APPLICATION REQUIREMENTS SPECIFICATION

National Park Management System(NPMS)

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1) Introduction

1.1 Purpose

The purpose of this document is to present a detailed description of National Park Management System or NPMS in short. It will explain the purpose and features of the system, what the system will do, the interfaces of the system. This document is intended for both stakeholders and the developers of the system.

1.2 Intended Audience

The NPMS application is used by the general public who are interested in visiting and hosting their own events in national parks in the United States. The NPMS application can also be used by the candidates who are interested in career opportunities at various national parks.

1.3 Project Scope

The NPMS application assists customers to view details about national parks like holidays, timings, how to reach, activities currently going on in national parks. The NPMS is designed to help customers to purchase parking passes online allowing them to skip the long queues at the entrance and can also buy individual passes if customers are arriving by walk. NPMS also allows regular customers to buy subscriptions and based on the subscription they would be getting discounts on parking passes, entrance fees and various events. The application has an Admin actor who has the highest level of access to manage the whole application and people who are registered with the application.

2) Overall Description

2.1 Product Perspective

This product is a web-based application that provides a simple mechanism for customers or users to view the details and services of national parks in the United States. The following are the main features that are included in this product:

- Customer: The system allows the user to view the details of national parks like timings, transportation, holidays etc..
- User account: The system allows the user to create their accounts in the system and provide features of registering for events and allows users to host events.
- Admin account: The system allows admin user to add details of the events of a particular park, updating the details of the subscriptions and managing access of the users.

2.2 System Environment
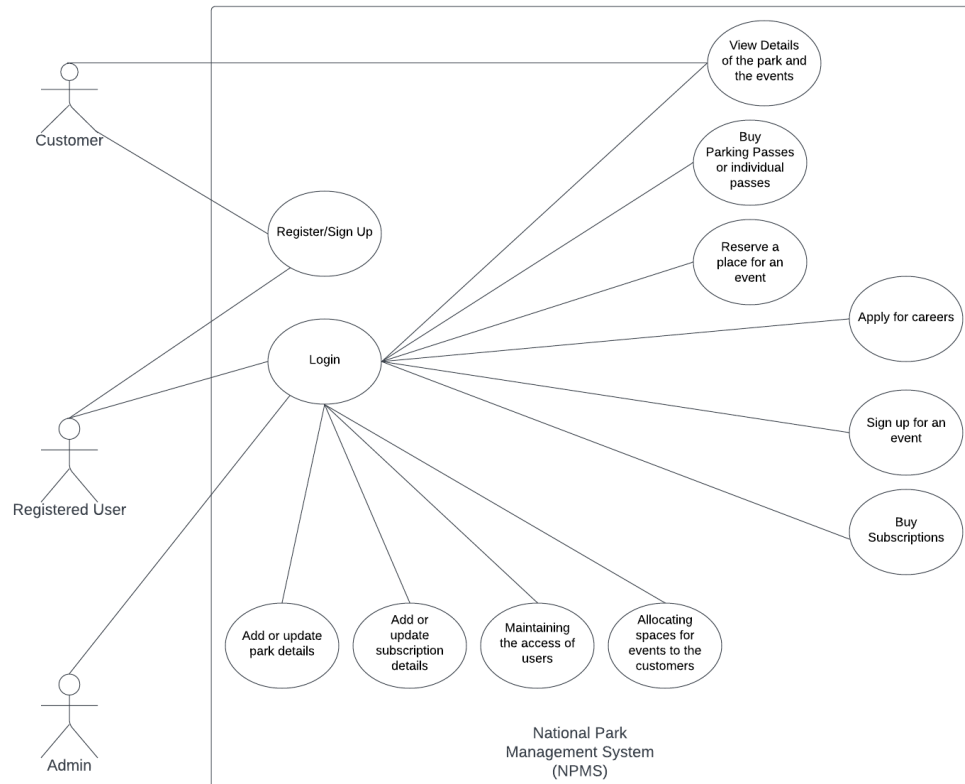
Figure 1: System Environment

The National Park Management System has three active roles. The Customer who can view the details of the national parks without registering or logging in over the internet. The Registered User who can access the services by logging in through the NPMS web portal over the internet. The Admin has access to the full system. The communication between the roles and system happens through the email-based authentication.

3) Requirements Specification

3.1 Functional Requirements

3.1.1 View Details of National Parks and events

Brief Description:

The Customer can view the details of National Parks and the events happening in national parks in the United States without registering or logging in.

Step-by-Step Description:

1. The Customer access the web application through the web portal over the internet.
2. The Customer can find a drop-down menu where the Customer can find the parks by State.
3. After selecting the state customers can view all the national parks in the selected state.
4. Customer can learn and explore about national parks and can also view events which are available on the right side of the web page.

3.1.2 Buy parking and individual passes

Brief Description:

A User can buy parking pass if they are arriving by car and can purchase individual pass if they are arriving by walk.

Step-by-Step Description:

1. After logging in User searches for the national parks and clicks on purchase parking pass or purchase individual pass.
2. The User will be directed to payment page where the User will be entering his credit/debit card details for the purchase and User will be entering email address to which the pass will be delivered.

3.1.3 Sign up for an event

Brief Description:

Users can sign up for events like rock climbing, hiking, cycling etc. which are happening in national parks.

Step-by-Step Description:

1. After clicking on the event, the customer will be directed to the login/register page where customer has to login/register to sign up for an event.
2. After logging in the user is directed to the same page mentioned in the step 1. After clicking on the event, the user is directed to payment page where the user will be paying for the event.
3. After payment the event details will be sent to the mentioned email address by the user

3.1.4 Reserve a place for an event

<u>Brief Description:</u>

Users can reserve a place in national park if available to host their own events like birthdays, anniversaries etc..

<u>Step-by-Step Description:</u>

1. After logging in User can see a button which says, 'Host an event'.
2. User will be selecting the national park and enter their details like First name, Last name, Date of Birth, Email address, Event type and click on submit button.
3. An email will be sent to administrators, and they will email the details of the reservation to the user.

3.1.5 Apply for careers

<u>Brief Description:</u>

Customers can also apply for careers if available in the national parks.

<u>Step-by-Step Description:</u>

1. Customers can click on 'Apply to Careers button' and they will be directed to login/register page where customers have to sign up or sign in into the application.
2. After signing in they can click on 'Apply to Careers' button and can find the email addresses of the respective parks career team.
3. Users then can email their resume to the mentioned email addresses.

3.1.6 Buy Subscriptions

<u>Brief Description:</u>

Users can buy subscriptions. Subscriptions are of three types Monthly, Quarterly and Annual subscriptions.

<u>Step-by-Step Description:</u>

1. Users needs to login into the application to buy subscriptions.
2. User will be clicking 'Buy Subscription' button and choose the subscription type and user will be redirected to the payment page.
3. After entering the valid payment details, the subscription code will be sent to the users via email by administrators.

3.1.7 Add or update Park Details

Brief Description:

Admin user can add a park to the NPMS web application or update the details of existing national park.

Step-by-Step Description:

1. Admin will be logging into the NPMS web application by clicking login button.
2. After logging in the admin can use add/update panel to add and update the details of a national park by entering in the details what needs to be entered.

3.1.8 Add or update subscription details

Brief Description:

Admin user can add or update subscription details like the cost of the subscription, the time period of the subscription etc..

Step-by-Step Description

1. Admin will be logging into the NPMS web application by clicking login button.
2. After logging in the admin can make use of the add/update subscription details and enter the details which are to be updated and click the submit button which will update the details of the subscription plans.

3.1.9 Allocating spaces for events to the customers

Brief Description

Admin user can allocate spaces for events to the customers by emailing the details regarding the reservation to the customer.

Step-by-Step Description:

1. Admin will be logging into the NPMS web application by clicking login button.
2. After logging in the admin can use Reservation Requests panel and can check the details of the users who have requested to host their event in a national park.
3. After checking the details of the user, the admin will be sending email to the users requested.

3.1.10 Maintaining the access of users

<u>Brief Description:</u>

Admin user can delete the access of user from the NPMS web application if the user chooses his account to be terminated.

<u>Step-by-Step Description:</u>

1. Admin will be logging into the NPMS web application by clicking login button.
2. After logging in the admin can make use of Maintaining access panel to remove the registered users.
3. The admin will be entering the details of the user in the input field provided and the user access will be revoked, and his/her account will be deleted from NPMS application.

3.2 Use Cases

Customer Use Case

Figure 2: Customer Use Case

Any customer can view details of National Parks in the United States.

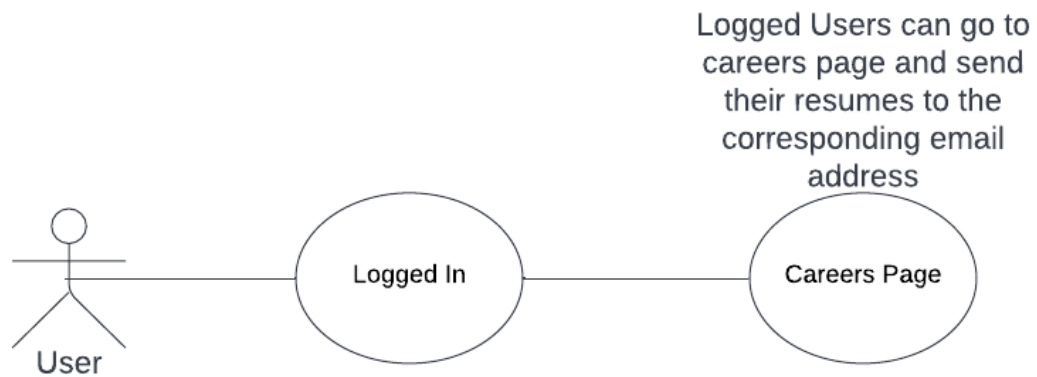### Apply for Careers Use Case

Figure 3: Apply for Careers Use Case

Users also can apply for careers in which they are interested in the careers page of the application.
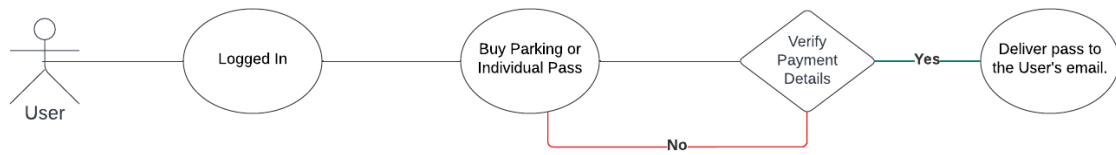
Buy Parking or Individual pass Use Case

Figure 4: Buy Parking or Individual pass Use Case

A valid user can buy parking or individual passes.
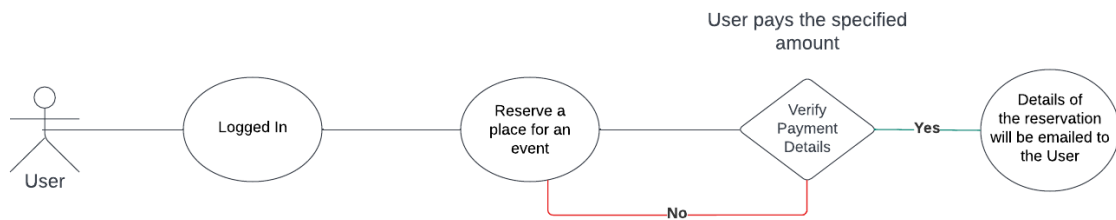
Reserve a place for an event Use Case

Figure 5: Reserve a place for an event Use Case

A valid user can reserve a place in national park by paying the specified amount.
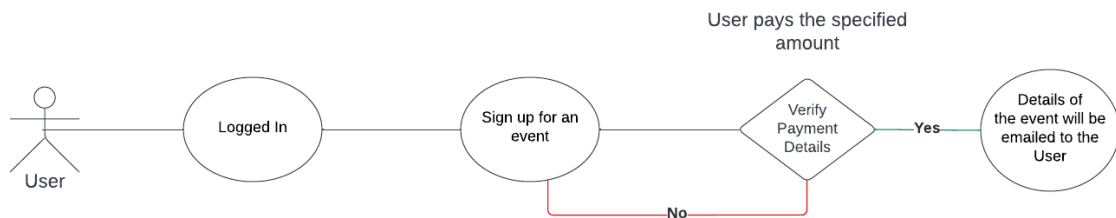
Sign up for an event Use Case

Figure 6: Sign up for an event Use Case

A valid user can purchase tickets for the events like hiking, rock climbing and the tickets will be emailed to the user.

Buy Subscriptions

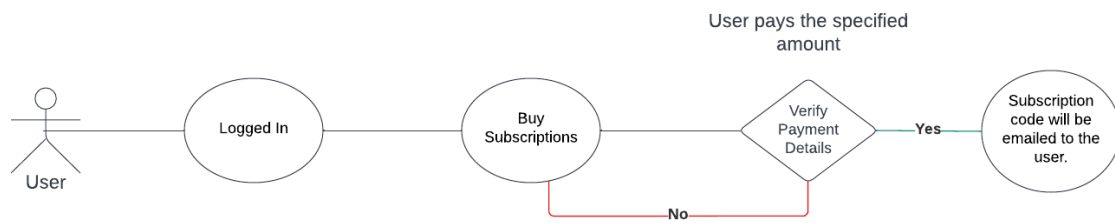*Figure 7: Buy Subscriptions*

Users can buy subscriptions according to their needs and the subscription code will sent to the users email address.

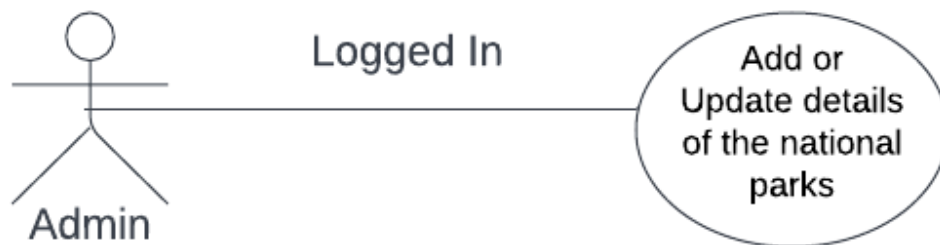## Add or Update Park Details Use Case

Figure 8: Add or Update Park Details Use Case

An administrator can Add or update or delete the details of the national parks.
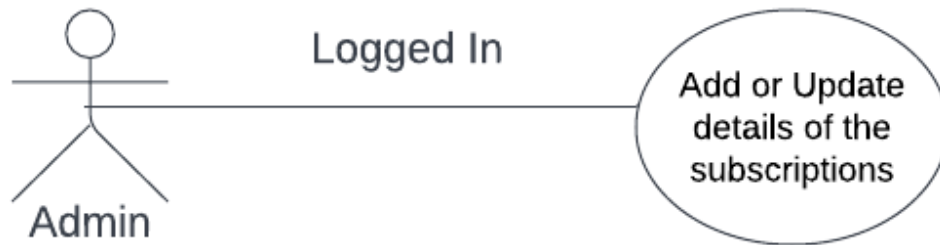
Add or modify details of Subscriptions Use Case

Figure 9: Add or modify details of Subscriptions Use Case

Admin can add or modify or delete the subscriptions details.

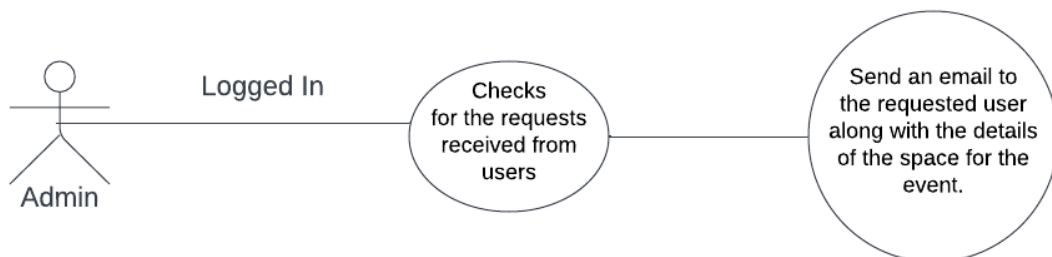## Allocation of spaces for events Use Case

Figure 10: Allocation of spaces for events Use Case

Admin is responsible for allocating spaces for events mentioned in the 'Reserve an event Use Case'.
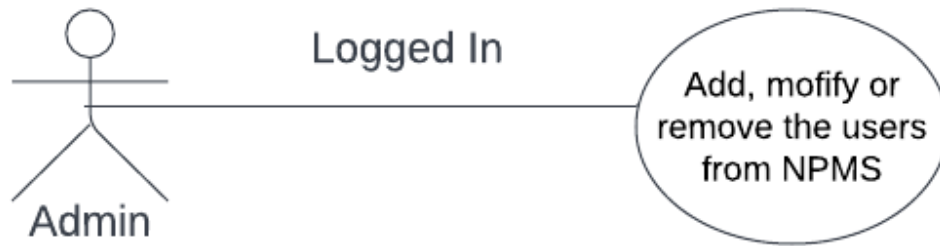
Maintaining the access of the users Use Case

Figure 11: Maintaining the access of the users Use Case

Admin is responsible to add, modify or remove the users from NPMS application.

3.3 Misuse Cases

Misuse Case	Unauthorized Access to Database
Description	An attacker may spoof Host and gain access to Web Application
Possible Mitigation	Consider using a standard authentication mechanism to authenticate to Web Application

Misuse Case	Attacker may change the subscription details
Description	An attacker may tamper the subscription details
Possible Mitigation	Ensuring that type safe parameters are used in web application Data Access

Misuse Case	Attacker can sniff data from server
Description	An attacker may sniff the data from the communication happening between client and server
Possible Mitigation	Ensuring that all traffic is over HTTPS connection

Misuse Case	Elevation of Privilege
Description	A user with lower-level privileges is able to access features of a higher privilege user
Possible Mitigation	Ensuring that principle of least privilege is implemented.

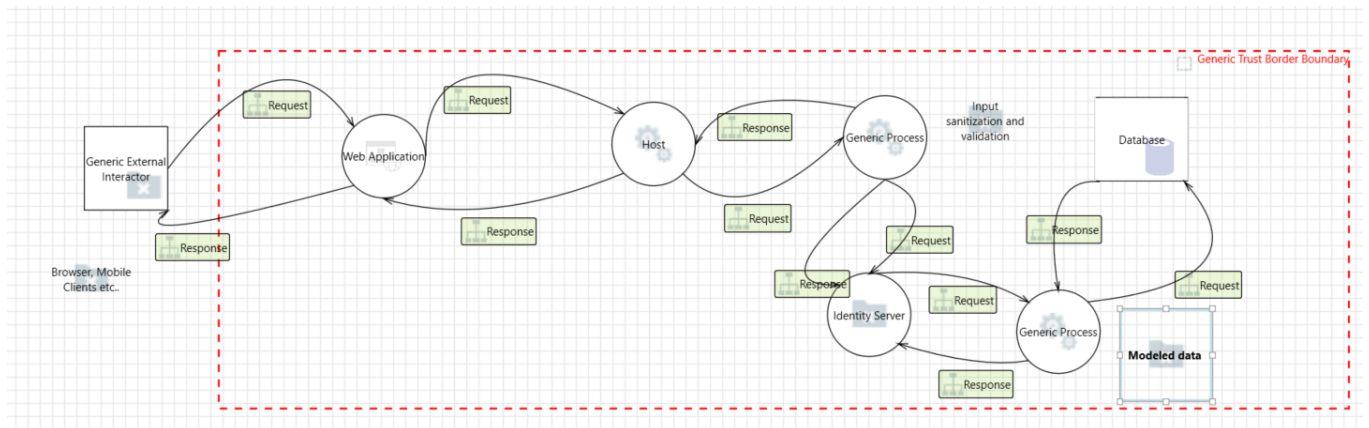| Misuse Case	Denial of Service
Description	An attacker can leverage the weak scalability of NPMS application and can cause DoS
Possible Mitigation	Detecting and blocking illegitimate traffic and managing the bandwidth of the services.

Threat Model:

Figure 12: Threat Model

3.4 Security and Privacy Requirements

1. The NPMS application should be accessed on HTTPS connections so that the channel is secure
2. All the credentials should be encrypted and stored in database
3. Implementation of principle of least privilege should be ensured
4. To ensure that there's a secure access, the application will have a login screen protection which will require an email address and password for authentication
5. Users can be added, modified, or deleted only by the administrators
6. Input validations and sanitization should be done at all places
7. Logging mechanisms should be implemented at all phases like for every successful login, unsuccessful login, adding or removal of the users etc.
8. URL's should be sanitized and validated.
9. Passwords should be of 9 to 15 characters in length with at least one uppercase, one lowercase, one special character and one number.
10. Ensuring the password policies are implemented.

3.5 Detailed Non-Functional Requirements

3.5.1 Efficiency and Usability

This system ensures a high level of efficiency which can be accomplished through many levels of testing and iteration of the user experience flow.

3.5.2. Scalability and Performance

The system was designed with scalability in mind. In addition, the application can handle usual issues like resources limitation, delay in processing of requests etc.. and increases reliability.