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## RELIEF MANAGEMENT: RESOURCE ALLOCATION-PRIORITIZATION SYSTEM

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**Abstract:** Disaster Relief is important to hasten the distribution of supplies and aid those in need. Given that humans can only survive without food and water for a certain number of days, it is crucial to prepare relief supplies as early as possible and to be able to circulate it to the affected areas. Since the municipality's current processes for relief management are done manually, there are usually discrepancies in relief goods accountability, delivery, allocation and prioritization of high risk areas. This paper aims to highlight and identify current practices, particularities, and challenges in disaster relief supply chains while making use of the Canonical Action Research for the methodology. It focuses on response and recovery carried out by different disaster relief organizations through a further comprehension on planning and distribution of relief goods during disaster reinforcement. This ensures that there will be proper dissemination of goods including adequate prioritization of communities most devastated by the disaster. The developed Resource Allocation Prioritization System (RAPS) has increased productivity within the local government unit in terms of relief management. RAPS will improve reaction time of the Municipality and risk rating will enable users to determine which areas are in need of immediate relief in case of disasters. Usage of SIDI will enable relief centers to monitor the population per center moreover use the data previously given by the owner to determine what package would best fit the needs and composition of their family. RAPS website features a Donors' page wherein donors can create an account and enable them to directly create donation pledges within the system. General users can view the site for updates given via the PAG-ASA feeds, news given by barangay officials, and view maps to see which areas are flood-prone and which areas are currently flooded during a disaster.

**Key Words:** relief operations; information system; prioritization; allocation; relief goods

### 1. INTRODUCTION

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Relief goods have always been a vital part in helping those people who have scarce supplies (food, water, clothes, etc.) in times of natural or man-made disasters. Being able to manage relief goods is vital especially when it comes to unexpected occurrence or severity of any disaster. This serves as additional aid to those victims of certain calamities especially that of flooding and fire, which is a common event in our country. The supplies used which are packed to certain extents that are made to cater the needs of the community and number of people is always taken into consideration by this part.

Disaster is an inevitable and unforeseen foe. You can never predict what happens next and how it can impact the lives of many people. These days, there have been a lot of casualties happening from all sorts—may it be by nature or man-made. What is worse is that these disasters have evolved into far greater than what “disasters” used to be defined as. Based on the Annual Disaster Statistical Review, in the year 2010 there have been roughly about 385 natural disasters globally that have killed almost 297, 000 people worldwide. These disasters affected almost 217 million families and caused damages that costs over US\$ 123.9 billion. The Philippines, on the other hand encounters approximately 19 typhoons each year, with the northern and eastern parts being strongly affected (Disaster Monitor, 2008).

To be able to control the loss and suffering encountered during disasters, it is important to properly allocate resources as well as to give value to prioritization. Given that humans can only survive without food and water for a certain number of days, it is crucial to prepare relief supplies as early as possible and to be able to circulate it to the affected areas. However, as communities settle to different location in which some inhabit vulnerable locations and increase in their densities, the concern about managing and rendering of relief efforts are even more critical (Inyang, 2000). With that, response to highly disaster prone areas must be given priority. This topic was inspired by the movement of the World Health Organization to utilize prioritization upon allocating medicinal relief to third world countries through strategic and systemized research and planning. The group has decided that this topic may possibly be beneficial for our country in terms on how to properly allocate our resources to aid victims of disastrous events especially those of provinces or highly disaster prone communities whom are not as accessible as others such as that of San Isidro, Nueva Ecija wherein some roads may be hazardous for trucks and other moving vehicles due to soft soil or clay loam and sandy loam.

Proper monitoring of resources both in the warehouse of relief goods as well as the resources being allocated could improve on relief operation in terms of having quicker response time to those affected by the unfortunate event as well as save lives. This means that it would be much easier to have an idea of the things to be allocated to the relief



sites. Being able to monitor the necessary resources that each individual or family needs in a relief goods package which would be distributed later on is vital in knowing how to cater to the crowd especially to the necessities that they need. The system then aims to address this need for proper resource allocation and prioritization in order to pave way to a means that would be suitable to the conditions in the communities. Also, it would be able to have knowledge of information on who to prioritize when disasters occur.

Resolving this issue means being able to take note of the important things, which should be considered in relief goods allocation and prioritization. To be able to control the loss and suffering encountered during disasters, it is important to hasten the distribution of supplies and aid those in need. Given that humans can only survive without food and water for a certain number of days, it is crucial to prepare relief supplies as early as possible and to be able to circulate it to the affected areas. However, as communities settle to different location in which some inhabit vulnerable locations and increase in their densities, the concern about managing and rendering of relief efforts are even more critical (Inyang, 2000).

The main objective of this study is to be able to develop a system that would administer the tracking, controlling and allocation of resources at flood and fire prone areas of San Isidro, Nueva Ecija, Philippines, which would handle prioritization and allocation of relief resources as well as facilitate an immediate response during disasters. The study will also focus on the prioritization of goods to be distributed in order to cater the needs of the disaster victims situated at the municipality of San Isidro, Nueva Ecija more efficiently and effectively.

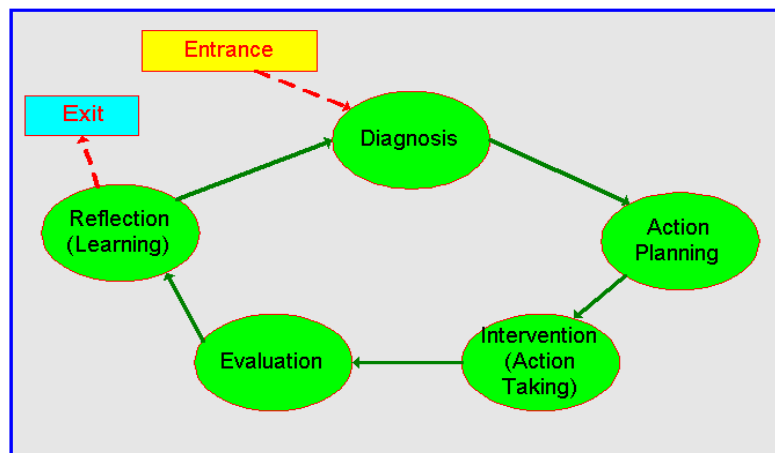
## **2. METHODOLOGY**

To be able to gather proper data, the proponents of this project made use of research tools appropriate for the study. Because the study will tackle on the real life situations of disaster and relief, it was then decided that Canonical Action Research would be used to conduct this study.

Canonical Action Research is a methodology wherein the researchers would need to engage in many interpretive and diagnostic acts with careful and critical view of the community's situation and the nature of the intervention as proposed in the solution. The researchers must then be proficient in disciplined subjectivity and critical skills (Davison, et al, 2004). The reason why CAR is the appropriate methodology for this research is that it is iterative, rigorous and collaborative wherein there is continuous research diagnosis being done as well as flexible application of the methodology (Davison and Vogel 2000). A particular characteristic of this method is that it promotes a research-client collaboration wherein the clients must actively participate in the research giving the

proponents an in-depth view of the situation as well as client intel on how the proposed solution would go about.

By utilizing this methodology, it is expected that the investigation of the evolution of the community's change process will be in great detail. By conducting study on site, the researchers will be able to view, adjust and adapt to the different possible circumstances that may occur in the said area. Picture 2.1 shows a simplified CAR diagram on how research data is usually gathered and utilized.



Picture 2.1: CAR Cyclical Process Model (IS8004, 2007)

In this project, the group would make use of the CAR method in order to gather appropriate hands-on data on how Nueva Ecija experiences and counter disasters such as flooding due to typhoons and/or heavy rainfall. Since CAR makes use of researcher-client collaboration as well as hands-on interpretation of data, it would enable the researchers to view the problem in various lights and through various data.

### 3. RESULTS AND DISCUSSIONS

The Municipal Social Welfare and Development Office (MSWDO) handles the humanitarian operations and preparedness during times of disasters in the municipality of San Isidro, Nueva Ecija. Relief operation especially the allocation and prioritization of relief goods among different barangays must be taken into account by MSWDO. However, there are some limitations with regards to being able to manage the relief



goods. The municipality of San Isidro is aware on their inefficient managing their relief goods during disaster especially how to allocate and prioritize their relief goods for different barangays of San Isidro. The municipality of San Isidro has difficulty mainly with their way of allocating resources, monitoring the number of families in the evacuation centers, there are no centralized allocating resources, and there is no appropriate way of prioritization of relief goods. For those reasons, Resource Allocation and Prioritization System (RAPS) was formed.

Resource Allocation and Prioritization System (RAPS) has three modules namely data Acquisition, Participation of People, and Historical Data wherein the users are the administrator, relief centers, and public viewers. The administrator of RAPS will be the MSWDO that can access all the modules of the system while Relief Centers can access the data acquisition module and part of the website is used for public viewers/donors.

The Administrator (MSWDO) can allocate and prioritize the relief goods based on the number of families per relief centers and risk area rating. The user can also approve/reject the requests of relief centers for relief goods. This task of admin for all modules is important to test so that the administrator of the system can access and use the transactions properly.

The Relief Centers can view the information of each family, such as number of family members, age and gender of each family member, and historical data of the family, based on ID card that can be used to know the specific package for each family during flood and fire. Relief centers can request relief packages to the admin based if their stock for relief goods are not enough. It is important to test this task to make sure that the relief centers needs would apply and received the feedback of Municipal Social Welfare and Development of San Isidro regarding to their requests correctly.

The public viewers/donors can know the relief goods needed by Municipal Social Welfare and Development and the update status of San Isidro during disaster. The public viewers can post their status and the admin will approve it or not by checking on it while donors can view the relief goods needed as a guide on what they need to donate and they will contact the MSWDO to donate. This task is also important so that Municipal Social Welfare and Development of San Isidro will also accommodate the public/donors.

There are three (3) types of testing which are proponents that were implemented. The testing includes unit testing, system testing, and user acceptance testing. Testing is



vital since this is conducted in order to ensure that the system developed is a product which will prove to be useful to the end user—or in this case, Municipality of San Isidro. It is also done in order to ensure that there are no bugs or defects in the project and if ever there are problems, this is just an opportunity in which the system could be improved on and given solution to. It is when the integration errors are fixed that the users themselves can have a hands-on experience of the system in order to test it themselves and they can also aid in giving suggestions for possible improvements of the system during the user acceptance testing.

During the testing phase, the group constantly met up in order to keep each other updates on the different modules and changes that would be and are revised. Program codes and database fields were also corrected to ensure that the different components are working together as a whole system. The test scripts were also updates to include as much scenarios as possible. It was after the correction of the bugs and errors of the modules when the system was re-tested to ensure proper communication with other modules included in the whole system. System testing took the group roughly three weeks. Final tests were completed in the first week of October 2012.

Based on the ratings from the different tests, it can be concluded that the system was improved the workflow of the users. It can also satisfy the user's specifications, security and alerts, content and functionality, user requirements, and the system as a whole. In addition, based on the comments of users, the system was able meet the needs and standards of the company though there were minor corrections on user interface, and some system features.

#### **4. CONCLUSION**

The developed Resource Allocation Prioritization System (RAPS) has increased productivity within the local government unit in terms of relief management. Since the municipality's current processes for relief management are done manually, there are usually cases of discrepancies in relief goods accountability, delivery, allocation and prioritization of high risk areas. Some issues regarding the present system is that conflicts may arise between barangays with regards to the demand and allocation of the relief goods.

The RAPS will improve the reaction time of the Municipality of San Isidro at times of disastrous events with consideration of the risk rating and relief allocation. Since San Isidro is a small municipality in Nueva Ecija, a farm town situated near the Pampanga River and mostly covered in rice fields, the risk rating will enable the users of the system to determine which areas are in need of immediate relief in cases of flood



and/or fire. The system also tackles the costs of each relief item thus enabling it to generate reports of relief goods expenditures at the particular dates. This feature targets the transparency as well as monitoring of expenses during those times of disastrous events.

The usage of the SIDI will enable the relief centers and the Municipal Social Welfare and Development Officer (MSWDO) to monitor which relief centers are in populated, the status of the fields, the residents affected as well as a control factor to prevent duplication of relief goods with a lock of 24 hours thus allowing the local government unit to minimize costs. The RAPS website features a Donors' page wherein the donors can create an account and enabled to directly create donation pledges within the system. The website also allows the donors to see the main inventory thus allowing him or her to give donations that are highly demanded for such events. Since the donors are also notified of the status of their pledges, it gives insurance to the donors that the donation they pledged were received.

The RAPS will centralize decision making factors in terms of relief allocation and management for the local government unit and therefore will prevent further issues from rising.

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