THE GAMING ROOM

Creative Technology Solutions (CTS)

CS 230 Project Software Design Template

Version 1.0

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Document Revision History

Version	Date	Author	Comments
3.0	08/17/2022	Jerry Barboza	Updated Recommendations.

Instructions

Fill in all bracketed information on page one (the cover page), in the Document Revision History table, and below each header. Under each header, remove the bracketed prompt and write your own paragraph response covering the indicated information.

Executive Summary

CTS wants to develop a web-page game that serves multiple platforms. These platforms are based on their current game, “Draw It or Lose It” and is currently only available on Android app. The client requested this game to be able to have one or more teams involved and every team will have multiple players assigned to it. The game and the team names must be unique. Finally, there can only exists only one instance of the game in the memory at a given time. Since the staff at The Gaming Rom don’t know how to set up the environment, I will need to help them with this, and any software struggles they are having. I will have to approach every task the client has asked and approach these tasks by most important to least important. The most important tasks I will have to spend more time on them. Once the client gives me the total budget and deadline of the project, I will have a better understanding on how I will be approaching these tasks. The higher the budget and longer the deadline, the more in depth I will be able to go into the project.

Design Constraints

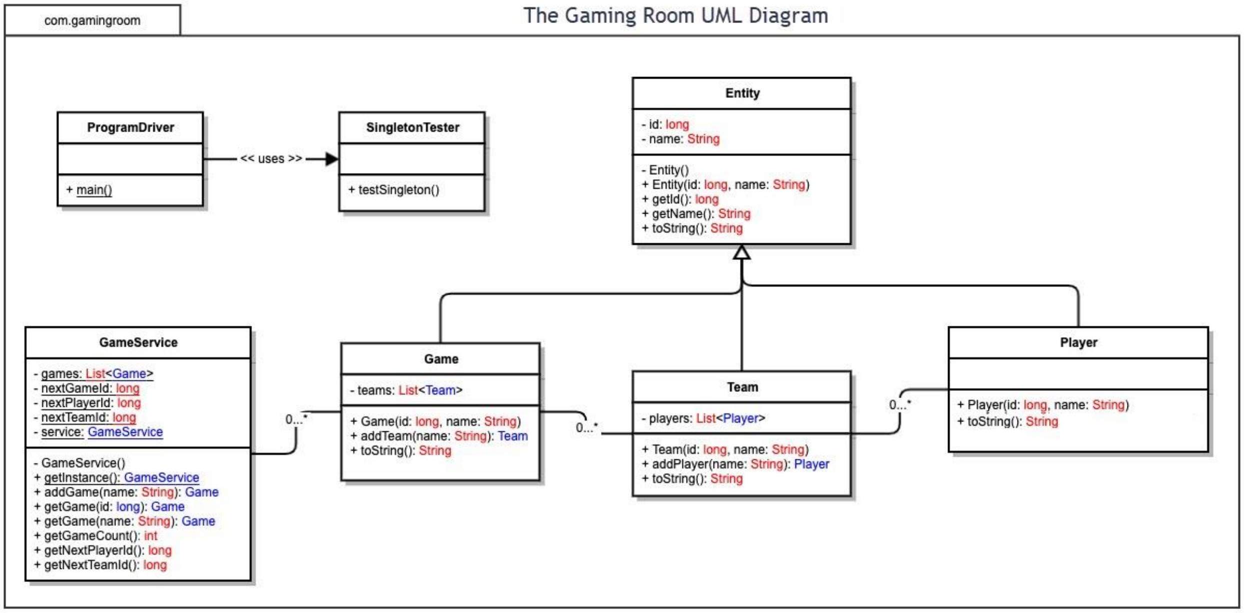
Some of these designs’ constraints will be the budget and deadline since knowing these two, I will be able to approach it differently. Like I mentioned in the Summary, knowing the deadline and budget, I can understand better on how to approach these designs. A higher budget and deadline will give me more time to focus on the UI/UX design before starting to code the project. A good UI/UX is very important for a successful project.

System Architecture View

Please note: There is nothing required here for these projects, but this section serves as a reminder that describing the system and subsystem architecture present in the application, including physical components or tiers, may be required for other projects. A logical topology of the communication and storage aspects is also necessary to understand the overall architecture and should be provided.

Domain Model

Looking at the UML diagram below, we can see how Game, Team and Player are inherited from Entity class since there is an open arrow pointing from Game, Team and Player to the Entity class. This open arrow is a symbol for inheritance from what we have learned earlier this course. We can also see the symbol 0..* from GameService to Game to Team and to Player meaning that there is a relationship between these four classes. This object relationship is called **none to many.** We also see how the class GameService can have multiple games then moving to Games we see how Games has a list of Team and every team will get its id and name then add it. Moving to the Team class we can see how the Team can have multiple players also assigned the id and name of the Team.



Evaluation

Using your experience to evaluate the characteristics, advantages, and weaknesses of each operating platform (Linux, Mac, and Windows) as well as mobile devices, consider the requirements outlined below and articulate your findings for each. As you complete the table, keep in mind your client's requirements and look at the situation holistically, as it all has to work together.

In each cell, remove the bracketed prompt and write your own paragraph response covering the indicated information.

Development Requirements	**Mac**	**Linux**	**Windows**	**Mobile Devices**
Server Side	Mac has a higher price but similar to Windows since require higher-end hardware. Releases updates frequently. Good terminal. Potential licensing cost to the client for the server operating system would be around $1,000 for a standard server. **Advantages:** Hardware is top-of-the-line from all platforms. You can rely on it to protect all the users data and not get hacked since it is the hardest one to get hacked. **Disadvantages:** Not as popular for web hosting services	Linux is free software that anyone can alter. Server is cheaper than Mac or Windows. Potential licensing cost to the client for the server operating system would similar to Mac and Windows but still little cheaper. **Advantages:** Most popular for web hosting services. **Disadvantages:** Less applications for web hosting support.	Similar price as Mac. A lot of software available. According to Microsoft, the licensing cost to the client anywhere from $500 to $6,155. The Standard one is about $1,000 with minimal virtualized environments. **Advantages:** Lots of resources available, good graphics and fast speeds. **Disadvantages:** More virus attacks on this platform	Server not as good as the others since servers are better on devices that are not mobile. Licensing prices are cheaper than MAC and Windows. **Advantages:** There is less loading time than the other platforms. **Disadvantages:** poor tech support
Client Side	High price but Similar price as Windows. Moderate time required and moderate expertise.	Cheapest with High expertise and high time required.	Similar price as Mac. Minimum expertise and minimum time required.	Thanks to its very portability, clients and developers can see updates at any place with internet.

Development Tools	One programming language that only Apple uses from the rest is Swift mostly for their mobile devices. Python, C++, Java, Objectice-. For front-end HTML/CSS/JavaScript is used. Visual Studio does have a free version including Visual Studio Code. This applies to MAC, Windows and Linux programming languages used. Visual Studio Enterprise is $2,569 after the first year. The first year costing $6,000.	Linux uses C programming. Also uses Java, HTML, CSS, JavaScript for front end. Visual Studio does have a free version including Visual Studio Code. Visual Studio Enterprise is $2,569 after the first year. The first year costing $6,000.	Windows is in C but for development Java, Python, C++ is used a lot. For front-end, php, Ruby on Rails, CSS,HTML and JavaScript is also used. Visual Studio does have a free version including Visual Studio Code. Visual Studio Enterprise is $2,569 after the first year. The first year costing $6,000.	Apple uses mostly Swift for their mobile devices while Android uses JAVA. The problem with Apple devices is that they use Swift and not many programmers know Swift especially since Apple is the only company using that language and you need Mac to program in Swift. Therefore a developer that knows Swift will be needed for Apple mobile devices. Swift is free to use as long as you own a Mac. Visual Studio Enterprise is $2,569 after the first year. The first year costing $6,000.

Recommendations

Analyze the characteristics of and techniques specific to various systems architectures and make a recommendation to The Gaming Room. Specifically, address the following:

1. **Operating Platform**: This means the computer equipment, hardware and operating system that executes the object code. From above we mentioned Mac, Linux, Windows and mobile devices like Apple and Android. From online data and statistics, Windows is the most popular platform for gamers. We should expand it to Mac, Linux and mobile devices too since this will help the game be available to everyone with these platforms and maximize its full reach of audience. Every platform is different therefore some platforms will have an advantage over the other and have their own pros and cons.

   Best Server Platform

   > Linux is better when it comes to speed and security so if the client wants better security, then we might have to go with Linux for the server platform. Linux is also open source and Windows is not and however for gaming, windows is more ideal than Linux. At the end, the client can't go wrong with wither Linux or Windows depending on what the client prioritizes more. Linux can do what Windows can however it is not as user friendly as windows.

2. **Operating Systems Architectures**: For windows, X86 is really good for game development since it focuses on performance and high throughputs, however ARM processors are generally more efficient than x86. On the other hand, Linux Kernel is a free and open-source and very secure.

3. **Storage Management**: Solid State Drive (SSD) is very popular for storage management since it has very fast speeds making games more enjoyable since it prevents or minimize the game to lag. Since The Gaming Room will have 200 high-definition images and each one being approximately 8 megabytes in size then the total memory needed for the images is 1,600 megabytes or 1.6 gigabytes. 1.6GB is very low since majority of devices including mobile devices start at 32GB of Storage. Most computers have at least 128GB of Storage, so this is plenty to run the images on these devices.

4. **Memory Management**: We should have an option on how the people want to run the game memory withing its RAM, GPU, and CPU. Some computers might have a good CPU but a bad GPU therefore giving an option for the players to pick between their CPU or GPU to prevent any computer graphics lag and have a better memory management for smother game play. To ensure that memory is effectively managed in the software application for *"Draw It or Lose It",* the memory of the game must be good enough to make the game run smooth and fast. Also, I have to make sure that the game runs smoothly on all mobile devices since some mobile devices only have 1GB of RAM therefore the game on mobile devices should not be heavy on graphics. Nowadays, some mobile devices come with a lot of RAM for example the new iPhone pro have 6GB of RAM and the newer iPad pros have 8GB of RAM. Hence the new iPad pros have enough memory to even run more heavy graphics games that runs on PCs. Since not everyone has these mobile devices that have lots of RAM in them, we need to make sure the game runs in a 1GB of RAM on mobile devices.

5. **Distributed Systems and Networks**: There must be a database being shared to all platforms so players can communicate between platforms and be able to play with each other. These networks should be connected to unique IP addresses for every player.

6. **Security**: Since Linux is considered the most secure operating system available in the market, I recommend Linux for security reasons. On the other hand, Mac is also still very secure and more secure than Windows since the code on Mac is more complicated and have a lower probability of having bugs on the code therefore making it more secure. Also, since Linux has segmented working environments that secures it from attackers and Windows is not as segmented hence it is more vulnerable to threats. Finally, since Linux is not as popular as Windows and Mac, attackers try to attack platforms that are more populated and knowing that that they have a better chance of stealing information from other platforms, it pushed attackers away from Linux.