**NDRRMC Monitoring System**

Project Documentation Submitted

To the Faculty of School of

Computer Science and Information Technology

Of

Asia Pacific College

In Partial Fulfillment of the Requirements for the subject

Software Development

By:

Carpio, Aira Joyce A.

Haboc, Florence Gail G.  
Salazar, Arnold

Professor:

Mr. Edmundo Casiño

April 2017

Contents

[Executive Summary 3](#_Toc477140585)

[I. Introduction 3](#_Toc477140586)

[1.1 Project Context 3](#_Toc477140587)

[1.2 Purpose and Description 3](#_Toc477140588)

[1.3 Objectives 4](#_Toc477140589)

[1.3.1 General Objectives 4](#_Toc477140590)

[1.3.2 Specific Objectives 4](#_Toc477140591)

[1.4 Scope and Limitations 4](#_Toc477140592)

[II. Review of Related Literature/System 4](#_Toc477140593)

[2.1 Sahana Eden (Emergency Development ENvironment) 4](#_Toc477140594)

[2.2 Pentaho Analysis Tool 5](#_Toc477140595)

[2.3 Karnataka State Natural Disaster Monitoring Centre (KSNDMC) GIS System 5](#_Toc477140596)

[III. Technical Background 5](#_Toc477140597)

[3.1 Relevant technical aspects of the project 5](#_Toc477140598)

[IV. Methodology, Results and Discussion 6](#_Toc477140599)

[4.1 Requirements Analysis 6](#_Toc477140600)

[4.2 Requirements Documentation 6](#_Toc477140601)

[Input 6](#_Toc477140602)

[Output 6](#_Toc477140603)

[4.3 Gap Analysis 7](#_Toc477140604)

[4.4 Design of Software, Systems, Product, and/or Processes 7](#_Toc477140605)

[4.5 Development and Testing 7](#_Toc477140606)

[4.6 Description of the Prototype 7](#_Toc477140607)

[4.7 Implementation Plan 7](#_Toc477140608)

[4.8 Implementation Results 7](#_Toc477140609)

[4.9 Conceptual design / system architecture/ block diagrams and algorithms 7](#_Toc477140610)

[V. Conclusions and Recommendations 7](#_Toc477140611)

[VI. Appendices 7](#_Toc477140612)

[6.1 Relevant Source Code 7](#_Toc477140613)

[6.2 Evaluation Tool or Test Documents 7](#_Toc477140614)

[6.3 Sample input/output/Reports 7](#_Toc477140615)

[6.4 Users Guide 7](#_Toc477140616)

[6.5 Process/Data/Information Flow 7](#_Toc477140617)

[6.6 Screen layouts 7](#_Toc477140618)

[6.7 Test Results 7](#_Toc477140619)

[6.8 Sample Generated Outputs 7](#_Toc477140620)

[6.9 Pictures showcasing the data gathering, investigation done 7](#_Toc477140621)

[6.10 One-Page Curriculum Vitae per team member 7](#_Toc477140622)

# Executive Summary

NDRRMC Monitoring System is a web-based system that provides data warehouse to connect multi-sourced data from different stand-alone NDRRMC systems (e.g. Logistics, Inventory, Procurement, etc.). The system includes embedded Business Intelligence Tool to properly monitor data in real time and for better decision-making.

The system also gives real time reports delivered by the Law and Order System to the users. With that, the in-charged user/s registered to Monitoring System will be notified and know what action they should do to respond on the reported area.

# Introduction

## 1.1 Project Context

The team identified the following problems of NDRRMC and LGUs when it comes to preparing for a disaster:

1. Lack of capacity and technical expertise
2. Lack of public awareness or the threats and impacts of all types of hazards
3. Lack of necessary skills to cope with the impacts of disaster
4. Lack of communication and coordination

The project aims to solve the identified problem by proposing the NDRRMC Monitoring System. The system will give awareness and public safety to the community to respond on the disaster effectively and be well prepared in incoming disaster. This also allows ease of access of information for NDRRMC and other Government Agencies to easily monitors and identifies the needs of the area that was reported. Thus, it will reduce the number of families that might be affected. The coordination and communication will also improve since each of the users will and have an access to each summary reports of different data sources.

## 1.2 Purpose and Description

The NDRRMC Monitoring System is a system where Local Government Units(LGUs), NDRRMC member agencies, and/or other authorized users can view summary reports of each of the NDRRMC related systems. The summary reports consist of multi-sourced data from different stand-alone NDRRMC systems which has two classifications: The Preparedness Team and the Response Team. Under the teams are Inventory System, Procurement System, Logistics System, Food and Non-food System, Dead and Missing System, Camp Management and Coordination System and Law and Order System. Summary reports include data visualization, interactive reporting, dashboards and predictive analytics for better analyzing and monitoring of the big data and for fast decision-making.

The system also includes reporting from Law and Order data to make the information quickly available for better preparedness and respond. The responsible users will then receive a notification about the report details. Since the data from different system will be on use and the information of report is already in the system, it will help the NDRRMC and/or the users for recommendation and decision making in analyzing the needs of the affected area. From the collected data and the details of report received, the users can easily evaluate and identify what preparation he/she should do. It will also be useful in improving the planning process, correcting problems and obviating similar problems in the future.

## 1.3 Objectives

### *1.3.1 General Objectives*

* To increase community disaster awareness and improve disaster preparation coordination

### *1.3.2 Specific Objectives*

* To enable users to be updated about the reports
* To have the users a coordination with each other
* To help users in decision-making for disaster preparation and respond

## 1.4 Scope and Limitations

The coverage of NDRRMC Monitoring System is the following:

* NDRRMC Monitoring System collects the data from different resources or system
* NDRRMC Monitoring System data gathered from Law and Order Report will be send to responsible user/s as notification
* NDRMMC Monitoring System provides summary reports in form of dashboards using analytic tool

The NDRRMC Monitoring System is limited only to register account for LGUs, NDRRMC NDRRMC member agencies, admins of different NDRRMC system. Each user will only have view access to the dashboards. The collection of data gathered will not be all visualized since system will only produce summary reports of the data of each of the system. Also, the report details that is being notified to users heavily depends on Law and Order System inputs such as its reliability and accuracy of the report.

# Review of Related Literature/System

## 2.1 Sahana Eden (Emergency Development ENvironment)

This software provides solution to manage the organizations, people, projects, inventory and assets as well as collecting information through maps. It is designed to help Disaster Management practitioners to better mitigate, prepare for, respond to and recover form disaster more effectively and efficiently. Sahana Eden contains a number of different modules which can be configured to provide a wide range of functionality.  Its main capabilities are organization registry, project tracking, human resources, inventory, assets, assessments, shelter management, scenarios and events, mapping and messaging.

(<https://sahanafoundation.org/products/eden> )

## 2.2 Pentaho Analysis Tool

Pentaho Business Analytics is an open source visual integration tool with comprehensive data discovery and visualization, interactive reporting, dashboards and predictive analytics. Pentaho is embeddable architecture supports any type or source of data with native support for Hadoop, NoSQL and analytic databases. It also supports and augments “human decision-making” with automated algorithms and machine learning.

(<http://www.pentaho.com/solutions/government>)

## 2.3 Karnataka State Natural Disaster Monitoring Centre (KSNDMC) GIS System

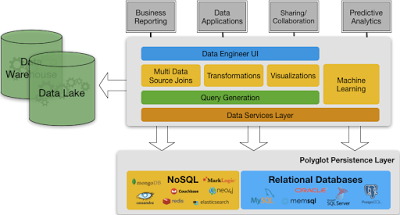
KSNDMC provides regular weather and natural hazards-related updates to the farming community, agriculture and horticulture sector, fishermen, transport sector, power and electricity sector and state and district level disaster management authorities in Karnataka. The center provides ’Early Warning and Preparedness’ activities related to management of natural hazards in Karnataka. Its objective is to develop a geospatial database for the decision making and management in an event of natural hazards, envisaged a system to capture the data in a near real-time and automate the generation of reports, alerts and early warnings to government bodies and communities. (<http://www.nasscom.in/sites/default/files/NIIT_Natural%20Disaster%20Monitoring%20Centre.pdf> )

# Technical Background

## 3.1 Relevant technical aspects of the project

To develop the system, the project team propose to use Cloud9 Charts for Data Warehousing and for Data Analytics. Cloud9 charts is embeddable tool that support multiple data resources such as structured and unstructured data which makes it perfectly fit for use in this system. The team will also use Django Framework for the interface of the system and complete the features.

The diagram below shows the main process of the Cloud9 Charts to properly understand the its feature:



<http://blog.cloud9charts.stfi.re/2017/02/modern-analytics-architecture.html?sf=apvppbe&utm_content=bufferf5d3e&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer#aa>

# Methodology, Results and Discussion

## 4.1 Requirements Analysis

After analyzing the problems that the NDRRMC encounter in disaster preparation, the team came up with proposal of possible solutions that the system could provide. Most problems that the NDRRMC encounter are lack of communication and coordination which might lead to absence of public awareness. With the NDRRMC Monitoring System, the problem that the facility encounters will be resolved and minimized.

## 4.2 Requirements Documentation

### Input

* System admin shall validate the registered users
* Report details from Law and Order must be notified to users
* System dashboards must be timely updated when there is changes from other systems

### Output

* The Business Intelligence tool shall use data from database used by all other operations
* The Business Intelligence tool shall generate reports
* Users shall only view the monitored data visualizations
* Users shall receive the notification reported in real time

## 4.4 Design of Software, Systems, Product, and/or Processes

## 4.9 Conceptual design / system architecture/ block diagrams and algorithms

# VI. Appendices

## 6.1 Relevant Source Code

## 6.3 Sample input/output/Reports

## 6.4 Users Guide

## 6.6 Screen layouts

## 6.8 Sample Generated Outputs

## 6.9 Pictures showcasing the data gathering, investigation done

## 6.10 One-Page Curriculum Vitae per team member