

# Draw It or Lose

# **CS 230 Project Software Design Template**

Version 1.0

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## [Document Revision History](#_grjogdjh5fi8)

| Version | Date | Author | Comments |
| --- | --- | --- | --- |
| 1.0 | 01/24/2022 | Santiago Ramirez Jimenez | Design Document analyzing the requirements and the constraints needed to accomplish the applications goal. |

**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 solution is trying to satisfied its new client that wants to broaden the gaming room from the Android app to other platforms as a web-based game.

## [Design Constraints](#_2et92p0)

The issues that the company have are:

Changing an Android application to a web application

What does the client mean with multiple platforms exactly in the web based game

Does the company have a team to render the library stock of drawings for the game

Changing application android to web application: it is a technical constrain , this issues involves the understanding of what are the specific API’s the web will use for its platform as well as the people who do updates and maintenance of this website. Finally the programming languages that have to be use will be either a transitioning from java to html, JavaScript and CSS or other programming languages required to run the application on the web service

Multiple platforms: it considered a technical constrain since it has to be talk about what they mean by “multiple platforms” are they talking about it being used in different operating system, are they talking about different browser or even different gaming website platforms or is the game just going to be independent game in its own website.

The library rendering from a library stock: it is a considered a business constraint because its to understand what exactly is the team we are working with which are visual designers and/or data scientist that are involved with handling the images being render to the players.

## [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)

In the UML class we can see that the parent Class of Player , Team , and Games is Entity and they are all considered inheritance. We can also tell there is an association relationship between GameServices->Games, Games->Team, Team->Player. The UML also demonstrates that there are multiplicity between all of these association relationships that are zero to many .

**"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 is made by Apple which has the potential to be the less malware platform according to statistics, it has multiple features that stands out different then other such as incorporating adobe application as part of its free applications, it is easy to run its application on any apple related machine local. The weakness of Mac is the lack of compatibility with many new applications, it has limit amount of applications that can run compared to other platforms and its limited option of upgrading hardware. For the web application I believe that if we are talking about compatibility issues Mac will be the worst based on compatibility on web games so its possible that the game can still run since its on the web but host through Mac may cause issues in compatibility for this platform. Another weakness is the fact that mac servers cost more because of less demand and servers hard to find hosted on the web. | Linux is an open source operating system which has a variety of features as well as application that allow for a diversity of things to do specially for hosting a website. High performance, its better for software updates and has many security features. The weakness of Linux is that it has unsupported hardware, it is difficult to troubleshoot, its hard learning curve. Another weakness its transitioning its data into another platform which will take a while but its not compatible for example with windows because windows is more of an updated software. Hosting a website through Linux will be great for developing a website and it has had the necessary applications that can make it work the only negative thing is the hardware and the compatibility of transitioning. Based on cost Linux is the least expensive since it’s an open source platform | Windows is developed by Microsoft and is one of the most used operating system around the world, most if not all application are made through windows and has diversity in control of application with hardware as well as the implementation of updating its Operating System to new hardware. Most of website are hosted through windows so it will be easier to find in there domains compared to a website in mac. The weakness of Windows it that it is not a safe platform because its used often it has develop many malware issues that can cause problems to any company that has its own server, unless they have the necessary protection. Windows will also be considered great for a Web-based game because it has its application as well as its compatibility with most application but the only negative thing is the fact that it requires more security. Windows is not as expensive as mac but still have to spend some money | Mobile device has multiple platforms but the most common operating system of mobile device is Android and IOS which advantages are that they have full access of the software and hardware which is more controlled than other OS, it has more of a user experience and has a variety of applications that allow it to be diverse. Mobile Device tends to be the least expensive to host because there isn’t much that it requires. The disadvantage of mobile devices is that it lacks optimization compared to other platforms , less memory storage, it has less, compatibility with older applications since they are mostly dedicated to newer applications and lack of security. For web-based hosting I feel like the power that other OS is not enough to host a web-based game since it requires storage, hardware and optimization |
| **Client Side** | The expertise that are needed using a mac is the fact in which the developer needs to understand what the mac can be compatible with as well as the cost of it being hosted through a mac and how it can allow the web to be fully functional with other operating systems. Cost: it will cost a lot more than other platforms.  Expertise: since it less common to be used in companies there is lack of expertise or professionals that know about the architecture of a mac. Based on Time apparently its not as demanding because apple does have some features such as Iweb that allow to build through there OS but requires money. | While using Linux the expertise depends how well recognized the developer is using Linux because is one of the hardest OS to learn and it needs the necessary hardware that is compatible with Linux to make it work. Since Linux is an open source the cost for it will be minimal and will only be required for the developer. Cost: out of all the other OS, the Linux is the less expensive one for hosting. Expertise: there is a lack of expertise in Linux because it has so many features that is hard to find someone that will know every single application that is offer by Linux. Time I believe will take longer with Linux since it requires the person who host to understand the Operating System correctly an implementing every feature such as security in a proper manner | Using Windows the client needs to understand that there may be issues based on security that needs to be address in which the client needs to create measures that allow for the web-based game to be less affected on attacks from malwares or DDOS.  Cost: it will be the most reasonable operating system based on cost because its not cheap but not too expensive either which is the one in between based on money. Experis: most if not all professionals know how windows work because is the most common used operating system in the world and in companies. Time: similar to mac it has a lot of 3rd party tools and domains that can be purchased through the web or features to host which required less time to developed and faster way to host | Using a mobile device client should be aware of the hardware issues and the optimizing issues that are required to run the web as efficient as possible so understanding those factors makes it possible for the client to understand the possibility as well as the cost if it being done. Cost: it is the cheapest of all the operating systems to develop but its not free of course since it does not required so much hardware and software to host it in a mobile device. Expertise: there is a lot of experts that know about mobile device because of how much it utilized java which is one of the most common programming languages. Time: out of all 4 OS mobile device takes time to developed because of the lack of features and minimum applications that will allow to host a website through a mobile device. |
| **Development Tools** | Trough Mac we will utilizes the programming languages such as JavaScript, html and ccs that are commonly used for we developing and most mac user might use PHP instead of CSS to develop the design part and even thou the game requires drawing utilizing the adobe premiere can help with the graphical designing of the pictures that need to be use in the web. Mac uses The Xcode IDE which is the most common IDE and many other free IDE and as I mention before they have Iweb which is the most common way to host a website on mac but as I stated before it cost more than what other operating system may have, these license can go around 50+ a month for a individual user so imagine how much it will be for a company to host, especially a game that requires maintenance. There wont need a lot of development team because most features that mac have allow for the team to used there abilities such as adobe illustrator for graphic designing. | Linux will utilize similar to mac languages such as JavaScript, html and css and since it is compatible with most programing languages and applications it is most likely that Linux can developed a well established web based game. Linux has a lot of IDE for web developing such as visual studio, PHPstorm, Atom, etc.. Hosting in Linux will not be so expensive there are hosting platforms such as BlueHost that will go around 3.95 a month which is cheap at a price like that. Development team will be needed since there are so many features that are needed to be establish especially for the security features that need to be developed by a team. | Similar to Linux and mac, Windows can use programming languages such as Java Script, html and css and many other compatible programming languages that allow for diversity in which it develops a web based game. Windows has a lot of IDE that are free for developing website such as visual studio which is already implemented into the windows applications as well as other IDEs that Linux also has. The developing team might just be modern in this case because there is the need to have a team taking care of features such as the graphics of the game but the most important one is making sure that the website is hosted with as much security as possible which is the most common thing to do in all OS but more importantly in Windows. BlueHost is also possible to be used in windows and its cheap so there many things that wouldn’t go wrong with hosting through windows. | The mobile Device lacks in diversity with programming languages because most of its application is made mostly with java but it still has the compatibility to use languages such as JavaScript, html and css but it lacks on the items and tools that are necessary to make a web-based game. Mobile Device will required to use AWD for web developing but it lacks the applications needed to build a website itself as well as having its graphical designs since it requires the features and application for this although the IOS does have adobe premiere install in some of there devices. The team that is required for the job will be somewhat in between because not a lot of people host a website through phone so trying to get the right team could be challenging. The hosting of the website will most likely be in a cloud because of lack of hardware that will support the hosting so most common use will be in Digital Ocean which is cheap but cost is through hardware not monthly. |

## 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**:

**Windows**: I truly believe that the best operating system for this job will be windows because it has vast amounts of features that allow for the web-based game to be fully functional as well as its compatibility with many application that makes it more possible to optimize and maintain the game. Windows itself has been the most reliable operating system that can tackle upon any task that a user might need such as gaming, web developing, Deep learning/ Machine Learning servers, etc… Windows because of its compatibility with most features, especially features that are constantly being updated, makes it possible to get the latest security and applications that will work efficient for the server that is hosting the web game.

**Linux:** I believe this operating system will be second as being used for hosting the web server and the reason is since it has a vast majority of features that are available for free, most of its features are out of date and not recent and since it’s an open source there rarely any amount of maintenance in the operating system that allows it to be more modernized compared to like windows. It is a great operating to do many task including the task of hosting a web server since it has the required APIS and features that will make it possible to host.

**Mac:** mac is third for recommendation since it is an operating system that has barely any compatibility with most of the apps that are being used in the present time which will give certain limitations to the hosting especially if we were to talk about the domains that mac have available which are not as recognizable compared to windows domain. Additionally, hosting in a mac will required the company to pay more than other operating system since it has its own expensive way for users to upload its web to the internet.

**Cellphone:** Cellphone at all of them is the worst one because it does not have enough storage in its hardware unless you spend money on a cloud, it lacks power if the server will get over crowded with users and it does not support most apps as well as it lacks features to make the options more broader for the developer. Out of all of the other operating system cellphone will be the one that will take more time to figure out how to host compared to other operating system so overall I think this will be the last option.

1. **Operating Systems Architectures**:

**Windows:** The architecture of windows consist in an operating system that has full control of its hardware through application and can be compatible with most application and hardware because of its constant update on its OS. Windows architecture layered design has two main components which are the kernel and the user mode which mean that user mode has limited access compared to the kernel mode that has full access of the resources that the operating system has. There are manly two architecture which is 32bits and 64 bits which consist on the amount of power the operating system will have on its hardware for running apps that can potentially need more power and in this case it will be the web server .

**Linux:** The Linux is an operating system that allows users to run programs conveniently or efficiently if needed. Linux has a system library of multiple functions that allow for variety of the user. Linux works in 4 layers which are hardware, kernel, shell and application. The hardware part is all of the devices attack to the system, the kernel is basically the components that communicate with the hardware of the system, the shell is the interface of user interaction which its inputs from the developer side. Finally application are all the applications that can be run for not only its functionality of the OS but of running other programs such as hosting a web server.

**Mac:** Mac architecture is very unique to itself most if not all of its components, hardware and applications are meant for the use of Apple use product such as IOS and for this reason its compatibility with other Operating system will usually lack. The mac architecture has different aspect of what a regular pc will be and for this reason it is very isolated to other Operating systems except for its own operating system features.

**Cellphones:** the arquitecture of a cellphone consist on basic needs which is the hardware and software which are the main components. The controller which users might use with its tactile for the cellphone to interact with other components such as the audio, video, use of application, or even configuration. Cellphone is more of a user experience of its architect and multiple layer which allow for it to be used for the need of app creation.

1. **Storage Management**:

**Windows:** there are many options for storage management and flexibility that makes it possible for Windows to be more reliable like the fact that its operating system has a way to make sure that information being stored is not lost such as raid that allows servers to mirror data or store data in a way where is efficient and reliable. The features that allow user to not loose data as well as clean the data in its hardware is important and what makes windows especial.

**Linux:** a standard partition similar to how windows is with its raid allows for the protection of data being lost in the storage which will allow for storage to be secure and avoid of any corrupted issues .Linux has filesystem which will give the user the ability to arrange its context accordingly to what the user will want to do.

**Mac:** mac is an operating system that has a lot of features that will either optimized storage, reduced the amount of storage its being used or even empty the storage of unnecessary files. One of the best things which it also has is the iCloud which will most of the time keep your physical storage clear of saturated data and will most likely saved enough space for things that are more important for developing a web page such as the pictures.

**Cellphone:** Cellphone out of all the operating system lacks storage because it does not have enough storage to maintain it from not being full so most of the time it will be recommended to use a cloud to keep storage from oversaturating and it will most likely take more money out of the user that requires this feature.

1. **Memory Management**:

**Windows** has a way to allocated memory in order for certain applications to run faster, making sure the ram usage is steady the only issues with the windows memory management is when it has an update it will usually have time where it uses that memory to update the OS are random times. Task Manager is an incredible feature that windows has which allows for the users to take control of how much memory is being used

**Linux:** Similar to windows Linux has a way of allocating memory and reusing memory efficiently but apart from that it has a lot of configurable settings that allow for the memory of the system to be free of unnecessary space being used incorrectly. Linux has a memory management scheme tat allows for swapping and demanding of paging writhing its memory which will most likely make it easier for the application to run faster and not end up using the unnecessary power of memory.

**MAC:** Mac similar to windows has a feature which is called activity monitor which free up ram space in order for it to be used correctly and have the user take control of what will be using memory. Mac lacks a bit in memory when a user has a bunch of icons on its desktop because Mac will most likely believe that it is an active windows which is an annoying thing because of these unused application or hugging on the memory which is not used at the moment.

**Cellphone:** cellphone will have the worst memory management out of all of the operating system because even thou it lacks hardware optimization and will probably use a RAM that barely has enough power it will most likely be running applications in the background that will always take up all the memory of the phone so it will be a bit tedious having to constantly be closing every background app every single time.

1. **Distributed Systems and Networks**:

Since Windows is compatible with mostly anything and it can give compatibility to any OS it is possible that Windows can easily communicated between different platforms and there are IPC mechanism that are supported by windows which allows to facilitate the communication of data sharing between different platforms.

**Linux:** Linux as an open source can be downloaded on top of another Operating system as long as the operating system has a virtual machine but overall its possible that there will be a communication between OS but Linux does lack the distribution of system because it may take longer times to distribute an application that was build from Linux and send to another operating system, it is not an impossible task but will ultimately take a while to achieve. Linux can be obtain trough Linux distribution which is available in the web in order to run its OS.

**MAC:** mac has a distributing system called Xgrid which allows for multiple computers to contribute into a single task which in a way works perfectly as a server to communicate effectively with other systems. Mac has an amazing feature with Xgrid that allow for application to be run on multiple platforms as well as computers that need to run the application and its being run through 3 pain parts which are the controller the agent and the client.

**Cellphone:** cellphone has a distributed system such as the interaction between phones that will allow for it to send each other data through its interaction. Features such as hotspot is a way for cellphones to also shared a network through the main sever which was the one who initiated the hotspot. Many of the distribution of the system will only required the use of Wi-Fi for it to communicated correctly to one another and in this way it is possible for endless interaction between multiple devices.

1. **Security**:

**Windows:** Security is very important no matter what platform you are being used but understanding that windows can tend to be a bit less safer than other OS is important because you have to take the necessary precautions to make sure that everything at your company is safe from any danger and can be access in a secure way where there is enough measures that are put into place to keep the company safe but overall every company has to be aware of this even if there is more security in other platforms. Windows does offer multi authentication as well as kernel vs user mode which allows for certain users to have some sort of hiherchy control over the system which is important to make it more secure for everyone.

**Linux:** Linux has so many security features that are endless and will also work with different levels of authorization which will have access to its operating system and there are 3 types which are the user, group and other. Linux itself is one of the most secure operating system because apart from having basic security levels it also has user profiles, password protection and file ownership which are great factors that gives reliability to the user using the Linux OS.

**Mac:** mac is one of the most secure OS because it has a few compatibilities with some features which makes it less possible to affected by any antimalware or other intrusions. Apple itself makes sure that Mac is kept away from being vulnerable and will most often put very quick updates which comeback against viruses that affect the Operating system. Mac build in system make sure attackers don’t steal information and have tools that will remove malware easily.

**Cellphones:** cellphone has build in features that will keep you safe but is the least reliable to maintain information sage because of the lack of protection and authentication that allows for any information to be leaked or malware to attack the system which will corrupt the data. The other things with cellphone is that the older they are the less likely they will received the latest system update and then will required to buy a new system which could cost more than what it will originally be.