

Draw It or Lose It

# **CS 230 Project Software Design**

Version 3.0

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## [Document Revision History](#_grjogdjh5fi8)

| Version | Date | Author | Comments |
| --- | --- | --- | --- |
| 3.0 | 12/10/2021 | Brandon Petersen | Updating information on operating platform, operating systems, storage management, memory management, and security |

## [Executive Summary](#_sbfa50wo7nsh)

The new client, The Gaming Room, wants to develop a new web-based game that runs on multiple platforms. This game will be based on their current game, Draw it or Lose It, which is currently only available on Android’s Google Play Store. In addition, the Draw It or Lost It game is loosely based on Win, Lose, or Draw from the 1980s. In this game, multiple teams attempt to guess what is about to be drawn. Four rounds consist of a minute each where an image is pulled from a database. If the team cannot answer correctly, then the opposing team will have the opportunity to respond within fifteen seconds.

## [Design Constraints](#_2et92p0)

* The game must be web-based and run-on multiple platforms
* The game will need to have the ability for one or more teams
* Each team in the game will need to have numerous individuals assigned to it
* Each team must have a unique name and inform the team when their name is not unique and must be chosen again
* There can only be one instance of the game running at any given moment

The client, The Gaming Room, wants the game to be web-based and multi-platform to reach as many end-users as possible. This means we must expand away from its current platform of Android to iOS, macOS, Windows, and Linux machines. Since the game has already been developed on Android, the central portion of the code has already been completed; it just needs to be translated to other platforms. Therefore, languages like Swift, JavaScript, WebGL, and C++, will need to be implemented by the development team.

## [Domain Model](#_8h2ehzxfam4o)

As seen in the UML Class Diagram below, the Entity class creates the relationships between Game, Team, and Player classes. This means that information from these classes is directly inherited from the Entity class. So, for example, when observing the GameService class, it’s seen that it references the game 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** | Has flexible terminal commands  It has a variety of web hosting, each with its pros and cons  Unlike on Windows, web hosting is not very common | Has flexible terminal commands  For specific features, Linux provides the best security  Web hosting is much more cost-effective on Linux | Highest user base, which results in the most available software  Windows has solid resources and quick load times  Windows are often targeted by hackers and other individuals | Servers can be placed in one location and consistently monitored  Mobile devices are one of the most popular operating systems  Mobile devices have a wide range of compatibility along with having the lowest cost devices  Mobile devices have the most extensive security issue due to their popularity and wide arrange of devices |
| **Client-Side** | macOS has a higher cost compared to windows and Linux  The learning curve for MacOS is moderate and can be learned quickly | Linux has the lowest price but has the lowest user base  The learning curve for Linux is the largest. This makes using Linux the most time consuming | The Windows learning curve is shallow and has the highest user base. This makes  Windows is the least time consuming  Depending on the hardware and software being used, Windows can be none of the cheapest options | The implementation creates  maximum time consumptions and creates the need for support for the variety of devices and OS  Since the application are run through an app store, any individual can view updates and their documentation |
| **Development Tools** | The Swift programming language when developing on any of Apple’s hardware.  Other languages can be used, such as HTML, Python, Java, RUBY, etc. | Linux has a variety of languages and resources at its disposal, such as Python, Java, C++, HTML, RUBY, PHP, etc. | Windows has a variety of programming languages at its disposal, such as Python, Java, C++, HTML, etc.  Along with that, Windows has Visual Studio and VS Code, both of which are solid applications for programming. | Mobile OS has a variety of programming languages at its disposal, such as Python, Java, C++, etc |

## Recommendations

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

1. Operating Platform**:** To expand the game “Draw or Lost it” from Android to multi-platform, The Gaming Room should use the Windows operating platform. Windows has the most extensive user base compared to macOS and Linux, which means it has the most comprehensive software library available. With Windows, The Game Room will have access to both paid software and free, open-source software, or FOSS. In conjunction, Windows has the lowest learning curve, which means it’s the most time-efficient and requires the least support. Like the other operating platforms, users have access to command line input, or CLI, with PowerShell.
2. Operating Systems Architectures: The Windows operating platform will provide all Windows applications using the graphical user interface, or GUI, while still accessing system resources. The resources can be accessed and monitored through the user account or the server. Windows has one of the largest software libraries where numerous different tools can be used. For instance, there are multiple IDEs for developing, and countless other types of databases developed and administered. Furthermore, with Windows, the developers can choose which language they want to build their program since Windows is compatible with most programming languages.
3. Storage Management: Windows built-in storage system allows the development team to easily create projects of various sizes and store them where they would like. This allows the development team to stay organized and prevent unnecessary files from getting lost or deleted by mistake. Windows has a built-in storage sense, which is a helpful feature within the OS that will monitor your storage, inform you when it’s getting low, and tell you of large files that are not being utilized that can be deleted or removed to free up space. If the HDD or SSD is used for the game runs low on storage space, Windows does offer multiple tiers to their cloud-based storage option. This can also be an excellent option to ensure that the project is backed up.
4. Memory Management: As previously mentioned, the game will be utilizing a database containing images to be used. This database does not need to be localized on the device. Windows default memory management allows the development team to easily store and create files outside the default picture folder.
5. Distributed Systems and Networks: Since windows have extensive software compatibility, there are numerous ways to spread the application. For instance, the Desktop Bridge allows the application to quickly be packaged as a .appx file and distributed to the Windows store. In addition, the desktop Bridge supports multiple file package types.
6. Security: Since Windows has the highest user base, hackers often target it. Since this is the case, Windows has developed and built its security protection software. Windows allows each of the users of the machines to go into the security tab within settings and change the level of security on the device. In conjunction, there is software that can increase safety on a Windows device. For instance, a VPN can be used to help protect user information. A VPN can also connect to the company’s network if any of the developers need to work remotely.