

The Gaming Room

# **CS 230 Project Software Design Template**

Version 1.0

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## [Document Revision History](#_grjogdjh5fi8)

| Version | Date | Author | Comments |
| --- | --- | --- | --- |
| 1.0 | 2/1/2023 | Misty-Ann Mordoff | Added Evaluation |
| 1.0 | 01/16/2023 | Misty-Ann Mordoff | Document Created  Added Executive Summary, Design Constraints, and Domain Model |

**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 looking to create a web-based version of their gaming application “Draw It or Lose It”. The web application must be able to have multiple teams and players, unique names, and only allow a single instance of the game to exist in memory. The web-based version must have a large library stock of drawings to use as clues for 30 seconds each round, contain four one-minute rounds, and allows the opposing team 15 seconds to guess a clue if the team guessed incorrectly.

## [Design Constraints](#_2et92p0)

The following are design constraints for this project:

* The game will have the ability to have one or more teams involved.
* Each team will have multiple players assigned to it. This can be done at random or allow users to find each other on the platform to create their own team.
* Game and team names must be unique to allow users to check whether a name is in use when choosing a team name by using unique identifiers.
* Only one instance of the game can exist in memory.
* The web-based application must be accessible on all operating platforms by using a common web-based programming language.
* The web-based application must be designed similar to the mobile application in order to make it user-friendly.

## [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)

The entity class is the super class in this UML diagram. It holds all of the common attributes and behaviors that all the other classes inherit. The entity class is the parent class to the child classes player, team, and game. Inheritance is shown in the UML diagram for these classes with the open arrow. Player, team, game, and gameService classes can have many or no objects. GameService also contains most of the methods that create the game. The gameService class contains the methods in order to create a single instance to meet The Gaming Room’s design constraints of having unique identifiers. The programDriver class holds the main method, which is able to call upon the singletonTester class in order to test the code to ensure only a single instance of the game exists. By testing the functionality of the game, abstraction is used. This UML diagram also incorporates polymorphism, as the unique identifiers in the game all come from the same attributes.

**"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** | Mac uses a UNIX-based server. It contains their tool, WebDAV, which enables web publishing and remote content management. Mac has an easy-to-use graphical user interface and accessibility. The server can be purchased ranging from $499-$3999 according to www.apple.com. | Linux is an open sourced operating system based upon the principles and design of UNIX. Linux is cost friendly, as it is a free operating system. Linux also has a command shell for simple server accessibility. | Windows is a versatile operating system and does have more available software compared to other operating systems. Windows has an easy-to-use graphical user interface and accessibility. The server can be purchased ranging from $501-$6155 according to www.windows.com | Mobile devices have various specifications not only from user to user but also for each different device. Therefore, this would not be the best option. There would be little to no cost. |
| **Client Side** | Mac can be one of the more expensive options for users. It requires an average amount of time and expertise to use. The operating system is not an open source. | Linux is the cheapest option for users, as it is available for no cost. Linux is not a commonly used operating system, therefore maximum time and expertise would be required to have enough knowledge to proficiently use it. | Windows is comparable in price to Mac for users. It does not require a lot of time and expertise to use. | Mobile platforms are difficult to perform applications that were designed for other mobile platforms. A benefit of using a mobile platform is it is relatively easy for the developer to send updates. A mobile device would be more difficult to implement than other devices, as users need more time and skill to be able to support a mobile platform. |
| **Development Tools** | Some programming languages are HTML, CSS, and JavaScript. Some IDE’s are JavaScript, Python, and Ruby. Mac does contain some development tools such as Eclipse, Visual Studio, and GitHub. | Some programming languages are HTML, CSS, and JavaScript. Some IDE’s are JavaScript, Python, PHP, and Ruby. Some development tools for Linux are Eclipse, Visual Studio, and GitHub. | Some programming languages are HTML, CSS, and JavaScript. Some IDE’s are Python, C++, and HTML. Some development tools are Eclipse, PyCharm, Visual Studio, and GitHub. | Some programming languages are HTML, CSS, and JavaScript. Some IDE’s are HTML, php, C++, and Python. Some development tools are Visual Studio, PyCharm, Eclipse, and GitHub. |

## 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**: The recommended operating platform that will allow the gaming Room to expand Draw It or Lose It to other computing environments is the Windows server operating system. Windows has more software availability while being user-friendly and low cost. Windows is designed to operate on server hardware and is supported by other server roles like file server, web server, application server, and database server.
2. **Operating Systems Architectures**: Windows operates from multiple rings of protection. The kernel is the most trusted part of the operating system. Windows also allows the user to control and manage the computer’s memory. Windows is compatible with multiple programming languages.
3. **Storage Management**: Windows has versatile options when it comes to storage. If the user were playing the game on a mobile phone, the windows server allows the application to be stored directly on the phone’s main memory. This allows for a faster process when loading the game and allows for great memory management. Windows operating system can also utilize cloud server storage to offer developers any amount of storage space they may need for this application. By using the cloud server, the developers can store the image library, so images are able to be accessed quickly.
4. **Memory Management**: Windows uses its own memory management system to maintain the main memory and transfer processes from the primary memory to the disk during execution. Windows has its own virtual address space along with its own physical address space. Windows offers a 32-bit architecture and 64-bit architecture. The 64-bit will allow for additional virtual memory and a faster processor.
5. **Distributed Systems and Networks**: Windows offers simple communication between one operating system/platform to another by utilizing Unity or Unreal Engine 4. Unity is cost effective and supports multiple operating platforms. Some issues that may occur are routing and congestion glitches. However, having a dedicated gaming server would help with high traffic levels to always allow players gaming access.
6. **Security**: Windows offers clients user account control settings that help to protect data going in and out of the system. The VPN service capabilities assist in protecting the client’s data and accounts. It also has anti-spyware but has options to add additional spyware programs for added protection.