

A Project Report

on

**Design and implementation of disaster
management application using react-native**

*Submitted in partial fulfillment of the
requirement for the award of the degree of*

**Bachelor of Technology in Computer Science and
Engineering**



(Established under Galgotias University Uttar Pradesh Act No. 14 of 2011)

Under The Supervision of

**Ms. Deepika Sherawat
Assistant Professor**

Department of Computer Science and Engineering

Submitted By

**19SCSE1010597 - SHIVANSH SRIVASTAVA
19SCSE1010004 - ROHAN KUMAR**

**SCHOOL OF COMPUTING SCIENCE AND ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
GALGOTIAS UNIVERSITY, GREATER NOIDA, INDIA
DECEMBER - 2021**



**SCHOOL OF COMPUTING SCIENCE AND
ENGINEERING
GALGOTIAS UNIVERSITY, GREATER NOIDA**

CANDIDATE'S DECLARATION

I/We hereby certify that the work which is being presented in the project, entitled “ **Disaster management application in react** ” in partial fulfillment of the requirements for the award of the **BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING** submitted in the **School of Computing Science and Engineering** of Galgotias University, Greater Noida, is an original work carried out during the period of **JULY-2021 to DECEMBER-2021**, under the supervision of **Praveen Misra, Assistant Professor, Department of Computer Science and Engineering** of School of Computing Science and Engineering , Galgotias University, Greater Noida

The matter presented in the project has not been submitted by me/us for the award of any other degree of this or any other places.

**19SCSE1010597 - SHIVANSH SRIVASTAVA
19SCSE1010004 - ROHAN KUMAR**

This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Supervisor

(Ms. Deepika Sherawat)

CERTIFICATE

The Final Thesis/Project/ Dissertation Viva-Voce examination of **19SSE1010597-SHIVANSH SRIVASTAVA ,19SCSE1010004-ROHAN KUMAR** has been held on _____ and his/her work is recommended for the award of **BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING**.

Signature of Examiner(s)

Signature of Supervisor(s)

Signature of Project Coordinator

Signature of Dean

Date:

Place:

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Abstract

We see disasters strike and affect the lives of millions of people each year. Most of us are aware of the key role disaster management plays in responses to such crises. However, over the recent decade's disaster management has grown to become an established career and academic field. Therefore, it is only right to ask, what really is the importance of disaster management and how does it help people affected by crises?

Disaster management is important because it aims to ensure an effective and coordinated response to disasters. Through work to save lives and reduce the impact of crises on affected communities, disaster management is fundamental to timely and effectual assistance to disaster hit people.

We are making a disaster management react native app which can be used by NGOs or other helping organizations in time or disaster this app features can be used as a user guide to know about natural disasters, man-made disasters, disaster management life cycle, emergency kit, etc. It includes details of helpline centers with an in-built calling feature. Technology and crowdsourced data have played a role in disaster management in multiple instances in India. However, disaster-related mobile apps have not yet taken off as a resource among users. this app is made using react native and uses natural language processing and machine learning for data collection and analysis and prediction of natural calamities before it happens with the help from various government API's and resources and this app also incorporates a chatbot that will use NLP and reduce human work in maintaining the website The mobile app also provides information related to earthquakes, floods, landslides, cyclones, tsunamis, urban floods, and heatwaves, etc.

Technologies used: react-native, firebase, docker, sentry, strapi, TensorFlow, IBM Watson,figma

INTRODUCTION

Today society started to adapt information technologies and as citizens they want to benefit governmental services in electronic environment. According to this situation some associations started to invest in developing their systems in order to service online. It appeared that there has to be coordination between these systems in order to accomplish effective and productive usage of the sources, correct investment planning and to form productive decision support systems. Also, it is agreed that coordination is needed for obtaining opportunity equality in reaching information and to associating with the world, etc. For that reason, Prime Ministry of Turkey decided governmental services to be online according to EU targets. After the problems at 17 Th August 1999 earthquake as a part of eGovernment project Disaster and emergency management system is decided to be build. Istanbul is selected for pilot project area because of being a perfect model of whole country and being the highest populated city, which will suffer the worst from possible earthquake. The consultancy of this project has been given to Yildiz Technical University (YTU) by Prime Ministry of Turkey. Information about the design of Disaster and Emergency Management System is given in this paper.

REQUIREMENTS

This section discusses about what are the requirements to make a mobile application, Disaster Management app. Basically, we need to know all about a android application (like how it works, what languages are used, how to host on web, etc.) for creating a web application. We also need the good knowledge of React, NodeJS, firebase, mongo DB, Heroku, Docker, TensorFlow, AWS.

React is the JavaScript library, which is used for building User Interface components. is a free and open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta and a community of individual developers and companies. React can be used as a base in the development of single-page or mobile applications.

Nodejs is used to generate or make content of the page dynamic. It is used to create, open, read, or close files on the server and it can modify your data which is in your database.

Firebase is another product which is used by developers to build web application easily and faster. It is so easy as compared to others as it does not need any programming knowledge or skills.

Mongo DB MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas.

Heroku is a container-based cloud Platform as a Service (PaaS). Developers use Heroku to deploy, manage, and scale modern apps. Our platform is elegant, flexible, and easy to use, offering developers the simplest path to getting their apps to market.

Docker is a set of platform as a service products that use OS-level virtualization to deliver software in packages called containers. Containers are isolated from one another and bundle their own software, libraries and configuration files; they can communicate with each other through well-defined channels **TensorFlow** is a free and open-source software library for machine learning and artificial intelligence. It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks.

AWS (Amazon Web Services) is a comprehensive, evolving cloud computing platform provided by Amazon that includes a mixture of infrastructure as a service (IaaS), platform as a service (PaaS) and packaged software as a service (SaaS) offerings.

LITERATURE REVIEW

Crisis informatics is a broad research field that integrates “disaster management, information, and communication technology, and socially generated and processed content” ([Tan et al., 2017](#), p. 299). These studies investigate the role of information technology and new media during crises ([Tan et al., 2017](#)), emergencies ([Sutton & Kuligowski, 2019](#)), and disasters ([Palen et al., 2010](#)). Mobiles, wireless devices, and social media are new media that can facilitate the communication process to spread both alerts and warnings ([Sutton & Kuligowski, 2019](#)). Alerts “capture the attention” of their audience before warnings are issued, while warnings contain important information in the case of emergencies that require protective behavior ([Sutton & Kuligowski, 2019](#)).

Literature concerning public alerts and warnings suggests that protective action compliance improves when warning messages are specific, consistent, confident, clear, and accurate ([Mileti & Sorensen, 1990](#)). Alerts and warnings provided through mobile Short Message Service (SMS) usually include messages of up to 90 characters and can be sent using geo-referenced technology to target audiences according to devices' live-location or last wi-fi access ([Sutton & Kuligowski, 2019](#)). These messages can also be delivered by disaster management or general- or different scope (e.g., social media) apps ([Tan et al., 2017](#)), although longer messages are available when the message is provided by social networks such as Twitter's 280 characters (since November 2017) ([Sutton & Kuligowski, 2019](#)). Social media has increased the complexity of the disaster communication system due to users' increased interactions ([Manoj & Baker, 2007](#)).

Studies on crisis informatics have risen since 2010, typically focusing on the response and recovery stages rather than disaster preparedness ([Tan et al., 2017](#)). Recent studies suggest that, in case of disasters, the public tends to communicate through familiar, frequently used and trusted platforms, such as Google, Twitter, Facebook, etc. ([Liu, Fraustino, & Jin, 2016](#); [Tan et al., 2017](#)). Despite this fact, current academic studies tend to primarily focus on disaster apps rather than existing social media ([Tan et al., 2017](#)). This trend is justified by the fact that the usage of social-media often depends on the nationality of the travelers (e.g. WeChat in China and LINE in Japan) ([Chen, 2016](#)). In addition, several authors highlight additional social media-related issues such as privacy, information quantity, and content quality, which favor the use of disaster apps ([Schimak, Havlik, & Pielorz, 2015](#); [Tan et al., 2017](#), p. 301). This is the case, for instance, of Alipay (wallet app) in China. This mobile application has been used to check users' health-status during COVID-19 infectious disease emergency, suggesting if they should be quarantined or allowed into subways, malls and other public spaces ([Mozur & Zhong, 2020](#)). However, this privacy issue seems to be relevant also in the case of built-for-disaster-purpose apps. This is the case, for instance, of Corona 100 m (Co100) or Coronamap in South Korea where the users are informed about when they come close to a spot visited by infected person ([Watson & Jeong, 2020](#)).

Both social media and disaster-focused apps can facilitate several disaster management-related actions along the disaster life cycle ([Houston et al., 2015](#); [Tan et al., 2017](#)). They can be used for sharing important information and images to assess post-disaster damages and/or pre-disaster risk; to facilitate dialogue among stakeholders, generating active collaborations; to disseminate alerts and information from authorities to the public; to collate existing relevant multisource disaster management information and adapt them for easier communication to stakeholders; and to notify others about personal status after disasters ([Tan et al., 2017](#)). Unlike social media, disasters-specific apps must be initially identified, perceived as an effective tool for disaster risk reduction, and finally downloaded by users. Intuitive applications, with an attractive, well-designed interface and endorsed by authorities, facilitate this process ([Tan et al., 2017](#)). However, the level of complexity increases for tourist-gearred disasters apps as risk communication strategies that consider tourists' behavioral characteristics must be developed ([Aliperti & Cruz, 2019](#)).

Website development process

The web development process goes like first we design the backend with all the API needed for the social media part of the website and then the code editor and messaging feature then comes creating and implementing the machine learning model to our code editor the deploying everything to different micro-services

1. Analysis
2. Requirements
3. Content Writing
4. Coding

Analysis: - The languages required for this project is JavaScript and python the framework used for the frontend is react js and the backend is based on node js and express server for chat feature socket.io is used for user authentication firebase service is used and data of the user is stored in MongoDB database the package manager used for frontend and backend is npm and for the machine learning part machine learning model is made on development environment and deployed on AWS services to use

Content Writing: Our website contains a blog section where the website new feature and updates are published if a user is new to our website to explain how everything works, they can take the help of our blogs and get started these blogs should be easy to understand even for a beginner so content writing is a key aspect of our website.

Requirements: The coding phase started by creating user and post models and routed and then working on the frontend in parallel and implementing these features using Axios to fetch data from MongoDB and authenticate the user using firebase then implementing chat feature by using sockets for individual chat and chat rooms and then creating a basic code editor and compiler after that creating a docker image and pushing it on docker hub after that comes creating ML model by gathering datasets using TensorFlow unsupervised learning then uploading it to AWS service and used it in our website compiler.

Coding: We containerized our application using docker and used Heroku for deployment backend and frontend separately and for caching error we also connected Redis container and used AWS SageMaker to deploy our ML model.

FEASIBILITY STUDY

We are highly vulnerable to either natural or artificial catastrophes and therefore, Public Protection and Disaster Relief (PPDR) operators need reliable wireless communications for successful operations especially in critical rescue missions. PPDR dedicated or commercial terrestrial networks have always been used which at most times lead to unsuccessful operations. This is due to the fact these networks are all infrastructure-based which can be destroyed, fail to deliver the required service or the networks are not able to support and sustain the sudden traffic surge. Long-Term Evolution (LTE) is earmarked as the future candidate technology for PPDR purpose and so much have been put into it in terms of research, perhaps suitable architecture that will meet mission-critical requirements can be developed. This can only work if terrestrial networks will always be available. Unfortunately, in worst case scenarios, infrastructures might get damaged totally or might be destroyed by subsequent disasters. As a result, adequate guarantees can only be possible in the hypothesis of very high financial involvement. Fortunately, considering availability, coverage ubiquity and reliability, satellite technologies have lately proven good. So, to maximize the high channel performance of terrestrial networks and the availability and reliability of non-terrestrial networks, the solution lies in a hybrid system. It is on this ground that this work deals with the integration of LTE and satellite networks in both infrastructure-based and infrastructure-less topologies for PPDR purpose. It is aim at providing people trapped in disaster and field operators with a transparent accessibility and guaranteed coverage even when infrastructures are damaged. The requirements are defined and the model simulated. The network is able to provide network coverage, enhanced capacity and promised greater resilience.

Operational Feasibility

This software is incredibly simple to use because it has been made user-friendly with the help of popular GUI tools. The most important factor is that all system operations are easily accessible to users. Another important factor to evaluate is if the user business has received adequate training on how to use the new technology. All of the functionality is similar to that of a previous operating plan, therefore prospective modifying shouldn't be difficult.

Behavioural Feasibility Humans aren't immune to change, and computers and mobile phones are well-known for facilitating it. The ranking should be based on the likelihood of a user's reaction to the computers system's use. As a result, it's natural that launching an election campaign necessitates extra work in terms of employee education and training. The software being created is simple to use and understand. As a result, modern software performs admirably and is adaptable to any situation, culture, or environment.

Economic Feasibility

The only cost for building this project is for printing and binding the report files and system uses cost. Additionally, effort and time of every team member is the cost involved for this project. Also, the user does not need to pay a single penny to use this app. Just the use of browser. And hence, Disaster management is economically feasible for anyone with a browser.

Problem Formulation

Disaster response and recovery are crucial phases of disaster management. Decision-support systems used in disaster management must cope with the complexity and uncertainty involved with the scheduling and assignment of differentially-skilled personnel and assets to specific tasks. Operational constraints—such as workload and labor requirements, precedence constraints, resource availability, and critical deadlines among others—make timely and appropriate task assignment and sequencing difficult. Failure to assign personnel in an efficient and effective manner may result in unnecessary fatalities and significant additional loss of property as well as damaging the reputation of the disaster management organizations. Therefore, this paper proposes a decision-support system for disaster response and recovery

using hybrid meta-heuristics. The ability of governmental agencies and relief organizations to respond quickly and appropriately to a natural or man-made disaster is crucial in saving lives and/or preventing additional loss of property. In the case of Hurricane Katrina's strike on the southern US coastline in 2005, the US Congressional investigation into the aftermath of the disaster found that the governmental hierarchy (federal, state, and local) failed to act decisively. Many of the elements of the nation's disaster management plan were either poorly implemented or never attempted resulting in an increased fatality rate and the preventable suffering of many of the survivors

Workflow

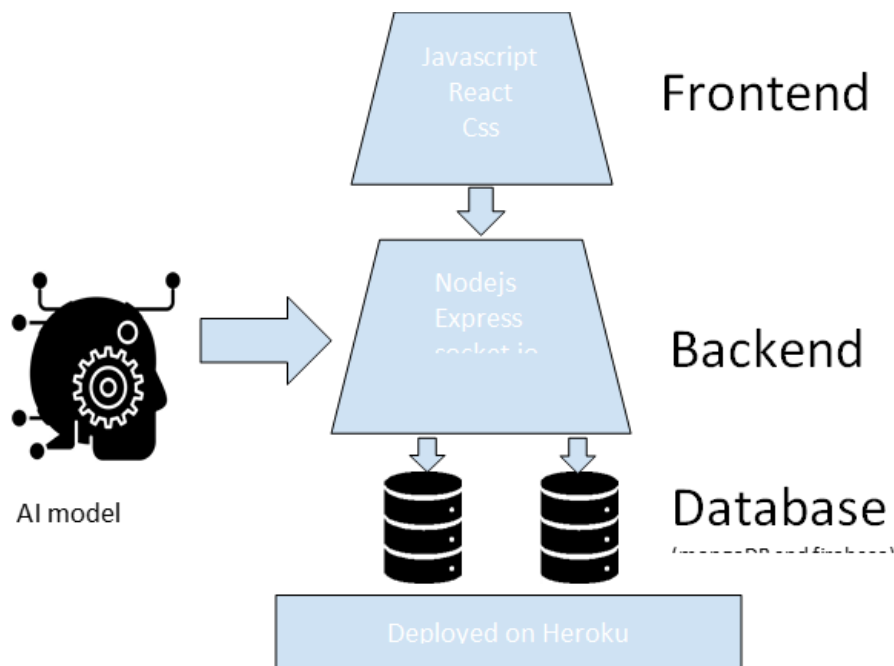


Fig:1 Architecture

NLP implementation

As shown above, Fig 1 as is the architecture of our web application Disaster management. It is the organized and systematic form to show the workflow of our project. The frontend consists of making of design or structure for the web app. The React, JavaScript and CSS use to create all the contents like app bar , Login/Signup section, different pages etc. which is design by React and the styling is done by CSS. JavaScript is basically used to make web application responsive.

The backend is divided in three parts, Nodejs, Express and socket io. All three technologies are used for backend which consists of login and registration of new user, working of all buttons, etc.

The database is used to store data of users, it includes mongo DB and Firebase. A user all the required information is stored in Mongo dB and Firebase and after deployment of our web app we use Heroku and get a domain for our application from where they can easily navigate to our application.

Disaster management modules

The app includes a separate part to method specific standard tasks. this may facilitate the app to grow simply and create it easier to use.

The project modules are: -

Access Module: -

This will facilitate users to sign on to the app exploitation registered id and arcanum. A user with a sound id and arcanum will solely log in to their accounts.

And if account isn't produced then create one exploitation sign in module that helps to register the user into the info.

It will facilitate evidence user login. The module provides a layer of security over the system as solely approved personnel will log into the system. This prevents any anonymous person from accessing the system and misusing records. It is better than the manual methodology as they are doing not have a security rating of United Nations agency will access this program and United Nations agency will.

The access module will control the login register and role assign from admin Pannel role to be made are user admin super admin and volunteer

Home Module: -

This module is first page of the screen where contact information will be displayed when user scrolls below there will be information related to missing persons and resources available in the area this module uses google map Api

Top make the use of app easy no login will be required login will be mostly for nog's and other donating and help providing agencies user can log in to report missing person to make sure correct information is passed

Admin Module: -

Admin module is for a few user who will monitor the whole functionality of the app see who can be a volunteer or admin and add the resources themself

It allows system administrator to set up back-end of the system and perform basic system configuration, mainly definition of predefined drop-down fields, definition of classes time schedule, etc

Machine learning module: -

Data pre-processing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model.

When creating a machine learning project, it is not always a case that we come across the clean and formatted data. And while doing any operation with data, it is mandatory to clean it and put in a formatted way. So for this, we use data pre-processing task.

NLP module: -

There are many different types of chatbots created for various purposes like FAQ, customer service, virtual assistance and much more. Chatbots without NLP rely majorly on pre-fed static information & are naturally less equipped to handle human languages that have variations in emotions, intent, and sentiments to express each specific query.

1. Natural Conversations across Languages: -

The problem with the approach of pre-fed static content is that languages have an infinite number of variations in expressing a specific statement. There are uncountable ways a user can produce a statement to express an emotion. Researchers have worked long and hard to make the systems interpret the language of a human being.

Through NLP, it is possible to make a connection between the incoming text from a human being and the system generated a response. This response can be anything starting from a simple answer to a query, action based on customer request or store any information from the customer to the system database.

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Module Descriptions

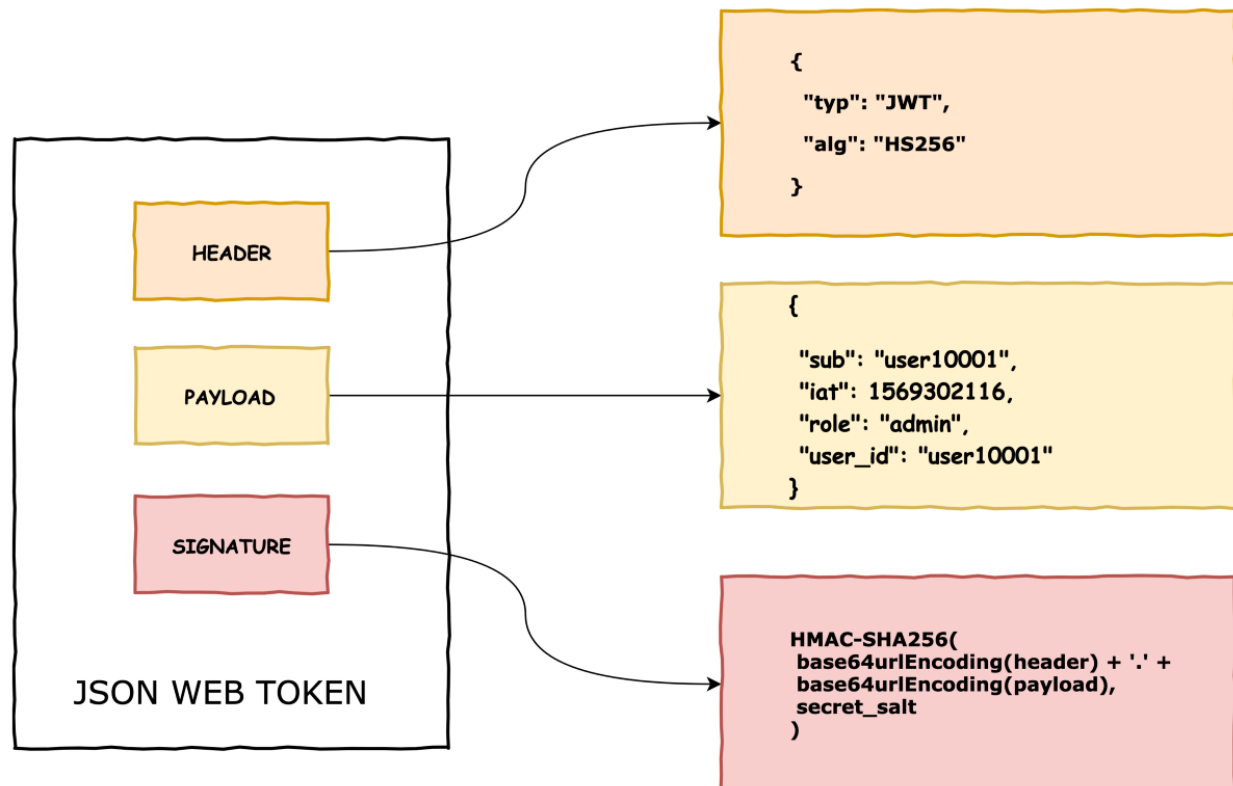
In this project there are some various types of modules :

1. Authentication Module

The user authentication for the application is handled by the authentication module. the authentication module is basically the JWT auth Jwt means "JSON web token" authentication, where the user has a token after login and when it hits any protected screen then token from the AsyncStroage is verify, if the user has a token then, have access to the protected screen otherwise redirect to the home screen with the message of "Access denied".

Authentication in our application is built upon nodejs and expressjs, these are the frameworks to build the backend or REST full apis. Express is basically used for API development. The Authentication module working is shown in the image below

Doing authentication is part of the backend development. we use mongo Db as a database, MongoDB is a non-relational database and no-SQL database, where you can store your data from the client, in the form of collections

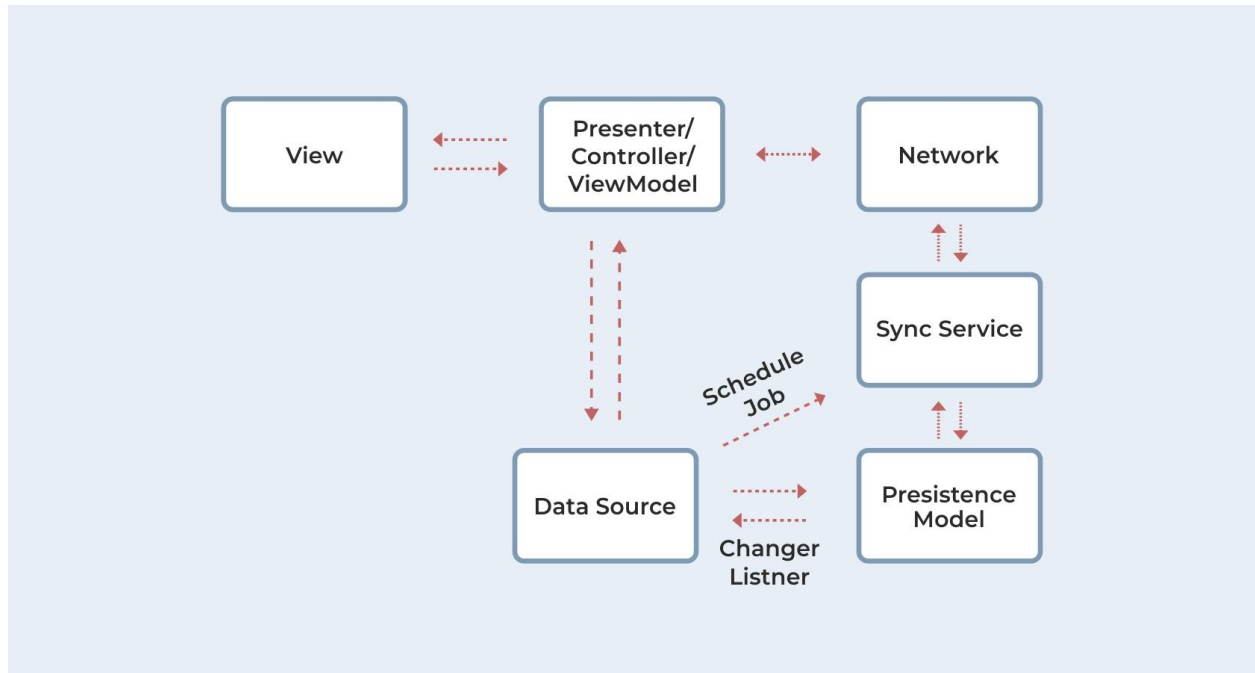


2. Offline Support Module.

Offline support is something when user has no internet or too low internet connectivity in some areas, so the user can have access to some screens which do not require any data packet to fetch the data from the storage, it will store the data in AsyncStorage in the mobile application bundle, and sync the application according to that data from the storage. No matter, applications are getting slow because of internet connectivity. It means that without internet connection data can't be fetched from the cloud storage, but can use the existing data from the local storage which is present under the application bundle called Async storage, this is just like the local storage that we have in our typical browsers like Chrome and Mozilla Firefox. Etc

Offline Support to Access data-

The app needs to be able to display information even when there is no internet connection, but, in less connected situations, the data needs to be updated as well. This is accomplished by somehow insisting on the data on the cell phone, usually for a longer period of time.



Data Sync:

The app needs to be able to display information even when there is no internet connection, but, in less connected situations, the data needs to be updated as well. This is accomplished by somehow insisting on the data on the cell phone, usually for a longer period of time.

Important things to be addressed -

1. Data Size
2. Data Storage.
3. Battery Usage
4. Consuming the data

3. Image Recognition Module

The image recognition module is used for recognizing the image in the posts from the user, it checks if it is fake or not. Because anyone can spam or can post a false post.

People's visual performance is much better than a computer, probably due to higher image comprehension, status information, and greater similar processing. But human power deteriorates dramatically after prolonged supervision, and some workplaces are inaccessible or extremely dangerous to humans. So for these reasons, automated alert systems are designed for a variety of applications. Driven by advances in computer technology and image processing technology, computer simulation of human vision has recently gained a foundation in many operating systems.

Image recognition refers to the technology that identifies places, logos, people, objects, buildings, and a few other variations in digital photography. It can be very easy for people like you and me to see different pictures, such as pictures of animals. We can easily see a picture of a cat and separate it from a picture of a horse. But it may not be so easy on a computer.

A digital image is an image composed of image elements, also known as pixels, each with a limited, distinct number of numerical representations by its intensity or gray level. So the computer sees the image as the numerical value of these pixels and to see a particular image, it must see patterns and norms in this numerical data.

4. Data Collection Module

Data collection modules work is to collect data from the different websites and different sources if someone needs help and he posts it on FB or Instagram or any other NGO website or any other social media platform. it will be redirected to us on the application with the help of IBM Watson Discovery and selenium which is a module in python is used for web scraping, it scrapped data from the different small sources,

Watson Discovery is an intelligent search and text analytics platform from IBM. It enables enterprises to quickly and accurately find and unlock insights hidden in documents and other structured and semi-structured information

Watson gives the data then it passed through a Natural language processing algorithm/method called sentiment analysis, for checking if data is false or not, if data is false then NLP rejects this data before showing it on the application screen and considering the next data which provided by the Watson discovery and selenium

A study that involves recording data simultaneously, so-called population summaries, is a separate study. This data is collected only once. Generally, these studies do not collect personally identifiable information (PII) as there is no need for follow-up studies. These types of studies are always observant, in which researchers record information about their studies without exploiting the learning environment. Examples of different subjects are patient registers or in-house surveys.

Watson was created as a [question answering](#) (QA) computing system that IBM built to apply advanced [natural language processing](#), [information retrieval](#), [knowledge representation](#), [automated reasoning](#), and [machine learning](#) technologies to the field of [open domain question answering](#).

When created, IBM stated that, "more than 100 different techniques are used to analyze natural language, identify sources, find and generate hypotheses, find and score evidence, and merge and rank hypotheses."

In recent years, the Watson capabilities have been extended and the way in which Watson works has been changed to take advantage of new deployment models (Watson on IBM Cloud) and evolved machine learning capabilities and optimised hardware available to developers and researchers. It is no longer purely a question answering (QA) computing system designed from Q&A pairs but can now 'see', 'hear', 'read', 'talk', 'taste', 'interpret', 'learn' and 'recommend'.

5.Admin Panel Module

Admin Panel module is used in our app for managing the data and user in the application who registered and signed in,

Admin can delete any post and any comment and add some useful or important information in the application, even from the admin panel admin have the power to send the notification to the specific user.

the more important use of the admin panel is to visualize all user data into the form of a table and chart so that the admin can manage the data.

by the admin panel user can see the visualization of the data by the charts and analyze the data, about the accidental most accidental areas and months in which more disasters had happened

The control panel can help with user-related tasks, such as providing insight into user behavior, dealing with profiles that violate site terms and conditions, and tracking activity. But you should know that management sites are not limited to user-related services.

A well-designed management panel can be converted into a dashboard to display business metrics and statistics without the viewer typing a single code, or exporting weekly data that can be used to create reports. Add to the list that any QA team member would like the control panel in the simple way it provides in validating data, quickly inserting or deleting data, and determining whether the problem is front or back. Working without a director panel can lead to a lack of understanding of your data, and add great difficulty to the test team.

AWS machine learning modules

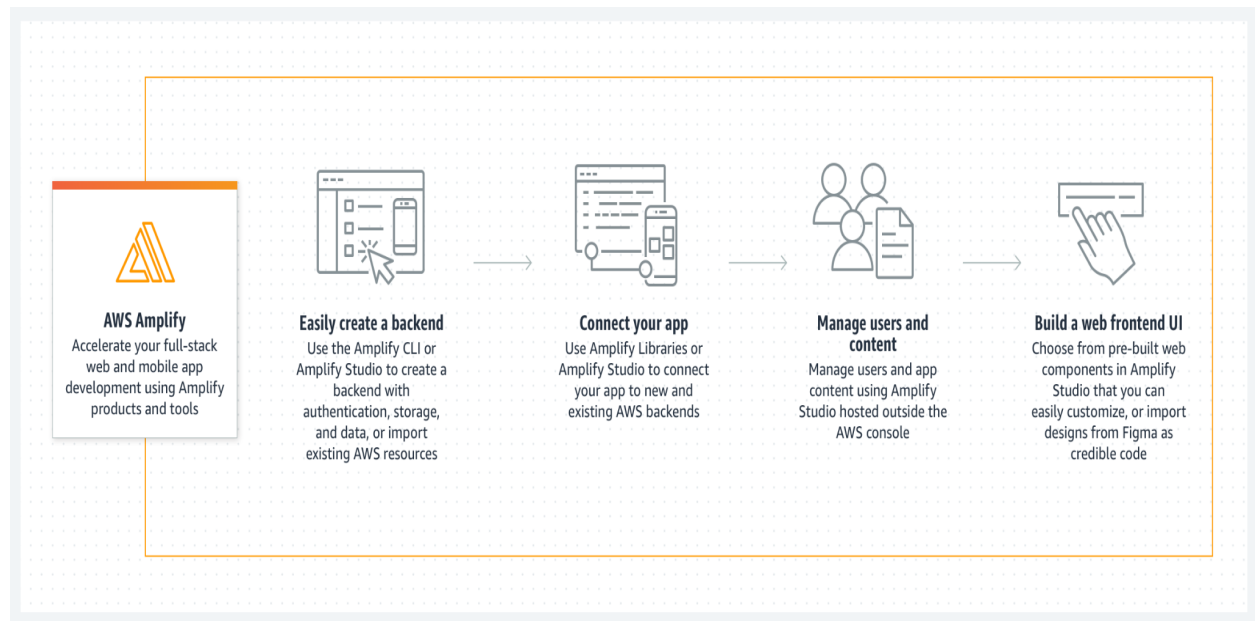
Taking ML models from conceptualization to production is typically complex and time-consuming. You have to manage large amounts of data to train the model, choose the best algorithm for training it, manage the compute capacity while training it, and then deploy the model into a production environment. Amazon SageMaker reduces this complexity by making it much easier to build and deploy ML models. After you choose the right algorithms and frameworks from the wide range of choices available, SageMaker manages all of the underlying infrastructure to train your model at petabyte scale, and deploy it to production.

In this tutorial, you will assume the role of a machine learning developer working at a bank. You have been asked to develop a machine learning model to predict whether a customer will enroll for a certificate of deposit (CD).

In this tutorial, you learn how to:

1. Create a SageMaker notebook instance
2. Prepare the data
3. Train the model to learn from the data
4. Deploy the model
5. Evaluate your ML model's performance

The model will be trained on the disaster management dataset that contains information on customer demographics, responses to marketing events, and external factors. The data has been labeled for your convenience, and a column in the dataset identifies whether the customer is enrolled for a product offered by the bank. A version of this dataset is [publicly available](#) from the Machine Learning Repository curated by the University of California, Irvine.



Nature can unleash its fury in any way and at any place in our world. Whether it is Tsunami, earthquake, or thunderstorm, natural calamities snatch away millions of lives every year. With the increasing issue of global warming in this world, we are facing a higher risk of natural calamities. While Nature becomes calm and tranquil, we start recovering the condition of the affected people. However, isn't it better to take some steps to save our lives from Nature's wrath? In some cases, like thunderstorms, the weather forecasting department of all countries gives prediction to everyone through the TV news channels. However, there are different other ways to stay safe from the effects of natural disasters.

You know that the present age is highly reliant on mobile technology. Then, why should we not use it for natural disaster management? You can claim that communication systems do not work during any natural calamity. But, after reestablishing the network, our mobiles could be the best tools for our rescue. The NGOs and government take a step to deal with the natural calamities. However, our Smartphones play essential roles in disaster management solutions. Warning, evacuation, monitoring, and rescue relief-everything becomes easier and faster with the use of Smartphones.

Nowadays, social networks and mobile-friendly apps are a very useful resource for us for sharing memorable moments and feelings. However, they are also valuable to manage post-disaster risks. Moreover, you can use the search engines to look for the Tsunami app. You will get different other feature-rich apps, providing you with the post-disaster news and latest information. We call them disaster management apps.

What is the purpose of creating disaster management apps?

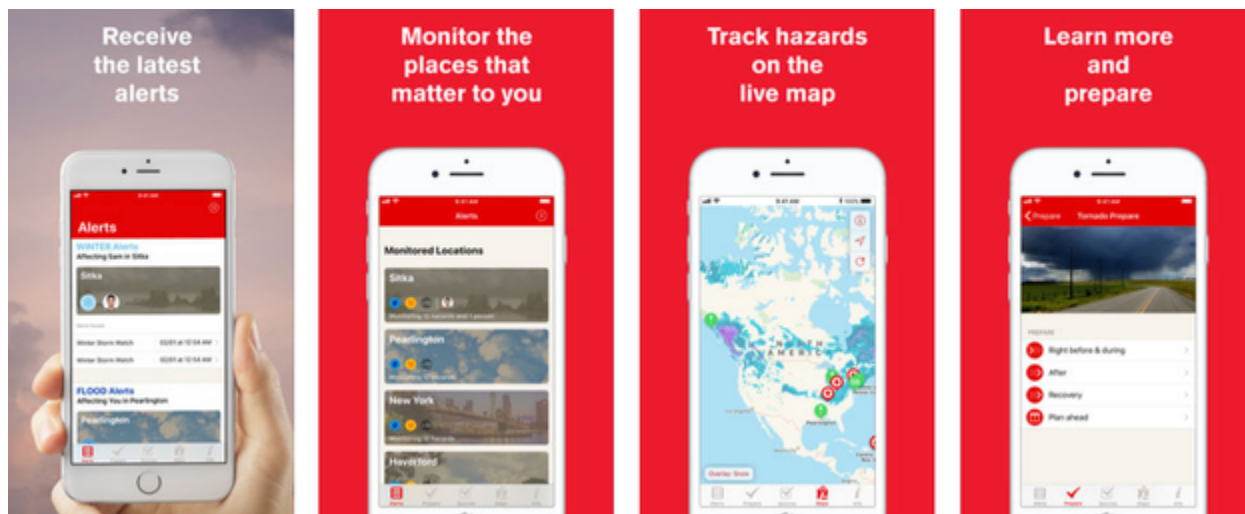
Natural calamities can affect people of different regions at a time. Lots of humanitarian agencies have thought of getting advantage from the mobiles by introducing disaster management apps. These apps are friendly to most of the mobile platforms, including iOS and Android. The disaster management applications, released by the humanitarian agencies, will be helpful to the victims and volunteers. The volunteers will have real-time and updated news on the potential natural disaster in a region.

While natural disasters turn up, the victims cannot make out what they should do to deal with the emergencies. The panic can increase death rates and injury cases.

The disaster management apps have different functionalities to help you. Thus, we have found out the major features and technologies that must be present in these apps.

Alerts on natural hazards-

How can you know about potential disasters? No one has the intuition to create a natural alert on the approaching danger. That is why you can rely on mobile apps to get emergency alerts. These alerts can save lots of lives. They inform everyone that it is the right time to move to the safest zone. After getting the alerts, we start preparing ourselves for natural hazards.



It is terrifying to think of an alert that an unpredictable danger is going to affect us. However, you will later feel grateful to your app, sending the alert. You will get some more time to prepare yourself to face a natural disaster.

You can claim that we never have the capability of fighting against God's will. However, due to the sudden occurrence of natural calamity, you will find the situation to be worse. That is why you can rely on the alert of disaster management apps. The technological

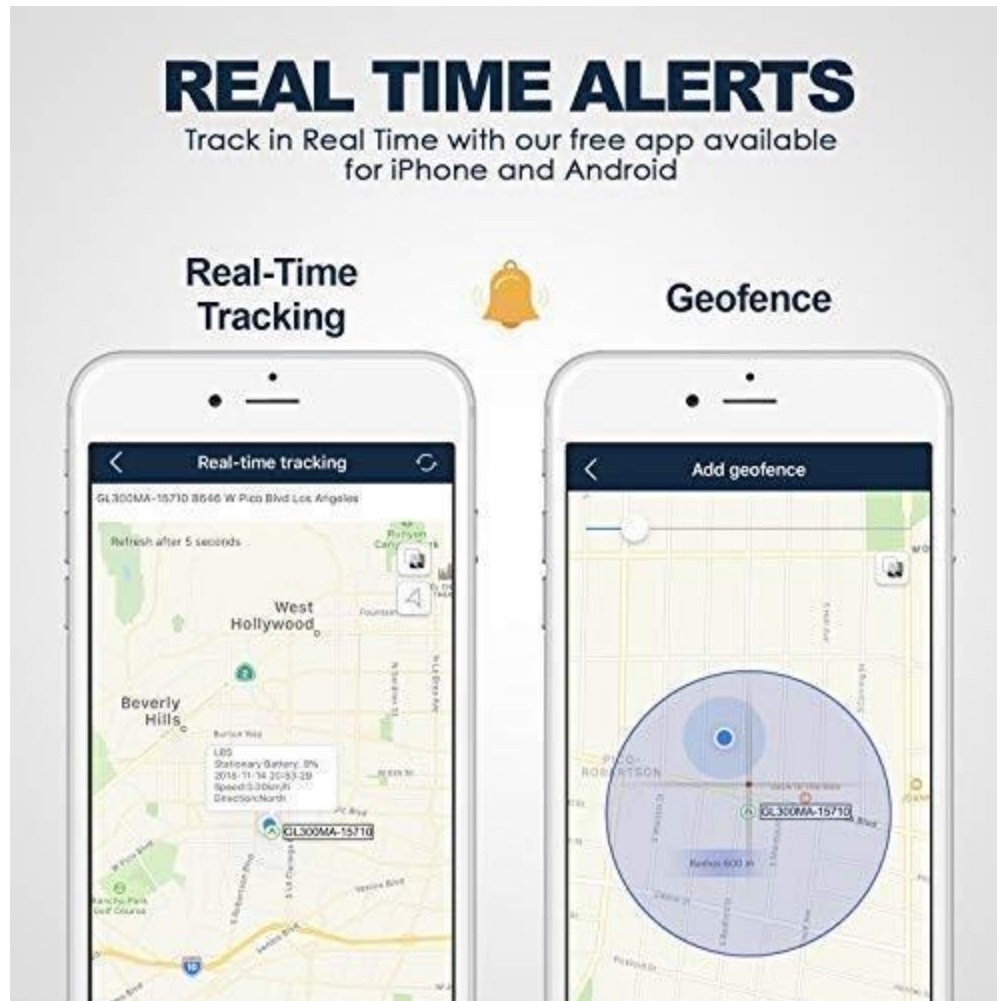
development is helpful for predicting the hazard in advance. As one of the regular app users, you will easily get the alerts. You will also be able to spread this message to your dear ones.

Sending the safety message and notifications-

This is one of the most useful features of reliable disaster management apps. Some of our relatives and family members stay abroad or at any remote place. Fear strikes your heart while you have heard the news of earthquake chaos or other natural hazards in their country. You start worrying that your dear ones have a chance of getting injured. However, when they are using the disaster management app, they can easily ensure their safety. You can instantly relieve your tension.

At this point, we can talk about the Safety Check page on Facebook. It is one of the latest disaster management features at this social networking site. During the emergency, this Safety Check feature lets others information that you are safe from the natural disaster. The disaster may be typhoon, landslide, fire hazard, bridge collapse, terrorist attack or any other type of calamity. You can find this Safety Check feature, activated on your timeline. You have a click a button to mark yourself as safe. While you have clicked this button, all your Facebook friends will get notifications on your safety. Most of us are familiar with this feature of Facebook. You will also get this type of technology in disaster management apps.

Real-time tracking of hazards using the maps



You may have learned that a cyclonic storm will hit the land very soon. However, after hearing this news, you will have different questions-

Will the cyclone affect the area tomorrow?

Is this storm going to cause hazards after a few hours?

You cannot get the answer to this question without the real-time tracking technology, integrated into the disaster management mobile apps. Natural disasters are always

unpredictable. However, the capability of real-time tracking of the coming disaster will give you some relief.

By having the information from the mobile apps, you can make sure that you are safe. Your preparation will help you to save your life. From the disaster-impact assessment report, the government and other authorities will also be able to save the life of lots of citizens.

Most of these disaster management apps have interactive maps to help you with the online tracking solution. However, there is one thing, notable to you. These real-time tracking technologies are effective just for cyclonic storm and volcanic eruptions. Some natural threats, like earthquakes, are not predictable to us in any way. In spite of having this limitation of the tracking technology, you will have benefit from the natural calamity management mobile apps.

This tracking system is also helpful to know about your situation. Some apps have a safety-ensuring button. You have to click on this button to get assistance during the natural calamity. When you have pushed the button, the GPS technology tracks your location. Then, the app sends the message to your contact list through email or SMS. You may also be able to post the issue on social media.

Finding the path for evacuation

You may have already received the notification or prediction of the natural disaster. Now, you can raise a question – What should I do for escaping from the potentially risky zone? What is the best option for evacuation? The most distressing thing is to leave

your home while the adverse natural phenomenon has already started. However, when your own home is already damaged, you have no other choice.

You can rely on the mobile-friendly disaster management app to find a safe shelter for evacuation. Most of the app interfaces have a map to help you in checking out your location. After detecting your present location, the app will present you with a list of nearest shelters. This is one of the effective ways for early evacuation. Use the app platform for shifting to the safest site in your city.

The best disaster management apps have localization functionality and give you live updates. Do not waste your time to take any step. After getting useful information from the app, you have to be responsible for your own safety.

Preparing you for the natural phenomena with the best tips-

Imagine the situation- You are hearing the siren of the hurricane. Isn't it terrifying for you to learn about the imminent disaster? The most annoying thing is that you do not know the way of saving your life from this adversity.

That is why disaster management apps provide you with some instructions and tips to increase your knowledge. This knowledge would act as your lifesaver.

For instance, the app may present you with a systematic and detailed guide on how you have to save your family during any emergency. By using these apps, you can increase your emergency readiness.

Thus, choose the most reliable disaster management apps that have all the above features. Make sure that the app works with your mobile OS. You and your dear ones may live in a place, prone to the adverse weather conditions. In this case, the disaster management apps will be very helpful to you. These apps can save several lives in the world. Download them from the Play Store or App Store. The modern technological innovations are helpful to us in different ways. However, always check out the features while choosing one of the disaster management mobile apps.

MongoDB realm

What Problem Does MongoDB Realm Solve?

Mobile developers face a number of unique challenges. You must:

- Handle the unpredictable environment of mobile apps. Connections can be lost, devices can shut down at any time, and clients often update long after release.
- Maintain common data schemas and APIs between mobile clients, backend APIs, and databases.
- Stay aware of security vulnerabilities across all components in an ecosystem.
- Consistently serialize objects between networks, database storage, and application memory.
- Program in the languages and frameworks for one or more mobile operating systems.

All of these challenges present different obstacles. You can solve each in isolation with a wide variety of libraries and frameworks. Deciding the right solution for each problem with the right tradeoffs is a challenge mobile developers know all too well.

The combination of multiple environments creates even more challenges. For instance, you can use a Java library on your Android client to serialize objects, but that library

likely wouldn't work on iOS. And this doesn't even take into account consistency across backend services.

Realm Database

Many of these challenges arise due to particularities of the mobile environment. These challenges include network reliability, local storage, and keeping UIs [reactive](#). [Realm Database](#) solves many common mobile programming headaches:

- Local storage: Realm Database runs right on client devices. Access objects using the native query language for each platform. Storing, accessing, and updating your data is simple and lightweight.
- Network reliability: Realm Database is offline-first. You always read from and write to the local database, not over the network. When [Realm Sync](#) is enabled, Realm Database synchronizes data with MongoDB Realm over the network in a background thread. The [sync protocol](#) resolves conflicts consistently on each client and in the [linked MongoDB Atlas cluster](#).
- Reactive UI: [Live objects](#) always reflect the latest data stored in Realm Database. You can subscribe to changes, letting you keep your UI consistently up to date.

The Realm SDK lets you connect to local realms for Android, iOS, Node.js, React Native, and UWP development.

MongoDB Atlas

Client applications generate a lot of data. Whether it's uploaded reviews and ratings, posts and comments on a blog, or inventory in a kitchen, you need to store that data somewhere. [MongoDB Atlas](#) provides cloud-hosted managed instances of MongoDB that are always available.

Atlas supports aggregations and other complex workloads with the full capabilities of MongoDB. You can connect to your Atlas instance in your backend services using MongoDB drivers for a wide range of languages. Or connect your Atlas instance to [MongoDB Charts](#) to visualize your data in real time. Storing your data in Atlas makes it easy to share data across users and platforms.

MongoDB Realm

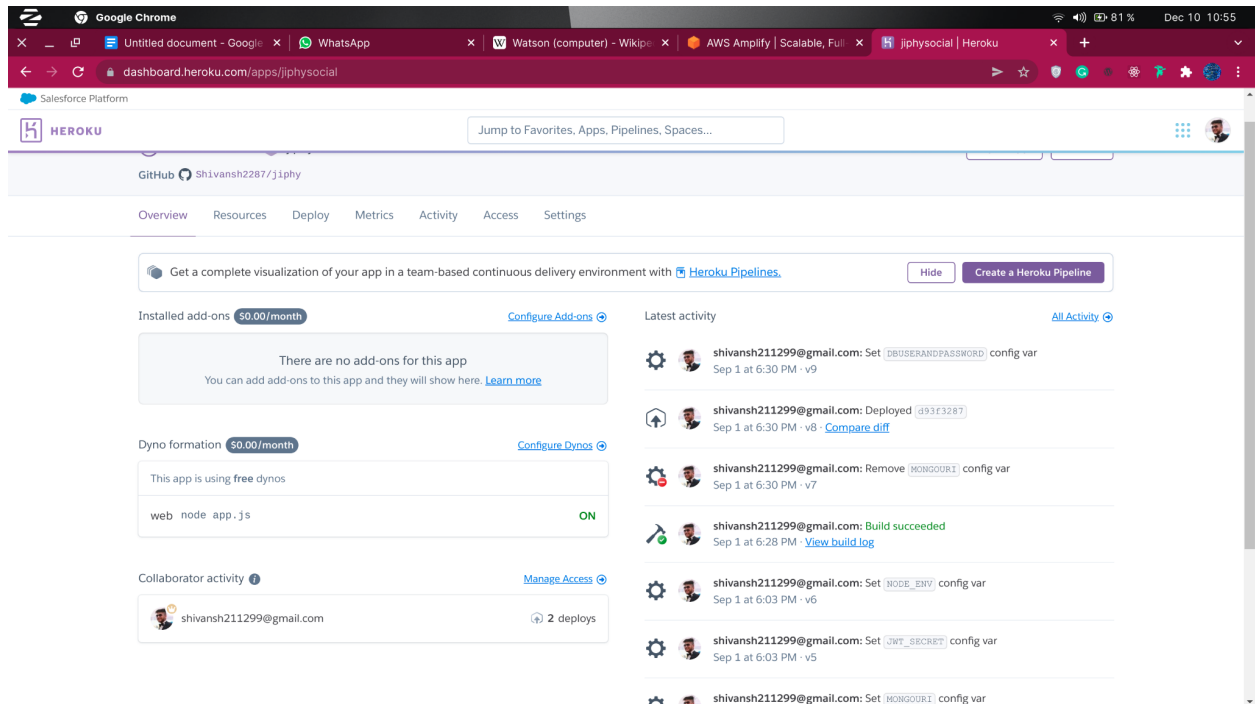
MongoDB Realm also provides services to fulfill several common application backend requirements:

- [Realm Users and Authentication](#) provide built-in user management. Integrate with [third-party authentication providers](#), like [Facebook](#), [Google](#), and [Apple](#).
- [Realm Functions](#) provide server-side logic for your [Realm app](#). You can call Realm Functions from the Realm SDK in your client application.
- [Realm Triggers](#) automatically execute a function at a scheduled time or when an event occurs, such as a change to a database or a call to a HTTP endpoint.
- [Realm Rules](#) let you control who accesses what data.
- [Realm Values and Realm Secrets](#) enable you to define global variables and private credentials once and use them across your entire Realm app.
- The [GraphQL API](#) lets you access data stored in a linked MongoDB cluster using any standard GraphQL client.

Heroku

Heroku is a container-based cloud Platform as a Service (PaaS). Developers use Heroku to deploy, manage, and scale modern apps. Our platform is elegant, flexible, and easy to use, offering developers the simplest path to getting their apps to market.

Heroku is fully managed, giving developers the freedom to focus on their core product without the distraction of maintaining servers, hardware, or infrastructure. The Heroku experience provides services, tools, workflows, and polyglot support—all designed to enhance developer productivity.



IBM Watson Natural language processing

Natural language processing (NLP) refers to the branch of computer science—and more specifically, the branch of [artificial intelligence or AI](#)—concerned with giving computers the ability to understand text and spoken words in much the same way human beings can.

NLP combines computational linguistics—rule-based modeling of human language—with statistical, machine learning, and deep learning models. Together, these technologies enable computers to process human language in the form of text or voice data and to ‘understand’ its full meaning, complete with the speaker or writer’s intent and sentiment.

NLP drives computer programs that translate text from one language to another, respond to spoken commands, and summarize large volumes of text rapidly—even in real time. There’s a good chance you’ve interacted with NLP in the form of voice-operated GPS systems, digital assistants, speech-to-text dictation software, customer service chatbots, and other consumer conveniences. But NLP also plays a

growing role in enterprise solutions that help streamline business operations, increase employee productivity, and simplify mission-critical business processes.

NLP tasks

Human language is filled with ambiguities that make it incredibly difficult to write software that accurately determines the intended meaning of text or voice data. Homonyms, homophones, sarcasm, idioms, metaphors, grammar and usage exceptions, variations in sentence structure—these just a few of the irregularities of human language that take humans years to learn, but that programmers must teach natural language-driven applications to recognize and understand accurately from the start, if those applications are going to be useful.

Several NLP tasks break down human text and voice data in ways that help the computer make sense of what it's ingesting. Some of these tasks include the following:

- Speech recognition, also called speech-to-text, is the task of reliably converting voice data into text data. Speech recognition is required for any application that follows voice commands or answers spoken questions. What makes speech recognition especially challenging is the way people talk—quickly, slurring words together, with varying emphasis and intonation, in different accents, and often using incorrect grammar.
- Part of speech tagging, also called grammatical tagging, is the process of determining the part of speech of a particular word or piece of text based on its use and context. Part of speech identifies 'make' as a verb in 'I can make a paper plane,' and as a noun in 'What make of car do you own?'
- Word sense disambiguation is the selection of the meaning of a word with multiple meanings through a process of semantic analysis that determine the word that makes the most sense in the given context. For example, word sense disambiguation helps distinguish the meaning of the verb 'make' in 'make the grade' (achieve) vs. 'make a bet' (place).
- Named entity recognition, or NEM, identifies words or phrases as useful entities. NEM identifies 'Kentucky' as a location or 'Fred' as a man's name.
- Co-reference resolution is the task of identifying if and when two words refer to the same entity. The most common example is determining the person or object to which a certain pronoun refers (e.g., 'she' = 'Mary'), but it can also involve identifying a metaphor or an idiom in the text (e.g., an instance in which 'bear' isn't an animal but a large hairy person).
- Sentiment analysis attempts to extract subjective qualities—attitudes, emotions, sarcasm, confusion, suspicion—from text.

- Natural language generation is sometimes described as the opposite of speech recognition or speech-to-text; it's the task of putting structured information into human language.

See the blog post [“NLP vs. NLU vs. NLG: the differences between three natural language processing concepts”](#) for a deeper look into how these concepts relate.

NLP tools and approaches

Python and the Natural Language Toolkit (NLTK)

The Python programming language provides a wide range of tools and libraries for attacking specific NLP tasks. Many of these are found in the Natural Language Toolkit, or NLTK, an open source collection of libraries, programs, and education resources for building NLP programs.

The NLTK includes libraries for many of the NLP tasks listed above, plus libraries for subtasks, such as sentence parsing, word segmentation, stemming and lemmatization (methods of trimming words down to their roots), and tokenization (for breaking phrases, sentences, paragraphs and passages into tokens that help the computer better understand the text). It also includes libraries for implementing capabilities such as semantic reasoning, the ability to reach logical conclusions based on facts extracted from text.

Statistical NLP, machine learning, and deep learning

The earliest NLP applications were hand-coded, rules-based systems that could perform certain NLP tasks, but couldn't easily scale to accommodate a seemingly endless stream of exceptions or the increasing volumes of text and voice data.

Enter statistical NLP, which combines computer algorithms with machine learning and [deep learning](#) models to automatically extract, classify, and label elements of text and voice data and then assign a statistical likelihood to each possible meaning of those elements. Today, deep learning models and learning techniques based on convolutional neural networks (CNNs) and recurrent neural networks (RNNs) enable NLP systems that 'learn' as they work and extract ever more accurate meaning from huge volumes of raw, unstructured, and unlabeled text and voice data sets.

For a deeper dive into the nuances between these technologies and their learning approaches, see [“AI vs. Machine Learning vs. Deep Learning vs. Neural Networks: What’s the Difference?”](#)

NLP use cases

Natural language processing is the driving force behind machine intelligence in many modern real-world applications. Here are a few examples:

- Spam detection: You may not think of spam detection as an NLP solution, but the best spam detection technologies use NLP's text classification capabilities to scan emails for language that often indicates spam or phishing. These indicators can include overuse of financial terms, characteristic bad grammar, threatening language, inappropriate urgency, misspelled company names, and more. Spam detection is one of a handful of NLP problems that experts consider 'mostly solved' (although you may argue that this doesn't match your email experience).
- Machine translation: Google Translate is an example of widely available NLP technology at work. Truly useful machine translation involves more than replacing words in one language with words of another. Effective translation has to capture accurately the meaning and tone of the input language and translate it to text with the same meaning and desired impact in the output language. Machine translation tools are making good progress in terms of accuracy. A great way to test any machine translation tool is to translate text to one language and then back to the original. An oft-cited classic example: Not long ago, translating “*The spirit is willing but the flesh is weak*” from English to Russian and back yielded “*The vodka is good but the meat is rotten.*” Today, the result is “*The spirit desires, but the flesh is weak,*” which isn't perfect, but inspires much more confidence in the English-to-Russian translation.
- Virtual agents and chatbots: [Virtual agents](#) such as Apple's Siri and Amazon's Alexa use speech recognition to recognize patterns in voice commands and natural language generation to respond with appropriate action or helpful comments. [Chatbots](#) perform the same magic in response to typed text entries. The best of these also learn to recognize contextual clues about human requests and use them to provide even better responses or options over time. The next enhancement for these applications is question answering, the ability to respond to our questions—anticipated or not—with relevant and helpful answers in their own words.
- Social media sentiment analysis: NLP has become an essential business tool for uncovering hidden data insights from social media channels. Sentiment analysis can analyze language used in social media posts, responses, reviews, and more

to extract attitudes and emotions in response to products, promotions, and events—information companies can use in product designs, advertising campaigns, and more.

- Text summarization: Text summarization uses NLP techniques to digest huge volumes of digital text and create summaries and synopses for indexes, research databases, or busy readers who don't have time to read full text. The best text summarization applications use semantic reasoning and natural language generation (NLG) to add useful context and conclusions to summaries.

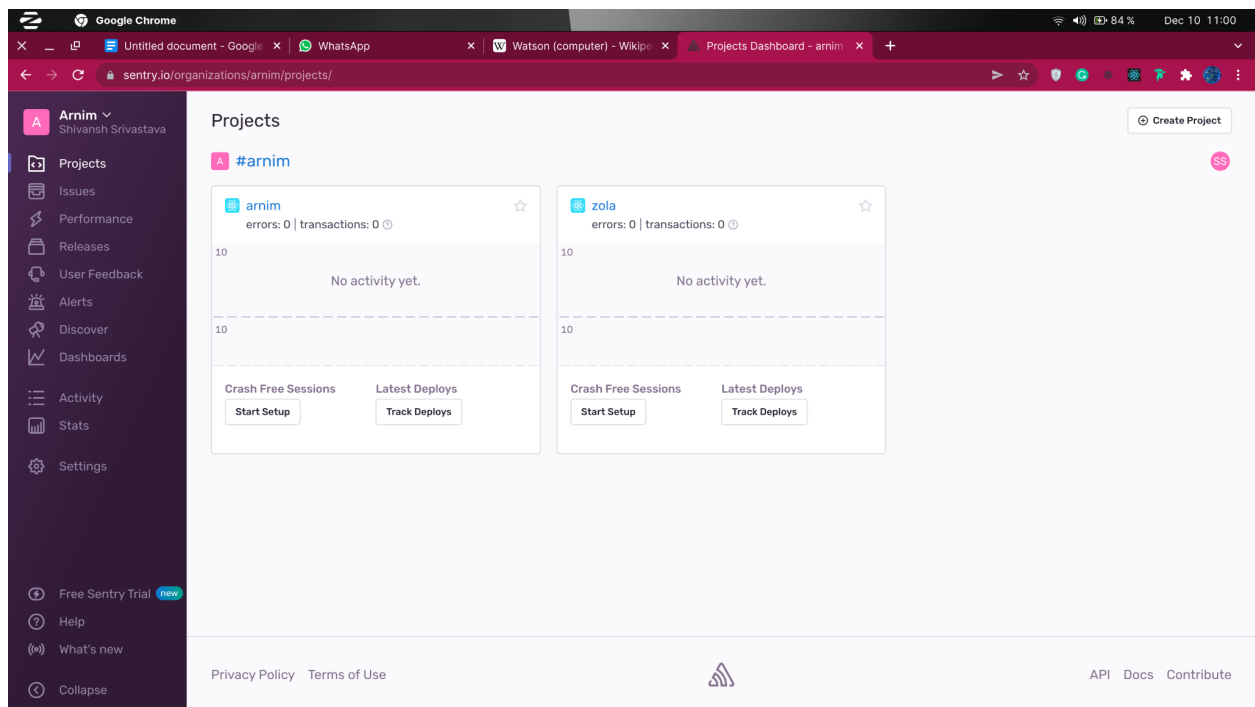
Natural language processing and IBM Watson

- IBM has innovated in the artificial intelligence space by pioneering NLP-driven tools and services that enable organizations to automate their complex business processes while gaining essential business insights. These tools include:
 - [Watson Discovery](#) - Surface high-quality answers and rich insights from your complex enterprise documents - tables, PDFs, big data and more - with AI search. Enable your employees to make more informed decisions and save time with real-time search engine and text mining capabilities that perform text extraction and analyze relationships and patterns buried in unstructured data. Watson Discovery leverages custom NLP models and machine learning methods to provide users with AI that understands the unique language of their industry and business. [Explore Watson Discovery](#)
 - [Watson Natural Language Understanding](#) (NLU) - Analyze text in unstructured data formats including HTML, webpages, social media, and more. Increase your understanding of human language by leveraging this natural language tool kit to identify concepts, keywords, categories, semantics, and emotions, and to perform text classification, entity extraction, named entity recognition (NER), sentiment analysis, and summarization. [Explore Watson Natural Language Understanding](#)
 - [Watson Assistant](#) - Improve the customer experience while reducing costs. Watson Assistant is an [AI chatbot](#) with an easy-to-use [visual builder](#) so you can deploy virtual agents across any channel, in minutes. [Explore Watson Assistant](#)
 - Purpose-built for healthcare and life sciences domains, [IBM Watson Annotator for Clinical Data](#) extracts key clinical concepts from natural language text, like conditions, medications, allergies and procedures. Deep contextual insights and values for key clinical attributes develop more meaningful data. Potential data sources include clinical notes, discharge summaries, clinical trial protocols and literature data.

Sentry:

[Sentry](#) is a crash reporting platform that provides you with "real-time insight into production deployments with info to reproduce and fix crashes".

It notifies you of exceptions or errors that your users run into while using your app, and organizes them for you on a web dashboard. Reported exceptions include stacktraces, device info, version, and other relevant context automatically; you can also provide additional context that is specific to your application, like the current route and user id.



```
1 igneous8k, a week ago | 1 author (igneous8k)
2 const mongoose = require("mongoose"); igneous8k, a week ago • First Commit
3 const isOnline = require("is-online"); Scanning for vulns... 3.2K (gzipped: 1.3K)
4 const cron = require("node-cron"); Scanning for vulns... Calculating...
5 let onlineStatus = false;
6 let connected = false;
7
8 mongoose
9   .connect(
10     "mongodb+srv://igneous:asdfghjkl@nsccloud.d14wv.mongodb.net/myFirstDatabase?retryWrites=true&w=majority",
11     {
12       dbName: "bus-app",
13       useNewUrlParser: true,
14       useUnifiedTopology: true,
15       // useFindAndModify: false,
16       // useCreateIndex: true,
17     }
18   )
19   .then(() => {
20     console.log("bus-app");
21     connected = true;
22   })
23   .catch((err) => console.log(err.message));
24
25 cron.schedule("* * * * *", async () => {
26   onlineStatus = await isOnline();
27   if (onlineStatus) {
28     if (!connected) {
29       mongoose
30         .connect(process.env.DB_URI, {
31           dbName: "bus-app",
32           useNewUrlParser: true,
33           useUnifiedTopology: true,
34           // useFindAndModify: false,
35           // useCreateIndex: true,
36         })
37         .then(() => {
38           console.log("bus-app mongodb re-connected.");
39         });
40     }
41   }
42 });
```

```
1 You, 4 days ago | 1 author (You)
2 const mongoose = require("mongoose"); ✓ You, 4 days ago • bugs
3 const UomSchema = new mongoose.Schema({
4   name: {
5     type: String,
6     required: true,
7     unique: true,
8     trim: true,
9     lowercase: true,
10   },
11   unit: {
12     type: Number,
13     required: true,
14     unique: true,
15     trim: true,
16   },
17 });
18
19 const UomModel = mongoose.model("Uom", UomSchema);
20 module.exports = UomModel;
```


Visual Studio Code

roles.js - bus-app-backend - Visual Studio Code

roles.js

```
1 const mongoose = require("mongoose");
2 const { ObjectId } = mongoose.Schema.Types;
3
4 const rolesSchema = new mongoose.Schema({
5   roleName: { type: String, required: true, unique: true },
6   permissions: [{ type: ObjectId, ref: "Permission" }],
7 });
8
9 const Roles = mongoose.model("Roles", rolesSchema);
10 module.exports = Roles;
```

Visual Studio Code

app.js - bus-app-backend - Visual Studio Code

app.js

```
1 const express = require("express");
2 const app = express();
3 const mongoose = require("mongoose");
4 const cors = require("cors");
5 const morgan = require("morgan");
6 //middlewares
7
8 app.use(cors());
9 app.use(morgan("dev"));
10 app.use(express.json());
11 app.use(
12   express.json({
13     limit: "50mb",
14   })
15 );
16 app.use(express.urlencoded({ extended: false, limit: "100mb" }));
17
18 require("./helpers/init_mongodb");
19 require("./helpers/generate");
20
21 //routes
22 app.use(require("./routes/supplierForm"));
23 app.use(require("./routes/poForms"));
24 app.use(require("./routes/itemForm"));
25 app.use(require("./routes/auth"));
26 app.use(require("./routes/roleandPermission"));
27 app.use(require("./routes/branches"));
28 app.use(require("./routes/categories"));
29 app.use(require("./routes/miscRoute"));
30
31 // handle 404 error
32 app.use(function (req, res, next) {
33   res.status(404).send("Sorry can't find that!");
34 });
35
36 //handling 500 error
37 app.use(function (err, req, res, next) {
38   console.error(err.stack);
39   res.status(500).send("Something broke!");
40 });
```