

Draw it or Lose IT

# **CS 230 Project Software Design**

## [Document Revision History](#_grjogdjh5fi8)

| Version | Date | Author | Comments |
| --- | --- | --- | --- |
| 1.0 | 07/23/2023-  07/02/2023 | Gentian Hoxha | Looking at the UML diagram we broke down the requirements for the staff to facilitate the development of the web-based version of the gaming app. |

## [Executive Summary](#_sbfa50wo7nsh)

A company called “The Gaming Room” aims to create a cross-platform web-based game named "Draw It or Lose It." Presently, the game is exclusively available on Android. The game's objective is to have multiple teams, each comprising several players, compete in four rounds, with each round lasting one minute. A random image is selected from a library, and one team tries to guess what it is before the time runs out. If the answer is not given in time, members of the opposing team can take turns answering until fifteen seconds elapse.

## Requirements and [Design Constraints](#_2et92p0)

1. The application needs to involve one or more teams.
2. Each team will consist of multiple individuals.
3. Game and Team names must be unique to enable users to check name availability.
4. The game should be a single instance, running on multiple platforms simultaneously.
5. It must be compatible with various platforms, including Android, Windows, Linux, and Apple devices.
6. To achieve multi-platform compatibility, the code may need to be re-written in Swift for Apple devices or explore using existing code with inheritance of other languages to make it more robust and compatible.

Keeping in mind that In addition to the game aspect, it is essential to consider application development for various devices. Currently, the game runs on Android, but the goal is to expand its availability to other mobile devices like Apple, as well as desktop machines running Windows and Linux. This can be achieved either through code translation to Swift for Apple devices or by integrating existing code with other languages to ensure seamless functionality across platforms. By combining multiple computer languages effectively, we can create a robust and versatile application that caters to a broader user base.

## [Domain Model](#_8h2ehzxfam4o)

Remembering that The Entity class establishes relationships between the Game, Team, and Player classes. This results in inheritance or the inheritance of information from the Entity class by the others. Representing this in UML allows us to visualize the inheritance relationships. Consequently, all three classes will share common attributes such as "name" and "id," making Entity the superclass.

­

Analyzing the relationships further, we observe that Team and Player have an association of "has a" type. In other words, Team and Player are instances of their respective classes and have references to instances of other classes. On the other hand, the Game class has a "has a" relationship with Team, and the GameService class has a "has a" relationship with Games.

In UML, this is depicted as aggregation (HAS-A). In practical terms, when a user "has a," it means they possess an instance of one class and have a reference to an instance of another class.

In summary, when examining the UML diagram, we find that GameService has a reference to Games, Games has a reference to Team, and Team has a reference to Player.

[Evaluation](#_2o15spng8stw)

| **Development Requirements** | **Mac** | **Linux** | **Windows** | **Mobile Devices** |
| --- | --- | --- | --- | --- |
| **Server Side** | The server offers versatile terminal commands that facilitate configuration, access, and modifications.  Characteristics The server's command-line interface is widely used and highly regarded in web hosting.  Advantages It allows for easy upgrades, ensuring adaptability to diverse web hosting needs.  Disadvantages It is less preferred for web hosting service | Similarly, the Mac offers additional cost savings along with its benefits.  The Mac platform is highly secure, making it the most preferred option.  Early detection and prevention of security flaws, making it the top choice for web hosting services.  The challenge lies in finding suitable applications that fully support the specific web hosting requirements. | Greater availability of software when compared to other operating systems.  Dominates over other platforms as a closed system.  Demands higher resource requirements but results in faster loading times and increased comfortability.  Prone to easy virus susceptibility and may suffer from inadequate technical support. | An immobile server that remains confined to a single location is preferable. However, other devices offer superior specifications.  The immobile server is more popular and boasts high portability.  It enables a broader reach and better compatibility, leading to cost-effectiveness.  The immobile server may exhibit limited compatibility with various smart mobile devices, resulting in poor security. |
| **Client Side** | What steps are necessary in the application development process to guarantee compatibility with all web browser platforms and mobile devices, considering a moderate level of expertise, a reasonable amount of time, and costs comparable to Windows development? | What are the essential requirements in the application development process to ensure maximum compatibility with all web browser platforms and mobile devices, while demanding extensive expertise and time investment, yet aiming for minimum costs? | What steps are necessary in the application development process to ensure the application's compatibility with all web browser platforms and mobile devices, while requiring minimal expertise and time, and with costs comparable to Mac development? | Offers the advantage of providing clients and developers with the flexibility to access updates from any location. However, its implementation may require slightly more effort compared to other devices. |
| **Development Tools** | When using Macs for programming, the more popular choice is to run Swift. Additionally, we can integrate useful tools like notepad++ into the workflow. However, Macs have the capability to run all programming languages. These languages include, but are not limited to, HTML/CSS/JavaScript, along with libraries that support frontend development and general-purpose languages such as Java, Python, PHP, and Ruby. | Linux supports a range of user-friendly tools like Visual Studio, Eclipse, and notepad++ to facilitate programming tasks effectively. Moreover, it offers compatibility with numerous programming languages and tools. These languages encompass, but are not restricted to, HTML/CSS/JavaScript, as well as libraries for frontend development and general-purpose languages like Java, Python, PHP, and Ruby. | It offers a more user-friendly experience compared to Linux while retaining the ability to run the same applications. For instance, Visual Studio and Eclipse are just a couple of the many supported languages. Additionally, it provides access to multiple tools, with notepad++ being one of the straightforward options. The supported languages include, but are not limited to, HTML/CSS/JavaScript, along with libraries for frontend development and general-purpose languages like Java, Python, PHP, and Ruby. | Android and Swift offer the potential to create numerous applications. Both programming languages and software are compatible with all three platforms. The supported languages include, but are not limited to, HTML/CSS/JavaScript, along with libraries that facilitate frontend development and general-purpose languages such as Java, Python, PHP, and Ruby. |

## Recommendations

1. **Operating Platform**: My recommendation is for The Gaming Room to begin development on Windows devices due to the abundance of available software and the minimal expertise and cost required to initiate projects. Moreover, working on Windows ensures a wide array of Integrated Development Environments (IDEs) to choose from, providing added flexibility in the development process.
2. **Operating Systems Architectures**: Being that Windows offers essential services utilized by all Windows-based applications, allowing them to present a Graphical User Interface (GUI) and access system resources, among other functionalities. These applications can also access Graphics and Multimedia features, messaging services, and web services. The utilization of these services is feasible either through a user account or a dedicated server.
3. **Storage Management**: Since Windows 10 offers a convenient feature called "storage sense" that enables users to examine and manage files on their hard drives, monitoring their storage usage. Additionally, the operating system allows users to designate preferred save locations for apps, making them easily accessible. Similar to other devices, Windows 10 also supports cloud storage for data backup. The built-in storage system facilitates effortless file creation and organization for significant projects, reducing the risk of losing or accidentally deleting essential data.
4. **Memory Management**: During the game creation process, it is necessary to establish a comprehensive database or library containing a substantial number of pictures. The memory allocation feature facilitates convenient storage of these pictures outside the default picture folder. This approach ensures that the entire project remains securely organized in a designated area on your computer. This includes working with your Integrated Development Environment (IDE) and opening files from it to develop the game.
5. **Distributed Systems and Networks**: Due to the variations among different operating systems, I explored methods to publish the game so that it can run on all devices. After thorough research, I discovered Develop 4, an Integrated Development Environment (IDE) that facilitates cross-platform game creation. This versatile IDE can be utilized on any device. Once the game is developed, it can be exported to various platforms, including web, iOS, Android, and many more, allowing for cross-play functionality. This approach also helps manage dependencies efficiently.

To prevent potential issues such as outages or connectivity problems, it is crucial for the company to ensure robust server capabilities capable of supporting large volumes of players. Additionally, having backup power systems in place can safeguard against power outages and maintain uninterrupted gameplay experiences.

1. **Security**: Being that Windows includes built-in security protection software. However, for enhanced data and information security, it is advisable to consider using an additional source. Nonetheless, concerning what comes pre-installed on the machine, Windows already provides protection. The system conducts real-time scans for malware, viruses, and security threats. Furthermore, automatic system updates are regularly implemented to adapt to evolving threats, ensuring the safety of both the system and user information.

**References**

**https://learning.oreilly.com/library/view/operating-system-concepts/9780470128725/silb\_9780470128725\_oeb\_c01\_r1.html#h3**

**https://learning.oreilly.com/library/view/operating-system-concepts/9780470128725/silb\_9780470128725\_oeb\_c01\_r1.html#h4**

**https://learning.oreilly.com/library/view/operating-system-concepts/9780470128725/silb\_9780470128725\_oeb\_c01\_r1.html#h5**

https://www.forbes.com/sites/adrianbridgwater/2015/03/17/whats-the-difference-between-a-software-product-and-a-platform/?sh=36f54e0b56a6

https://learning.oreilly.com/library/view/operating-system-concepts/9780470128725/silb\_9780470128725\_oeb\_c01\_r1.html#h6

https://learning.oreilly.com/library/view/systems-analysis-and/9781118037423/06\_chapter002.html#ch002-sec002

https://learning.oreilly.com/library/view/systems-analysis-and/9781118037423/06\_chapter002.html#ch002-sec019