PROJECT INFORMATION:

Project Title	**:** Crisis Business Collaboration
Date Started	**:** 5/9/2015
Date Completed	**:** 2/12/2015
Company Name	**:** Disaster Informatics
Company Address	**: U**niversity Of Southern California, Los Angeles, California 90007
Project Sponsor/Champion:	
Phone	**:**
Email	**:**

EXECUTIVE SUMMARY:

This project aims at helping the people stuck in crisis through their nearest source of assistance ,which are the businesses near the people and try to connect them together even before the emergency responses can get the information. We felt that this integration can help the people even if natural disasters strike at a large scale. The project contains different components which were carefully designed to be scalable, easy to be used and most importantly fast and light weighted. The modules of this project require integration with various data resources like twitter, crisislex and Wharton school of Business's business data. With these data banks, the inputs are received through various channels and these are processed in the right way to choose the business locations to help a person who is struck up in a crisis.

To achieve the goals of the project, the project had a planning phase wherein the project's detailed plan of action was outlined. The charts like the WBS, Gantt chart and other diagrams were built to get a much detailed view of the project. The risk analysis of the project was done to evaluate the foreseen and unforeseen risks of the project. The team of resources were brainstormed and the ideas were integrated to form reusable yet powerful project modules. The project was divided into various developmental phases throughout its cycle. The first phase of the project was the application GUI design where the basic screen expected of the application was made and was sent for an approval. During the second week, after the approval, the Application and its respective features were built.

The application's next development phase comprised of building the server components like the AWS setting up and other database aspects. This phase also saw the SMS api's integration with the businesses for sending messages to the businesses. This was followed by the building of the machine learning models that classified the tweets and messages. The models were designed with a new voting based selection algorithm which choose the best possible solution from different categories of the machine learning techniques, some of which were deep learning techniques. . In construction of the final phase, some changes were made to improve stability, reliability and effectiveness. After these development phases the project was tested throughout and various metrices where evaluated to make sure that the project reached its expected results.

In terms of resources used for the project, the project involved people from different domains of computer science. Every resource developed and tested different aspects of the project. The project did utilize a some financial resources to run the servers.

The project's reusable modules can be used to build projects with different genres like helping vendor rating, tweet extraction engine, crisis location classification etc.. With the intention to learn the project management techniques and methodologies, and also provide an extensive project that can serve a community, the team has built a small scale project that might be used on a large scale. The project is transferable to any students who wants to contribute over the modules we performed over the past few months.

Lean Six Sigma Project :

The detailed project report is organized by project phase (D-M-A-I-C) which is used in the lean six sigma process.

1. Define Phase:

The define phase of the project basically describes the problem and it is used to document the process. The problem statement of the project is well defined in the summary above. So this phases talks about factors like :

1. COPQ
2. Voice of Customer
3. Project Charter
4. SIPOC

Cost of Poor Quality Statement

The cost of poor quality statement is basically a lean framework stating that the activities and processes that do not meet the agreed performance and/or expected outcomes. The classic depiction of COPQ is an iceberg with only a small portion of the symptoms visible above the surface. COPQ is a Lean Six Sigma approach to solving business problems. There is a section of invisible components that the organizations solve while perfecting the process. The COPQ is shown with the following diagram:

Visible Components	- Bugs - Wrong testing - Rejects - Code Revision
Invisible Components	- Time lost - Product Failure in field - Ideal Time of project - Lack of softwares/tools - Server/Component failures - Excess server space

Project Charter:

The project charter diagram shows the scope, objectives, and participants in a project. For the defined problem, this Project charter talks about the various goals in the projects.

Analysis:	This project was undertaken to bring a new level into disaster mangement with integration of social media, business information and emergency responders.
Conclusion:	Reduce the response time and resource allocation time(emergency responders). Help people influenced by disaster and crime in a more timely and efficient manner.
Project Title:	Integration of Business and Social media in real time to help in disaster management

Business Case	**Problem/Opportunity Statement**
This project was undertaken so that we could help people who are stuck in disaster by sending information to emegency responders and nearby business locations.	Currently there is no established real time system which integrates social media and businesses to help in disaster management.

Goal Statement	**Scope**
The goal of the project is to reduce the response time by getting services from the best resources to help the people affected during disasters.	DDR - Dynamic Disaster Recovery

Team Members		**Project Timeline**		
Key Stakeholders	Member Names	Key Milestone	Target Date	Revised Date
Team Leader:	Atefeh Farzindar	Start Date:	7 Sept,2015	
Team Members:	Amarnath Seshadri	Design Phase:	23 Sept ,2015	
	Suboth Sah	Development Phase	20 Nov,2015	
	Ashwin Srinivas Subramaniam	Testing Phase:	2 Dec,2015	
	Yang Meng	End Date:	2 Dec,2015	
	Qi Zhang			

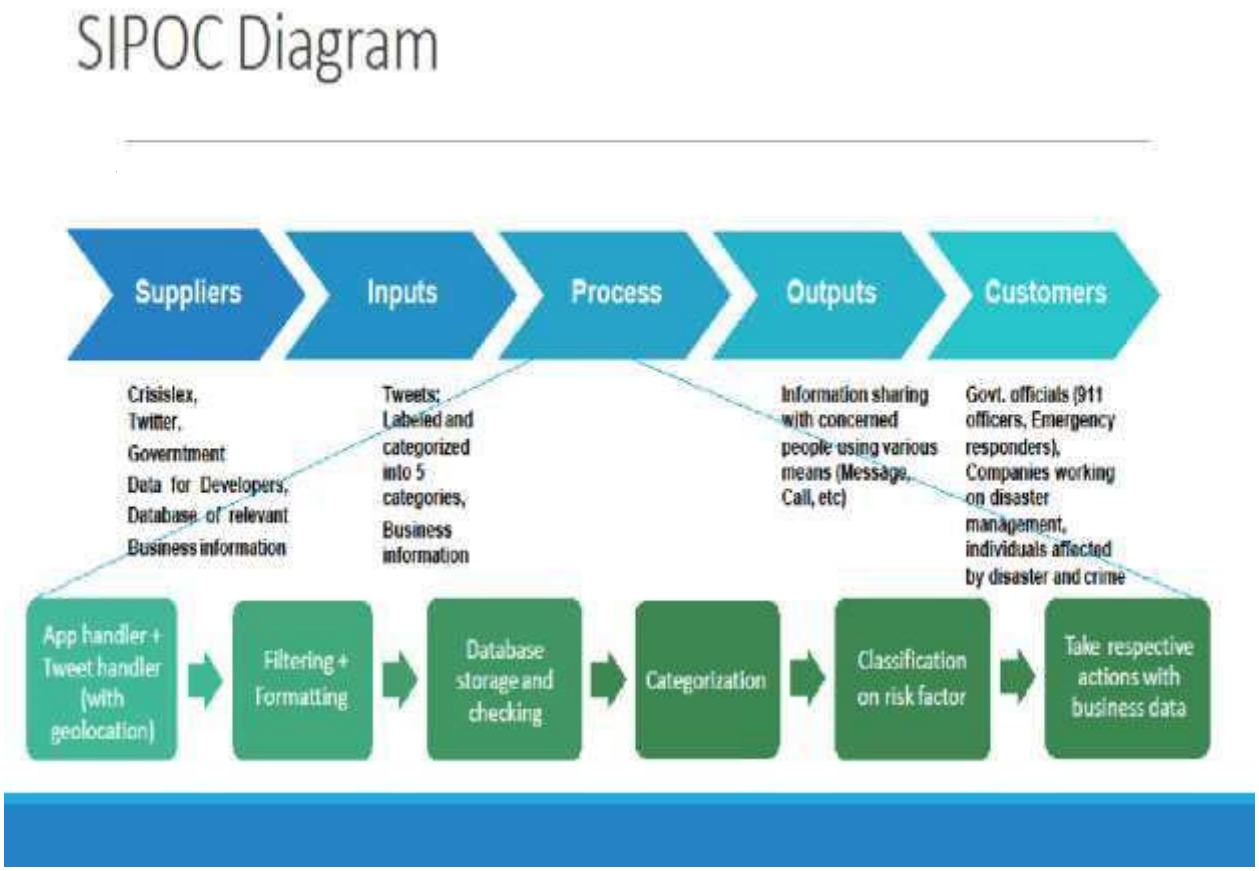
Project Budget:	N/A	**Project Resources:**	3 Developers(Subodh,Ashwin,Yang),1 Data Scientist(Summer),1 Data Architect(Amarnath)

Constraints, Assumptions, Risks and Dependencies	
Constraints	Veracity of the tweets
Assumptions	Business locations are willing to help
Risks & Dependencies	Estimating time for the project
	Integration of different modules
	Finding the relevant datasets

Approval		
Project Sponsor:	Disaster Informatics - eRespond	Date: 09/13/2015

Voice of the Customer and SIPOC:

The Voice of the Customer (VOC) is aggressively sought to evaluate needed outputs with the optimal process configuration needed to yield those outputs and their necessary inputs for which the best suppliers are identified and allied with. To evaluate this Voice of the customer, the SIPOC diagram which connects the entire process with the customer is drawn. Please note that the SIPOC oversees the entire process map of the project and gives us what we are looking into.



RISK DEFINITION:

The project has many risks which are defined in the initial phase od risk definition. The steps on mitigation/control of the risks are done in the control section of the document. Some of the risks in the project are:

1. Statement: Business data unavailable/changed
   Probability: High
   Impact: Medium

2. Statement: Twitter data unavailable
   Probability: Medium
   Impact: Medium

3. Statement: Twitter data Deleted
   Probability: Medium
   Impact: Low

4. Statement: Sending False Alarm
   Probability: Medium
   Impact: Medium

5. Statement: Location information unavailable
   Probability: Medium
   Impact: Medium

Tools Application

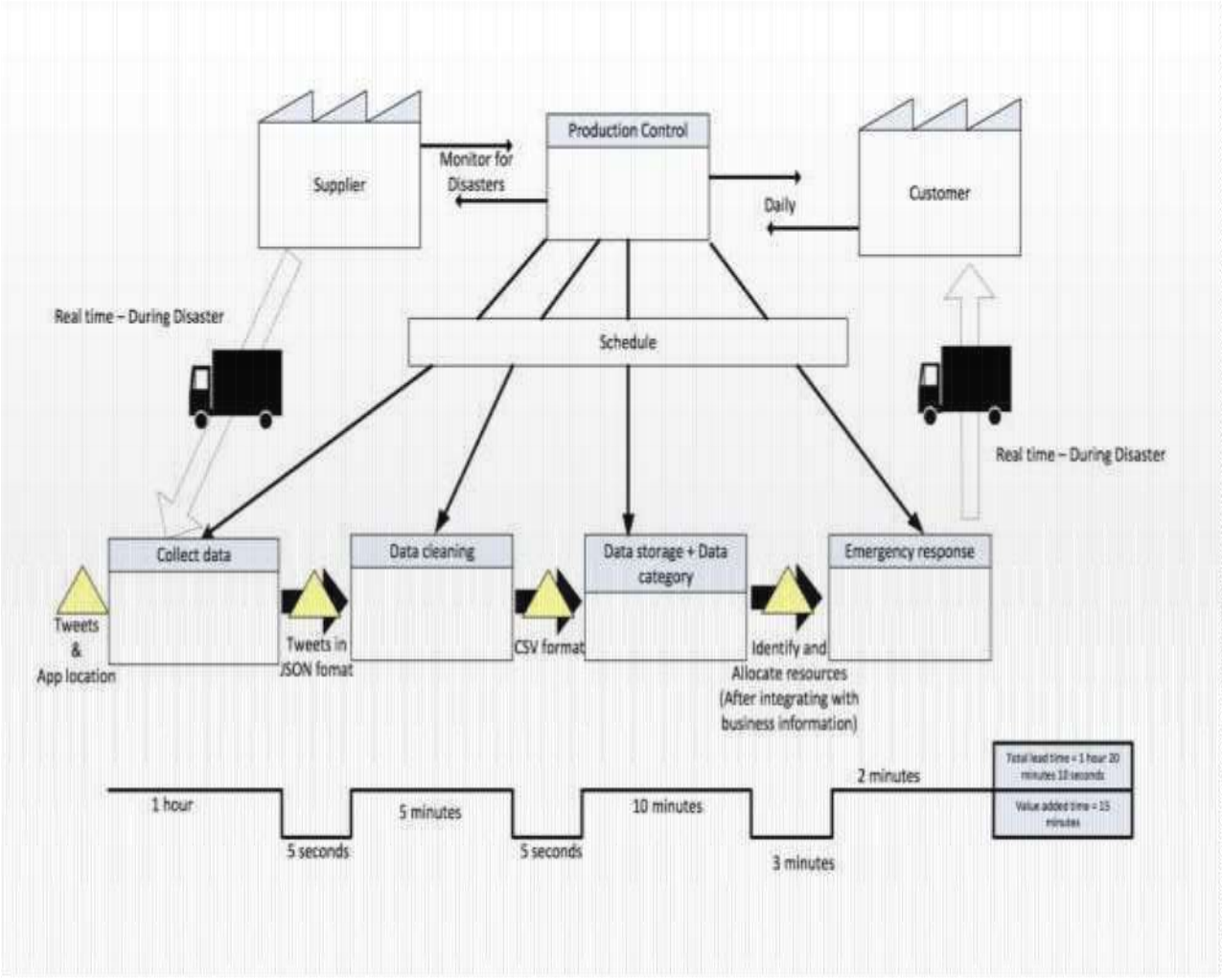
This phase had few tools which had to be used to come up with a good definition. They are:

1. Paint
2. Draw.io
3. Project Charter Sigma Magic Template for Excel

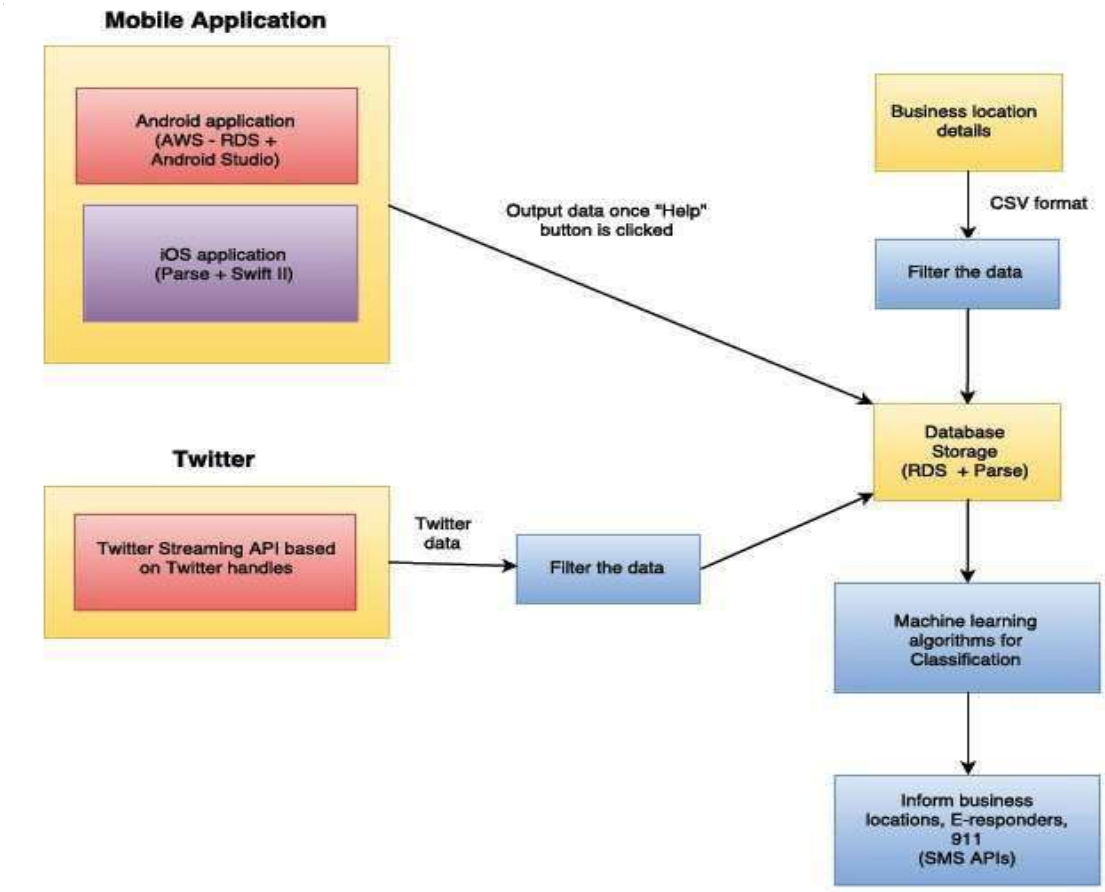
2. MEASURE PHASE:

Process Mapping/Process Visualization

1) We implemented Value Stream Mapping for the project. We came to understand the processes where we can optimize the steps to reduce time for production(in our case reducing the response time).
   First,we implemented the current Value stream map with the current implementation a general disaster management project. It was based on the initial idea we had on for the project. We then thought of ways to optimize the process by dividing it into different modules and then optimizing each module. By this we were able to reduce the response time from 15 mins to 10 mins.



2) Using the Block Diagram for separating the modules, we were able to compartmentalize the modules and easily divide the tasks into weekly sprints.



The Vital Few

We used methods like Fish Bone diagram and 5 Why's to identify the root problems or vital inputs .Using Fish Bone Diagram we identified that the root problem or the output(Y) which is inclusion of business datasets in disaster management projects. We also identified the inputs(X) as the branches in the fish bone digram like Input,Software/Product,People and Process.

Data Collection Planning and Execution

Business dataset- We used Dataset provided by USC libraries Wharton Research Data Services(WRDS),twitter data and crisislex data. We filtered out the business

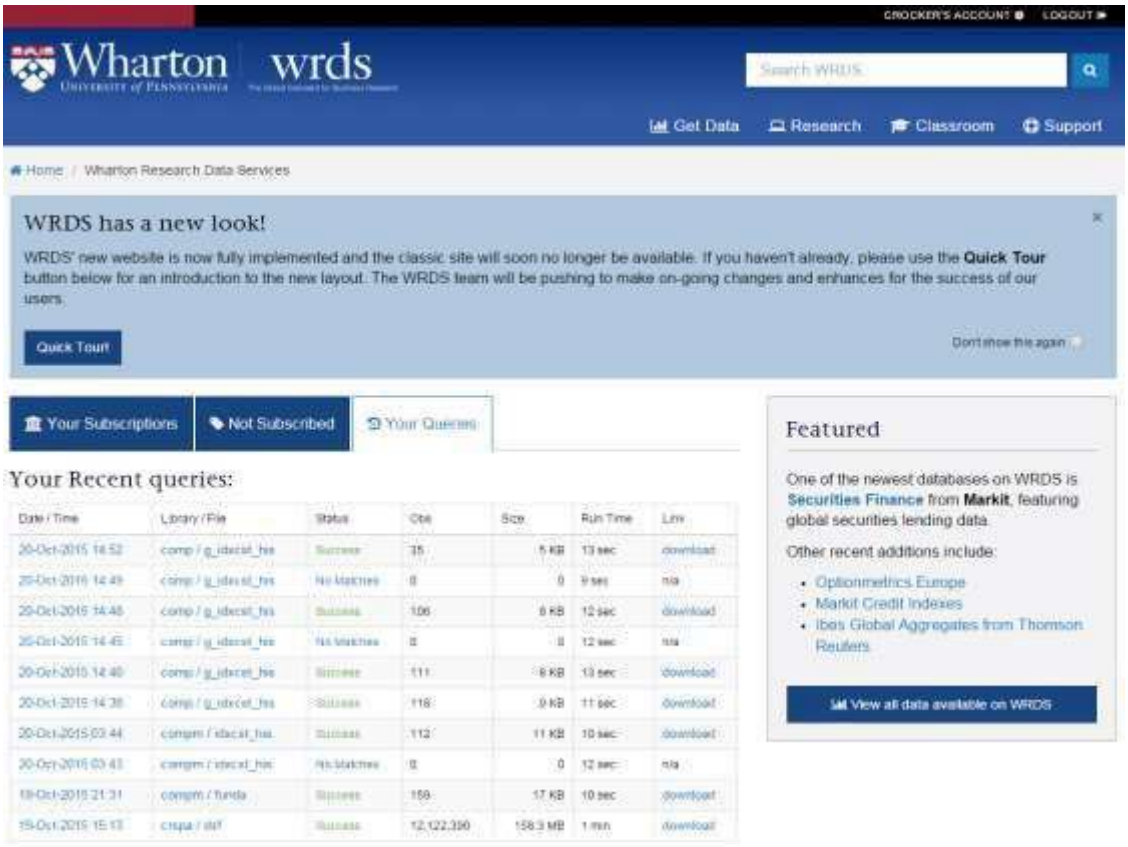
locations based on the location,business type,the availability of contact details .The pros and cons:

Pros:

1. The dataset is provided free of cost for the USC students.
2. We were able to get lot of relevant attributes for the data set.

Cons:

1. The number of records were around 60k. With a paid source we could have got more data.
2. We collect the business information for last few years. We had no way of verifying the stores are still in business.



Disaster Dataset - The data is collected by the python streaming API Tweepy. We mention tags/words for which the tweets are to be collected and filtered out. The hashtags are provided manually and then we run the code for automatic collection of tweets with that word.

Pros:

1. Since the hashtags were provided manual, we can be sure of the relevance of the data collected via streaming API.
2. We used twitter streaming API for collecting real time tweets. So we were able to collect tweets at a fast rate (18,000 tweets/15 mins).

Cons:

1. Setting manual tweets means we may miss some of the important tags.
2. Constant monitoring is required to check for important tags.

For the Machine learning , we had to get the samples from the dataset provided by crisislex site only. The reason for that is we had to get dataset with tags/labels already provided for training purpose.

Measurement Studies

Measurement system analysis like Gauge R&R or Attribute measures these things : ACCURACY / BIAS,RESOLUTION / DISCRIMINATION,REPEATABILITY & REPRODUCIBILITY (Gage R&R), LINEARITY,STABILITY

For our project,some of the metrics are not valid to use. The Core of the project is the machine learning implementation which does the risk assessment for the tweet/emergency text. The correct measurement metrics which we have employed are:

- Accuracy (Expected around 50-75%)
- Precision (Expected around 50-75%)
- Recall (Expected around 50-75%)
- F1 score (Expected around 50-75%)
- Average Time to request (Expected around 5 sec)
- Average Time to reach out to businesses(Expected around 12 sec)
- Average Total Time in system(Expected around 20 sec)

These scores are calculated on the training data where the correct labelling is already done. These have also been matched with the metrics that are from various industrial standards. For that we calculated the scores without the help of any packages. We wrote the code which will get the scores.And for the Measurement of system Analysis we only have to follow the Android Guidelines and Apple Human Interface Guidelines so that we can put the APP on the store.

Capability Studies

Desired State of the project:
Can be divided into desired states for the APP and the machine learning part.

1. For the APP:

a. Ease of use of the APP
b. Fast Response of the APP
c. Accuracy of the location of the phone

2. For the Machine Learning model
   a.High precision,accuracy and F1 score.
   b.Proper Risk assessment of the tweets.

Overall, we extracted maximum information from the tweets/emergency text and helped in reducing the response time in helping the person.

Key Observations:

1. Inclusion of social media in disaster management is less because of lack of all the information needed immediately to help the person.
2. As the market penetration of social media is increasing, a proper model for inclusion of social media to help people stuck in disasters is within an hour.

Future Capability Targets of the Project:

The project has many future scopes. Its scalable modules can be used to build a much advanced projects for the future safer communities. Some of them are as follows:

1. **Assistive vendor classification**

With the responses from the consumers, the information regarding the assisting vendors can be found out. From this a system called help credits per vendor can be gathered. The help credits can be used to give advertisement to the vendor for their assistance.

2. **Crisis location identification**

The results from the project can be used to identify the type crisis that takes place across a place in a season. Based on it the information the government can take necessary action to help or prevent that particular type of crisis.

Tools Application

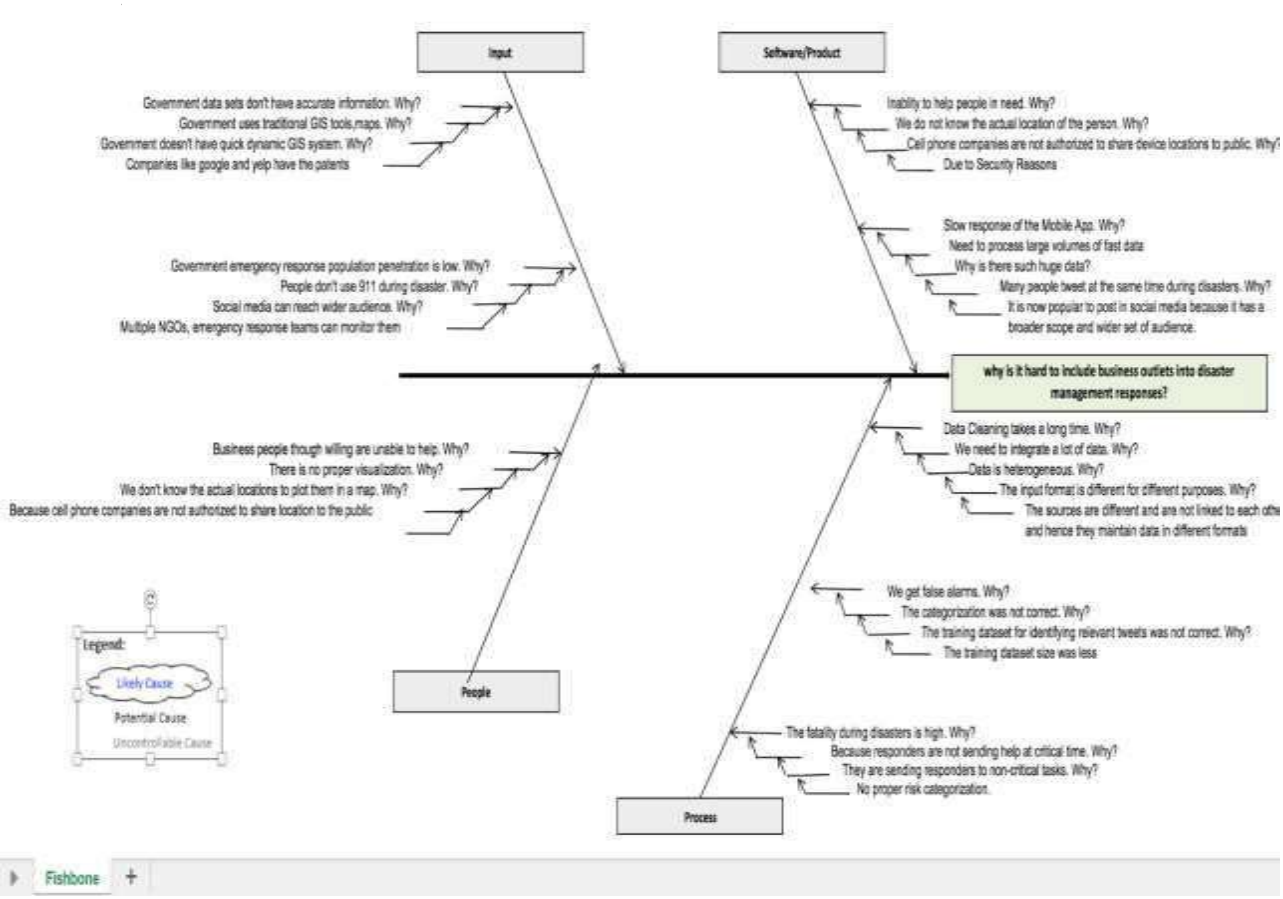
WBS	http://www.wbstool.com/
Gantt Chart	Microsoft Excel

VAS	Microsoft Visio

Microsoft provides support for lot of six sigma tools in office suite. There are also a lot of excellent online tools and documentation.

3. ANALYSIS PHASE

The analysis phase of the project began early, but the major analysis came as well started digging deep into the problem statement. In the first phase of analysis the fish bone diagram was drawn as follows:



During the next major phase of analysis, the different machine learning models considered were analyised with its pros and cons as follows:

Multinomial Bayesian Classifier	MultinomialNB implements the naive Bayes algorithm for multinomially distributed data, and is one of the two classic naive Bayes variants used in text classification (where the data are typically represented as word vector counts, although tf-idf vectors are also known to work well in practice). Naive Bayes classifier is very

	efficient since it is less computationally intensive (in both CPU and memory) and it requires a small amount of training data. Moreover, the training time with Naive Bayes is significantly smaller as opposed to alternative methods. We can use Naive Bayes when we have limited resources in terms of CPU and Memory. Moreover, when the training time is a crucial factor, Naive Bayes comes handy since it can be trained very quickly.
Support Vector Machines Classifier	SVM is a supervised machine learning algorithm which can be used for classification or regression problems. It uses a technique called the kernel trick to transform your data and then based on these transformations it finds an optimal boundary between the possible outputs. Simply put, it does some extremely complex data transformations, then figures out how to separate your data based on the labels or outputs you've defined. It capable of doing both classification and regression, and it is just what we need in our project.
NuSVC Classifier	The nu-SVM has the advantage of using a parameter nu for controlling the number of support vectors. Now despite the new bound, the nu-SVM is comparatively difficult to optimize and often the runtime is not scalable as compared to C-SVM.
Logistic Regression Classifier	It is a regression model where the dependent variable (DV) is categorical. It can be used to do the prediction and

	classification. Conditional random fields, an extension of logistic regression to sequential data, are used in natural language processing. In logistic regression, by contrast, we set all the weights together such that the linear decision function tends to be high for positive classes and low for negative classes.
Stochastic Gradient Descent Classifier	Stochastic gradient descent is a gradient descent optimization method for minimizing an objective function that is written as a sum of differentiable functions. Stochastic gradient descent is a popular algorithm for training a wide range of models in machine learning, including (linear) support vect - graphical models. When combined with the backpropagation algorithm, it is the de facto standard algorithm for training artificial neural networks.or machines, logistic regression.

Then, we can discuss more about the pros and cons for each classifiers:

	Pro.	Con.
MultiNomial Bayesian Classifier	Easier to implement and efficient.	If a given class and feature value never occur together in the training data, then the frequency-based probability estimate will be zero. This is problematic because it will wipe out all information in the

		other probabilities when they are multiplied. Fixed by pseudocount (Laplace smoothing and Lidstone smoothing)
Support Vector Machines Classifier	1. We can capture much more complex relationships between the data points without having to perform difficult transformations. 2. Current state of art classifier for text mining.	1.The fitting time complexity is more than quadratic with the number of samples which makes it hard to scale to dataset with more than a couple of 10000 samples. 2.The training time is much longer as it's much more computationally intensive. 3. The complex data transformations and resulting boundary plane are very difficult to interpret.
Nu-SVC	1. Similar to SVC but uses a parameter to control the number of support vectors. 2. Efficient in higher dimension space.	1.The Nu-SVM is comparatively difficult to optimize. 2. SVMs do not directly provide probability estimates, these are calculated using an expensive cross-validation.
Logistic Regression	Logistic Regression is good when you are dealing with very high dimension data. Text classification is a classic	1.Cannot deal with missing values. Substitute by Mean/Median.

	problem. Efficient in higher dimension space.	2. Does not handle nonlinearities well.
Stochastic Gradient Descent Classifier	Simple and Cheaper computation	1.Less stable in nature. 2. Slower to converge.

The analyze phase did comprise of running the tweets from the different models. The results from the different models are as follows:

1. Logistic Regression

LogRegress	Precision	Recall	Accuracy	F1 Score
High	98.32%	60.48%	71.25%	74.87%
Medium	68.92%	59.23%	92.37%	54.23%
Low	38.06%	100.00%	65.07%	55.12%

2. MultiNomial Bayesian Classifier

MultiNB	Precision	Recall	Accracy	F1 Score
High	89.64%	88.32%	85.03%	88.98%
Medium	73.23%	80.24%	91.04%	76.24%
Low	49.70%	88.16%	86.89%	63.54%

3. Nu-SVC

NuSVC	Precision	Recall	Accuracy	F1 Score
High	92.50%	88.55%	85.66%	90.49%
Medium	78.23%	89.85%	91.19%	80.24%
Low	48.98%	90.58%	85.24%	63.56%

4. Stochastic Gradient Descent Classifier

SGDC	Precision	Recall	Accuracy	F1 Score
High	93.22%	86.45%	84.63%	71.84%
Medium	0.00%	0.00%	92.22%	0.00%
Low	51.88%	93.12%	84.87%	54.04%

5. Support Vector Machine

SVC	Precision	Recall	Accuracy	F1 Score
High	89.64%	90.23%	87.55%	91.68%
Medium	65.78%	87.27%	90.98%	78.94%
Low	49.70%	89.64%	85.47%	64.91%

Potential Solutions:

The potential solution to the problem of choosing an algorithm and a classifier's rigid solution is to use all the models and build an overall classifier. This is what is delt in the Improve phase.

4. IMPROVE PHASE:

Alternative Solutions Considered

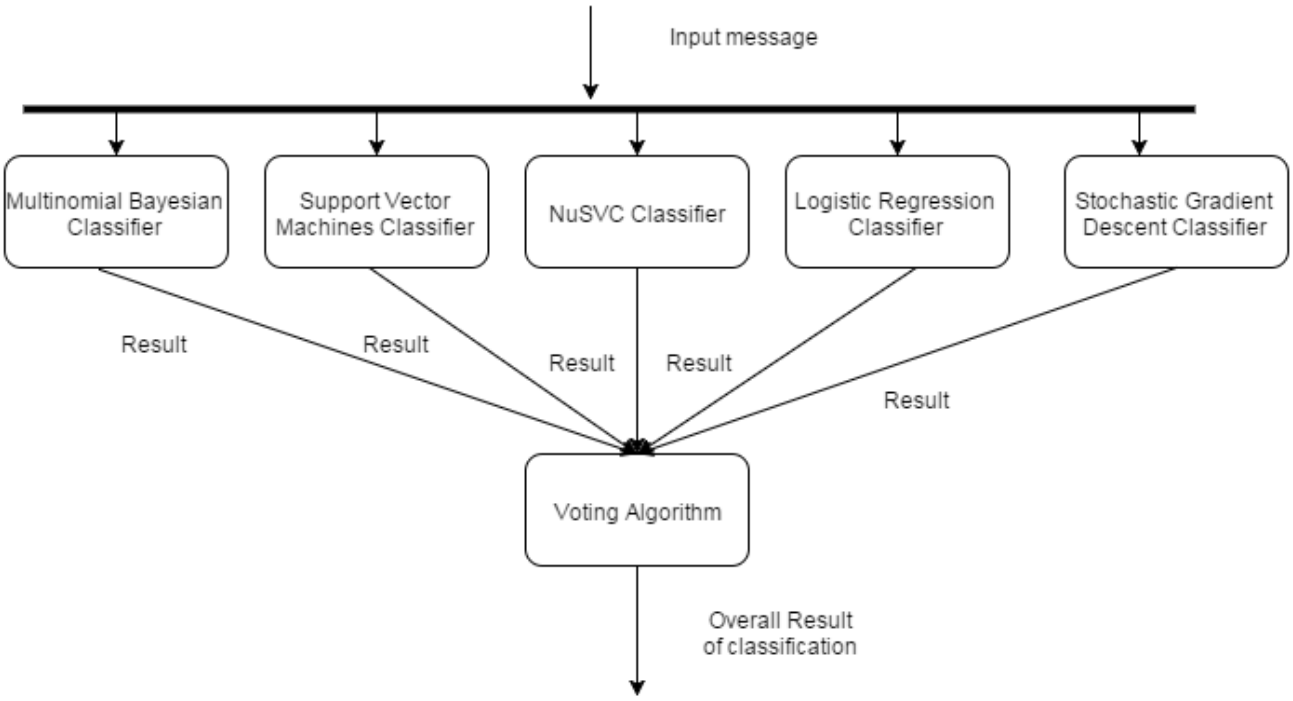
The project first started with the application of one of the machine learning techniques, but it was found that just one technique might be too rigid because every technique has its pros and cons. In Order to avoid this and to provide help even when an algorithm produces a wrong classification, we have designed a voting based algorithm which picks the result with maximum votes. In order to do that we have taken into consideration 5 algorithms. These algorithms provide a solution that is focused on better classification, because they are chosen with different genres. We also run Cross Validation for each method and parameter combination and select the best model, method and parameters. Some of these techniques are deep learning techniques while others are not. But the overall results can be used to give a better solution in terms of results.

Recommended Solution

Of all the ideas considering different algorithm the team felt that a collective approach with 5 algorithms can help choose a better result instead of one algorithm.

How to pilot the ideas?

The idea was piloted in a simple way. This can be seen in the diagram below.



Result of the improvement:

From the results of the various algorithms from the analysis phase and from the overall voting based algorithm in the improvement phase, we have a result from the system as follows:

VoteClassifier	Precision	Recall	Accuracy	F1 Score
High	91.91%	88.91%	86.97%	90.62%
Medium	75.57%	87.92%	90.58%	81.23%
Low	50.74%	88.75%	86.14%	65.26%

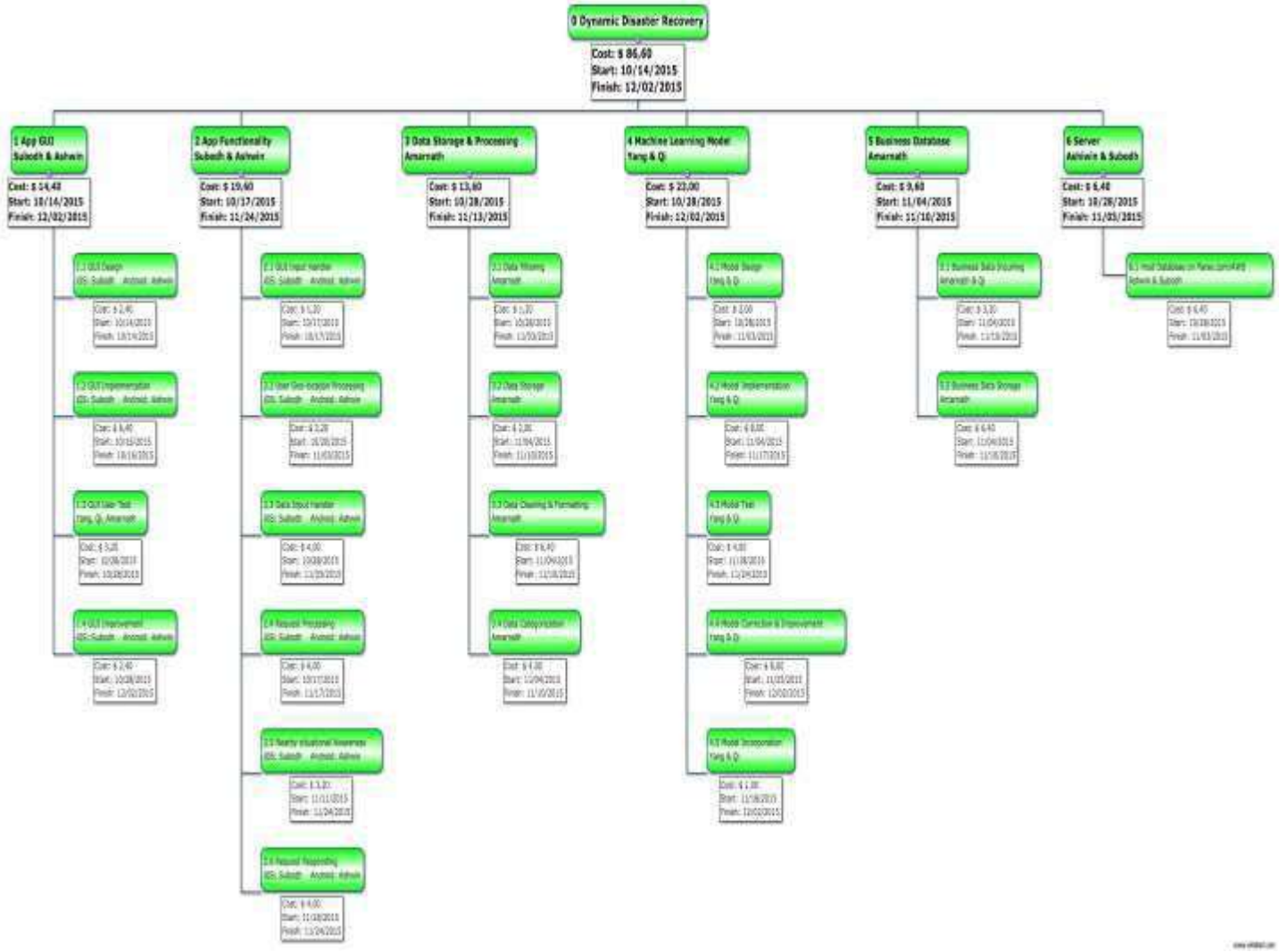
ACCEPTANCE OF RESULTS:

To maintain the industrial standards of the application and to make sure that the application follows the metrics defined we have compared the result with the accepted results from the industries. Please note that all our parameters have performed well with the expected industry standards.

Our Result	Accepted Result
Accuracy: 85.6%	50-75% is considered accurate
Time to request: 2 seconds	Time to request: 2-5 seconds
Total Time in system: 18 Seconds	Total Time in system: 15-25 seconds

WORK BREAKDOWN STRUCTURE (WBS):

WBS is a hierarchical and incremental decomposition of the project into phases, deliverables and work packages. It is a tree structure, which shows a subdivision of effort required to achieve an objective. The WBS for the projects is as follows:


0 Dynamic Disaster Recovery
Cost: $ 86,60
Start: 10/14/2015
Finish: 12/02/2015
1 App GUI
Subodh & Ashwin
Cost: $ 14,40
Start: 10/14/2015
Finish: 12/02/2015
2 App Functionality
Subodh & Ashwin
Cost: $ 19,60
Start: 10/17/2015
Finish: 11/24/2015
3 Data Storage & Processing
Amarnath
Cost: $ 13,60
Start: 10/28/2015
Finish: 11/13/2015
4 Machine Learning Model
Yang & Qi
Cost: $ 23,00
Start: 10/28/2015
Finish: 12/02/2015
5 Business Database
Amarnath
Cost: $ 9,60
Start: 11/04/2015
Finish: 11/10/2015
6 Server
Ashwin & Subodh
Cost: $ 6,40
Start: 10/28/2015
Finish: 11/03/2015

5. CONTROL PHASE

The final capability is determined and the closing performance and all related changes are documented in the closing contract. This phase is not as statistically intensive as the MEASURE, ANALYZE, and IMPROVE phases.
The important steps are:

1. **Risk Mitigation -** we had already identified the risks in the Design phase from the Fish Bone Diagram and 5 Why's. So we already knew the difficult tasks and tackled them early in the project. Like
    a. Implementation of the APP was done to mitigate the risk of not having the location from the user.
    b. Also five different machine learning models were employed so that the results are not biased because of one of them.
2. **Process Monitoring -**

. After each Meeting we created Minutes of Meeting(MOM) with the tasks assignment,impediments and the ways to remove them.
a. We employed use of Gantt chart and WBS to divide the tasks into sprints and monitor that we are following the timeline.

Risks Management and Mitigation:
Risk management is one of the important ideologies that has to considered while designing a project. In order to avoid any complication of the project in the future the analysis is done. Just like every other project this project also has a lot of risks involved in it. Please note that the risks involve both the direct risk and the indirect risks in the project. In this section the following steps are carried out in a sequential aspect for each of the known risks.

- Risk Identification
- Risk Description
- Risk Probability
- Risk Impact
- Risk Mitigation

RISK 1

Statement: Business data unavailable/changed

Description: The businesses around a customer always change with times. For examples, new shops springs up every day in cities, existing businesses close, existing businesses updates their information, Business takeover changes the business dat a etc. are some reasons why the business data has to be constantly updated.

Probability: High

Impact: Medium

Risk Mitigation: In order to keep the public aware of the businesses, the government of United States of America releases data sets regarding the businesses in each states every year. These data sets are free and are updated in the system to make sure that the latest businesses are included in the system. Please note that there are private organization's as well who sell this data to the clients and these data an as well be used in the system.

RISK 2

Statement: Twitter data unavailable

Description: The data in the twitter might not be available if the tweet is made private to a user. If the twitter user does not tweet to public, his tweet might be unavailable to process. Also in cases where the data twitter data has been processed but the tweet has been deleted, we might want to filter it out.

Probability: Medium

Impact: Medium

Risk Mitigation: In order to keep the data public, we expect the people to tweet to the team directly or a public tweet handler. If the user has a private tweet, the tweet can be retweeted by someone who has the location for the team to help.

RISK 3

Statement: Twitter data Deleted

Description: The tweet in the twitter might deleted by the user for some reasons and as a result, the system and the businesses needs to keep itself updated regarding the tweet's status.

Probability: Medium

Impact: Low

Risk Mitigation: In order to evaluate if the tweet is still is valid one, before we inform the business outlets near the system, we check whether the tweet is still available. If the tweet is deleted, the processing is aborted.

RISK 4

Statement: Sending False Alarm

Description: The tweet in the twitter might be describing something and our system misclassified the tweet into one of the categories and the corresponding action was taken.

Probability: Medium

Impact: Medium

Risk Mitigation: In order to prevent false alarms, the data classifier is trained with a large amount of data to make sure that the classification is done correctly.

RISK 5

Statement: Location information unavailable
Description: The GPS of the cell phone might be turned off making us unable to collect the Information about the user.

Probability: Medium

Impact: Medium

Risk Mitigation: The app automatically turns on the GPS and the location based services to enable you to give a location. If an accurate information is unavailable a relative information is available about the device.

Other Problems Faced and Mitigation:

1. When we started the project, we had not taken into account that 98% of tweets does not contain the location. After the identification of the problem we designed and developed the APP to remove this problem.

2. Use of only one machine learning model was giving Skewed results. So, we developed new design to include five machine learning models and assign risk based on voting from all of the models.

Follow Up Activities:

1. GUI improvement for the APP
2. Publishing the APP on store
3. Get more training dataset to get better precision,accuracy and f1 score.

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CONCLSUION:

Thus the project aims at helping the people stuck in crisis through their nearest source of assistance ,which are the businesses near the people and try to connect them together even before the emergency responses can get the information . This project is a prototype of a large scale disaster management project and can help and server different communities across the world.

APPENDICES

Mobile Application

The mobile application is built with two of the most used platforms in the mobile industry, namely the Google's Android and the Apple's iOS. These applications are built with the following features:

- Automatic phone number tracker (Android Only)
- Automatic GPS activator
- Automatic Location tracker
- Easy and one touch Interface (Minimum User Interaction to help in an emergency)

Android Application:

The android application is a 2 screen application which is built with the components such that it follows the google's standard of the applications in the play store. The application has the following screen, namely

1. Register screen.
2. Help request Screen.

Register Screen

The register screen contains the basic screen where the information of the user is gathered by the application. The information requested are

1. First name
2. Last Name
3. Address
4. State
5. Zipcode
6. Emergency contact name
7. Emergency contact number

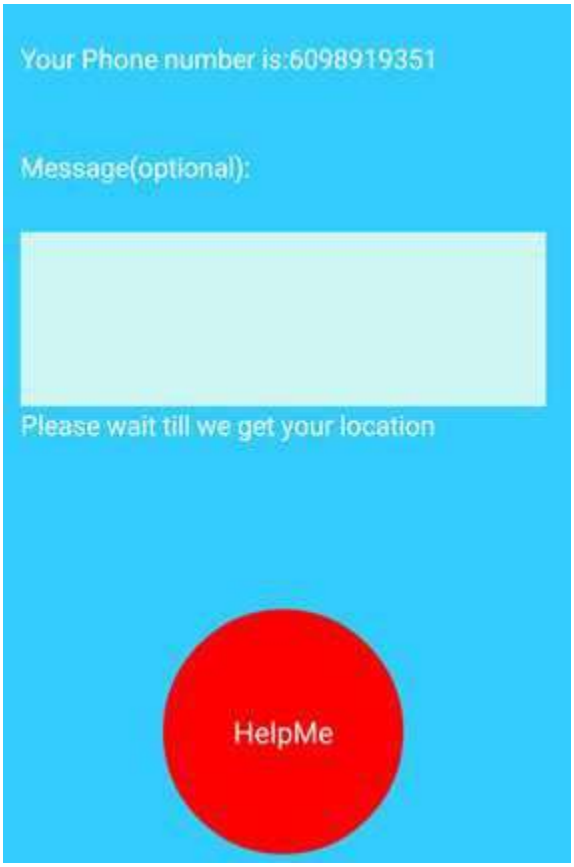
The screen has the ability to automatically gather the phone number of the SIM card from the cell phone. All the above information from the user along with the cell phone number is sent to the server for registering the user. A response window comes from the server after the user registers successfully. The application automatically moves to the next screen. Please note that the register screen appears only once. The application automatically checks whether the phone number of the user is already registered and displays it based on it.

Help request Screen

The help request screen has the following functionalities in built in it

1. Automatic phone number receiving
2. Automatic activation of GPS sensor
3. Automatic location gathering in terms of latitude and longitude

The screen has a message box in which the user can type in the message. Once the user types the message the user can press the help me button. The Application automatically sends a message to the server and the user gets a confirmation from the server where the other operations takes place.



Database:

The database stores the data regarding the user information ,the request information and the business information. The database is currently the infamous Relational database but it can be changed to a much better data stores that are available in the market like NoSql or Cassandra. There are 3 tables used in the databases namely

- UserData(Contains the user information)
- Appdata(Contains the requests by user)
- Business Data (Contains the business information)

The application connects to the database ddr_mobile which contain all these tables. Once the connection is established with the database, the basic operations of databases can be achieved in it.

Server:

The server the application is hosted in amazon's AWS. The data store is a relational data store(RDS). The server that is used comprises of

- 10 Gigabytes of storage
- 3.0 Ghz of processing power

Please note that the above storage and processing processor speed can be increased with better plans with Amazon. The Amazon AWS was chosen for the application

because they have reported only a very small down time for the for the past few years. Its important features are:

- 24x7 availability
- Automatic backup
- Quick connectivity from anywhere.

iOS APP:

Installation for Mac

1. Download Latest version of XCode (Version 7.1) on Mac
   https://developer.apple.com/xcode/download/

2. Install Cocoa Pods via Terminal:

   sudo gem install cocoapods

3. Get the app from Github to the desired folder:

   a. Git clone https://github.com/sahsubodh/HelpMeiOS.git

   b. Go to the folder HelpMeiOS/HelpMe and run this: open -a Xcode Podfile

   c. Then run this: pod install

   d. Open HelpMe.xcworkspace

   e. Select HelpMe app as entrance and then press the run button

4. Run the HelpMe app from Xcode

   When we run the simulator we need to set the default location to Apple as the Mac book doesn't have a location (it will work on the mobile correctly). So we have to run it a few times so that the default location is set on the Mac Book (there is some problem, I have to reset it a few times).

In the iOS APP we have implemented the part for sending the message to the emergency contact when the user asks for help using the APP. We can customize the

message in the message box . We have included the address of the person stuck in crisis for the emergency message by using Google's **'Reverse Geocoding'**.

The Flow goes like this:

1) The first time user opens the App the he will have to register with the details.

2) Once he has logged in he will directly go to the main page to ask for help without logging in again.

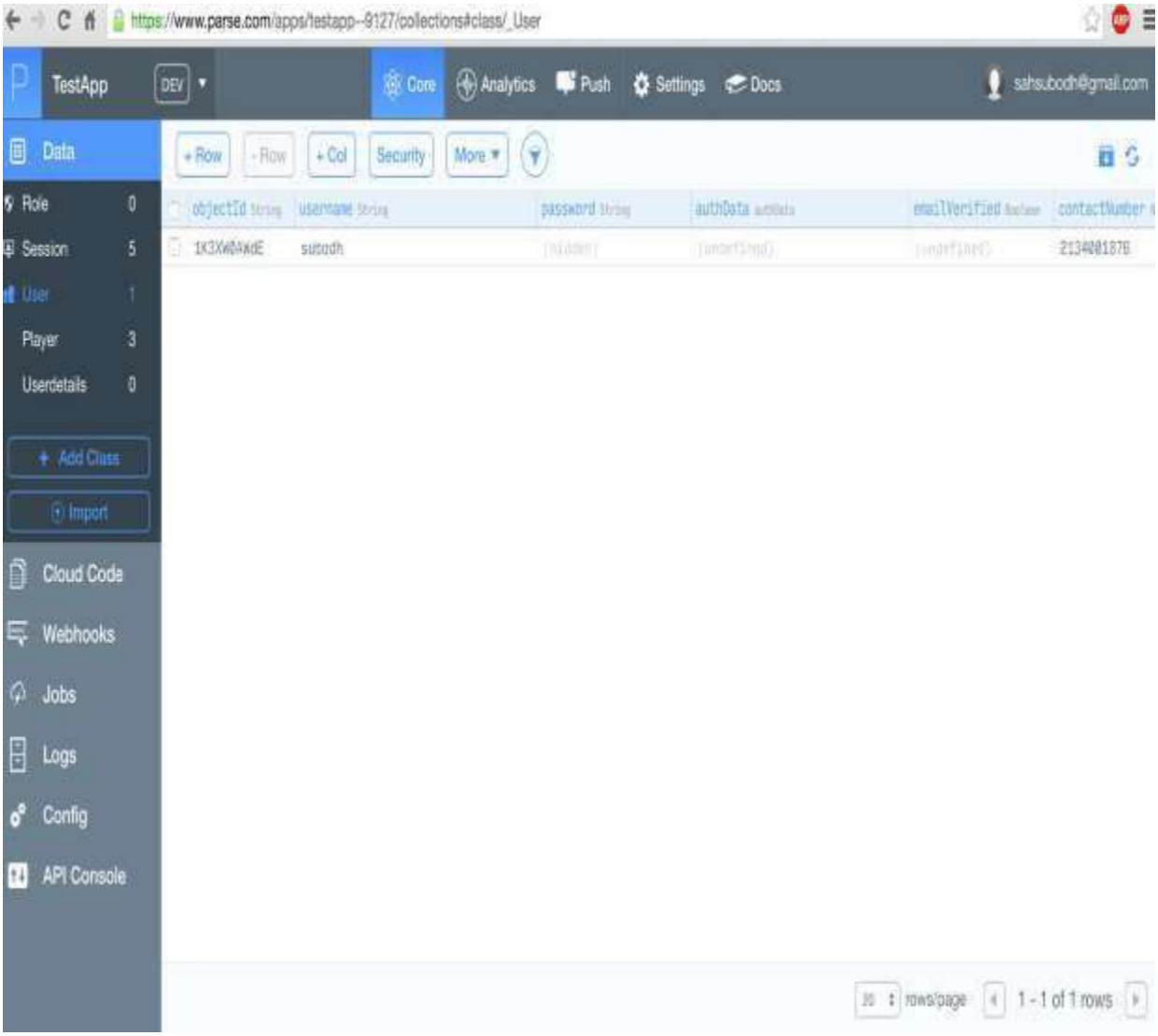
3) The User data is stored in Parse DB.

4) When the user puts in a Message and presses HelpMe Button ,the emergency contact will get the message from the user.

5) The contents of the SMS is the emergency text typed by the customer asking for help and a link to his current location on Google Maps.

Parse is a Backend provider(BaaS) It Has one of the best free plans out there. The documentation is the easiest to understand, and the service is one of the easiest to work with, especially for beginners.
.The Data for the iOS App is stored on Parse Database as backend and then transferred to AWS as well for machine learning and risk analysis.

User Table : where the customers information like his name,contact number and emergency contact details are stored.

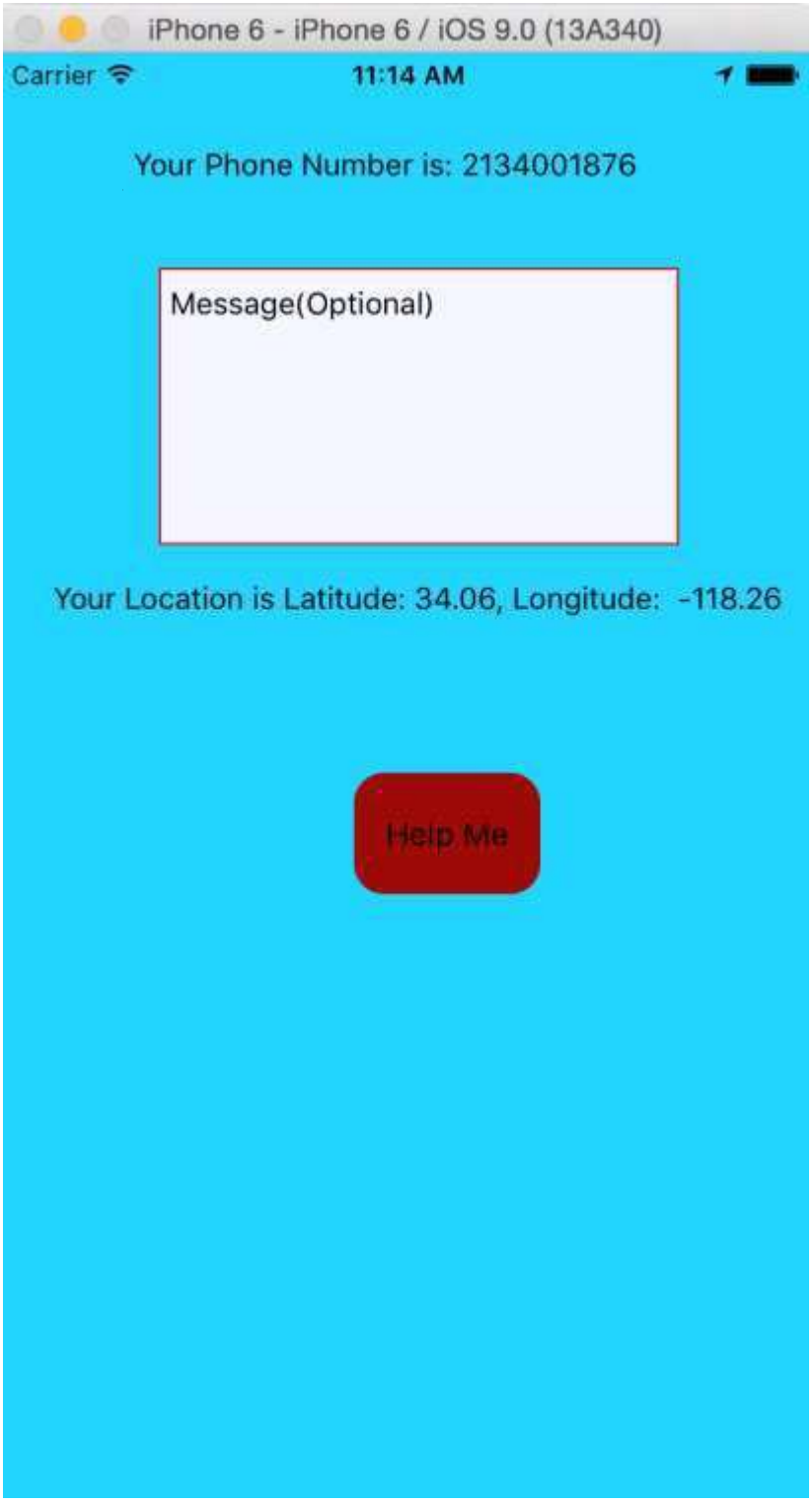


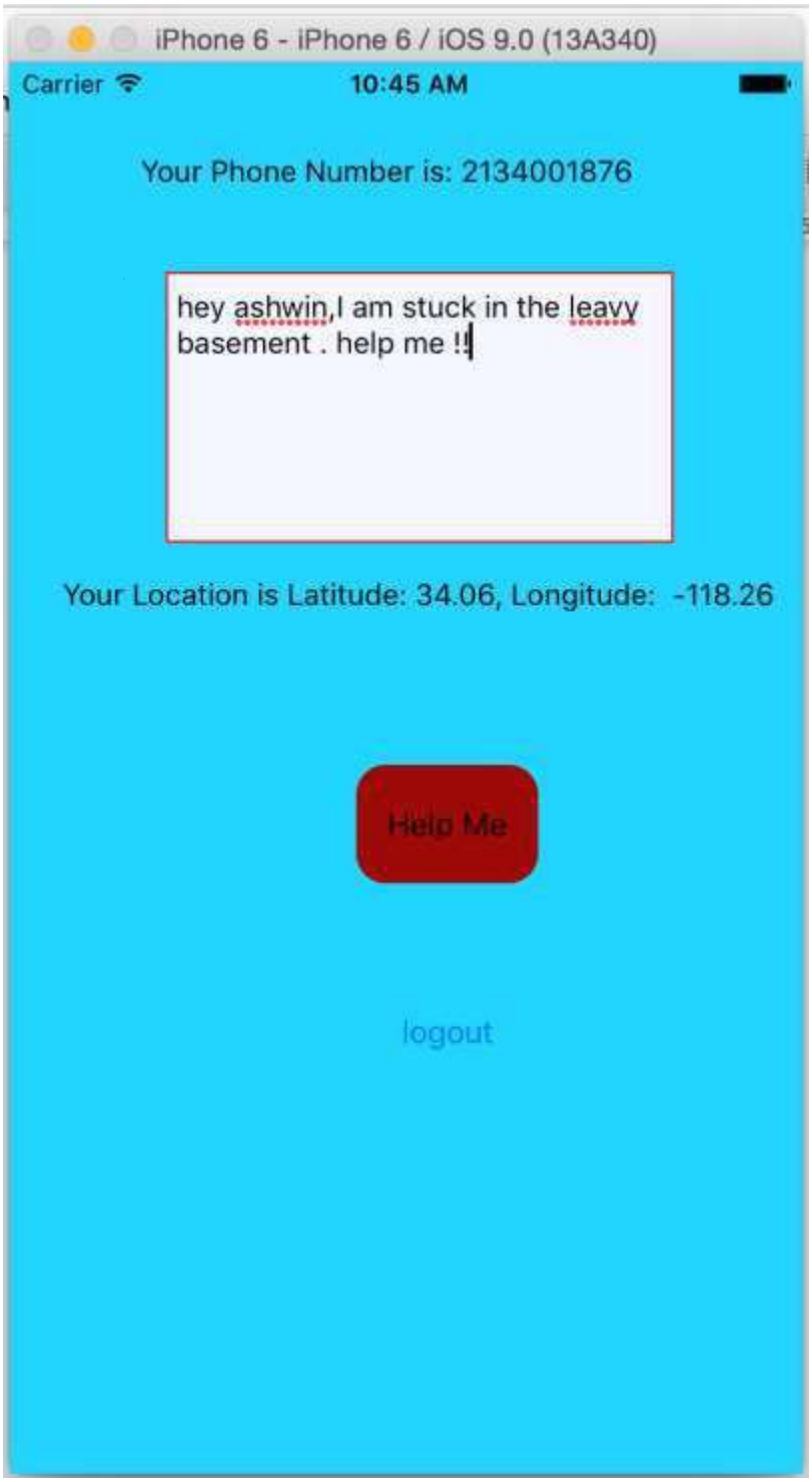
Screenshots

The App when running looks like this:

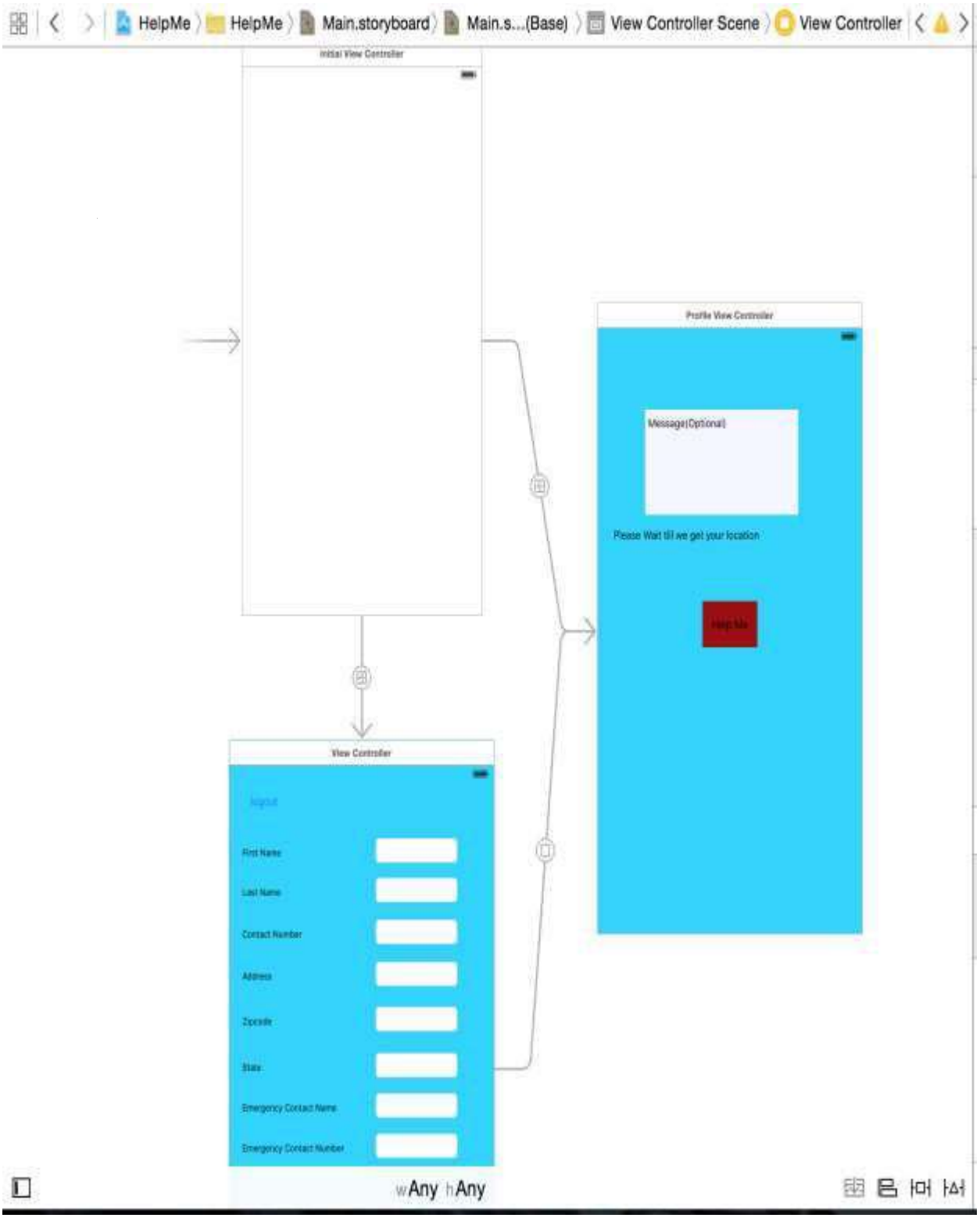

iPhone 6 - iPhone 6 / iOS 9.0 (13A340)
Carrier
4:04 PM
logout
First Name
Subodh
Last Name
Sah
Contact Number
2134001876
Address
1186 W,36 Street
Zipcode
90007
State
CA
Emergency Contact Name
Vinay
Emergency Contact Number
2134001876
Save and Continue

Second Screen:

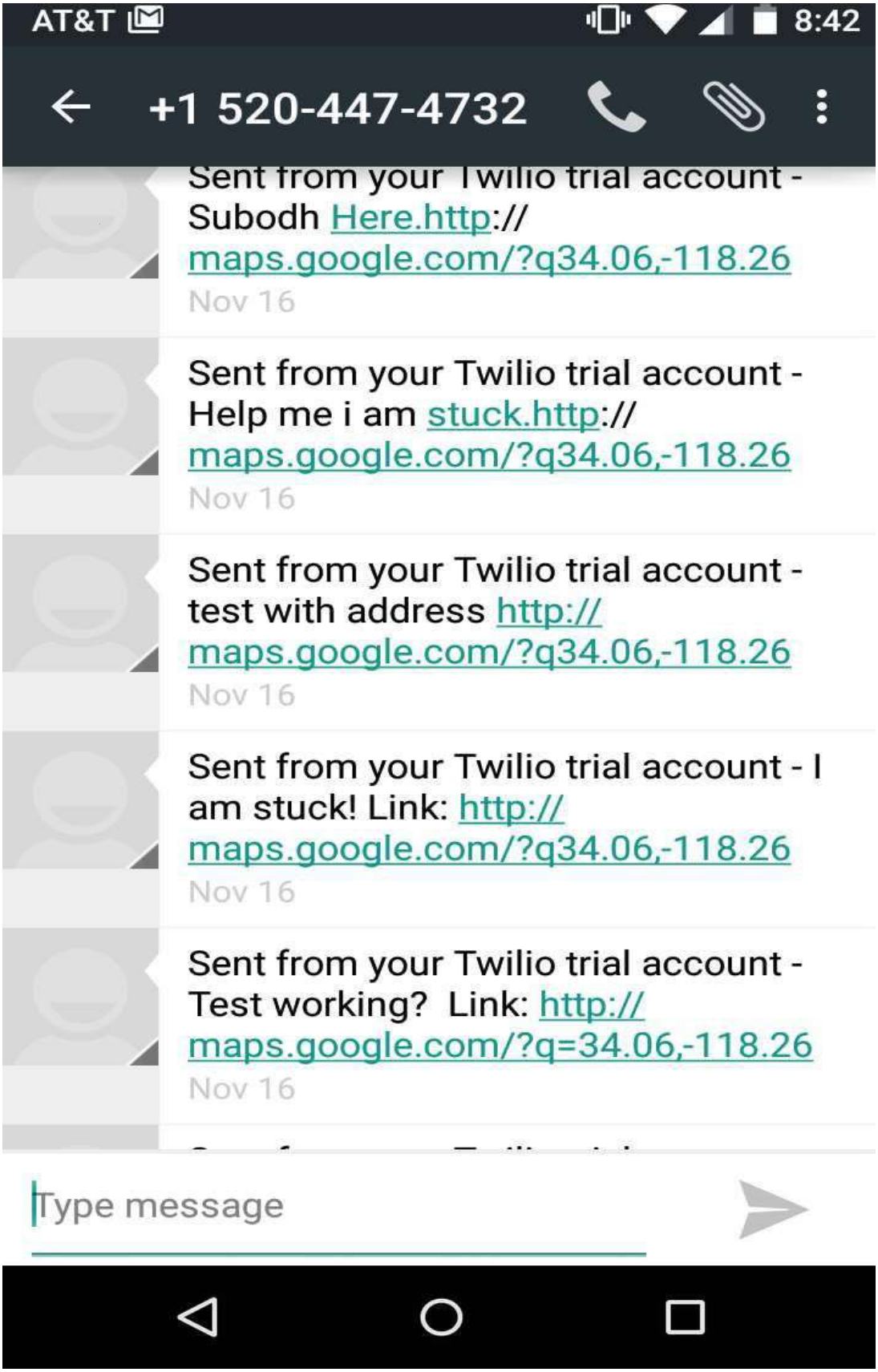


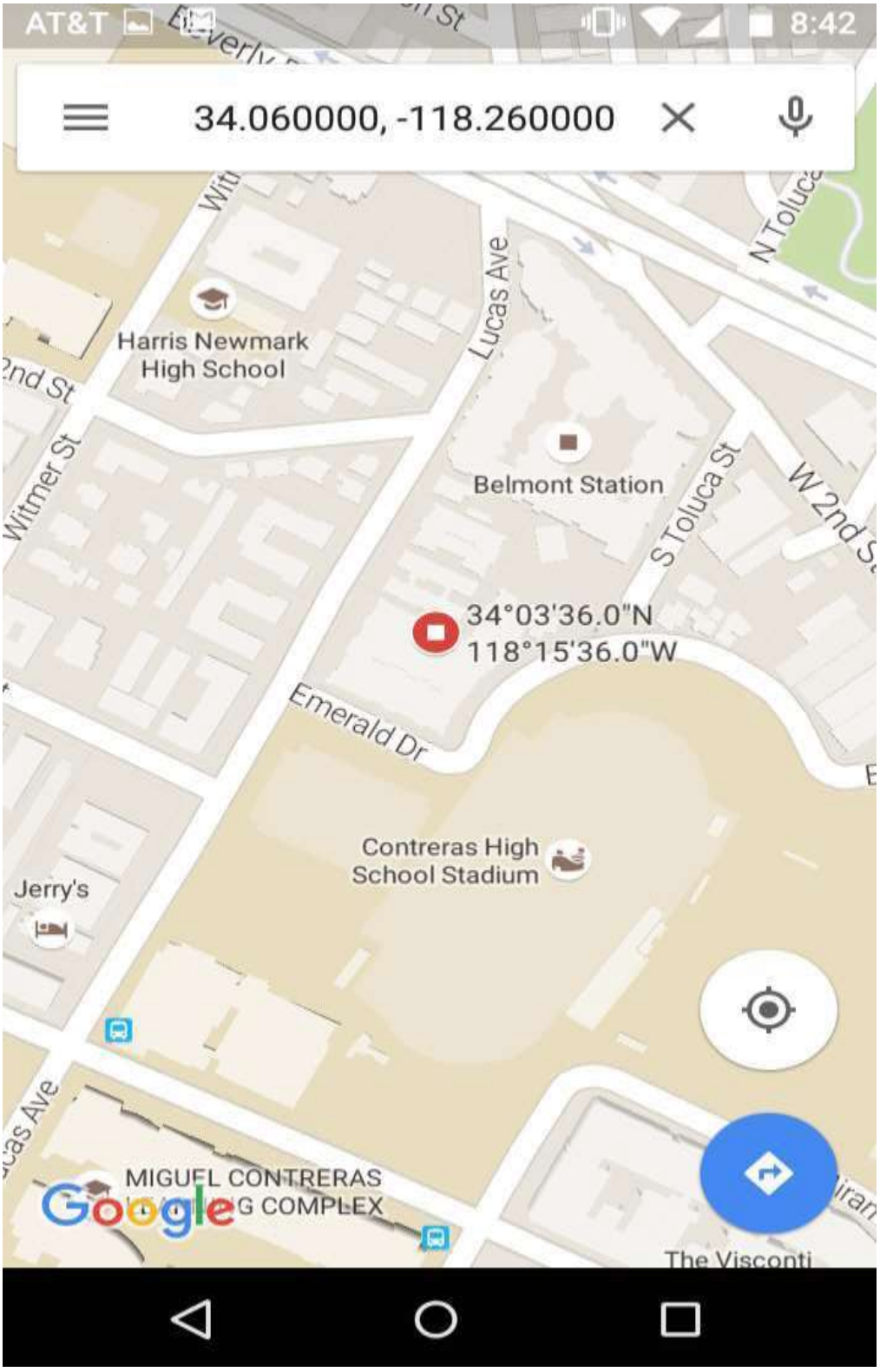


The flow with segues(links from one View controller to another):



The format of text emergency contact receives with the link to the location of the person stuck in the crisis:

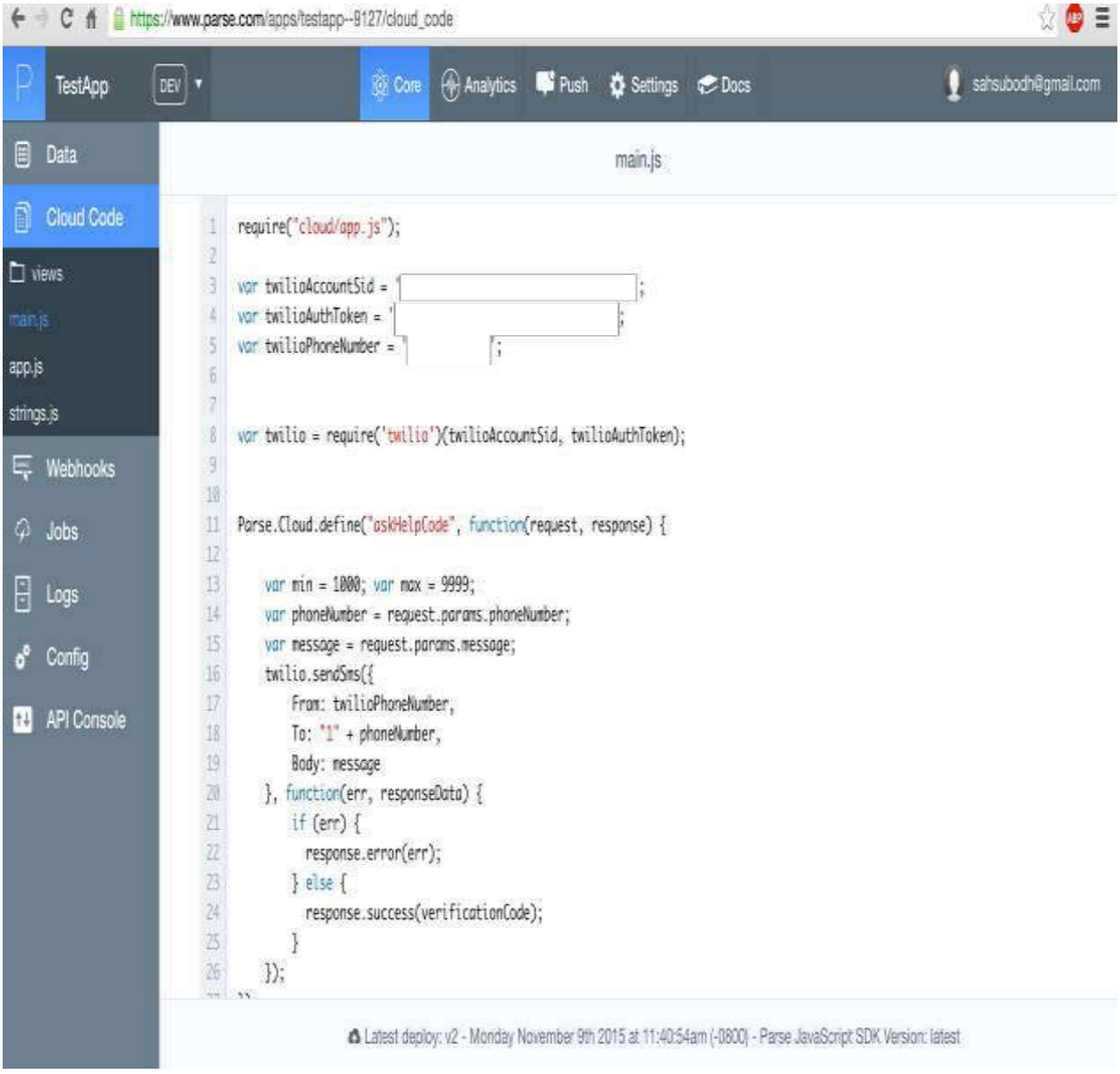

AT&T
8:42
+1 520-447-4732
Sent from your Twilio trial account - Subodh Here.http://maps.google.com/?q34.06,-118.26
Nov 16
Sent from your Twilio trial account - Help me i am stuck.http://maps.google.com/?q34.06,-118.26
Nov 16
Sent from your Twilio trial account - test with address http://maps.google.com/?q34.06,-118.26
Nov 16
Sent from your Twilio trial account - I am stuck! Link: http://maps.google.com/?q34.06,-118.26
Nov 16
Sent from your Twilio trial account - Test working? Link: http://maps.google.com/?q=34.06,-118.26
Nov 16
Type message



Parse Cloud:

1. This contains the javascript code which is the implementation of the Twilio's SMS api's. We have stored this code on Parse Cloud. There is no separate

implementation to run the code as it is automatically called when the HelpMe Button is pressed.



About Twilio SMS API:

After signing up for a phone number, Twilio lets you integrate phone services into your application using intuitive tags like *SMS* when you want your app to send an SMS. The basic idea remains the same. As with its telephony API, Twilio's SMS functionality is meant to make previously complex tasks as simple as possible.
The phone number validation has to be done as the part of code to make sure of the number of digits and invalid characters.