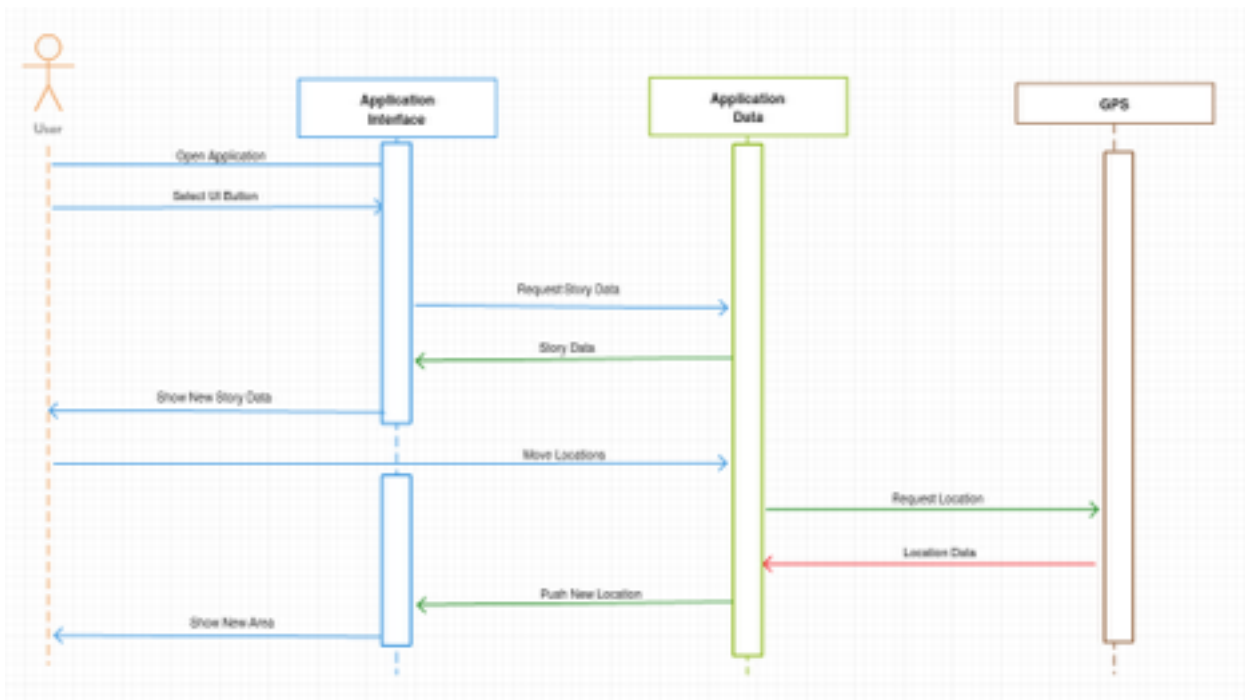
Android contains the android.location package which provides the API to determine the current geo position. The LocationManager class provides access to the Android location service. This services allows to access location providers, to register location update listeners and proximity alerts and more. The LocationProvider class is the superclass of the different location providers which deliver the information about the current location. This information is stored in the Location class.

The Android device might have several LocationProviders available and you can select which one you want to use. In most cases you have the following LocationProviders available.

LocationProvider	Description
network	Uses the mobile network or WI-Fi to determine the best location. Might have a higher precision in closed rooms then GPS.
gps	Use the GPS receiver in the Android device to determine the best location via satellites. Usually better precision than network.
passive	Allows to participate in location of updates of other components to save energy

While GPS will be used extensively in the game, precise locations will not be used. The GPS element of the game will guide the player to a general area (ie, Library area) where the player can interact with the location environment, NPCs, and items. This will reduce errors due to GPS precision.

The Google Maps API will also be used for pointing the locations of the users and characters within the map. Following is a simple example of Google Maps API in use setting a location point on Google Maps

** Further information about Android Studio can be accessed via their website (http://developer.android.com/tools/studio/index.html)

Team Roles

The primary design of the User Interface will be done by the project Toolsmith Isaac, and the Development Consultant Gabriel. Back end design will be completed by the Application Developer Ahbi, with assistance from the other group members. Story writing will be done by all group members.

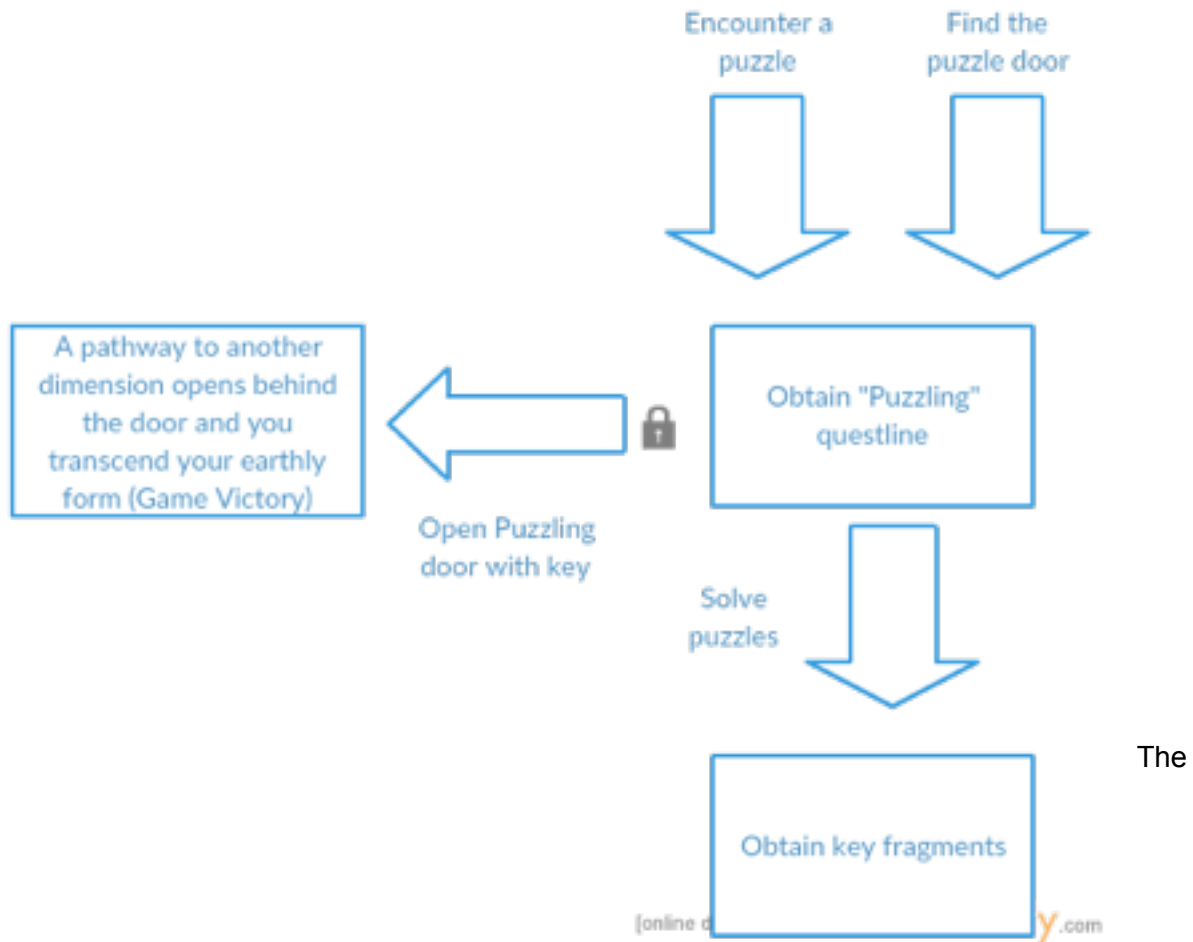# Application Architecture

UML Diagrams

Sequence Diagram

In the sequence diagram, the "Application Interface" layer provides all the options available to user for interaction with the application. The "Application Data" layer stores the data and the story line which interacts with the final hardware layer specifically the GPS. The application automatically archives data points for new locations uncovered which are pushed to the user and the "application interface" under the appropriate instances.

Use Case Diagrams

Basic Application Use
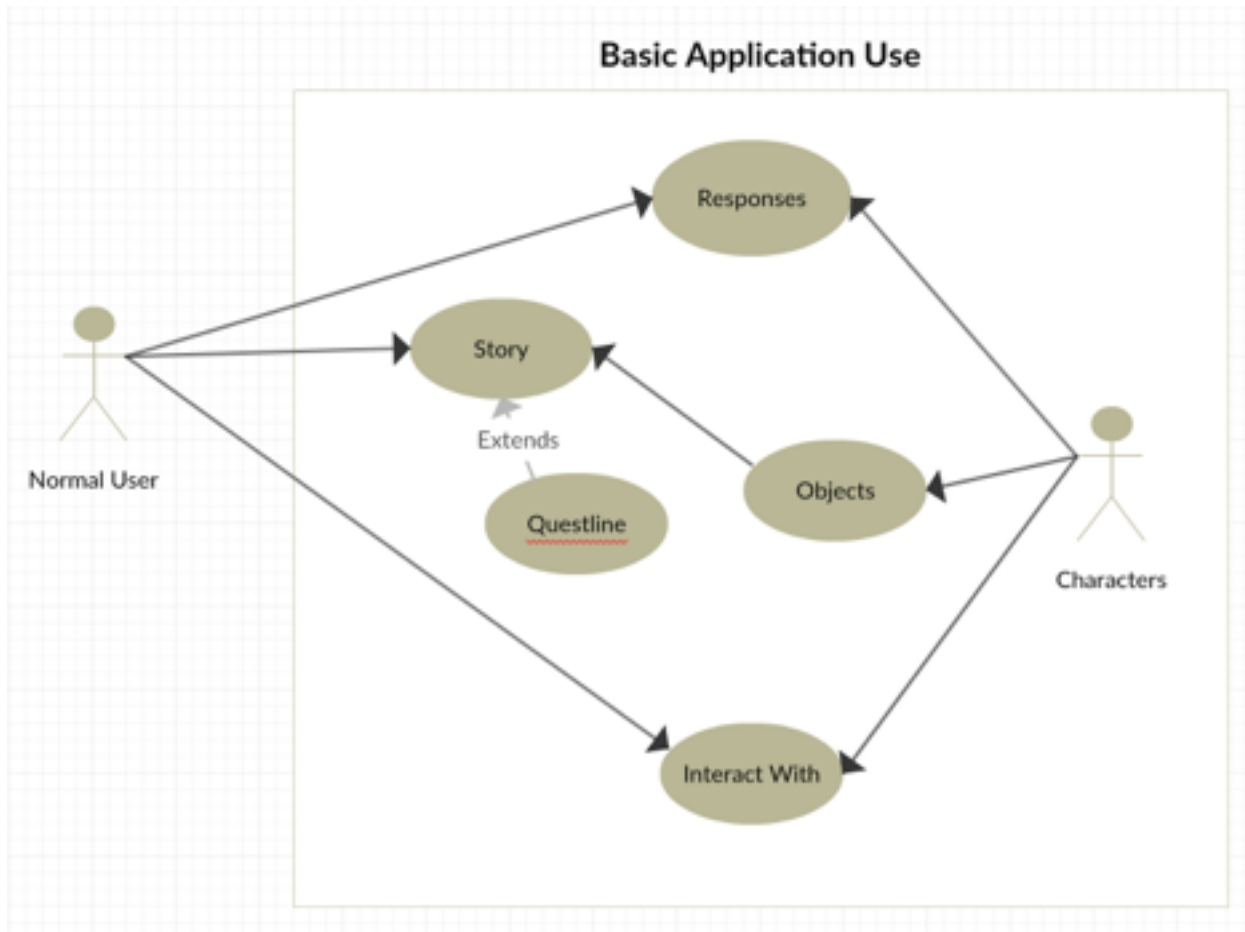
The user and the in-game characters interact in multiple ways within the application, both directly and indirectly. Directly, the user may choose options to interact with the in-game characters, like NPCs and items, via text prompts. These characters will respond to the user interaction, and the user will be prompted to interact with the object again, or be notified that the task has been completed. Indirectly, the user will interact with in-game characters by quests and quest objects. The quest objects will update quest progression.

Story Board Diagram #1

Encounter a puzzle

Find the puzzle door

A pathway to another dimension opens behind the door and you transcend your earthly form (Game Victory)

Open Puzzling door with key

Obtain "Puzzling" questline

Solve puzzles

Obtain key fragments

The

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Puzzling storyline starts with the discovery of the first puzzle or encountering the "puzzle door". This storyline is completed when all of the fragments of the key are found, and the "puzzle door" is unlocked. The fragments of the key to the "puzzle door" are found at the completion of each of the in-game puzzles. The "puzzle door" leads to another dimension and the player transcends their earthly form.

Story Board Diagram #2
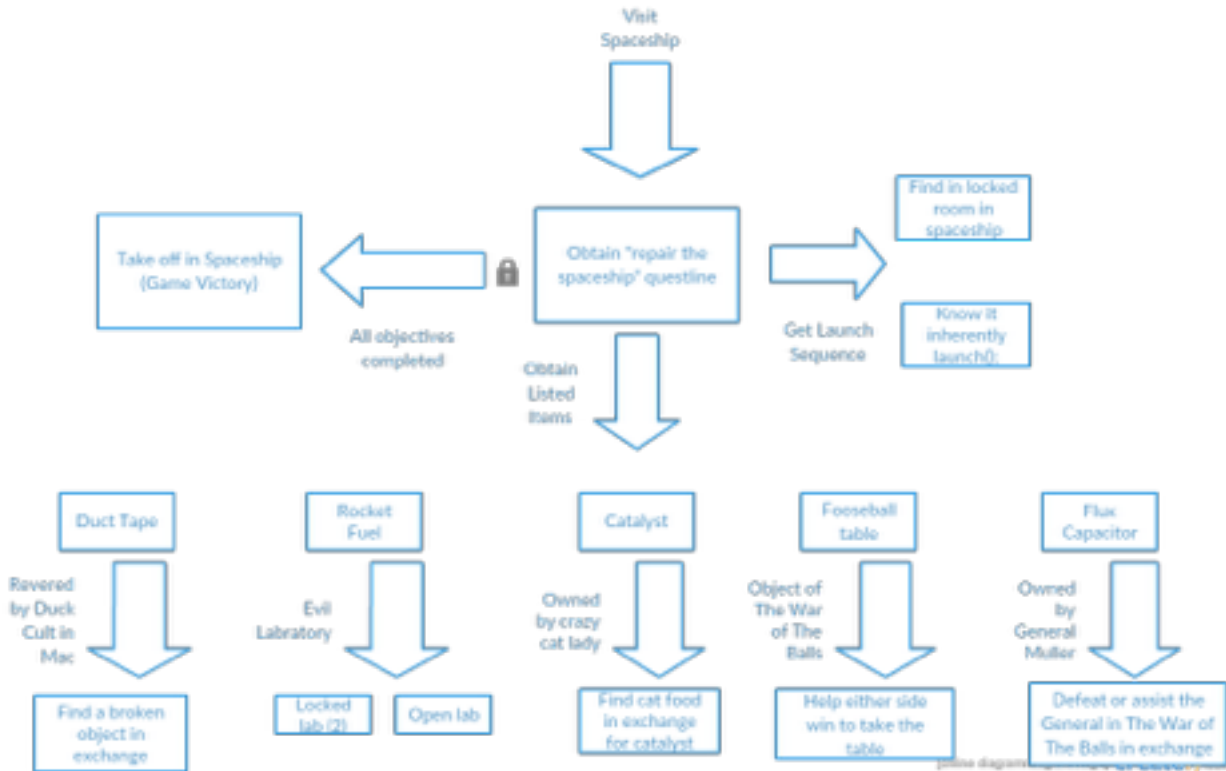
The Repair Spaceship starts with the discovery of the abandoned wreckage of a spaceship. There are two types of objects needed to repair the spaceship: launch code and equipment. The launch code has two options for discovery. The user may discover the launch code in a locked room of the spaceship or, if the user knows the launch code, they may input it into the game and launch the spaceship without discovering the launch code in the locked room. The equipment necessary to repair the spaceship may be found throughout the in-game world by exploration, talking to NPCs, solving puzzles, or completing quests.

Story Board Diagram #3
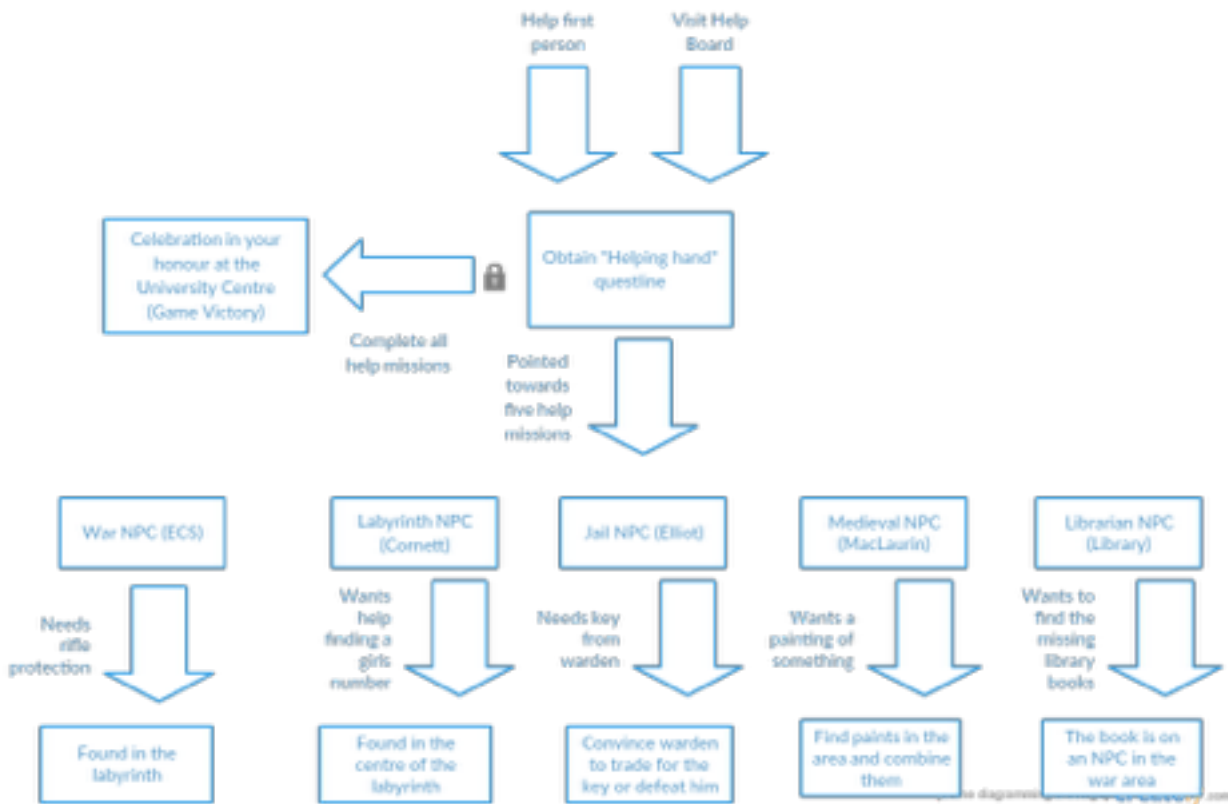
The Puzzling storyline starts with helping the first individual or discovering of the help board. There are 5 in-game characters to help in this storyline: the War NPC, the Labyrinth NPC, the Jail NPC, the Medieval NPC, and, the Library NPC. The War NPC requires rifle protection, found at the centre of the labyrinth. The Labyrinth NPC requires a girl's phone number, found at the centre of the labyrinth. The Jail NPC requires the warden's key, obtained by convincing the warden to give the key to the player, or by defeating the warden. The Medieval NPC requires a painting, created by the player by finding and combining in-game paints. The Librarian NPC requires the missing library book, on and NPC in the war area of the game. Once all the NPCs have been helped, the player must go to the University Centre to complete the game.

Story Board Diagram #4
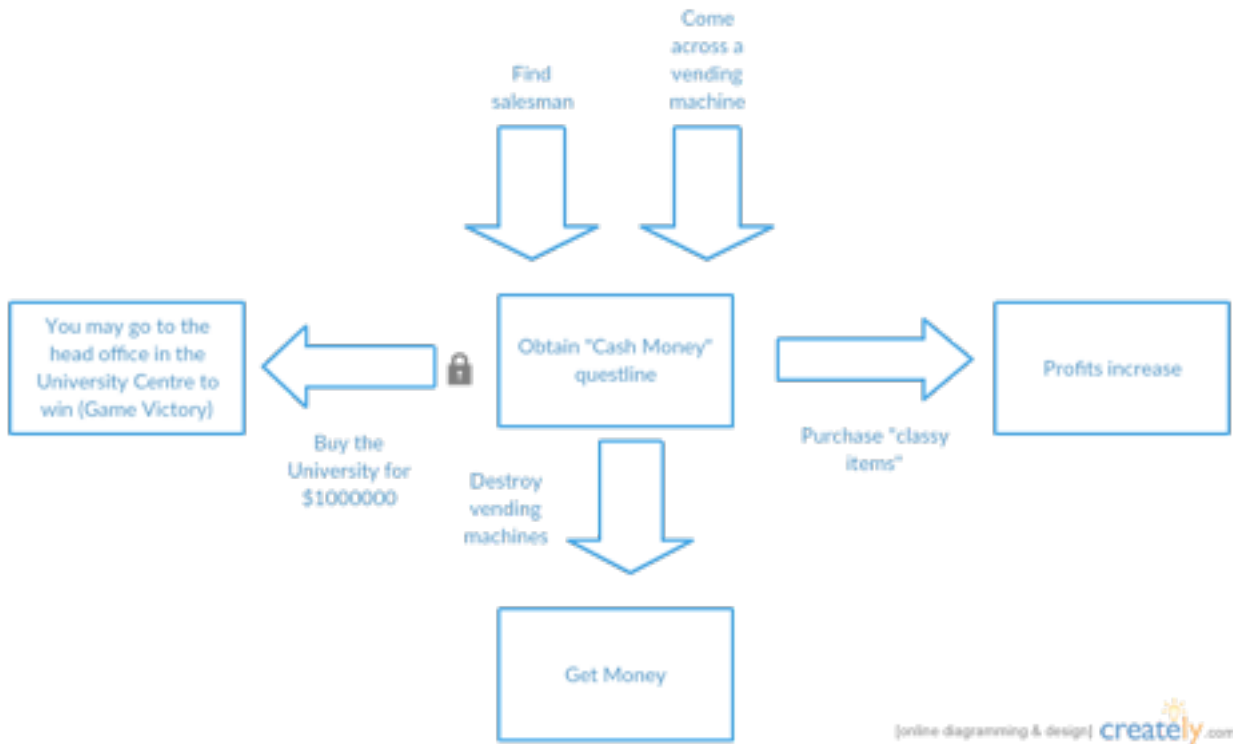
The Business storyline starts with the discovery of the salesman or the player discovers a vending machine. The goal of this storyline is to collect a specific amount of money by destroying the in-game vending machines. Once the specific monetary goal is complete, the user must go to the University Centre. Additionally, the player may purchase items to increase the amount of money received from the vending machines.

Class Diagram
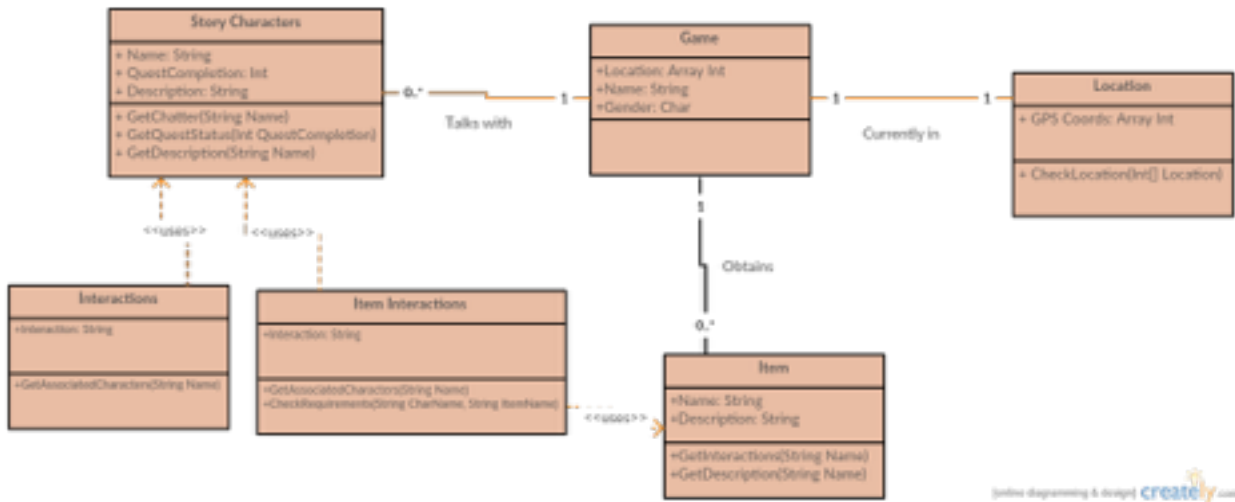
The class diagram depicts the interaction between all elements in the software. The game uses items, story characters, and locations to differentiate between the current available interactions. There are both Item and regular character interactions. Whenever the game interacts with a character there is a check between item and regular interactions to determine the current description.

Document Summary

All of the design constraints and information management for the creation of the UVic Breakout game have been listed above. The primary focus of the game is the story and puzzle solving elements, this is in line with the customers requests in the Request For Proposal of the UVic GPS based RPG. The game will use the familiar elements of UVic to build and establish a world that is heartfelt and hilarious. The secondary focus of the product is its usability and familiarity. Any University of Victoria student should be able to pick the game up and have fun with it. Each player should also be comfortable with a particular ending.