

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 | 04/13/2023 | Vincent Valente | Explained Various Recommendations |

## [Executive Summary](#_sbfa50wo7nsh)

The development of a cross-platform web game is the goal of The Gaming Room. The game, currently limited to Android, will be named "Draw It or Lose It". Its aim is to engage multiple teams comprising of several individuals for four rounds of one minute each. Upon selecting a picture from a pre-existing library of images, a team must guess the image before time expires. In the absence of a correct answer, each member of the opposing team is allowed to guess for a maximum of 15 seconds.

## [Design Constraints](#_2et92p0)

The following are the necessary criteria for coding and software development:

* There must be at least one team involved, and each team must have multiple members.
* The names of the game and teams must be unique to enable users to check whether they are already in use.
* Only one instance of the game can exist simultaneously.
* The game should be compatible with multiple platforms.

While this only pertains to the game aspect, we also need to consider application development. The goal is for the game to be accessible on all devices, not just android. We need to figure out how to incorporate it into other mobile devices, as well as machines such as Windows, Linux, and Apple. To achieve this, we may need to either rewrite the code in swift for Apple devices or incorporate other languages to make the code compatible with different devices.

## [Domain Model](#_8h2ehzxfam4o)

**"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.**To establish a connection between the Game, Team, and Player classes, an Entity is created. By using UML, we can depict the inheritance between these classes. This means that each class will have access to common attributes such as "name" and "id", with Entity acting as a superclass. The relationship between Team and Player is of "has a" type, while Game has a Team and GameService has Games. This relationship is called aggregation in UML, which means that one class has a reference to an instance of another class. By examining the UML diagram, we can see that GameService references Games, Games references Team, and Team references Player.

## [Evaluation](#_2o15spng8stw)

| **Development Requirements** | **Mac** | **Linux** | **Windows** | **Mobile Devices** |
| --- | --- | --- | --- | --- |
| **Server Side** | Modifiable command line prompts for server configuration, accessibility, and modifications.  Widely used in web hosting services.  Benefits: Can be updated to meet different web hosting needs with a range of options.  Drawbacks: Less favored as a web hosting option. | Similarly, the case applies to macOS, which is not only secure but also cost-effective. It is a secure and most preferred option for web hosting services as it catches security flaws before they can cause any harm. However, finding suitable applications to support the web hosting needs may pose a challenge. | There is a wider range of software options available. This platform is dominant over others and is a closed system. Some advantages include high resource requirements, shorter loading times, and high comfortability. Disadvantages include being more susceptible to viruses and having poor technical support. | For optimal performance, it is recommended to have a stationary server that can be centrally monitored. The advantages of using such devices include greater popularity and high portability, wider accessibility, better compatibility, and lower costs. May not be compatible with all smart mobile devices and may have weaker security measures. |
| **Client Side** | The process of ensuring compatibility with all web browser platforms and mobile devices requires a moderate level of expertise and time. The cost is comparable to Windows. | Ensuring application compatibility across all web browser platforms and mobile devices requires expertise and time while keeping costs low What measures need to be taken in the application development process to accomplish this? | Achieving compatibility across all web browser platforms and mobile devices is essential. This requires minimum expertise and time investment, and the associated costs are comparable to those for Mac devices. | Enables users or developers to view updates from any location, but may be more challenging to implement compared to alternative options. |
| **Development Tools** | To execute code on Macs, swift is the preferred language, and tools like notepad++ can be integrated for ease. However, all languages can be run on Macs, including HTML/CSS/JavaScript and libraries for frontend support as well as general-purpose languages such as Ruby, Python, Java and PHP. | There are various tools available for Linux, including visual studio, eclipse, and notepad++, which provide a user-friendly interface. In addition, Linux supports a range of programming languages and libraries, such as HTML/CSS/JavaScript for frontend development, as well as general-purpose languages like Java, Python, PHP, and Ruby, among others. | This software is user-friendly and can operate similarly to Linux. Some examples of languages include Visual Studio and Eclipse. Various tools like Notepad++. Programming languages include, but are not limited to, HTML, CSS, and JavaScript. Libraries for front-end development and general-purpose languages like Java, Python, PHP, and Ruby. | The possibilities for app creation are endless when using android and swift. These programming languages and their corresponding software can be executed on multiple platforms, including Windows, Linux, and Apple. In addition to HTML/CSS/JavaScript, there are many libraries available to support the frontend, as well as various general-purpose languages such as Java, Python, PHP, and Ruby. |

## Recommendations

1. **Operating Platform**:

My suggestion would be for The Gaming Room to begin developing their game on Windows devices, as it offers a wider range of software options and requires minimal expertise and cost to get started. Additionally, there are plenty of integrated development environments (IDEs) available to work with, so there should not be a shortage of options.

1. **Operating Systems Architectures**:

The suite of features offered by Windows operating system allows all Windows-based applications to access system resources and display Graphical User Interfaces (GUIs) to users. In addition to these resources, Windows applications also have access to Graphics and Multimedia, messaging, and web services. These services can be accessed through user accounts or dedicated servers.

1. **Storage Management**:

The Windows 10 operating system includes a convenient functionality known as storage sense. With this feature, you can effectively examine and regulate files saved on your hard drive, as well as monitor the amount of space they consume. Additionally, you can select preferred storage locations for apps, making them more accessible. As with other storage devices, the cloud can also be utilized to securely store data. The inbuilt storage system offers simple file organization and placement for extensive projects, ensuring they are not misplaced or mistakenly erased.

1. **Memory Management**:

To develop the game, it is necessary to build a database or a library with a large number of images. For efficient storage, the memory allocation feature enables the storage of pictures in a designated folder outside the default picture folder. This ensures that the entire project is kept in a secure location on your computer, including when working with the IDE and opening files to develop the game.

1. **Distributed Systems and Networks**:

To ensure that the game can be played on all devices, I researched ways to publish it for different operating systems. After exploring various options, I discovered Develop 4, an integrated development environment (IDE) that facilitates cross-platform game creation. This software can be used on any device, and once the game is created, it can be exported to multiple platforms such as the web, iOS, and Android, allowing for cross-play. This approach can also mitigate dependencies. However, to prevent issues such as outages or connectivity problems, it is crucial for the company to ensure that its servers are robust enough to support high volumes of players and have backup power in case of power outages.

1. **Security**:

While Windows provides built-in security protection software, it is advisable to use additional security measures to protect user data and information. However, in terms of what is already available on the machine, Windows does come with pre-installed protection. The system continuously scans for malware, viruses, and security threats in real-time, and automatically updates to address new threats and ensure the safety of the system and user information.