SOFTWARE

REQUIREMENTS

SPECIFICATION

Afetbilgi.com

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Group 88

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Revision History

Revision	Date	Author	Description
1.0.0	12.04.2023	Onur Okuducu	SRS First Draft
2.0.0	23.04.2023	Onur Okuducu	SRS Final

1. Introduction:

1.1 Purpose of the System:

As Turkey experienced two major earthquakes on March 6, 2023 which affected a population of nearly 12 million people and turned some major cities with high population density in ruins, the need for effective communication and coordination emerged. Because of these reasons, afetbilgi.com was put into service by a group of METU (Middle East Technical University, Ankara Turkey) students and graduates with the purpose of making a simple, easy to use and reliable source of information in order to assure the efficiency of the actions taken by the first responders and guide the survivors of the disasters to the reliable sources for meeting their healthcare, food and sheltering needs.

1.2 Scope:

In the scope of afetbilgi.com, reliable and verified information from different sources are aimed to be conveyed to both the people in the disaster zone and people willing to provide help to the ones in need. In order to gather the information that are presented on the website, afetbilgi.com uses a data search, validation & entrance team which searches relevant information through different means, validates them via different proofing techniques and collects all the validated information in a spreadsheet program. After the data process, the gathered information is presented on the website under the related sections and further specified according to their cities. Additionally, given that the internet access in the disaster zones is intermittent, the website also provides a downloadable pdf version of the desired information. Finally a map which encompasses all the geopositional information that is available on the website is also accessible.
So scope of the project can be listed as:

- Having an understandable, clear and not complicated user interface so that every disaster survivor can use it no matter the technological literacy levels.
- Presenting reliable and verified information that is handpicked by a trustable team of data gatherers.
- Reflecting the possible changes and alterations in the previous given information swiftly given the dire circumstances in the region.
- Assuring continuous availability of the website because of the ever ending need for relevant and up to date information.

Followings are not in the scope of the project:

- Coordinating volunteers to effectively take part in research and rescue operations.
- Collecting donations and functioning as a charity.

1.3 System Overview:

1.3.1. System Perspective:

Afetbilgi.com is not a part of a larger system but it is in symbiotic relationships with other services and products both in its fundamental architecture and in the main workflow of the admins of the website. The website itself makes use of AWS (Amazon Web Services) for its data bucket and Vercel for its hosting services. In addition to these, since the system is heavily dependent on the contributions of the data gatherers, validators and entrors, the systems that are used for these purposes are also worth mentioning. Data gatherers use various orthodox methods like Google Forms and unorthodox methods such as Tweets, Instagram posts and Text Messages. Data validators also use various methods like phone calls, Tweets and Instagram posts. Finally all the validated data is collected in a Google Sheet spreadsheet application and further used as the source of the data bucket of the website. From the user perspective, the website is accessible from any web browser on the HTTP/HTTPS protocol.

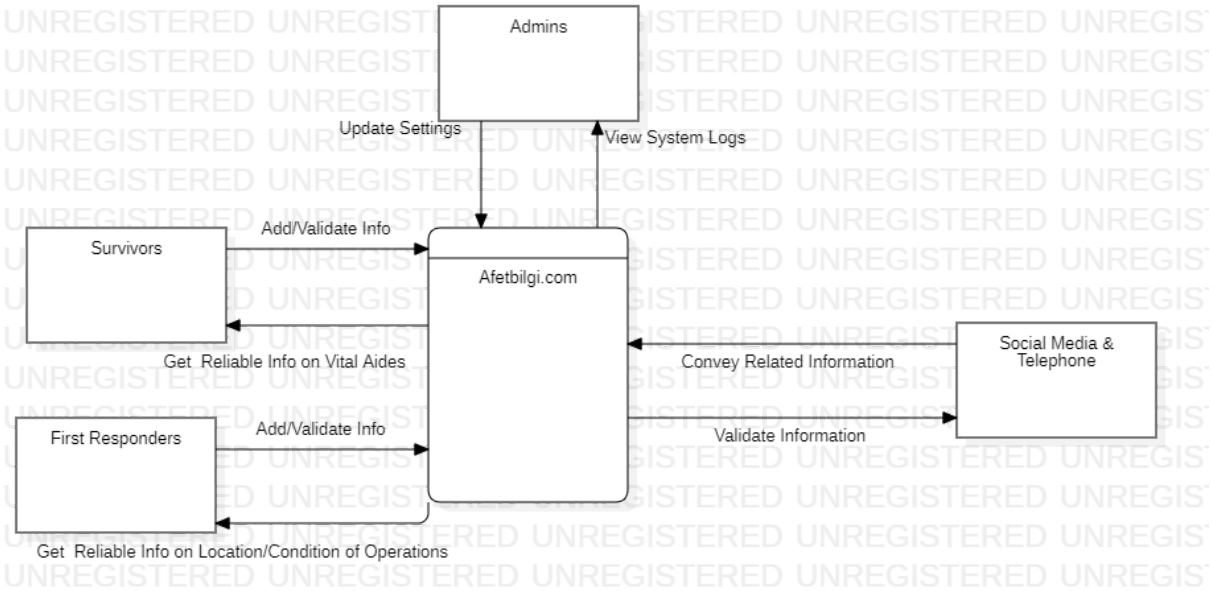

Figure 1: Context Model

1.3.1.1. System Interfaces:

Data Management Interface: This interface is the backbone of the website, responsible for parsing and storing all the information to be presented. Once the gathered information (such as addresses, telephone numbers etc.) is validated and preprocessed, it is parsed and stored in the data bucket provider (such as AWS). The interface handles multiple types of information and although there is no uniform structure for the data, address, validation source and location information is commonly presented. It also serves as the starting point for generating PDFs and maps on the website.

PDF Making Interface: This interface provides a convenient way for users with limited or no internet connection to access the website's content. Users can select their desired city and topic and the website will automatically generate a PDF containing the relevant information.

Map Generation Interface: The map generation interface creates a map that allows users to view the geopositions of relevant aid resources such as hospitals and shelters in all locations presented on the website. The map generation interface is integrated with the data management interface and uses the same validated data to provide accurate information.

1.3.1.2. User Interfaces:

The website afetbilgi.com has two types of user interfaces: one for data consumers (i.e end users) and one for data gatherer/validators (i.e admins and information support staff). The data consumer interface is designed to be easy to use, as we want our system to be accessible to people in urgent need. Data gatherer/validators interface is also picked to be in a simplistic manner as the process of presenting information on the website is desired to be as fast as possible.

Data Consumers (i.e end users) Interface: The system provides a web application through which end users can interact with in a simple manner. The website offers information on four general topics: General Needs, Important Resources, Health Services and To Help. Each of these topics contains several subtopics, providing users with reliable and informative content. The website is usable in four languages, Turkish, English, Arabic and Kurdish. To accommodate intermittent internet access in disaster zones, the website also offers downloadable PDF versions of the information. Additionally, users can access a map that shows all the available geolocation information like addresses of soup kitchens, shelters, gas stations and more.

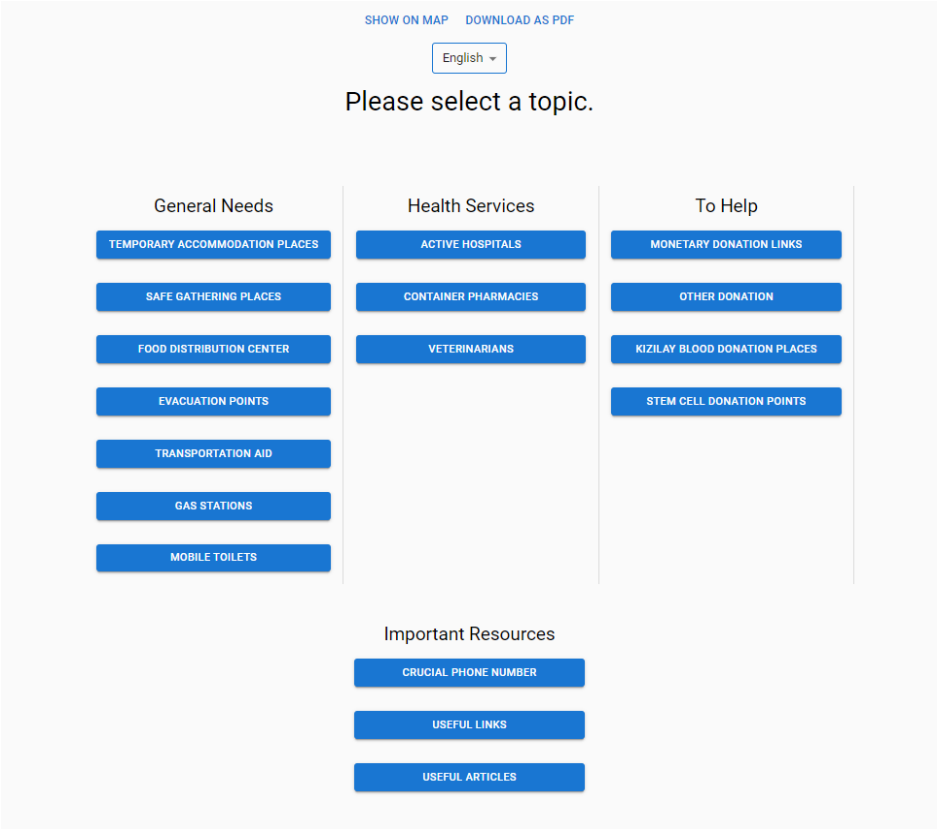

Figure 2: Afetbilgi.com main menu.

afetbilgi.com - Hatay

This document is from afetbilgi.com. Last data validation date: 03.04.2023 14:39:18

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Active Hospitals

District	Location	Map	Source	Telephone	Last Update	Güncelleme Saati (Update Time)
Antakya	Maxim Park	Google Maps Link		-	10/02/2023	20:00
Defne	Sümerler Anfi Tiyatro (Memorial Sağlık Destek Birimi)	Google Maps Link	Source	-	10/02/2023	20:30
Dörtyol	MMK Metalurji Limani (Gemi)	Google Maps Link	Source	-		

Figure 3: Afetbilgi.com downloadable PDF.

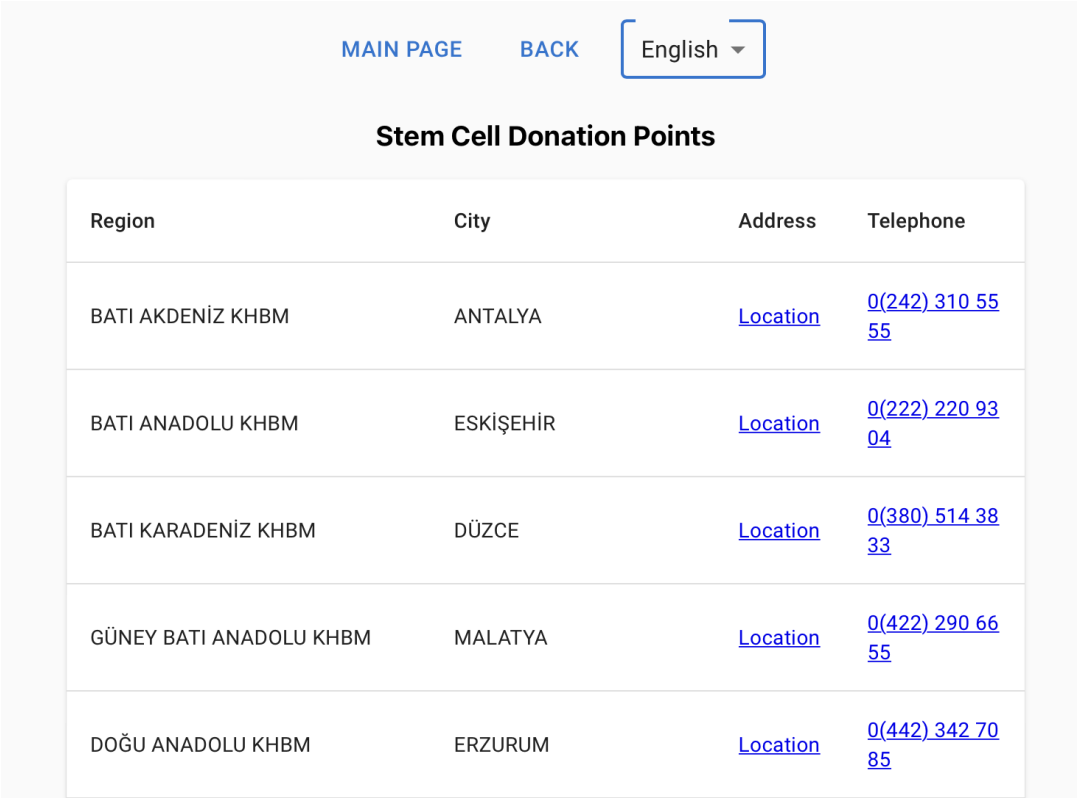

Figure 4: Afetbilgi.com information display.

Figure 5: Afetbilgi.com map based infographic.

Data Gatherer/Validator Interface: Although the website doesn't have a specific interface for data entry/validation, the interfaces used are worth mentioning as they play a crucial role in the data gathering process. The website uses multiple Google Sheets for crowdsourcing data from various sources such as Twitter, Discord, etc. Once the data is collected from differnet sources and validated, it is transferred to the data bucket. This interface is specifically selected for data gatherers/validators to ease the process of collecting and validating data.

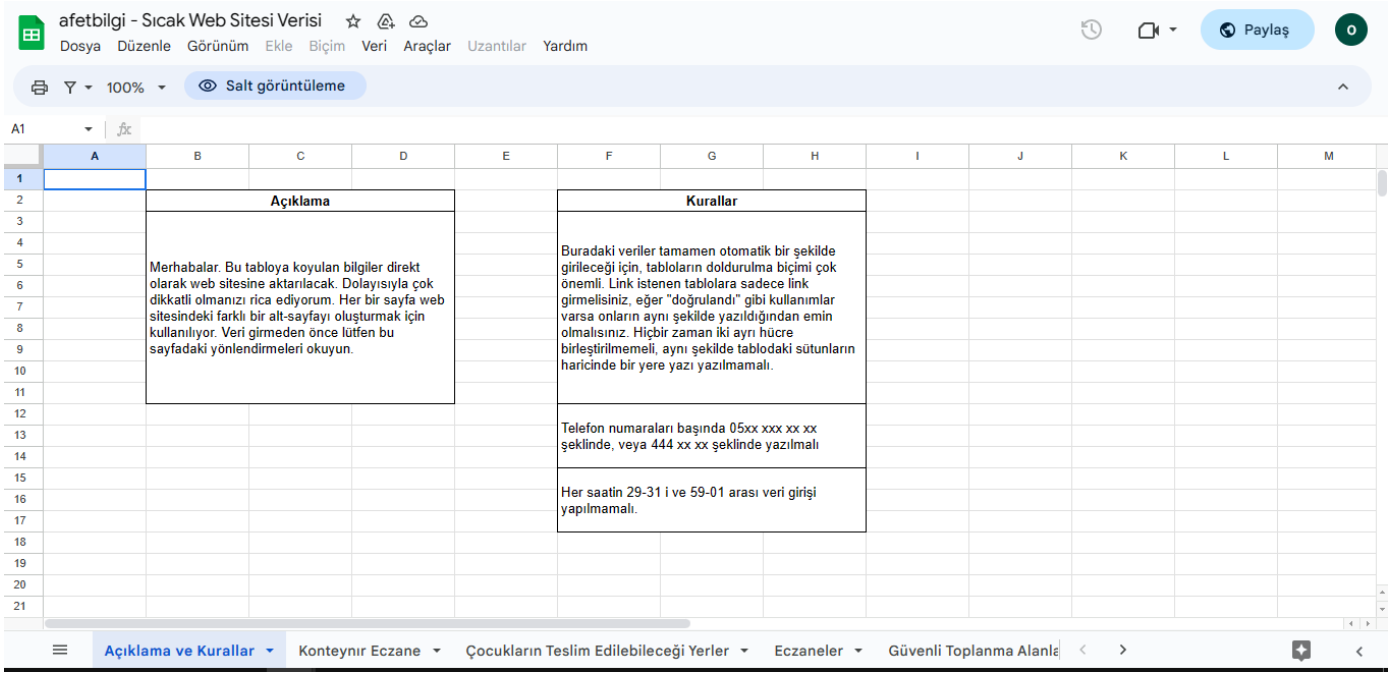

Figure 6: Afetbilgi.com information gathering interface.

1.3.1.3. Software Interfaces:

Data Bucket Provider: Afetbilgi uses AWS data bucket for storing validated information. This data bucket acts as a database for the verified information added by the information support staff.

Hosting Provider: Afetbilgi.com uses Vercel as its static website hosting provider. Vercel is a cloud platform that specializes in hosting static websites.

CDN Provider: To further optimize its website's performance, Afetbilgi.com takes use of Cloudflare as its Content Delivery Network (CDN) provider.

1.3.1.4. Communications Interfaces:

Afetbilgi.com uses the HTTP/HTTPS protocol to enable communication between its server and end user devices. The HTTP is used for transferring data between servers and browsers whereas the HTTPS provides security through encryption.

1.3.1.5. Memory Constraints:

Since Afetbilgi.com primarily serves as a provider of memory wise light yet important information, it does not face major memory constraints. This allows the website to function efficiently and provide a smooth user experience.

1.3.1.6. Operations:

Survivors:

- Check General Needs Availability
- Find Important Communication Resources
- Access Health related aid information
- Access site offline
- Get map of location based information
- Provide Info And FeedBack

First Responders:

- Provide Info And FeedBack
- Get how to help information

Data Staff:

- Verify&Add Information

Admins:

- Manage authentication to data collection process
- Update content as needed
- Resolve technical issues

A more detailed coverage of these operations will be provided in section 3.2.

1.3.2. System Functions:

Functionalities of afetbilgi.com is summarized as what they do in below

Function	Description
Check General Needs Availability	This function enables survivors to find information regarding the availability of general necessities such as food, water and shelter.
Find Important Communication Resources	This function involves accessing communication resources available on the website.
Access Health related aid information	This function helps people in need locate health services on the website such as hospitals, pharmacies and veterinarians.
Access site offline	This function enables people in need to use the website resources without an online connection.

Get map of location based information	This function shows the users a map with the website's location related data such as hospitals and food places.
Provide Info And Feedback	This function involves the exchange and validation of aid information for ongoing operations.
Get how to help information	This function explains how users who are not in need can find out ways to assist the people in need.
Verify&Add Information	This function explains the data collection and verification process of the data staff.
Manage authentication to data collection process	This function explains how to handle verification for using the data gathering process on Google Sheets.
Update content as needed	This function involves an admin modifying the website according to feedback from the disaster area.
Resolve technical issues	This function is about the admins identifying and solving technical issues that occur on the website.

Table 1: System Functions And Descriptions

1.3.3. Stakeholder Characteristics:

- **Survivors**: These are individuals who have been affected by the earthquake and are seeking reliable information on resources such as food, shelter and healthcare. They may not have access to stable internet connectivity or have limited technical skills, so the website is designed to be user friendly and accessible in multiple languages.

- **First responders**: They are the actors who offer emergency aid (financial, health related, s&r etc) to those affected by the disaster, whether they are professional emergency response team members or volunteers.

- **Information Staff**: This group is responsible for gathering and validating information related to resources available to the affected population. They must have strong research skills and attention to ensure that the information is accurate and up to date.

- **System Admins**: These are individuals responsible for managing the technical aspects of the website, ensuring that the website is accessible.

1.3.4. Limitations:

a) Regulatory requirements and policies: Afetbilgi.com shall ensure that the information provided is up to date and validated before it is published on the website.

b) Hardware limitations: The website shall be designed in such a way that it can operate efficiently under low or intermittent internet connectivity which are common in disaster zones. The website should also be optimized to work on a range of devices including old ones.

c) Interfaces to other applications: Afetbilgi.com shall be compatible with AWS, Vercel and Firecloud in order to assure the quality of its services.

d) Parallel operation: The system shall be designed to handle a large number of requests simultaneously especially given that in disaster times the number of users accessing the system is likely to be high.

e) Audit functions: The system shall have strong audit functions which record all the activities carried out by the information staff and the system admin.

f) Control functions: The system shall have strong control functions to ensure that only authorized personnel can access and modify the system's data.

g) Higher order language requirements: The system shall be designed using a programming language that is easy to debug and has large support to ensure the rapid development and improvement of the website.

h) Signal handshake protocols: The system shall have an efficient signal handshake protocol that guarantees the accuracy of data transmission between end users and the system. This needs the use of secure protocols like HTTPS.

i) Quality requirements: The system shall be reliable and provide accurate information to the users.The data validation process should be thorough to ensure that the information provided is correct. Also the system shall be user friendly.

j) Criticality of the application: The system is critical as it provides important information to the survivors and first responders of a disaster.

k) Safety and security considerations: The system shall not allow unauthorized access to databucket.

l) Physical/mental considerations: The system shall be designed with a user friendly interface. It should also be accessible to people with disabilities.

m) Limitations that are sourced from other systems: The system shall be designed to operate within the limitations of other systems to ensure that it can be accessed easily and continuously without any disruptions.

1.4 Definitions:

Term	Definition
HTTP	Hypertext transfer protocol
HTTPS	Hypertext transfer protocol secure
AWS	Amazon Web Services
S&R	Search and Rescue

2. References:

ISO/IEC/IEEE International Standard Systems and software engineering Life cycle processes Requirements engineering. (2018). *IEEE*. https://doi.org/10.1109/ieeestd.2018.8559686

3.Specific Requirement:

3.1. External Interfaces

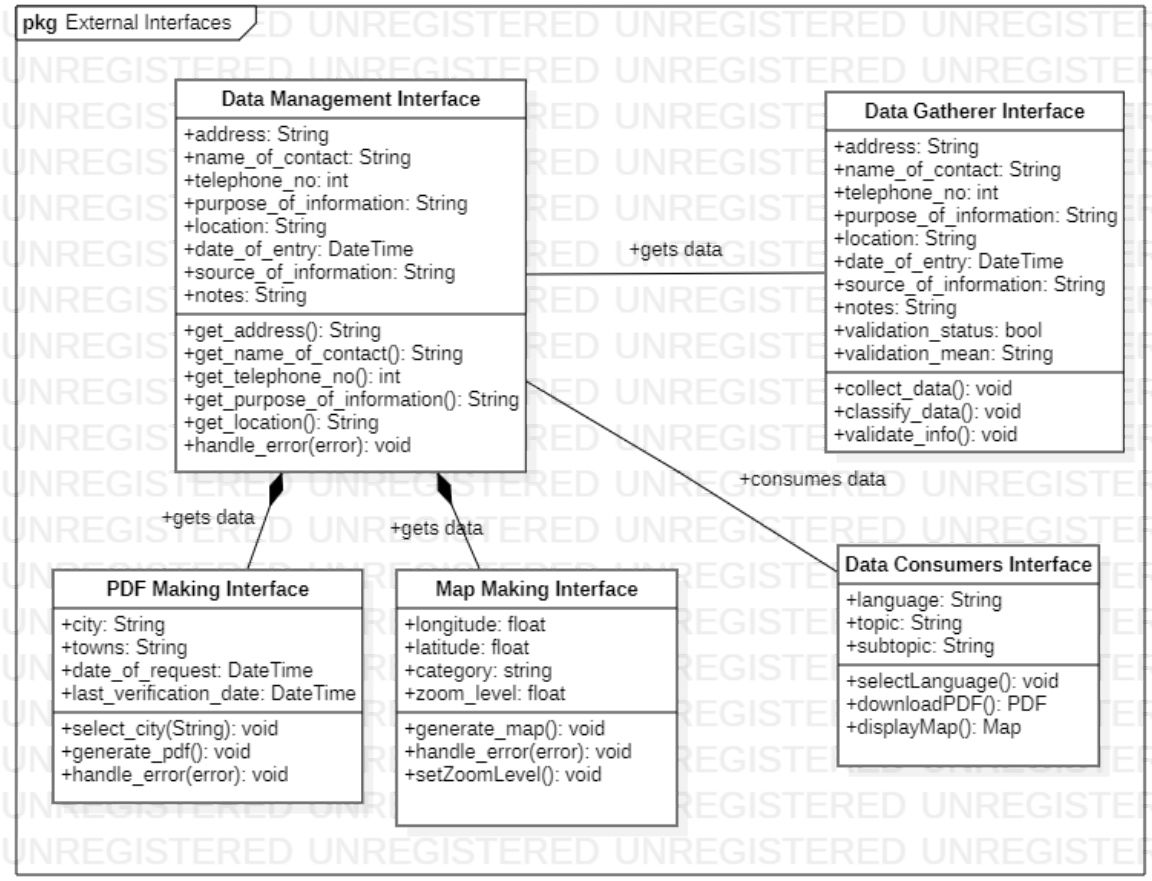

Figure 7: External Interfaces Class Diagram

3.2. Functions

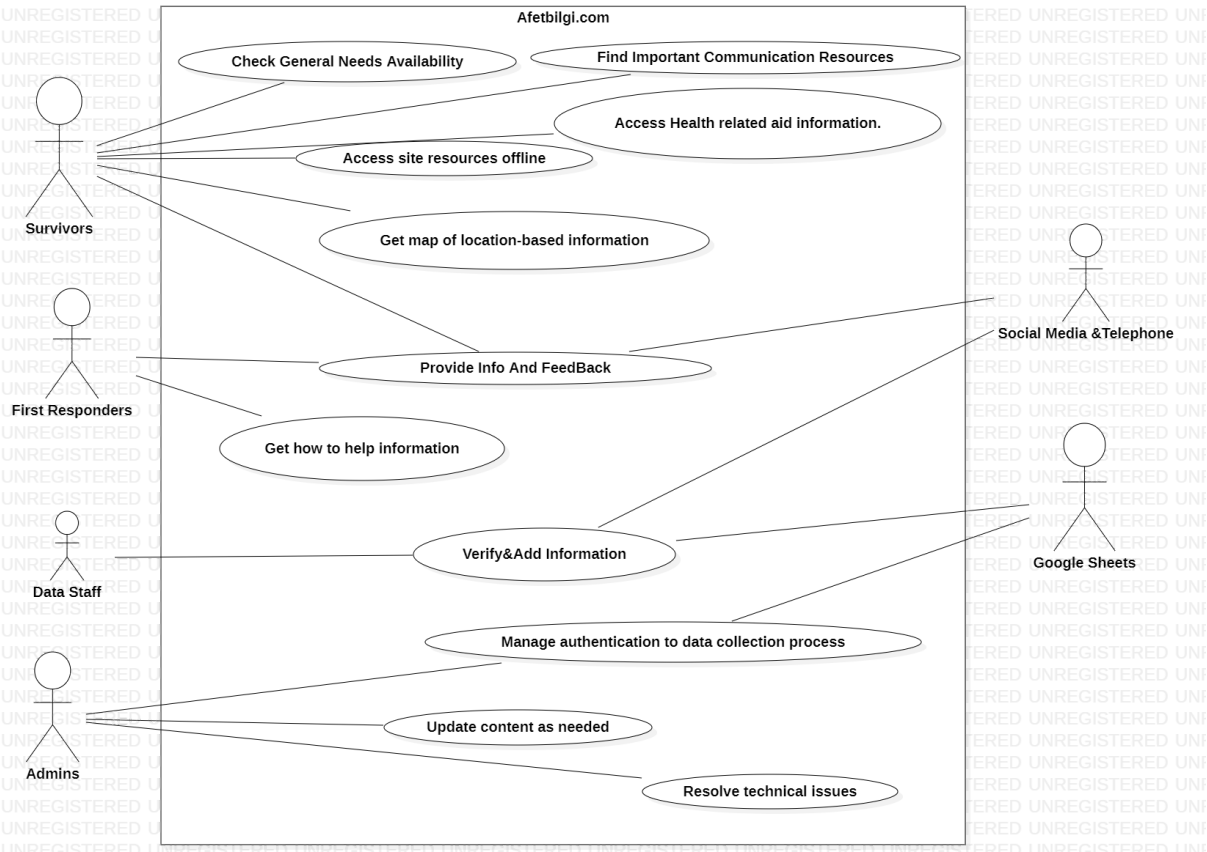

Figure 8: Use Case Model

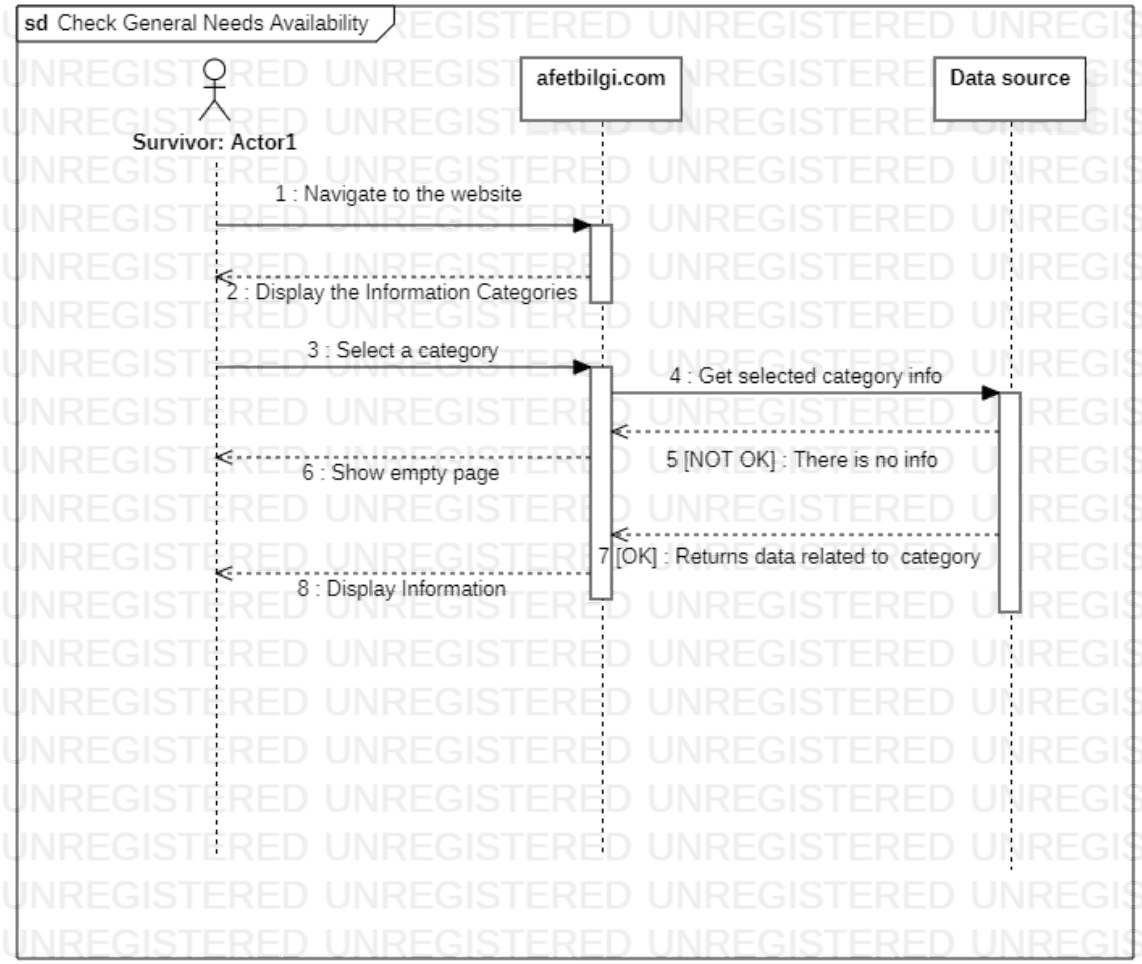

Figure 9: Sequence diagram of ”Check General Needs Availability”

Use case name:	Check General Needs Availability
Actors:	Survivors
Description:	This use case allows survivors to access information about where they can provide their general needs such as food, water, shelter.
Data:	Source of the information, address, content and contact information of the provider.
Preconditions:	The user must either have their device connected to the internet or have downloaded the PDF format of the information on the website.
Stimulus:	The user enters the website to have information on availability of general needs.

Basic Flow:	1. The user navigates to the website. 2. The user selects a category such as food distribution centers. 3. The website displays information related to the selected category, including available resources, locations and if available, contact information. 4. The user can then use the provided information to access the necessary resources.
Alternative Flow:	1. If the user does not have access to the internet, but has previously downloaded the site resources as a PDF, they can continue with the Basic Flow by accessing the downloaded PDF.
Exception Flow:	If the website is down or experiencing technical difficulties, the user will be unable to access the information.
Postconditions:	The survivor receives up to date information on the availability of general needs and can take action accordingly.

Table 2: Check General Needs Availability

Use case name:	Find Important Communication Resources
Actors:	Survivors
Description:	This use case describes how a survivor can find important communication resources available on the website..
Data:	Telephone numbers, names of the persons/organizations and links to government organizations, charities and NGOs.
Preconditions:	The user is required to have internet connection on their device or have already downloaded the information available on the website in PDF format.
Stimulus:	Survivors need to communicate with charities, hospitals and government agencies to access important information and resources such as medical assistance, shelter and basic needs.
Basic Flow:	1. The survivor opens the website. 2. The survivor navigates to the 'Important Resources' section of the website. 3. The survivor looks for the required communication resources which includes crucial phone numbers, useful links and useful articles. 4. The survivor selects the required communication resource.

	5. The survivor accesses the communication resource information.
Alternative Flow:	If the user does not have access to the internet, but has previously downloaded the site resources as a PDF, they can continue with the Basic Flow by accessing the downloaded PDF.
Exception Flow:	If the required communication resource is not available on the website, the survivor may need to try an alternate method to get the required communication information.
Postconditions:	The survivor has access to the required communication resources.

Table 3: Find Important Communication Resources

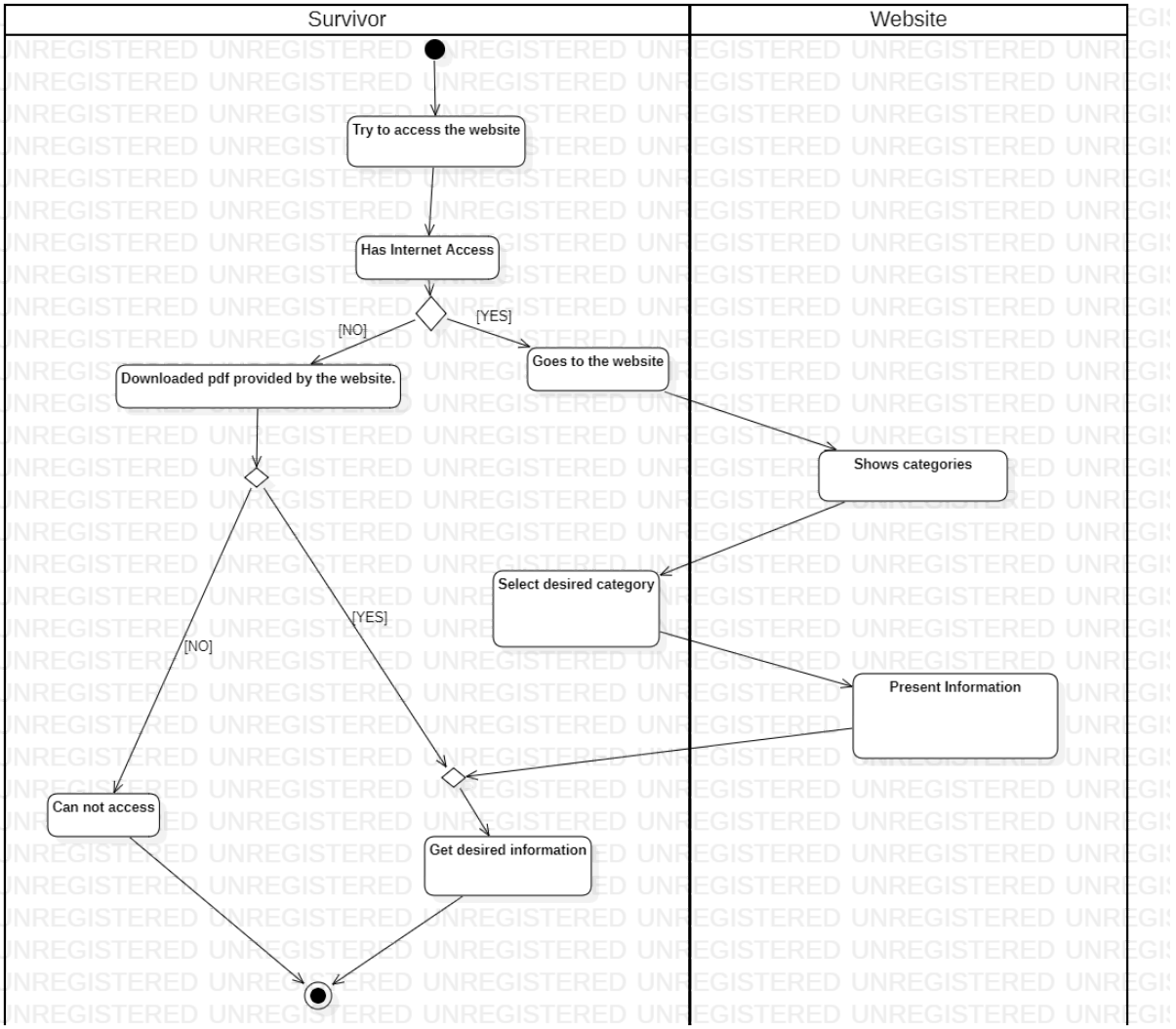

Figure 10: Activity Diagram for Find Health Related Aid Information

Use case name:	Find Health Related Aid Information
Actors:	Survivors
Description:	This use case helps survivors find health related aid information on the website, including hospitals, pharmacies and volunteer veterinarians.
Data:	Names and locations of hospitals and pharmacies, names, telephone numbers and addresses of volunteer veterinarians.
Preconditions:	The user is required to have internet connection on their device or have already downloaded the information available on the website in PDF format.
Stimulus:	The survivor needs to access health related aid information.
Basic Flow:	1. The survivor goes to the Health Services part of the website. 2. The survivor selects the desired category such as hospitals, pharmacies or volunteer veterinarians. 3. The website shows the information related to the selected category, including the names, locations, telephone numbers and capacities of the hospitals and pharmacies and the names and telephone numbers of volunteer veterinarians. 4. The survivor can contact the organization for further information or assistance.
Alternative Flow:	In case the user lacks internet access they can still proceed with the Basic Flow by using the downloaded PDF resources from the website.
Exception Flow:	If the required communication resource is not available on the website, the survivor may need to try an alternate method to get the required communication information.
Postconditions:	The survivor has accessed health related aid information to meet their needs.

Table 4: Find Health Related Aid Information

Use case name:	Provide Info And Feedback
Actors:	Survivors, First Responders
Description:	This use case involves the exchange and validation of aid information for ongoing operations.
Data:	Information related to ongoing aid operations such as aid locations, scope and updates.
Preconditions:	Survivors and first responders must have access to the internet or a telephone.
Stimulus:	Survivors and first responders provide information related to ongoing aid operations.
Basic Flow:	1. Survivor or first responder provides information about ongoing aid operations through social media, Google Forms or telephone. 2. The provided information is validated by the data staff. 3. If the provided information is accurate and relevant, it is presented on the website.
Alternative Flow:	3. If the provided information is not accurate or relevant, it is rejected.
Exception Flow:	If the communication channels are unavailable, the actors cannot provide information or validate information.
Postconditions:	Accurate and relevant information is presented on the website.

Table 5: Provide Info And Feedback

Use case name:	Manage authentication to data collection process
Actors:	Admins
Description:	This use case describes the process of managing authentication for accessing the data collection process on Google Sheets.
Data:	User authentication data, Access logs.
Preconditions:	The admins must have access to the Google Sheets containing the data collection process.

Stimulus:	The admins need to manage the authentication process for accessing the Google Sheets.
Basic Flow:	1. Admin accesses data sheet. 2. Admin approves/rejects user access. 3. The admin saves the changes.
Alternative Flow:	-
Exception Flow:	-
Postconditions:	The access privileges to the Google Sheets containing the data collection process have been updated.

Table 6: Manage authentication to data collection process

Use case name:	Access site resources offline
Actors:	Survivor
Description:	This use case involves the ability for survivors to access resources on the website even if they do not have internet connectivity.
Data:	PDF files containing website resources for selected cities and topics.
Preconditions:	The website must have previously been accessed online and the necessary resources must be downloaded for offline use.
Stimulus:	The survivor has limited or no internet connectivity and needs to access the website resources.
Basic Flow:	1. The user can't reach the website because it has little or no internet connection. 2. User opens the pre downloaded PDF containing resources for selected cities/topics. 3. The user can browse through the PDF file and access the website resources offline.
Alternative Flow:	-
Exception Flow:	If the user has not downloaded the PDF file, they will not be able to access the website resources
Postconditions:	The user has accessed the website resources offline and can utilize the information.

Table 7: Access site resources offline

Use case name:	Get how to help information
Actors:	First Responders
Description:	This use case describes how non survivor users can access information about how to help the survivors.
Data:	Information about how to help survivors, including addresses of donation collection centers, online donation campaign links and other resources.
Preconditions:	The website is accessible and functional.
Stimulus:	Non survivor user wants to learn about ways to help survivors.
Basic Flow:	1. User visits the website. 2. User goes to the "To Help" section. 3. User reads about donating options. 4. User selects desired help option(s).
Alternative Flow:	-
Exception Flow:	If the website is not accessible, the non survivor user cannot access the information about how to help.
Postconditions:	Non survivor users have accessed information about how to help survivors.

Table 8: Get how to help information

Use case name:	Resolve Technical Issues
Actors:	Admins
Description:	Admins identify and troubleshoot technical issues that occur on the website.
Data:	Error logs, website analytics.
Preconditions:	Admins must have access to the website's error logs and know where the technical issues occurred. They should also have the necessary knowledge and tools to resolve the issue.
Stimulus:	An error that affects the user occurs on the website such as a page not loading correctly etc.
Basic Flow:	1. Admin collects information about the issue and its impact.

	2. Admin identifies the root cause of the issue. 3. Admin fixes the issue. 4. Admin informs the team on the result of the error solving process.
Alternative Flow:	-
Exception Flow:	If the admin cannot solve the problem, they demand help from other admins.
Postconditions:	The website is operational and the technical issue has been solved.

Table 9: Resolve Technical Issues

Use case name:	Get map of location based information
Actors:	Survivor / non survivor user
Description:	This use case allows the users to access a map that displays all the location based information of the website such as addresses of hospitals, soup kitchens etc.
Data:	Locations of hospitals, soup kitchens, donation centers etc.
Preconditions:	Device with internet connection.
Stimulus:	The user accesses the website and selects the option to view the map of available resources
Basic Flow:	1. User opens the map of available resources on the website. 2. Website displays a map with icons representing resources based on the location of the resource. 3. User selects an icon to view address, phone number, operating hours etc.
Alternative Flow:	-
Exception Flow:	If website encounters an issue when a user tries to access the map, it displays an error.
Postconditions:	The user can access and use the map to find relevant resources.

Table 10: Get map of location based information

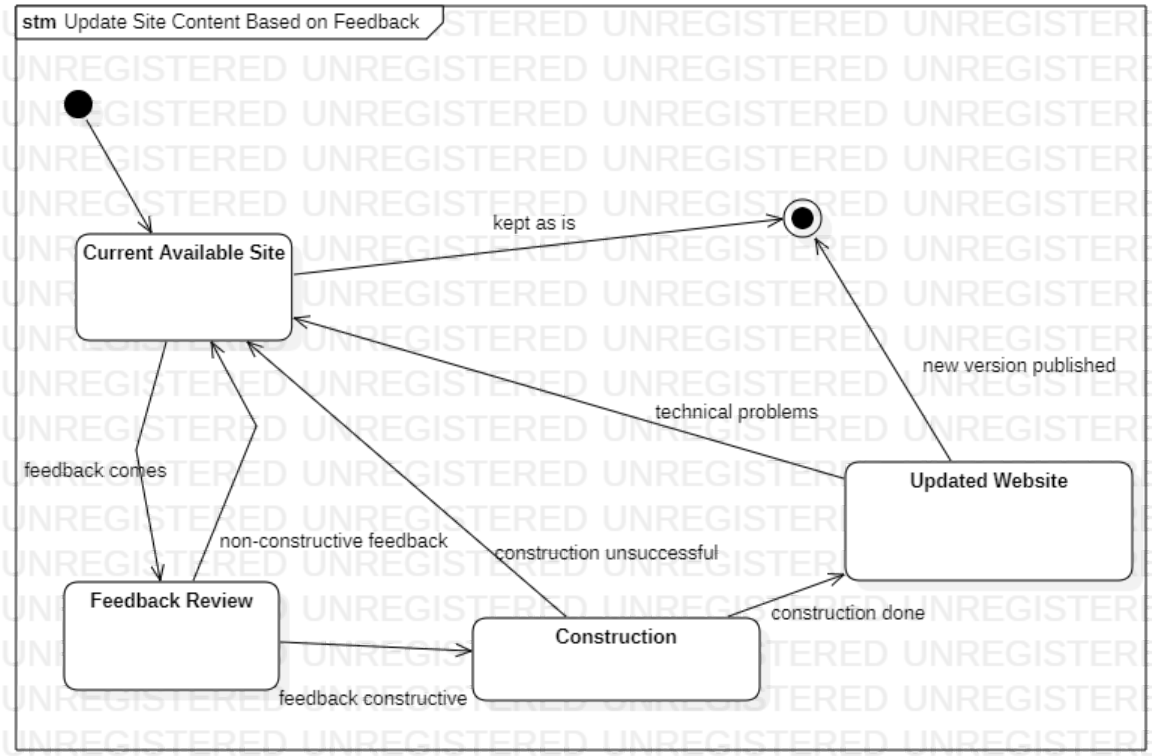

Figure 11: State Diagram for Update Site Content Based on Feedback

Use case name:	Update Site Content Based on Feedback
Actors:	Admins and Users
Description:	This use case involves an admin updating the website based on earthquake affected region feedback.
Data:	Feedback from people living in regions affected by the earthquake, website content.
Preconditions:	The admin has access to the website's content management system and has received feedback from people living in regions affected by the earthquake.
Stimulus:	Feedback is received from people living in regions affected by the earthquake indicating necessary changes to the website such as

	addition of new topics and functionalities.
Basic Flow:	1. The admin reviews the feedback. 2. The admin updates the website content to address the identified issues. 3. The updated version is published
Alternative Flow:	-
Exception Flow:	If there are issues with the updated version, the admin may need to revert to a previous version of the website.
Postconditions:	The website content is updated to address the identified issues based on feedback from people living in regions affected by the earthquake.

Table 11: Update Site Content Based on Feedback

Use case name:	Add&Verify information
Actors:	Data Staff
Description:	This use case involves adding and verifying disaster aid information obtained through social media, email or phone.
Data:	Disaster aid services information
Preconditions:	The data staff has access to the cold database and communication channels for social media, telephone etc.
Stimulus:	Data staff receive disaster aid services information through social media, email or phone.
Basic Flow:	1. Data staff adds the received information to the cold database. 2. Staff verifies the added information by checking the authenticity of the source through social media, email or phone. 3. If the information is verified, staff adds it to the hot database to be displayed on the website.
Alternative Flow:	-
Exception Flow:	If the information cannot be verified it is not added to the hot database and is removed from the cold database.
Postconditions:	The verified information is added to the hot database for website display.

Table 12: Add&Verify information

3.3. Usability Requirements:

- The system shall be easy to use for users to ensure that users of all levels of experience can use the system effectively and efficiently.

- The system shall provide clear and concise information to the user to ensure that users can easily understand the information presented on the system.

- The system shall be accessible to users with disabilities for making sure that users with disabilities are not excluded from using the system

- The system shall present accurate and reliable information in order to prevent harm that could arise from users making decisions based on inaccurate or unreliable information.

- The system shall be adaptable to different user demographics to respond accurately to the multicultural demographic conditions of the disaster region.

3.4. Performance Requirements:

- The system shall be able to support up to 10000 simultaneous users given that an area with a population of 12 million is effected.

- The system shall be able to provide search results within a maximum of 5 seconds to ensure that users can quickly find the information they need.

- The map function shall be able to display all the markers on the map in less than 5 seconds, even under peak workload conditions.

- PDF creation shall take no longer than 5 seconds to ensure efficient and timely creation of documents for users given the intermittent internet access in the region.

3.5. Logical Database Requirements:

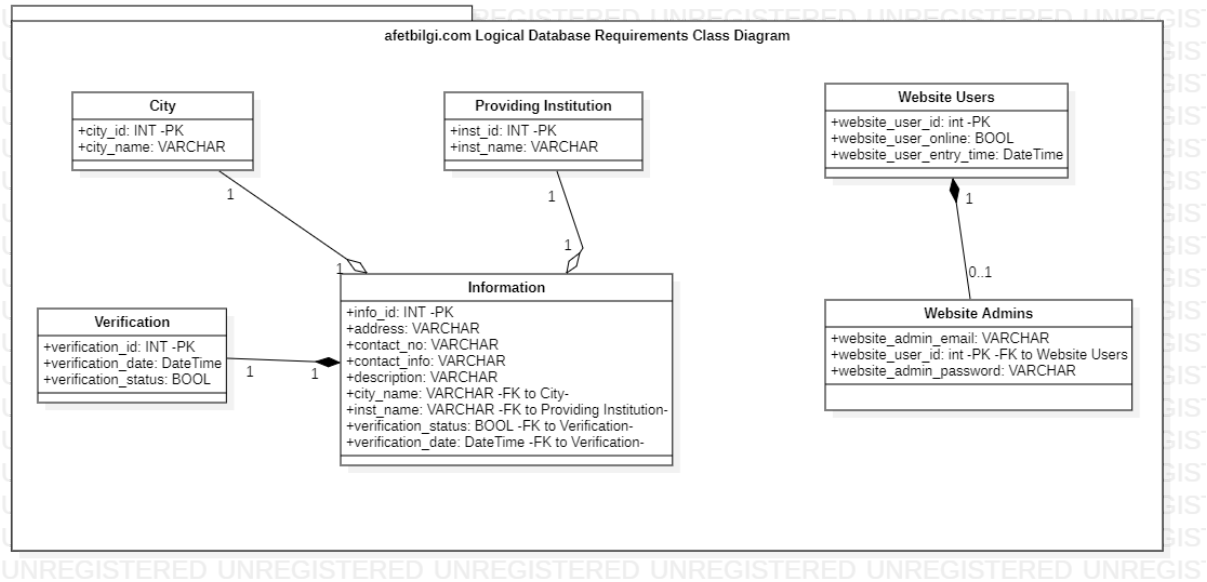

Figure 12: Logical Database Requirements Class Diagram

- The City table stores information about cities, including their unique city_id and city_name.

- The Providing Institution table stores information about institutions and has an inst_id field as the primary key, it also has a inst_name field.

- The Verification table has a verification_id field as the primary key, a verificaiton_date field to keep the time that the information is verified and a verificaition_status field to indicate whether or not the info is verified.

- The Information table is the table that stores the various information presented on the website. It includes the address, contact number, contact name, description, responsible institution, verification status and verification date of the information. Also it uses the info_id field as the primary key.

- The Information table has a foreign key to the City,Providing Institution and Verification table to link the information to their respective cities,responsible institution and the verification status of the information.

- Website Users table keeps the information on the users of the website.The website_user_id is a unique id given to each user on their visit and the table uses it as the primary key. The table also stores the connection condition of the user in website_user_online field and the time of the connection in website_user_entry_time field.
- Website admins stores the information on the admins of the site. It has a foreign key to the Website Users table for the website_user_id field and it uses this field as the

primary key. It also stores the email information of the admin in the website_admin_email field and stores the password of the admin in the website_admin_password field. Both of these fields can not be NULL.

3.6. Design Constraints:

- **Accuracy of information**: The website is under obligation to provide accurate and reliable information to its user. Providing false information can lead serious consequences such as legal liability or even harm to users..

- **Privacy concerns:** The website shall ensure that the personal information of its information collection/validation sources are protected.

- **Website security:** The website shall have security measures to protect against cyber attacks and unauthorized access to data sources such as regular security updates and data entry authentication.

3.7. System Attributes:

a)Reliability:

- The system shall handle high traffic volumes and maintain a fast response time.

- The data operation shall ensure high accuracy and reliability of data, as errors in data entry could have significant impacts on survivors.

b)Availability:

- The system shall be available 24/7 without any planned maintenance etc.

- If a failure or an error occurs, the website shall recover rapidly.

- Admins will be accountable for addressing critical failures, however the system shall be capable of withstanding minor failures and maintaining primary operations.

c)Security:

- Access to the website's administrative functions must be restricted to authorized personnel only.

- The website shall use HTTPS protocol to ensure secure communication between clients and the server.

- The website shall have mechanisms in place to detect and prevent unauthorized access to the database

d)Maintainability:

- The website shall provide comprehensive error messages to help Admins to resolve issues faster.

- The software architecture shall be designed to minimize code complexity and dependencies to facilitate easier maintenance.

e)Portability:

- The website shall be designed using web standards, i.e HTML, CSS and JavaScript to provide compatibility across different web browsers.

- The website must use open source software as much as possible to facilitate portability.

3.8. Supporting Information:

Afetbilgi.com is fully a community effort that has the sole goal of helping the ones affected by the earthquakes as much as possible. The system as of today lacks many functionalities and is useful in a limited way however given the dire circumstances that the website was built in, it realizes its reason for existence in a dutiful manner.

4. Suggestions to improve the existing system.

4.1. System Perspective:

Afetbilgi.com is a disaster aid information website that offers various services to survivors. Survivors can communicate on the forum site, post their services on the offered services page, report their urgent needs and access up to date information about tent cities.The website is in symbiotic relationships with other services and products in its fundamental architecture but it is not a part of a larger system. Data gatherers and validators use various methods to collect and verify information which is then stored in a Google Sheet and used as the source of the website's data bucket. The website uses AWS for its data bucket and Vercel for hosting. The website is accessible from any web browser on the HTTP/HTTPS protocol.

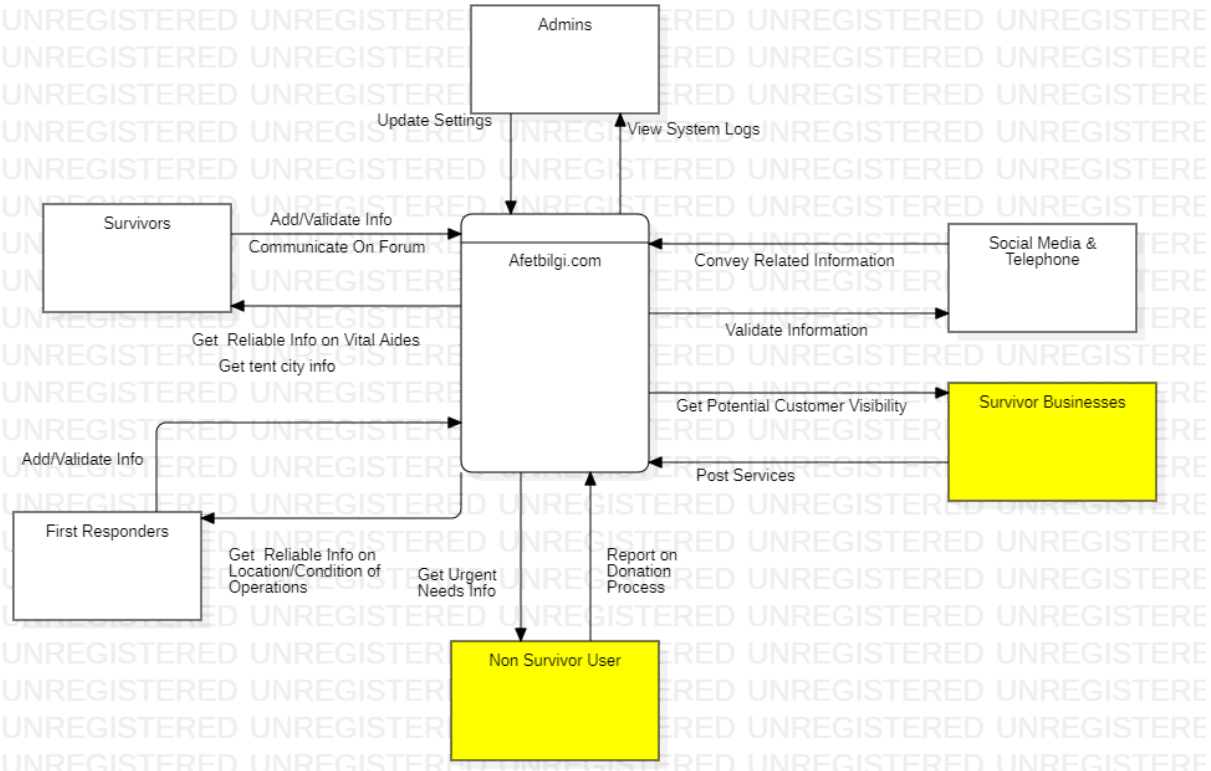

Figure 13: Context Diagram (Suggested)

4.3.1.1. System Interfaces:

In addition to the system interfaces described in section 1.3.1.1, afetbilgi.com has:

Forum Management Interface: The Forum Management Interface is a system interface that handles back end operations related to the forum feature. It manages the registration process and post and comment creation. It includes functionality for managing user accounts and permissions, moderating content and monitoring user activity.

4.3.1.2. User Interfaces:

In addition to the user interfaces described in section 1.3.1.2, afetbilgi.com has:

User Forum Interface: The website provides a web based user forum app where survivors can create posts, interact with other survivors and discuss topics related to the conditions of tent cities, possible improvement suggestions etc. The forum also includes a reporting system where users can flag inappropriate content for review by the system administrators.

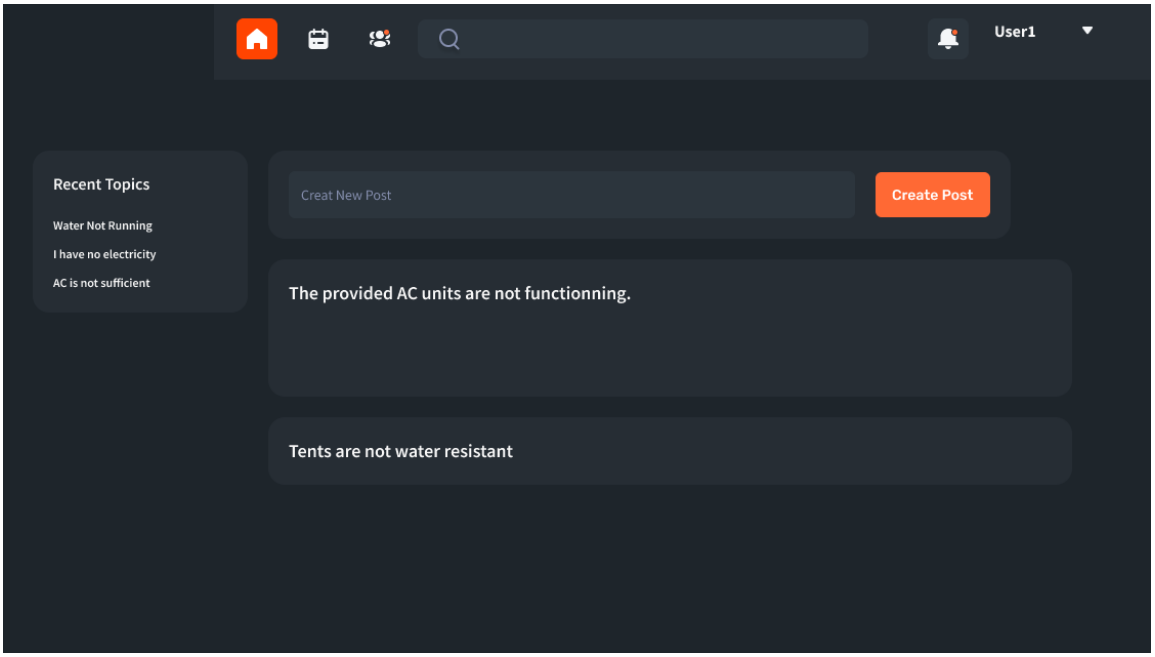

Figure 14: A Demo Of User Forum Interface

Post/Get Service Interface: This interface allows survivors to post the services offered by their active businesses. Non survivor users can search the list of available services and get information such as service description and contact information for each business to do business.

Contact Interface: The system provides a contact form through which users can communicate directly with the admins to add information to the website rather than using various social media sources like mail,Twitter etc. The contact form includes fields for the user to provide their name, email address and a message about the information. Users can use this interface to report urgent needs, post services and provide up to date information on aid operations.

4.3.1.3. Software Interfaces:

In addition to the user interfaces described in section 1.3.1.3, afetbilgi.com has:

Authentication provider: To implement the forum functionalities on afetbilgi.com, an authentication provider is required to ensure secure user authentication. While the website can develop its own authentication system, it may be more efficient to use an external

provider for swifter implementation. Popular authentication providers such as Firebase, OAuth or other similar services can be used to implement a secure and reliable authentication system.

Forum Database Provider: In order to store forum related data, Afetbilgi.com requires a more scalable database provider than its current data bucket solution. The forum database will store all the user information and forum related data. Afetbilgi.com can consider MySQL, MongoDB etc.

4.3.1.4. Communications Interfaces:

Afetbilgi.com uses the HTTP/HTTPS protocol to enable communication between its server and end user devices. The HTTP is used for transferring data between servers and browsers whereas the HTTPS provides security through encryption.

4.3.1.5. Memory Constraints:

Since Afetbilgi.com primarily serves as a provider of memory wise light yet important information, it does not face major memory constraints. This allows the website to function efficiently and provide a smooth user experience.

4.3.1.6. Operations:

Survivors:

- Check General Needs Availabilitydata staff
- Find Important Communication Resources
- Access Health related aid information
- Access site offline
- Get map of location based information
- Provide Info And FeedBack
- Get tent city related Information
- Report Urgent Needs
- Post Services on Functioning Local Businesses Page
- Use forum to express opinions on tent cities

First Responders:

- Provide Info And FeedBack
- Get how to help information

Data Staff:

- Verify&Add Information

Admins:

- Manage authentication to data collection process
- Update content as needed
- Resolve technical issues

Non Survivor Users:

- Get info from the directory of local businesses

4.2. External Interfaces:

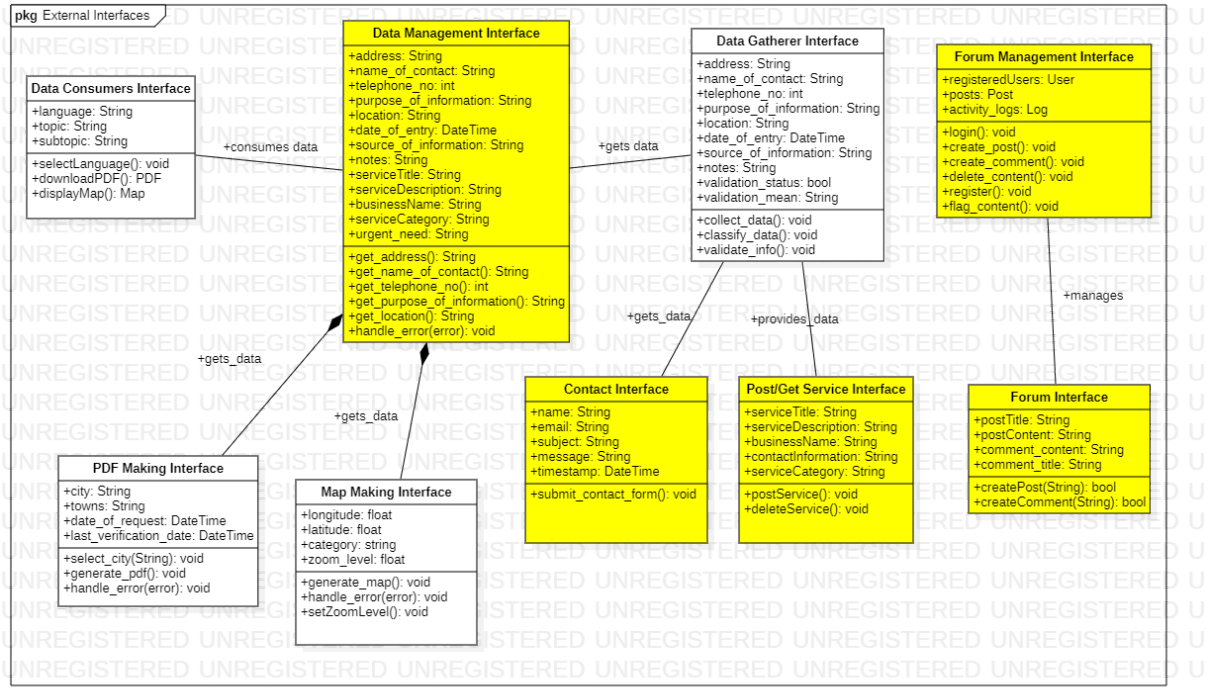

Figure 15: External Interfaces Class Diagram (Suggested)

4.3. Functions:

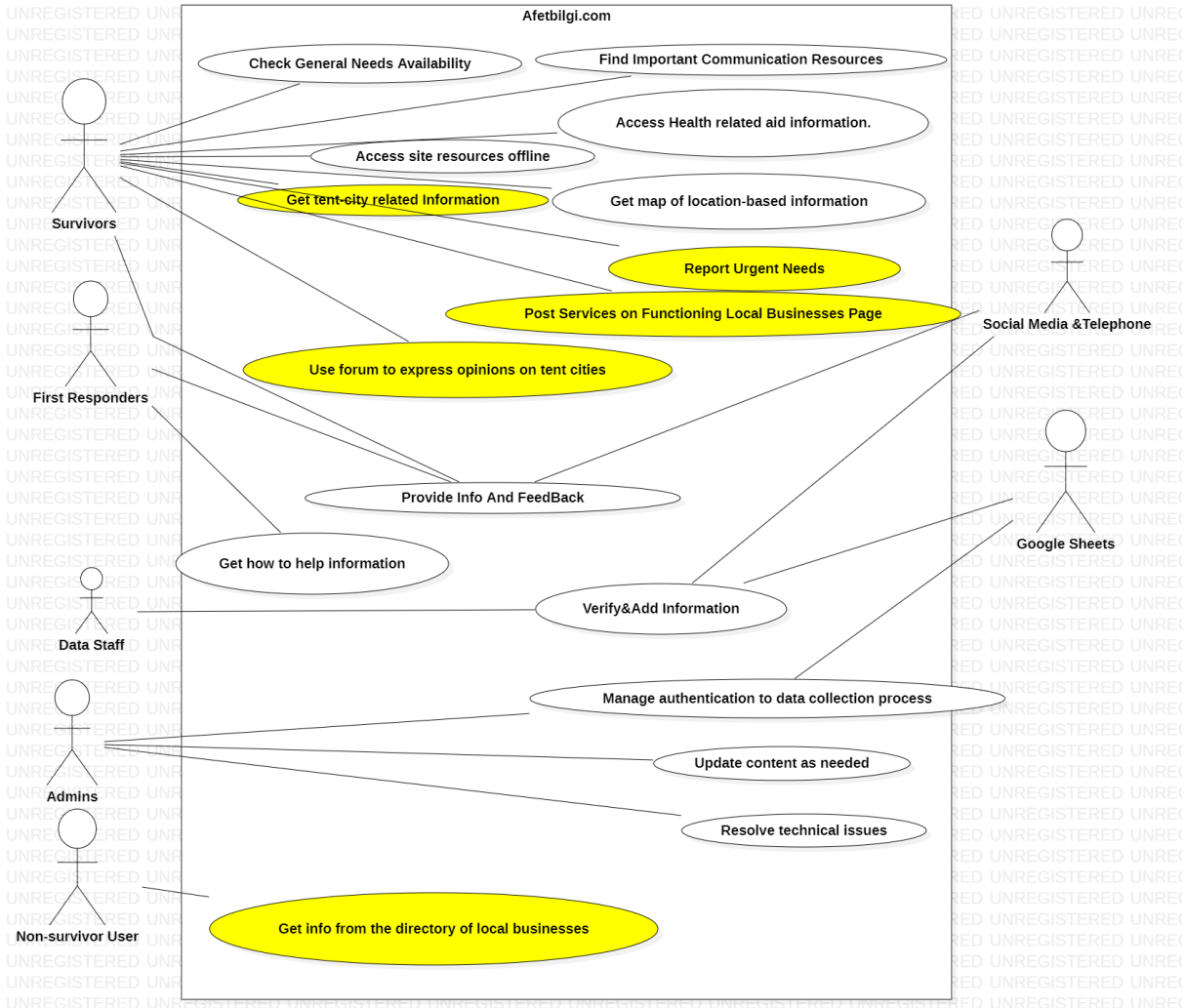

Figure 16: Use Case Model (Suggested)

Use case name:	Get tent city related Information
Actors:	Survivors
Description:	This use case helps tent city residents to access information related to tent cities.
Data:	Tent city responsible contact numbers, soup kitchen menus, daily events etc.
Preconditions:	The user is required to have internet connection on their device or have already downloaded the information available on the website in PDF format.
Stimulus:	The survivor wants to access information related to tent cities.
Basic Flow:	1. The survivor enters the afetbilgi.com website.

	2. The survivor selects the Tent City Info section of the website. 3. The website displays a list of available tent cities. 4. The survivor selects the relevant tent city from the list. 5. The website displays the relevant information about the tent city.
Alternative Flow:	-
Exception Flow:	If the required communication resource is not available on the website, the survivor may need to try an alternate method to get the information.
Postconditions:	The survivor is able to access the information related to the selected tent city.

Table 13: Get tent city related Information

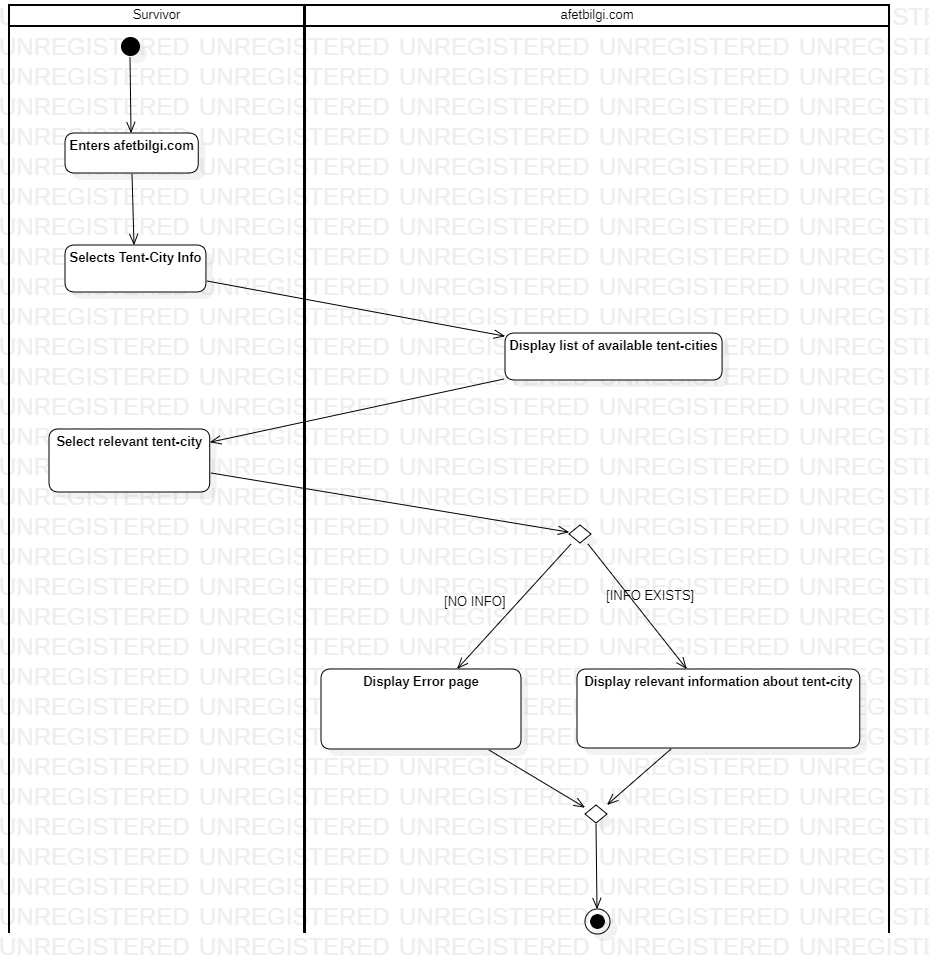

Figure 17: Activity Diagram of "Get tent city related Information"

Use case name:	Report Urgent Needs
Actors:	Survivors
Description:	Survivor informs afetbilgi.com staff about their needs which are added to the database and made visible on the website for authorities, charities and volunteers to provide the necessary items.
Data:	Name of survivor, location of the survivor, name and quantity of the needed item, urgency level.
Preconditions:	The survivor must have access to afetbilgi.com.
Stimulus:	The survivor needs a certain object that he/she can not procure from anywhere in the disaster zone.
Basic Flow:	1. The survivor enters afetbilgi.com and selects the "Inform Urgent Needs" section. 2. The survivor provides their name, location, name and quantity of the needed item and urgency level to the data staff member through the website. 3. The data staff member enters the necessary information into the database. 4. The website presents the urgent needs information on a page accessible to authorities, charities and volunteers.
Alternative Flow:	-
Exception Flow:	If the necessary information is missing/unclear ,the data staff member will ask for clarification and additional information.
Postconditions:	The necessary information is presented on the website and authorities, charities and volunteers can provide the necessary item to the survivor.

Table 14: Report Urgent Needs

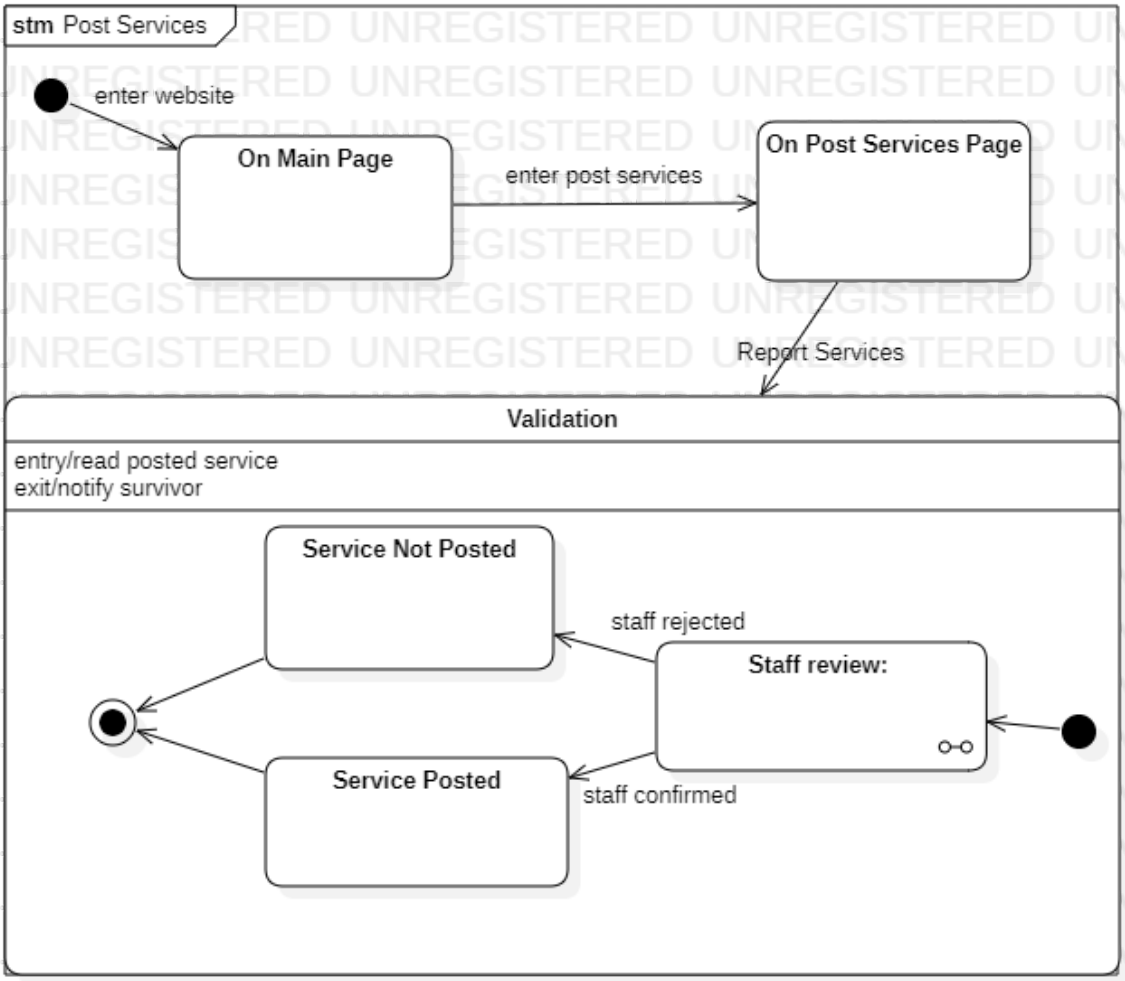

Figure 18: State Diagram of "Post Services on Functioning Local Businesses Page"

Use case name:	Post Services on Functioning Local Businesses Page
Actors:	Survivors
Description:	This use case involves a survivor posting about their services on the functioning local businesses page of afetbilgi.com. The data staff member verifies the legitimacy of the service and adds it to the database.
Data:	Service information, survivor name, business name.
Preconditions:	The survivor must have a functioning local business providing services that they wish to post on the website.
Stimulus:	Survivor request to post their service on the functioning local

	businesses page of afetbilgi.com to compensate for the weakened economic activity in the disaster zone.
Basic Flow:	1. Survivor enters afetbilgi.com and navigates to the functioning local businesses page. 2. Survivor selects the "Post Service" option and enters their service information and name. 3. Data staff member receives the service information and verifies its legitimacy. 4. Data staff member posts the service information on the functioning local businesses page.
Alternative Flow:	-
Exception Flow:	If the service information is not legitimate, the data staff member informs the survivor that their service cannot be posted.
Postconditions:	The survivor's service information is posted on the functioning local businesses page for the website visitors to see.

Table 15: Post Services on Functioning Local Businesses Page

Use case name:	Get info from the directory of local businesses
Actors:	Non survivor user
Description:	This use case involves a non survivor user accessing the directory of local businesses that are still operational to support the local economy.
Data:	Service information, survivor name, business name.
Preconditions:	The user has access to the internet and knows how to navigate afetbilgi.com.
Stimulus:	The user wants to support the local economy by purchasing goods or services from businesses that are still operational after the disaster.
Basic Flow:	1. The user goes to afetbilgi.com and navigates to the directory of local businesses. 2. The user searches for businesses based on their location and the type of goods or services they provide. 3. The user selects a business from the search results and views their contact information and other details. 4. The user contacts the business to purchase goods or services.
Alternative Flow:	-

Exception Flow:	-
Postconditions:	The user has found and contacted a local business to purchase goods or services, supporting the local economy.

Table 16: Get info from the directory of local businesses

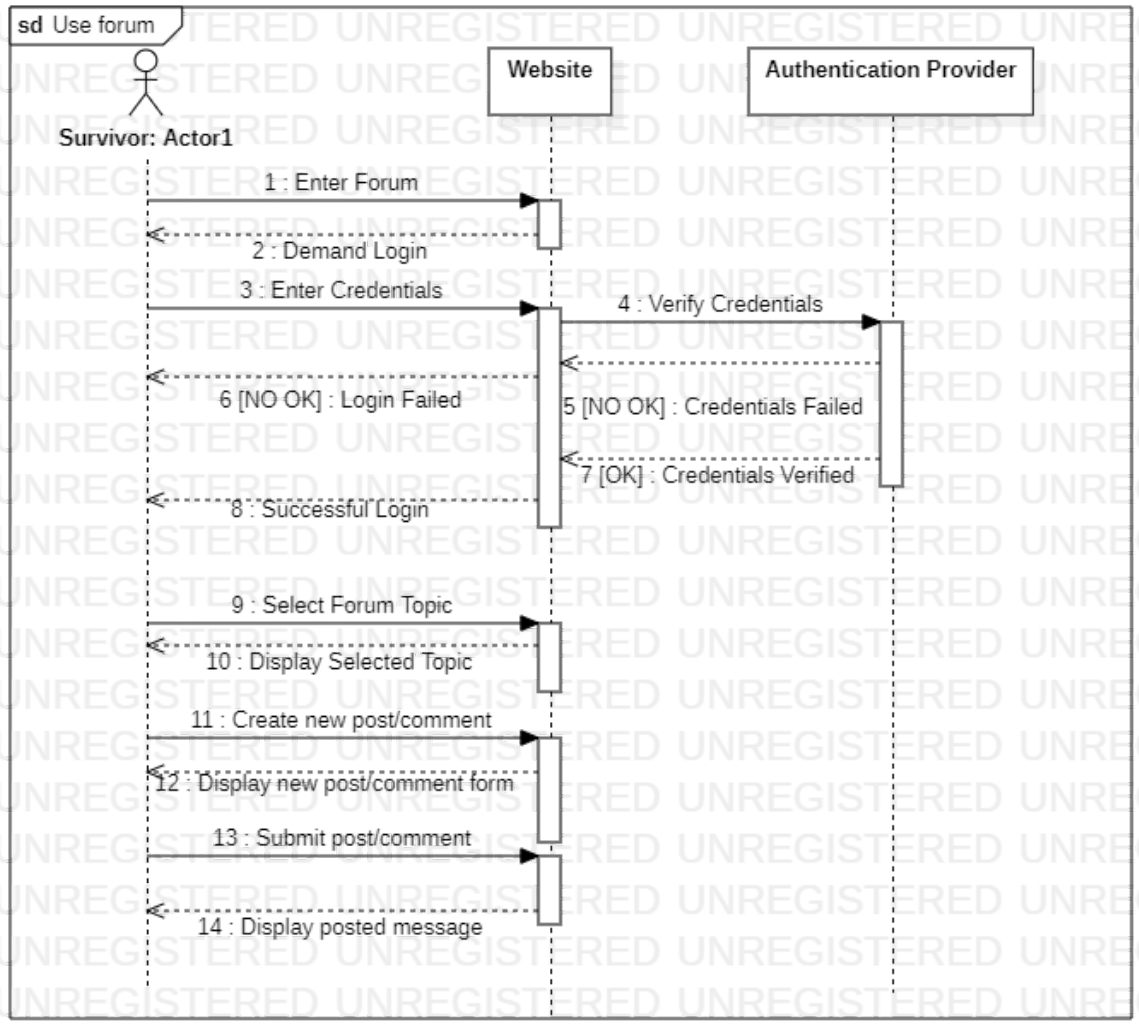

Figure 19: Sequence Diagram of "Use forum to express opinions on tent cities"

Use case name:	Use forum to express opinions on tent cities
Actors:	survivor
Description:	This use case involves the survivor using afetbilgi.com/forum to express their opinions on the problems and daily lives in the tent cities.

Data:	Forum posts, replies and user information.
Preconditions:	The survivor must have access to the internet and an account on afetbilgi.com/forum.
Stimulus:	The survivor wants to share their opinions on the problems and daily lives in the tent cities.
Basic Flow:	1. The survivor navigates to the forum section of the website. 2. The survivor logs in to their account on afetbilgi.com/forum. 3. The survivor creates a new post or replies to an existing post. 4. The survivor submits their post/reply.
Alternative Flow:	-
Exception Flow:	If a post contains inappropriate words, admins are notified and they delete it.
Postconditions:	The survivor's post/reply is added to the forum and can be viewed by other users.

Table 17: Use forum to express opinions on tent cities

4.4. Usability Requirements:

In addition to the usability requirements indicated in section 3.3, afetbilgi.com must have:

- The forum section should provide users with clear and simple instructions on how to post and access information to increase contribution.

- The services posting section of the website must provide clear and concise definitions of the scope and limitations of the offered services, goods and products in order to avoid misunderstandings and ensure that users can make informed decisions.

4.5. Performance Requirements:

In addition to the performance requirements indicated in section 3.4, afetbilgi.com must have:

- The forum section of afetbilgi.com shall load posts and comments within a maximum of 3 seconds to provide a smooth user experience.

- Given that 2.5 million people are currently living in tent cities, the system shall handle at least 10000 posts and 100000 comments per day to accommodate high traffic and usage.

4.6. Logical Database Requirements:

In addition to the logical database requirements given in section 3.5, afetbilgi.com must include database requirements for the forum functionality following the diagram below,

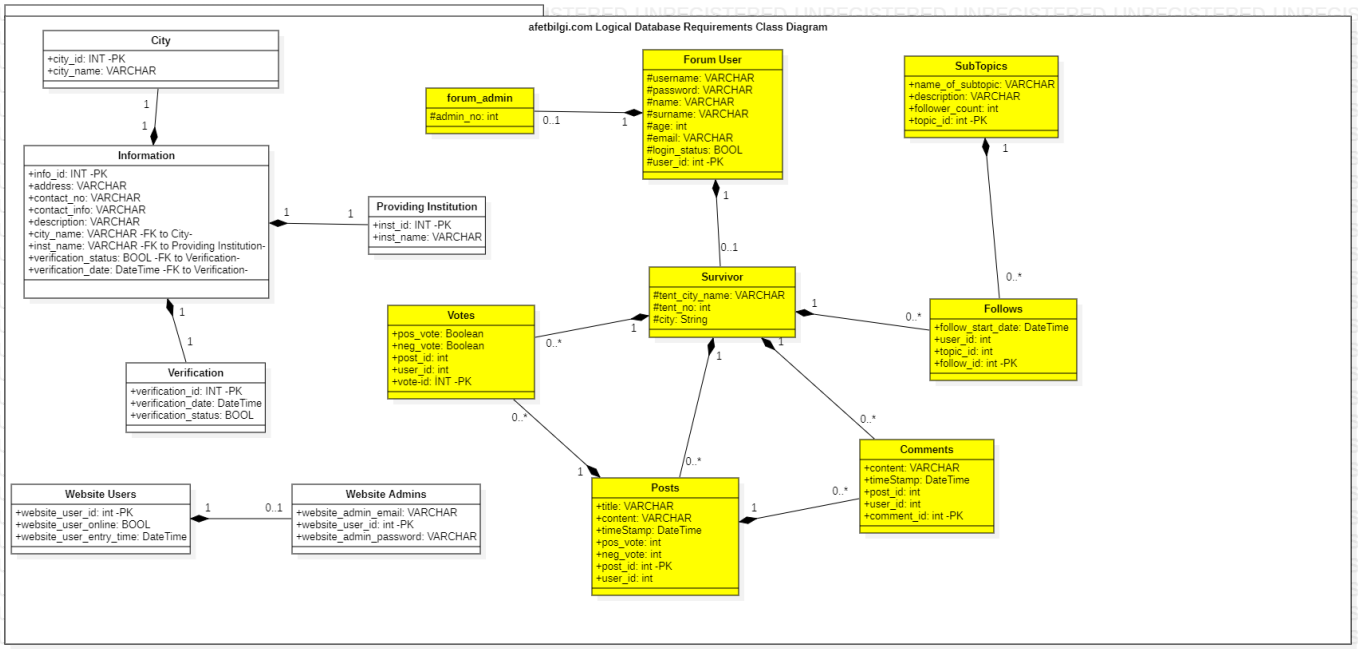

Figure 20: Logical Database Requirements Class Diagram(Suggested)

- When a user registers on the website, a new entry is created in the User table and Survivor or admin table depending on their status.
- Users may change their information, except for their user ID.
- An email address cannot be used by more than one user.
- When a user creates a new post or comment, a new entry is created in the Posts or Comments table, respectively. The post or comment is linked to the user who created it through a foreign key.

- The Posts and Comments tables are weak entities because they cannot exist without the Survivor table. They are in a many to one relationship with the Survivor table because each user can create many posts and comments, but each post and comment must belong to only one user.

- When a user votes on a post a new entry is created in the Votes table. The vote is linked to the survivor who voted and to the related post through foreign keys.

- The Votes table is a weak entity because it cannot exist without the Survivor table.

- The Subtopics table is in a many to many relationship with the Follows table. This means that many subtopics can be followed by many users.

- The Follows table is a weak entity because it cannot exist without the Survivor table.

- The user_id, post_id, comment_id, subtopic_id and admin_no fields are all unique identifiers for their respective tables. Also they can not be null.

4.7. Design Constraints:

In addition to the design constraints given in section 3.6, afetbilgi.com must have following constraints,

- Forum section user privacy constraints: afetbilgi.com must comply with the General Data Protection Regulation (GDPR) in terms of collecting, storing and processing personal data of the users of the forum section.

- Accessibility:Design of afetbdilgi.com/forum must follow the Web Content Accessibility Guidelines (WCAG) to ensure that people from different demographics can use the forum section.

4.8. System Attributes:

a)Reliability:

- The system should be able to handle high traffic volumes and maintain a fast response time.

- The data operation must ensure high accuracy and reliability of data, as errors in data entry could have significant impacts on survivors.

b)Availability:

- The system should be available 24/7 without any planned maintenance etc.

- If a failure or an error occurs, the website should recover rapidly.

- Admins will be accountable for addressing critical failures, however the system should be capable of withstanding minor failures and maintaining primary operations.

c)Security:

- Access to the website's administrative functions must be restricted to authorized personnel only.

- The website should use HTTPS protocol to ensure secure communication between clients and the server.

- The website should have mechanisms in place to detect and prevent unauthorized access to the database.

- The website should prioritize the data and information security of the forum users.

d)Maintainability:

- The website must provide comprehensive error messages to help Admins to resolve issues faster.

- The software architecture shall be designed to minimize code complexity and dependencies to facilitate easier maintenance.

e)Portability:

- The website must be designed using web standards, i.e HTML, CSS and JavaScript to provide compatibility across different web browsers.

- The website must use open source software as much as possible to facilitate portability.

4.9. Supporting Information:

Once these suggested modifications are put into service, afetbilgi.com will become more of a community communication application rather than information presenting service, which is an adequate necessity for the post disaster era of disaster management process.