

1.4. Challenges

Going into this, we have a lot of challenges to face. One of the most significant is that we have almost no experience working with C#, WPF, or in game design. If we are to complete PACRL within the time frame, we will need a lot of reference material. We believe it is doable though. Apart from getting used to WPF, there is no "most difficult" part that we can think of. All of the core mechanics that must be added will be difficult, some more than others; however, we lack the experience to differentiate the difficulty of each implementation.

2. Scope

In order of importance, these are the fundamental game mechanics that must be implemented for *CYBERNUKE* to be considered functional:

- 1) Operational Interfaces (Main Menu, Option Menu)
- 2) Maps
- 3) User Interface (Map Screen, Player HUD)
- 4) Character Movement, Interaction
- 5) Character Interface (Name, Stats)
- 6) Enemies, Enemy Encounters
- 7) Combat, Combat Interface
- 8) Player Saves & Load Menu

1. The Operational Interfaces are the menus that are used to interact with the game when the player is not playing the game (Main Menu, Option Menu).
2. The maps are pre-made rather than generated automatically; in this case, it will only be a simple testing map until later.
3. The User Interface includes the Map Screen, which renders the current map to the screen. The Player HUD displays the player's statistics such as Hit Points, Money, and so on.
4. Character Movement refers to moving around the map with the player character. Character Interaction refers to how the player interacts with the map, such as unlocking locked doors or moving between maps.
5. Character Interface differs from User Interface in that it is a separate menu that displays the character's full stats such as HP, Strength, Luck, Agility, and so on, as well as their name.
6. Enemies are the monsters/humans that the player will encounter throughout the game. Enemy Encounters refers to how you will find monsters in the first place, which is primarily done through a "percent encounter" system akin to the old *Pokemon* games. There may also be opportunities for pre-scripted encounters.
7. Combat refers to fights between the player character and enemies in this game, which will be turn-based. Actual combat is made possible by the Combat Interface.
8. Players can save their state (at specific points in the game) and load back in at a later time using Player Saves and the Load Menu.

After the fundamental game mechanics are in place, additional features that flesh out the game can be added.

Possible stretch-goal features:

- 1) Companions and Party System
- 2) Hacking Puzzles
- 3) More Enemy Types
- 4) More Story Content
- 5) Items, Loot, Weapons, Armor, etc.
- 6) Cybernetic Augmentation
- 7) Leveling System
- 8) Currency and Merchants
- 9) Expanded Character Creation (Species, Backstory, etc.)

Use Case ID	Use Case Name	Primary Actor	Complexity	Priority
1	Add item to cart	Shopper	Med	1
2	Checkout	Shopper	Med	1

TABLE 1. SAMPLE USE CASE TABLE

2.1. Requirements

As part of fleshing out the scope of your requirements, you'll also need to keep in mind both your functional and non-functional requirements. These should be listed, and explained in detail as necessary. Use this area to explain how you gathered these requirements.

2.1.1. Functional.

- User needs to have a private shopping cart – this cannot be shared between users, and needs to maintain state across subsequent visits to the site
- Users need to have website accounts – this will help track recent purchases, keep shopping cart records, etc.
- You'll need more than 2 of these...

2.1.2. Non-Functional.

- Security – user credentials must be encrypted on disk, users should be able to reset their passwords if forgotten
- you'll typically have fewer non-functional than functional requirements

2.2. Use Cases

This subsection is arguably part of how you define your project scope (why it is in the Scope section...). In a traditional Waterfall approach, as part of your requirements gathering phase (what does the product actually *need* to do?), you will typically sit down with a user to develop use cases.

You should have a table listing all use cases discussed in the document, the ID is just the order it is listed in, the name should be indicative of what should happen, the primary actor is typically most important in an application where you may have different levels of users (think admin vs normal user), complexity is a best-guess on your part as to how hard it should be. A lower number in priority indicates that it needs to happen sooner rather than later. A sample table, or Use Case Index can be seen in Table 1.

Use Case Number: 1

Use Case Name: Add item to cart

Description: A shopper on our site has identified an item they wish to buy. They will click on a “Add to Cart” button. This will kick off a process to add one instance of the item to their cart.

You will then go on to (minimally) discuss a basic flow for the process:

- 1) User navigates to page listing desired item
- 2) User left-clicks on “Add to Cart” button.
- 3) User cart is updated to reflect the new item, this also updates the current total.

Termination Outcome: The user now has a single instance of the item in their cart.

You may need to also add in any alternative flows:

Alternative: Item already exists in the cart

- 1) User navigates to page listing desired item
- 2) User left-clicks on “Add to Cart” button.
- 3) User cart is updated to reflect the new item, showing that one more instance of the existing item has been added. This also updates the current total.

Termination Outcome: The user now has multiple instances of the item in their cart.

You will often also need to include pictures or diagrams. It is quite common to see use-case diagrams in such write-ups. To properly reference an image, you will need to use the `figure` environment and will need to reference it in your text (via the `ref` command) (see Figure 1). NOTE: this is not a use case diagram, but a copybara.

After fully describing a use case, it is time to move on to the next use case:

Use Case Number: 2

Use Case Name: Checkout

Description: A shopper on our site has finished shopping. They will click on a “Checkout” button. This will kick off a process to calculate cart total, any taxes, shipping rates, and collect payment from the shopper.

You will then need to continue to flesh out all use cases you have identified for your project.



Figure 1. First picture, look at the capybara

2.3. Interface Mockups

At first, this will largely be completely made up, as you get further along in your project, and closer to a final product, this will typically become simple screenshots of your running application.

In this subsection, you will be showing what the screen should look like as the user moves through various use cases (make sure to tie the interface mockups back to the specific use cases they illustrate).

3. Project Timeline

Go back to your notes and look up a typical project development life cycle for the Waterfall approach. How will you follow this life cycle over the remainder of this semester? This will usually involve a chart showing your proposed timeline, with specific milestones plotted out. Make sure you have deliverable dates from the course schedule listed, with a plan to meet them (NOTE: these are generally optimistic deadlines).

4. Project Structure

At first, this will be a little empty (it will need to be filled in by the time you turn in your final report). This is your chance to discuss all of your design decisions (consider this the README's big brother).

4.1. UML Outline

Show the full structure of your program. Make sure to keep on updating this section as your project evolves (you often start out with one plan, but end up modifying things as you move along). As a note, while Dia fails miserably at generating pdfs (probably my fault), I have had much success with png files. Make sure to wrap your images in a `figure` environment, and to reference with the `ref` command. For example, see Figure 2.

4.2. Design Patterns Used

Make sure to actually use at least 2 design patterns from this class. This is not normally part of such documentation, but largely just specific to this class – I want to see you use the patterns!



Figure 2. Your figures should be in the *figure* environment, and have captions. Should also be of diagrams pertaining to your project, here we are teaching the capybaras to do our work.

5. Results

This section will start out a little vague, but it should grow as your project evolves. With each deliverable you hand in, give me a final summary of where your project stands. By the end, this should be a reflective section discussing how many of your original goals you managed to attain/how many desired use cases you implemented/how many extra features you added.

5.1. Future Work

Where are you going next with your project? For early deliverables, what are your next steps? (HINT: you will typically want to look back at your timeline and evaluate: did you meet your expected goals? Are you ahead of schedule? Did you decide to shift gears and implement a new feature?) By the end, what do you plan on doing with this project? Will you try to sell it? Set it on fire? Link to it on your resume and forget it exists?

References

- [1] Britannica, T. Editors of Encyclopaedia. "cyberpunk." Encyclopedia Britannica, 1999. <https://www.britannica.com/art/cyberpunk>.