



ELECTRONIC DISASTER MANAGEMENT

A Project Report of Capstone Project - 2

Submitted by

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SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

Under the Supervision of

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MAY 2020



SCHOOL OF COMPUTING AND SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

Certified that this project report “**ELECTRONIC DISASTER
MANAGEMENT**” is the bonafide work of “**VIVEK PAPNAI**” who carried
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Abstract

A disaster is something that causes a lot of harm. It destroys life, livelihoods, economy and everything that makes society work [1]. India is ranked as second most vulnerable country to natural hazards by Global Climate Change and Vulnerability Index. As disasters are unavoidable in most of the cases but if effective disaster management measures are applied, suffering can be minimized. In the current times, advanced Information and Communication Technology (ICT) could be very useful and reliable in disastrous situations. Reliable and accurate data, the capacity to assess, analyses and integrate the various information is the key for successful pre and post disaster management [3]. Correct information about the disaster is one of the necessities among others like food, water, medicines and support. Effective communication of right information at right time is very crucial and can save many lives and livelihoods [2]. To reduce the disaster losses, disaster awareness system and related safety messages are very crucial as well. The following research provides a Web based software which has three main features. To begin with it gives a long-term database of enrolled catastrophes and crisis contact[4]. Second, the software provides a message distribution system (By using Mobile Short Message service (SMS) and Electronic Mail (Email)) for disaster awareness, disaster forecasting messages. Third the framework moreover gives benefit of online public's complaints enlistment and their arrangement [4]. A real-time graph to show human losses and economic losses for the selected year, month wise is also included in the software. So, this system can be really helpful in Disaster Management[4].

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.CHAPTER 1.

Introduction

2.1 Overall Description

Disaster may be a genuine disturbance that causes far reaching human, fabric, financial or natural misfortune which surpasses the ability of the influenced community or society to manage utilizing its claim assets. Different phenomena like earthquake, avalanches, volcanic eruptions, surges, storms, tornadoes, snowstorms, tsunamis, and tornados are all natural disasters that slaughter thousands of individuals and annihilates billions of property each year It has been revealed by the Global Climate Change and Vulnerability Index that India is ranked as the second most vulnerable country in the world to natural hazards[3].

Himalayan and Sub-Himalayan regions are the most vulnerable areas of the country. Developing nations endure the most noteworthy costs when a disaster hits – more than 95 percent of all passing's caused by hazards happen in developing nations, and misfortunes due to natural dangers and 20 times more prominent in developing nations than in industrialized nations [3]. As per the estimation, 70% of the Uttarakhand's population depends on agriculture and 25% on livelihood. Most of the tourist and pilgrims visit Uttarakhand in the months from May to August which is very sensitive and most of the incidents accrues during uncertain and irregular Monsoon in that time [2]. When we look in

previous disaster's record, we can say that these 3 months are very sensitive. Indeed, with the Present Disaster management plans of government, there's still the nonattendance of Information and Communication Innovation (ICT) based quick and proficient disaster management system which is able get ready open for catastrophe and offer assistance them within the time of catastrophe [3].

Disaster Subgroup	Definition	Disaster Main Types
Geophysical	Events originating from solid earth	Earthquake, Volcano, Mass Movement (dry)
Meteorological	Events caused by short-lived/small to meso scale atmospheric processes (in the spectrum from minutes to days)	Storm
Hydrological	Events caused by deviations in the normal water cycle and/or overflow of bodies of water caused by wind set-up	Flood, Mass Movement (wet)
Climatological	Events caused by long-lived/meso to macro scale processes (in the spectrum from intra-seasonal to multi-decadal climate variability)	Extreme Temperature, Drought, Wildfire
Biological	Disaster caused by the exposure of living organisms to germs and toxic substances	Epidemic, Insect Infestation, Animal Stampede

Table 1 – Disaster subgroup definition and classification

2.2 Purpose

The purpose of an online sports management system can be understood with the help of the following points:

2.2.1 Disasters warning/ awareness messages distribution by Mobile SMS and by Email.

2.2.2 Disasters Record Management including information of losses of life, houses, relief fund distributed, related document etc.

2.2.3 Disaster forecasting on the bases of analysis of previous Disasters records

2.2.4 Implements wide-scale awareness and knowledge about disasters.

2.2.5 Real-time Disaster Losses Graph for easy understanding of disasters scenario and making future action.

CHAPTER 2.

LITERATURE SURVEY

Disaster Management is a process in which we can find various methods for reducing losses in disaster. The process of disaster management involves four phases mitigation, preparedness, response, and recovery.

The mitigation phase is the attempt to reduce disaster risks by focusing on long-term measures of eliminating disasters. The preparedness phase is the development of an action plan for an upcoming disaster. The response phase is the mobilization of services and relief when disaster strikes and the recovery phase is the restoration of the affected area to its previous state. In short steps are as-

Mitigation-- > Risk Reduction-- > Prevention-- > Preparedness-- > Response-- > Recovery

To manage disasters, India enacted the Disaster Management Act in 2005 and established the National Disaster Management Authority (NDMA) and State Disaster Management Authorities (SDMAs).

one of the major drawbacks in the system needs special attention. Another disadvantage of this system is, it is difficult to prepare report for decision making and forecasting of disaster etc. These all processes contain paperwork, time consuming process flow, laborious work environment for employees, difficulty

to access old data records at anywhere. Yet government is providing training to public for facing disaster but limited persons are getting the knowledge. We have to develop a system which can provide safety tricks and tips to all persons in the region and solve their problems quickly.

It is not possible to avoid disasters, but suffering can be minimized by applying effective ICT tools for disaster management. It is said that keeping people connected and aware is keeping people safe. The effect of disaster increases because of limited knowledge about the prevention of disaster, lack of education, no proper disaster alert system etc. ICT can help in this, and this research provides a web-based disaster management system to manage disaster by spreading disaster awareness, forecasting of disaster and response upon public's complaints. Pre disaster management and post disaster management demands rapid access to reliable and accurate data and the capacity to assess analyse and integrate information from varied sources. This initiative aims with Automation of Disaster management Process using Information Technology for fast pre preparation of disaster and provide input for decision-making.

CHAPTER 3.

Existing System

The current system of disaster management has many advantages as well as disadvantages too. In the present system we have to deal with maintaining physical records of disaster, important contact detail and public complaints etc. in traditional files. There is not any system to maintain the record in digital form. As the same there is not any warning system available with the disaster management department. The department is using traditional communication methods like- pear to pear phone calls, satellite communication etc. at the time of disaster. There is also not any facility to maintain digital record of public complaints. Apart from the above stated problems there is lack of transparency in the existing system

CHAPTER 4.

Proposed System

Disasters warning/ awareness messages distribution by SMS and by Email

- Disaster forecasting on the bases of previous Disasters records
- Online Public complaint registration system
- Online Record Management of previous disasters and important emergency contacts with data export.
- Research on disaster management and making action plan for mitigation of disaster.

Sn.	Questions	By using traditional Method (Minimum)	By using DMS Software (Minimum)
1	Time required to register any disaster	10-15 Minute	4-8 Minute
2	Time required to search any recorded disaster	10-20 Minute	2-5 Minute
3	Time required to search any contact number	5-10 Minute	2-5 Minute
4	Time required to Send disaster information up to any Officer/ Public/ Volunteer	10-15 Minute	2-5 Minute
5	Time required to register a complaint	10-15 Minute	5-8 Minute
6	Number of staff required to maintain records	2 persons Minimum	None
7	Forecasting of any disaster	No method	Yes, by using Real-time graph/ research study
8	Online public query registration	No method	Available
9	Disaster awareness electronic medium	No method	Available (SMS, Email)
10	Disaster related data access/ data security	Only from the Disaster Management Office/ None	Data can be accessed from anywhere/ secured

Table 2. Questioner for Disaster Management System

CHAPTER 5.

Implementation and Architecture Diagrams.

5.1 System Architecture Design:

5.1.1. Base layer

The base layer provides the fundamental software and hardware environment required for the system, including network, server, storage, firewall, UPS, operating system, and so on [5].

5.1.2. Data Layer

The data layer stores all the data resources which are needed within the system, including disaster data, location data, user data and so on [5].

5.1.3. Application Layer

The application layer provides the communication bridge between user operations and background database. The key function modules include load balancing, data analysis, data management, data backup, portal integration, other web services, and so on [5].

5.1.4. Interactive Layer

The interactive layer provides the interface and interactive operations for users and managers. The interactive operations include user management, data management, data query, data export, system [5].

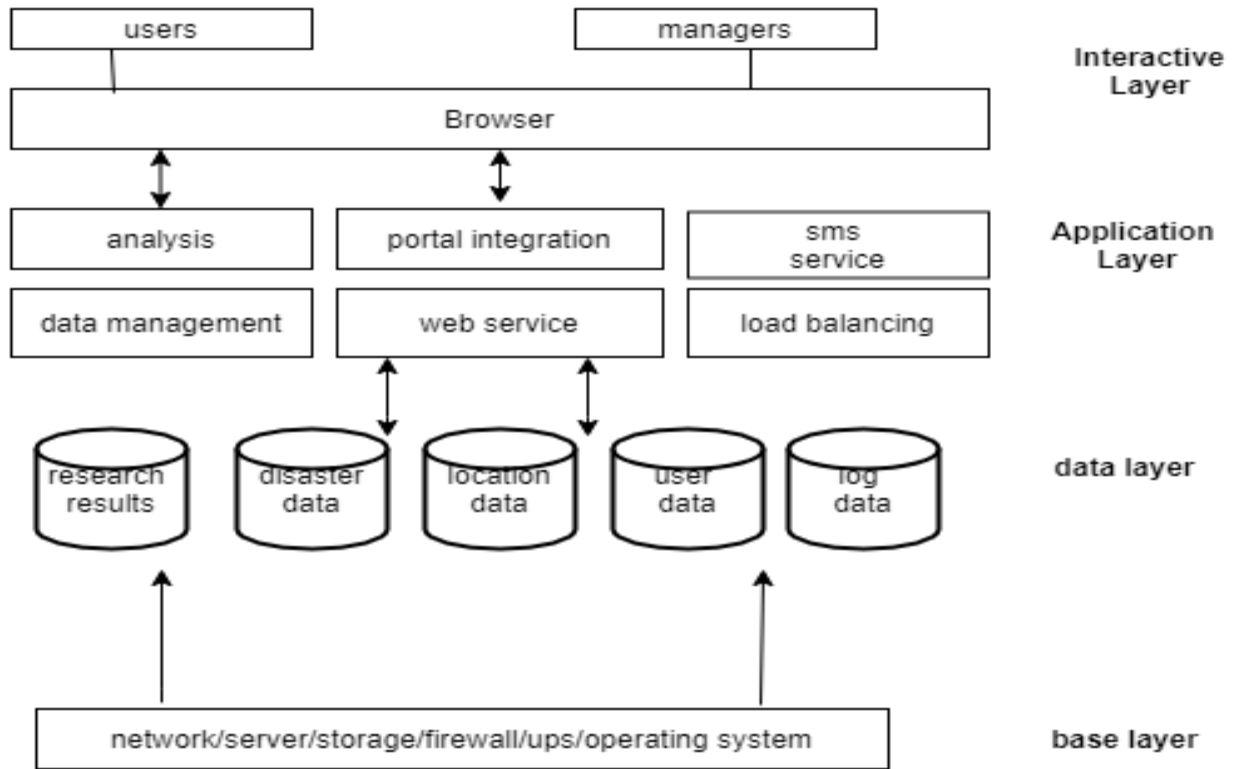


Fig 1. System Architecture Design

5.2 Use Case Diagram:

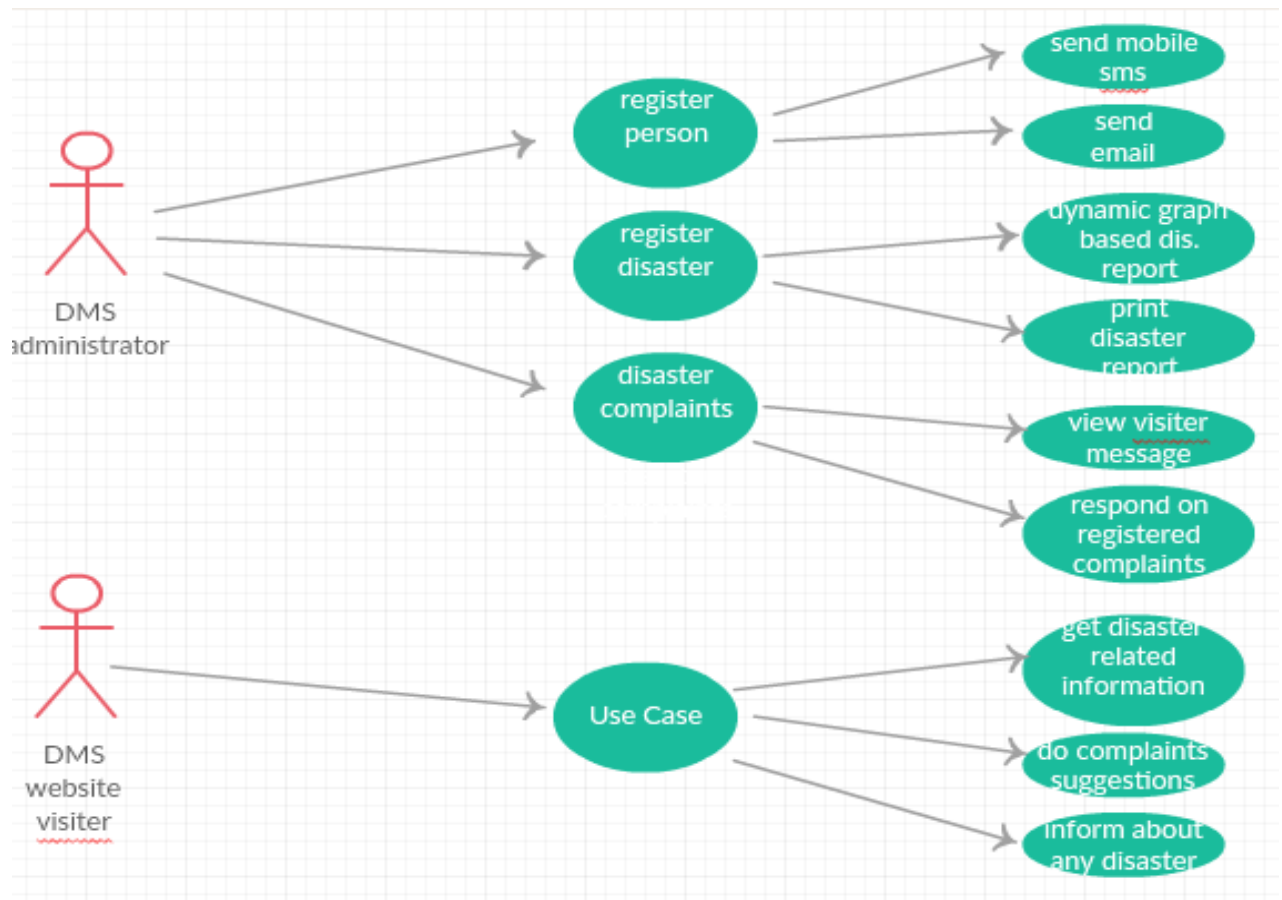


Fig 2. Use Case Diagram for EDM.

CHAPTER 6.

OUTPUT SCREENSHOTS AND CODE SNIPPETS.

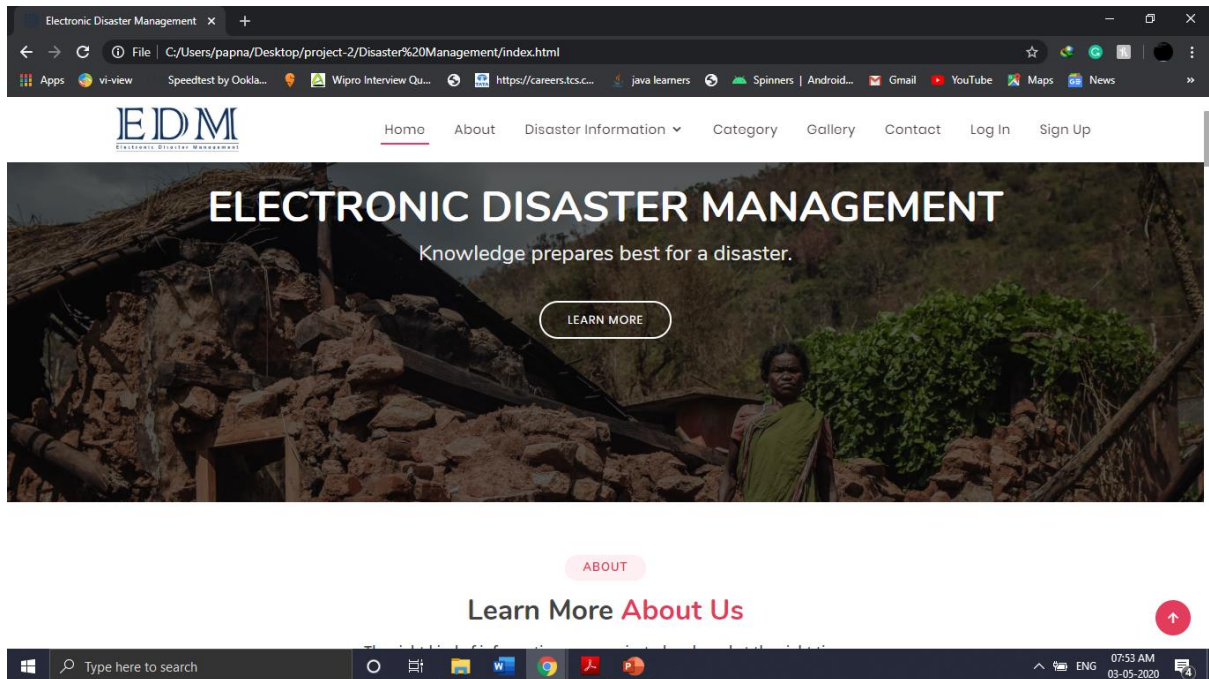


Fig- 3 Home page

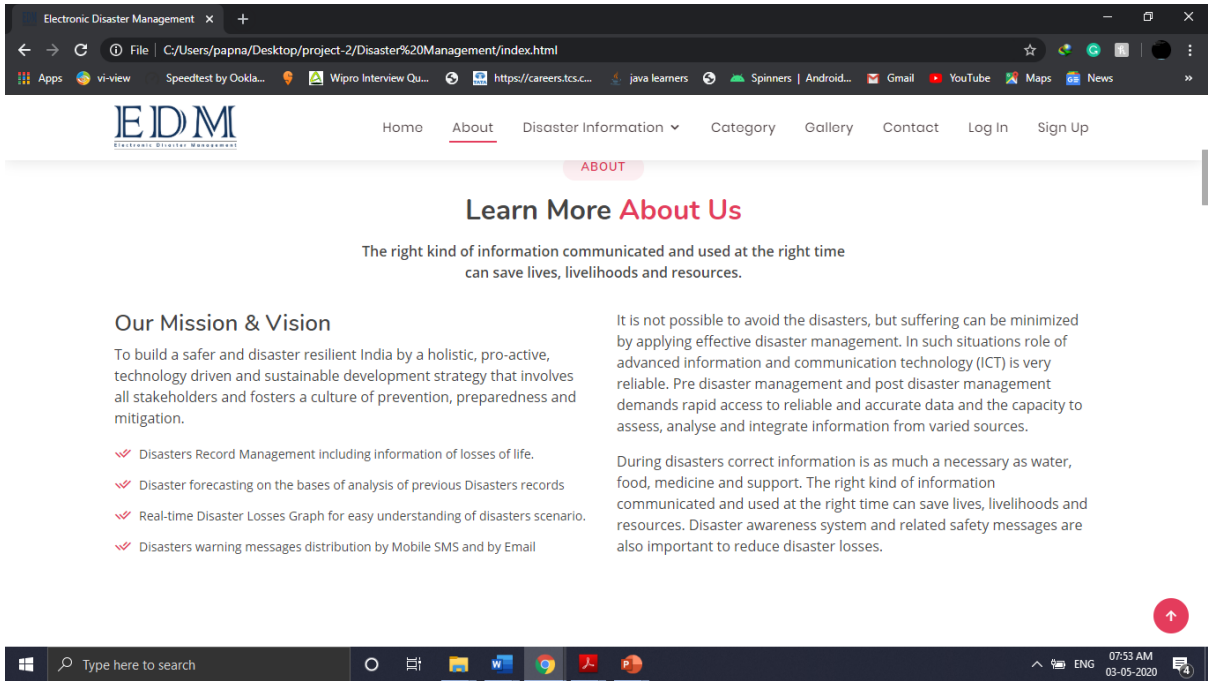
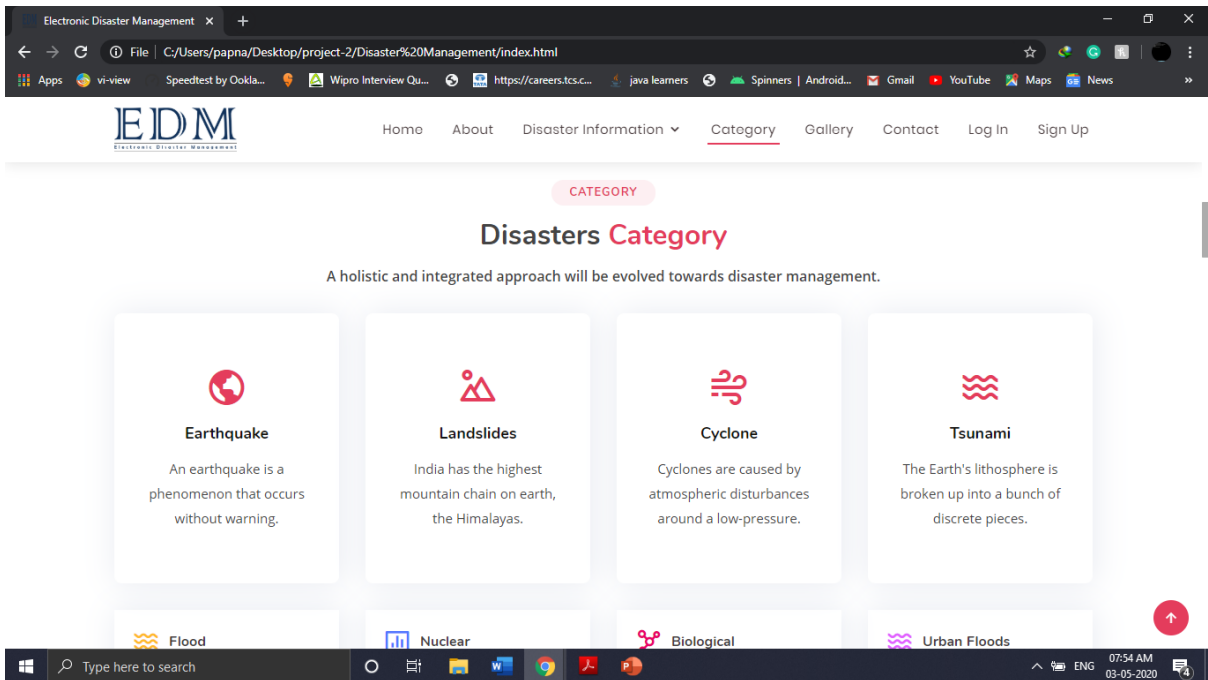


Fig -4 About us



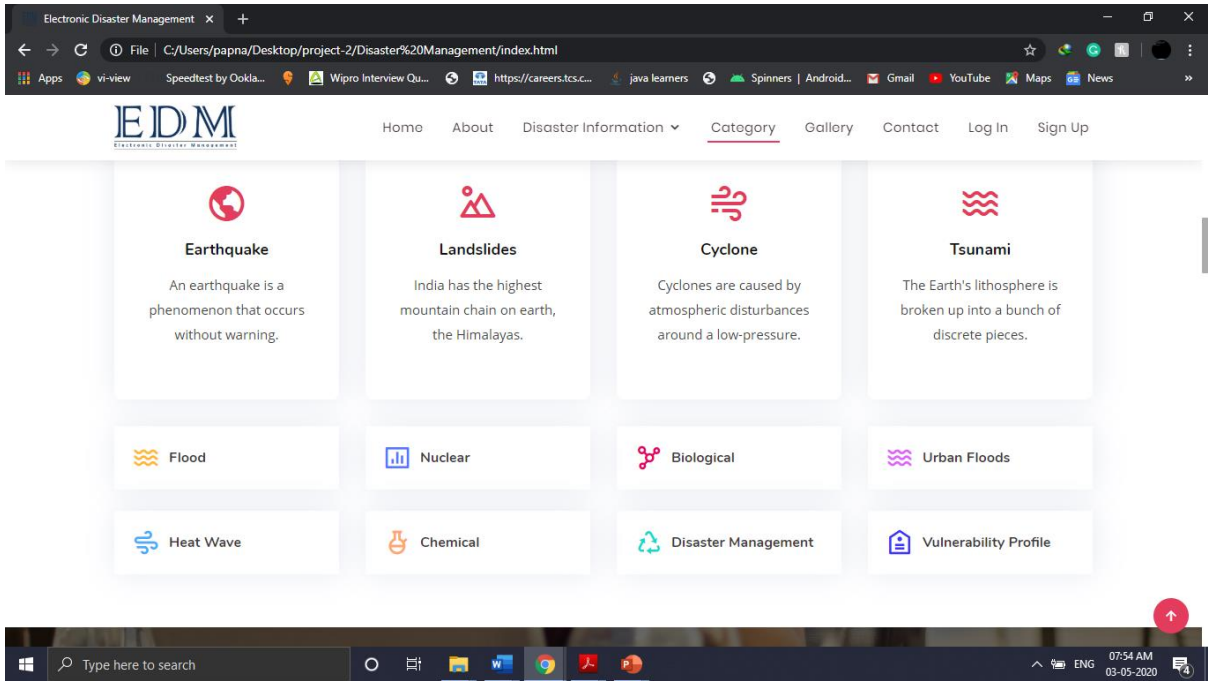


Fig – 5 Categories

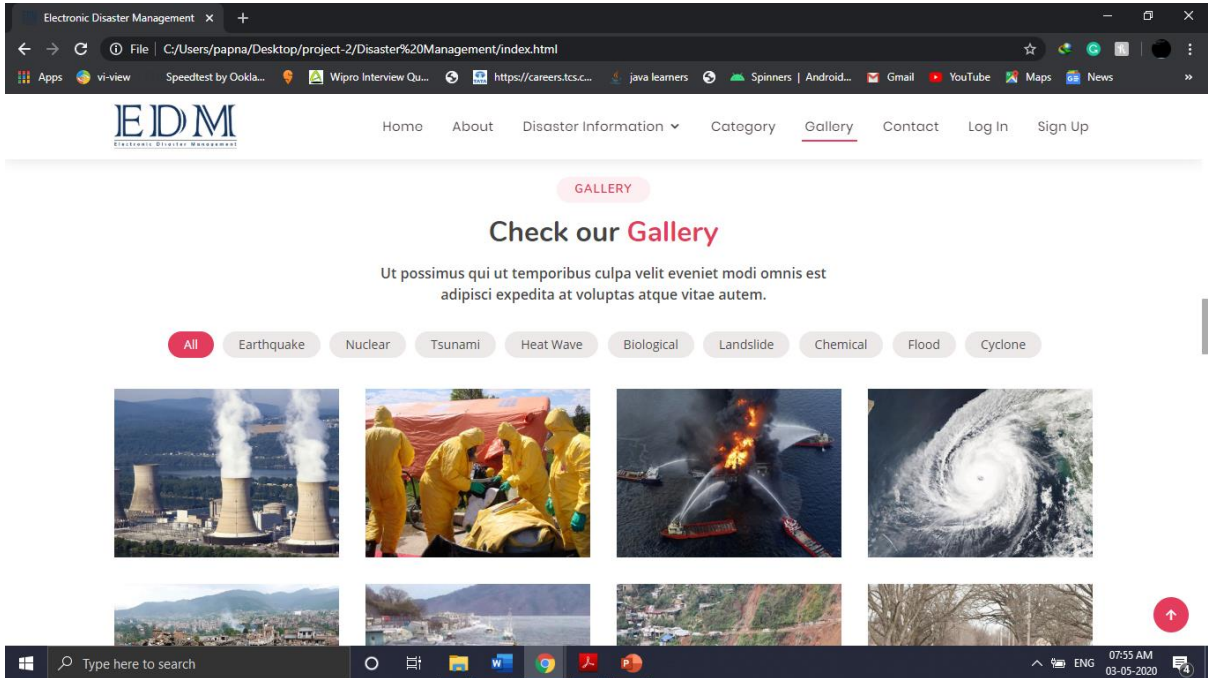


Fig - 6 Gallery

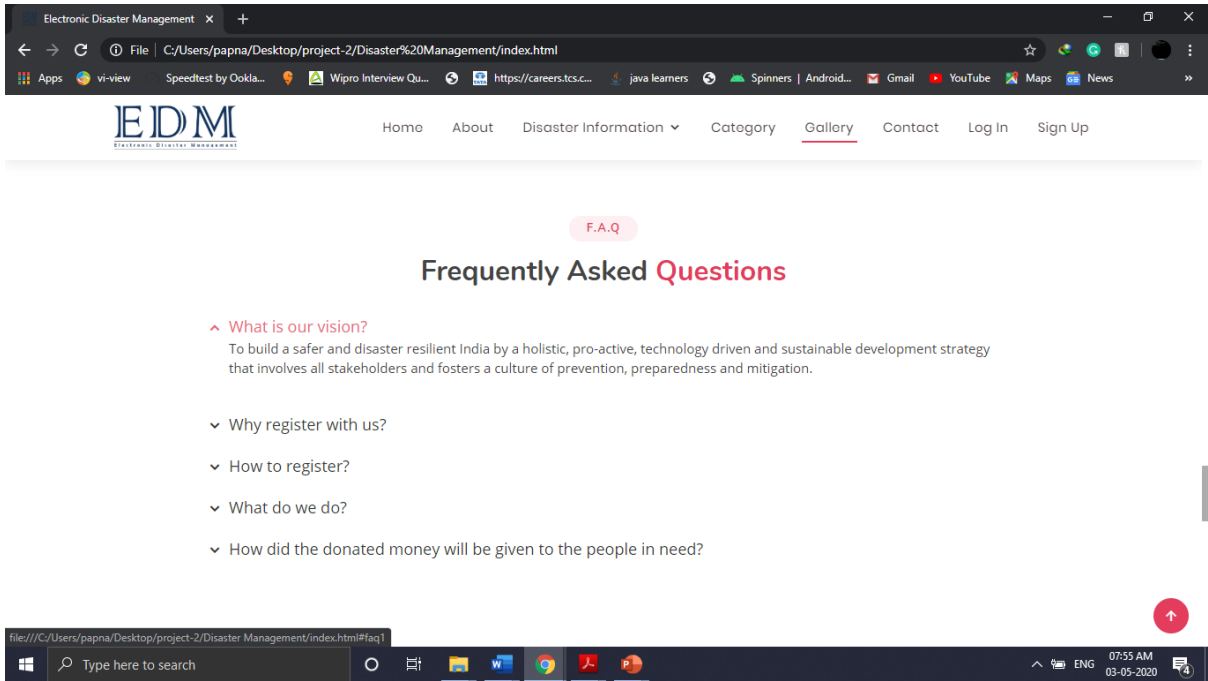


Fig- 7 Frequently asked questions

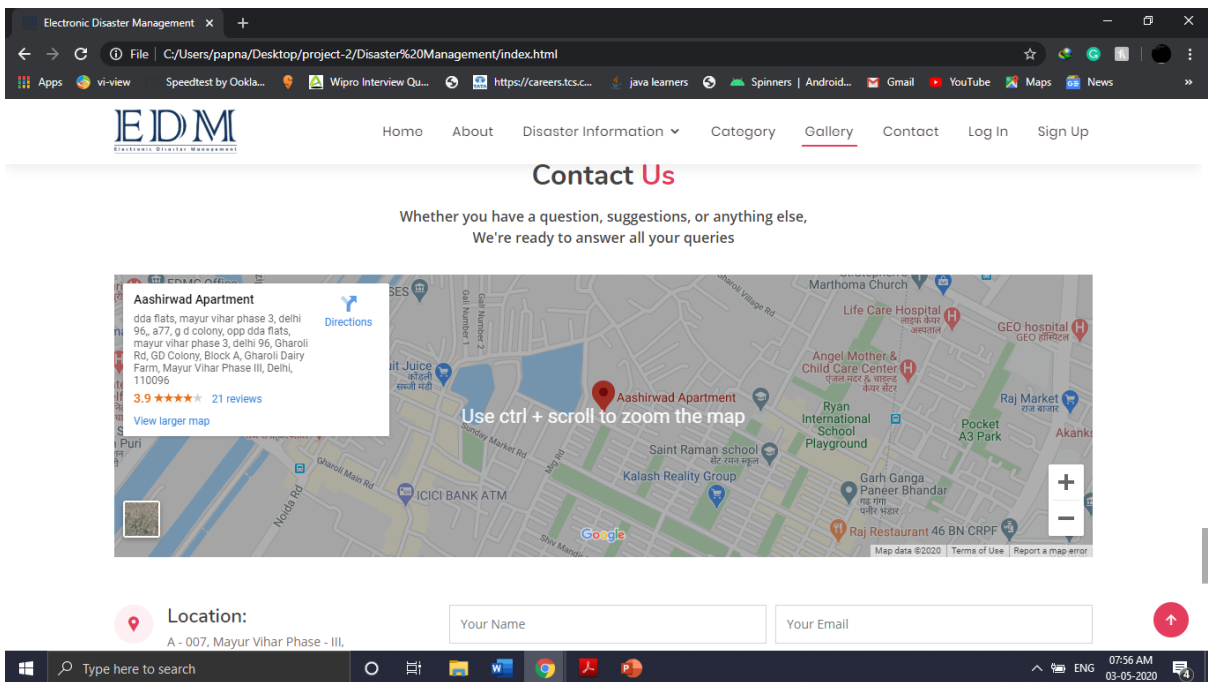


Fig- 8 Contact us

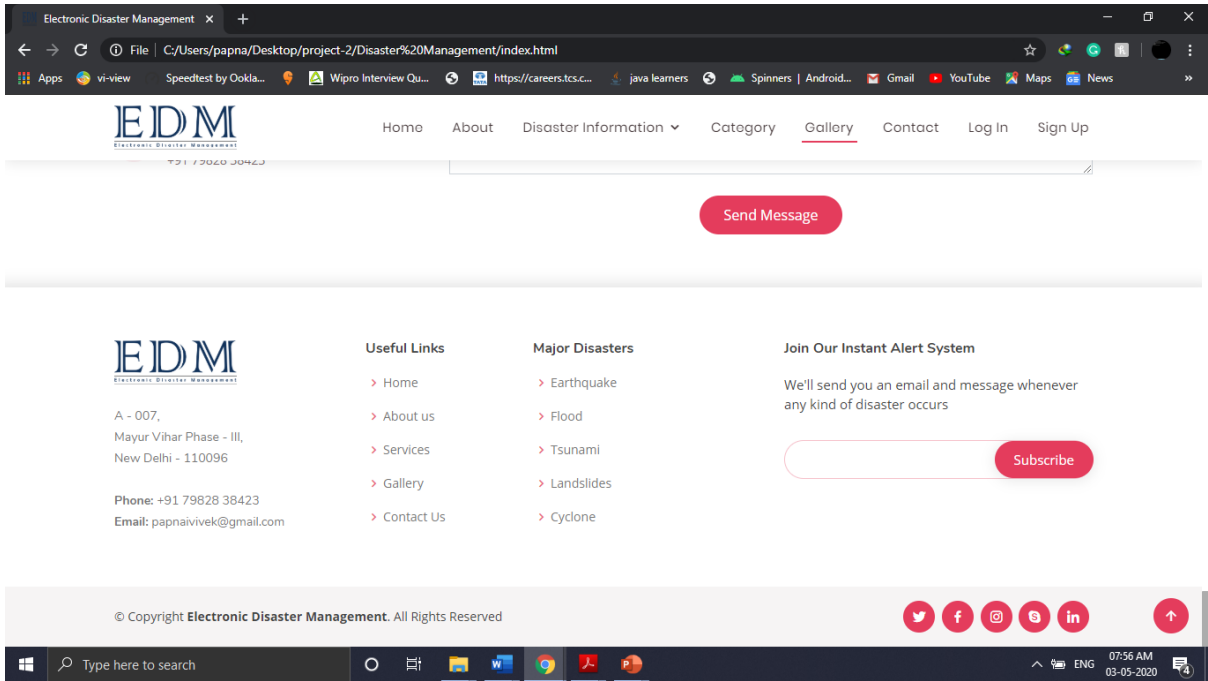


Fig-9 Footer

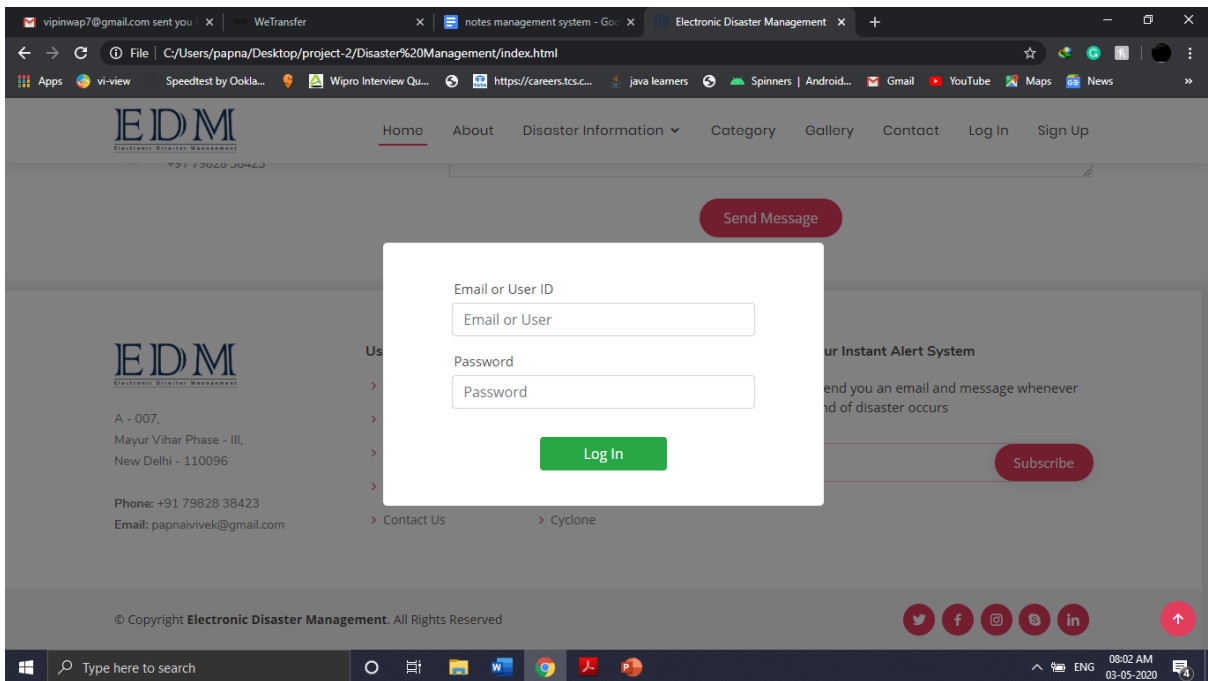


Fig- 10 Login/signup

```
File Edit Selection View Go Run Terminal Help index.html - Disaster Management - Visual Studio Code
EXPLORER
index.html x
index.html
DISASTER MANAGEMENT
assets
Biological.html
Chemical.html
cydone.html
DM_Cycle.html
earthquake.html
Flood.html
HeatWave.html
index.html
Landslides.html
notes.html
Nuclear.html
Tsunami.html
UrbanFloods.html
VulnerabilityProfile.html
OUTLINE
TIMELINE
Python 3.8.1 64-bit 0 0 0 Ln 97, Col 46 Spaces:2 UTF-8 CRLF HTML Go Live
Type here to search
```

```
75 <form class="row py-4">
76 <div class="col-md-9 mx-auto form-group">
77 <label>Email or User ID</label>
78 <input type="text" class="form-control" placeholder="Email or User" required>
79 </div>
80 <div class="col-md-9 mx-auto form-group">
81 <label>Password</label>
82 <input type="text" class="form-control" placeholder="Password" required>
83 </div>
84 <div class="col-md-12 text-center">
85 <input class="btn btn-success px-5 mt-3" value="Log In" type="submit" />
86 </div>
87 </form>
88 </div>
89 </div>
90 </div>
91 </div>
92
93 <!-- ===== Hero Section ===== -->
94 <section id="hero">
95 <div class="hero-container">
96 <h3>Welcome to</h3>
97 <h1>Electronic Disaster Management</h1>
98 <h2>Knowledge prepares best for a disaster.</h2>
99 <a href="#about" class="btn-get-started scrollto">learn more</a>
100 </div>
101 </section><!-- End Hero -->
102
103 <main id="main">
104
105 <!-- ===== About Section ===== -->
106 <section id="about" class="about">
```

There's an update available: Visual Studio Code 1.45.1
Install Update Later Release Notes

02:17 PM
17-05-2020

Fig- 11 Code snippets

CHAPTER 7.

Future Scope:

We are able execute effortlessly this application in disaster management. Reusability of components is conceivable as per necessity[3]. The coding design is kept as dynamic as possible with least sum of static values to form it simpler for future expansions. As the current framework is anticipated to include more functionality and dependency agreeing to necessity changes and innovation, legitimate coding guidelines and working stage have been kept in intellect to create a quality product.

➤ *Integration of Geographic Data Framework (GIS) with the framework-*

GIS is additionally a common IT device which is utilized in catastrophe management [5]. By using Mapping and Remotely detected information we can estimate disaster and minimize misfortunes amid disasters[5].

➤ *Online disaster and rescue awareness Programs-*

Utilizing data innovation ready to give online preparing to many peoples in a fast time and convey critical data [2]. This can be a fetched effective way of expanding knowledge and spread data at distinctive sorts of people groups. We can utilize SMS/Email to make public away

to disaster.

➤ *Public-Private Association in disaster management-*

With regard to disaster management, it is getting to be found that governments alone cannot give support to society [1]. Government ought to incorporate common public and private offices to oversee disaster. In Public-Private Organization show of disaster management, this computer program will work as bridge [1].

➤ *Can interface with Meta University for research in disaster management-*

In an unused trend, colleges and institutes are tying up to offer cross-university instruction, Research & Development and credit exchange offices to students in India [4]. This framework can too connect with such venture which encourages diverse partners and analysts for further research in disaster management.

➤ *We can create a national level disaster management framework-*

This demonstrate can be changed over into National or International level disaster management framework [5]. This framework is a financial way to oversee catastrophe and contains features for all stages of disaster management.

CHAPTER 8.

Conclusion

Data and communication innovation is growing quickly with expanding applications and modern roads are being search. In this research paper, it has been depicted, how web innovations are utilized in advancement of the Disaster management framework. The most reason of the project is to integrate distinct segments of disaster management into reliable way so that complex functions can be handled smoothly by any technical or non-technical people. The framework ought to be able to handle loads of demands from distinctive users around the world at the same time. This framework will offer assistance within the development of well-coordinated plans and procedures for disaster management with speed.

CHAPTER 9.

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