Software Requirements Specification

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1. Introduction

1.1 Purpose of the System

afetbilgi.com is a website created with the aim of providing information and raising awareness about natural disasters in Turkey. It was established in response to the lack of easily accessible and reliable information during and after disasters. The website provides real-time updates on disasters and their impact, as well as information on how to prepare for and respond to emergencies. It also offers a platform for individuals and organizations to share their experiences and knowledge, creating a community of support and learning. Overall, the project serves as a valuable resource for those seeking to stay informed and prepared in the face of natural disasters in Turkey.

1.2 Scope

The afetbilgi.com website will provide essential information on hospitals, assembly points, shelter locations, and pharmacies. Users will be able to access information on hospitals and medical centers that are available to help earthquake victims. The website will also provide information on designated assembly points where people can gather during an emergency. Users will be able to locate shelters and other safe locations where they can go during an emergency. Additionally, the website will provide information on pharmacies where people can obtain medication and other essential supplies.

In addition to essential information, afetbilgi.com will also provide supporting information on helping centers. The website will provide information on centers that provide assistance and support to earthquake victims. Users who want to support earthquake victims will be able to find resources on how to donate and support relief efforts.

To make the information more accessible, afetbilgi.com will support multiple languages, including Turkish, Kurdish, Arabic, and English. The website will integrate Google Maps to provide users with a visual representation of where essential locations are located. Users will be able to filter information based on their location to receive the most relevant results. Additionally, the website will provide users with the option to download PDFs of the information for offline usage.

Overall, AfetBilgi.com is designed to be a well-rounded and useful resource for earthquake victims and their communities. The website aims to provide a comprehensive collection of information that is easy to access and use, with the ultimate goal of helping people during difficult times.

1.3 System Overview

1.3.1 System Perspective

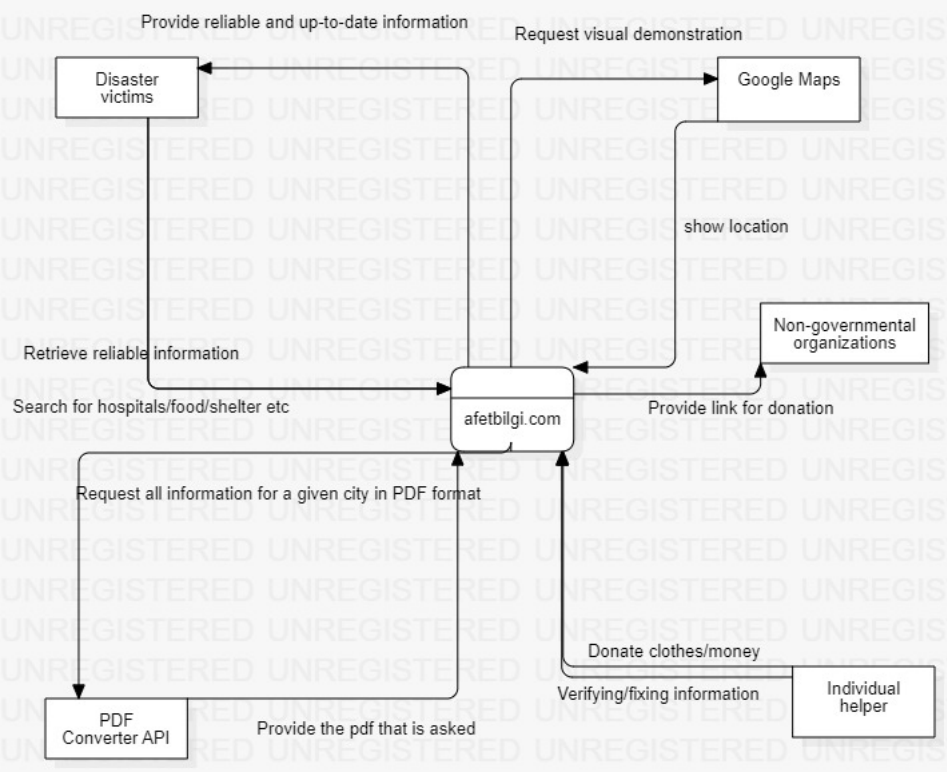

Figure 1.1: Context diagram

System Interfaces

Using Google Maps API to show where important information is located. Integration with social media sites for sharing information. APIs are used for getting data from external sources like pharmacies and hospitals.

User Interfaces

User-friendly interface for language and location-based information search with filtering system for the best viewing experience across many platforms, including desktops, laptops, tablets, and smartphones, using responsive design. Users have the choice to download reliable information PDFs for cities for offline use.

Software Interfaces

Using Google Maps API integration to display locations. Information is shared through integration with social media platforms. PDF Converter API is used to enable users download reliable and up-to-date information about cities for offline use. Language translation API is used to make website more accessible to speakers of other languages.

Communication Interfaces

Provide links for donation and help for individuals/non-governmental organizations. HTTPS protocol is used to exchange data with the end-user, including payment and personal information.

Memory Constraints

Since visitors could only have a limited amount of internet connectivity in an emergency, the website is optimized for quick loading and low bandwidth usage. To ensure that it can be accessible on low-end devices, the website is built to use the least amount of RAM possible.

Operations

User operations: Search for hospitals, shelter locations, gathering places and pharmacies etc. View details on pharmacies, hospitals, gathering places, and shelters. Filter the website with one of the provided languages. Download PDFs

Admin operations: Update the website frequently with the most recent details and information. Create regular website backups for a server failure.

Overall operations: Maintaining the website often to keep it up-to-date and functional. The website is optimized for quick loading and low bandwidth usage. Information that is sent by users should be verified and added to system.

1.3.2 System Functions

Function	Description
View accomodation places	List possible temporary acommodation places in the selected city
View gathering places	List safe gathering places in cities affected from the earthquake
View evacuation points	List evacuation points for the selected city
View transportation aids	List institutions and their information which provide transportation service for earthquake victims
View food distribution centers	List available food distribution centers and their information in the selected city
View gas stations	List gas station locations in the selected city
View donation information	List monetary donation informations, blood donation informations and digital solidarity campaigns
View health services	List hospital, pharmacy and veterinerian locations in the selected city
Filter by city	Filter all information by city
Generate PDF	Generate PDF output of helping informations for offline usage
View on Google Maps	View locations on the Google Maps

Table 1.1: System functions

1.3.3 Stakeholder Characteristics

There are two main users of afetbilgi.com which are users and developers.

Users can be grouped into three: Disaster victims, non-governmental organizations and individual helpers. Users are the ones visiting the website for searching information and resources related to natural disasters in Turkey.

For disaster victims, they can search the closest shelters, food, hospitals, pharmacies and information gathered by the website. They can use the website to create pdf of information related to the cities and visualize the locations they want. The website is easy to use, therefore disaster victims just need the internet connection to click on the website and use it.

For non-governmental organizations, they can find the donation links and they might

use the website to coordinate relief efforts. Therefore, they require technical information about the resources available.

For individual helpers, same with the non-governmental organizations, they can find donation links for money, food and blood. They can also help the developers to verify the information and if something is wrong, they can contact them through the link provided. Just like disaster victims, individual helpers just need the internet connection to use the website.

Developers for afetbilgi.com are responsible for creating, maintaining, updating and verifying the data. They gather all the information they can about the cities especially the cities that has been affected by the disaster and categorize them by city. They use some APIs such as Google Maps and PDF Converter to make users' lives easier. Developers need to have high computer skills, good coding skills and knowledge about creating websites.

1.3.4 Limitations

Regulatory policies

afetbilgi.com should be considered as a website to provide information and guidance in case of a natural disaster. It should be used to gather reliable information.

Hardware limitations

During the peak times for the website, in other words disaster times, website speed and performance might go lower because of the processing and power limitations.

Interface to other applications

The system should be able to detect whether the user is connecting through computer or smart phone and create the visual for the page layout and screen size accordingly.

Parallel operation

In afetbilgi.com, multiple processes and algorithms may run concurrently to provide up-to-date information. This might result in delays.

Audit functions

afetbilgi.com does not have any audit functions.

Control functions

Control functions are determined by the developers and all of them are reachable for only developers, and it requires necessary privileges.

High-order language requirements

React Native programming language and Typescript is used to create and design afetbilgi.com.

Signal handshake protocols

The communication between afetbilgi.com and external sources use secure channels such as HTTPS to ensure data privacy. The website follows established web standards.

Quality requirements

afetbilgi.com is designed to provide up-to-date and reliable information. However, sometimes this might be affected by wrong information provided by people.

Criticality of the application

In case of a disaster, breakdown of the server and wrong information can cause some problems. Therefore, these problems should be solved rapidly.

Safety and security considerations

Since the website does not ask for any private data, and only direct the user to other links (donations and other websites), developers only need to verify the links that are provided.

Physical/mental considerations

afetbilgi.com is designed to be used easily by all users.

Limitations that are sourced from other systems

There is no such limitation.

1.4 Definitions

HTTPS, Hyper Text Transfer Protocol
RAM, Memory
API, Application Programming Interface

2. References

Alpaylan. (n.d.). GitHub - alpaylan/afetbilgi.com. GitHub. https://github.com/alpaylan/afetbilgi.com

3. Specific Requirements

3.1 External Interfaces

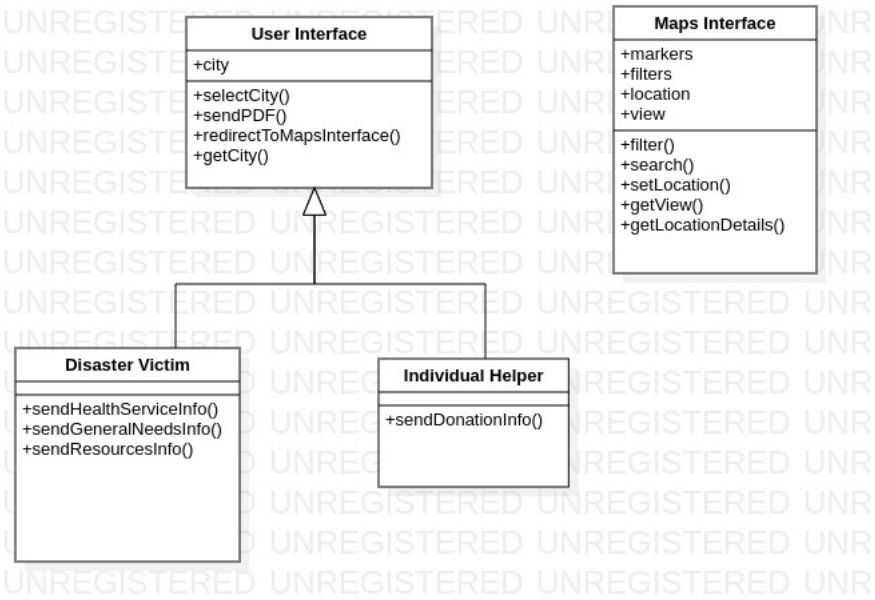

Figure 3.1: External interfaces

3.2 Functions

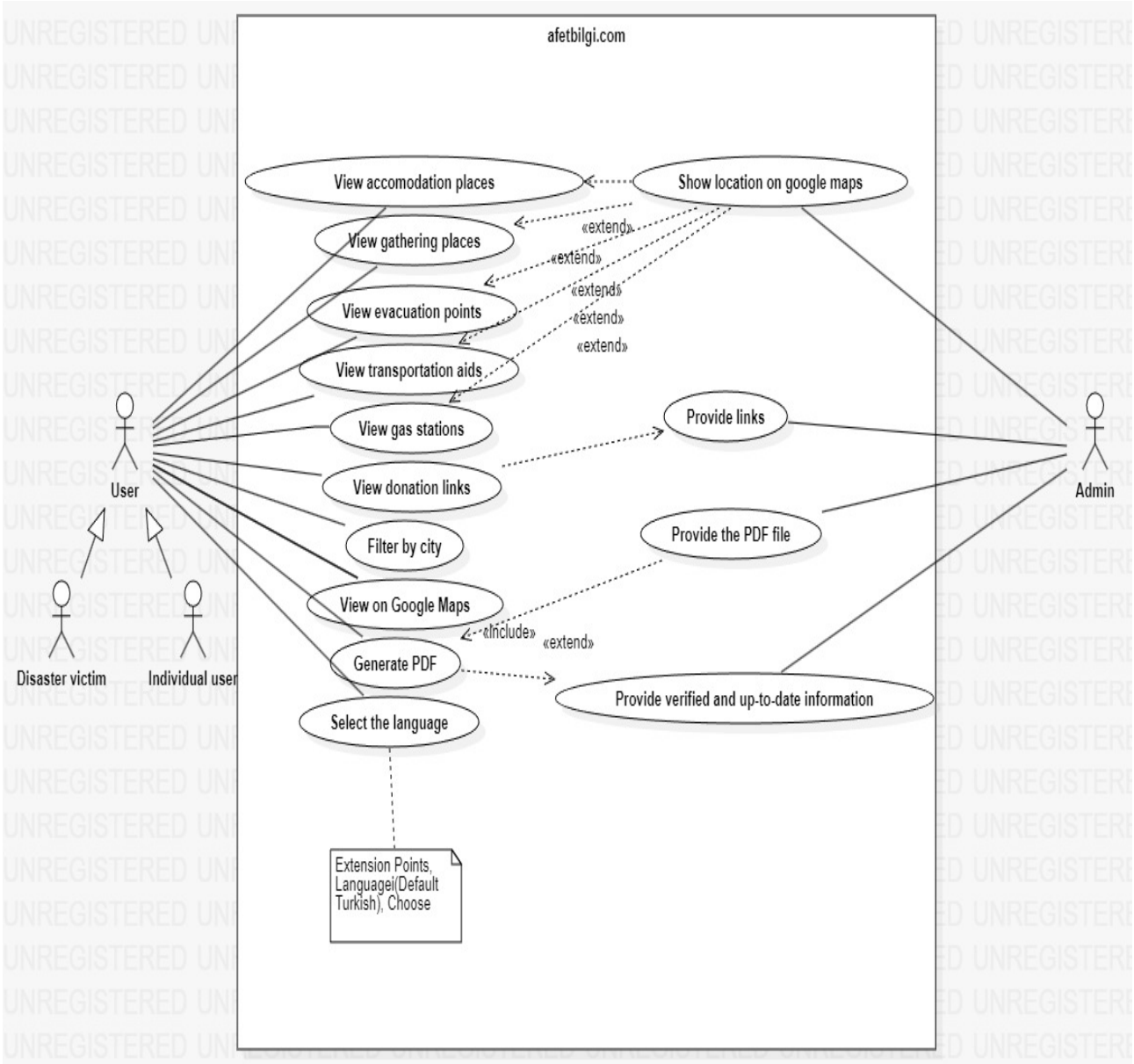

Figure 3.2: Use-case diagram

Use-case Name	View accomodation places
Actors	User
Description	Show a list of available acommodation places nearby
Data	Location of the user
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks the accomodation places button 3. User selects a location
Alternative Flow	1. User enters the website 2. User filters by location 3. User clicks the accomodation places button
Exception Flow	-
Postconditions	User is able to see available acommodation places

Table 3.1: View accomodation places

Use-case Name	View gathering places
Actors	User
Description	Show a list of available gathering places nearby
Data	Location of the user
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks the gathering places button 3. User selects a location
Alternative Flow	1. User enters the website 2. User filters by location 3. User clicks the gathering places button
Exception Flow	-
Postconditions	User is able to see available gathering places

Table 3.2: View gathering places

Use-case Name	View evacuation points
Actors	User
Description	Show a list of evacuation points in a city
Data	Location of the user
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks the evacuation points button 3. User selects a location
Alternative Flow	1. User enters the website 2. User filters by location 3. User clicks the evacuation points button
Exception Flow	-
Postconditions	User is able to see evacuation points in their city

Table 3.3: View evacuation points

Use-case Name	View transportation aids
Actors	User
Description	Show a list of transportation aids in the selected city
Data	Location of the user
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks the transportation aids button 3. User selects a location
Alternative Flow	1. User enters the website 2. User filters by location 3. User clicks the transportation aids button
Exception Flow	-
Postconditions	User is able to see transportation aids in their city

Table 3.4: View transportation aids

Use-case Name	View food distribution centers
Actors	User
Description	Show a list of food distribution centers in the selected city
Data	Location of the user
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks the food distribution centers button 3. User selects a location
Alternative Flow	1. User enters the website 2. User filters by location 3. User clicks the food distribution centers button
Exception Flow	-
Postconditions	User is able to see food distribution centers in their city

Table 3.5: View food distribution centers

Use-case Name	View gas stations
Actors	User
Description	Show a list of gas stations in the selected city
Data	Location of the user
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks the gas stations button 3. User selects a location
Alternative Flow	1. User enters the website 2. User filters by location 3. User clicks the gas stations button
Exception Flow	-
Postconditions	User is able to see gas stations in their city

Table 3.6: View gas stations

Use-case Name	View donation information
Actors	User
Description	Show donation information for various organizations
Data	-
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks one of the donation information buttons
Alternative Flow	-
Exception Flow	-
Postconditions	User is able to see donation informations

Table 3.7: View donation information

Use-case Name	View health services
Actors	User
Description	Show a list of hospitals, pharmacies and veterinerians in the selected city
Data	Location of the user
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks the hospitals or pharmacies or veterinerians button 3. User selects a location
Alternative Flow	1. User enters the website 2. User filters by location 3. User clicks the hospitals or pharmacies or veterinerians button
Exception Flow	-
Postconditions	User is able to see hospitals, pharmacies and veterinerians in their city

Table 3.8: View health services

Use-case Name	Filter by city
Actors	User
Description	Filter all informations and features by the selected city
Data	Location of the user
Preconditions	-
Stimulus	Selecting a city from the dropdown list
Basic Flow	1. User enters the website 2. User clicks the dropdown list which is at the top of the page 3. User selects a city from the list
Alternative Flow	-
Exception Flow	-
Postconditions	User is able to see all features which are filtered by a city

Table 3.9: Filter by city

Use-case Name	Generate PDF
Actors	User
Description	Generate a PDF for selected informations or city
Data	Location of the user
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks generate PDF button 3. User selects a city from the list
Alternative Flow	-
Exception Flow	-
Postconditions	User is able to view infromations for the selected city on a PDF for offline usage

Table 3.10: Generate PDF

Use-case Name	View on Google Maps
Actors	User
Description	Show locations on the Google Maps
Data	-
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks map button 3. User filters location on the map
Alternative Flow	-
Exception Flow	-
Postconditions	User is able to view locations and filter them on Google Maps

Table 3.11: View on Google Maps

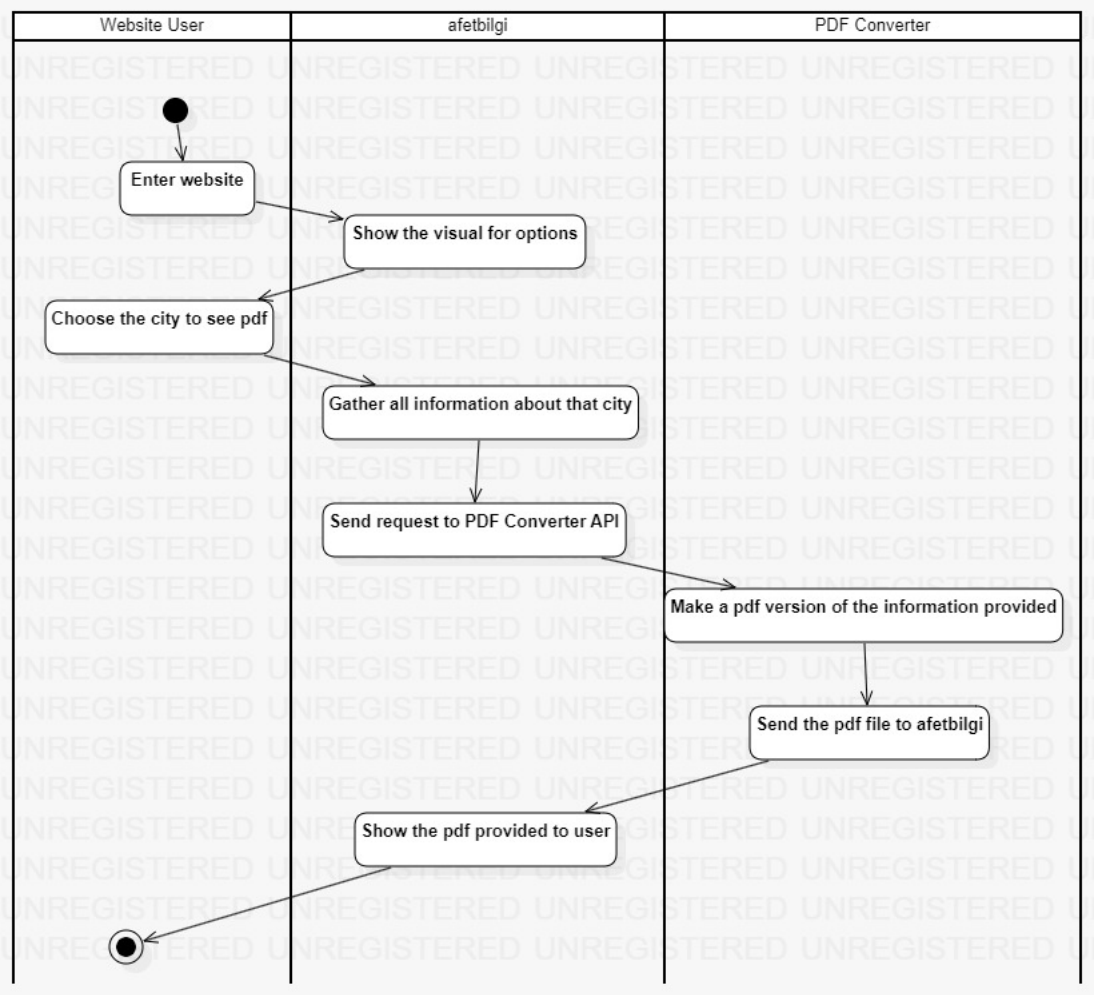

Figure 3.3: Activity diagram

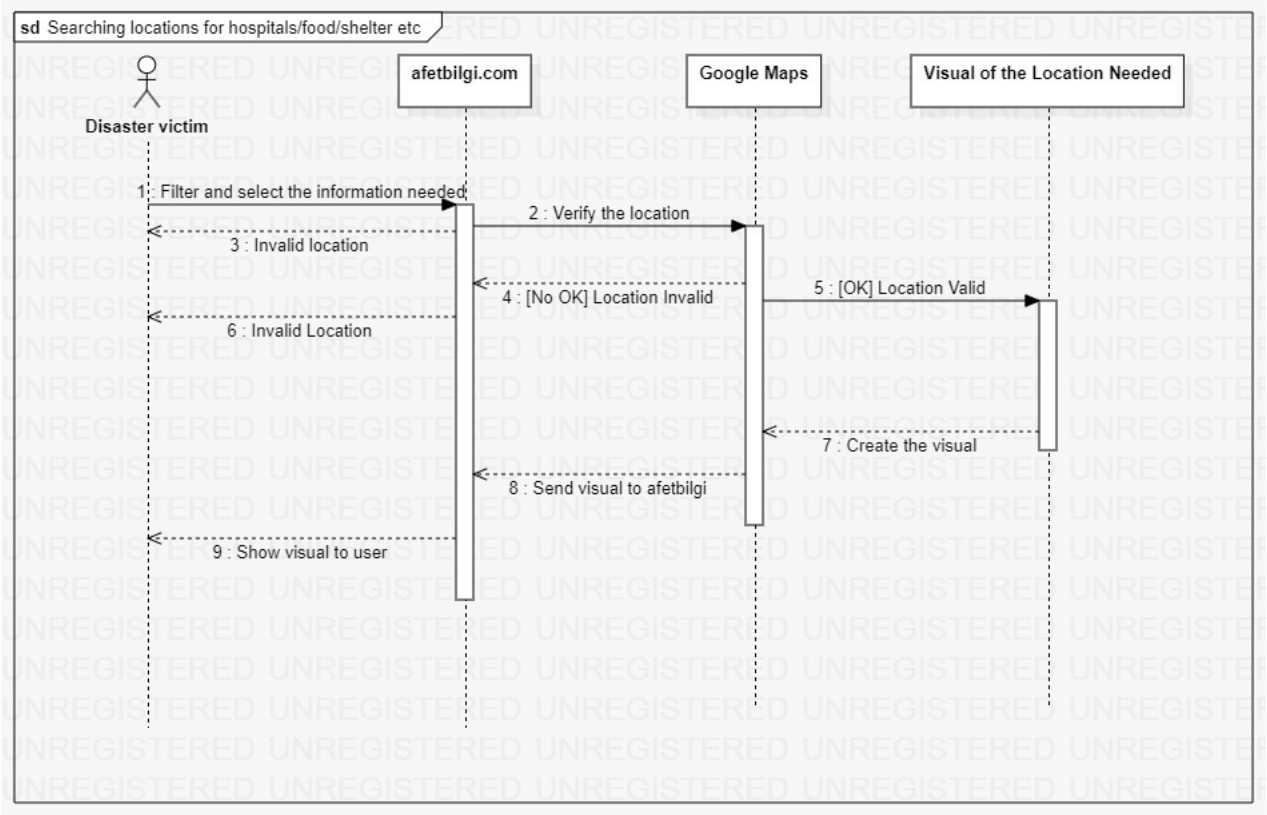

Figure 3.4: Sequence diagram

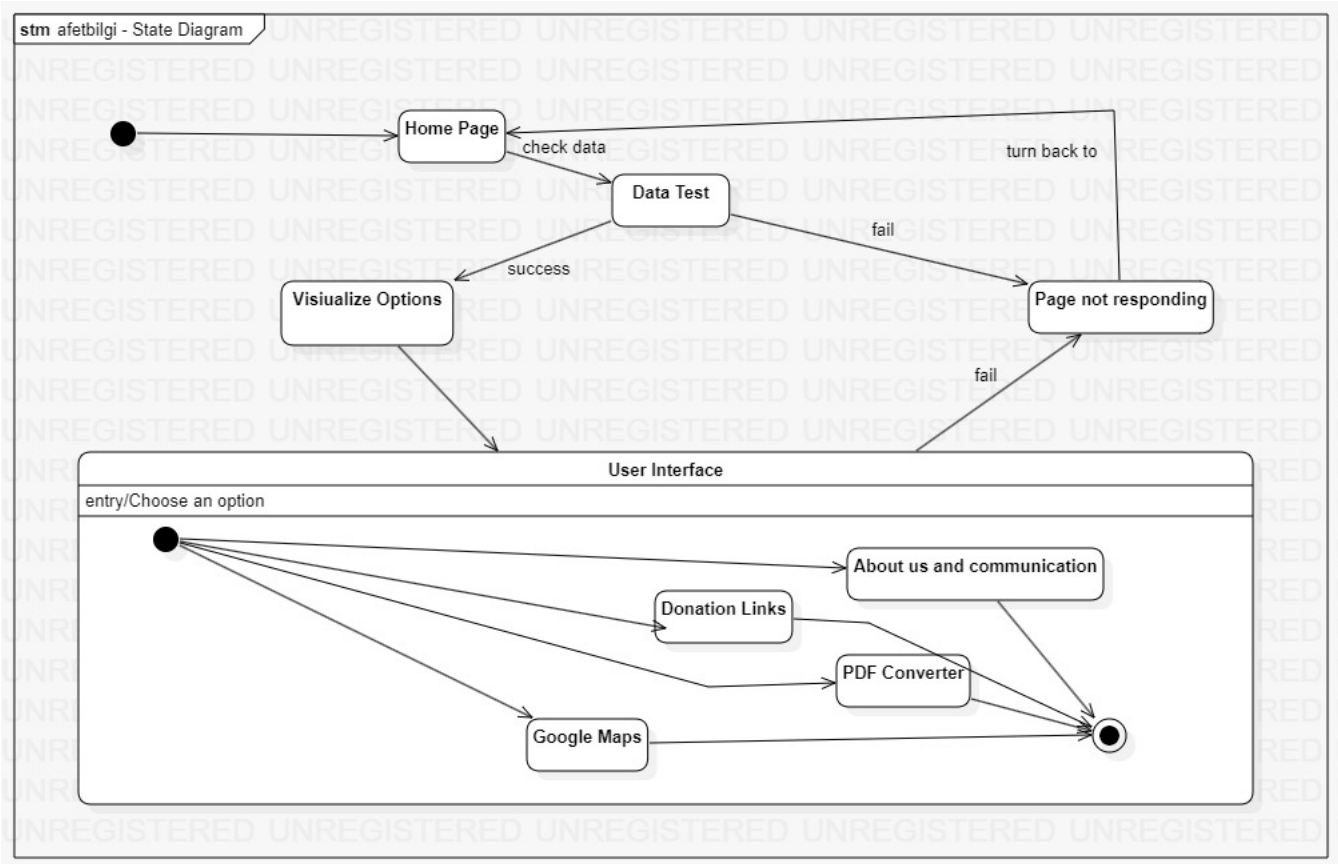

Figure 3.5: State diagram

3.3 Usability Requirements

Users should have an internet connection to connect to afetbilgi.com.

Users who have even a slight knowledge about technology shall be able to navigate afetbilgi.com efficiently with basic computer or smartphone or any device that can the access for internet.

Users shall be able to get the information they want about recent and ongoing natural disasters on the homepage in a short time.

Whenever a user wants to find specific information about the disaster, he/she shall be able to find it within at most 3 steps.

Afetbilgi.com shall provide the visual of the location asked or provide the pdf file that is asked.

3.4 Performance Requirements

The system shall be able to handle many users at the same time especially at a disaster time.

All pages and links provided shall be loaded within 3 seconds after a user clicks on them.

Afetbilgi.com shall retrieve the results for any given query in less than 3 seconds.

System shall be able to provide the visual of the location chosen from Google Maps and provide the pdf file that is asked according to the city within 5 seconds at most.

The response time of the database for any operation shall not exceed 10 seconds.

3.5 Logical Database Requirements

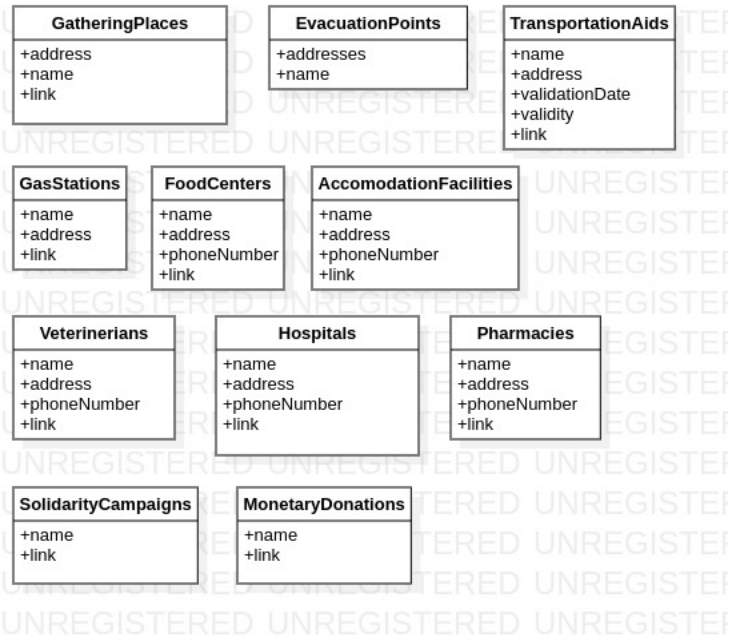

Figure 3.6: Logical Database Diagram

The proposed database structure for the emergency information stored on the website involves using separate Google Sheets files to represent tables or collections within the database. Each Google Sheets file would correspond to a separate table/collection in the database, with each row in the file representing a separate record in the table/collection.

The columns in the Google Sheets file would represent the different fields associated with each record, such as the name of the location, its address, phone number, and type of emergency resource it offers. To ensure that the information presented on the website is up-to-date and accurate, the tables/collections would be periodically parsed at specific time intervals.

The parsing process would involve extracting the data from the Google Sheets files, checking for any updates or changes, and then updating the corresponding records in the database accordingly. This approach would provide a simple and efficient way to manage the emergency information stored on the website, as well as enable easy updates to be made by authorized personnel.

The database would be designed to handle a large amount of data, with appropriate indexing and optimization techniques employed to ensure fast and efficient data retrieval. The database would also be secure, with appropriate access controls and permissions put in place to restrict unauthorized access to the data. Finally, the database would be scalable, allowing for additional emergency information to be easily added in the future as needed

3.6 Design Constraints

The website design should be accessible and easy to use for people.

The website should be reachable on multiple devices such as computers, smart phones and basically devices that have access to internet.

The website developers must ensure that the provided links in homepage must be secure links.

The website should support the languages that are spoken in Turkey such as Turkish, English, Kurdish and Arabic.

The website should be optimized for faster loading times.

3.7 System Attributes

Reliability

The system shall be able to operate without significant errors or crashes most of the time. In case of hardware or software failures, the system shall recover automatically. Data that is stored by the system shall be backed up regularly. Data that is used by the system should be verified regularly.

Availability

The system shall be available 24/7 especially at the disaster times. Assuming the device has a stable internet connection, the system shall be available to use within a short time.

Security

All links provided on afetbilgi.com must be safe and verified and should not lead to any malicious websites. The system shall use HTTPS encryption to ensure user data transmitted over the internet is safe. The website should have protocols to ensure that it is safe from cyber-attacks.

Maintainability

The system shall be easily maintainable for developers. New features or improvements shall be easily implementable to the system without causing any problems. The system shall require minimal dependency on specific hardware.

Portability

The website should be accessible on multiple web browsers, Google Chrome, Opera, Mozilla Firefox, Microsoft Edge etc. The website shall be able to visualize the pages according to the devices that have different screen sizes. The database of the server should be easily transferable.

3.8 Supporting Information

afetbilgi.com is a website that was created and designed by volunteers. A user can use it to search for information, location or get the pdf file of the information for cities. Furthermore, users with technical background or have an idea to improve it can contribute to the website by contacting the developers through “About us” at homepage of the website.

4. Suggestions to Improve the System

4.1 System Perspective

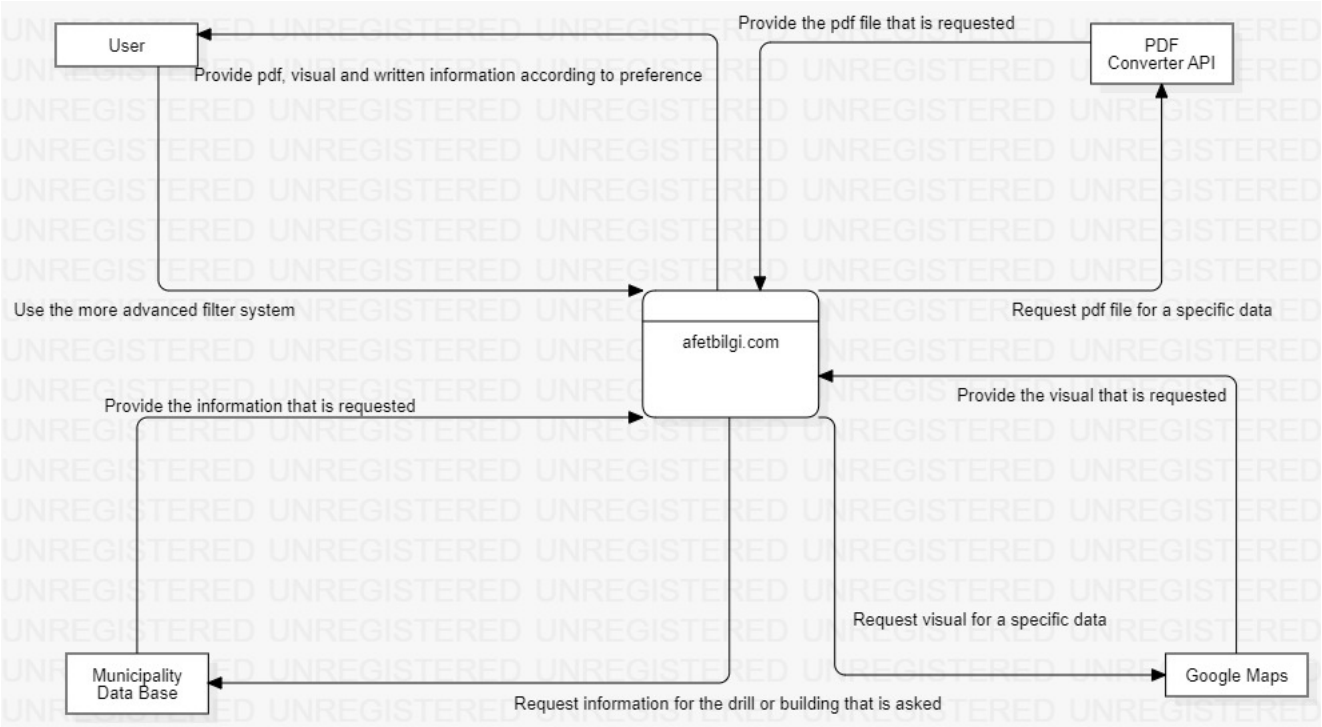

Figure 4.1: Context Diagram Suggestion

System Interfaces

Using Google Maps, PDF Converter API and Municipality Data Base to provide related and up-to-date information. APIs are also used for getting data from external sources.

User Interfaces

Easier to use and find the related information with advanced filter system so that they can reach or get the pdf file also for specific information. Regulating the screen size according to the device that is connected to the server. Users can use pdf files offline too. Users can also upload data to the system and wait for its verification.

Software Interfaces

Using Google Maps API integration to visualize the locations according to the search of the user. PDF Converter API is used to give the pdf file that user asked information with filter. REST API to provide information through the website of Municipality.

Communication Interfaces

Provide links for donations and help for individuals/non-governmental organizations. HTTPS protocol is used to exchange data with the end-user, including payment and personal information.

Memory Constraints

Memory Constraints Since visitors could only have a limited amount of internet connectivity in an emergency, the website is optimized for quick loading and low bandwidth usage. To ensure that it can be accessible on low-end devices, the website is built to use the least amount of RAM possible.

Operations

User operations: Use the advanced filter to search for specific information and get the pdf file for it. Upload data and wait for its verification.

Admin operations: Update the website frequently with the most recent details and information. Create regular website backups for a server failure. Check for the data that is uploaded by users and verify it.

Overall operations: Maintaining the website often to keep it up-to-date and functional. The website is optimized for quick loading and low bandwidth usage. Information that is sent by users should be verified and added to the system.

4.2 External Interfaces

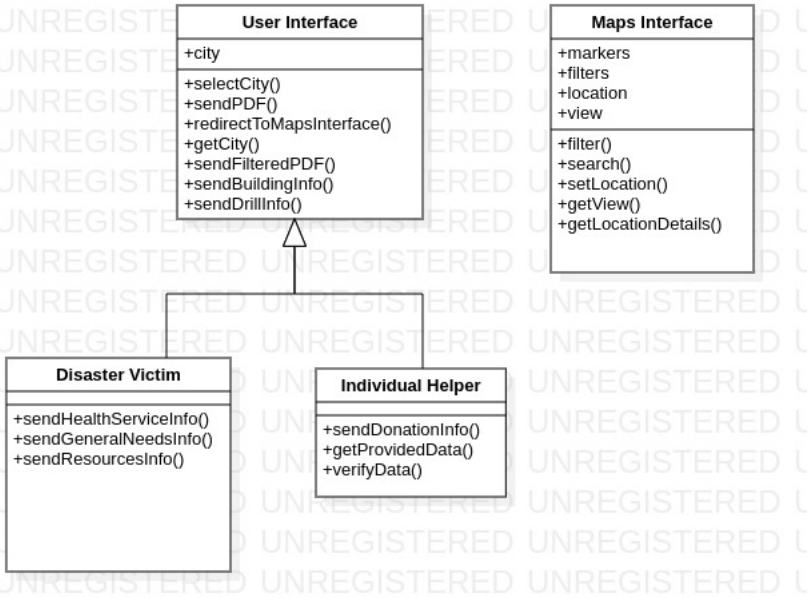

Figure 4.2: External interfaces suggestion

4.3 Functions

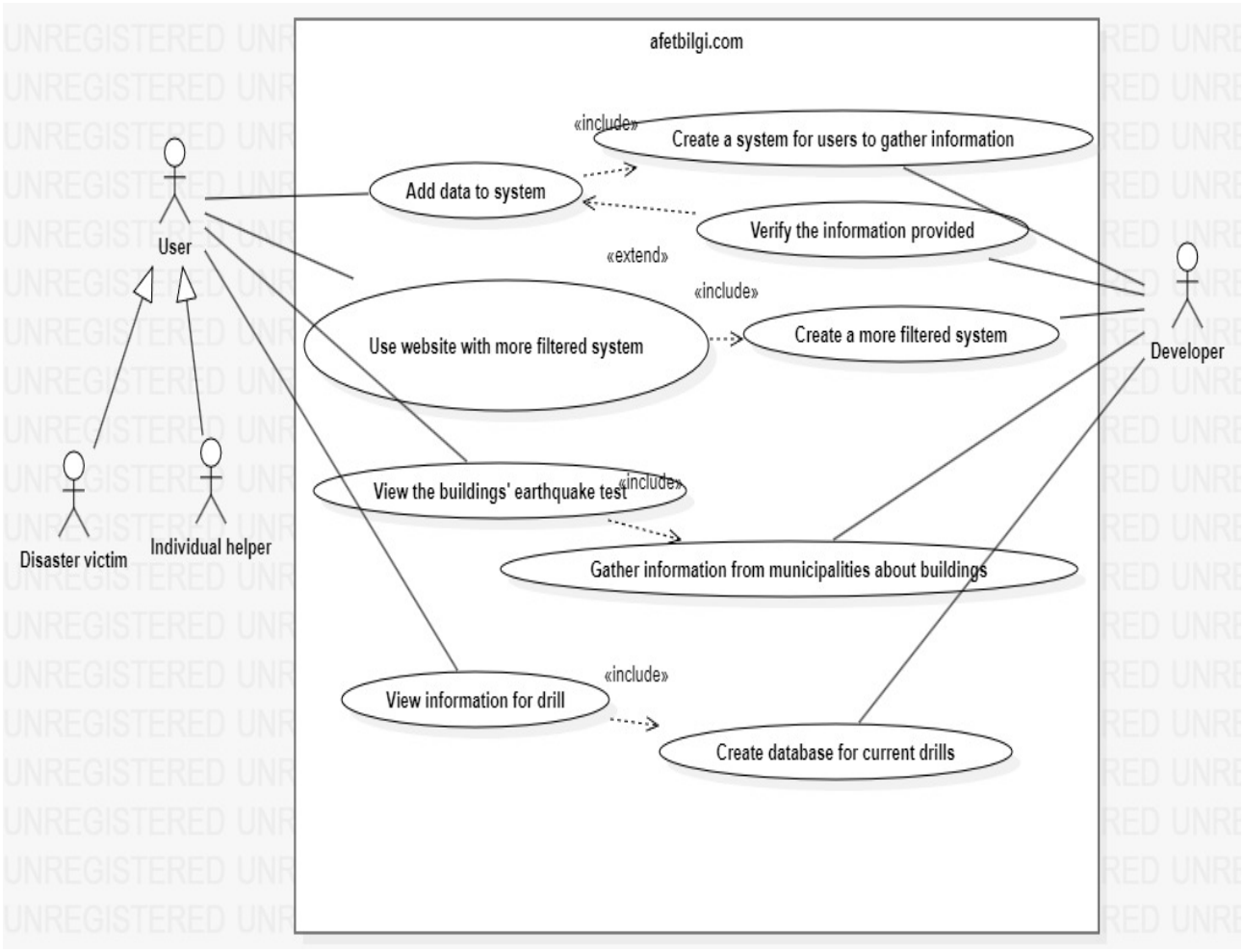

Figure 4.3: Use-case diagram suggestion

Use-case Name	Provide data
Actors	User
Description	Provide helpful data for disaster victims. These data includes types of food centers, acommodation facilities, transportation help, services
Data	Any type of data user wishes to provide
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks provide data button 3. User selects data type he wishes to provide (accomodation, transportation, food center, ...) 4. User enters data to text field 5. User clicks send data request
Alternative Flow	-
Exception Flow	-
Postconditions	User is provided his data and waiting for approval of system admins

Table 4.1: Provide data

Use-case Name	Generate PDF with filtering
Actors	User
Description	Generate PDF which only includes data which is related to selected filters
Data	Location of the user, filters
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks generate PDF button 3. User selects the filters (location, food centers, assembly points, acommodation, ...) 4. User clicks download PDF button
Alternative Flow	-
Exception Flow	-
Postconditions	User is able to read informations which only he requested offline

Table 4.2: Generate PDF with filtering

Use-case Name	View disaster drill dates, locations and education centers
Actors	User
Description	Show date and location of disaster drills and education centers in the selected city
Data	Location of the user
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks view drill and education centers button 3. User selects a city from the list
Alternative Flow	-
Exception Flow	If user filled address form incorrectly then the building will not be found on the database.
Postconditions	User is able to view disaster drill dates, locations and education centers

Table 4.3: View disaster drill dates, locations and education centers

Use-case Name	Check building strength
Actors	User
Description	Provide information about a building's strength and status
Data	Address of the building
Preconditions	-
Stimulus	Button click
Basic Flow	1. User enters the website 2. User clicks check building status button 3. User fills the address form 4. User clicks check buildings button
Alternative Flow	-
Postconditions	User is able to view disaster drill dates, locations and education centers

Table 4.4: Check building strength

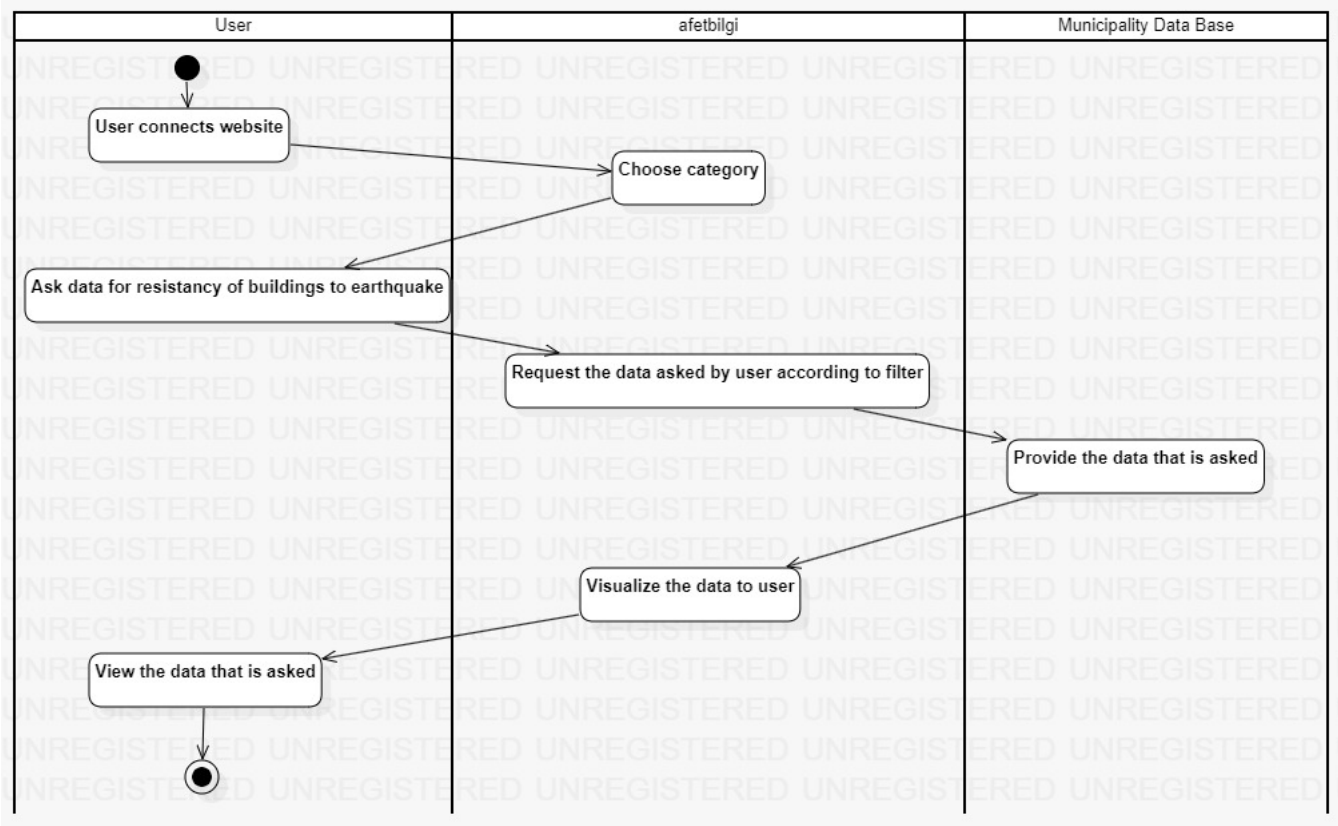

Figure 4.4: Activity diagram suggestion

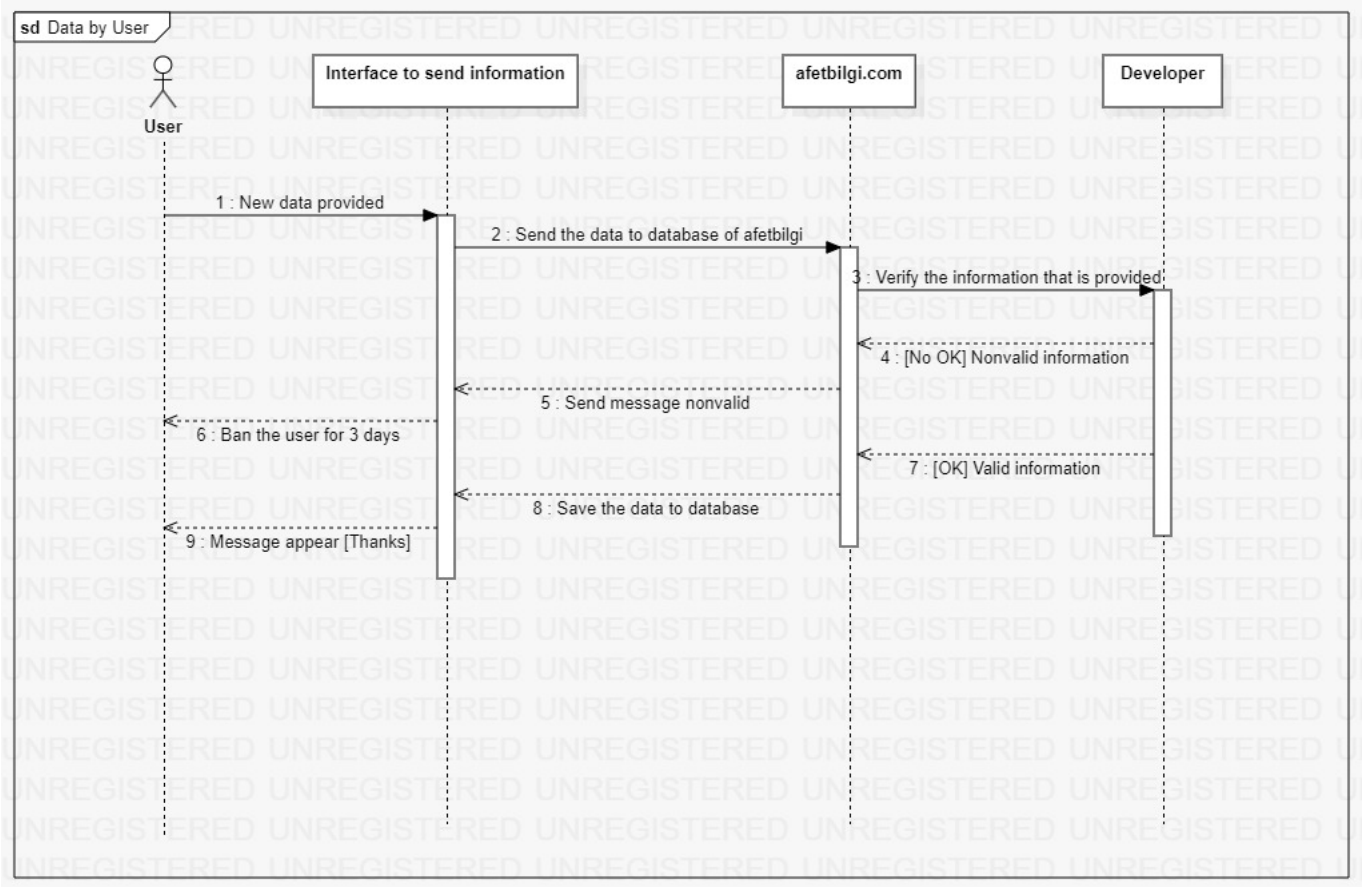

Figure 4.5: Sequence diagram suggestion

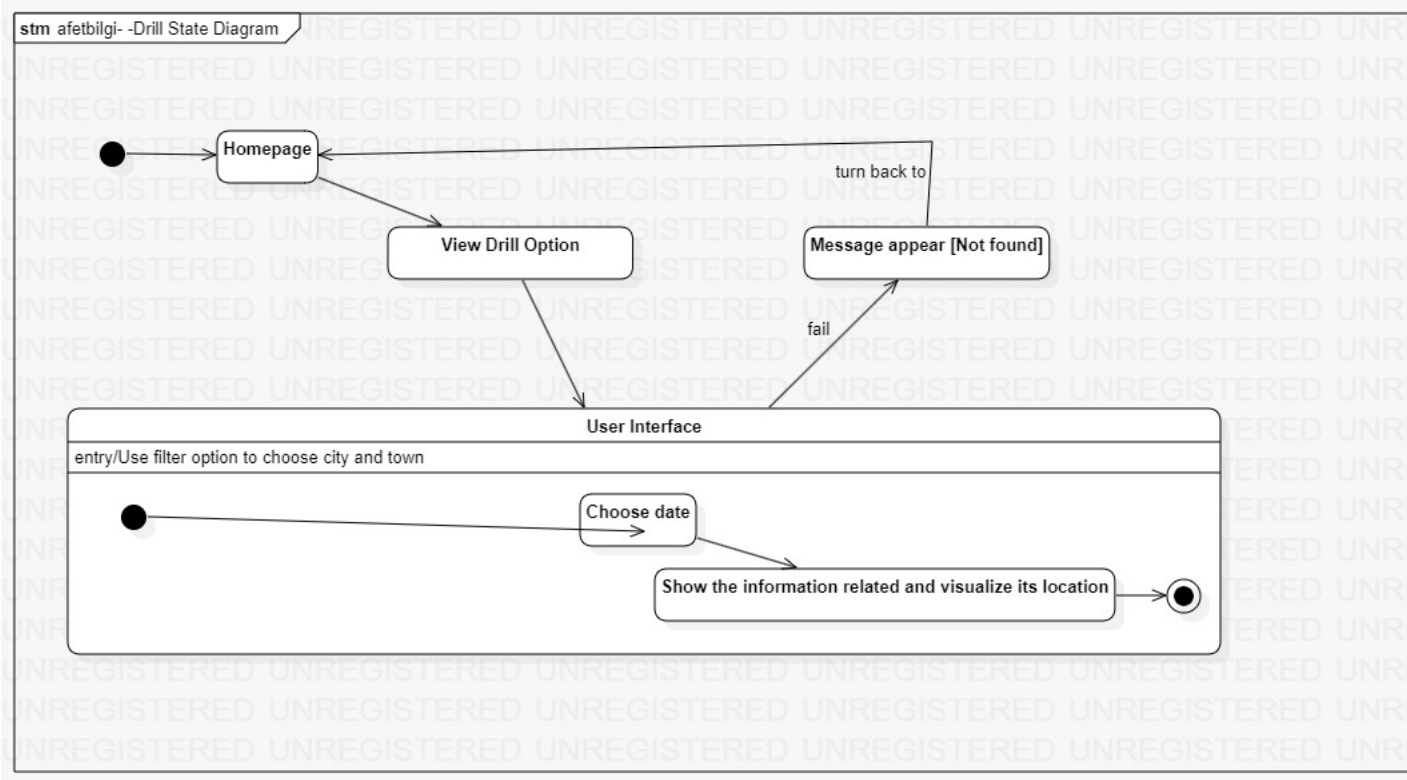

Figure 4.6: State diagram suggestion

4.4 Usability Requirements

Users still need an internet connection to benefit from these new features.

User should select and specify related filters for advanced PDF generation.

Users should provide exact address and location for buildings which they are willing to learn about their strength against disasters.

Users should specify their location to learn about disaster drill and education locations and dates.

4.5 Performance Requirements

The website should quickly generate the PDF with the contents which user asked to and respond to user in an efficient way.

Data which an individual helper wants to share with the website, should be verified quickly by system admins and put into the database of the website.

Website should quickly retrieve information from the municipalities' database about the building which user asked to find out about its strength against earthquakes.

4.6 Logical Database Requirements

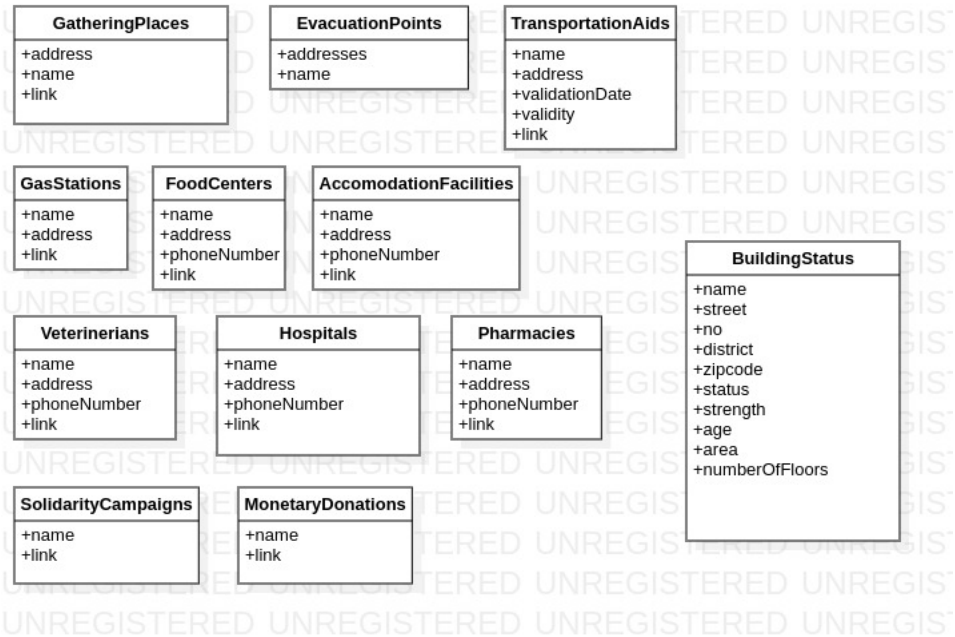

Figure 4.7: Logical Database Diagram Suggestion

4.7 Design Constraints

System admins should regularly verify and update the website as users share useful and up-to-date data about disasters.

Address specification for buildings' strength information should be easy to understand and descriptive for users.

Filter options for advanced PDF generation must be clear and easy to use for users.

4.8 System Attributes

Reliability

Data provided by individual helpers should be carefully inspected and verified by system admins. These data also must be backed up in case of any failure of the system.

PDF generation with filters should not include irrelevant information. Filters must work properly.

Availability

Assuming user has a stable internet connection, user must be able benefit from PDF generation with filters, building strength checking, disaster drill and education information and sata sharing features all the time. All these features must be available in all kinds of browsers.

Security

For retrieving building informations, connection between municipalities' databases and afetbilgi.com should be secure and reliable so that any possible attack must not succeed.

Maintainability

Newly added features should be implemented in a way such that it is easy to change, update and develop on top of for the developers of the system.

4.9 Supporting Information

The aim of the four features proposed is to enhance the website's functionality and usefulness, providing users with advanced tools and resources to help them prepare for and respond to emergency situations. These features aim to provide users with customized information, enable user sharing and verification of information, provide accurate information on building status and strength, and offer information on upcoming disaster drills and training sessions. Ultimately, these features aim to promote safety and resilience in the face of natural disasters.