1. Introduction
1.1. Purpose of Document

This is a Requirements Specification document for a new system for a software company. The company is planning to raise awareness about the carbon footprint of personal computing usage. The new system, named GreenMyCloud, will be able to allow its user to monitor the carbon footprint of their smartphone, IoT, cloud and online usage. GreenMyCloud will access the power and network usage of the smartphone and provide a user interface for users to monitor a range of activities that use online and cloud services for storage and processing. This document describes the proposal and its scope and goals. In addition to describing non-functional requirements, this document models the functional requirements with use cases and interaction diagrams. It also contains the results of a small interview asking people about the use of the app and its effects.

1.2. Background

Mobile phones and laptops being our main source of work and connections in today's world have made it difficult to function without them. All aspects of human life have been affected by Artificial Intelligence or will be in the near future [2]. Most users are not aware of the carbon footprint these devices leave behind based on the applications used. Estimated studies of ICT's (Information and Communication Technology) share of the global greenhouse gas (GHG) emissions are at 2.1%-3.9% of global GHG emissions and this could rise rapidly with the increasing use of smartphones, cloud applications, Artificial Intelligence (AI), Internet of Things (IoT) and blockchain technologies such as Bitcoin and other cryptocurrencies [1].

One such example of a cryptocurrency is Bitcoin which is considered the most attractive and promising technological breakthrough for industries such as logical management, supply chain system, operational management, and the Internet of Things (IoT) as well as its increasing use in finance, retail, and politics [3]. Bitcoin Mining, meaning the entering of new bitcoins in circulation, is the main way to update the blockchain [4]. Bitcoin has proved to consume more electricity (TWh per year) than the Philippines and Kazakhstan [5]. On 9 November 2022 the estimated TWh per year consumption of energy through bitcoin was 117.83 and a single bitcoin transaction carbon footprint is 751.20 kg CO_2 and 1246.81 kWh of electrical energy and 450.50 grams of electronic waste [6]. The United Nations Agenda for Sustainable Development stated that it is necessary to provide solutions for the increasing environmental impact [7].

A requirements investigation, design brief and proof of architecture prototype for GreenMyCloud has been requested by the software company to allow its users to be able to monitor the carbon footprint by putting their daily online activity through a user interface.

2. Summary of Proposed Solution
2.1. Users

The users who will benefit and be affected by using GreenMyCloud are
1. Customers:

Everyone using Internet of Things (IoT) such as smart TVs, smart speakers, toys, wearables, and smart appliances will feel the need to use the app to control the carbon emissions from their devices. Everyone using cloud will also require the app.

2. Finance Agents and bank owners
3. Cryptocurrency Users:
   NFT owners will be able to use the app to find the amount of carbon emissions being produced.
4. Stock Market
5. Environmentalists:
   People who work for the environment and analyze the carbon footprint from various intakes will feel the need to use the app.
6. Large companies:
   Companies like Disney, apple, Samsung, Tesla will have the need to use the app to control the carbon footprint from their devices to decrease its effects on the environment. One such example is that Elon Musk has decision that Tesla will discontinue the use of bitcoin as payment [4].
7. Companies that focus on climate change safety:
   Such companies will use the app to search for alternatives to help reduce the GHG emissions.
8. Forestry developers
   People focusing on forestry will be interested in knowing the GHG emissions and its effects on the environment.
9. Geoengineering

2.2. App Requirements

The responsibilities of the app include:
1. Providing customers information regarding the carbon emissions from their device in the form of graphs and tables.
2. Allowing the customer to input their daily online activity.
3. Providing customers with complete security and protecting their personal data.
4. Allowing the customers to have access to the app's features in multiple different languages
5. Allowing the customer to have access to the carbon footprint of all devices on one device connecting all their other devices.
6. Allowing the customer to be able to search for details on devices they don't own to know its effects on the environment before purchasing.
7. Allowing customers to color theme their graphs in case of any customer suffering from any type of color blindness.
8. Customer status will be stored in the system every time they log out.
9. Customer will be able to access GreenMyCloud in any kind of smart device.
10. The transaction data will be transmitted in encrypted form for security reasons.
11. The app has a 7-day period trial before the customer is asked to pay for the system services.

Other desired features:
1. Easy to use look and feel.
2. On-line help in app navigation
3. Access to multiple languages translation
4. Password protection

2.3. Project Scope

The scope of this project is an application/web-based system that follows the requirements for the proposed application and advertising of the products and account billing will not be taken as part of this project. Users will be able to access the system through their smartphones as well as laptops with a small fee per device for the desired result. A web search engine and translator will be inbuilt into the system to allow users from all over the world to access it without any difficulty. The internal details and security within the site for the systems' components are not part of this project. The system will be password protected. With the increasing use of devices, carbon emissions have increased a lot in the past year. This app is required to be able to help with the control of the increased percentage of such emissions and make the environment cleaner and healthier to live in.

3. Requirements

Case Diagram
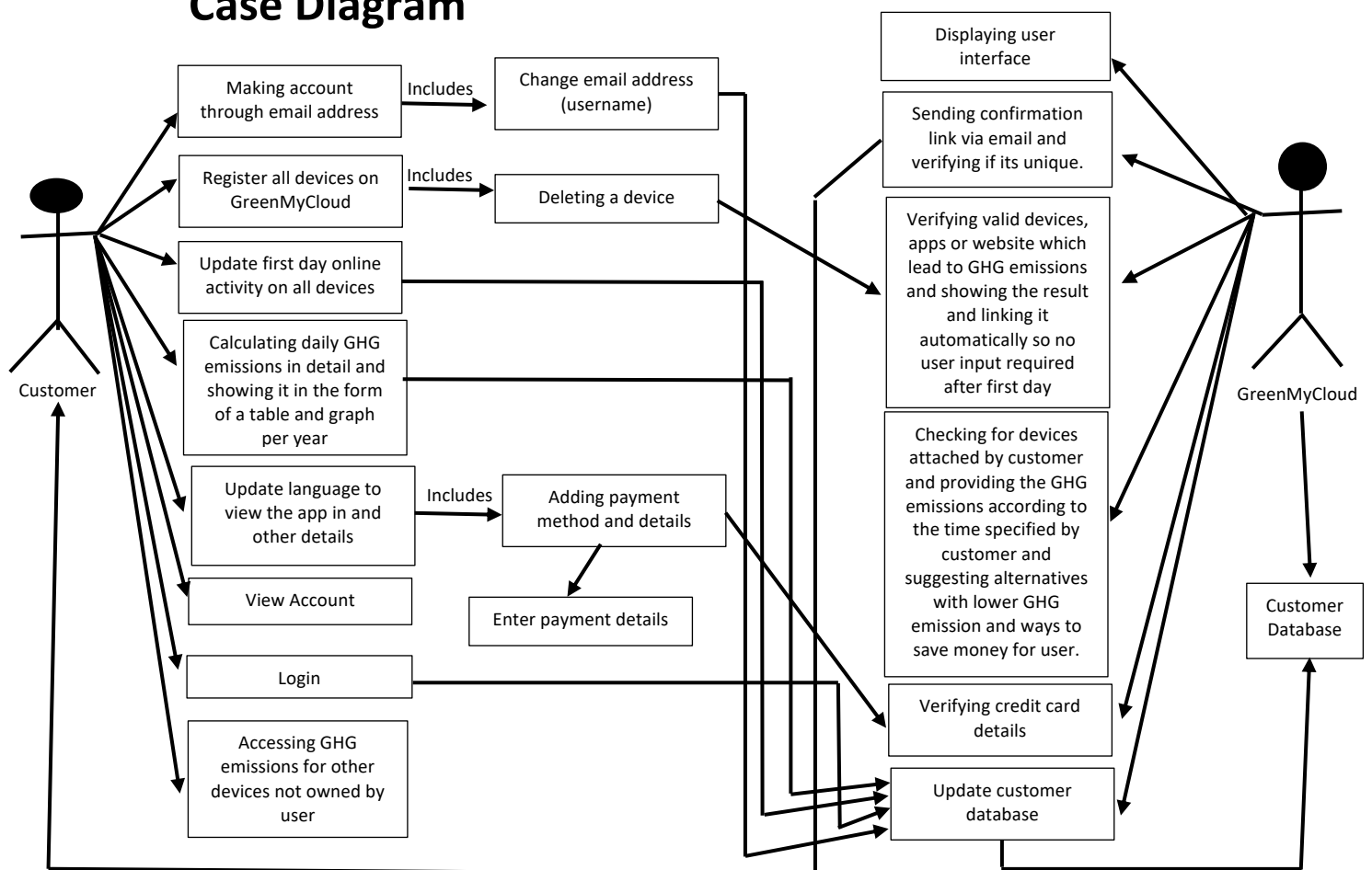
The Case diagram shows that the app will take a small fee after the trail period for displaying the GHG emissions of all devices of the user as well as calculating the daily total carbon footprint and displaying it on the user interface. It also calculates the yearly emissions for the user. The app is also available in multiple languages and is password protected. The app also suggests alternatives to the user for devices with high carbon emissions. It allows its user to search of devices which they do not own to see the GHG emissions before purchasing or for extra information wanted.

4. Using the Proposed Solution
User Story

Making an Account and adding your device

The account is created using an email address that is run through the system to check if it is unique. The user is asked to create a password.

The automated language of the app is English but can be changed under the account settings.

All devices which need to be scanned for the total GHG emissions are asked to be registered to the user interface on the home page once logged in.

To register the device, type the first couple of letters. You will see a list of possible devices starting with these letters.

After pressing "Add" the device is added to your list and you will have to update your daily online activity and the GHG emissions on each device are calculated. If you click on "Change" you will be asked to re-enter the 'adding your device' process.

You will then be prompted to select between per minute, daily or yearly emissions report. Each selection selected is shown in the form of a graph and table according to the highest to lowest emission report.

The system will update the reports every time you login in to check.

Prototype of Proposed Screen
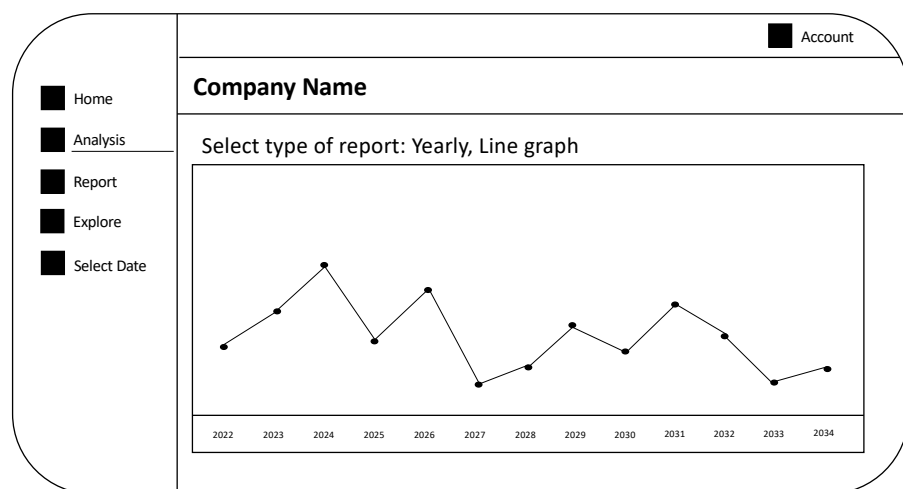
5. Implementing the Proposed Solution
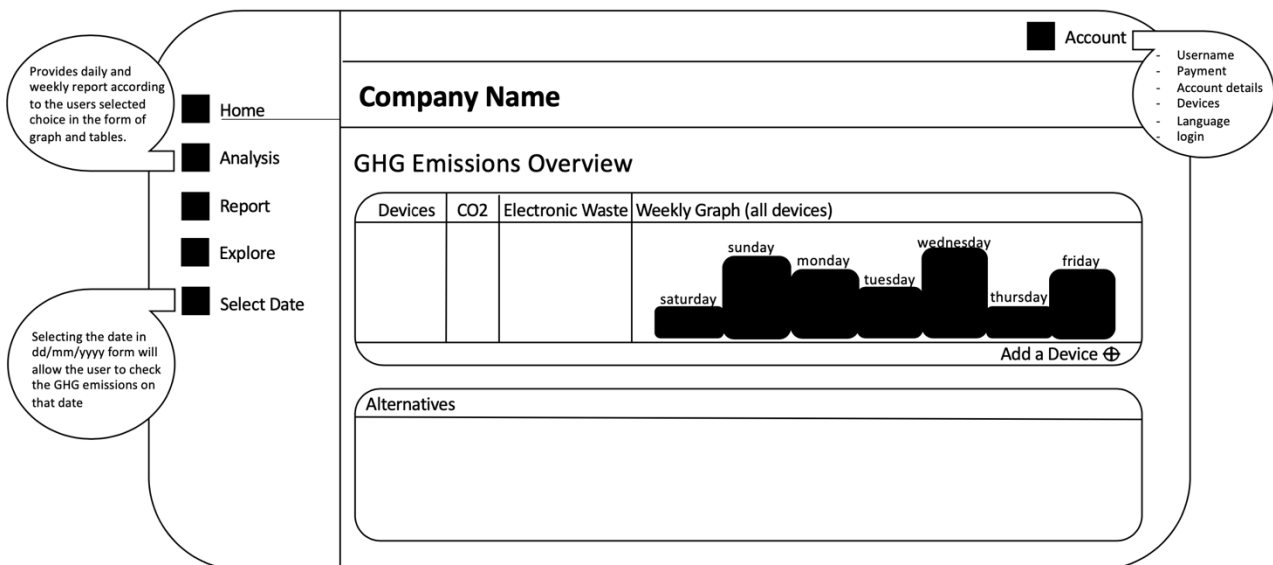
5.1. Hardware

1. Hard Drive
   - Minimum - 32 GB
   - Recommended - 64 GB
2. Processing Power:
   - Minimum - 1 GHz
   - Recommended – 2 GHz or above
3. Ethernet Connection (LAN) / Wireless Adapter (Wi-Fi)
4. CPU
5. Memory (RAM)
   - Minimum 1GB
   - Recommended 4 GB or above
   - Secondary Storage if possible

5.2. Software

Technology Platforms
- Chrome
- Safari
- Firefox

6. Conclusion

Anthropogenic climate change has become a big concern and is now a global priority. The start of Geoengineering, the intentional manipulation of the earth's climate, is helping to counteract anthropogenic climate change and its effects [8]. There are multiple legal, ethical, and sociological issues related to Geoengineering.

6.1. Ethical Issues

One of the main questions raised by geoengineering is whether the intentional manipulation of the climate is ethically acceptable as the intentional manipulation has

never been done before and might cause more disturbance [8]. This can be monitored through GreenMyCloud and can be continued if the results are seen as positive.

6.2. Sociological Issues

As the awareness about Geoengineering is low among the public, it has become a must to address this situation and spread knowledge. One such method to spread knowledge can be done through the app as it gives, in detail, information regarding carbon emission and its effects in non-technical terms for its user to understand. As the control of GHG emissions has become vital, bringing the public forward as one is a must to help control its effects faster.

6.3. GreenMyCloud

The proposal is achievable within the budget and timescale as it is easy to make a system with the basic requirements making it convenient to use for the users.
It follows sound software engineering principles:

1. KISS (Keep it Simple, Stupid)
   This principle states that software systems work best when they are simply avoiding unnecessary complexity. The proposal shows that the system created will be simple and easy to use.
2. YAGNI (You Aren't Gonna Need It)
   This principle also aims at keeping the system as simple as possible. The principle states that no such feature be implemented which might create a problem in the future. The proposal states no such feature.

6.4. Limitations

GreenMyCloud has some limitations:

1. Cannot provide GHG emission results for years before installation.
2. Takes up a lot of space in the Memory and Hard drive.
3. Cannot make sure the user takes the alternative suggestions into account.

7. REFERENCES

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