



## **GreenGauge Website and Mobile Apps**

Functional Specifications

V 1.1

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## Confidentiality of Important Information

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## Objective

GreenGauge intends to launch a website, an iOS and an Android app that allows users to determine their carbon footprint when traveling, contributing towards creating more sustainable tourism, immersing in local culture and having a positive impact on local communities. The goal is to have people do this incrementally, and driving attitude changes towards travel and its impact.

Users can come to the website or the app and input the details of their travel plans to see what their carbon footprint would be. Based on the Carbon Emission the platform would provide carbon offsets suggestions to neutralize the environmental impact of everyday activities like flights, ridesharing.

SDI will design and build a robust, user friendly, and impressive Web platform, Android app, and iOS app for GreenGauge that will allow its users to access multiple functions.

## Development Principles

- Smart and clean UI's (User Interfaces)
- Smart Navigation Tabs for easy and fast access to all the functions.
- Language of Development – English
- Language of Data Entry – English



## Team Structure

- Project Manager
- UI/UX Expert
- Web Programmer
- iOS Programmer
- Android Programmer
- Quality Assurance Testers
- Server Administrator

## Main Modules

Web platform - This will be the main website where visitors can access all features.

Mobile Apps - iOS iPhone app and Android Phone App for all visitors

Super Admin portal for GreenGauge and its Employees - This will be a browser based web admin which will enable the Super Admin to manage their web and app platforms.

## Web and App platforms for Users

1. **Sign up/ Sign In** (Visitors can browse the entire site/app without sign in/sign up)
  - a. Sign Up - User can create a profile which will ask for the following:
    - i. Name
    - ii. Email



- iii. Create Password
- iv. Sign up via
  - Facebook
  - Google
- b. Sign In
  - i. Using their Email & Password or via
    - Facebook
    - Google
  - ii. Forgot password
  - iii. Remember me

**Note** - Password security - The passwords will be alphanumeric, minimum 8 characters, encrypted using SHA-2

## 2. Forgot password

- a. GreenGauge will ask the user to provide their email to receive a reset password link which can be used to change the password.
- b. Once the user clicks on the link, GreenGauge will ask the user to enter a new password and then confirm the new password.

## 3. Homepage

- a. Details about what GreenGauge is
- b. Create itinerary/Plan Trip
  - i. Enter to and from location
  - ii. Dates of travel
- c. The platform will display flight information, transportation options, activities, hotels, and restaurant details. We suggest 2 options

- i. Build your own database search engine to find green sustainability hotels, zero footprint restaurants, and low carbon emission transport options using MongoDB. *MongoDB is a scalable, high performance NoSQL database. The key advantages is*
  - *Scalability - MongoDB offers scale-out features, automatic sharding, and replica set to maintain constant availability*
  - *Flexibility - It's schemaless, there is no need to predefine schema.*
  - *Performance - Due to the flexibility of JSON documents, it makes apps fast since all the data for an object is stored in a single document.*

## Data Ingestion

- SDI will provide an interface in the Admin portal to add (or bulk upload via csv), edit and delete the data i.e green sustainability hotels, zero footprint restaurants, and low carbon emission transport options.
- GreenGauge will be responsible for providing content.

OR

- ii. Use 3rd Party services to search Flights, Hotels, Transport options. Note: The following services do not provide carbon footprint details.
  - Flight information
    - a. <https://www.partners.skyscanner.net/distribution/flights-integrations>
  - Hotels
    - a. <https://www.partners.skyscanner.net/distribution/hotels-integrations>
  - Transport options
    - a. <https://skedgo.com/tripgo-api/>
- d. Initially Travel data will be for one zone - for eg - UK to Italy. GreenGauge will be responsible for providing content or selecting API's.



#### 4. Results

- a. List of
  - i. Flights
  - ii. Hotels
  - iii. Restaurants
    - Images
    - Details
- b. Information about selections and their impact
- c. Offset carbon footprint suggestions will be displayed
- d. Save trip to profile

SDI recommends the following 3rd party API services to

- i. Calculate the carbon emission - To calculate the carbon emission for the following
  - a. Flight - Single flight or Multiple flights based on the origin airport, the destination and the seat class.
  - b. Car - One or Multiple car trips based on fuel type such as petrol, diesel, biogas, and electric.

**API: <https://connect.myclimate.org/api-overview>**

- ii. Carbon Offset Suggestions - Based on the Carbon Emission

**API: <https://www.cloverly.com/>, <https://www.patch.io/>**

#### 5. Saved Trips

- a. To and from locations
  - i. Chosen flight, hotel, activities, restaurants



**6. Settings**

- a. View / Edit profile
- b. Change password
- c. Edit push notifications/alerts - Turn on/off
- d. Sign out

**7. Help Center**

- a. FAQ
- b. Contact Form
  - i. Name
  - ii. Email
  - iii. Message
  - iv. Send

**AI & Machine Learning**

To make our search more efficient while ensuring fast response times and high-quality results, SDI will implement algorithmic strategies to optimize search performance. We will implement machine learning classification algorithms to run and provide low carbon footprint results.

In search applications, we will apply Artificial Intelligence to optimize the search algorithm itself.

SDI will write Classification algorithms trained on historical searches to identify & provide results that produce less CO2 emissions.

SDI will use Tensorflow Deep Learning library through the Keras API to achieve the following

- Better exploitation of bigger data volumes

- Automated feature extraction / representation learning process\*
- Flexibility in defining the model architecture
- Ability to exploit AI architectures

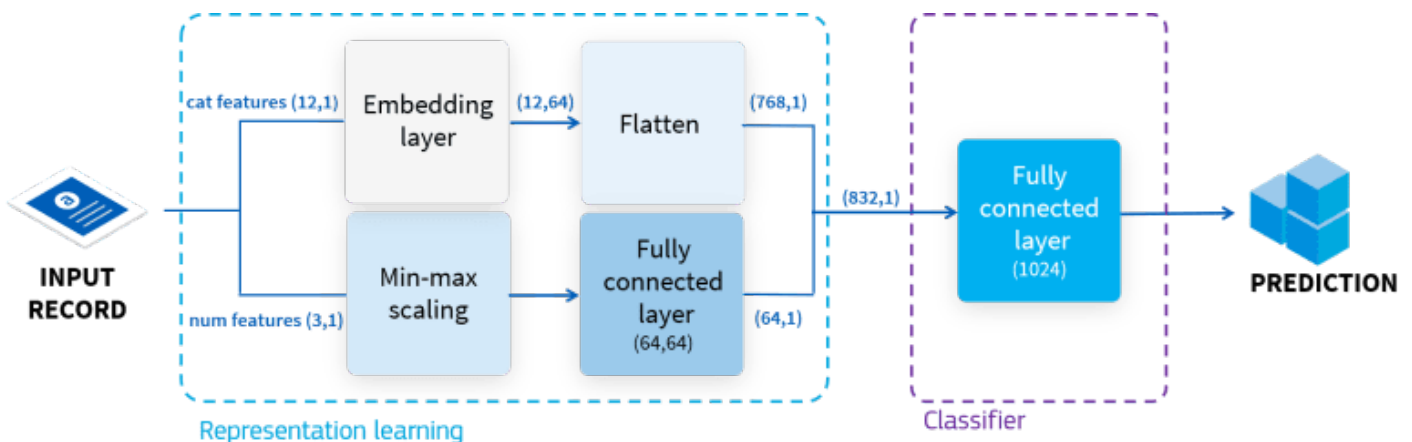
We start our training process with a simple feed-forward, fully connected deep learning model to serve as a baseline for evaluating our model performance later in the model tuning process:

The architecture will be structured around two neural networks executed in parallel:

One with an embedding layer to properly encode categorical values into continuous vector representations i.e Word2Vec and Keras Embedding Layer

Another dedicated to numerical features. The min-max scaling helps the learning process by making numerical inputs smaller.

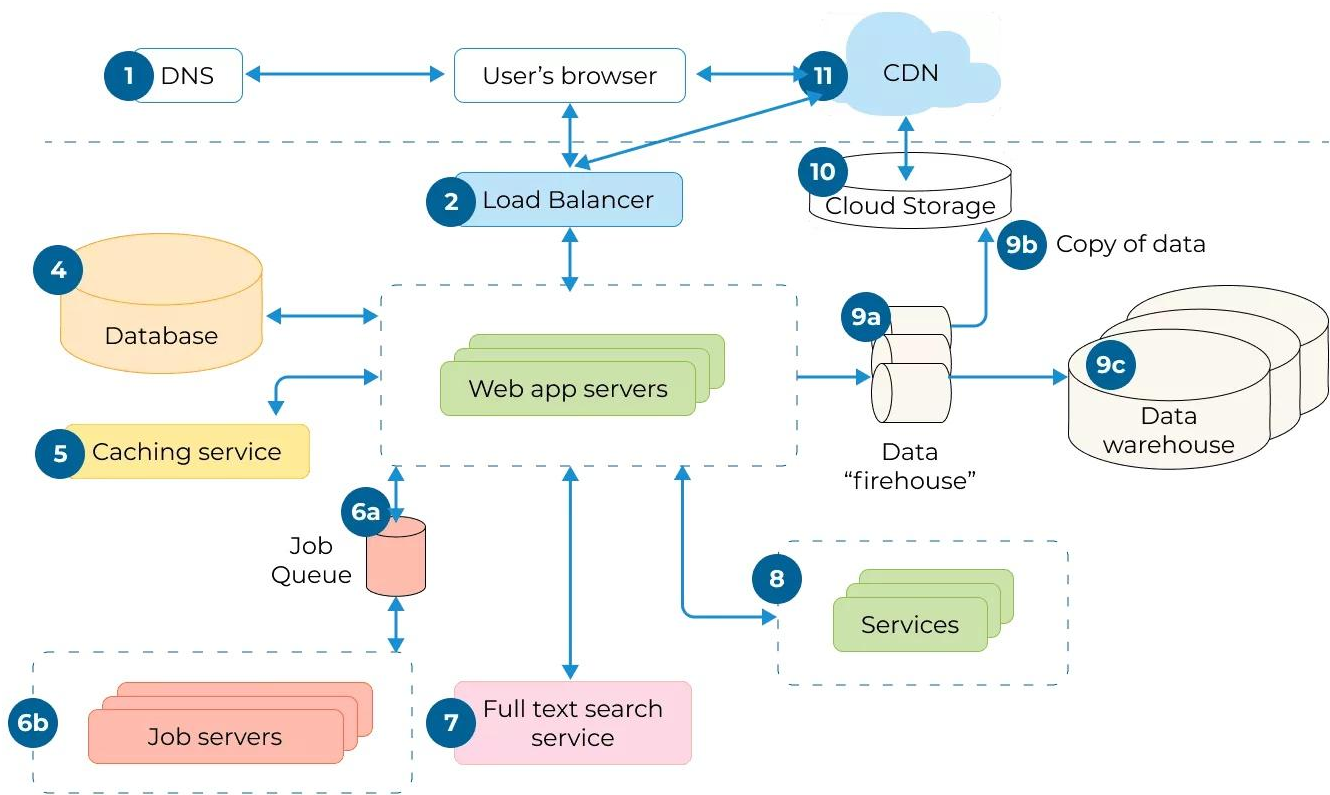
The first part of the model will be tasked with learning the optimal representation of our input sample, while the second will take care of the actual classification task. This is performed by a Fully Connected Layer followed by a Sigmoid activation function to provide a score which can be assimilated to class probabilities.





## Platform Architecture Diagram

SDI recommends the following system architecture for GreenGauge Platform



### DNS

DNS or Domain Name System is a fundamental system that helps search a domain name and IP address

### Load Balancer

Load Balancer primarily deals with horizontal scaling & distributes tasks among 2 or more web servers



## Web App Servers

The Web App Server processes a user's request and sends a response back to a browser or to a Mobile app.

## Database

## Caching Service

Caching service provides storage for data, which allows storing and searching data. Whenever a user gets some information from the server, the results of this operation goes to cache. So, future requests return faster.

## Job Queue

Job queue consists of two components: the job queue itself and servers. These servers will process jobs in the queue.

## Services

When an application reaches a specific level, services will be created in the form of separate apps.

## Data Warehouse

These processes require three stages:

The data is sent to the data "firehose", which provides a streaming interface for absorption and processing of data. Raw, processed, and additional data is sent to cloud storage and processed and additional data also go to a data warehouse.



## Admin portal for GreenGauge & its Employees

### 1. Login

- a. Admin will login with their email & password.
- b. Forgot Password: Admin will be able to reset their password, it will send an email with a link to set up a new password.

### 2. Employees/Sub-admin management

- a. Add employees as sub admins
  - i. Name
  - ii. Email
  - iii. Password
  - iv. Status - Active or Inactive
- b. Assign & Manage roles / permissions for each sub admin (The admin can select roles & permissions when creating a sub admin account. This will allow sub admins to access specific modules on the platform)
- c. Edit sub admin details (The admin can make changes to the existing sub admin profile, for e.g. removing access to previously assigned roles & permissions, allowing access to more roles, changing password)
- d. Delete sub admins

### 3. Manage Profiles

- a. Add a new user
  - i. Name
  - ii. Email
  - iii. Password



- b. Edit user details
- c. Delete a user

#### **4. Manage Affiliates**

- a. View list of connected affiliates

#### **5. Help Center**

- a. FAQ
  - i. Add new FAQ
  - ii. Edit existing FAQ
  - iii. Delete an FAQ
- b. Contact form
  - i. List of submissions
    - 1. Option to respond
    - 2. Archive
    - 3. Delete
    - 4. Flag

#### **6. Analytics**

- a. This will display reports
  - i. Clicks and Taps
  - ii. Filter by category (flights, restaurants, etc)
  - iii. Number of users



## 7. Settings

- a. Edit profile details
- b. Change password
- c. Logout

## Investment details

Website and Admin portal - GBP 22800

iOS app - GBP 9000

Android phone app - GBP 9000

## Delivery Timelines

4 months after UI/UX approvals

## Payment terms

- 35% upon contract submission
- 35% on UI/UX completion
- 30% on completion of development (Before submission to cloud or App stores)



## Warranty

SDI guarantees all of its projects for bug resolution for 6 months after delivery. For the initial 6 months after delivery, if any bugs occur and are identified, we will fix them without any cost to you.

## Ongoing Maintenance

Beyond the warranty, we provide an optional 12 month Annual maintenance contract at a fixed additional cost of 25% of the original project cost. This will include updates for the latest OS updates and bug resolutions.

## Source Codes

All of the project Source codes will be handed over to the client on project completion. Upon completion and payment of all agreed invoices to SDI, the Client will be the sole and exclusive owner of all software assets and IP of the project.

Thank You,  
Raj Srivastav

Software Developers, Inc