**Business Case**

**"E-Nodes"**

**Emergency Communications Nodes**

**Disaster Recovery Communications**

**Humabon, Makati**

**Manila, 1232**

**October 21, 2016**

# Executive Summary

In times where telecommunications services are down due to natural disasters, post-disaster relief and rescue operations is greatly crippled. Their coordination is hindered by the lack of constant communication. The current backup system relies on expensive and limited satellite phones and hand held radios to get the job done.

DiRe-Comm Inc. proposes a solution for this problem, the E-Nodes.E-Nodes are devices that will provide a temporary wireless mesh network that connects everyone within range with a Wi-Fi capable smartphone. The nodes are equipped with a custom web application named PDECC (Post-Disaster Emergency Command Center) tailored for disaster rescue and recovery teams. This is to enable real-time communication between the teams and individuals as well as being a tool for resource planning during rescue missions. It will greatly improve coordination and enhance the capabilities of the NDRRMC/OCD personnel together with volunteer rescue teams in times of need.

## Issue

At present, Filipinos rely heavily on smartphones for communicating with each other and this reliance continues to grow. These smartphones however, rely solely on telecommunication services for connectivity so if these services were to fail, communication will be cut off. This issue is especially evident when infrastructures of these services were damaged by a natural disaster. It may take days or even weeks to repair the damages and at that time, people have no choice but to rely on older communication systems such as handheld radios which only a few people have. Since these tools are rarely used today, most people need to be trained on how to use one.

According to a report made by CNN in 2013, the places that were hit by Typhoon Haiyan on November 2013 suffered a 6,000 death toll and P14 billion worth of damage to properties. After the calamity, local and international humanitarian relief efforts experienced difficulty in communicating with each other due to the damage done in the telecommunications infrastructures. The number of casualties and damages should have been reduced it relief teams had better way of communicating with each other.

When Typhoon Ruby hit Leyte last December 2014, OCD partnered with Radio Amateur Network to improve the communication system and to train the city staff in using equipment such as portable Very High Frequency radios, dual band base radios, and repeater systems. This kind of system provides only one methodof communication which is voice. Some operations may prove difficult to accomplish with just a voice communication and it even requires a lot of training for the personnel.

Sources:

http://edition.cnn.com/2013/11/07/world/asia/philippines-typhoon-haiyan/

http://edition.cnn.com/2013/12/13/world/asia/philippines-typhoon-haiyan/

http://reliefweb.int/report/philippines/philippines-typhoon-hagupit-situation-report-no-3-8-december-2014

http://www.fmuser.net/content/?1459.html

## Anticipated Outcomes

With the completion of this project, OCD will have another method of communication that they can provide to NDRRMC for disaster response and relief. It will offer features that are not present on the currently used emergency communication systems. This will make planning easier and will greatly improve the coordination of the response teams without requiring too much cost. As the network to be provided is scalable, OCD can acquire only what they need at present and just purchase additional units if the situation arises.

When implemented, every response team in the vicinity of a disaster struck area will be able to talk and plan from great distances. It will enable fast and reliable feedback between teams to be able to properly supply only what is enough and needed in effect saving many lives and conserving limited resources.

## Recommendation

Currently, it is not just difficult but also expensive to erect communications infrastructure especially when there is no electricity available.

E-Nodes are cheap and lightweight devices that you just attach on any elevated area to create an instant network. It utilizes the ubiquitous smartphones that a majority of people now have.

E-Nodes are easily deployable and don't need much supervision. It solves the problem of needing to have highly skilled individuals to create a communications network. They are battery powered and use only a small amount of power making them last long so that only minimal maintenance is required.

This cost-efficient and effective system will be the first communications infrastructure ever to be used in a post-disaster scenario in the Philippines.

## Justification

Compared to the handheld transceivers which have very limited range, and just provide voice communication and satellite phones which are expensive, bulky, and requires training to use, the E-Node system was created to be the most effective because it offers a more robust infrastructure, cost efficient and easy to maintain, wide coverage, and it can accommodate a large number of users as long as they have a smartphone.

If this project will not be used, the current difficulties that rescue and recovery teams face will remain problems and a lot of effort and resources will be wasted on false alarms, poor planning, and late response times. Lives saved will be the major measure of how effective relief operations are and this system can greatly improve that.

Tomio Tonoike, the Chief Executive Officer spearheaded the research and development of the E-Nodes, Benjamin Rivera the Chief Technology Officer is the main developer of the PDECC web application and currently in-charge of maintaining the software, and Allen Ellana the Chief Finance Officer who oversees the expenses and the ground deployment of the whole system all collaborated in the analysis and development of the business case.

# Problem Definition

## Problem Statement

The Philippines is one of the countries surrounding the Pacific ring of fire which causes volcanic eruptions and earthquakes and the Pacific Ocean which causes typhoons. In 2013, the Philippines experienced one of the biggest (and worst?) typhoon in recorded history which knocked out power grids, power lines, cell sites, and took thousands of lives in its wake. The government together with the telecommunication providers took more than a month to restore the cell sites in Leyte and other parts of Samar. The Office of Civil Defense had a limited number of satellite phones due to its expensiveness and because of that, communications between different teams of rescuers, medical teams, and different agencies was hard. They even had to rely on outside help just to get communications between organizations possible.

## Organizational Impact

The system will streamline all operations as communication is one of the biggest needs for proper coordination of teams. It will conserve manpower and the limited resources each team may have. It will improve operations on all levels from the building of command centers to the provision of relief goods and other services to victims near and far.

It can even replace the existing communication methods for emergency situations because satellite phone units are expensive and require subscriptions to their providers. This system only makes use of a device majority of people already have, the smartphone.

## Technology Migration

Not much migration is needed for the technical aspect because E-Nodes are providing a communications network for scenarios where network and power infrastructure is down or inaccessible and such technology currently non-existent. Most of the changes that will be made will be in the policies and in the training of the people to be able deploy these plug-and-play devices properly.

# Project Overview

DiRe-Comm will instigate the implementation of two systems, namely Emergency Nodes (E-Nodes) and Post Disaster Emergency Command Center (PDECC). E-Nodes is a system that will provide temporary network connectivity to places where telecommunication services are down. Its primary use is providing wireless connectivity on an area to enable communication between devices. The PDECC on the other hand,has a main goal of providing a tool for communication to rescue teams. With the E-Nodes providing the network connectivity, PDECC will be the end-user application to be used by rescuers to aid them in organizing their operations. This project should be implementable on post-hydro-meteorological and post-seismic scenarios wherein the areas affected usually suffer from networking problems.

## Project Description

E-Nodes is a temporary communication system composed of multiple portable routers that will act as nodes. When an area suffers from network failure due to a disaster, these nodes will be deployed in strategic locations to cover an area with wireless network connectivity. These nodes are interconnected, meaning, a user connected to a node can reach all users connected to other nodes.

PDECC is a web application that will be hosted on an E-Node. It will serve as an end-user application that can be accessed through a web browser of a smartphonewhich is connected to a node.All nodes in the mesh have its own instance of the PDECC, and all of these instances share information with each other. When a message is sent using an instance of aPDECC,it will be received by all other instances that are hosted by other nodes. This message can then be viewed by devices connected to those nodes enabling a two-way communication to its users. The web application’smain features are: a bulletin board where members can post any significant information; a personal chat system;a VoIP call; and a shared map that allows users to view and post markers regarding an immediate need in an area.

## Goals and Objectives

Communication is vital in organizing people. After the worse natural disasters, communication between people becomes a need that can be used to save lives and bring order back to prevent additional damage. This project aims to provide that avenue of communication to rescuers and aid them in accomplishing their objectives more efficiently than normal methods. When telecommunication services are down, the project will be the tool of rescuers in calling and messaging each other. The map feature of ECC can be used to lessen the difficulty of finding resources and to signal other rescuers for help. Rescuers can easily locate the areas that need attention and also guide people to places that have their needs.

## Project Performance

The performance of DiRe-Comm is vital as it will be used in emergency situations where human lives are at risk.

E-Nodes Metrics:

1. Network speed – time is important in emergency situations so the delay between the sending and receiving of information should be minimal. Huge delays in the network could also cause additional problems in chat and other features as it will be confusing whether the message is actually sent first or is just received first.

2. Network throughput–all messages should be transmitted carefully. Messages sent should be completely broadcasted to all nodes to ensure that the target receiver/s receives it.

3. Portability – as it requires numerous nodes to cover an area, a single node should be as small as possible to prevent any transportation issues. The project’s main objective is disaster response so it should be assumed that transportation is a huge issue. This is why nodes should be easy to move and deploy.

4. Physical security – the nodes should be weatherproof since it is going to be deployed outdoors. Their casing should be well built as it is unavoidable for these nodes to be exposed to rain, strong winds and other elements.

PDECC Metrics:

1. Usability –the user interface should be easy to be familiar with. All software functions should be easy to use and requires fewer clicks as possible.

2. Portability – the web application should be able to run on most devices that are Wi-Fi compatible.

3. Software Security – since this project is to be deployed outdoors, a certain level of software security is required. This is to prevent any potential hackers from disrupting the system.

## Project Assumptions

ECC is a web application so it is assumed that all users have a device that can run a web browser. It considers the procedures of rescue operations as stated in the National Disaster Risk Reduction and Management Council’s (NDRRMC)National Disaster Plan for Hydro-meteorological Hazards therefore it is important for its users to be familiar with the said manual. The project will be designed to be easily usable and deployable; however, it is still important for its users to have a basic knowledge of how to use a smartphone and web applications. ECC is supplementary to E-Node so its performance is only be maximized when E-Nodes are properly deployed.

## Project Constraints

ECC should always be used together with E-Nodes and cannot be used otherwise. This project is designed to work in post disaster scenarios in the Philippines, specifically post-hydro meteorological and post-seismic disasters. These two are chosen as they are the most probable to happen in the country. All features provided by the application are targeted for Filipino people and communities therefore may not have the same applicability to other countries.

## Major Project Milestones

|  |  |
| --- | --- |
| **Week** | **Milestones** |
| 1 | Initial E-Node design |
| Hardware acquisition |
| Initial ECC design |
| 2 | E-Node Development start |
| 4 | ECC Development start |
| 9 | E-Node Completion |
| 10 | ECC Completion |
| 12 | E-Node and ECC full integration |
| 15 | Project testing |
| 17 | Project deployment |

# Strategic Alignment

The company is committed to its vision of connecting people regardless of geographical and environmental challenges. Current networking technology connects people in a global scale, however, problem arises when an unfortunate event happens that isolates an area from the rest of the world. Damage done by these events to network infrastructures takes time to fix, and during that time, communication within the affected area is limited. This project is a huge step towards the company’s vision as it will enable communication on places that are encountering network interference. Implementing this solution will undoubtedly help in the company’s goal of minimizing damages caused by natural disasters and more importantly save lives.

As this is the first big project of the company, it would provide enormous amount of data that can be used in the future for research and development of similar projects. The company would also be able to test the waters of the industry and have a better grasp on networking and emergency situation handling.

# Cost Benefit Analysis

The project will cost 700,000php but the benefits will be millions.

The provision of this project will improve all aspects of all operations at the ground level during post-disaster scenarios. It will save costs incurred from the current inaccurate and wasteful provision of needs like water, food, and medicine and of services like medical checkups and treatment to victims. It will hasten planning and implementation of rescue missions and remove the chances of error due to lack of communication. It will save time and money by improving planning times and methods. The end target of the project is to increase the number of victims saved. And the lives of our fellow Filipino are priceless.

# Alternatives Analysis

The only alternative to adapting to current technologies is really just doing nothing. This will just leave the current state of things to be outdated and slow. It will cause more harm than good to do nothing because it will incur costs that are greater than solutions such as ours.

In these times where computing has been growing at an immense rate, we need not only know about how the new tools and how they are utilized but also invest in them because the only way to improve is to move forward.

There are plenty of offerings for emergency network provisions but most are outsourced and expensive. Most of them rely on power sockets to be able to work and the technical knowhow to maintain and manage.

# Approvals

Approved by the Project Sponsor:

**USEC RICARDO B. JALAD  Date: 10/21/2016**  
Administrator, Office of Civil Defense &

Executive Director, National Disaster

Risk Reduction and Management Council

**Project Charter**

**'E-Nodes'**

**Disaster Recovery Communications Inc.**

**Humabon, Makati**

**Manila, 1232**

**October 21, 2016**

**Table of Contents**

[Executive Summary 11](#_Toc332021424)

[Project Purpose/Justification 11](#_Toc332021425)

[Business Need/Case 11](#_Toc332021426)

[Business Objectives 11](#_Toc332021427)

[Project Description 11](#_Toc332021428)

[Project Objectives and Success Criteria 12](#_Toc332021429)

[Requirements 12](#_Toc332021430)

[Constraints 12](#_Toc332021431)

[Assumptions 12](#_Toc332021432)

[Preliminary Scope Statement 13](#_Toc332021433)

[Risks 13](#_Toc332021434)

[Project Deliverables 13](#_Toc332021435)

[Summary Milestone Schedule 13](#_Toc332021436)

[Summary Budget 14](#_Toc332021437)

[Project Approval Requirements 14](#_Toc332021438)

[Project Manager 14](#_Toc332021439)

[Authorization 16](#_Toc332021440)

# Executive Summary

# In times where telecommunications services are down due to natural disasters, post-disaster relief and rescue operations is greatly crippled. Their coordination is hindered by the lack of constant communication. The current backup system relies on expensive and limited satellite phones and hand held radios to get the job done.

# DiRe-Comm Inc. proposes a solution for this problem, the E-Nodes. It is a network infrastructure that will be put in place during post-natural disaster scenarios to help coordinate efforts of rehabilitation and recovery. Also, a software will be built in to interface offline maps and create a tool for planning

# Project Purpose/Justification

## Business Need/Case

With the completion of this project, OCD will have another method of communication that they can provide to NDRRMC for disaster response and relief. It will offer features that are not present on the currently used emergency communication systems. This will make planning easier and will greatly improve the coordination of the response teams without requiring too much cost. As the network to be provided is scalable, OCD can acquire only what they need at present and just purchase additional units if the situation arises.

When implemented, every response team in the vicinity of a disaster struck area will be able to talk and plan from great distances. It will enable fast and reliable feedback between teams to be able to properly supply only what is enough and needed in effect saving many lives and conserving limited resources.

## Business Objectives

The business objective of this project is to create an emergency communications platform in a post-disaster scenario for the republic of the Philippines, to replace the existing emergency communications of the Philippines, and help save more lives.

* Plan, design, develop, and test the communication system within the next 35 weeks.
* Complete implementation demo and deployment plan within 20 days after the 35 weeks
* Increase the percentage of lives saved by at least 5% in the first year

# Project Description

E-Nodes are devices that will provide a temporary wireless mesh network that connects everyone within range with a Wi-Fi capable smartphone. The nodes are equipped with a custom web application named PDECC (Post-Disaster Emergency Command Center) tailored for disaster rescue and recovery teams. This is to enable real-time communication between the teams and individuals as well as being a tool for resource planning during rescue missions. It will greatly improve coordination and enhance the capabilities of the NDRRMC/OCD personnel together with volunteer rescue teams in times of need.

## Project Objectives and Success Criteria

The objectives which mutually support the milestones and deliverables for this project have been identified. In order to achieve success on the E-Nodes project, the following objectives must be met within the designated time and budget allocations:

* Complete list of required hardware/software which meets budget allocation within the next 25 days
* Source all the necessary hardware to create the nodes
* Create a simulated solution in the office using all purchased hardware and software to test the solution within the next 30 weeks
* Achieve a simulated solution and gather data in different possible disaster environments in the Philippine setting by the 40th week.
* Implement the solution and be ready for deployment (training and deployment seminars completed) 3 weeks after the project has been completed.

## Requirements

This project must meet the following list of requirements in order to achieve success.

* The system must be first planned, developed, and tested in different geographical locations.
* Solution must be implemented without disruption to operations. The system must be implemented in a post-disaster scenario.

Additional requirements may be added as necessary, with project sponsor approval, as the project moves forward.

## Constraints

The following constraints pertain to the Emergency Nodes project:

* The framework, database, web sockets, and maps must be compatible to one another.
* The nodes must be purchase in accordance to the allocated budget, specific needs, and time duration of the project.
* Each member of the team must have an in-depth knowledge in computer networking specifically in the mesh topology and must have a working knowledge in different languages and frameworks.

## Assumptions

The following are a list of assumptions. Upon agreement and signature of this document, all parties acknowledge that these assumptions are true and correct:

* This project has the full support of the project members, the National Disaster Risk Reduction Management Council, and the Office of Civil Defense
* The purpose of this project will be communicated throughout the company prior to deployment
* The project manager will provide additional resources if necessary

## Preliminary Scope Statement

This plan documents the scope management approach; roles and responsibilities as they pertain to project scope; scope definition; verification and control measures; scope change control; and the project’s work breakdown structure. Any project communication which pertains to the project’s scope should adhere to the Scope Management Plan.

This project includes designing, assembling, programming, and testing a new product composed of both software and hardware components. The software will be used as the interface for the temporary network to be put up by the raspberry pi nodes. This includes design of the software, all programming and coding, and testing/validation of the software. The hardware would be the implementation of the easily-deployable mesh network for post disaster situations. No external resources or outsourcing are anticipated for this project.

# Risks

The following risks for the Emergency Nodes project have been identified. The project manager will determine and employ the necessary risk mitigation/avoidance strategies as appropriate to minimize the likelihood of these risks:

* Potential disruption to operations during solution deployment
* External threats breaching intranet security via new methods

# Project Deliverables

The following deliverables must be met upon the successful completion of the Emergency Nodes project. Any changes to these deliverables must be approved by the project sponsor.

* Fully developed, tested, and deployed Emergency Nodes
* Technical documentation for Emergency Nodes System
* Recommendation list for future updates for the system

# Summary Milestone Schedule

The project Summary Milestone Schedule is presented below. As requirements are more clearly defined this schedule may be modified. Any changes will be communicated through project status meetings by the project manager.

|  |  |
| --- | --- |
| **Summary Milestone Schedule – List key project milestones relative to project start.** | |
| **Project Milestone** | **Target Start** |
| 1. Project Start | Week |
| * Complete Solution Design | 01/21/2017 |
| 1. Acquire Hardware and Software Needed | 02/26/2017 |
| 1. Complete Network Platform with Testing and Revisions | 03/15/2017 |
| 1. Complete Software Solution with Testing and Revisions | 05/01/2017 |
| 1. E-Nodes Turnover and Complete Training Seminars | 06/01/2017 |
| 1. Project Complete | 06/15/2017 |

# Summary Budget

The following table contains a summary budget based on the planned cost components and estimated costs required for successful completion of the project.

NOTE : The computation of the personnel resources is multiplied in 7 since the duration of the research and development is 7 months. 75 nodes will be created for the project.

|  |  |
| --- | --- |
| **Summary Budget – List component project costs** | |
| **Project Component** | **Component Cost** |
| 1. Personnel Resources | ₱1,108,000 |
| * Hardware(₱15,000 Per Node) | ₱1,125,000 |
| * Fixed Costs (Rent/Utilities) | ₱770,000 |
| * Management Reserve | ₱200,000 |
| **Total** | ₱**3,203,000** |

# Project Approval Requirements

The success of the project mainly rely on the research, development, documentation, and testing of the system indicated in this charter. Additionally, the measure of success must include recommendations list for future developers to update and upgrade the system along with its components. The success of the project will be determined by Mr. Ricardo Jalad the head of the NDRRMC, who will also authorize the start and completion of the project.

# Project Manager

The Chief Executive Officer of DiRe-Comm Inc., Tomio Tonoike, will serve as the project manager of the E-Nodes projects. He will have the overall authority for planning tasks, scheduling workloads, and executing this project along with approving, allocating, and managing the company’s resources. The main team led by Mr. Tonoike will be consisting of two computer scientists, Mr. Rivera and Mr. Ellana. The project manager will be the one coordinating to Mr. Rivera for the man power and to Mr. Ellana for the releasing of the funds and budget. Mr. Tonoike will be the one in charge of providing the weekly updates to Mr. Ricardo Jalad.

# Authorization

Approved by the Project Sponsor:

**USEC RICARDO B. JALAD  Date: 10/21/2016**  
Administrator, Office of Civil Defense &

Executive Director, National Disaster

Risk Reduction and Management Council

**Stakeholder Management Strategy**

**E-Nodes**

**Disaster Recovery Communications**

**Humabon, Makati**

**Manila, 1232**

**October 21, 2016**

**Table of Contents**

[1. Introduction 18](#_Toc315954379)

[2. Identify Stakeholders 18](#_Toc315954380)

[3. Key Stakeholders 19](#_Toc315954381)

[4. Stakeholder Analysis 19](#_Toc315954382)

# Introduction

This documentation for Project E-Nodes of the company Disaster Recovery Communications (DiRe-Comm) is used to identify, categorize, and determine the power of project stakeholders. The Stakeholder Management Strategy allows the project team to determine the influential entities that may have an influence to the project. It is important for the project to recognize who the stakeholders are as it is essential to satisfy their needs and wants for the success of E-Nodes.

The project can affect the stakeholders in many different ways, some are positive while some are negative. Thus, it is important to balance their interests to gain their support while making the project and also prevent encountering problems such as having competing objectives with them.

# Identify Stakeholders

The project team assigned to E-Nodes had a meeting with the NDRRMC and OCD representatives to list all people and organizations that are possibly affected by the project. These entities were evaluated to determine who the actual stakeholders are and how they can influence the project. All personnel employed by the company, whether outsourced or otherwise, are automatically added to the list.

As stated earlier, stakeholders play a major role on the outcome of the project. Because of this, it is necessary to have a specific set of criteria to identify who these stakeholders are. If any of the answer to the following questions is yes, that entity is a stakeholder.

1. Is the entity directly or indirectly affected by the project?

2. Can the entity influence the project?

3. Can the project influence the entity?

4. Is there a chance that the project may need a special kind of expertise that the entity possesses?

After the criteria had been given, it is up to the project team to filter the list of entities to figure out who the project’s stakeholders are. Following the criteria above, the stakeholders are as follows:

1. All DiRe-Comm personnel

2. NDRRMC

3. OCD

4. Rescue teams

5. Local government units

6. People living in the affected areas

7. Computer networking companies

8. Telecommunication services providers

9. Satellite phone providers

10. Ham radio providers

11. Hardware providers

# Key Stakeholders

Different stakeholders can affect and be affected by the project in different levels. After the list of stakeholders is finished, it is important for the team to identify the projects’ key stakeholders. These key stakeholders have a certain level of power over the project that if they refuse to cooperate, it will cause problems that may even lead to the project’s failure. It is the job of the team to establish constant communication with the key stakeholders to get their feedback and adjust things as necessary.

It has been decided by the project team that these entities are they key stakeholders:

1. DiRe-Comm personnel

2. NDRRMC

3. OCD

4. Rescue teams

5. Local government units

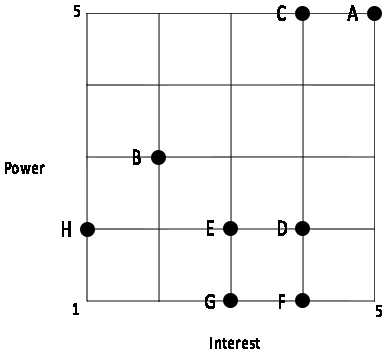
# Stakeholder Analysis

Now that all E-Nodes Project stakeholders have been recognized, the project team will categorize and analyze the level of power they hold. As stakeholders can affect the project in many different ways, it is important to determine the level of power or influence that they have over the project. This will enable the team to plan their management approach and to maintain the proper level of communication with each of these stakeholders.

The table below is used to establish stakeholders and their levels of power and interest that will be used on the power/interest chart as part of the stakeholder analysis.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Key | Organization | Name | Power (1-5) | Interest (1-5) |
| A | DiRe-Comm | Project team | 5 | 5 |
| B | NDRRMC | Department chairperson | 3 | 2 |
| C | OCD | Department chairperson | 5 | 4 |
| D | Government/  NGOs | Rescue teams | 2 | 4 |
| E | LGU | Mayor to barangay chairman of LGU | 2 | 3 |
| F | Civilians | People in the affected areas | 1 | 4 |
| G | Competitors | Telecommunication services providers, satellite phone providers | 1 | 3 |
| H | Suppliers | Hardware suppliers | 2 | 1 |

The graph below represents the power/interest chart for the E-Nodes’ stakeholders. Each letter represents a stakeholder that was specified with the key in the table above.



This matrix will be reviewed and updated as the project progresses to be in line with any changes that may occur. The table below provides additional details about the matrix above.

|  |  |  |  |
| --- | --- | --- | --- |
| Key | Concern | Quadrant | Strategy |
| A | Be sure to keep every member motivated throughout the lifespan of the project | Key player | Meet regularly |
| B | Deploys rescue teams to affected areas | Keep satisfied | Communicate test results and performance specifications and obtain feedback on requirements or any changes. |
| C | Provides emergency communications to NDRRMC | Key player | Communicate test results and performance specifications and obtain feedback on requirements or any changes. Provide frequent status reports and updates. |
| D | End users of the system. Must be able to use the product and be comfortable with it. | Keep satisfied | Communicate test results and performance specifications and obtain feedback on requirements or any changes. |
| E | Helps the rescuers by providing the necessary information when deploying the system | Keep informed | Communicate performance specifications and obtain feedback |
| F | Present during the system deployment. Should not interfere with the deployed hardware and software. | Keep satisfied | Communicate performance specifications and obtain feedback |
| G | May provide products with the same purpose. | Observe | Gather data if they have plans on becoming direct competitors |
| H | Provides all hardware necessary for the system | Minimal effort | Ensure that they will notify the company if there are any new products that can be used in the system. |

**Sponsor Acceptance**

Approved by the Project Sponsor:

**USEC RICARDO B. JALAD  Date: 10/21/2016**  
Administrator, Office of Civil Defense &

Executive Director, National Disaster

Risk Reduction and Management Council

**Scope Management Plan**

**"E-Nodes"**

**Disaster Recovery Communications Inc. (DiRe-Comm Inc.)**

**3 Humabon Place, Magallanes Village**

**Makati City, 1232**

**10/14/2016**

**Table of Contents**

[Introduction 24](#_Toc332300830)

[Scope Management Approach](#_Toc332300831) 26

[Roles and Responsibilities](#_Toc332300832) 26

[Scope Definition](#_Toc332300833) 24

[Project Scope Statement 25](#_Toc332300834)

[Work Breakdown Structure](#_Toc332300835) 26

[Scope Verification](#_Toc332300836) 34

[Scope Control](#_Toc332300837) 34

[Sponsor Acceptance 33](#_Toc332300838)

# Introduction

The Scope Management Plan provides the scope framework for this project.This plan documents the scope management approach; roles and responsibilities as they pertain to project scope; scope definition; verification and control measures; scope change control; and the project’s work breakdown structure. Any project communication which pertains to the project’s scope should adhere to the Scope Management Plan.

This project includesdesigning, assembling, programming, and testing a new product composed of both software and hardware components. The software will be used as the interface for the temporary network to be put up by the raspberry pi nodes. This includes design of the software, all programming and coding, and testing/validation of the software. The hardware would be the implementation of the easily-deployable mesh network for post disaster situations.No external resources or outsourcing are anticipated for this project.

# Scope Management Approach

For this project, scope management will be the sole responsibility of the Project Manager. The scope for this project is defined by the Scope Statement, Work Breakdown Structure (WBS) and WBS Dictionary. The Project Manager, Sponsor and Stakeholders will establish and approve documentation for measuring project scope which includes deliverable quality checklists and work performance measurements. Proposed scope changes may be initiated by the Project Manager, Stakeholders or any member of the project team. All change requests will be submitted to the Project Manager who will then evaluate the requested scope change. Upon acceptance of the scope change request the Project Manager will submit the scope change request to the Change Control Board and Project Sponsor for acceptance. Upon approval of scope changes by the Change Control Board and Project Sponsor the Project Manager will update all project documents and communicate the scope change to all stakeholders. Based on feedback and input from the Project Manager and Stakeholders, the Project Sponsor is responsible for the acceptance of the final project deliverables and project scope.

# Roles and Responsibilities

The Project Manager, Sponsor and team will all play key roles in managing the scope of this project. As such, the project sponsor, manager, and team members must be aware of their responsibilities in order to ensure that work performed on the project is within the established scope throughout the entire duration of the project. The table below defines the roles and responsibilities for the scope management of this project.

|  |  |  |
| --- | --- | --- |
| **Name** | **Role** | **Responsibilities** |
| Secretary  Ricardo T. Jalad | Sponsor | * Approve or deny scope change requests as needed * Evaluate the need for scope change requests * Review project deliverables |
| TomioTonoike | Project Manager | * Measure and verify project scope * Facilitate scope change requests * Facilitate impact assessments of scope change requests * Organize and facilitate scheduled change control meetings * Communicate outcomes of scope change requests * Update project documents upon approval of all scope changes |
| TomioTonoike | Team Leader | * Measure and verify project scope * Validate scope change requests * Participate in impact assessments of scope change requests * Communicate outcomes of scope change requests to team * Facilitate team level change review process |
| Benjamin Rivera | Team Member | * Participate in defining change resolutions * Evaluate the need for scope changes and communicate them to the project manager as necessary |
| Allen Ellana | Team Member | * Participate in defining change resolutions * Evaluate the need for scope changes and communicate them to the project manager as necessary |

**Table 1.1,*Scope Management Roles and Responsibilities***

# Scope Definition

The scope for this project was defined through a comprehensive requirements collection process. First, research was performed to correctly identify the problem of NDRRMC in communications during post-disaster scenarios. Historical data from past natural disaster events together with interviews from NDRRMC were collected and analyzed to formulate possible communications solutions. From this information, the project team has then come up with a list of software and hardware requirements for the solution agreed upon.

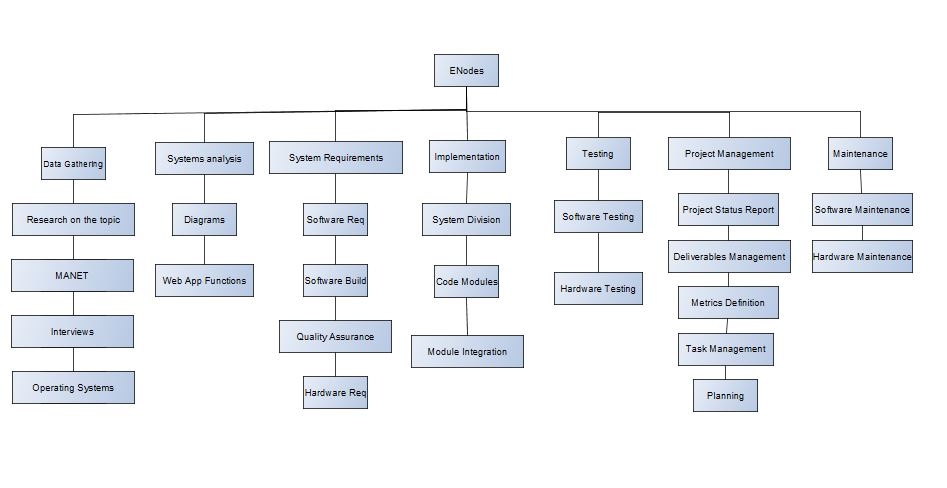
The project description and deliverables were created based on the requirements acquired from historical data of natural disaster incidents and how they were handled by response teams. Consultants also gave input on software design and hardware specifications and provided key techniques to meet the requirements of the sponsor. This research process narrowed the possible solutions made us select the solution that we are

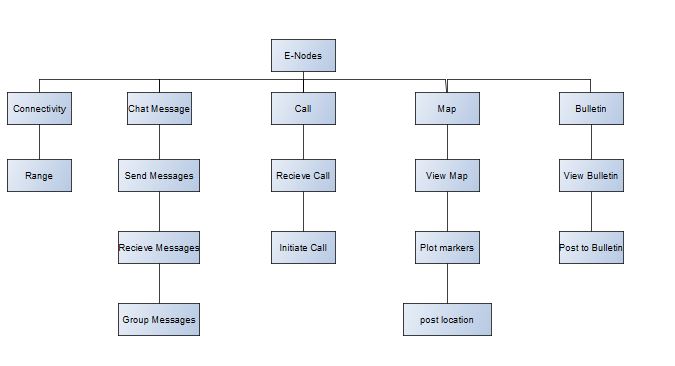
# Project Scope Statement

This project includes the design, programming, and testing of a new software application for providing the necessary communication platform for post-disaster recovery scenarios. The deliverables for this project are the completed hardware nodes with a web application for disaster response and recovery. It also includes the flexibility to modify and expand the hardware and web application as necessary in the future. This project will be accepted once the whole mesh network has been successfully tested in each simulated environment and has been shown to be compliant with the needs in communication infrastructure when power and access to the persistent communications infrastructure is gone. This project does not include ongoing operations and maintenance of the software. Only internal personnel and resources may be used for this project. Additionally, the project is not to exceed P300,000.00in spending. Assumptions for this project are that support will be provided by the project sponsor and all department managers and that adequate internal resources are available for the successful completion of this project.

# Work Breakdown Structure

In order to effectively manage the work required to complete this project, it will be subdivided into individual work packages which will not exceed 30 hours of work. This will allow the Project Manager to more effectively manage the project’s scope as the project team works on the tasks necessary for project completion.

**Figure 1.1,*Work Breakdown Structure for Project (WBS)***



**Figure 1.2,*Work Breakdown Structure for Product (WBS)***

In order to more clearly define the work necessary for project completion the WBS Dictionary is used. The WBS Dictionary includes an entry for each WBS element. The WBS Dictionary includes a detailed description of work for each. The project team will use the WBS Dictionary as a statement of work for each WBS element.

| Level | WBS Code | Element Name | Definition |
| --- | --- | --- | --- |
| 1 | 1 | Emergency Nodes | The company’s core product |
| 2 | 1.1 | Data Gathering | This phase is focused on the research and development of the product |
| 3 | 1.1.1 | Research on the Topic | This subsection focuses on the background of the study and the background of Mobile Ad hoc Networks |
| 3 | 1.1.2 | Research on Microcontrollers | This subsection focuses in the device to be used for our product |
| 3 | 1.1.3 | Research on Networking protocols | This subsection focuses on the networking protocols to be implemented on the company’s product |
| 3 | 1.1.4 | Interview OCD and DND | To gather more facts about the typhoon Yolanda the researchers interviews the head of NDRRMC, the Department of National Defense |
| 3 | 1.1.5 | Research on Operating System | Since the company is going to use a microcomputer. They need an operating system that is lightweight, manageable, and flexible |
| 2 | 1.2 | Systems Analysis and Design | Most of the frameworks and diagrams to be used on the development of the system is designed under here |
| 3 | 1.2.1 | Formulation of Diagrams for the Web App | The systematic approach of the team in designing and creating of the web app to be implemented on the system. This includes the different diagrams for the development team to follow |
| 3 | 1.2.2 | Web App Functions | This subsection focuses on the development of each functions of the product |
| 2 | 1.3 | System Requirements | This section discusses the requirements that the company for its product |
| 3 | 1.3.1 | Software Design | Under this subsection describes the specifications of the Web App to be implemented by the company |
| 3 | 1.3.2 | Software Build | This subsection the modules needed by the system to work |
| 3 | 1.3.3 | Software Quality Assurance | This is to ensure that the Web App to be developed by the company is up to standard |
| 3 | 1.3.4 | Hardware Requirements | This defines the needed requirements to be met for the system to work |
| 2 | 1.4 | Implementation | This discusses the steps that the company needs to divide its workload in developing the software |
| 3 | 1.4.1 | Dividing System into modules | The division of the whole system into modules to be coded |
| 3 | 1.4.2 | Coding modules | The development of each modules. |
| 3 | 1.4.3 | Module Integration | This process integrates different components that was coded |
| 2 | 1.5 | Testing | This is a process of evaluating the system. |
| 3 | 1.5.1 | Software Testing | To check whether the system doesn’t have errors or comply with the standards set by the ISO and the company |
| 3 | 1.5.2 | Hardware Testing | To test whether the system would still work on different environments before deployment. |
| 2 | 1.6. | Project Management | To ensure that the whole company would work. To plan and mitigate the problems that the company would eventually encounter |
| 3 | 1.6.1 | Project Status Report | This report contains the current problems, milestones, and issues that the development team is/or currently encountering/encountered |
| 3 | 1.6.2 | Deliverables Management | This ensures that the things needed by the client is delivered on time |
| 3 | 1.6.3 | Metrics Definition | This defines the metrics for the system |
| 3 | 1.6.4 | Prepare Quality Assurance Plan | To describe the strategy and methods that the company will need |
| 3 | 1.6.5 | Task Management | The distribution of load to each personnel in the company |
| 3 | 1.6.6 | Planning | This describes the all the steps that the company needs or might need in embarking this project |
| 2 | 1.7 | Maintenance | To ensure that the whole system would still work more than its intended life span |
| 3 | 1.7.1 | Software Maintenance | To ensure that the software is up to date and constantly evolving for the users’ needs |
| 3 | 1.7.2 | Hardware Maintenance | To ensure the hardware components of the system is in shape and ready for immediate deployment |

**Table 1.2,*WBS Dictionary for Project***

| Level | WBS Code | Element Name | Definition |
| --- | --- | --- | --- |
| 1 | 1 | Emergency Nodes | The company’s core product |
| 2 | 1.1 | Connectivity | To ensure that users are connected in the system for them to communicate in a post disaster scenario |
| 3 | 1.1.1 | Range | So that the users could use the system. This is mainly defined by the hardware that the company used in developing the system. |
| 2 | 1.2 | Chat Messaging | To send a simple message to its intended end device |
| 3 | 1.2.1 | Able to send messages |  |
| 3 | 1.2.2 | Able to receive messages |  |
| 3 | 1.2.3 | Able to Send Group Messages |  |
| 2 | 1.3 | Call | This enables the user to have a real time Voice Over Internet Protocol |
| 3 | 1.3.1 | Able to call another user |  |
| 3 | 1.3.2 | Able to receive call |  |
| 2 | 1.4 | Map | To be used by the users in navigating to the nearest evacuation center, medical center, or food distribution efforts |
| 3 | 1.4.1 | Able to view map |  |
| 3 | 1.4.2 | Plot markers on map |  |
| 3 | 1.4.3 | Able to post current location |  |
| 2 | 1.5 | Bulletin | This is a feature of the web app that features the current and updated news |

**Table 1.3,*WBS Dictionary for Product***

# 

# Scope Verification

As this project progresses the Project Manager will verify interim project deliverables against the original scope as defined in the scope statement, WBS and WBS Dictionary. Once the Project Manager verifies that the scope meets the requirements defined in the project plan, the Project Manager and Sponsor will meet for formal acceptance of the deliverable. During this meeting the Project Manager will present the deliverable to the Project Sponsor for formal acceptance. The Project Sponsor will accept the deliverable by signing a project deliverable acceptance document. This will ensure that project work remains within the scope of the project on a consistent basis throughout the life of the project.

# Scope Control

The Project Manager and the project team will work together to control of the scope of the project. The project team will leverage the WBS Dictionary by using it as a statement of work for each WBS element. The project team will ensure that they perform only the work described in the WBS dictionary and generate the defined deliverables for each WBS element. The Project Manager will oversee the project team and the progression of the project to ensure that this scope control process if followed.

If a change to the project scope is needed the process for recommending changes to the scope of the project must be carried out. Any project team member or sponsor can request changes to the project scope. All change requests must be submitted to the Project Manager in the form of a project change request document. The Project Manager will then review the suggested change to the scope of the project. The Project Manager will then either deny the change request if it does not apply to the intent of the project or convene a change control meeting between the project team and Sponsor to review the change request further and perform an impact assessment of the change. If the change request receives initial approval by the Project Manager and Sponsor, the Project Manager will then formally submit the change request to the Change Control Board. If the Change Control Board approves the scope change the Project Sponsor will then formally accept the change by signing the project change control document. Upon acceptance of the scope change by the Change Control Board and Project Sponsor the Project Manager will update all project documents and communicate the scope change to all project team members stakeholders.

# Sponsor Acceptance

Approved by the Project Sponsor:

**USEC RICARDO B. JALAD  Date: 10/21/2016**  
Administrator, Office of Civil Defense &

Executive Director, National Disaster

Risk Reduction and Management Council

**Work Breakdown Structure**

**“E-Nodes”**

**Disaster Recovery Communications Inc. (DiRe-Comm Inc.)**

**3 Humabon Place, Magallanes Village**

**Makati City, 1232**

**10/14/2016**

# Introduction

The Work Breakdown Structure presented here represents all the work required to complete this project.

# Hierarchical Structure

Work Breakdown Structure for Project

|  |  |  |
| --- | --- | --- |
| Level | WBS Code | Element Name |
| 1 | 1 | E-Nodes |
| 2 | 1.1 | Connectivity |
| 3 | 1.1.1 | Range |
| 2 | 1.2 | Chat Messaging |
| 3 | 1.2.1 | Able to Send Messages |
| 3 | 1.2.2 | Able to Receive Messages |
| 3 | 1.2.3 | Able to Send Group Messages |
| 2 | 1.3 | Call |
| 3 | 1.3.1 | Able to Call Another User |
| 3 | 1.3.2 | Able to Receive Call |
| 2 | 1.4 | Map |
| 3 | 1.4.1 | Able to View Map |
| 3 | 1.4.2 | Able to Plot Markers on Map |
| 3 | 1.4.3 | Able to Post Current Location |
| 2 | 1.5 | Bulletin |
| 3 | 1.5.1 | Able to View Bulletin |
| 3 | 1.5.2 | Able to Post to Bulletin |

# Hierarchical Structure

Work Breakdown Structure for Product

|  |  |  |
| --- | --- | --- |
| Level | WBS Code | Element Name |
| 1 | 1 | E-Nodes |
| 2 | 1.1 | Data Gathering |
| 3 | 1.1.1 | Research on Background of the Study |
| 3 | 1.1.2 | Research on Microcontrollers |
| 3 | 1.1.3 | Research on Networking Protocols |
| 3 | 1.1.4 | Interview OCD and DND |
| 3 | 1.1.5 | Research on operating system |
| 2 | 1.2 | Systems Analysis and Design |
| 3 | 1.2.1 | Formulation of Diagrams for Web App |
| 3 | 1.2.2 | Web App Functions |
| 2 | 1.3 | System Requirements |
| 3 | 1.3.1 | Software Requirements |
| 3 | 1.3.2 | Software Quality Assurance |
| 3 | 1.3.3 | Hardware Requirements |
| 2 | 1.4 | Implementation |
| 3 | 1.4.1 | Dividing System Into Modules |
| 3 | 1.4.2 | Code Modules |
| 3 | 1.4.3 | Module Integration |
| 2 | 1.5 | Quality Assurance |
| 3 | 1.5.1 | Test Plan |
| 3 | 1.5.3 | Test Cases |
| 3 | 1.5.2 | Hardware Testing |
| 2 | 1.6 | Project Management |
| 3 | 1.6.1 | Project Status Report |
| 3 | 1.6.2 | Deliverables Management |
| 3 | 1.6.3 | Metrics Definition/Creation |
| 3 | 1.6.4 | Prepare Quality Assurance Plan |
| 3 | 1.6.5 | Task Management |
| 3 | 1.6.7 | Planning |
| 2 | 1.7 | Maintenance |
| 3 | 1.7.1 | Hardware Maintenance |
| 3 | 1.7.2 | Software Maintenance |

# WBS Dictionary

Work Breakdown Structure for Project

| Level | WBS Code | Element Name | Definition |
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Work Breakdown Structure for Product

| Level | WBS Code | Element Name | Definition |
| --- | --- | --- | --- |
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| 3 | 1.4.2 | Plot markers on map |  |
| 3 | 1.4.3 | Able to post current location |  |
| 2 | 1.5 | Bulletin | This is a feature of the web app that features the current and updated news |

# Glossary of Terms

Level of Effort: Level of Effort (LOE) is how much work is required to complete a task.

WBS Code: A unique identifier assigned to each element in a Work Breakdown Structure for the purpose of designating the elements hierarchical location within the WBS.

Work Package: A Work Package is a deliverable or work component at the lowest level of its WBS branch.

WBS Component: A component of a WBS which is located at any level. It can be a Work Package or a WBS Element as there's no restriction on what a WBS Component is.

WBS Element: A WBS Element is a single WBS component and its associated attributes located anywhere within a WBS. A WBS Element can contain work, or it can contain other WBS Elements or Work Packages.

**Schedule Management Plan**

**"E-Nodes"**

**Disaster Recovery Communications Inc. (DiRe-Comm Inc.)**

**3 Humabon Place, Magallanes Village**

**Makati City, 1232**

**10/28/2016**

**Table of Contents**

[Introduction 43](#_Toc332285001)

[Schedule Management Approach 43](#_Toc332285002)

[Schedule Control 44](#_Toc332285003)

[Schedule Changes and Thresholds 44](#_Toc332285004)

[Scope Change 44](#_Toc332285005)

# Introduction

The project schedule management plan is one of the most vital documents in project planning. This document will show the timetable on how the project will be accomplished. The entire project team, project manager, sponsors, and stakeholders will rely on this schedule to know the status of the project at any given time. Since time is one of the major constraints in any project, it is imperative for the team to monitor it. Should there be a change which the team considers inevitable, it is the responsibility of the project manager to inform and get the approval of the appropriate entities.

# Schedule Management Approach

The Work Breakdown Structure of the company will be derived from the information gathered from the interview with the client and the Software Development Life Cycle that the company will be following in the development of the project. The company will use ProjectLibre and Microsoft Visio 2013 in creating its WBS.

The roles and workload of each members would be defined in the schedule that will be created from the work breakdown structure and it will be analyzed by the team and the project manager. The project team and must agree to the roles, workload, and time schedule. Once agreed, the schedule along with the WBS would be presented to the client and their approval. Once approved, the team could now formally start the project.

Below are the milestones that the team should achieve for the Project

- Completion of the Project Scope and Work Breakdown Structure

- Signing of the Project Charter

- Approved schedule and Time Table of the Project

- Approved budget allocation

- Project Initiation

- Project Planning

- Design and Development

- Testing

- Implementation

- Project Deployment

The roles and responsibilities of each member are defined as follows:

The project manager will be the one responsible in distributing the tasks to the members and budgeting all of the finances. The project manager is also responsible in creating the schedules using ProjectLibre and is the one responsible in giving the clients progress and milestone reports.

The project team should follow the schedule and the guidance of the project manager to finish the tasks properly. The team should also review and validate the schedule approved by the client as the project progresses.

# Schedule Control

The project schedule will be reviewed and updated as necessary on a weekly basis with actual start, actual finish, and completion percentages which will be provided by task owners.

The project manager is responsible for holding weekly schedule updates/reviews; determining impacts of schedule variances; submitting schedule change requests; and reporting schedule status in accordance with the project’s communications plan.

The project team is responsible for participating in weekly schedule updates/reviews; communicating any changes to actual start/finish dates to the project manager; and participating in schedule variance resolution activities as needed.

The project sponsor will maintain awareness of the project schedule status and review/approve any schedule change requests submitted by the project manager.

# Schedule Changes and Thresholds

As stated earlier, proper planning is vital to any project. However, taking everything into consideration while planning is close to impossible so there are times when an event may cause an inevitable change to the schedule of the project. If this is encountered during the project execution, the project manager will meet all of the team members. They will review and evaluate any changes and alternatives to determine how the entire project together with its results will be affected.

Since DiRe-Comm Inc. is a relatively new company, it has yet to establish a foothold in estimating its constraints. Because of this, the change threshold set by the team is 18%. This means that if the proposed change will increase or decrease the duration of the project or a milestone by 18%, it will be first submitted to the project sponsor for evaluation.

If the change is less than the threshold however, it will only be submitted to the project manager for approval. It will be then his/her responsibility to inform the project sponsors and stakeholders. Any proposed changes, approved or otherwise, will be recorded in the project’s repository.

# Scope Change

If the project team encountered an event that may push them to modify the scope, it is required that they should also evaluate the effects of these modifications to the current schedule. It will be the job of the project manager to let the project sponsor know if the schedule changed significantly and also ask for its reevaluation. It will depend on the decision of the project sponsor whether or not this request will be accepted. **Sponsor Acceptance**

Approved by the Project Sponsor:

**USEC RICARDO B. JALAD  Date: 10/28/2016**  
Administrator, Office of Civil Defense &

Executive Director, National Disaster

Risk Reduction and Management Council

**Statement of Work (SOW)**

**"E-Nodes"**

**Disaster Recovery Communications Inc. (DiRe-Comm Inc.)**

**3 Humabon Place, Magallanes Village**

**Makati City, 1232**

**11/09/2016**

**Table of Contents**

[Introduction/Background 2](#__RefHeading___Toc332473318)

[Scope of Work 2](#__RefHeading___Toc332473319)

[Period of Performance 2](#__RefHeading___Toc332473320)

[Place of Performance 3](#__RefHeading___Toc332473321)

[Work Requirements 3](#__RefHeading___Toc332473322)

[Schedule/Milestones 4](#__RefHeading___Toc332473323)

[Acceptance Criteria 5](#__RefHeading___Toc332473324)

[Other Requirements 5](#__RefHeading___Toc332473325)

# Introduction/Background

DiReComm Inc has recently developed their initial prototype – the “E-Nodes” to be presented to the Secretary of the Office of Civil Defense Mr. Ricardo Jalad and deployed in a post-disaster scenario. The main goals of this project is to to provide an improved communications platform for the rescuers and to help save more lives. The web application that consists a chat module and an offline map module included in the “E-Nodes” is simplified and user-friendly. In order for a good quality product, the DiReComm project team will test, implemet, and create a instructional video on how to use the product for its future users.

# Scope of Work

The scope of work for the Emergency Nodes Project includes all planning, execution, and implementation plan which includes an instructional video for the future users of the project. The selected vendors will be responsible for the shipping of the Raspberry Pi 3 model B, Tenda W311U+, and Sandisk 16Gb Secure Digital Card to be procured by the company. Each stage of the project will require approval from project manager and Chief Executive Officer before moving on to the next stage. The selected vendors must ensure that the products to be procured by the company is shipped timely and in good quality. Specific deliverables and milestones will be listed in the Work Requirements and Schedules and Milestones sections of this SOW.

# Period of Performance

The period of planning, analysis, design, development, testing, deployment, and implementation for the Emergency Nodes Project is one year (365 days) beginning on 4 January 2017 through 22 December 2017. All work must be scheduled to complete within this timeframe. Any modifications or extensions will be requested through DiReComm for review and discussion.

# Place of Performance

The selected vendors for the Emergency Nodes Project must deliver the products on time. The vendors will be required to meet at the DiReComm's main office at Makati City before the acquisition and shipping of the products. The company will provide meeting spaces in the main office for all the vendors along with the project sponsors and stakeholders.

# Work Requirements

As part of the Emergency Nodes Project the project team will be responsible for performing tasks throughout various stages of this project. The following is a list of these tasks which will result in the successful completion of this project:

Kickoff:

* Project team will create and present detailed project plan including schedule, WBS, testing plan, implementation plan, training plan, and transition plan
* Project team will present project plan to the Secretary of the Office of Civil Defense, Mr. Ricardo Jalad for review and approval.

Design Phase:

* The project team will work with the Office of Civil Defense to gather requirements and establish metrics
* Create site design based on collected requirements
* Present written status at weekly meeting

Build Phase:

* The project team will complete all coding for approved the Emergency Nodes web application
* Project team will provide the Office of Civil Defence with a detailed testing plan
* Project team will include all content provided by the OCD for the Emergency Nodes Project
* Project team will conduct testing in an open-area
* Project team will resolve any coding and site issues identified in testing
* Project team will compile a testing report to present to SCG for review/approval
* Present written status at weekly meeting

Implementation Phase:

* Project team will create an implementation plan for the Emergency Nodes Project
* Present written status at weekly meeting

Training Phase:

* Project team will provide an instructional video in accordance with approved training plan provided in the kickoff
* Present written status at weekly meeting

Project Handoff/Closure:

* Project team will provide the OCD with all documentation in accordance with the approved project plan
* Project team will present project closure report to the OCD for review and approval
* Project team will complete the project requirements checklist showing that all project tasks have been completed
* Present written status at weekly meeting

# Schedule/Milestones

The below list consists of the initial milestones identified for the Website Redesign Project:

RFP/SOW Release January 4, 2017

Vendors Selection Review January 25, 2017

Vendor Selection February 13, 2017

Period of Development Begins February15, 2017

Project Testing August 1, 2017

Project Testing Review August 31, 2017

Implementation Plan Creation September 1, 2017

Instructional video production September 15, 2017

Project Completion Review December 15, 2017

Project Closure/Archives Complete December 20, 2017

# Acceptance Criteria

For the Emergency Nodes Project the acceptance of all deliverables will reside with Mr. Ricardo Jalad. The project manager will maintain a small team of three advisors in order to ensure the completeness of each stage of the project and that the scope of work has been met. Once a project phase is completed and the vendor provides their report/presentation for review and approval, Mr. Ricardo Jalad will either sign off on the approval for the next phase to begin, or reply to the project team, in writing, advising what tasks must still be accomplished.

Once all project tasks have been completed, the project will enter the handoff/closure stage. During this stage of the project, the vendor will provide their project closure report and project task checklist to Mr. Ricardo Jalad the Secretary of the Office of Civil Defense. The acceptance of this documentation by the Secretary of the OCD will acknowledge acceptance of all project deliverables and that the vendor has met all assigned tasks.

Any discrepancies involving completion of project tasks or disagreement between OCD and the project team will be referred to both organizations’ contracting offices for review and discussion.

# Other Requirements

The project team members will submit security forms to OCD for clearance and access badges to the facility. The project team members will be granted access to OCD file servers and all necessary IT functions. They will also be given temporary OCD accounts which are to be used only for work pertaining to the Emergency Nodes Project. Upon completion of the project these accounts will be closed.

All programming and testing will be done in the project team's main office in Makati.

**Acceptance**

Approved by the Project Sponsor:

**USEC RICARDO B. JALAD  Date: 11/09/2016**  
Administrator, Office of Civil Defense &

Executive Director, National Disaster

Risk Reduction and Management Council

**Quality Management Plan**

**"E-Nodes"**

**Disaster Recovery Communications Inc. (DiRe-Comm Inc.)**

**3 Humabon Place, Magallanes Village**

**Makati City, 1232**

**11/18/2016**

**Table of Contents**

[Introduction 2](#__RefHeading___Toc332265121)

[Quality Management Approach 2](#__RefHeading___Toc332265122)

[Quality Requirements / Standards 3](#__RefHeading___Toc332265123)

[Quality Assurance 4](#__RefHeading___Toc332265124)

[Quality Control 5](#__RefHeading___Toc332265125)

[Quality Control Measurements 6](#__RefHeading___Toc332265126)

# Introduction

The Quality Management Plan for the Emergency Nodes project will establish the activities, processes, and procedures for ensuring a quality product upon the conclusion of the project. The purpose of this plan is to:

* Ensure quality is planned
* Define project metrics
* Define how quality will be managed
* Define quality assurance activities
* Define quality control activities
* Define acceptable quality standards

# Quality Management Approach

The quality management approach for the ENodes project will ensure quality is planned for both the software and network. In order to be successful, this project will meet its quality objectives by utilizing an integrated quality approach to define quality standards, measure quality and continuously improve quality.

Product quality for the ENodes project will be defined by the company’s current standards and define the product metrics set by the project team. The focus is on the project’s deliverable and the standards and criteria being used will ensure the product meets established quality standards and customer satisfaction.

Process quality for the ENodes project will focus on the processes by which the project deliverable will be manufactured. Establishing process quality standards will ensure that all activities conform to an organizational standard which results in the successful delivery of the product.

The project team will work with the Quality Group to define and document all organizational and project specific quality standards for both product and processes. All quality documentation will become part of the ENodes Project Plan and will be transitioned to operations upon the successful completion of the project.

Metrics will be established and used to measure quality throughout the project life cycle for the product and processes. The Project Manager along with the help of the Software Systems Engineers and Network Engineers will be responsible for defining these metrics, conduct measurements, and analyze results. These product and process measurements will be used as one criterion in determining the success of the project and must be reviewed by the project sponsor. Metrics will include:

* Schedule
* Resources
* Cost
* Network performance
  + Mesh Range
  + Access Point Range
  + Throughput
  + Latency
  + Packet Delay Variation
  + Error Rate
* Software performance

Quality improvements will be identified by any member of the project team. Each recommendation will be reviewed to determine the cost versus benefit of implementing the improvement and how the improvement will impact the product or processes. If an improvement is implemented the project manager will update all project documentation to include the improvement and the quality manager will update the organizational documentation the improvement affects.

# Quality Requirements / Standards

***Product Quality:***

The product quality standards and requirements will be determined by the project team and will be reviewed by the project manager. These standards will primarily be based on the company’s documented standards for the coding practices, Wi-Fi dongle, and Raspberry pi. There may be product-specific quality standards identified that are not currently part of the documented organizational standards. In this case, the project manager will review these newly identified standards and incorporate them into organizational documentation if approved. The project team will also document any newly identified quality standards into the ENodes project plan and ensure communication with all stakeholders.

***Process Quality:***

The process quality standards and requirements will be determined by the project team and project manager. Many of these standards will be based on existing company process standards. However, it is anticipated that there will be several unique steps in developing of the ENodes project which will require new quality standards. The ENodes project team will work with the project manager to establish acceptable standards and document these standards for incorporation into both organizational process documents as well as the ENodes project plan. These standards will be communicated to all project stakeholders.

As the test plan are created, the project metrics will be defined, measured, and analyzed to determine the quality of the system. Once the ENodes project meets the standards set by the company and passed all the necessary tests, the team will achieve the process compliance for the ENodes project.

# Quality Assurance

The quality assurance of the ENodes Project focuses on the processes used in the manufacturing of the ENodes product. In order to ensure quality, an iterative quality process will be used throughout the project life cycle. This iterative process includes measuring process metrics, analyzing process data, and continuously improving the processes.

The ENodes Project Manager and the project team will perform assessments at planned intervals throughout the project to ensure all processes are being correctly implemented and executed. Key performance metrics for the manufacturing of the ENodes product include a Raspberry 3 model B and a Tenda W311U+ Wi-Fi dongle. The established project tolerances for these metrics are the organizational standards for all other cable products. The table below provides the key quality assurance metrics for the ENodes Project.

|  |  |  |
| --- | --- | --- |
| **Item to test** | **Pass** | **Fail** |
| Mesh Range | >120m radius maximum effective range  >150m radius maximum range | <120m radius maximum effective range  <150m radius maximum range |
| AP Range | >120m radius maximum effective range  >150m radius maximum range | <120m radius maximum effective range  <150m radius maximum range |
| Throughput | <120kbps at effective range | >120kbps at effective range |
| Latency | <600ms at effective range | >600ms at effective range |
| PDV | <300ms at effective range | >300ms at effective range |

The quality manager will provide day to day quality management and conduct process audits on a weekly basis, monitor process performance metrics, and assure all processes comply with project and organizational standards. If discrepancies are found, the Project Team will meet with the Project Manager and review the identified discrepancies.

The Project Manager will schedule regularly occurring project, management, and document reviews. In these reviews, an agenda item will include a review of project processes, any discrepancies and/or audit findings from the quality manager, and a discussion on process improvement initiatives.

Process improvement is another aspect of quality assurance. Quality assurance reviews, findings, and assessments should always result in some form of process improvement and, as a result, product improvement. All process improvement efforts must be documented, implemented, and communicated to all stakeholders as changes are made.

# Quality Control

The quality control of the ENodes project focuses primarily on the ENodes project and the acceptable standards and performance set by the International Organization for Standardization. The quality performance standards for the ENodes Project are in accordance with the organizational standards of performance of in this project. However, there are several project-specific quality standards which were established specifically for the ENodes Project. Performance testing, Stress testing, Unit testing, and Integration testing will be performed by the project team. The table below illustrates all performance and physical quality standards for the ENodes Project:

Performance Testing

|  |  |  |
| --- | --- | --- |
| **Item to test** | **Pass** | **Fail** |
| Mesh Range | >120m radius maximum effective range  >150m radius maximum range | <120m radius maximum effective range  <150m radius maximum range |
| AP Range | >120m radius maximum effective range  >150m radius maximum range | <120m radius maximum effective range  <150m radius maximum range |
| Throughput | <120kbps at effective range | >120kbps at effective range |
| Latency | <600ms at effective range | >600ms at effective range |
| PDV | <300ms at effective range | >300ms at effective range |

Stress Testing

|  |  |  |
| --- | --- | --- |
| **Item to Test** | **Pass** | **Fail** |
| Access Point Concurrent Devices | Maximum concurrent users is at least 8 per node | Maximum concurrent users does not reach at least eight devices per node. |
| Mesh Network Load | The connection between nodes did not terminate at any point of the test. | The connection between nodes terminated at any point of the test. |

Unit Testing

|  |  |  |
| --- | --- | --- |
| **Item to Test** | **Pass** | **Fail** |
| Access Point Concurrent Devices | Maximum concurrent users is at least 8 per node | Maximum concurrent users does not reach at least eight devices per node. |
| Mesh Network Load | The connection between nodes did not terminate at any point of the test. | The connection between nodes terminated at any point of the test. |

Integration Testing

|  |  |  |
| --- | --- | --- |
| **Item to test** | **START** | **END** |
| Integration of all units in Section 4.2 | All individual units should have passed their respective criteria before proceeding to this test | All units work as specified in Section 4.4 |
| Apache Cassandra’s integration with Raspberry Pi | Raspberry Pi is running properly complete with OS and necessary software packages | Cassandra DB is working in Raspberry Pi |
| Cassandra’s integration with the Chat Application | Cassandra DB and Chat Application are both hosted in the Raspberry Pi | Chat Application can access &  update the DB |
| Map service’s integration with Raspberry Pi | Raspberry Pi is running properly complete with OS and necessary software packages | Map Service is hosted in the Raspberry Pi |
| Map service’s integration with Cassandra DB | Map Service and Cassandra DB are hosted in the Raspberry Pi | Map properties can be stored in Cassandra DB |
| Bulletin Board’s integration with Cassandra | Bulletin Board and Cassandra DB are hosted in the Raspberry Pi | Bulletin Board can access and update the DB |

The project team will perform all the test indicated to check the effective range of the network and access points. The characterization group will perform attenuation testing and will provide the results back to the project team within 3 business days after the test sample is submitted. The project team will ensure the software and network standard would be properly met, perform audits and analysis, and provide a documentation related to the quality of the product

The Project Manager will schedule regularly occurring project, management, and document reviews. In these reviews, an agenda item will include a review of products, any discrepancies and/or audit findings from the quality manager, and a discussion on product improvement initiatives.

It is imperative to the success of the project that all of the established physical and performance standards are met. By doing so, the ENodes Project Team will ensure that the product achieves the high level of customer satisfaction anticipated and that future operational cable production will be in line with budget and resource allocations.

# Quality Control Measurements

The ENodes Project processes must be measured and fall within the established standards and tolerances. The below logs will be used by the project and quality teams in conducting these measurements and will be maintained for use as supporting documentation for the project’s acceptance.

***Quality Assurance Log***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Trial # | Date | Process Measured | Required Value | Actual Measured | Acceptable? (Y/N) | Recommendation | Date Resolved |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

***Quality Control Log***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cable # | Date | Item Measured | Required Value | Actual Measured | Acceptable? (Y/N) | Recommendation | Date Resolved |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

**Sponsor Acceptance**

Approved by the Project Sponsor:

**USEC RICARDO B. JALAD  Date: 11/18/2016**  
Administrator, Office of Civil Defense &

Executive Director, National Disaster

Risk Reduction and Management Council

**Human Resource Plan**

**"E-Nodes"**

**Disaster Recovery Communications Inc. (DiRe-Comm Inc.)**

**3 Humabon Place, Magallanes Village**

**Makati City, 1232**

**11/18/2016**

**Table of Contents**

[Introduction 2](#__RefHeading___Toc332206932)

[Roles and Responsibilities 2](#__RefHeading___Toc332206933)

[Project Organizational Charts 3](#__RefHeading___Toc332206934)

[Staffing Management 4](#__RefHeading___Toc332206935)

# Introduction

Human resources management is an important part of the Emergency Nodes Project. The human resources management plan is a tool which will aid in the management of this project’s human resource activities throughout the project until closure. The human resources management plan includes:

* Roles and responsibilities of team members throughout the project
* Project organization charts
* Staffing management plan to include:

How resources will be acquired

Timeline for resources/skill sets

Training required to develop skills

How performance reviews will be conducted

Recognition and rewards system

The purpose of the human resources management plan is to achieve project success by ensuring the appropriate human resources are acquired with the necessary skills, resources are trained if any gaps in skills are identified, team building strategies are clearly defines, and team activities are effectively managed.

# Roles and Responsibilities

The roles and responsibilities for the Emergency Nodes Project are essential to project success. All team members must clearly understand their roles and responsibilities in order to successfully perform their portion of the project. For the Emergency Nodes Project the following project team roles and responsibilities have been established:

**Project Manager (PM), (1 position):** responsible for the overall success of the Emergency Nodes Project. The PM must authorize and approve all project expenditures. The PM is also responsible for approving that work activities meet established acceptability criteria and fall within acceptable variances. The PM will be responsible for reporting project status to the Office of Civil Defense. The PM will evaluate the performance of all project team members. The PM must possess the following skills: leadership/management, budgeting, scheduling, and effective communication.

**Software System Engineer (SSE), (2 positions):** responsible for gathering coding requirements for the Emergency Nodes Project. The Es are responsible for all analysis, design, coding, and testing of the Emergency Nodes project. The SSEs along with the NEs will be the ones responsible the in the deployment and implementation of this project in a disaster stricken area. The SSEs will be responsible for timely status reporting to the PM as required by the communications management plan. The SSEs may not authorize any project expenditures nor allocate any resources without PM approval. SSEs tasks and performance will be managed by the PM. SSEs must be proficient in programming html, php, and ajax, must have a minimum working knowledge in a php framework, and must be knowledgeable in cassandra nosql database.

**Network Engineer (NE), (2 positions):** responsible for configuring and initiating the database of the Emergency Nodes Project. The NEs are responsible for all the network designand implementations of different networking protocols of the project. The Nes along with the DEs will be the ones responsible the in the deployment and implementation of this project in a disaster stricken area. The NEs will be responsible for timely status reporting to the PM as required by the communications management plan. The NEs may not authorize any project expenditures nor allocate any resources without PM approval. NE’s performance will be managed by the PM. NEs must posses a certificate in networking and a basic knowledge in programming.

**Finance Officer(FO), (1 position):** The FO is responsible for reviewing and auditing the budget to be approved by th.e project manager The FO is responsible for working with the Des and NEs to ensure all coding and networking on the project conforms with needs of the Office of the Civil Defence. The FO must have a basic knowledge in book keeping and auditing or a graduate of accountancy.

# Project Organizational Charts

The following RACI chart shows the relationship between project tasks and team members. Any proposed changes to project responsibilities must be reviewed and approved by the project manager. Changes will be proposed in accordance with the project’s change control process. As changes are made all project documents will be updated and redistributed accordingly.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Project Manager | Software System Engineers | Network Engineer | Finance Officer |
| Requirements Gathering | A | R | R | C |
| Coding Design | A | R | C |  |
| Coding Input | A | R |  |  |
| Software Testing | A | R | C |  |
| Network Preparation | A | C | R |  |
| Implementation | A | C | R | C |
| Conduct Training | A |  |  | R |
| Budget Auditing | A |  |  | R |

Key:

R – Responsible for completing the work

A – Accountable for ensuring task completion/sign off

C – Consulted before any decisions are made

I – Informed of when an action/decision has been made

# Staffing Management

**Staff Acquisition:**

For the Emergency Nodes Project staff will consist two SSEs, two NEs, and one FO . There will be no outsourcing/contracting performed within the scope of this project. The Project Manager is responsible in updating the status of the project to the Office of Civil Defense and the one responsible in communicating with the whole team. All resources must be first audited by the finance officer and be approved by the project manager before the resource may begin any project work. The project team will not be co-located for this project and all resources will remain in their current workspace.

**Resource Calendars:**

The Software Upgrade Project will last for 42 weeks. All resources are required before the project can begin. The resource histogram below illustrates that design engineers are required to perform a minimum of 40 hours per week per engineer for throughout the development of the project. The finance officer will only work 8 hours a month to keep track of the expenditures and auditing of the books.

**Training:**

There is currently no training scheduled with regards to the Emergency Nodes Project since the organization has adequate staff with required skill sets. However, if training requirements are identified, funding will be provided from the project reserve.

**Performance Reviews:**

The project manager will review each team member’s assigned work activities at the onset of the project and communicate all expectations of work to be performed. The project manager will then evaluate each team member throughout the project to evaluate their performance and how effectively they are completing their assigned work. Prior to releasing project resources, the project manager will meet with the appropriate functional manager and provide feedback on employee project performance.

**Recognition and Rewards:**

Although the scope of this project does not allow for ample time to provide cross-training or potential for monetary rewards there are several planned recognition and reward items for project team members.

* Upon successful completion of the Emergency Node Project, an out of town party will be held to celebrate the success of each team member with the team members’ families present.

# Sponsor Acceptance

Approved by the Project Sponsor:

**USEC RICARDO B. JALAD  Date: 11/18/2016**  
Administrator, Office of Civil Defense &

Executive Director, National Disaster

Risk Reduction and Management Council

**Communications Management Plan**

**"E-Nodes"**

**Disaster Recovery Communications Inc. (DiRe-Comm Inc.)**

**3 Humabon Place, Magallanes Village**

**Makati City, 1232**

**11/25/16**

**Table of Contents**

[Introduction 2](#__RefHeading___Toc339366622)

[Communications Management Approach 2](#__RefHeading___Toc339366623)

[Communications Management Constraints 3](#__RefHeading___Toc339366624)

[Stakeholder Communication Requirements 3](#__RefHeading___Toc339366625)

[Roles 4](#__RefHeading___Toc339366626)

[Project Team Directory 6](#__RefHeading___Toc339366627)

[Communication Methods and Technologies 6](#__RefHeading___Toc339366628)

[Communications Matrix 8](#__RefHeading___Toc339366629)

[Communication Flowchart 9](#__RefHeading___Toc339366630)

[Guidelines for Meetings 9](#__RefHeading___Toc339366631)

[Communication Standards 10](#__RefHeading___Toc339366632)

[Communication Escalation Process 11](#__RefHeading___Toc339366633)

[Glossary of Communication Terminology 12](#__RefHeading___Toc339366634)

# Introduction

This Communications Management Plan sets the communications framework for this project. It will serve as a guide for communications throughout the life of the project and will be updated as communication needs change. This plan identifies and defines the roles of persons involved in this project. It also includes a communications matrix which maps the communication requirements of this project. An in-depth guide for conducting meetings details both the communications rules and how the meetings will be conducted, ensuring successful meetings. A project team directory is included to provide contact information for all stakeholders directly involved in the project.

# Communications Management Approach

The Project Manager will take a proactive role in ensuring effective communications on this project. The communications requirements are documented in the Communications Matrix presented in this document. The Communications Matrix will be used as the guide for what information to communicate, who is to do the communicating, when to communicate it and to whom to communicate.

As with most project plans, updates or changes may be required as the project progresses or changes are approved. Changes or updates may be required due to changes in personnel, scope, budget, or other reasons. Additionally, updates may be required as the project matures and additional requirements are needed. The project manager is responsible for managing all proposed and approved changes to the communications management plan. Once the change is approved, the project manager will update the plan and supporting documentation and will distribute the updates to the project team and all stakeholders. This methodology is consistent with the project’s Change Management Plan and ensures that all project stakeholders remain aware and informed of any changes to communications management.

# Communications Management Constraints

All project communication activities will occur within the project’s approved budget, schedule, and resource allocations. The project manager is responsible for ensuring that communication activities are performed by the project team and without external resources which will result in exceeding the authorized budget. Communication activities will occur in accordance with the frequencies detailed in the Communication Matrix in order to ensure the project adheres to schedule constraints. Any deviation of these timelines may result in excessive costs or schedule delays and must be approved by the project sponsor.

DiRe-Comm Inc organizational policy states that where applicable, standardized formats and templates must be used for all formal project communications. The details of these policy requirements are provided in the section titled “Standardization of Communication” in this document.

DiRe-Comm Inc organizational policy also states that the Chief Technology Officer or higher level employee may authorize the distribution of confidential information. The project manager is responsible for ensuring that approval is requested and obtained prior to the distribution of any confidential information regarding this project.

# Stakeholder Communication Requirements

As part of identifying all project stakeholders, the project manager will communicate with each stakeholder in order to determine their preferred frequency and method of communication. This feedback will be maintained by the project manager in the project’s Stakeholder Register. Standard project communications will occur in accordance with the Communication Matrix; however, depending on the identified stakeholder communication requirements, individual communication is acceptable and within the constraints outlined for this project.

In addition to identifying communication preferences, stakeholder communication requirements must identify the project’s communication channels and ensure that stakeholders have access to these channels. If project information is communicated via secure means or through internal company resources, all stakeholders, internal and external, must have the necessary access to receive project communications.

Once all stakeholders have been identified and communication requirements are established, the project team will maintain this information in the project’s Stakeholder Register and use this, along with the project communication matrix as the basis for all communications.

# Roles

**Project Sponsor**

The project sponsor is the champion of the project and has authorized the project by signing the project charter. This person is responsible for the funding of the project and is ultimately responsible for its success. Since the Project Sponsor is at the executive level communications should be presented in summary format unless the Project Sponsor requests more detailed communications.

**Project Manager**

The Project Manager has overall responsibility for the execution of the project. The Project Manager manages day to day resources, provides project guidance and monitors and reports on the projects metrics as defined in the Project Management Plan. As the person responsible for the execution of the project, the Project Manager is the primary communicator for the project distributing information according to this Communications Management Plan.

**Project Team**

The Project Team is comprised of all persons who have a role performing work on the project. The project team needs to have a clear understanding of the work to be completed and the framework in which the project is to be executed. Since the Project Team is responsible for completing the work for the project they played a key role in creating the Project Plan including defining its schedule and work packages. The Project Team requires a detailed level of communications which is achieved through day to day interactions with the Project Manager and other team members along with weekly team meetings.

# Project Team Directory

The following table presents contact information for all persons identified in this communications management plan. The email addresses and phone numbers in this table will be used to communicate with these people.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role** | **Name** | **Title** | **Organization/ Department** | **Email** | **Phone** |
| **Project Sponsor** | R. Jalad | VP of Technology | IT | VGaz[@gmail.com](mailto:a.white@abc.com) | (0999)4565 766 |
| **Project Manager** | T. Tonoike | Project Manager | PMO | tstonoike@student.apc.edu.[.com](mailto:c.black@abc.com) | (0927)167-0580 |

# Communication Methods and Technologies

The project team will determine, in accordance with DiRe-Comm Inc organizational policy, the communication methods and technologies based on several factors to include: stakeholder communication requirements, available technologies (internal and external), and organizational policies and standards.

DiReComm Inc maintains a GitHub platform within the PMO which all projects use to provide updates, archive various reports, and conduct project communications. This platform enables senior management, as well as stakeholders with compatible technology, to access project data and communications at any point in time. GitHub also provides the ability for stakeholders and project team members to collaborate on project work and communication.

For stakeholders who do not have the ability to access SharePoint, a web site will also be established for the project. Access to the website will be controlled with a username and password. Any stakeholders identified who are not able to access SharePoint will be issued a unique username and password in order to access the web site. The project manager is responsible for ensuring all project communications and documentation are copied to the web site and that the content mirrors what is contained on the SharePoint platform.

DiReComm Inc maintains software licenses for Microsoft Visual Studio and Microsoft Office software. All project teams are responsible for developing, maintaining, and communicating schedules using this software. Gantt Charts are the preferred format for communicating schedules to stakeholders. The project schedule will be maintained on both the GitHub platform and the project website.

All project communication and documentation, in addition to being maintained on the GitHub platform and project website, will be archived on the internal DiReComm Inc shared drive which resides in the PMO program directory. Organizational naming conventions for files and folder will be applied to all archived work.

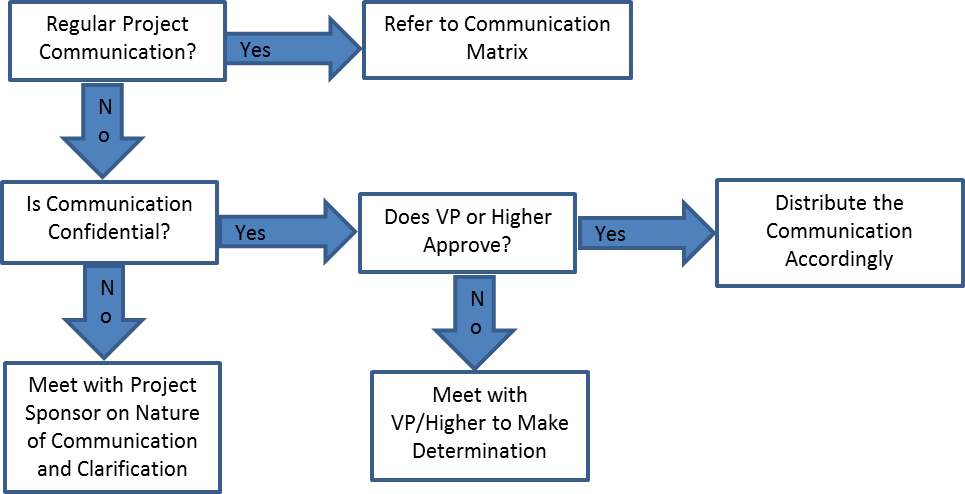
# Communications Matrix

The following table identifies the communications requirements for this project.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Communication Type** | **Objective of Communication** | **Medium** | **Frequency** | **Audience** | **Owner** | **Deliverable** | **Format** |
| Kickoff Meeting | Introduce the project team and the project. Review project objectives and management approach. | * Face to Face | Once | * Project Sponsor * Project Team * Stakeholders | Project Manager | * Agenda * Meeting Minutes | * Soft copy archived on project GitHub site and project web site |
| Project Team Meetings | Review status of the project with the team. | * Face to Face * Conference Call | Weekly | * Project Team | Project Manager | * Agenda * Meeting Minutes * Project schedule | * Soft copy archived on project GitHub site and project web site |
| Technical Design Meetings | Discuss and develop technical design solutions for the project. | * Face to Face | As Needed | * Project Team | Technical Lead | * Agenda * Meeting Minutes | * Soft copy archived on project GitHub site and project web site |
| Monthly Project Status Meetings | Report on the status of the project to management. | * Face to Face * Conference Call | Monthly | * Project Manager * Project Sponsor | Project Manager | * Slide updates * Project schedule | * Soft copy archived on project GitHub site and project web site |
| Project Status Reports | Report the status of the project including activities, progress, costs and issues. | * Email | Monthly | * Project Sponsor * Project Team * PMO | Project Manager | * Project Status Report * Project schedule | * Soft copy archived on project GitHub site and project web site |

# Communication Flowchart

The communication flowchart below was created to aid in project communication. This flowchart provides a framework for the project team to follow for this project. However, there may be occasions or situations which fall outside of the communication flowchart where additional clarification is necessary. In these situations the Project Manager is responsible for discussing the communication with the Project Sponsor and making a determination on how to proceed.



# Guidelines for Meetings

**Meeting Agenda**

Meeting Agenda will be distributed 5 business days in advance of the meeting. The Agenda should identify the presenter for each topic along with a time limit for that topic. The first item in the agenda should be a review of action items from the previous meeting.

**Meeting Minutes**

Meeting minutes will be distributed within 2 business days following the meeting. Meeting minutes will include the status of all items from the agenda along with new action items and the Parking Lot list.

**Action Items**

Action Items are recorded in both the meeting agenda and minutes. Action items will include both the action item along with the owner of the action item. Meetings will start with a review of the status of all action items from previous meetings and end with a review of all new action items resulting from the meeting. The review of the new action items will include identifying the owner for each action item.

**Meeting Chair Person**

The Chair Person is responsible for distributing the meeting agenda, facilitating the meeting and distributing the meeting minutes. The Chair Person will ensure that the meeting starts and ends on time and that all presenters adhere to their allocated time frames.

**Note Taker**

The Note Taker is responsible for documenting the status of all meeting items, maintaining a Parking Lot item list and taking notes of anything else of importance during the meeting. The Note Taker will give a copy of their notes to the Chair Person at the end of the meeting as the Chair Person will use the notes to create the Meeting Minutes.

**Time Keeper**

The Time Keeper is responsible for helping the facilitator adhere to the time limits set in the meeting agenda. The Time Keeper will let the presenter know when they are approaching the end of their allocated time. Typically a quick hand signal to the presenter indicating how many minutes remain for the topic is sufficient.

**Parking Lot**

The Parking Lot is a tool used by the facilitator to record and defer items which aren’t on the meeting agenda; however, merit further discussion at a later time or through another forum.

A parking lot record should identify an owner for the item as that person will be responsible for ensuring follow-up. The Parking Lot list is to be included in the meeting minutes.

# Communication Standards

For this project, DiReComm Inc will utilize standard organizational formats and templates for all formal project communications. Formal project communications are detailed in the project’s communication matrix and include:

Kickoff Meeting – project team will utilize DiReComm Inc standard templates for meeting agenda and meeting minutes. Additionally, any slides presented will use the DiReComm Inc standard slideshow template.

Project Team Meetings – project team will utilize DiReComm Inc standard templates for meeting agenda and meeting minutes. Additionally, any slides presented will use the DiReComm Inc standard slideshow template.

Technical Design Meetings - project team will utilize DiReComm Inc standard templates for meeting agenda and meeting minutes. Additionally, any slides presented will use the DiReComm Inc standard slideshow template.

Monthly Project Status Meetings - project team will utilize DiReComm Inc standard templates for meeting agenda and meeting minutes. Additionally, any slides presented will use the DiReComm Inc standard slideshow template.

Project Status Reports – project team will utilize DiReComm Inc standard templates for meeting agenda and meeting minutes. Additionally the standard project status report document, available on the share drive, will be used to provide project status.

Informal project communications should be professional and effective but there is no standard template or format that must be used.

# Communication Escalation Process

Efficient and timely communication is the key to successful project completion. As such, it is imperative that any disputes, conflicts, or discrepancies regarding project communications are resolved in a way that is conducive to maintaining the project schedule, ensuring the correct communications are distributed, and preventing any ongoing difficulties. In order to ensure projects stay on schedule and issues are resolved, DiReComm Inc will use its standard escalation model to provide a framework for escalating communication issues. The table below defines the priority levels, decision authorities, and timeframes for resolution.

|  |  |  |  |
| --- | --- | --- | --- |
| **Priority** | **Definition** | **Decision Authority** | **Timeframe for Resolution** |
| Priority 1 | Major impact to project or business operations. If not resolved quickly there will be a significant adverse impact to revenue and/or schedule. | Vice President or higher | Within 4 hours |
| Priority 2 | Medium impact to project or business operations which may result in some adverse impact to revenue and/or schedule. | Project Sponsor | Within one business day |
| Priority 3 | Slight impact which may cause some minor scheduling difficulties with the project but no impact to business operations or revenue. | Project Manager | Within two business days |
| Priority 4 | Insignificant impact to project but there may be a better solution. | Project Manager | Work continues and any recommendations are submitted via the project change control process |

\*\* NOTE: Any communication including sensitive and/or confidential information will require escalation to VP level or higher for approval prior to external distribution.

# Glossary of Communication Terminology

|  |  |
| --- | --- |
| Term | Definition |
| Communication | The effective sending and receiving of information. Ideally, the information received should match the information sent. It is the responsibility of the sender to ensure this takes place. |
| Stakeholder | Individuals or groups involved in the project or whose interests may be affected by the project’s execution or outcome. |
| Communications Management Plan | Portion of the overall Project Management Plan which details how project communications will be conducted, who will participate in communications, frequency of communications, and methods of communications. |
| Escalation | The process which details how conflicts and issues will be passed up the management chain for resolution as well as the timeframe to achieve resolution. |
|  |  |

Sponsor Acceptance

Approved by the Project Sponsor:

**USEC RICARDO B. JALAD  Date: 11/25/2016**  
Administrator, Office of Civil Defense &

Executive Director, National Disaster

Risk Reduction and Management Council

**Procurement Management Plan**

**"E-Nodes"**

**Disaster Recovery Communications Inc. (DiRe-Comm Inc.)**

**3 Humabon Place, Magallanes Village**

**Makati City, 1232**

**11/25/16**

**Table of Contents**

[Introduction 3](#__RefHeading___Toc341074639)

[Procurement Management Approach 3](#__RefHeading___Toc341074640)

[Procurement Definition 4](#__RefHeading___Toc341074641)

[Type of Contract to be Used 4](#__RefHeading___Toc341074642)

[Procurement Risks 5](#__RefHeading___Toc341074643)

[Procurement Risk Management 5](#__RefHeading___Toc341074644)

[Cost Determination 6](#__RefHeading___Toc341074645)

[Standardized Procurement Documentation 6](#__RefHeading___Toc341074646)

[Procurement Constraints 7](#__RefHeading___Toc341074647)

[Contract Approval Process 8](#__RefHeading___Toc341074648)

[Decision Criteria 9](#__RefHeading___Toc341074649)

[Vendor Management 9](#__RefHeading___Toc341074650)

[Performance Metrics for Procurement Activities 9](#__RefHeading___Toc341074651)

[Sponsor Acceptance 11](#__RefHeading___Toc341074652)

# Introduction

This Procurement Management Plan sets the procurement framework for this project. It will serve as a guide for managing procurement throughout the life of the project and will be updated as acquisition needs change. This plan identifies and defines the items to be procured, the types of contracts to be used in support of this project, the contract approval process, and decision criteria. The importance of coordinating procurement activities, establishing firm contract deliverables, and metrics in measuring procurement activities is included. Other items included in the procurement management plan include: procurement risks and procurement risk management considerations; how costs will be determined; how standard procurement documentation will be used; and procurement constraints.

# Procurement Management Approach

The Project Manager will provide oversight and management for all procurement activities under this project. The Project Manager will work with the project team to identify all items to be procured for the successful completion of the project. The Project Manager and the Finance Officer will then review the procurement list prior to submitting it to the contracts and purchasing department. The contracts and purchasing department will review the procurement items, determine whether it is advantageous to make or buy the items, and begin the vendor selection, purchasing and the contracting process.

# Procurement Definition

The following procurement items and/or services have been determined to be essential for project completion and success. The following list of items/services, justification, and timeline will be reviewed by the FO before submission to the to the distributors:

|  |  |  |
| --- | --- | --- |
| Item/Service | Justification | Needed By |
| Raspberry Pi 3 modelB | The current model of the raspberry pi is needed by the project team since this would serve as the main device of the software | 14 May 2016 |
| Tenda W311U+ | This Wi-Fi dongle will be used in as the access point for the mobile phones to connect to. | 14 May 2016 |
| Sandisk 16gb SD Card | This secured digital card will be used to store the files and where the operating system will be installed | 14 May 2016 |

In addition to the above list of procurement items, the following individuals are authorized to approve purchases for the project team:

**Name** **Role**

Tomio Tonoike Project Manager

Allen Rodri Ellana Finance Officer

# Type of Contract to be Used

All items and services to be procured for this project will be solicited under firm-fixed price contracts. The project team will work with the contracts and purchasing department to define the item types, quantities, services and required delivery dates. The contracts and purchasing department will then solicit bids from various vendors in order to procure the items within the required time frame and at a reasonable cost under the firm fixed price contract once the vendor is selected. This contract will be awarded with only one year.

# Procurement Risks

All procurement activities carry some potential for risk which must be managed to ensure project success. While all risks will be managed in accordance with the project’s risk management plan, there are specific risks which pertain specifically to procurement which must be considered:

* Shipping delays of the Raspberry Pi
* No official distributor of the Raspberry Pi in the Philippines
* Availability of the Tenda W311U+ in Metro Manila
* Availability of a Class 10 Sandisk 16Gb Secure Digital Card

These risks are not all-inclusive and the standard risk management process of identifying, documenting, analyzing, mitigating, and managing risks will be used.

# Procurement Risk Management

As previously stated, project risks will be managed in accordance with the project’s risk management plan. However, for risks related specifically to procurement, there must be additional consideration and involvement. Project procurement efforts involve external organizations and potentially affect current and future business relationships as well as internal supply chain and vendor management operations. Because of the sensitivity of these relationships and operations the project team will include the project sponsor and a designated representative from the contracting department in all project meetings and status reviews.

Additionally, any decisions regarding procurement actions must be approved by the project sponsor or, in his absence, the Project Manager or the Finance Officer before implementation. Any issues concerning procurement actions or any newly identified risks will immediately be communicated to the project’s contracting department point of contact as well as the project sponsor.

# Cost Determination

For this project we will issue a Request for Proposal (RFP) in order to solicit proposals from various vendors which describe how they will meet our requirements and the cost of doing so. All proposals will include vendor support for the Raspberry Pi 3 Model B, Tenda W311U+ Wi-Fi dongle, and Sandisk 16Gb SD Card as well as the base and out-year costs. The vendors will outline how the work will be accomplished, who will perform the work, vendors’ experience in providing these goods, customer testimonials, backgrounds and resumes of employees performing the work, and a line-item breakdown of all costs involved. Additionally, the vendors will be required to submit work breakdown structures (WBSs) and work schedules to show their understanding of the work to be performed and their ability to meet the project schedule.

All information must be included in each proposal as the proposals will be used as the foundation of our selection criteria. Proposals which omit solicited information or contain incomplete information will be discarded from consideration.

# Standardized Procurement Documentation

The procurement management process consists of many steps as well as ongoing management of all procurement activities and contracts. In this dynamic and sensitive environment, our goal must be to simplify procurement management by all necessary means in order to facilitate successful completion of our contracts and project. To aid in simplifying these tasks, we will use standard documentation for all steps of the procurement management process. These standard documents have been developed and revised over a period of many years in an effort to continually improve procurement efforts. They provide adequate levels of detail which allows for easier comparison of proposals, more accurate pricing, more detailed responses, and more effective management of contracts and vendors.

The PMO maintains a repository on the company’s shared drive which contains standard project management and procurement documentation that will be used for this project. The following standard documents will be used for project procurement activities:

* Standard Request for Proposal Template to include

Background

Proposal process and timelines

Proposal guidelines

Proposal formats and media

Source selection criteria

Pricing forms

Statement of work

Terms and Conditions

* Internal source selection evaluation forms
* Non-disclosure agreement
* Letter of intent
* Firm fixed price contract
* Procurement audit form
* Procurement performance evaluation form
* Lessons learned form

# Procurement Constraints

There are several constraints that must be considered as part of the project’s procurement management plan. These constraints will be included in the RFP and communicated to all vendors in order to determine their ability to operate within these constraints. These constraints apply to several areas which include schedule, cost, scope, resources, and technology:

Schedule:

* Project schedule is not flexible and the procurement activities, contract administration, and contract fulfillment must be completed within the established project schedule.

Cost:

* Project budget has contingency and management reserves built in; however, these reserves may not be applied to procurement activities. Reserves are only to be used in the event of an approved change in project scope or at management’s discretion.

Scope:

* All procurement activities and contract awards must support the approved project scope statement. Any procurement activities or contract awards which specify work which is not in direct support of the project’s scope statement will be considered out of scope and disapproved.

Resources:

* All procurement activities must be performed and managed with current personnel. No additional personnel will be hired or re-allocated to support the procurement activities on this project.

Technology:

* Parts specifications have already been determined and will be included in the statement of work as part of the RFP. While proposals may include suggested alternative material or manufacturing processes, parts specifications must match those provided in the statement of work exactly.

# Contract Approval Process

The first step in the contract approval process is to determine what items or services will require procurement from outside vendors. This will be determined by conducting a cost analysis on products or services which can be provided internally and compared with purchase prices from vendors. Once cost analyses are complete and the list of items and services to be procured externally is finalized, the purchasing and contracts department will send out solicitations to outside vendors. Once solicitations are complete and proposals have been received by all vendors the approval process begins. The first step of this process is to conduct a review of all vendor proposals to determine which meet the criteria established by the project team and the purchasing and contracts department. Purchases less than 100,000Php only require the approval of the Project Manager; whereas, purchases greater than 500,000Php must be approved by the whole project team including the Finance Officer. For these larger purchases the contract review board will meet to determine which contract will be accepted. The Contract Review Board consists of representatives from the project team, project manager and finance officer.

# Decision Criteria

The criteria for the selection and award of procurement contracts under this project will be based on the following decision criteria:

* Ability of the vendor to provide all items by the required delivery date
* Quality
* Cost
* Expected delivery date
* Comparison of outsourced cost versus in-sourcing
* Past performance

These criteria will be measured by the contracts review board and/or the Project Manager. The ultimate decision will be made based on these criteria as well as available resources.

# Vendor Management

The Project Manager is ultimately responsible for managing vendors. In order to ensure the timely delivery and high quality of products from vendors the Project Manager, or his/her designee will meet weekly with the contract and purchasing department and each vendor to discuss the progress for each procured item. The meetings can be in person or by teleconference. The purpose of these meetings will be to review all documented specifications for each product as well as to review the quality test findings. This forum will provide an opportunity to review each item’s development or the service provided in order to ensure it complies with the requirements established in the project specifications. It also serves as an opportunity to ask questions or modify contracts or requirements ahead of time in order to prevent delays in delivery and schedule. The Project Manager will be responsible for scheduling this meeting on a weekly basis until all items are delivered and are determined to be acceptable.

# Performance Metrics for Procurement Activities

While the purchasing and contracts department has their own internal metrics for procurement, the following metrics are established for vendor performance for this project’s procurement activities. Each metric is rated on a 1-3 scale as indicated below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Vendor | Product Quality | On Time Delivery | Documentation Quality | Development Costs | Development Time | Cost per Unit | Transactional Efficiency |
| Amazon |  |  |  |  |  |  |  |
| Asianic |  |  |  |  |  |  |  |
| PC Express |  |  |  |  |  |  |  |

1 – Unsatisfactory

2 – Acceptable

3 - Exceptional

In addition to rating each vendor, actual values will be noted in order to build a past-performance data base for selecting vendors for future procurement activities.

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