

<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 | 10/7/2021 | Garrett Dunn | Updated information on the working game, player and team classes, and new entity class |

## [Executive Summary](#_sbfa50wo7nsh)

When designing software, a developer is faced with many challenges that they need to solve. One of these massive challenges is requirement volitality, and it is a huge reason for the design complexity because the system requirements determine the correct approaches and type of design system that will be used in the design process. Having a solid understanding of the principles of software design will help the developer navigate through the complexity and fast paced changes that are all too familiar in software development. This document aims to evaluate the different operating systems available for the development of the game. Those operating systems include Windows, Mac, Linux, and mobile devices. Recommendations including storage, memory, security, OS architecture and platforms will be offered according to the clients needs. Examining the advantages and disadvantages of the available OS will allow the client to choose the perfect OS to develop the game.

## [Design Constraints](#_2et92p0)

The design phase is one of the most important stages when developing an application. When designing web-based software, there are a number of different constraints that need to be taken into consideration. Some of these constraints include UML diagrams, ESS diagrams, and class diagrams. These are examples of non-functional elements that are visual representation of the software and are used to aid the developers as they begin working on the application. They provide the programming requirements, technology requirements, and other needs of the client. These contraints cover the main actions, actors, artifacts, classes and roles which lead to a better understanding of the develping software.

## [Domain Model](#_8h2ehzxfam4o)

There are seven classes in the UML diagram listed below. These classes are ProgramDriver, SingletonTester, Entity, GameService, Game, Team, and Player. The Enity class is a parent class which relates to the four child classes. GameService, Gaame, Team, and Player all relate to each other in an associative relationship and they each rely upon one another. The SingletonTester class inherits from the ProgramDriver class, which is the main class. Inheritence is most definitely the most prevalent OOP principle shown in the UML diagram below, and lets the SingletonTester class perform activities and responsibitlities inherited from the ProgramDriver class.

**"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)

| **Development Requirements** | **Mac** | **Linux** | **Windows** | **Mobile Devices** |
| --- | --- | --- | --- | --- |
| **Server Side** | **Characteristics:**  Very popular for web hosting.  **Advantages:**  Very upgradable, and offers many options for web hosting requirements.  **Disadvantages:**  Less preferred for web hosting services. | **Characteristics:**  Very secure, and preferred.  **Advantages:**  The security is stellar, and issues are caught before they cause any trouble. It is also perferred for web hosting services.  **Disadvantages:**  Much more difficult to find an application to support the web hosting requirements. | **Characteristics:**  The dominant platform compared to the others. It is closed as well.  **Advantages:**  Demanding of resources, less loading time, stellar comfortability.  **Disadvantages:**  Virus succeptibility, horrid tech support. | **Characteristics:**  Very popular, and high portability.  **Advantages:**  Has a much wider reach than other OS, excellent compatibility, and is incredibly cost-effective.  **Disadvantages:**  Poor security, and very selective due to competition of manufacturers. |
| **Client Side** | It requires much more expertise to develop software for the Mac. Due to monthly fees charged to the clients, it is much more expensive, and requires more time to access the software. | Requires high expertise because there are not many applications available. It also has less loading time, and is more expensive as it isn’t as popular. | Requires high expertise because of the high resource requirements. Very expensive as well because of the need for more resources. | Cost-effective, quick loading times, and incredibly common. Great tech support for clients. |
| **Development Tools** | PHP, JavaScript. | PHP | Java, NetBeans, HTML/CSS | Android studio, Android programming |

## Recommendations

1. **Operating Platform**: Based on the comparison of the available OS, the Windows operating platform is the recommended environment for this project. It is common in web-based software development, hass less loading time, is highly secured and is relatively cheap. It is portable and compatible so it would be a great choice for the Draw It or Lose It game.
2. **Operating Systems Architectures**: Windows OS contains two main components, the user model and the kernel model. The OS is preemptive and reentrant and is designed to work with either uniprocessor or symmetric multi-processor architectures. The kernel mode is allowed unrestriced access to the system memory and external devices, however programs and subsystems are limited in user mode in terms of what the have access to. Packet driven I/O is uses to process input/output requests.
3. **Storage Management**: The best storage management system for this project would be a database management system. It’s high compatibility, ease of use, adaptibility, and ability to run multiple operating platforms makes it highly suitable for the Windows platform.
4. **Memory Management**: Windows will apply a memory compression technique to compensate for the high memory use from the application. This increases the responsiveness of the OS. Windows can also use a page file system in which Windows will begin removing pages of memory from the RAM and then store it temporarily on the HDD whenever the amount of memory from Draw It or Lose it is exceeded.
5. **Distributed Systems and Networks**: Using LAN, the distributed system will use hubs connecting to multiple computers. This makes it so if one computer crashes, the game will still be able to operate and function. This hub will also represent a repeater to help amplify the signal which will inevitably deteriorate when travelling long distances. Using LAN as our network and a hub as the connectivity hardware will prevent major outages from ever occuring.
6. **Security**: To ensure the security of the clients’ details, encryption will be used as the basis of security for the application. Because of the high security capabilities of the Windows platform, the protection of the user from intruders will be stellar.