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System Analysis of the URI Hurricane Preparedness Plan

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Executive Summary

The objective of the system analysis was to uncover improvements that could be made to the current hurricane preparedness planning system. The study was conducted through a series of interviews with disaster planning personnel. The results of the study uncovered several key weaknesses of the current system. The plan system is physically located in only one location. The burden of creating maintaining and improving the plan relies solely in the hands of one person and his staff. Several important elements of a solid disaster plan are missing from the current composition. These issues are outlined and addressed in the system proposal that follows.

The recommendation that follows this study is the relocation of the plan to a collaborative online environment. This can be achieved either through free online services or extensive disaster specific systems developed expressly for disaster planning for large organizations. The ability to effectively manage a disaster would be greatly improved by an all inclusive information system instead of the current collection of various written documents. These recommendations are made in order to improve the viability and capability of the plan to be executed successfully in the event of a destructive storm.

Outline of Systems Study

The URI Hurricane Planning information system has been studied through interviews with emergency facilitators and planning experts along with supplemental material on planning for a hurricane. The primary source of data was J. Kevin Culley Director of Safety and Risk Management at the University of Rhode Island. Kevin Culley was interviewed on Feb 7 and April 3, 2008 about the details of the plan, the people involved and where he got the information he needed to carry it out. The police for both URI and South Kingstown were also interviewed (March 6, and March 13, 2008, respectively) as to their role in an evacuation situation. Another key interviewee was Richard Horowitz (interviewed March 7, 2008) who is well known in his field as being an expert in disaster preparation. The supplementary materials were provided through the South Kingstown Police's Hurricane Preparedness Binder.

The documents examined consisted of evacuation routes, mapped out shelter facilities, news articles about past storms and preparing for storms, as well as numerous pamphlets from Rhode Island Emergency Management Agency (REMA), Federal Emergency Management Agency (FEMA) and the Red Cross. These documents provided copious resources for preparing for a disaster at both the individual and town level.

The breadth of information gathered during the interview process was highly instrumental in understanding how information flows throughout the Disaster Planning Process. The supplementary material also helped framed how complex a well-formed Disaster Plan needs to be written.

An analysis of the current system was conducted. See the diagram on Current Plan of Action page 10, as well as the Data Flow Diagram of URI's Disaster Plan on page 12.

System Specifics

Project Name:

System Analysis of the URI Hurricane Preparedness Plan

Project Sponsors:

Judith Swift, Professor Theater & Communication Studies, Associate Director of URI Coastal Institute
Paul Mangiamelli, Professor of Management of Information Systems
J. Kevin Culley, Director of Safety and Risk at the University of Rhode Island

Business Need:

The reality of the current global condition is that the temperature of the Oceans has risen. This rise in temperature has lead to an increase in the frequency and intensity of Tropical Depressions. This means that coastal areas need to accept the reality that they may be hit by a storm that causes millions of dollars in damage and loss of lives. Reducing this toll on life is best achieved by having a solid plan of action for dealing with an impending storm. The University of Rhode Island is responsible for the lives of thousands of students, faculty and staff. Therefore, the need for an effective and well executed plan in the case of an impending hurricane is of vital importance.

The current system doesn't allow for sufficient collaboration. Different versions exist in many different places and are not available to all the people who need to access it. The successful execution of the plan requires that the people in charge have access to it and are allowed to add input and correct discrepancies. Relying on e-mails, meeting notes and loose documents in the future will cause plans to be discarded and unreliable in a real emergency.

Functionality:

The purpose of the new information system will be to enhance the functionality of the current plan as well as improve accessibility. The system will include a collaborative document website accounts such as Google Docs which will contain all elements of the plan as well as being password protected. The site will contain the necessary documents that outline the improvements that need to be made to the current system. Four system options were evaluated based on their ability to handle improvements to the planning process in the future.

Results of the Current System Study

The current system is lacking the collaborative nature that is necessary in a plan that deals with thousands of people across many different departments and functions. There are many different scenarios in which the system could easily deteriorate in its current state. The plan relies on 48 hours notice of a storm hitting and is highly dependent on numerous meetings instead of pre-planned decisions. While the Emergency Alert System is a huge asset to the ability to orchestrate the plan, it is not usable until messages have been formulated from meetings. Having a location where all these elements where predefined and ready to initiate would greatly improve the success of the plan.

Strengths:

The current planning system still has many strengths that should not be ignored. There is a specific timetable for preparations and meetings. The plan instructions can be easily communicated to the University through the website and the Emergency Alert System. Authority figures are given sufficient control over the execution of the plan. The plan is regional and addresses how the surrounding communities interact with URI during a disaster situation. It is flexible and constantly changing to address new issues that are brought to the attention of those in charge. The planning system allows for the changes caused by external organizations that may come in to take control of certain areas. The plan addresses the reality of many different organizations interacting with URI during a disaster situation including the Red Cross, Rhode Island Emergency Management agency and the Rhode Island Disaster Animal Response Team. Most importantly the planning system is constructed in such a way that it can be improved without needing to start from scratch.

Weaknesses:

There are also several serious flaws with the current planning system that need to be addressed. The prewritten plan resides on one person's hard drive. The person who is to execute the plan, namely URI's Vice President Robert Weygand, isn't involved in the planning system at all until he assumes authority. The planning system does not adequately address a way to deal with traffic, phone failure, or less than 24 hours notice of an impending storm.

There are several assumptions that the planners have made that should be considered best case scenarios instead of primary scenarios. The most critical assumption is that should a hurricane be projected to hit URI, officials would have "at least 48 hours notice." The crucial reason this cannot be a primary assumption is that weather officials often have no way of knowing whether a storm is going to hit the Northeast until approximately 24 hours before the eye hits. It would be irresponsible to act on the first 24 hours of the 48 hour plan every time a tropical depression appeared in the Atlantic. It isn't economically feasible to truly start executing a plan until the Governor or President has declared an emergency. This is because preparing for an impending storm is costly and people will be less likely to respond in a real disaster if there have been many false alarms. A more realistic 18 to 24 hour plan should be developed.

The other critical assumption is that *most* of URI's population will be successfully evacuated before the storm hits. A huge influx of people from the community will be traveling north and west to be clear of flood zones. A large majority of people on campus who are being sent home are going to be traveling against or with these masses of evacuating vehicles. The fact that one of the state's emergency shelters is the URI Athletic complex means that masses of people will be trying to leave and come to the University at the same time. It is not realistic to assume that the majority of people will have a safe evacuation location to which they may successfully reach. Instead of relying on this assumption, officials should plan on accommodating a larger number of the URI Community during the height of the storm.

Issues that need to be addressed:

- The plan is only accessible through one person
- Traffic is not adequately addressed
- Insufficient resources such as food and gas are not addressed
- Communication channels for facilitators should be pre-arranged
- All people involved in executing the plan should have access to it ahead of time
- Students and Faculty should be aware of the need to create their own personal plans
- Emergency Alert Instructions are not pre-written
- Communication with State and Town Police is currently non-existent.

System Analyst's Recommendations

As a result of the weaknesses that have been uncovered, there are several key recommendations that could greatly improve the current planning system. The plan should be uploaded to an Internet Collaboration site that requires a password, allows for different privileges and can be accessed by any computer with an internet connection. This could be done with the current leader in collaboration with software such as Google Docs. This service is free, very reliable and easy to use. The planning document should be uploaded to one person's account and then shared with all people who are involved in the planning process. Different write privileges can be set so only certain authorities control the content. The following Items should be included on this site:

Collaboration Site Documents:

- The plan as it is now
- Phone Numbers
- Phone Tree that establishes control over the flow of instructions
- Lists of emergency equipment that needs to be tested
- Instructions for facility and maintenance workers in charge of securing buildings
- Maps of evacuation routes
- Decision Tree (A set of instructions that follows a hierarchal structure of who decides what)

- List of people who own radios, their channels and instructions for communicating with them
- Contingency Plans for loss of telephone communication and other major utility failures
- Prearranged compensation chart for employees who continue to work through disaster
- Instructions for each department involved in facilitation for example:
    - State Vehicles
    - Housing Directors
    - Dining Services
    - Facilities
    - Police
    - Communications
    - Utility workers
    - Risk Management workers
    - Volunteer Workers

Additionally a Survey should be sent to students and faculty that asks at least the following two important questions: Where do you plan to stay in the event of a hurricane? How do you plan to get there? This information could help planners determine the number of students and faculty who may need shelter at the University during a storm. This information could also help planners determine how to stagger the evacuation to lessen the strain on major intersections and roads.

After more people have been given access to and input in the planning process, the planning system should be tested. This could be done by one day of simulation training where a theoretical storm would hit in 24 hours. A simulation is the best way to expose the remaining weaknesses in the plan. It also helps reinforce to those in charge what needs to be done.

Communication channels need to be set up ahead of time. An emergency call center to accommodate the influx of phone calls to the university needs to have location, phone lines and phones ready to set up in less than 1 hours notice. Conference calling between campus authorities in charge of emergency evacuation decisions needs to be prearranged and available without the aid of communications staff. A set up so only staff and supervisors are contacted initially through Emergency Alert should also be arranged.

Benefits of Information System

An implementation of a web-enabled planning system will address many of the issues of the current plan as well as provide resources for developing plans. Benefits of an improved system are numerous and include:

a) An all-inclusive system that provides the building blocks necessary for creating a sustainable and reliable plan.

b) The ability to create a more extensive collection of needed actions which will reduce execution time in the event of a disaster.

c) A reliable medium for which to store information. This will reduce the strain of technology failure and make the plan accessible to more people.

d) Reduced reliance on spur of the moment contingency plans. A system that predefines plans of action and provides a place to store these instructions will help reduce mistakes and poor decision making in panic situations.

e) Reduced strain on emergency planning staff by allowing collaboration across multiple departments.

Economic Feasibility Analysis

The planning administrators have several options for implementing a disaster planning information system.

1) Do nothing, leave planning system as-is
2) Use Google Docs to make current plan more collaborative and make all improvements in house
3) Buy a Plan Creation Software package from a third party planning information system company
4) Hire a company to come in and do a university wide evaluation and system implementation specifically tailored to the University of Rhode Island

I. System #1

The planning system will remain where it is with no significant changes. The planning document itself will continue to be the primary responsibility of J. Kevin Culley and his staff. There will be no additional cost to the University for the planning system to remain how it is. There is still financial risk however due to the chance that in a real disaster significant financial loss could result from lack of adequate planning.

II. System #2

Google Docs is a free online service that could serve as a disaster planning hub. Using this software is no additional cost to the University nor will it take extensive time to create. In order to fully implement all the changes that need to be made, however, it will need to be continuously updated and developed by URI personnel. This system does not take into consideration the expertise of a third party or tailor made service from experts. All elements of the plan would be the responsibility of planning staff as well as department supervisors in charge of contingency planning.

III. System #3

Third party software that specializes in disaster planning for large organizations is available online. After much research of the different packages available, Kingsbridge Disaster Recovery software seems best suited to the needs of the University of Rhode Island. Twenty two Colleges and Universities already use this package including Vanderbilt University and Portland State University. This software has an excellent foundation for developing a stellar plan. This service would also create an online collaboration environment. Much of the research on proven planning techniques is built into the system. This service also provides training seminars and consulting services for developing a organization specific system.

The initial cost of the system is $2,351 for the small business edition and consulting and training would add additional cost. Implementing this system would also be time consuming and costly to planning staff due to the breadth of material involved in creating a plan with this software. The fact that the planning software adds "25 years of business continuity planning experience" (disasterrecovery.com) means that it could greatly reduce disaster recovery costs following a storm. This option would develop a plan that is proven to work for other Universities.

IV. System #4

A tailor-made system developed by planning experts would provide the most reliable and effective planning system of any of the four options. This option would be specifically created for the University of Rhode Island, therefore fitting the needs that are specific to the university. This would also be the most costly system to implement due to the level of customization and development costs. This option would remove some of the burden of disaster planning from URI's current planning staff. The company that is hired would be responsible for evaluating the Universities need and creating a sustainable planning system.

Operational Feasibility Analysis

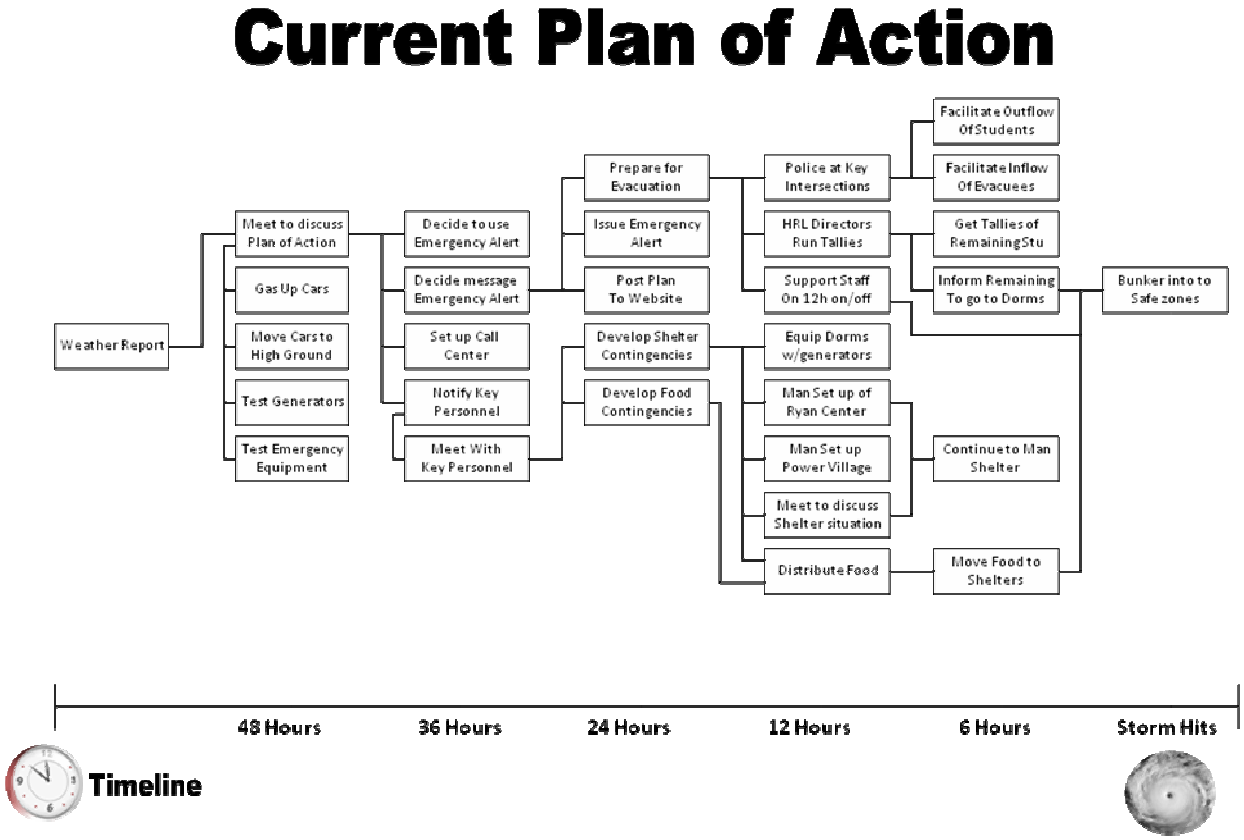
The most important element for a disaster planning system is usability. If the system is too complicated and difficult to understand, the full benefits of the system are completely lost. It has to be user friendly and improve the ability to create plans. The University of Rhode Island is responsible for creating a plan that will reduce the loss of life and damage in the event of a destructive storm. Implementing an improved disaster planning system is the most conscientious way to address this need. A new system will offer the following improvements:

- An environment where more people can be involved in the decision making process
- A secure and universal location for the plan to reside
- A user-friendly system that provides greater organization
- Greater capacity to handle extensive contingency plans
- A system that the university can trust

Technical Feasibility Analysis

Technology for reliably sharing and storing information is readily available on the market today. Thanks to the widespread availability of the Internet, data can be accessed from multiple locations. Information that sits on servers available to multiple computers reduces risk of one computer failure bringing down the whole system. The majority of people on campus that need to have access to the plan have access to the internet through their own computers and machines available throughout the university. Listed below are technical components of a new planning information system:

- A universal and secure location for the plan to reside
- The ability to integrate many components in one place that can be searched and retrieved quickly
- Ease of spreading the necessary material without message deterioration caused by multiple mediums
- Back-up services and data recovery more available and effective than paper storage



URI's Current Disaster Preparedness Plan

Notification

The first stage of the plan involves who notifies the Risk Management Agency (RMA) of a potential problem. In an electrical, flood or fire problem the RMA officials first step is determining the location that the problem originated and to get as much up to date information on the situation as possible. They ask three important questions: Who first noticed a problem, how widespread is it, and what caused it.

An example of this process is a power and network outage experienced about two weeks before school began. Safety and Risk received a call from the network command center that a large section of campus had loss of internet. Shortly after that they learned that several of the Academic buildings did not have power. They knew the problem was legitimate because it was reported by the command center. They determined the scope of the outage from the problems reported and by asking maintenance staff to check all buildings. The source of the problem became the major issue in question. There was no physical damage to any of the buildings in the area and the only weather issue was a fresh snow. Through network monitoring software they discovered the first place to lose internet connectivity was Lippitt. Then they also determined that Lippitt was the first place to lose power. The source of the problem appeared to have been accidental damage caused by construction. With that

information they were able to repair the source of the issue and get campus back up and running.

In a weather situation URI's first source of information is the news. Weather monitoring is a regular part of the daily routine at Safety and Risk. It takes 48 hours to successfully prepare for an impending hurricane of large proportions. Planning officials begin acting the minute they get news of any disturbance that could develop into a hurricane that travels up the East Coast.

First Steps

If planning officials get weather reports of an impending storm the first thing they do is notify all drivers of state vehicles on campus. They are directed to gas up and move to uphill to areas that are not prone to flooding. Weather watching becomes their top priority. Two way and battery operated Radios are tested. The next steps are to make sure the backup generators have enough gas and are in a location that they are less likely to be damaged. They have a meeting to discuss whether or not the impending disaster should warrant using the alert system. Full time staff members are put on a 12 hour on 12 hour off schedule and asked to work through the duration of the storm. If the disaster is serious they only expect about one fifth of staff will actually show up to work.

Escape

The emergency facilitators usually wait until the weather stations are reporting major warnings. At this point they activate the emergency alert system and encourage all students and faculty to leave. They contact health and disability services and make sure that all disabled people have the accommodations they need to evacuate. These students are their top priority. Police officials take over control of the major intersections to facilitate the evacuation. Officials are not too concerned about traffic congestion. The data they have on the time it will take to evacuate campus is based on sporting events that fill campus and let out at approximately the same time.

Shelter

The athletic complex is prepped for people from the surrounding communities. The weather proof dorms are prepped for students and staff. The Dining services are asked to move all food that does not require preparation into weather safe locations that can be accessed directly following the storm. Currently shelter planners do not know how many people to expect to need emergency shelter or how many people can fit in the fortified sections of the emergency shelter buildings. This is one piece of information that is still needed.

Strategic Agreements

The Red Cross plans to set up and operate an emergency village following the storm in the Athletic Complex. National Grid is also setting up an emergency village on campus to facilitate bringing power back to the rest of South County. They have arangments with URI that URI's power will be turned back on first for allowing them this location.

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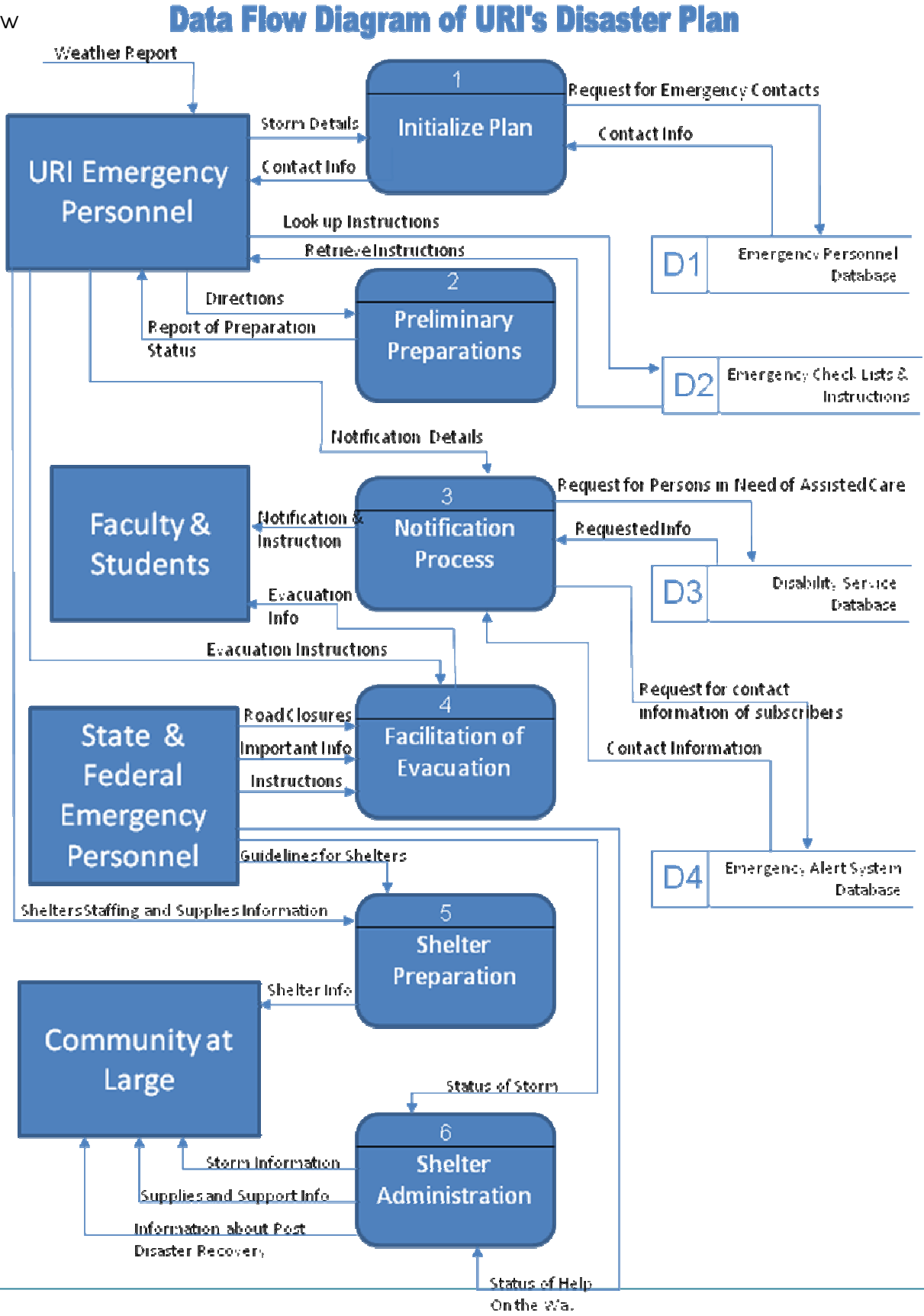
Data Flow Diagram of URI's Disaster Plan
Weather Report
URI Emergency Personnel
1
Initialize Plan
Storm Details
Contact Info
Request for Emergency Contacts
Contact Info
Look up Instructions
Retrieve Instructions
D1
Emergency Personnel Database
2
Preliminary Preparations
Directions
Report of Preparation Status
D2
Emergency Check Lists & Instructions
Notification Details
Faculty & Students
3
Notification Process
Notification & Instruction
Request for Persons in Need of Assisted Care
Requested Info
D3
Disability Service Database
Evacuation Info
Evacuation Instructions
Request for contact information of subscribers
Contact Information
State & Federal Emergency Personnel
4
Facilitation of Evacuation
Road Closures
Important Info
Instructions
Guidelines for Shelters
D4
Emergency Alert System Database
Shelters Staffing and Supplies Information
5
Shelter Preparation
Shelter Info
Community at Large
Status of Storm
6
Shelter Administration
Storm Information
Supplies and Support Info
Information about Post Disaster Recovery
Status of Help On the Wa.