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CARLOW

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Final Year Project
Functional Specification

Project Title: ClickNWin

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1.0 Introduction

The purpose of this document is to define the functionality of the application, ClickNWin. The document will outline and describe the fundamental functionalities of the application. It will also document some of the smaller functions of the application. These functions will be described using use cases. The functional specification will also look at some other aspects of the project such as the expected user base of the application and the metrics that will be used to determine the successfulness of the project. The document will also explore some of the project's non-functional requirements such as the application's security.

2.0 Application Definition

ClickNWin is an application that will allow users to buy electronically generated online scratch cards and use them to possibly win a cash prize. The prize awarded will be based on a scaling amount. Users will buy a card by topping up their balance with the application using a debit or credit card. Payments to ClickNWin will be facilitated by PayPal which will be used to process card payments or allow users use their PayPal account to pay. Users will also be able to give a card as a gift to friends who are also registered users of the site. To be able to purchase cards from the application, users must also register with the site and provide basic details to create a user account. If prizes are won, the money won from them can be used to buy more cards or be redeemed to the user's PayPal account.

There will also be some basic functionality for administrators to manage the application. Admins will be able to add new admins to the database, add new scratch card games and modify the existing games. To perform these actions, admins will have to be logged on with a username and password that are separate from the regular user ones.

3.0 Supported Platforms

Initial development of the ClickNWin application will be focused on developing a working web application. The application will be supported by multiple browsers including Google Chrome, Firefox, and Edge. If time constraints on the project allow, development may begin

on a mobile application version of ClickNWin. This development would be done with a hybrid approach to mobile application development. The URL for the existing web application would be packaged in a hybrid application and would allow for a quick port to the phone market with a minimum amount of coding work to be done.

4.0 Core Functionality

The heart of the application is the functionality to create electronic scratch cards and display them to the user. These scratch cards should not all be winning cards and the prizes on the winning cards should be weighted in favour of the smaller prizes. To accomplish this, a random generation algorithm will be used to decide which winning cards and what prizes will be on any winning cards.

The application will also have to have a mechanism that allows users to pay for the cards using their debit or credit cards. Users will also have an option to redeem the prizes they have won on winning cards and transfer the winnings to their card. The PayPal sandbox system will be used to facilitate the online payments made with debit and credit cards. Users will also have the option to be directed to the PayPal website to top up their account balance. This is an alternative to storing a payment card with ClickNWin.

When buying scratch cards, users will have an option to purchase the card for themselves or to give them as a gift to a friend. The friend should be a registered member of the application before this can be done. The card will be added to the chosen users account and they can redeem it next time they log on.

To track the cards being bought by different users, a registration system will be implemented which will take basic details from the users and store them in a database. The registration system will use a CRUD model to create, read, update and delete the user accounts.

There will also be an admin logon capability where admins can log onto the system and perform basic configuration changes. The main functionality of this is to modify the prizes awarded by cards and the chances for those prizes to appear.

5.0 Use Case Diagram

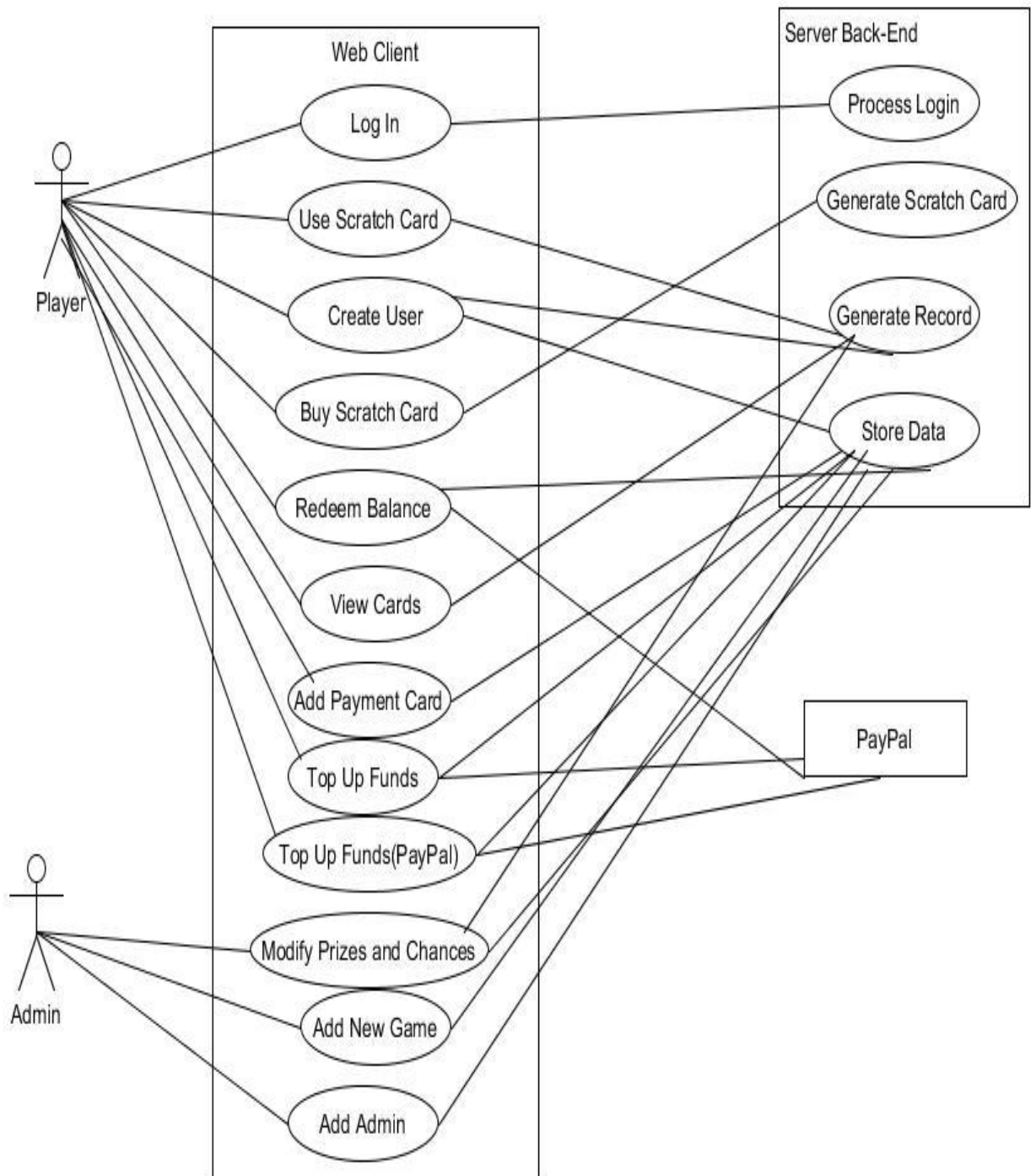


Fig 1. Use case diagram for ClickNWin

6.0 Brief Use Cases

1. Log In

Actors: Player, Admin

Description: This use case begins when a registered user is on the home page of the application and wishes to log in. The user selects the log in option and inputs their username and password. The system validates them and returns a message telling them they are logged in. The use case ends with the player redirected to the logged in homepage.

2. Process Login

Actors: System

Description: This use case begins when the system makes a request to the database to validate a login request. The database checks the inputted username and password against the user table and returns a message to the system that they are valid. The use case ends with a successful login.

3. Generate Scratch Card

Actors: Player, Client

Description: This use case begins after a user has bought a scratch card. The system then generates a random scratch card and links it to the user's account. The use case ends when the card is successfully saved to the user's account in the database.

4. Use Scratch Card

Actors: Player

Description: This use case begins when a user wants to redeem a scratch card they have previously purchased. The user selects the scratch card from a list of their previously bought cards. The system displays the scratch card to the user and the user reveals the prize on it. The winning amount is then added to the player's balance. The use case ends after confirmation of the new balance is received.

5. Create User

Actors: Player

Description: This use case starts when a user wishes to create a new user account on the system. The player fills out the registration form which is validated in the client and submitted to the server to be saved. The use case ends when the user has submitted the registration form and the new account has been created

6. Buy Scratch Card

Actors: Player

Description: This use case begins when a user wishes to purchase a new scratch card. The user selects the type of scratch card to buy. The appropriate funds are then deducted from the player's balance and a card is created and linked to the player's account. The use case ends when confirmation of the card's creation is received.

7. Redeem Balance

Actors: Player, PayPal

Description: The use case starts when a user wishes to redeem the balance in their account. The user selects the option to redeem their balance. They are then sent to the PayPal system for verification. The use case ends when the balance is paid into the user's account.

8. Modify Prizes and Chances

Actors: Admin

Description: This use case starts when an admin wishes to change the prize amounts and the chances for winning the prizes on the application. The admin logs into their account and selects to modify prizes. The new prizes and chances are then inputted by the admin and submitted. The use case ends when the new details are successfully saved.

9. Generate Record

Actors: System

Description: The use case starts when the system makes a request to the database for a record. The database retrieves the specified record or records and returns their details to the system. The use case ends when the records have been successfully returned.

10. Store Data

Actors: System

Description: The use case starts when the system sends details to the database to be saved. The database selects the correct record and inserts or modifies the selected data. The use case ends when the new data is successfully saved.

11. Top Up Funds

Actors: Player, PayPal

Description: This use case begins when a player wishes to add funds to their account balance. The player selects the top up option on their account screen. They then input the amount they wish to top up by and the payment card to use. They are then asked to confirm the top up. The use case ends when the selected amount is added to the user's balance.

12. Add Payment Card

Actors: Player

Description: This use case begins when a player wishes to add a payment card to their account. The player selects the add card option from the account screen. The client then displays the add card form to the player. The player inputs the card details and submits them. The use case ends when the card has been successfully saved to the account.

13. View Cards

Actors: Player

Description: This use case begins when the player wishes to view the list of cards they have not yet redeemed. The system displays a list of the user's unredeemed cards starting with the oldest. The use case ends when the user redeems a card or switches to a different page.

14. Add Admin

Actors: Admin

Description: This use case begins when a logged in administrator wants to add a new administrator to the system. The admin enters a new username and password for the

new admin and submits them to the database. The use case ends when the new admin is successfully created.

15. Add New Game

Actors: Admin

Description: This use case begins when an admin wants to add a new scratch card game to the system. The admin enters the details for the new game and submits them to the database. The use case ends when the new game is successfully saved.

16. Top Up Funds(PayPal)

Actors: Player, PayPal

Description: This use case begins when a player wishes to top up their account balance using PayPal. The player enters the payment amount and is sent to the PayPal website. The player confirms the payment on the PayPal website. The use case ends when the player is redirected back to ClickNWin and the appropriate funds added to their balance.

7.0 User Base

The user base for ClickNWin is expected to be a large amount of the population over the age of eighteen. The Irish Betting Act 1931 makes it an offence to “engage in a betting transaction with a person under the age of eighteen years” [1]. Therefore, when collecting user data during registration for the application a date of birth should be a mandatory field and those under eighteen should not be allowed to hold an account with ClickNWin. As the application requires a debit or credit card to be able to make purchases and these are only available to over eighteens, it is reasonable to assume that any user who registers with the site and adds a payment card is over 18.

People who use the web application are not expected to be highly proficient in computer usage. Therefore, the application should account for this by having a simple design and providing as much guidance as possible to help users navigate the various aspect of the application.

Guidance will be in the form of instructions detailing the actions that can be taken on each page and how to accomplish each action.

8.0 Non-Functional Requirements

8.1 Security

The main non-functional requirement for this project is security. ClickNWin will not only handle user data for the registered users but will also handle the data for the generated scratch cards which may contain prizes worth a lot of money. If the data for these cards could be accessed by a malicious user, then non-redeemed cards that do have prizes on them could potentially be redeemed by a user who didn't pay for them. The application will also store the details for user's credit cards, if the user desires. This means that all this data should be encrypted as well as payment card details should be kept highly secure due to the sensitivity of their data and the potential impact it could have if this data was compromised. It would not only result in financial losses for the user but also a loss in reputation for ClickNWin

To counteract malicious activities, it is planned to implement an encryption system in ClickNWin. Data being stored by the application will be encrypted and then inserted in the database. Data will only be decrypted after it leaves the database and is returned to the server. Data that is encrypted by the application should be impervious to decryption without the malicious user possessing the secret key for decryption. By using the Advanced Encryption Standard(AES) encryption algorithm, it can be assumed that any intercepted data will take so long to decrypt that it will be a waste of time for anyone to try. ClickNWin will use a 128 bit key for its AES algorithm. As discussed in the research report, a brute force attack against AES 128 would take $3.4e + 38$ years. This is over 34 billion years so this makes ClickNWin's database contents very secure.

It is also planned to use the Hyper Text Transmission Protocol Secure(HTTPS) protocol to secure transmissions made between the client and the server. This will prevent malicious attackers from intercepting transmissions from the browser to the server and vice versa. HTTPS adds an extra layer of security to the application and will help users be more comfortable with storing their personal details with ClickNWin.

8.2 User Experience

The user experience in ClickNWin will be tailored towards non-computing individuals as previously mentioned. To accommodate this, the web site will provide instructions and guidance at as many points as possible throughout the application. This will include the registration page, payment screens and card redeeming screens.

When a new user is registering on the application they should be able to register quite quickly. A new user should be able to complete registration within three minutes. This will involve filling out the necessary forms and agreeing to the application's legal agreement.

The front end of the application will have a simple design which will be focused on funnelling users to either the registration screen to sign up if they are not logged in or the card purchase screen for logged in users. This will be accomplished with graphics around the card purchase links directing users to try their luck at the game and maybe win big prizes. There will also be messages and graphics encouraging non-registered users to sign up. The web application will try to keep the site as simple as possible with all use cases requiring as little typing and mouse clicks as can be helped so that users will not become frustrated or bored with the site and go elsewhere.

8.3 Performance

Performance is not a large factor in the development of ClickNWin. However, it must be monitored to ensure that the application is running reasonably fast or else users may become frustrated and stop using the application. To that end, it is expected that any screen changes which require any processing or scripts to be run will be finished within one minute. The project team will try to stick with this limit for all processing that the application must do.

9.0 Project Metrics

To gauge the success of this project, several indicators of success will be used. While there are few figures that can be used to accurately quantify this project's success, there are some

true/false statements that can be used to decide if the project meets requirements and is fit for purpose. These include:

- Can the project generate scratch cards with random prizes?
- Is all data stored in the application database encrypted?
- Can a user successfully make payments for their scratch cards?
- Can prizes be redeemed back to the user's account?
- Can individual user accounts be successfully created and maintained?

If all these requirements are met, the project will have successfully met all main requirements and can be considered a success. The follow up metrics, such as the number of cards sold, will not be applicable to the project for some time and goals are needed soon to ensure the project remains on the right track.

References

[1] – Government of Ireland (1931). *Betting Act*. Irish Statute Book

[2] - Search Security/Margeret Rouse. 2014. Advanced Encryption Standard. [ONLINE] Available at: <http://searchsecurity.techtarget.com/definition/Advanced-Encryption-Standard>. [Accessed 7 October 2016].

[3] – Hartley Brody. 2013. How HTTPS Secures Connections: What Every Web Dev Should Know. [ONLINE]. Available at: <https://blog.hartleybrody.com/https-certificates/>. [Accessed 28 March 2017].