

Draw It or Lose It

# **CS 230 Project Software Design Template**

Version 1.0

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## [Document Revision History](#_grjogdjh5fi8)

| Version | Date | Author | Comments |
| --- | --- | --- | --- |
| 1.0 | 11/13/21 | Pasco Logan | Recommendations for The Gaming Room Software  Update existing classes and add Entity Class |
| 1.1 | 11/26/21 | Pasco Logan | Updated Evaluation and Recommendations |
| 1.2 | 12/10/21 | Pasco Logan | Completed 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](#_sbfa50wo7nsh)

The gaming room is a client looking to expand their already developed game to serve multiple platforms. The game is called "Draw It or Lose it" and is currently on the android app store only. By expanding the game to multiple platforms, will increase the game room's customers and revenue.

## [Design Constraints](#_2et92p0)

* Each game must have the ability to have one or more teams involved.
* Each team will have multiple players assigned to it.
* Game and team names must be unique to allow the user to check if a name is in use
* There should only be one instance of the game at a time.
* Must be able to run on multiple platforms.
* Language Java
* Framework API

These design constraints will have to be met by the developers so the game can run properly. The client would also like the game to run on multiple platforms. At the same time, it is using the already existing code that only runs on android devices. This will require more development time due to refactoring / redesigning the code to run on other platforms. Other issues could be cloud space when developing the web application or limits on the number of games, teams, and players due to the server.

## [System Architecture View](#_ilbxbyevv6b6)

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](#_8h2ehzxfam4o)

This UML diagram uses seven classes. Classes Game, Team, and Player have a generalization relationship that references the same general class Entity, this example of multiple inheritances. These three classes, along with the GameService class, share a direct association and multiplicity, shown in the curly brackets that say our classes might share zero to many objects. Multiple players can be added to a team, each identified with an id and name. Multiple teams can be added to a game, each also identified with a name. The GamerService class has a list of games and also the singleton method called to service. This class also has references from the game class. We also have a class SingletonTester that is testing if a single occurrence of the game is running at a time associated with the ProgramDriver class. Within the ProgramDriver class, the main method is stored for the terms of use.

**"The Gaming Room UML diagram. The top of the diagram is labeled as com dot gamingroom. Test boxes are placed in two layers. The first layer has three text boxes and the second layer has four of them. In the first layer, the 'ProgramDriver' textbox points to 'SingletonTester' textbox. The 'ProgramDriver' textbox contains the text 'asterisk main round brackets.' The 'SingletonTester' textbox contains the text 'asterisk testSingleton round brackets.' The arrow between these two text boxes are labeled 'open two angle brackets uses close two angle brackets'. In the second layer, there are 'GameService', 'Game', 'Team', and 'Player' text boxes. The 'GameService' textbox has texts arranged in two layers. The first layer contains games colon List open angle bracket Game close angle bracket, nextGamesId colon long, nextPlayer Id colon long, nextTeamId colon long, and service colon GameService. The second layer contains GameService round brackets, getinstance round brackets colon GameService, addGame open parenthesis name colon String close parenthesis colon Game, getGame open parenthesis id colon long close open parenthesis colon Game, getGame open open parenthesis name colon String close open parenthesis colon Game, getGameCount round brackets colon int, getNextPlayerID round brackets colon long, and getNextTeamId round brackets colon long. The 'GameService' box is connected with the 'Game' textbox with a line labeled 'zero dot dt dot asterisk'.  The 'Game' textbox also contains text in two layers. The first layers contains the text teams colon List open angle bracket Team close angle bracket. The second layer has Game open round bracket id colon long comma name colon String close parenthesis, addTeam open parenthesis name colon String close parenthesis Team, toString round brackets colon String. The 'Game' textbox is connected with the 'Team' textbox with a line labeled 'zero dot dt dot asterisk'. The 'Team' textbox also contains text in two layers. The first layers contains the text players colon List open angle bracket Player close angle bracket. The second layer has Team open parenthesis id colon long comma name colon String close parenthesis, addPlayer open parenthesis name colon String close parenthesis colon Player, and toString round brackets colon String. The 'Team' textbox is connected with the 'Player' textbox with a line labeled 'zero dot dt dot asterisk'. It contains the text Player open parenthesis id colon long comma name colon String close parenthesis and toString round brackets colon String. The 'Game', the 'Team, and the 'Player' boxes point to the 'Entity' textbox in first layer. The 'Entity' textbox contains text in two layers. The first layer has the text id colon long and name colon String. The second layer has Entity round brackets, Entity open parenthesis id colon long comma name colon String close parenthesis, getId round brackets colon long, getName round brackets colon String, toString round brackets colon String.**

## [Evaluation](#_2o15spng8stw)

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** | Some Advantages of the Mac OS are that it is trendily upgradable and the simple yet powerful GUI OS. There are various options for different web hosting requirements. Flexible terminal commands to configure the server, access, or make changes and are very secure. Mac has one of the best anti-malware programs to protect against spyware, adware, and worms. Apple makes using a Mac as a server very easy.  Some disadvantages are that the cost is very high due to only having to buy Mac products with higher licensing costs and web hosting services less prefer it. | Similar to Mac  Flexible terminal commands Very secured. Linux offers a lot of what Mac does but is very cost-effective. Linux is also less prone to cyber threats. Due to the open-source format that makes Linux fully customizable and generally the preferred choice for web hosting services. Some disadvantages are that Linux is not user-friendly and is far less compatible than windows for gaming. It is harder to find applications and drivers that support web hosting needs. There are far fewer Linux pre-built machines. | Some advantages are that the OS is straightforward to use there is an extensive library of software that offers extensive support. Also, the compatibility with other programs.  Some disadvantages are susceptibility to getting viruses due to the constant updates and poor technical support. Windows can also be expensive to start up due to the upfront cost for licenses but still less than the price of apple. | Some advantages are that mobile phones have a large user base, are user-friendly, and are less prone to viruses such as Malware. Some disadvantages are that the hardware is not upgradable, and if a virus happens, there is no support. It would be better if the server was immobile and could be tracked in a single place. |
| **Client Side** | Moderate expertise and time are required. Integration between other Apple devices is straightforward. The updates are significantly less and ordinarily automatic—great at multitasking able to run macOS, Windows, and Linux apps side–by–side. The cost of setup is expensive, and you could be charged monthly for some software. Often there are years between new hardware updates. | Maximum expertise and time are required.  Due to the lack of applications available, Linux is the hardest to set up. However, it could be the most secure behind apple. Linux's open-source format also makes it the most cost-effective. However, because it is free and the lack of debugging, there are more bugs and no tech support. | Minimum expertise and time required. There is a vast selection of window base PCs in all price ranges.  Many applications share compatibility that helps streamline the process and makes it the best for gaming. Furthermore, the cost is similar to mac. There are forced updates that can take time. Inconsistent functionality and quality among off-brand makers and Malware, spyware, and ransomware could be an issue. | Very cost-effective and is user-friendly. It takes less time to load a page and provides flexibility. However, designing and maintaining applications for phones or other mobile devices could be very costly, depending on the device and the frequency of the updates. Both android and apple use their own languages, so development can take longer and require more expertise. |
| **Development Tools** | Languages that consist but are not limited to HTML, CSS, and javaScript. Mac is also better suited to do much more from the terminal compared to windows. IDE's can be Java, Python, PHP, and ruby. Development tools within Mac OS can be pycharm, eclipse visual studios notepad++, and online tools. | Linux can work with all the Similar IDE used in the Mac OS, but all the software is unsupported. | Windows is easier to use than Linux but can run the same IDE. It is possible to run both Windows and Linux at the same time. They are giving you the use of essential apps. Moreover, there are also many other tools and resources to help. | You could use apps like android and swift that will help create the software, and the software would run on any of the other machines. |

## 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**: I recommend the Gaming Room to start the project with the Windows OS after considering the level of expertise required and the software availability. Windows is by far the best option for gaming. The cost for windows is relatively low, and the Windows OS is full of helpful IDE's that can make code writing/development much faster.
2. **Operating Systems Architectures**: Windows is a layered design. The layered design consists of two primary components user mode and kernel mode. Windows provides services used by all Windows applications, including File management and Graphical User Interface (GUI).
3. **Storage Management**: Storage can be handled through a cloud storage solution due to the relatively small file size and the ability to add to or modify the existing image library quickly and easily without using physical hardware. The Windows server operating system allows for memory management by allowing you to manage files on your hard drive and how much space is available. Also, having the ability to choose a location to save files or applications makes them easier to find, and the use of the cloud helps with load times and speed.
4. **Memory Management**: Windows OS has a physical address space and its own virtual address space that enables the addressing of memory. Each process has a virtual address. However, threads cannot access memory that belongs to another process, which protects a process from being corrupted. Using a 64-bit architecture will allow for more virtual address space, thus allowing for images files to be accessed more quickly without paging, affecting the program's overall performance.
5. **Distributed Systems and Networks**: I would use a cross-platform development tool such as unity or unreal engines to cover all platforms regardless of the operating system. I prefer to use unity because it is cost-friendly and can support windows Linux, android and ios. Choosing a dedicated gaming server would be the best option to handle high traffic and give the application more uptime and bandwidth at a low cost.
6. **Security**: Windows server operating system offers the user account control settings that help protect data going in and out of the system. The OS has features like memory allocation, a virtual address that will stay private for processes and cannot be accessed by other processes unless explicitly shared. The VPN service capabilities help protect the client's data and accounts from being stolen or used elsewhere. The Windows operating system uses anti-spyware as a built-in solution to help keep unwanted malware software or viruses from getting into the client's system. Other programs such as Macfee and Norton can be purchased to help protect the system.