

Enhancing Community Resilience through the Government Text Alert System: A Case Study in Baranggay San Miguel, Bulacan

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Abstract— *The Government Text Alert System is a pivotal response to the pressing challenge of ensuring effective communication and updates between government agencies and citizens during emergencies. This research outlines the development of a localized public warning system designed to deliver crucial information through text messages during local emergencies, aiding authorities in swiftly disseminating vital announcements and disaster-related guidance. The system's objectives encompass creating a user-friendly application that enables administrators to interact with residents and respond to information requests, thereby alleviating the workload of the Municipal Disaster Risk Reduction and Management Office (MDRRMO). The research results demonstrate widespread acceptability among users, clients, and IT experts, highlighting its efficacy in providing essential notifications and updates, ultimately contributing to community safety and disaster preparedness.*

Keywords— *Communication technology; disaster management; emergency communication; government text alert system; information dissemination; technology adoption*

I. INTRODUCTION

Striving to better connect and serve citizens. As information consumption grows more computerized and accessible, this has often entailed embracing new technology. To keep up with these shifting patterns, several government agencies are turning to text messaging services as a quick and easy way to communicate.

In the Philippines, 37% of participants said that the amount of time they consumed sending SMS texts had significantly grown. The majority of Filipinos use their smart devices to make video calls and other comparable services (Insight, 2021). Every day, around 1 billion text messages are sent by 50 million mobile customers. This translates into billions of dollars in revenue for the country's two largest providers, Smart Communications and Globe Telecom (Pinaroc, 2015). Despite the fact that the Philippines was relatively behind in the smartphone sector at the time, the analysis claimed that the Philippines had the greatest growth potential (Gray, 2020).

Innovative solutions are the correct response. Due to its accessibility and availability, SMS is currently commonly utilized by marketers to reach a highly targeted client base. In contrast to programs that require a Wi-Fi connection or have multiple settings to understand, SMS is simple and straightforward (AdSpark Team, 2016). Text messaging programs are intended to be part of a larger integrated communications program for the Municipality of San Miguel,

Bulacan. Because of the areas with low connection rates, the shaky coordination, and guidance of local government of their respective centers, including communications strategic plan and announcement,

Although cellular phone, text messaging, and e-mail services can target specific persons, they would be ineffective in a location-specific emergency because such services can only target individuals selectively on an individual basis by phone number, regardless of their physical location. People who just use their cellphones would be exempt from the warning. Networks such as Ethernet and Wi-Fi are prone to failure in times of an emergency due to potential power outages that could shut down the network or one or more network devices, thereby causing the failure of communication for an entire building or geographical area.

Government agencies are struggling and need to be informed and updated. Which inspires the researchers to develop a system that would cater to the needs of the citizens with information, updates, and announcements anchored to their respective concerns.

The Government Text Alert System is a local public warning system that allows the government to address the people during a local emergency. The alerts are sent through text messages. The system may also be used by local authorities to deliver important emergency information.

The purpose of this system is to provide the necessary information to warn the public and disaster effects of the necessary actions that will lead to their safety and to deliver the messages to residents at risk of imminent threats with the goal of maximizing the probability that people take protective actions and minimizing the delay in taking those actions.

Generally, the objective is for the researchers to create an application with notification alerts through text messages linked to the available contacts of the resident's concern.

Specifically, the study aimed to

1. Develop a system that provides information such as news, announcements, and updates from MDRRMO.
2. Implement user-friendly interaction for an administrator that will respond to information requests from the user.
3. Assist the MDRRMO office in lowering their workload by contacting users in different modes of transactions in order for the citizens of San Miguel to get essential notifications.

The Government Text Alert System was established to provide a centralized texting system that facilitates interaction

between citizens and administrators and is capable of implementing an efficient text alert system for the San Miguel, Bulacan area. The system will give a warning to all citizens via text message in a time of emergency. The system is capable of contacting message recipients through a variety of methods, including selecting a request, manual input, and major transactions.

The Government Text Alert System requires the internet to perform the function and uses a system and a website to acquire the prior transaction in the system. The Administrator is only responsible for disseminating necessary information such as weather information, imminent threats, and local incident information to the rest of the citizens. And also, this system has no registration name as an authorized number.

II. LITERATURE REVIEW

According to Q. Xiong et al. (2020) designed a task system that can include the realization of the correct classification of the public's questions, the acquisition of the message hot spots, and automatic scoring and evaluation of the quality of the message replies. Effectiveness and efficiency are present to provide support vector machines, convenience of logistics, etc. The rules for evaluating the quality of message responses based on relevance, integrity, and interpretability are defined as the key factors for this. They found out that the call rate of messages is more than 84%, which can be effectively valued for the use of the mass population.

In D. J. Wong et al. (2017), phone text messages can be used to disseminate information to everyone and most likely tend to give advice to the public in disasters. However, since technology is indeed prevalent towards people, it would be more effective if the users were oriented towards the system. Also, the messages sent must be from a trusted and reliable source; messages should only be reserved for serious incidents; multiple messages were sent; messages were kept short and formal for getting the gist of information.

A. Ameen et al. (2019) developed Structural Equations Modelling (SEM) via SmartPLS 3.0 to analyze the 355 to identify factors affecting smart government usage. Mainly, this covers the variables such as quality, information quality, and service quality. It is concluded that the e-system in the government improved insight on the importance of technological characteristics of smart government applications.

A. Avotra et al. (2021) discussed that e-government had a negative influence on corporate social responsibility. As a result, while developing e-government policy, the government and related stakeholders should consider these findings. ICT-related issues have an impact on human behavior, and they may present both opportunities and challenges in terms of creating, obtaining, processing, and utilizing accurate data. Furthermore, the most important aspect is to ensure that ICT can eliminate problems like corruption, poverty, and others through digitalized systems linked to institutions and the government.

M. Lee (2021) discussed how emergency alert text messages sent to individuals' mobile phones are timely and effective strategies for encouraging preventive behavior in the

public. Sending emergency alert text messages to provide the public with accurate and reliable information could be positively considered by the health authorities, which might reduce the negative impact of epidemics.

F. J. Montserrat et al. (2018) believed that the number of deaths and injuries had increased. To reduce the catastrophic debris, there is a need to develop emergency alerts worldwide. This system is not only for the emergency field, but it is also being developed to meet the communication needs of the population at risk in the event of a forecasted, impending, or already occurring hazard event.

Leederman et al. (2020) believe that giving real-time alerts during emergencies is essential for ordinary individuals affected by hazards and calamities. Notification alerts give a higher sense of security, trust, and safety. Using alert systems during calamities enables the user to participate and respond faster personally.

P. Talari et al. (2021) agreed that integrating flood warning and alarm systems utilizing the Internet of Things (IoT) allows them to interact with one another in the presence of the internet. This is useful for environmental surveillance, tracing, management, and sensing.

K. Goniewicz & F.M. Burkle (2019) ideally want to ensure that developing text alert systems for any purpose must provide equal access to the most vulnerable populations and all those, vulnerable and not, who do not have immediate access to text messaging systems.

D. Valle Cruz (2019) implies that smart tactics and technologies should be guided by the creation of public value via anti-corruption initiatives, open data, information access, and data privacy. Technology plays a critical role in increasing public value creation. As a result, governments' primary goals should be to avoid corruption, make government more transparent, provide open data, and correct information privacy.

E. Figuracion et al. (2016) argued that public alerts are essential to assure public safety during emergencies and reduce possible casualties. This led him to develop an alert system named the (ALERRT) Albay Emergency Response and Report Tool. This is used to improve solutions to accidents from both natural and human causes, especially in calamity-prone areas like Albay.

In M. J. Suaybaguio (2016), SMS was viewed as a more trustworthy source of information, prompting citizens to demand information from the authorities. As a result, people may face network issues, connectivity issues, and spam messages, all of which might obstruct information transfer. It must also be addressed in order to institutionalize SMS technology in order for it to properly serve its function.

J. Maggay (2019) explained that the use of auto reply SMS is confusing for beginners; however, people can grasp the portability of it. Also, text alert systems are flexible because any SMS enabled mobile phone can be used. Moreover, the system can send very accurate data with high usability and satisfaction for specific needs.

In C. Carpio (2020), a web-based administration system for E-barangays was developed. The barangay secretary was in charge of receiving and recording residents' registrations,

document requests, and complaints. The barangay chairman, as the approving authority, can approve requests, view and reply to complaints, and issue reports even when he is away on official business. It can also send notice alerts to people who are concerned, which is highly advised when scheduling time-consuming government appointments.

C. A. Batitis et al. (2019), modernization-driven barangay operations stay abreast with new technology to deliver better service. Unfortunately, the majority of barangays are currently unprepared to implement this type of innovative technology. LGUs all around the Philippines use manual document processing and manual delivery of information to their constituents. The SMS Notification System for Barangay Labas, City of Santa Rosa, Laguna is a system that will assist the barangay in processing document requests and providing the most up-to-date information to its citizens. Through the use of Short Message Services Technology, this system may process papers required in a timely and convenient manner, as well as convey information to its citizens (SMS).

III. METHODOLOGY

The purpose of the project was to develop a government text alert system for the (MDRRMO) of the Municipality of San Miguel. The project involves an innovative way of disseminating information with the use of SMS notification.

Environment

The Municipal Disaster Risk Reduction and Management Office is one of the departments at the Municipal Office. The department is designated to provide the legal basis for policies, plans, and programs to deal with disasters under the Municipality of San Miguel. The address of the office is Mulawin St, San Miguel, Bulacan. This will benefit the municipality of San Miguel, where the project will be conducted, which has a total population of 172,073 residents.

Requirements Specifications

The researcher gathered information and conducted authentication by interviewing the client in the Municipal Disaster Risk Reduction and Management Office in San Miguel Bulacan Municipality. The client requested an SMS alert system that could be easily used for announcements and disaster alert transactions. Manage to create modified transaction messages for the user and handle some user requests. Generate a contact list and view it without modification of system transactions.

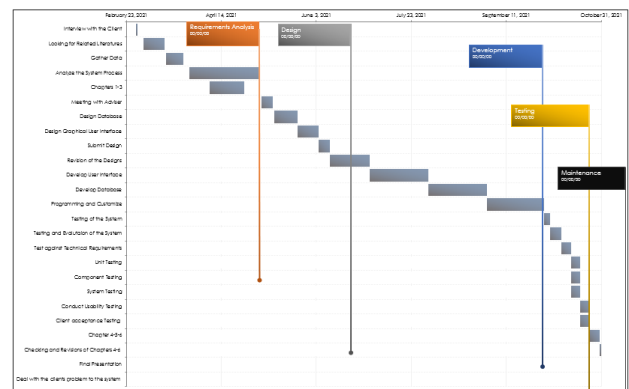
Operational Feasibility

The developer will also develop the system software. For the project to become operational, the client needs to install the project on a desktop computer, depending on the client. The project merely ran on the Windows operating system since Windows is the most used operating system. The municipality will need computer-savvy staff to operate the system. The system will serve as a warning, awareness, and readiness for the residents of San Miguel Bulacan about what is happening and to be aware and ready.

Technical Feasibility

The Municipal Disaster Risk Reduction and Management Office (MDRRMO) has the necessary resources for a computer desktop to run the system that will notify the citizens of San Miguel, but the system will be eligible for only one desktop or one laptop, so the personnel in charge can only access the system. The technical expertise for this project would be provided by the developers through training. The platform for the project has sufficient capacity for future needs since the database for the project is a MySQL database that can handle large amounts of data.

Schedule Feasibility



TASK NAME	START DATE	END DATE	DURATION IN DAYS
Interview with the Client	02/28/21	03/01/21	1
Looking for Related Literatures	03/04/21	03/15/21	11
Gather Data	03/18/21	03/25/21	9
Analyze the System Process	03/28/21	05/04/21	37
Chapters 1-3	04/08/21	04/26/21	18
Meeting with Adviser	05/05/21	05/11/21	6
Design Database	05/12/21	05/24/21	12
Design Graphical User Interface	05/24/21	06/04/21	11
Submit Design	06/04/21	06/10/21	6
Revision of the Designs	06/10/21	07/01/21	21
Develop User Interface	07/01/21	08/01/21	31
Develop Database	08/01/21	09/01/21	31
Programming and Customize	09/01/21	10/01/21	30
Testing of the System	10/01/21	10/04/21	3
Testing and Evaluation of the System	10/04/21	10/10/21	6
Test against Technical Requirements	10/10/21	10/15/21	5
Unit Testing	10/15/21	10/20/21	5
Component Testing	10/15/21	10/20/21	5
System Testing	10/15/21	10/20/21	5
Conduct Usability Testing	10/20/21	10/25/21	5
Client acceptance Testing	10/20/21	10/25/21	5
Chapter 4-5-6	10/25/21	10/30/21	5
Checking and Revisions of Chapters 4-6	10/30/21	11/05/21	6
Final Presentation	02/12/21	02/12/21	0
Deal with the clients problem to the system			0

Fig. 1. Gantt Chart

Fig 1 shows the proposed work plan and time frame for the project. In development and testing, developers must meet the adviser and consolidate with the client for further added information. With the testing and evaluation conducted with the client, the developers must evaluate with the target population and get their responses at a satisfactory rate to further enhance the project. Then, after getting the necessary information, the developers must conduct the revisions of the chapter and be ready for the final presentation.

Economic Feasibility

Upon completion of the project, this will be donated to the MDRRMO Office of the Municipality of San Miguel. Different alternatives are identified by the developers, and the

hardware cost will be shouldered by their client.

Upon the implementation of the system, this would be recommended to create a study on how the system will cope with the environment of the MDRRMO Office. Moreover, as time goes by, the system will be expected to make the process easier and faster. This will help the MDRRMO provide announcements from their office regarding the emergency alerts and other messages information that deal with the concerns raised by the system users, and respond to their requests.

Creating new admin personnel will only be granted by the head of the MDRRMO. In terms of the hardware, the system will be installed with the Windows 10 operating system. This Operating System is the standard OS for this project just to allow the configuration more easily and make the processed work on the most basic platform.

Design of Software, Systems, and/or Processes

The system design illustrates how the system operates and performs. It contains project-related information. This also assist readers in understanding the project content. In the project research design, the IPO Model Conceptual Framework, Crow Foot Notation, Context Diagram, Data Flow Diagram, and System Architecture were used. This includes information on how the system operates.

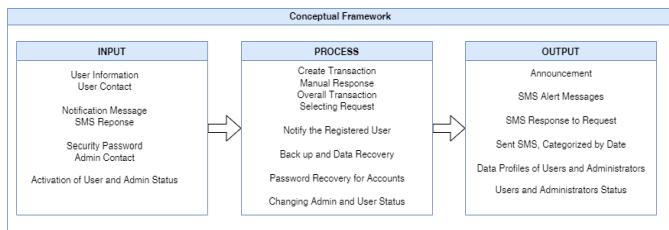


Fig. 2. Conceptual Framework of Government Text Alert System

Fig. 2 illustrates the requirements, which include the data that will be entered, the process where the process involved will operate, the output where the result will be established, the performance of where the system will operate, and management for the user who will obtain access to the system. The message is entered by the administrator for notice and responses. The administrator is the only person who can perform transactions that can be needed for the announcement and alert messages. These are all included in the Input, Process, and Output (IPO) conceptual models that are gathered and requested by the administrator.

Fig. 3 shows the Crows Foot Notation of Government Text Alert System. It is the relationship between an administrator, user, sender, response input, user request, off record, and SMS notification. The Administrator, who has the ADMIN_ID, operates the entire process of the system and is able to perform SMS NOTIFICATION with modified transactions; it has attributes like MESSAGE_ID, RECORD, and SEND MESSAGE. The message will be received by the USER. In a regular transaction, SENDERS have attributes like SENDER_ID and CONTACT. The message will be on the USER REQUEST that contains REQUEST_ID. These will be saved in OFF RECORD. This has the SMS_CONCERN that it

is perceived. The administrator will be able to provide the feedback through RESPONSE INPUT, which includes AD_CONTACT, DATE, and CONTENT. The ADMINISTRATOR has the ability to change the USER STATUS from INACTIVE to ACTIVE and also manage the information provided by the USER, such as the FNAME, LNAME, MNAME, BDAY, BARANGAY, ADDRESS, EMAIL and CNUMBER.

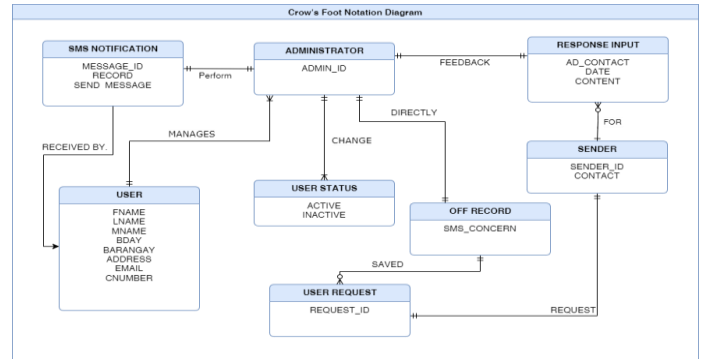


Fig. 3. Crows Foot Notation of Government Text Alert System

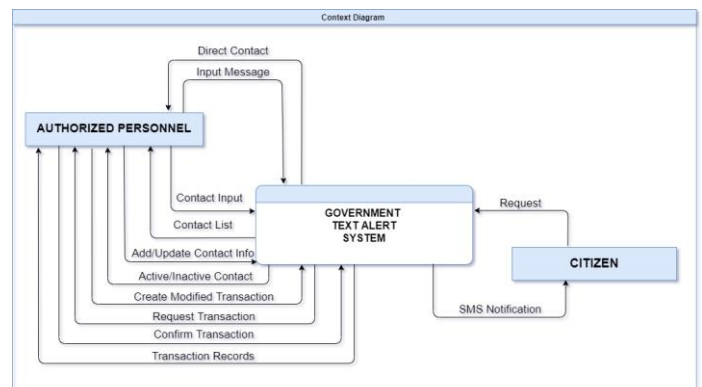


Fig. 4. Context Diagram of Government Text Alert System

Fig. 4 shows the Context Diagram design of the Government Text Alert System. There are two users, namely the system AUTHORIZED PERSONNEL, whose task is to input user data profiles and activate their user status, citizen data, and mobile numbers, and store them in the system database. Furthermore, while CITIZEN receive notifications in the form of SMS sent from the system, authorized personnel receive requests and respond to their concerns through the system. The Manual Transaction, Selecting Request, and Overall Transaction can be processed by the system, and all transactions are for the user registered in the system. Information consists of announcements, SMS emergency alerts, and other local news.

Fig. 5 shows the Data Flow Diagram of the Government Text Alert System. The AUTHORIZED PERSONNEL will be able to access all the data in the system, create modified transactions for specific actions for the user, and respond to specific concerns and requests. The Administrator is the only person who has access and has the authority to alter the user status from inactive to active. It would show all of the requests and users' info and sent messages in history, along with access

to all transaction effort.

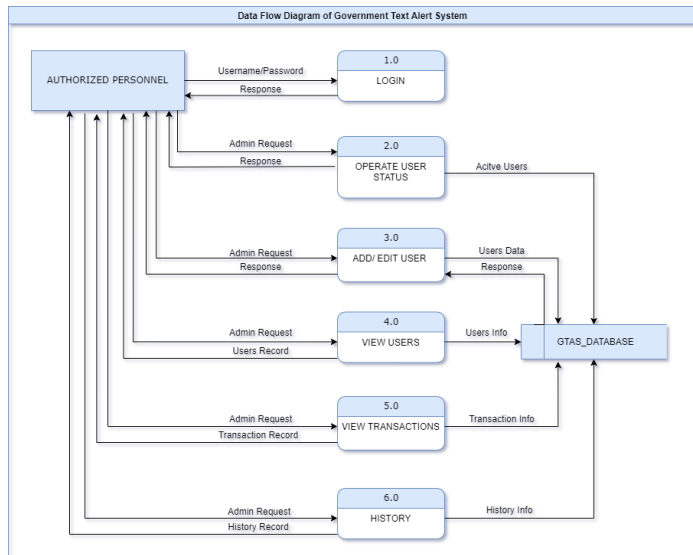


Fig. 5. Data Flow Diagram of Government Text Alert System

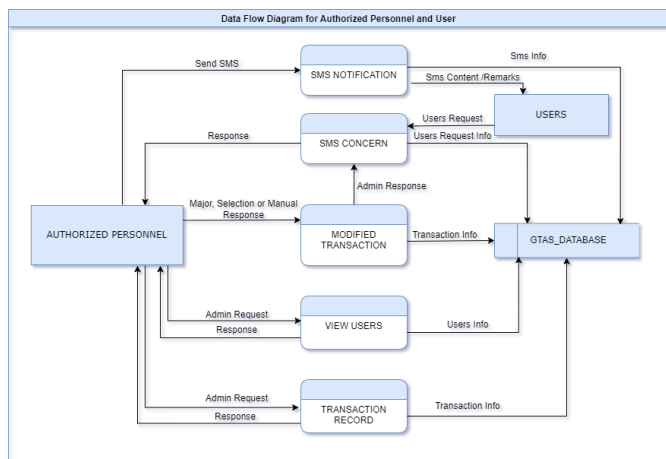


Fig. 6. Data Flow Diagram for Authorized Personnel and User

Fig. 6 shows the detailed Data Flow Diagram for Authorized personnel and user. When the AUTHORIZED PERSONNEL need to send an SMS notification to the user, it is accessible to make a transaction. The SMS request from the user and other related concerns are prompts to perform MODIFIED TRANSACTIONS such as the Manual Transaction, Selecting Request, and Major Transactions. The Manual and Major Transactions are used to send messages to all or selected users. All the user information and accomplished transactions are displayed on the system. The USER status can be processed by activating and deactivating their accounts, and the data profile is displayed in the system. Then all the sent messages are categorized by date.

Fig. 7 shows the system architecture the framework includes information from the database and the expert system. The system includes template services, transaction validation, and other services. All the acts of system services are illustrated in Fig. 7. The wireless carrier then forwards the SMS to the bulk SMS service provider. The SMS Response

Service then forwards these messages to the mobile devices.

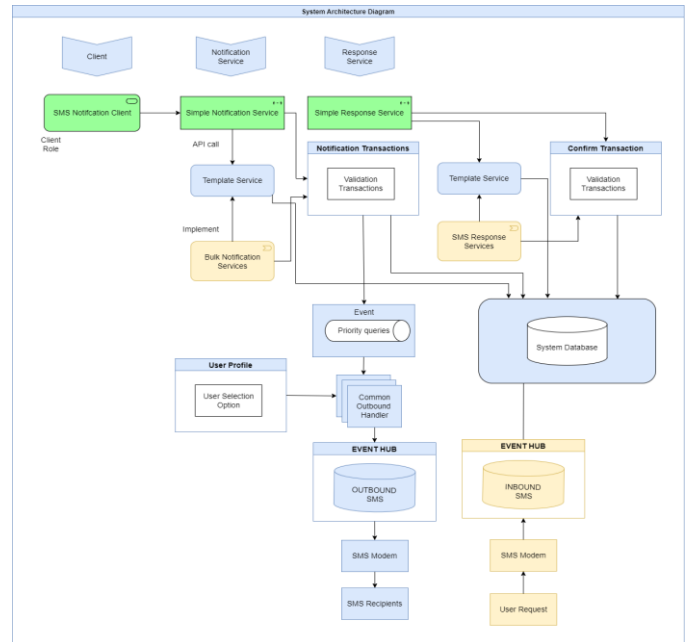


Fig. 7. System Architecture Diagram of Government Text Alert System

The Notification Service must first settle the selected notification transaction (all users or specific users) for transaction validation before it can proceed. Each event is prioritized in each query. Then the common outbound handler under the Event Hub is responsible for outbound SMS through the SMS modem. The message will be received by the recipients, and all the transactions will be saved in the system database.

The Response service is based on the Template Service. Once properly selected, you can proceed with the confirm transaction and be required for the validation transaction. System Database: All the confirmed transactions are saved in the system database. The user request will be received via SMS modem. The receive message is in the inbound SMS. It is in the event hub that it will manifest in the system. This SMS also goes directly to the database.

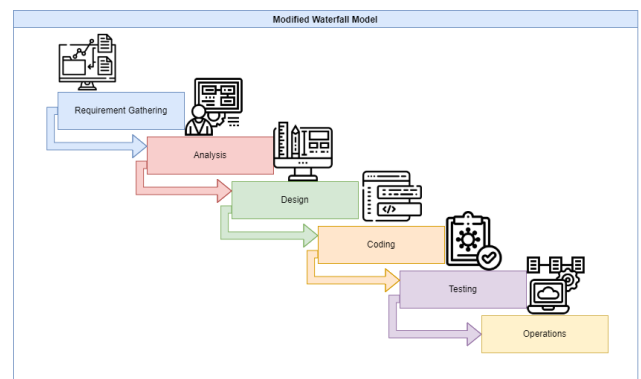


Fig. 8. SDLC – Modified Waterfall Model

Fig. 8 shows Modified Waterfall Model The developers choose this development method because it ensures that the defects in a software system are removed in the development

stage, thereby reducing the overhead cost of making changes to a software project before the implementation stage. Therefore, this model is very suitable for the software development of the proposed system; it is simple, easy to understand and use.

A review of literature reveals that the waterfall model usually has distinct goals. For each phase of development, once a phase is completely developed, the development proceeds into the next phase and there is no opportunity to go back and revisit an earlier stage. The waterfall model has recently undergone various revisions in an effort to address the issues that the old waterfall model had. The upgrades led to the "Modified Waterfalls" quick development models, according to McConnell.

The modified waterfall model still includes the phases of requirement analysis, design, implementation (or coding), testing, and maintenance, but it permits project phases to overlap. Verification and validation have been introduced to each phase in the redesigned model, and each phase now influences and depends on the phase before it. The system process is flexible because of the overlap of phases.

Development

Software Specification

Different software will be used in implementing the system, such as Xampp, Visual Studio Code, Visual Basic.NET, MySQL, and Windows 10. The software needed to develop the system is Visual Basic.NET, which is used for coding and creating the interface of the system. Xampp serves as a development environment. Visual Studio Code serves as the source-code editor. MySQL is used for storing information in a system that serves as a database. And windows 10 is the operating system that will be used for implementation.

Hardware Specification

The basis of the computer hardware specification is based on the required development tools to be used. The developer recommended having at least computer or laptop with 4 GB of RAM and a processor to run the system smoothly and quickly. Below are some minimum and recommended laptop specifications according to Sema Software Company (Sema, 2021). The developer used it as the basis for the hardware specification of the project.

Program Specification

The system involves SMS alerts through registered phone numbers in the system. There is an interaction between the user and the administrator in the system and the admin has full access to the system. The system has a log-in form for security purposes and also to recover old passwords in the system. After logging in, the admin manages user information on the system. Only the admin has the access to create transaction information such as news, updates, and emergency alerts that are specific to the area of San Miguel, Bulacan. The user displayed the data profile and approved user status to activate the user through modification of the profile. The transaction can be seen in the admin panel to monitor the recipient's transaction and access request for the proper response to their concerns. The system has different modes of response for the user. After the transactions are completed, the sent messages

are arranged and categorized by date. Able to back up the system and restore it.

TABLE 1. Minimum and Recommended Hardware Specification

COMPONENTS	WINDOWS PC
Processor	MINIMUM Intel Pentium or AMD RECOMMENDED Intel Core i5, i7 or AMD FX with at least 3.0 GHz
Memory	MINIMUM 4 GB RAM RECOMMENDED 8 GB RAM or higher
System hard disk	MINIMUM 200 GB SATA RECOMMENDED 256 GB SSD or higher
Data hard disk	RECOMMENDED 256 GB SSD or 1 TB SATA
Interfaces	MINIMUM USB 2.0 RECOMMENDED USB 2.0 or USB 3.0
Operating system	MINIMUM Windows 8.1 64Bit RECOMMENDED Windows 10 64Bit
Graphics card	MINIMUM 3D graphics card compatible with Open-GL (no ATI) with 1 GB RAM RECOMMENDED Nvidia GeForce from RTX 2xxx series from 4 GB RAM or equivalent Nvidia Quadro card
Resolution	MINIMUM 1024 x 768 resolution RECOMMENDED Full-HD 1920 x 1080 or higher resolution

Programming Environment

Front End

The developer used The Visual Studio IDE includes the.NET Framework for developing the front end of the system and will be used for the design and coding of the system. Visual Studio code is a complete set of development tools for building websites. It is an integrated development environment (IDE) from Microsoft. These languages will be used in the functionality of the.NET framework, which provides access to key technologies that simplify the development of ASP Web applications and XML Web Services.

Back End

MySQL will serve as the back-end in developing this project. MySQL must be connected to Visual Basic.NET in order to execute the different SQL syntax and commands when connecting to the database. This served as the data storage for all information needed to be stored or recorded in the database.

Testing and Evaluation

Testing Procedure

In testing, the registration of the user and the access of the administrators were done with the aid of the developer or even the administrator. After the administrator registers their name, the administrators will input the user's data. Evaluation will be done by the developer to test the project's performance,

usability, user-friendliness, consistency, and security by giving out questionnaires to the respondents. Every comment and suggestion will be considered with regards to the revision of the system.

After collecting the needed data, it will be computed, analyzed, and interpreted. Through this, the developer was able to know the degree of acceptability of the system that was developed.

Unit Testing

This step will ensure that every part of the system is working properly. Every button and function of the system must attain acceptable performance in order to accomplish the client's needs and requests.

1. Install the system on a PC that has the same specs as the client will use.
2. Connect the system to an internet connection.
3. Connect the broadband stick to access the network.
4. Log in as an administrator of the system for username and password validation,
5. Check all the buttons of the system to see if they are working properly based on its functions.
6. Manifest the contact list and the user's info.
7. Run the sample data.

Evaluation

The researcher shared the link to the online evaluation forms with the user, client, panelist, adviser, and IT expert so that they could determine whether the project would be of great assistance or benefit to the local government. This includes questions regarding system performance, usability, user friendly, consistency, and security.

In preparing the questionnaire, the researcher conducted an interview with the user and gathered some other information to determine the current situation.

The researcher will use an online evaluation form as a data collection tool for the system. The evaluation form will ask different questions about the functions of the project.

Evaluation Procedure

1. The developers distributed the evaluation form to the respondents.
2. The developers conducted a brief discussion about the website and the system software.
3. Respondents observed and tested the website and system software to properly complete the evaluation form.

Respondents of the Study

The researcher provides an online evaluation form and will discuss the functionality of the system. The evaluation form has a different type of respondents, it also has different types of questions regarding the system interface, content and ease of use. The developer analyzed the comments and suggestions to make the system efficiently.

TABLE 2. Total Number of Respondents

Sets of Respondents	No. of Respondents
User	26
Client	2
Panelist	3
Adviser	1
IT Expert	1
Total	33

Implementation

The project was implemented in the Municipal Disaster Risk Reduction and Management Office (MDRRMO). All the documents related to the project were signed before being implemented in the designated area, and they provide a backup for the data on CD/DVD.

The application of the system will be installed by the developer on the computer or laptop of the client. The developers explained all the processes to the staff that were used the system. They also provide a user manual so that the system administrator and the user can use the system correctly.

This system would help the MDRRMO with managing resident information and data. It is more secure than the usual process they use and saved them more time because this system is easy to use. The developers used the system to provide more secure data and an easier process of gathering and storing data for the residents of San Miguel, Bulacan.

IV. RESULTS AND DISCUSSION

The following are the project's system interfaces and the system evaluation findings.

The System Information Interface

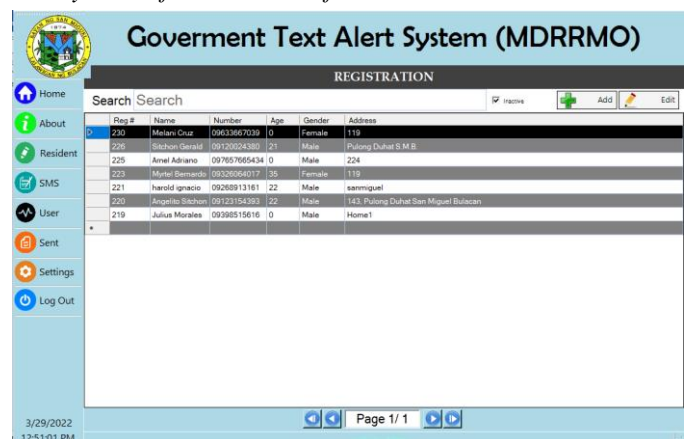


Fig. 9. Resident Registration Form

Fig. 9 shows the Resident Registration Form where the active and inactive users will be displayed on the system. In this form the data profile can be managed and customized their status. Once a user registered on the website or entered their information directly into the system, their information was displayed in a tabulated form that included their registration number, name, contact number, age, gender, and address.

Fig. 10 shows an SMS form that sends out SMS notifications for disaster alerts and announcements. The system can also generate various transactions for the user. The administrator can also respond to the user's request. The proper connection function for the connection of a broadband stick and can read the incoming messages from the user. The message process had three processes, the manual procedure for the manual of contact number that was directly sent to the specific user, the major procedure "All" that directly contacted all registered users in the system, and the selection where the incoming message was selected for the response for the

specific user. Incoming messages are in tabulated form (index, message status, contact number, date and time, and message).

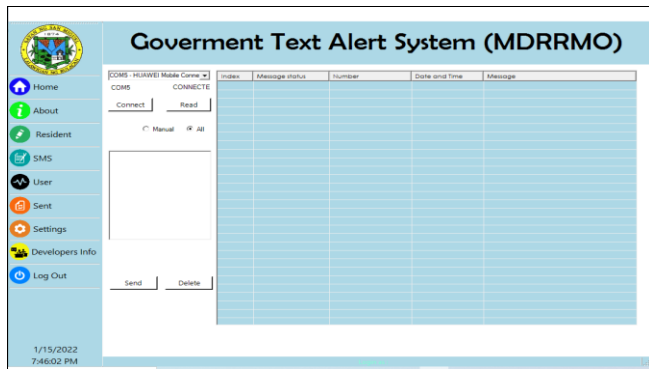


Fig. 10. SMS Form – SMS Notification

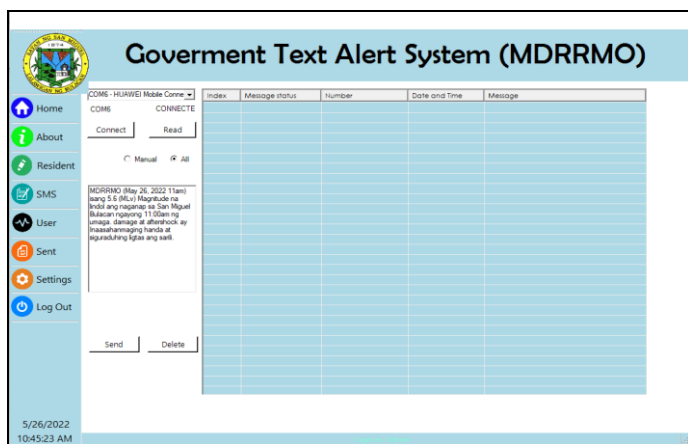


Fig. 11. SMS Form – News Update

Fig. 11 shows the content of the SMS Form for news updates. The admin is responsible for inputting the news content in the message box. It contains important messages for the citizens of San Miguel, Bulacan.

Fig. 12 shows the SMS Form for an announcement. It contains the actual situation handled by the MDRRMO Officers for the specific situation and disaster. Once the announcement is cleared, the admin immediately sent it to all registered users in the system.

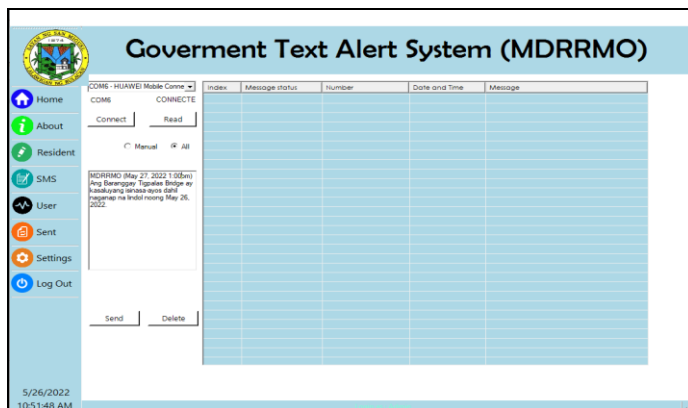


Fig. 12. SMS Form – Announcement

Fig. 13 shows the SMS Form for the updates. In this SMS text box includes the content on the actions taken by the MDRRMOs and the peace of mind of the people regarding the situation in the town of San Miguel Bulacan.

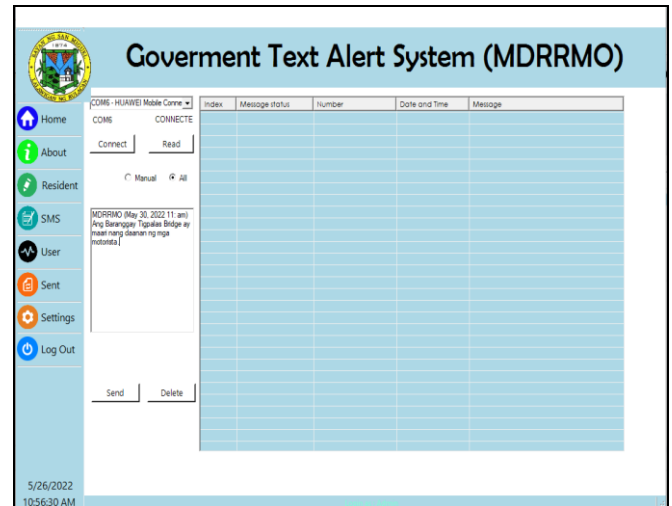


Fig. 13. SMS Form – Updates

Summary of Evaluation Results

TABLE 3. Respondent’s Evaluation Summary

Respondent	Total (Result)	Average	Remarks
2 Client	96	100%	System Acceptable
3 Panelist	144	95.83%	System Acceptable
1 Adviser	48	100%	System Acceptable
26 User	1248	100%	System Acceptable
1 IT Expert	48	100%	System Acceptable

The result from the respondent evaluation was that two (2) clients answered ninety-six (96) "Yes" in the evaluation form and got an average of one hundred percent (100%) and remarked "System Acceptable." The three (3) panelists answered one hundred forty-four (144) "Yes" total results in the evaluation form and got an average of ninety-five-point eighty-three hundredths' percent (95.83%) with a remark of "System Acceptable". One (1) adviser answered forty-eight (48) total "Yes" in the evaluation form and got an average of one hundred (100%) with a remark of "System Acceptable". The twenty-six (26) users answered one thousand two hundred forty-eight (1,248) total "Yes" in the evaluation form and got an average of one hundred percent (100%) with the remark "System Acceptable". One (1) IT expert answered forty-eight (48) "Yes" in the evaluation form and got an average of one hundred percent (100%) with a remark "System Acceptable." The respondents answered "Yes" with a total of one thousand five hundred eighty-four (1,584) in the evaluation. All the system requirements passed with the remark "System Acceptable."







The research evaluation results provided a comprehensive assessment of the performance of the Government Text Alert System through a series of statements and corresponding responses. Each statement pertains to a specific functionality or aspect of the system. The responses are categorized as either "Yes" or "No," indicating whether the system successfully fulfilled the stated functionality. The "Percentage

Rate" column indicates the percentage of "Yes" responses out of the total number of responses for each statement.

TABLE 4. Evaluation Computation

Client Evaluation	
FORMULA	Percentage (%) = (YES/Result) *100
COMPUTATION	Percentage % =96/96 * 100
PERCENTAGE RATING	100% - SYSTEM ACCEPTABLE
Panelist Evaluation	
FORMULA	Percentage (%) = (YES/Result) *100
COMPUTATION	Percentage % =138/144 * 100
PERCENTAGE RATING	95.83% - SYSTEM ACCEPTABLE
Adviser Evaluation	
FORMULA	Percentage (%) = (YES/Result) *100
COMPUTATION	Percentage % =48/48 * 100
PERCENTAGE RATING	100% - SYSTEM ACCEPTABLE
User Evaluation	
FORMULA	Percentage (%) = (YES/Result) *100
COMPUTATION	Percentage % =1248/1248 * 100
PERCENTAGE RATING	100% - SYSTEM ACCEPTABLE
IT Expert Evaluation	
FORMULA	Percentage (%) = (YES/Result) *100
COMPUTATION	Percentage % =1248/1248 * 100
PERCENTAGE RATING	100% - SYSTEM ACCEPTABLE

TABLE 5. Evaluation Results Performance

PERFORMANCE	(Yes)	(No)	Percentage Rate
1. The system opens quickly when the icon is clicked.	33	0	100%
2. The system prompts the main page after it has been opened.	33	0	100%
3. When the  About is clicked, the About Form will prompt.	33	0	100%
4. When the  Resident is clicked, the New Resident Form will prompt.	33	0	100%
5. When the  User is clicked, the User Form will prompt.	33	0	100%
6. When the  Sent is clicked, the Sent SMS Form will prompt.	33	0	100%
7. When the  Other is clicked, the others form will prompt.	33	0	100%
8. When the  Log Out is clicked, the system exits successfully.	33	0	100%
9. The system displays time.	33	0	100%
10. The system displays the date.	33	0	100%
11. The system displays sent messages.	33	0	100%
12. The system is well connected to the SMS modem.	33	0	100%
13. Displaying Residents' Records	33	0	100%
14. Adding and updating of information entered in the system.	33	0	100%
15. The search query provides search results.	33	0	100%

The results show that for all 15 aspects evaluated, the system performed exceptionally well, receiving a "Yes" response for each statement from all 33 participants. This indicates that the system's functionalities, such as quick opening, correct prompts of various forms, accurate display of time and date, successful SMS integration, effective display of sent messages, resident records management, updating of information, and successful search functionality, were all

successfully implemented and met the participants' expectations. The consistent 100% "Yes" response rate suggests a high level of satisfaction and suggests that the evaluated aspects of the system were functioning as intended.

TABLE 6. Evaluation Results User-Friendliness

USER-FRIENDLINESS	(Yes)	(No)	Percentage Rate
1. All text fields are labeled and organized properly.	33	0	100%
2. The system gives appropriate instructions.	33	0	100%
3. The user can easily operate and navigate the system.	33	0	100%
4. The user can easily understand the functions of buttons and menus on the system.	33	0	100%
5. The system's flow is simple and easy to understand.	32	1	97%
6. The system is easy to operate and navigate.	31	2	93%

The research evaluation results presented an analysis of user-friendliness for the Government Text Alert System. The evaluation involved a set of statements pertaining to the system's ease of use, and participants' responses were categorized as either "Yes" or "No," signifying whether they agreed or disagreed with the given statement. The "Percentage Rate" column reflects the proportion of "Yes" responses out of the total responses for each statement.

Across the six statements evaluated, it is evident that the system generally performed well in terms of user-friendliness, with high "Yes" response rates for most aspects. The results indicate that users found the text fields labeled and organized properly, appreciated the provision of appropriate instructions, and perceived the system's operability and navigation to be easy. Furthermore, participants found the functions of buttons and menus comprehensible and the system's flow straightforward, with a majority of responses reflecting these positive perceptions.

For statements 5 and 6, while still showing a high "Yes" response rate of 97% and 93% respectively, there were slightly more mixed responses. Some users felt that the system's flow could be made even simpler and easier to understand, resulting in a small percentage (3% and 7% respectively) of "No" responses.

The evaluation results suggest that the Government Text Alert System was largely user-friendly, with a significant majority of users agreeing that it offered effective labeling, clear instructions, and easy navigation. The minor variations in response rates indicate that while the system's user-friendliness was well-received overall, there might be some room for further improvements to enhance the simplicity and ease of use, particularly in terms of system flow and navigation.

The research evaluation results presented an analysis of consistency in the Government Text Alert System, focusing on elements such as font size and style, alignment, icons, tabs, links, color scheme, and arrangement of forms. The participants' responses were categorized as either "Yes" or "No," indicating whether they observed consistency in these

aspects. The "Percentage Rate" column demonstrates the percentage of "Yes" responses out of the total responses for each statement.

TABLE 7. Evaluation Results Consistency

CONSISTENSY	(Yes)	(No)	Percentage Rate
1. The system provides the appropriate font size and font style on all labels.	32	1	97%
2. Text fields are aligned with the forms.	32	1	97%
3. The system provides appropriate icons on every button.	33	0	100%
4. Tab are uniformly placed.	33	0	100%
5. The links between buttons and menus are correct.	32	1	97%
6. The system's color was appropriate for its concept.	32	1	97%
7. The forms are well arranged.	33	0	100%

Across the seven statements evaluated, the results underscore a high level of consistency in the majority of assessed aspects. The participants found that the system's labels generally had appropriate font size and style, text fields were aligned well with the forms, appropriate icons were used for buttons, tabs were uniformly placed, links between buttons and menus were correct, the system's color scheme matched its concept, and the forms were well arranged. The "Yes" response rates for most of these statements were notably high, ranging from 97% to 100%.

Statement 1 and statement 2 garnered responses indicating minor discrepancies, resulting in one "No" response for each. These responses, representing 3% of the participants, suggest that some users noticed a lack of perfect consistency in terms of font size, style, and alignment of text fields.

The evaluation results reveal that the Government Text Alert System generally demonstrated a high level of consistency in its design elements, with the majority of users perceiving uniformity in font size, style, alignment, icons, tabs, links, color scheme, and form arrangement. While a small portion of users noted minor inconsistencies, the overall findings highlight the system's successful implementation of consistent design principles, contributing to a coherent and user-friendly interface.

The research evaluation results focused on the security aspects of the Government Text Alert System, examining various components related to access control, data modification, password recovery, and data backup. Participants' responses were classified as either "Yes" or "No," indicating their agreement or disagreement with the security-related statements. The "Percentage Rate" column illustrates the percentage of "Yes" responses out of the total responses for each statement.

Across the five statements evaluated, the results indicate a high level of security measures integrated into the system. All participants agreed that the system provided different access level accounts for different users, ensuring controlled and restricted access to different functionalities based on user roles. Additionally, participants confirmed that only administrators were able to modify system information, reinforcing data integrity and preventing unauthorized

changes.

TABLE 8. Evaluation Results Security

SECURITY	(Yes)	(No)	Percentage Rate
1. Providing different access level accounts for different users	33	0	100%
2. An administrator can only change and modify the information in the system.	33	0	100%
3. The system is able to provide the forgotten password of the admin via SMS message.	33	0	100%
4. Providing backup of the data in the database.	33	0	100%
5. The system can restore data via a backed-up database.	33	0	100%

The system's capability to provide a forgotten password via SMS message received a unanimous "Yes" response, indicating that users were assured of a secure method for recovering access to their accounts. Furthermore, participants confirmed that the system offered data backup in the database, providing an essential layer of protection against data loss.

Statement 5 also received a "Yes" response from all participants, highlighting that the system was capable of restoring data through a backed-up database. This ensures that in case of data corruption or loss, the system could retrieve the information from a secure backup source, maintaining data reliability.

The evaluation results showcase that the Government Text Alert System incorporated robust security measures to safeguard user accounts, data integrity, and system functionality. The consistent 100% "Yes" response rate across all five statements demonstrates that the security features of the system were effectively implemented and well-received by the participants, affirming its commitment to maintaining the confidentiality, integrity, and availability of user data and system operations.

The Government Text Alert System was developed for the Municipal Disaster Risk Reduction and Management Office under the custody of Mr. Emmanuel D. Zabat. It takes advantage of SMS capabilities in order to achieve its proposed goal effectively. This system would be cost-effective while also providing dependable and innovative services to the San Miguel community by automating the alert message of the notification to the resident via SMS. Moreover, the systematic interaction of the public, and those authorities will oblige them to exert effort and establish trust and transparency among constituents. The system is only used in conjunction with other forms of communication to guarantee that messages reach the largest number of people available. The project assisted in identifying the concerned resident who messaged on the system in order to reply with a mode of communication to the prior case and take action on it. This will also deliver a message warning, an emergency alert, and a local announcement directly to the residents who have registered on the system.

The Proponent Develops a system that provides information such as news, announcements, and updates from MDRRMO. That helps the community to access the

information they need for the emergency. The Develop system Implements user-friendly interaction for an administrator that will respond to information requests from the user. Through the system it assists the MDRMO office in lowering their workload by contacting users in different modes of transactions in order for the citizens of San Miguel to get essential notifications. The evaluation process results show that the users, clients, and IT experts answered "YES" and gained an average percentage of one hundred percent (100%), indicating that the Government Text Alert System is overall acceptable, while panelists gained an average percentage of ninety-five-point eight percent (95.8%), indicating that the system is system acceptable.

Recommendation

The Government Text Alert Systems only work at areas with good coverage of at least 2G. Far flung and remote areas might not receive alerts due to signal limitation. The best alternative is to expand communication thru radiophones from the user to the alert system administrator. Moreover, the system might have a minimal delay to transmission. Due to the number of users and areas scope of the alert system, the transmission to certain number might be affected. Also, the data should be verified and validated and must be used with an active phone number.

The Government Text Alert System is at risk of being used as a bout of spreading malicious information or any intentional propagandas. The best way to avoid it is to make sure that the administrator must be held responsible when blasting text. The system with customer service feature might not be always available and crash for a while. If this case might happen, the system administrator must do ahead of time announcement to troubleshoot possible problems. The system requires the internet to perform the function and uses a system and a website to acquire the prior transaction in the system. The Administrator is only responsible for disseminating necessary information such as weather information, imminent threats, and local incident information to the rest of the citizens. And also, this system has no registration name as an authorized number.

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