DEVELOPMENT AND IMPLEMENTATION OF FIRE INCIDENT VERIFICATION FOR THE BUREAU OF FIRE PROTECTION – MANILA

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ABSTRACT

Firefighter in Sampaloc, Manila, dedicate their lives to the fire service, working 24-hour shifts, responding to fires and explosions and other emergencies. According to an interview with Hector Agadulin, the station commander of Sampaloc fire station, normally they will wait to receive a phone call about a location of an incident and will have to proceed to the incident scene to find out the intensity of the fire incident through a verification alarm.

The researcher chose to implement a system that will make it possible for citizens of Sampaloc Manila to capture an image and video to report a fire incident for the initial fire response.

KEYWORDS: *BFP*

1 INTRODUCTION

The enactment of Republic Act 6975, otherwise known as the Department of Interior and Local Government Act of 1990 which took effect on January 1, 1991 paved the way for the establishment of the Philippine Bureau of Fire Protection (BFP).

BFP manila mission statement is "we commit to prevent and suppress destructive fires, fire code and other related laws, and respond to man-made and natural disasters and other emergencies. Its vision statement is "A modern fire service fully capable of ensuring a fire safe nation by 2034.

Sampaloc fire station is located at A.H Lacson Co. Fajardo, Sampaloc, Manila, 1008 Metro Manila. It is headed by sub-station commander Senior Inspector Hector M. Agadulin. Currently, there are seventeen firefighters in Sampaloc Manila, and one fire truck given by the Bureau of fire protection.

Consolidated fire incident in Manila report by F01 Bautista (2015) said in 2017, there were about 14,197 fire incidents in the whole of Manila, with damages of up to P7,861,505,751. In 2018 they were about 722 incidents in the whole of Manila, with damages costing about P125,593,600.

2 EXISTING FIRE RESPONSE SYSTEM

According to the Bureau of Fire Protection Operational Procedures Manual, Firefighting Operations (Chapter 2) and Emergency Medical Services (Chapter 3) Response to Fire Alarm of the Memorandum Circular No. 2008-011 - Amended Policies, Guidelines and Protocols on BFP EMS Operations. Sec. III SOP No. 0-001 - Establishment of a Coordinating Response & Procedural Aspects in Fire Operations by All Responding Units of the BFP National Office for the Monitoring & Dispatching Function of the Fire Control Operations Center (FCOC) *(BFP Operational Procedures Manual, 2015)* the following are the General Procedures:

For this process, the researcher presents few firefighting operations as a reference for the study but is not limited to since the guidelines provided by the Bureau of Fire Protection covers different incidents and occurrences.

Based on Chapter 2. Paragraph 6. Fire in LPG Installation

Purpose: Effectively and safely respond to fire incidents involving LPG installation and protect the firefighters from harm.

Basic Concepts, Principles and Guideposts: Always stay away from tanks engulfed in fire. BLEVE may occur at any point.

Table 1. Alternatives Considered

#	Alternatives Considered
1	Status Quo
2	Barangay Initial Response
3	Citizens Alarm Setting Awareness
4	Development & Implementation of Fire Incident Verification for the Bureau of Fire Protection - Sampaloc, Manila

Status Quo primarily covers the usual/manual process of reporting incidents through phone call and physical appearance. This was taken into considerations since the said government agency has been using this methodology for ages despite the advancement of technology. BFP may have found this process effective due to different reasons such as requirement of logistics, additional trainings and the like which will be needed if a new process is implemented and may not help in the urgency of their responsibilities and obligations as public servants.

Barangay Initial Response

Consider using Barangay personnel to declare fire alarm. It is possible to delegate the declaration of fire alarm to the barangay level to which the fire incident is ongoing. However, manpower training is required and takes time. Literacy is a challenge to the training and report accuracy without bias is unavoidable.

Citizens Alarm Setting Awareness

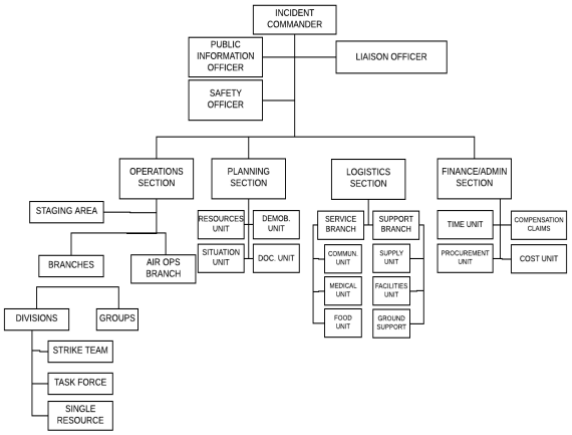

Figure 1. Incident Command System

Consider using Citizens Alarm Setting Awareness. It is possible to integrate alarm awareness to the public that is taught in the high school level. However, the credibility and rampant false alarm may be possible leading to inaccuracy of the response system and waste of resources. Moreover, the possibility of a real file alarm not being responded because of faulty dispatch.

Development & Implementation of Fire Incident Verification for the Bureau of Fire Protection - Sampaloc, Manila

The development of an official Fire Incident Verification system for BFP landed as the last alternative considered by the proponent. It is for considering different aspects such as: user's trust, generation of automatic reports, GPS guided tracker for Incident Commander and the Firemen, identification of nearby hydrants, and efficient dispatch of resources in the fastest time possible to reduce collateral damage.

4 CONCEPTUAL ANALYSIS

Costs involved in the implementation of mitigation options for Status Quo was presented with a value of zero (0). This denotes that given the said alternative, nothing will be spent in excess to the

usual monetary movement of the client government agency. The expected customer satisfaction, measured through the responses of the client using BFP's procedure will also be zero (0), where no change in response is expected since the system remains status quo. Gains will reflect a value of zero (0). The proponent interpreted this factor outside the premise of the agency's expenditures and profit. Nothing will be added on the agency's projected profit since the system remains the same.

For the second alternatives considered, the proponent assigned an estimated value of negative two (-2) for cost of implementation. Given the data, it is assumed that the expected customer satisfaction value will still be zero (0). Expected gains for the client will be positive one (+1) due to any possible ease of deployment in coordination with the accommodation of a barangay. Thus, a total of negative one (-1) came out as a result.

Citizens Alart Setting Awareness was considered for the evaluation of alternatives for this study. Cost of implementation was assigned with a value of negative three (-3) since lesser cost or below zero will be generated for this alternative. The expected customer satisfaction is positive one (+1) due to the inclusion of citizens in this endeavor and improving community involvement/understanding of the BFP process. For the expected gains, this alternative was assigned with positive one (+1) having the context of improvement as referred to the initial alternative, Status Quo. The total points for this alternative came out as negative one (-1). This is the same as the second alternative, Barangay initial response.

The last alternative considered by the proponent is the development and implementation of fire incident verification for the Bureau of Fire Protection - Sampaloc, Manila. The cost of implementation for this alternative was given a value of negative five (-5) for its great inclination as compared to the other alternatives. A score of positive two (+2) was assigned for the Expected Customer Satisfaction. This was assigned due to automation and additional features that this alternatives covers. Expected gains had a score of positive four (+4) considering the benefits of the proposed alternative including, database, GPS, hydrants allocation, correct dispatch, and reports generation. Thus, a total of positive one (+1) came out as a result for this alternative. This was then presented as the only alternative with a positive result based on the other considerations.

5 METHODOLOGY

Scope and Limitations

The proposed system covers the creation of data for hydrants within the premise of BFP Sampaloc, Manila. Then, records for fire hydrants locations, image reports, video reports, and monthly reports. Also, the metro manila fire station map, a user management feature which allows removal and edit of any additional user, and the create system user feature that enables inputs and activation of new users for the system.

The Project Scope

The proposed system is composed of the following modules and technical background:

Operations Officer for Incident Calls

- Checking of Image uploads from citizens from the system dashboard
- Verification of Information sent
- Dispatch of appropriate number of firemen and firetrucks

Operations Officer for Records *(Admin)*

- Processes the After Activity Report
- Submits records to the National Head Quarters

Fire Safety Enforcement Division (*Records)*

- Manages records from different Fire Stations
- Collects records from different Fire Stations

Firemen (*Incident Response)*

- Extinguish Fires
- Reports possible cause of fire incident
- Reports resolutions to fire incidents
- Stabilizes fire incident situations

Software Acceptance Evaluation

The proponent used a checklist-based evaluation to analyze user acceptance for the proposed Fire Incident Verification System for the Bureau of Fire Protection - Sampaloc, Manila. The survey questionnaire were floated to eighteen (18) participants where three (3) came from the administration of the station such as the Officer-in-Charge and Sub Station Commander. The other participants were Fire Officers 1/drivers, Pump Operator and DPO.

Random Sampling was performed to choose the respondents from the population of firefighters in the identified station for the evaluation of the proposed Fire Incident Verification System for the Bureau of Fire - Sampaloc, Manila

6 RESEARCH METHODOLOGY

Descriptive Research. This study is classified as Descriptive research used to "describe" a situation, subject, behavior or phenomenon. To characterize it briefly, it may be said that the descriptive research is fact-finding with adequate interpretation. Its attempt is to gather quantifiable information that can be used to statistically analyze a target audience or a particular subject.

7 GENERAL RECOMMENDATIONS

As assessed in the Analysis of Alternatives, implementing a web-based system for reporting of fire incident, providing critical information and automation of reports for fire fighter's is an efficient alternative compared to the existing system currently being used. It is highly recommended that the project proposal be implemented.

The proposed system contains the following modules and their respective features. As means of basic network security, selective modules of the system will be functional under the intranet or internet infrastructure. The technical background are as follows:

Table 2. Risks and Mitigation Plan

Risks	Mitigation Plan
Susceptibility to Cyber Attack	Include Network Security/Firewall features in the improvement stage
User to accept / adapt to new system	Promote Training Program
Maintenance of new system infrastructure	Request additional or train existing manpower
Budget	Invoke budget to next fiscal year through the agency's capital expenditure (CAPEX)

8 RESULTS AND DISCUSSIONS

Summary of Findings

The proponent included different features on the proposed system to be evaluated by the stakeholders of the Bureau of Fire Protection - Sampaloc, Manila. Each of the features were evaluated using the Likert Scale as a measuring tool with rankings for success indicators.

Below are the results and discussions for each success indicators:

Functionality

It is practical to indicate functionality as part of the success indicators since the proponent believed that development and implementation lean so much on this factor and that the users whose thrust rely on mobility would agree. Based on the result of responses, most of the participants believed that the functionality of the proposed system commence the requirement of tasks delegated to an operations officer for a fire incident. The proposed system's capability to track the location based on the file sent by the reporter lessens the workload of BFP officers and rapidly provides resolution in case routes are clogged and or traffic problems arise.

Usability
Based on the evidences manifested using tables and charts for this category, the respondents believed that the proposed system's capacity to accommodate human-computer interaction is appropriate. One additional feature of the system is the navigational advantage of switching from "Filipino" language to "English" and vice versa based on the reporter's preference. It is also a considerable factor that the proposed system can generate automated reports based on the incident and giving the administrator an upper hand as to remark the report whether it is resolved of to be removed on the database if null and void.

Reliability
The proponent has presented evidences for the proposed system's reliability most specially when an incident is reported. It is crucial for this endeavor to commit any possible errors knowing that life is at stake. Therefore, the proponent emphasized the processing time spent in verifying an incident as per reports. These remarks were counterchecked by the Operations Officer of the Bureau of Fire Protection - Sampaloc, Manila and indicated "Excellent" as one of the presented responses for this category.

Performance
Based on the evaluation answered by the proponents, the proposed system was able to handle the required performance needed by the stakeholders to be able to administer fire incident verification in the fastest time possible. With the proposed system, the respondents believed that they will be able to extinguish any eminent concerns arising but limited to its scope.

Security
Since the system will be carrying out the brand of a BFP and administering vital role in the operation of the agency as well as collect data from the citizens of Sampaloc, Manila, the proponent made sure that the system is qualifies at the basic requirement of security with updated SSL/TLS and accession. The respondents believed that after using the proposed system, it is already capable of handling and securing information in accordance to the National Privacy Act.

Robustness
The proposed system's robustness was measured mainly on the user's capability to administer changes in some aspects of the system but not entirely. Some examples of access to change are user management, fire hydrants allocation and report generation. It is evident that the respondents agreed to the system's ability to adapt to future advancement for the agency and to the world wide web.

Results
The proponent listed the different results manifested from the proposed Development and Implementation of the Fire Verification system for Bureau of Fire Protection - Sampaloc, Manila and have come up with the following:

- Incident report submission and verification
- Incident report handling and management with Mapping
- Fast Reports documentation
- User management
- System Sustainability

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