



Software Requirements Specification

afetbilgi.com

Group 1

Emirhan Oğul 2580777
Mehmet Rüçhan Yavuzdemir 2522159

24.04.2023

Table of Contents

1	Introduction	1
1.1	Purpose of The System	1
1.2	Scope	1
1.3	System Overview	1
1.3.1	System Perspective	1
1.3.1.1	System Interfaces	2
1.3.1.2	User Interfaces	3
1.3.1.3	Hardware Interfaces	8
1.3.1.4	Software Interfaces	8
1.3.1.5	Communication Interfaces	9
1.3.1.6	Memory Constraints	9
1.3.1.7	Operations	9
1.3.2	System Functions	10
1.3.3	Stakeholder Characteristics	10
1.3.4	Limitations	11
1.4	Definitions	12
2	References	13
3	Specific Requirements	14
3.1	External Interfaces	14
3.2	Functions	15
3.3	Usability Requirements	34
3.4	Performance Requirements	35
3.5	Logical Database Requirements	35
3.6	Design Constraints	35
3.7	System Attributes	36
3.7.1	Reliability	36
3.7.2	Availability	36
3.7.3	Security	36
3.7.4	Maintainability	36
3.7.5	Portability	36
3.8	Supporting Information	36
4	Suggestions to improve the existing system	37
4.1	System Perspective	37
4.2	External Interfaces	38

4.3	Functions	40
4.4	Usability Requirements	48
4.5	Performance Requirements	48
4.6	Logical Database Requirements	49
4.7	Design Constraints	50
4.8	System Attributes	50
4.8.1	Reliability	50
4.8.2	Availability	50
4.8.3	Security	50
4.8.4	Maintainability	50
4.8.5	Portability	50
4.9	Supporting Information	51
5	Appendices	52
5.1	Assumptions and Dependencies	52
5.2	Acronyms and Abbreviations	52

List of Figures

1	Context Diagram	2
2	End User Topic Selection Interface	3
3	Information List Interface	4
4	PDF Creation Screen	5
5	Output PDF	6
6	Google Maps Interface	7
7	Google Docs Interface	8
8	External Interfaces Class Diagram	14
9	Use Case Diagram	15
10	Select General Needs Activity Diagram	22
11	View Map State Diagram	29
12	Convert to PDF Sequence Diagram	34
13	Logical Database Diagram	35
14	Context Diagram	38
15	External Interfaces	39
16	Use Case Diagram	40
17	Chat with Chatbot Sequence Diagram	42
18	Contact Admins via WhatsApp Activity Diagram	45
19	Display News Feed State Diagram	48
20	Logical Database Requirements	49

List of Tables

1	System functions	10
2	Definitions	12
3	View important phone numbers	16
4	View useful links	17
5	View useful articles	18
6	Change UI Language	19
7	Contact with admins	20
8	Select general needs	21
9	Select health service	23
10	Add verified information	24
11	Remove outdated information	25
12	Select address	26
13	View selected topic	27
14	View map	28
15	View source	30
16	View details	31
17	View contacts	32
18	Convert to PDF	33
19	Chat with Chatbot	41
20	Change UI Theme	43
21	Contact admins via WhatsApp	44
22	Convert to PDF	46
23	Display News Feed	47

Chapter 1

Introduction

1.1 Purpose of The System

The purpose of this system is to provide reliable and validated information in the fight against the Pazarcık Earthquake on 6 February 2023, to both disaster victims and those who want to help. It aims to prevent the spread of misinformation thanks to its completely human-made database which is accurate, user-friendly, fast, and simple.

1.2 Scope

The main scope of afetbilgi.com is that view reliable information split into various interfaces like topic selection interface, information list, Google Maps, and PDFs.

- The system will maintain a human-made, reliable, and trusted database to persist information about the earthquake.
- The system will have a map service where you can filter and see the places of temporary accommodation places, food distribution centers, active hospitals, container pharmacies, evacuation points, safe gathering places, veterinarians, and charity collection centers.
- The system will have a PDF conversion service where you can select any city and get the appropriate information on natural disasters in that area.
- The system will utilize Google Docs to keep the information in a easy to understand and structured manner.

1.3 System Overview

1.3.1 System Perspective

afetbilgi.com is not a large system itself. It is an intermediate layer between trusted sources and end users. However, it interacts with lots of systems and APIs such as Google Maps, Google Docs, AWS for backing data up, Cloudflare for CDN and caching, PDF Conversion service, and so on. The functionalities and use cases of those systems and APIs will be explained later in this document.

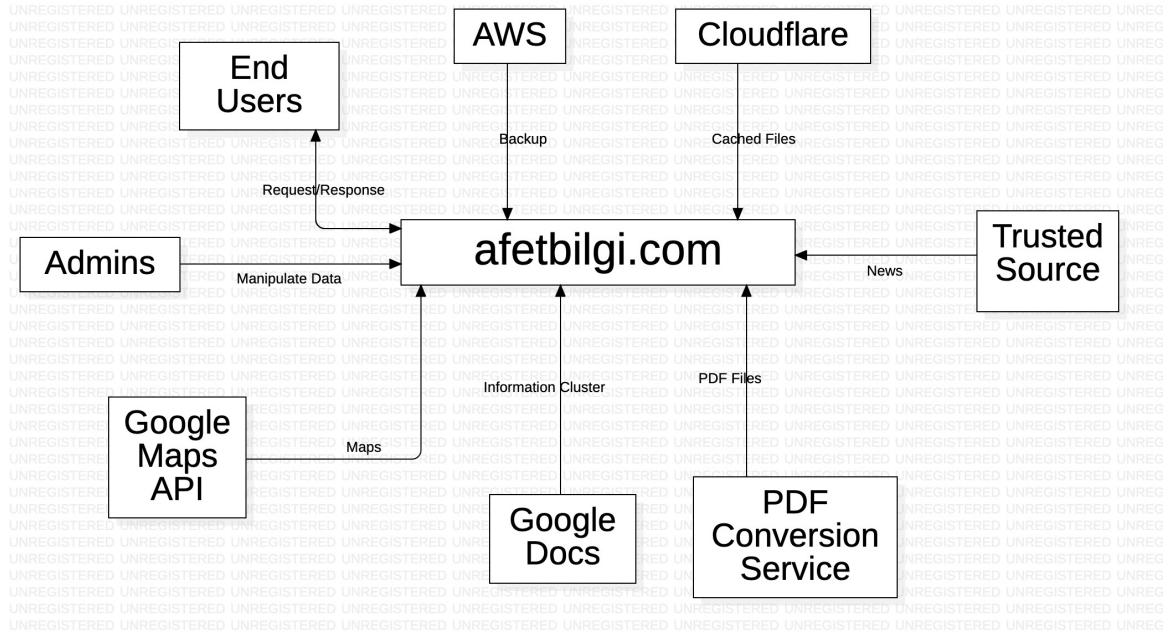


Figure 1: Context Diagram

1.3.1.1 System Interfaces

Google Maps API: This API is used to search and filter useful locations such as accommodation, food distribution centers, active hospitals, veterinarians, gas stations, evacuation points, and emergency gathering places in Turkey's map. The users should consent to share their location with the API.

PDF Conversion API: This API is used to convert the selected address' information list into a PDF document which is easy to download and share. The created PDF will include all the information about the selected address.

Database Management Interface: This interface is the building block of afetbilgi.com since all of the information stored in the database is human-made and verified by trusted authorities. It has components to keep track of up-to-date information. The information stored in the database is categorized. They have appropriate names, links, and details.

Google Docs API: This API keeps track of the relevant details of the general needs, important resources, and health services, such as phone numbers, addresses, and organization names in a structured, reachable, and easy-to-understand way.

Cloudflare: It provides content delivery networks for static data of the underlying services such as CDN, Google Maps API, and PDF Conversion Interface with the help of caching.

AWS: This service provides an update and backup functionality for CDN and database.

Back End Error Management Interface: This interface is highly responsive in case of any system failure so that the downtime of the website is minimal, and the information loss is nearly guaranteed to be none.

1.3.1.2 User Interfaces

People who want to reach the topic selection page, information page, map, PDF converter, and documents do not have to download any external application, it is highly accessible and can be used by only an Internet browser. It has a clean and button-oriented UI. More detailed information will be given in section (3.1).

End User Topic Selection Interface

End users can see the topic selection interface without having to be registered to the website, and interact with the UI right away. End users can select any type of help using the user-friendly and simple UI. General needs, important resources, health, services, donation, contact page, relevant social media links, changing UI language, Google Maps, and PDF Conversion Service are all present in this interface.

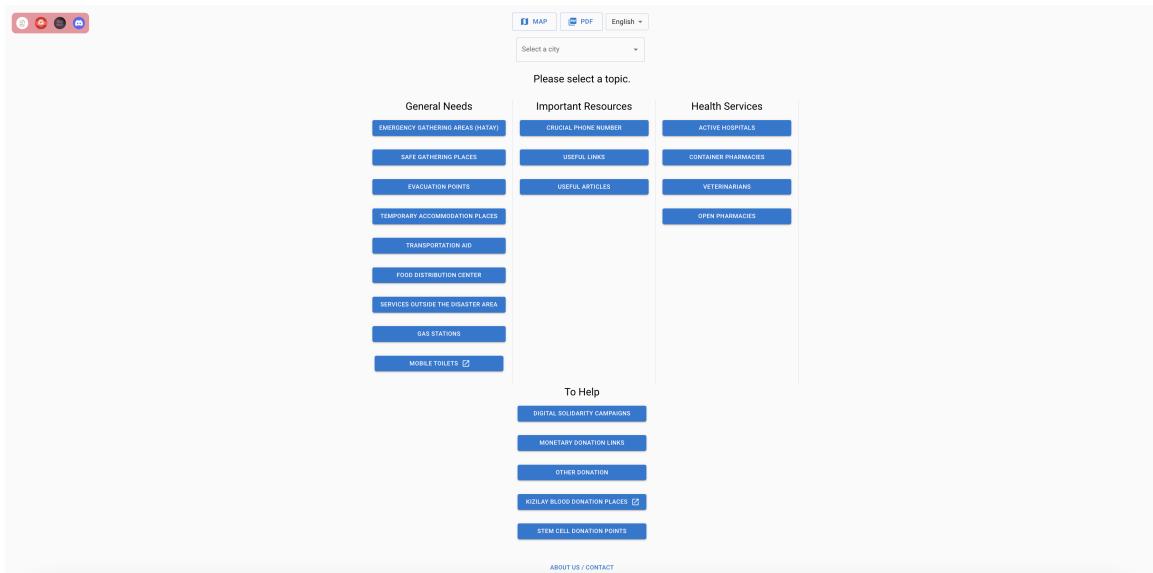


Figure 2: End User Topic Selection Interface

Information List Interface

Users can see the related information about the topic they selected and the address they provided. There are several types of list interfaces such as food providers list, health services list, veterinarians list, pharmacies list, transportation aid providers list, evacuation points list, and so on with the columns "Name", "Category", "Map location" and "Details".

The screenshot shows a web-based application interface titled "Hatay, Iskenderun Free Food Delivery Locations". At the top, there are navigation buttons for "MAIN PAGE", "BACK", "MAP", "PDF", and a language selector for "English". Below the title, a note states: "All locations on this page have been verified by phone. However, since this information can change within days or even hours, you are kindly requested to do your own research." The main content is a table with two columns: "Name" and "Map". Each row contains a link to "Location" and "Details". The table lists 20 different locations, including "Iskenderun Gençlik Merkezi", "Iskenderun Teknik Üniversitesi Bahçesi", "Adileye yanı i Bankası Karşı", "St. George Kibar Avlusu", "Minch's Burger", "Pınarbaşı Cad. Eski İftalye Yarı No:6 Iskenderun", "Maydanız Kafe Önü", "Hatay İl Jandarma Komutanlığı", "Iskenderun Kaymakamlık", "Iskenderun Millet Parkı", "Iskenderun Mevlüt Hamamı", "EXPO Iskenderun Fuar Alanı", "İskenderun Adilet Sarayı Yarı, Gürel, Fiyap Sultan Cd. No:2 Kızılay Çadır", "Hımyerit İkinci, Mustafa Kemal Mahallesi 588. Sok. No:1", "Demirözü Erkek Öğrenci Yurdu", "Muhyiddin İmzı Asıllı KMK Yurdu Erkek Öğrenci Yurdu", "Barış Yolu Açıklığında (Yeni Boulevard Cafe)", "Görme Mahallesine Mevlevî İmâkulu İç", "Sakarya Mahallesi 288/13 no:21 Yeni Camii yanı", and "Iskenderun Mar Cirços Kılıçlı Aspesi".

Name	Map	Details
İskenderun Gençlik Merkezi	Location	Details
İskenderun Teknik Üniversitesi Bahçesi	Location	Details
Adileye yanı i Bankası Karşı	Location	Details
St. George Kibar Avlusu	Location	Details
Minch's Burger	Location	Details
Pınarbaşı Cad. Eski İftalye Yarı No:6 Iskenderun	Location	Details
Maydanız Kafe Önü	Location	Details
Hatay İl Jandarma Komutanlığı	Location	Details
İskenderun Kaymakamlık	Location	Details
İskenderun Millet Parkı	Location	Details
İskenderun Mevlüt Hamamı	Location	Details
EXPO İskenderun Fuar Alanı	Location	Details
İskenderun Adilet Sarayı Yarı, Gürel, Fiyap Sultan Cd. No:2 Kızılay Çadır	Location	Details
Hımyerit İkinci, Mustafa Kemal Mahallesi 588. Sok. No:1	Location	Details
Demirözü Erkek Öğrenci Yurdu	Location	Details
Muhyiddin İmzı Asıllı KMK Yurdu Erkek Öğrenci Yurdu	Location	Details
Barış Yolu Açıklığında (Yeni Boulevard Cafe)	Location	Details
Görme Mahallesine Mevlevî İmâkulu İç	Location	Details
Sakarya Mahallesi 288/13 no:21 Yeni Camii yanı	Location	Details
İskenderun Mar Cirços Kılıçlı Aspesi	Location	Details

Figure 3: Information List Interface

PDF Conversion Interface

Users can convert the selected province's Information List Interface into a PDF document which is easy to download and share. The created PDF includes all the information such as Google Maps link, website links, addresses, and phone numbers of evacuation points, food distribution centers, gas stations, open pharmacies, safe gathering places, temporary accommodation places, and veterinarians in the selected city, with the last data validation date.

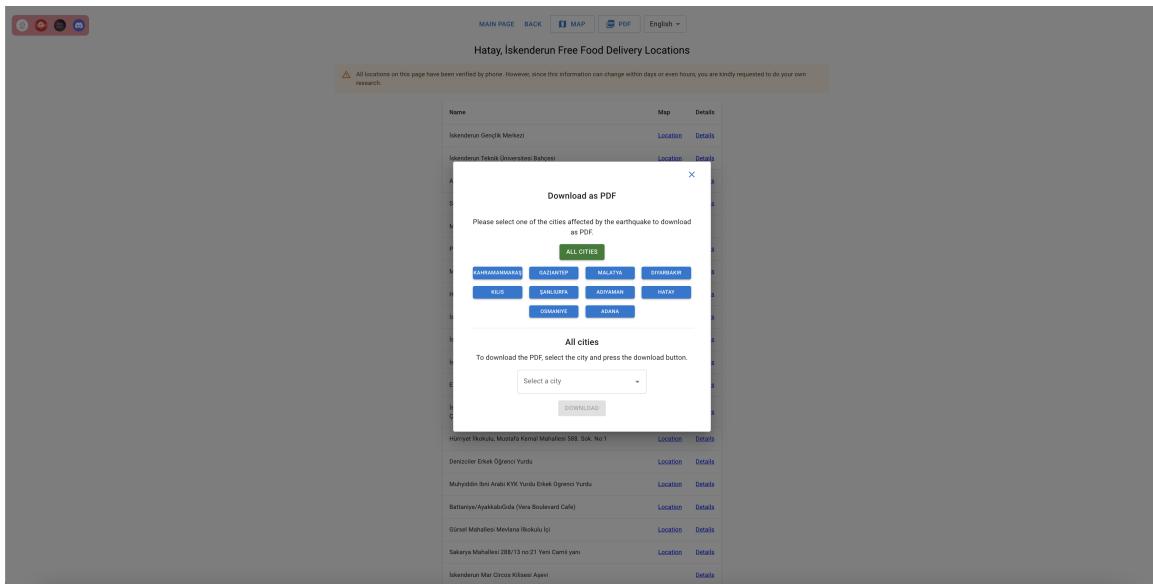


Figure 4: PDF Creation Screen

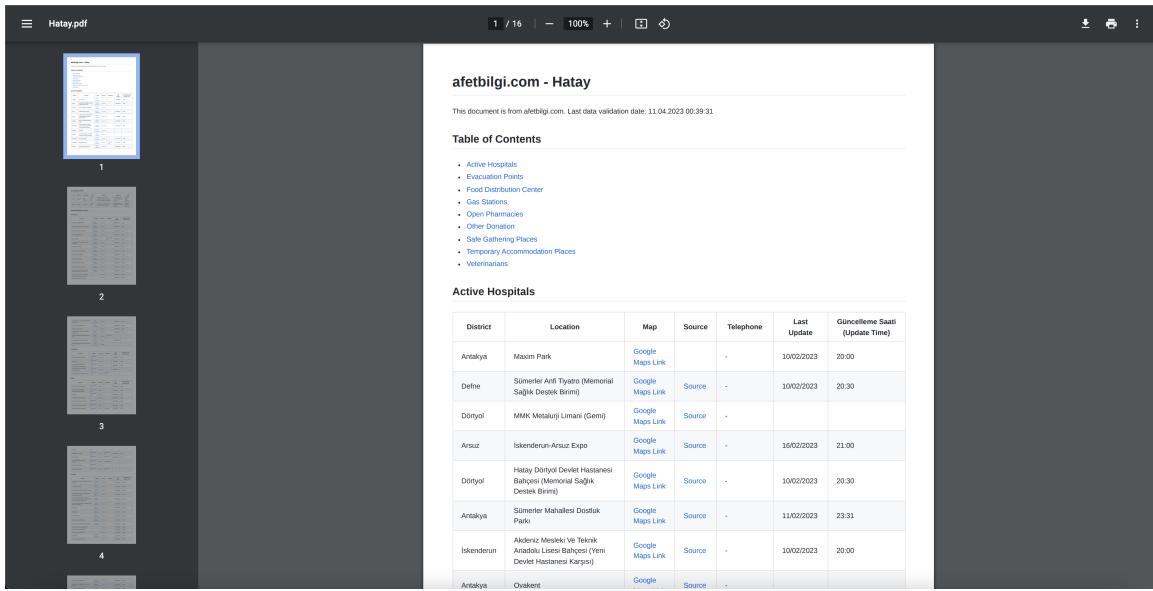


Figure 5: Output PDF

Google Maps Interface

afetbilgi.com provides a Google Maps Interface to its users. It provides functionalities like searching by name or filtering by categories. Users can search for useful locations such as temporary accommodation places, food distribution centers, active hospitals, container pharmacies, evacuation points, safe gathering places, veterinarians, and donation centers. The map itself is fully interactive and it supports zooming in and zooming out. Every useful location on the map has a source associated with it and there is an option to see the locations in the actual Google Maps application to get even further information. Users should consent to share their location with the API.

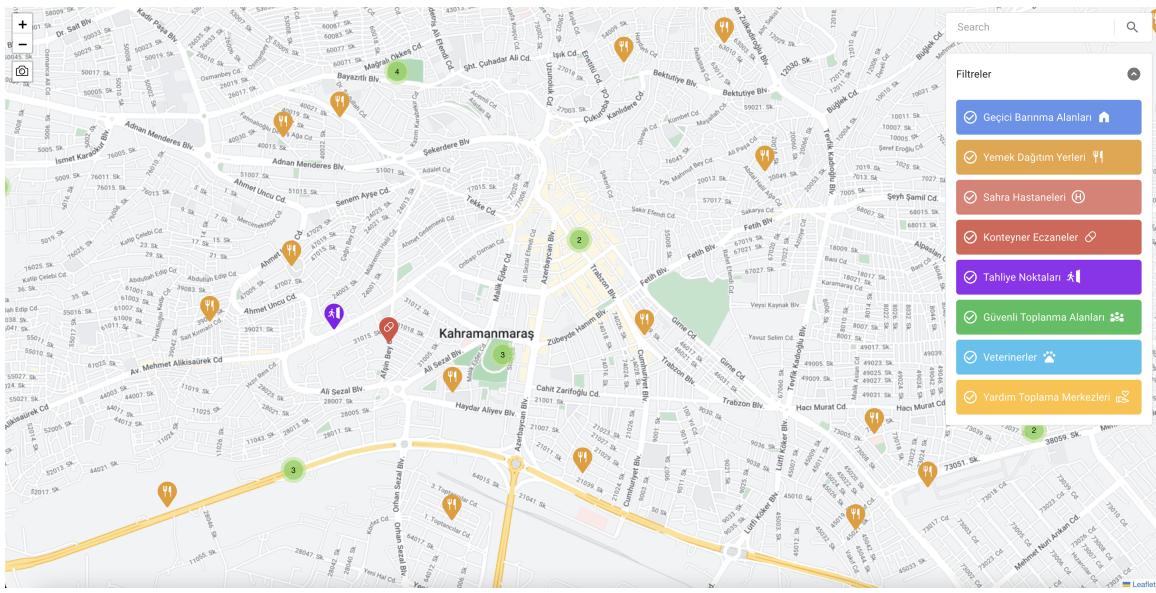


Figure 6: Google Maps Interface

Google Docs Interface

afetbilgi.com provides data sheets in the form of Google Docs. All the data stored in these data sheets are verified by highly trusted sources and kept in a structured manner. Information stored in Google Docs has a couple of columns to indicate what service is being provided, where is it, which organization is providing it, and so on. It also includes a timestamp so the users can be guaranteed that the information is always up-to-date. Data sheets also include contact numbers, website links, and sources of information.

Deprem Bölgesi Aktif Hastane Listesi				
	A	B	C	D
1	Son Güncelleme: 10/04/2023 18:00	Türkiye Psikiyatri Derneği Online Ruhşat Desteği: http://drhursadestek.psikiyatrig.org.tr	İletişim: 0530 173 0285	AfetHaritasi.com: AfetBilgi.com: İBB Afet Haritası: Aħbaq Għieni! Bölgeħer Haritasi
2	İL/İLÇE	HASTANE TİPİ/ADI	ÖZELHİZMET	ADRES
3	HATAY			KURUM
4	DÖRTYOL	Yüzler Hastane - TCG Bayraktar - MMK Metalurji Limanı	Kadın doğum, ortopedi, genel cerrahi ve anestezji, dahliliye, çocuk uzmanı	Özerli, Alpaslan Türkş Bld NO: 342/91, 31600 Döertyol/Hatay
5	DÖRTYOL	Yüzler Hastane - TCG Sanactırıcı - İdemir Limanı	Kargı, 31900 Döertyol/Hatay	Milli Savunma Bakanlığı
6	ANTAKYA	Sahra Hastanesi - Antalya Atatürk Parkı (Cumhuriyet)	Cumhuriyet, Cumhuriyet Mahallesi, 31040 Antalya/Hatay	AFAD
7	ANTAKYA	Sahra Hastanesi - İftaiye Daire Başkanlığı AKOM	Aksaray, Şüküri Balıcı Cd. No:3, 31030 Antalya/Hatay	Hatay Büyükşehir Belediyesi
8	ANTAKYA	Sahra Hastanesi - Antalya Atatürk Parkı (Keşla Sarayı)	Keşla Sarayı, Park Sk. No:23, 31070 Antalya/Hatay	Türk Kalp Cerrahisi Derneği
9	ANTAKYA	Sahra Hastaneleri - Hatay Eğitim ve Araştırma Hastanesi bahçesi	Genc cerrahi, kardiyoloji, dahiliye, kadın doğum, ortopedi, çocuk uzmanı, psikiyatри, göğüs hastalıkları	Güzelburç, 31001 Antalya/Hatay
10	ANTAKYA	Sahra Hastanesi - Mustafa Kemal Üniversitesi Araştırma Ve Uygulama Hastanesi bahçesi ve yanı	Genc cerrahi, kardiyoloji, dahiliye, kadın doğum, ortopedi, ağız-dağ sağlığı, nöroloji, KBB	Alahan, Tayfur Sökmen Kampüsü, 31001 Antalya/Hatay
11	ANTAKYA	Sahra Hastanesi - Hatay Fuar Alanı	Akasya, Çevreyolu Otagar yanı No:6, 31030 Antalya/Hatay	UMKE + ABD yardım ekibi
12	ANTAKYA	Sahra Hastanesi - Hatay Fuar Alanı Tahliye Noktası - Kocaeli Büyükşehir Belediyesi Hastanesi (prefabrik)	Genel cerrahi, dahiliye, çocuk uzmanı, ağız-dağ sağlığı	Akasya, Fuar Alanı 31030 Antalya/Hatay
13	ANTAKYA	Sahra Hastanesi - Eryüapaga Hastanesi (Hatay Expo yolu üzeri, Primenmall AVM yanı)	Cocuk uzmanı, dahiliye, KBB, ağız-dağ sağlığı	İzmir Büyükşehir Belediyesi
14	ANTAKYA	Sahra Poliklinik - HASÜDER Drenre Sağlığı Merkezi (Hatay Expo'ya giden Kiselek yolu üzeri)	Uroloji	Haik Sağlığı Uzmanları Derneği
15	ANTAKYA	Sahra Hastanesi - Hatay Stadyumu içi (Hatayspor)	Kiselek, 31001 Antalya/Hatay	UMKE
16	ANTAKYA	Sahra Poliklinik - MKU Diş Hekimliği Fakültesi Ağız ve Diş Sağlığı Ünitesi (Fakülte yanına Tayfur Sökmen Kampüsü)	Ağız-dağ sağlığı	Marmara Diş Hekimliği Fakültesi
17	ANTAKYA	Sahra Revir - İBB Revir (Otagar arkası İBB Koordinatörüğü alanında)	Ağız-dağ sağlığı	İstanbul Büyükşehir Belediyesi & Türk Diş Hekimleri Birliği
18	ANTAKYA			
19	ANTAKYA			
20	ANTAKYA			

Figure 7: Google Docs Interface

1.3.1.3 Hardware Interfaces

- Data centers should be highly available to serve CDN content. Although the website is updated frequently, due to the high amount of requests, caching mechanism shall be implemented.

1.3.1.4 Software Interfaces

- **Database:** afetbilgi.com uses a read-heavy database to store important information. The database should be secure and only store verified information. The database should be backed up on a daily basis.
- **Operating System:** afetbilgi.com uses a Unix-based operating system Linux which is internally used by AWS on the back end side. However, on the front end side, all of the operating systems that have Internet browsers are supported.
- **Google Maps:** It is used for displaying useful locations on Turkey's map.

1.3.1.5 Communication Interfaces

- The communication between clients and servers on the afetbilgi.com website is secured with HTTPS. Meanwhile, when transferring data between sources, TCP is used.

1.3.1.6 Memory Constraints

- The memory usage of the system shall be efficient, and GPU and RAM shall be enough to be able to interact with Google Maps. It shouldn't crash on low-end devices. Also, the system should have enough memory to handle database operations. Furthermore, cache capacity should be just enough to store CDN contents.

1.3.1.7 Operations

The operations provided by afetbilgi.com are:

User operations:

- View important phone numbers
- View useful links
- View useful articles
- Contact with admins
- Change UI language
- Select general needs
- Select health services
- View map of useful locations
- View source of the information
- View details of the information
- View contacts of the information
- Convert information to PDF

Admin operations:

- Add verified information
- Remove outdated information

All details of these operations will be explained in the 3.2 Functions section.

1.3.2 System Functions

Function	Summary
View important phone numbers	Users can see important numbers tagged with categories such as Tent Request, Whatsapp, AFAD, Health, Governmental Support Line, Association, and so on. Also includes detailed information about the phone numbers.
View useful links	Users can see important links tagged with categories such as Emergency Needs, Education, Animals, Employment, Accommodation, Mobile Toilets, Health, and other natural disaster awareness projects.
View useful articles	Users can see useful articles about post-earthquake, written by authorized people. Also includes links to the relevant websites.
Contact with admins	Users can contact admins via e-mail, Instagram, Twitter, and GitHub.
Change UI language	Users can change the UI language according to their choices. Users can choose between English, Turkish, Kurdish, and Arabic.
Select general needs	Users can find providers such as accommodation, transportation, gas stations, evacuation points, emergency gathering places, and so on according to their needs, in their province.
Select health services	Users can see active hospitals, open pharmacies, container pharmacies, and veterinarians and see the relevant Google Doc.
Add verified information	Admins can add information verified by trusted authorities.
Remove outdated information	Admins can remove outdated information from the database and Google Docs.

Table 1: System functions

1.3.3 Stakeholder Characteristics

There are 5 main stakeholders of afetbilgi.com, which are suppliers, admins, users, government, and developers.

- Suppliers are the companies or organizations that want to help people in various ways, such as temporary accommodation places, food distribution centers, gas stations, mobile toilets, and so on.
- Admins are the people who organize and update the information that is present in the current human-made database.

- Users can be divided into two categories:
 - Users who try to help others, such as doctors, winch operators, veterinarians, and so on.
 - Users who try to find help on the site, i.e, people who were affected by the earthquake.
- Government organizations such as AFAD are making use of this website for finding missing people, reported by trusted sources.
- Developers: Developers are highly active in GitHub, they give full support to the open source project on GitHub. In the early stages, they work almost full-time for the website.

1.3.4 Limitations

- **Regulatory Policies:** The system doesn't hold any critical personal information, such as credit card numbers, therefore
- **Hardware Limitations:** The system heavily relies on CDN's, so the Data Centers should always be up and running, there should be enough memory and disk space in the cloud computers.
- **Interfaces to other systems:** afetbilgi.com should be compatible with all the systems that it is interacting with, such as Google Maps API, PDF Conversion Service and Google Docs Interface.
- **High-Level Language Requirements:** Due to rapid changes and feature needs, as well as supporting all of the devices, high-level languages like Python or JVM languages like Java should be used.
- **Parallel Operations:** Concurrency and multi-threading are problematic, the system should not assume that a device can do multiple tasks at a time, it should design the system such that they are no parallel operations because of the hardware limitations.
- **Quality Requirements:** Should be reliable and secure, the system shall have backup databases. Quality assurance tests must be conducted every week.
- **Criticality of application:** System failure could be life-threatening for someone, since the information that the site provides is extremely useful in certain life-threatening scenarios.

1.4 Definitions

Term	Definition
API	Application Programming Interface
UI	User Interface
ID	A unique number to identify a database entry
CDN	Content Delivery Network
AWS	Amazon Web Services
HTTPS	Hypertext Transfer Protocol Secure
TCP	Transmission Control Protocol
PDF	Portable Document Format
JVM	Java Virtual Machine
DDOS	Distributed Denial Of Service
CAPTCHA	Completely Automated Public Turing test to tell Computers and Humans Apart

Table 2: Definitions

Chapter 2

References

This document is written with respect to the IEEE 29148-2018 standards:

29148-2018 - ISO/IEC/IEEE International Standard - Systems and software engineering – Life cycle processes – Requirements engineering

Chapter 3

Specific Requirements

3.1 External Interfaces

The following class diagram represents the relationship between interfaces and their functionalities. For an explanation of the interfaces, please refer to section (1.3.1.2).

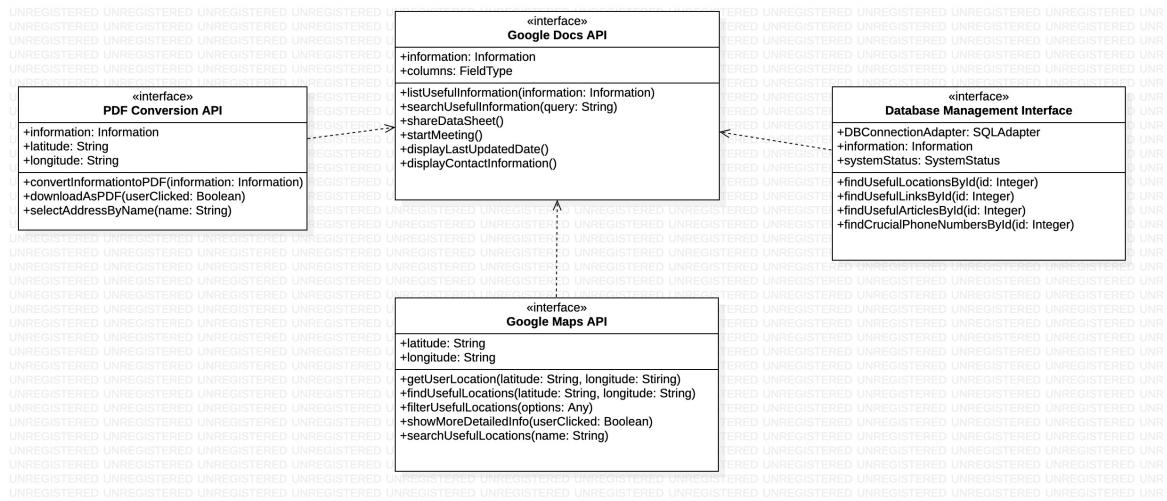


Figure 8: External Interfaces Class Diagram

3.2 Functions

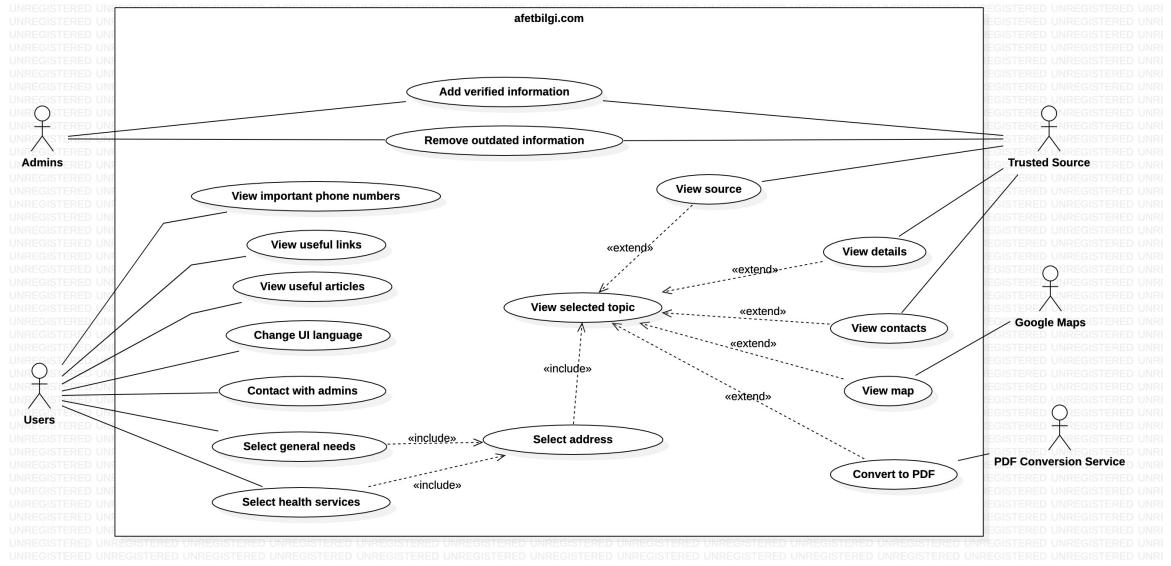


Figure 9: Use Case Diagram

Use case name	View important phone numbers
Actors	Users
Description	Users can see the important phone numbers by selecting the "Crucial Phone Numbers button", and they will be redirected to the communication application on their device.
Data	Category, Unit, Telephone, and Details
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on the "Crucial Phone Numbers button" under the important resources section on the home page of the website.
Basic flow	<p>Step 1: User clicks on the button labeled as "Crucial Phone Number".</p> <p>Step 2: User selects the phone number they want to call and get information about</p> <p>Step 3: User is redirected to the communication application on their device.</p> <p>Step 4: User calls the relevant phone number.</p>
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the webpage will not be provided and they have to wait until the issues get solved.
Postconditions	User calls and gets information about relevant institution or service.

Table 3: View important phone numbers

Use case name	View useful links
Actors	Users
Description	Users can see the important links by selecting the "Useful Links" button, and they will be redirected to the relevant website.
Data	Web pages
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on the "Useful Links" button under the important resources section on the home page of the website.
Basic flow	Step 1: User clicks on the button labeled as "Useful Links". Step 2: User selects the website link to get information about Step 3: User is redirected to the website.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	User is redirected to the relevant website.

Table 4: View useful links

Use case name	View useful articles
Actors	Users
Description	Users can see the important links by selecting the "Useful Articles" button, and they will be redirected to the relevant website.
Data	Article website
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on the "Useful Articles" button under the important resources section on the home page of the website.
Basic flow	Step 1: User clicks on the button labeled as "Useful Articles". Step 2: User selects the website link to read the article. Step 3: The user is redirected to the website.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	User is redirected to the relevant website.

Table 5: View useful articles

Use case name	Change UI language
Actors	Users
Description	User will be able to change the UI language based on their selection.
Data	Human-made database.
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on one of the language options on the drop-down menu.
Basic flow	Step 1: The user clicks on one of the options on the drop-down menu. Step 2: The UI language changes according to their choice.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	Language has been changed to what the user has chosen from the drop-down menu.

Table 6: Change UI Language

Use case name	Contact with admins
Actors	Users
Description	Users will get the relevant information about the ways to contact the admins.
Data	Human-made database.
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on the "About Us / Contact" button at the bottom of the home page.
Basic flow	Step 1: User clicks on the "About Us / Contact" button. Step 2: About Us page will be opened and the user can now freely contact the admins.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	Users will get a chance to contact admins.

Table 7: Contact with admins

Use case name	Select general needs
Actors	Users
Description	Users can select general needs like emergency gathering areas, evacuation points, temporary accommodation places, food distribution centers, gas stations, mobile toilets, and so on.
Data	Human-made database.
Preconditions	Users must have an Internet connection.
Stimulus	User can click on the buttons under the section of "General Needs" to see what they need.
Basic flow	Step 1: Users can select the general needs that they need. Step 2: Users must select their address in order to see the general needs that they selected in their area.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	Users will get informed about the general needs that they selected.

Table 8: Select general needs

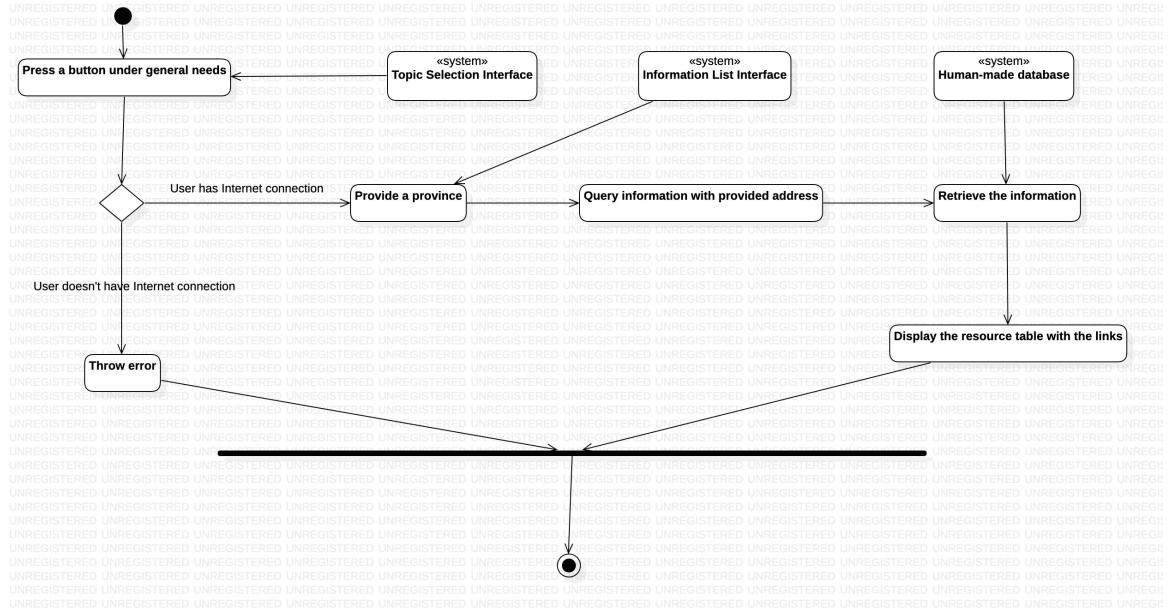


Figure 10: Select General Needs Activity Diagram

Use case name	Select health service
Actors	Users
Description	Users will be able to select the relevant health services, such as active hospitals, open pharmacies, container pharmacies and veterinarians.
Data	Human-made database.
Preconditions	User must have an Internet connection.
Stimulus	User selects a health service from the End User Topic Selection Interface.
Basic flow	Step 1: Users can select the health service that they need. Step 2: Users must select their address in order to see the health services in their area.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	The user has chosen one of the health services and sees its details.

Table 9: Select health service

Use case name	Add verified information
Actors	Admins
Description	Admins can add the information provided by the trusted sources to the database.
Data	Trusted sources
Preconditions	Users must have an Internet connection.
Stimulus	When a piece of new information is obtained from a trusted source, the admins should take the corresponding action.
Basic flow	Step 1: Information is obtained from a trusted source. Step 2: The admins make a query to the database to add the mentioned information.
Alternative flow #1	-
Exception flow	If an admin doesn't have database access, then this process cannot be completed and the admin must obtain the relevant access.
Postconditions	Verified information is added to the database.

Table 10: Add verified information

Use case name	Remove outdated information
Actors	Admins, Trusted Source
Description	Admins can remove outdated information from the database when they are informed by trusted sources.
Data	Trusted sources
Preconditions	Admins must have an Internet connection and the relevant database access.
Stimulus	When a piece of information is declared "outdated" by a trusted source, the admins should take the corresponding action.
Basic flow	Step 1: Information is declared "outdated" by a trusted source. Step 2: The admins make a query to the database to remove the mentioned information.
Alternative flow #1	-
Exception flow	If an admin doesn't have database access, then this process cannot be completed and the admin must obtain the relevant access.
Postconditions	The outdated information will be vanished from the database.

Table 11: Remove outdated information

Use case name	Select address
Actors	Users
Description	Users must provide their address information in order to see the relevant Information List Interface.
Data	City, county, and neighborhood information
Preconditions	Users must have an Internet connection and select their address details in the drop-down menu.
Stimulus	Users first select their city, and they are prompted to select their county, and after that, they are prompted to select their neighborhood.
Basic flow	Step 1: Users select their city. Step 2: Users select their county. Step 3: Users select their neighborhood.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	The user has chosen the city they want to get information about.

Table 12: Select address

Use case name	View selected topic
Actors	Users
Description	Users can see the detailed columns about the topic they have selected.
Data	Human-made database
Preconditions	Users must have an Internet connection.
Stimulus	User selects his/her address to move on.
Basic flow	Step 1: The user can see the detailed information in the Information List Interface. Step 2: The user can click on the relevant links to get further information.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	The user can see the topics.

Table 13: View selected topic

Use case name	View map
Actors	Users, Google Maps API
Description	Users can see Turkey's map and find useful locations on it. Functionalities like searching by name and filtering by categories will be provided in the Google Maps Interface.
Data	Turkey Natural Disaster Map
Preconditions	Users must have an Internet connection and enough GPU power to render the map. In addition, location permission should be given.
Stimulus	User clicks on the button labeled as "MAP".
Basic flow	Step 1: User clicks on the button labeled as "MAP". Step 2: The user has been brought to the Google Maps Interface. Step 3: The user can now see the useful locations, and he/she can search locations by name or filter them by categories.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	The user can see the map, filter the location by topic, and zoom in and zoom out on the map.

Table 14: View map

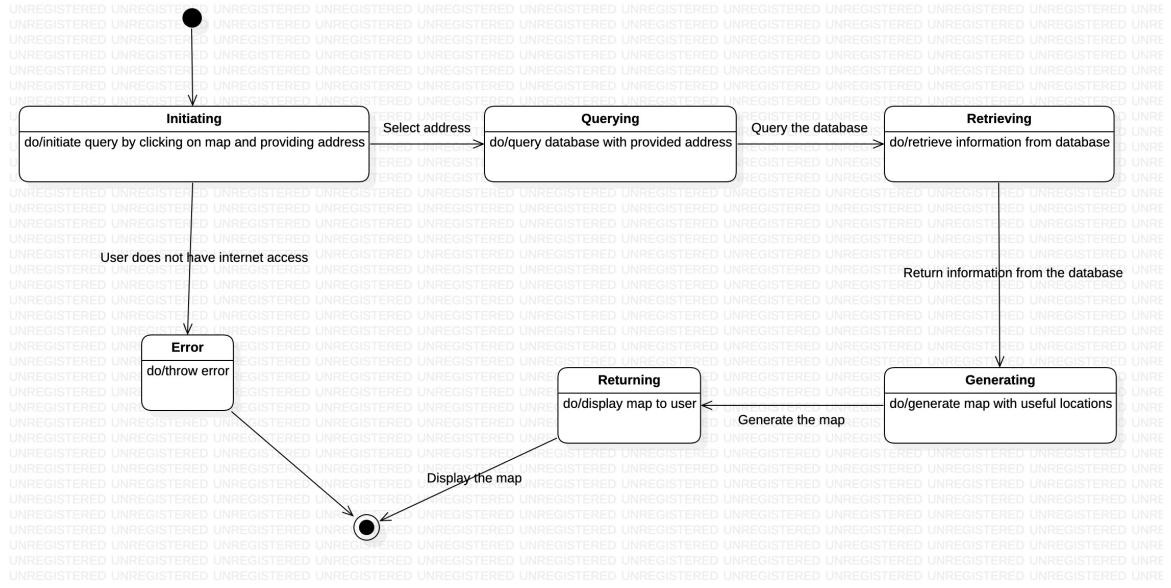


Figure 11: View Map State Diagram

Use case name	View source
Actors	Users
Description	Users can click on the link provided in the "Source" column in the Information List Interface to guarantee that the information listed is indeed valid.
Data	Trusted sources
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on the relevant source link to see the trusted source's website.
Basic flow	Step 1: Users will be able to see the relevant source links on the Information List Interface. Step 2: The user must click on the link to see the trusted source's website.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	The user will be taken to the trusted source website or the relevant Google Docs.

Table 15: View source

Use case name	View details
Actors	Users
Description	Users can click on the relevant columns, such as a trusted website or Google Docs links to get further information.
Data	All details in the human-made database about selected topic
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on the relevant links to get further information.
Basic flow	Step 1: Users will be able to see the relevant details links on the Information List Interface. Step 2: The link must be clicked to further get informed about the selected topic.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	User will receive detailed information about the selected topic.

Table 16: View details

Use case name	View contacts
Actors	Users
Description	Users can click on the relevant columns, such as telephone numbers or e-mail addresses to get in touch with the providers.
Data	Telephone numbers, e-mail addresses, and location information
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on the contact links to get further information.
Basic flow	Step 1: Users will be able to see the relevant contact information on the Information List Interface. Step 2: Users may click on the contact links to get further information.
Alternative flow #1	Step 2: If a contact link has been clicked on the Information List Interface, then the user will be taken to the relevant trusted source.
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	User will receive the desired contact information.

Table 17: View contacts

Use case name	Convert to PDF
Actors	Users, PDF Conversion Service
Description	Users can initiate the PDF Conversion process by selecting the address they are currently at or they can query a PDF for all the cities, and then they can click on the "Download" button to download the desired PDF.
Data	Phone numbers, addresses, sources, and the location on Google Maps
Preconditions	Users must have an Internet connection and enough disk storage in their device.
Stimulus	User clicks on the "PDF" button on the relevant topic selection page.
Basic flow	Step 1: User clicks on the button labeled as "PDF". Step 2: User selects the city they want to get information about Step 3: User clicks on the "Download" button to download the PDF. Step 4: The user has now received a PDF.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	User receives a PDF with all the relevant information that they have desired.

Table 18: Convert to PDF

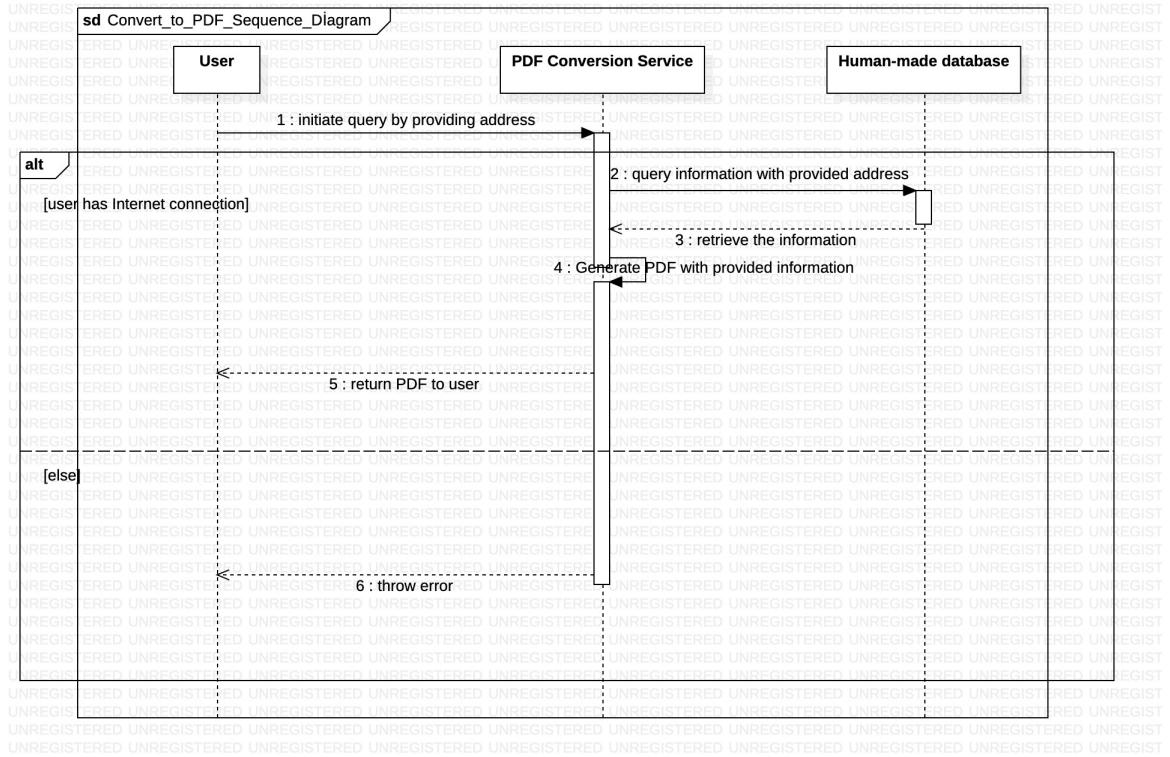


Figure 12: Convert to PDF Sequence Diagram

3.3 Usability Requirements

- All the functions of the system shall be ready to use for the user when they have an Internet connection.
 - Users shall be able to reach any information on the site by at most 5 button clicks.
 - A dropdown menu shall be provided for user to change the UI language according to user's desires.
 - An intuitive interface for address selection shall be provided to users for them to get the most accurate information about the earthquake.
 - The system functionalities itself shall be self-explanatory, there shall not be any question marks in the head of the users.
 - All the interfaces in the system shall have user-friendly views, they shall include lively colors and large enough fonts for everyone to see.

3.4 Performance Requirements

- Bandwidth shall be sufficient such that afetbilgi.com handles 1 million HTTP requests such as per hour.
- Users with an average Internet speed should download the PDFs within 10 seconds at most.
- Database query latency should be less than 4 seconds.

3.5 Logical Database Requirements

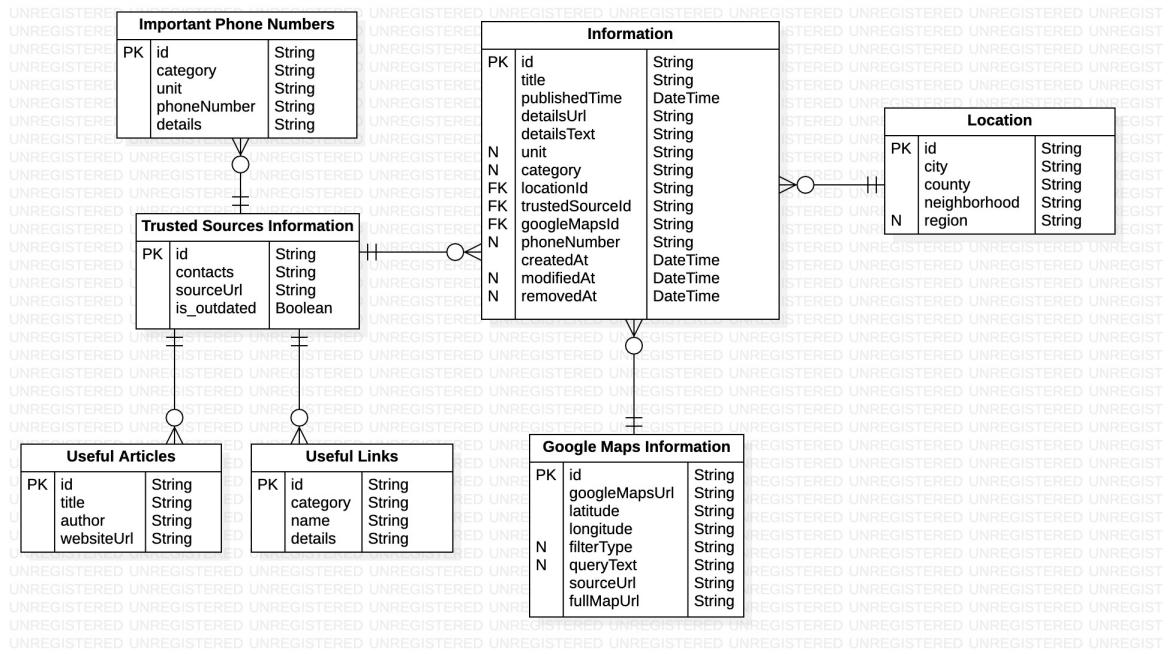


Figure 13: Logical Database Diagram

3.6 Design Constraints

- The system shall be designed in accordance with the law of privacy.
- All the information stored in the human database shall be categorized and kept private.
- Any information stored shall comply with the regulatory policies.

3.7 System Attributes

3.7.1 Reliability

- If there is a sudden shutdown, the system should stand up within a couple of minutes.
- There should not be any data loss in the database.

3.7.2 Availability

- The downtime of the application shall be less than 0.0000001% (six zeros) in a year.
- The system backup process shall be done at a time when the application usage statistics are at their lowest.
- If the system needs to be restarted or updated, then the system shall be available again in at most 5 minutes.

3.7.3 Security

- Since afetbilgi.com doesn't store any personal information in their human-made database, in terms of data security and leakage prevention, there are no further measures to take.
- However, like all websites, there is a risk of DDOS attacks. To prevent that, traffic filtering, rate limiting, and CAPTCHA should be implemented.

3.7.4 Maintainability

- Documentation shall be updated regularly to ease the use of the system.
- Integration of the new system shall not lead to the crash of the application.

3.7.5 Portability

- The software application should be compatible with all Operating Systems. It shall run on MacOS, Windows, Linux, Android, iOS, and so on.
- The choice of the programming language shall not be platform-dependent, a JVM language such as Java or Kotlin shall be used.
- Any external libraries used in the system shall have up-to-date support and they shall work on all environments.

3.8 Supporting Information

- Content blockers and adblockers may affect the user experience. To be on the safe side, the user might disable them since afetbilgi.com does not have any ads.

Chapter 4

Suggestions to improve the existing system

- **Chatbot:** It is better to provide a chatbot at the bottom right of the website so that users can easily navigate between what they need, rather than searching through and discovering all the buttons. An artificial intelligence API should be used, or a machine learning model should be trained.
- **Translation:** Since Turkey is a popular tourist attraction, German, Russian or French, Spanish, Italian, and other the most spoken languages should be added. Furthermore, since the translation is provided by static HTML files, there are some translation issues. A translation API can be used.
- **News Feed:** This website lacks a user-friendly News Feed interface with the latest news from trusted sources. It can serve as a daily news digest. It's better for people to see the news in a more interactive way.
- **Dark mode:** Dark mode is a trend these days because of its effect on battery life and eyes. It should be added and integrated into the website smoothly.
- **WhatsApp support line:** Email support is great but if we consider the hurry and rush in the disaster area, WhatsApp would be faster, and it is much more common than email. In addition, we can learn if the message is delivered to the recipient. In Turkey, no one sends emails very frequently, but they send WhatsApp messages.
- **Improve front-end components and widgets:** Although the website is fast because it has fewer UI components, the trade-off is not in the optimal case. It can be more cleaner and user-friendly. The buttons are clustered in such a way that sometimes users cannot find what they want at first look.

4.1 System Perspective

afetbilgi.com interacts with Google Maps, Google Docs, AWS, Cloudflare, PDF Conversion service, CDN, trusted sources, and more. In the improved version, in addition to the current version, afetbilgi.com interacts with Translation API for supporting more languages, with fewer

bugs caused by static HTML files, and OpenAPI for a fully functional Chatbot that meets users' demands quickly and effectively. Furthermore, using trusted sources, the news feed represents the data in a more organized and user-friendly way. Users see the most breaking news on the home page of the website. The dark mode is added in and integrated with all the components of the website smoothly. Also, our system has a Whatsapp support line, which redirects users to the Whatsapp chat when they need something as well as want to report something. Although it does not solely improve the functionality of the system, the new system has better front-end and functional widgets.

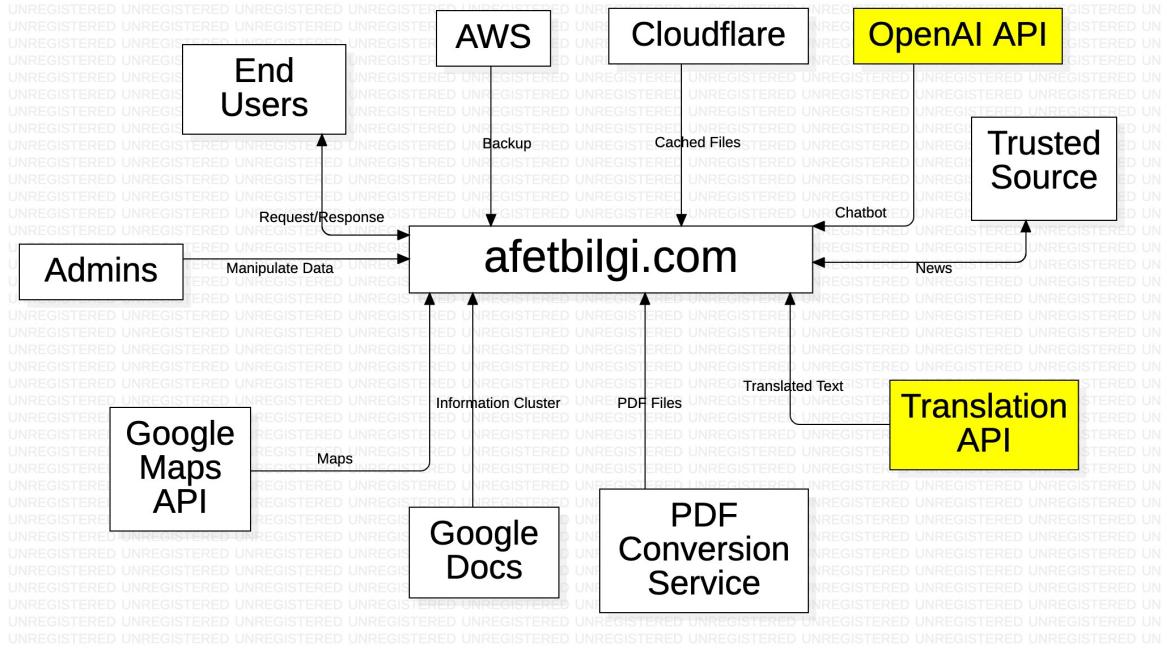


Figure 14: Context Diagram

4.2 External Interfaces

The following class diagram represents the relationship between new application programming interfaces and their new functionalities.

Translation API

Users can see all the Information List Interfaces, Google Maps Interfaces, Google Docs Interfaces, Topic Selection Interfaces and finally generated PDFs in their language thanks to the Translation API. It handles all the complex text and generates the response very quickly. However, in the old version, everything was not integrated into the translation, and they were several interfaces that does not have language support. Even if we select a specific language, they are a lot of text in Turkish, which is not convenient for foreign users. For example, maps.afetbilgi.com does not have

any language support. Translation API solves this.

OpenAI API

The system needs some artificial assistance for users to make their life easier and help them find what they are looking for. OpenAI is known for its very complex and high-performance servers and models. Therefore, there is no need to reinvent the wheel. We can trust and rely on this API. Searching all through the website and trying to find what they need is very cumbersome for especially the people in rural areas, elders, children, and so on. Chatbot powered by OpenAI solves this problem efficiently.

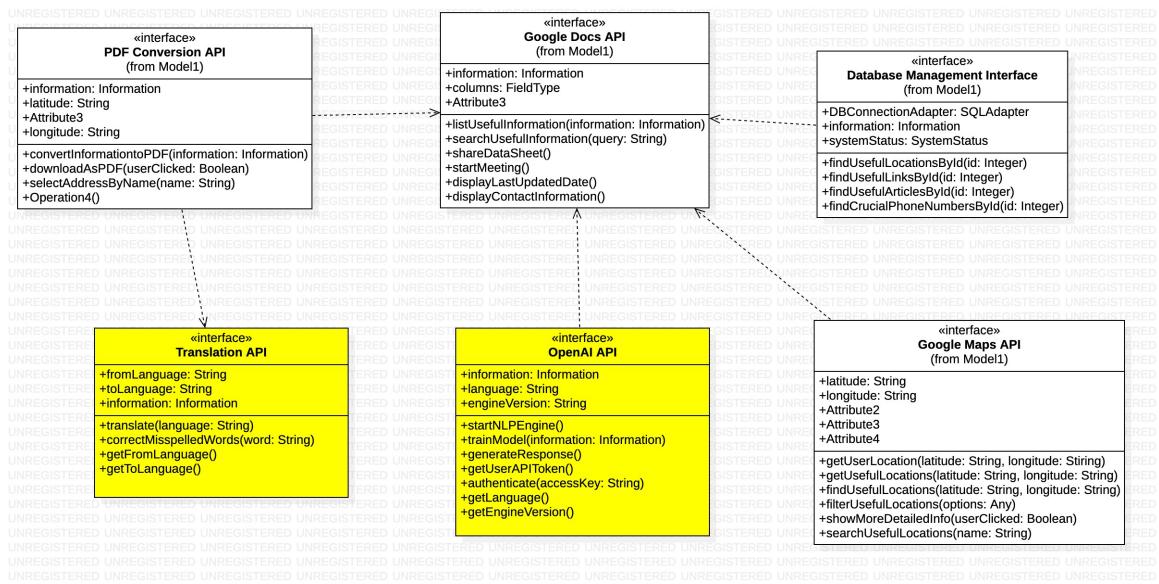


Figure 15: External Interfaces

4.3 Functions



Figure 16: Use Case Diagram

Use case name	Chat with Chatbot
Actors	Users, OpenAI API
Description	Users can initiate a conversation with the Chatbot to navigate through the website efficiently or get information through messaging box directly. Chatbot shall be capable of keeping up the conversation with the user as the new questions come in.
Data	User Input and Machine Learning Model
Preconditions	Users must have an Internet connection and enough disk storage in their device.
Stimulus	User clicks on the "Chatbot" button at the bottom right of the page.
Basic flow	Step 1: User clicks on the button labeled as "Chatbot". Step 2: User asks a question through the messaging box. Step 3: User gets a detailed explanation of what they need.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	User gets a response with the relevant information.

Table 19: Chat with Chatbot

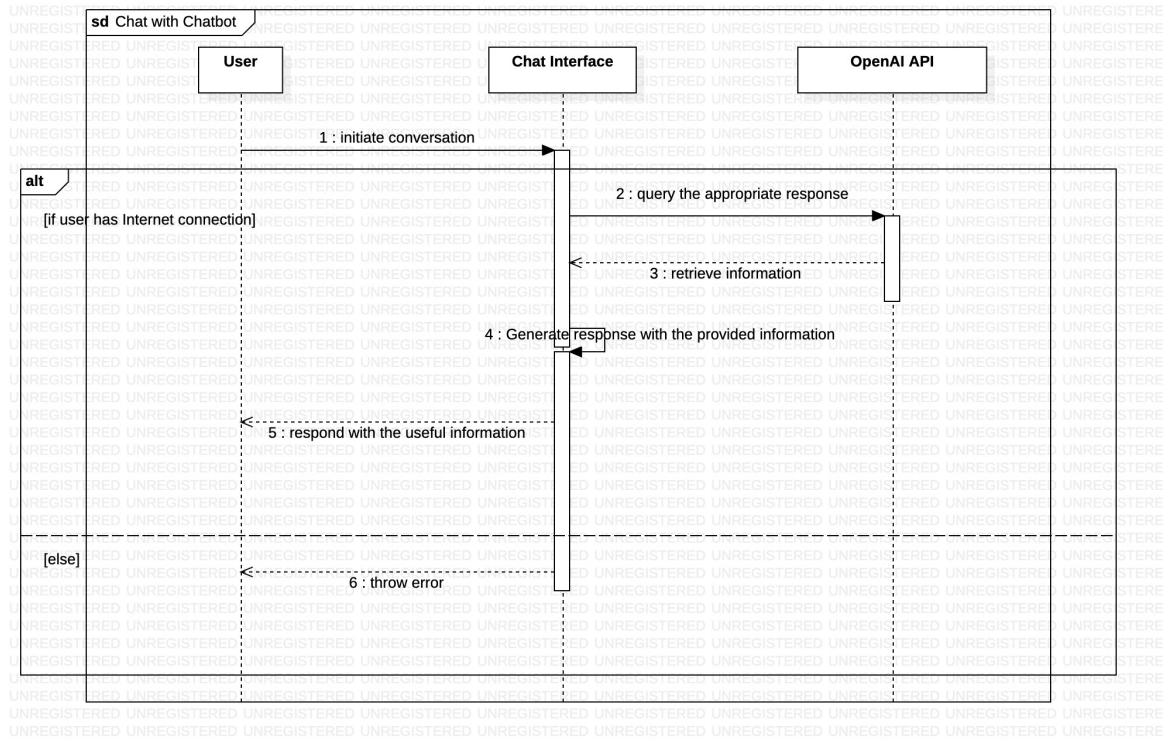


Figure 17: Chat with Chatbot Sequence Diagram

Use case name	Change UI Theme
Actors	Users
Description	User will be able to change the UI theme based on their selection.
Data	Color of the background.
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on one of the color options on the drop-down menu.
Basic flow	Step 1: The user clicks on one of the options on the drop-down menu. Step 2: The UI theme changes according to their choice.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	Theme has been changed to what the user has chosen from the drop-down menu.

Table 20: Change UI Theme

Use case name	Contact admins via WhatsApp
Actors	Users, WhatsApp
Description	Users can contact admins via WhatsApp, which is much more common than email in Turkey. The admins should have a WhatsApp Support Line number.
Data	WhatsApp link
Preconditions	Users must have an Internet connection and enough disk storage in their device.
Stimulus	User clicks on the "WhatsApp" icon, which redirects the user to the support line.
Basic flow	Step 1: User clicks on the "WhatsApp" icon. Step 2: The user is redirected to the WhatsApp support line. Step 3: User has a conversation with afetbilgi.com admins.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	User gets a chance to contact the admins via WhatsApp.

Table 21: Contact admins via WhatsApp

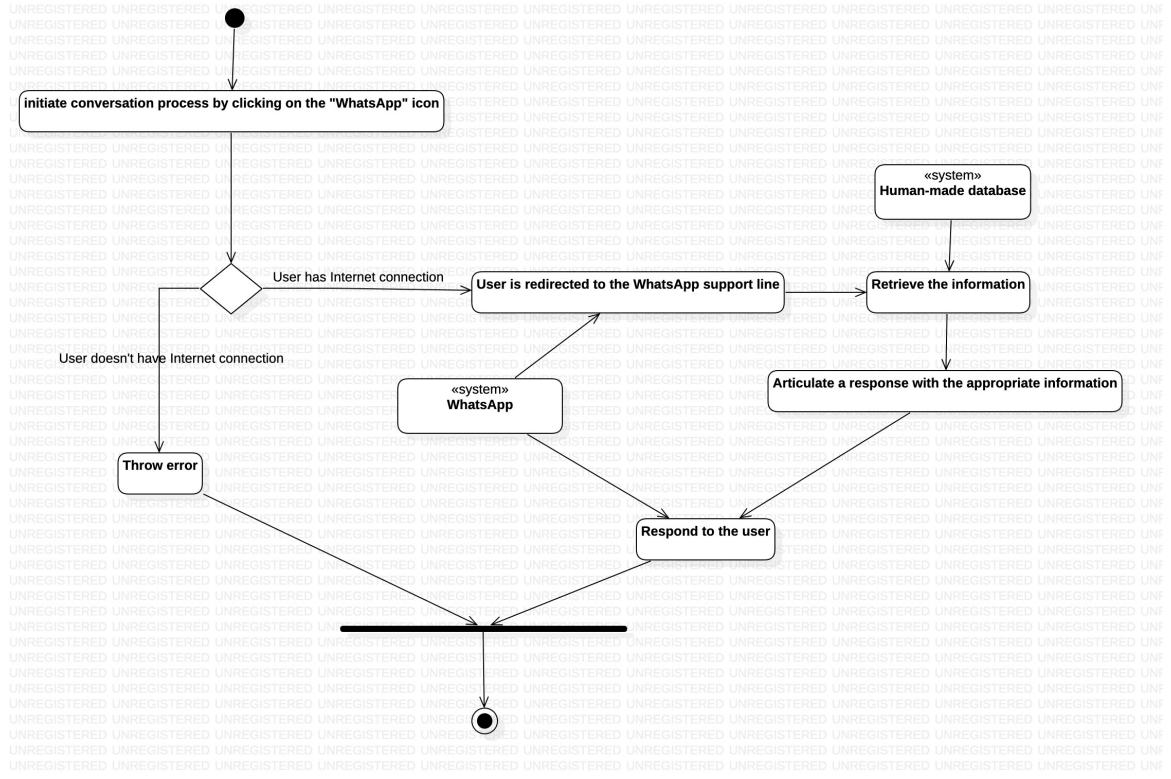


Figure 18: Contact Admins via WhatsApp Activity Diagram

Use case name	Set language
Actors	Users, Translation API
Description	Users can see the web page with more than 50 languages, with highly trained translation API. Before that, the HTML pages are kept as static files and actually, there is no live translation. There are some problems and a mixture of languages on a single page. From now on, the language support extended to more than 50 languages, which enables us tourists from a wide range of nationalities to use the website.
Data	Translation API Model
Preconditions	Users must have an Internet connection and enough disk storage in their device.
Stimulus	User clicks on the "Language" button on the relevant page.
Basic flow	Step 1: User clicks on the button labeled as "Language". Step 2: User selects the desired language in the drop-down menu. Step 4: The site has now been translated to the selected language.
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	The site has now been translated to any selected language.

Table 22: Convert to PDF

Use case name	Display News Feed
Actors	Users, Trusted Sources
Description	Users can initiate the News Feed screen by selecting the topic that they want to get informed, and then they can see the user-friendly News Feed page with the relevant information.
Data	Phone numbers, addresses, and sources
Preconditions	Users must have an Internet connection.
Stimulus	User clicks on the "News Feed" button on the relevant topic selection page.
Basic flow	<p>Step 1: User clicks on the button labeled as "News Feed".</p> <p>Step 2: User selects the topic they want to get information about</p> <p>Step 3: Website generates a News Feed page with all the relevant information.</p> <p>Step 4: Website displays a user-friendly News Feed to the user.</p>
Alternative flow #1	-
Exception flow	If the user has Internet connectivity problems or the system is currently facing an issue, then the web page will not be provided and they have to wait until the issues get solved.
Postconditions	Website displays a News Feed with all the relevant information that the user desires.

Table 23: Display News Feed

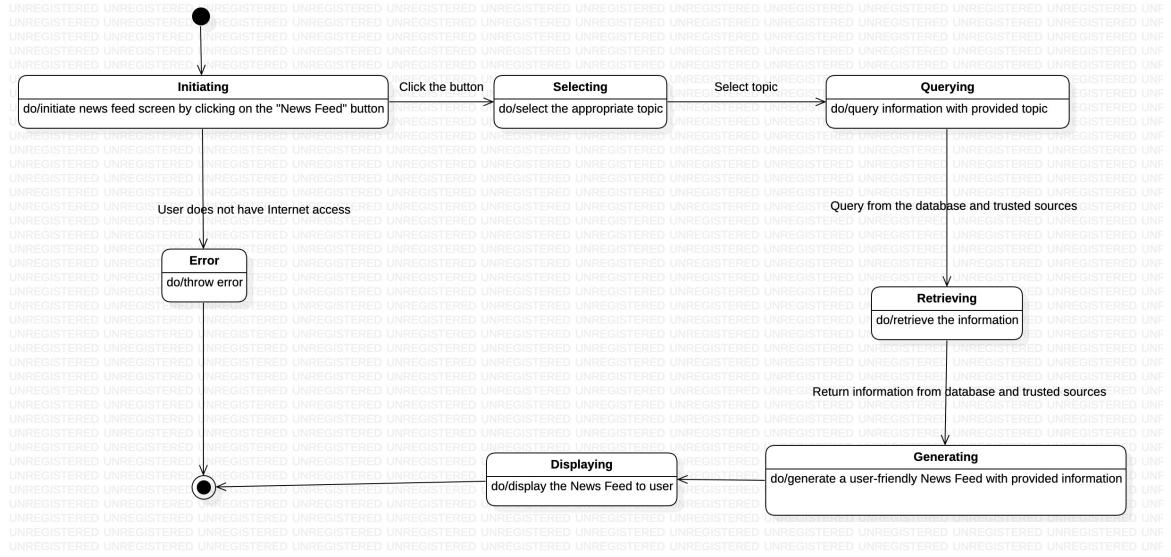


Figure 19: Display News Feed State Diagram

4.4 Usability Requirements

- Chatbot should be human-like, it should meet users' needs and give satisfactory answers.
- Dark mode should be integrated pretty well, there should not be a mixture of dark and light modes.
- All the functions of the system shall be ready to use for the user when they have an Internet connection.
- Users shall be able to reach any information on the site by at most 5 button clicks.
- A dropdown menu shall be provided for user to change the UI language according to user's desires.
- An intuitive interface for address selection shall be provided to users for them to get the most accurate information about the earthquake.
- The system functionalities itself shall be self-explanatory, there shall not be any question marks in the head of the users.
- All the interfaces in the system shall have user-friendly views, they shall include lively colors and large enough fonts for everyone to see.

4.5 Performance Requirements

- New UI components should be fast to load and highly responsive.

- Our requests to the Translation and Artificial Intelligence APIs should be handled within 1 second.
- Bandwidth shall be sufficient such that afetbilgi.com handles 1 million HTTP requests such as per hour.
- Users with an average Internet speed should download the PDFs within 10 seconds at most.
- Database query latency should be less than 1 second.

4.6 Logical Database Requirements

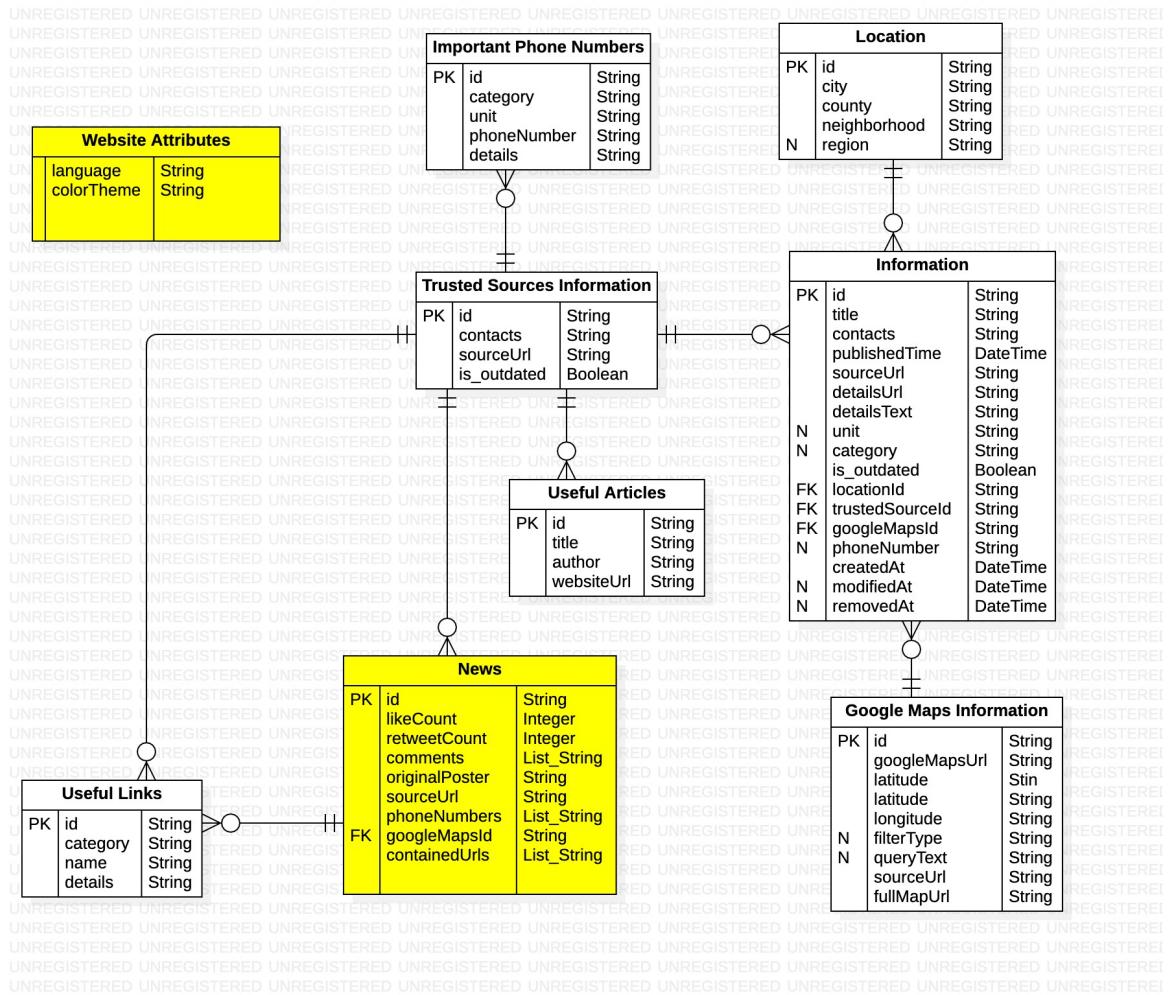


Figure 20: Logical Database Requirements

4.7 Design Constraints

- Since we have added a couple of dependencies like Translation and Artificial Intelligence API, our availability depends on their availability. We get rid of some responsibility but it has a cost.
- The system shall be designed in accordance with the law of privacy.
- All the information stored in the human database shall be categorized and kept private.
- Any information stored shall comply with the regulatory policies.

4.8 System Attributes

4.8.1 Reliability

- If there is a sudden shutdown, the system should stand up within a couple of minutes.
- There should not be any data loss in the database.

4.8.2 Availability

- The downtime of the application shall be less than 0.0000001% (six zeros) in a year.
- The system backup process shall be done at a time when the application usage statistics are at their lowest.
- If the system needs to be restarted or updated, then the system shall be available again in at most 5 minutes.

4.8.3 Security

- Since afetbilgi.com doesn't store any personal information in their human-made database, in terms of data security and leakage prevention, there are no further measures to take.
- However, like all websites, there is a risk of DDOS attacks. To prevent that, traffic filtering, rate limiting, and CAPTCHA should be implemented.

4.8.4 Maintainability

- Documentation shall be updated regularly to ease the use of the system.
- Integration of the new system shall not lead to the crash of the application.

4.8.5 Portability

- The software application should be compatible with all Operating Systems. It shall run on MacOS, Windows, Linux, Android, iOS, and so on.
- The choice of the programming language shall not be platform-dependent, a JVM language such as Java or Kotlin shall be used.

- Any external libraries used in the system shall have up-to-date support and they shall work on all environments.

4.9 Supporting Information

- For low-end devices, the dark mode may be unsupported.

Chapter 5

Appendices

5.1 Assumptions and Dependencies

5.2 Acronyms and Abbreviations