

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 | 09/15/2022 | Michael Garramone | Information for Initial design project added. Completed Executive Summary, Design Constraints, and Domain Model Information |
| 1.1 | 09/29/2022 | Michael Garramone | Development Requirements – Server Side, Client Side, and Development Tools |
| 1.2 | 10/14/2022 | Michael Garramone | Recommendations Section |

**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)

Creative Technology Solutions (CTS) has been presented with a project from the company, The Gaming Room. CTS is to develop a web-based game that serves on multiple platforms, and the game is based on the Android app game, Draw It or Lose It. The Gaming Room wants CTS to allow Draw It or Lose It to have multiple teams in a single game, each team being able to have more than one player, each team to have their own unique names as well as the players on each team, and only one instance of the game can be saved in the memory storage at a given time.

## [Design Constraints](#_2et92p0)

**Operating System and Platforms Supported** – Draw It or Lose It must be able to be able to be used on the web that serves on multiple platforms. This could include Linux, MacOS, and Windows Operating Systems.

**Programming Language** – When programming the game to be a web-based application that is used on multiple platforms, decision on the language necessary is paramount. Once a language is decided on the team is stuck with it.

**Software Licensing requirements or restrictions** – Specific Software from the company may be required to be used in the building of the game for the other Operating Systems, or the other Operating Systems may require the use of specific software.

**Specific Library or Framework** – Use of open-source or an approved list of Libraries that the client company may want us to use. Being that the project is a game, the libraries that may be used to create Unique IDs and a Secure Log-In may be different than other open-source Libraries CTS has used in prior projects.

## [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 Unified Modeling Language (UML) is utilized to display the design of the game system that will be created for Draw It or Lose It. In this diagram, you can see that the Entity Class has a relationship with the three classes of Team, Game, and Player Classes. Each class, Team, Game, and Player are drawn to the Entity Class with an open arrow showing that they all inherit from the Super Class Entity. Meaning that each subclass inherits all the attributes of the Entity Class. However, each subclass is not the same as the other and can have their own attributes that make them unique. The ProgramDriver Class is pointing to the SingletonTester Class with a closed arrow and text stating “<<uses>>” signifying that the ProgramDriver class will use the SingletonTester Class to test the code that is written. This is done so that the restriction of having one instance where the game can exist in memory is tested. The GameService Class holds complex code that makes up the game and its functions. Being that each game and team names are unique, the user can check if the name is in use or not. The lines that connect GameService to Game to Team to Player shows that each class is associated with one another. The numbers in the middle of each line show that the number of associations each class with the other. Player could have zero to many players associated with the Team 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)

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 Servers cost more due to being in low demand, and servers are harder to find. In addition finding a third party to Web-Host the product will be more costly. (Cudmore, 2020)  There are no known Mac Web Hosting Packages (Heng, 2020)  Security features are well met compared to Windows (Cudmore, 2020) | Cheapest server pricing out of the other Operating Systems.  Security is at the level that MAC OS has (Cudmore, 2022)  Linux has OS that are outdated but still some of the best systems – Red Hat Linux – Military grade security (Horne, 2019)  No licensing costs/fees being that it is open source and free (Horne, 2019) | Not as expensive as the MAC OS servers would cost, but higher in price compared to Linux. (Cudmore, 2020)  In addition , there are licensing fees involved with these servers (Horne, 2019)  Security is not as strong as Linux or MAC (Cudmore, 2020) | i-jetty is an open-source software based on jetty that allows mobile devices to host web servers (Mobile Web Server)  I-jetty is a web container serving Java-based web content, and its API is available as a set of JARs (Mobile Web Server) |
| **Client Side** | More costly side of the cross-platform group. Using Mac systems will be the only way to Access their OS, and their OS only function with Apple hardware. | With the no licensing of the open sources, this will be the least costly when it comes to licensing. However, you will need someone that has good knowledge of the OS being used by LInux | Second most costly due to Licensing and fees that are involved with the host server sites. Have a member on the team be knowledgeable in .NET and ASP.NET | Developers that specialize in mobile app creation are needed |
| **Development Tools** | With MAC OS being an Apple product, it uses the IDE Xcode which is compatible with other apple products such as the iPhone (Cudmore, 2020)  Type of hardware that the system would use is designed by Apple only (Cudmore, 2020)  Compatibility with Visual Studio (Merideth, 2022) | IDE used by Linux such as Microsoft’s Visual Studio, which offers up a large amount of programming languages and libraries (Arslan, 2022) | Work with the .NET Framework and ASP.NET, and Microsoft -based programming languages (Horne, 2019)  IDE used by Windows such as Microsoft’s Visual Studio, which offers up a large amount of programming languages and libraries (Sogbesan, 2022) | Migeran developed by Intel enables developers to create on Android and iOS app in Java programming language (Bartos, 2017)  Has full support of external native libraries, and fully integrated with Android Studio and Xcode (Bartos, 2017) |

## 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**:

When it comes down to the best Operating Platform to use between the three: Linux, MacOS, and Windows. The Windows Operating System would be the best OS to use for The Gaming Room to create cross platform gaming for their game Draw It or Lose It. Though there are Licensing fees included with its servers, it is not as expensive as it would be using MacOS (Horne, 2019). In addition, the IDE used by Windows such as Microsoft’s Visual Studio, which offers up a large amount of programming languages and libraries (Sogbesan, 2022).

1. **Operating Systems Architectures**:

Windows allows for the use of not only Microsoft’s Visual Studio but other IDE’s such as IntelliJ, Eclipse, PyCharm and others. This allows for a wide range of languages to be executed in the creation of the code need for the cross-platform use. Microsoft Azure works in tandem with Windows and the systems Serverless Architecture allows for simplistic movement and creation. “Build more scalable and stable event-driven applications with a microservices-friendly approach” (Azure Functions).

1. **Storage Management**:

Cloud Service through Microsoft Azure would be the focus for The Gaming Room to adequately store all of the data need for the gamer Draw It or Lose It, and to add more data and pictures for the game, if need be, in the future. “Store terabytes of data in the cloud for only a few dollars a month and repurpose your storage infrastructure for other critical business objectives” ( Azure Archive Storage). Microsoft Azure allows for high-definition digital media such as pictures to be easily stored with low cost as well.

1. **Memory Management**:

As stated above in the Storage Management section, Virtual Memory is a much better system to use rather than physical memory. Cloud Services though over time become more costly are best for The Gaming Room. It allows for the company to add on more data that would need to be stored and manage if it were need in the future.

1. **Distributed Systems and Networks**:

<Knowing that the client would like Draw It or Lose It to communicate between various platforms, explain how this may be accomplished with distributed software and the network that connects the devices. Consider the dependencies between the components within the distributed systems and networks (connectivity, outages, and so on).>

1. **Security**:

Security plays a major role creating a platform that allows for cross platform use in a game. There will need to be a system that allows for users to create a log in and verification would be required for the user. Microsoft’s Azure allows for the Server side to be protected with multilayered cybersecurity. “Protect your workloads quickly with built-in controls and services in Azure across identity, data, networking, and apps” (Azure Security).

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