Gamesino Research Manual

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Abstract

The purpose of this research manual for Online Games platform is to shed light on the research and early development of an Online Games Platform.

This online games platform will work as a platform where users will be able to play games, purchase games securely.

This new platform will also allow users to see their winnings from their games and their claims from their winnings.

This research manual will be talking about what is going into the development process which includes (but not limited to): E-Commerce, User interface, security, Software Frameworks, Games and many other topics related to the online games platform.

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Introduction

The following research document will provide an insight into the development of this project.

The goal of this project is to develop an online games platform application that allows people to purchase/play online games with friends and others wherever.

In this project, it will go into great detail what were the requirements of this project, already available Gaming platforms that has the same/similar concept to this project, how the games are being stored, the security that's implemented into the project, the different payment systems that can be used and discuss the numerous types of languages and frameworks that went into the making of the application.

Application Description

Since the 1970's, Gaming has evolved into something more than the occasional ping pong and chucking marbles at the floor. Today gaming consists of playing new generational games that look real to the extent you couldn't tell if it was a game at first glance on your phone, console or computer. Millions of people around the word connect with each other to play the newest and online games whenever they like.

When gaming was prominent on phones, consoles and computers, many people around the world were buying disc versions of their favorite games and this for many people can cause a stockpile of unnecessary and old games they don't play anymore or from old generation consoles and many of these discs would wear and tear due to them being left out but ever since the development of gaming platforms such as Steam, Origin, Battle.Net to name a few, the buying and storing of games has made gaming better and added a longer longevity of new and old games.

The purpose of using these online gaming platforms was to purchase free and paid games and play games and to manage your collection of games based on popularity, hours played, reviews etc.

These gaming platforms were also use to connect with friends by adding them and instant messaging your friends, even while you were playing, receive game discounts on a daily basis on a number of games, browse the web while you play, update your games automatically even when you weren't at your computer, let you family share your games to members in your family, let you play two player games remotely etc.

This project couldn't have been better for me since I have been using most of these gaming platforms everyday since I was 7 so developing a gaming platform based on these existing software was perfect.

In this project, I aim to implement most of these popular features that makes all of these gaming platforms popular for everyone of every age and add new features that some of these applications don't use.

Proposed features for the Application include(but not limited to):

- Secure delivery of paid games
- Secure storage of games
- Secure payment of winnings/purchases of games
- Receipt of winnings
- Game categories

These are the most popular features in gaming platforms and I aim to include this so it can compete with the top competitors in the market.

Pre-Existing Applications

For this project, the most popular gaming platforms that are the same or have similar functionality to this project have been researched. These applications provide gamers everywhere to connect with people and purchase new games, play online games with their friends and randoms. We will take a look into why these applications are being used by gamers and others and how their functionality make them retain millions of users worldwide.

1. Steam

The first application that has been researched for this project is Steam. Steam is a video game distribution service and was founded by value in 2003 and is the one of the most popular gaming platform applications available world wide with millions of users everyday. "Steam is the pioneer of online video game distribution platforms. By the time other digital distribution services started their operations, Steam had already established itself as the best for the gaming community."[1]

Steam was the first application I researched since I use it myself and it has most if not all of the functionality I plan to implement on my project. The steam client is made from C++ and other languages and the client is available to download on Windows, Mac, IOS, Android and Linux, and they have a website version but you can only purchase and view games, in order to play games, you will have to download the steam client. The main functionalities of the Steam client that I plan to implement on my project are

- Lets you add friends
- Buy games/Play games
- Form parties with friends
- Voice chat with your friends
- Search for new games based on their category or without
- Broadcast your games to your friends
- See all your account purchases
- Have a wishlist of games you would like to purchase
- And many more!

Steam allows users of the application to add friends or random gamers they met online in a game to their friends list.

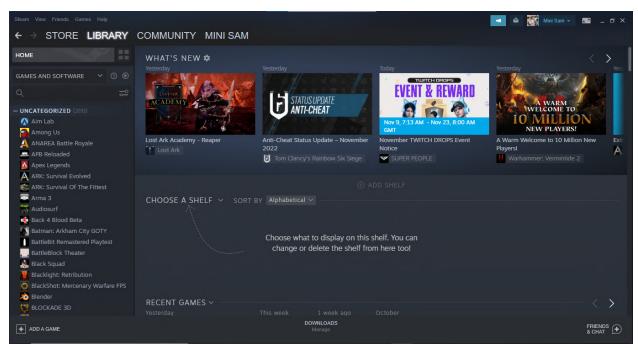


Figure 1: A picture of Steam Library full of games

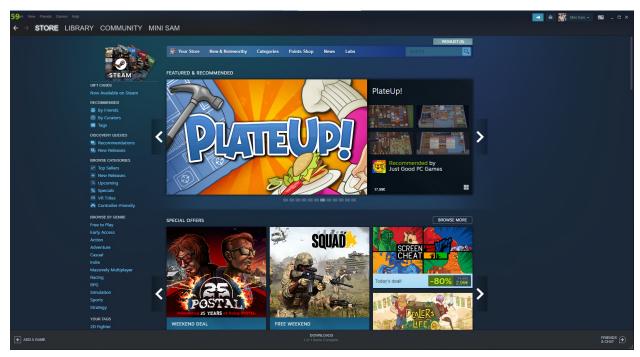


Figure 2: A picture of Steam Store Page

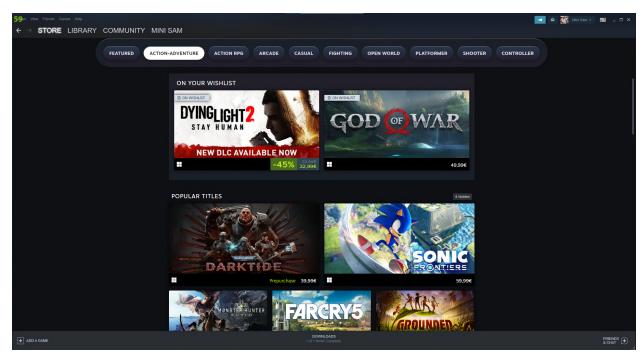


Figure 3: A picture of Steam Store Page of games based on category "Action-Adventure"

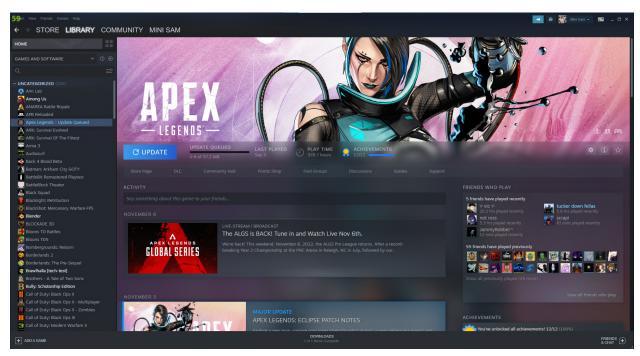


Figure 4:: A picture of a purchased game in Steam Library"

2. Origin

The next application that has been researched for this project is Origin. Origin is a video game distribution service made by EA (Electronic Arts) in June of 2011 and is used to publish only EA made games. The origin client is made with the programming language C++. The origin client is available on Windows and Mac. This gaming platform allows you to purchase and play games only made by EA Games, no third party developers. Origin has most of the functionality I plan to implement in my project such as

- Buy/Purchase games
- See recent purchase history
- Have a wishlist of games you want to buy.
- Message friends and form parties
- And many more!

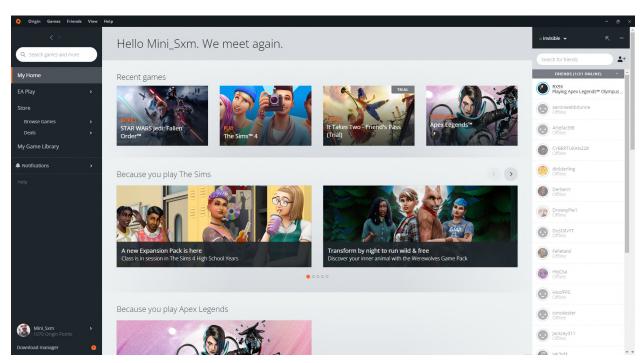


Figure 5: A picture of Origin home page with friends list on the side"

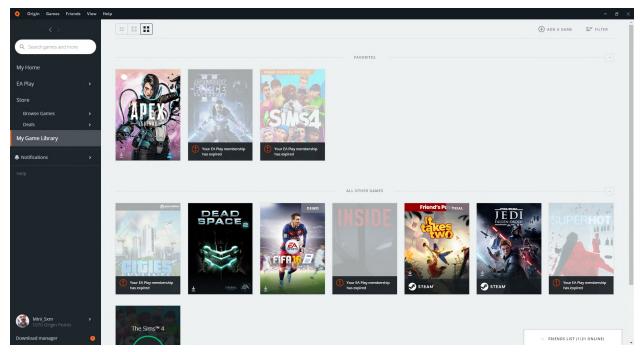


Figure 6: A picture of a game Library in Origin"

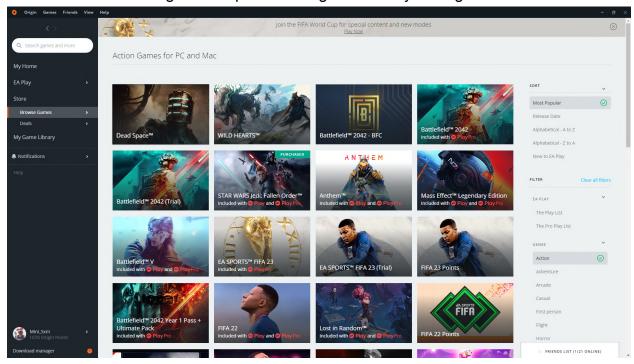


Figure 7: A picture of Origin's "Action Games" store page"

3. Battle.net

Another gaming platform I researched for this project was Battle.Net. A gaming platform made by Blizzard Enternaiment. This platform publishes games made By Blizzard but

have recently started allowing another triple AAA gaming company called Activison to publish their games on their gaming platform. Battle .net is released on Windows, IOS and Android, although the Mobile versisons of this application only allow you to chat to friends and purchase games, not play them. Battle.net has some functionality that its shares with its peers such as

- Add Friends
- Buy/Play games
- Form parties with your friends
- Make a wishlist of games you want to buy
- See purchase history
- And others!

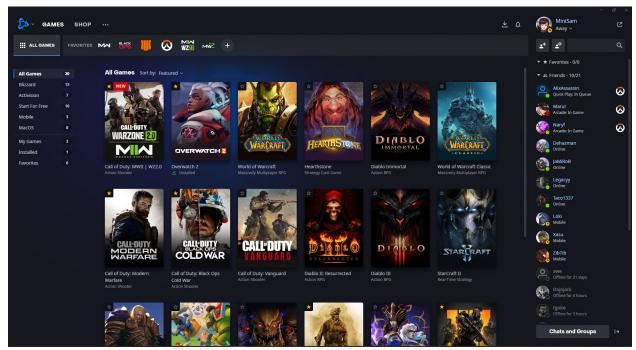


Figure 8: A picture of Batlle.net All games on the client"

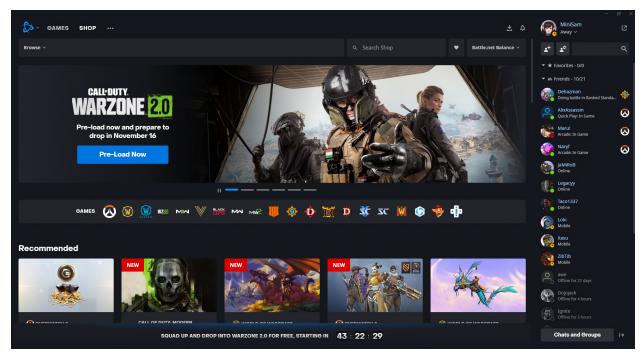


Figure 9: A picture of Battle.Net Shop"

4. Epic Games

- The last gaming platform i researched was Epic games. Epic games is a video game publisher, developer & distributor. Epic games is well known for their hit game called Fortnite which pulls in more then 3 million users to their client everyday. They are also the makers of Unreal Engine 5. Epic games client is made from c++ and allows games from lots of developers, free & paid. Epic games is available on the Windows & Mac but isn't available on IOS or Android. They also have a website version of their client but you can only view and purchase games. The main functionality that Epic games Has that I plan to implement is
- Purchase/play games
- Add games to a wishlist
- Search for games based on category
- See account purchase
- And Many more!

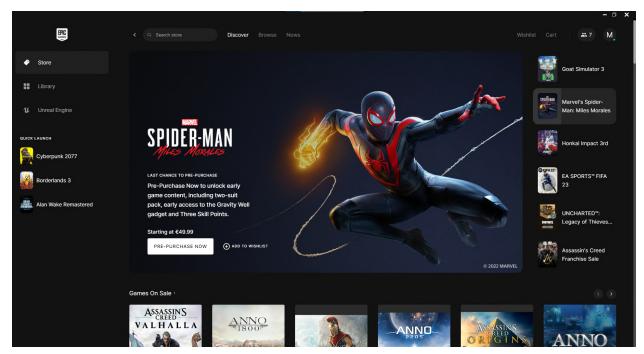


Figure 10: A picture of Epic Games Store"

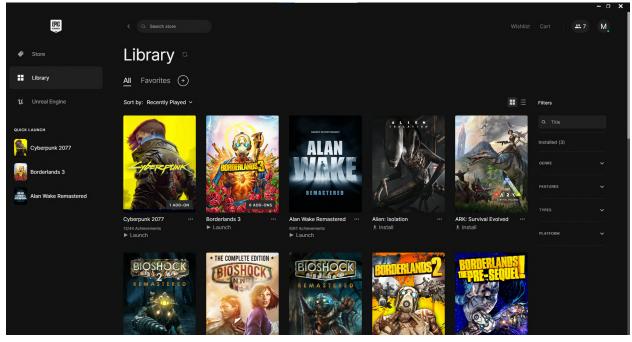


Figure 11: A picture of Epic games Library of paid games sorted by recently played"

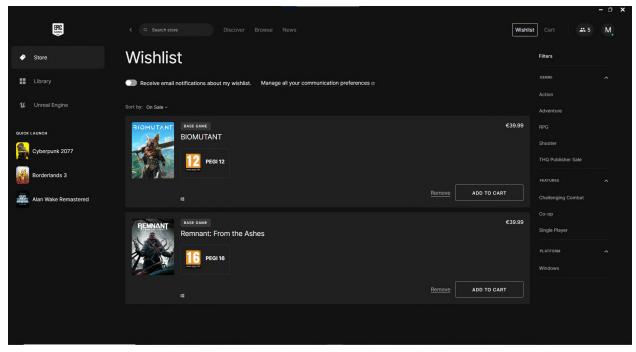


Figure 12: A picture of a wishlist on Epic Games"

Difference between Gamesino and Alternative platforms

The alternative platforms mentioned above have similar features in their clients such as friends list, buying/storing of electronic games and many more.

These alternative platforms have a wide range of games from certain publishers that is available to play and download on demand. Steam is the biggest out of all the platforms and it accepts games from indie publishers to triple AAA publishers while origin accepts games only from their publisher EA and Battle. Net only takes games from its partners.

Gamesino combats this by offering a broader selection of games such as executables, old classical games, games from AAA publishers and indie developers which gives the users the avaliablity to choose from a wide range of games to choose from if they are using a high-end pc to a low-end pc.

In order to use these clients, you will have to download their clients and download regular updates to the client but for gamesino since it is a e-commerce website, it provides users a website to just download their games and play them from their straight away making it highly convenient for thoses who don't want to fill their computers with lots of clients just to play their favourite games.

Gamesino is a better option for those who want to play and download games straight away instead of downloading clients just to play one games.

PC store feature comparison Feature Steam by Valve Origin by EA Uplay by Ubisoft GOG by CDP Battle.net by Acti-Bliz Bethesda Launcher Epic Games 1 Regional Pricing 2 Cloud Saves Yes/Free 3 Online Gamina 4 Friends Lists 5 Friend Activity 7 Automatic Refunds 8 Curation 9 Curators Yes 10 Early Access 11 Workshop/Mod Support 12 Marketplace 13 Overlay Yes Yes Yes Yes Yes Yes Yes 14 Big Picture / TV Mode Yes 15 Streaming Support 16 Multiple Controller Support Yes Yes 18 Screenshot Uploads Yes 19 Community Discussions 20 Community Guides Yes Yes 21 Trading Cards 22 Badges 23 Customizable Profile Page Yes Yes 24 Name Change Yes Yes Yes/Contact Support Yes/Contact Support Yes/One Free Change Yes/1 Per Fortnig 25 VR Support 26 MacOS/Linux Support 27 Gifting Yes Yes 28 DRM Free Suppl 29 Version Rollback Support 30 Store Preferences Nitro Twitch Prime 31 Subscription Services 32 Loyalty Program 33 User Reviews 4 Install Folder Relocation 35 Cross-Platform Account Connection Yes Yes 36 Matchmaking 37 Inventory Support 38 Anti Cheat Support 39 Microtransaction Suppo 40 Cloud Storage 41 3rd Party Keys

Here's a comparison table between the many gaming clients that exist today.

Figure 12: A picture of the different comparisons between gaming clients (Source: https://www.reddit.com/r/gaming/comments/alouny/steam_compared_to_other_services/)

Software Frameworks/Languages

1. ASP. Net Core

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ASP.net Core is an open source, cross platform web framework using C# built by microsoft to allow for the development and deployment of cloud - hosted websites.

Asp. net core has been chosen for this project because it allows for the development of websites and their back end can also be used for the development of mobile Apps. Asp.Net allows for the development and deployment on Linux, Windows and MacOS devices.

For this project, it is going to be a large scaled Website with some complexities. There is going to be playable games that the user would be able to play on their phone and the user would also be able to purchase games they want to play. Also there will be a

casino of some sort implemented into the website as well so that users can also gamble to their discretion and alternate between the two. In this project, the MVC (Model, View Controller) pattern will be implemented.

The MVC allows for the distinct separation of different concerns associated with the project.

Model: The Model in the MVC pattern is used to handle all the business logic or data that is being transferred against the View and Controller. "The Model component corresponds to all the data-related logic that the user works with. This can represent either the data that is being transferred between the View and Controller components or any other business logic-related data."[2]. This model pattern will update and process user data from purchasing, playing to withdrawing funds on the web application.

View: The view pattern in the MVC pattern is esstientially what the user will see through the user interface/ GUI. This will be used to present content in a viewable experience and should barely handle all the Logic for the application. "Views are responsible for presenting content through the user interface." [3].

Controller: The controller is in its name. This will control everything the user is doing on the sent such as the processing data, sending new data to the user, withdrawing funds etc. The view only shows what the user should be seeing e.g a Html Page. The controller handles all the user input on that specific page."the view only displays information; the controller handles and responds to user input and interaction. "[4]

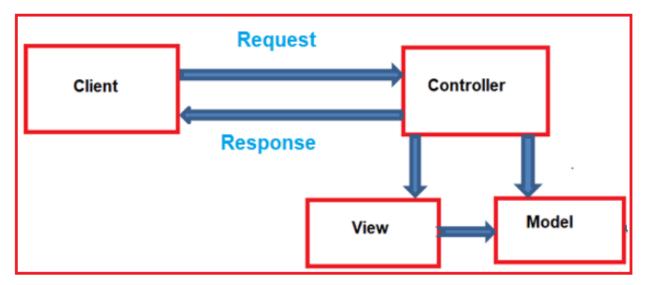


Figure 13: A picture showing how the MVC pattern works: https://dotnettutorials.net/lesson/controllers-asp-net-core-mvc/

The is a number of benefits for using asp.net core with MVC as the base fo this project. Gamesino is a e-commerce gaming platform where users can buy/play their favourite games by themselves or with randoms. Since Gamesino is a gaming platform, user traffic will rise at day and night at certain times.

2. C#

C# is a popular programming language made by microsoft used around the globe and is used with ASP.Net. C# is used to make large scale web applications, mobile apps and many more! Since C# is a "object-oriented language. You define types and their behavior."[5]. C# is similar to the likes of Java, C/C++ and is easy to learn for anybody.

E-Commerce: This project is not only being used to play games, it is a full fledged E-commerce website where users can purchase a wide range of games from a growing catalog in "Action", "Horror" "Free to play" etc. New games will be added and existing will be getting updated constantly with discounts or the game information has to change. As mentioned above when Steam was being explained, one of the cons of using Steam is that its a client that gets regular updates to update a large quantity of games, technical issues. For the E-commerce of this application, New games and and features are being added constantly to allow users to be able to play any category of games they would like. Having a client like Steam can slow down regular updates since users's broadband can be from slow to fast etc. C# allows developers to make fast, easy to maintain regular updates to products or services quickly without changing too much of the code. C# ensures regular updates of the website and its services easily and fast and gain more engagement with customers."you can ensure regular updates of content easily and keep your customers well informed about your products" [6].

Gaming: The games platform will have games that range from browser games to executable games that will run on your machine. Casino will have games that will require you to perform an action in a limited time. C# is a fast compiler language which means that actions done by the user will be rendered fast to the client and server.

C# is a popular choice for this project since it can be used cross platform for Mobile and Web Applications. C# is a highly maintainable and in the event something goes wrong, it is easy to debug and find out where the error is occurring. C# also works with the ASP.NET Core.

3. Bootstrap

Bootstrap is a free frontend toolkit that allows for fully customizable UI elements for web applications. It allows for responsive designs to be implemented into a web app. For Gamesino, it allows for a more maintainable and allows for a fast responsive design without losing out on quality."Web developers using Bootstrap can build websites much faster without spending time worrying about basic commands and functions."[7] Gamesino is gaming platform with support for mobile and computer devices. With Bootstrap, it allows for the Web application UI to be rescaled and re designed based on what type of device is being used. This saves time as by using bootstrap components, it allows for an maintainable web application and runs well on any device.

DataBases

For this project, Users will purchase games to their account and add money/withdraw money to their account. A way to store this data is crucial to this web application in order to manage and clean the data the server sends."A database is an organized collection of structured information, or data, typically stored electronically in a computer system." A database should be implemented to handle the user account details, their purchase, how much funds they have got in their account, hours played etc. Here are some of the databases that are researched for this project.

1. MySQL

MySql is the first database researched for this project. MySQL is a relational database developed by Oracle that is based of the language SQL, hence its name MySQL. "MySQL is a relational database management system (RDBMS) developed by Oracle that is based on structured query language (SQL)."[8]. MySQL can hold small, medium to large quantities of data and is stored in relational tables. Using MySQL can prove beneficial for the project since once a table has been made, it can easily be grouped with other tables and databases. MySQL can be used on Windows, Linux and MacOS.

The Games platform will have to handle lots of data such as Games, money, customer accounts. MySQL is a relational database so that means databases in MySql can be linked together so that customer accounts and their games can be linked to their account along with their winnings. This is beneficial as we need to be able to have customer accounts and what is attached to their account such as their games.

2. NoSQL

NoSQL is different to MySQL. NoSQL doesn't store its data in relational tables like MySQL and uses graphs, key values, columns, to hold its data. "The main types are document, key-value, wide-column, and graph."[9]. NoSQL stores data in different formats then MySQL such as JSON etc. NoSQL can be used for semi-structured, unstructured data and if a project is being developed with the cloud, its flexible enough to perform faster then its relational counterpart."The flexibility and ease of use of their data models can speed development in comparison to the relational model, especially in the cloud computing environment."[10].

As mentioned above, A database that is suitable for this project is one that can handle millions of data. NoSQL isn't like MySQL, it dosen't store it's data in a table format. Instead it uses keys for its data.

3. Azure SQL Database

Azure SQL Database is cloud database made by Microsoft that can handle relational data and unstructured data like graphs and XML etc."SQL Database can be the right choice for a variety of modern cloud applications because it enables you to process both relational data and non-relational structures, such as graphs, JSON, spatial, and XML."[11]. Games platform will built off the asp.net core with c#. This is a cloud database which works well with the current technologies planned to be used. If the games platform is hosted by Microsoft Azure Cloud, this database can be used to run in the cloud to handle the large amounts of data an customer's account will have. Since Gamesino is an e-commerce gaming website, being able to handle the large requests an database is essential because of the many transactions and user data that is going in and out of the database.

Security

1. ASP.Net Identity

Every game client has a thousand of users daily using their services to access purchased content tied to their account. This can be games, extra content, money etc. Users log into accounts everyday to access these items that only they can use and see.

ASP.Net identity is a an API that is made by microsoft that works with ASP.Net applications. It is an API that allows developers to manage users, passwords, handle email confirmations and more." Is an API that supports user interface (UI) login

functionality. Manages users, passwords, profile data, roles, claims, tokens, email confirmation, and more."[12].

Auhthorization handles all the permissions that a user will have when they create an account on the games platform.

Since this games platform will have thousands to millions of users daily, authorization is something that shouldn't be looked over. For account creations, ASP.Net identity allows users to have roles such as admin, user etc. This is one of the authorization methods that identity provides as it allows certain users with roles to access certain pages etc. For example, a user with admin will be able to accept / reject people's proof of ID for use of the casino and others.

Authentication handles the log in for the user.

When a User creates an account on the games platform, it will ask for their username, email address, password etc. The next time a user will log into the games platform, it will require them to enter these details again. This is the authentication. It is making sure it confirms this is the owner of the account.

Asp.Net Identify is chosen for this project to handle the login security as the documentation is regularly updated and there is a wide community support. The Api provides the necessary implementations needed for to handle the authorization and authentication part of the login for the user creation therefore reducing the additional workload working on the games application.

Payment Options

For this project, An important aspect of this application is the buying of games on the store, paying for casino games or for adding money to your balance. Users will need to be able to make secure payments online with their banking details without fear of their information being leaked or passed on to third parties. Out of the multiple payment options listed here, it will allow users who would like to withdraw their winnings.

Here are the multiple payment providers I have researched for my project.

1. Skrill

Skrill is a digital wallet provider that allows for over 100+ payment methods which includes cards, instant bank transfers and alternative payment methods."You can enable 100+ local payment methods including cards, digital wallets, instant bank transfers and other alternative payment methods."[13]. Skrill has been researched for this project as users from all over the world would be using the games platform daily and different currencies and banks will be used to deposit and withdraw money into the games platform. This will allow the games platform to allow users to pay in their local currency. When users shop for items on a ecommerce website, most users abandon their shopping carts without continting due to a poor design or poor performance. "Shopping cart and checkout abandonment are one of the greatest challenges for eCommerce merchants. Up to 70% of shoppers have been found to abandon their carts."[14]. Skrill allows for a fast checkout process without any confusing designs and doesnt hinder performance. This is crucial to the mobile application as this will allow mobile users of the game platform to get their games fast and easy.

2. Paypal

Paypal is a digital wallet that can accept transactions from multiple countries just like stripe or Skrill. This is a company that's known for payment processing around the world by many. It is a secure way to handle payments for any e commerce website.

For the games platform, users will have fill in their banking details in order to make a purchase of a game. With paypal, this can save time as paypal allows for the a quick checkout where it allows users to log in and then use their paypal balance or credit cards to purchase a game. This can save time as users would be eager to start playing their newly purchased games fast.

3. Stripe

Stripe is a payment processing platform. Stirpe uses a host of APIs in to allow for payment processing across many sites of all sizes.

For Gamesino, Stripe is used as Stripe offers a easy guideline on how to integrate Stripe easily into the technologies thats being used. Stripe Checkout is an API hosted checkout page powered by stripe that allows for the secure and easy payment processing for gamesino and encrypted all purchases made through the site.

Target Platforms

For the games platform, it is being built off the ASP.Net Core framework with c#. Windows & Linux & Mac is supported with ASP.Net.

1. Windows

For the games platform, it is being built off the ASP.Net Core framework with C#. Windows has been chosen as the platform of choice for this web browser for a number of reasons.

Windows is the most used out of Mac and Linux, even though Linux has its pros and cons, Windows will be the platform of choice.

Gaming: Windows is the go to for pc gaming since the beginning of time. Most games are available for use on windows then its peers such as Mac. To back this statement up, The usage of windows on pc's since its start in 1985 has been 91& compared to Apple's Macs 7%.[16]. Windows has a tools and supports for gaming such as it's built in features like it's game mode, supported Nvidia Control Panel which enchanes your gaming experience to another level and gives it's users better performance and frames, something that isn't achievable on Mac.

2. Mobile Phones (IOS, Android)

One of the requirements for Gamesino is to be readily available for anyone, so, Gamesino will be able to be ran on phones and computers. Allowing Gamesino to be functional on phones is beneficial to the sites growth as there is millions of mobile users that play games and a certain amount of these users will also enjoy the aspect of gambling straight from their phone all on the one website.

Application Deployment

As mentioned above, the games application will be a web based games platform based off the ASP.NET Core Framework. The database will be based off the cloud database called Azure Cloud SQL database. There is many website hosting providers that can help host and deploy this gaming platform but there is one that just has all the essentials we need.

For the gaming platform, the hosting provider that has been researched is Microsoft Azure app service.

Microsoft's Azure gives developers a range of tools and technologies to build their web applications. Microsoft's Azure App service provides the Azure SQL cloud database that is being used for this project as well. The games platform will have thousands to millions of users daily and Microsoft's Azure cloud hosting will be able to handle the surge in traffic. Azure's cloud hosting provides "faster response time and is able to reduce load times and save bandwidth" [16].

This is especially good for users that are gaming and gambling as it provides no lag during gaming and enables users to bet in time sensitive situations with ease.

Azure App service provides another tool that will allow developers to check daily traffic and analytics of the website.

Conclusion

In conclusion of this research manual, the planned technologies used for this project has been researched to the highest degree in order to decide which technologies is the best course of action for the project. Since Asp.NET Core MVC is being used as the base of this project, C# is going to be the language of choice. C# is heavily supported and is used widely by full stack developers in website design development.

Azure's cloud Database is going to be the database of choice which allows for database to be running separately away from my machine and securely. This will prevent any corruption of happening in case of a hard disk error or another circumstance. Azure's database is cheap and affordable and Azure itself offers a hosting plan which the website will run which will prove beneficial to the project.

Languages, tools and Operating Systems has been listed above for this project and Gamesino will be a responsive web application capable of running large amount of users and will allow for users to gamble and play with one another.

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