

IT8x10: Assignment 2

Civil Defence Notification Project Requirements Document

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Executive Summary

The New Zealand National Emergency Management Agency seeks to develop a civil defence notification app to alert the New Zealand public of possible threats. The app needs to be able to meet the requirements of all stakeholders including NEMA, the NZ public, regional councils, and emergency services. The app seeks to address the weaknesses of current systems. The app must first determine the threat's risk level, then distribute an appropriate alert to the NZ public containing information on the threat and any required instructions. The user should also be able to report their safety status, alerting emergency services to their location if needed. The app should be easy to use, available in multiple languages, and provide support for infirmity and disability. Finally, the app must store user data under the NZ Privacy Act 2020, be available 24/7, and should be available on all smartphones from the top 3 brands, as well as be fast and reliable.

Introduction and Background

Natural disasters have the potential to cause large-scale destruction and loss of life. New Zealand is vulnerable to many types of natural disasters including volcanic eruptions, lahars, earthquakes, tsunamis, bushfires, floods, as well as severe weather. Due to this, having an effective and reliable method for quickly alerting people of any identified threats is crucial to ensuring the safety of the NZ public.

Currently, The New Zealand National Emergency Management Agency (NEMA) uses a multi-channel approach to alerting the public about emergencies (National Emergency Management Agency, n.d.). This involves warnings and alerts being sent to radio stations, television, websites, and social media, as well as the use of physical sirens. This current system suffers from a delay in communication as NEMA doesn't directly send these alerts to the public but rather they rely on other parties, such as news agencies, to relay the message. This system also relies heavily on the public coming across the alert on television or social media, rather than having the alert directly sent to them.

The New Zealand National Emergency Management Agency (NEMA) has proposed a new system, the Civil Defence Notification (CDN) project. The CDN project involves the development of a smartphone application that is capable of alerting all of New Zealand to civil defence emergencies. The app will be useful to the public as it will provide information on the threat, as well as important instructions on how people should respond to protect themselves, helping to ensure their safety. It also aims to address the weaknesses of currently available services to provide a more effective, reliable, and useful tool for alerting, informing, and protecting the New Zealand public. By not relying on external agencies to relay the alerts, NEMA hopes that emergency response times will be improved and that people will be far less likely to miss an alert.

Customer Value Proposition

The Civil Defence Notification app will provide real-time alerts and instructions about impending natural disasters straight to the user's smartphone, ensuring every member of the New Zealand public is kept safe.

Stakeholder Analysis

There are many concerned stakeholders for the CDN app. A stakeholder is anyone who may be affected by the CDN app or anyone who has an interest in it. For the CDN app, the stakeholders are the NZ public, NEMA, regional councils, and emergency services. Each stakeholder's power and interest in the project can be seen in Figure 1.

The New Zealand public are the targeted users of the CDN app. The NZ public consists of anyone currently within New Zealand, this includes both residents and international visitors. They have low influence over how the app is developed as they are not involved in the development process and do not have the power to directly influence decisions. Due to this, they also have low interest in the app. Therefore, the NZ public can be ignored during day-to-day operations and no special effort needs to take place to keep them informed (Paul et al., 2014).

NEMA is the owner and sponsor of the CDN mobile app. NEMA is a government agency that aims to reduce risks, improve readiness, and aid in the response to emergencies within New Zealand (National Emergency Management Agency, n.d.). NEMA has very high power over the CDN app as they are the owners and are funding the project. This means that NEMA has complete power over decisions relating to the CDP mobile app and how it is developed. As they are funding the project, they also have a high interest in it. Due to this, NEMA needs to be managed very closely and kept involved during all stages of the project (Paul et al., 2014).

Another stakeholder is the regional councils around New Zealand. Regional councils are local government bodies that are responsible for the wellbeing of their region. One of these responsibilities is emergency management and civil defence preparedness and therefore the CDN mobile app is of significant interest to them (Department of Internal Affairs, n.d.). They are considered a 'regulator' as they require the project to fall within their rules and regulations regarding local emergency response plans. They have some power over the decision-making process as the project needs to align with any local response plans but they are not funding the project in any way so do not have the final say on decisions. Due to their high interest in the project, more frequent communication is required to keep them well informed.

The last stakeholder is the emergency services. Emergency services consist of police, firefighters, paramedics and other hospital staff, and the civil defence force. This group has low influence over decisions made regarding the project as they are not financially involved.

However, they do have some interest in the project as it could have a significant impact on their role in response to civil defence emergencies. Emergency services need to be kept well informed so that they can do their jobs in line with the notifications sent by the CDN mobile app.

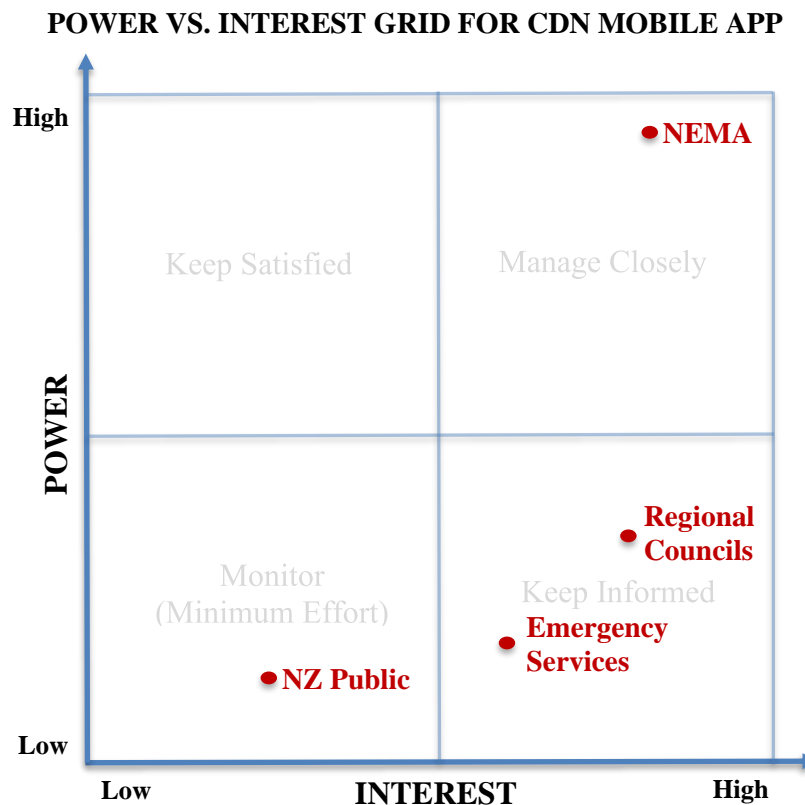


Figure 1: Power vs. Interest Grid for CDN Mobile App

Collection of Requirements

To gather the requirements of the NZ public, online questionnaires will be used. This is the most appropriate method as it is the most effective at gathering the requirements of a very large group of people due to its ease of distribution (Paul et al., 2014). As the NZ public is made up of several subgroups, such as international visitors, online questionnaires will better enable their concerns to be heard as they can be easily distributed to target them. For example, the questionnaire could be advertised at international embassies, airports, or popular tourist locations, to gain the attention and participation of international visitors.

The requirements of NEMA will be collected using one-on-one interviews with managers. This method is most appropriate as NEMA is a relatively small stakeholder group and has very high influence and interest in the project. Due to this, their concerns must be heard and well understood. Using interviews will help establish a closer relationship with this stakeholder and make them feel highly valued and involved (Paul et al., 2014).

Small workshops will be held with councillors to gather the requirements of the regional councils. This stakeholder group is reasonably large and therefore small workshops of 5-10 people in various regions will be an effective method for gathering their requirements. As regional councils have high interest, this will help them feel more involved and valued in the project.

The requirements of the emergency services will be collected through workshops consisting of 15-20 members in multiple locations around the country. These workshops will use brainstorming and breakout group techniques to facilitate communication and collaboration. This method will be useful as it is useful for gaining a more complete view of the requirements and is less time-consuming than one-on-one interviews (Paul et al., 2014). This method will also help to gain the acceptance of the emergency services which is significant for the project's success (Paul et al., 2014).

Analysis of Current Systems

At present, various applications attempt to alert the public of civil defence threats but they do express clear limitations and weaknesses. An example of a current app being used is Alpher's Tsunami Ready app (Alpher, n.d.). This free app is a learning tool to help the public be prepared in the event of a tsunami. The app uses GPS technology to display a route from a person's current location to the nearest safe zone. However, the app does not alert the user of potential tsunamis, it is simply a learning tool. The greatest limitation of this app is that it is only relevant to tsunamis and only supports the greater Wellington region. Another app currently available is The Red Cross's Hazard App (New Zealand Red Cross, n.d.). This app allows the user to receive alerts about civil defence threats in New Zealand based on the user's specified location. The app also provides information on how to prepare for various threats in New Zealand. One of the key features of the app is that it allows you to send a safety report to friends and family, letting them know if you are safe or not. The app, however, is limited to only a small number of locations around NZ and has very little support for smaller towns.

The CDN mobile app will improve upon these apps. The CDN app will provide alerts to all regions in New Zealand and will support all civil defence threats. The CDN app will make use of the Hazard App's safety message system and Tsunami Ready's GPS, allowing users to report their safety status, alerting emergency services and sending them the users exact GPS location if assistance is required.

Functional Models

Activity diagrams show the activities performed by a system, relative to the actors involved. As shown by Figure 2, for the CDN mobile app, NEMA first receives the notification of a civil defence threat. NEMA then determines the risk level of the threat as either high or low risk depending on its potential for harm. If the threat is determined to be low risk, NEMA sends out a warning to the NZ public, making them aware of the threat. If the risk is determined to be high, NEMA produces instructions such as evacuation procedures, and then sends this to the NZ public in the form of an alert. The NZ public can then report if they are safe or not safe. If they report as being safe, no further actions are needed. If they report as being not safe, emergency services are alerted to their location.

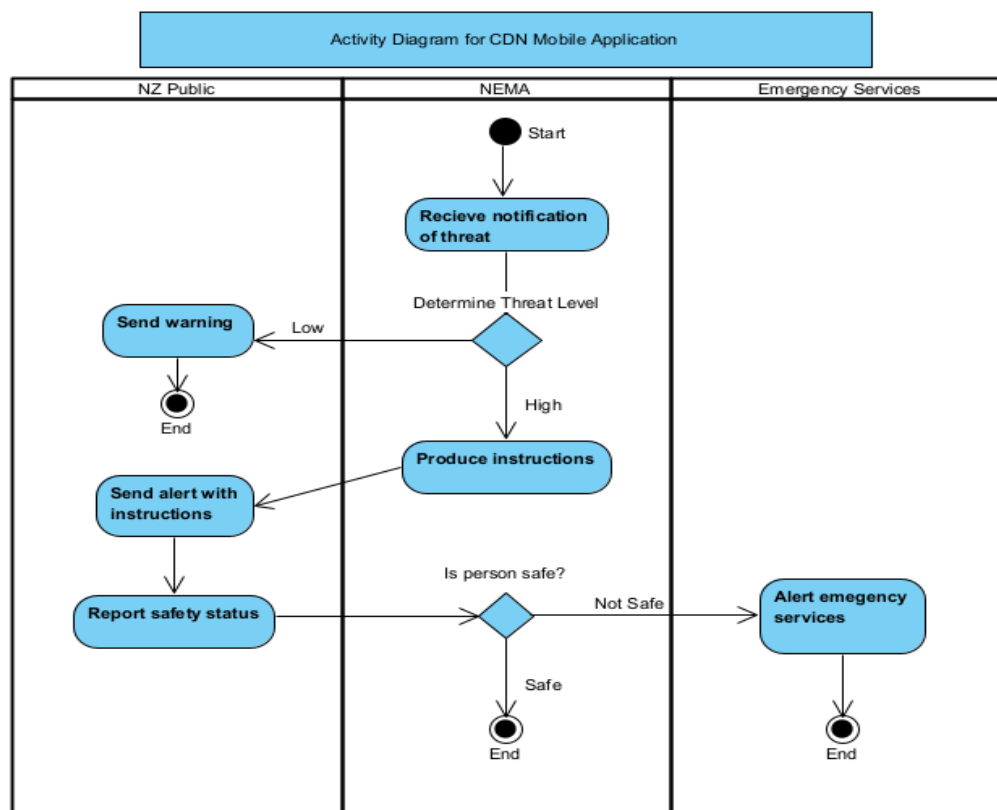


Figure 2: UML Activity Diagram for CDN Mobile App

A use-case model shows the interactions between the different actors of a system. A use-case model for the CDN mobile app is shown in Figure 3. The NZ public, consisting of anyone currently within New Zealand, can create an account where important contact details such as their name and phone number. NEMA can set the risk level of any civil defence threats. The NZ public can receive an alert sent by NEMA, containing important instructions and information. The NZ public is also able to report their safety status as either ‘safe’ or ‘not safe’. If a member of the NZ public reports themselves as not safe, emergency services can receive a request for assistance and can then respond accordingly.

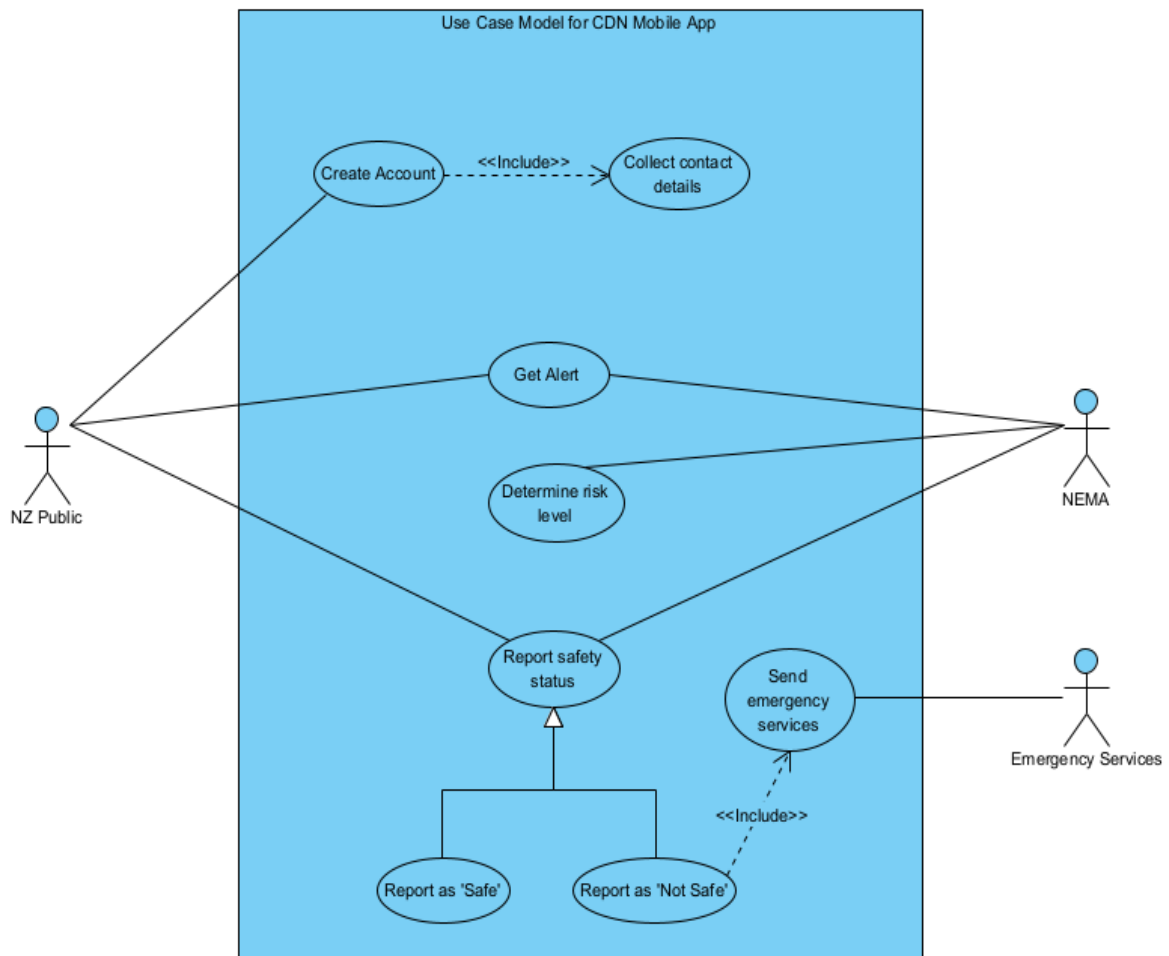


Figure 3: Use-Case Diagram for CDN Mobile Application

Requirements Catalogue

Requirements show what is needed from a system by the stakeholders and are separated into four categories, as seen in Table 1. A list of requirements for the CDN mobile app can be seen in Table 2 and a requirements catalogue entry example can be seen in Table 3.

Table 1: Requirement Types and Descriptions

TYPE	DESCRIPTION
GENERAL	General requirements define the standards, needs, and policies of the project. This includes things like budget, resources, timescale, legal requirements, and language requirements (Paul et al., 2014).
TECHNICAL	Technical requirements refer to technical policies and constraints, for example the hardware, software, and internet requirements, as well as requirements relating to the interoperability of the system (Paul et al., 2014).
FUNCTIONAL	Functional requirements outline what features the system is required to have (Paul et al., 2014). An example of these sorts of requirements is data entry and maintenance requirements or retrieval requirements.
NON-FUNCTIONAL	Non-functional requirements relate to how well the system operates. For example, performance speed, level of security, and system maintenance (Paul et al., 2014).

Table 2: Requirements for CDN Mobile App

TYPE	REQUIREMENT
Functional	The app needs to retrieve an alert, including the risk level and any information or instructions from NEMA
Functional	The app needs to be able to send an alert to the NZ public, alerting them of civil defence threats via smartphone with information about it and relevant safety instructions depending on the threat level
Functional	The app needs to be able to alert emergency services when a member of the NZ public needs assistance, sending their GPS location to the emergency services
Functional	The app needs to allow users to create accounts, storing their contact information
General	The app needs to be available in the five most common languages in New Zealand e.g., English, Chinese, German, etc.
General	The app needs to store and use data as per the NZ Privacy Act 2020
General	The app needs to have 'NEMA' branding to improve trust and ensure credibility
General	The app needs to be developed within NEMA's budget and timeframe
Non-Functional	The app needs to be easily usable
Non-Functional	The app needs to be accessible 24/7
Non-Functional	The app needs to be fast and reliable
Non-Functional	The app needs to be able to cover all NZ regions and be capable of handling every member of the NZ public
Non-Functional	The app needs to provide support for infirmity and disability e.g., poor eyesight
Technical	The app needs to support all smartphones from at least the top 3 mobile phone brands in New Zealand

Table 3: Requirements Catalogue Entry Example

<u>REQUIREMENTS CATALOGUE ENTRY</u>			
Project Name: CDN Mobile Application			
Author: J. Bloggs	Date: 31/05/2021	Version: 0.1	Status: In development
Requirement ID	F-001v0.1		
Requirement Name	Send Alert		
Source	NEMA		
Priority	M (Must)		
Type of Requirement	Functional		
Description	The app needs to be able to send an alert to the NZ public, alerting them of civil defence threats via smartphone with information about it and relevant safety instructions		
Associated non-functional requirements	NF-001: App Capabilities		
Acceptance criteria	A user must receive an alert containing relevant information and instructions		
Justification	Functional requirement. The main function of the app.		
Comments	N/A		
Related Documents	N/A		
Resolution	To be implemented in phase 1		

To validate the app's requirements, a review group needs to be established. This group will consist of representatives from NEMA, regional councils, and emergency services, as well as the app developers and testers. It is important to include developers and testers in the validation phase as they will confirm if the requirements are technically possible and testable (Paul et al., 2014). The NZ public won't be included as they have very low interest and power over any decisions and selecting representatives from such a large group is not feasible. The requirements document will be sent to these representatives to be reviewed and signed off on. If changes are required, the changes will be made and then signed off by the relevant representatives.

Functional requirements will be prioritised using the MoSCoW technique. The MoSCoW technique is made up of four levels: M – must have, S – should have, C – could have, and W – won’t have (Hudaib et al., 2018). ‘Must have’ requirements are the crucial requirements the app must have to function. ‘Should have’ requirements are important but not vital to the app’s operations. ‘Could have’ requirements are nice to have but are not necessary. Lastly, ‘won’t have’ requirements provide very little value, if any, to the project and do not need to be implemented (Hudaib et al., 2018).

Conclusion

New Zealand faces the possibility of many different civil defence threats, necessitating a robust and reliable safety system. New Zealand’s current emergency alert system relies too heavily on external agencies to relay messages, making it slow and ineffective. The proposed CDN mobile app seeks to improve upon the current system, drawing on the safety report system and GPS technology currently being used by The Red Cross’s Hazard App and Alphero’s Tsunami Ready app, respectively. The app also aims to meet the requirements of all interested stakeholders by carefully gathering and analysing their needs. It is hoped that the proposed app will help to secure the safety of every member of the NZ public, ensuring they are well-informed and prepared.

Glossary of Terms

Term	Description
NEMA	National Emergency Management Agency. Responsive for providing support regarding emergencies
Stakeholder	An individual or group with interest in the project who can affect or be affected by the project
CDN	Civil Defence Notification
GPS	Global Positioning System
Interoperability	The ability of a system to use and exchange data with other systems
Civil Defence Threats	Anything that threatens public safety such as natural disasters

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